



Phoenix Technology Services LP
Survey Report



Company:	EQT PRODUCTION	Local Co-ordinate Reference:	Well Well #515108 -MRC - Slot 515108
Project:	Wetzel County, WV	TVD Reference:	KB @23' @ 1022.0usft
Site:	BIG 360	MD Reference:	KB @23' @ 1022.0usft
Well:	Well #515108 -MRC	North Reference:	Grid
Wellbore:	Main	Survey Calculation Method:	Minimum Curvature
Design:	515108 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 #515108 -MRC - Slot 515108					
Well Position	+N/-S	0.0 usft	Northing:	378,111.72 usft	Latitude:	39° 31' 57.942 N
	+E/-W	0.0 usft	Easting:	1,684,982.78 usft	Longitude:	80° 37' 0.828 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	10/13/2017	-8.20	66.85	52,299

Design	515108 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	349.92	

Survey Program	Date	10/24/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.0	5,102.0	Gyrodata Gyros (Main)	GYD_DP_MS	Gyrodata gyro-compassing and drop	
5,183.0	12,821.0	Phoenix MWD Surveys (Main)	MWD+HDGM	OWSG Rev.2 MWD + HDGM	

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	0.23	95.15	100.0	0.0	0.2	-0.1	0.23	0.23	0.00		
200.0	0.25	72.25	200.0	0.0	0.6	-0.1	0.10	0.02	-22.90		
300.0	0.12	72.64	300.0	0.1	0.9	0.0	0.13	-0.13	0.39		
400.0	0.19	41.09	400.0	0.3	1.1	0.1	0.11	0.07	-31.55		
500.0	0.12	45.60	500.0	0.5	1.3	0.2	0.07	-0.07	4.51		
600.0	0.07	21.15	600.0	0.6	1.4	0.4	0.06	-0.05	-24.45		
700.0	0.07	319.11	700.0	0.7	1.4	0.5	0.07	0.00	-62.04		
800.0	0.08	35.14	800.0	0.8	1.4	0.6	0.09	0.01	76.03		
900.0	0.44	144.04	900.0	0.6	1.7	0.3	0.47	0.36	108.90		

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Wellbore:	Main	Survey Calculation Method:	Minimum Curvature
Design:	515108 As Drilled	Database:	Compass 5000 NER

Survey										
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1,000.0	0.59	149.76	1,000.0	-0.2	2.1	-0.6	0.16	0.15	5.72	
1,100.0	0.59	147.04	1,100.0	-1.1	2.7	-1.5	0.03	0.00	-2.72	
1,200.0	0.51	143.17	1,200.0	-1.9	3.2	-2.4	0.09	-0.08	-3.87	
1,300.0	0.51	151.48	1,300.0	-2.6	3.7	-3.2	0.07	0.00	8.31	
1,400.0	0.55	142.40	1,400.0	-3.4	4.2	-4.1	0.09	0.04	-9.08	
1,500.0	0.63	143.92	1,500.0	-4.2	4.8	-5.0	0.08	0.08	1.52	
1,600.0	0.71	149.95	1,600.0	-5.2	5.5	-6.1	0.11	0.08	6.03	
1,700.0	0.77	151.09	1,700.0	-6.3	6.1	-7.3	0.06	0.06	1.14	
1,800.0	0.63	155.35	1,799.9	-7.4	6.6	-8.4	0.15	-0.14	4.26	
1,900.0	0.62	159.93	1,899.9	-8.4	7.1	-9.5	0.05	-0.01	4.58	
2,000.0	0.57	163.90	1,999.9	-9.4	7.4	-10.5	0.06	-0.05	3.97	
2,100.0	0.47	174.70	2,099.9	-10.3	7.6	-11.4	0.14	-0.10	10.80	
2,200.0	0.38	179.60	2,199.9	-11.0	7.6	-12.2	0.10	-0.09	4.90	
2,300.0	0.32	187.61	2,299.9	-11.6	7.6	-12.8	0.08	-0.06	8.01	
2,400.0	0.31	201.00	2,399.9	-12.1	7.4	-13.3	0.07	-0.01	13.39	
2,500.0	0.38	219.94	2,499.9	-12.7	7.1	-13.7	0.13	0.07	18.94	
2,600.0	0.42	261.50	2,599.9	-13.0	6.5	-13.9	0.29	0.04	41.56	
2,700.0	0.56	284.11	2,699.9	-12.9	5.7	-13.7	0.24	0.14	22.61	
2,800.0	0.61	293.50	2,799.9	-12.6	4.8	-13.2	0.11	0.05	9.39	
2,900.0	0.68	304.49	2,899.9	-12.0	3.8	-12.5	0.14	0.07	10.99	
3,000.0	0.69	301.81	2,999.9	-11.4	2.8	-11.7	0.03	0.01	-2.68	
3,100.0	0.70	304.28	3,099.9	-10.7	1.8	-10.8	0.03	0.01	2.47	
3,200.0	0.66	308.52	3,199.9	-10.0	0.8	-10.0	0.06	-0.04	4.24	
3,300.0	0.66	310.75	3,299.9	-9.3	-0.1	-9.1	0.03	0.00	2.23	
3,400.0	0.55	316.75	3,399.9	-8.5	-0.9	-8.3	0.13	-0.11	6.00	
3,500.0	0.63	319.99	3,499.9	-7.8	-1.5	-7.4	0.09	0.08	3.24	
3,600.0	0.58	315.88	3,599.9	-7.0	-2.2	-6.5	0.07	-0.05	-4.11	
3,700.0	0.60	309.67	3,699.9	-6.3	-3.0	-5.7	0.07	0.02	-6.21	
3,800.0	0.74	308.30	3,799.8	-5.6	-3.9	-4.8	0.14	0.14	-1.37	
3,900.0	0.76	309.93	3,899.8	-4.7	-4.9	-3.8	0.03	0.02	1.63	
4,000.0	0.65	310.40	3,999.8	-3.9	-5.9	-2.8	0.11	-0.11	0.47	
4,100.0	0.54	311.93	4,099.8	-3.3	-6.6	-2.0	0.11	-0.11	1.53	
4,200.0	0.22	327.24	4,199.8	-2.8	-7.1	-1.5	0.33	-0.32	15.31	
4,300.0	0.26	23.56	4,299.8	-2.4	-7.1	-1.1	0.23	0.04	56.32	
4,400.0	0.34	41.46	4,399.8	-2.0	-6.8	-0.8	0.12	0.08	17.90	
4,500.0	0.66	93.05	4,499.8	-1.8	-6.1	-0.7	0.52	0.32	51.59	
4,600.0	0.69	96.89	4,599.8	-1.9	-4.9	-1.0	0.05	0.03	3.84	
4,700.0	0.42	87.54	4,699.8	-1.9	-3.9	-1.2	0.28	-0.27	-9.35	
4,800.0	0.28	79.87	4,799.8	-1.9	-3.3	-1.3	0.15	-0.14	-7.67	
4,900.0	0.38	81.70	4,899.8	-1.8	-2.7	-1.3	0.10	0.10	1.83	
5,000.0	0.44	124.67	4,999.8	-2.0	-2.1	-1.6	0.31	0.06	42.97	
5,100.0	0.71	164.06	5,099.8	-2.8	-1.6	-2.5	0.46	0.27	39.39	
5,102.0	0.72	165.26	5,101.8	-2.8	-1.6	-2.5	0.90	0.50	60.00	

