

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

API 47-095-02378 County Tyler District Centerville
Quad Middlebourne 7.5' Pad Name Vera Pad Field/Pool Name -----
Farm name Vera O. Thomas Well Number Emerger 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 4363972m Easting 508278m
Landing Point of Curve Northing 4364038.53m Easting 508649.70m
Bottom Hole Northing 4361618m Easting 509547m

Elevation (ft) 1148.1' 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 10/27/2016 Date drilling commenced 3/22/2017 Date drilling ceased 8/15/2017
Date completion activities began 1/26/2018 Date completion activities ceased 6/27/2018
Verbal plugging (Y/N) N/A Date permission granted N/A Granted by N/A RECEIVED
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Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug **FEB 13 2019**

Freshwater depth(s) ft 65', 215', 261', 399' Open mine(s) (Y/N) depths No
Salt water depth(s) ft 620', 1614', 1974' Void(s) encountered (Y/N) depths No
Coal depth(s) ft 620', 879' Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) No

Reviewed

Reviewed by:
JEB
12/21/2019

API 47-095 - 02376 Farm name Vera O. Thomas Well number Emerger Unit 2H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	24"	20"	95'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	713'	New	48#, H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2479'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	15610'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6877'		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	200 sx	15.6	1.18	120	0'	8 Hrs.
Surface	Class A	685 sx	15.6	1.18	826	0'	8 Hrs.
Coal							
Intermediate 1	Class A	928 sx	15.6	1.18	1181	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	740 sx (Lead) 1685 sx (Tail)	13.5 (Lead), 15.2 (Tail)	1.53 (Lead), 1.83 (Tail)		-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 15610' MD, 6581' TVD (BHL), 6596' (Deepest Point Drilled) Loggers TD (ft) 15610' MD
 Deepest formation penetrated Marcellus Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 5926'

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 _____

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WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

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WERE TRACERS USED Yes No TYPE OF TRACER(S) USED N/A

WV Department of Environmental Protection

API 47- 095 - 02376 Farm name Vera O. Thomas Well number Emerger Unit 2H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
<u>Marcellus</u>	<u>6565' (TOP)</u> TVD	<u>6939' (TOP)</u> 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 7495 mcfpd Oil 166 bpd NGL --- bpd Water 17 bpd GAS MEASURED BY Estimated Orifice Pilot

<u>LITHOLOGY/ FORMATION</u>	<u>TOP</u>		<u>BOTTOM</u>		<u>DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H₂S, ETC)</u>
	<u>DEPTH IN FT</u>	<u>DEPTH IN FT</u>	<u>DEPTH IN FT</u>	<u>DEPTH IN FT</u>	
	<u>NAME</u>	<u>TVD</u>	<u>MD</u>	<u>MD</u>	

***PLEASE SEE ATTACHED EXHIBIT 3**

Please insert additional pages as applicable.

Drilling Contractor Frontier Drilling LLC
Address 562 Spring Run Road City Pennsboro State WV Zip 26415

Logging Company Schlumberger
Address 5599 San Felipe Street City Houston State TX Zip 77056

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

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 2/8/2019

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

API 47-095-02378 Farm Name Vera O. Thomas Well Number Emerger Unit 2H

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	4/20/2018	15340	15509	60	Marcellus
2	4/21/2018	15141	15309	60	Marcellus
3	4/21/2018	14941	15109	60	Marcellus
4	4/22/2018	14742	14910	60	Marcellus
5	4/23/2018	14542	14710	60	Marcellus
6	4/23/2018	14342	14511	60	Marcellus
7	4/24/2018	14143	14311	60	Marcellus
8	4/24/2018	13943	14112	60	Marcellus
9	4/25/2018	13744	13912	60	Marcellus
10	4/25/2018	13544	13712	60	Marcellus
11	4/26/2018	13345	13513	60	Marcellus
12	4/26/2018	13145	13313	60	Marcellus
13	4/27/2018	12945	13114	60	Marcellus
14	4/28/2018	12746	12914	60	Marcellus
15	4/28/2018	12546	12715	60	Marcellus
16	4/29/2018	12347	12515	60	Marcellus
17	4/29/2018	12147	12316	60	Marcellus
18	4/30/2018	11948	12116	60	Marcellus
19	4/30/2018	11748	11916	60	Marcellus
20	5/1/2018	11549	11717	60	Marcellus
21	5/1/2018	11349	11517	60	Marcellus
22	5/2/2018	11149	11318	60	Marcellus
23	5/2/2018	10950	11118	60	Marcellus
24	5/3/2018	10750	10919	60	Marcellus
25	5/3/2018	10551	10719	60	Marcellus
26	5/4/2018	10351	10520	60	Marcellus
27	5/4/2018	10152	10320	60	Marcellus
28	5/5/2018	9952	10120	60	Marcellus
29	5/5/2018	9753	9921	60	Marcellus
30	5/6/2018	9553	9721	60	Marcellus
31	5/6/2018	9353	9522	60	Marcellus
32	5/7/2018	9154	9322	60	Marcellus
33	5/7/2018	8954	9123	60	Marcellus
34	5/8/2018	8755	8923	60	Marcellus
35	5/8/2018	8555	8723	60	Marcellus
36	5/9/2018	8356	8524	60	Marcellus
37	5/9/2018	8156	8324	60	Marcellus
38	5/10/2018	7956	8125	60	Marcellus
39	5/10/2018	7757	7925	60	Marcellus
40	5/11/2018	7557	7726	60	Marcellus
41	5/11/2018	7358	7526	60	Marcellus
42	5/12/2018	7158	7327	60	Marcellus
43	5/12/2018	6959	7127	60	Marcellus

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API 47-095-02378 Farm Name Vera O. Thomas Well Number Emerger Unit 2H

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	4/20/2018	76	7450	5258	3645	16353	4568	N/A
2	4/21/2018	76.9	7482	5887	3728	17097	8251	N/A
3	4/21/2018	74.4	7092	5119	3597	15808	8494	N/A
4	4/22/2018	75.1	7441	5806	3761	17008	9024	N/A
5	4/23/2018	72.2	7844	6306	3958	18108	9024	N/A
6	4/23/2018	53.7	7950	5732	3864	17546	8258	N/A
7	4/24/2018	74.1	7360	5462	4000	16822	8275	N/A
8	4/24/2018	76.3	7560	4973	3804	16337	8509	N/A
9	4/25/2018	76.1	7782	5629	3796	17207	8265	N/A
10	4/25/2018	74.2	7860	5542	3917	17319	8245	N/A
11	4/26/2018	77.4	7513	5410	3810	16733	8050	N/A
12	4/26/2018	75.2	7833	5657	4051	17541	8090	N/A
13	4/27/2018	69.2	7957	5691	4733	18381	8160	N/A
14	4/28/2018	69.2	7852	5484	4054	17390	8291	N/A
15	4/28/2018	72.3	7798	5372	3793	16963	8137	N/A
16	4/29/2018	75	7667	5363	3954	16984	8184	N/A
17	4/29/2018	65.8	7308	5735	3928	16971	10165	N/A
18	4/30/2018	73.6	7438	5481	3795	16714	9118	N/A
19	4/30/2018	75.1	7373	5456	3773	16602	8278	N/A
20	5/1/2018	77.5	7553	5602	3719	16874	8132.005	N/A
21	5/1/2018	73.9	7282	5767	4022	17071	8059	N/A
22	5/2/2018	75.6	7090	5422	4016	16528	12882	N/A
23	5/2/2018	73	7225	5892	3803	16920	7983	N/A
24	5/3/2018	76	7429	5740	5007	18176	8136	N/A
25	5/3/2018	74.7	7038	5343	3703	16084	8260	N/A
26	5/4/2018	74.3	6995	5837	3745	16577	7973	N/A
27	5/4/2018	75.3	7180	5871	3679	16730	9918	N/A
28	5/5/2018	78	6890	6196	3882	16968	8222	N/A
29	5/5/2018	77.3	6878	5569	3868	16315	8038	N/A
30	5/6/2018	75.8	6916	6096	3778	16790	7898	N/A
31	5/6/2018	75.1	6877	5909	3990	16776	8150	N/A
32	5/7/2018	77	6903	5851	4071	16825	7741	N/A
33	5/7/2018	74.7	7072	5786	3945	16803	7856	N/A
34	5/8/2018	77.4	6878	6069	3900	16847	8337	N/A
35	5/8/2018	76.5	6496	5493	3855	15844	8164	N/A
36	5/9/2018	77.6	6591	5917	3863	16371	7947	N/A
37	5/9/2018	75.4	7342	5812	4034	17188	9432	N/A
38	5/10/2018	76.8	6780	5658	4023	16461	8043	N/A
39	5/10/2018	76.8	6953	5912	4152	17017	7944	N/A
40	5/11/2018	77.5	6686	5750	4119	16555	8418	N/A
41	5/11/2018	78.2	6950	5673	3992	16615	7894	N/A
42	5/12/2018	68.9	7466	7623	4245	19334	9351	N/A
43	5/12/2018	77.4	6769	6576	4171	17516	7949	N/A
		74.5	7,274	5,738	3,943	729,069	360,113	N/A

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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
Sandstone	100	N/A	100	N/A
Sandy Siltstone	120	N/A	120	N/A
Sandy Shale	740	N/A	740	N/A
Calcareous Shale	880	N/A	880	N/A
Shaly Sandstone	920	N/A	920	N/A
Shaly Siltstone	1,020	N/A	1,020	N/A
Silty Shale	1,180	N/A	1,180	N/A
Sandstone	1,360	N/A	1,360	N/A
Sandy Shale	1,400	N/A	1,400	N/A
Shaly Sandstone	1,640	N/A	1,640	N/A
Silty Shale	1,700	N/A	1,700	N/A
Sandy Shale	1,780	N/A	1,780	N/A
Sandy Shale/Coal	1,920	N/A	1,920	N/A
Big Lime	2,007	N/A	2,008	N/A
Big Injun	2,177	N/A	2,179	N/A
Gantz Sand	2,613	N/A	2,614	N/A
Fifty Foot Sandstone	2,751	N/A	2,763	N/A
Gordon	2,858	N/A	2,860	N/A
Fifth Sandstone	3,036	N/A	3,037	N/A
Bayard	3,322	N/A	3,325	N/A
Warren	3,614	N/A	3,622	N/A
Speechley	4,003	N/A	4,024	N/A
Balltown	4,487	N/A	4,548	N/A
Bradford	4,686	N/A	4,768	N/A
Benson	4,916	N/A	5,022	N/A
Alexander	5,299	N/A	5,443	N/A
Rhinestreet	5,929	N/A	6,134	N/A
Sycamore	6,250	N/A	6,490	N/A
Middlesex	6,413	N/A	6,687	N/A
Burkett	6,507	N/A	6,816	N/A
Tully	6,533	N/A	6,863	N/A
Marcellus	6,565	N/A	6,939	N/A

