

JUN 01 2015

WV GEOLOGICAL SURVEY
MORGANTOWN, WV



Duff Unit 2H
Doddridge County WV
Northings: 14295242.98
Eastings: 1715886.72
As Drilled



PROJECT DETAILS: Doddridge County WV
Geodetic System: Universal Transverse Mercator (US Survey Feet)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: Zone 17N (84 W to 78 W)
System Datum: Mean Sea Level

WELL DETAILS Duff Unit 2H
Ground Level: 998.0
+N-S +E-W Northing Easting Latitude Longitude
0.0 0.0 14295242.98 1715886.72 39° 21' 56.959 N 80° 43' 58.707 W

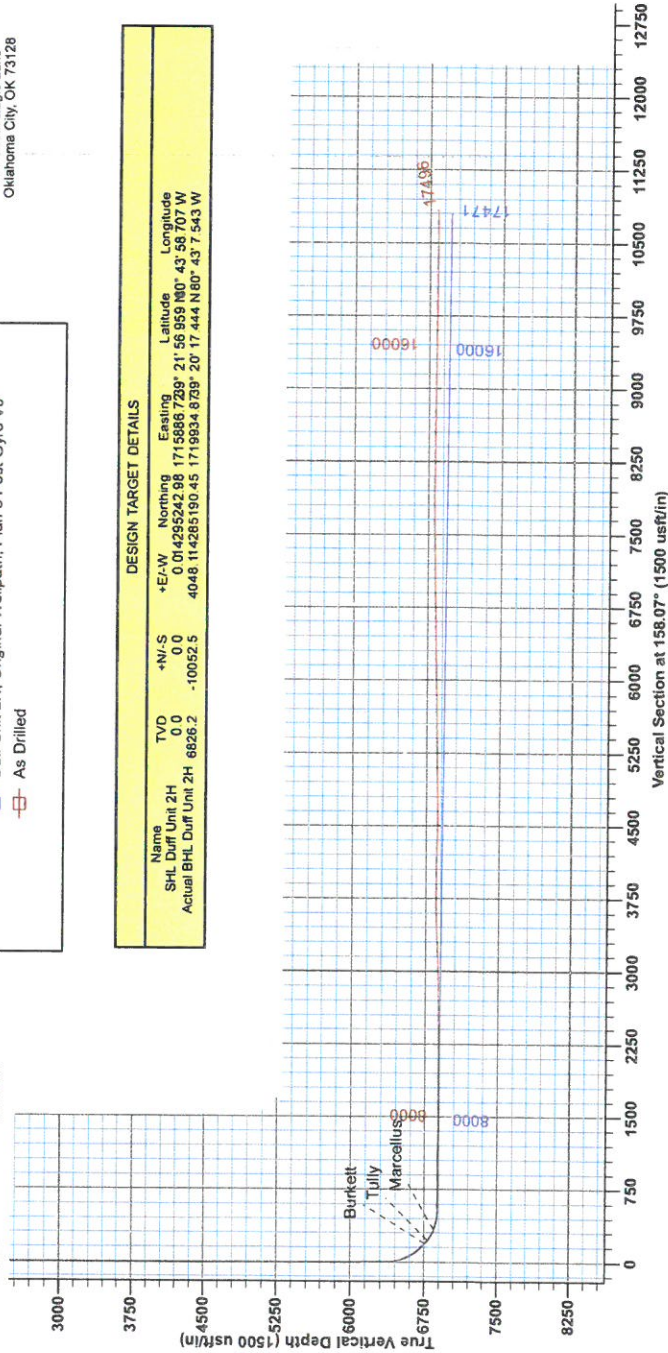
LEGEND

- ▽ Duff Unit 1H, Original Wellpath, As Drilled V0
- Costlow Unit 2H, Original Wellpath, As Drilled V0
- Duff Unit 2H, Original Wellpath, Plan 3 Post Gyro V0
- As Drilled

SITE DETAILS: Costlow/Duff/Mishka
Site Centre Northing: 14285223.06
Easting: 1715881.05
Positional Uncertainty: 0.0
Convergence: 0.17
Local North: Grid

