



## **EQT Production - Marcellus**

**Wetzel County, WV**  
**Wetzel County 514567**  
**Well #514567**

**Main Wellbore**

**Design: AS Drilled Surveys**

## **Standard Survey Report**

**22 July, 2014**



**Where energy meets innovation.**  
WV Department of  
Environmental Protection

**10/28/2016**



Where energy meets innovation

Database:	US State Plane 1927	Local Co-ordinate Reference:	US State Plane 1927
Company:	QDI Petroleum - Minerals	TVD Reference:	US State Plane 1927
Project:	West Virginia, WV	MD Reference:	US State Plane 1927
Site:	West Virginia, WV	North Reference:	US State Plane 1927
Well:	West Virginia	Survey Calculation Method:	Minimum Curvature
Wellbore:	West Virginia		
Design:	West Virginia		

Project:	West Virginia		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	West Virginia North 4701		Using geodetic scale factor

Site:	West Virginia				
Site Position:		Northing:	386,623.50 usft	Latitude:	39.56
From:	Map	Easting:	1,695,492.14 usft	Longitude:	-80.58
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.69 °

Well:	West Virginia					
Well Position	+N-S	0.0 usft	Northing:	386,623.50 usft	Latitude:	39° 33' 23.336 N
	+E-W	0.0 usft	Easting:	1,695,492.14 usft	Longitude:	80° 34' 48.007 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	1,443.0 usft

Wellbore:	Main Wellbore				
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010_14	7/4/2014	-8.68	66.99	52,398

Design:	West Virginia				
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Audit Notes:

Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
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Vertical Section:	Depth From (TVD) (usft)	+N-S (usft)	+E-W (usft)	Direction (°)
	0.0	0.0	0.0	158.88

Survey Program		Date			
From (')	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	5,893.0	514567 VES Gyros (Main Wellbore)	GyroFlex		
0.00	17,430.0	Phoenix MWD (Main Wellbore)	MWD+IGRF	MWD+IGRF v3 standard declination	

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	-1,459.0	0.0	0.0	0.0	0.00	0.00	0.00
103.0	0.35	126.74	103.0	-1,356.0	-0.2	0.3	0.2	0.34	0.34	0.00
203.0	0.66	137.33	203.0	-1,256.0	-0.8	0.9	1.0	0.32	0.31	10.59
303.0	0.62	141.33	303.0	-1,156.0	-1.6	1.6	1.9	0.06	-0.04	4.00
403.0	0.28	133.58	403.0	-1,056.0	-2.2	2.1	2.6	0.34	-0.34	-7.75
503.0	0.22	130.50	503.0	-956.0	-2.5	2.5	3.0	0.06	-0.06	-3.08
603.0	0.36	149.16	603.0	-856.0	-2.9	2.8	3.4	0.17	0.14	18.66
703.0	0.06	151.87	703.0	-756.0	-3.2	2.9	3.7	0.30	-0.30	2.71

Database:	COMPASS 5000.1	Local Co-ordinate Reference:	WGS 84
Company:	Q.T. Production, Inc.	TVD Reference:	KB - 5400000
Project:	PHOENIX, WY	MD Reference:	KB - 5400000
Site:	PHOENIX, WY	North Reference:	KB - 5400000
Well:	PHOENIX	Survey Calculation Method:	Manual
Wellbore:	PHOENIX		
Design:	PHOENIX		

