



Antero
 Doddridge County WV
 R.J. Smith Pad: Costlow/Duff/Gibson/Mishka/Vinola
 Gibson Unit 1H
 Original Hole
 Plan 4

9-54, June 22 2015
 Antero to Grid North
 Magnetic North: -8.707
 Magnetic Field
 Street: E21
 Dip Angle: 66.84°
 Date: 5/20/2015
 Model: BCGM2014



SURFACE DETAILS

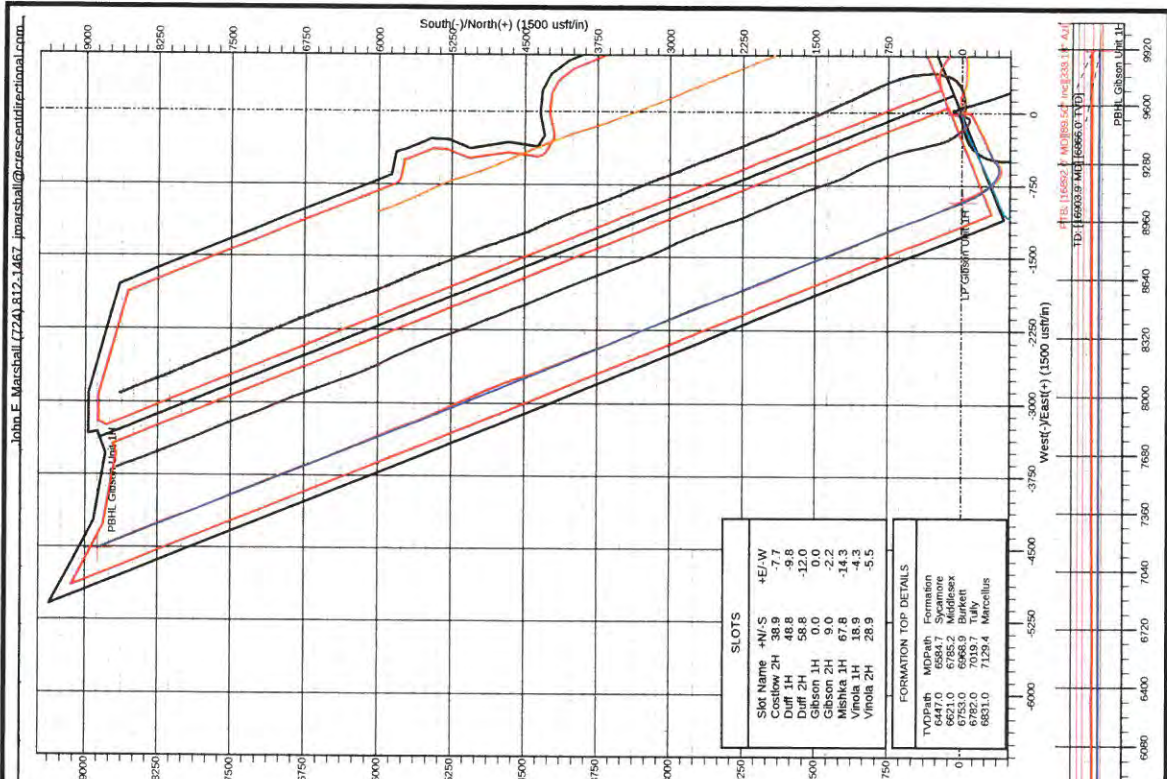
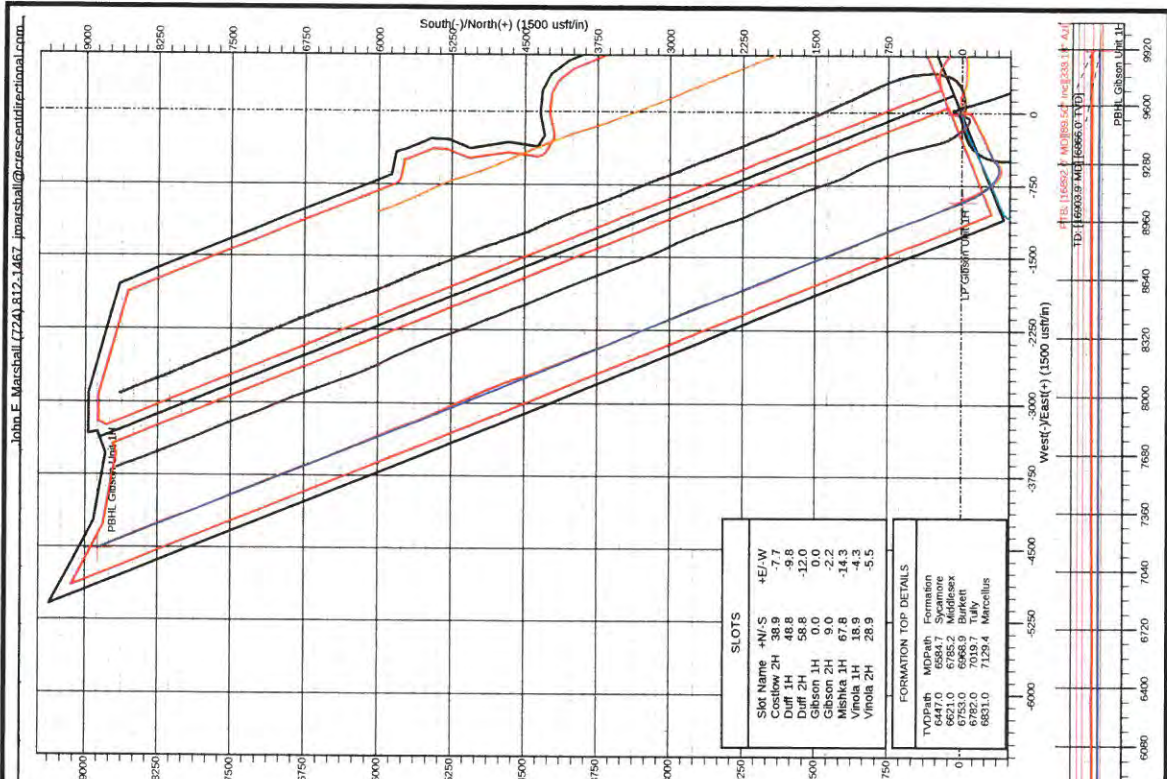
	+N/S	+E/W	Northing	Easting	Latitude	Longitude
Ground Level:	998.0		14295184.20	1715898.70	39° 21' 56.378 N	80° 43' 58.556 W
KB Elevation @ 1016.0usft (Precision 522 (187))						

TARGET DETAILS

Name	TVD	+N/S	+E/W	Northing	Easting	Latitude	Longitude
LP Gibson Unit 1H	6866.0	-15.0	-919.0	14295169.20	1714979.70	39° 21' 56.256 N	80° 44' 10.262 W
PBHL Gibson Unit 1H	6866.0	8867.7	-4507.8	14304051.90	1711390.90	39° 23' 24.184 N	80° 44' 55.659 W

PLAN SECTIONS

Sec	MD	Inc	Azi	TVD	+N/S	+E/W	Dleg	TFace	Vsect
1	6156.0	28.14	245.39	6067.8	-280.1	-380.2	0.00	0.00	-117.3
2	6355.0	28.14	245.39	6243.2	-319.2	-465.5	0.00	0.00	-121.6
3	6467.0	28.62	220.64	6342.0	-350.8	-507.2	10.49	-97.69	-135.2
4	6723.6	90.00	338.00	6866.0	-15.0	-919.0	12.00	114.39	330.4
5	6903.9	90.00	338.00	6866.0	8867.7	-4507.8	0.00	0.00	9910.6



