



Phoenix Technology Services LP
Survey Report



Company:	EQT PRODUCTION	Local Co-ordinate Reference:	Well Well #515109 -MRC - Slot 515109
Project:	Wetzel County, WV	TVD Reference:	KB @23' @ 1022.0usft
Site:	BIG 360	MD Reference:	KB @23' @ 1022.0usft
Well:	Well #515109 -MRC	North Reference:	Grid
Wellbore:	Main	Survey Calculation Method:	Minimum Curvature
Design:	515109 As Drilled	Database:	Compass 5000 NER

Project	Wetzel County, WV		
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 360				
Site Position:		Northing:	378,106.49 usft	Latitude:	39° 31' 57.892 N
From:	Map	Easting:	1,684,996.84 usft	Longitude:	80° 37' 0.648 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.71 °

Well	Well #515109 -MRC - Slot 515109					
Well Position	+N/-S	0.0 usft	Northing:	378,106.49 usft	Latitude:	39° 31' 57.892 N
	+E/-W	0.0 usft	Easting:	1,684,996.84 usft	Longitude:	80° 37' 0.648 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	999.0 usft

Wellbore	Main				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	10/5/2017	-8.20	66.85	52,302

Design	515109 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		342.26

Survey Program	Date	10/13/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.0	5,561.0	Gyrodata Gyro (Main)	GYD_DP_MS	Gyrodata gyro-compassing and drop	
5,654.0	12,775.0	Phoenix MWD Survey (Main)	MWD+HDGM	OWSG Rev.2 MWD + HDGM	

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Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical 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	0.0	0.0	0.0	0.00	0.00	0.00	
100.0	0.10	311.34	100.0	0.1	-0.1	0.1	0.10	0.10	0.00	
200.0	0.14	311.61	200.0	0.2	-0.2	0.3	0.04	0.04	0.27	
300.0	0.14	243.34	300.0	0.2	-0.4	0.3	0.16	0.00	-68.27	
400.0	0.11	262.39	400.0	0.2	-0.6	0.3	0.05	-0.03	19.05	
500.0	0.14	12.02	500.0	0.3	-0.7	0.5	0.21	0.03	109.63	
600.0	0.17	16.66	600.0	0.5	-0.6	0.7	0.03	0.03	4.64	
700.0	0.15	20.01	700.0	0.8	-0.5	0.9	0.02	-0.02	3.35	
800.0	0.11	15.58	800.0	1.0	-0.5	1.1	0.04	-0.04	-4.43	
900.0	0.75	123.77	900.0	0.7	0.1	0.7	0.79	0.64	108.19	

WV Department of Environmental Protection

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Wellbore:	Main	Survey Calculation Method:	Minimum Curvature
Design:	515109 As Drilled	Database:	Compass 5000 NER

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,000.0	1.01	117.13	1,000.0	0.0	1.4	-0.5	0.28	0.26	-6.64
1,100.0	0.96	116.76	1,100.0	-0.8	3.0	-1.7	0.05	-0.05	-0.37
1,200.0	0.78	108.36	1,200.0	-1.4	4.4	-2.7	0.22	-0.18	-8.40
1,300.0	0.71	107.25	1,299.9	-1.8	5.6	-3.4	0.07	-0.07	-1.11
1,400.0	0.76	109.42	1,399.9	-2.2	6.8	-4.2	0.06	0.05	2.17
1,500.0	0.84	111.15	1,499.9	-2.7	8.1	-5.0	0.08	0.08	1.73
1,600.0	0.82	120.33	1,599.9	-3.3	9.4	-6.0	0.13	-0.02	9.18
1,700.0	0.65	127.73	1,699.9	-4.0	10.5	-7.0	0.19	-0.17	7.40
1,800.0	0.65	128.85	1,799.9	-4.7	11.4	-8.0	0.01	0.00	1.12
1,900.0	0.65	123.65	1,899.9	-5.4	12.3	-8.9	0.06	0.00	-5.20
2,000.0	0.53	130.54	1,999.9	-6.0	13.1	-9.7	0.14	-0.12	6.89
2,100.0	0.52	127.78	2,099.9	-6.6	13.8	-10.5	0.03	-0.01	-2.76
2,200.0	0.46	131.59	2,199.9	-7.1	14.5	-11.2	0.07	-0.06	3.81
2,300.0	0.25	133.17	2,299.9	-7.6	14.9	-11.7	0.21	-0.21	1.58
2,400.0	0.22	131.04	2,399.9	-7.8	15.2	-12.1	0.03	-0.03	-2.13
2,500.0	0.19	128.38	2,499.9	-8.1	15.5	-12.4	0.03	-0.03	-2.66
2,600.0	0.24	263.50	2,599.9	-8.2	15.4	-12.5	0.40	0.05	135.12
2,700.0	0.48	292.46	2,699.9	-8.0	14.8	-12.2	0.29	0.24	28.96
2,800.0	0.64	299.84	2,799.9	-7.6	14.0	-11.5	0.18	0.16	7.38
2,900.0	0.80	307.56	2,899.9	-6.9	12.9	-10.5	0.19	0.16	7.72
3,000.0	0.75	305.23	2,999.9	-6.1	11.8	-9.4	0.06	-0.05	-2.33
3,100.0	0.75	301.65	3,099.8	-5.4	10.8	-8.4	0.05	0.00	-3.58
3,200.0	0.75	300.93	3,199.8	-4.7	9.6	-7.4	0.01	0.00	-0.72
3,300.0	0.68	308.03	3,299.8	-4.0	8.6	-6.4	0.11	-0.07	7.10
3,400.0	0.48	315.72	3,399.8	-3.3	7.9	-5.6	0.21	-0.20	7.69
3,500.0	0.48	311.77	3,499.8	-2.8	7.2	-4.8	0.03	0.00	-3.95
3,600.0	0.53	305.29	3,599.8	-2.2	6.6	-4.1	0.08	0.05	-6.48
3,700.0	0.63	301.05	3,699.8	-1.7	5.7	-3.3	0.11	0.10	-4.24
3,800.0	0.67	307.83	3,799.8	-1.0	4.8	-2.4	0.09	0.04	6.78
3,900.0	0.70	304.92	3,899.8	-0.3	3.8	-1.5	0.05	0.03	-2.91
4,000.0	0.56	306.49	3,999.8	0.3	2.9	-0.6	0.14	-0.14	1.57
4,100.0	0.54	294.73	4,099.8	0.8	2.1	0.1	0.11	-0.02	-11.76
4,200.0	0.23	331.56	4,199.8	1.2	1.6	0.7	0.38	-0.31	36.83
4,300.0	0.22	355.97	4,299.8	1.6	1.5	1.0	0.10	-0.01	24.41
4,400.0	0.21	11.78	4,399.8	1.9	1.5	1.4	0.06	-0.01	15.81
4,500.0	0.36	82.58	4,499.8	2.2	1.8	1.5	0.35	0.15	70.80
4,600.0	0.50	100.21	4,599.8	2.1	2.6	1.2	0.19	0.14	17.63
4,700.0	0.47	98.37	4,699.8	2.0	3.4	0.8	0.03	-0.03	-1.84
4,800.0	0.47	58.36	4,799.8	2.1	4.2	0.8	0.32	0.00	-40.01
4,900.0	0.47	78.40	4,899.8	2.4	4.9	0.8	0.16	0.00	20.04
5,000.0	0.65	119.17	4,999.8	2.2	5.8	0.4	0.43	0.18	40.77
5,100.0	0.59	126.51	5,099.8	1.7	6.7	-0.5	0.10	-0.06	7.34
5,200.0	0.29	131.51	5,199.8	1.2	7.3	-1.1	0.30	-0.30	5.00