*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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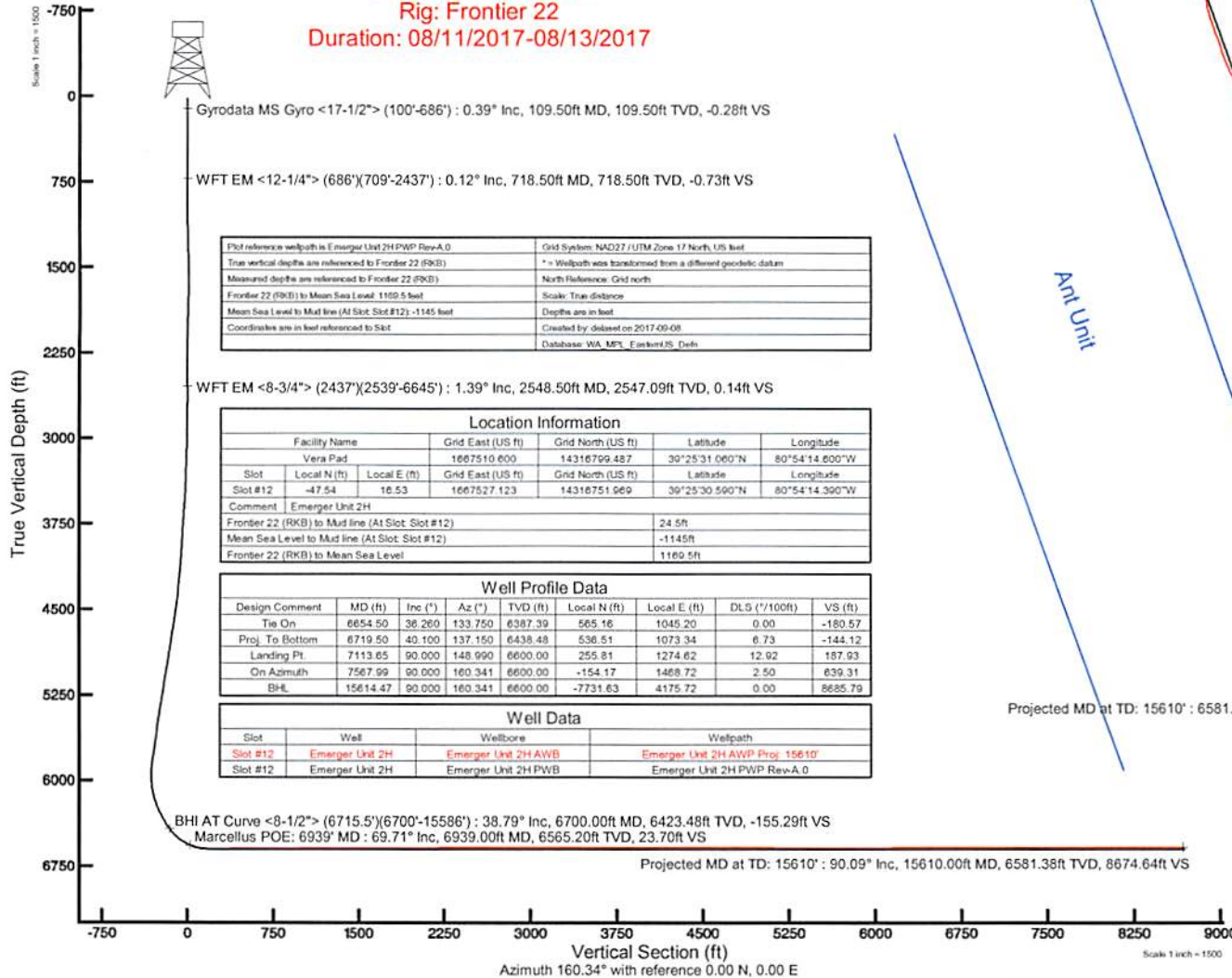
ANTERO RESOURCES CORPORATION

Location: Tyler County, WV
 Field: Tyler
 Facility: Vera Pad

Slot: Slot #12
 Well: Emerger Unit 2H
 Wellbore: Emerger Unit 2H PWB



API: 47-095-02378-0000
 BHI Job #: 8696636
 Rig: Frontier 22
 Duration: 08/11/2017-08/13/2017

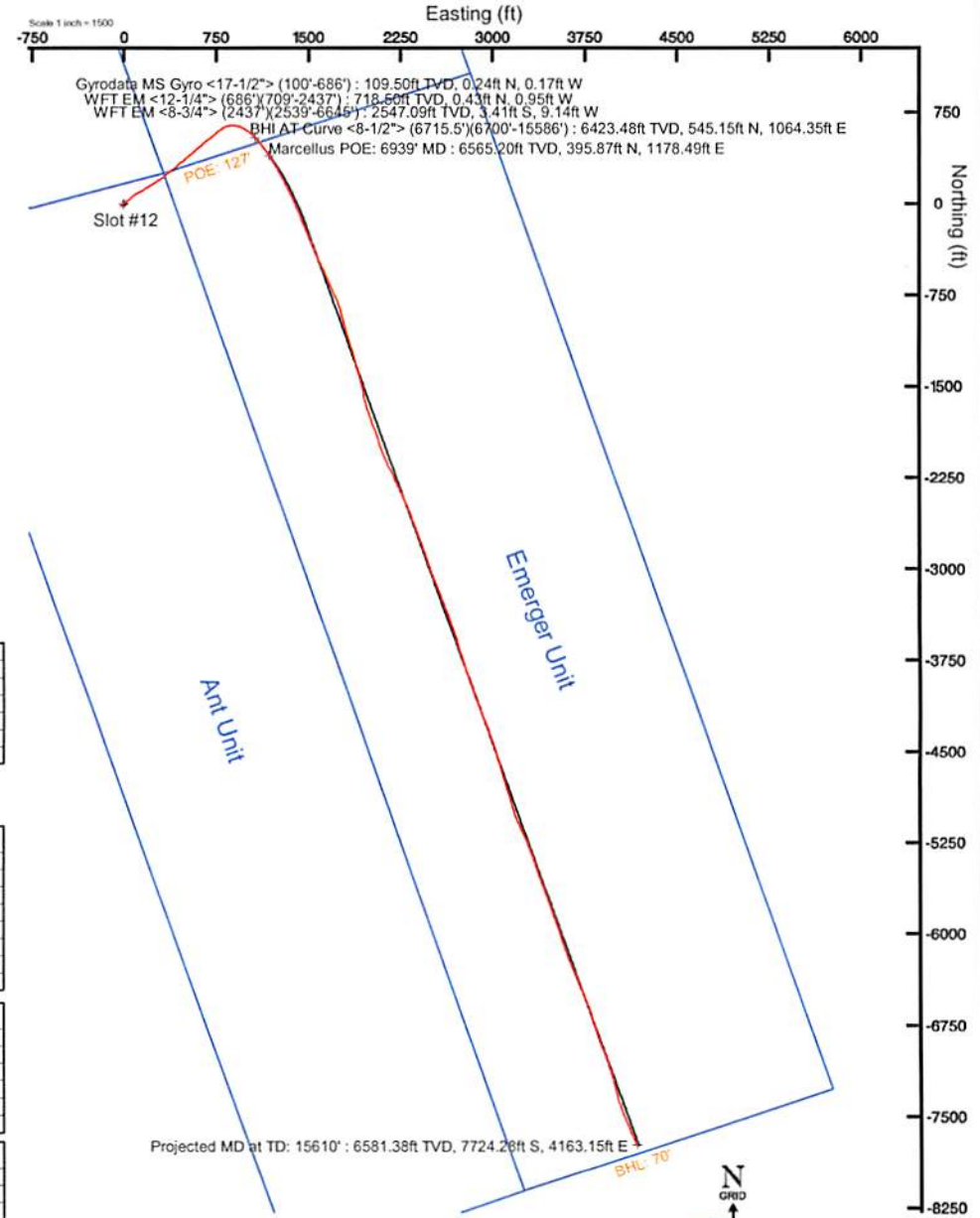


Plot reference wellpath is Emerger Unit 2HPWB Rev-A.0	Grid System: NAD27 / UTM Zone 17 North, US feet
True vertical depths are referenced to Frontier 22 (RKB)	* = Wellpath was transformed from a different geoidetic datum
Measured depths are referenced to Frontier 22 (RKB)	North Reference: Grid north
Frontier 22 (RKB) to Mean Sea Level: 1160.5 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot Slot #12): -1145 feet	Depths are in feet
Coordinate are in feet referenced to Slot	Created by: dslabed on 2017-09-08
	Database: WA_MPL_Electrod.S.Defs

Location Information				
Facility Name	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Vera Pad	1667510.600	14316799.487	39°25'31.060"N	80°54'14.600"W
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)
Slot #12	-47.54	16.53	1667527.123	14316751.969
Comment	Emerger Unit 2H		Latitude	Longitude
Frontier 22 (RKB) to Mud line (At Slot Slot #12)			39°25'30.590"N	80°54'14.390"W
Mean Sea Level to Mud line (At Slot Slot #12)				
Frontier 22 (RKB) to Mean Sea Level				
			24.5ft	
			-1145ft	
			1160.5ft	