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Wellbore: Main	Survey Calculation Method: Minimum Curvature
Design: 515108 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)	
Tie In										
5,183.0	0.53	225.50	5,182.8	-3.6	-1.7	-3.2	0.80	-0.23	74.37	
First Phoenix MWD Survey										
5,214.0	0.69	219.42	5,213.8	-3.8	-2.0	-3.4	0.56	0.52	-19.61	
5,226.0	1.20	212.80	5,225.8	-4.0	-2.1	-3.5	4.31	4.22	-55.20	
As-Drilled KOP:5226'MD/5225.8'TVD										
5,245.0	2.01	209.20	5,244.8	-4.4	-2.3	-3.9	4.31	4.28	-18.92	
5,277.0	4.68	190.12	5,276.7	-6.2	-2.8	-5.6	8.93	8.34	-59.63	
5,308.0	7.78	175.82	5,307.5	-9.5	-2.9	-8.9	11.11	10.00	-46.13	
5,340.0	10.61	165.60	5,339.1	-14.6	-2.0	-14.0	10.18	8.84	-31.94	
5,371.0	13.39	157.40	5,369.4	-20.6	0.1	-20.3	10.50	8.97	-26.45	
5,403.0	17.09	159.09	5,400.3	-28.4	3.2	-28.6	11.64	11.56	5.28	
5,434.0	20.21	159.77	5,429.7	-37.7	6.6	-38.3	10.09	10.06	2.19	
5,465.0	23.33	160.28	5,458.5	-48.5	10.6	-49.6	10.08	10.06	1.65	
5,497.0	26.55	159.91	5,487.5	-61.2	15.2	-62.9	10.07	10.06	-1.16	
5,528.0	29.37	156.44	5,514.9	-74.7	20.6	-77.1	10.50	9.10	-11.19	
5,560.0	33.32	153.26	5,542.2	-89.7	27.7	-93.2	13.38	12.34	-9.94	
5,591.0	37.92	151.26	5,567.4	-105.7	36.1	-110.4	15.31	14.84	-6.45	
5,623.0	41.75	151.19	5,592.0	-123.7	46.0	-129.8	11.97	11.97	-0.22	
5,654.0	44.23	151.00	5,614.6	-142.2	56.2	-149.8	8.01	8.00	-0.61	
5,749.0	44.43	149.51	5,682.6	-199.8	89.1	-212.3	1.12	0.21	-1.57	
5,843.0	43.16	151.60	5,750.4	-256.4	121.1	-273.7	2.05	-1.35	2.22	
5,937.0	41.60	154.54	5,819.9	-312.9	149.8	-334.3	2.68	-1.66	3.13	
6,032.0	40.73	152.66	5,891.4	-368.9	177.6	-394.3	1.59	-0.92	-1.98	
6,126.0	39.65	153.13	5,963.2	-422.9	205.2	-452.3	1.19	-1.15	0.50	
6,158.0	38.84	152.23	5,988.0	-440.9	214.5	-471.6	3.09	-2.53	-2.81	
6,189.0	36.06	149.44	6,012.6	-457.4	223.7	-489.4	10.50	-8.97	-9.00	
6,220.0	33.86	146.33	6,038.0	-472.4	233.1	-505.9	9.13	-7.10	-10.03	
6,252.0	31.55	143.00	6,064.9	-486.5	243.1	-521.6	9.15	-7.22	-10.41	
6,283.0	28.53	142.26	6,091.8	-498.9	252.5	-535.3	9.81	-9.74	-2.38	
6,315.0	25.04	138.85	6,120.3	-510.0	261.7	-547.9	11.91	-10.91	-10.66	
6,346.0	22.13	135.29	6,148.7	-519.1	270.1	-558.3	10.45	-9.39	-11.46	
6,378.0	19.05	130.57	6,178.7	-526.8	278.3	-567.3	10.93	-9.63	-14.75	
6,409.0	16.70	124.17	6,208.2	-532.6	285.8	-574.4	9.87	-7.58	-20.65	
6,440.0	15.67	116.68	6,238.0	-537.0	293.3	-580.0	7.50	-3.32	-24.16	
6,472.0	15.86	110.33	6,268.8	-540.4	301.2	-584.8	5.42	0.59	-19.84	
6,503.0	15.93	102.33	6,298.6	-542.8	309.4	-588.5	7.07	0.23	-25.81	
6,534.0	15.45	90.08	6,328.4	-543.7	317.6	-590.9	10.78	-1.55	-39.52	
6,566.0	14.99	75.88	6,359.3	-542.7	325.9	-591.4	11.71	-1.44	-44.38	
6,597.0	15.00	62.68	6,389.3	-539.9	333.4	-589.9	10.99	0.03	-42.58	
6,629.0	15.30	47.08	6,420.2	-535.1	340.1	-586.4	12.74	0.94	-48.75	
6,660.0	16.18	33.85	6,450.0	-528.7	345.5	-581.0	11.89	2.84	-42.68	
6,692.0	17.70	27.89	6,480.6	-520.7	350.3	-574.0	7.21	4.75	-18.63	
6,723.0	18.68	22.73	6,510.1	-512.0	354.4	-566.1	6.08	3.16	-16.65	