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Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,300.0	0.32	111.96	5,299.8	0.9	7.8	-1.5	0.11	0.03	-19.55	
5,400.0	0.23	111.90	5,399.8	0.7	8.2	-1.8	0.09	-0.09	-0.06	
5,500.0	0.11	121.88	5,499.8	0.6	8.5	-2.0	0.12	-0.12	9.98	
5,561.0	0.06	100.82	5,560.8	0.6	8.6	-2.1	0.10	-0.08	-34.52	
Tie In										
5,654.0	0.16	83.11	5,653.8	0.6	8.7	-2.1	0.11	0.11	-19.04	
First Phoenix MWD Survey										
5,686.0	1.09	156.93	5,685.8	0.3	8.9	-2.4	3.30	2.91	230.69	
5,696.0	2.27	171.07	5,695.8	0.0	9.0	-2.7	12.39	11.77	141.40	
KOP As-Drilled: 5696'MD/5695.8'TVD										
5,717.0	4.84	177.71	5,716.7	-1.3	9.1	-4.0	12.39	12.25	31.62	
5,749.0	8.86	181.32	5,748.5	-5.1	9.1	-7.6	12.63	12.56	11.28	
5,780.0	12.64	184.85	5,778.9	-10.9	8.7	-13.0	12.37	12.19	11.39	
5,812.0	15.29	187.28	5,810.0	-18.5	7.9	-20.1	8.48	8.28	7.59	
5,843.0	17.90	188.21	5,839.7	-27.3	6.7	-28.1	8.46	8.42	3.00	
5,874.0	20.96	188.91	5,868.9	-37.5	5.2	-37.3	9.90	9.87	2.26	
5,906.0	24.16	189.05	5,898.5	-49.6	3.2	-48.3	10.00	10.00	0.44	
5,937.0	26.63	189.52	5,926.5	-62.7	1.1	-60.1	7.99	7.97	1.52	
5,969.0	28.70	189.86	5,954.8	-77.4	-1.4	-73.3	6.49	6.47	1.06	
6,000.0	31.01	190.16	5,981.7	-92.6	-4.1	-86.9	7.47	7.45	0.97	
6,032.0	33.64	190.00	6,008.7	-109.4	-7.1	-102.1	8.22	8.22	-0.50	
6,064.0	37.14	190.58	6,034.8	-127.7	-10.4	-118.4	10.99	10.94	1.81	
6,095.0	40.67	190.83	6,058.9	-146.8	-14.0	-135.5	11.40	11.39	0.81	
6,126.0	42.66	190.92	6,082.1	-167.0	-17.9	-153.6	6.42	6.42	0.29	
6,220.0	40.63	188.89	6,152.3	-228.5	-28.7	-209.0	2.59	-2.16	-2.16	
6,252.0	40.28	188.15	6,176.7	-249.1	-31.7	-227.6	1.86	-1.09	-2.31	
6,283.0	39.50	188.91	6,200.5	-268.7	-34.7	-245.4	2.97	-2.52	2.45	
6,315.0	36.69	190.69	6,225.6	-288.2	-38.0	-262.9	9.43	-8.78	5.56	
6,346.0	32.76	193.45	6,251.1	-305.5	-41.7	-278.2	13.65	-12.68	8.90	
6,378.0	29.62	196.78	6,278.5	-321.5	-46.0	-292.2	11.19	-9.81	10.41	
6,409.0	26.45	199.88	6,305.9	-335.3	-50.6	-303.9	11.25	-10.23	10.00	
6,440.0	24.32	202.83	6,333.9	-347.7	-55.4	-314.3	7.99	-6.87	9.52	
6,472.0	22.41	208.14	6,363.2	-359.1	-60.8	-323.5	8.88	-5.97	16.59	
6,503.0	20.72	212.83	6,392.1	-368.9	-66.6	-331.1	7.78	-5.45	15.13	
6,534.0	20.39	218.33	6,421.1	-377.8	-72.9	-337.6	6.32	-1.06	17.74	
6,566.0	20.15	223.57	6,451.1	-386.2	-80.2	-343.4	5.72	-0.75	16.38	
6,597.0	19.66	228.26	6,480.3	-393.5	-87.7	-348.1	5.39	-1.58	15.13	
6,629.0	18.80	238.29	6,510.5	-399.8	-96.1	-351.5	10.65	-2.69	31.34	
6,660.0	18.42	248.40	6,539.9	-404.2	-104.9	-353.0	10.47	-1.23	32.61	
6,692.0	18.43	256.97	6,570.2	-407.2	-114.6	-353.0	8.46	0.03	26.78	
6,723.0	20.12	269.59	6,599.5	-408.4	-124.7	-351.0	14.47	5.45	40.71	
6,755.0	22.94	279.98	6,629.3	-407.3	-136.3	-346.4	14.79	8.81	32.47	
6,786.0	24.69	285.38	6,657.7	-404.6	-148.5	-340.1	9.01	5.65	17.42	
6,818.0	26.18	289.44	6,686.6	-400.4	-161.6	-332.2	7.17	4.66	12.69	