Well Profile Data						
Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)
Tie On	6654.50	38.260	133.750	6387.39	565.16	1045.20
Proj. To Bottom	6719.50	40.100	137.150	6438.48	536.51	1073.34
Landing Pt.	7113.65	90.000	148.990	6600.00	255.81	1274.62
On Azimuth	7567.99	90.000	160.341	6600.00	-154.17	1468.72
BHL	15614.47	90.000	160.341	6600.00	-7731.63	4175.72
						0.00
						8685.79

Well Data			
Slot	Well	Wellbore	Wellpath
Slot #12	Emerger Unit 2H	Emerger Unit 2HAWB	Emerger Unit 2HAWP Proj: 15610'
Slot #12	Emerger Unit 2H	Emerger Unit 2HPWB	Emerger Unit 2HPWB Rev-A.0



User specified Dip: 66.71° Field: 52015 nT
 Magnetic North is 7.63 degrees West of True North (at 10/Aug/2017)
 Grid North is 0.06 degrees East of True North
 To correct azimuth from True to Grid subtract 0.06 degrees
 To correct azimuth from Magnetic to Grid subtract 7.69 degrees

Vertical Section (ft)
 Azimuth 160.34° with reference 0.00 N, 0.00 E



Actual Wellpath Report

Emerger Unit 2H AWP Proj: 15610'
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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #12
Area	Tyler County, WV	Well	Emerger Unit 2H
Field	Tyler	Wellbore	Emerger Unit 2H AWB
Facility	Vera Pad		

REPORT SETUP INFORMATION			
Projection System	NAD27 / UTM Zone 17 North, US feet	Software System	WellArchitect® 5.0
North Reference	Grid	User	Delaset
Scale	0.999601	Report Generated	08/Sep/2017 at 18:23
Convergence at slot	0.06° East	Database/Source file	WA_MPL_EasternUS_Defn/Emerger_Unit_2H_AWP_Proj_15610_.xml

WELLPATH LOCATION						
	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	-47.54	16.53	1667527.12	14316751.97	39°25'30.590"N	80°54'14.390"W
Facility Reference Pt			1667510.60	14316799.49	39°25'31.060"N	80°54'14.600"W
Field Reference Pt			0.00	0.00	0°00'00.000"	85°29'19.301"W

WELLPATH DATUM			
Calculation method	Minimum curvature	Frontier 22 (RKB) to Facility Vertical Datum	24.50ft
Horizontal Reference Pt	Slot	Frontier 22 (RKB) to Mean Sea Level	1169.50ft
Vertical Reference Pt	Frontier 22 (RKB)	Frontier 22 (RKB) to Mud Line at Slot (Slot #12)	24.50ft
MD Reference Pt	Frontier 22 (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	160.34°

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Actual Wellpath Report

Emerger Unit 2H AWP Proj: 15610'
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REFERENCE WELLPATH IDENTIFICATION	
Operator	ANTERO RESOURCES CORPORATION
Area	Tyler County, WV
Field	Tyler
Facility	Vera Pad
Slot	Slot #12
Well	Emerger Unit 2H
Wellbore	Emerger Unit 2H AWB

WELLPATH DATA (188 stations)																
MD (ft)	Inclination (°)	Azimuth (°)	TVD (ft)	Vert Sect (ft)	North (ft)	East (ft)	Grid East (ft)	Grid North (ft)	Latitude	Longitude	Closure Dist (ft)	Closure Dir (°)	DLS (F/100ft)	Build Rate (F/100ft)	Turn Rate (F/100ft)	Comments
2738.50	1.000	42.840	2737.06	-0.14	-2.19	-6.53	1667520.59	14316749.78	39°25'30.566"N	80°54'14.473"W	6.89	251.486	0.12	-0.12	2.25	
2833.50	0.880	41.590	2832.05	-0.87	-1.03	-5.48	1667521.64	14316750.94	39°25'30.580"N	80°54'14.460"W	5.58	259.324	0.13	-0.13	-1.32	
2928.50	1.050	20.320	2927.04	-1.89	0.33	-4.70	1667522.43	14316752.30	39°25'30.593"N	80°54'14.450"W	4.71	273.995	0.41	0.18	-22.39	
3024.50	3.120	53.910	3022.97	-3.30	2.69	-2.28	1667524.84	14316754.66	39°25'30.617"N	80°54'14.419"W	3.53	319.732	2.42	2.16	34.99	
3119.50	5.450	55.140	3117.70	-5.22	6.79	3.51	1667530.63	14316758.76	39°25'30.657"N	80°54'14.345"W	7.65	27.330	2.45	2.45	1.29	
3213.50	6.740	49.760	3211.17	-8.33	12.91	11.39	1667538.60	14316764.87	39°25'30.717"N	80°54'14.245"W	17.21	41.410	1.50	1.37	-5.72	
3308.50	7.560	58.090	3305.43	-11.61	19.81	20.95	1667548.06	14316771.78	39°25'30.786"N	80°54'14.123"W	28.83	46.591	1.39	0.86	8.77	
3403.50	8.680	53.190	3399.48	-15.05	27.41	31.99	1667559.10	14316779.37	39°25'30.861"N	80°54'13.982"W	42.13	49.407	1.38	1.18	-5.16	
3498.50	9.790	50.320	3493.24	-19.93	36.87	43.95	1667571.05	14316788.82	39°25'30.954"N	80°54'13.829"W	57.36	50.008	1.26	1.17	-3.02	
3592.50	11.610	46.950	3585.81	-26.42	48.43	57.01	1667584.11	14316800.38	39°25'31.068"N	80°54'13.663"W	74.80	49.655	2.05	1.94	-3.59	
3687.50	12.570	51.750	3678.50	-33.51	61.35	72.11	1667599.21	14316813.30	39°25'31.196"N	80°54'13.470"W	94.68	49.610	1.46	1.01	5.05	
3782.50	13.900	57.950	3770.98	-39.28	73.81	89.91	1667616.99	14316825.75	39°25'31.319"N	80°54'13.243"W	116.32	50.616	2.05	1.40	6.53	
3876.50	14.530	58.800	3862.10	-44.04	85.91	109.56	1667636.64	14316837.84	39°25'31.438"N	80°54'12.993"W	139.23	51.900	0.71	0.67	0.90	
3971.50	16.920	59.980	3953.54	-48.91	99.00	131.73	1667658.80	14316850.93	39°25'31.567"N	80°54'12.710"W	164.78	53.074	2.54	2.52	1.24	
4065.50	19.210	59.730	4042.90	-54.22	113.64	156.93	1667683.99	14316865.56	39°25'31.712"N	80°54'12.389"W	193.76	54.090	2.44	2.44	-0.27	
4160.50	21.060	57.090	4132.09	-61.01	130.79	184.76	1667711.81	14316882.71	39°25'31.881"N	80°54'12.034"W	226.37	54.705	2.17	1.95	-2.78	
4255.50	23.050	57.700	4220.14	-68.99	150.01	214.82	1667741.85	14316901.92	39°25'32.070"N	80°54'11.651"W	262.01	55.073	2.11	2.09	0.64	
4350.50	23.760	58.360	4307.32	-77.03	169.99	246.83	1667773.85	14316921.89	39°25'32.267"N	80°54'11.242"W	299.70	55.446	0.80	0.75	0.69	
4445.50	25.200	56.090	4393.78	-85.99	191.31	279.91	1667806.92	14316943.20	39°25'32.478"N	80°54'10.820"W	339.04	55.649	1.81	1.52	-2.39	
4540.50	24.810	53.300	4479.88	-96.80	214.51	312.68	1667839.67	14316966.39	39°25'32.707"N	80°54'10.403"W	379.18	55.549	1.31	-0.41	-2.94	
4635.50	24.190	50.710	4566.33	-109.18	238.74	343.72	1667870.71	14316990.62	39°25'32.946"N	80°54'10.007"W	418.50	55.217	1.31	-0.65	-2.73	
4730.50	25.260	51.730	4652.62	-122.19	263.62	374.70	1667901.67	14317015.49	39°25'33.192"N	80°54'09.612"W	458.15	54.871	1.21	1.13	1.07	
4825.50	25.140	50.500	4738.58	-135.51	289.01	406.19	1667933.15	14317040.87	39°25'33.442"N	80°54'09.210"W	498.51	54.567	0.57	-0.13	-1.29	
4920.50	24.880	48.360	4824.67	-149.84	315.13	436.69	1667963.64	14317066.97	39°25'33.700"N	80°54'08.821"W	538.52	54.185	0.99	-0.27	-2.25	
5015.50	25.720	51.060	4910.56	-164.13	341.36	467.66	1667994.60	14317093.20	39°25'33.959"N	80°54'08.426"W	579.00	53.873	1.50	0.88	2.84	
5110.50	25.130	50.480	4996.36	-177.78	367.16	499.26	1668026.18	14317118.98	39°25'34.213"N	80°54'08.023"W	619.73	53.669	0.67	-0.62	-0.61	
5204.50	24.630	47.210	5081.64	-192.26	393.17	529.03	1668055.94	14317144.98	39°25'34.470"N	80°54'07.643"W	659.13	53.381	1.56	-0.53	-3.48	
5299.50	24.610	50.780	5168.01	-206.66	419.12	558.88	1668085.78	14317170.92	39°25'34.726"N	80°54'07.262"W	698.58	53.133	1.57	-0.02	3.76	
5393.50	24.970	50.330	5253.34	-220.00	444.16	589.32	1668116.21	14317195.96	39°25'34.974"N	80°54'06.874"W	737.96	52.995	0.43	0.38	-0.48	
5488.50	24.900	47.710	5339.49	-234.56	470.42	619.55	1668146.42	14317222.20	39°25'35.233"N	80°54'06.489"W	777.91	52.791	1.16	-0.07	-2.76	

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Actual Wellpath Report

Emerger Unit 2H AWP Proj: 15610'

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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #12
Area	Tyler County, WV	Well	Emerger Unit 2H
Field	Tyler	Wellbore	Emerger Unit 2H AWP
Facility	Vera Pad		