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/S (usft)	+E/W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
803.0	0.13	125.00	803.0	-656.0	-3.3	3.1	3.9	0.08	0.07	-26.87
903.0	0.13	102.78	903.0	-556.0	-3.4	3.3	4.0	0.05	0.00	-22.22
1,003.0	0.05	99.10	1,003.0	-456.0	-3.5	3.4	4.1	0.08	-0.08	-3.68
1,103.0	0.20	93.64	1,103.0	-356.0	-3.5	3.6	4.1	0.15	0.15	-5.46
1,203.0	0.34	87.84	1,203.0	-256.0	-3.5	4.1	4.2	0.14	0.14	-5.80
1,303.0	0.36	86.56	1,303.0	-156.0	-3.5	4.7	4.3	0.02	0.02	-1.28
1,403.0	0.33	90.18	1,403.0	-56.0	-3.4	5.3	4.4	0.04	-0.03	3.62
1,503.0	0.41	85.60	1,503.0	44.0	-3.4	6.0	4.5	0.09	0.08	-4.58
1,603.0	0.49	84.89	1,603.0	144.0	-3.3	6.7	4.6	0.08	0.08	-0.71
1,703.0	0.41	61.42	1,703.0	244.0	-3.1	7.5	4.5	0.20	-0.08	-23.47
1,803.0	0.51	54.04	1,803.0	344.0	-2.7	8.2	4.2	0.12	0.10	-7.38
1,903.0	0.34	57.21	1,903.0	444.0	-2.3	8.8	3.9	0.17	-0.17	3.17
2,003.0	0.76	53.89	2,003.0	544.0	-1.7	9.6	3.5	0.42	0.42	-3.32
2,103.0	0.92	51.10	2,102.9	643.9	-0.8	10.7	2.9	0.17	0.16	-2.79
2,203.0	1.21	36.67	2,202.9	743.9	0.5	12.0	1.8	0.39	0.29	-14.43
2,303.0	1.23	29.42	2,302.9	843.9	2.3	13.1	0.3	0.16	0.02	-7.25
2,403.0	1.66	26.21	2,402.9	943.9	4.5	14.3	-1.7	0.44	0.43	-3.21
2,503.0	1.58	15.99	2,502.8	1,043.8	7.2	15.3	-4.1	0.30	-0.08	-10.22
2,603.0	1.61	12.93	2,602.8	1,143.8	9.9	16.0	-6.6	0.09	0.03	-3.06
2,703.0	1.83	9.29	2,702.8	1,243.8	12.8	16.6	-9.4	0.25	0.22	-3.64
2,803.0	1.72	7.54	2,802.7	1,343.7	15.9	17.0	-12.3	0.12	-0.11	-1.75
2,903.0	1.82	8.72	2,902.7	1,443.7	18.9	17.5	-15.2	0.11	0.10	1.18
3,003.0	1.61	8.55	3,002.6	1,543.6	21.9	17.9	-18.0	0.21	-0.21	-0.17
3,103.0	1.31	344.17	3,102.6	1,643.6	24.4	17.8	-20.5	0.68	-0.30	-24.38
3,203.0	0.75	311.21	3,202.6	1,743.6	25.9	17.0	-22.1	0.79	-0.56	-32.96
3,303.0	0.54	324.70	3,302.6	1,843.6	26.7	16.3	-23.1	0.26	-0.21	13.49
3,403.0	0.86	330.34	3,402.6	1,943.6	27.7	15.6	-24.2	0.33	0.32	5.64
3,503.0	0.80	327.36	3,502.5	2,043.5	29.0	14.9	-25.6	0.07	-0.06	-2.98
3,603.0	0.95	322.96	3,602.5	2,143.5	30.2	14.0	-27.0	0.16	0.15	-4.40
3,703.0	0.95	320.74	3,702.5	2,243.5	31.5	13.0	-28.4	0.04	0.00	-2.22
3,803.0	0.96	316.66	3,802.5	2,343.5	32.8	11.9	-29.9	0.07	0.01	-4.08
3,903.0	0.79	317.91	3,902.5	2,443.5	33.9	10.8	-31.2	0.17	-0.17	1.25
4,003.0	0.81	321.81	4,002.5	2,543.5	35.0	9.9	-32.4	0.06	0.02	3.90
4,103.0	0.71	322.52	4,102.5	2,643.5	36.0	9.1	-33.6	0.10	-0.10	0.71
4,203.0	0.79	323.19	4,202.5	2,743.5	37.1	8.3	-34.8	0.08	0.08	0.67
4,303.0	0.81	324.05	4,302.5	2,843.5	38.2	7.5	-36.0	0.02	0.02	0.86
4,403.0	0.69	329.74	4,402.4	2,943.4	39.3	6.8	-37.2	0.14	-0.12	5.69
4,503.0	0.59	332.96	4,502.4	3,043.4	40.3	6.2	-38.3	0.11	-0.10	3.22
4,603.0	0.56	333.72	4,602.4	3,143.4	41.2	5.8	-39.3	0.03	-0.03	0.76
4,703.0	0.80	343.46	4,702.4	3,243.4	42.3	5.4	-40.4	0.27	0.24	9.74
4,803.0	0.67	349.37	4,802.4	3,343.4	43.5	5.1	-41.7	0.15	-0.13	5.91
4,903.0	0.29	357.87	4,902.4	3,443.4	44.3	4.9	-42.6	0.39	-0.38	8.30



**Phoenix Technology Services**  
Survey Report



Where energy meets innovation.

Database: J:\Projects\1008121081\1008121081.DW	Local Co-ordinate Reference: NAD 83
Company: JH Petroleum - Marcellus	TVD Reference: NAD 83
Project: Wells: Quanta, WV	MD Reference: NAD 83
Site: W222 - Quanta, WV	North Reference: NAD 83
Well: Wellbore: Quanta	Survey Calculation Method: Minimum Curvature
Design: 420-1081 Survey	