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6,849.0	27.54	295.55	6,714.2	-395.1	-174.6	-323.1	9.92	4.39	19.71	
6,881.0	29.60	301.22	6,742.3	-387.8	-188.0	-312.1	10.64	6.44	17.72	
6,912.0	31.42	307.61	6,769.0	-378.9	-200.9	-299.6	11.99	5.87	20.61	
6,944.0	33.45	312.46	6,796.1	-367.8	-214.1	-285.1	10.31	6.34	15.16	
6,975.0	35.20	315.83	6,821.7	-355.6	-226.6	-269.7	8.33	5.65	10.87	
7,006.0	37.55	320.28	6,846.6	-342.0	-238.9	-252.9	11.40	7.58	14.35	
7,038.0	40.62	324.21	6,871.5	-326.0	-251.2	-234.0	12.32	9.59	12.28	
7,069.0	43.41	326.97	6,894.5	-308.9	-262.9	-214.1	10.79	9.00	8.90	
7,101.0	46.90	329.28	6,917.1	-289.6	-274.9	-192.1	12.05	10.91	7.22	
7,132.0	50.24	330.85	6,937.6	-269.5	-286.5	-169.4	11.42	10.77	5.06	
7,164.0	53.18	332.22	6,957.4	-247.4	-298.4	-144.7	9.78	9.19	4.28	
7,195.0	56.04	332.76	6,975.3	-225.0	-310.1	-119.8	9.33	9.23	1.74	
7,227.0	58.46	334.22	6,992.7	-200.9	-322.1	-93.2	8.48	7.56	4.56	
7,258.0	59.90	336.01	7,008.5	-176.8	-333.3	-66.8	6.79	4.65	5.77	
7,289.0	61.32	337.32	7,023.7	-152.0	-344.0	-39.9	5.88	4.58	4.23	
7,321.0	63.54	338.57	7,038.6	-125.7	-354.6	-11.6	7.75	6.94	3.91	
7,352.0	67.56	339.43	7,051.4	-99.3	-364.7	16.5	13.21	12.97	2.77	
7,384.0	71.68	341.64	7,062.5	-71.0	-374.7	46.5	14.41	12.88	6.91	
7,415.0	74.62	342.93	7,071.5	-42.8	-383.8	76.2	10.29	9.48	4.16	
7,447.0	77.36	344.26	7,079.3	-13.0	-392.5	107.2	9.46	8.56	4.16	
7,478.0	80.19	345.20	7,085.3	16.3	-400.5	137.6	9.60	9.13	3.03	
7,510.0	82.28	345.79	7,090.2	46.9	-408.4	169.1	6.78	6.53	1.84	
7,541.0	84.30	346.74	7,093.8	76.8	-415.8	199.9	7.19	6.52	3.06	
7,573.0	86.58	347.17	7,096.3	107.9	-423.0	231.6	7.25	7.13	1.34	
7,626.0	90.71	345.97	7,097.6	159.4	-435.3	284.5	8.11	7.79	-2.26	
LP As-Drilled: 7626'MD/7097.6'TVD - Purcell Target										
7,635.0	91.41	345.77	7,097.4	168.2	-437.5	293.4	8.11	7.79	-2.26	
7,729.0	90.01	344.70	7,096.3	259.1	-461.4	387.3	1.87	-1.49	-1.14	
7,823.0	88.87	343.61	7,097.2	349.5	-487.1	481.3	1.68	-1.21	-1.16	
7,918.0	88.65	344.80	7,099.2	440.9	-512.9	576.2	1.27	-0.23	1.25	
8,012.0	89.36	346.02	7,100.9	531.8	-536.6	670.0	1.50	0.76	1.30	
8,107.0	90.10	344.87	7,101.3	623.8	-560.5	764.9	1.44	0.78	-1.21	
8,201.0	89.35	345.45	7,101.8	714.6	-584.5	858.7	1.01	-0.80	0.62	
8,292.0	89.72	345.60	7,102.5	802.7	-607.3	949.6	0.44	0.40	0.17	
Deepest Point @ 8292'MD/7102.5'TVD										
8,295.0	89.73	345.61	7,102.5	805.6	-608.0	952.6	0.44	0.40	0.17	
8,389.0	91.35	348.39	7,101.6	897.2	-629.2	1,046.2	3.42	1.72	2.96	
8,483.0	90.27	348.28	7,100.3	989.3	-648.2	1,139.7	1.15	-1.15	-0.12	
8,578.0	90.65	349.54	7,099.5	1,082.5	-666.5	1,234.1	1.39	0.40	0.17	
8,672.0	89.93	348.44	7,099.1	1,174.8	-684.4	1,327.4	1.40	-0.77	-1.17	
8,766.0	90.21	345.34	7,099.0	1,266.3	-705.7	1,421.1	3.31	0.30	-3.30	
8,860.0	90.99	345.56	7,098.0	1,357.3	-729.3	1,514.9	0.86	0.83	0.23	
8,954.0	90.16	345.95	7,097.0	1,448.4	-752.5	1,608.8	0.98	-0.88	0.23	