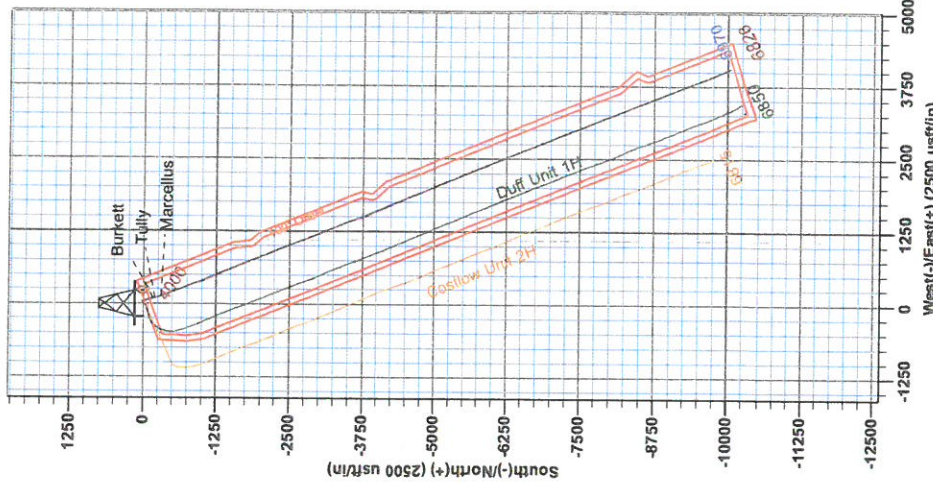
Genie Lightfoot
14.46, February 12, 2014
Scientific Drilling
421 South Eagle Lane
Oklahoma City, OK 73128

Duff 2H 996 GL + 19 KB @ 1015 Usuff
Gr: 998.0



Azimuths to Grid North
True North: -0.17°
Magnetic North: -8.88°
Magnetic Field
Strength: 52388.6nT
Dip Angle: 66.91°
Date: 12/19/2013
Model: IGRF2010

To convert Magnetic North to Grid, Subtract 8.69°
To convert True North to Grid, Subtract 0.17°



DESIGN TARGET DETAILS					
Name	+N-S	TVD	+E-W	Northing	Longitude
SHL Duff Unit 2H	0.0	0.0	0.0	14295242.98	80° 43' 58.707 W
Actual BHL Duff Unit 2H	6826.2	-10052.5	4046	14285190.45	1719934.839° 20' 17.444 N 80° 43' 7.543 W



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WV GEOLOGICAL SURVEY
MORGANTOWN, WV

Antero Resources

Doddridge County WV
Costlow/Duff/Mishka
Duff Unit 2H
Original Wellpath

Design: As Drilled

EOW Completion Report

12 February, 2014





WV GEOLOGICAL SURVEY
MORGANTOWN, WV
EOW Completion Report



Company: Antero Resources	Local Co-ordinate Reference: Well Duff Unit 2H
Project: Doddridge County WV	TVD Reference: Duff 2H 996 GL + 19 KB @ 1015.0usft
Site: Costlow/Duff/Mishka	MD Reference: Duff 2H 996 GL + 19 KB @ 1015.0usft
Well: Duff Unit 2H	North Reference: Grid
Wellbore: Original Wellpath	Survey Calculation Method: Minimum Curvature
Design: As Drilled	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	Costlow/Duff/Mishka				
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	Duff Unit 2H, Marcellus					
Well Position	+N/-S	0.0 usft	Northing:	14,295,242.98 usft	Latitude:	39° 21' 56.959 N
	+E/-W	0.0 usft	Easting:	1,715,886.72 usft	Longitude:	80° 43' 58.707 W
Position Uncertainty	2.0 usft		Wellhead Elevation:	1,015.0 usft	Ground Level:	996.0 usft

Wellbore	Original Wellpath				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/19/2013	-8.51	66.91	52,389

Design	As Drilled				
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	158.07	

