



Scardina Unit 4H
Tyler County WW
Northing: 14331702.25
Easting: 1681960.10
As Drilled



Scientific Drilling

Genie Lightfoot
 11.38, May 11 2016
 Scientific Drilling
 12220 NW 10th Street
 Yukon OK 73099

WELL DETAILS		Scardina Unit 4H	
Ground Level:	814.0	Latitude	Longitude
+N/-S	0.0	1681960.1089° 27' 58.217 80° 51' 10.085 W	
+E/-W	0.0		
0.0	14331702.25		

SITE DETAILS: Weigle East Pad, Dean/Goodfellow/Hawkeye/Scardina

Site Centre Northing: 14331712.20
 Easting: 1681956.94

Positional Uncertainty: 0.0
 Convergence: 0.09
 Local North: Grid

PROJECT DETAILS: Tyler County WW

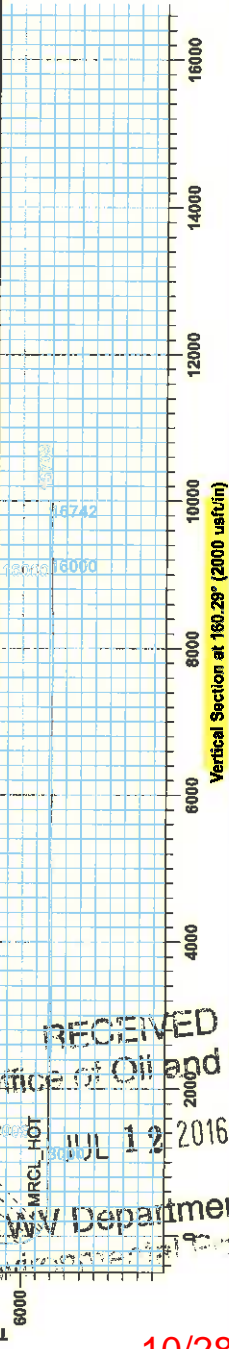
Geodetic System: Universal Transverse Mercator (US Survey Feet)
 Datum: NAD 1983 (NAD83 CONUS)
 Ellipsoid: Clarke 1866
 Zone: Zone 17N (R4 W to 78 W)
 System Datum: Mean Sea Level

LEGEND

- Scardina Unit 3H, Original Wellpath, As Drilled V0
- Hawkeye Unit 3H, Original Wellpath, As Drilled V0
- Hawkeye Unit 2H, Original Wellpath, As Drilled V0
- Scardina Unit 2H, Original Wellpath, As Drilled V0
- Scardina Unit 4H, Original Wellpath, Plan 5 V0
- Hawkeye Unit 1H, Original Wellpath, As Drilled V0
- Scardina Unit 1H, Original Wellpath, As Drilled V0
- As Drilled

DESIGN TARGET DETAILS

Name	MDLX	MDLX	MDLX	MDLX	MDLX	MDLX	MDLX	MDLX	MDLX
SCMR	MDLX	MDLX	MDLX	MDLX	MDLX	MDLX	MDLX	MDLX	MDLX
BRKT	MDLX	MDLX	MDLX	MDLX	MDLX	MDLX	MDLX	MDLX	MDLX
TILLY	MDLX	MDLX	MDLX	MDLX	MDLX	MDLX	MDLX	MDLX	MDLX
MRCL_HOT	MDLX	MDLX	MDLX	MDLX	MDLX	MDLX	MDLX	MDLX	MDLX

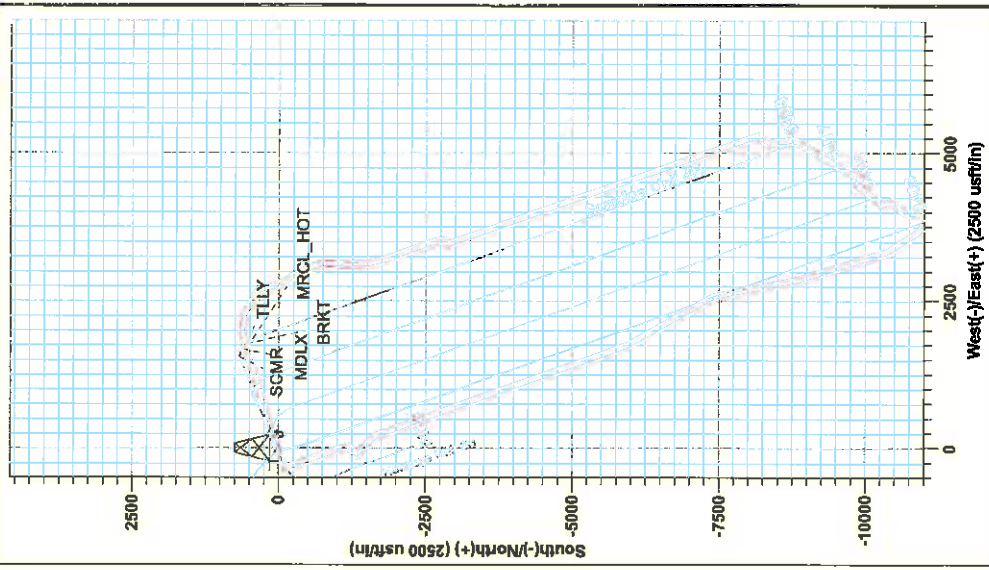


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 WV Department of
 Environmental Protection

10/28/2016

Azimuths to Grid North
 True North: -0.09°
 Magnetic North: -8.56°
 Magnetic Field
 Strength: 52249.2nT
 Dip Angle: 66.94°
 Date: 4/20/2015
 Model: EGGIM2014

To convert Magnetic North to Grid, Subtract 8.69°
 To convert True North to Grid, Subtract 0.09°





Antero

Tyler County WV

Weigle East Pad: Dean/Goodfellow/Hawkeye/Scardina

Scardina Unit 4H

Original Wellpath

Design: As Drilled

EOW Completion Report

11 May, 2015

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Environmental Protection



Scientific Drilling

10/28/2016



Company: Antero	Local Co-ordinate Reference: Well Scardina Unit 4H
Project: Tyler County WV	TVD Reference: Precision 523 GL 814' + 19' @ 833.0usft
Site: Weigle East Pad: Dean/Goodfellow/Hawkeye/Sc	MD Reference: Precision 523 GL 814' + 19' @ 833.0usft
Well: Scardina Unit 4H	North Reference: Grid
Wellbore: Original Wellpath	Survey Calculation Method: Minimum Curvature
Design: As Drilled	Database: Oklahoma District

