



## **EQT PRODUCTION**

**Wetzel County, WV**

**BIG 333**

**Well #514419 - Marcellus - Slot 514419**

**API #47-10303036**

**Main Wellbore**

**Design: 514419 As Drilled Surveys**

## **Standard Survey Report**

**10 September, 2015**

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Environmental Protection



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Survey Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Well #514419 - Marcellus - Slot 514419
Company:	EQT PRODUCTION	TVD Reference:	KB @ 1468.0usft
Project:	Wetzel County, WV	MD Reference:	KB @ 1468.0usft
Site:	BIG 333	North Reference:	Grid
Well:	Well #514419 - Marcellus	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	514419 As Drilled Surveys		

Project	Wetzel County, WV
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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		

Site	BIG 333
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Site Position:		Northing:	374,995.30 usft	Latitude:	39.52
From:	Map	Easting:	1,692,038.00 usft	Longitude:	-80.59
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.70 °

Well	Well #514419 - Marcellus - Slot 514419
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Well Position	+N-S	0.0 usft	Northing:	375,039.50 usft	Latitude:	39° 31' 28.435 N
	+E-W	0.0 usft	Easting:	1,692,029.60 usft	Longitude:	80° 35' 30.416 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	1,452.0 usft

Wellbore	Main Wellbore
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	8/25/2015	-8.28	67.03	52,490

Design	514419 As Drilled Surveys
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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	342.20

Survey Program	Date	9/10/2015
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From (')	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	6,564.0	514419 Gyrodata Gyros (Main Wellbore)	GYD_DP_MS	Gyrodata gyro-compassing and drop
0.00	15,365.0	514419 PHX MWD (Main Wellbore)	PHX+MWD+HDGM	PHX+OWSG MWD + HDGM

Survey	
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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	-1,468.0	0.0	0.0	0.0	0.00	0.00	0.00
103.0	0.10	214.95	103.0	-1,365.0	-0.1	-0.1	-0.1	0.10	0.10	0.00
203.0	0.09	205.29	203.0	-1,265.0	-0.2	-0.1	-0.2	0.02	-0.01	-9.66
303.0	0.08	233.23	303.0	-1,165.0	-0.3	-0.2	-0.2	0.04	-0.01	27.94
403.0	0.07	224.97	403.0	-1,065.0	-0.4	-0.3	-0.3	0.01	-0.01	-8.26
503.0	0.04	283.00	503.0	-965.0	-0.4	-0.4	-0.3	0.06	-0.03	58.03
603.0	0.05	118.14	603.0	-865.0	-0.5	-0.4	-0.3	0.09	0.01	-164.86
703.0	0.11	36.62	703.0	-765.0	-0.4	-0.3	-0.3	0.11	0.06	-81.52



Phoenix Technology Services  
Survey Report



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<b>Company:</b>	EQT PRODUCTION	<b>TVD Reference:</b>	KB @ 1468.0usft
<b>Project:</b>	Wetzel County, WV	<b>MD Reference:</b>	KB @ 1468.0usft
<b>Site:</b>	BIG 333	<b>North Reference:</b>	Grid
<b>Well:</b>	Well #514419 - Marcellus	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Main Wellbore		
<b>Design:</b>	514419 As Drilled Surveys		

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)	
803.0	0.17	19.41	803.0	-665.0	-0.2	-0.2	-0.1	0.07	0.06	-17.21	
903.0	0.20	50.22	903.0	-565.0	0.1	0.0	0.1	0.10	0.03	30.81	
1,003.0	0.23	111.45	1,003.0	-465.0	0.1	0.3	0.0	0.22	0.03	61.23	
1,103.0	0.25	133.58	1,103.0	-365.0	-0.1	0.7	-0.3	0.09	0.02	22.13	
1,203.0	0.31	149.58	1,203.0	-265.0	-0.5	1.0	-0.8	0.10	0.06	16.00	
1,303.0	0.31	153.70	1,303.0	-165.0	-1.0	1.2	-1.3	0.02	0.00	4.12	
1,403.0	0.31	152.30	1,403.0	-65.0	-1.5	1.5	-1.8	0.01	0.00	-1.40	
1,503.0	0.28	162.48	1,503.0	35.0	-1.9	1.7	-2.3	0.06	-0.03	10.18	
1,603.0	0.34	162.24	1,603.0	135.0	-2.5	1.8	-2.9	0.06	0.06	-0.24	
1,703.0	0.56	139.01	1,703.0	235.0	-3.1	2.2	-3.6	0.28	0.22	-23.23	
1,803.0	0.64	133.20	1,803.0	335.0	-3.9	3.0	-4.6	0.10	0.08	-5.81	
1,903.0	0.68	132.26	1,903.0	435.0	-4.6	3.8	-5.6	0.04	0.04	-0.94	
2,003.0	0.67	135.21	2,003.0	535.0	-5.5	4.7	-6.6	0.04	-0.01	2.95	
2,103.0	0.67	138.57	2,103.0	635.0	-6.3	5.5	-7.7	0.04	0.00	3.36	
2,203.0	0.75	137.58	2,203.0	735.0	-7.2	6.3	-8.8	0.08	0.08	-0.99	
2,303.0	0.64	112.56	2,302.9	834.9	-7.9	7.2	-9.8	0.32	-0.11	-25.02	
2,403.0	0.66	113.85	2,402.9	934.9	-8.4	8.3	-10.5	0.02	0.02	1.29	
2,503.0	0.61	110.17	2,502.9	1,034.9	-8.8	9.3	-11.2	0.06	-0.05	-3.68	
2,603.0	0.52	103.24	2,602.9	1,134.9	-9.1	10.2	-11.8	0.11	-0.09	-6.93	
2,703.0	0.12	345.90	2,702.9	1,234.9	-9.1	10.7	-11.9	0.58	-0.40	-117.34	
2,803.0	4.28	302.72	2,802.8	1,334.8	-7.0	7.5	-8.9	4.19	4.16	-43.18	
2,903.0	7.79	300.53	2,902.3	1,434.3	-1.5	-1.5	-1.0	3.52	3.51	-2.19	
3,003.0	9.65	297.31	3,001.1	1,533.1	5.8	-14.8	10.0	1.92	1.86	-3.22	
3,103.0	9.63	288.14	3,099.7	1,631.7	12.2	-30.2	20.9	1.53	-0.02	-9.17	
3,203.0	8.34	283.37	3,198.5	1,730.5	16.5	-45.2	29.5	1.49	-1.29	-4.77	
3,303.0	7.57	277.65	3,297.5	1,829.5	19.1	-58.8	36.1	1.10	-0.77	-5.72	
3,403.0	4.24	286.87	3,397.0	1,929.0	21.0	-68.8	41.1	3.45	-3.33	9.22	
3,503.0	3.98	303.32	3,496.7	2,028.7	24.0	-75.3	45.9	1.20	-0.26	16.45	
3,603.0	4.48	299.46	3,596.4	2,128.4	27.8	-81.6	51.4	0.58	0.50	-3.86	
3,703.0	3.07	254.88	3,696.2	2,228.2	29.1	-87.5	54.4	3.15	-1.41	-44.58	
3,803.0	1.36	135.78	3,796.2	2,328.2	27.5	-89.3	53.5	3.92	-1.71	-119.10	
3,903.0	0.20	310.44	3,896.2	2,428.2	26.8	-88.6	52.6	1.56	-1.16	174.66	
4,003.0	0.27	313.33	3,996.2	2,528.2	27.0	-88.9	52.9	0.07	0.07	2.89	
4,103.0	0.31	314.13	4,096.2	2,628.2	27.4	-89.3	53.4	0.04	0.04	0.80	
4,203.0	0.32	317.43	4,196.2	2,728.2	27.8	-89.7	53.9	0.02	0.01	3.30	
4,303.0	0.31	306.55	4,296.2	2,828.2	28.2	-90.1	54.3	0.06	-0.01	-10.88	
4,403.0	0.36	317.57	4,396.2	2,928.2	28.6	-90.5	54.9	0.08	0.05	11.02	
4,503.0	0.34	304.11	4,496.2	3,028.2	28.9	-91.0	55.4	0.08	-0.02	-13.46	
4,603.0	0.27	320.03	4,596.2	3,128.2	29.3	-91.4	55.8	0.11	-0.07	15.92	
4,703.0	0.31	294.49	4,696.2	3,228.2	29.6	-91.8	56.2	0.13	0.04	25.50	
4,803.0	0.21	293.95	4,796.2	3,328.2	29.8	-92.2	56.5	0.10	-0.10	-0.54	
4,903.0	0.16	300.24	4,896.2	3,428.2	29.9	-92.5	56.8	0.05	-0.05	6.29	