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6,755.0	19.21	15.54	6,540.4	-502.2	357.8	-557.0	7.48	1.66	-22.47	
6,786.0	20.14	8.55	6,569.6	-492.0	360.0	-547.4	8.16	3.00	-22.55	
6,818.0	21.53	3.63	6,599.5	-480.7	361.2	-536.5	6.98	4.34	-15.38	
6,849.0	22.85	0.48	6,628.2	-469.0	361.6	-525.0	5.73	4.26	-10.16	
6,881.0	23.23	357.95	6,657.6	-456.5	361.4	-512.7	3.31	1.19	-7.91	
6,912.0	24.61	357.86	6,686.0	-443.9	361.0	-500.2	4.45	4.45	-0.29	
6,944.0	26.60	357.68	6,714.8	-430.1	360.4	-486.5	6.22	6.22	-0.56	
6,975.0	28.45	356.93	6,742.3	-415.8	359.7	-472.3	6.07	5.97	-2.42	
7,007.0	31.22	356.86	6,770.1	-399.9	358.9	-456.5	8.66	8.66	-0.22	
7,038.0	34.21	357.44	6,796.1	-383.1	358.0	-439.9	9.70	9.65	1.87	
7,069.0	37.33	356.83	6,821.3	-365.1	357.1	-421.9	10.13	10.06	-1.97	
7,101.0	39.14	356.77	6,846.4	-345.3	356.0	-402.2	5.66	5.66	-0.19	
7,132.0	41.07	356.59	6,870.1	-325.3	354.9	-382.4	6.24	6.23	-0.58	
7,164.0	42.85	356.02	6,893.9	-304.0	353.5	-361.1	5.69	5.56	-1.78	
7,195.0	45.91	354.88	6,916.1	-282.4	351.8	-339.6	10.20	9.87	-3.68	
7,227.0	49.40	353.60	6,937.6	-258.9	349.4	-316.0	11.30	10.91	-4.00	
7,258.0	52.60	352.87	6,957.1	-234.9	346.5	-291.9	10.48	10.32	-2.35	
7,289.0	55.33	352.41	6,975.4	-210.1	343.3	-266.9	8.89	8.81	-1.48	
7,321.0	56.51	352.07	6,993.3	-183.8	339.8	-240.4	3.79	3.69	-1.06	
7,352.0	58.00	351.65	7,010.1	-158.0	336.1	-214.4	4.94	4.81	-1.35	
7,384.0	60.78	351.55	7,026.4	-130.8	332.0	-186.8	8.69	8.69	-0.31	
7,415.0	63.97	352.18	7,040.7	-103.6	328.2	-159.4	10.45	10.29	2.03	
7,447.0	67.46	352.51	7,053.9	-74.7	324.3	-130.3	10.95	10.91	1.03	
7,478.0	69.71	352.87	7,065.2	-46.1	320.6	-101.4	7.34	7.26	1.16	
7,510.0	71.92	352.30	7,075.7	-16.1	316.7	-71.2	7.11	6.91	-1.78	
7,541.0	74.29	351.17	7,084.7	13.3	312.4	-41.6	8.40	7.65	-3.65	
7,573.0	77.65	349.73	7,092.5	43.9	307.3	-10.6	11.37	10.50	-4.50	
7,604.0	81.07	348.50	7,098.2	73.8	301.5	19.9	11.70	11.03	-3.97	
7,635.0	83.69	347.78	7,102.3	103.9	295.2	50.6	8.76	8.45	-2.32	
7,667.0	85.80	346.87	7,105.3	134.9	288.2	82.4	7.18	6.59	-2.84	
7,698.0	86.40	347.19	7,107.4	165.1	281.3	113.3	2.19	1.94	1.03	
7,729.0	87.73	347.53	7,109.0	195.3	274.5	144.3	4.43	4.29	1.10	
As-Drilled LP:7729'MD/7109'TVD - Cherry Valley Target										
7,824.0	88.67	347.43	7,111.9	288.0	253.9	239.1	1.00	0.99	-0.11	
7,918.0	88.95	346.87	7,113.9	379.6	233.0	333.0	0.67	0.30	-0.60	
8,013.0	90.84	347.21	7,114.1	472.2	211.7	427.9	2.02	1.99	0.36	
Deepest Point @ 8013'MD/7114.1'TVD										
8,107.0	91.13	346.84	7,112.5	563.8	190.6	521.7	0.50	0.31	-0.39	
8,201.0	91.78	347.40	7,110.1	655.4	169.7	615.6	0.91	0.69	0.60	
8,296.0	93.11	346.55	7,106.0	747.8	148.3	710.4	1.66	1.40	-0.89	
8,389.0	91.53	346.00	7,102.2	838.1	126.2	803.1	1.80	-1.70	-0.59	
8,484.0	88.61	344.88	7,102.1	930.0	102.3	897.8	3.29	-3.07	-1.18	
8,578.0	88.99	345.33	7,104.1	1,020.9	78.2	991.4	0.63	0.40	0.48	