Survey Program	Date 2/2/2014				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
99.5	913.2	Survey #2 Gyro to 913.2 (Original Wellpath)	SDI Standard Keeper	Scientific Drilling Intl. Standard Wireline Keeper	
1,000.0	2,578.2	Survey #4 Def Gyro to Int (Original Wellpath)	SDI Standard Keeper	Scientific Drilling Intl. Standard Wireline Keeper	
2,600.0	6,331.4	Survey #6 Def Gyro to KOP (Original Wellpath)	SDI Standard Keeper	Scientific Drilling Intl. Standard Wireline Keeper	
6,385.0	17,496.0	Survey #7 MWD (Original Wellpath)	MWD SDI	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	0.00	0.0	0.0	0.0	0.0	0.00
99.5	0.36	211.39	99.5	-0.3	-0.2	0.2	0.2	0.36
100.0	0.36	211.31	100.0	-0.3	-0.2	0.2	0.2	0.10
150.0	0.30	206.14	150.0	-0.5	-0.3	0.4	0.4	0.13
200.0	0.12	245.81	200.0	-0.7	-0.4	0.5	0.5	0.44
250.0	0.30	218.32	250.0	-0.8	-0.5	0.5	0.5	0.40
300.0	0.21	232.01	300.0	-0.9	-0.7	0.6	0.6	0.22
350.0	0.34	213.51	350.0	-1.1	-0.8	0.7	0.7	0.31
400.0	0.25	216.99	400.0	-1.3	-1.0	0.9	0.9	0.18

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WV GEOLOGICAL SURVEY EOW Completion Report
Resource: MORGANTOWN, WV



Company: Antero Resources
Project: Doddridge County WV
Site: Costlow/Duff/Mishka
Well: Duff Unit 2H
Wellbore: Original Wellpath
Design: As Drilled

Local Co-ordinate Reference: Well Duff Unit 2H
TVD Reference: Duff 2H 996 GL + 19 KB @ 1015.0usft
MD Reference: Duff 2H 996 GL + 19 KB @ 1015.0usft
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)
450.0	0.42	226.06	450.0	-1.5	-1.2	1.0	0.36
500.0	0.39	204.89	500.0	-1.8	-1.4	1.2	0.30
550.0	0.26	217.27	550.0	-2.1	-1.5	1.4	0.29
600.0	0.40	231.38	600.0	-2.3	-1.7	1.5	0.32
650.0	0.33	214.50	650.0	-2.5	-2.0	1.6	0.26
700.0	0.49	217.97	700.0	-2.8	-2.2	1.8	0.32
750.0	0.32	221.20	750.0	-3.1	-2.4	1.9	0.34
