

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

API 47-017-06810 County Doddridge District West Union
Quad West Union 7.5' Pad Name Addie Pad Field/Pool Name ----
Farm name Antero Resources Corporation Well Number Cobra 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 4353811m Easting 516772m
Landing Point of Curve Northing 4354074m Easting 517539m
Bottom Hole Northing 4356469m Easting 516593m

Elevation (ft) 891' 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 5/11/2017 Date drilling commenced 7/6/2017 Date drilling ceased 12/17/2017
Date completion activities began 2/12/2018 Date completion activities ceased 6/30/2018
Verbal plugging (Y/N) N/A Date permission granted N/A Granted by N/A

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 370' Open mine(s) (Y/N) depths No
Salt water depth(s) ft 1495', 1535' 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:

API 47-017 06810

Farm name Antero Resources Corporation Well number Cobra 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"	488'	New	54#, J-55	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2644'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	16175'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	7355'		4.7#, L-80		
Packer type and depth set		N/A					

Comment Details Cement Plug 12/6/2017 with 260 sacks @ 7616'

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	236	0'	8 Hrs.
Surface	Class A	440 sx	15.6	1.19	524	0'	8 Hrs.
Coal							
Intermediate 1	Class A	960 sx	15.6	1.18	1133	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	757sx (Lead) 1438sx (Tail)	13.5(Lead), 15.2 (Tail)	1.53 (Lead), 1.83 (Tail)	3790	~500' Into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 16175' MD, 6485' TVD (BHL), 6511' (Deepest Point Drilled) Loggers TD (ft) 16175' MD

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

Plug back procedure N/A

Kick off depth (ft) 6737'

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- 017 - 06810 Farm name Antero Resources Corporation Well number Cobra Unit 2H

PRODUCING FORMATION(S)	DEPTHS		
	6467' (TOP)	TVD	7396' (TOP) MD
Marcellus			

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 3600 psi Bottom Hole -- psi DURATION OF TEST -- hrs

OPEN FLOW Gas 13188 mcfpd Oil 94 bpd NGL -- bpd Water 73 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 ₂ S, ETC)
	DEPTH IN FT	DEPTH IN FT	DEPTH IN FT	DEPTH IN FT	
	NAME TVD	TVD	MD	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

Logging Company Allied Horizontal
Address 381 Colonial Manor Rd City North Huntington State PA Zip 15642

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

Stimulating Company Keane Group
Address 5825 North Sam Houston Parkway West, Suite 600 City Houston State TX Zip 77086

Please insert additional pages as applicable.

Completed by Karin Cox Telephone 303-357-6820
Signature  Title Permitting Agent Date 11/9/2018

API 47-017-06810 Farm Name Antero Resources Corp Well Number Cobra Unit 2H

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	2/11/2018	15906	16073	48	Marcellus
2	4/17/2018	15709	15875	48	Marcellus
3	4/17/2018	15511	15678	48	Marcellus
4	4/18/2018	15314	15480	48	Marcellus
5	4/18/2018	15116	15283	48	Marcellus
6	4/18/2018	14919	15085	48	Marcellus
7	4/19/2018	14721	14888	48	Marcellus
8	4/19/2018	14524	14690	48	Marcellus
9	4/20/2018	14326	14493	48	Marcellus
10	4/20/2018	14129	14296	48	Marcellus
11	4/21/2018	13932	14098	48	Marcellus
12	4/21/2018	13734	13901	48	Marcellus
13	4/21/2018	13537	13703	48	Marcellus
14	4/22/2018	13339	13506	48	Marcellus
15	4/22/2018	13142	13308	48	Marcellus
16	4/22/2018	12944	13111	48	Marcellus
17	4/23/2018	12747	12913	48	Marcellus
18	4/23/2018	12549	12716	48	Marcellus
19	4/24/2018	12352	12519	48	Marcellus
20	4/24/2018	12155	12321	48	Marcellus
21	4/24/2018	11957	12124	48	Marcellus
22	4/25/2018	11760	11926	48	Marcellus
23	4/25/2018	11562	11729	48	Marcellus
24	4/25/2018	11365	11531	48	Marcellus
25	4/26/2018	11167	11334	48	Marcellus
26	4/26/2018	10970	11136	48	Marcellus
27	4/26/2018	10772	10939	48	Marcellus
28	4/27/2018	10575	10742	48	Marcellus
29	4/27/2018	10378	10544	48	Marcellus
30	4/28/2018	10180	10347	48	Marcellus
31	4/28/2018	9983	10149	48	Marcellus
32	4/29/2018	9785	9952	48	Marcellus
33	4/29/2018	9588	9754	48	Marcellus
34	4/29/2018	9390	9557	48	Marcellus
35	4/30/2018	9193	9359	48	Marcellus
36	4/30/2018	8995	9162	48	Marcellus
37	5/1/2018	8798	8964	48	Marcellus
38	5/1/2018	8600	8767	48	Marcellus
39	5/1/2018	8403	8570	48	Marcellus
40	5/2/2018	8206	8372	48	Marcellus
41	5/2/2018	8008	8175	48	Marcellus
42	5/2/2018	7811	7977	48	Marcellus
43	5/3/2018	7613	7780	48	Marcellus
44	5/3/2018	7416	7582	48	Marcellus

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	2/11/2018	74.8	7720	5483	3299	499610	10381	N/A
2	4/17/2018	74.2	8160	5886	3061	499560	10746	N/A
3	4/17/2018	73.1	8082	5738	4078	502925	12147	N/A
4	4/18/2018	74.8	7704	5729	3553	499000	10525	N/A
5	4/18/2018	76.3	7687	5769	3389	498900	10261	N/A
6	4/18/2018	75.9	7995	5975	3485	499000	10266	N/A
7	4/19/2018	75.7	7897	5667	3656	501000	10271	N/A
8	4/19/2018	79	7750	2	3785	509782	10218	N/A
9	4/20/2018	75.4	7752	5544	3651	499000	10285	N/A
10	4/20/2018	76.2	7905	5634	4845	500000	10203	N/A
11	4/21/2018	78.7	7827	5662	3728	502000	10252	N/A
12	4/21/2018	77.4	7789	5382	4606	499084	10216	N/A
13	4/21/2018	76.7	7743	5747	4025	500047	10178	N/A
14	4/22/2018	74.9	7447	5623	4582	499000	10201	N/A
15	4/22/2018	79.3	7685	5903	4612	502006	10229	N/A
16	4/22/2018	67.3	7821	5550	4121	498000	12156	N/A
17	4/23/2018	78.4	7771	5407	3830	498900	10163	N/A
18	4/23/2018	75.1	7428	5687	3718	501097	10193	N/A
19	4/24/2018	73.2	7246	5448	4035	499000	10175	N/A
20	4/24/2018	78.6	7507	5898	3764	501099	10077	N/A
21	4/24/2018	77.5	7524	5493	4179	498000	10419	N/A
22	4/25/2018	78.7	7241	5643	3660	499000	10130	N/A
23	4/25/2018	75.8	7499	5232	4160	499430	12300	N/A
24	4/25/2018	77.4	7247	5542	4474	498006	10137	N/A
25	4/26/2018	77.7	7242	5566	3527	499700	10179	N/A
26	4/26/2018	79.2	7205	6175	3684	499250	10234	N/A
27	4/26/2018	78.8	7070	5528	3567	501000	10100	N/A
28	4/27/2018	78.3	7172	5508	3593	499420	10101	N/A
29	4/27/2018	78.4	7104	5978	3496	498970	10693	N/A
30	4/28/2018	76.8	7192	6515	3509	501000	10092	N/A
31	4/28/2018	79.2	7157	5694	3508	499040	10214	N/A
32	4/29/2018	78.6	6976	6027	4094	501000	10077	N/A
33	4/29/2018	79.3	7032	5994	3456	499100	10116	N/A
34	4/29/2018	77.5	7017	6035	3504	499300	10120	N/A
35	4/30/2018	78.4	7064	5945	3392	502000	9986	N/A
36	4/30/2018	79.7	7017	6565	3477	499170	10018	N/A
37	5/1/2018	79.3	6932	6331	4561	499000	11456	N/A
38	5/1/2018	79.1	6985	5724	4264	500000	9919	N/A
39	5/1/2018	79.1	7181	6754	4712	499380	10037	N/A
40	5/2/2018	79	6950	6417	3447	500856	10459	N/A
41	5/2/2018	80.2	7019	6225	3555	499300	10028	N/A
42	5/2/2018	78.9	6800	6455	3268	499000	9851	N/A
43	5/3/2018	79.3	6902	6300	4594	498644	9742	N/A
44	5/3/2018	79.7	6541	6815	3542	502866	9853	N/A
	AVG=	77	7,386	5,732	3,842	22,001,442	455,404	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	197	0	197
Sandy shale	197	357	197	357
Sandstone	357	417	357	417
Sandstone tr coal	417	437	417	437
Sandy shale	437	537	437	537
Shale	537	737	537	737
Silty sandstone	737	817	737	817
Silty shale	817	997	817	997
Sandstone	997	1,017	997	1,017
Silty shale	1,017	1,277	1,017	1,277
Sandstone	1,277	1,417	1,277	1,417
Sandy shale	1,417	1,677	1,417	1,677
Silty shale	1,677	1,762	1,677	1,800
Big Lime	1,762	2,303	1,800	2,370
Fifty Foot Sandstone	2,303	2,516	2,370	2,590
Gordon	2,516	2,714	2,590	2,794
Fifth Sandstone	2,714	2,780	2,794	2,863
Bayard	2,780	3,567	2,863	3,749
Speechley	3,567	3,754	3,749	3,970
Balltown	3,754	4,377	3,970	4,706
Bradford	4,377	4,807	4,706	5,219
Benson	4,807	5,098	5,219	5,564
Alexander	5,098	6,062	5,564	6,719
Sycamore	6,062	6,236	6,719	6,947
Middlesex	6,236	6,369	6,947	7,186
Burkett	6,369	6,398	7,186	7,254
Tully	6,398	6,442	7,254	7,371
Marcellus	6,442	NA	7,371	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: Doddridge Co., WV
 Field: Doddridge
 Facility: Addie Pad

Slot: Slot #09
 Well: Cobra Unit 2H ST02
 Wellbore: Cobra Unit 2H ST02 PWB



API: 47-017-06810-0200
 BHI Job #: 8883995B
 Rig: Frontier 22
 Duration: 11/23/2017-12/11/2017

Plot reference wellbore is Cobra Unit 2H ST02 PWB Rev-B.0	Grid System: NAD27 / UTM Zone 17 North, US feet
True vertical depths are referenced to Frontier 22 (RXB)	North Reference: Grid north
Measured depths are referenced to Frontier 22 (RXB)	Scale: True distance
Frontier 22 (RXB) to Mean Sea Level: 914.5 feet	Depths are in feet
Mean Sea Level to Mud line (At Slot #09): -990 feet	Created by: daban on 2018-01-11
Coordinates are in feet referenced to Slot	Database: WA MFL - EasternUS-Data