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,003.0	0.08	327.10	5,002.4	3,543.4	44.7	4.9	-42.9	0.22	-0.21	-30.57
5,103.0	0.28	313.21	5,102.4	3,643.4	44.9	4.7	-43.1	0.20	0.20	-13.89
5,203.0	0.56	305.29	5,202.4	3,743.4	45.3	4.1	-43.7	0.29	0.28	-7.92
5,303.0	0.50	308.24	5,302.4	3,843.4	45.9	3.4	-44.4	0.07	-0.06	2.95
5,403.0	0.25	307.71	5,402.4	3,943.4	46.3	2.9	-44.9	0.25	-0.25	-0.53
5,503.0	0.19	314.54	5,502.4	4,043.4	46.5	2.6	-45.2	0.07	-0.06	6.83
5,603.0	0.23	316.99	5,602.4	4,143.4	46.8	2.3	-45.5	0.04	0.04	2.45
5,703.0	0.37	324.98	5,702.4	4,243.4	47.2	2.0	-45.9	0.15	0.14	7.97
5,803.0	0.45	314.09	5,802.4	4,343.4	47.7	1.5	-46.6	0.11	0.08	-10.87
5,893.0	0.69	305.80	5,892.4	4,433.4	48.3	0.8	-47.2	0.28	0.27	-9.21
5,907.0	0.60	323.20	5,906.4	4,447.4	48.4	0.7	-47.4	1.53	-0.64	124.29
5,939.0	2.20	295.30	5,938.4	4,479.4	48.8	0.1	-47.9	5.29	5.00	-87.19
5,971.0	6.50	287.10	5,970.3	4,511.3	49.6	-2.2	-49.1	13.54	13.44	-25.63
6,003.0	9.50	285.90	6,002.0	4,543.0	50.9	-6.5	-51.2	9.39	9.38	-3.75
6,034.0	9.80	285.50	6,032.5	4,573.5	52.3	-11.5	-53.5	0.99	0.97	-1.29
6,066.0	9.10	284.10	6,064.1	4,605.1	53.6	-16.6	-55.8	2.30	-2.19	-4.38
6,098.0	9.60	273.10	6,095.7	4,636.7	54.4	-21.7	-57.5	5.79	1.56	-34.38
6,129.0	11.80	263.20	6,126.1	4,667.1	54.1	-27.4	-58.4	9.22	7.10	-31.94
6,161.0	13.10	259.60	6,157.4	4,698.4	53.1	-34.3	-58.7	4.73	4.06	-11.25
6,193.0	14.40	261.60	6,188.5	4,729.5	51.9	-41.8	-58.9	4.33	4.06	6.25
6,224.0	17.60	259.10	6,218.3	4,759.3	50.4	-50.2	-59.1	10.56	10.32	-8.06
6,256.0	19.90	255.30	6,248.6	4,789.6	48.1	-60.2	-58.8	8.13	7.19	-11.88
6,288.0	23.10	255.00	6,278.3	4,819.3	45.1	-71.5	-58.1	10.01	10.00	-0.94
6,319.0	25.00	254.10	6,308.6	4,847.6	41.7	-83.7	-57.1	6.24	6.13	-2.90
6,351.0	28.00	251.90	6,335.3	4,876.3	37.6	-97.3	-55.6	9.86	9.38	-6.88
6,383.0	31.00	249.40	6,363.1	4,904.1	32.3	-112.2	-53.4	10.13	9.38	-7.81
6,414.0	33.90	247.70	6,389.3	4,930.3	26.2	-127.7	-50.4	9.81	9.35	-5.48
6,446.0	36.90	245.60	6,415.4	4,956.4	18.9	-144.7	-46.4	10.12	9.38	-6.56
6,510.0	42.50	248.40	6,464.6	5,005.6	3.0	-182.3	-38.1	9.18	8.75	4.38
6,573.0	40.50	246.90	6,511.8	5,052.8	-12.9	-220.9	-30.0	3.54	-3.17	-2.38
6,636.0	40.50	245.80	6,559.7	5,100.7	-29.3	-258.4	-21.1	1.13	0.00	-1.75
6,700.0	41.40	247.00	6,608.0	5,149.0	-46.1	-296.8	-12.0	1.87	1.41	1.88
6,763.0	41.40	245.90	6,655.3	5,196.3	-62.7	-335.0	-3.1	1.15	0.00	-1.75
6,826.0	41.50	246.60	6,702.5	5,243.5	-79.5	-373.2	6.1	0.75	0.16	1.11
6,889.0	41.50	245.80	6,749.7	5,290.7	-96.4	-411.4	15.2	0.84	0.00	-1.27
6,953.0	41.90	246.40	6,797.5	5,338.5	-113.6	-450.3	24.6	0.88	0.63	0.94
7,016.0	41.90	246.00	6,844.4	5,385.4	-130.6	-488.8	33.9	0.42	0.00	-0.63
7,079.0	41.80	245.90	6,891.3	5,432.3	-147.7	-527.2	43.3	0.19	-0.16	-0.16
7,143.0	41.80	245.50	6,939.0	5,480.0	-165.3	-566.1	53.0	0.42	0.00	-0.63
7,206.0	41.80	245.50	6,986.0	5,527.0	-182.7	-604.3	62.7	0.00	0.00	0.00
7,269.0	42.10	245.80	7,032.8	5,573.8	-200.1	-642.7	72.4	0.57	0.48	0.48
7,332.0	42.30	245.40	7,079.5	5,620.5	-217.6	-681.2	82.1	0.53	0.32	-0.63

Database:	Wellbore Survey	Local Co-ordinate Reference:	Wellbore Survey
Company:	Phoenix Technology Services	TVD Reference:	Wellbore Survey
Project:	Wellbore Survey	MD Reference:	Wellbore Survey
Site:	Wellbore Survey	North Reference:	Wellbore Survey
Well:	Wellbore Survey	Survey Calculation Method:	Wellbore Survey
Wellbore:	Wellbore Survey		
Design:	Wellbore Survey		

