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WV GEOLOGICAL SURVEY
MORGANTOWN, WV



Mishka Unit 1H
Doddridge County WV
Northing: 14295251.95
Easting: 1715884.57
ST1 As Drilled



Azimuth to Grid North
True North: -0.17°
Magnetic North: -8.88°
Magnetic Field
Strength: 52362.8nT
Dip Angle: 66.89°
Date: 3/02/2014
Model: IGRF2010

To convert Magnetic North to Grid, Subtract 8.88°
To convert True North to Grid, Subtract 0.17°

WELL DETAILS Mishka Unit 1H
Ground Level: 996.0
Northing: 14295251.95
Easting: 1715884.57
Latitude: 21° 57' 04.8" N
Longitude: 43° 58' 73.4" W

SITE DETAILS: Costlow/Duff/Mishka
Site Centre Northing: 14295233.06
Easting: 1715881.05
Positional Uncertainty: 0.0
Convergence: 0.17
Local North: Grid

LEGEND

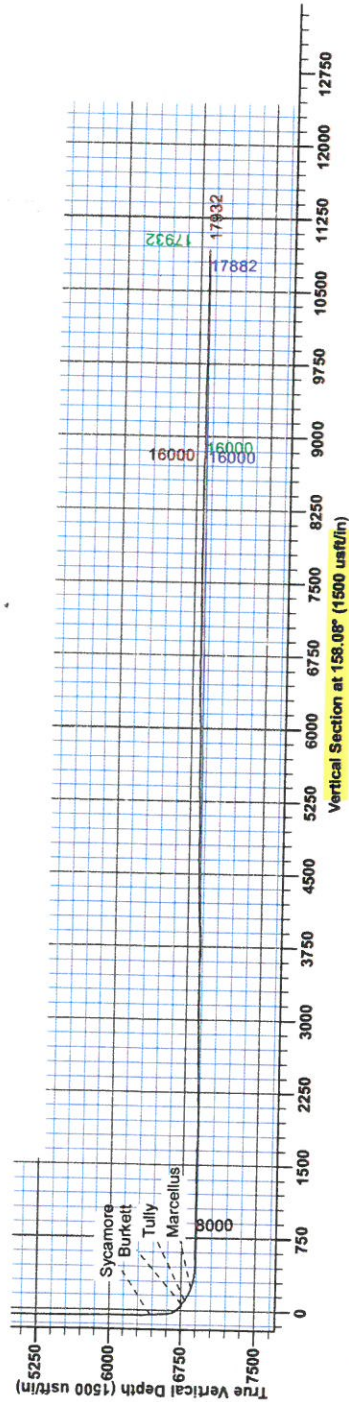
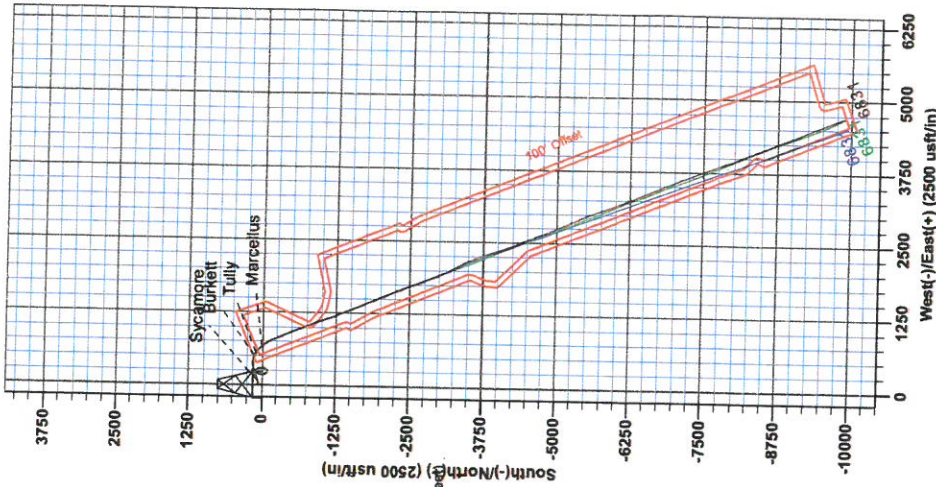
- Mishka Unit 1H Original Wellpath, As Drilled VO
- Mishka Unit 1H, ST1 Mishka Unit 1H, ST1 Plan 2 VO
- ST1 As Drilled