Antero

Doddridge County WV

R.J. Smith Pad: Costlow/Duff/Gibson/Mishka/Vinola

Gibson Unit 1H

Original Hole

Design: Surveys

Standard Survey Report

22 June, 2015

Survey Report

Company:	Antero	Local Co-ordinate Reference:	Well Gibson Unit 1H
Project:	Doddridge County WV	TVD Reference:	KB Elevation @ 1016.0usft (Precision 522 (18'))
Site:	R.J. Smith Pad: Costlow/Duff/Gibson/Mishka/Vinola	MD Reference:	KB Elevation @ 1016.0usft (Precision 522 (18'))
Well:	Gibson Unit 1H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	North East R5000 Database

Project	Doddridge County WV, McClellan District		
Map System:	Universal Transverse Mercator (US Survey Feet)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Zone 17N (84 W to 78 W)		

Site	R.J. Smith Pad: Costlow/Duff/Gibson/Mishka/Vinola				
Site Position:		Northing:	14,295,223.06 usft	Latitude:	39° 21' 56.762 N
From:	Map	Easting:	1,715,891.05 usft	Longitude:	80° 43' 58.652 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.17 °

Well	Gibson Unit 1H, Marcellus					
Well Position	+N/-S	0.0 usft	Northing:	14,295,184.20 usft	Latitude:	39° 21' 56.378 N
	+E/-W	0.0 usft	Easting:	1,715,898.70 usft	Longitude:	80° 43' 58.556 W
Position Uncertainty		2.0 usft	Wellhead Elevation:	1,009.0 usft	Ground Level:	998.0 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	User Defined	5/20/2015	-8.53	66.84	52,173

Design	Surveys				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0		338.00

Survey Program	Date 6/22/2015				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
105.0	6,156.0	Final Gyro (Original Hole)	NS-GYRO-SS	NS Gyro single shots	
6,324.0	16,892.0	Crescent Surveys (Original Hole)	MWD+HDGM+MS-Edit	OWSG MWD + HDGM + Multi-Station Correction	

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
105.0	0.11	172.61	105.0	-0.1	0.0	-0.1	0.10	0.10	0.00
130.0	0.07	184.77	130.0	-0.1	0.0	-0.1	0.18	-0.16	48.64
155.0	0.18	207.42	155.0	-0.2	0.0	-0.2	0.47	0.44	90.60
180.0	0.15	161.93	180.0	-0.3	0.0	-0.2	0.52	-0.12	-181.96
205.0	0.14	224.89	205.0	-0.3	0.0	-0.3	0.61	-0.04	251.84
230.0	0.11	236.84	230.0	-0.3	-0.1	-0.3	0.16	-0.12	47.80
255.0	0.15	227.26	255.0	-0.4	-0.1	-0.3	0.18	0.16	-38.32
280.0	0.16	212.00	280.0	-0.4	-0.2	-0.3	0.17	0.04	-61.04

Survey Report

Company: Antero
Project: Doddridge County WV
Site: R.J. Smith Pad:
 Costlow/Duff/Gibson/Mishka/Vinola
Well: Gibson Unit 1H
Wellbore: Original Hole
Design: Surveys

Local Co-ordinate Reference: Well Gibson Unit 1H
TVD Reference: KB Elevation @ 1016.0usft (Precision 522 (18'))
MD Reference: KB Elevation @ 1016.0usft (Precision 522 (18'))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: North East R5000 Database

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
305.0	0.09	240.24	305.0	-0.5	-0.2	-0.4	0.37	-0.28	112.96
330.0	0.04	229.34	330.0	-0.5	-0.2	-0.4	0.21	-0.20	-43.60
355.0	0.28	234.57	355.0	-0.5	-0.3	-0.4	0.96	0.96	20.92
380.0	0.15	244.96	380.0	-0.6	-0.3	-0.4	0.54	-0.52	41.56
405.0	0.16	230.81	405.0	-0.6	-0.4	-0.4	0.16	0.04	-56.60
430.0	0.28	215.86	430.0	-0.7	-0.5	-0.5	0.53	0.48	-59.80
455.0	0.26	212.25	455.0	-0.8	-0.5	-0.5	0.10	-0.08	-14.44
480.0	0.32	191.57	480.0	-0.9	-0.6	-0.6	0.48	0.24	-82.72
505.0	0.42	179.54	505.0	-1.1	-0.6	-0.8	0.50	0.40	-48.12
530.0	0.73	180.79	530.0	-1.3	-0.6	-1.0	1.24	1.24	5.00
555.0	1.37	185.08	555.0	-1.8	-0.6	-1.4	2.58	2.56	17.16
580.0	2.07	179.14	580.0	-2.5	-0.6	-2.1	2.89	2.80	-23.76
605.0	2.66	179.22	605.0	-3.5	-0.6	-3.1	2.36	2.36	0.32
630.0	3.29	179.68	629.9	-4.8	-0.6	-4.3	2.52	2.52	1.84
655.0	3.90	180.63	654.9	-6.4	-0.6	-5.7	2.45	2.44	3.80
680.0	4.33	181.02	679.8	-8.2	-0.6	-7.4	1.72	1.72	1.56
705.0	4.47	179.79	704.7	-10.1	-0.7	-9.1	0.68	0.56	-4.92
730.0	5.25	177.32	729.6	-12.2	-0.6	-11.1	3.23	3.12	-9.88
755.0	5.64	176.77	754.5	-14.6	-0.5	-13.4	1.57	1.56	-2.20
780.0	5.68	177.93	779.4	-17.1	-0.4	-15.7	0.48	0.16	4.64
805.0	5.72	177.70	804.3	-19.6	-0.3	-18.0	0.18	0.16	-0.92
830.0	5.80	177.41	829.2	-22.1	-0.2	-20.4	0.34	0.32	-1.16
855.0	5.75	176.91	854.0	-24.6	0.0	-22.8	0.28	-0.20	-2.00
880.0	5.81	177.02	878.9	-27.1	0.1	-25.1	0.24	0.24	0.44
905.0	5.98	176.82	903.8	-29.6	0.2	-27.6	0.68	0.68	-0.80
930.0	6.04	176.08	928.6	-32.3	0.4	-30.1	0.39	0.24	-2.96
955.0	6.05	177.19	953.5	-34.9	0.5	-32.6	0.47	0.04	4.44
980.0	6.13	177.64	978.4	-37.5	0.7	-35.1	0.37	0.32	1.80
1,005.0	5.92	177.13	1,003.2	-40.2	0.8	-37.5	0.87	-0.84	-2.04
1,030.0	5.41	175.16	1,028.1	-42.6	1.0	-39.9	2.18	-2.04	-7.88
1,055.0	5.13	174.83	1,053.0	-44.9	1.2	-42.1	1.13	-1.12	-1.32
1,080.0	4.80	174.04	1,077.9	-47.1	1.4	-44.1	1.35	-1.32	-3.16
1,105.0	4.58	173.43	1,102.8	-49.1	1.6	-46.1	0.90	-0.88	-2.44
1,130.0	4.15	172.95	1,127.7	-51.0	1.8	-47.9	1.73	-1.72	-1.92
1,155.0	3.86	173.13	1,152.7	-52.7	2.0	-49.6	1.16	-1.16	0.72
1,180.0	3.61	173.29	1,177.6	-54.3	2.2	-51.2	1.00	-1.00	0.64
1,205.0	3.12	174.12	1,202.6	-55.8	2.4	-52.6	1.97	-1.96	3.32
1,230.0	2.83	174.76	1,227.6	-57.1	2.5	-53.9	1.17	-1.16	2.56
1,255.0	2.59	175.77	1,252.5	-58.3	2.6	-55.0	0.98	-0.96	4.04
1,280.0	2.22	175.24	1,277.5	-59.3	2.7	-56.0	1.48	-1.48	-2.12
1,305.0	2.03	176.18	1,302.5	-60.2	2.8	-56.9	0.77	-0.76	3.76
1,330.0	1.83	175.97	1,327.5	-61.1	2.8	-57.7	0.80	-0.80	-0.84

