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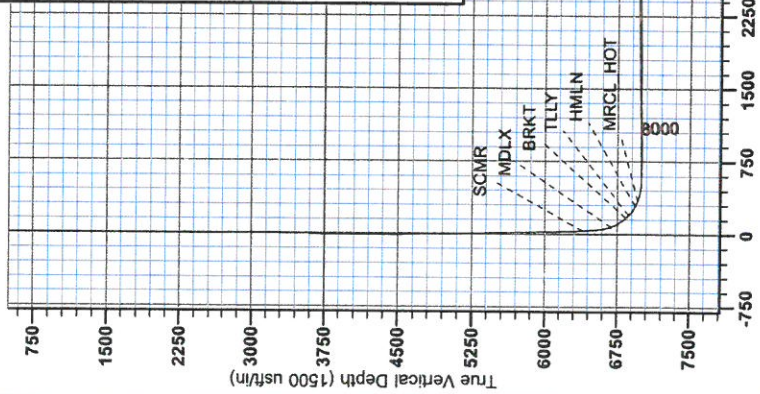
AUG 03 2015

WV GEOLOGICAL SURVEY

MORGANTOWN, WV



Antero Resources
Manser Unit 1H
 Doddridge County WV
 Northing: 14265920.69
 Easting: 1732889.32
 Sidetrack 1



WELL DETAILS: Manser Unit 1H
 Ground Level: 1141.0
 Slit
 +N/S +E/W Northing Easting Longitude
 0.0 0.0 14265920.69 1732889.32 30° 17' 8.483 N 80° 40' 23.491 W

REFERENCE INFORMATION
 Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: NAD 1983 (NAD83)
 Zone: Zone 17N (84°W to 78°W)
 System Datum: Mean Sea Level

PROJECT DETAILS: Doddridge County WV
 Genie Lightfoot
 13.28, October 29 2014
 Scientific Drilling
 421 South Eagle Lane
 Oklahoma City, OK

LEGEND

- Manser Unit 1H, Sidetrack 1, Plan 1 Revised V0
- Manser Unit 1H, Original Wellpath, Plan 6 V0
- ✕ Manser Unit 1H, Original Wellpath, As Drilled V0
- ▣ Sidetrack 1

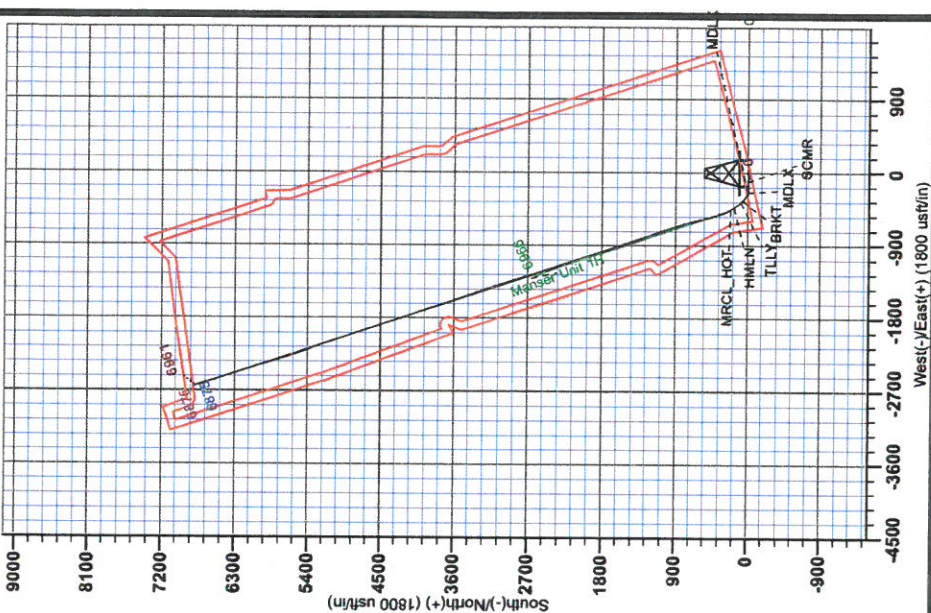
DESIGN TARGET DETAILS

Name	+N/S	+E/W	TVD	Northing	Easting	Latitude	Longitude
SHL Manser Unit 1H	0.0	0.0	0	0.01426592068	1732889.3139	17° 6' 48.3 N	80° 40' 23.491 W
Actual BHL Manser Unit 1H Sigsbee	0.0	0.0	6766.6	-2635.11427270751	1730254.23918	13° 68.1 N	80° 40' 56.713 W
Actual BHL Manser Unit 1H Oberg	0.0	0.0	2861.7	-1308.31426658243	1731581.03917	32° 84.7 N	80° 40' 40.015 W

To convert Magnetic North to Grid, Subread 0.78"
 To convert True North to Grid, Subread 0.21"

Azimuths to Grid North
 True North: -0.21"
 Magnetic North: -3.78"

Magnetic Field
 Strength: 57.09 Oer
 Dip Angle: 68.82°
 Date: 10/18/2014
 Model: BGGM2014



Vertical Section at 341.64° (1500 usft/in)