Project Tyler County WV, Tyler Co West Virginia
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 Weigle East Pad Dean/Goodfellow/Hawkeye/Scardina
Site Position: Northing: 14,331,712.20usft Latitude: 39° 27' 58.315 N
From: Map Easting: 1,681,956.94usft Longitude: 80° 51' 10.125 W
Position Uncertainty: 0.0 usft Slot Radius: 13-3/16" Grid Convergence: 0.09 °

Well Scardina Unit 4H, Marcellus
Well Position +N/-S 0.0 usft Northing: 14,331,702.25 usft Latitude: 39° 27' 58.217 N
+E/-W 0.0 usft Easting: 1,681,960.10 usft Longitude: 80° 51' 10.085 W
Position Uncertainty 2.0 usft Wellhead Elevation: 833.0 usft Ground Level: 814.0 usft

Wellbore Original Wellpath

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2014	4/20/2015	-8.47	66.94	52,249

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 0.0 160.29

Survey Program Date 5/11/2015
From (usft) To (usft) Survey (Wellbore) Tool Name Description
106.0 6,044.9 Survey #6 Def Gyro to KOP (Original Well) Standard Keeper 104 Standard Wireline Keeper ver 1.0.4
6,044.9 16,709.0 Survey #7 SDI MWD (Original Wellpath) SDI MWD Scientific Drilling Intl. MWD - Standard ver 1.0.1

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLog (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00
106.0	0.09	247.86	106.0	0.0	-0.1	0.0	0.08
131.0	0.08	200.44	131.0	-0.1	-0.1	0.0	0.28
156.0	0.11	246.80	156.0	-0.1	-0.1	0.0	0.32
181.0	0.05	50.82	181.0	-0.1	-0.1	0.0	0.03
206.0	0.08	23.55	206.0	-0.1	-0.1	0.0	0.03
231.0	0.08	35.56	231.0	0.0	-0.1	0.0	0.07
256.0	0.02	14.69	256.0	0.0	-0.1	0.0	0.25
281.0	0.08	342.30	281.0	0.0	-0.1	0.0	0.26
306.0	0.11	19.37	306.0	0.0	-0.1	-0.1	0.27
331.0	0.11	314.23	331.0	0.1	-0.1	-0.1	0.47

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Environmental Protection



Company:	Antero	Local Co-ordinate Reference:	Well Scardina Unit 4H
Project:	Tyler County WV	TVD Reference:	Precision 523 GL 814' + 19' @ 833.0usft
Site:	Weigle East Pad. Dean/Goodfellow/Hawkeye/Sc	MD Reference:	Precision 523 GL 814' + 19' @ 833.0usft
Well:	Scardina Unit 4H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
356.0	0.12	11.50	356.0	0.1	-0.1	-0.2	0.44
381.0	0.12	12.23	381.0	0.2	-0.1	-0.2	0.01
406.0	0.06	343.77	406.0	0.2	-0.1	-0.2	0.29
431.0	0.08	36.96	431.0	0.2	-0.1	-0.3	0.26
456.0	0.04	335.85	456.0	0.3	-0.1	-0.3	0.28
481.0	0.06	324.17	481.0	0.3	-0.1	-0.3	0.09
506.0	0.05	327.26	506.0	0.3	-0.1	-0.3	0.04
531.0	0.08	330.35	531.0	0.3	-0.1	-0.4	0.12
556.0	0.41	24.08	556.0	0.4	-0.1	-0.4	1.47
581.0	1.28	32.26	581.0	0.7	0.1	-0.7	3.50
606.0	1.89	36.73	606.0	1.3	0.5	-1.1	2.49
631.0	2.58	39.97	631.0	2.1	1.1	-1.6	2.80
656.0	3.12	40.72	655.9	3.0	1.9	-2.2	2.17
681.0	4.18	43.92	680.9	4.2	3.0	-2.9	4.32
706.0	4.75	46.48	705.8	5.6	4.3	-3.8	2.41
731.0	4.92	47.88	730.7	7.0	5.9	-4.6	0.83
756.0	4.98	49.34	755.6	8.4	7.5	-5.4	0.56
781.0	5.08	49.14	780.5	9.9	9.2	-6.2	0.41
806.0	5.08	49.99	805.4	11.3	10.9	-7.0	0.30
831.0	5.10	49.38	830.3	12.7	12.5	-7.7	0.23
856.0	5.27	49.66	855.2	14.2	14.3	-8.5	0.69
881.0	5.27	49.36	880.1	15.7	16.0	-9.4	0.11
906.0	5.32	49.16	905.0	17.2	17.8	-10.2	0.21
931.0	5.35	48.20	929.9	18.7	19.5	-11.0	0.38
956.0	5.35	48.61	954.8	20.3	21.2	-11.9	0.15
981.0	5.31	48.14	979.7	21.8	23.0	-12.8	0.24
1,006.0	5.09	47.61	1,004.6	23.3	24.7	-13.6	0.90
1,031.0	4.25	44.72	1,029.5	24.7	26.1	-14.5	3.49
1,056.0	4.11	44.68	1,054.4	26.0	27.4	-15.3	0.56
1,081.0	3.89	44.55	1,079.4	27.3	28.6	-16.0	0.88
1,106.0	3.59	44.57	1,104.3	28.4	29.8	-16.7	1.20
1,131.0	3.41	45.18	1,129.3	29.5	30.9	-17.4	0.74
1,156.0	2.88	46.44	1,154.2	30.5	31.8	-17.9	2.14
1,181.0	2.69	46.19	1,179.2	31.3	32.7	-18.4	0.76
1,206.0	2.38	46.56	1,204.2	32.1	33.5	-18.9	1.24
1,231.0	2.18	47.60	1,229.2	32.8	34.3	-19.3	0.82
1,256.0	2.03	48.82	1,254.2	33.4	34.9	-19.6	0.63
1,281.0	1.82	50.57	1,279.1	33.9	35.6	-19.9	0.87
1,306.0	1.59	54.29	1,304.1	34.4	36.2	-20.2	1.02
1,331.0	1.37	53.66	1,329.1	34.7	36.7	-20.3	0.88
1,356.0	1.25	54.54	1,354.1	35.1	37.2	-20.5	0.49
1,381.0	1.11	56.49	1,379.1	35.4	37.6	-20.6	0.58
1,406.0	0.98	55.27	1,404.1	35.6	38.0	-20.7	0.53
1,431.0	0.94	56.67	1,429.1	35.9	38.3	-20.8	0.19