Gyrodatta MS Gyro <17-1/2"> (100-472) : 0.27° Inc, 109.50ft MD, 108.50ft TVD, 0.18ft VS

WFT EM <12-1/4"> (472)(520-2562) : 0.69° Inc, 529.50ft MD, 529.49ft TVD, 2.20ft VS

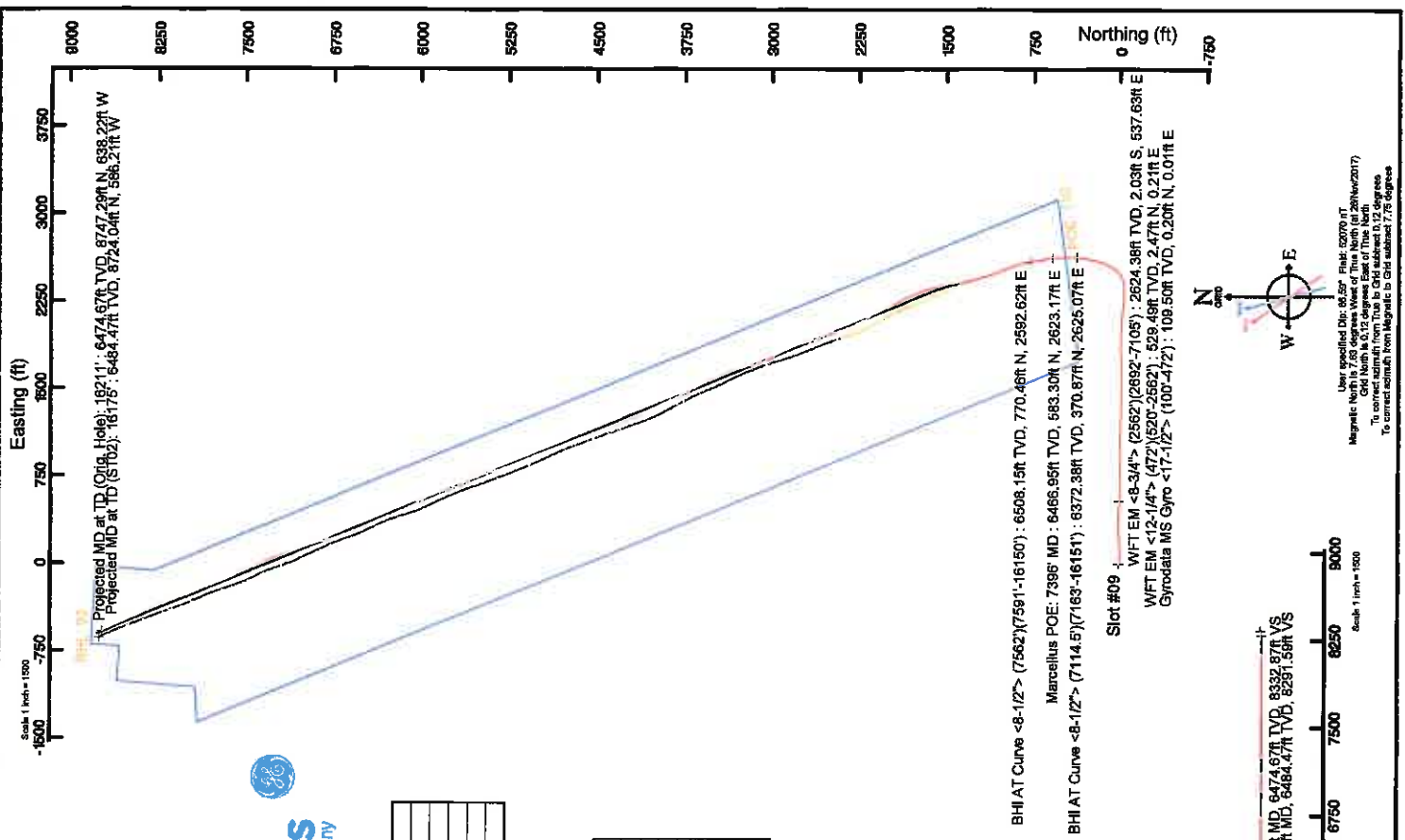
Location Information			
Facility Name	Grid East (US ft)	Grid North (US ft)	Longitude
Addie Pad	1695325.147	14293415.128	80°48'20.930"W
Slot	Local E (ft)	Grid North (US ft)	Longitude
Slot #09	-0.86	14293414.265	80°48'20.040"W
Comment	Cobra Unit 2H		
Frontier 22 (RXB) to Mud line (At Slot: Slot #09)	24.6ft		
Mean Sea Level to Mud line (At Slot: Slot #09)	-990ft		
Frontier 22 (RXB) to Mean Sea Level	914.5ft		

WFT EM <8-3/4"> (2562)(2692-7105) : 13.43° Inc, 2701.50ft MD, 2624.38ft TVD, -206.32ft VS

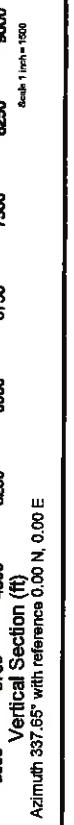
Well Profile Data						
Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local E (ft)	DLS (ft/100ft)
Tie On	7990.00	88.970	343.150	6507.63	1148.90	6.85
Est. TOC	8000.00	90.095	343.237	6507.63	2466.65	1.52
ST Point	8100.00	90.976	343.240	6506.69	1254.22	0.88
End of 3D Arc	8219.82	90.200	346.750	6505.46	2406.80	3.00
On Azimuth	8223.03	90.200	337.654	6504.40	2314.22	3.00
BHL	18203.03	90.200	337.654	6477.60	8761.53	-605.72
						0.00
						0.00

Well Data		
Well	Wellbore	Wellpath
Slot #09	Cobra Unit 2H	Cobra Unit 2H AMP Prof: 162.1'
Slot #09	Cobra Unit 2H ST02	Cobra Unit 2H ST02 PWB Rev-B.0

BHI AT Curve <8-1/2"> (7114.5)(7163-16151) : 60.64° Inc, 7163.00ft MD, 6372.38ft TVD, -656.21ft VS
 Marcelius POE: 7396' MD : 6466.95ft TVD, 563.30ft N, 2623.17ft E
 Gyrodatta MS Gyro <8-1/2"> (100-472) : 0.27° Inc, 109.50ft MD, 108.50ft TVD, 0.18ft VS
 BHI AT Curve <8-1/2"> (7114.5)(7163-16151) : 60.64° Inc, 7163.00ft MD, 6372.38ft TVD, -656.21ft VS
 Marcelius POE: 7396' MD : 6466.95ft TVD, 563.30ft N, 2623.17ft E
 Gyrodatta MS Gyro <8-1/2"> (100-472) : 0.27° Inc, 109.50ft MD, 108.50ft TVD, 0.18ft VS



Well specified Dip: 60.59° Final: 60.70° TT
 Magnetic North: 60.13° (North: 0.13 degrees East of True North)
 To correct azimuth from True to Grid subtract 0.12 degrees
 To correct azimuth from Magnetic to Grid subtract 7.76 degrees





Actual Wellpath Report

Cobra Unit 2H ST02 AWP Proj: 16175'

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REFERENCE WELLPATH IDENTIFICATION

Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #09
Area	Doddridge Co., WV	Well	Cobra Unit 2H ST02
Field	Doddridge	Wellbore	Cobra Unit 2H ST02 AWB
Facility	Addle Pad	Sidetrack from	Cobra Unit 2H AWP Proj: 16211' at 7562.00 MD

REPORT SETUP INFORMATION

Projection System	NAD27 / UTM Zone 17 North, US feet	Software System	WellArchitect® 5.1
North Reference	Grid	User	Delaset
Scale	0.999603	Report Generated	11/Jan/2018 at 15:42
Convergence at slot	0.12° East	Database/Source file	WA_MPL_EasternUS_Defn/Cobra_Unit_2H_ST02_AWP_Proj_16175_.xml

WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	-0.86	69.94	1695395.05	14283414.27	39°20'00.520"N	80°48'20.040"W
Facility Reference Pt			1695325.15	14283415.13	39°20'00.530"N	80°48'20.330"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	914.50ft
Vertical Reference Pt	Frontier 22 (RKB)	Frontier 22 (RKB) to Mud Line at Slot (Slot #09)	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	337.65°



Actual Wellpath Report

Cobra Unit 2H ST02 AWP Proj: 16175'
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REFERENCE WELLPATH IDENTIFICATION		Slot	Slot #09
Operator	ANTERO RESOURCES CORPORATION		
Area	Doddridge Co., WV	Well	Cobra Unit 2H ST02
Field	Doddridge	Wellbore	Cobra Unit 2H ST02 AWB
Facility	Addle Pad	Side-track from	Cobra Unit 2H AWP Proj: 16211' at 7562.00 MD