WELLPATH DATA (188 stations) † = interpolated/extrapolated station																
MD (ft)	Inclination (°)	Azimuth (°)	TVD (ft)	Vert Sect (ft)	North (ft)	East (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude	Closure Dist (ft)	Closure Dir (°)	DLS (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Comments
5582.50	24.350	49.350	5424.94	-249.12	496.36	648.89	1668175.75	14317248.13	39°25'35.489"N	80°54'06.114"W	816.97	52.586	0.93	-0.59	1.74	
5677.50	24.180	53.920	5511.56	-261.63	520.58	679.48	1668206.33	14317272.34	39°25'35.728"N	80°54'05.724"W	855.98	52.543	1.98	-0.18	4.81	
5772.50	24.110	52.230	5598.25	-273.16	543.92	710.54	1668237.38	14317295.67	39°25'35.958"N	80°54'05.328"W	894.83	52.566	0.73	-0.07	-1.78	
5866.50	23.480	48.780	5684.26	-286.01	568.02	739.80	1668266.63	14317319.77	39°25'36.196"N	80°54'04.955"W	932.72	52.483	1.63	-0.67	-3.67	
5961.50	23.710	52.020	5771.32	-298.97	592.25	769.10	1668295.91	14317343.98	39°25'36.435"N	80°54'04.581"W	970.70	52.402	1.39	0.24	3.41	
6056.50	24.290	52.870	5858.11	-310.84	615.80	799.73	1668326.53	14317367.52	39°25'36.668"N	80°54'04.190"W	1009.34	52.403	0.71	0.61	0.89	
6087.50	23.220	57.300	5886.49	-314.13	622.95	809.96	1668336.75	14317374.67	39°25'36.738"N	80°54'04.060"W	1021.81	52.436	6.71	-3.45	14.29	
6118.50	22.470	62.150	5915.06	-316.36	629.02	820.34	1668347.13	14317380.74	39°25'36.798"N	80°54'03.928"W	1033.74	52.520	6.54	-2.42	15.65	
6150.50	22.180	67.660	5944.66	-317.51	634.17	831.33	1668358.12	14317385.89	39°25'36.849"N	80°54'03.787"W	1045.60	52.662	6.60	-0.91	17.22	
6182.50	22.050	73.140	5974.31	-317.50	638.21	842.67	1668369.45	14317389.92	39°25'36.889"N	80°54'03.643"W	1057.07	52.861	6.46	-0.41	17.13	
6213.50	22.320	78.570	6003.02	-316.37	641.07	854.01	1668380.79	14317392.78	39°25'36.917"N	80°54'03.498"W	1067.85	53.106	6.67	0.87	17.52	
6245.50	22.760	84.040	6032.58	-314.04	642.91	866.12	1668392.90	14317394.62	39°25'36.935"N	80°54'03.344"W	1078.66	53.414	6.69	1.37	17.09	
6276.50	23.980	88.530	6061.04	-310.65	643.70	878.39	1668405.16	14317395.41	39°25'36.943"N	80°54'03.188"W	1088.99	53.765	6.96	3.94	14.48	
6308.50	25.370	93.040	6090.12	-305.97	643.50	891.73	1668418.50	14317395.21	39°25'36.940"N	80°54'03.018"W	1099.67	54.185	7.31	4.34	14.09	
6340.50	26.560	97.410	6118.89	-300.07	642.21	905.68	1668432.44	14317393.93	39°25'36.928"N	80°54'02.840"W	1110.26	54.660	7.04	3.72	13.66	
6371.50	27.920	101.940	6146.45	-293.11	639.82	919.65	1668446.41	14317391.53	39°25'36.904"N	80°54'02.662"W	1120.32	55.173	8.00	4.39	14.61	
6403.50	29.190	106.500	6174.56	-284.58	636.05	934.47	1668461.21	14317387.77	39°25'36.866"N	80°54'02.473"W	1130.39	55.759	7.88	3.97	14.25	
6434.50	29.160	111.370	6201.63	-275.16	631.15	948.75	1668475.49	14317382.87	39°25'36.818"N	80°54'02.291"W	1139.51	56.366	7.66	-0.10	15.71	
6465.50	29.380	115.710	6228.68	-264.79	625.10	962.64	1668489.37	14317376.82	39°25'36.758"N	80°54'02.114"W	1147.79	57.002	6.88	0.71	14.00	
6497.50	30.520	119.500	6256.41	-253.06	617.69	976.78	1668503.51	14317369.41	39°25'36.684"N	80°54'01.934"W	1155.70	57.692	6.90	3.56	11.84	
6529.50	31.750	123.710	6283.80	-240.15	609.02	990.86	1668517.59	14317360.74	39°25'36.599"N	80°54'01.755"W	1163.06	58.424	7.81	3.84	13.16	
6560.50	33.110	126.820	6309.97	-226.55	599.42	1004.42	1668531.14	14317351.14	39°25'36.504"N	80°54'01.582"W	1169.69	59.172	6.94	4.39	10.03	
6591.50	33.880	128.940	6335.82	-212.11	588.91	1017.92	1668544.64	14317340.64	39°25'36.400"N	80°54'01.410"W	1176.00	59.949	4.52	2.48	6.84	
6623.50	35.060	130.710	6362.20	-196.51	577.31	1031.83	1668558.54	14317329.05	39°25'36.285"N	80°54'01.233"W	1182.35	60.773	4.84	3.69	5.53	
6654.50	36.260	133.750	6387.39	-180.57	565.16	1045.20	1668571.91	14317316.90	39°25'36.165"N	80°54'01.063"W	1188.21	61.599	6.90	3.87	9.81	
6687.00†	38.047	137.292	6413.30	-162.76	551.15	1058.94	1668585.64	14317302.90	39°25'36.026"N	80°54'00.888"W	1193.78	62.504	8.58	5.50	10.90	Middlesex: 6687' MD
6700.00	38.790	138.630	6423.48	-155.29	545.15	1064.35	1668591.04	14317296.90	39°25'35.967"N	80°54'00.819"W	1195.84	62.879	8.58	5.72	10.29	BHI AT Curve <-8-1/2"> (6715.5')(6700'-15586')
6768.00	43.750	140.690	6474.58	-113.33	510.95	1093.34	1668620.02	14317262.72	39°25'35.628"N	80°54'00.450"W	1206.84	64.952	7.56	7.29	3.03	
6815.00	51.660	142.420	6506.18	-80.43	483.73	1114.91	1668641.59	14317235.50	39°25'35.359"N	80°54'00.176"W	1215.33	66.545	17.05	16.83	3.68	
6816.00†	51.832	142.454	6506.80	-79.68	483.11	1115.39	1668642.07	14317234.88	39°25'35.353"N	80°54'00.170"W	1215.52	66.581	17.39	17.19	3.36	Burket: 6816' MD

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Actual Wellpath Report

Emerger Unit 2H AWP Proj.: 15610'



REFERENCE WELLPATH IDENTIFICATION

Operator	ANTERO RESOURCES CORPORATION
Area	Tyler County, WV
Field	Tyler
Facility	Vera Pad
Slot	Slot #12
Well	Emerger Unit 2H
Wellbore	Emerger Unit 2H AWB