Genie Lightfoot
11/11, April 28 2014
Scientific Drilling
421 South Eagle Lane
Oklahoma City, OK 73128

DESIGN TARGET DETAILS

Name	+N/-S	+E/-W	TVD	Northing	Easting	Latitude	Longitude
SHL Mishka Unit 1H	0.0	0.0	0.0	0.014295251.95	0.014295251.95	21° 57' 04.8" N	43° 58' 73.4" W
Actual BHL Mishka Unit 1H ST	-8878.4	4709.814285373.54	6830.9	1720594.3593°	20° 19' 23.4" N	42° 59' 13.9" W	
Actual BHL Mishka Unit 1H OH	-9865.9	4697.114285366.06	6831.2	1720581.6893°	20° 19' 16.0" N	42° 59' 30.1" W	

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 76 W)
System Datum: Mean Sea Level



Mishka Unit 1H GL 996' ± 19' RKB @ 1015.0usft
Gr. 896.0



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Antero Resources

**Doddridge County WV
Costlow/Duff/Mishka
Mishka Unit 1H
ST1 Mishka Unit 1H**

Design: ST1 As Drilled

EOW Completion Report

28 April, 2014





Company: Antero Resources	Local Co-ordinate Reference: Well Mishka Unit 1H
Project: Doddridge County WV	TVD Reference: Mishka Unit 1H GL 996' + 19' RKB @ 1015.0usft
Site: Costlow/Duff/Mishka	MD Reference: Mishka Unit 1H GL 996' + 19' RKB @ 1015.0usft
Well: Mishka Unit 1H	North Reference: Grid
Wellbore: ST1 Mishka Unit 1H	Survey Calculation Method: Minimum Curvature
Design: ST1 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	Mishka Unit 1H		
Well Position	+N/-S 0.0 usft	Northing: 14,295,251.95 usft	Latitude: 39° 21' 57.048 N
	+E/-W 0.0 usft	Easting: 1,715,884.57 usft	Longitude: 80° 43' 58.734 W
Position Uncertainty 2.8 usft		Wellhead Elevation: 1,015.0 usft	Ground Level: 996.0 usft

Wellbore	ST1 Mishka Unit 1H				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/6/2014	-8.51	66.89	52,363

Design	ST1 As Drilled				
Audit Notes:					
Version: 1.0	Phase: ACTUAL	Tie On Depth: 10,561.0			
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	158.08	

Survey Program	Date 4/28/2014				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.0	6,158.9	Survey #6 Final Gyro (Original Wellpath)	SDI Standard Keeper	Scientific Drilling Intl. Standard Wireline Keeper	
6,205.0	10,561.0	Survey #7 MWD (Original Wellpath)	SDI MWD	Scientific Drilling Intl. MWD - Standard ver 1.0.1	
10,611.0	17,932.0	Survey #1 SDI MWD (ST1 Mishka Unit 1H)	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	
100.0	0.21	256.91	100.0	0.0	-0.2	0.0	0.21	
200.0	0.07	240.23	200.0	-0.1	-0.4	0.0	0.14	
300.0	0.03	192.61	300.0	-0.2	-0.5	0.0	0.05	
400.0	0.21	213.42	400.0	-0.3	-0.6	0.1	0.18	
500.0	0.21	217.26	500.0	-0.6	-0.8	0.3	0.01	
600.0	0.19	200.38	600.0	-0.9	-1.0	0.5	0.06	
700.0	0.21	189.62	700.0	-1.3	-1.0	0.8	0.04	
800.0	0.37	188.96	800.0	-1.8	-1.1	1.2	0.16	
900.0	0.29	174.35	900.0	-2.4	-1.2	1.8	0.12	

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EOW Completion Report



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Project: Doddridge County WV
Site: Costlow/Duff/Mishka
Well: Mishka Unit 1H
Wellbore: ST1 Mishka Unit 1H
Design: ST1 As Drilled