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 (ft/100ft)	Build Rate (ft/100ft)	Turn Rate (°/100ft)	Comments
0.00	0.00	2.630	0.00	0.00	0.00	0.00	1695395.05	14283414.27	39°20'00.520"N	80°48'20.040"W	0.00	0.000	0.00	0.00	0.00	
24.50	0.00	2.630	24.50	0.00	0.00	0.00	1695395.05	14283414.27	39°20'00.520"N	80°48'20.040"W	0.00	0.000	0.00	0.00	0.00	
109.50	0.270	2.630	109.50	0.18	0.20	0.01	1695395.06	14283414.47	39°20'00.522"N	80°48'20.040"W	0.20	2.630	0.32	0.32	3.09	Syrodota MS Gyro <17-1/2"> (100-472)
209.50	0.280	350.080	209.50	0.63	0.88	-0.02	1695395.03	14283414.94	39°20'00.527"N	80°48'20.040"W	0.68	358.129	0.06	0.01	-12.55	
309.50	0.280	350.800	309.50	1.09	1.14	-0.10	1695394.95	14283415.41	39°20'00.531"N	80°48'20.041"W	1.15	354.828	0.02	-0.02	0.52	
409.50	0.330	357.590	409.50	1.59	1.65	-0.15	1695394.90	14283415.92	39°20'00.536"N	80°48'20.042"W	1.66	354.798	0.08	0.07	6.99	
481.50	0.450	15.350	481.49	2.00	2.13	-0.08	1695394.97	14283416.40	39°20'00.541"N	80°48'20.041"W	2.13	357.736	0.23	0.17	24.67	
529.50	0.690	57.390	529.49	2.20	2.47	0.21	1695395.26	14283416.73	39°20'00.544"N	80°48'20.037"W	2.48	4.839	0.97	0.50	87.58	MFT EM <12-1/4"> (472)(620-2562)
559.50	0.970	72.180	559.49	2.22	2.84	0.60	1695395.66	14283416.91	39°20'00.546"N	80°48'20.032"W	2.71	12.844	1.17	0.93	49.30	
619.50	1.990	89.050	619.47	1.80	2.82	2.13	1695397.18	14283417.08	39°20'00.548"N	80°48'20.013"W	3.53	37.066	1.83	1.70	28.12	
709.50	4.180	97.740	709.33	-0.42	2.40	6.94	1695401.99	14283416.67	39°20'00.544"N	80°48'19.952"W	7.35	70.916	2.48	2.43	9.66	
798.50	6.480	96.630	797.94	-4.48	1.38	15.15	1695410.19	14283415.65	39°20'00.533"N	80°48'19.847"W	15.21	84.776	2.59	2.58	-1.25	
892.50	9.000	98.740	891.08	-10.85	-0.35	27.68	1695422.73	14283413.92	39°20'00.516"N	80°48'19.688"W	27.68	80.715	2.70	2.68	2.24	
986.50	12.380	99.320	983.43	-19.94	-3.10	44.90	1695439.93	14283411.17	39°20'00.488"N	80°48'19.468"W	45.01	93.844	3.60	3.60	0.62	
1081.50	15.180	95.310	1075.69	-31.06	-5.90	67.34	1695482.36	14283408.37	39°20'00.460"N	80°48'19.183"W	67.59	95.004	3.11	2.95	-4.22	
1176.50	14.880	89.670	1167.45	-41.41	-6.98	91.92	1695486.94	14283407.29	39°20'00.449"N	80°48'18.870"W	92.19	94.341	1.57	-0.32	-5.94	
1271.50	14.930	84.830	1259.25	-49.60	-5.80	116.31	1695511.32	14283408.46	39°20'00.480"N	80°48'18.560"W	116.45	92.857	1.31	0.05	-5.09	
1365.50	15.890	85.570	1349.87	-57.13	-3.72	141.20	1695536.20	14283410.55	39°20'00.480"N	80°48'18.243"W	141.25	91.509	1.04	1.02	0.79	
1460.50	18.140	87.760	1440.71	-66.22	-2.14	168.95	1695563.93	14283412.13	39°20'00.495"N	80°48'17.890"W	168.96	90.724	2.46	2.37	2.31	
1554.50	18.510	85.090	1529.95	-75.72	-0.29	198.43	1695593.41	14283413.98	39°20'00.513"N	80°48'17.515"W	198.43	90.083	0.98	0.39	-2.84	
1649.50	18.940	81.470	1619.92	-83.93	3.29	228.71	1695623.67	14283417.55	39°20'00.548"N	80°48'17.129"W	228.73	89.176	1.30	0.45	-3.81	
1743.50	18.930	83.740	1708.83	-91.80	7.22	258.95	1695653.90	14283421.48	39°20'00.586"N	80°48'16.744"W	259.05	88.404	0.78	-0.01	2.41	
1838.50	18.880	87.950	1798.71	-101.40	9.45	289.63	1695684.57	14283423.71	39°20'00.607"N	80°48'16.354"W	289.78	88.132	1.44	-0.05	4.43	
1933.50	19.490	92.150	1888.44	-113.30	9.40	320.83	1695715.75	14283423.66	39°20'00.606"N	80°48'15.957"W	320.97	88.321	1.59	0.64	4.42	
2028.50	19.400	94.800	1978.03	-127.08	7.49	352.39	1695747.30	14283421.75	39°20'00.586"N	80°48'15.555"W	352.47	88.783	0.93	-0.09	2.79	
2122.50	18.590	91.860	2066.91	-140.34	5.69	382.92	1695777.82	14283419.96	39°20'00.568"N	80°48'15.167"W	382.96	89.148	1.33	-0.86	-3.13	
2217.50	18.660	89.440	2156.93	-152.20	5.35	413.25	1695808.14	14283419.61	39°20'00.564"N	80°48'14.781"W	413.29	89.258	0.82	0.07	-2.55	
2311.50	17.200	91.800	2246.37	-163.47	5.06	442.18	1695837.06	14283419.32	39°20'00.561"N	80°48'14.412"W	442.21	89.344	1.73	-1.55	2.51	
2406.50	14.320	95.320	2337.79	-174.67	3.33	467.93	1695862.82	14283417.79	39°20'00.545"N	80°48'14.085"W	467.94	89.568	3.19	-3.03	3.71	
2501.50	13.250	94.080	2430.05	-184.97	1.87	490.49	1695885.34	14283415.93	39°20'00.526"N	80°48'13.798"W	490.49	89.805	1.17	-1.13	-1.31	



Actual Wellpath Report

Cobra Unit 2H ST02 AWP Proj: 16175'

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REFERENCE WELLPATH IDENTIFICATION

Operator	Antero Resources Corporation	Slot	Slot #09
Area	Doddridge Co., WV	Well	Cobra Unit 2H ST02
Field	Doddridge	Wellbore	Cobra Unit 2H ST02 AWB
Facility	Addle Pad	Sidetrack from	Cobra Unit 2H AWP Proj: 16211' at 7562.00 MD

WELLPATH DATA (202 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/100ft	°/100ft	°/100ft	
2571.50	13.990	94.840	2498.08	-192.41	0.38	506.92	1695907.77	14283414.65	39°20'00.513"N	80°48'13.589"W	506.92	89.957	1.09	1.06	1.09	
2701.50	13.430	94.110	2624.38	-206.32	-2.03	537.63	1695932.47	14283412.24	39°20'00.468"N	80°48'13.198"W	537.64	90.216	0.45	-0.43	-0.56	WFT EM <8-3/4"> (2562)(2892-7105)
2796.50	15.150	95.790	2716.44	-217.09	-4.07	560.99	1695956.82	14283410.20	39°20'00.468"N	80°48'12.901"W	561.01	90.416	1.86	1.81	1.77	
2890.50	17.780	94.570	2806.57	-229.38	-6.45	587.52	1695982.34	14283407.82	39°20'00.444"N	80°48'12.563"W	587.56	90.629	2.82	2.80	2.80	
2986.50	20.366	91.870	2897.30	-242.87	-8.17	618.83	1696013.84	14283406.10	39°20'00.426"N	80°48'12.165"W	618.88	90.756	2.84	2.69	-2.81	
3081.50	22.250	89.840	2985.80	-256.44	-8.65	653.34	1696048.13	14283405.61	39°20'00.420"N	80°48'11.726"W	653.39	90.759	2.14	1.99	-2.14	
3176.50	24.440	88.160	3073.02	-270.13	-7.97	690.97	1696085.75	14283406.30	39°20'00.426"N	80°48'11.247"W	691.02	90.661	2.41	2.31	-1.77	
3270.50	26.580	86.720	3157.86	-283.81	-6.15	731.39	1696126.15	14283408.12	39°20'00.444"N	80°48'10.732"W	731.42	90.481	2.35	2.28	-1.53	
3364.50	28.990	87.240	3241.03	-298.31	-3.85	775.13	1696169.88	14283410.42	39°20'00.465"N	80°48'10.175"W	775.14	90.284	2.60	2.59	0.55	
3458.50	31.080	89.870	3323.27	-315.23	-2.60	822.65	1696217.38	14283411.67	39°20'00.477"N	80°48'08.571"W	822.66	90.181	2.55	2.20	2.56	
3553.50	32.890	92.360	3403.00	-335.00	-3.51	872.42	1696267.13	14283410.76	39°20'00.467"N	80°48'08.937"W	872.43	90.230	2.45	1.93	2.86	
3647.50	32.960	91.750	3481.90	-356.11	-5.34	923.48	1696318.17	14283408.93	39°20'00.447"N	80°48'08.288"W	923.50	90.331	0.36	0.07	-0.65	
3742.50	32.850	89.870	3561.66	-376.40	-6.07	975.08	1696369.75	14283408.20	39°20'00.439"N	80°48'07.631"W	975.10	90.357	1.08	-0.12	-1.98	
3836.50	32.390	87.890	3640.84	-394.75	-5.09	1025.74	1696420.38	14283410.16	39°20'00.448"N	80°48'06.986"W	1025.75	90.284	1.24	-0.49	-2.11	
3931.50	31.710	89.900	3721.36	-413.01	-4.11	1076.13	1696470.78	14283410.16	39°20'00.456"N	80°48'06.345"W	1076.14	90.219	1.33	-0.72	2.12	
4025.50	32.210	92.890	3801.11	-432.97	-5.24	1125.87	1696520.47	14283409.03	39°20'00.444"N	80°48'05.712"W	1125.88	90.267	1.66	0.53	2.97	
4120.50	31.320	91.920	3881.88	-453.84	-7.25	1176.84	1696570.42	14283407.01	39°20'00.423"N	80°48'05.076"W	1176.86	90.353	1.03	-0.94	-0.81	
4214.50	30.600	91.340	3962.49	-473.49	-8.63	1224.17	1696618.74	14283405.84	39°20'00.408"N	80°48'04.461"W	1224.20	90.404	0.83	-0.77	-0.82	
4308.50	32.200	93.720	4043.58	-494.33	-10.84	1273.61	1696668.16	14283403.43	39°20'00.385"N	80°48'03.832"W	1273.65	90.488	2.13	1.68	2.51	
4403.50	33.170	92.520	4122.69	-516.15	-13.60	1324.29	1696718.82	14283400.68	39°20'00.357"N	80°48'03.187"W	1324.36	90.588	1.24	1.03	-1.28	
4497.50	32.290	91.070	4201.77	-536.95	-15.19	1375.09	1696769.59	14283399.08	39°20'00.340"N	80°48'02.541"W	1375.17	90.633	1.25	-0.94	-1.64	
4592.50	33.150	88.970	4281.70	-556.48	-15.20	1426.43	1696820.92	14283399.07	39°20'00.339"N	80°48'01.887"W	1426.51	90.811	1.50	0.91	-2.21	
4687.50	33.320	90.230	4361.16	-575.94	-14.84	1478.49	1696872.96	14283399.43	39°20'00.341"N	80°48'01.224"W	1478.57	90.575	0.75	0.18	1.33	
4781.50	32.980	89.810	4439.86	-595.42	-14.77	1529.90	1696924.34	14283399.50	39°20'00.341"N	80°48'00.570"W	1529.97	90.553	0.51	-0.36	-0.66	
4876.50	33.350	90.430	4519.38	-615.20	-14.79	1581.86	1696976.29	14283399.48	39°20'00.340"N	80°47'59.909"W	1581.93	90.536	0.61	0.39	0.86	
4971.50	32.320	89.530	4599.21	-634.78	-14.78	1633.37	1697027.78	14283399.49	39°20'00.339"N	80°47'59.253"W	1633.44	90.518	1.20	-1.08	-0.95	
5065.50	32.950	88.900	4678.37	-653.41	-14.08	1684.06	1697078.44	14283400.19	39°20'00.344"N	80°47'58.608"W	1684.12	90.479	0.76	0.67	-0.67	
5160.50	32.310	87.810	4758.37	-671.52	-12.61	1735.26	1697128.63	14283401.66	39°20'00.358"N	80°47'57.957"W	1735.31	90.416	0.91	-0.67	-1.15	
5254.50	33.440	88.410	4837.32	-689.36	-10.93	1786.26	1697180.60	14283403.33	39°20'00.373"N	80°47'57.308"W	1786.29	90.351	1.25	1.20	0.64	
5348.50	32.730	87.720	4916.08	-707.26	-9.21	1837.84	1697231.86	14283405.06	39°20'00.389"N	80°47'56.655"W	1837.56	90.287	0.86	-0.76	-0.73	