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Site:	BIG 333	North Reference:	Grid
Well:	Well #514419 - Marcellus	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	514419 As Drilled Surveys		

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	0.21	19.30	4,996.2	3,528.2	30.2	-92.5	57.0	0.24	0.05	79.06
5,103.0	0.36	18.33	5,096.2	3,628.2	30.6	-92.4	57.4	0.15	0.15	-0.97
5,203.0	0.42	28.84	5,196.2	3,728.2	31.3	-92.1	57.9	0.09	0.06	10.51
5,303.0	0.64	75.50	5,296.2	3,828.2	31.7	-91.4	58.1	0.47	0.22	46.66
5,403.0	0.97	105.59	5,396.2	3,928.2	31.6	-90.0	57.6	0.53	0.33	30.09
5,503.0	0.89	117.33	5,496.1	4,028.1	31.0	-88.5	56.6	0.21	-0.08	11.74
5,603.0	0.61	125.36	5,596.1	4,128.1	30.4	-87.4	55.6	0.30	-0.28	8.03
5,703.0	0.26	124.08	5,696.1	4,228.1	29.9	-86.8	55.0	0.35	-0.35	-1.28
5,803.0	0.08	302.32	5,796.1	4,328.1	29.9	-86.6	54.9	0.34	-0.18	178.24
5,903.0	0.63	304.89	5,896.1	4,428.1	30.2	-87.1	55.4	0.55	0.55	2.57
6,003.0	1.21	305.46	5,996.1	4,528.1	31.1	-88.4	56.7	0.58	0.58	0.57
6,103.0	1.46	309.91	6,096.1	4,628.1	32.6	-90.3	58.6	0.27	0.25	4.45
6,203.0	1.63	311.09	6,196.1	4,728.1	34.3	-92.3	60.9	0.17	0.17	1.18
6,303.0	1.41	316.43	6,296.0	4,828.0	36.1	-94.3	63.2	0.26	-0.22	5.34
6,403.0	1.27	317.06	6,396.0	4,928.0	37.8	-95.9	65.3	0.14	-0.14	0.63
6,503.0	1.24	323.86	6,496.0	5,028.0	39.5	-97.2	67.4	0.15	-0.03	6.80
Gyro Tie On=5564' MD										
6,564.0	1.18	323.46	6,556.9	5,088.9	40.6	-98.0	68.6	0.10	-0.10	-0.66
6,593.0	1.10	330.20	6,585.9	5,117.9	41.0	-98.3	69.1	0.54	-0.28	23.24
6,625.0	1.90	218.60	6,617.9	5,149.9	40.9	-98.8	69.2	7.88	2.50	-348.75
6,656.0	5.40	205.20	6,648.9	5,180.9	39.2	-99.8	67.8	11.54	11.29	-43.23
6,687.0	9.10	204.90	6,679.6	5,211.6	35.6	-101.4	64.9	11.94	11.94	-0.97
6,719.0	11.10	206.80	6,711.1	5,243.1	30.6	-103.9	60.9	6.34	6.25	5.94
6,750.0	14.30	206.70	6,741.4	5,273.4	24.5	-106.9	56.0	10.32	10.32	-0.32
6,782.0	17.20	204.90	6,772.2	5,304.2	16.7	-110.7	49.7	9.19	9.06	-5.63
6,813.0	19.60	200.80	6,801.5	5,333.5	7.6	-114.5	42.3	9.37	8.39	-13.23
6,845.0	22.60	197.40	6,831.4	5,363.4	-3.3	-118.3	33.0	9.55	8.75	-10.63
6,876.0	26.10	197.50	6,859.6	5,391.6	-15.5	-122.1	22.6	11.29	11.29	0.32
6,907.0	27.90	202.60	6,887.2	5,419.2	-28.7	-126.9	11.5	9.46	5.81	16.45
6,938.0	26.50	209.00	6,914.8	5,446.8	-41.5	-133.1	1.2	10.46	-4.52	20.65
6,970.0	24.60	212.50	6,943.7	5,475.7	-53.3	-140.1	-7.9	7.58	-5.94	10.94
7,001.0	22.90	219.00	6,972.1	5,504.1	-63.5	-147.4	-15.4	10.06	-5.48	20.97
7,032.0	21.10	227.70	7,000.8	5,532.8	-71.9	-155.3	-21.0	12.00	-5.81	28.06
7,064.0	20.00	238.60	7,030.8	5,562.8	-78.6	-164.2	-24.7	12.42	-3.44	34.06
7,095.0	19.00	241.10	7,060.0	5,592.0	-83.8	-173.2	-26.9	4.20	-3.23	8.06
7,126.0	17.80	243.60	7,089.4	5,621.4	-88.4	-181.8	-28.6	4.63	-3.87	8.06
7,158.0	17.60	253.50	7,119.9	5,651.9	-91.9	-190.9	-29.2	9.42	-0.63	30.94
7,189.0	18.70	263.80	7,149.4	5,681.4	-93.8	-200.3	-28.1	10.93	3.55	33.23
7,220.0	19.90	272.20	7,178.7	5,710.7	-94.1	-210.5	-25.3	9.75	3.87	27.10
7,252.0	21.00	281.10	7,208.6	5,740.6	-92.8	-221.6	-20.6	10.30	3.44	27.81
7,283.0	22.20	289.30	7,237.5	5,769.5	-89.8	-232.6	-14.4	10.47	3.87	28.45
7,314.0	24.30	296.10	7,266.0	5,798.0	-85.1	-243.8	-6.5	10.98	6.77	21.94
7,346.0	26.60	302.40	7,294.9	5,826.9	-78.3	-255.8	3.6	11.09	7.19	19.69