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Phoenix Technology Services LP
Survey Report



Company:	EQT PRODUCTION	Local Co-ordinate Reference:	Well Well #515108 -MRC - Slot 515108
Project:	Wetzel County, WV	TVD Reference:	KB @23' @ 1022.0usft
Site:	BIG 360	MD Reference:	KB @23' @ 1022.0usft
Well:	Well #515108 -MRC	North Reference:	Grid
Wellbore:	Main	Survey Calculation Method:	Minimum Curvature
Design:	515108 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)	
8,672.0	89.12	345.83	7,105.7	1,111.9	54.8	1,085.2	0.55	0.14	0.53	
8,766.0	89.38	346.17	7,106.9	1,203.1	32.0	1,178.9	0.46	0.28	0.36	
8,860.0	89.38	346.25	7,107.9	1,294.4	9.6	1,272.7	0.09	0.00	0.09	
8,955.0	91.33	345.71	7,107.3	1,386.5	-13.4	1,367.5	2.13	2.05	-0.57	
9,049.0	91.67	345.78	7,104.8	1,477.6	-36.5	1,461.2	0.37	0.36	0.07	
9,143.0	92.05	345.90	7,101.8	1,568.7	-59.5	1,554.9	0.42	0.40	0.13	
9,238.0	92.45	345.11	7,098.1	1,660.6	-83.3	1,649.6	0.93	0.42	-0.83	
9,332.0	91.02	346.44	7,095.2	1,751.7	-106.3	1,743.3	2.08	-1.52	1.41	
9,427.0	91.38	346.22	7,093.2	1,844.0	-128.8	1,838.1	0.44	0.38	-0.23	
9,521.0	89.78	346.89	7,092.3	1,935.4	-150.6	1,931.9	1.85	-1.70	0.71	
9,615.0	89.65	346.25	7,092.7	2,026.8	-172.5	2,025.7	0.69	-0.14	-0.68	
9,710.0	89.75	346.61	7,093.2	2,119.2	-194.8	2,120.6	0.39	0.11	0.38	
9,805.0	89.99	345.62	7,093.5	2,211.4	-217.6	2,215.3	1.07	0.25	-1.04	
9,899.0	90.58	345.24	7,093.0	2,302.4	-241.2	2,309.1	0.75	0.63	-0.40	
9,993.0	88.98	347.91	7,093.4	2,393.8	-263.0	2,402.9	3.31	-1.70	2.84	
10,088.0	88.98	347.71	7,095.0	2,486.6	-283.1	2,497.8	0.21	0.00	-0.21	
10,182.0	89.29	346.78	7,096.5	2,578.3	-303.8	2,591.7	1.04	0.33	-0.99	
10,276.0	89.44	345.78	7,097.5	2,669.6	-326.1	2,685.5	1.08	0.16	-1.06	
10,370.0	91.34	346.39	7,096.9	2,760.8	-348.7	2,779.3	2.12	2.02	0.65	
10,465.0	92.07	345.25	7,094.0	2,852.9	-372.0	2,874.0	1.42	0.77	-1.20	
10,559.0	93.73	344.66	7,089.3	2,943.6	-396.4	2,967.5	1.87	1.77	-0.63	
10,653.0	91.95	346.51	7,084.6	3,034.5	-419.7	3,061.1	2.73	-1.89	1.97	
10,748.0	90.72	348.43	7,082.4	3,127.2	-440.3	3,156.0	2.40	-1.29	2.02	
10,842.0	91.41	348.42	7,080.7	3,219.3	-459.2	3,250.0	0.73	0.73	-0.01	
10,937.0	89.56	347.85	7,079.9	3,312.2	-478.7	3,344.9	2.04	-1.95	-0.60	
11,031.0	90.04	348.22	7,080.2	3,404.2	-498.2	3,438.8	0.64	0.51	0.39	
11,125.0	89.76	347.97	7,080.4	3,496.2	-517.6	3,532.8	0.40	-0.30	-0.27	
11,219.0	87.47	347.98	7,082.6	3,588.1	-537.2	3,626.7	2.44	-2.44	-0.12	
11,313.0	87.69	347.87	7,086.6	3,679.9	-556.8	3,720.6	0.26	0.23	-0.12	
11,408.0	89.96	348.01	7,088.5	3,772.8	-576.7	3,815.5	2.39	2.39	0.15	
11,502.0	90.27	348.05	7,088.4	3,864.7	-596.2	3,909.4	0.33	0.33	0.04	
11,596.0	90.90	348.93	7,087.4	3,956.8	-614.9	4,003.4	1.15	0.67	0.94	
11,690.0	90.39	345.66	7,086.3	4,048.5	-635.6	4,097.3	3.52	-0.54	-3.48	
11,784.0	90.16	344.76	7,085.9	4,139.4	-659.6	4,191.0	0.99	-0.24	-0.96	
11,879.0	91.12	343.16	7,084.8	4,230.7	-685.8	4,285.4	1.96	1.01	-1.68	
11,973.0	93.21	343.89	7,081.3	4,320.8	-712.5	4,378.8	2.35	2.22	0.78	
12,067.0	92.08	346.13	7,076.9	4,411.5	-736.7	4,472.3	2.67	-1.20	2.38	
12,161.0	90.10	346.27	7,075.1	4,502.7	-759.2	4,566.1	2.11	-2.11	0.15	
12,256.0	90.33	346.08	7,074.8	4,595.0	-781.9	4,660.9	0.31	0.24	-0.20	
12,351.0	90.82	345.54	7,073.8	4,687.1	-805.2	4,755.6	0.77	0.52	-0.57	
12,445.0	91.47	344.75	7,072.0	4,777.9	-829.2	4,849.3	1.09	0.69	-0.84	
12,540.0	89.72	346.75	7,071.0	4,870.0	-852.6	4,944.0	2.80	-1.84	2.11	
12,634.0	90.12	347.03	7,071.1	4,961.5	-874.0	5,037.9	0.52	0.43	0.30	
12,728.0	90.36	347.04	7,070.7	5,053.1	-895.0	5,131.8	0.26	0.26	0.01	