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,396.0	42.20	246.30	7,126.9	5,667.9	-235.2	-720.5	91.8	0.96	-0.16	1.41
7,427.0	43.50	248.70	7,149.6	5,690.6	-243.2	-739.9	95.9	6.73	4.19	7.74
7,459.0	42.70	248.70	7,173.0	5,714.0	-251.2	-760.3	99.8	2.50	-2.50	0.00
7,490.0	42.10	244.50	7,195.8	5,736.8	-259.5	-779.5	104.2	9.34	-1.94	-13.55
7,522.0	42.20	237.90	7,219.6	5,760.6	-269.8	-798.3	110.8	13.84	0.31	-20.63
7,554.0	43.20	231.70	7,243.1	5,784.1	-282.3	-816.0	119.6	13.50	3.13	-19.38
7,585.0	44.20	226.70	7,265.5	5,806.5	-296.3	-832.2	130.2	11.60	3.23	-16.13
7,617.0	44.40	222.90	7,288.4	5,829.4	-312.1	-847.9	142.7	8.32	0.63	-11.88
7,648.0	45.60	218.90	7,310.4	5,851.4	-328.7	-862.3	156.2	9.91	3.87	-12.90
7,680.0	46.70	215.20	7,332.5	5,873.5	-347.1	-876.2	171.6	9.02	3.44	-11.56
7,711.0	48.20	211.60	7,353.5	5,894.5	-366.2	-888.7	187.9	9.83	4.84	-11.61
7,743.0	49.30	210.30	7,374.6	5,915.6	-366.8	-901.1	205.8	4.60	3.44	-4.06
7,774.0	50.70	206.60	7,394.5	5,935.5	-407.7	-912.4	224.1	10.20	4.52	-11.94
7,806.0	52.80	203.70	7,414.3	5,955.3	-430.4	-923.1	244.3	9.68	6.56	-9.06
7,838.0	54.50	200.00	7,433.3	5,974.3	-454.4	-932.6	265.9	10.72	5.31	-11.56
7,869.0	56.90	197.40	7,450.8	5,991.8	-478.6	-940.8	288.2	10.39	7.74	-8.39
7,901.0	58.90	194.30	7,467.8	6,008.8	-504.7	-948.2	312.3	10.31	6.25	-9.69
7,932.0	60.40	191.30	7,483.5	6,024.5	-530.8	-954.2	336.8	9.65	4.84	-9.68
7,964.0	61.50	187.80	7,499.0	6,040.0	-558.4	-958.8	362.9	10.16	3.44	-10.94
7,996.0	63.50	185.80	7,513.8	6,054.8	-586.5	-962.2	389.9	8.35	6.25	-6.25
8,027.0	65.40	183.30	7,527.1	6,068.1	-614.4	-964.4	416.9	9.51	6.13	-8.06
8,059.0	67.30	180.70	7,540.0	6,081.0	-643.7	-965.4	445.4	9.52	5.94	-8.13
8,090.0	69.50	178.40	7,551.4	6,092.4	-672.5	-965.2	473.7	9.90	7.10	-7.42
8,122.0	71.70	176.80	7,562.0	6,103.0	-702.7	-963.9	503.6	8.34	6.88	-5.00
8,138.4	72.93	176.03	7,567.0	6,108.0	-718.3	-962.9	519.0	8.74	7.49	-4.72
8,154.0	74.10	175.30	7,571.4	6,112.4	-733.2	-961.8	533.9	8.74	7.51	-4.66
8,185.0	76.20	173.40	7,579.4	6,120.4	-763.0	-958.8	563.7	9.00	6.77	-6.13
8,217.0	78.00	171.20	7,586.5	6,127.5	-793.9	-954.6	594.9	8.75	5.63	-6.88
8,248.0	80.00	169.80	7,592.4	6,133.4	-823.9	-949.6	625.3	7.83	6.45	-4.52
8,280.0	82.10	168.50	7,597.4	6,138.4	-855.0	-943.7	656.9	7.69	6.56	-4.06
8,312.0	83.50	166.50	7,601.4	6,142.4	-866.0	-936.8	688.6	7.59	4.38	-6.25
8,343.0	85.60	164.70	7,604.4	6,145.4	-915.8	-929.1	719.4	8.90	6.77	-5.81
8,406.0	88.40	160.70	7,607.7	6,148.7	-975.9	-910.4	782.0	7.74	4.44	-6.35
8,469.0	87.90	161.20	7,609.7	6,150.7	-1,035.4	-889.9	844.3	1.12	-0.79	0.79
8,533.0	87.20	160.40	7,612.4	6,153.4	-1,095.8	-868.8	907.6	1.66	-1.09	-1.25
8,596.0	88.10	160.50	7,615.0	6,156.0	-1,155.1	-847.8	969.9	1.44	1.43	0.16
8,659.0	89.10	159.10	7,616.6	6,157.6	-1,214.2	-826.0	1,032.1	2.73	1.59	-2.22
8,722.0	87.40	156.70	7,618.5	6,159.5	-1,272.6	-802.3	1,093.9	4.67	-2.70	-3.81
8,785.0	88.00	157.60	7,621.0	6,162.0	-1,330.6	-777.9	1,155.5	1.72	0.95	1.43
8,848.0	91.10	161.50	7,621.5	6,162.5	-1,389.6	-755.9	1,217.7	7.91	4.92	6.19
8,911.0	90.10	160.90	7,620.8	6,161.8	-1,449.2	-735.6	1,280.1	1.85	-1.59	-0.95



Database:	Oil Field - Eagle 1000 02	Local Co-ordinate Reference:	North American Datum 1983
Company:	Oil Production - Mississippi	TVD Reference:	NA 83 - 1011 Point
Project:	Wells - Cassidy, WY	MD Reference:	NA 83 - 1011 Point
Site:	Woods County, WY	North Reference:	NA 83 - 1011 Point
Well:	Woods County, WY	Survey Calculation Method:	Minimum Curvature
Wellbore:	Woods County, WY		
Design:	Oil Field Survey		