Local Co-ordinate Reference: Well Mishka Unit 1H
TVD Reference: Mishka Unit 1H GL 996' + 19' RKB @ 1015.0usft
MD Reference: Mishka Unit 1H GL 996' + 19' RKB @ 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)
1,000.0	0.28	187.43	1,000.0	-2.8	-1.2	2.2	0.07
1,100.0	0.37	192.22	1,100.0	-3.4	-1.3	2.7	0.09
1,200.0	0.26	177.91	1,200.0	-3.9	-1.3	3.2	0.13
1,300.0	0.24	172.19	1,300.0	-4.4	-1.3	3.6	0.03
1,400.0	0.18	160.86	1,400.0	-4.7	-1.2	3.9	0.07
1,500.0	0.23	148.77	1,500.0	-5.1	-1.0	4.3	0.07
1,600.0	0.26	138.90	1,600.0	-5.4	-0.8	4.7	0.05
1,700.0	0.33	144.80	1,700.0	-5.8	-0.5	5.2	0.08
1,800.0	0.38	155.81	1,800.0	-6.3	-0.2	5.8	0.08
1,900.0	0.36	125.23	1,900.0	-6.8	0.2	6.4	0.20
2,000.0	0.53	136.01	2,000.0	-7.3	0.8	7.1	0.19
2,100.0	0.39	141.00	2,100.0	-7.9	1.3	7.9	0.15
2,200.0	0.35	147.80	2,200.0	-8.5	1.7	8.5	0.06
2,300.0	0.38	146.51	2,300.0	-9.0	2.1	9.1	0.03
2,400.0	0.21	128.50	2,400.0	-9.4	2.4	9.6	0.19
2,500.0	0.35	150.79	2,500.0	-9.8	2.7	10.1	0.17
2,600.0	0.16	140.00	2,600.0	-10.1	2.9	10.5	0.20
2,700.0	0.12	231.41	2,700.0	-10.3	2.9	10.7	0.20
2,800.0	0.14	263.35	2,800.0	-10.4	2.7	10.7	0.07
2,900.0	0.13	238.07	2,900.0	-10.5	2.5	10.6	0.06
3,000.0	0.32	216.00	3,000.0	-10.8	2.2	10.8	0.21
3,100.0	0.26	202.53	3,100.0	-11.2	2.0	11.1	0.09
3,200.0	0.24	217.93	3,200.0	-11.6	1.8	11.4	0.07
3,300.0	0.25	233.02	3,300.0	-11.9	1.5	11.6	0.07
3,400.0	0.40	217.52	3,400.0	-12.3	1.1	11.8	0.17
3,500.0	0.42	209.86	3,500.0	-12.9	0.7	12.2	0.06
3,600.0	0.30	271.20	3,600.0	-13.2	0.2	12.3	0.38
3,700.0	0.31	238.96	3,700.0	-13.3	-0.3	12.3	0.17
3,800.0	1.88	15.93	3,799.9	-11.9	0.0	11.0	2.12
3,900.0	4.01	17.92	3,899.8	-7.0	1.5	7.0	2.13
4,000.0	5.81	13.55	3,999.4	1.3	3.8	0.2	1.84
4,100.0	5.96	12.97	4,098.9	11.3	6.1	-8.2	0.16
4,200.0	6.79	11.61	4,198.3	22.1	8.5	-17.4	0.84
4,300.0	6.88	12.42	4,297.6	33.7	10.9	-27.2	0.13
4,400.0	6.53	8.95	4,396.9	45.2	13.1	-37.1	0.54
4,500.0	5.81	9.36	4,496.3	55.8	14.8	-46.3	0.72
4,600.0	3.16	13.55	4,596.0	63.5	16.3	-52.8	2.67
4,700.0	1.90	13.42	4,695.9	67.8	17.3	-56.4	1.26
4,800.0	1.11	15.03	4,795.9	70.3	18.0	-58.6	0.79
4,900.0	0.62	26.73	4,895.8	71.8	18.4	-59.7	0.52
5,000.0	0.52	33.87	4,995.8	72.6	18.9	-60.3	0.12
5,100.0	0.30	16.50	5,095.8	73.2	19.3	-60.8	0.25
5,200.0	0.25	30.30	5,195.8	73.7	19.5	-61.1	0.08
5,300.0	0.20	34.14	5,295.8	74.0	19.7	-61.3	0.05
5,400.0	0.16	56.06	5,395.8	74.2	19.9	-61.5	0.08