Actual Wellpath Report

Cobra Unit 2H ST02 AWP Proj: 16175'

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REFERENCE WELLPATH IDENTIFICATION

Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #09
Area	Doddridge Co., WY	Well	Cobra Unit 2H ST02
Field	Doddridge	Wellbore	Cobra Unit 2H ST02 AWB
Facility	Addie Pad	Sidetrack from	Cobra Unit 2H AWP Proj: 16211' at 7562.00 MD

WELLPATH DATA (202 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/100ft	ft/100ft	°/100ft	
5443.50	32.130	89.700	4998.26	-725.56	-8.05	1888.47	1697282.77	14283406.22	39°20'00.400"N	80°47'56.007"W	1888.48	90.244	1.28	-0.63	2.08	
5538.50	33.310	91.880	5076.19	-745.75	-8.77	1939.80	1697334.09	14283405.48	39°20'00.391"N	80°47'55.354"W	1839.82	90.259	1.76	-1.24	2.29	
5632.50	33.810	93.230	5154.52	-767.64	-11.09	1991.71	1697385.97	14283403.17	39°20'00.367"N	80°47'54.693"W	1991.74	90.319	0.96	0.53	1.44	
5727.50	32.390	91.720	5234.11	-789.43	-13.35	2043.53	1697437.77	14283400.92	39°20'00.344"N	80°47'54.034"W	2043.58	90.374	1.74	-1.51	-1.59	
5822.50	32.800	93.400	5314.15	-810.98	-15.64	2094.85	1697488.86	14283398.63	39°20'00.320"N	80°47'53.383"W	2094.70	90.428	1.05	0.44	1.77	
5916.50	34.100	95.280	5392.58	-834.26	-19.57	2146.30	1697540.50	14283394.70	39°20'00.280"N	80°47'52.726"W	2146.39	90.522	1.77	1.38	2.00	
6011.50	33.990	96.070	5471.30	-859.25	-24.83	2199.23	1697593.40	14283389.44	39°20'00.227"N	80°47'52.052"W	2199.37	90.647	0.48	-0.12	0.83	
6106.50	31.960	95.080	5550.99	-883.47	-29.87	2250.68	1697644.84	14283384.41	39°20'00.176"N	80°47'51.388"W	2250.88	90.760	2.21	-2.14	-1.04	
6200.50	31.930	93.670	5630.76	-905.84	-33.66	2300.27	1697694.41	14283380.62	39°20'00.137"N	80°47'50.767"W	2300.52	90.838	0.79	-0.03	-1.50	
6295.50	32.580	89.770	5711.11	-926.49	-35.17	2350.92	1697745.04	14283379.11	39°20'00.121"N	80°47'50.122"W	2351.19	90.857	2.29	0.88	-4.11	
6327.50	32.660	88.700	5738.06	-932.84	-34.94	2368.17	1697792.28	14283379.34	39°20'00.123"N	80°47'49.903"W	2368.43	90.845	1.82	0.25	-3.34	
6358.50	31.600	84.760	5764.31	-938.23	-34.00	2384.62	1697778.73	14283380.28	39°20'00.132"N	80°47'49.693"W	2384.87	90.817	7.57	-3.42	-12.71	
6390.50	29.920	79.690	5781.82	-942.37	-31.81	2400.83	1697794.93	14283382.47	39°20'00.153"N	80°47'49.487"W	2401.04	90.759	9.65	-5.25	-15.84	
6421.50	29.770	74.220	5818.71	-944.86	-28.33	2415.84	1697809.94	14283385.94	39°20'00.187"N	80°47'49.296"W	2416.01	90.672	8.79	-0.48	-17.65	
6453.50	30.870	69.520	5846.34	-946.04	-23.30	2431.18	1697825.27	14283390.98	39°20'00.237"N	80°47'49.100"W	2431.29	90.549	8.17	3.44	-14.69	
6485.50	31.910	65.550	5873.66	-946.00	-16.92	2446.57	1697840.65	14283397.35	39°20'00.300"N	80°47'48.904"W	2446.83	90.396	7.23	3.25	-12.41	
6516.50	32.810	62.290	5899.84	-944.91	-9.63	2461.47	1697855.54	14283404.64	39°20'00.371"N	80°47'48.715"W	2461.48	90.224	6.33	2.90	-10.52	
6548.50	33.370	57.890	5926.68	-942.61	-0.92	2476.60	1697870.67	14283413.35	39°20'00.457"N	80°47'48.522"W	2476.80	90.021	7.71	1.75	-13.75	
6579.50	34.330	52.820	5952.66	-942.61	8.90	2490.78	1697884.85	14283423.16	39°20'00.564"N	80°47'48.341"W	2490.81	89.795	9.62	3.10	-16.35	
6611.50	35.210	46.980	5978.70	-933.36	20.65	2504.73	1697898.79	14283434.91	39°20'00.670"N	80°47'48.163"W	2504.81	89.528	10.76	2.76	-18.25	
6642.50	34.880	35.980	6004.04	-926.22	33.48	2517.15	1697911.20	14283447.73	39°20'00.796"N	80°47'48.005"W	2517.38	89.238	10.75	0.00	-18.65	
6674.50	34.840	30.550	6030.24	-917.31	47.82	2528.61	1697922.65	14283462.07	39°20'00.938"N	80°47'47.859"W	2529.06	88.916	9.42	-1.03	-16.31	
6705.50	34.880	33.850	6055.67	-907.72	62.36	2538.75	1697932.80	14283476.60	39°20'01.081"N	80°47'47.729"W	2539.52	88.593	3.93	0.03	-8.87	
6737.50	34.840	27.940	6107.18	-885.84	93.52	2557.28	1697951.31	14283507.75	39°20'01.234"N	80°47'47.605"W	2558.68	88.251	5.90	-0.16	-10.31	
6768.50	36.076	25.990	6132.78	-873.33	110.69	2565.87	1697959.90	14283524.91	39°20'01.369"N	80°47'47.492"W	2558.98	87.906	6.28	3.97	-8.42	
6800.50	37.870	26.940	6167.07	-860.07	128.26	2573.74	1697967.77	14283542.48	39°20'01.558"N	80°47'47.383"W	2568.26	87.530	7.05	5.00	-8.28	
6831.50	39.150	22.990	6181.67	-845.34	147.29	2581.29	1697975.31	14283551.50	39°20'01.732"N	80°47'47.282"W	2576.93	87.147	6.64	4.77	-7.42	
6863.50	40.410	20.320	6181.67	-830.00	166.60	2587.90	1697981.92	14283560.80	39°20'02.110"N	80°47'47.185"W	2585.49	86.734	6.63	3.94	-8.34	
6894.50	41.940	17.530	6205.00	-813.54	186.78	2593.71	1697987.73	14283560.98	39°20'02.310"N	80°47'47.101"W	2593.25	86.317	7.71	4.94	-9.00	
6925.50	43.410	14.620	6227.80	-813.54	186.78	2593.71	1697987.73	14283560.98	39°20'02.310"N	80°47'47.026"W	2600.42	85.881	7.93	4.74	-9.39	



Actual Wellpath Report

Cobra Unit 2H ST02 AWP Proj: 16175'

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**BAKER
HUGHES**
a GE company

REFERENCE WELLPATH IDENTIFICATION

Operator	Area	Field	Facility	Slot #09
ANTERO RESOURCES CORPORATION	Doddridge Co., WV	Doddridge	Addle Pad	Cobra Unit 2H ST02
				Cobra Unit 2H ST02 AWP
				Cobra Unit 2H AWP Proj: 16211' at 7562.00 MD