WELLPATH DATA (188 stations) + = Interpolated/extrapolated station												
MD	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	Latitude	Longitude	Closure Dist	Closure Dir
[ft]	[°]	[°]	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[°]
6863.00	59.920	143.880	6533.15	-42.54	451.98	1138.68	1668665.34	14317203.77	39.2535 045°N	80.5359 873°W	1225.10	68.350
6910.00	66.380	144.760	6554.36	-2.25	417.93	1163.11	1668689.77	14317169.73	39.2534 708°N	80.5359 562°W	1235.92	70.236
6939.00	69.711	145.463	6565.20	23.70	395.87	1178.49	1668705.14	14317147.68	39.2534 490°N	80.5359 367°W	1243.21	71.432
6959.00	72.010	145.930	6571.76	41.98	380.26	1189.14	1668715.79	14317132.08	39.2534 336°N	80.5359 231°W	1248.46	72.267
7006.00	77.490	147.710	6584.12	86.05	342.32	1213.94	1668740.57	14317094.15	39.2533 960°N	80.5358 916°W	1261.28	74.252
7054.00	83.020	149.460	6592.24	132.35	301.66	1238.58	1668765.21	14317053.81	39.2533 561°N	80.5358 602°W	1274.86	76.299
7115.00	90.370	152.630	6595.76	192.40	248.72	1268.03	1668794.65	14317000.59	39.2533 035°N	80.5358 228°W	1292.20	78.903
7149.00	90.520	153.490	6595.49	226.12	218.41	1283.44	1668810.05	14316970.29	39.2532 735°N	80.5358 032°W	1301.89	80.342
7244.00	90.370	152.750	6594.75	320.37	133.67	1326.39	1668852.98	14316885.59	39.2531 897°N	80.5357 486°W	1333.11	84.245
7340.00	91.140	155.180	6593.49	415.76	47.43	1368.52	1668895.09	14316799.38	39.2531 044°N	80.5356 950°W	1369.34	88.015
7434.00	90.370	157.240	6592.25	509.50	-38.57	1406.43	1668932.99	14316713.42	39.2530 194°N	80.5356 468°W	1406.96	91.571
7529.00	90.430	158.510	6591.59	604.41	-126.57	1442.21	1668968.75	14316625.45	39.2529 323°N	80.5356 014°W	1447.75	95.016
7623.00	90.460	158.140	6590.86	698.34	-213.92	1476.92	1669003.45	14316538.13	39.2528 460°N	80.5355 572°W	1492.34	98.242
7719.00	90.400	158.250	6590.14	794.27	-303.05	1512.58	1669039.10	14316449.04	39.2527 578°N	80.5355 119°W	1542.64	101.329
7813.00	90.250	157.300	6589.60	888.18	-390.06	1548.14	1669074.64	14316362.06	39.2526 718°N	80.5354 668°W	1596.52	104.142
7908.00	90.340	154.830	6589.11	982.90	-476.89	1586.67	1669113.16	14316275.27	39.2525 860°N	80.5354 178°W	1656.79	106.729
8003.00	90.370	155.660	6588.53	1077.53	-563.15	1626.45	1669152.92	14316189.04	39.2525 006°N	80.5353 672°W	1721.19	109.098
8088.00	90.250	154.630	6588.01	1172.13	-649.35	1666.38	1669192.84	14316102.88	39.2524 154°N	80.5353 164°W	1788.43	111.290
8193.00	90.310	156.120	6587.55	1266.77	-735.71	1705.97	1669232.40	14316016.56	39.2523 300°N	80.5352 661°W	1857.84	113.328
8287.00	90.550	159.250	6586.84	1360.66	-822.66	1741.65	1669268.08	14315929.64	39.2522 440°N	80.5352 208°W	1926.17	115.283
8382.00	90.400	165.470	6586.05	1455.55	-913.14	1770.43	1669296.84	14315839.19	39.2521 545°N	80.5351 843°W	1992.04	117.284
8476.00	90.490	165.650	6585.32	1549.16	-1004.17	1793.87	1669320.27	14315748.20	39.2520 646°N	80.5351 545°W	2055.80	119.239
8571.00	90.030	162.760	6584.89	1643.93	-1095.57	1819.72	1669346.11	14315656.84	39.2519 742°N	80.5351 217°W	2124.07	121.050
8665.00	89.940	161.920	6584.92	1737.87	-1185.14	1848.24	1669374.62	14315567.30	39.2518 857°N	80.5350 855°W	2195.57	122.669
8759.00	90.060	164.300	6584.92	1831.75	-1275.08	1875.55	1669401.92	14315477.40	39.2517 967°N	80.5350 508°W	2267.93	124.210
8854.00	90.030	165.270	6584.84	1926.47	-1366.75	1900.48	1669426.84	14315385.77	39.2517 061°N	80.5350 192°W	2340.90	125.722
8948.00	90.120	165.290	6584.72	2020.12	-1457.66	1924.36	1669450.71	14315294.89	39.2516 162°N	80.5349 889°W	2414.11	127.143
9042.00	90.060	166.470	6584.57	2113.68	-1548.82	1947.29	1669473.63	14315203.77	39.2515 261°N	80.5349 598°W	2488.13	128.498
9137.00	90.370	166.010	6584.22	2208.17	-1641.09	1969.89	1669496.22	14315111.53	39.2514 349°N	80.5349 311°W	2563.91	129.797
9232.00	90.650	161.070	6583.37	2302.99	-1732.17	1996.80	1669523.12	14315020.50	39.2513 448°N	80.5348 970°W	2643.41	130.941
											2643.41	130.941
											2563.91	129.797
											2488.13	128.498
											2414.11	127.143
											2340.90	125.722
											2267.93	124.210
											2195.57	122.669
											2124.07	121.050
											2055.80	119.239
											1992.04	117.284
											1926.17	115.283
											1857.84	113.328
											1788.43	111.290
											1721.19	109.098
											1656.79	106.729
											1596.52	104.142
											1542.64	101.329
											1492.34	98.242
											1447.75	95.016
											1406.96	91.571
											1369.34	88.015
											1333.11	84.245
											1301.89	80.342
											1292.20	78.903
											1274.86	76.299
											1261.28	74.252
											1248.46	72.267
											1243.21	71.432
											1235.92	70.236
											1225.10	68.350
											1225.10	68.350
											1235.92	70.236
											1243.21	71.432
											1248.46	72.267
											1261.28	74.252
											1274.86	76.299
											1292.20	78.903
											1301.89	80.342
											1333.11	84.245
											1369.34	88.015
											1406.96	91.571
											1447.75	95.016
											1492.34	98.242
											1542.64	101.329
											1596.52	104.142
											1656.79	106.729
											1721.19	109.098
											1788.43	111.290
											1857.84	113.328
											1926.17	115.283
											1992.04	117.284
											2055.80	119.239
											2124.07	121.050
											2195.57	122.669
											2267.93	124.210
											2340.90	125.722
											2414.11	127.143
											2488.13	128.498
											2563.91	129.797
											2643.41	130.941

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Actual Wellpath Report

Emerger Unit 2H AWP Proj: 15610'

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REFERENCE WELLPATH IDENTIFICATION				
Operator	ANTERO RESOURCES CORPORATION		Slot	Slot #12
Area	Tyler County, WV		Well	Emerger Unit 2H
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Facility	Vera Pad			

WELLPATH DATA (188 stations)																
MD (ft)	Inclination (°)	Azimuth (°)	TVD (ft)	Vert Sect (ft)	North (ft)	East (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude	Closure Dist (ft)	Closure Dir (°)	DLS (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	Comments
9327.00	90.060	158.250	6582.78	2397.97	-1821.23	2029.81	1669556.12	14314931.47	39°25'12.568"N	80°53'48.550"W	2727.09	131.900	3.03	-0.62	-2.97	
9422.00	90.150	162.350	6582.61	2492.95	-1910.65	2061.83	1669588.13	14314842.08	39°25'11.684"N	80°53'48.144"W	2811.01	132.821	4.32	0.09	4.32	
9518.00	90.000	162.380	6582.48	2588.89	-2002.14	2090.92	1669617.20	14314750.63	39°25'10.779"N	80°53'47.775"W	2894.91	133.758	0.16	-0.16	0.03	
9612.00	89.660	156.100	6582.76	2682.83	-2090.00	2124.22	1669650.49	14314662.81	39°25'09.910"N	80°53'47.351"W	2980.00	134.535	6.69	-0.36	-6.68	
9706.00	89.720	153.530	6583.27	2776.38	-2175.05	2164.21	1669690.47	14314577.79	39°25'09.069"N	80°53'46.843"W	3068.33	135.143	2.73	0.06	-2.73	
9801.00	89.850	156.040	6583.62	2870.93	-2260.99	2204.68	1669730.92	14314491.88	39°25'08.219"N	80°53'46.329"W	3157.96	135.722	2.65	0.14	2.64	
9896.00	90.000	155.510	6583.75	2965.63	-2347.63	2243.66	1669769.89	14314405.29	39°25'07.363"N	80°53'45.833"W	3247.36	136.297	0.58	0.16	-0.56	
9991.00	90.030	156.300	6583.72	3060.34	-2434.35	2282.45	1669808.65	14314318.60	39°25'06.505"N	80°53'45.340"W	3337.01	136.845	0.83	0.03	0.83	
10086.00	90.090	158.420	6583.62	3155.21	-2522.02	2319.01	1669845.21	14314230.96	39°25'05.638"N	80°53'44.876"W	3426.14	137.401	2.23	0.06	2.23	
10181.00	90.280	160.220	6583.32	3250.19	-2610.90	2352.56	1669878.74	14314142.12	39°25'04.759"N	80°53'44.450"W	3514.44	137.979	1.91	0.20	1.89	
10275.00	90.310	159.340	6582.83	3344.18	-2699.10	2385.05	1669911.21	14314053.95	39°25'03.887"N	80°53'44.037"W	3601.89	138.535	0.94	0.03	-0.94	
10370.00	90.280	160.080	6582.34	3439.17	-2788.21	2417.99	1669944.14	14313964.88	39°25'03.006"N	80°53'43.619"W	3690.63	139.067	0.78	-0.03	0.78	
10465.00	90.090	160.910	6582.04	3534.17	-2877.75	2449.71	1669975.85	14313875.37	39°25'02.121"N	80°53'43.216"W	3779.22	139.594	0.90	-0.20	0.87	
10560.00	90.340	161.400	6581.68	3629.16	-2967.66	2480.40	1670006.52	14313785.50	39°25'01.232"N	80°53'42.826"W	3867.73	140.111	0.58	0.26	0.52	
10655.00	90.280	159.230	6581.17	3724.15	-3057.10	2512.39	1670038.51	14313696.10	39°25'00.348"N	80°53'42.420"W	3957.02	140.586	2.29	-0.06	-2.28	
10750.00	89.850	157.680	6581.06	3819.10	-3145.46	2547.28	1670073.38	14313607.77	39°24'59.474"N	80°53'41.976"W	4047.54	140.998	1.69	-0.45	-1.63	
10845.00	89.910	158.350	6581.26	3914.02	-3233.55	2582.84	1670108.93	14313519.72	39°24'58.603"N	80°53'41.525"W	4138.47	141.383	0.71	0.06	0.71	
10939.00	89.880	159.390	6581.43	4007.99	-3321.23	2616.73	1670142.80	14313432.07	39°24'57.736"N	80°53'41.094"W	4228.22	141.766	1.11	-0.03	1.11	
11034.00	89.850	160.130	6581.66	4102.98	-3410.36	2649.59	1670175.65	14313342.98	39°24'56.854"N	80°53'40.677"W	4318.67	142.155	0.78	-0.03	0.78	
11129.00	89.850	162.010	6581.90	4197.97	-3500.22	2680.41	1670206.46	14313253.15	39°24'55.966"N	80°53'40.285"W	4408.64	142.556	1.98	0.00	1.98	
11224.00	90.000	163.990	6582.03	4292.86	-3591.06	2708.19	1670234.22	14313162.35	39°24'55.068"N	80°53'39.933"W	4497.78	142.978	2.09	0.16	2.08	
11319.00	89.820	163.040	6582.18	4387.71	-3682.16	2735.14	1670261.17	14313071.29	39°24'54.167"N	80°53'39.591"W	4586.86	143.395	1.02	-0.19	-1.00	
11414.00	89.660	162.750	6582.61	4482.62	-3772.95	2763.08	1670289.10	14312980.53	39°24'53.270"N	80°53'39.236"W	4676.52	143.783	0.35	-0.17	-0.31	
11509.00	89.940	161.880	6582.94	4577.56	-3863.46	2791.94	1670317.95	14312890.06	39°24'52.375"N	80°53'38.870"W	4766.69	144.146	0.96	0.29	-0.92	
11604.00	89.720	161.700	6583.22	4672.53	-3953.71	2821.63	1670347.62	14312799.85	39°24'51.482"N	80°53'38.493"W	4857.30	144.486	0.30	-0.23	-0.19	
11699.00	89.880	159.460	6583.55	4767.52	-4043.29	2853.22	1670379.19	14312710.30	39°24'50.597"N	80°53'38.092"W	4948.64	144.791	2.36	0.17	-2.36	
11794.00	89.940	158.960	6583.70	4862.50	-4132.11	2886.94	1670412.90	14312621.52	39°24'49.718"N	80°53'37.664"W	5040.71	145.060	0.53	0.06	-0.53	
11890.00	89.910	157.850	6583.83	4958.45	-4221.37	2922.27	1670448.22	14312532.29	39°24'48.836"N	80°53'37.215"W	5134.16	145.307	1.16	-0.03	-1.16	
11984.00	89.850	159.150	6584.03	5052.40	-4308.83	2956.72	1670482.65	14312444.87	39°24'47.971"N	80°53'36.777"W	5225.72	145.542	1.38	-0.06	1.38	
12080.00	89.850	160.810	6584.28	5148.39	-4399.02	2989.58	1670515.50	14312354.71	39°24'47.079"N	80°53'36.360"W	5318.74	145.800	1.73	0.00	1.73	