800.0	0.32	219.10	800.0	-3.3	-2.6	2.1	0.02
850.0	0.31	204.14	850.0	-3.5	-2.7	2.2	0.17
900.0	0.43	203.45	900.0	-3.8	-2.8	2.5	0.24
913.2	0.49	198.33	913.1	-3.9	-2.9	2.5	0.55
1,000.0	0.17	178.43	1,000.0	-4.4	-3.0	2.9	0.39
1,100.0	1.39	69.47	1,100.0	-4.1	-1.9	3.1	1.45
1,200.0	3.55	53.71	1,199.9	-1.8	1.8	2.4	2.24
1,300.0	3.67	51.08	1,299.7	2.0	6.8	0.7	0.20
1,400.0	4.71	47.87	1,399.4	6.8	12.3	-1.7	1.07
1,500.0	5.02	44.30	1,499.0	12.6	18.4	-4.9	0.43
1,600.0	3.76	45.42	1,598.8	18.1	23.8	-7.9	1.26
1,700.0	2.71	44.78	1,698.6	22.1	27.8	-10.1	1.05
1,800.0	2.10	52.12	1,798.5	24.9	30.9	-11.5	0.68
1,900.0	1.38	54.44	1,898.5	26.7	33.3	-12.3	0.72
2,000.0	1.11	58.63	1,998.4	27.9	35.1	-12.8	0.28
2,100.0	0.84	65.05	2,098.4	28.7	36.6	-13.0	0.29
2,200.0	0.65	76.22	2,198.4	29.1	37.8	-12.9	0.24
2,300.0	0.43	101.94	2,298.4	29.2	38.8	-12.6	0.32
2,400.0	0.42	90.77	2,398.4	29.1	39.5	-12.3	0.08
2,500.0	0.20	133.09	2,498.4	29.0	40.0	-12.0	0.30
2,578.2	0.23	156.96	2,576.6	28.8	40.1	-11.7	0.12
2,600.0	0.25	151.52	2,598.4	28.7	40.2	-11.6	0.14
2,700.0	0.23	233.12	2,698.4	28.4	40.1	-11.3	0.31
2,800.0	0.29	228.19	2,798.4	28.1	39.8	-11.2	0.06
2,900.0	0.26	261.98	2,898.4	27.9	39.4	-11.2	0.16
3,000.0	0.38	247.01	2,998.4	27.7	38.8	-11.2	0.15
3,100.0	0.29	222.11	3,098.4	27.4	38.4	-11.1	0.17
3,200.0	0.27	221.41	3,198.4	27.0	38.0	-10.9	0.02
3,300.0	0.37	209.79	3,298.4	26.6	37.7	-10.6	0.12
3,400.0	0.24	223.29	3,398.4	26.1	37.4	-10.3	0.15
3,500.0	0.23	238.35	3,498.4	25.9	37.1	-10.2	0.06
3,600.0	0.23	210.14	3,598.4	25.6	36.8	-10.0	0.11
3,700.0	0.24	205.10	3,698.4	25.2	36.6	-9.7	0.02
3,800.0	0.22	248.91	3,798.4	25.0	36.4	-9.6	0.17
3,900.0	0.26	225.62	3,898.4	24.8	36.0	-9.5	0.10
4,000.0	0.34	213.25	3,998.4	24.4	35.7	-9.3	0.10
4,100.0	0.18	253.04	4,098.4	24.1	35.4	-9.1	0.23