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<b>Site:</b>	BIG 333	<b>North Reference:</b>	Grid
<b>Well:</b>	Well #514419 - Marcellus	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Main Wellbore		
<b>Design:</b>	514419 As Drilled Surveys		

Survey											
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7,377.0	29.50	309.70	7,322.2	5,854.2	-69.7	-267.5	15.4	14.48	9.35	23.55	
7,408.0	32.20	314.40	7,348.8	5,880.8	-59.1	-279.3	29.1	11.67	8.71	15.16	
7,440.0	35.00	318.00	7,375.5	5,907.5	-46.3	-291.5	45.1	10.74	8.75	11.25	
7,471.0	37.70	320.80	7,400.5	5,932.5	-32.3	-303.5	62.0	10.22	8.71	9.03	
<b>514570 Top of Perf (copy)</b>											
7,496.7	40.02	322.39	7,420.5	5,952.5	-19.7	-313.5	77.1	9.82	9.02	6.19	
7,502.0	40.50	322.70	7,424.5	5,956.5	-17.0	-315.6	80.3	9.82	9.07	5.83	
7,533.0	43.40	324.10	7,447.6	5,979.6	-0.3	-327.9	99.9	9.83	9.35	4.52	
7,565.0	46.10	326.70	7,470.3	6,002.3	18.2	-340.7	121.5	10.19	8.44	8.13	
7,596.0	49.00	328.40	7,491.2	6,023.2	37.5	-353.0	143.6	10.19	9.35	5.48	
7,627.0	52.30	328.80	7,510.9	6,042.9	58.0	-365.5	166.9	10.69	10.65	1.29	
7,659.0	55.80	329.70	7,529.6	6,061.6	80.2	-378.7	192.2	11.17	10.94	2.81	
7,690.0	60.00	330.50	7,546.1	6,078.1	103.0	-391.8	217.8	13.72	13.55	2.58	
7,721.0	62.90	331.70	7,560.9	6,092.9	126.8	-404.9	244.6	9.95	9.35	3.87	
7,753.0	66.40	333.30	7,574.6	6,106.6	152.5	-418.3	273.1	11.83	10.94	5.00	
7,784.0	69.70	335.10	7,586.2	6,118.2	178.4	-430.8	301.5	11.93	10.65	5.81	
7,816.0	73.10	337.00	7,596.4	6,128.4	206.1	-443.1	331.7	12.02	10.63	5.94	
<b>514419 Plat LP</b>											
7,844.0	75.99	337.81	7,603.9	6,135.9	231.0	-453.5	358.6	10.70	10.32	2.91	
7,847.0	76.30	337.90	7,604.6	6,136.6	233.7	-454.6	361.5	10.70	10.33	2.86	
7,879.0	78.60	339.10	7,611.6	6,143.6	262.7	-466.0	392.6	8.07	7.19	3.75	
7,910.0	80.80	339.90	7,617.1	6,149.1	291.3	-476.7	423.1	7.54	7.10	2.58	
7,941.0	82.50	341.00	7,621.6	6,153.6	320.2	-486.9	453.8	6.51	5.48	3.55	
7,973.0	84.70	342.20	7,625.2	6,157.2	350.4	-497.0	485.6	7.82	6.88	3.75	
8,004.0	87.60	342.70	7,627.3	6,159.3	379.9	-506.3	516.5	9.49	9.35	1.61	
<b>514419 LP 539' VS 1 - 514419 LP 539' VS p8</b>											
8,010.5	88.16	342.80	7,627.5	6,159.5	386.1	-508.2	523.0	8.86	8.71	1.61	
<b>LP/Deepest Point=8035' MD/7628' TVD</b>											
8,035.0	90.30	343.20	7,627.8	6,159.8	409.5	-515.4	547.5	8.86	8.71	1.61	
<b>514419 Plat LP 2 (copy)</b>											
8,060.2	90.61	342.69	7,627.6	6,159.6	433.6	-522.8	572.6	2.38	1.25	-2.03	
8,099.0	91.10	341.90	7,627.0	6,159.0	470.6	-534.6	611.5	2.38	1.25	-2.03	
8,162.0	90.30	340.00	7,626.3	6,158.3	530.1	-555.1	674.4	3.27	-1.27	-3.02	
8,225.0	90.10	340.70	7,626.0	6,158.0	589.4	-576.3	737.4	1.16	-0.32	1.11	
8,288.0	90.00	341.30	7,626.0	6,158.0	649.0	-596.8	800.4	0.97	-0.16	0.95	
8,351.0	90.20	341.30	7,625.9	6,157.9	708.7	-617.0	863.4	0.32	0.32	0.00	
8,414.0	89.50	340.80	7,626.0	6,158.0	768.3	-637.5	926.4	1.37	-1.11	-0.79	
8,477.0	89.50	341.30	7,626.6	6,158.6	827.8	-658.0	989.4	0.79	0.00	0.79	
8,540.0	89.20	342.90	7,627.3	6,159.3	887.8	-677.3	1,052.4	2.58	-0.48	2.54	RECEIVED
8,603.0	90.00	343.80	7,627.8	6,159.8	948.1	-695.4	1,115.3	1.91	1.27	0.68	Office of Oil and Gas
8,666.0	91.40	344.90	7,627.0	6,159.0	1,008.8	-712.4	1,178.3	2.83	2.22	1.75	
8,729.0	91.60	345.30	7,625.3	6,157.3	1,069.7	-728.6	1,241.2	0.71	0.32	0.63	JAN 27 2016
8,792.0	91.50	345.00	7,623.6	6,155.6	1,130.5	-744.7	1,304.1	0.50	-0.16	-0.48	