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Actual Wellpath Report

Emerger Unit 2H AWP Proj: 15610



REFERENCE WELLPATH IDENTIFICATION

Operator	ANTERO RESOURCES CORPORATION
Area	Tyler County, WV
Field	Tyler
Facility	Vera Pad
Slot	Slot #12
Well	Emerger Unit 2H
Wellbore	Emerger Unit 2H AWB

WELLPATH DATA (188 stations)																
MD	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	Latitude	Longitude	Closure Dist	Closure Dir	DLS	Build Rate	Turn Rate	Comments
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/100ft)	(°/100ft)	(ft/100ft)
12175.00	89.910	162.840	6584.48	-4489.28	3019.21	1670545.12	14312264.49	14312264.49	39°24'46.18"N	80°53'35.98"W	5410.11	146.078	2.14	0.06	2.14	
12270.00	89.850	163.240	6584.67	-4538.25	3046.92	1670572.82	14312173.66	14312173.66	39°24'45.288"N	80°53'35.632"W	5501.04	146.366	0.43	-0.06	0.42	
12364.00	89.850	163.210	6584.92	-4532.13	3074.05	1670599.94	14312083.70	14312083.70	39°24'44.399"N	80°53'35.288"W	5591.07	146.646	0.03	0.00	-0.03	
12459.00	89.880	163.170	6585.14	-4527.01	3101.53	1670627.41	14311992.80	14311992.80	39°24'43.499"N	80°53'34.939"W	5682.20	146.918	0.05	0.03	-0.04	
12554.00	89.880	163.440	6585.34	-4521.88	3128.82	1670654.69	14311901.84	14311901.84	39°24'42.600"N	80°53'34.593"W	5773.40	147.184	0.28	0.00	0.28	
12649.00	90.090	163.500	6585.37	-4493.15	3155.85	1670681.70	14311810.80	14311810.80	39°24'41.699"N	80°53'34.250"W	5864.65	147.445	0.23	0.22	0.06	
12743.00	90.460	160.100	6584.92	-5032.44	3185.20	1670711.05	14311721.55	14311721.55	39°24'40.816"N	80°53'33.877"W	5955.75	147.669	3.64	0.39	-3.62	
12838.00	90.090	154.680	6584.46	-5120.10	3221.71	1670747.54	14311633.92	14311633.92	39°24'39.950"N	80°53'33.413"W	6049.37	147.821	5.72	-0.39	-5.71	
12934.00	90.030	155.740	6584.36	-5207.25	3261.96	1670787.78	14311546.81	14311546.81	39°24'39.088"N	80°53'32.902"W	6144.58	147.936	1.11	-0.06	1.10	
13029.00	90.060	159.670	6584.29	-5295.13	3298.00	1670823.80	14311458.96	14311458.96	39°24'38.219"N	80°53'32.444"W	6238.21	148.084	4.14	0.03	4.14	
13124.00	90.090	160.660	6584.16	-5384.50	3330.23	1670856.02	14311369.63	14311369.63	39°24'37.335"N	80°53'32.035"W	6331.13	148.264	1.04	0.03	1.04	
13218.00	90.280	162.060	6583.86	-5473.56	3360.27	1670888.05	14311280.60	14311280.60	39°24'36.455"N	80°53'31.653"W	6422.72	148.454	1.50	0.20	1.49	
13313.00	90.060	159.930	6583.58	-5563.38	3391.21	1670916.97	14311190.82	14311190.82	39°24'35.566"N	80°53'31.280"W	6515.48	148.635	2.25	-0.23	-2.24	
13407.00	90.060	160.520	6583.48	-5651.84	3423.01	1670948.76	14311102.40	14311102.40	39°24'34.692"N	80°53'30.857"W	6607.59	148.799	0.63	0.00	0.63	
13502.00	90.060	161.760	6583.38	-5741.73	3453.72	1670979.46	14311012.54	14311012.54	39°24'33.803"N	80°53'30.467"W	6700.42	148.973	1.31	0.00	1.31	
13597.00	89.970	160.410	6583.35	-5831.60	3484.52	1671010.24	14310922.71	14310922.71	39°24'32.914"N	80°53'30.076"W	6793.34	149.141	1.42	-0.09	-1.42	
13692.00	90.090	160.200	6583.30	-5920.99	3516.67	1671042.38	14310833.35	14310833.35	39°24'32.031"N	80°53'29.667"W	6886.59	149.293	0.43	0.13	-0.41	
13787.00	89.880	162.550	6583.33	-6010.96	3547.15	1671072.85	14310743.42	14310743.42	39°24'31.141"N	80°53'29.280"W	6979.54	149.455	2.67	-0.22	2.66	
13881.00	90.120	161.400	6583.33	-6100.35	3576.24	1671101.93	14310654.07	14310654.07	39°24'30.257"N	80°53'28.911"W	7071.33	149.620	1.25	0.26	-1.22	
13975.00	90.030	158.010	6583.21	-6188.50	3608.84	1671134.51	14310565.95	14310565.95	39°24'29.386"N	80°53'28.497"W	7163.88	149.751	3.61	-0.10	-3.61	
14070.00	90.060	159.660	6583.13	-6277.09	3643.14	1671168.80	14310477.40	14310477.40	39°24'28.510"N	80°53'28.062"W	7257.70	149.870	1.74	0.03	1.74	
14166.00	90.120	157.460	6582.98	-6366.44	3678.22	1671203.87	14310388.08	14310388.08	39°24'27.626"N	80°53'27.616"W	7352.61	149.983	2.29	0.06	-2.29	
14261.00	90.060	155.510	6582.83	-6453.55	3716.13	1671241.76	14310301.01	14310301.01	39°24'26.765"N	80°53'27.135"W	7447.00	150.065	2.05	-0.06	-2.05	
14356.00	90.090	158.250	6582.71	-6540.91	3753.43	1671279.04	14310213.69	14310213.69	39°24'25.901"N	80°53'26.661"W	7541.33	150.151	2.88	0.03	2.88	
14451.00	90.120	161.740	6582.53	-6630.16	3785.92	1671311.52	14310124.47	14310124.47	39°24'25.018"N	80°53'26.248"W	7634.93	150.273	3.67	0.03	3.67	
14545.00	90.060	163.960	6582.38	-6719.98	3813.64	1671339.23	14310034.69	14310034.69	39°24'24.130"N	80°53'25.896"W	7726.70	150.425	2.36	-0.06	2.36	
14640.00	90.120	161.690	6582.23	-6810.73	3841.69	1671367.27	14309943.97	14309943.97	39°24'23.233"N	80°53'25.540"W	7819.50	150.574	2.39	0.06	-2.39	
14735.00	90.000	159.580	6582.14	-6900.35	3873.19	1671398.76	14309854.38	14309854.38	39°24'22.347"N	80°53'25.141"W	7913.06	150.694	2.22	-0.13	-2.22	
14830.00	89.970	159.250	6582.16	-6989.29	3906.59	1671432.14	14309765.49	14309765.49	39°24'21.467"N	80°53'24.716"W	8006.97	150.797	0.35	-0.03	-0.35	
14925.00	90.120	161.640	6582.09	-7078.80	3938.38	1671463.93	14309676.01	14309676.01	39°24'20.582"N	80°53'24.313"W	8100.64	150.910	2.52	0.16	2.52	

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Actual Wellpath Report

Emerger Unit 2H AWP Proj: 15610'

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REFERENCE WELLPATH IDENTIFICATION				
Operator	ANTERO RESOURCES CORPORATION		Slot	Slot #12
Area	Tyler County, WV		Well	Emerger Unit 2H
Field	Tyler		Wellbore	Emerger Unit 2H AWB
Facility	Vera Pad			

WELLPATH DATA (188 stations)																
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]	Comments
15019.00	90.150	164.800	6581.86	8085.04	-7168.79	3965.52	1671491.05	14309586.06	39°24'19.693"N	80°53'23.968"W	8192.49	151.050	3.36	0.03	3.36	
15114.00	90.030	166.010	6581.71	8179.67	-7260.72	3989.46	1671514.98	14309494.16	39°24'18.784"N	80°53'23.665"W	8284.55	151.213	1.28	-0.13	1.27	
15209.00	90.060	164.270	6581.64	8274.33	-7352.54	4013.82	1671539.33	14309402.38	39°24'17.876"N	80°53'23.356"W	8376.79	151.369	1.83	0.03	-1.83	
15304.00	90.030	158.640	6581.57	8369.27	-7442.57	4044.02	1671569.52	14309312.38	39°24'16.986"N	80°53'22.973"W	8470.30	151.482	5.93	-0.03	-5.93	
15399.00	89.940	158.170	6581.59	8464.22	-7530.90	4078.98	1671604.47	14309224.09	39°24'16.112"N	80°53'22.529"W	8564.61	151.559	0.50	-0.09	-0.49	
15493.00	90.090	157.910	6581.57	8558.14	-7618.08	4114.14	1671639.61	14309136.94	39°24'15.250"N	80°53'22.082"W	8658.02	151.629	0.32	0.16	-0.28	
15586.00	90.090	153.450	6581.42	8650.81	-7702.81	4152.43	1671677.88	14309052.25	39°24'14.412"N	80°53'21.596"W	8750.77	151.672	4.80	0.00	-4.80	
15610.00	90.090	153.450	6581.38	8674.64	-7724.28	4163.15	1671688.61	14309030.79	39°24'14.200"N	80°53'21.459"W	8774.75	151.677	0.00	0.00	0.00	Projected MD at TD: 15610'