Survey											
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
8,974.0	88.30	158.90	7,621.7	6,162.7	-1,508.4	-713.9	1,342.3	4.27	-2.86	-3.17	
9,016.9	88.30	159.44	7,623.0	6,164.0	-1,548.4	-698.7	1,384.5	1.27	0.00	1.27	
9,037.0	88.30	159.70	7,623.6	6,164.6	-1,567.3	-691.7	1,404.4	1.27	0.00	1.27	
9,100.0	89.30	162.00	7,624.9	6,165.9	-1,626.8	-671.0	1,466.8	3.98	1.59	3.65	
9,163.0	90.10	162.20	7,625.2	6,166.2	-1,696.7	-651.7	1,529.3	1.31	1.27	0.32	
9,226.0	90.10	163.30	7,625.1	6,166.1	-1,746.9	-633.0	1,592.0	1.75	0.00	1.75	
9,290.0	89.50	163.40	7,625.4	6,166.4	-1,808.2	-614.6	1,655.7	0.95	-0.94	0.16	
9,353.0	89.20	164.40	7,626.1	6,167.1	-1,868.7	-597.2	1,718.4	1.66	-0.48	1.59	
9,416.0	89.10	164.80	7,627.0	6,168.0	-1,929.4	-580.4	1,781.3	0.65	-0.16	0.63	
9,479.0	88.20	164.30	7,628.5	6,169.5	-1,990.2	-563.7	1,844.1	1.63	-1.43	-0.79	
9,542.0	88.10	164.20	7,630.5	6,171.5	-2,050.8	-546.6	1,906.8	0.22	-0.16	-0.16	
9,605.0	87.60	163.90	7,632.9	6,173.9	-2,111.3	-529.3	1,969.5	0.93	-0.79	-0.48	
9,668.0	88.60	164.00	7,635.0	6,176.0	-2,171.8	-511.9	2,032.3	1.60	1.59	0.16	
9,731.0	92.50	163.90	7,634.4	6,175.4	-2,232.3	-494.5	2,095.0	6.19	6.19	-0.16	
9,795.0	92.20	162.80	7,631.8	6,172.8	-2,293.6	-476.1	2,158.7	1.78	-0.47	-1.72	
9,858.0	92.10	162.30	7,629.4	6,170.4	-2,353.6	-457.3	2,221.3	0.81	-0.16	-0.79	
9,921.0	91.10	162.80	7,627.6	6,168.6	-2,413.7	-438.4	2,283.8	1.77	-1.59	0.79	
9,983.0	89.90	163.10	7,627.1	6,168.1	-2,473.0	-420.2	2,345.5	2.00	-1.94	0.48	
10,046.0	89.30	163.10	7,627.5	6,168.5	-2,533.3	-401.9	2,408.2	0.95	-0.95	0.00	
10,109.0	89.00	162.90	7,628.5	6,169.5	-2,593.5	-383.5	2,470.8	0.57	-0.48	-0.32	
10,172.0	88.20	162.80	7,630.0	6,171.0	-2,653.7	-364.9	2,533.5	1.28	-1.27	-0.16	
10,235.0	89.20	162.90	7,631.4	6,172.4	-2,713.9	-346.3	2,596.1	1.60	1.59	0.16	
10,298.0	90.90	162.90	7,631.4	6,172.4	-2,774.1	-327.8	2,658.8	2.70	2.70	0.00	
10,361.0	89.80	162.30	7,631.0	6,172.0	-2,834.2	-309.0	2,721.4	1.99	-1.75	-0.95	
10,424.0	88.90	159.60	7,631.7	6,172.7	-2,893.7	-288.4	2,783.8	4.52	-1.43	-4.29	
10,487.0	89.20	159.90	7,632.7	6,173.8	-2,952.8	-266.6	2,846.0	0.87	0.48	0.48	
10,550.0	89.60	160.20	7,633.4	6,174.4	-3,012.1	-245.1	2,908.2	0.79	0.63	0.48	
10,613.0	89.80	161.10	7,633.7	6,174.7	-3,071.5	-224.2	2,970.6	1.46	0.32	1.43	
10,676.0	88.50	158.00	7,634.7	6,175.7	-3,130.5	-202.2	3,032.7	5.34	-2.06	-4.92	
10,739.0	88.60	157.90	7,636.3	6,177.3	-3,188.9	-178.6	3,094.6	0.22	0.16	-0.16	
10,802.0	91.50	159.90	7,636.2	6,177.2	-3,247.7	-155.9	3,156.6	5.59	4.60	3.17	
10,865.0	90.90	160.50	7,634.9	6,175.9	-3,306.9	-134.6	3,218.9	1.35	-0.95	0.95	
10,929.0	90.20	160.60	7,634.3	6,175.3	-3,367.3	-113.3	3,282.2	1.10	-1.09	0.16	
10,992.0	89.50	160.10	7,634.4	6,175.4	-3,426.6	-92.1	3,344.5	1.37	-1.11	-0.79	
11,055.0	90.10	161.90	7,634.7	6,175.7	-3,486.2	-71.6	3,406.9	3.01	0.95	2.86	
11,118.0	90.30	165.20	7,634.4	6,175.4	-3,546.6	-53.7	3,469.6	5.25	0.32	5.24	
11,181.0	88.30	164.70	7,635.2	6,176.2	-3,607.4	-37.4	3,532.4	3.27	-3.17	-0.79	
11,244.0	88.10	166.10	7,637.2	6,178.2	-3,668.6	-22.6	3,595.3	5.40	-0.32	5.40	
11,307.0	87.30	166.40	7,639.7	6,180.7	-3,730.0	-8.7	3,658.3	2.98	-1.27	2.98	
11,370.0	86.70	164.00	7,643.0	6,184.0	-3,790.8	7.4	3,721.0	3.92	-0.95	-3.81	
11,433.0	87.30	164.40	7,646.3	6,187.3	-3,851.3	24.5	3,783.8	1.14	0.95	0.95	
11,496.0	88.70	163.70	7,648.5	6,189.5	-3,911.9	41.8	3,846.5	2.48	2.22	-1.11	