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North Reference: Grid
Survey Calculation Method: Minimum Curvature
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Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
5,500.0	0.44	127.58	5,495.8	74.1	20.3	-61.2	0.42
5,600.0	0.55	130.64	5,595.8	73.5	21.0	-60.4	0.11
5,700.0	0.64	130.40	5,695.8	72.9	21.8	-59.5	0.09
5,800.0	0.81	143.62	5,795.8	71.9	22.6	-58.3	0.24
5,900.0	0.69	144.09	5,895.8	70.9	23.4	-57.0	0.12
6,000.0	0.56	148.48	5,995.8	70.0	24.0	-56.0	0.14
6,100.0	0.57	185.48	6,095.8	69.1	24.2	-55.0	0.36
6,158.9	0.47	156.40	6,154.7	68.5	24.3	-54.5	0.47
6,205.0	0.59	134.06	6,200.8	68.2	24.5	-54.1	0.51
6,251.0	5.28	76.00	6,246.7	68.6	26.7	-53.6	10.85
6,295.0	10.48	69.64	6,290.3	70.4	32.5	-53.2	11.97
6,341.0	16.05	70.92	6,335.1	74.0	42.4	-52.8	12.12
6,385.0	20.44	75.77	6,376.8	77.9	55.6	-51.5	10.55
6,431.0	25.14	76.19	6,419.2	82.2	72.9	-49.0	10.22
6,474.0	29.86	74.30	6,457.4	87.2	92.1	-46.6	11.16
6,520.0	35.55	73.41	6,496.1	94.2	115.9	-44.1	12.41
6,564.0	40.58	72.39	6,530.7	102.2	141.8	-41.8	11.52
6,610.0	46.15	72.35	6,564.1	111.7	171.9	-39.5	12.11
6,654.0	51.55	71.80	6,593.1	121.9	203.4	-37.2	12.31
6,699.0	57.50	71.20	6,619.2	133.5	238.2	-35.0	13.27
6,743.0	62.95	71.99	6,641.0	145.6	274.4	-32.6	12.48
6,789.0	63.50	79.61	6,661.7	155.7	314.2	-27.1	14.84
6,833.0	64.30	86.51	6,681.1	160.4	353.4	-16.9	14.20
6,879.0	63.27	93.41	6,701.5	160.5	394.6	-1.5	13.64
6,923.0	62.56	100.76	6,721.5	155.6	433.4	17.4	14.96
6,968.0	63.00	107.59	6,742.1	145.8	472.2	41.0	13.53
7,012.0	62.26	113.73	6,762.4	132.1	508.7	67.4	12.50
7,058.0	62.47	119.52	6,783.7	113.8	545.1	97.9	11.16
7,102.0	64.69	125.82	6,803.3	92.5	578.3	130.0	13.78
7,148.0	66.98	130.21	6,822.1	66.7	611.3	166.3	10.03
7,191.0	68.89	134.47	6,838.3	39.9	640.8	202.2	10.20
7,237.0	71.59	139.35	6,853.9	8.2	670.3	242.6	11.58
7,281.0	75.96	144.77	6,866.2	-25.1	696.3	283.2	15.44
7,327.0	79.68	148.71	6,875.9	-62.7	720.9	327.2	11.64
7,371.0	82.97	151.08	6,882.5	-100.3	742.7	370.3	9.18
7,424.0	88.22	153.69	6,886.6	-147.1	767.2	422.8	11.05
7,514.0	90.77	159.04	6,887.4	-229.5	803.2	512.8	6.58
7,604.0	90.00	157.37	6,886.8	-313.1	836.7	602.8	2.04
7,693.0	89.60	155.44	6,887.1	-394.6	872.3	691.7	2.21
7,783.0	89.33	157.56	6,887.9	-477.1	908.2	781.7	2.37
7,872.0	89.09	159.61	6,889.1	-560.0	940.7	870.7	2.32
7,962.0	90.67	159.02	6,889.3	-644.2	972.4	960.6	1.87
8,052.0	90.17	157.54	6,888.7	-727.8	1,005.8	1,050.6	1.74
8,141.0	90.37	157.24	6,888.3	-809.9	1,040.0	1,139.6	0.41