Phoenix Technology Services  
Survey Report



<b>Database:</b>	EDM 5000-1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well Well #514419 - Marcellus - Slot 514419
<b>Company:</b>	EQT PRODUCTION	<b>TVD Reference:</b>	KB @ 1468.0usft
<b>Project:</b>	Wetzel County, WV	<b>MD Reference:</b>	KB @ 1468.0usft
<b>Site:</b>	BIG 333	<b>North Reference:</b>	Grid
<b>Well:</b>	Well #514419 - Marcellus	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Main Wellbore		
<b>Design:</b>	514419 As Drilled Surveys		

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)
8,856.0	90.90	344.10	7,622.3	6,154.3	1,192.2	-761.7	1,368.0	1.69	-0.94	-1.41
8,919.0	90.00	342.30	7,621.8	6,153.8	1,252.5	-779.9	1,431.0	3.19	-1.43	-2.86
8,982.0	89.70	341.30	7,622.0	6,154.0	1,312.4	-799.6	1,494.0	1.66	-0.48	-1.59
9,045.0	89.60	342.00	7,622.3	6,154.3	1,372.1	-819.5	1,557.0	1.12	-0.16	1.11
9,108.0	90.90	343.20	7,622.1	6,154.1	1,432.3	-838.3	1,620.0	2.81	2.06	1.90
9,171.0	90.40	342.40	7,621.4	6,153.4	1,492.4	-856.9	1,683.0	1.50	-0.79	-1.27
9,234.0	90.80	344.20	7,620.7	6,152.7	1,552.8	-875.0	1,746.0	2.93	0.63	2.86
9,297.0	90.50	344.40	7,620.0	6,152.0	1,613.4	-892.1	1,808.9	0.57	-0.48	0.32
9,360.0	90.20	344.20	7,619.6	6,151.6	1,674.1	-909.1	1,871.9	0.57	-0.48	-0.32
9,423.0	89.90	343.50	7,619.5	6,151.5	1,734.6	-926.6	1,934.8	1.21	-0.48	-1.11
9,487.0	90.40	344.50	7,619.4	6,151.4	1,796.1	-944.3	1,998.8	1.75	0.78	1.56
9,550.0	90.60	345.10	7,618.8	6,150.8	1,856.9	-960.8	2,061.7	1.00	0.32	0.95
9,613.0	90.20	344.80	7,618.4	6,150.4	1,917.7	-977.2	2,124.7	0.79	-0.63	-0.48
9,676.0	89.90	344.60	7,618.3	6,150.3	1,978.5	-993.8	2,187.6	0.57	-0.48	-0.32
9,739.0	88.60	342.80	7,619.2	6,151.2	2,039.0	-1,011.5	2,250.6	3.52	-2.06	-2.86
9,802.0	89.00	342.60	7,620.5	6,152.5	2,099.1	-1,030.2	2,313.6	0.71	0.63	-0.32
9,865.0	90.00	343.50	7,621.0	6,153.0	2,159.4	-1,048.6	2,376.5	2.14	1.59	1.43
9,928.0	90.80	343.50	7,620.6	6,152.6	2,219.8	-1,066.5	2,439.5	1.27	1.27	0.00
9,991.0	92.60	343.80	7,618.7	6,150.7	2,280.2	-1,084.2	2,502.5	2.90	2.86	0.48
10,055.0	93.10	343.10	7,615.5	6,147.5	2,341.5	-1,102.4	2,566.4	1.34	0.78	-1.09
10,118.0	93.20	343.20	7,612.1	6,144.1	2,401.7	-1,120.6	2,629.3	0.22	0.16	0.16
10,181.0	90.20	342.90	7,610.2	6,142.2	2,461.9	-1,139.0	2,692.2	4.79	-4.76	-0.48
10,244.0	90.10	342.70	7,610.0	6,142.0	2,522.1	-1,157.6	2,755.2	0.35	-0.16	-0.32
<b>514419 Plat TD</b>										
10,247.2	90.08	342.70	7,610.0	6,142.0	2,525.2	-1,158.6	2,758.5	0.63	-0.63	0.00
10,307.0	89.70	342.70	7,610.1	6,142.1	2,582.2	-1,176.3	2,818.2	0.63	-0.63	0.00
10,370.0	90.30	341.60	7,610.1	6,142.1	2,642.2	-1,195.7	2,881.2	1.99	0.95	-1.75
10,433.0	90.30	340.80	7,609.8	6,141.8	2,701.8	-1,216.0	2,944.2	1.27	0.00	-1.27
10,497.0	90.50	341.60	7,609.4	6,141.4	2,762.4	-1,236.6	3,008.2	1.29	0.31	1.25
10,560.0	90.40	341.90	7,608.9	6,140.9	2,822.2	-1,256.3	3,071.2	0.50	-0.16	0.48
10,622.0	90.90	343.30	7,608.2	6,140.2	2,881.4	-1,274.8	3,133.2	2.40	0.81	2.26
10,686.0	91.50	343.90	7,606.8	6,138.8	2,942.8	-1,292.9	3,197.2	1.33	0.94	0.94
10,748.0	91.30	343.60	7,605.3	6,137.3	3,002.3	-1,310.3	3,259.1	0.58	-0.32	-0.48
10,812.0	90.40	344.60	7,604.4	6,136.4	3,063.8	-1,327.8	3,323.1	2.10	-1.41	1.56
10,875.0	90.00	345.80	7,604.1	6,136.1	3,124.7	-1,343.9	3,386.0	2.01	-0.63	1.90
10,938.0	89.80	345.20	7,604.3	6,136.3	3,185.7	-1,359.7	3,448.9	1.00	-0.32	-0.95
11,001.0	89.80	345.10	7,604.5	6,136.5	3,246.6	-1,375.8	3,511.8	0.16	0.00	-0.16
11,064.0	89.40	345.00	7,604.9	6,136.9	3,307.5	-1,392.1	3,574.7	0.65	-0.63	-0.16
11,127.0	89.50	344.90	7,605.5	6,137.5	3,368.3	-1,408.4	3,637.6	0.22	0.16	-0.16
11,191.0	90.00	344.40	7,605.8	6,137.8	3,430.0	-1,425.3	3,701.6	1.10	0.78	-0.78
11,254.0	90.40	344.20	7,605.6	6,137.6	3,490.7	-1,442.4	3,764.5	0.71	0.63	0.32
11,317.0	90.70	342.90	7,605.0	6,137.0	3,551.1	-1,460.2	3,827.5	2.12	0.48	-2.06
11,380.0	91.00	342.30	7,604.0	6,136.0	3,611.2	-1,479.1	3,890.5	1.06	0.48	-0.95