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# Phoenix Technology Services

## Survey Report



EQT Energy Services International

<b>Database:</b>	PHOENIX Eagle Well CN	<b>Local Co-ordinate Reference:</b>	PHOENIX Eagle Well CN
<b>Company:</b>	EQT Production - Malaysia	<b>TVD Reference:</b>	10 @ 14.00 feet
<b>Project:</b>	WAZA-001-001	<b>MD Reference:</b>	10 @ 14.00 feet
<b>Site:</b>	WAZA-001-001	<b>North Reference:</b>	10 @ 14.00 feet
<b>Well:</b>	WAZA-001-001	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	WAZA-001-001		
<b>Design:</b>	WAZA-001-001		

### Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,559.0	87.80	163.70	7,650.4	6,191.4	-3,972.3	59.5	3,909.2	1.43	-1.43	0.00
11,622.0	88.80	163.90	7,652.3	6,193.3	-4,032.8	77.1	3,971.9	1.62	1.59	0.32
11,685.0	90.90	163.90	7,652.5	6,193.5	-4,093.3	94.5	4,034.7	3.33	3.33	0.00
11,748.0	90.20	164.60	7,651.9	6,192.9	-4,153.9	111.6	4,097.5	1.57	-1.11	1.11
11,811.0	90.00	163.70	7,651.8	6,192.8	-4,214.6	128.8	4,160.3	1.46	-0.32	-1.43
11,875.0	89.00	161.50	7,652.3	6,193.3	-4,275.6	148.0	4,223.9	3.78	-1.56	-3.44
11,938.0	88.40	160.20	7,653.7	6,194.7	-4,335.1	168.6	4,286.2	2.27	-0.95	-2.06
12,001.0	89.40	160.90	7,655.0	6,196.0	-4,394.5	189.6	4,348.6	1.94	1.59	1.11
12,064.0	90.50	161.40	7,655.0	6,196.0	-4,454.1	210.0	4,411.0	1.92	1.75	0.79
12,127.0	89.80	160.80	7,654.8	6,195.8	-4,513.7	230.4	4,473.4	1.46	-1.11	-0.95
12,190.0	89.00	160.90	7,655.5	6,196.5	-4,573.2	251.0	4,535.8	1.28	-1.27	0.16
12,253.0	89.60	160.50	7,656.3	6,197.3	-4,632.7	271.9	4,598.1	1.14	0.95	-0.83
12,316.0	91.20	160.80	7,655.8	6,196.8	-4,692.1	292.7	4,660.5	2.58	2.54	0.48
12,379.0	91.30	160.80	7,654.5	6,195.5	-4,751.6	313.5	4,722.8	0.16	0.16	0.00
12,442.0	90.60	160.00	7,653.4	6,194.4	-4,811.0	334.6	4,785.1	1.69	-1.11	-1.27
12,505.0	90.40	159.50	7,652.9	6,193.9	-4,870.1	356.4	4,847.3	0.85	-0.32	-0.79
12,568.0	90.30	160.60	7,652.5	6,193.5	-4,929.3	377.9	4,909.6	1.75	-0.16	1.75
12,631.0	88.40	158.70	7,653.2	6,194.2	-4,988.3	399.8	4,971.8	4.26	-3.02	-3.02
12,694.0	87.30	159.20	7,655.6	6,196.6	-5,047.1	422.4	5,033.8	1.92	-1.75	0.79
12,757.0	88.10	159.70	7,658.1	6,199.1	-5,106.0	444.5	5,095.9	1.50	1.27	0.79
12,820.0	90.70	162.10	7,658.7	6,199.7	-5,165.5	465.1	5,158.3	5.62	4.13	3.81
12,883.0	89.10	159.90	7,658.9	6,199.9	-5,225.1	485.8	5,220.7	4.32	-2.54	-3.49
12,946.0	89.20	160.00	7,659.8	6,200.8	-5,284.3	507.2	5,282.9	0.22	0.16	0.16
13,009.0	92.70	162.30	7,658.7	6,199.7	-5,343.9	527.6	5,345.3	6.65	5.56	3.65
13,072.0	92.70	162.80	7,655.8	6,196.8	-5,403.9	546.4	5,407.8	0.79	0.00	0.79
13,135.0	90.50	161.40	7,654.0	6,195.0	-5,463.8	565.8	5,470.4	4.14	-3.49	-2.22
13,199.0	88.00	159.30	7,654.9	6,195.9	-5,524.1	587.3	5,533.6	5.10	-3.91	-3.28
13,262.0	88.00	162.00	7,657.1	6,198.1	-5,583.5	608.2	5,596.0	4.28	0.00	4.29
13,325.0	89.20	162.80	7,658.6	6,199.6	-5,643.5	627.2	5,658.5	2.29	1.90	1.27
13,388.0	90.10	164.90	7,659.0	6,200.0	-5,704.0	644.7	5,721.3	3.63	1.43	3.33
13,451.0	88.70	166.00	7,659.6	6,200.6	-5,765.0	660.6	5,784.2	2.83	-2.22	1.75
13,514.0	89.00	165.20	7,660.9	6,201.9	-5,826.0	676.2	5,847.0	1.38	0.48	-1.27
13,577.0	89.70	164.90	7,661.6	6,202.6	-5,886.9	692.5	5,909.9	1.21	1.11	-0.48
13,641.0	90.40	163.70	7,661.6	6,202.6	-5,948.5	709.8	5,973.7	2.17	1.09	-1.88
13,704.0	90.90	163.70	7,660.9	6,201.9	-6,009.0	727.5	6,036.4	0.79	0.79	0.00
13,767.0	90.50	162.80	7,660.1	6,201.1	-6,069.3	745.6	6,099.1	1.56	-0.63	-1.43
13,830.0	89.10	161.10	7,660.3	6,201.3	-6,129.2	765.1	6,161.7	3.50	-2.22	-2.70
13,893.0	89.90	163.70	7,660.9	6,201.9	-6,189.2	784.2	6,224.3	4.32	1.27	4.13
13,956.0	89.90	165.40	7,661.0	6,202.0	-6,249.9	801.0	6,287.1	2.70	0.00	2.70
14,019.0	90.30	167.30	7,660.9	6,201.9	-6,311.2	815.8	6,350.0	3.08	0.63	3.02
14,082.0	89.50	163.60	7,661.0	6,202.0	-6,372.1	831.7	6,412.9	6.01	-1.27	-5.87
14,146.0	88.50	162.00	7,662.1	6,203.1	-6,433.3	850.6	6,476.5	2.95	-1.56	-2.50