Survey Report

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Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,355.0	1.63	174.50	1,352.5	-61.8	2.9	-58.4	0.82	-0.80	-5.88
1,380.0	1.44	173.49	1,377.4	-62.5	2.9	-59.0	0.77	-0.76	-4.04
1,405.0	1.39	170.84	1,402.4	-63.1	3.0	-59.6	0.33	-0.20	-10.60
1,430.0	1.24	172.42	1,427.4	-63.7	3.1	-60.2	0.62	-0.60	6.32
1,455.0	1.05	170.14	1,452.4	-64.2	3.2	-60.7	0.78	-0.76	-9.12
1,480.0	0.94	167.88	1,477.4	-64.6	3.3	-61.1	0.47	-0.44	-9.04
1,505.0	0.89	169.31	1,502.4	-65.0	3.3	-61.5	0.22	-0.20	5.72
1,530.0	0.84	167.23	1,527.4	-65.3	3.4	-61.9	0.24	-0.20	-8.32
1,555.0	0.75	176.56	1,552.4	-65.7	3.5	-62.2	0.63	-0.36	37.32
1,580.0	0.75	171.37	1,577.4	-66.0	3.5	-62.5	0.27	0.00	-20.76
1,605.0	0.63	173.54	1,602.4	-66.3	3.5	-62.8	0.49	-0.48	8.68
1,630.0	0.57	174.91	1,627.4	-66.6	3.6	-63.1	0.25	-0.24	5.48
1,655.0	0.48	169.70	1,652.4	-66.8	3.6	-63.3	0.41	-0.36	-20.84
1,680.0	0.42	167.25	1,677.4	-67.0	3.6	-63.5	0.25	-0.24	-9.80
1,705.0	0.45	160.79	1,702.4	-67.2	3.7	-63.7	0.23	0.12	-25.84
1,730.0	0.50	167.27	1,727.4	-67.4	3.8	-63.9	0.29	0.20	25.92
1,755.0	0.50	168.54	1,752.4	-67.6	3.8	-64.1	0.04	0.00	5.08
1,780.0	0.53	175.61	1,777.4	-67.8	3.8	-64.3	0.28	0.12	28.28
1,805.0	0.41	173.59	1,802.4	-68.0	3.8	-64.5	0.48	-0.48	-8.08
1,830.0	0.39	172.54	1,827.4	-68.2	3.9	-64.7	0.09	-0.08	-4.20
1,855.0	0.40	177.15	1,852.4	-68.4	3.9	-64.8	0.13	0.04	18.44
1,880.0	0.38	170.08	1,877.4	-68.5	3.9	-65.0	0.21	-0.08	-28.28
1,905.0	0.33	174.19	1,902.4	-68.7	3.9	-65.2	0.22	-0.20	16.44
1,930.0	0.28	177.78	1,927.4	-68.8	3.9	-65.3	0.21	-0.20	14.36
1,955.0	0.23	169.23	1,952.4	-68.9	3.9	-65.4	0.25	-0.20	-34.20
1,980.0	0.31	171.78	1,977.4	-69.0	4.0	-65.5	0.32	0.32	10.20
2,005.0	0.20	160.96	2,002.4	-69.2	4.0	-65.6	0.48	-0.44	-43.28
2,030.0	0.32	166.05	2,027.4	-69.3	4.0	-65.7	0.49	0.48	20.36
2,055.0	0.23	174.24	2,052.4	-69.4	4.0	-65.8	0.39	-0.36	32.76
2,080.0	0.28	194.77	2,077.4	-69.5	4.0	-65.9	0.41	0.20	82.12
2,105.0	0.17	218.21	2,102.4	-69.6	4.0	-66.0	0.57	-0.44	93.76
2,130.0	0.16	184.32	2,127.4	-69.6	4.0	-66.1	0.39	-0.04	-135.56
2,155.0	0.19	209.15	2,152.4	-69.7	3.9	-66.1	0.32	0.12	99.32
2,180.0	0.24	185.00	2,177.4	-69.8	3.9	-66.2	0.41	0.20	-96.60
2,205.0	0.05	164.14	2,202.4	-69.9	3.9	-66.2	0.78	-0.76	-83.44
2,230.0	0.10	222.41	2,227.4	-69.9	3.9	-66.3	0.34	0.20	233.08
2,255.0	0.13	199.69	2,252.4	-69.9	3.9	-66.3	0.22	0.12	-90.88
2,280.0	0.23	173.48	2,277.4	-70.0	3.9	-66.4	0.51	0.40	-104.84
2,305.0	0.14	160.03	2,302.4	-70.1	3.9	-66.4	0.40	-0.36	-53.80
2,330.0	0.13	186.84	2,327.4	-70.1	3.9	-66.5	0.25	-0.04	107.24
2,355.0	0.05	311.74	2,352.4	-70.2	3.9	-66.5	0.66	-0.32	499.60
2,380.0	0.18	150.10	2,377.4	-70.2	3.9	-66.5	0.91	0.52	-646.56
2,405.0	0.12	237.74	2,402.4	-70.2	3.9	-66.6	0.85	-0.24	350.56

Survey Report

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Design: Surveys

Local Co-ordinate Reference: Well Gibson Unit 1H
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: North East R5000 Database