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Phoenix Technology Services LP
Survey Report



Company:	EQT PRODUCTION	Local Co-ordinate Reference:	Well Well #515109 -MRC - Slot 515109
Project:	Wetzel County, WV	TVD Reference:	KB @23' @ 1022.0usft
Site:	BIG 360	MD Reference:	KB @23' @ 1022.0usft
Well:	Well #515109 -MRC	North Reference:	Grid
Wellbore:	Main	Survey Calculation Method:	Minimum Curvature
Design:	515109 As Drilled	Database:	Compass 5000 NER

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
9,048.0	90.21	345.19	7,096.7	1,539.4	-775.9	1,702.6	0.81	0.05	-0.81	
9,143.0	90.65	343.82	7,096.0	1,631.0	-801.3	1,797.5	1.51	0.46	-1.44	
9,237.0	89.10	343.58	7,096.2	1,721.2	-827.7	1,891.5	1.67	-1.65	-0.26	
9,332.0	89.16	343.49	7,097.7	1,812.3	-854.6	1,986.5	0.11	0.06	-0.09	
9,426.0	88.58	344.88	7,099.5	1,902.7	-880.2	2,080.4	1.60	-0.62	1.48	
9,521.0	89.72	346.12	7,100.9	1,994.6	-904.0	2,175.2	1.77	1.20	1.31	
9,615.0	91.62	345.35	7,099.8	2,085.7	-927.1	2,269.0	2.18	2.02	-0.82	
9,710.0	92.67	347.28	7,096.3	2,178.0	-949.6	2,363.7	2.31	1.11	2.03	
9,804.0	91.44	345.96	7,092.9	2,269.4	-971.3	2,457.4	1.92	-1.31	-1.40	
9,898.0	89.98	346.10	7,091.7	2,360.6	-994.0	2,551.2	1.56	-1.55	0.15	
9,993.0	89.47	347.07	7,092.2	2,453.0	-1,016.1	2,645.9	1.15	-0.54	1.02	
10,087.0	90.47	348.48	7,092.2	2,544.8	-1,036.0	2,739.5	1.84	1.06	1.50	
10,181.0	90.13	347.83	7,091.7	2,636.8	-1,055.3	2,833.0	0.78	-0.36	-0.69	
10,276.0	91.04	347.26	7,090.8	2,729.6	-1,075.7	2,927.6	1.13	0.96	-0.60	
10,370.0	90.98	348.14	7,089.1	2,821.4	-1,095.8	3,021.1	0.94	-0.06	0.94	
10,464.0	89.79	344.62	7,088.5	2,912.8	-1,117.9	3,114.9	3.95	-1.27	-3.74	
10,559.0	91.07	343.30	7,087.8	3,004.0	-1,144.1	3,209.8	1.94	1.35	-1.39	
10,653.0	89.81	344.35	7,087.0	3,094.3	-1,170.3	3,303.8	1.74	-1.34	1.12	
10,747.0	90.55	345.09	7,086.8	3,185.0	-1,195.1	3,397.7	1.11	0.79	0.79	
10,842.0	90.07	346.94	7,086.2	3,277.2	-1,218.1	3,492.5	2.01	-0.51	1.95	
10,936.0	90.33	348.16	7,085.9	3,369.0	-1,238.3	3,586.1	1.33	0.28	1.30	
11,030.0	91.04	347.78	7,084.8	3,460.9	-1,257.9	3,679.6	0.86	0.76	-0.40	
11,124.0	91.59	348.22	7,082.6	3,552.8	-1,277.4	3,773.1	0.75	0.59	0.47	
11,219.0	90.41	345.20	7,081.0	3,645.2	-1,299.3	3,867.8	3.41	-1.24	-3.18	
11,313.0	90.27	347.47	7,080.4	3,736.6	-1,321.5	3,961.5	2.42	-0.15	2.41	
11,407.0	89.81	345.95	7,080.3	3,828.1	-1,343.1	4,055.3	1.69	-0.49	-1.62	
11,501.0	90.30	348.62	7,080.3	3,919.7	-1,363.8	4,148.9	2.89	0.52	2.84	
11,595.0	90.98	349.21	7,079.2	4,012.0	-1,381.9	4,242.2	0.96	0.72	0.63	
11,690.0	91.98	349.14	7,076.8	4,105.3	-1,399.7	4,336.5	1.06	1.05	-0.07	
11,784.0	89.99	347.98	7,075.1	4,197.4	-1,418.3	4,429.9	2.45	-2.12	-1.23	
11,878.0	89.15	346.72	7,075.8	4,289.1	-1,438.9	4,523.6	1.61	-0.89	-1.34	
11,973.0	90.16	347.66	7,076.4	4,381.7	-1,460.0	4,618.2	1.45	1.06	0.99	
12,067.0	91.59	346.51	7,075.0	4,473.3	-1,481.0	4,711.9	1.95	1.52	-1.22	
12,161.0	91.92	346.25	7,072.1	4,564.6	-1,503.1	4,805.6	0.45	0.35	-0.28	
12,255.0	92.87	345.85	7,068.2	4,655.8	-1,525.7	4,899.3	1.10	1.01	-0.43	
12,350.0	91.48	345.94	7,064.6	4,747.8	-1,548.9	4,994.0	1.47	-1.46	0.09	
12,445.0	92.25	345.97	7,061.5	4,840.0	-1,571.9	5,088.8	0.81	0.81	0.03	
12,539.0	90.25	346.77	7,059.4	4,931.3	-1,594.1	5,182.5	2.29	-2.13	0.85	
12,634.0	89.02	347.32	7,060.0	5,023.9	-1,615.4	5,277.2	1.42	-1.29	0.58	
12,698.0	89.73	347.43	7,060.7	5,086.3	-1,629.4	5,340.9	1.12	1.11	0.17	
Final Phoenix MWD Survey										
12,775.0	89.73	347.43	7,061.1	5,161.5	-1,646.1	5,417.6	0.00	0.00		
PTBAs-Drilled: 12775MD/7061TVD										