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8,231.0	90.20	156.58	6,887.8	-892.7	1,075.3	1,229.6	0.76
8,321.0	90.07	161.39	6,887.6	-976.7	1,107.5	1,319.6	5.35
8,410.0	90.07	161.61	6,887.5	-1,061.1	1,135.8	1,408.4	0.25
8,500.0	89.77	159.59	6,887.6	-1,146.0	1,165.7	1,498.3	2.27
8,589.0	89.43	159.86	6,888.2	-1,229.5	1,196.5	1,587.3	0.49
8,679.0	88.59	156.37	6,889.8	-1,313.0	1,230.0	1,677.2	3.99
8,769.0	88.32	155.63	6,892.2	-1,395.2	1,266.6	1,767.1	0.87
8,858.0	90.10	158.41	6,893.4	-1,477.1	1,301.4	1,856.1	3.71
8,948.0	91.51	160.50	6,892.2	-1,561.3	1,332.9	1,946.1	2.80
9,037.0	89.73	156.10	6,891.2	-1,644.0	1,365.8	2,035.0	5.33
9,127.0	91.41	157.78	6,890.3	-1,726.8	1,401.1	2,125.0	2.64
9,217.0	91.44	157.28	6,888.1	-1,809.9	1,435.5	2,215.0	0.56
9,306.0	90.54	155.32	6,886.5	-1,891.4	1,471.2	2,303.9	2.42
9,396.0	90.34	154.28	6,885.9	-1,972.9	1,509.6	2,393.8	1.18
9,486.0	92.59	158.53	6,883.5	-2,055.3	1,545.6	2,483.7	5.34
9,575.0	90.74	158.45	6,881.0	-2,138.0	1,578.2	2,572.6	2.08
9,665.0	90.44	156.95	6,880.0	-2,221.3	1,612.3	2,662.6	1.70
9,754.0	91.28	159.95	6,878.7	-2,304.1	1,645.0	2,751.6	3.50
9,844.0	90.87	158.19	6,877.0	-2,388.1	1,677.2	2,841.6	2.01
9,934.0	89.77	157.11	6,876.5	-2,471.3	1,711.4	2,931.6	1.71
10,023.0	90.50	160.27	6,876.3	-2,554.2	1,743.7	3,020.5	3.64
10,113.0	90.40	159.81	6,875.6	-2,638.8	1,774.4	3,110.5	0.52
10,202.0	89.03	158.22	6,876.0	-2,721.9	1,806.3	3,199.5	2.36
10,292.0	91.01	159.06	6,876.0	-2,805.7	1,839.1	3,289.5	2.39
10,382.0	90.67	157.47	6,874.7	-2,889.3	1,872.4	3,379.4	1.81
10,471.0	90.94	157.24	6,873.4	-2,971.5	1,906.7	3,468.4	0.40
10,561.0	89.80	157.57	6,872.9	-3,054.5	1,941.3	3,558.4	1.32
10,611.0	85.12	159.37	6,875.1	-3,101.0	1,959.6	3,608.4	10.03
10,655.0	84.69	155.28	6,879.0	-3,141.4	1,976.5	3,652.2	9.31
10,745.0	88.90	150.23	6,884.0	-3,221.3	2,017.6	3,741.6	7.30
10,833.0	91.61	149.48	6,883.6	-3,297.4	2,061.8	3,828.7	3.20
10,922.0	94.27	150.99	6,879.1	-3,374.5	2,105.9	3,916.7	3.44
11,012.0	95.08	153.40	6,871.7	-3,453.8	2,147.7	4,005.9	2.82
11,102.0	92.99	159.82	6,865.4	-3,536.2	2,183.4	4,095.6	7.48
11,191.0	92.02	159.22	6,861.5	-3,619.5	2,214.5	4,184.5	1.28
11,281.0	91.68	158.54	6,858.6	-3,703.4	2,246.9	4,274.5	0.84
11,371.0	92.69	161.30	6,855.2	-3,787.9	2,277.8	4,364.3	3.26
11,460.0	91.65	161.95	6,851.8	-3,872.3	2,305.8	4,453.1	1.38
11,550.0	90.87	160.73	6,849.8	-3,957.5	2,334.6	4,542.9	1.61
11,640.0	90.81	163.18	6,848.5	-4,043.1	2,362.5	4,632.7	2.72
11,729.0	89.43	159.64	6,848.3	-4,127.4	2,390.8	4,721.5	4.27
11,824.0	90.54	158.96	6,848.3	-4,216.3	2,424.4	4,816.5	1.37
11,919.0	88.82	157.59	6,848.9	-4,304.5	2,459.6	4,911.5	2.31
12,014.0	89.70	155.80	6,850.1	-4,391.8	2,497.1	5,006.5	2.10