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WV GEOLOGICAL SURVEY
MORGANTOWN, WV

Antero Resources

**Doddridge County WV
Zimka/Manser Pad
Manser Unit 1H
Sidetrack 1**

Design: Sidetrack 1

EOW Completion Report

10 November, 2014



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EOW Completion Report



Company:	Antero Resources	Local Co-ordinate Reference:	Well Manser Unit 1H
Project:	Doddridge County WV	TVD Reference:	Patterson 325 GL 1141 +24' RKB @ 1165.0usft
Site:	Zimka/Manser Pad	MD Reference:	Patterson 325 GL 1141 +24' RKB @ 1165.0usft
Well:	Manser Unit 1H	North Reference:	Grid
Wellbore:	Sidetrack 1	Survey Calculation Method:	Minimum Curvature
Design:	Sidetrack 1	Database:	Oklahoma District

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

Site	Zimka/Manser Pad				
Site Position:		Northing:	14,265,927.56 usft	Latitude:	39° 17' 6.551 N
From:	Map	Easting:	1,732,882.20 usft	Longitude:	80° 40' 23.581 W
Position Uncertainty:	2.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	0.21 °

Well	Manser Unit 1H, Marcellus					
Well Position	+N/-S	0.0 usft	Northing:	14,265,920.69 usft	Latitude:	39° 17' 6.483 N
	+E/-W	0.0 usft	Easting:	1,732,889.32 usft	Longitude:	80° 40' 23.491 W
Position Uncertainty		2.0 usft	Wellhead Elevation:	1,165.0 usft	Ground Level:	1,141.0 usft

Wellbore	Sidetrack 1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2014	10/19/2014	-8.55	66.82	52,199

Design	Sidetrack 1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	7,400.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	341.64	

Survey Program	Date 10/28/2014				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
36.0	6,079.3	Survey #8 Final Gyro (Original Wellpath)	SDI Standard Keeper	Scientific Drilling Intl. Standard Wireline Keeper	
6,095.0	7,400.0	Survey #9 MWD (Original Wellpath)	MWD SDI	MWD - Standard ver 1.0.1	
7,446.0	14,074.0	Survey #1 SDI MWD (Sidetrack 1)	SDI MWD	Scientific Drilling Intl. MWD - Standard ver 1.0.1	

Survey									
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)		
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00		0.00
36.0	0.01	206.43	36.0	0.0	0.0	0.0	0.03		0.03
61.0	0.02	206.43	61.0	0.0	0.0	0.0	0.04		0.04
86.0	0.03	206.43	86.0	0.0	0.0	0.0	0.04		0.04
111.0	0.05	206.43	111.0	0.0	0.0	0.0	0.08		0.08
136.0	0.06	206.43	136.0	-0.1	0.0	0.0	0.04		0.04
161.0	0.07	206.43	161.0	-0.1	0.0	-0.1	0.04		0.04
186.0	0.08	206.43	186.0	-0.1	-0.1	-0.1	0.04		0.04
211.0	0.09	206.43	211.0	-0.1	-0.1	-0.1	0.04		0.04
236.0	0.19	196.67	236.0	-0.2	-0.1	-0.2	0.41		0.41

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EOW Completion Report



Company: Antero Resources
Project: Doddridge County WV
Site: Zimka/Manser Pad
Well: Manser Unit 1H
Wellbore: Sidetrack 1
Design: Sidetrack 1

Local Co-ordinate Reference: Well Manser Unit 1H
TVD Reference: Patterson 325 GL 1141 +24' RKB @ 1165.0usft
MD Reference: Patterson 325 GL 1141 +24' RKB @ 1165.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Oklahoma District

Survey

Table with 10 columns: MD (usft), Inc (°), Azi (azimuth) (°), TVD (usft), N/S (usft), E/W (usft), V. Sec (usft), DLeg (°/100usft). Contains 40 rows of survey data.