WELLPATH DATA (202 stations) † = interpolated/extrapolated station

MD	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	Latitude	Longitude	Closure Dist	Closure Dir	DLS	Built Rate	Turn Rate	Comments
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	(°)	(ft)	(°)	(ft/100ft)	(ft/100ft)	(°/100ft)	(ft/100ft)
6957.50	45.050	12.800	6250.73	-795.49	208.47	2598.99	1697993.01	14283622.65	39°20'02.52"N	80°47'46.958"W	2607.34	85.414	6.48	5.12	-5.89	
6972.00†	46.108	12.147	6260.87	-786.99	218.58	2601.23	1697995.25	14283632.76	39°20'02.62"N	80°47'46.929"W	2610.40	85.197	7.97	7.30	-4.50	Middlesex: 6972 MD
6989.50	47.390	11.390	6272.87	-776.44	231.06	2603.83	1697997.84	14283645.23	39°20'02.74"N	80°47'46.896"W	2614.06	84.928	7.97	7.32	-4.33	
7020.50	49.840	10.850	6293.36	-757.04	253.88	2608.31	1698002.32	14283668.04	39°20'02.92"N	80°47'46.858"W	2620.64	84.441	8.01	7.90	-1.74	
7051.50	52.770	10.670	6312.74	-738.77	277.65	2612.83	1698008.84	14283691.80	39°20'03.20"N	80°47'46.780"W	2627.54	83.894	9.46	9.45	-0.58	
7083.50	56.130	9.640	6331.34	-714.82	303.27	2617.41	1698011.42	14283717.41	39°20'03.46"N	80°47'46.721"W	2634.82	83.391	10.82	10.50	-3.22	
7114.50	58.950	7.160	6347.98	-692.34	329.14	2621.22	1698015.23	14283743.28	39°20'03.71"N	80°47'46.672"W	2641.81	82.843	11.33	9.10	-8.00	
7163.00	60.840	3.400	6372.38	-665.21	370.87	2625.07	1698019.07	14283784.99	39°20'04.12"N	80°47'46.632"W	2651.13	81.959	7.55	3.48	-7.75	BH AT Curve <8-1/2"> (7114.5) (7163-16151)
7211.00†	63.217	2.156	6394.97	-616.87	413.17	2627.11	1698021.12	14283827.27	39°20'04.54"N	80°47'46.594"W	2659.40	81.062	5.83	5.37	-2.59	Burkett: 7211 MD
7230.00	64.240	1.680	6403.38	-601.33	430.19	2627.69	1698022.45	14283868.02	39°20'04.71"N	80°47'46.587"W	2662.67	80.702	5.83	5.38	-2.51	
7279.00†	67.636	0.282	6423.32	-560.24	474.94	2628.44	1698022.45	14283887.17	39°20'05.19"N	80°47'46.576"W	2670.88	79.797	7.59	7.15	-2.78	
7326.00	68.490	358.230	6440.88	-518.71	518.53	2627.89	1698021.89	14283932.59	39°20'05.58"N	80°47'46.582"W	2678.56	78.838	4.44	1.78	-4.39	Tully: 7279 MD
7370.00†	67.720	355.076	6457.29	-481.12	559.28	2625.51	1698019.51	14283973.32	39°20'05.99"N	80°47'46.611"W	2684.41	77.975	6.88	-1.75	-7.17	Hamilton: 7370 MD
7396.00†	68.812	353.913	6466.95	-458.01	583.30	2623.17	1698017.18	14283997.33	39°20'06.22"N	80°47'46.640"W	2684.75	77.916	6.88	-1.68	-7.21	
7420.00	70.010	352.940	6475.39	-436.39	605.62	2620.60	1698014.61	14284019.64	39°20'06.44"N	80°47'46.672"W	2687.24	77.463	6.27	4.97	-4.12	Marcellus POE: 7396 MD
7467.00	75.420	351.040	6489.35	-392.93	650.04	2614.34	1698008.35	14284064.05	39°20'06.89"N	80°47'46.750"W	2693.94	76.987	6.27	4.99	-4.05	
7515.00	80.180	349.550	6499.49	-347.17	696.27	2606.43	1698000.44	14284110.26	39°20'07.34"N	80°47'46.850"W	2697.82	75.044	10.37	11.51	-4.04	
7562.00	84.370	349.350	6505.81	-301.59	742.04	2597.90	1697991.92	14284156.01	39°20'07.98"N	80°47'46.957"W	2701.80	74.059	8.92	8.91	-0.43	
7591.00	86.370	349.560	6508.15	-273.29	770.46	2592.62	1697986.84	14284184.42	39°20'08.07"N	80°47'47.023"W	2704.68	73.449	6.94	6.90	0.79	BH AT Curve <8-1/2"> (7562) (7591-16150)
7718.00	91.230	344.790	6510.81	-148.15	894.20	2564.47	1697958.50	14284308.11	39°20'09.30"N	80°47'47.378"W	2715.89	70.777	5.37	3.83	-3.77	
7813.00	90.310	337.950	6509.53	-53.42	984.16	2534.14	1697928.18	14284398.03	39°20'10.19"N	80°47'47.761"W	2718.53	68.776	7.26	-0.97	-7.20	
7908.00	89.600	337.390	6508.61	41.58	1072.03	2498.04	1697892.10	14284485.87	39°20'11.06"N	80°47'48.218"W	2718.36	66.774	0.95	-0.75	-0.59	
8003.00	90.150	343.590	6509.81	136.42	1161.53	2466.33	1697860.40	14284575.33	39°20'11.94"N	80°47'48.619"W	2726.16	64.782	6.55	0.58	6.53	
8098.00	90.180	344.780	6509.54	230.80	1252.93	2440.44	1697834.52	14284666.70	39°20'12.85"N	80°47'48.946"W	2743.28	62.824	1.25	0.03	1.25	
8193.00	90.090	347.890	6509.32	324.70	1345.23	2418.00	1697812.09	14284758.96	39°20'13.76"N	80°47'49.229"W	2767.02	60.911	3.28	-0.09	3.27	
8288.00	89.970	350.360	6509.27	417.79	1438.52	2400.06	1697794.18	14284852.21	39°20'14.68"N	80°47'49.455"W	2798.16	59.063	2.60	-0.13	2.60	
8383.00	90.180	349.980	6509.14	510.53	1532.12	2383.86	1697777.97	14284945.78	39°20'15.61"N	80°47'49.658"W	2833.78	57.271	0.46	0.22	-0.40	
8477.00	90.220	343.160	6508.81	603.34	1623.60	2362.04	1697756.15	14285037.12	39°20'16.51"N	80°47'49.933"W	2866.18	55.498	7.26	0.04	-7.26	



Actual Wellpath Report

Cobra Unit 2H ST02 AWP Proj: 16175

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REFERENCE WELLPATH IDENTIFICATION

Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #09
Area	Doddridge Co., WV	Well	Cobra Unit 2H ST02
Field	Doddridge	Wellbore	Cobra Unit 2H ST02 AWB
Facility	Addie Pad	Sidetrack from	Cobra Unit 2H AWP Proj: 16211 at 7562.00 MD

WELLPATH DATA (202 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 (1/100ft)	Build Rate (1/100ft)	Turn Rate (1/100ft)	Comments
8572.00	90.120	341.020	6508.53	698.05	1713.89	2332.83	1697726.95	14285121.47	39°20'17.409"N	80°47'50.303"W	2894.74	53.896	2.26	-0.11	-2.25	
8667.00	90.180	336.820	6508.28	783.01	1802.51	2298.67	1697692.81	14285216.06	39°20'18.285"N	80°47'50.735"W	2921.12	51.898	4.42	0.06	-4.42	
8762.00	90.030	330.910	6508.11	887.76	1887.76	2256.84	1697651.00	14285301.27	39°20'19.129"N	80°47'51.265"W	2942.27	50.089	6.22	-0.16	-6.22	
8857.00	90.090	330.970	6508.01	982.11	1970.80	2210.70	1697604.87	14285384.28	39°20'19.951"N	80°47'51.850"W	2961.63	48.283	0.89	0.06	0.06	
8952.00	90.120	332.770	6507.84	1076.62	2054.58	2185.91	1697560.10	14285468.02	39°20'20.780"N	80°47'52.417"W	2985.37	46.511	1.89	0.03	1.89	
9047.00	90.060	332.780	6507.69	1171.27	2139.05	2122.45	1697516.66	14285552.47	39°20'21.616"N	80°47'52.968"W	3013.36	44.777	0.06	-0.06	0.01	
9141.00	90.080	332.940	6507.56	1264.95	2222.70	2079.57	1697473.79	14285636.08	39°20'22.443"N	80°47'53.511"W	3043.85	43.094	0.17	0.03	0.17	
9237.00	90.060	334.790	6507.44	1360.73	2308.86	2037.24	1697431.48	14285722.01	39°20'23.298"N	80°47'54.048"W	3079.15	41.424	1.86	-0.03	1.86	
9331.00	90.090	341.750	6507.32	1454.67	2396.11	2002.41	1697386.67	14285809.42	39°20'24.159"N	80°47'54.489"W	3122.66	39.885	7.47	0.03	7.47	
9426.00	90.740	342.110	6506.63	1549.40	2486.42	1972.95	1697347.21	14285899.70	39°20'25.062"N	80°47'54.861"W	3174.08	38.432	0.78	0.68	0.38	
9521.00	90.520	336.460	6505.58	1644.31	2575.24	1939.36	1697303.64	14285988.48	39°20'25.931"N	80°47'55.286"W	3223.81	36.983	5.95	-0.23	-5.95	
9616.00	90.060	340.380	6505.10	1739.29	2663.56	1904.42	1697298.72	14286076.76	39°20'26.804"N	80°47'55.728"W	3274.35	35.564	4.15	-0.48	4.13	
9711.00	90.490	342.150	6504.64	1834.08	2753.62	1873.91	1697288.22	14286166.69	39°20'27.694"N	80°47'56.114"W	3330.68	34.237	1.92	0.45	1.86	
9806.00	90.340	336.700	6503.96	1929.01	2842.43	1840.54	1697234.86	14286255.56	39°20'28.574"N	80°47'56.536"W	3386.29	32.924	5.74	-0.16	-5.74	
9900.00	90.030	332.000	6503.65	2022.83	2927.14	1799.86	1697194.20	14286340.24	39°20'29.412"N	80°47'57.051"W	3436.23	31.587	5.01	-0.33	-5.00	
9995.00	90.030	335.230	6503.60	2117.59	3012.23	1757.66	1697152.00	14286425.30	39°20'30.254"N	80°47'57.588"W	3487.53	30.264	3.40	0.00	3.40	
10090.00	90.060	337.860	6503.53	2212.55	3099.37	1719.84	1697114.21	14286512.40	39°20'31.116"N	80°47'58.065"W	3544.57	29.028	2.77	0.03	2.77	
10185.00	90.120	344.000	6503.38	2307.35	3189.12	1688.82	1697083.20	14286602.11	39°20'32.004"N	80°47'58.457"W	3608.68	27.904	6.46	0.06	6.46	
10279.00	90.650	345.050	6502.75	2400.67	3279.71	1663.74	1697058.13	14286699.66	39°20'32.899"N	80°47'58.774"W	3677.57	26.898	1.25	0.56	1.12	
10374.00	90.620	337.830	6501.68	2495.39	3369.70	1633.52	1697027.92	14286782.62	39°20'33.790"N	80°47'59.156"W	3744.76	25.863	7.60	-0.03	-7.60	
10468.00	90.220	336.310	6501.04	2589.38	3456.27	1596.90	1696991.32	14286869.15	39°20'34.646"N	80°47'59.620"W	3807.34	24.798	1.67	-0.43	-1.62	
10563.00	90.150	333.570	6500.72	2684.31	3542.66	1557.40	1696951.83	14286955.51	39°20'35.501"N	80°48'00.120"W	3869.88	23.731	1.86	-0.11	-1.85	
10657.00	90.090	333.220	6500.55	2778.10	3627.06	1516.02	1696910.47	14287039.88	39°20'36.356"N	80°48'00.644"W	3931.15	22.684	1.42	-0.03	-1.41	
10752.00	90.120	335.470	6500.35	2872.84	3712.00	1473.48	1696867.95	14287124.79	39°20'37.176"N	80°48'01.184"W	3993.76	21.651	0.37	0.06	0.37	
10847.00	90.250	334.800	6500.02	2967.66	3797.52	1432.11	1696826.59	14287210.27	39°20'38.022"N	80°48'01.708"W	4056.58	20.662	1.30	0.11	1.29	
10942.00	90.120	335.470	6499.71	3062.57	3883.71	1392.17	1696786.67	14287296.43	39°20'38.875"N	80°48'02.214"W	4125.69	19.721	0.72	-0.14	0.71	
11037.00	90.150	335.850	6499.49	3157.51	3970.27	1353.01	1696747.53	14287382.95	39°20'39.731"N	80°48'02.710"W	4194.48	18.818	0.40	0.03	0.40	
11131.00	90.080	335.010	6499.29	3251.44	4055.76	1313.93	1696708.46	14287468.41	39°20'40.577"N	80°48'03.205"W	4263.28	17.951	0.90	-0.06	-0.89	
11225.00	90.220	335.000	6499.04	3345.34	4140.95	1274.21	1696668.75	14287553.57	39°20'41.420"N	80°48'03.708"W	4332.56	17.104	0.14	0.14	-0.01	
11320.00	90.090	337.420	6498.78	3440.31	4227.87	1235.89	1696630.45	14287640.45	39°20'42.280"N	80°48'04.193"W	4404.81	16.295	2.55	-0.14	2.55	