AUG 10 2015



**WV GEOLOGICAL SURVEY
MORGANTOWN, WV**

EOW Completion Report



Company: Antero Resources
Project: Doddridge County WV
Site: Costlow/Duff/Mishka
Well: Mishka Unit 1H
Wellbore: ST1 Mishka Unit 1H
Design: ST1 As Drilled

Local Co-ordinate Reference: Well Mishka Unit 1H
TVD Reference: Mishka Unit 1H GL 996' + 19' RKB @ 1015.0usft
MD Reference: Mishka Unit 1H GL 996' + 19' RKB @ 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)
12,108.0	91.58	158.87	6,849.0	-4,478.5	2,533.4	5,100.4	3.83
12,203.0	92.32	158.64	6,845.8	-4,567.0	2,567.8	5,195.4	0.82
12,298.0	92.76	159.02	6,841.6	-4,655.5	2,602.0	5,290.3	0.61
12,393.0	90.34	157.34	6,839.0	-4,743.6	2,637.3	5,385.2	3.10
12,488.0	90.17	157.71	6,838.6	-4,831.4	2,673.6	5,480.2	0.43
12,582.0	90.20	158.32	6,838.3	-4,918.6	2,708.8	5,574.2	0.65
12,677.0	89.90	156.15	6,838.2	-5,006.2	2,745.6	5,669.2	2.31
12,772.0	88.96	154.55	6,839.2	-5,092.5	2,785.2	5,764.1	1.95
12,866.0	90.57	155.42	6,839.5	-5,177.7	2,825.0	5,857.9	1.95
12,956.0	91.24	157.60	6,838.1	-5,260.2	2,860.8	5,947.9	2.53
13,045.0	90.24	154.57	6,837.0	-5,341.5	2,896.9	6,036.8	3.58
13,135.0	92.25	157.49	6,835.0	-5,423.7	2,933.4	6,126.7	3.94
13,224.0	92.82	157.83	6,831.1	-5,506.0	2,967.2	6,215.6	0.75
13,314.0	91.01	158.53	6,828.1	-5,589.5	3,000.7	6,305.6	2.16
13,404.0	91.34	159.10	6,826.2	-5,673.4	3,033.2	6,395.6	0.73
13,493.0	90.64	160.24	6,824.7	-5,756.8	3,064.1	6,484.5	1.50
13,583.0	89.78	159.45	6,824.4	-5,841.3	3,095.1	6,574.5	1.30
13,673.0	90.71	160.31	6,824.0	-5,925.8	3,126.1	6,664.4	1.41
13,762.0	89.19	158.24	6,824.0	-6,009.1	3,157.6	6,753.4	2.89
13,852.0	89.03	158.79	6,825.4	-6,092.8	3,190.5	6,843.4	0.64
13,942.0	89.26	158.52	6,826.8	-6,176.6	3,223.3	6,933.4	0.39
14,031.0	91.24	159.34	6,826.4	-6,259.6	3,255.3	7,022.3	2.41
14,121.0	90.67	158.09	6,824.9	-6,343.5	3,287.9	7,112.3	1.53
14,211.0	89.76	157.70	6,824.6	-6,426.9	3,321.8	7,202.3	1.10
14,300.0	91.07	156.84	6,823.9	-6,509.0	3,356.2	7,291.3	1.76
14,390.0	91.07	155.64	6,822.2	-6,591.3	3,392.4	7,381.2	1.33
14,480.0	91.98	157.71	6,819.8	-6,673.9	3,428.1	7,471.2	2.51
14,569.0	90.20	159.64	6,818.1	-6,756.8	3,460.4	7,560.2	2.95
14,659.0	90.07	157.43	6,817.9	-6,840.6	3,493.4	7,650.1	2.46
14,749.0	90.13	156.80	6,817.8	-6,923.5	3,528.4	7,740.1	0.70
14,838.0	90.20	155.97	6,817.5	-7,005.0	3,564.0	7,829.1	0.94
14,928.0	91.04	159.37	6,816.5	-7,088.3	3,598.2	7,919.1	3.89
15,017.0	89.73	160.19	6,816.0	-7,171.8	3,629.0	8,008.0	1.74
15,107.0	89.06	158.93	6,816.9	-7,256.1	3,660.4	8,098.0	1.59
15,197.0	89.16	158.54	6,818.3	-7,340.0	3,693.0	8,188.0	0.45
15,286.0	89.56	159.58	6,819.3	-7,423.1	3,724.8	8,276.9	1.25
15,376.0	90.13	158.10	6,819.5	-7,507.0	3,757.3	8,366.9	1.76
15,466.0	90.34	159.44	6,819.2	-7,590.9	3,789.9	8,456.9	1.51
15,555.0	90.70	160.72	6,818.4	-7,674.6	3,820.2	8,545.9	1.49
15,645.0	88.02	159.23	6,819.4	-7,759.1	3,851.0	8,635.8	3.41
15,735.0	87.55	157.66	6,822.8	-7,842.7	3,884.1	8,725.7	1.82
15,824.0	89.53	158.35	6,825.1	-7,925.2	3,917.4	8,814.7	2.36
15,914.0	90.10	158.02	6,825.4	-8,008.8	3,950.8	8,904.7	0.73
16,004.0	90.13	156.34	6,825.2	-8,091.7	3,985.7	8,994.7	1.87



