



Where energy meets innovation.

EQT PRODUCTION

Wetzel County, WV

BIG 360

Well #515110 -MRC - Slot 515110

API #47-103-03163

Main

Design: 515110 As Drilled

Standard Survey Report

03 October, 2017

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PHOENIX
TECHNOLOGY SERVICES



Where energy meets innovation.

Phoenix Technology Services LP Survey Report



Company:	EQT PRODUCTION	Local Co-ordinate Reference:	Well Well #515110 -MRC - Slot 515110
Project:	Wetzel County, WV	TVD Reference:	KB @23' @ 1022.0usft
Site:	BIG 360	MD Reference:	KB @23' @ 1022.0usft
Well:	Well #515110 -MRC	North Reference:	Grid
Wellbore:	Main	Survey Calculation Method:	Minimum Curvature
Design:	515110 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 #515110 -MRC - Slot 515110					
Well Position	+N/-S	0.0 usft	Northing:	378,101.24 usft	Latitude:	39° 31' 57.842 N
	+E/-W	0.0 usft	Easting:	1,685,010.89 usft	Longitude:	80° 37' 0.468 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	9/28/2017	-8.20	66.85	52,304

Design	515110 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	357.55	

Survey Program	Date	10/3/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
110.0	4,655.0	Gyrodata Gyro (Main)	GYD_DP_MS	Gyrodata gyro-compassing and drop	
4,697.0	6,155.4	SDI Air Curve (Main)	ProMWD	MWD - Standard	
6,155.4	13,468.0	Phoenix MWD Surveys (Main)	MWD - OWSG	MWD - OWSG	

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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	
110.0	0.07	108.99	110.0	0.0	0.1	0.0	0.06	0.06	0.00	
210.0	0.11	325.42	210.0	0.0	0.1	0.0	0.17	0.04	-143.57	
310.0	0.09	339.46	310.0	0.2	0.0	0.2	0.03	-0.02	14.04	
410.0	0.12	37.94	410.0	0.3	0.0	0.3	0.11	0.03	58.48	
510.0	0.08	70.63	510.0	0.5	0.2	0.4	0.07	-0.04	32.69	
610.0	0.05	151.36	610.0	0.4	0.2	0.4	0.09	-0.03	80.73	
710.0	0.03	234.18	710.0	0.4	0.2	0.4	0.06	-0.02	82.82	
810.0	0.02	135.71	810.0	0.4	0.2	0.3	0.04	-0.01	-98.47	