Actual Wellpath Report

Cobra Unit 2H ST02 AWP Proj: 16175'

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REFERENCE WELLPATH IDENTIFICATION

Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #09
Area	Doddridge Co., WV	Well	Cobra Unit 2H ST02
Field	Doddridge	Wellbore	Cobra Unit 2H ST02 AWB
Facility	Addle Pad	Sidetrack from	Cobra Unit 2H AWP Proj: 16211' at 7562.00 MD

WELLPATH DATA (202 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/100ft	ft/100ft	ft/100ft	
11416.00	90.150	337.840	6498.58	3536.30	4319.85	1199.35	1696593.93	14287729.18	39°20'43.158"N	80°48'04.658"W	4480.17	15.828	0.44	0.06	0.44	
11510.00	90.150	340.060	6498.33	3630.27	4404.37	1185.59	1696560.18	14287816.88	39°20'44.028"N	80°48'05.083"W	4555.99	14.823	2.36	0.00	2.36	
11605.00	90.250	339.960	6498.00	3725.19	4493.65	1133.12	1696527.72	14287906.12	39°20'44.909"N	80°48'05.494"W	4634.31	14.153	0.15	0.11	-0.11	
11700.00	90.280	338.160	6497.56	3820.16	4582.37	1099.17	1696493.78	14287994.81	39°20'45.787"N	80°48'05.924"W	4712.35	13.488	1.89	0.03	-1.89	
11795.00	89.910	337.550	6497.40	3915.16	4670.38	1063.36	1696457.89	14288082.76	39°20'46.657"N	80°48'06.377"W	4789.86	12.827	0.75	-0.39	-0.64	
11890.00	90.150	338.330	6497.35	4010.16	4758.40	1027.68	1696422.32	14288170.77	39°20'47.528"N	80°48'06.829"W	4868.11	12.187	0.86	0.25	0.82	
11985.00	90.180	340.540	6497.08	4105.10	4847.34	994.31	1696388.97	14288259.68	39°20'48.408"N	80°48'07.251"W	4948.27	11.582	2.33	0.03	2.33	
12080.00	90.490	337.980	6496.53	4200.06	4936.18	960.67	1696355.34	14288348.48	39°20'49.287"N	80°48'07.877"W	5028.79	11.013	2.71	0.33	-2.69	
12175.00	90.090	338.190	6496.04	4295.05	5024.31	925.21	1696319.90	14288436.57	39°20'50.159"N	80°48'08.125"W	5108.79	10.434	0.48	-0.42	0.22	
12270.00	89.970	335.790	6495.98	4390.04	5111.75	886.08	1696282.78	14288523.98	39°20'51.023"N	80°48'08.596"W	5188.32	9.856	2.53	-0.13	-2.53	
12363.00	90.060	337.650	6495.97	4483.02	5197.20	851.40	1696246.12	14288609.40	39°20'51.869"N	80°48'09.060"W	5266.48	9.304	2.11	0.10	2.11	
12458.00	90.180	341.080	6495.77	4577.96	5286.12	818.00	1696212.73	14288696.28	39°20'52.748"N	80°48'09.483"W	5349.04	8.796	3.51	0.13	3.51	
12553.00	90.220	340.730	6495.44	4672.81	5375.90	786.93	1696181.67	14288786.02	39°20'53.636"N	80°48'09.876"W	5433.19	8.328	0.37	0.04	-0.37	
12647.00	90.120	338.200	6495.16	4766.76	5463.92	753.96	1696148.71	14288876.00	39°20'54.507"N	80°48'10.283"W	5515.68	7.857	2.69	-0.11	-2.69	
12742.00	90.150	335.690	6494.94	4861.74	5551.32	716.76	1696111.52	14288963.37	39°20'55.372"N	80°48'10.784"W	5597.40	7.357	2.64	0.03	-2.64	
12837.00	89.910	336.330	6494.89	4956.70	5638.11	678.13	1696072.92	14289050.13	39°20'56.230"N	80°48'11.254"W	5678.75	6.858	0.72	-0.25	0.67	
12932.00	90.310	340.040	6494.70	5051.68	5726.30	642.83	1696037.63	14289138.28	39°20'57.103"N	80°48'11.700"W	5762.27	6.405	3.93	0.42	3.91	
13026.00	90.830	340.570	6493.77	5145.67	5814.79	611.16	1696005.97	14289226.74	39°20'57.978"N	80°48'12.101"W	5846.82	6.000	0.79	0.55	0.56	
13121.00	90.180	335.060	6492.93	5240.63	5902.72	575.30	1695970.13	14289314.63	39°20'58.848"N	80°48'12.555"W	5930.69	5.567	5.84	-0.68	-5.80	
13216.00	90.180	333.690	6492.63	5335.37	5988.37	534.22	1695929.06	14289400.25	39°20'59.696"N	80°48'13.076"W	6012.16	5.098	1.44	0.00	-1.44	
13310.00	90.090	333.380	6492.41	5429.13	6072.92	492.33	1695887.18	14289484.37	39°21'00.528"N	80°48'13.607"W	6092.45	4.635	0.34	-0.10	-0.33	
13406.00	89.540	335.870	6492.72	5524.99	6159.25	451.19	1695846.08	14289571.06	39°21'01.366"N	80°48'14.128"W	6175.76	4.190	2.66	-0.57	2.59	
13501.00	90.340	339.330	6492.82	5619.87	6247.07	414.99	1695809.88	14289656.85	39°21'02.255"N	80°48'14.586"W	6260.84	3.801	3.74	0.84	3.64	
13596.00	90.310	335.990	6492.28	5714.96	6335.25	379.65	1695774.56	14289746.99	39°21'03.127"N	80°48'15.034"W	6346.61	3.429	2.46	-0.03	-2.46	
13691.00	90.000	335.630	6492.03	5809.93	6422.24	341.49	1695736.40	14289833.94	39°21'03.988"N	80°48'15.517"W	6431.31	3.044	1.47	-0.33	-1.43	
13785.00	89.380	336.810	6492.53	5903.90	6506.25	303.58	1695698.52	14289919.93	39°21'04.839"N	80°48'15.997"W	6515.33	2.671	1.42	-0.86	1.26	
13880.00	90.520	339.440	6492.62	5998.89	6596.41	268.19	1695663.14	14290008.04	39°21'05.711"N	80°48'16.445"W	6601.85	2.328	3.02	1.20	2.77	
13975.00	89.720	340.230	6492.42	6093.82	6685.58	235.44	1695630.40	14290097.18	39°21'06.593"N	80°48'16.860"W	6689.72	2.017	1.18	-0.84	0.83	
14070.00	90.370	343.990	6492.34	6188.51	6775.97	206.27	1695601.24	14290187.53	39°21'07.467"N	80°48'17.229"W	6778.11	1.744	4.02	0.68	3.96	
14164.00	90.710	340.890	6491.46	6282.17	6865.67	177.91	1695572.89	14290271.10	39°21'08.373"N	80°48'17.587"W	6867.88	1.484	3.32	0.36	-3.30	



Actual Wellpath Report

Cobra Unit 2H ST02 AWP Proj: 16175'
Page 8 of 10



REFERENCE WELLPATH IDENTIFICATION	
Operator	ANTERO RESOURCES CORPORATION
Area	Doddridge Co., WV
Field	Doddridge
Facility	Addle Pad
Slot	Slot #09
Well	Cobra Unit 2H ST02
Wellbore	Cobra Unit 2H ST02 AWB
Sidetrack from	Cobra Unit 2H AWP Proj: 16211' at 7562.00 MD

WELLPATH DATA (202 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/100ft	ft/100ft	°/100ft	
14258.00	90.150	340.360	6490.75	6376.04	6954.25	146.73	1695541.72	14290365.74	39°21'09.250"N	80°48'17.982"W	6955.80	1.209	0.82	-0.60	-0.56	
14353.00	90.220	341.350	6490.44	6470.89	7043.99	115.57	1695510.58	14290455.45	39°21'10.138"N	80°48'18.376"W	7044.94	0.940	1.04	0.07	1.04	
14448.00	90.340	341.860	6489.98	6565.66	7134.14	85.59	1695480.61	14290545.56	39°21'11.029"N	80°48'18.755"W	7134.65	0.687	0.55	0.13	0.54	
14544.00	91.170	339.870	6488.72	6661.49	7224.82	54.13	1695449.16	14290636.21	39°21'11.928"N	80°48'19.153"W	7225.02	0.429	2.25	0.86	-2.07	
14639.00	89.750	334.320	6487.95	6756.45	7312.29	17.17	1695412.22	14290723.64	39°21'12.791"N	80°48'19.821"W	7312.31	0.135	6.03	-1.49	-5.84	
14734.00	88.600	336.990	6488.49	6851.38	7398.83	-21.99	1695373.08	14290810.15	39°21'13.648"N	80°48'20.117"W	7398.87	359.830	2.81	-0.16	2.81	
14828.00	90.180	335.850	6488.67	6945.36	7484.98	-59.59	1695335.49	14290896.26	39°21'14.500"N	80°48'20.594"W	7485.22	359.544	1.36	0.62	-1.21	
14924.00	90.220	333.150	6488.34	7041.20	7571.62	-100.91	1695294.18	14290982.87	39°21'15.357"N	80°48'21.117"W	7572.29	359.236	2.81	0.04	-2.81	
15019.00	90.090	335.320	6488.08	7136.03	7657.17	-142.20	1695252.91	14291068.39	39°21'16.203"N	80°48'21.641"W	7658.49	358.936	2.29	-0.14	2.29	
15114.00	90.280	339.560	6487.77	7231.00	7744.88	-178.64	1695216.48	14291156.08	39°21'17.071"N	80°48'22.102"W	7746.84	358.679	4.47	0.20	4.46	
15208.00	90.250	339.870	6487.34	7324.95	7832.99	-211.39	1695183.75	14291244.14	39°21'17.943"N	80°48'22.516"W	7835.85	358.454	0.12	-0.03	0.12	
15304.00	90.060	337.880	6487.08	7420.93	7922.42	-246.29	1695148.86	14291333.52	39°21'18.827"N	80°48'22.958"W	7926.24	358.219	2.08	-0.20	-2.07	
15400.00	90.340	339.990	6486.74	7516.80	8011.93	-280.95	1695114.21	14291423.01	39°21'19.713"N	80°48'23.397"W	8016.86	357.992	2.42	0.29	2.41	
15494.00	90.180	338.000	6486.32	7610.87	8099.68	-314.65	1695080.53	14291510.72	39°21'20.581"N	80°48'23.824"W	8105.79	357.775	2.12	-0.17	-2.12	
15589.00	90.220	337.820	6485.98	7705.87	8187.71	-350.37	1695044.82	14291598.71	39°21'21.452"N	80°48'24.276"W	8195.20	357.550	0.19	-0.04	-0.19	
15684.00	90.090	337.190	6485.73	7800.87	8275.48	-386.72	1695008.49	14291686.45	39°21'22.320"N	80°48'24.736"W	8284.51	357.324	0.68	-0.14	-0.66	
15779.00	90.250	334.500	6485.45	7895.81	8362.15	-425.59	1694969.63	14291773.09	39°21'23.177"N	80°48'25.229"W	8372.98	357.086	2.84	0.17	-2.83	
15874.00	90.180	336.030	6485.09	7990.72	8448.43	-465.34	1694929.90	14291859.33	39°21'24.031"N	80°48'25.733"W	8461.24	356.847	1.81	-0.07	1.81	
15969.00	90.120	336.320	6484.84	8085.69	8535.34	-503.71	1694891.54	14291946.20	39°21'24.891"N	80°48'26.219"W	8550.19	356.623	0.31	-0.06	0.31	
16064.00	90.060	338.070	6484.69	8180.88	8622.91	-540.53	1694854.74	14292033.74	39°21'25.757"N	80°48'26.685"W	8639.83	356.413	1.84	-0.09	1.84	
16150.00	90.150	334.190	6484.53	8266.64	8701.54	-575.33	1694818.96	14292121.33	39°21'26.535"N	80°48'27.126"W	8720.54	356.217	4.51	0.10	-4.51	
16175.00	90.150	334.190	6484.47	8291.59	8724.04	-586.21	1694809.08	14292134.83	39°21'26.757"N	80°48'27.294"W	8743.72	356.156	0.00	0.00	0.00	Projected MD at TD: 16175'