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# Phoenix Technology Services

## Survey Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well Well #514419 - Marcellus - Slot 514419
<b>Company:</b>	EQT PRODUCTION	<b>TVD Reference:</b>	KB @ 1468.0usft
<b>Project:</b>	Wetzel County, WV	<b>MD Reference:</b>	KB @ 1468.0usft
<b>Site:</b>	BIG 333	<b>North Reference:</b>	Grid
<b>Well:</b>	Well #514419 - Marcellus	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Main Wellbore		
<b>Design:</b>	514419 As Drilled Surveys		

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)	
11,443.0	90.90	342.80	7,603.0	6,135.0	3,671.3	-1,498.0	3,953.5	0.81	-0.16	0.79	
11,506.0	90.90	343.50	7,602.0	6,134.0	3,731.6	-1,516.2	4,016.5	1.11	0.00	1.11	
11,569.0	91.00	343.20	7,601.0	6,133.0	3,791.9	-1,534.3	4,079.5	0.50	0.16	-0.48	
<b>514419 Plat Deflection point</b>											
11,580.0	90.62	343.08	7,600.8	6,132.8	3,802.5	-1,537.5	4,090.4	3.66	-3.49	-1.11	
<b>514419 Plat Deflection point p8</b>											
11,580.6	90.59	343.07	7,600.8	6,132.8	3,803.1	-1,537.6	4,091.1	3.66	-3.49	-1.11	
11,632.0	88.80	342.50	7,601.1	6,133.1	3,852.1	-1,552.8	4,142.5	3.66	-3.49	-1.11	
11,695.0	89.00	342.90	7,602.3	6,134.3	3,912.3	-1,571.6	4,205.4	0.71	0.32	0.63	
11,759.0	88.80	341.80	7,603.5	6,135.5	3,973.3	-1,591.0	4,269.4	1.75	-0.31	-1.72	
11,822.0	89.60	342.90	7,604.4	6,136.4	4,033.3	-1,610.1	4,332.4	2.16	1.27	1.75	
11,885.0	90.40	343.80	7,604.4	6,136.4	4,093.6	-1,628.1	4,395.4	1.91	1.27	1.43	
11,948.0	90.00	344.10	7,604.2	6,136.2	4,154.2	-1,645.5	4,458.4	0.79	-0.63	0.48	
12,011.0	89.80	344.00	7,604.3	6,136.3	4,214.8	-1,662.9	4,521.3	0.35	-0.32	-0.16	
12,074.0	90.30	344.90	7,604.2	6,136.2	4,275.5	-1,679.7	4,584.3	1.63	0.79	1.43	
12,137.0	90.90	346.70	7,603.6	6,135.6	4,336.5	-1,695.2	4,647.2	3.01	0.95	2.86	
12,200.0	91.30	348.50	7,602.4	6,134.4	4,398.0	-1,708.7	4,709.9	2.93	0.63	2.86	
12,263.0	91.00	347.30	7,601.1	6,133.1	4,459.6	-1,721.9	4,772.5	1.96	-0.48	-1.90	
12,326.0	91.00	346.40	7,600.0	6,132.0	4,521.0	-1,736.3	4,835.3	1.43	0.00	-1.43	
12,389.0	90.60	346.80	7,599.1	6,131.1	4,582.2	-1,750.9	4,898.1	0.90	-0.63	0.63	
12,452.0	90.30	347.00	7,598.6	6,130.6	4,643.6	-1,765.1	4,960.9	0.57	-0.48	0.32	
12,515.0	90.50	346.40	7,598.2	6,130.2	4,704.9	-1,779.6	5,023.7	1.00	0.32	-0.95	
12,578.0	90.00	347.40	7,597.9	6,129.9	4,766.3	-1,793.9	5,086.5	1.77	-0.79	1.59	
12,642.0	89.80	348.60	7,598.0	6,130.0	4,828.9	-1,807.2	5,150.2	1.90	-0.31	1.88	
12,705.0	90.30	347.80	7,598.0	6,130.0	4,890.5	-1,820.1	5,212.8	1.50	0.79	-1.27	
12,768.0	90.70	347.70	7,597.4	6,129.4	4,952.1	-1,833.5	5,275.5	0.65	0.63	-0.16	
12,831.0	90.30	345.70	7,596.9	6,128.9	5,013.4	-1,848.0	5,338.3	3.24	-0.63	-3.17	
12,894.0	90.30	346.10	7,596.5	6,128.5	5,074.5	-1,863.3	5,401.2	0.63	0.00	0.63	
12,957.0	89.80	346.10	7,596.5	6,128.5	5,135.7	-1,878.4	5,464.1	0.79	-0.79	0.00	
13,020.0	90.20	347.20	7,596.5	6,128.5	5,197.0	-1,893.0	5,526.9	1.86	0.63	1.75	
13,084.0	90.60	348.90	7,596.0	6,128.0	5,259.6	-1,906.2	5,590.5	2.73	0.63	2.66	
13,147.0	90.80	348.50	7,595.3	6,127.3	5,321.3	-1,918.6	5,653.1	0.71	0.32	-0.63	
13,210.0	90.60	347.60	7,594.5	6,126.5	5,383.0	-1,931.6	5,715.8	1.46	-0.32	-1.43	
13,273.0	90.50	347.10	7,593.9	6,125.9	5,444.4	-1,945.4	5,778.5	0.81	-0.16	-0.79	
13,335.0	90.10	347.30	7,593.6	6,125.6	5,504.9	-1,959.2	5,840.3	0.72	-0.65	0.32	
13,399.0	90.00	346.10	7,593.5	6,125.5	5,567.2	-1,973.9	5,904.1	1.88	-0.16	-1.88	