Company:	Antero	Local Co-ordinate Reference:	Well Scardina Unit 4H
Project:	Tyler County WV	TVD Reference:	Precision 523 GL 814' + 19' @ 833.0usft
Site:	Weigle East Pad: Dean/Goodfellow/Hawkeye/Scz	MD Reference:	Precision 523 GL 814' + 19' @ 833.0usft
Well:	Scardina Unit 4H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Oklahoma District

Survey							
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V Sec (usft)	DLeg (°/100usft)
1,456.0	0.88	58.09	1,454.1	36.1	38.6	-20.9	0.26
1,481.0	0.66	51.71	1,479.1	36.3	38.9	-21.0	0.94
1,506.0	0.48	50.98	1,504.1	36.4	39.1	-21.1	0.72
1,531.0	0.33	33.12	1,529.1	36.5	39.2	-21.2	0.78
1,556.0	0.34	23.34	1,554.1	36.7	39.3	-21.3	0.23
1,581.0	0.27	35.86	1,579.1	36.8	39.4	-21.4	0.39
1,606.0	0.18	19.35	1,604.1	36.9	39.4	-21.4	0.44
1,631.0	0.13	340.51	1,629.1	36.9	39.4	-21.5	0.45
1,656.0	0.10	328.51	1,654.1	37.0	39.4	-21.5	0.15
1,681.0	0.12	5.07	1,679.1	37.0	39.4	-21.6	0.29
1,706.0	0.09	294.49	1,704.1	37.1	39.4	-21.6	0.50
1,731.0	0.09	338.21	1,729.1	37.1	39.3	-21.6	0.27
1,756.0	0.10	291.95	1,754.1	37.1	39.3	-21.7	0.30
1,781.0	0.12	334.45	1,779.1	37.1	39.3	-21.7	0.33
1,806.0	0.18	351.07	1,804.1	37.2	39.3	-21.8	0.29
1,831.0	0.12	337.68	1,829.1	37.3	39.2	-21.9	0.28
1,856.0	0.15	298.01	1,854.1	37.3	39.2	-21.9	0.38
1,881.0	0.17	321.37	1,879.1	37.4	39.2	-22.0	0.27
1,906.0	0.14	350.84	1,904.1	37.4	39.1	-22.0	0.34
1,931.0	0.21	296.08	1,929.1	37.5	39.1	-22.1	0.69
1,956.0	0.13	324.95	1,954.1	37.5	39.0	-22.1	0.46
1,981.0	0.09	23.30	1,979.1	37.5	39.0	-22.2	0.45
2,006.0	0.09	359.28	2,004.1	37.6	39.0	-22.2	0.15
2,031.0	0.17	273.33	2,029.1	37.6	39.0	-22.3	0.75
2,056.0	0.16	276.53	2,054.1	37.6	38.9	-22.3	0.05
2,081.0	0.05	281.66	2,079.1	37.6	38.9	-22.3	0.44
2,106.0	0.22	307.87	2,104.1	37.7	38.8	-22.4	0.71
2,131.0	0.10	288.75	2,129.1	37.7	38.8	-22.4	0.52
2,156.0	0.11	333.27	2,154.1	37.7	38.7	-22.4	0.32
2,181.0	0.26	313.26	2,179.1	37.8	38.7	-22.5	0.64
2,206.0	0.14	254.45	2,204.1	37.8	38.6	-22.6	0.89
2,231.0	0.25	256.14	2,229.1	37.8	38.5	-22.6	0.44
2,256.0	0.17	309.84	2,254.1	37.8	38.4	-22.6	0.81
2,281.0	0.11	310.94	2,279.1	37.8	38.4	-22.7	0.24
2,306.0	0.16	248.51	2,304.1	37.8	38.3	-22.7	0.59
2,331.0	0.26	250.57	2,329.1	37.8	38.3	-22.7	0.40
2,356.0	0.28	271.62	2,354.1	37.8	38.1	-22.7	0.40
2,381.0	0.25	298.83	2,379.1	37.8	38.0	-22.8	0.51
2,406.0	0.31	250.44	2,404.1	37.8	37.9	-22.8	0.94
2,431.0	0.22	273.34	2,429.1	37.8	37.8	-22.8	0.58
2,456.0	0.21	262.52	2,454.1	37.8	37.7	-22.9	0.47
2,481.0	0.11	286.45	2,479.1	37.8	37.7	-22.9	0.47
2,506.0	0.23	219.74	2,504.1	37.8	37.6	-22.9	0.85
2,531.0	0.10	322.55	2,529.1	37.7	37.5	-22.9	1.08
2,556.0	0.17	330.98	2,554.1	37.8	37.5	-22.9	0.29

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 WV Department of Environmental Protection



Company:	Antero	Local Co-ordinate Reference:	Well Scardina Unit 4H
Project:	Tyler County WV	TVD Reference:	Precision 523: GL 814' + 19' @ 833.0usft
Site:	Weigle East Pad Dean/Goodfellow/Hawkeye/Sca	MD Reference:	Precision 523: GL 814' + 19' @ 833.0usft
Well:	Scardina Unit 4H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Oklahoma District