Actual Wellpath Report

Cobra Unit 2H ST02 AWP Proj: 16175'

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REFERENCE WELLPATH IDENTIFICATION

Operator	ANTERO RESOURCES CORPORATION	Slot #09
Area	Doddridge Co., WV	Cobra Unit 2H ST02
Field	Doddridge	Cobra Unit 2H ST02 AWB
Facility	Addle Pad	Sidetrack from
		Cobra Unit 2H AWP Proj: 16211' at 7562.00 MD

HOLE & CASING SECTIONS - Ref Wellbore: Cobra Unit 2H ST02 AWB Ref Wellpath: Cobra Unit 2H ST02 AWP Proj: 16175'

String/Diameter	Start MD [ft]	End MD [ft]	Interval [ft]	Start TVD [ft]	End TVD [ft]	Start N/S [ft]	Start EW [ft]	End N/S [ft]	End EW [ft]
20in Conductor	24.50	104.50	80.00	24.50	104.50	0.00	0.00	0.18	0.01
17.5in Open Hole	104.50	497.50	393.00	104.50	497.49	0.18	0.01	2.25	-0.03
13.375in Casing Surface	24.50	497.50	473.00	24.50	497.49	0.00	0.00	2.25	-0.03
12.75in Open Hole	497.50	2653.50	2156.00	497.49	2577.71	2.25	-0.03	-1.19	526.43
9.625in Casing Intermediate	24.50	2653.50	2629.00	24.50	2577.71	0.00	0.00	-1.19	526.43
8.75in Open Hole	2653.50	7187.50	4534.00	2577.71	6384.15	-1.19	526.43	392.33	2626.22
8.5in Open Hole	7187.50	7562.00	374.50	6384.15	6505.81	392.33	2626.22	742.04	2597.90
8.5in Open Hole	7562.00	16175.00	8613.00	6505.81	6484.47	742.04	2597.90	8724.04	-586.21
5.5in Casing Production	24.50	16175.00	16150.50	24.50	6484.47	0.00	0.00	8724.04	-586.21

TARGETS

Name		Grid North [US ft]	Grid East [US ft]	East [ft]	North [ft]	TVD [ft]	Longitude	Latitude	Shape
Cobra Unit 2H ST02 BHL Rev-1		14292172.30	1694769.57	-605.72	8761.53	6477.60	80°48'27.511"W	39°21'27.126"N	point

WELLPATH COMPOSITION - Ref Wellbore: Cobra Unit 2H ST02 AWB Ref Wellpath: Cobra Unit 2H ST02 AWP Proj: 16175'

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment
24.50	481.50	Gyrodatta standard - Drop gyro or Multi-shot	01 Gyrodatta MS Gyro <1'-1/2"> (100'-472')
481.50	2571.50	ISCWSA MWD, Rev. 4 (Standard)	02 WFT EM <12'-1/4"> (472')(520'-2562')
2571.50	7114.50	ISCWSA MWD, Rev. 4 (Standard)	03 WFT EM <8-3/4"> (2562')(2692'-7105')
7114.50	7562.00	BHL AutoTrak Curve (Short)	04 BH AT Curve <8-1/2"> (7114.5')(7163'-16151')
7562.00	16150.00	BHL AutoTrak Curve (Short)	06 AT Curve <8-1/2"> (7562')(7591'-16150')
16150.00	16175.00	Blind Drilling (std)	Projection to bit



Actual Wellpath Report

Cobra Unit 2H ST02 AWP Proj: 16175'
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REFERENCE WELLPATH IDENTIFICATION			
Operator	ANTERO RESOURCES CORPORATION	Slot	Slot #09
Area	Doddridge Co., WV	Well	Cobra Unit 2H ST02
Field	Doddridge	Wellbore	Cobra Unit 2H ST02 AWB
Facility	Addie Pad	Side-track from	Cobra Unit 2H AWP Proj: 16211' at 7562.00 MD

COMMENTS
<p>Wellpath general comments</p> <p>API: 47-017-06810-0200</p> <p>BHI Job #: 8883995B</p> <p>Rig: Frontier 22</p> <p>Duration: 11/27/2017-12/11/2017</p> <p>BHI AT Curve <8-1/2"> (7562')(7591'-16150')</p> <p>Projected MD at TD: 16175'</p> <p>API: 47-017-06810-0000</p> <p>BHI Job #: 8883995</p> <p>Rig: Frontier 22</p> <p>Duration: 11/27/2017-11/30/2017</p> <p>Gyrodatta MS Gyro <17-1/2"> (100'-472')</p> <p>WFT EM <12-1/4"> (472')(520'-2562')</p> <p>WFT EM <8-3/4"> (2562')(2692'-7105')</p> <p>BHI AT Curve <8-1/2"> (7114.5')(7163'-16151')</p> <p>Middlesex: 6972' MD</p> <p>Burkett: 7211' MD</p> <p>Tully: 7279' MD</p> <p>Hamilton: 7370' MD</p> <p>Marcellus POE: 7396' MD</p> <p>Projected MD at TD: 16211'</p>

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date	4/16/2018
Job End Date	5/3/2018
State	West Virginia
County	Doddridge
API Number	47-017-06811-00-00
Operator Name	Antero Resources Corporation
Well Name and Number	Cobra 2H
Latitude	39.20005200
Longitude	-80.48200400
Datum	NAD83
Federal Well	NO
Indian Well	NO
True Vertical Depth	6,510
Total Base Water Volume (gal)	19,568,514
Total Base Non Water Volume	0