EOW Completion Report



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 Site: Costlow/Duff/Mishka
 Well: Duff Unit 2H
 Wellbore: Original Wellpath
 Design: As Drilled

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 TVD Reference: Duff 2H 996 GL + 19 KB @ 1015.0usft
 MD Reference: Duff 2H 996 GL + 19 KB @ 1015.0usft
 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)
4,200.0	0.20	222.52	4,198.4	23.9	35.1	-9.0	0.10
4,300.0	0.17	308.25	4,298.4	23.8	34.9	-9.1	0.25
4,400.0	0.25	331.91	4,398.4	24.1	34.7	-9.4	0.12
4,500.0	0.19	120.32	4,498.4	24.2	34.7	-9.5	0.42
4,600.0	0.10	124.76	4,598.4	24.1	34.9	-9.3	0.09
4,700.0	0.30	141.28	4,698.4	23.9	35.2	-9.0	0.21
4,800.0	0.15	124.25	4,798.4	23.6	35.4	-8.6	0.16
4,900.0	0.51	153.18	4,898.4	23.1	35.7	-8.1	0.39
5,000.0	0.40	157.43	4,998.4	22.4	36.1	-7.3	0.11
5,100.0	0.21	152.24	5,098.4	21.9	36.3	-6.8	0.19
5,200.0	0.25	144.54	5,198.4	21.6	36.5	-6.4	0.05
5,300.0	0.16	139.48	5,298.4	21.3	36.7	-6.0	0.09
5,400.0	0.25	119.78	5,398.4	21.1	37.0	-5.7	0.11
5,500.0	0.35	103.58	5,498.4	20.9	37.5	-5.4	0.13
5,600.0	0.50	118.66	5,598.4	20.6	38.2	-4.9	0.19
5,700.0	0.49	130.12	5,698.4	20.1	38.9	-4.1	0.10
5,800.0	0.67	152.58	5,798.4	19.3	39.5	-3.2	0.29
5,900.0	1.04	175.82	5,898.4	17.9	39.8	-1.7	0.50
6,000.0	0.94	197.35	5,998.3	16.2	39.6	-0.2	0.38
6,100.0	0.61	216.09	6,098.3	15.0	39.1	0.7	0.41
6,200.0	0.60	233.28	6,198.3	14.3	38.3	1.1	0.18
6,300.0	0.55	231.40	6,298.3	13.6	37.5	1.4	0.05
6,331.4	0.75	224.83	6,329.7	13.4	37.3	1.5	0.68
6,385.0	1.75	165.74	6,383.3	12.4	37.2	2.4	2.82
6,431.0	8.30	156.14	6,429.1	8.6	38.8	6.5	14.31
6,474.0	13.39	153.53	6,471.3	1.3	42.2	14.5	11.89
6,520.0	18.66	152.99	6,515.5	-10.0	48.0	27.2	11.46
6,564.0	23.88	154.27	6,556.5	-24.3	55.0	43.1	11.91
6,610.0	28.63	159.36	6,597.8	-43.0	63.0	63.4	11.42
6,654.0	33.70	161.92	6,635.4	-64.5	70.5	86.1	11.91
6,700.0	38.69	164.20	6,672.5	-90.5	78.3	113.2	11.23
6,743.0	43.13	166.58	6,705.0	-117.7	85.4	141.1	10.94
6,789.0	45.36	167.36	6,737.9	-149.0	92.7	172.8	4.99
6,814.0	48.23	166.50	6,755.1	-166.7	96.8	190.8	11.74
Burkett							
6,833.0	50.41	165.89	6,767.4	-180.7	100.2	205.1	11.74
6,859.0	53.86	164.76	6,783.4	-200.6	105.4	225.4	13.71
Tully							
6,879.0	56.52	163.95	6,794.8	-216.4	109.8	241.8	13.71
6,923.0	62.44	162.20	6,817.2	-252.6	120.9	279.5	13.88
6,968.0	67.61	161.62	6,836.1	-291.4	133.6	320.2	11.55
6,986.0	69.56	161.57	6,842.7	-307.3	138.9	336.9	10.82
Marcellus							
7,012.0	72.37	161.50	6,851.2	-330.6	146.6	361.4	10.82
7,058.0	76.45	161.62	6,863.6	-372.6	160.6	405.7	8.87

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EOW Completion Report



Company: Antero Resources
 Project: Doddridge County WV
 Site: Costlow/Duff/Mishka
 Well: Duff Unit 2H
 Wellbore: Original Wellpath
 Design: As Drilled