Database:	EQ 2003 - Phoenix Tech	Local Co-ordinate Reference:	1000000000000000000
Company:	OT Production - Houston	TVD Reference:	0 0 0 0 0 0 0 0 0 0 0
Project:	Well 5000 - WY	MD Reference:	0 0 0 0 0 0 0 0 0 0 0
Site:	1000000000000000000	North Reference:	0 0 0 0 0 0 0 0 0 0 0
Well:	1000000000000000000	Survey Calculation Method:	Minimum Curvature
Wellbore:	1000000000000000000		
Design:	1000000000000000000		

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate ("/100usft)	Turn Rate (°/100usft)
14,209.0	88.30	163.20	7,663.8	6,204.8	-6,493.3	869.4	6,539.1	1.93	-0.32	1.90
14,272.0	87.40	164.10	7,666.2	6,207.2	-6,553.8	887.1	6,601.8	2.02	-1.43	1.43
14,335.0	87.00	164.10	7,669.3	6,210.3	-6,614.3	904.4	6,664.5	0.63	-0.63	0.00
14,399.0	87.40	163.30	7,672.4	6,213.4	-6,675.6	922.3	6,728.2	1.40	0.63	-1.25
14,462.0	88.10	163.00	7,674.9	6,215.9	-6,735.9	940.6	6,790.8	1.21	1.11	-0.48
14,525.0	87.30	163.00	7,677.4	6,218.4	-6,796.1	959.0	6,853.4	1.27	-1.27	0.00
14,588.0	88.70	163.00	7,679.6	6,220.6	-6,856.3	977.4	6,916.0	2.22	2.22	0.00
14,652.0	89.80	156.80	7,680.4	6,221.4	-6,916.3	999.4	6,979.2	9.84	1.72	-9.69
14,715.0	90.40	156.60	7,680.3	6,221.3	-6,974.2	1,024.3	7,040.8	1.00	0.95	-0.32
14,779.0	92.60	159.70	7,678.7	6,219.7	-7,033.6	1,048.1	7,103.7	5.94	3.44	4.84
14,842.0	92.10	158.90	7,676.1	6,217.1	-7,092.5	1,070.3	7,165.7	1.50	-0.79	-1.27
14,905.0	91.80	158.90	7,673.9	6,214.9	-7,151.2	1,093.0	7,227.7	0.48	-0.48	0.00
14,968.0	91.00	159.50	7,672.4	6,213.4	-7,210.1	1,115.4	7,289.8	1.59	-1.27	0.95
15,032.0	88.90	155.00	7,672.4	6,213.4	-7,269.1	1,140.1	7,352.5	7.76	-3.28	-7.03
15,095.0	88.60	155.90	7,673.8	6,214.8	-7,326.4	1,166.3	7,413.7	1.51	-0.48	1.43
15,158.0	89.50	160.30	7,674.9	6,215.9	-7,384.8	1,189.8	7,475.6	7.13	1.43	6.98
15,222.0	89.30	160.80	7,675.5	6,216.5	-7,445.1	1,211.1	7,538.9	0.84	-0.31	0.78
15,285.0	89.90	162.70	7,676.0	6,217.0	-7,505.0	1,230.8	7,601.4	3.16	0.95	3.02
15,348.0	89.50	162.10	7,676.3	6,217.3	-7,565.0	1,249.8	7,664.0	1.14	-0.63	-0.95
15,412.0	88.70	162.20	7,677.3	6,218.3	-7,625.9	1,269.5	7,727.6	1.26	-1.25	0.16
15,474.0	88.10	162.60	7,679.0	6,220.0	-7,685.0	1,288.2	7,789.2	1.16	-0.97	0.65
15,538.0	89.30	162.70	7,680.5	6,221.5	-7,746.1	1,307.3	7,852.8	1.88	1.88	0.16
15,601.0	91.20	165.00	7,680.2	6,221.2	-7,806.6	1,324.8	7,915.5	4.74	3.02	3.65
15,664.0	90.50	164.40	7,679.3	6,220.3	-7,867.3	1,341.4	7,978.3	1.46	-1.11	-0.95
15,727.0	89.60	164.50	7,679.2	6,220.2	-7,928.0	1,358.3	8,041.2	1.44	-1.43	0.16
15,790.0	90.20	164.00	7,679.3	6,220.3	-7,988.7	1,375.4	8,104.0	1.24	0.95	-0.79
15,853.0	90.40	161.40	7,679.0	6,220.0	-8,048.8	1,394.2	8,166.6	4.14	0.32	-4.13
15,916.0	89.20	158.10	7,679.2	6,220.2	-8,107.9	1,416.0	8,228.8	5.57	-1.90	-5.24
15,979.0	88.40	156.50	7,680.6	6,221.6	-8,166.0	1,440.3	8,290.5	2.84	-1.27	-2.54
16,043.0	89.50	158.90	7,681.7	6,222.7	-8,225.2	1,464.5	8,353.2	4.12	1.72	3.75
16,106.0	89.70	159.90	7,682.2	6,223.2	-8,284.2	1,486.7	8,415.4	1.62	0.32	1.59
16,169.0	90.60	162.50	7,682.0	6,223.0	-8,343.8	1,507.0	8,477.8	4.37	1.43	4.13
16,233.0	90.20	160.30	7,681.6	6,222.6	-8,404.5	1,527.4	8,541.3	3.49	-0.63	-3.44
16,295.0	90.20	161.50	7,681.3	6,222.3	-8,463.1	1,547.7	8,602.7	1.94	0.00	1.94
16,359.0	91.20	164.10	7,680.6	6,221.6	-8,524.2	1,566.6	8,666.3	4.35	1.56	4.06
16,422.0	90.40	164.10	7,679.7	6,220.7	-8,584.8	1,583.9	8,729.1	1.27	-1.27	0.00
16,486.0	89.30	163.50	7,679.8	6,220.8	-8,646.2	1,601.7	8,792.8	1.96	-1.72	-0.94
16,549.0	90.20	163.40	7,680.1	6,221.1	-8,706.6	1,619.7	8,855.5	1.44	1.43	-0.16
16,612.0	89.80	163.00	7,680.1	6,221.1	-8,766.9	1,637.9	8,918.2	0.90	-0.63	-0.63
16,675.0	88.40	161.10	7,681.1	6,222.1	-8,826.8	1,657.3	8,980.8	3.75	-2.22	-3.02
16,738.0	90.80	162.90	7,681.5	6,222.5	-8,886.8	1,676.8	9,043.3	4.76	3.81	2.86
16,801.0	89.80	164.00	7,681.2	6,222.2	-8,947.1	1,694.7	9,106.0	2.36	-1.59	1.75
16,864.0	88.90	162.80	7,681.9	6,222.9	-9,007.5	1,712.7	9,168.7	2.38	-1.43	-1.90