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Company:	EQT PRODUCTION	Local Co-ordinate Reference:	Well Well #515108 -MRC - Slot 515108
Project:	Wetzel County, WV	TVD Reference:	KB @23' @ 1022.0usft
Site:	BIG 360	MD Reference:	KB @23' @ 1022.0usft
Well:	Well #515108 -MRC	North Reference:	Grid
Wellbore:	Main	Survey Calculation Method:	Minimum Curvature
Design:	515108 As Drilled	Database:	Compass 5000 NER

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)
12,744.0	90.42	346.92	7,070.6	5,068.7	-898.6	5,147.8	0.84	0.38	-0.75
Final Phoenix MWD Survey									
12,821.0	90.42	346.92	7,070.0	5,143.7	-916.1	5,224.7	0.00	0.00	0.00
PTBIAs-Drilled TD:12821'MD/7070'TVD									

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
515108 - As-Drilled KOF - actual wellpath hits target center - Point	0.00	0.00	5,225.8	-4.0	-2.1	378,107.76	1,684,980.70	39° 31' 57.903 N	80° 37' 0.854 W
515108 - As-Drilled TD - actual wellpath hits target center - Point	0.00	360.00	7,070.0	5,143.7	-916.1	383,255.44	1,684,066.71	39° 32' 48.666 N	80° 37' 13.338 W
515108 - As-Drilled LP - actual wellpath hits target center - Point	0.00	0.00	7,109.0	195.3	274.5	378,307.01	1,685,257.28	39° 31' 59.906 N	80° 36' 57.356 W

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,102.0	5,101.8	-2.8	-1.6	Tie In
5,183.0	5,182.8	-3.6	-1.7	First Phoenix MWD Survey
5,226.0	5,225.8	-4.0	-2.1	As-Drilled KOP:5226'MD/5225.8'TVD
7,729.0	7,109.0	195.3	274.5	As-Drilled LP:7729'MD/7109'TVD
7,729.0	7,109.0	195.3	274.5	Cherry Valley Target
8,013.0	7,114.1	472.2	211.7	Deepest Point @ 8013'MD/7114.1'TVD
12,744.0	7,070.6	5,068.7	-898.6	Final Phoenix MWD Survey
12,821.0	7,070.0	5,143.7	-916.1	PTBIAs-Drilled TD:12821'MD/7070'TVD