Local Co-ordinate Reference: Well Duff Unit 2H
 TVD Reference: Duff 2H 996 GL + 19 KB @ 1015.0usft
 MD Reference: Duff 2H 996 GL + 19 KB @ 1015.0usft
 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)
7,102.0	80.81	161.19	6,872.2	-413.5	174.4	448.7	9.96
7,137.0	84.24	160.42	6,876.8	-446.3	185.8	483.4	10.04
7,189.0	89.52	158.14	6,879.6	-494.8	204.2	535.3	11.06
7,247.0	89.25	157.61	6,880.2	-548.5	226.0	593.3	1.03
7,337.0	89.52	160.51	6,881.2	-632.6	258.2	683.2	3.24
7,426.0	89.52	158.14	6,881.9	-715.8	289.6	772.2	2.66
7,516.0	90.31	160.95	6,882.1	-800.2	321.0	862.2	3.24
7,606.0	91.24	164.42	6,880.9	-886.1	347.8	951.8	3.99
7,695.0	89.69	160.33	6,880.1	-970.9	374.8	1,040.6	4.91
7,785.0	88.79	157.86	6,881.3	-1,054.9	406.9	1,130.5	2.92
7,875.0	88.05	156.53	6,883.8	-1,137.8	441.7	1,220.5	1.69
7,964.0	87.71	155.76	6,887.1	-1,219.2	477.7	1,309.4	0.95
8,054.0	90.54	157.42	6,888.5	-1,301.8	513.5	1,399.3	3.65
8,143.0	90.67	157.77	6,887.5	-1,384.0	547.4	1,488.3	0.42
8,233.0	90.20	156.71	6,886.9	-1,467.0	582.2	1,578.3	1.29
8,323.0	90.44	156.19	6,886.4	-1,549.5	618.2	1,668.3	0.64
8,412.0	90.54	155.69	6,885.6	-1,630.8	654.4	1,757.2	0.57
8,502.0	89.93	157.85	6,885.2	-1,713.5	689.9	1,847.2	2.49
8,592.0	90.34	157.99	6,885.0	-1,796.9	723.8	1,937.2	0.48
8,681.0	90.94	157.53	6,884.0	-1,879.3	757.4	2,026.2	0.85
8,771.0	89.60	155.52	6,883.6	-1,961.8	793.3	2,116.1	2.68
8,860.0	89.16	158.75	6,884.6	-2,043.8	827.9	2,205.1	3.66
8,950.0	89.03	158.37	6,886.0	-2,127.6	860.8	2,295.1	0.45
9,040.0	90.97	159.40	6,886.0	-2,211.5	893.2	2,385.1	2.44
9,129.0	90.97	158.32	6,884.5	-2,294.5	925.3	2,474.0	1.21
9,219.0	90.54	155.91	6,883.3	-2,377.4	960.3	2,564.0	2.72
9,308.0	90.92	156.91	6,882.2	-2,459.0	995.9	2,653.0	1.20
9,398.0	91.14	159.09	6,880.5	-2,542.4	1,029.6	2,742.9	2.43
9,488.0	91.44	158.76	6,878.5	-2,626.3	1,061.9	2,832.9	0.50
9,577.0	90.54	159.48	6,877.0	-2,709.5	1,093.7	2,921.9	1.29
9,667.0	90.92	160.25	6,875.8	-2,794.0	1,124.6	3,011.8	0.95
9,756.0	91.88	158.93	6,873.7	-2,877.4	1,155.7	3,100.8	1.83
9,846.0	93.43	159.56	6,869.5	-2,961.4	1,187.5	3,190.7	1.86
9,936.0	93.19	157.56	6,864.3	-3,045.1	1,220.4	3,280.5	2.23
10,025.0	92.69	157.68	6,859.7	-3,127.2	1,254.2	3,369.4	0.58
10,115.0	92.42	157.21	6,855.7	-3,210.3	1,288.7	3,459.3	0.60
10,205.0	91.78	156.17	6,852.4	-3,292.9	1,324.3	3,549.2	1.36
10,294.0	90.34	158.65	6,850.8	-3,375.0	1,358.5	3,638.2	3.22
10,384.0	90.31	159.98	6,850.3	-3,459.2	1,390.3	3,728.1	1.48
10,474.0	88.89	159.50	6,850.9	-3,543.6	1,421.4	3,818.1	1.67
10,563.0	90.13	160.73	6,851.6	-3,627.3	1,451.7	3,907.0	1.96
10,653.0	90.64	162.31	6,851.0	-3,712.7	1,480.2	3,996.9	1.84
10,742.0	89.56	161.88	6,850.9	-3,797.4	1,507.6	4,085.6	1.31
10,832.0	87.95	158.75	6,852.8	-3,882.1	1,537.9	4,175.5	3.91
10,922.0	88.06	156.19	6,856.0	-3,965.2	1,572.3	4,265.5	2.85

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EOW Completion Report



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Site: Costlow/Duff/Mishka
Well: Duff Unit 2H
Wellbore: Original Wellpath
Design: As Drilled