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EOW Completion Report



Company: Antero Resources
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	EW (usft)	V. Sec (usft)	DLeg (°/100usft)
1,386.0	0.54	262.97	1,386.0	-1.8	-4.5	-0.3	0.52
1,411.0	0.51	252.21	1,411.0	-1.8	-4.7	-0.2	0.41
1,436.0	0.46	250.28	1,436.0	-1.9	-4.9	-0.2	0.21
1,461.0	0.40	241.26	1,461.0	-2.0	-5.1	-0.3	0.36
1,486.0	0.35	230.94	1,486.0	-2.1	-5.3	-0.3	0.34
1,511.0	0.33	222.53	1,511.0	-2.2	-5.4	-0.4	0.21
1,536.0	0.23	202.29	1,536.0	-2.3	-5.4	-0.4	0.56
1,561.0	0.38	182.77	1,561.0	-2.4	-5.5	-0.6	0.72
1,586.0	0.44	179.38	1,586.0	-2.6	-5.5	-0.7	0.26
1,611.0	0.40	185.78	1,611.0	-2.8	-5.5	-0.9	0.25
1,636.0	0.40	171.10	1,636.0	-2.9	-5.5	-1.1	0.41
1,661.0	0.42	171.27	1,661.0	-3.1	-5.4	-1.2	0.08
1,686.0	0.48	162.06	1,686.0	-3.3	-5.4	-1.4	0.38
1,711.0	0.39	140.42	1,711.0	-3.5	-5.3	-1.6	0.74
1,736.0	0.51	106.22	1,736.0	-3.6	-5.1	-1.8	1.15
1,761.0	0.48	113.24	1,761.0	-3.6	-4.9	-1.9	0.27
1,786.0	0.53	118.65	1,786.0	-3.7	-4.7	-2.1	0.28
1,811.0	0.51	105.22	1,811.0	-3.8	-4.5	-2.2	0.49
1,836.0	0.51	108.84	1,836.0	-3.9	-4.3	-2.3	0.13
1,861.0	0.43	106.01	1,861.0	-3.9	-4.1	-2.4	0.33
1,886.0	0.53	90.08	1,886.0	-4.0	-3.9	-2.5	0.66
1,911.0	0.40	105.02	1,911.0	-4.0	-3.7	-2.6	0.71
1,936.0	0.34	95.25	1,936.0	-4.0	-3.6	-2.7	0.35
1,961.0	0.29	82.45	1,961.0	-4.0	-3.4	-2.7	0.34
1,986.0	0.21	112.05	1,986.0	-4.0	-3.3	-2.8	0.60
2,011.0	0.21	110.69	2,011.0	-4.1	-3.2	-2.8	0.02
2,036.0	0.15	102.97	2,036.0	-4.1	-3.2	-2.9	0.26
2,061.0	0.17	173.54	2,061.0	-4.1	-3.1	-2.9	0.74
2,086.0	0.05	243.12	2,086.0	-4.2	-3.1	-3.0	0.64
2,111.0	0.24	284.05	2,111.0	-4.2	-3.2	-2.9	0.82
2,136.0	0.25	244.80	2,136.0	-4.2	-3.3	-2.9	0.66
2,161.0	0.23	254.99	2,161.0	-4.2	-3.4	-2.9	0.19
2,186.0	0.20	274.97	2,186.0	-4.2	-3.5	-2.9	0.32
2,211.0	0.30	285.76	2,211.0	-4.2	-3.6	-2.9	0.44
2,236.0	0.32	279.62	2,236.0	-4.2	-3.7	-2.8	0.15
2,261.0	0.34	275.55	2,261.0	-4.2	-3.9	-2.7	0.12
2,286.0	0.43	284.86	2,286.0	-4.1	-4.0	-2.6	0.44
2,311.0	0.32	283.45	2,311.0	-4.1	-4.2	-2.6	0.44
2,336.0	0.28	292.54	2,336.0	-4.0	-4.3	-2.5	0.25
2,361.0	0.45	278.21	2,361.0	-4.0	-4.5	-2.4	0.77
2,386.0	0.41	288.69	2,386.0	-4.0	-4.6	-2.3	0.35
2,411.0	0.44	275.07	2,411.0	-3.9	-4.8	-2.2	0.42
2,436.0	0.43	273.18	2,436.0	-3.9	-5.0	-2.1	0.07
2,461.0	0.46	284.95	2,461.0	-3.9	-5.2	-2.0	0.38

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EOW Completion Report



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Site: Zimka/Manser Pad
Well: Manser Unit 1H
Wellbore: Sidetrack 1
Design: Sidetrack 1