13,461.0	90.70	347.80	7,593.1	6,125.1	5,627.6	-1,987.9	5,965.9	2.97	1.13	2.74	
13,525.0	91.70	349.50	7,591.8	6,123.8	5,690.3	-2,000.5	6,029.4	3.08	1.56	2.66	
13,588.0	91.60	348.50	7,590.0	6,122.0	5,752.1	-2,012.5	6,092.0	1.59	-0.16	-1.59	
13,651.0	90.60	348.30	7,588.8	6,120.8	5,813.8	-2,025.1	6,154.6	1.62	-1.59	-0.32	
<b>514419 Plat TD 2</b>											
13,653.1	90.56	348.32	7,588.7	6,120.7	5,815.8	-2,025.6	6,156.6	2.07	-1.75	1.11	
13,714.0	89.50	349.00	7,588.7	6,120.7	5,875.6	-2,037.5	6,217.2	2.07	-1.75	1.11	

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Phoenix Technology Services  
Survey Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well: Well #514419 - Marcellus - Slot 514419
<b>Company:</b>	EQT PRODUCTION	<b>TVD Reference:</b>	KB @ 1468.0usft
<b>Project:</b>	Wetzel County, WV	<b>MD Reference:</b>	KB @ 1468.0usft
<b>Site:</b>	BIG 333	<b>North Reference:</b>	Grid
<b>Well:</b>	Well #514419 - Marcellus	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Main Wellbore		
<b>Design:</b>	514419 As Drilled Surveys		

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)
13,777.0	89.20	348.50	7,589.4	6,121.4	5,937.4	-2,049.8	6,279.8	0.93	-0.48	-0.79
13,840.0	89.50	348.60	7,590.1	6,122.1	5,999.1	-2,062.3	6,342.4	0.50	0.48	0.16
13,903.0	89.90	347.80	7,590.5	6,122.5	6,060.8	-2,075.2	6,405.0	1.42	0.63	-1.27
13,967.0	91.00	347.10	7,590.0	6,122.0	6,123.2	-2,089.1	6,468.8	2.04	1.72	-1.09
14,030.0	91.20	346.90	7,588.8	6,120.8	6,184.6	-2,103.3	6,531.5	0.45	0.32	-0.32
14,093.0	90.90	346.20	7,587.6	6,119.6	6,245.9	-2,118.0	6,594.3	1.21	-0.48	-1.11
14,156.0	90.60	345.20	7,586.8	6,118.8	6,306.9	-2,133.5	6,657.2	1.66	-0.48	-1.59
14,219.0	90.20	346.50	7,586.3	6,118.3	6,368.0	-2,148.9	6,720.1	2.16	-0.63	2.06
14,282.0	90.30	349.10	7,586.1	6,118.1	6,429.6	-2,162.2	6,782.8	4.13	0.16	4.13
14,345.0	91.10	350.00	7,585.3	6,117.3	6,491.5	-2,173.6	6,845.3	1.91	1.27	1.43
14,408.0	91.00	350.10	7,584.1	6,116.1	6,553.6	-2,184.5	6,907.7	0.22	-0.16	0.16
14,471.0	89.90	348.80	7,583.6	6,115.6	6,615.5	-2,196.1	6,970.1	2.70	-1.75	-2.06
14,534.0	90.00	348.20	7,583.7	6,115.7	6,677.2	-2,208.6	7,032.8	0.97	0.16	-0.95
14,597.0	89.70	347.50	7,583.9	6,115.9	6,738.8	-2,221.9	7,095.5	1.21	-0.48	-1.11
14,660.0	90.70	347.10	7,583.6	6,115.6	6,800.3	-2,235.7	7,158.2	1.71	1.59	-0.63
14,723.0	90.60	346.90	7,582.9	6,114.9	6,861.7	-2,249.9	7,221.0	0.35	-0.16	-0.32
14,786.0	90.60	346.90	7,582.3	6,114.3	6,923.0	-2,264.2	7,283.8	0.00	0.00	0.00
14,849.0	90.90	347.10	7,581.4	6,113.4	6,984.4	-2,278.4	7,346.5	0.57	0.48	0.32
14,912.0	90.70	347.20	7,580.6	6,112.6	7,045.8	-2,292.4	7,409.3	0.35	-0.32	0.16
14,975.0	90.00	345.70	7,580.2	6,112.2	7,107.1	-2,307.1	7,472.1	2.63	-1.11	-2.38
15,038.0	89.70	345.30	7,580.3	6,112.3	7,168.1	-2,322.9	7,535.0	0.79	-0.48	-0.63
15,101.0	89.30	344.20	7,580.9	6,112.9	7,228.8	-2,339.5	7,598.0	1.86	-0.63	-1.75
15,164.0	88.80	343.70	7,581.9	6,113.9	7,289.4	-2,356.9	7,660.9	1.12	-0.79	-0.79
15,227.0	90.90	344.20	7,582.1	6,114.1	7,349.9	-2,374.3	7,723.9	3.43	3.33	0.79
15,290.0	91.00	344.60	7,581.1	6,113.1	7,410.6	-2,391.2	7,786.8	0.65	0.16	0.63
Final Survey=15308' MD/7581' TVD										
15,308.0	90.90	344.40	7,580.8	6,112.8	7,427.9	-2,396.1	7,804.8	1.24	-0.56	-1.11
514419 Plat TD 3										
15,364.3	90.90	344.40	7,579.9	6,111.9	7,482.2	-2,411.2	7,861.1	0.00	0.00	0.00
PROJ to Bit=15365' MD/7580' TVD - 514419 Plat TD p8										
15,365.0	90.90	344.40	7,579.9	6,111.9	7,482.8	-2,411.4	7,861.8	0.00	0.00	0.00