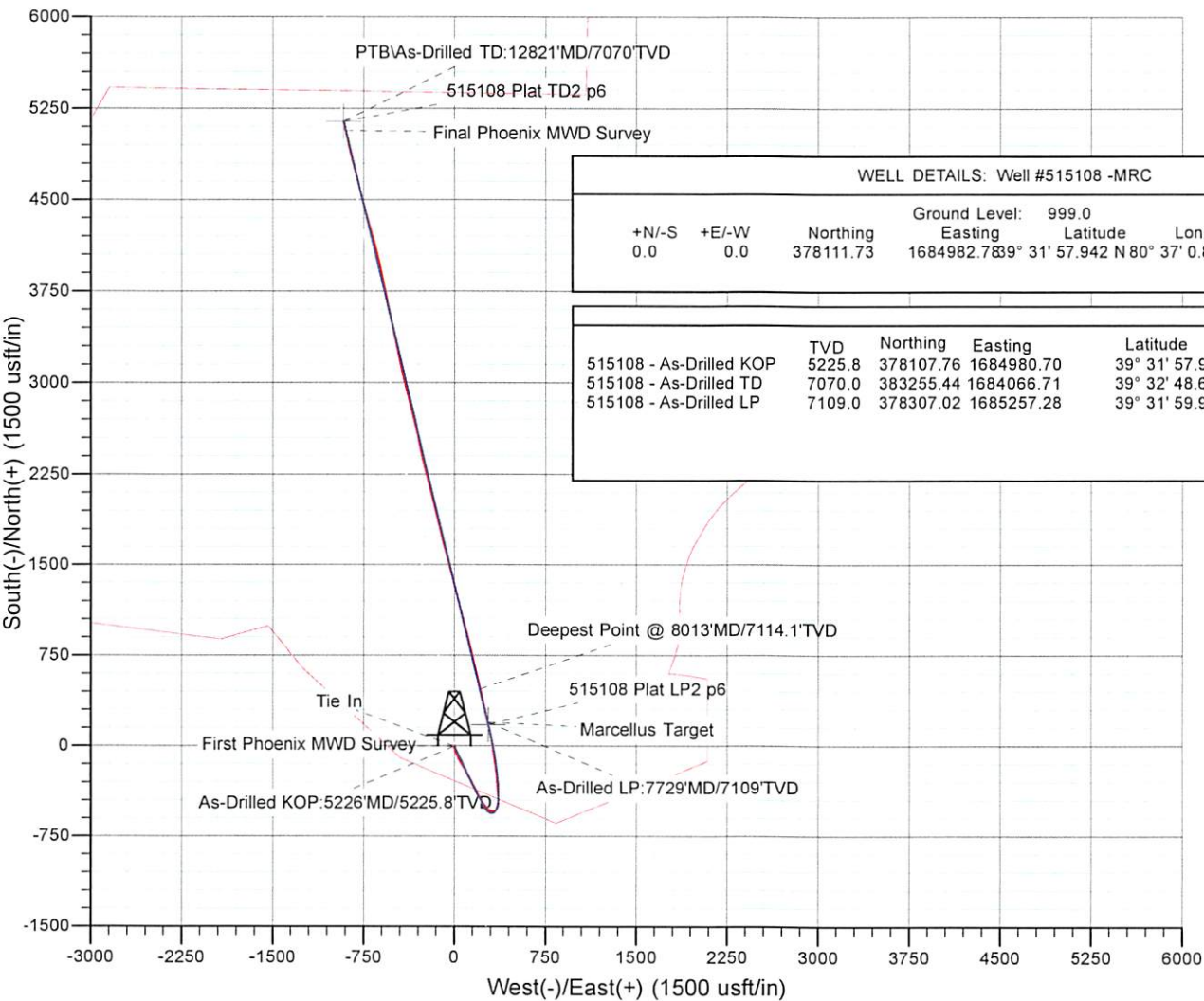
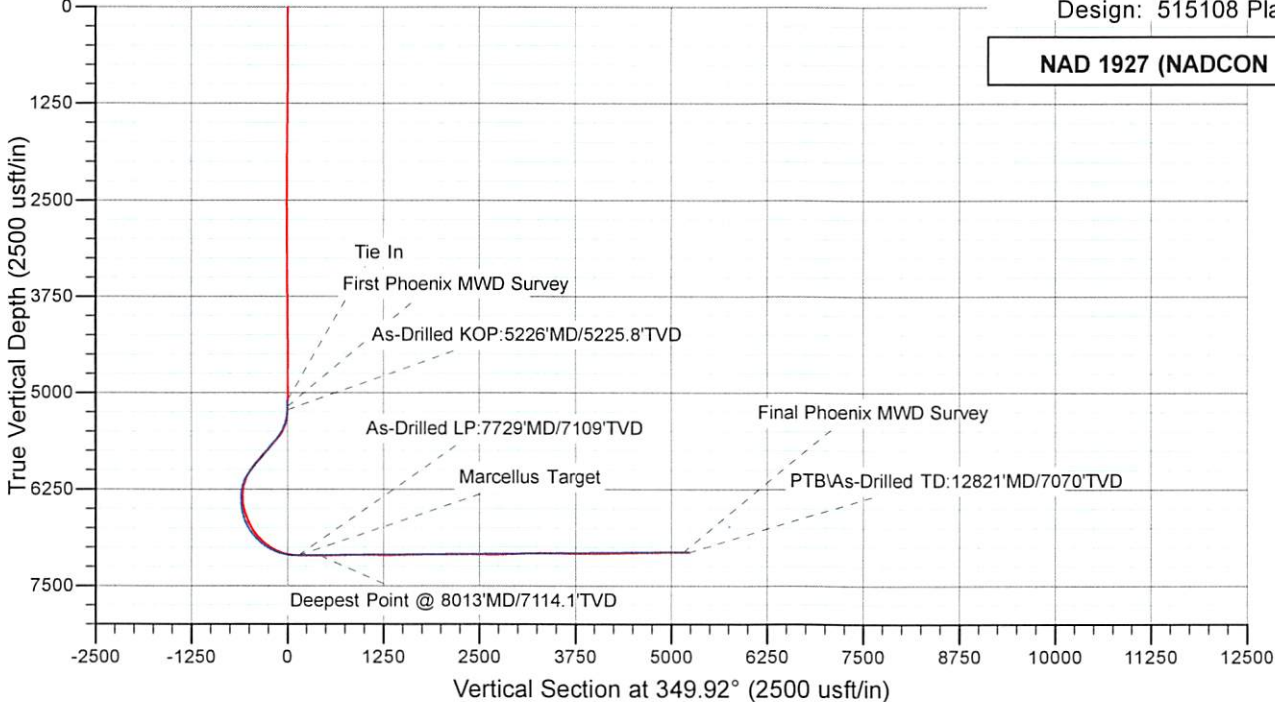
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KB Elevation=1319 FT
Ground Elevation=1296 FT

Project: Wetzel County, WV
Site: BIG 360
Well: Well #515108 -MRC
Wellbore: Main
Design: 515108 Plan 10

All Survey Measurements were taken from KB Elevation

NAD 1927 (NADCON CONUS)



WELL DETAILS: Well #515108 -MRC						
			Ground Level:	999.0		
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	378111.73	1684982.7839°	31' 57.942 N	80° 37' 0.828 W	515108

	TVD	Northing	Easting	Latitude	Longitude
515108 - As-Drilled KOP	5225.8	378107.76	1684980.70	39° 31' 57.903 N	80° 37' 0.854 W
515108 - As-Drilled TD	7070.0	383255.44	1684066.71	39° 32' 48.666 N	80° 37' 13.338 W
515108 - As-Drilled LP	7109.0	378307.02	1685257.28	39° 31' 59.906 N	80° 36' 57.356 W

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

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

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

DISTRICT: Grant COUNTY: Wetzel

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

(IF GAS) PRODUCTION: STORAGE DEEP SHALLOW

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL

FILE NO: 174-13
DRAWING NO: 174-13 Big 360 H1
SCALE: 1" = 2000'
MINIMUM DEGREE OF ACCURACY: 1:2500
PROVEN SOURCE OF ELEVATION: NGS CORS Station