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Survey Calculation Method: Minimum Curvature
Database: Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
2,486.0	0.43	294.49	2,486.0	-3.8	-5.4	-1.9	0.32
2,511.0	0.45	311.38	2,511.0	-3.7	-5.5	-1.8	0.52
2,536.0	0.72	281.69	2,536.0	-3.6	-5.8	-1.6	1.59
2,561.0	0.54	292.01	2,561.0	-3.5	-6.0	-1.5	0.85
2,586.0	0.43	293.33	2,586.0	-3.5	-6.2	-1.3	0.44
2,611.0	0.51	271.08	2,611.0	-3.4	-6.4	-1.2	0.79
2,636.0	0.62	273.18	2,636.0	-3.4	-6.7	-1.1	0.45
2,661.0	0.48	283.63	2,661.0	-3.4	-6.9	-1.0	0.69
2,686.0	0.61	283.46	2,686.0	-3.3	-7.1	-0.9	0.52
2,711.0	0.66	286.34	2,710.9	-3.2	-7.4	-0.7	0.24
2,736.0	0.67	281.03	2,735.9	-3.2	-7.7	-0.6	0.25
2,761.0	1.07	268.51	2,760.9	-3.2	-8.1	-0.5	1.76
2,786.0	1.91	262.03	2,785.9	-3.2	-8.7	-0.3	3.42
2,811.0	3.20	257.80	2,810.9	-3.4	-9.8	-0.2	5.21
2,836.0	4.30	256.88	2,835.9	-3.8	-11.4	0.0	4.41
2,861.0	5.25	256.49	2,860.8	-4.3	-13.4	0.2	3.80
2,886.0	5.50	257.44	2,885.7	-4.8	-15.7	0.4	1.06
2,911.0	5.51	256.91	2,910.5	-5.3	-18.0	0.6	0.21
2,936.0	5.38	258.04	2,935.4	-5.8	-20.4	0.9	0.67
2,961.0	5.47	258.18	2,960.3	-6.3	-22.7	1.1	0.36
2,986.0	5.40	258.61	2,985.2	-6.8	-25.0	1.4	0.32
3,011.0	5.44	258.01	3,010.1	-7.3	-27.3	1.7	0.28
3,036.0	5.43	256.87	3,035.0	-7.8	-29.6	1.9	0.43
3,061.0	5.24	253.79	3,059.9	-8.4	-31.9	2.1	1.37
3,086.0	5.13	252.21	3,084.8	-9.0	-34.0	2.1	0.72
3,111.0	5.09	252.29	3,109.7	-9.7	-36.1	2.2	0.16
3,136.0	4.80	251.42	3,134.6	-10.4	-38.2	2.2	1.20
3,161.0	3.83	244.92	3,159.5	-11.1	-39.9	2.1	4.34
3,186.0	2.61	230.45	3,184.5	-11.8	-41.1	1.8	5.83
3,211.0	1.80	205.63	3,209.5	-12.5	-41.7	1.3	4.94
3,236.0	1.52	191.03	3,234.4	-13.2	-42.0	0.7	2.02
3,261.0	1.34	184.25	3,259.4	-13.8	-42.1	0.1	0.99
3,286.0	1.37	184.99	3,284.4	-14.4	-42.1	-0.4	0.14
3,311.0	1.38	185.68	3,309.4	-15.0	-42.2	-1.0	0.08
3,336.0	1.30	185.48	3,334.4	-15.6	-42.2	-1.5	0.32
3,361.0	1.30	178.37	3,359.4	-16.1	-42.2	-2.0	0.64
3,386.0	1.24	182.65	3,384.4	-16.7	-42.2	-2.5	0.45
3,411.0	1.23	182.76	3,409.4	-17.2	-42.3	-3.0	0.04
3,436.0	1.29	175.21	3,434.4	-17.8	-42.3	-3.6	0.71
3,461.0	1.14	181.49	3,459.4	-18.3	-42.2	-4.1	0.80
3,486.0	1.13	181.74	3,484.4	-18.8	-42.3	-4.5	0.04
3,511.0	1.24	184.92	3,509.4	-19.3	-42.3	-5.0	0.51
3,536.0	1.20	186.93	3,534.4	-19.9	-42.3	-5.5	0.23
3,561.0	1.10	188.59	3,559.4	-20.4	-42.4	-6.0	0.42

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EOW Completion Report



Company: Antero Resources
Project: Doddridge County WV
Site: Zimka/Manser Pad
Well: Manser Unit 1H
Wellbore: Sidetrack 1
Design: Sidetrack 1

Local Co-ordinate Reference: Well Manser Unit 1H
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Survey Calculation Method: Minimum Curvature
Database: Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
3,586.0	1.03	192.22	3,584.4	-20.8	-42.5	-6.4	0.39
3,611.0	1.01	203.22	3,609.4	-21.2	-42.6	-6.7	0.79
3,636.0	0.94	199.77	3,634.3	-21.6	-42.8	-7.0	0.37
3,661.0	0.98	201.69	3,659.3	-22.0	-42.9	-7.4	0.21
3,686.0	0.93	197.51	3,684.3	-22.4	-43.1	-7.7	0.34
3,711.0	0.93	200.09	3,709.3	-22.8	-43.2	-8.0	0.17
3,736.0	0.90	204.74	3,734.3	-23.2	-43.4	-8.3	0.32
3,761.0	0.92	207.43	3,759.3	-23.5	-43.5	-8.6	0.19
3,786.0	0.73	213.40	3,784.3	-23.8	-43.7	-8.8	0.83
3,811.0	0.76	217.22	3,809.3	-24.1	-43.9	-9.0	0.23
3,836.0	0.69	217.38	3,834.3	-24.3	-44.1	-9.2	0.28
3,861.0	0.65	217.96	3,859.3	-24.6	-44.3	-9.4	0.16
3,886.0	0.69	230.19	3,884.3	-24.8	-44.5	-9.5	0.59
3,911.0	0.55	227.07	3,909.3	-25.0	-44.7	-9.6	0.58
3,936.0	0.54	240.59	3,934.3	-25.1	-44.9	-9.7	0.51
3,961.0	0.51	234.04	3,959.3	-25.2	-45.1	-9.8	0.27
3,986.0	0.41	228.84	3,984.3	-25.4	-45.2	-9.8	0.43
4,011.0	0.54	239.41	4,009.3	-25.5	-45.4	-9.9	0.62
4,036.0	0.55	237.89	4,034.3	-25.6	-45.6	-9.9	0.07
4,061.0	0.57	238.52	4,059.3	-25.7	-45.8	-10.0	0.08
4,086.0	0.61	245.76	4,084.3	-25.8	-46.0	-10.0	0.34
4,111.0	0.63	242.02	4,109.3	-26.0	-46.3	-10.1	0.18
4,136.0	0.67	259.53	4,134.3	-26.1	-46.5	-10.1	0.81
4,161.0	0.60	259.76	4,159.3	-26.1	-46.8	-10.0	0.28
4,186.0	0.63	259.40	4,184.3	-26.2	-47.1	-10.0	0.12
4,211.0	0.73	269.56	4,209.3	-26.2	-47.4	-9.9	0.63
4,236.0	0.74	271.41	4,234.3	-26.2	-47.7	-9.8	0.10
4,261.0	0.69	268.60	4,259.3	-26.2	-48.0	-9.7	0.24
4,286.0	0.74	273.84	4,284.3	-26.2	-48.3	-9.6	0.33
4,311.0	0.81	275.30	4,309.3	-26.1	-48.6	-9.5	0.29
4,336.0	0.62	263.59	4,334.3	-26.1	-49.0	-9.4	0.96
4,361.0	0.69	270.62	4,359.3	-26.2	-49.2	-9.3	0.43
4,386.0	0.72	276.88	4,384.3	-26.1	-49.5	-9.2	0.33
4,411.0	0.71	278.42	4,409.3	-26.1	-49.9	-9.1	0.09
4,436.0	0.85	278.21	4,434.3	-26.0	-50.2	-8.9	0.56
4,461.0	0.84	281.63	4,459.3	-26.0	-50.6	-8.7	0.21
4,486.0	0.85	285.74	4,484.3	-25.9	-50.9	-8.5	0.25
4,511.0	0.89	286.72	4,509.3	-25.8	-51.3	-8.3	0.17
4,536.0	0.81	289.39	4,534.3	-25.7	-51.6	-8.1	0.36
4,561.0	0.89	289.30	4,559.3	-25.5	-52.0	-7.9	0.32
4,586.0	0.88	290.93	4,584.3	-25.4	-52.3	-7.6	0.11
4,611.0	0.99	290.05	4,609.3	-25.3	-52.7	-7.4	0.44
4,636.0	1.08	288.40	4,634.3	-25.1	-53.1	-7.1	0.38
4,661.0	1.05	291.95	4,659.3	-25.0	-53.6	-6.8	0.29