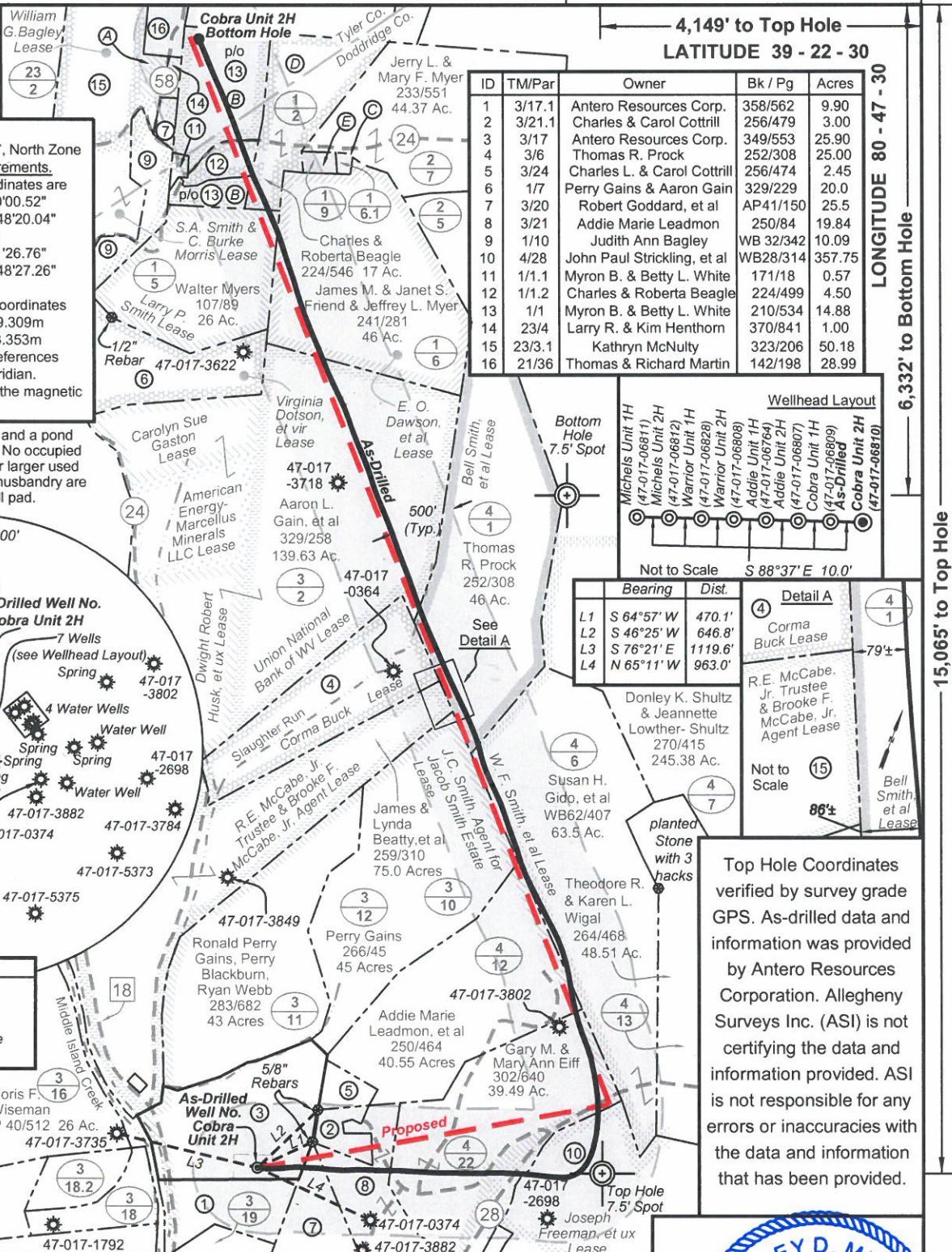


Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Service Abstract Number (CAS #)	Maximum Ingredient Concentration Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Ascent	Carrier/Base Fluid	Water	7732-18-5	100.00000	87.90915	None
Sand (Proppant)	Keane	Proppant					
XFR-16FW	Keane	Friction Reducer	Crystalline silica: Quartz (SiO2)	14808-60-7	100.00000	11.84407	None
			Water	7732-18-5	60.00000	0.04199	None
			Distillates (petroleum), hydrotreated light	64742-47-8	20.00000	0.01400	None
			oleic acid diethanolamide	93-83-4	1.50000	0.00105	None
			ammonium chloride	12125-02-9	1.50000	0.00105	None
			alcohols, C12-16, ethoxylated	68551-12-2	1.00000	0.00070	None
KWG-11LS	Keane	Gel					
			Distillates (petroleum), hydrotreated light	64742-47-8	55.00000	0.01475	None
			Guar gum	9000-30-0	55.00000	0.01475	None
Hydrochloric Acid (15%)	Keane	Acidizing					
MBC-516W	Keane	Biocide	Hydrochloric Acid	7647-01-0	15.00000	0.01893	None

			Water	7732-18-5	56.70000	0.00496	None
			Glutaral	111-30-8	26.70000	0.00233	None
			didecyltrimethylammonium chloride	7173-51-5	8.00000	0.00070	None
			quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides	68424-85-1	5.30000	0.00046	None
KSI-19	Keane	Scale Inhibitor	ethonal	64-17-5	2.80000	0.00024	None
KWBO-2	Keane	Breaker	Methanol	67-56-1	30.00000	0.00402	None
KAI-12	Keane	Acid Inhibitor	Sodium persulfate	7775-27-1	99.00000	0.00059	None
			Ethylene glycol	107-21-1	40.00000	0.00011	None
			dipropylene glycol, monomethyl ether	34590-94-8	20.00000	0.00006	None
			Cinnamaldehyde	104-55-2	10.00000	0.00003	None
			formic acid	64-18-6	10.00000	0.00003	None
			Ethoxylated alcohol	68131-39-5	10.00000	0.00003	None
			Tar bases, quinoline derivs., benzyl chloride-quaternized	72480-70-7	10.00000	0.00003	None
			isopropyl alcohol	67-63-0	5.00000	0.00001	None
KFEAC-30	Keane	Iron Control	Citric acid	77-92-9	30.00000	0.00023	None
			Acetic acid	64-19-7	5.00000	0.00004	None
Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.							
Other Chemical(s)	Listed Above	See Trade Name(s) List					
			Distillates (petroleum), hydrotreated light	64742-47-8	55.00000	0.01475	
			Distillates (petroleum), hydrotreated light	64742-47-8	20.00000	0.01400	
			Glutaral	111-30-8	26.70000	0.00233	
			ammonium chloride	12125-02-9	1.50000	0.00105	
			oleic acid diethanolamide	93-83-4	1.50000	0.00105	
			alcohols, C12-16, ethoxylated	68551-12-2	1.00000	0.00070	
			didecyltrimethylammonium chloride	7173-51-5	8.00000	0.00070	
			quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides	68424-85-1	5.30000	0.00046	
			ethonal	64-17-5	2.80000	0.00024	
			Citric acid	77-92-9	30.00000	0.00023	
			dipropylene glycol, monomethyl ether	34590-94-8	20.00000	0.00006	
			Ethoxylated alcohol	68131-39-5	10.00000	0.00003	
			Tar bases, quinoline derivs., benzyl chloride-quaternized	72480-70-7	10.00000	0.00003	
			Cinnamaldehyde	104-55-2	10.00000	0.00003	
			formic acid	64-18-6	10.00000	0.00003	

Antero Resources
Well No. Cobra Unit 2H
As-Drilled Plat
Antero Resources Corporation

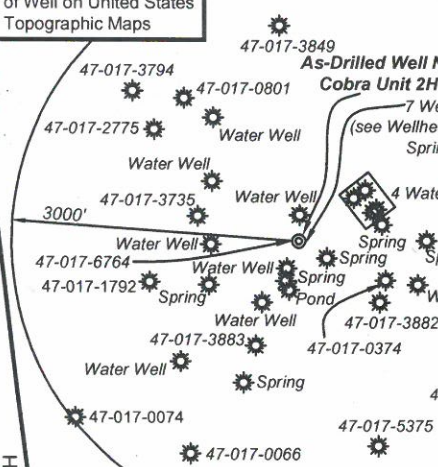


Notes:
 West Virginia Coordinate System of 1927, North Zone based upon Differential GPS Measurements. Well No. Cobra Unit 2H Top Hole coordinates are N: 306,252.54" Latitude: 39°20'00.52" E: 1,630,717.97" Longitude: 80°48'20.04" Bottom Hole coordinates are N: 314,985.15" Latitude: 39°21'26.76" E: 1,630,277.39" Longitude: 80°48'27.26" UTM Zone 17, NAD 1983 Top Hole Coordinates Bottom Hole Coordinates N: 4,353,811.142m N: 4,356,469.309m E: 516,771.965m E: 516,593.353m Plat orientation and corner and well references are based upon the grid north meridian. Well location references are based upon the magnetic meridian.

Note: It appears 13 water wells, 7 springs and a pond were found within 2000' of proposed well. No occupied dwellings or buildings 2,500 square feet or larger used to house or shelter dairy cattle or poultry husbandry are located within 625' of the center of the well pad.

(*) Denotes Location of Well on United States Topographic Maps

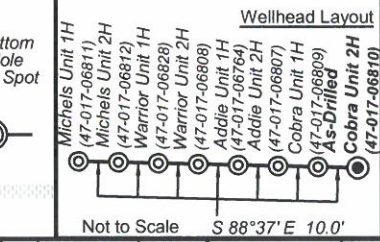
Scale: 1" = 2000'



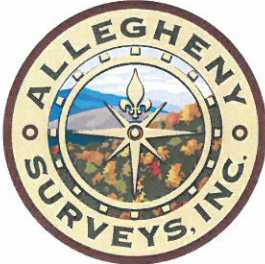
- Leases**
- A. Jerry L. Myer Lease
 - B. Thomas Lee White Lease
 - C. Sam Horton Lease
 - D. Kendra K. Cottrill Wyke Lease
 - E. Jeffrey W. Smith Lease

- Legend**
- As-Drilled gas well
 - Monument, as noted
 - Existing Well, as noted
 - Creek or Drain
 - Existing Road
 - Surface boundary (approx.)
 - Interior surface tracts (approx.)

ID	TM/Par	Owner	Bk / Pg	Acres
1	3/17.1	Antero Resources Corp.	358/562	9.90
2	3/21.1	Charles & Carol Cottrill	256/479	3.00
3	3/17	Antero Resources Corp.	349/553	25.90
4	3/6	Thomas R. Prock	252/308	25.00
5	3/24	Charles L. & Carol Cottrill	256/474	2.45
6	1/7	Perry Gains & Aaron Gain	329/229	20.0
7	3/20	Robert Goddard, et al	AP41/150	25.5
8	3/21	Addie Marie Leadmon	250/84	19.84
9	1/10	Judith Ann Bagley	WB 32/342	10.09
10	4/28	John Paul Strickling, et al	WB28/314	357.75
11	1/1.1	Myron B. & Betty L. White	171/18	0.57
12	1/1.2	Charles & Roberta Beagle	224/499	4.50
13	1/1	Myron B. & Betty L. White	210/534	14.88
14	23/4	Larry R. & Kim Henthorn	370/841	1.00
15	23/3.1	Kathryn McNulty	323/206	50.18
16	21/36	Thomas & Richard Martin	142/198	28.99

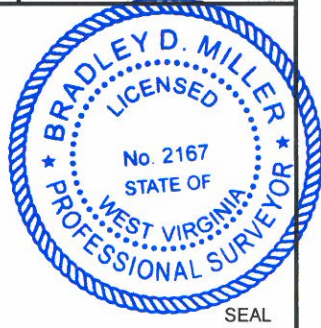


Top Hole Coordinates verified by survey grade GPS. As-drilled data and information was provided by Antero Resources Corporation. Allegheny Surveys Inc. (ASI) is not certifying the data and information provided. ASI is not responsible for any errors or inaccuracies with the data and information that has been provided.



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.

Bradley D. Miller
Bradley D. Miller, P.S. 2167



FILE NO: 45-30-WU-14
 DRAWING NO: Cobra 2H As-Drilled Well Plat
 SCALE: 1" = 1200'
 MINIMUM DEGREE OF ACCURACY: Submeter
 PROVEN SOURCE OF ELEVATION: WVDOT, Harrisville, WV

STATE OF WEST VIRGINIA
 DEPARTMENT OF ENVIRONMENTAL PROTECTION
OIL AND GAS DIVISION

DATE: June 7 20 18
 OPERATOR'S WELL NO. Cobra Unit 2H
 API WELL NO
 47 - 017 - 06810
 STATE COUNTY PERMIT

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
 (IF GAS) PRODUCTION: STORAGE DEEP SHALLOW

LOCATION: ELEVATION: 891' As-Drilled WATERSHED: Headwaters Middle Island Creek QUADRANGLE: West Union
 DISTRICT: West Union E.O. Dawson, et al; Kendra K. Cottrill Wyke COUNTY: Doddridge 600;
 SURFACE OWNER: Antero Resources Corp. W.F. Smith, et al; Thomas Lee White; Larry P. Smith ACREAGE: 25.9 22.5; 50
 ROYALTY OWNER: J.C. Smith, Agent for Jacob Smith Estate; Bell Smith, et al LEASE NO: ACREAGE: 28.1; 45; 290; 79

PROPOSED WORK: DRILL CONVERT DRILL DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
 PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) As-Drilled 6,484.5' TVD
 PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 16,175' MD

WELL OPERATOR: Antero Resources Corporation DESIGNATED AGENT: Dianna Stamper - CT Corporation System
 ADDRESS: 1615 Wynkoop Street ADDRESS: 5400 D Big Tyler Road
 Denver, CO 80202 Charleston, WV 25313