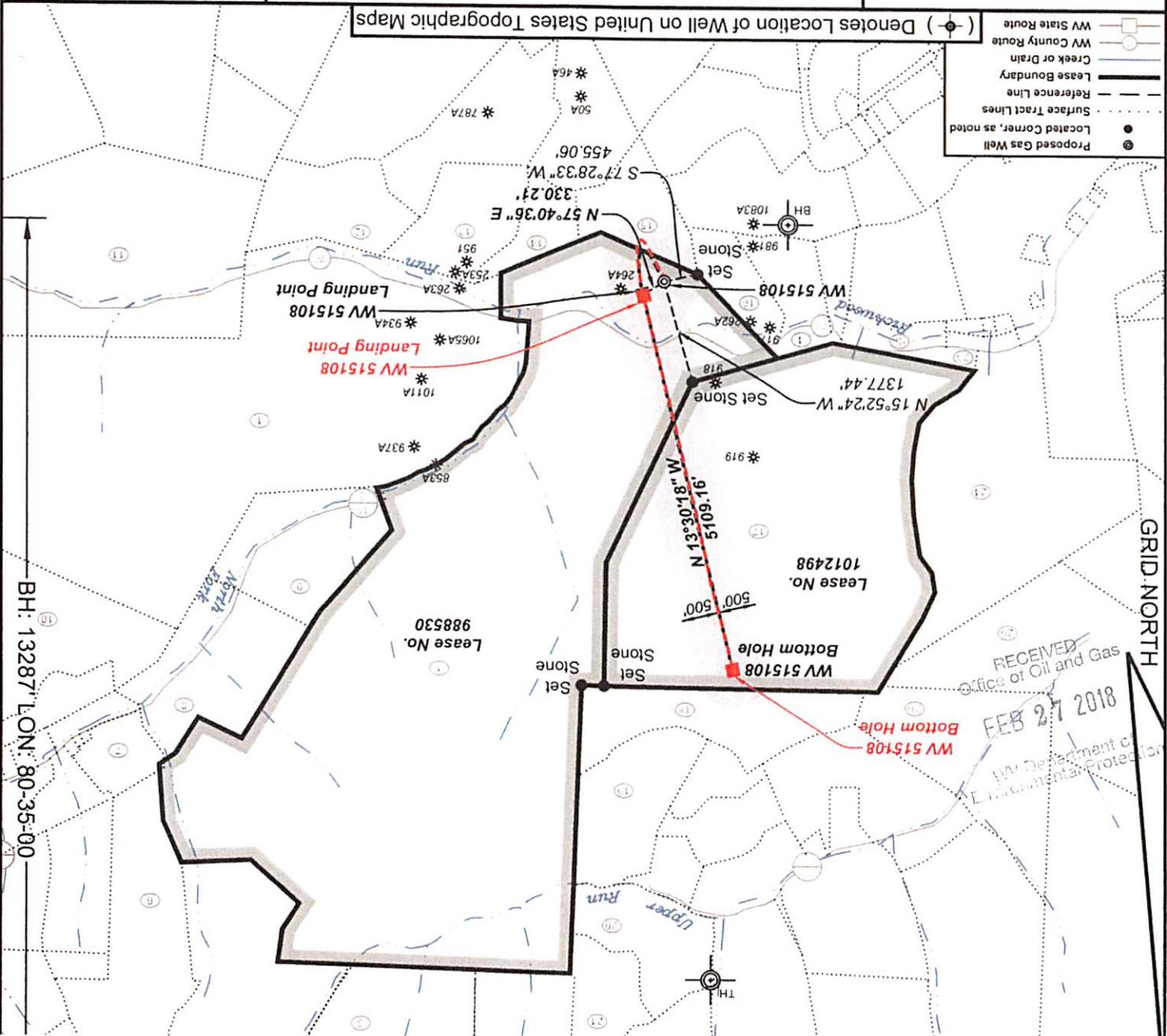
STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OIL AND GAS DIVISION

DATE: October 25 20 17
OPERATORS WELL NO. 515108
API WELL NO
STATE 47 COUNTY 103 PERMIT 03159



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

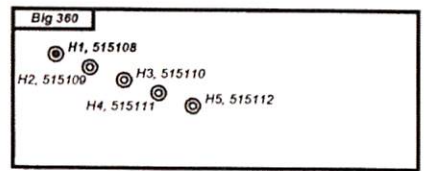


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3	12	47	Wetzel	Grant	Coastal Forest Resources Co.	87.50
4	22	12	Wetzel	Grant	James Jones, et al.	18.67
5	22	11	Wetzel	Grant	Mary M. Snodgrass	10.14
6	18	1	Wetzel	Grant	McKinley E. Calvert Heirs	100.00
7	18	14	Wetzel	Grant	Frank M. & Frankie L. Dulaney	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

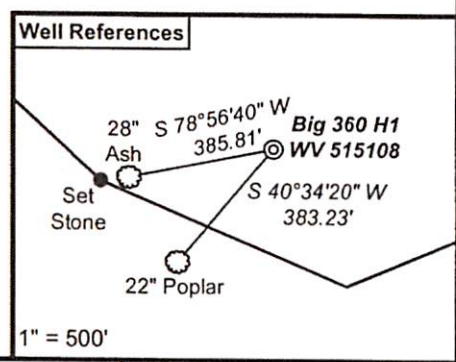
NAD 27 N: 383,255.44 E: 1,684,066.71
 NAD 83 UTM N: 4,377,542.15 E: 532,633.90

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.

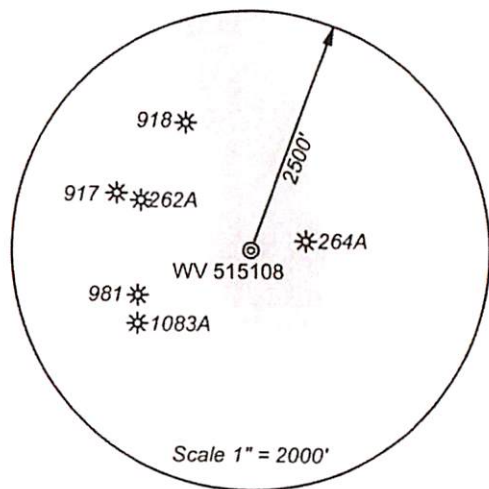


Lease No.	Acres	Owner
1012498	514	Kenneth R. Mason, et al.