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Database: Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
11,011.0	87.95	155.58	6,859.1	-4,046.3	1,608.7	4,354.4	0.70
11,101.0	88.99	155.16	6,861.5	-4,128.1	1,646.2	4,444.2	1.25
11,190.0	90.84	158.49	6,861.6	-4,209.9	1,681.2	4,533.2	4.28
11,285.0	90.17	155.84	6,860.8	-4,297.5	1,718.1	4,628.2	2.88
11,380.0	90.74	156.24	6,860.0	-4,384.3	1,756.6	4,723.1	0.73
11,475.0	91.36	156.99	6,858.3	-4,471.5	1,794.3	4,818.0	1.02
11,570.0	90.30	157.65	6,856.9	-4,559.1	1,831.0	4,913.0	1.31
11,664.0	91.10	157.61	6,855.7	-4,646.0	1,866.7	5,007.0	0.85
11,759.0	91.28	158.14	6,853.8	-4,734.0	1,902.5	5,102.0	0.59
11,854.0	90.66	156.64	6,852.2	-4,821.7	1,939.0	5,197.0	1.71
11,949.0	91.11	157.88	6,850.7	-4,909.3	1,975.7	5,291.9	1.39
12,044.0	90.22	157.52	6,849.6	-4,997.2	2,011.8	5,386.9	1.01
12,138.0	91.54	158.49	6,848.2	-5,084.3	2,047.0	5,480.9	1.74
12,233.0	90.50	157.85	6,846.5	-5,172.5	2,082.3	5,575.9	1.29
12,328.0	90.48	158.05	6,845.7	-5,260.5	2,118.0	5,670.9	0.21
12,418.0	91.36	158.49	6,844.2	-5,344.1	2,151.3	5,760.9	1.09
12,507.0	90.84	156.47	6,842.5	-5,426.3	2,185.4	5,849.9	2.34
12,597.0	90.87	156.08	6,841.2	-5,508.7	2,221.6	5,939.8	0.43
12,687.0	91.04	158.06	6,839.7	-5,591.6	2,256.6	6,029.8	2.21
12,776.0	91.80	158.66	6,837.4	-5,674.3	2,289.4	6,118.7	1.09
12,866.0	90.48	157.26	6,835.7	-5,757.7	2,323.2	6,208.7	2.14
12,956.0	90.84	157.35	6,834.6	-5,840.7	2,357.9	6,298.7	0.41
13,046.0	90.84	157.96	6,833.3	-5,924.0	2,392.1	6,388.7	0.68
13,135.0	91.98	159.72	6,831.1	-6,006.9	2,424.2	6,477.7	2.36
13,225.0	91.28	159.37	6,828.6	-6,091.2	2,455.7	6,567.6	0.87
13,315.0	90.92	158.31	6,826.8	-6,175.1	2,488.2	6,657.6	1.24
13,404.0	91.28	157.87	6,825.1	-6,257.7	2,521.4	6,746.5	0.64
13,494.0	91.28	158.66	6,823.1	-6,341.3	2,554.7	6,836.5	0.88
13,583.0	90.92	158.40	6,821.4	-6,424.1	2,587.3	6,925.5	0.50
13,673.0	90.40	156.91	6,820.4	-6,507.3	2,621.5	7,015.5	1.75
13,763.0	90.48	158.14	6,819.7	-6,590.5	2,655.9	7,105.5	1.37
13,852.0	91.28	159.02	6,818.3	-6,673.3	2,688.4	7,194.5	1.34
13,942.0	91.10	158.40	6,816.4	-6,757.1	2,721.0	7,284.4	0.72
14,032.0	91.54	159.89	6,814.4	-6,841.2	2,753.1	7,374.4	1.73
14,121.0	90.66	158.66	6,812.7	-6,924.4	2,784.6	7,463.4	1.70
14,211.0	91.10	158.85	6,811.3	-7,008.3	2,817.2	7,553.3	0.53
14,301.0	90.75	155.68	6,809.8	-7,091.3	2,852.0	7,643.3	3.54
14,390.0	90.13	155.59	6,809.1	-7,172.4	2,888.7	7,732.2	0.70
14,480.0	90.17	160.14	6,808.9	-7,255.7	2,922.6	7,822.2	5.06
14,570.0	89.87	161.48	6,808.9	-7,340.7	2,952.2	7,912.1	1.53
14,659.0	89.25	160.42	6,809.5	-7,424.8	2,981.2	8,001.0	1.38
14,749.0	89.34	158.66	6,810.7	-7,509.2	3,012.7	8,090.9	1.96
14,839.0	89.60	156.91	6,811.5	-7,592.5	3,046.7	8,180.9	1.97
14,928.0	89.52	155.94	6,812.2	-7,674.0	3,082.3	8,269.9	1.09