Survey							
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
2,581.0	0.26	7.77	2,579.1	37.9	37.5	-23.0	0.64
2,606.0	1.65	48.23	2,604.1	38.2	37.8	-23.2	5.85
2,631.0	2.90	48.28	2,629.1	38.8	38.5	-23.6	5.00
2,656.0	4.33	47.91	2,654.0	39.9	39.7	-24.2	5.72
2,681.0	5.71	48.17	2,678.9	41.4	41.3	-25.0	5.52
2,706.0	6.92	49.87	2,703.8	43.2	43.4	-26.0	4.90
2,731.0	7.93	55.89	2,728.6	45.1	46.0	-26.9	5.09
2,756.0	8.65	62.90	2,753.3	46.9	49.1	-27.6	4.96
2,781.0	9.20	68.34	2,778.0	48.5	52.6	-27.9	4.03
2,806.0	9.26	70.34	2,802.7	49.9	56.4	-28.0	1.31
2,831.0	9.45	69.99	2,827.3	51.3	60.2	-28.0	0.79
2,856.0	9.55	69.67	2,852.0	52.7	64.1	-28.0	0.45
2,881.0	9.52	68.95	2,876.6	54.2	67.9	-28.1	0.49
2,906.0	9.55	68.95	2,901.3	55.7	71.8	-28.2	0.12
2,931.0	9.72	69.01	2,925.9	57.2	75.7	-28.3	0.68
2,956.0	10.43	69.25	2,950.6	58.7	79.8	-28.4	2.84
2,981.0	11.30	68.55	2,975.1	60.4	84.2	-28.5	3.52
3,006.0	11.75	68.13	2,999.6	62.3	88.8	-28.7	1.83
3,031.0	11.99	67.19	3,024.1	64.2	93.6	-28.9	1.23
3,056.0	12.80	65.81	3,048.5	66.4	98.5	-29.3	3.45
3,081.0	13.69	64.61	3,072.8	68.8	103.7	-29.8	3.73
3,106.0	14.62	64.09	3,097.1	71.4	109.2	-30.4	3.75
3,131.0	15.41	63.97	3,121.2	74.3	115.0	-31.1	3.16
3,156.0	16.22	63.67	3,145.3	77.3	121.2	-31.9	3.26
3,181.0	16.82	64.14	3,169.2	80.4	127.5	-32.7	2.46
3,206.0	17.27	65.57	3,193.1	83.5	134.2	-33.4	2.46
3,231.0	17.97	68.10	3,217.0	86.5	141.1	-33.8	4.15
3,256.0	18.44	71.64	3,240.7	89.2	148.5	-33.9	4.81
3,281.0	18.87	74.90	3,264.4	91.5	156.1	-33.5	4.51
3,306.0	19.55	76.38	3,288.0	93.5	164.1	-32.7	3.35
3,331.0	20.36	78.13	3,311.5	95.4	172.4	-31.6	4.03
3,356.0	20.83	79.54	3,334.9	97.1	181.0	-30.3	2.73
3,381.0	21.57	79.98	3,358.2	98.7	189.9	-28.9	3.03
3,406.0	22.23	79.89	3,381.4	100.3	199.1	-27.3	2.64
3,431.0	23.21	78.68	3,404.5	102.1	208.6	-25.8	4.34
3,456.0	24.07	77.62	3,427.4	104.2	218.4	-24.4	3.84
3,481.0	25.15	76.62	3,450.1	106.5	228.6	-23.2	4.63
3,506.0	26.30	75.96	3,472.6	109.1	239.1	-22.0	4.74
3,531.0	27.14	75.06	3,495.0	111.9	250.0	-21.0	3.73
3,556.0	28.40	74.15	3,517.1	115.0	261.2	-20.1	5.32
3,581.0	29.23	73.03	3,539.0	118.4	272.8	-19.5	3.96
3,606.0	30.12	72.29	3,560.7	122.1	284.6	-18.9	3.85
3,631.0	30.99	71.00	3,582.2	126.1	296.6	-18.6	4.36
3,656.0	31.39	68.87	3,603.6	130.5	308.8	-18.7	4.69



Company:	Antero	Local Co-ordinate Reference:	Well Scardina Unit 4H
Project:	Tyler County WV	TVD Reference:	Precision 523 GL 814' + 19' @ 833.0usft
Site:	Weigle East Pad Dean/Goodfellow/Hawkeye/Scardina	MD Reference:	Precision 523 GL 814' + 19' @ 833.0usft
Well:	Scardina Unit 4H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
3,681.0	31.09	65.59	3,625.0	135.5	320.8	-19.4	6.91
3,706.0	30.58	63.97	3,646.5	141.0	332.3	-20.6	3.90
3,731.0	30.50	63.15	3,668.0	146.7	343.7	-22.1	1.70
3,756.0	29.89	62.49	3,689.6	152.4	354.9	-23.8	2.78
3,781.0	29.49	62.28	3,711.3	158.1	365.9	-25.5	1.65
3,806.0	29.28	62.28	3,733.1	163.8	376.7	-27.2	0.84
3,831.0	28.88	62.69	3,755.0	169.5	387.5	-28.8	1.79
3,856.0	28.82	63.07	3,776.8	175.0	398.2	-30.4	0.77
3,881.0	28.57	63.62	3,798.8	180.3	409.0	-31.8	1.45
3,906.0	28.76	64.42	3,820.7	185.6	419.8	-33.2	1.71
3,931.0	29.10	65.22	3,842.6	190.7	430.7	-34.3	2.06
3,956.0	29.28	66.90	3,864.4	195.7	441.8	-35.2	3.36
3,981.0	29.62	67.56	3,886.2	200.4	453.2	-35.9	1.88
4,006.0	30.24	68.49	3,907.9	205.1	464.7	-36.4	3.10
4,031.0	30.55	68.94	3,929.4	209.7	476.5	-36.7	1.54
4,056.0	31.03	68.95	3,950.9	214.3	488.5	-37.0	1.92
4,081.0	31.43	68.90	3,972.3	219.0	500.6	-37.3	1.60
4,106.0	31.44	69.00	3,993.6	223.6	512.7	-37.6	0.21
4,131.0	31.23	68.31	4,015.0	228.4	524.8	-38.0	1.66
4,156.0	30.30	67.54	4,036.4	233.2	536.7	-38.5	4.04
4,181.0	29.07	66.59	4,058.2	238.0	548.1	-39.2	5.27
4,206.0	27.96	65.65	4,080.1	242.8	559.0	-40.1	4.79
4,231.0	27.98	65.30	4,102.2	247.7	569.7	-41.1	0.66
4,256.0	27.84	65.30	4,124.3	252.6	580.3	-42.1	0.56
4,281.0	27.86	65.74	4,146.4	257.4	590.9	-43.0	0.83
4,306.0	28.14	65.55	4,168.5	262.3	601.6	-44.0	1.18
4,331.0	28.12	65.38	4,190.5	267.2	612.4	-45.0	0.33
4,356.0	28.62	65.16	4,212.5	272.1	623.1	-46.0	2.04
4,381.0	28.74	64.95	4,234.5	277.2	634.0	-47.1	0.63
4,406.0	28.99	64.84	4,256.3	282.3	645.0	-48.3	1.02
4,431.0	29.03	64.46	4,278.2	287.5	655.9	-49.4	0.75
4,456.0	28.89	64.28	4,300.1	292.7	666.8	-50.7	0.66
4,481.0	28.95	64.07	4,322.0	298.0	677.7	-52.0	0.47
4,506.0	29.14	64.35	4,343.8	303.3	688.6	-53.3	0.93
4,531.0	28.89	64.76	4,365.7	308.5	699.6	-54.5	1.28
4,556.0	28.57	65.38	4,387.6	313.6	710.5	-55.6	1.75
4,581.0	28.45	66.43	4,409.6	318.4	721.4	-56.5	2.06
4,606.0	28.68	67.00	4,431.5	323.2	732.4	-57.2	1.43
4,631.0	28.53	67.84	4,453.5	327.8	743.4	-57.8	1.72
4,656.0	28.89	68.32	4,475.4	332.2	754.5	-58.3	1.71
4,681.0	29.17	69.46	4,497.3	336.6	765.9	-58.6	2.48
4,706.0	30.93	70.94	4,518.9	340.8	777.6	-58.6	7.64
4,731.0	33.33	71.84	4,540.1	345.1	790.2	-58.3	9.79
4,756.0	35.79	72.29	4,560.7	349.4	803.7	-57.9	9.89