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Phoenix Technology Services  
Survey Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Well #514419 - Marcellus - Slot 514419
Company:	EQT PRODUCTION	TVD Reference:	KB @ 1468.0usft
Project:	Wetzel County, WV	MD Reference:	KB @ 1468.0usft
Site:	BIG 333	North Reference:	Grid
Well:	Well #514419 - Marcellus	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	514419 As Drilled Surveys		

Design Targets										
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	
- hit/miss target	(°)	(°)	(usft)	(-14.2)	(-181.8)	(usft)	(usft)			
- Shape										
514570 Top of Perf (cop	0.00	360.00	7,483.2	-14.2	-181.8	375,025.32	1,691,847.84	39° 31' 28.273 N	80° 35' 32.733 W	
- actual wellpath misses target center by 146.0usft at 7496.7usft MD (7420.5 TVD, -19.7 N, -313.5 E)										
- Rectangle (sides W1,000.0 H1,000.0 D0.0)										
514419 Plat TD p8	0.00	360.00	7,595.0	7,485.2	-2,403.7	382,524.72	1,689,625.93	39° 32' 42.123 N	80° 36' 2.260 W	
- actual wellpath misses target center by 17.2usft at 15365.0usft MD (7579.9 TVD, 7482.8 N, -2411.4 E)										
- Point										
514419 Plat Deflection p	0.00	360.00	7,615.7	3,798.4	-1,552.5	378,837.94	1,690,477.09	39° 32' 5.789 N	80° 35' 50.820 W	
- actual wellpath misses target center by 21.6usft at 11580.4usft MD (7600.8 TVD, 3802.8 N, -1537.6 E)										
- Point										
514419 LP 539' VS p8	0.00	0.00	7,635.0	385.6	-509.1	375,425.09	1,691,520.52	39° 31' 32.185 N	80° 35' 36.972 W	
- actual wellpath misses target center by 7.6usft at 8010.5usft MD (7627.5 TVD, 386.1 N, -508.2 E)										
- Point										
514419 Plat LP 2 (copy)	0.00	0.00	7,638.0	433.4	-523.7	375,472.90	1,691,505.90	39° 31' 32.656 N	80° 35' 37.166 W	
- actual wellpath misses target center by 10.4usft at 8060.2usft MD (7627.6 TVD, 433.6 N, -522.8 E)										
- Point										

Design Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(usft)	(usft)	+N/-S	+E/-W		
		(usft)	(usft)		
6,564.0	6,556.9	40.6	-98.0	Gyro Tie On=6564' MD	
8,035.0	7,627.8	409.5	-515.4	LP/Deepest Point=8035' MD/7628' TVD	
15,308.0	7,580.8	7,427.9	-2,396.1	Final Survey=15308' MD/7581' TVD	
15,365.0	7,579.9	7,482.8	-2,411.4	PROJ to Bit=15365' MD/7580' TVD	