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
2,430.0	0.17	205.84	2,427.4	-70.3	3.9	-66.6	0.37	0.20	-127.60
2,455.0	0.06	242.25	2,452.4	-70.3	3.8	-66.6	0.51	-0.44	145.64
2,480.0	0.10	221.93	2,477.4	-70.3	3.8	-66.6	0.19	0.16	-81.28
2,505.0	0.08	230.27	2,502.4	-70.4	3.8	-66.7	0.10	-0.08	33.35
2,530.0	0.08	234.79	2,527.4	-70.4	3.7	-66.7	0.03	0.00	18.08
2,555.0	0.11	206.85	2,552.4	-70.4	3.7	-66.7	0.22	0.12	-111.76
2,580.0	0.09	195.34	2,577.4	-70.5	3.7	-66.7	0.11	-0.08	-46.04
2,605.0	0.10	196.25	2,602.4	-70.5	3.7	-66.8	0.04	0.04	3.64
2,630.0	0.16	187.94	2,627.4	-70.6	3.7	-66.8	0.25	0.24	-33.24
2,655.0	0.15	203.57	2,652.4	-70.6	3.7	-66.9	0.17	-0.04	62.52
2,680.0	0.18	204.43	2,677.4	-70.7	3.6	-66.9	0.12	0.12	3.44
2,705.0	0.20	219.99	2,702.4	-70.8	3.6	-67.0	0.22	0.08	62.24
2,730.0	0.19	207.98	2,727.4	-70.8	3.5	-67.0	0.17	-0.04	-48.04
2,755.0	0.19	232.13	2,752.4	-70.9	3.5	-67.0	0.32	0.00	96.60
2,780.0	0.22	230.51	2,777.4	-70.9	3.4	-67.1	0.12	0.12	-6.48
2,805.0	0.18	226.29	2,802.4	-71.0	3.4	-67.1	0.17	-0.16	-16.88
2,830.0	0.19	235.92	2,827.4	-71.1	3.3	-67.1	0.13	0.04	38.52
2,855.0	0.27	230.46	2,852.4	-71.1	3.2	-67.1	0.33	0.32	-21.84
2,880.0	0.18	233.13	2,877.4	-71.2	3.1	-67.2	0.36	-0.36	10.68
2,905.0	0.12	270.68	2,902.4	-71.2	3.1	-67.2	0.45	-0.24	150.20
2,930.0	0.12	220.66	2,927.4	-71.2	3.0	-67.2	0.41	0.00	-200.08
2,955.0	0.09	251.80	2,952.4	-71.2	3.0	-67.2	0.25	-0.12	124.56
2,980.0	0.15	226.38	2,977.4	-71.3	3.0	-67.2	0.32	0.24	-101.68
3,005.0	0.11	229.86	3,002.4	-71.3	2.9	-67.2	0.16	-0.16	13.92
3,030.0	0.07	194.35	3,027.4	-71.3	2.9	-67.2	0.27	-0.16	-142.04
3,055.0	0.10	204.25	3,052.4	-71.4	2.9	-67.3	0.13	0.12	39.60
3,080.0	0.16	198.59	3,077.4	-71.4	2.9	-67.3	0.25	0.24	-22.64
3,105.0	0.16	204.15	3,102.4	-71.5	2.8	-67.4	0.06	0.00	22.24
3,130.0	0.13	217.84	3,127.4	-71.6	2.8	-67.4	0.18	-0.12	54.76
3,155.0	0.19	190.27	3,152.4	-71.6	2.8	-67.4	0.38	0.24	-110.28
3,180.0	0.15	211.05	3,177.4	-71.7	2.8	-67.5	0.29	-0.16	83.12
3,205.0	0.15	197.22	3,202.4	-71.7	2.7	-67.5	0.14	0.00	-55.32
3,230.0	0.15	210.38	3,227.4	-71.8	2.7	-67.6	0.14	0.00	52.64
3,255.0	0.15	213.62	3,252.4	-71.9	2.7	-67.6	0.03	0.00	12.96
3,280.0	0.09	214.73	3,277.4	-71.9	2.6	-67.7	0.24	-0.24	4.44
3,305.0	0.11	247.99	3,302.4	-71.9	2.6	-67.7	0.24	0.08	133.04
3,330.0	0.16	194.68	3,327.4	-72.0	2.6	-67.7	0.52	0.20	-213.24
3,355.0	0.08	199.40	3,352.4	-72.0	2.6	-67.7	0.32	-0.32	18.88
3,380.0	0.11	180.31	3,377.4	-72.1	2.6	-67.8	0.17	0.12	-76.36
3,405.0	0.11	176.16	3,402.4	-72.1	2.6	-67.8	0.03	0.00	-16.60
3,430.0	0.09	177.54	3,427.4	-72.2	2.6	-67.9	0.08	-0.08	5.52
3,455.0	0.18	182.44	3,452.4	-72.2	2.6	-67.9	0.36	0.36	19.60

Survey Report

Company: Antero
Project: Doddridge County WV
Site: R.J. Smith Pad
 Costlow/Duff/Gibson/Mishka/Vinola
Well: Gibson Unit 1H
Wellbore: Original Hole
Design: Surveys

Local Co-ordinate Reference: Well Gibson Unit 1H
TVD Reference: KB Elevation @ 1016.0usft (Precision 522 (18'))
MD Reference: KB Elevation @ 1016.0usft (Precision 522 (18'))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: North East R5000 Database

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
3,480.0	0.18	186.63	3,477.4	-72.3	2.6	-68.0	0.05	0.00	16.76
3,505.0	0.20	182.24	3,502.4	-72.4	2.5	-68.1	0.10	0.08	-17.56
3,530.0	0.22	187.62	3,527.4	-72.5	2.5	-68.1	0.11	0.08	21.52
3,555.0	0.26	196.10	3,552.4	-72.6	2.5	-68.2	0.21	0.16	33.92
3,580.0	0.23	208.01	3,577.4	-72.7	2.5	-68.3	0.24	-0.12	47.64
3,605.0	0.23	206.60	3,602.4	-72.8	2.4	-68.4	0.02	0.00	-5.64
3,630.0	0.25	216.11	3,627.4	-72.8	2.4	-68.4	0.18	0.08	38.04
3,655.0	0.17	220.29	3,652.4	-72.9	2.3	-68.5	0.33	-0.32	16.72
3,680.0	0.15	219.58	3,677.4	-73.0	2.3	-68.5	0.08	-0.08	-2.84
3,705.0	0.15	235.37	3,702.4	-73.0	2.2	-68.5	0.16	0.00	63.16
3,730.0	0.16	233.70	3,727.4	-73.1	2.2	-68.5	0.04	0.04	-6.68
3,755.0	0.20	221.82	3,752.4	-73.1	2.1	-68.6	0.22	0.16	-47.52
3,780.0	0.18	229.67	3,777.4	-73.2	2.1	-68.6	0.13	-0.08	31.40
3,805.0	0.17	244.66	3,802.4	-73.2	2.0	-68.6	0.19	-0.04	59.96
3,830.0	0.12	240.59	3,827.4	-73.2	1.9	-68.6	0.20	-0.20	-16.28
3,855.0	0.09	216.53	3,852.4	-73.3	1.9	-68.6	0.21	-0.12	-96.24
3,880.0	0.10	228.31	3,877.4	-73.3	1.9	-68.7	0.09	0.04	47.12
3,905.0	0.07	204.16	3,902.4	-73.3	1.9	-68.7	0.18	-0.12	-96.60
3,930.0	0.06	192.49	3,927.4	-73.3	1.8	-68.7	0.07	-0.04	-46.68
3,955.0	0.12	205.07	3,952.4	-73.4	1.8	-68.7	0.25	0.24	50.32
3,980.0	0.18	195.44	3,977.4	-73.4	1.8	-68.8	0.26	0.24	-38.52
4,005.0	0.18	187.23	4,002.4	-73.5	1.8	-68.8	0.10	0.00	-32.84
4,030.0	0.14	199.99	4,027.4	-73.6	1.8	-68.9	0.21	-0.16	51.04
4,055.0	0.20	188.88	4,052.4	-73.7	1.8	-69.0	0.27	0.24	-44.44
4,080.0	0.22	190.03	4,077.4	-73.8	1.7	-69.0	0.08	0.08	4.60
4,105.0	0.21	171.98	4,102.4	-73.8	1.7	-69.1	0.27	-0.04	-72.20
4,130.0	0.26	175.33	4,127.4	-73.9	1.8	-69.2	0.21	0.20	13.40
4,155.0	0.12	146.64	4,152.4	-74.0	1.8	-69.3	0.66	-0.56	-114.76
4,180.0	0.22	166.49	4,177.4	-74.1	1.8	-69.4	0.46	0.40	79.40
4,205.0	0.24	161.86	4,202.4	-74.2	1.8	-69.5	0.11	0.08	-18.52
4,230.0	0.24	166.55	4,227.4	-74.3	1.9	-69.6	0.08	0.00	18.76
4,255.0	0.25	158.65	4,252.4	-74.4	1.9	-69.7	0.14	0.04	-31.60
4,280.0	0.27	152.20	4,277.4	-74.5	1.9	-69.8	0.14	0.08	-25.80
4,305.0	0.29	129.28	4,302.4	-74.6	2.0	-69.9	0.45	0.08	-91.68
4,330.0	0.32	137.79	4,327.4	-74.7	2.1	-70.0	0.22	0.12	34.04
4,355.0	0.38	145.06	4,352.4	-74.8	2.2	-70.2	0.30	0.24	29.08
4,380.0	0.35	124.11	4,377.4	-74.9	2.3	-70.3	0.54	-0.12	-83.80
4,405.0	0.39	126.67	4,402.4	-75.0	2.4	-70.5	0.17	0.16	10.24
4,430.0	0.43	128.76	4,427.4	-75.1	2.6	-70.6	0.17	0.16	8.36
4,455.0	0.50	137.87	4,452.4	-75.3	2.7	-70.8	0.41	0.28	36.44
4,480.0	0.51	115.53	4,477.4	-75.4	2.9	-71.0	0.78	0.04	-89.36
4,505.0	0.54	118.71	4,502.4	-75.5	3.1	-71.2	0.17	0.12	12.72
4,530.0	0.64	112.39	4,527.4	-75.6	3.3	-71.3	0.48	0.40	-25.28