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EOW Completion Report



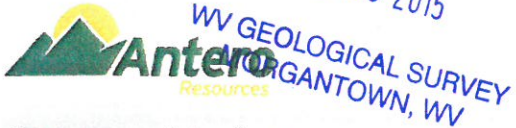
Company: Antero Resources
Project: Doddridge County WV
Site: Zimka/Manser Pad
Well: Manser Unit 1H
Wellbore: Sidetrack 1
Design: Sidetrack 1

Local Co-ordinate Reference: Well Manser Unit 1H
TVD Reference: Patterson 325 GL 1141 +24' RKB @ 1165.0usft
MD Reference: Patterson 325 GL 1141 +24' RKB @ 1165.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	EW (usft)	V. Sec (usft)	DLeg (°/100usft)
4,686.0	1.14	291.81	4,684.3	-24.8	-54.0	-6.5	0.36
4,711.0	1.13	289.25	4,709.3	-24.6	-54.5	-6.2	0.21
4,736.0	1.19	295.06	4,734.2	-24.4	-55.0	-5.9	0.53
4,761.0	1.04	292.54	4,759.2	-24.2	-55.4	-5.5	0.63
4,786.0	1.23	294.16	4,784.2	-24.0	-55.9	-5.2	0.77
4,811.0	1.24	291.96	4,809.2	-23.8	-56.4	-4.9	0.19
4,836.0	1.25	295.89	4,834.2	-23.6	-56.8	-4.5	0.34
4,861.0	1.29	293.91	4,859.2	-23.4	-57.4	-4.1	0.24
4,886.0	1.26	295.88	4,884.2	-23.1	-57.9	-3.7	0.21
4,911.0	1.34	294.87	4,909.2	-22.9	-58.4	-3.3	0.33
4,936.0	1.37	296.73	4,934.2	-22.6	-58.9	-2.9	0.21
4,961.0	1.36	295.40	4,959.2	-22.4	-59.4	-2.5	0.13
4,986.0	1.27	300.73	4,984.2	-22.1	-59.9	-2.1	0.61
5,011.0	1.44	295.17	5,009.2	-21.8	-60.5	-1.7	0.86
5,036.0	1.49	294.58	5,034.2	-21.6	-61.0	-1.2	0.21
5,061.0	1.46	296.65	5,059.2	-21.3	-61.6	-0.8	0.24
5,086.0	1.50	299.47	5,084.2	-21.0	-62.2	-0.3	0.33
5,111.0	1.58	299.32	5,109.1	-20.6	-62.8	0.2	0.32
5,136.0	1.46	297.99	5,134.1	-20.3	-63.4	0.7	0.50
5,161.0	1.43	298.64	5,159.1	-20.0	-63.9	1.1	0.14
5,186.0	1.50	296.66	5,184.1	-19.7	-64.5	1.6	0.35
5,211.0	1.59	297.86	5,209.1	-19.4	-65.1	2.1	0.38
5,236.0	1.52	299.91	5,234.1	-19.1	-65.7	2.6	0.36
5,261.0	1.48	296.77	5,259.1	-18.8	-66.3	3.0	0.37
5,286.0	1.51	298.09	5,284.1	-18.5	-66.8	3.5	0.18
5,311.0	1.74	297.48	5,309.1	-18.2	-67.5	4.0	0.92
5,336.0	1.57	296.16	5,334.1	-17.8	-68.1	4.5	0.70
5,361.0	1.51	297.13	5,359.1	-17.5	-68.7	5.0	0.26
5,386.0	1.66	298.02	5,384.0	-17.2	-69.3	5.5	0.61
5,411.0	1.69	300.69	5,409.0	-16.8	-70.0	6.0	0.33
5,436.0	1.63	302.12	5,434.0	-16.5	-70.6	6.6	0.29
5,461.0	1.80	305.47	5,459.0	-16.1	-71.2	7.2	0.79
5,486.0	1.79	302.02	5,484.0	-15.6	-71.8	7.8	0.43
5,511.0	1.92	299.61	5,509.0	-15.2	-72.5	8.4	0.61
5,536.0	1.81	298.48	5,534.0	-14.8	-73.2	9.0	0.46
5,561.0	1.97	297.08	5,559.0	-14.4	-74.0	9.6	0.67
5,586.0	1.89	299.54	5,583.9	-14.0	-74.7	10.2	0.46
5,611.0	1.86	300.38	5,608.9	-13.6	-75.4	10.8	0.16
5,636.0	1.99	301.98	5,633.9	-13.2	-76.1	11.5	0.56
5,661.0	2.22	305.05	5,658.9	-12.7	-76.9	12.2	1.02
5,686.0	2.28	304.86	5,683.9	-12.1	-77.7	13.0	0.24
5,711.0	2.24	302.25	5,708.9	-11.6	-78.5	13.8	0.44
5,736.0	2.30	299.41	5,733.8	-11.1	-79.4	14.5	0.51
5,761.0	2.30	302.54	5,758.8	-10.5	-80.2	15.3	0.50