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

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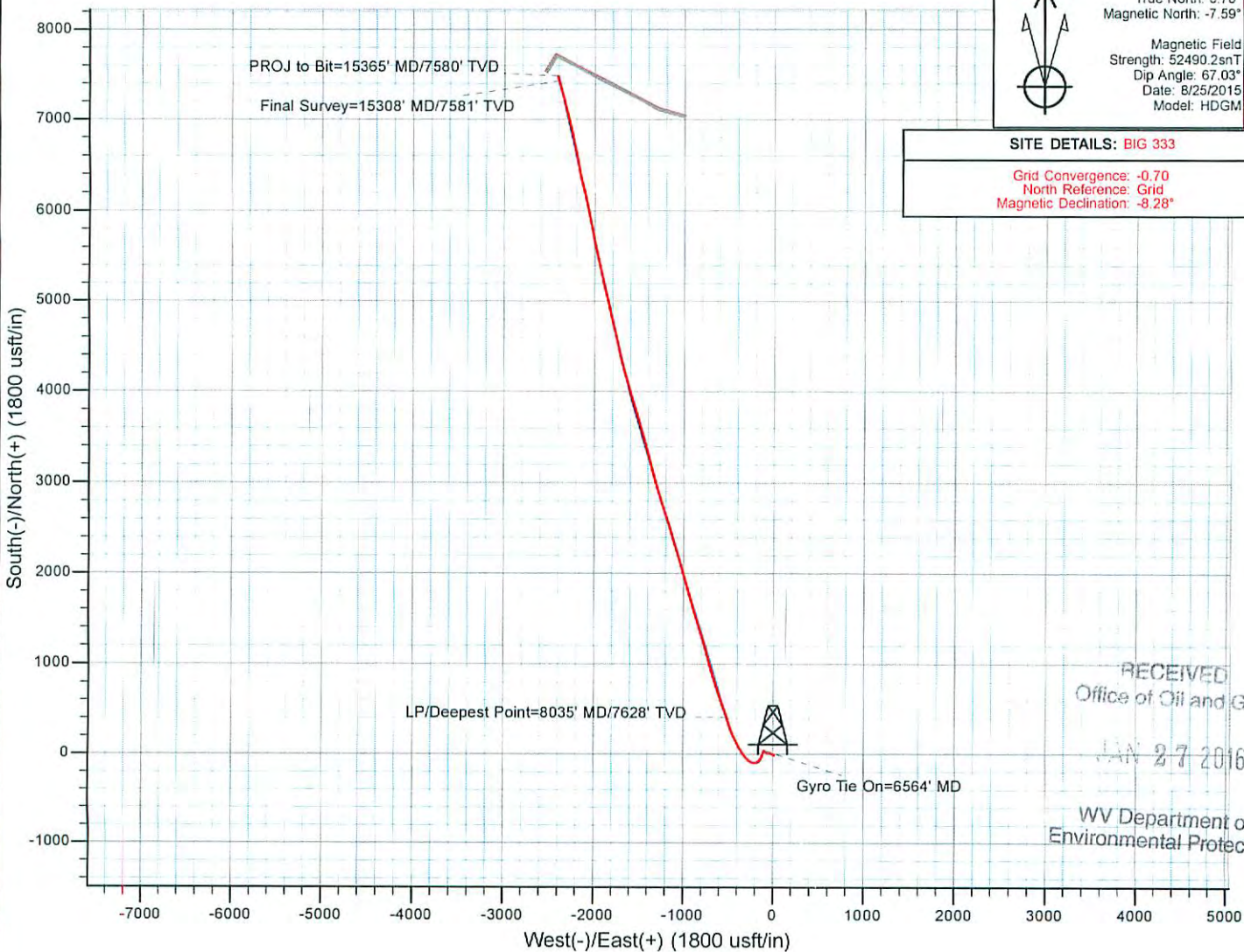
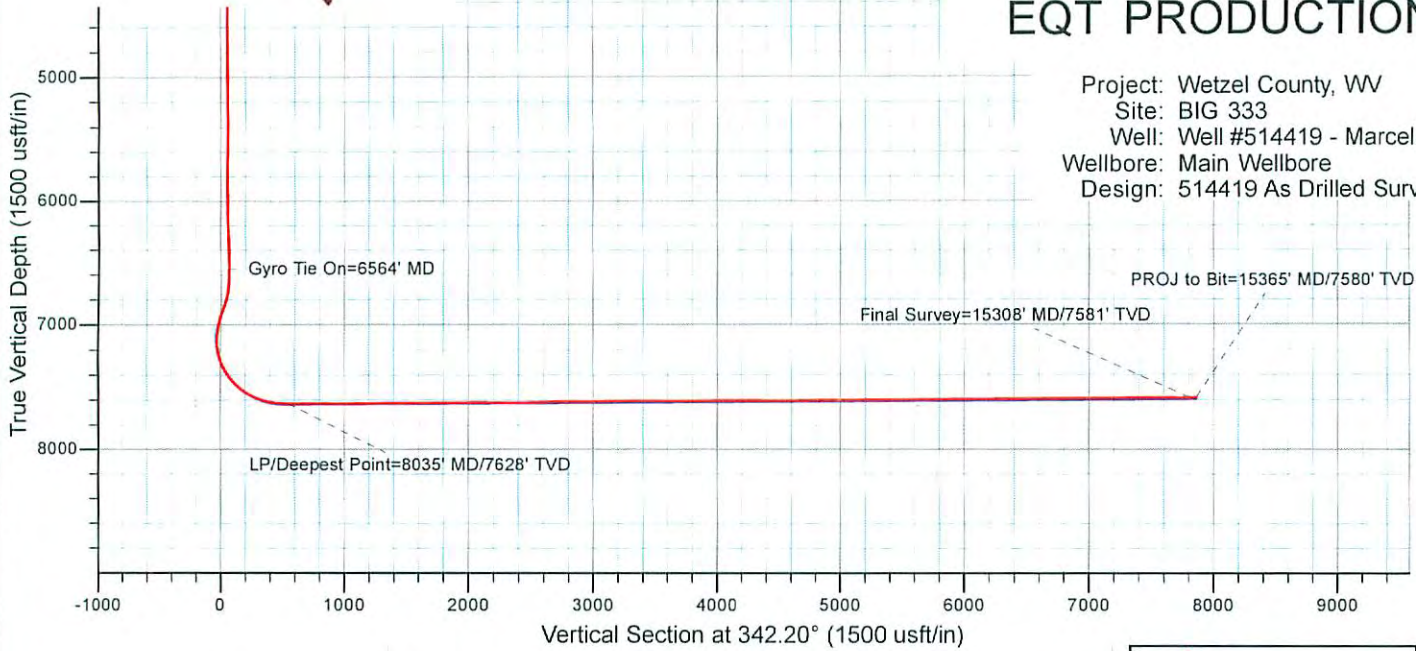
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# EQT PRODUCTION

Project: Wetzel County, WV  
 Site: BIG 333  
 Well: Well #514419 - Marcellus  
 Wellbore: Main Wellbore  
 Design: 514419 As Drilled Surveys



	Azimuths to Grid North True North: 0.70° Magnetic North: -7.59°
	Magnetic Field Strength: 52490.2snT Dip Angle: 67.03° Date: 8/25/2015 Model: HDGM

<b>SITE DETAILS: BIG 333</b>
Grid Convergence: -0.70
North Reference: Grid
Magnetic Declination: -8.28°

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