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Company:	EQT PRODUCTION	Local Co-ordinate Reference:	Well Well #515109 -MRC - Slot 515109
Project:	Wetzel County, WV	TVD Reference:	KB @23' @ 1022.0usft
Site:	BIG 360	MD Reference:	KB @23' @ 1022.0usft
Well:	Well #515109 -MRC	North Reference:	Grid
Wellbore:	Main	Survey Calculation Method:	Minimum Curvature
Design:	515109 As Drilled	Database:	Compass 5000 NER

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
515109 - As-Drilled KOF - hit/miss target - Shape - actual wellpath hits target center - Point	0.00	0.00	5,695.8	0.0	9.0	378,106.50	1,685,005.82	39° 31' 57.894 N	80° 37' 0.533 W
515109 - As-Drilled TD - actual wellpath hits target center - Point	0.00	0.00	7,061.1	5,161.5	-1,646.1	383,267.95	1,683,350.73	39° 32' 48.701 N	80° 37' 22.480 W
515109 - As-Drilled LP - actual wellpath hits target center - Point	0.00	0.00	7,097.6	159.4	-435.3	378,265.93	1,684,561.58	39° 31' 59.415 N	80° 37' 6.228 W

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
5,561.0	5,560.8	0.6	8.6	Tie In	
5,654.0	5,653.8	0.6	8.7	First Phoenix MWD Survey	
5,696.0	5,695.8	0.0	9.0	KOP As-Drilled: 5696'MD/5695.8'TVD	
7,626.0	7,097.6	159.4	-435.3	LP As-Drilled: 7626'MD/7097.6'TVD	
7,626.0	7,097.6	159.4	-435.3	Purcell Target	
8,292.0	7,102.5	802.7	-607.3	Deepest Point @ 8292'MD/7102.5'TVD	
12,698.0	7,060.7	5,086.3	-1,629.4	Final Phoenix MWD Survey	
12,775.0	7,061.1	5,161.5	-1,646.1	PTBAs-Drilled: 12775'MD/7061'TVD	