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EOW Completion Report



Company: Antero Resources
Project: Doddridge County WV
Site: Costlow/Duff/Mishka
Well: Duff Unit 2H
Wellbore: Original Wellpath
Design: As Drilled

Local Co-ordinate Reference: Well Duff Unit 2H
TVD Reference: Duff 2H 996 GL + 19 KB @ 1015.0usft
MD Reference: Duff 2H 996 GL + 19 KB @ 1015.0usft
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)
15,018.0	89.96	157.52	6,812.6	-7,756.7	3,117.8	8,359.9	1.82
15,108.0	89.25	157.87	6,813.2	-7,840.0	3,152.0	8,449.9	0.88
15,197.0	89.34	158.05	6,814.3	-7,922.5	3,185.4	8,538.9	0.23
15,287.0	90.13	157.43	6,814.7	-8,005.8	3,219.5	8,628.9	1.12
15,376.0	89.52	157.35	6,815.0	-8,087.9	3,253.7	8,717.8	0.69
15,466.0	90.84	158.22	6,814.7	-8,171.2	3,287.7	8,807.8	1.76
15,556.0	89.96	158.05	6,814.1	-8,254.8	3,321.2	8,897.8	1.00
15,645.0	89.08	158.40	6,814.8	-8,337.4	3,354.2	8,986.8	1.06
15,735.0	88.81	157.26	6,816.5	-8,420.7	3,388.2	9,076.8	1.30
15,825.0	88.99	156.99	6,818.2	-8,503.6	3,423.2	9,166.8	0.36
15,914.0	88.90	155.59	6,819.8	-8,585.1	3,459.0	9,255.7	1.58
16,004.0	89.69	157.70	6,820.9	-8,667.7	3,494.6	9,345.7	2.50
16,094.0	90.40	159.10	6,820.9	-8,751.4	3,527.8	9,435.7	1.74
16,183.0	88.72	157.96	6,821.6	-8,834.2	3,560.3	9,524.7	2.28
16,273.0	89.87	159.02	6,822.7	-8,917.9	3,593.3	9,614.7	1.74
16,363.0	90.48	159.10	6,822.4	-9,002.0	3,625.5	9,704.6	0.68
16,452.0	89.43	156.91	6,822.5	-9,084.5	3,658.8	9,793.6	2.73
16,541.0	88.99	157.87	6,823.7	-9,166.7	3,693.0	9,882.6	1.19
16,629.0	89.25	159.19	6,825.0	-9,248.5	3,725.2	9,970.6	1.53
16,718.0	88.90	156.64	6,826.5	-9,331.0	3,758.7	10,059.6	2.89
16,806.0	89.60	158.91	6,827.6	-9,412.4	3,792.0	10,147.6	2.70
16,895.0	89.34	160.42	6,828.5	-9,495.9	3,822.9	10,236.5	1.72
16,983.0	90.84	162.18	6,828.3	-9,579.2	3,851.1	10,324.4	2.63
17,072.0	89.43	158.49	6,828.1	-9,663.0	3,881.1	10,413.3	4.44
17,160.0	89.69	157.52	6,828.8	-9,744.6	3,914.0	10,501.3	1.14
17,249.0	90.31	158.22	6,828.8	-9,827.1	3,947.5	10,590.3	1.05
17,337.0	90.75	157.26	6,828.0	-9,908.5	3,980.9	10,678.3	1.20
17,427.0	90.40	153.83	6,827.1	-9,990.4	4,018.1	10,768.2	3.83
17,445.0	90.75	154.27	6,826.9	-10,006.6	4,026.0	10,786.1	3.12
17,496.0	90.75	154.27	6,826.2	-10,052.5	4,048.1	10,837.0	0.00

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
6,814.0	6,755.1	-166.7	96.8	Burkett
6,859.0	6,783.4	-200.6	105.4	Tully
6,986.0	6,842.7	-307.3	138.9	Marcellus

Checked By: _____ Approved By: _____ Date: _____