HOLE & CASING SECTIONS - Ref Wellbore: Emerger Unit 2H AWB Ref Wellpath: Emerger Unit 2H AWP Proj: 15610'									
String/Diameter	Start MD [ft]	End MD [ft]	Interval [ft]	Start TVD [ft]	End TVD [ft]	Start N/S [ft]	Start E/W [ft]	End N/S [ft]	End E/W [ft]
20in Conductor	24.50	104.50	80.00	24.50	104.50	0.00	0.00	0.21	-0.15
17.5in Open Hole	104.50	722.10	617.60	104.50	722.10	0.21	-0.15	0.43	-0.94
13.375in Casing Surface	24.50	722.10	697.60	24.50	722.10	0.00	0.00	0.43	-0.94
12.25in Open Hole	722.10	2488.10	1766.00	722.10	2488.71	0.43	-0.94	-2.51	-10.17
9.625in Casing Intermediate	24.50	2488.10	2463.60	24.50	2486.71	0.00	0.00	-2.51	-10.17

TARGETS								
Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
Emerger Unit 2H BHL - Rev-3	6600.00	-7731.63	4175.72	1671701.17	14309023.44	39°24'14.127"N	80°53'21.299"W	point
Emerger Unit 2H LP - Rev-1	6600.00	255.81	1274.62	1668801.23	14317007.68	39°25'33.105"N	80°53'58.144"W	point

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Actual Wellpath Report

Emerger Unit 2H AWP Proj: 15610'

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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #12
Area	Tyler County, WV	Well	Emerger Unit 2H
Field	Tyler	Wellbore	Emerger Unit 2H AWB
Facility	Vera Pad		

WELLPATH COMPOSITION - Ref Wellbore: Emerger Unit 2H AWB Ref Wellpath: Emerger Unit 2H AWP Proj: 15610'				
Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
24.50	695.50	Gyrodata standard - Drop gyro or Multi-shot	01 Gyrodata MS Gyro <17-1/2">(100'-686')	Emerger Unit 2H AWB
695.50	2446.50	ISCWSA MWD, Rev. 4 (Standard)	02 WFT EM <12-1/4">(686')(709'-2437')	Emerger Unit 2H AWB
2446.50	6654.50	ISCWSA MWD, Rev. 4 (Standard)	03 WFT EM <8-3/4">(2437')(2539'-6645')	Emerger Unit 2H AWB
6654.50	15586.00	BHI AutoTrak Curve (Short)	04 BHI AT Curve <8-1/2">(6654.5)(6700'-15586')	Emerger Unit 2H AWB
15586.00	15610.00	Blind Drilling (std)	Projection to bit	Emerger Unit 2H AWB

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Actual Wellpath Report

Emerger Unit 2H AWP Proj: 15610'

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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #12
Area	Tyler County, WV	Well	Emerger Unit 2H
Field	Tyler	Wellbore	Emerger Unit 2H AWB
Facility	Vera Pad		

COMMENTS

Wellpath general comments

API: 47-095-02378-0000
BHI Job #: 8696636
Rig: Frontier 22
Duration: 08/11/2017-08/13/2017
Gyrodata MS Gyro <17-1/2"> (100'-686')
WFT EM <12-1/4"> (686')(709'-2437')
WFT EM <8-3/4"> (2437')(2539'-6645')
BHI AT Curve <8-1/2"> (6715.5')(6700'-15586')
Middlesex: 6687' MD
Burket: 6816' MD
Tully: 6863' MD
Marcellus POE: 6939' MD
Projected MD at TD: 15610'

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	4/20/2018
Job End Date:	5/13/2018
State:	West Virginia
County:	Tyler
API Number:	47-095-02378-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Emerger Unit 2H
Latitude:	39.42524197
Longitude:	-80.90382689
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,594
Total Base Water Volume (gal):	19,331,071
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
Fresh Water	Operator	Base Fluid					
			Water	7732-18-5	100.00000	87.91267	Density = 8.330
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	100.00000	0.24344	

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SAND-COMMON WHITE-100 MESH, SSA-2, BULK (100003676)	Halliburton	Proppant					
				Listed Below			
WG-36 GELLING AGENT	Halliburton	Gelling Agent					
				Listed Below			
FR-76	Halliburton	Friction Reducer					
				Listed Below			
HAI-OS ACID INHIBITOR	Halliburton	Corrosion Inhibitor					
				Listed Below			
SAND- PREMIUM WHITE-40/70, BULK	Halliburton	Proppant					
				Listed Below			
SCALECHEK LP-70	Halliburton	Scale Inhibitor					
				Listed Below			
SP BREAKER	Halliburton	Breaker					
				Listed Below			
MC B-8614	Halliburton	Biocide					
				Listed Below			

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HYDROCHLORIC ACID	Halliburton	Solvent					
				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	11.79042	
			Hydrochloric acid	7647-01-0	60.00000	0.11580	
			Guar gum	9000-30-0	100.00000	0.02260	
			Acrylamide acrylate copolymer	Proprietary	30.00000	0.01715	Denise Tuck, Halliburton, 3000 N. Sam Houston Pkwy E., Houston, TX 77032, 281-871-6226
			Inorganic salt	Proprietary	30.00000	0.01715	
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.01715	
			Ethylene glycol	107-21-1	60.00000	0.00875	
			Glutaraldehyde	111-30-8	30.00000	0.00267	
			Telmer	Proprietary	10.00000	0.00146	
			Sodium persulfate	7775-27-1	100.00000	0.00051	
			Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl chlorides	68424-85-1	5.00000	0.00045	
			Sodium polyacrylate	9003-04-7	1.00000	0.00015	
			Methanol	67-56-1	60.00000	0.00010	
			Ethanol	64-17-5	1.00000	0.00009	
			Ethoxylated alcohols	Proprietary	30.00000	0.00004	
			Fatty acids, tall oil	Proprietary	30.00000	0.00004	
			Modified thiourea polymer	Proprietary	30.00000	0.00004	
			Olefins	Proprietary	5.00000	0.00002	
			Propargyl alcohol	107-19-7	10.00000	0.00001	
			Phosphoric acid	7664-38-2	0.10000	0.00001	
			Acrylic acid	79-10-7	0.01000	0.00000	

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			Sodium sulfate	7757-82-6	0.10000	0.00000
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* 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°27'30"

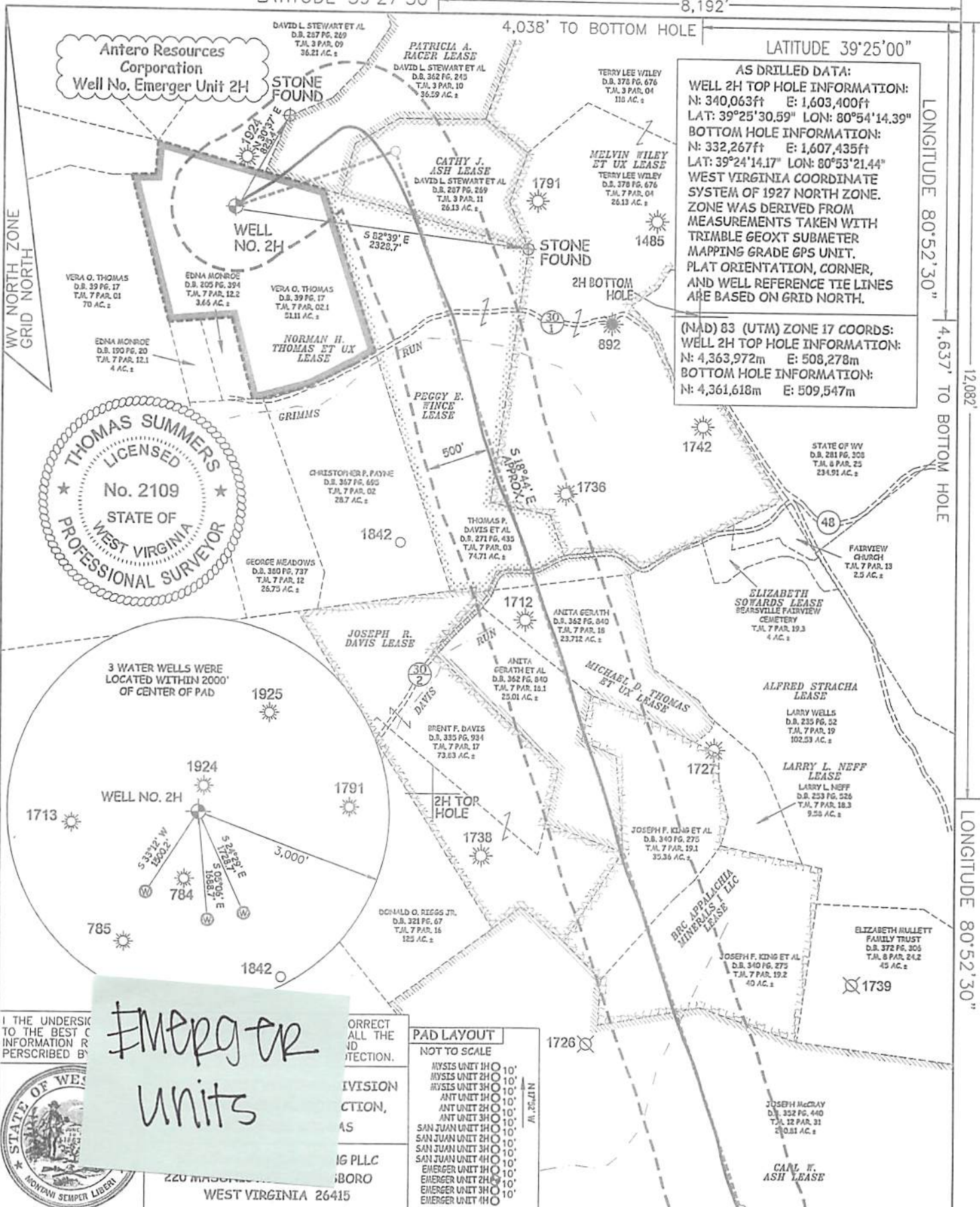
8,192'