Survey Report

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Design: Surveys

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Survey Calculation Method: Minimum Curvature
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Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,555.0	0.71	107.54	4,552.4	-75.7	3.6	-71.5	0.36	0.28	-19.40
4,580.0	0.73	105.64	4,577.4	-75.8	3.9	-71.7	0.12	0.08	-7.60
4,605.0	0.72	109.55	4,602.4	-75.9	4.2	-71.9	0.20	-0.04	15.64
4,630.0	0.74	112.31	4,627.4	-76.0	4.5	-72.2	0.16	0.08	11.04
4,655.0	0.82	115.64	4,652.4	-76.1	4.8	-72.4	0.37	0.32	13.32
4,680.0	0.80	141.34	4,677.4	-76.3	5.1	-72.7	1.44	-0.08	102.80
4,705.0	1.21	182.06	4,702.4	-76.7	5.2	-73.1	3.19	1.64	162.88
4,730.0	1.68	200.17	4,727.4	-77.4	5.1	-73.6	2.60	1.88	72.44
4,755.0	1.70	203.94	4,752.4	-78.0	4.8	-74.1	0.45	0.08	15.08
4,780.0	2.02	207.71	4,777.3	-78.8	4.4	-74.7	1.37	1.28	15.08
4,805.0	2.55	215.99	4,802.3	-79.6	3.9	-75.3	2.49	2.12	33.12
4,830.0	2.95	217.38	4,827.3	-80.6	3.2	-75.9	1.62	1.60	5.56
4,855.0	3.89	219.01	4,852.2	-81.7	2.3	-76.6	3.78	3.76	6.52
4,880.0	4.69	220.50	4,877.2	-83.2	1.1	-77.5	3.23	3.20	5.96
4,905.0	5.27	221.16	4,902.1	-84.8	-0.4	-78.5	2.33	2.32	2.64
4,930.0	5.65	222.66	4,927.0	-86.6	-2.0	-79.5	1.62	1.52	6.00
4,955.0	6.35	226.09	4,951.8	-88.4	-3.8	-80.6	3.14	2.80	13.72
4,980.0	7.27	227.47	4,976.7	-90.5	-5.9	-81.7	3.74	3.68	5.52
5,005.0	8.23	229.46	5,001.4	-92.7	-8.5	-82.8	3.99	3.84	7.96
5,030.0	8.94	230.91	5,026.1	-95.1	-11.3	-83.9	2.97	2.84	5.80
5,055.0	9.61	231.96	5,050.8	-97.6	-14.5	-85.1	2.76	2.68	4.20
5,080.0	10.49	233.71	5,075.4	-100.2	-18.0	-86.2	3.73	3.52	7.00
5,105.0	11.08	234.66	5,100.0	-103.0	-21.8	-87.3	2.46	2.36	3.80
5,130.0	11.71	236.45	5,124.5	-105.8	-25.8	-88.4	2.89	2.52	7.16
5,155.0	12.70	238.13	5,148.9	-108.6	-30.3	-89.4	4.21	3.96	6.72
5,180.0	13.57	239.44	5,173.3	-111.6	-35.1	-90.3	3.68	3.48	5.24
5,205.0	14.21	239.97	5,197.5	-114.6	-40.3	-91.1	2.61	2.56	2.12
5,230.0	14.91	241.19	5,221.7	-117.7	-45.8	-92.0	3.06	2.80	4.88
5,255.0	15.55	241.86	5,245.9	-120.8	-51.6	-92.7	2.66	2.56	2.68
5,280.0	16.18	242.83	5,269.9	-124.0	-57.6	-93.4	2.73	2.52	3.88
5,305.0	16.91	243.67	5,293.9	-127.2	-64.0	-94.0	3.07	2.92	3.36
5,330.0	17.85	244.39	5,317.7	-130.4	-70.7	-94.5	3.86	3.76	2.88
5,355.0	18.78	244.91	5,341.5	-133.8	-77.8	-94.9	3.78	3.72	2.08
5,380.0	19.58	245.39	5,365.1	-137.3	-85.2	-95.3	3.26	3.20	1.92
5,405.0	20.23	245.19	5,388.6	-140.8	-93.0	-95.7	2.61	2.60	-0.80
5,430.0	21.00	244.88	5,412.0	-144.5	-101.0	-96.2	3.11	3.08	-1.24
5,455.0	21.54	244.83	5,435.3	-148.4	-109.2	-96.7	2.16	2.16	-0.20
5,480.0	21.93	244.90	5,458.5	-152.3	-117.6	-97.2	1.56	1.56	0.28
5,505.0	22.45	244.69	5,481.7	-156.3	-126.1	-97.7	2.10	2.08	-0.84
5,530.0	22.83	244.60	5,504.7	-160.5	-134.8	-98.3	1.53	1.52	-0.36
5,555.0	23.55	243.76	5,527.7	-164.8	-143.7	-98.9	3.17	2.88	-3.36
5,580.0	23.85	242.43	5,550.6	-169.3	-152.6	-99.8	2.45	1.20	-5.32