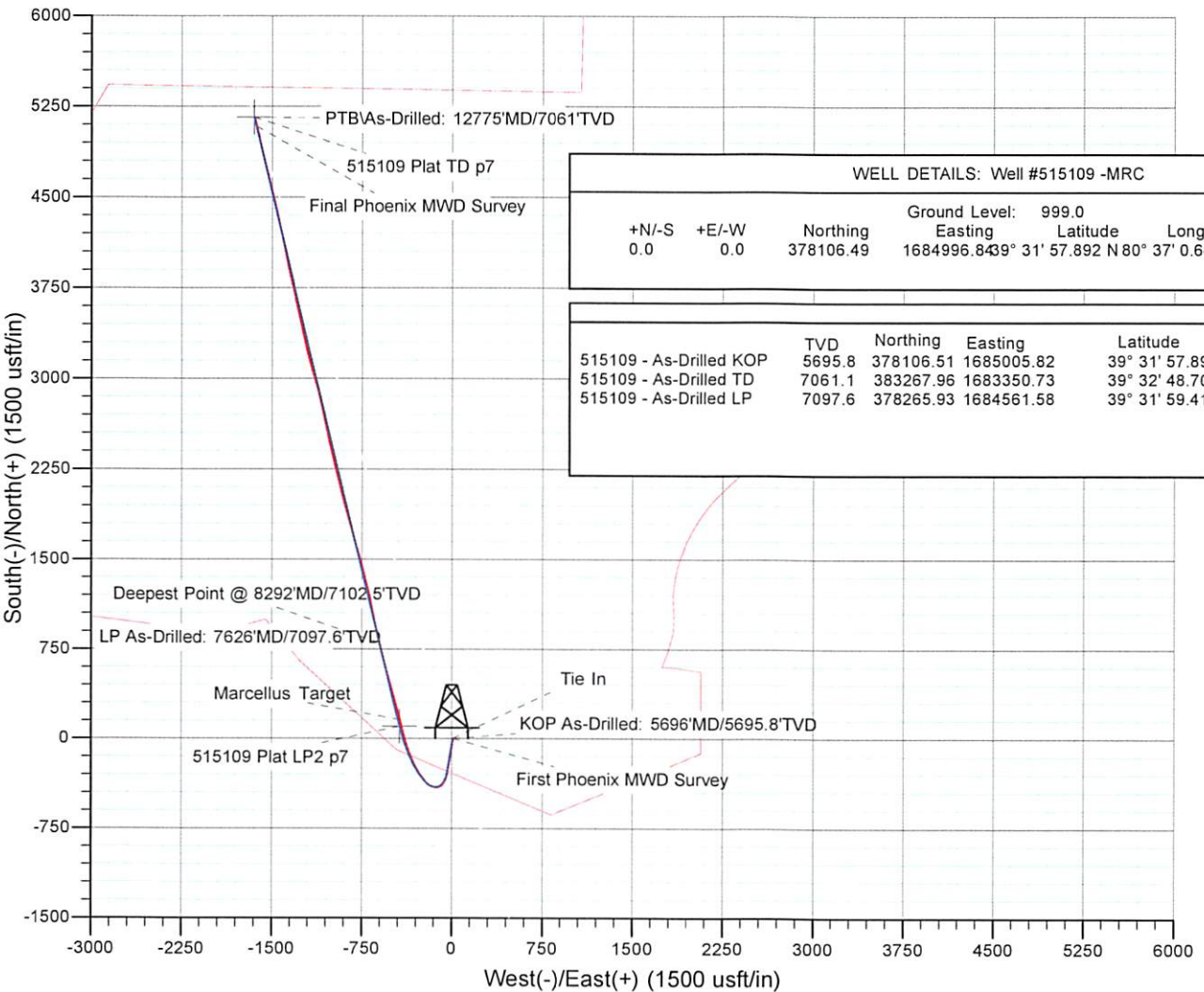
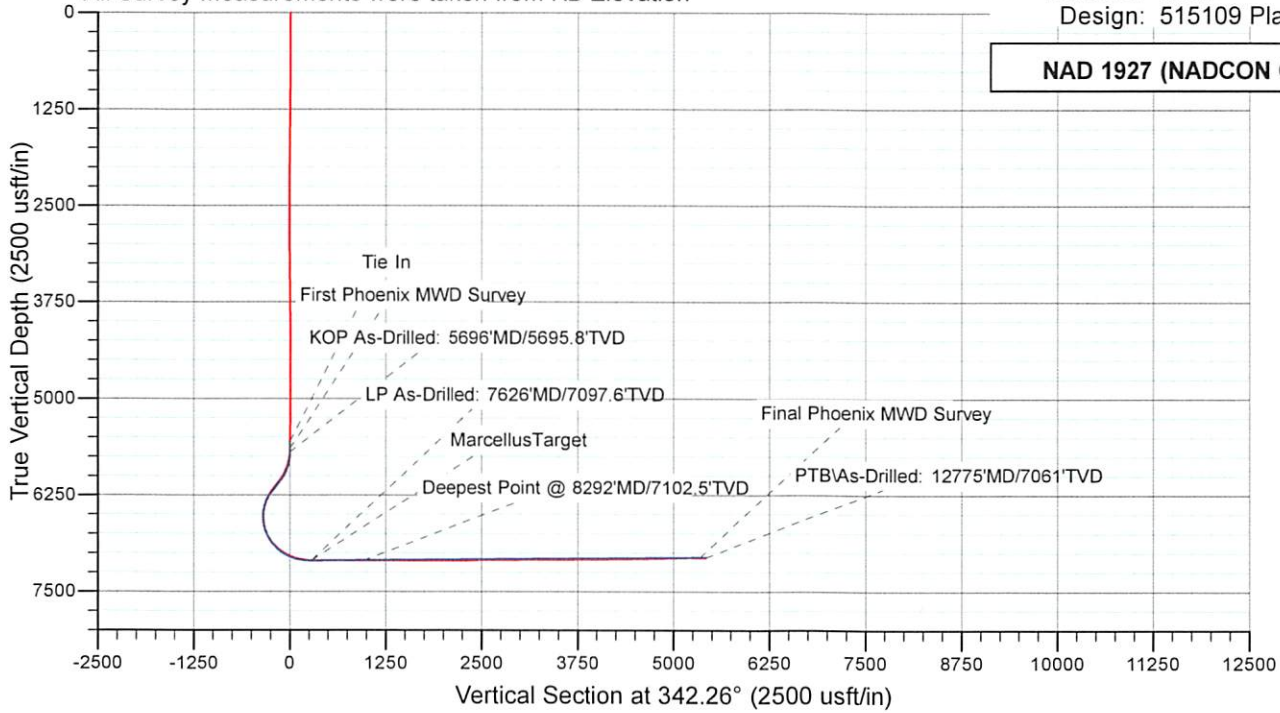
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KB Elevation=1319 FT
Ground Elevation=1296 FT