Company:	Antero	Local Co-ordinate Reference:	Well Scardina Unit 4H
Project:	Tyler County WV	TVD Reference:	Precision 523 GL 814' + 19' @ 833.0usft
Site:	Weigle East Pad Dean/Goodfellow/Hawkeye/Sc	MD Reference:	Precision 523 GL 814' + 19' @ 833.0usft
Well:	Scardina Unit 4H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
4,781.0	37.41	72.36	4,580.7	354.0	817.9	-57.4	6.48
4,806.0	37.32	71.60	4,600.6	358.7	832.4	-56.9	1.88
4,831.0	35.56	68.32	4,620.7	363.7	846.3	-57.0	10.50
4,856.0	33.91	64.89	4,641.3	369.4	859.4	-57.9	10.23
4,881.0	32.63	62.27	4,662.2	375.5	871.7	-59.5	7.70
4,906.0	31.81	60.60	4,683.3	381.9	883.4	-61.6	4.84
4,931.0	30.84	59.23	4,704.7	388.4	894.6	-63.9	4.81
4,956.0	30.77	58.68	4,726.1	395.0	905.6	-66.4	1.16
4,981.0	29.93	60.07	4,747.7	401.4	916.5	-68.8	4.38
5,006.0	29.05	62.24	4,769.5	407.3	927.2	-70.8	5.54
5,031.0	27.83	64.94	4,791.5	412.6	937.9	-72.2	7.09
5,056.0	27.57	66.50	4,813.6	417.4	948.5	-73.1	3.08
5,081.0	27.56	67.26	4,835.8	422.0	959.1	-73.8	1.41
5,106.0	28.46	67.81	4,857.8	426.5	970.0	-74.3	3.75
5,131.0	28.21	67.50	4,879.8	431.0	980.9	-74.9	1.16
5,156.0	27.81	67.21	4,901.9	435.5	991.8	-75.5	1.69
5,181.0	27.69	66.44	4,924.0	440.1	1,002.5	-76.2	1.51
5,206.0	28.07	66.30	4,946.1	444.7	1,013.2	-77.0	1.54
5,231.0	28.55	65.98	4,968.1	449.5	1,024.0	-77.8	2.01
5,256.0	28.77	65.80	4,990.1	454.4	1,035.0	-78.8	0.95
5,281.0	29.14	65.71	5,012.0	459.4	1,046.0	-79.7	1.49
5,306.0	29.70	66.01	5,033.7	464.4	1,057.2	-80.7	2.32
5,331.0	30.00	66.26	5,055.4	469.5	1,068.6	-81.6	1.30
5,356.0	30.14	66.26	5,077.0	474.5	1,080.1	-82.4	0.56
5,381.0	29.61	66.03	5,098.7	479.5	1,091.5	-83.3	2.17
5,406.0	30.29	66.14	5,120.4	484.6	1,102.9	-84.3	2.73
5,431.0	30.63	65.94	5,141.9	489.8	1,114.4	-85.2	1.42
5,456.0	30.77	66.01	5,163.4	495.0	1,126.1	-86.2	0.58
5,481.0	30.40	65.06	5,185.0	500.2	1,137.7	-87.2	2.43
5,506.0	30.14	64.50	5,206.5	505.6	1,149.1	-88.4	1.54
5,531.0	29.80	63.29	5,228.2	511.1	1,160.3	-89.8	2.77
5,556.0	29.51	63.15	5,249.9	516.7	1,171.3	-91.3	1.19
5,581.0	28.71	64.68	5,271.8	522.0	1,182.3	-92.7	4.37
5,606.0	27.99	66.73	5,293.8	526.9	1,193.1	-93.6	4.84
5,631.0	27.77	68.11	5,315.9	531.4	1,203.9	-94.2	2.73
5,656.0	27.40	67.71	5,338.0	535.7	1,214.6	-94.7	1.66
5,681.0	27.35	67.61	5,360.2	540.1	1,225.2	-95.2	0.27
5,706.0	27.80	68.14	5,382.4	544.5	1,236.0	-95.7	2.05
5,731.0	28.32	69.48	5,404.5	548.7	1,246.9	-96.0	3.27
5,756.0	28.78	69.92	5,426.4	552.9	1,258.1	-96.1	2.02
5,781.0	28.98	69.98	5,448.3	557.0	1,269.5	-96.2	0.81
5,806.0	29.10	69.83	5,470.2	561.2	1,280.9	-96.3	0.56
5,831.0	29.86	70.02	5,491.9	565.4	1,292.4	-96.4	3.06
5,856.0	30.96	70.03	5,513.5	569.7	1,304.3	-96.4	4.40