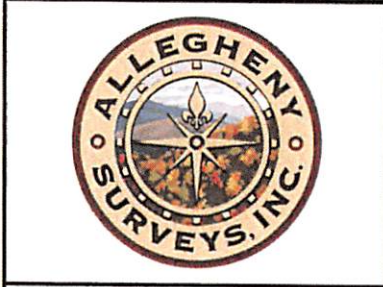
Sub Surface Tract	Acres	Owner
15	31.35	Dallison Lumber Inc.



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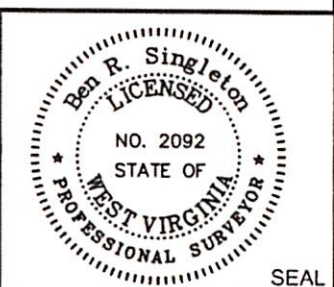


- Proposed Gas Well
- Located Corner, as noted
- Surface Tract Lines
- Reference Line
- Lease Boundary
- Creek or Drain
- WV County Route
- WV State Route



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 H1
 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 25 20 17
 OPERATOR'S WELL NO. 515108
 API WELL NO
 47 - 103 - 03159
 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

515108 47-103-03159-0000 - Perforations

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Stage Number	Perforation Date	Top Perf Depth (ftKB)	Bottom Perf Depth (ftKB)	Number of Shots	Formation
Initiation Sleeve	11/2/2017	12,779	12,806	10	Marcellus
1	11/7/2017	12,719	12,751	16	Marcellus
1	11/8/2017	12,659	12,691	16	Marcellus
2	11/9/2017	12,509	12,631	40	Marcellus
3	11/9/2017	12,309	12,471	40	Marcellus
4	11/11/2017	12,109	12,271	40	Marcellus
5	11/12/2017	11,909	12,071	40	Marcellus
6	11/13/2017	11,709	11,871	40	Marcellus
7	11/13/2017	11,509	11,671	40	Marcellus
8	11/14/2017	11,309	11,471	40	Marcellus
9	11/16/2017	11,109	11,271	40	Marcellus
10	11/16/2017	10,909	11,071	40	Marcellus
11	11/17/2017	10,709	10,871	40	Marcellus
12	11/18/2017	10,509	10,671	40	Marcellus
13	11/19/2017	10,309	10,471	40	Marcellus
14	11/19/2017	10,109	10,271	40	Marcellus
15	11/20/2017	9,909	10,071	40	Marcellus
16	11/21/2017	9,709	9,871	40	Marcellus
17	11/22/2017	9,509	9,671	40	Marcellus
18	11/23/2017	9,309	9,471	40	Marcellus
19	11/24/2017	9,109	9,271	40	Marcellus
20	11/25/2017	8,909	9,071	40	Marcellus
21	11/25/2017	8,709	8,871	40	Marcellus
22	11/27/2017	8,509	8,671	40	Marcellus
23	11/27/2017	8,309	8,471	40	Marcellus
24	11/28/2017	8,109	8,271	40	Marcellus
25	11/29/2017	7,909	8,071	40	Marcellus
26	11/29/2017	7,709	7,871	40	Marcellus

515108 47-103-03159-0000 - Stimulated Stages

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Stage Number	Stimulation Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
1.01	11/7/2017	13	7,535	8,897	5,087	0	7,254	0
1	11/8/2017	93	8,935	9,260	4,344	451,522	8,326	0
2	11/9/2017	94	9,008	9,362	4,281	450,842	7,614	0
3	11/11/2017	90	8,905	9,458	4,679	450,253	8,431	0
4	11/12/2017	90	8,865	9,391	4,563	448,920	7,660	0
5	11/12/2017	92	8,654	9,291	4,562	451,007	7,625	0
6	11/13/2017	92	8,746	9,254	4,805	450,083	7,717	0
7	11/14/2017	97	8,781	9,232	4,742	451,228	7,542	0
8	11/16/2017	97	8,783	9,119	4,738	458,840	7,684	0
9	11/16/2017	90	8,906	9,267	4,628	450,798	8,453	0
10	11/17/2017	97	8,753	9,231	4,491	450,870	7,526	0
11	11/18/2017	96	8,903	9,089	4,957	450,797	7,329	0
12	11/18/2017	92	9,034	9,403	4,314	450,944	7,733	0
13	11/19/2017	99	8,613	9,095	4,406	449,180	7,554	0
14	11/20/2017	100	8,661	8,946	4,476	450,787	7,515	0
15	11/21/2017	84	8,954	9,321	4,151	450,196	9,291	0
16	11/22/2017	100	8,962	9,271	4,774	449,968	7,493	0
17	11/23/2017	94	8,869	9,421	4,412	450,714	7,784	0
18	11/24/2017	91	9,036	9,378	4,336	450,283	8,137	0
19	11/25/2017	101	8,483	8,786	4,522	450,577	7,437	0
20	11/25/2017	99	8,798	9,365	4,565	451,354	8,633	0
21	11/26/2017	100	8,442	8,885	4,351	449,421	7,186	0
22	11/27/2017	100	8,540	9,081	4,156	449,632	7,472	0
23	11/28/2017	100	8,542	9,097	4,365	451,112	7,118	0
24	11/29/2017	99	8,467	9,250	4,274	450,556	7,196	0
25	11/29/2017	96	8,347	9,240	4,390	448,876	7,212	0
26	11/30/2017	102	8,216	8,729	4,534	450,493	7,196	0