Survey Report

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Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,605.0	24.17	241.91	5,573.4	-174.0	-161.6	-100.8	1.53	1.28	-2.08
5,630.0	24.42	241.47	5,596.2	-178.9	-170.7	-102.0	1.23	1.00	-1.76
5,655.0	24.74	241.23	5,619.0	-183.9	-179.8	-103.2	1.34	1.28	-0.96
5,680.0	24.69	240.90	5,641.7	-189.0	-188.9	-104.4	0.59	-0.20	-1.32
5,705.0	25.07	240.78	5,664.3	-194.1	-198.1	-105.7	1.53	1.52	-0.48
5,730.0	25.31	240.95	5,687.0	-199.3	-207.4	-107.1	1.00	0.96	0.68
5,755.0	25.63	241.31	5,709.5	-204.5	-216.8	-108.4	1.42	1.28	1.44
5,780.0	25.74	241.74	5,732.1	-209.6	-226.4	-109.6	0.87	0.44	1.72
5,805.0	25.55	242.71	5,754.6	-214.7	-235.9	-110.7	1.84	-0.76	3.88
5,830.0	25.66	243.61	5,777.2	-219.6	-245.6	-111.6	1.62	0.44	3.60
5,855.0	25.61	244.63	5,799.7	-224.3	-255.3	-112.3	1.78	-0.20	4.08
5,880.0	25.53	245.57	5,822.2	-228.8	-265.1	-112.9	1.65	-0.32	3.76
5,905.0	25.72	246.00	5,844.8	-233.3	-274.9	-113.3	1.06	0.76	1.72
5,930.0	25.92	246.09	5,867.3	-237.7	-284.9	-113.6	0.82	0.80	0.36
5,955.0	26.19	246.30	5,889.7	-242.1	-294.9	-114.0	1.14	1.08	0.84
5,980.0	26.53	246.67	5,912.1	-246.5	-305.1	-114.3	1.51	1.36	1.48
6,005.0	27.14	246.68	5,934.5	-251.0	-315.5	-114.5	2.44	2.44	0.04
6,030.0	27.70	246.48	5,956.6	-255.6	-326.0	-114.8	2.27	2.24	-0.80
6,055.0	28.07	245.96	5,978.7	-260.3	-336.7	-115.2	1.77	1.48	-2.08
6,080.0	28.34	245.58	6,000.8	-265.1	-347.5	-115.7	1.30	1.08	-1.52
6,105.0	28.28	245.58	6,022.8	-270.0	-358.3	-116.2	0.24	-0.24	0.00
6,130.0	28.08	245.04	6,044.8	-275.0	-369.0	-116.7	1.30	-0.80	-2.16
6,155.0	28.12	245.38	6,066.9	-279.9	-379.7	-117.3	0.66	0.16	1.36
6,156.0	28.14	245.39	6,067.8	-280.1	-380.2	-117.3	2.05	2.00	1.00
End of Gyro: [6157.0' MD] [6068.8' TVD]									
6,324.0	27.64	243.34	6,216.2	-314.1	-451.0	-122.3	0.64	-0.30	-1.22
6,355.0	27.55	238.60	6,243.7	-321.1	-463.6	-124.0	7.09	-0.29	-15.29
6,386.0	28.23	228.12	6,271.1	-329.7	-475.1	-127.7	15.95	2.19	-33.81
6,417.0	29.89	223.31	6,298.2	-340.2	-485.9	-133.4	9.24	5.35	-15.52
6,448.0	32.11	221.02	6,324.8	-352.0	-496.6	-140.4	8.11	7.16	-7.39
6,478.0	31.26	224.85	6,350.3	-363.6	-507.3	-147.1	7.28	-2.83	12.77
6,509.0	31.35	231.33	6,376.8	-374.3	-519.3	-152.5	10.86	0.29	20.90
6,540.0	31.60	236.85	6,403.3	-383.8	-532.4	-156.4	9.33	0.81	17.81
6,571.0	31.26	244.22	6,429.7	-391.7	-546.5	-158.5	12.44	-1.10	23.77
6,602.0	30.75	252.58	6,456.3	-397.6	-561.3	-158.4	13.98	-1.65	26.97
6,633.0	30.73	260.05	6,483.0	-401.4	-576.6	-156.1	12.31	-0.06	24.10
6,664.0	30.56	269.77	6,509.7	-402.8	-592.3	-151.5	15.98	-0.55	31.35
6,695.0	31.70	279.00	6,536.2	-401.5	-608.3	-144.4	15.81	3.68	29.77
6,725.0	33.45	286.84	6,561.5	-397.9	-624.0	-135.2	15.22	5.83	26.13
6,756.0	35.35	293.81	6,587.1	-391.8	-640.4	-123.4	14.10	6.13	22.48
6,787.0	37.65	300.43	6,612.0	-383.4	-656.7	-109.4	14.70	7.42	21.35
6,818.0	40.79	304.77	6,636.0	-372.8	-673.2	-93.5	13.45	10.13	14.00
6,849.0	43.40	310.74	6,659.1	-360.1	-689.6	-75.5	15.41	8.42	19.26

Survey Report

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Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
6,880.0	46.44	313.95	6,681.0	-345.3	-705.8	-55.8	12.23	9.81	10.35
6,911.0	50.20	317.16	6,701.6	-328.8	-722.0	-34.4	14.38	12.13	10.35
6,941.0	53.15	319.83	6,720.2	-311.2	-737.6	-12.2	12.06	9.83	8.90
6,972.0	56.69	323.53	6,738.0	-291.2	-753.3	12.1	15.02	11.42	11.94
7,003.0	59.91	327.77	6,754.3	-269.5	-768.1	37.9	15.60	10.39	13.68
7,034.0	62.47	332.85	6,769.3	-245.9	-781.6	64.8	16.56	8.26	16.39
7,065.0	64.10	334.09	6,783.2	-221.1	-793.9	92.4	6.36	5.26	4.00
7,096.0	65.76	333.51	6,796.4	-195.9	-806.3	120.4	5.62	5.35	-1.87
7,127.0	68.53	332.56	6,808.4	-170.5	-819.3	148.9	9.37	8.94	-3.06
7,158.0	72.82	332.50	6,818.6	-144.5	-832.8	178.0	13.84	13.84	-0.19
7,189.0	76.30	332.29	6,826.9	-118.0	-846.6	207.7	11.24	11.23	-0.68
7,219.0	80.41	333.07	6,833.0	-91.9	-860.1	237.0	13.93	13.70	2.60
7,250.0	82.52	333.63	6,837.6	-64.5	-873.8	267.5	7.04	6.81	1.81
7,281.0	84.66	334.24	6,841.0	-36.9	-887.4	298.2	7.17	6.90	1.97
7,312.0	87.79	333.65	6,843.1	-9.1	-901.0	329.1	10.27	10.10	-1.90
7,343.0	87.57	332.37	6,844.3	18.5	-915.0	359.9	4.19	-0.71	-4.13
7,382.0	86.79	332.65	6,846.2	53.1	-933.0	398.7	2.12	-2.00	0.72
7,413.0	86.95	332.56	6,847.9	80.6	-947.2	429.5	0.59	0.52	-0.29
7,443.0	88.21	333.56	6,849.2	107.3	-960.8	459.4	5.36	4.20	3.33
7,474.0	88.69	334.06	6,850.0	135.1	-974.5	490.3	2.24	1.55	1.61
7,567.0	90.06	337.35	6,851.0	219.8	-1,012.8	583.2	3.83	1.47	3.54
7,659.0	88.04	337.90	6,852.6	304.9	-1,047.8	675.2	2.28	-2.20	0.60
7,752.0	88.46	337.90	6,855.4	391.0	-1,082.7	768.1	0.45	0.45	0.00
7,845.0	89.47	339.72	6,857.1	477.7	-1,116.3	861.1	2.24	1.09	1.96
7,937.0	90.28	340.44	6,857.3	564.2	-1,147.7	953.1	1.18	0.88	0.78
8,030.0	91.15	338.21	6,856.1	651.2	-1,180.5	1,046.0	2.57	0.94	-2.40
8,122.0	90.89	338.64	6,854.5	736.7	-1,214.3	1,138.0	0.55	-0.28	0.47
8,215.0	88.86	335.54	6,854.7	822.4	-1,250.5	1,231.0	3.98	-2.18	-3.33
8,308.0	88.13	336.24	6,857.1	907.2	-1,288.5	1,323.9	1.09	-0.78	0.75
8,400.0	88.35	335.96	6,860.0	991.3	-1,325.8	1,415.8	0.39	0.24	-0.30
8,493.0	88.55	337.85	6,862.5	1,076.8	-1,362.2	1,508.7	2.04	0.22	2.03
8,585.0	88.35	337.21	6,865.0	1,161.8	-1,397.4	1,600.7	0.73	-0.22	-0.70
8,678.0	87.15	338.42	6,868.6	1,247.9	-1,432.5	1,693.6	1.83	-1.29	1.30
8,770.0	91.45	340.47	6,869.7	1,334.0	-1,464.8	1,785.5	5.18	4.67	2.23
8,862.0	91.62	337.93	6,867.3	1,419.9	-1,497.4	1,877.5	2.77	0.18	-2.76
8,955.0	90.22	338.25	6,865.8	1,506.2	-1,532.1	1,970.5	1.54	-1.51	0.34
9,048.0	91.15	338.77	6,864.7	1,592.7	-1,566.2	2,063.5	1.15	1.00	0.56
9,140.0	91.56	337.31	6,862.5	1,678.0	-1,600.6	2,155.4	1.65	0.45	-1.59
9,233.0	90.39	337.22	6,860.9	1,763.8	-1,636.5	2,248.4	1.26	-1.26	-0.10
9,325.0	90.53	335.63	6,860.2	1,848.1	-1,673.3	2,340.4	1.73	0.15	-1.73
9,417.0	89.72	336.13	6,860.0	1,932.1	-1,710.9	2,432.3	1.03	-0.88	0.54
9,510.0	90.61	338.86	6,859.7	2,018.0	-1,746.5	2,525.3	3.09	0.96	2.94