Company:	Antero	Local Co-ordinate Reference:	Well Scardina Unit 4H
Project:	Tyler County WV	TVD Reference:	Precision 523 GL 814' + 19' @ 833.0usft
Site:	Weigle East Pad: Dean/Goodfellow/Hawkeye/Sc	MD Reference:	Precision 523 GL 814' + 19' @ 833.0usft
Well:	Scardina Unit 4H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
5,881.0	31.56	69.96	5,534.9	574.1	1,316.5	-96.5	2.40
5,906.0	31.63	69.44	5,556.1	578.7	1,328.8	-96.6	1.13
5,931.0	31.13	68.91	5,577.5	583.3	1,341.0	-96.9	2.28
5,956.0	30.77	68.19	5,598.9	588.0	1,352.9	-97.3	2.07
5,981.0	30.53	67.60	5,620.4	592.8	1,364.7	-97.8	1.54
6,006.0	29.92	67.90	5,642.0	597.6	1,376.4	-98.4	2.51
6,031.0	28.77	69.10	5,663.8	602.1	1,387.8	-98.8	5.17
6,044.9	28.17	69.83	5,676.1	604.4	1,394.0	-98.9	4.99
6,092.0	26.38	71.16	5,717.9	611.6	1,414.3	-98.8	4.01
6,122.0	26.82	71.60	5,744.7	615.9	1,427.0	-98.5	1.61
6,152.0	27.61	72.64	5,771.4	620.1	1,440.1	-98.1	3.07
6,182.0	27.43	73.38	5,798.0	624.2	1,453.4	-97.4	1.29
6,212.0	27.44	70.45	5,824.6	628.5	1,466.5	-97.0	4.50
6,241.0	27.83	62.49	5,850.3	633.8	1,478.8	-97.9	12.79
6,271.0	28.61	55.23	5,876.8	641.1	1,490.9	-100.8	11.73
6,301.0	29.21	57.17	5,903.1	649.2	1,503.0	-104.3	3.71
6,331.0	30.35	64.87	5,929.1	656.4	1,516.0	-106.7	13.29
6,361.0	31.96	73.19	5,954.8	661.9	1,530.5	-107.0	15.31
6,391.0	33.27	80.47	5,980.1	665.6	1,546.2	-105.1	13.78
6,398.0	33.43	82.47	5,985.9	666.2	1,550.0	-104.4	15.85
SCMR							
6,420.0	34.14	88.61	6,004.2	667.1	1,562.2	-101.2	15.85
6,450.0	34.96	95.89	6,028.9	666.4	1,579.1	-94.8	14.02
6,480.0	35.72	101.85	6,053.4	663.7	1,596.3	-86.5	11.76
6,510.0	37.02	106.85	6,077.6	659.3	1,613.5	-76.5	10.79
6,540.0	38.35	112.05	6,101.3	653.2	1,630.8	-64.9	11.48
6,570.0	39.45	116.34	6,124.7	645.5	1,647.9	-51.9	9.70
6,599.0	41.17	120.00	6,146.8	636.6	1,664.5	-38.0	10.09
6,623.0	42.70	122.71	6,164.6	628.3	1,678.2	-25.5	9.87
MDLX							
6,629.0	43.09	123.36	6,169.0	626.0	1,681.6	-22.2	9.87
6,659.0	45.67	126.25	6,190.5	614.1	1,698.8	-5.2	10.92
6,689.0	48.73	129.02	6,210.9	600.6	1,716.2	13.4	12.24
6,719.0	50.07	131.23	6,230.4	585.9	1,733.6	33.1	7.16
6,749.0	51.62	133.65	6,249.3	570.2	1,750.8	53.6	8.11
6,767.0	52.79	135.78	6,260.4	560.2	1,760.9	66.5	11.40
BRKT							
6,778.0	53.53	137.05	6,266.9	553.8	1,767.0	74.5	11.40
6,808.0	56.01	140.31	6,284.3	535.4	1,783.1	97.3	12.13
6,820.0	57.34	141.52	6,290.8	527.7	1,789.4	106.8	13.89
TLLY							
6,838.0	59.35	143.26	6,300.3	515.5	1,798.8	121.3	13.89
6,868.0	63.29	144.90	6,314.7	494.2	1,814.2	146.6	13.98
6,898.0	67.80	146.30	6,327.1	471.7	1,829.6	173.0	15.62



Company:	Antero	Local Co-ordinate Reference:	Well Scardina Unit 4H
Project:	Tyler County WV	TVD Reference:	Precision 523 GL 814' + 19' @ 833.0usft
Site:	Weigle East Pad Dean/Goodfellow/Hawkeye/Sc	MD Reference:	Precision 523 GL 814' + 19' @ 833.0usft
Well:	Scardina Unit 4H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Oklahoma District