**Phoenix Technology Services**  
Survey Report



Database:	2013001 (Block 1000) EQ	Local Co-ordinate Reference:	US State Plane, NAD83
Company:	EQE Production (Marcellus)	TVD Reference:	US State Plane
Project:	Yates Creek, NY	MD Reference:	US State Plane
Site:	Yates County, NY	North Reference:	US State Plane
Well:	17431-000	Survey Calculation Method:	Minimum Curvature
Wellbore:	New Wellbore		
Design:	US State Plane		

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
16,927.0	89.90	164.70	7,682.6	6,223.6	-9,068.0	1,730.3	9,231.5	3.41	1.59	3.02
16,991.0	91.50	165.80	7,681.8	6,222.8	-9,129.9	1,746.6	9,295.3	3.03	2.50	1.72
17,054.0	90.50	165.00	7,680.7	6,221.7	-9,190.8	1,762.5	9,358.2	2.03	-1.59	-1.27
17,117.0	90.40	165.90	7,680.2	6,221.2	-9,251.8	1,778.3	9,421.1	1.44	-0.16	1.43
17,180.0	90.00	166.60	7,680.0	6,221.0	-9,313.0	1,793.3	9,484.0	1.28	-0.63	1.11
17,244.0	89.60	165.90	7,680.2	6,221.2	-9,375.2	1,808.5	9,547.9	1.26	-0.63	-1.09
17,307.0	89.30	165.80	7,680.8	6,221.8	-9,436.2	1,823.9	9,610.9	0.50	-0.48	-0.16
17,370.0	88.60	165.50	7,682.0	6,223.0	-9,497.3	1,839.5	9,673.7	1.21	-1.11	-0.48
17,430.0	88.60	165.50	7,683.4	6,224.4	-9,555.3	1,854.5	9,733.6	0.00	0.00	0.00

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
8,138.4	7,567.0	Top of Marcellus@7567' TVD		0.00	
9,016.9	7,623.0	Top of Onondaga@7623' TVD		0.00	

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,907.0	5,906.4	48.4	0.7	KOP=5907' MD
8,469.0	7,609.7	-1,035.4	-889.9	LP=8469' MD/7610' TVD
17,370.0	7,682.0	-9,497.3	1,839.5	Last Survey=17370' MD/ 7682' TVD
17,430.0	7,683.4	-9,555.3	1,854.5	Projection to TD/Deepest Point of Well=17430' MD/ 7683' TVD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

KB Elevation=1459 FT  
 Ground Elevation= 1443 FT

All measurements were taken from KB Elevation