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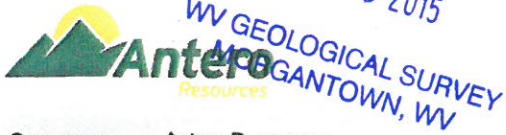
Company: Antero Resources
Project: Doddridge County WV
Site: Zimka/Manser Pad
Well: Manser Unit 1H
Wellbore: Sidetrack 1
Design: Sidetrack 1

Local Co-ordinate Reference: Well Manser Unit 1H
TVD Reference: Patterson 325 GL 1141 +24' RKB @ 1165.0usft
MD Reference: Patterson 325 GL 1141 +24' RKB @ 1165.0usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
5,786.0	2.14	303.47	5,783.8	-10.0	-81.1	16.0	0.66
5,811.0	2.15	306.01	5,808.8	-9.5	-81.8	16.8	0.38
5,836.0	2.12	304.82	5,833.8	-8.9	-82.6	17.5	0.21
5,861.0	2.20	302.09	5,858.8	-8.4	-83.4	18.3	0.52
5,886.0	1.99	300.79	5,883.7	-7.9	-84.2	19.0	0.86
5,911.0	2.01	302.59	5,908.7	-7.5	-84.9	19.6	0.26
5,936.0	1.86	298.09	5,933.7	-7.1	-85.6	20.3	0.85
5,961.0	1.81	304.65	5,958.7	-6.6	-86.3	20.9	0.86
5,986.0	1.80	305.15	5,983.7	-6.2	-86.9	21.5	0.07
6,011.0	1.83	302.21	6,008.7	-5.8	-87.6	22.1	0.39
6,036.0	1.92	299.62	6,033.7	-5.3	-88.3	22.8	0.49
6,061.0	1.75	298.42	6,058.6	-4.9	-89.0	23.3	0.70
6,079.3	1.82	292.91	6,076.9	-4.7	-89.5	23.7	1.01
6,095.0	1.60	297.02	6,092.6	-4.5	-89.9	24.1	1.60
6,127.0	1.84	311.31	6,124.6	-4.0	-90.7	24.8	1.53
6,158.0	2.70	302.84	6,155.6	-3.2	-91.7	25.8	2.97
6,189.0	3.07	292.85	6,186.6	-2.5	-93.1	26.9	2.01
6,221.0	3.36	282.27	6,218.5	-2.0	-94.8	28.0	2.06
6,252.0	4.54	272.48	6,249.4	-1.7	-96.9	28.9	4.37
6,283.0	4.26	269.43	6,280.3	-1.7	-99.3	29.7	1.18
6,315.0	4.58	272.68	6,312.2	-1.7	-101.8	30.5	1.27
6,346.0	6.84	273.93	6,343.1	-1.5	-104.8	31.6	7.30
6,377.0	10.38	274.56	6,373.7	-1.1	-109.5	33.4	11.42
6,409.0	13.14	271.06	6,405.1	-0.8	-116.0	35.8	8.90
6,440.0	17.10	266.72	6,435.0	-1.0	-124.1	38.1	13.28
6,472.0	20.46	261.48	6,465.3	-2.1	-134.3	40.3	11.74
6,503.0	22.15	257.37	6,494.2	-4.2	-145.3	41.8	7.27
6,534.0	23.33	258.32	6,522.7	-6.7	-157.1	43.1	3.99
6,566.0	25.63	265.71	6,551.9	-8.5	-170.2	45.5	11.96
6,597.0	27.74	269.91	6,579.6	-9.0	-184.1	49.4	9.13
6,628.0	29.03	273.09	6,606.8	-8.6	-198.8	54.4	6.41
6,659.0	28.57	274.96	6,634.0	-7.6	-213.7	60.1	3.26
6,691.0	29.24	282.09	6,662.0	-5.3	-229.0	67.1	10.97
6,722.0	31.82	288.88	6,688.7	-1.1	-244.1	75.9	13.88
6,753.0	34.51	293.95	6,714.7	5.2	-259.9	86.7	12.46
6,785.0	35.72	298.36	6,740.9	13.3	-276.4	99.7	8.78
6,816.0	37.06	302.70	6,765.8	22.6	-292.2	113.5	9.36
6,847.0	39.86	306.85	6,790.1	33.6	-308.0	128.9	12.28
6,879.0	42.54	310.76	6,814.2	46.8	-324.4	146.7	11.61
6,910.0	45.56	312.49	6,836.5	61.2	-340.5	165.3	10.49
6,942.0	49.32	314.62	6,858.1	77.4	-357.6	186.1	12.73
6,973.0	52.33	317.39	6,877.7	94.7	-374.3	207.8	11.93
7,005.0	55.57	321.69	6,896.5	114.4	-391.0	231.7	14.85
7,036.0	59.12	323.77	6,913.2	135.2	-406.8	256.4	12.77