Project: Wetzel County, WV
Site: BIG 360
Well: Well #515109 -MRC
Wellbore: Main
Design: 515109 Plan 9

All Survey Measurements were taken from KB Elevation

NAD 1927 (NADCON CONUS)



WELL DETAILS: Well #515109 -MRC						
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	378106.49	1684996.8439	31° 57.892 N	80° 37' 0.648 W	515109

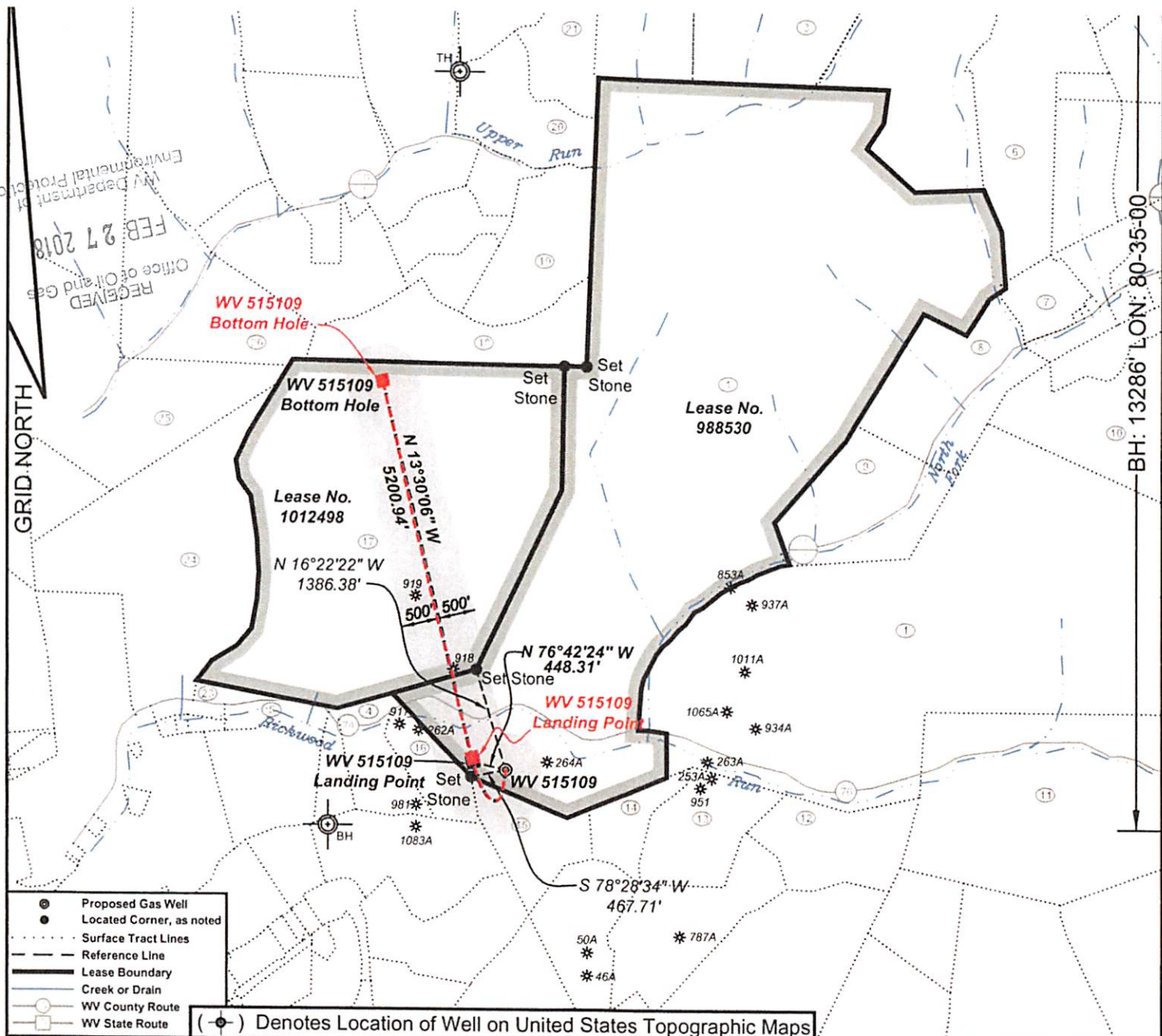
	TVD	Northing	Easting	Latitude	Longitude
515109 - As-Drilled KOP	5695.8	378106.51	1685005.82	39° 31' 57.894 N	80° 37' 0.533 W
515109 - As-Drilled TD	7061.1	383267.96	1683350.73	39° 32' 48.701 N	80° 37' 22.480 W
515109 - As-Drilled LP	7097.6	378265.93	1684561.58	39° 31' 59.415 N	80° 37' 6.228 W