Survey							
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
6,921.0	70.43	148.33	6,335.3	453.6	1,841.2	194.0	14.09
MRCL_HOT							
6,928.0	71.23	148.94	6,337.6	447.9	1,844.7	200.4	14.09
6,957.0	74.72	151.55	6,346.1	423.9	1,858.4	227.7	14.79
6,987.0	77.73	154.83	6,353.2	397.9	1,871.6	256.6	14.61
7,017.0	81.52	157.45	6,358.6	370.9	1,883.5	286.1	15.28
7,047.0	85.47	159.31	6,362.0	343.2	1,894.5	315.8	14.54
7,085.0	89.93	159.98	6,363.6	307.6	1,907.7	353.8	11.87
7,176.0	90.74	161.21	6,363.0	221.8	1,937.9	444.8	1.62
7,265.0	89.63	160.95	6,362.7	137.6	1,966.8	533.8	1.28
7,355.0	89.13	161.06	6,363.7	52.5	1,996.1	623.8	0.57
7,444.0	89.87	160.11	6,364.5	-31.4	2,025.6	712.8	1.35
7,534.0	88.69	160.23	6,365.6	-116.1	2,056.2	802.8	1.32
7,624.0	90.23	159.28	6,366.5	-200.5	2,087.3	892.7	2.01
7,713.0	89.66	161.06	6,366.6	-284.2	2,117.5	981.7	2.10
7,803.0	89.10	161.19	6,367.5	-369.4	2,146.6	1,071.7	0.64
7,892.0	89.97	160.79	6,368.3	-453.5	2,175.6	1,160.7	1.08
7,982.0	88.80	159.96	6,369.2	-538.3	2,205.8	1,250.7	1.59
8,071.0	90.07	160.01	6,370.1	-621.9	2,236.3	1,339.7	1.43
8,161.0	89.13	159.91	6,370.7	-706.5	2,267.1	1,429.7	1.05
8,250.0	89.36	159.86	6,371.9	-790.0	2,297.7	1,518.7	0.26
8,340.0	90.17	160.54	6,372.3	-874.7	2,328.2	1,608.7	1.18
8,429.0	88.66	159.70	6,373.2	-958.4	2,358.5	1,697.7	1.94
8,519.0	89.73	161.94	6,374.4	-1,043.4	2,388.0	1,787.7	2.76
8,609.0	90.47	162.78	6,374.3	-1,129.2	2,415.3	1,877.6	1.24
8,698.0	88.86	160.49	6,374.8	-1,213.6	2,443.4	1,966.6	3.15
8,788.0	89.53	160.12	6,376.1	-1,298.3	2,473.7	2,056.6	0.85
8,877.0	89.93	160.36	6,376.5	-1,382.1	2,503.8	2,145.6	0.52
8,967.0	89.76	158.81	6,376.7	-1,466.4	2,535.2	2,235.5	1.73
9,056.0	89.87	160.00	6,377.0	-1,549.8	2,566.5	2,324.5	1.34
9,145.0	89.43	160.15	6,377.6	-1,633.4	2,596.8	2,413.5	0.52
9,235.0	89.09	160.65	6,378.7	-1,718.2	2,627.0	2,503.5	0.67
9,324.0	89.73	158.48	6,379.6	-1,801.6	2,658.1	2,592.5	2.54
9,414.0	90.10	157.65	6,379.8	-1,885.1	2,691.7	2,682.4	1.01
9,504.0	90.10	159.69	6,379.6	-1,968.9	2,724.4	2,772.4	2.27
9,593.0	90.40	162.65	6,379.2	-2,053.1	2,753.1	2,861.4	3.34
9,683.0	88.93	162.44	6,379.8	-2,139.0	2,780.1	2,951.3	1.65
9,773.0	88.72	161.98	6,381.6	-2,224.7	2,807.6	3,041.2	0.56
9,862.0	89.33	160.84	6,383.1	-2,309.0	2,836.0	3,130.2	1.45
9,952.0	89.70	161.00	6,383.9	-2,394.1	2,865.4	3,220.2	0.45
10,041.0	89.33	162.36	6,384.6	-2,478.5	2,893.4	3,309.2	1.58
10,131.0	88.76	157.68	6,386.1	-2,563.1	2,924.1	3,399.1	5.24
10,220.0	90.17	158.80	6,387.0	-2,645.7	2,957.1	3,488.1	2.02
10,310.0	89.29	157.35	6,387.4	-2,729.2	2,990.7	3,578.0	1.88



Company:	Antero	Local Co-ordinate Reference:	Well Scardina Unit 4H
Project:	Tyler County WV	TVD Reference:	Precision 523. GL 814' + 19' @ 833.0usft
Site:	Weigle East Pad: Dean/Goodfellow/Hawkeye/Sc	MD Reference:	Precision 523 GL 814' + 19' @ 833.0usft
Well:	Scardina Unit 4H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Oklahoma District

Survey							
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
10,399.0	89.56	159.02	6,388.3	-2,811.9	3,023.8	3,666.9	1.90
10,489.0	90.81	160.81	6,388.0	-2,896.4	3,054.7	3,756.9	2.43
10,578.0	90.34	160.12	6,387.1	-2,980.2	3,084.5	3,845.9	0.94
10,668.0	89.56	160.01	6,387.2	-3,064.9	3,115.1	3,935.9	0.88
10,758.0	90.00	161.33	6,387.5	-3,149.8	3,144.9	4,025.9	1.55
10,847.0	90.07	160.03	6,387.5	-3,233.8	3,174.4	4,114.9	1.46
10,937.0	91.58	162.64	6,386.2	-3,319.0	3,203.2	4,204.9	3.35
11,026.0	91.21	161.92	6,384.0	-3,403.8	3,230.2	4,293.8	0.91
11,116.0	90.03	162.89	6,383.0	-3,489.5	3,257.5	4,383.7	1.70
11,206.0	88.52	160.70	6,384.2	-3,575.0	3,285.6	4,473.7	2.96
11,295.0	89.66	160.14	6,385.6	-3,658.9	3,315.4	4,562.6	1.43
11,385.0	89.09	159.68	6,386.6	-3,743.4	3,346.3	4,652.6	0.81
11,475.0	90.57	159.82	6,386.8	-3,827.8	3,377.4	4,742.6	1.65
11,564.0	90.67	160.53	6,385.9	-3,911.5	3,407.6	4,831.6	0.81
11,654.0	88.96	159.80	6,386.2	-3,996.2	3,438.2	4,921.6	2.07
11,743.0	89.30	160.06	6,387.5	-4,079.8	3,468.7	5,010.6	0.48
11,833.0	88.76	159.42	6,389.0	-4,164.2	3,499.9	5,100.6	0.93
11,922.0	89.90	159.71	6,390.1	-4,247.6	3,530.9	5,189.6	1.32
12,012.0	89.36	160.07	6,390.7	-4,332.1	3,561.9	5,279.6	0.72
12,102.0	88.73	159.86	6,392.2	-4,416.6	3,592.7	5,369.6	0.74
12,191.0	89.66	160.35	6,393.4	-4,500.3	3,623.0	5,458.5	1.18
12,281.0	89.80	160.30	6,393.8	-4,585.1	3,653.3	5,548.5	0.17
12,370.0	89.09	159.92	6,394.7	-4,668.8	3,683.6	5,637.5	0.90
12,460.0	89.43	160.21	6,395.9	-4,753.4	3,714.3	5,727.5	0.50
12,549.0	89.66	160.98	6,396.6	-4,837.3	3,743.8	5,816.5	0.90
12,639.0	89.70	160.19	6,397.1	-4,922.2	3,773.7	5,906.5	0.88
12,728.0	89.19	160.12	6,397.9	-5,005.9	3,803.9	5,995.5	0.58
12,818.0	88.08	159.78	6,400.1	-5,090.4	3,834.8	6,085.5	1.29
12,908.0	89.50	160.94	6,402.0	-5,175.1	3,865.0	6,175.5	2.04
12,997.0	89.70	161.44	6,402.6	-5,259.4	3,893.7	6,264.4	0.61
13,087.0	90.23	163.86	6,402.6	-5,345.3	3,920.6	6,354.4	2.75
13,176.0	88.86	160.96	6,403.4	-5,430.1	3,947.5	6,443.3	3.60
13,266.0	90.24	162.80	6,404.1	-5,515.6	3,975.4	6,533.2	2.56
13,356.0	89.19	160.63	6,404.5	-5,601.1	4,003.7	6,623.2	2.68
13,445.0	89.23	159.31	6,405.7	-5,684.7	4,034.2	6,712.2	1.48
13,535.0	88.96	159.19	6,407.2	-5,768.8	4,066.0	6,802.2	0.33
13,624.0	90.07	158.27	6,407.9	-5,851.8	4,098.3	6,891.1	1.62
13,714.0	90.91	159.43	6,407.1	-5,935.7	4,130.8	6,981.1	1.59
13,804.0	89.50	159.26	6,406.8	-6,019.9	4,162.5	7,071.1	1.58
13,893.0	90.60	162.79	6,406.7	-6,104.1	4,191.5	7,160.1	4.15
13,983.0	90.77	161.06	6,405.7	-6,189.6	4,219.4	7,250.0	1.93
14,072.0	90.07	160.25	6,405.0	-6,273.6	4,248.9	7,339.0	1.20
14,162.0	89.09	159.65	6,405.7	-6,358.1	4,279.7	7,429.0	1.28
14,252.0	89.83	156.69	6,406.5	-6,441.7	4,313.2	7,518.9	3.39
14,341.0	90.44	158.83	6,406.3	-6,524.0	4,346.9	7,607.8	2.50



Company:	Antero	Local Co-ordinate Reference:	Well Scardina Unit 4H
Project:	Tyler County WV	TVD Reference:	Precision 523. GL 814' + 19' @ 833.0usft
Site:	Weigle East Pad. Dean/Goodfellow/Hawkeye/Sc	MD Reference:	Precision 523 GL 814' + 19' @ 833 0usft
Well:	Scardina Unit 4H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Oklahoma District

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
14,431.0	90.10	157.63	6,405.9	-6,607.6	4,380.3	7,697.8	1.39
14,520.0	90.97	159.54	6,405.1	-6,690.5	4,412.8	7,786.7	2.36
14,610.0	89.80	159.23	6,404.5	-6,774.7	4,444.4	7,876.7	1.34
14,699.0	90.77	159.53	6,404.0	-6,858.0	4,475.8	7,965.7	1.14
14,789.0	91.01	161.33	6,402.6	-6,942.8	4,505.9	8,055.7	2.02
14,878.0	90.74	161.63	6,401.3	-7,027.2	4,534.2	8,144.7	0.45
14,968.0	90.37	160.32	6,400.4	-7,112.2	4,563.5	8,234.6	1.51
15,058.0	89.60	159.07	6,400.4	-7,196.6	4,594.8	8,324.6	1.63
15,148.0	91.14	161.23	6,399.8	-7,281.3	4,625.3	8,414.6	2.95
15,237.0	90.44	160.78	6,398.6	-7,365.4	4,654.3	8,503.6	0.93
15,327.0	91.21	162.71	6,397.3	-7,450.9	4,682.5	8,593.6	2.31
15,416.0	90.87	161.70	6,395.7	-7,535.6	4,709.7	8,682.5	1.20
15,506.0	90.44	160.45	6,394.7	-7,620.7	4,738.8	8,772.5	1.47
15,596.0	90.27	160.63	6,394.1	-7,705.6	4,768.8	8,862.5	0.28
15,685.0	89.76	160.20	6,394.1	-7,789.5	4,798.7	8,951.5	0.75
15,775.0	90.20	159.23	6,394.1	-7,873.9	4,829.9	9,041.5	1.18
15,864.0	89.76	159.17	6,394.1	-7,957.1	4,861.5	9,130.5	0.50
15,954.0	90.27	161.27	6,394.1	-8,041.8	4,891.9	9,220.5	2.40
16,043.0	90.10	160.46	6,393.8	-8,125.8	4,921.1	9,309.4	0.93
16,133.0	89.53	159.96	6,394.1	-8,210.5	4,951.6	9,399.4	0.84
16,222.0	90.84	159.72	6,393.8	-8,294.1	4,982.2	9,488.4	1.50
16,312.0	90.67	160.24	6,392.6	-8,378.6	5,013.0	9,578.4	0.61
16,402.0	90.50	159.33	6,391.7	-8,463.1	5,044.1	9,668.4	1.03
16,491.0	90.20	159.60	6,391.2	-8,546.4	5,075.4	9,757.4	0.45
16,581.0	89.63	159.49	6,391.3	-8,630.7	5,106.8	9,847.4	0.65
16,651.0	88.93	159.99	6,392.2	-8,696.4	5,131.1	9,917.4	1.23
16,709.0	88.93	159.99	6,393.3	-8,750.9	5,150.9	9,975.4	0.00

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
8,398.0	5,985.9	666.2	1,550.0	SCMR
6,623.0	6,164.6	628.3	1,678.2	MDLX
6,767.0	6,260.4	560.2	1,760.9	BRKT
6,820.0	6,290.8	527.7	1,789.4	TLTY
6,921.0	6,335.3	453.6	1,841.2	MRCL_HOT

Checked By: _____ Approved By: _____ Date: _____