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MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
7,067.0	61.46	326.62	6,928.6	157.3	-422.2	282.2	10.99
7,099.0	65.15	328.46	6,943.0	181.4	-437.5	310.0	12.62
7,130.0	69.20	329.80	6,955.0	205.9	-452.2	337.9	13.66
7,161.0	71.56	331.33	6,965.4	231.3	-466.5	366.5	8.92
7,192.0	73.23	334.58	6,974.8	257.7	-480.0	395.7	11.35
7,224.0	77.19	337.20	6,983.0	285.9	-492.6	426.5	14.69
7,255.0	80.80	339.58	6,988.9	314.2	-503.8	456.9	13.87
7,286.0	83.40	341.97	6,993.1	343.2	-513.9	487.6	11.34
7,318.0	85.89	341.97	6,996.1	373.5	-523.8	519.4	7.78
7,400.0	90.78	343.24	6,998.5	451.7	-548.3	601.4	6.16
7,446.0	89.93	346.40	6,998.2	496.0	-560.3	647.3	7.11
7,509.0	89.90	348.44	6,998.3	557.5	-574.0	709.9	3.24
7,603.0	91.11	347.77	6,997.5	649.5	-593.4	803.3	1.47
7,697.0	90.44	344.58	6,996.2	740.8	-615.8	897.0	3.47
7,791.0	90.27	341.88	6,995.6	830.7	-643.0	991.0	2.88
7,886.0	90.60	342.51	6,994.9	921.2	-672.0	1,086.0	0.75
7,980.0	91.24	341.13	6,993.4	1,010.5	-701.3	1,180.0	1.62
8,074.0	91.08	340.47	6,991.5	1,099.2	-732.2	1,273.9	0.72
8,168.0	90.13	340.75	6,990.5	1,187.9	-763.4	1,367.9	1.05
8,263.0	89.77	339.95	6,990.6	1,277.4	-795.4	1,462.9	0.92
8,357.0	90.81	341.74	6,990.1	1,366.2	-826.2	1,556.9	2.20
8,451.0	91.48	341.45	6,988.2	1,455.3	-855.9	1,650.8	0.78
8,545.0	91.24	339.69	6,986.0	1,543.9	-887.2	1,744.8	1.89
8,638.0	90.94	339.30	6,984.2	1,631.0	-919.7	1,837.7	0.53
8,733.0	91.07	340.81	6,982.6	1,720.3	-952.1	1,932.7	1.60
8,827.0	90.87	342.87	6,981.0	1,809.6	-981.4	2,026.6	2.20
8,921.0	91.07	343.21	6,979.4	1,899.5	-1,008.8	2,120.6	0.42
9,015.0	91.17	341.50	6,977.6	1,989.1	-1,037.3	2,214.6	1.82
9,110.0	91.21	341.30	6,975.6	2,079.1	-1,067.6	2,309.6	0.21
9,204.0	91.41	341.19	6,973.4	2,168.1	-1,097.8	2,403.5	0.24
9,298.0	91.78	340.29	6,970.8	2,256.8	-1,128.8	2,497.5	1.03
9,392.0	92.11	340.70	6,967.6	2,345.3	-1,160.2	2,591.4	0.56
9,486.0	91.58	340.81	6,964.6	2,434.0	-1,191.2	2,685.3	0.58
9,580.0	90.67	342.22	6,962.8	2,523.2	-1,221.0	2,779.3	1.79
9,674.0	90.57	340.94	6,961.7	2,612.4	-1,250.7	2,873.3	1.37
9,769.0	90.87	343.16	6,960.5	2,702.7	-1,279.9	2,968.3	2.36
9,863.0	91.58	344.20	6,958.5	2,792.9	-1,306.3	3,062.2	1.34
9,957.0	91.71	343.93	6,955.8	2,883.3	-1,332.1	3,156.1	0.32
10,047.0	91.65	342.26	6,953.2	2,969.3	-1,358.3	3,246.0	1.86
10,139.0	91.81	341.40	6,950.4	3,056.7	-1,387.0	3,338.0	0.95
10,230.0	92.15	341.33	6,947.3	3,142.9	-1,416.0	3,428.9	0.38
10,322.0	90.81	339.90	6,944.9	3,229.6	-1,446.6	3,520.9	2.13
10,413.0	90.27	338.87	6,944.0	3,314.8	-1,478.6	3,611.8	1.28
10,504.0	91.75	341.60	6,942.4	3,400.4	-1,509.4	3,702.7	3.41
10,595.0	90.60	339.44	6,940.6	3,486.2	-1,539.7	3,793.7	2.69