Survey Report

Company: Antero
Project: Doddridge County WV
Site: R.J. Smith Pad:
 Costlow/Duff/Gibson/Mishka/Vinola
Well: Gibson Unit 1H
Wellbore: Original Hole
Design: Surveys

Local Co-ordinate Reference: Well Gibson Unit 1H
TVD Reference: KB Elevation @ 1016.0usft (Precision 522 (18'))
MD Reference: KB Elevation @ 1016.0usft (Precision 522 (18'))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: North East R5000 Database

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,603.0	90.87	337.66	6,858.5	2,104.4	-1,780.9	2,618.3	1.32	0.28	-1.29
9,695.0	89.61	338.97	6,858.1	2,189.8	-1,814.9	2,710.3	1.98	-1.37	1.42
9,788.0	90.25	339.16	6,858.2	2,276.7	-1,848.2	2,803.3	0.72	0.69	0.20
9,880.0	91.03	339.37	6,857.2	2,362.7	-1,880.7	2,895.2	0.88	0.85	0.23
9,973.0	91.37	337.97	6,855.3	2,449.3	-1,914.6	2,988.2	1.55	0.37	-1.51
10,066.0	91.93	337.94	6,852.6	2,535.5	-1,949.4	3,081.2	0.60	0.60	-0.03
10,158.0	90.87	339.65	6,850.3	2,621.3	-1,982.7	3,173.1	2.19	-1.15	1.86
10,251.0	90.75	337.84	6,849.0	2,707.9	-2,016.4	3,266.1	1.95	-0.13	-1.95
10,343.0	88.21	337.85	6,849.8	2,793.1	-2,051.1	3,358.1	2.76	-2.76	0.01
10,436.0	88.63	338.05	6,852.4	2,879.3	-2,086.0	3,451.0	0.50	0.45	0.22
10,529.0	88.55	337.30	6,854.7	2,965.3	-2,121.3	3,544.0	0.81	-0.09	-0.81
10,621.0	89.47	336.44	6,856.3	3,049.8	-2,157.5	3,636.0	1.37	1.00	-0.93
10,714.0	90.75	338.44	6,856.1	3,135.7	-2,193.1	3,729.0	2.55	1.38	2.15
10,806.0	91.76	338.01	6,854.1	3,221.1	-2,227.2	3,820.9	1.19	1.10	-0.47
10,899.0	90.11	337.79	6,852.6	3,307.3	-2,262.2	3,913.9	1.79	-1.77	-0.24
10,991.0	90.75	338.06	6,851.9	3,392.5	-2,296.8	4,005.9	0.76	0.70	0.29
11,084.0	90.70	336.59	6,850.7	3,478.3	-2,332.7	4,098.9	1.58	-0.05	-1.58
11,176.0	90.13	338.71	6,850.0	3,563.4	-2,367.6	4,190.9	2.39	-0.62	2.30
11,269.0	91.02	341.11	6,849.1	3,650.8	-2,399.6	4,283.8	2.75	0.96	2.58
11,362.0	91.31	338.95	6,847.2	3,738.1	-2,431.3	4,376.7	2.34	0.31	-2.32
11,454.0	89.47	337.71	6,846.6	3,823.6	-2,465.3	4,468.7	2.41	-2.00	-1.35
11,547.0	90.64	339.72	6,846.5	3,910.3	-2,499.1	4,561.7	2.50	1.26	2.16
11,639.0	92.07	340.75	6,844.3	3,996.8	-2,530.2	4,653.6	1.92	1.55	1.12
11,732.0	91.28	339.05	6,841.6	4,084.1	-2,562.1	4,746.5	2.01	-0.85	-1.83
11,825.0	90.53	339.48	6,840.1	4,171.1	-2,595.0	4,839.5	0.93	-0.81	0.46
11,917.0	90.20	337.53	6,839.6	4,256.7	-2,628.7	4,931.5	2.15	-0.36	-2.12
12,010.0	90.23	337.60	6,839.2	4,342.6	-2,664.2	5,024.5	0.08	0.03	0.08
12,102.0	90.50	340.48	6,838.6	4,428.5	-2,697.1	5,116.4	3.14	0.29	3.13
12,195.0	90.64	343.45	6,837.7	4,517.0	-2,725.9	5,209.2	3.20	0.15	3.19
12,287.0	89.94	340.63	6,837.2	4,604.5	-2,754.3	5,301.0	3.16	-0.76	-3.07
12,380.0	90.02	339.62	6,837.3	4,691.9	-2,785.9	5,393.9	1.09	0.09	-1.09
12,472.0	90.16	336.94	6,837.1	4,777.4	-2,819.9	5,485.9	2.92	0.15	-2.91
12,565.0	90.36	337.30	6,836.7	4,863.1	-2,856.1	5,578.9	0.44	0.22	0.39
12,657.0	91.20	336.13	6,835.4	4,947.6	-2,892.5	5,670.8	1.57	-0.91	-1.27
12,750.0	89.72	336.16	6,834.7	5,032.6	-2,930.1	5,763.8	1.59	-1.59	0.03
12,842.0	89.94	336.00	6,835.0	5,116.7	-2,967.4	5,855.7	0.30	0.24	-0.17
12,935.0	90.56	338.03	6,834.6	5,202.3	-3,003.7	5,948.7	2.28	0.67	2.18
13,027.0	90.16	336.21	6,834.0	5,287.1	-3,039.5	6,040.7	2.03	-0.43	-1.98
13,119.0	90.30	335.67	6,833.6	5,371.1	-3,077.0	6,132.6	0.61	0.15	-0.59
13,211.0	90.55	334.24	6,832.9	5,454.4	-3,115.9	6,224.5	1.58	0.27	-1.55
13,302.0	89.63	335.23	6,832.8	5,536.7	-3,154.7	6,315.4	1.49	-1.01	1.09
13,394.0	89.94	339.77	6,833.1	5,621.7	-3,189.9	6,407.3	4.95	0.34	4.93
13,485.0	89.80	340.14	6,833.3	5,707.2	-3,221.1	6,498.3	0.43	-0.15	0.41