LATITUDE 39°25'00"

LONGITUDE 80°52'30"

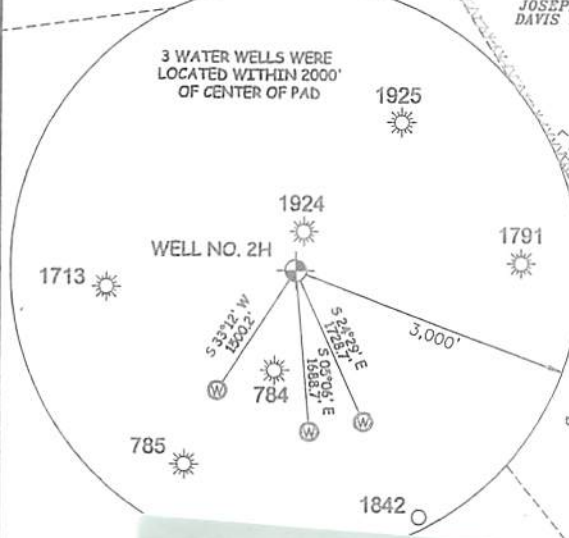
12,082'

LONGITUDE 80°52'30"



AS DRILLED DATA:
WELL 2H TOP HOLE INFORMATION:
 N: 340,063ft E: 1,603,400ft
 LAT: 39°25'30.59" LON: 80°54'14.39"
BOTTOM HOLE INFORMATION:
 N: 332,267ft E: 1,607,435ft
 LAT: 39°24'14.17" LON: 80°53'21.44"
 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: 4,363,972m E: 508,278m
BOTTOM HOLE INFORMATION:
 N: 4,361,618m E: 509,547m



Emerger units

THE UNDERSIGNED HAS PROVIDED THE BEST OF HIS SKILL AND INFORMATION TO THE BEST OF HIS KNOWLEDGE AND BELIEF AS REQUIRED BY THE STATUTES OF WEST VIRGINIA.



THOMAS SUMMERS P.S. 2109
 DATE 10/12/18
 OPERATOR'S WELL# EMERGER UNIT #2H

PAD LAYOUT	
NOT TO SCALE	
MYSTIS UNIT 1HO	10'
MYSTIS UNIT 2HO	10'
MYSTIS UNIT 3HO	10'
ANT UNIT 1HO	10'
ANT UNIT 2HO	10'
ANT UNIT 3HO	10'
SAN JUAN UNIT 1HO	10'
SAN JUAN UNIT 2HO	10'
SAN JUAN UNIT 3HO	10'
EMERGER UNIT 1HO	10'
EMERGER UNIT 2HO	10'
EMERGER UNIT 3HO	10'
EMERGER UNIT 4HO	10'

JOB # 16-020WA
 DRAWING # EMERGER2HAD
 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

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

THOMAS SUMMERS P.S. 2109
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NOTICE
 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 LEASEE BOUNDARIES.
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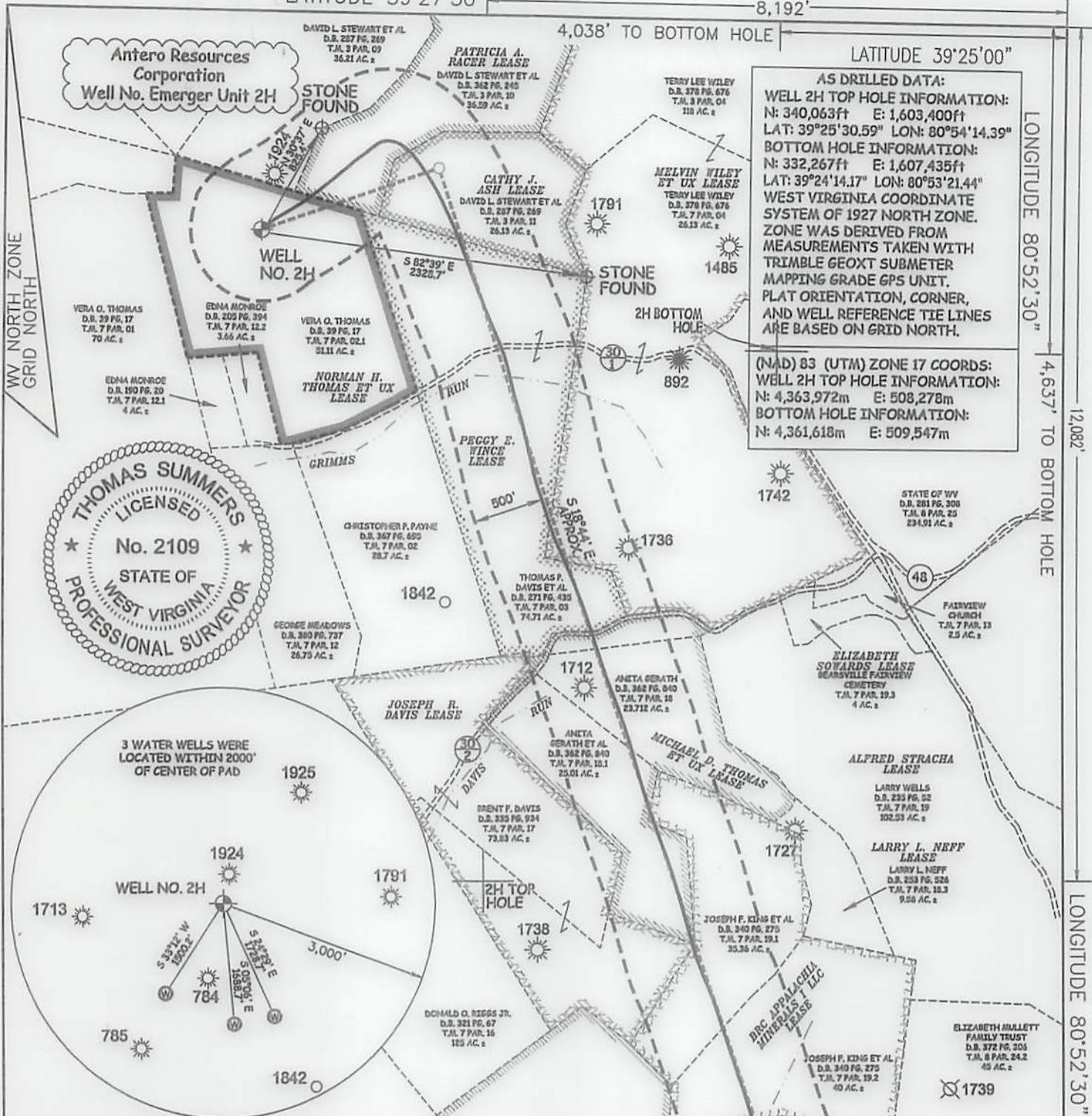
WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL 47 - 095 - 02378
 (IF "GAS") PRODUCTION STORAGE DEEP SHALLOW STATE COUNTY PERMIT
 LOCATION: ELEVATION 1,148.1 AS BUILT WATERSHED OUTLET MIDDLE ISLAND CREEK
 QUADRANGLE MIDDLEBOURNE 7.5' DISTRICT CENTERVILLE COUNTY TYLER
 SURFACE OWNER VERA O. THOMAS ACREAGE 51.11 ACRES +/-
 OIL & GAS ROYALTY OWNER NORMAN H. THOMAS ET UX; PATRICIA A. RACER; CATHY J. ASH; LEASE ACREAGE 125 AC.±; 36.59 AC.±; 30 AC.±;
 PEGGY E. WINCE; MELVIN WILEY ET UX; MICHAEL D. THOMAS ET UX; JOSEPH R. DAVIS; BRC APPALACHIA MINERALS I LLC; CARL W. ASH 74.71 AC.±; 553.16 AC.±; 48.13 AC.±; 73.83 AC.±; 79.74 AC.±; 392.8 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
 TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,581' TVD 15,610' 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°27'30"

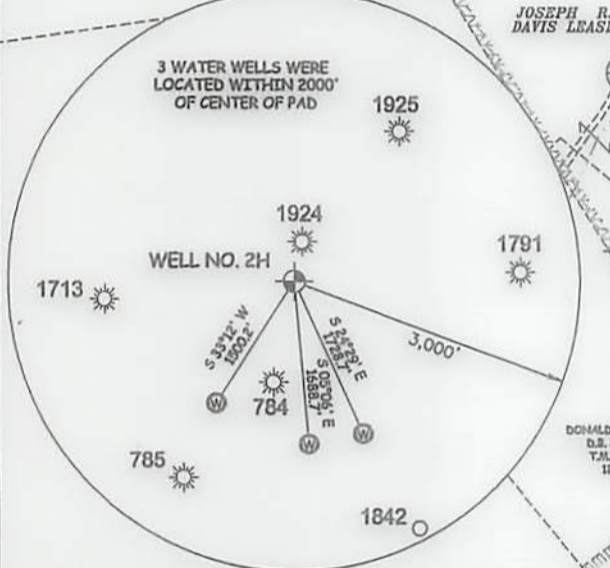
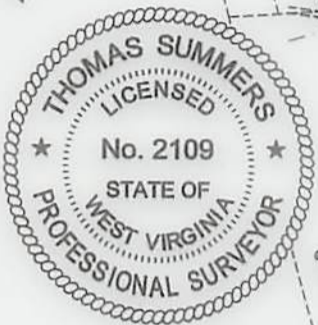
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STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
 WILLOW LAND SURVEYING PLLC
 220 MASONIC AVE. PENNSBORO WEST VIRGINIA 26415

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 NOT TO SCALE

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