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WV GEOLOGICAL SURVEY
MORGANTOWN, WV

EOW Completion Report



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10,686.0	89.90	340.14	6,940.2	3,571.6	-1,571.1	3,884.7	1.09
10,776.0	90.91	342.10	6,939.5	3,656.7	-1,600.3	3,974.6	2.45
10,867.0	90.50	341.27	6,938.4	3,743.1	-1,628.9	4,065.6	1.02
10,958.0	91.28	341.36	6,937.0	3,829.3	-1,658.0	4,156.6	0.86
11,049.0	90.57	341.75	6,935.5	3,915.6	-1,686.8	4,247.6	0.89
11,143.0	91.17	339.55	6,934.1	4,004.3	-1,717.9	4,341.6	2.43
11,237.0	91.58	339.06	6,931.9	4,092.2	-1,751.1	4,435.5	0.68
11,332.0	91.21	342.12	6,929.5	4,181.8	-1,782.7	4,530.4	3.24
11,426.0	88.05	339.63	6,930.1	4,270.5	-1,813.5	4,624.4	4.28
11,520.0	89.19	342.62	6,932.4	4,359.5	-1,843.9	4,718.3	3.40
11,614.0	89.63	342.38	6,933.4	4,449.1	-1,872.2	4,812.3	0.53
11,708.0	89.87	342.25	6,933.8	4,538.7	-1,900.7	4,906.3	0.29
11,802.0	89.60	342.13	6,934.2	4,628.2	-1,929.5	5,000.3	0.31
11,895.0	89.76	342.19	6,934.7	4,716.7	-1,957.9	5,093.3	0.18
11,989.0	89.60	341.62	6,935.3	4,806.0	-1,987.1	5,187.3	0.63
12,083.0	87.95	342.56	6,937.3	4,895.4	-2,016.0	5,281.3	2.02
12,177.0	89.36	342.60	6,939.5	4,985.1	-2,044.2	5,375.2	1.50
12,272.0	87.98	340.01	6,941.7	5,075.1	-2,074.6	5,470.2	3.09
12,366.0	88.59	340.69	6,944.5	5,163.5	-2,106.2	5,564.1	0.97
12,460.0	90.10	340.58	6,945.6	5,252.2	-2,137.4	5,658.1	1.61
12,554.0	90.27	339.19	6,945.3	5,340.5	-2,169.7	5,752.1	1.49
12,648.0	88.92	338.22	6,945.9	5,428.1	-2,203.8	5,845.9	1.77
12,742.0	88.42	340.88	6,948.1	5,516.1	-2,236.7	5,939.8	2.88
12,836.0	88.86	343.53	6,950.4	5,605.6	-2,265.4	6,033.8	2.86
12,931.0	90.50	343.00	6,950.9	5,696.5	-2,292.7	6,128.8	1.81
13,025.0	90.40	341.30	6,950.1	5,786.0	-2,321.5	6,222.7	1.81
13,119.0	90.00	342.97	6,949.8	5,875.5	-2,350.4	6,316.7	1.83
13,214.0	89.60	341.83	6,950.1	5,966.0	-2,379.1	6,411.7	1.27
13,308.0	89.80	343.37	6,950.6	6,055.7	-2,407.2	6,505.7	1.65
13,403.0	89.50	342.78	6,951.2	6,146.6	-2,434.9	6,600.7	0.70
13,497.0	87.75	340.96	6,953.5	6,235.9	-2,464.1	6,694.6	2.69
13,591.0	89.23	342.01	6,956.0	6,325.0	-2,493.9	6,788.6	1.93
13,686.0	88.86	341.92	6,957.5	6,415.3	-2,523.4	6,883.6	0.40
13,780.0	89.26	342.41	6,959.1	6,504.8	-2,552.1	6,977.6	0.67
13,874.0	89.93	343.87	6,959.7	6,594.8	-2,579.4	7,071.5	1.71
13,968.0	89.60	344.03	6,960.1	6,685.1	-2,605.4	7,165.5	0.39
14,020.0	89.26	344.19	6,960.6	6,735.1	-2,619.6	7,217.4	0.72
14,074.0	89.00	342.50	6,961.5	6,786.8	-2,635.1	7,271.4	3.17

Checked By: _____ Approved By: _____ Date: _____