Survey Report

Company: Antero
Project: Doddridge County WV
Site: R. J. Smith Pad:
 Costlow/Duff/Gibson/Mishka/Vinola
Well: Gibson Unit 1H
Wellbore: Original Hole
Design: Surveys

Local Co-ordinate Reference: Well Gibson Unit 1H
TVD Reference: KB Elevation @ 1016.0usft (Precision 522 (18'))
MD Reference: KB Elevation @ 1016.0usft (Precision 522 (18'))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: North East R5000 Database

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,577.0	89.69	338.63	6,833.8	5,793.3	-3,253.5	6,590.2	1.65	-0.12	-1.64
13,669.0	90.16	337.27	6,833.9	5,878.6	-3,288.1	6,682.2	1.56	0.51	-1.48
13,760.0	91.00	336.54	6,833.0	5,962.3	-3,323.8	6,773.2	1.22	0.92	-0.80
13,851.0	91.08	337.36	6,831.3	6,046.0	-3,359.4	6,864.2	0.91	0.09	0.90
13,944.0	89.91	337.83	6,830.5	6,132.0	-3,394.8	6,957.2	1.36	-1.26	0.51
14,036.0	90.19	336.24	6,830.4	6,216.7	-3,430.7	7,049.2	1.75	0.30	-1.73
14,129.0	89.97	337.42	6,830.3	6,302.2	-3,467.3	7,142.1	1.29	-0.24	1.27
14,222.0	90.78	338.46	6,829.7	6,388.3	-3,502.2	7,235.1	1.42	0.87	1.12
14,314.0	89.60	336.98	6,829.4	6,473.5	-3,537.1	7,327.1	2.06	-1.28	-1.61
14,407.0	89.52	337.69	6,830.1	6,559.3	-3,572.9	7,420.1	0.77	-0.09	0.76
14,500.0	90.53	338.84	6,830.0	6,645.7	-3,607.4	7,513.1	1.65	1.09	1.24
14,592.0	90.72	339.28	6,829.0	6,731.6	-3,640.3	7,605.1	0.52	0.21	0.48
14,685.0	89.97	338.99	6,828.5	6,818.5	-3,673.4	7,698.1	0.86	-0.81	-0.31
14,778.0	90.30	338.57	6,828.3	6,905.2	-3,707.0	7,791.1	0.57	0.35	-0.45
14,871.0	90.55	338.94	6,827.6	6,991.9	-3,740.7	7,884.1	0.48	0.27	0.40
14,963.0	91.49	337.06	6,825.9	7,077.1	-3,775.2	7,976.0	2.28	1.02	-2.04
15,056.0	89.90	337.76	6,824.8	7,163.0	-3,810.9	8,069.0	1.87	-1.71	0.75
15,148.0	89.85	337.19	6,825.0	7,248.0	-3,846.2	8,161.0	0.62	-0.05	-0.62
15,241.0	90.39	337.83	6,824.8	7,333.9	-3,881.7	8,254.0	0.90	0.58	0.69
15,333.0	90.70	337.13	6,823.9	7,418.9	-3,917.0	8,346.0	0.83	0.34	-0.76
15,426.0	89.81	336.24	6,823.5	7,504.3	-3,953.8	8,439.0	1.35	-0.96	-0.96
15,519.0	89.72	337.00	6,823.9	7,589.7	-3,990.7	8,531.9	0.82	-0.10	0.82
15,612.0	89.81	337.55	6,824.3	7,675.4	-4,026.6	8,624.9	0.60	0.10	0.59
15,704.0	89.47	338.51	6,824.9	7,760.7	-4,061.0	8,716.9	1.11	-0.37	1.04
15,797.0	89.81	337.65	6,825.5	7,847.0	-4,095.7	8,809.9	0.99	0.37	-0.92
15,889.0	90.31	340.23	6,825.4	7,932.9	-4,128.8	8,901.9	2.86	0.54	2.80
15,982.0	90.56	341.10	6,824.6	8,020.6	-4,159.6	8,994.8	0.97	0.27	0.94
16,075.0	90.56	340.13	6,823.7	8,108.3	-4,190.5	9,087.7	1.04	0.00	-1.04
16,167.0	90.03	337.16	6,823.3	8,194.0	-4,224.0	9,179.7	3.28	-0.58	-3.23
16,260.0	90.28	337.64	6,823.0	8,279.9	-4,259.7	9,272.7	0.58	0.27	0.52
16,352.0	90.56	337.56	6,822.3	8,364.9	-4,294.8	9,364.7	0.32	0.30	-0.09
16,445.0	89.50	338.09	6,822.3	8,451.0	-4,329.9	9,457.7	1.27	-1.14	0.57
16,537.0	90.31	337.03	6,822.4	8,536.1	-4,365.0	9,549.7	1.45	0.88	-1.15
16,630.0	90.92	336.11	6,821.4	8,621.4	-4,401.9	9,642.6	1.19	0.66	-0.99
16,722.0	89.67	336.48	6,821.0	8,705.6	-4,438.9	9,734.6	1.42	-1.36	0.40
16,815.0	89.50	338.18	6,821.6	8,791.4	-4,474.8	9,827.6	1.84	-0.18	1.83
16,892.0	89.50	338.18	6,822.3	8,862.9	-4,503.4	9,904.6	0.00	0.00	0.00

PTB: [16892.0' MD][89.50° Inc][338.18° Azi]

Survey Report

Company: Antero
Project: Doddridge County WV
Site: R. J. Smith Pad:
 Costlow/Duff/Gibson/Mishka/Vinola
Well: Gibson Unit 1H
Wellbore: Original Hole
Design: Surveys

Local Co-ordinate Reference: Well Gibson Unit 1H
TVD Reference: KB Elevation @ 1016.0usft (Precision 522 (18'))
MD Reference: KB Elevation @ 1016.0usft (Precision 522 (18'))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: North East R5000 Database

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
6,156.0	6,067.8	-280.1	-380.2	End of Gyro: [6157.0' MD] [6068.8' TVD]
16,892.0	6,822.3	8,862.9	-4,503.4	PTB: [16892.0' MD][89.50° Inc][338.18° Azi]

Checked By: _____ Approved By: _____ Date: _____