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GRID NORTH

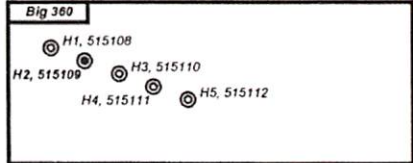
BH: 13286' LON: 80-35-00
LON: 80-35-00



2	15	46	Wetzel	Grant	Buri Henthorn Est, et al.	99.00
3	12	47	Wetzel	Grant	Coastal Forest Resources Co.	87.50
4	22	12	Wetzel	Grant	James Jones, et al.	18.67
5	22	11	Wetzel	Grant	Mary M. Snodgrass	10.14
6	18	1	Wetzel	Grant	McKinley E. Calvert Heirs	100.00
7	18	14	Wetzel	Grant	Frank M. & Frankie L. Dulaney	9.55
8	18	13	Wetzel	Grant	Ralph G. Dulaney	87.50
9	18	17	Wetzel	Grant	Alan D. & Diana L. Barr	13.00
10	18	22	Wetzel	Grant	Karen R. Dennison, et al.	111.40
11	23	5	Wetzel	Grant	Thomas E. Wyatt, et al.	174.68
12	23	4	Wetzel	Grant	Dallison Lumber Inc.	36.10
13	23	2	Wetzel	Grant	Billy D. Arnolds, Jr.	38.80
14	23	1	Wetzel	Grant	Billy D. Arnolds, Jr.	16.50
15	22	27	Wetzel	Grant	Dallison Lumber Inc.	31.35
16	22	13	Wetzel	Grant	James Jones, et al.	16.75
17	17	16	Wetzel	Grant	David A. Arnolds	402.61
18	17	13	Wetzel	Grant	David A. Arnolds	62.25
19	17	12	Wetzel	Grant	Rhonda K. Spencer	57.20
20	17	4	Wetzel	Grant	George W. Cain	42.60
21	12	45	Wetzel	Grant	Jimmy L & James C. Yoho	44.10
22	12	46	Wetzel	Grant	Jimmy L & James C. Yoho	56.10
23	22	7	Wetzel	Grant	Billy D. Arnolds	5.20
24	17	16.1	Wetzel	Grant	Coastal Forest Resources Co.	137.39
25	16	40	Wetzel	Grant	Coastal Forest Resources Co.	412.80
26	17	6	Wetzel	Grant	Georgia Ann Smith	0.55

WV 515109 Bottom Hole coordinates:
 NAD 27 N: 383,267.94 E: 1,683,350.73
 NAD 83 UTM N: 4,377,542.31 E: 532,415.70

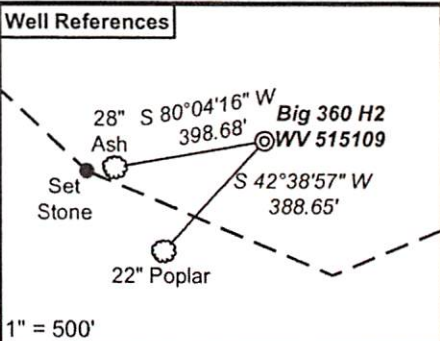
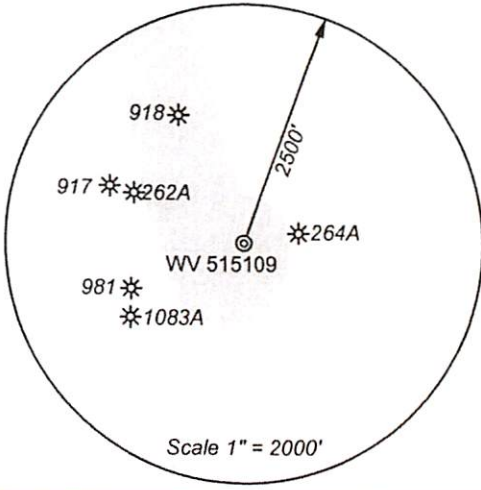
West Virginia Coordinate System of 1927 (North Zone) based upon Differential GPS Measurements.
 Plat orientation, corner and well ties are based upon the grid north meridian.
 Well location references are based upon the grid north meridian.
 UTM coordinates are NAD83, Zone 17, Meters.



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Sub Surface Tract 15	Acres	Owner
	31.35	Dallison Lumber Inc.

Lease No.	Acres	Owner
1012498	514	Kenneth R. Mason, et al.



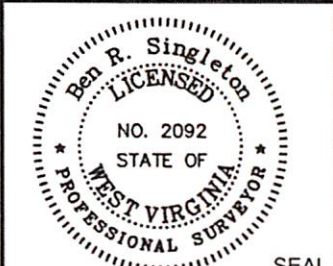
- Proposed Gas Well
- Located Corner, as noted
- Surface Tract Lines
- Reference Line
- Lease Boundary
- Creek or Drain
- WV County Route
- WV State Route



I, the undersigned, hereby certify that this plat is correct to the best of my knowledge and belief and shows all the information required by law and the regulations issued and prescribed by the Department of Environmental Protection.

Ben R. Singleton

P.S. 2092



FILE NO: 174-13
 DRAWING NO: 174-13 Big 360 H2
 SCALE: 1" = 2000'
 MINIMUM DEGREE OF ACCURACY: 1:2500
 PROVEN SOURCE OF ELEVATION: NGS CORS Station

STATE OF WEST VIRGINIA
 DEPARTMENT OF ENVIRONMENTAL PROTECTION
 OIL AND GAS DIVISION

DATE: October 24 20 17
 OPERATOR'S WELL NO. 515109
 API WELL NO 47 - 103 - 03162
 STATE COUNTY PERMIT

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
 (IF GAS) PRODUCTION: STORAGE DEEP SHALLOW

LOCATION: ELEVATION: Original Ground = 1008' Proposed Ground = 998' WATERSHED Richwood Run QUADRANGLE: Big Run

DISTRICT: Grant COUNTY: Wetzel

SURFACE OWNER: Coastal Forest Resources Company d/b/a Coastal Timberlands Company ACREAGE: 1,636.5

ROYALTY OWNER: Mills-Wetzel Land, Inc. LEASE NO: 988530 ACREAGE: 659

PROPOSED WORK: DRILL CONVERT DRILL DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION