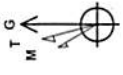




Richard Unit 2H
Dodderidge County WV
Northing: 14242005.14
Easting: 1747848.84
As Drilled



Azimuths to Grid North
 True North: -0.24°
 Magnetic North: -8.82°
 Magnetic Field
 Strength: 52163.9aT
 Dip Angle: 66.77°
 Date: 10/3/2014
 Model: BGGM2014



To convert Magnetic North to Grid, Subtract 8.82°
 To convert True North to Grid, Subtract 0.24°

Precision 523: 0L 1331° +458.10' @ 1350.0usft
 Gr: 1331.0

WELL DETAILS		Richard Unit 2H	
Ground Level:	1331.0	Latitude	39° 13' 9.439 N
Eastings	1747848.84	Longitude	80° 37' 14.442 W
+N/-S	0.0	Northing	14242005.14
+E/-W	0.0	Eastings	1747848.84

SITE DETAILS: Hughes Pad Belton/Carole/Eartewine/Gully/Hughes
 Carole/Belton/McClain/Richard/Eartewine/Hughes/Gul

Site Centre Northing: 14242041.55
 Easting: 1747814.24

Positional Uncertainty: 2.0
 Convergence: 0.24
 Local North: Grid

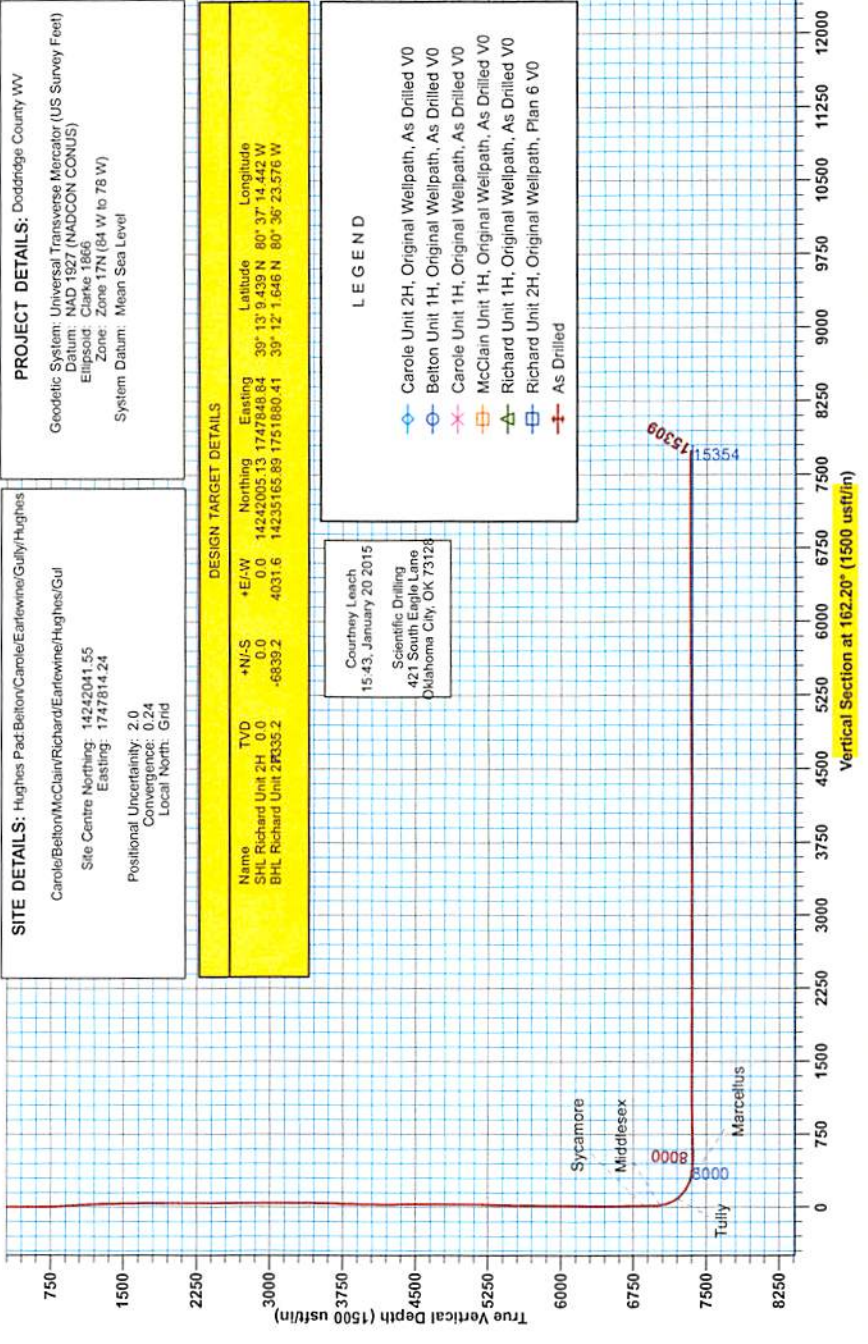
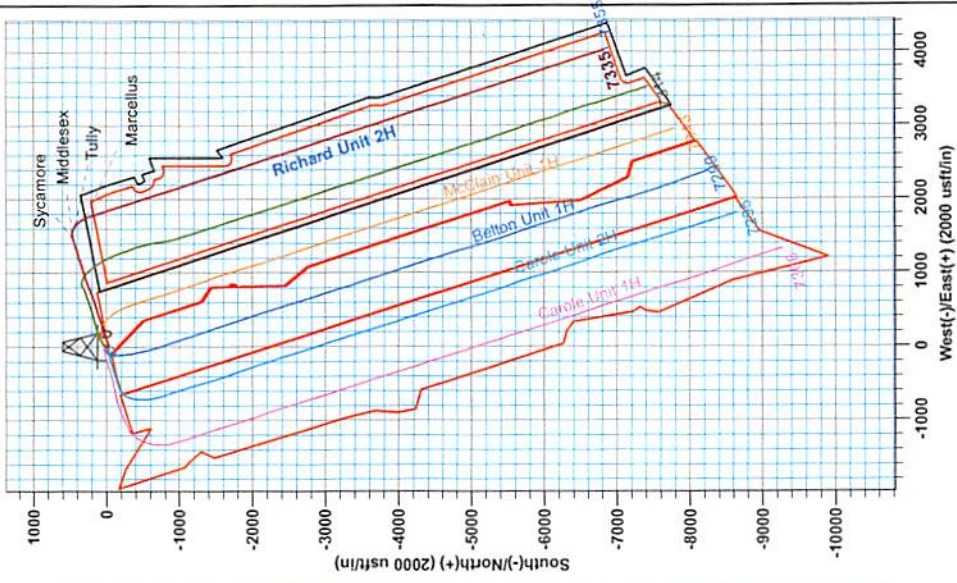
PROJECT DETAILS: Doddridge County WV

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

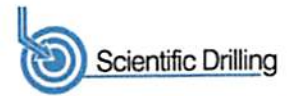
DESIGN TARGET DETAILS			
Name	+E/-W	+N/-S	TVD
SHL Richard Unit 2H	0.0	0.0	0.0
BHL Richard Unit 2H35.2	4031.6	-6839.2	14235165.89

Courtesy Leach
 15.43, January 20 2015
 Scientific Drilling
 421 South Engle Lane
 Oklahoma City, OK 73128

- LEGEND**
- Carole Unit 2H, Original Wellpath, As Drilled V0
 - Belton Unit 1H, Original Wellpath, As Drilled V0
 - Carole Unit 1H, Original Wellpath, As Drilled V0
 - McClain Unit 1H, Original Wellpath, As Drilled V0
 - Richard Unit 1H, Original Wellpath, As Drilled V0
 - Richard Unit 2H, Original Wellpath, Plan 6 V0
 - As Drilled



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Company:	Antero	Local Co-ordinate Reference:	Well Richard Unit 2H
Project:	Doddridge County WV	TVD Reference:	Precision 523: GL 1331' + KB 19' @ 1350.0usft
Site:	Hughes Pad:Belton/Carole/Earlewine/Gully/Hugh	MD Reference:	Precision 523: GL 1331' + KB 19' @ 1350.0usft
Well:	Richard 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	Hughes Pad:Belton/Carole/Earlewine/Gully/Hughes				
Site Position:	Northing:	14,242,041.55 usft	Latitude:	39° 13' 9.801 N	
From: Map	Easting:	1,747,814.24 usft	Longitude:	80° 37' 14.880 W	
Position Uncertainty:	2.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	0.24 °

Well	Richard Unit 2H, Marcellus				
Well Position	+N/-S	0.0 usft	Northing:	14,242,005.14 usft	
	+E/-W	0.0 usft	Easting:	1,747,848.84 usft	
Position Uncertainty	2.0 usft	Wellhead Elevation:	1,350.0 usft	Ground Level:	1,331.0 usft

Wellbore	Original Wellpath
-----------------	-------------------

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2014	10/3/2014	-8.58	66.77	52,164

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	162.20	

Survey Program	Date 1/20/2015				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
31.0	6,306.0	Survey #4 Final Gyro (Original Wellpath)	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4	
6,306.0	15,309.0	Survey #5 MWD (Original Wellpath)	MWD SDI	MWD - Standard ver 1.0.1	

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
31.0	0.10	62.72	31.0	0.0	0.0	0.0	0.32
56.0	0.21	62.72	56.0	0.0	0.1	0.0	0.44
81.0	0.31	62.72	81.0	0.1	0.2	0.0	0.40
106.0	0.41	62.72	106.0	0.2	0.3	-0.1	0.40
131.0	0.30	70.22	131.0	0.2	0.5	-0.1	0.48
156.0	0.17	60.58	156.0	0.3	0.6	-0.1	0.54
181.0	0.12	203.33	181.0	0.3	0.6	-0.1	1.10
206.0	0.01	86.76	206.0	0.2	0.6	-0.1	0.50
231.0	0.03	215.60	231.0	0.2	0.6	0.0	0.15
256.0	0.07	291.16	256.0	0.2	0.6	-0.1	0.28



EOW Completion Report



Company:	Antero	Local Co-ordinate Reference:	Well Richard Unit 2H
Project:	Doddridge County WV	TVD Reference:	Precision 523: GL 1331' + KB 19' @ 1350.0usft
Site:	Hughes Pad:Belton/Carole/Earlewine/Gully/Hugh	MD Reference:	Precision 523: GL 1331' + KB 19' @ 1350.0usft
Well:	Richard Unit 2H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Oklahoma District

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Survey								
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	
281.0	0.06	197.32	281.0	0.2	0.5	-0.1	0.38	
306.0	0.03	180.01	306.0	0.2	0.5	0.0	0.13	
331.0	0.09	231.20	331.0	0.2	0.5	0.0	0.30	
356.0	0.08	100.74	356.0	0.2	0.5	0.0	0.62	
381.0	0.13	58.57	381.0	0.2	0.6	0.0	0.36	
406.0	0.16	207.86	406.0	0.2	0.6	0.0	1.12	
431.0	0.12	171.04	431.0	0.1	0.6	0.1	0.38	
456.0	0.11	112.86	456.0	0.1	0.6	0.1	0.45	
481.0	0.12	175.63	481.0	0.0	0.6	0.1	0.48	
506.0	0.16	158.23	506.0	0.0	0.6	0.2	0.23	
531.0	0.12	169.00	531.0	-0.1	0.6	0.3	0.19	
556.0	0.19	165.96	556.0	-0.1	0.7	0.3	0.28	
581.0	0.14	209.11	581.0	-0.2	0.6	0.4	0.52	
606.0	0.09	123.33	606.0	-0.2	0.7	0.4	0.64	
631.0	0.10	113.54	631.0	-0.3	0.7	0.5	0.08	
656.0	0.14	169.09	656.0	-0.3	0.7	0.5	0.47	
681.0	0.44	155.36	681.0	-0.4	0.8	0.6	1.22	
706.0	1.14	141.19	706.0	-0.7	1.0	1.0	2.89	
731.0	2.23	137.06	731.0	-1.2	1.4	1.6	4.38	
756.0	2.75	139.43	756.0	-2.1	2.2	2.6	2.12	
781.0	3.27	141.56	780.9	-3.1	3.0	3.8	2.13	
806.0	3.64	140.04	805.9	-4.2	3.9	5.2	1.52	
831.0	4.40	139.33	830.8	-5.6	5.1	6.9	3.05	
856.0	4.72	139.20	855.7	-7.1	6.4	8.7	1.28	
881.0	4.77	139.30	880.7	-8.7	7.7	10.6	0.20	
906.0	4.84	139.39	905.6	-10.2	9.1	12.5	0.28	
931.0	4.85	138.74	930.5	-11.8	10.5	14.5	0.22	
956.0	4.86	139.51	955.4	-13.4	11.9	16.4	0.26	
981.0	4.87	139.60	980.3	-15.0	13.2	18.4	0.05	
1,006.0	4.62	138.05	1,005.2	-16.6	14.6	20.3	1.12	
1,031.0	4.19	138.17	1,030.1	-18.0	15.9	22.0	1.72	
1,056.0	4.02	137.55	1,055.1	-19.4	17.1	23.7	0.70	
1,081.0	3.68	138.17	1,080.0	-20.6	18.2	25.2	1.37	
1,106.0	3.42	137.74	1,105.0	-21.8	19.2	26.6	1.05	
1,131.0	3.18	137.84	1,129.9	-22.8	20.2	27.9	0.96	
1,156.0	3.01	137.63	1,154.9	-23.8	21.1	29.1	0.68	
1,181.0	2.98	139.37	1,179.9	-24.8	22.0	30.3	0.38	
1,206.0	2.56	139.94	1,204.8	-25.7	22.8	31.4	1.68	
1,231.0	2.32	139.71	1,229.8	-26.5	23.5	32.4	0.96	
1,256.0	2.15	141.21	1,254.8	-27.3	24.1	33.3	0.72	
1,281.0	1.85	140.45	1,279.8	-28.0	24.6	34.1	1.20	
1,306.0	1.61	143.12	1,304.8	-28.6	25.1	34.9	1.01	
1,331.0	1.56	147.29	1,329.7	-29.1	25.5	35.5	0.50	
1,356.0	1.47	150.05	1,354.7	-29.7	25.8	36.2	0.46	



Company:	Antero	Local Co-ordinate Reference:	Well Richard Unit 2H
Project:	Doddridge County WV	TVD Reference:	Precision 523: GL 1331' + KB 19' @ 1350.0usft
Site:	Hughes Pad:Belton/Carole/Earlewine/Gully/Hugh	MD Reference:	Precision 523: GL 1331' + KB 19' @ 1350.0usft
Well:	Richard Unit 2H	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)
1,381.0	1.28	149.16	1,379.7	-30.2	26.1	36.7	0.76
1,406.0	1.29	150.23	1,404.7	-30.7	26.4	37.3	0.10
1,431.0	1.21	157.25	1,429.7	-31.2	26.7	37.8	0.69
1,456.0	1.02	159.66	1,454.7	-31.6	26.8	38.3	0.78
1,481.0	0.87	162.83	1,479.7	-32.0	27.0	38.7	0.64
1,506.0	0.67	176.43	1,504.7	-32.3	27.0	39.1	1.08
1,531.0	0.64	172.78	1,529.7	-32.6	27.1	39.3	0.21
1,556.0	0.53	169.00	1,554.7	-32.9	27.1	39.6	0.47
1,581.0	0.27	162.72	1,579.7	-33.0	27.1	39.8	1.05
1,606.0	0.26	152.22	1,604.7	-33.2	27.2	39.9	0.20
1,631.0	0.22	152.75	1,629.7	-33.2	27.2	40.0	0.16
1,656.0	0.21	146.00	1,654.7	-33.3	27.3	40.1	0.11
1,681.0	0.17	150.81	1,679.7	-33.4	27.3	40.2	0.17
1,706.0	0.25	142.32	1,704.7	-33.5	27.4	40.2	0.34
1,731.0	0.18	127.13	1,729.7	-33.5	27.4	40.3	0.36
1,756.0	0.30	150.96	1,754.7	-33.6	27.5	40.4	0.61
1,781.0	0.28	142.01	1,779.7	-33.7	27.6	40.5	0.20
1,806.0	0.21	171.31	1,804.7	-33.8	27.6	40.6	0.56
1,831.0	0.19	141.89	1,829.7	-33.9	27.7	40.7	0.41
1,856.0	0.28	139.97	1,854.7	-34.0	27.7	40.8	0.36
1,881.0	0.27	135.30	1,879.7	-34.1	27.8	40.9	0.10
1,906.0	0.19	159.53	1,904.7	-34.1	27.9	41.0	0.50
1,931.0	0.27	139.04	1,929.7	-34.2	27.9	41.1	0.45
1,956.0	0.18	131.01	1,954.7	-34.3	28.0	41.2	0.38
1,981.0	0.06	136.05	1,979.7	-34.3	28.0	41.3	0.48
2,006.0	0.07	44.14	2,004.7	-34.3	28.0	41.3	0.37
2,031.0	0.03	90.40	2,029.7	-34.3	28.1	41.3	0.22
2,056.0	0.10	125.76	2,054.7	-34.3	28.1	41.3	0.31
2,081.0	0.12	77.55	2,079.7	-34.3	28.1	41.3	0.37
2,106.0	0.16	107.69	2,104.7	-34.3	28.2	41.3	0.33
2,131.0	0.19	142.93	2,129.7	-34.4	28.2	41.4	0.44
2,156.0	0.18	161.12	2,154.7	-34.5	28.3	41.5	0.24
2,181.0	0.05	105.16	2,179.7	-34.5	28.3	41.5	0.63
2,206.0	0.13	127.89	2,204.7	-34.5	28.3	41.5	0.34
2,231.0	0.13	130.88	2,229.7	-34.6	28.4	41.6	0.03
2,256.0	0.03	126.07	2,254.7	-34.6	28.4	41.6	0.40
2,281.0	0.08	117.04	2,279.7	-34.6	28.4	41.6	0.20
2,306.0	0.07	104.75	2,304.7	-34.6	28.5	41.6	0.08
2,331.0	0.05	277.65	2,329.7	-34.6	28.5	41.6	0.48
2,356.0	0.10	38.89	2,354.7	-34.6	28.5	41.6	0.53
2,381.0	0.14	167.31	2,379.7	-34.6	28.5	41.7	0.87
2,406.0	0.15	213.31	2,404.7	-34.7	28.5	41.7	0.45
2,431.0	0.22	223.96	2,429.7	-34.7	28.4	41.7	0.31
2,456.0	0.19	188.85	2,454.7	-34.8	28.4	41.8	0.51
2,481.0	0.13	226.24	2,479.7	-34.9	28.3	41.9	0.47



Company:	Antero	Local Co-ordinate Reference:	Well Richard Unit 2H
Project:	Doddridge County WV	TVD Reference:	Precision 523: GL 1331' + KB 19' @ 1350.0usft
Site:	Hughes Pad:Belton/Carole/Earlewine/Gully/Hugh	MD Reference:	Precision 523: GL 1331' + KB 19' @ 1350.0usft
Well:	Richard Unit 2H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Oklahoma District

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Survey							
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
2,506.0	0.16	270.92	2,504.7	-34.9	28.3	41.9	0.45
2,531.0	0.19	273.95	2,529.7	-34.9	28.2	41.8	0.13
2,556.0	0.22	279.59	2,554.7	-34.9	28.1	41.8	0.14
2,581.0	0.22	281.47	2,579.7	-34.8	28.0	41.7	0.03
2,606.0	0.33	262.94	2,604.7	-34.8	27.9	41.7	0.56
2,631.0	0.24	273.55	2,629.7	-34.8	27.8	41.7	0.42
2,656.0	0.29	263.28	2,654.7	-34.9	27.7	41.6	0.28
2,681.0	0.27	266.48	2,679.7	-34.9	27.6	41.6	0.10
2,706.0	0.31	259.63	2,704.7	-34.9	27.4	41.6	0.21
2,731.0	0.24	251.69	2,729.7	-34.9	27.3	41.6	0.32
2,756.0	0.34	263.25	2,754.7	-34.9	27.2	41.6	0.46
2,781.0	0.28	263.11	2,779.7	-34.9	27.1	41.5	0.24
2,806.0	0.42	263.55	2,804.7	-35.0	26.9	41.5	0.56
2,831.0	0.29	269.61	2,829.7	-35.0	26.8	41.5	0.54
2,856.0	0.34	258.51	2,854.7	-35.0	26.6	41.5	0.31
2,881.0	0.30	263.51	2,879.7	-35.0	26.5	41.4	0.19
2,906.0	0.39	260.40	2,904.7	-35.0	26.3	41.4	0.37
2,931.0	0.45	257.38	2,929.7	-35.1	26.1	41.4	0.26
2,956.0	0.41	255.29	2,954.7	-35.1	26.0	41.4	0.17
2,981.0	0.38	255.69	2,979.7	-35.2	25.8	41.4	0.12
3,006.0	0.40	253.25	3,004.7	-35.2	25.6	41.4	0.10
3,031.0	0.44	256.67	3,029.7	-35.3	25.5	41.3	0.19
3,056.0	0.40	248.54	3,054.7	-35.3	25.3	41.3	0.29
3,081.0	0.45	250.47	3,079.7	-35.4	25.1	41.4	0.21
3,106.0	0.48	264.30	3,104.7	-35.4	24.9	41.3	0.46
3,131.0	0.40	252.06	3,129.7	-35.5	24.7	41.3	0.49
3,156.0	0.45	254.52	3,154.7	-35.5	24.5	41.3	0.21
3,181.0	0.46	256.73	3,179.7	-35.6	24.4	41.3	0.08
3,206.0	0.42	250.20	3,204.7	-35.6	24.2	41.3	0.26
3,231.0	0.44	256.09	3,229.7	-35.7	24.0	41.3	0.19
3,256.0	0.43	247.75	3,254.7	-35.7	23.8	41.3	0.26
3,281.0	0.49	259.60	3,279.7	-35.8	23.6	41.3	0.45
3,306.0	0.45	256.03	3,304.7	-35.8	23.4	41.3	0.20
3,331.0	0.48	255.95	3,329.7	-35.9	23.2	41.3	0.12
3,356.0	0.25	41.23	3,354.7	-35.9	23.2	41.2	2.80
3,381.0	1.32	57.22	3,379.7	-35.7	23.4	41.1	4.33
3,406.0	2.89	59.44	3,404.7	-35.2	24.2	40.9	6.29
3,431.0	4.22	61.83	3,429.6	-34.4	25.6	40.6	5.35
3,456.0	5.58	66.26	3,454.5	-33.5	27.5	40.3	5.64
3,481.0	6.39	72.77	3,479.4	-32.6	29.9	40.2	4.22
3,506.0	6.72	77.15	3,504.2	-31.9	32.7	40.3	2.40
3,531.0	6.91	76.95	3,529.0	-31.2	35.6	40.6	0.77
3,556.0	6.92	77.01	3,553.9	-30.5	38.5	40.8	0.05
3,581.0	7.36	72.80	3,578.7	-29.7	41.5	41.0	2.73



EOW Completion Report



Company:	Antero	Local Co-ordinate Reference:	Well Richard Unit 2H
Project:	Doddridge County WV	TVD Reference:	Precision 523: GL 1331' + KB 19' @ 1350.0usft
Site:	Hughes Pad:Belton/Carole/Earlewine/Gully/Hugh	MD Reference:	Precision 523: GL 1331' + KB 19' @ 1350.0usft
Well:	Richard Unit 2H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Oklahoma District

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MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	EW (usft)	V. Sec (usft)	DLeg (°/100usft)
3,606.0	8.14	67.58	3,603.4	-28.6	44.7	40.9	4.20
3,631.0	9.08	64.41	3,628.2	-27.0	48.1	40.4	4.21
3,656.0	9.84	64.31	3,652.8	-25.3	51.8	39.9	3.04
3,681.0	10.49	65.99	3,677.4	-23.4	55.8	39.3	2.86
3,706.0	11.27	64.53	3,702.0	-21.4	60.1	38.8	3.31
3,731.0	11.79	63.46	3,726.5	-19.2	64.6	38.1	2.25
3,756.0	11.82	64.03	3,750.9	-17.0	69.2	37.3	0.48
3,781.0	11.76	63.70	3,775.4	-14.7	73.8	36.6	0.36
3,806.0	11.91	64.53	3,799.9	-12.5	78.4	35.8	0.91
3,831.0	12.51	64.87	3,824.3	-10.2	83.1	35.2	2.42
3,856.0	13.03	64.45	3,848.7	-7.9	88.1	34.4	2.11
3,881.0	13.40	65.00	3,873.0	-5.4	93.3	33.7	1.56
3,906.0	13.57	66.42	3,897.4	-3.0	98.6	33.0	1.49
3,931.0	13.61	68.50	3,921.7	-0.8	104.0	32.5	1.96
3,956.0	14.13	69.34	3,945.9	1.4	109.6	32.2	2.23
3,981.0	14.61	69.47	3,970.1	3.6	115.4	31.9	1.92
4,006.0	15.48	70.02	3,994.3	5.8	121.5	31.6	3.53
4,031.0	16.47	69.09	4,018.3	8.2	128.0	31.3	4.09
4,056.0	17.24	68.86	4,042.2	10.8	134.7	30.9	3.09
4,081.0	18.00	68.91	4,066.1	13.5	141.8	30.5	3.04
4,106.0	18.62	69.09	4,089.8	16.4	149.1	30.0	2.49
4,131.0	19.29	69.82	4,113.4	19.2	156.7	29.6	2.84
4,156.0	20.11	70.22	4,137.0	22.1	164.7	29.3	3.32
4,181.0	20.74	70.33	4,160.4	25.0	172.9	29.0	2.52
4,206.0	21.28	70.94	4,183.8	28.0	181.3	28.8	2.33
4,231.0	21.77	71.82	4,207.0	30.9	190.0	28.6	2.35
4,256.0	22.33	72.69	4,230.2	33.8	199.0	28.6	2.59
4,281.0	22.84	73.06	4,253.3	36.6	208.1	28.8	2.12
4,306.0	23.35	73.76	4,276.3	39.4	217.5	29.0	2.32
4,331.0	24.38	74.37	4,299.1	42.2	227.3	29.3	4.24
4,356.0	25.00	74.62	4,321.8	45.0	237.3	29.7	2.51
4,381.0	25.69	74.73	4,344.4	47.8	247.6	30.2	2.77
4,406.0	26.34	74.58	4,366.9	50.7	258.2	30.6	2.61
4,431.0	26.47	74.02	4,389.3	53.7	268.9	31.1	1.12
4,456.0	26.63	73.35	4,411.7	56.9	279.6	31.3	1.36
4,481.0	26.97	73.54	4,434.0	60.1	290.5	31.6	1.40
4,506.0	26.92	73.29	4,456.3	63.3	301.3	31.8	0.50
4,531.0	26.45	72.63	4,478.6	66.6	312.0	32.0	2.22
4,556.0	26.73	72.22	4,500.9	70.0	322.7	32.0	1.34
4,581.0	27.21	72.02	4,523.2	73.5	333.5	32.0	1.95
4,606.0	27.52	71.97	4,545.4	77.0	344.4	32.0	1.24
4,631.0	27.41	71.21	4,567.6	80.7	355.4	31.8	1.47
4,656.0	27.68	71.01	4,589.8	84.4	366.3	31.6	1.14
4,681.0	27.83	70.92	4,611.9	88.2	377.3	31.4	0.62



EOW Completion Report



Company:	Antero	Local Co-ordinate Reference:	Well Richard Unit 2H
Project:	Doddridge County WV	TVD Reference:	Precision 523: GL 1331' + KB 19' @ 1350.0usft
Site:	Hughes Pad:Belton/Carole/Earlewine/Gully/Hugh	MD Reference:	Precision 523: GL 1331' + KB 19' @ 1350.0usft
Well:	Richard Unit 2H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Oklahoma District

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4,706.0	27.85	70.84	4,634.0	92.0	388.3	31.1	0.17
4,731.0	27.60	70.78	4,656.1	95.8	399.3	30.8	1.01
4,756.0	27.91	71.43	4,678.3	99.6	410.3	30.6	1.73
4,781.0	28.10	72.13	4,700.3	103.3	421.5	30.5	1.52
4,806.0	28.27	72.32	4,722.4	106.9	432.7	30.5	0.77
4,831.0	28.18	72.43	4,744.4	110.5	444.0	30.6	0.42
4,856.0	28.37	72.90	4,766.4	114.0	455.3	30.7	1.17
4,881.0	28.50	73.56	4,788.4	117.4	466.7	30.9	1.36
4,906.0	28.64	74.13	4,810.4	120.8	478.2	31.2	1.23
4,931.0	29.12	74.61	4,832.2	124.0	489.8	31.7	2.13
4,956.0	29.30	74.83	4,854.1	127.2	501.6	32.2	0.84
4,981.0	29.16	74.71	4,875.9	130.4	513.4	32.8	0.61
5,006.0	29.04	74.21	4,897.7	133.7	525.1	33.2	1.08
5,031.0	28.75	73.62	4,919.6	137.0	536.7	33.6	1.63
5,056.0	28.41	72.99	4,941.6	140.5	548.1	33.8	1.82
5,081.0	27.99	72.37	4,963.6	144.0	559.4	33.9	2.05
5,106.0	27.52	71.82	4,985.7	147.6	570.5	33.9	2.14
5,131.0	27.09	71.37	5,007.9	151.2	581.4	33.8	1.91
5,156.0	27.20	71.14	5,030.2	154.8	592.2	33.6	0.61
5,181.0	27.66	71.17	5,052.4	158.6	603.1	33.4	1.84
5,206.0	27.66	71.43	5,074.5	162.3	614.1	33.2	0.48
5,231.0	27.00	70.81	5,096.7	166.0	624.9	33.0	2.88
5,256.0	27.15	70.33	5,119.0	169.8	635.7	32.7	1.06
5,281.0	27.01	69.96	5,141.2	173.7	646.4	32.3	0.88
5,306.0	26.65	69.50	5,163.6	177.6	657.0	31.8	1.66
5,331.0	25.97	68.55	5,186.0	181.5	667.3	31.2	3.20
5,356.0	26.07	68.37	5,208.4	185.6	677.5	30.4	0.51
5,381.0	25.88	67.92	5,230.9	189.6	687.7	29.7	1.10
5,406.0	25.92	67.64	5,253.4	193.8	697.8	28.8	0.51
5,431.0	26.42	67.70	5,275.8	197.9	708.0	28.0	2.00
5,456.0	26.67	67.88	5,298.2	202.2	718.3	27.1	1.05
5,481.0	27.02	68.12	5,320.5	206.4	728.8	26.3	1.47
5,506.0	26.80	67.54	5,342.8	210.7	739.3	25.4	1.37
5,531.0	26.78	66.95	5,365.1	215.0	749.7	24.4	1.07
5,556.0	27.39	67.31	5,387.4	219.5	760.1	23.4	2.53
5,581.0	27.47	69.29	5,409.6	223.7	770.8	22.6	3.66
5,606.0	27.47	69.62	5,431.7	227.8	781.6	22.1	0.61
5,631.0	27.35	69.33	5,453.9	231.8	792.4	21.5	0.72
5,656.0	27.37	69.15	5,476.1	235.9	803.2	21.0	0.34
5,681.0	27.45	69.16	5,498.3	240.0	813.9	20.3	0.32
5,706.0	27.39	68.81	5,520.5	244.1	824.7	19.7	0.69
5,731.0	27.12	69.84	5,542.7	248.1	835.4	19.1	2.17
5,756.0	27.04	70.50	5,565.0	252.0	846.1	18.7	1.24
5,781.0	26.65	70.37	5,587.3	255.8	856.7	18.4	1.58

Company:	Antero	Local Co-ordinate Reference:	Well Richard Unit 2H
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Site:	Hughes Pad:Belton/Carole/Earlewine/Gully/Hugh	MD Reference:	Precision 523: GL 1331' + KB 19' @ 1350.0usft
Well:	Richard Unit 2H	North Reference:	Grid
Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
Design:	As Drilled	Database:	Oklahoma District

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5,806.0	26.28	70.31	5,609.7	259.5	867.2	18.0	1.48
5,831.0	26.43	70.07	5,632.1	263.3	877.7	17.6	0.74
5,856.0	26.61	70.38	5,654.5	267.1	888.2	17.2	0.91
5,881.0	26.56	71.03	5,676.8	270.8	898.7	16.9	1.18
5,906.0	26.58	70.89	5,699.2	274.4	909.3	16.7	0.26
5,931.0	26.51	70.77	5,721.5	278.1	919.8	16.4	0.35
5,956.0	25.64	71.15	5,744.0	281.7	930.2	16.2	3.54
5,981.0	24.97	71.43	5,766.6	285.1	940.4	16.0	2.72
6,006.0	24.83	71.42	5,789.3	288.4	950.3	15.9	0.56
6,031.0	24.84	72.22	5,812.0	291.7	960.3	15.8	1.34
6,056.0	25.05	72.82	5,834.6	294.9	970.4	15.9	1.32
6,081.0	25.06	72.75	5,857.3	298.0	980.5	16.0	0.13
6,106.0	24.94	72.48	5,879.9	301.2	990.6	16.1	0.66
6,131.0	25.58	72.20	5,902.5	304.4	1,000.7	16.1	2.60
6,156.0	25.86	71.61	5,925.1	307.8	1,011.0	16.0	1.52
6,181.0	26.27	71.00	5,947.5	311.3	1,021.4	15.9	1.96
6,206.0	26.14	71.16	5,970.0	314.9	1,031.9	15.6	0.59
6,231.0	25.69	72.14	5,992.4	318.3	1,042.3	15.5	2.48
6,256.0	25.63	72.83	6,015.0	321.6	1,052.6	15.6	1.22
6,281.0	25.88	72.68	6,037.5	324.8	1,062.9	15.7	1.03
6,306.0	26.07	72.94	6,060.0	328.0	1,073.4	15.8	0.89
6,482.0	27.08	70.81	6,217.4	352.5	1,148.2	15.3	0.79
6,571.0	25.69	69.93	6,297.1	365.8	1,185.5	14.1	1.62
6,661.0	23.70	73.15	6,378.9	377.8	1,221.1	13.6	2.67
6,750.0	22.87	73.53	6,460.6	387.9	1,254.8	14.3	0.95
6,839.0	24.02	71.26	6,542.3	398.6	1,288.6	14.4	1.64
6,929.0	26.57	70.36	6,623.6	411.2	1,324.9	13.5	2.87
7,018.0	28.60	73.95	6,702.5	423.8	1,364.1	13.5	2.95
7,108.0	28.66	75.48	6,781.5	435.2	1,405.7	15.4	0.82
7,198.0	27.30	73.47	6,861.0	446.5	1,446.4	17.1	1.84
Sycamore							
7,287.0	25.59	73.79	6,940.7	457.6	1,484.4	18.0	1.93
7,317.0	25.99	73.40	6,967.7	461.3	1,496.9	18.4	1.45
7,347.0	26.97	78.28	6,994.6	464.6	1,509.9	19.2	7.95
7,377.0	28.19	84.61	7,021.1	466.6	1,523.6	21.5	10.58
7,382.0	28.34	85.70	7,025.6	466.8	1,526.0	22.0	10.74
Middlesex							
7,407.0	29.21	90.98	7,047.5	467.2	1,538.0	25.3	10.74
7,437.0	29.70	98.38	7,073.6	466.0	1,552.7	31.0	12.23
7,466.0	30.37	103.85	7,098.7	463.2	1,566.9	38.0	9.72
7,496.0	31.98	109.27	7,124.4	458.7	1,581.7	46.8	10.78
7,526.0	34.46	115.26	7,149.5	452.5	1,596.9	57.4	13.70
7,555.0	37.54	120.29	7,172.9	444.5	1,612.0	69.5	14.71
7,585.0	40.63	125.53	7,196.2	434.2	1,627.8	84.2	15.07



EOW Completion Report



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Wellbore:	Original Wellpath	Survey Calculation Method:	Minimum Curvature
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7,598.0	42.22	127.40	7,206.0	429.1	1,634.7	91.2	15.49	
Tully								
7,615.0	44.34	129.68	7,218.4	421.8	1,643.9	100.9	15.49	
7,645.0	47.91	133.39	7,239.2	407.5	1,660.0	119.5	14.87	
7,675.0	51.31	137.19	7,258.6	391.3	1,676.1	139.8	14.88	
7,705.0	54.87	141.30	7,276.6	373.1	1,691.7	161.9	16.15	
7,734.0	57.93	145.84	7,292.7	353.6	1,706.0	184.8	16.77	
7,764.0	61.52	149.62	7,307.8	331.7	1,719.9	209.9	16.17	
7,794.0	65.58	152.59	7,321.2	308.2	1,732.8	236.2	16.18	
7,823.0	70.02	155.21	7,332.1	284.1	1,744.6	262.8	17.44	
7,830.0	71.07	155.86	7,334.4	278.1	1,747.3	269.4	17.37	
Marcellus								
7,853.0	74.53	157.95	7,341.2	257.9	1,756.0	291.2	17.37	
7,883.0	78.30	161.48	7,348.3	230.6	1,766.1	320.4	16.99	
7,913.0	80.76	164.07	7,353.7	202.4	1,774.8	349.8	11.80	
7,943.0	82.26	163.81	7,358.2	173.9	1,783.0	379.5	5.07	
7,973.0	84.52	162.83	7,361.6	145.3	1,791.6	409.3	8.20	
8,037.0	89.70	161.03	7,364.9	84.6	1,811.4	473.2	8.57	
8,129.0	91.41	161.76	7,364.0	-2.6	1,840.7	565.2	2.02	
8,223.0	92.25	163.06	7,361.0	-92.2	1,869.1	659.1	1.65	
8,317.0	90.71	162.17	7,358.5	-181.8	1,897.2	753.1	1.89	
8,411.0	90.13	161.44	7,357.8	-271.1	1,926.5	847.1	0.99	
8,505.0	91.04	161.24	7,356.9	-360.2	1,956.6	941.1	0.99	
8,598.0	91.21	162.78	7,355.1	-448.6	1,985.3	1,034.0	1.67	
8,692.0	90.54	162.71	7,353.6	-538.4	2,013.2	1,128.0	0.72	
8,786.0	89.97	162.86	7,353.2	-628.2	2,041.0	1,222.0	0.63	
8,880.0	89.97	161.73	7,353.3	-717.7	2,069.6	1,316.0	1.20	
8,974.0	90.37	162.82	7,353.0	-807.2	2,098.2	1,410.0	1.24	
9,068.0	90.57	160.95	7,352.2	-896.6	2,127.5	1,504.0	2.00	
9,161.0	90.00	162.21	7,351.7	-984.8	2,156.8	1,597.0	1.49	
9,256.0	90.47	162.51	7,351.4	-1,075.3	2,185.6	1,692.0	0.59	
9,345.0	89.90	163.95	7,351.1	-1,160.5	2,211.3	1,781.0	1.74	
9,435.0	89.63	162.82	7,351.4	-1,246.8	2,237.0	1,871.0	1.29	
9,524.0	88.99	161.37	7,352.5	-1,331.5	2,264.4	1,959.9	1.78	
9,614.0	89.73	163.08	7,353.5	-1,417.2	2,291.9	2,049.9	2.07	
9,703.0	91.11	163.51	7,352.9	-1,502.4	2,317.5	2,138.9	1.62	
9,793.0	91.31	163.21	7,351.0	-1,588.6	2,343.2	2,228.9	0.40	
9,882.0	90.00	162.50	7,349.9	-1,673.7	2,369.5	2,317.9	1.67	
9,972.0	90.07	161.79	7,349.9	-1,759.3	2,397.1	2,407.9	0.79	
10,061.0	90.37	161.50	7,349.5	-1,843.8	2,425.1	2,496.9	0.47	
10,151.0	90.13	160.20	7,349.2	-1,928.8	2,454.6	2,586.8	1.47	
10,241.0	90.00	162.12	7,349.0	-2,014.0	2,483.7	2,676.8	2.14	
10,330.0	90.84	160.99	7,348.4	-2,098.4	2,511.8	2,765.8	1.58	
10,420.0	89.93	162.22	7,347.8	-2,183.8	2,540.2	2,855.8	1.70	



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10,509.0	89.66	163.64	7,348.1	-2,268.9	2,566.3	2,944.8	1.62
10,599.0	89.56	162.69	7,348.7	-2,355.0	2,592.4	3,034.8	1.06
10,688.0	89.70	161.84	7,349.3	-2,439.8	2,619.5	3,123.8	0.97
10,778.0	90.13	161.70	7,349.4	-2,525.3	2,647.7	3,213.8	0.50
10,867.0	89.77	162.93	7,349.5	-2,610.1	2,674.7	3,302.8	1.44
10,957.0	90.10	161.87	7,349.6	-2,695.8	2,701.9	3,392.8	1.23
11,046.0	90.54	162.14	7,349.1	-2,780.5	2,729.4	3,481.8	0.58
11,136.0	89.87	161.40	7,348.8	-2,866.0	2,757.6	3,571.7	1.11
11,226.0	90.13	161.43	7,348.8	-2,951.3	2,786.3	3,661.7	0.29
11,315.0	90.77	162.56	7,348.1	-3,035.9	2,813.8	3,750.7	1.46
11,404.0	90.24	162.22	7,347.3	-3,120.7	2,840.7	3,839.7	0.71
11,494.0	90.24	163.10	7,346.9	-3,206.6	2,867.5	3,929.7	0.98
11,583.0	90.44	162.59	7,346.4	-3,291.7	2,893.8	4,018.7	0.62
11,673.0	89.83	162.51	7,346.2	-3,377.5	2,920.8	4,108.7	0.68
11,763.0	90.57	161.95	7,345.9	-3,463.2	2,948.2	4,198.7	1.03
11,852.0	90.81	162.57	7,344.8	-3,548.0	2,975.3	4,287.7	0.75
11,942.0	91.08	162.90	7,343.3	-3,633.9	3,002.0	4,377.7	0.47
12,032.0	90.54	162.33	7,342.0	-3,719.8	3,028.9	4,467.7	0.87
12,121.0	89.77	160.82	7,341.8	-3,804.3	3,057.1	4,556.7	1.90
12,211.0	89.90	161.43	7,342.1	-3,889.4	3,086.2	4,646.7	0.69
12,300.0	90.23	160.98	7,342.0	-3,973.7	3,114.8	4,735.6	0.63
12,389.0	89.87	161.12	7,341.9	-4,057.8	3,143.7	4,824.6	0.43
12,479.0	90.64	162.44	7,341.5	-4,143.3	3,171.9	4,914.6	1.70
12,568.0	91.04	161.30	7,340.2	-4,227.9	3,199.6	5,003.6	1.36
12,657.0	91.01	163.37	7,338.6	-4,312.7	3,226.6	5,092.6	2.33
12,747.0	89.97	164.07	7,337.8	-4,399.1	3,251.8	5,182.5	1.39
12,836.0	90.37	163.45	7,337.6	-4,484.5	3,276.7	5,271.5	0.83
12,926.0	90.57	162.07	7,336.8	-4,570.5	3,303.4	5,361.5	1.55
13,015.0	91.24	161.55	7,335.4	-4,655.0	3,331.2	5,450.5	0.95
13,105.0	90.50	161.44	7,334.0	-4,740.3	3,359.7	5,540.5	0.83
13,194.0	89.76	162.87	7,333.8	-4,825.1	3,387.0	5,629.5	1.81
13,283.0	89.63	161.61	7,334.3	-4,909.8	3,414.1	5,718.5	1.42
13,373.0	90.67	162.44	7,334.1	-4,995.4	3,441.9	5,808.5	1.48
13,462.0	90.77	162.62	7,333.0	-5,080.3	3,468.6	5,897.5	0.23
13,552.0	91.28	162.04	7,331.4	-5,166.1	3,495.9	5,987.4	0.86
13,641.0	89.40	161.71	7,330.8	-5,250.6	3,523.6	6,076.4	2.14
13,731.0	89.87	161.96	7,331.4	-5,336.1	3,551.7	6,166.4	0.59
13,820.0	90.03	162.69	7,331.5	-5,420.9	3,578.7	6,255.4	0.84
13,910.0	89.53	161.48	7,331.8	-5,506.6	3,606.4	6,345.4	1.45
13,999.0	90.74	163.14	7,331.6	-5,591.4	3,633.4	6,434.4	2.31
14,089.0	89.83	161.79	7,331.2	-5,677.2	3,660.5	6,524.4	1.81
14,179.0	89.40	161.43	7,331.8	-5,762.6	3,688.9	6,614.4	0.62
14,269.0	89.30	162.29	7,332.8	-5,848.1	3,717.0	6,704.4	0.96
14,358.0	90.91	162.67	7,332.6	-5,933.0	3,743.7	6,793.4	1.86



Company: Antero	Local Co-ordinate Reference: Well Richard Unit 2H
Project: Doddridge County WV	TVD Reference: Precision 523: GL 1331' + KB 19' @ 13500usft
Site: Hughes Pad:Belton/Carole/Earlewine/Gully/Hugh	MD Reference: Precision 523: GL 1331' + KB 19' @ 13500usft
Well: Richard Unit 2H	North Reference: Grid
Wellbore: Original Wellpath	Survey Calculation Method: Minimum Curvature
Design: As Drilled	Database: Oklahoma District

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MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)
14,448.0	90.37	161.85	7,331.6	-6,018.7	3,771.2	6,883.4	1.09
14,538.0	90.60	163.54	7,330.9	-6,104.6	3,797.9	6,973.4	1.90
14,627.0	89.06	162.71	7,331.1	-6,189.8	3,823.8	7,062.4	1.97
14,717.0	89.16	162.13	7,332.5	-6,275.5	3,850.9	7,152.4	0.65
14,806.0	89.87	161.07	7,333.3	-6,360.0	3,879.0	7,241.3	1.43
14,896.0	90.47	162.96	7,333.0	-6,445.6	3,906.8	7,331.3	2.20
14,985.0	90.61	161.47	7,332.2	-6,530.3	3,934.0	7,420.3	1.68
15,075.0	90.40	162.91	7,331.4	-6,616.0	3,961.5	7,510.3	1.62
15,165.0	88.92	162.42	7,331.9	-6,701.9	3,988.3	7,600.3	1.73
15,245.0	88.59	162.57	7,333.6	-6,778.2	4,012.4	7,680.3	0.45
15,309.0	88.59	162.57	7,335.2	-6,839.2	4,031.6	7,744.3	0.00

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
7,198.0	6,861.0	446.5	1,446.4	Sycamore
7,382.0	7,025.6	466.8	1,526.0	Middlesex
7,598.0	7,206.0	429.1	1,634.7	Tully
7,830.0	7,334.4	278.1	1,747.3	Marcellus

Checked By: _____	Approved By: _____	Date: _____
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