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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)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
16,093.0	90.74	158.31	6,824.5	-8,173.9	4,020.0	9,083.7	2.32
16,183.0	89.23	159.14	6,824.6	-8,257.7	4,052.7	9,173.7	1.91
16,273.0	89.33	158.15	6,825.7	-8,341.5	4,085.5	9,263.6	1.11
16,362.0	89.66	158.20	6,826.5	-8,424.2	4,118.6	9,352.6	0.38
16,452.0	90.07	157.85	6,826.7	-8,507.6	4,152.2	9,442.6	0.60
16,541.0	88.99	157.78	6,827.4	-8,590.0	4,185.8	9,531.6	1.22
16,629.0	89.25	158.22	6,828.8	-8,671.6	4,218.8	9,619.6	0.58
16,718.0	89.03	158.13	6,830.1	-8,754.2	4,251.9	9,708.6	0.27
16,808.0	89.16	158.60	6,831.5	-8,837.9	4,285.1	9,798.6	0.54
16,897.0	89.93	158.10	6,832.2	-8,920.6	4,317.9	9,887.6	1.03
16,986.0	89.76	157.97	6,832.5	-9,003.1	4,351.2	9,976.6	0.24
17,074.0	89.53	158.19	6,833.0	-9,084.8	4,384.0	10,064.6	0.36
17,164.0	89.23	157.65	6,834.0	-9,168.1	4,417.9	10,154.6	0.69
17,254.0	89.73	158.06	6,834.8	-9,251.5	4,451.8	10,244.6	0.72
17,343.0	89.80	157.24	6,835.2	-9,333.8	4,485.6	10,333.6	0.92
17,432.0	90.00	156.18	6,835.3	-9,415.6	4,520.8	10,422.6	1.21
17,522.0	89.43	157.87	6,835.8	-9,498.4	4,556.0	10,512.5	1.98
17,612.0	90.03	158.29	6,836.2	-9,581.9	4,589.6	10,602.5	0.81
17,701.0	90.84	158.43	6,835.5	-9,664.6	4,622.4	10,691.5	0.92
17,791.0	90.91	157.78	6,834.2	-9,748.1	4,655.9	10,781.5	0.73
17,881.0	91.54	157.43	6,832.2	-9,831.3	4,690.2	10,871.5	0.80
17,932.0	91.54	157.43	6,830.9	-9,878.4	4,709.8	10,922.5	0.00

Checked By: _____ Approved By: _____ Date: _____

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 MORGANTOWN, WV