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Site:	BIG 360	MD Reference:	KB @23' @ 1022.0usft
Well:	Well #515110 -MRC	North Reference:	Grid
Wellbore:	Main	Survey Calculation Method:	Minimum Curvature
Design:	515110 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)	
910.0	0.55	108.80	910.0	0.2	0.7	0.2	0.53	0.53	-26.91	
1,010.0	0.76	106.64	1,010.0	-0.2	1.8	-0.2	0.21	0.21	-2.16	
1,110.0	0.77	105.22	1,110.0	-0.5	3.1	-0.7	0.02	0.01	-1.42	
1,210.0	0.69	94.95	1,210.0	-0.8	4.3	-0.9	0.15	-0.08	-10.27	
1,310.0	0.62	93.25	1,310.0	-0.8	5.5	-1.1	0.07	-0.07	-1.70	
1,410.0	0.67	92.83	1,410.0	-0.9	6.6	-1.2	0.05	0.05	-0.42	
1,510.0	0.70	98.68	1,510.0	-1.0	7.8	-1.3	0.08	0.03	5.85	
1,610.0	0.77	104.66	1,609.9	-1.3	9.0	-1.7	0.10	0.07	5.98	
1,710.0	0.75	109.12	1,709.9	-1.7	10.3	-2.1	0.06	-0.02	4.46	
1,810.0	0.68	111.53	1,809.9	-2.1	11.5	-2.6	0.08	-0.07	2.41	
1,910.0	0.59	116.68	1,909.9	-2.5	12.5	-3.1	0.11	-0.09	5.15	
2,010.0	0.42	109.30	2,009.9	-2.9	13.3	-3.5	0.18	-0.17	-7.38	
2,110.0	0.41	109.82	2,109.9	-3.1	14.0	-3.7	0.01	-0.01	0.52	
2,210.0	0.44	106.28	2,209.9	-3.4	14.7	-4.0	0.04	0.03	-3.54	
2,310.0	0.48	106.59	2,309.9	-3.6	15.4	-4.2	0.04	0.04	0.31	
2,410.0	0.43	108.06	2,409.9	-3.8	16.2	-4.5	0.05	-0.05	1.47	
2,510.0	0.36	112.05	2,509.9	-4.1	16.8	-4.8	0.08	-0.07	3.99	
2,610.0	0.09	122.87	2,609.9	-4.2	17.2	-5.0	0.27	-0.27	10.82	
2,710.0	0.17	297.42	2,709.9	-4.2	17.1	-4.9	0.26	0.08	174.55	
2,810.0	0.48	306.70	2,809.9	-3.9	16.7	-4.6	0.31	0.31	9.28	
2,910.0	0.58	309.09	2,909.9	-3.3	15.9	-4.0	0.10	0.10	2.39	
3,010.0	0.67	305.88	3,009.9	-2.6	15.1	-3.3	0.10	0.09	-3.21	
3,110.0	0.68	303.36	3,109.9	-2.0	14.1	-2.6	0.03	0.01	-2.52	
3,210.0	0.75	302.83	3,209.9	-1.3	13.1	-1.9	0.07	0.07	-0.53	
3,310.0	0.67	310.54	3,309.9	-0.6	12.1	-1.1	0.12	-0.08	7.71	
3,410.0	0.61	327.45	3,409.9	0.3	11.3	-0.2	0.20	-0.06	16.91	
3,510.0	0.61	324.92	3,509.9	1.1	10.7	0.7	0.03	0.00	-2.53	
3,610.0	0.64	328.33	3,609.9	2.1	10.1	1.6	0.05	0.03	3.41	
3,710.0	0.60	318.39	3,709.8	2.9	9.5	2.5	0.11	-0.04	-9.94	
3,810.0	0.64	308.73	3,809.8	3.7	8.7	3.3	0.11	0.04	-9.66	
3,910.0	0.69	307.37	3,909.8	4.4	7.8	4.0	0.05	0.05	-1.36	
4,010.0	0.62	311.58	4,009.8	5.1	6.9	4.8	0.08	-0.07		
4,110.0	0.52	314.46	4,109.8	5.8	6.2	5.5	0.10	-0.10		
4,210.0	0.41	327.18	4,209.8	6.4	5.7	6.2	0.15	-0.11		
4,310.0	0.32	355.53	4,309.8	7.0	5.5	6.7	0.20	-0.09		
4,410.0	0.29	37.96	4,409.8	7.5	5.6	7.2	0.22	-0.03		
4,510.0	0.42	76.41	4,509.8	7.7	6.1	7.5	0.26	0.13		
4,610.0	0.58	91.80	4,609.8	7.8	7.0	7.5	0.21	0.16		
4,655.0	0.60	86.10	4,654.8	7.8	7.4	7.5	0.14	0.04		
4,697.0	1.02	105.80	4,696.8	7.7	8.0	7.4	1.19	1.00		
4,741.0	3.56	126.06	4,740.8	6.8	9.5	6.4	5.97	5.77		
4,784.0	6.85	129.46	4,783.6	4.4	12.5	3.9	7.68	7.65		
4,828.0	10.19	131.84	4,827.1	0.1	17.5	-0.6	7.63	7.59		

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Site:	BIG 360	MD Reference:	KB @23' @ 1022.0usft
Well:	Well #515110 -MRC	North Reference:	Grid
Wellbore:	Main	Survey Calculation Method:	Minimum Curvature
Design:	515110 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)
4,872.0	13.85	135.05	4,870.1	-6.2	24.1	-7.2	8.45	8.32	7.30
4,915.0	17.65	137.56	4,911.5	-14.6	32.1	-16.0	8.98	8.84	5.84
4,959.0	21.47	139.16	4,953.0	-25.7	41.9	-27.4	8.77	8.68	3.64
5,003.0	24.88	138.30	4,993.4	-38.7	53.3	-40.9	7.79	7.75	-1.95
5,046.0	27.57	136.35	5,032.0	-52.6	66.2	-55.4	6.57	6.26	-4.53
5,090.0	30.40	134.93	5,070.5	-67.9	81.1	-71.3	6.62	6.43	-3.23
5,129.5	33.19	135.46	5,104.0	-82.6	95.8	-86.6	7.10	7.07	1.35
5,134.0	33.51	135.52	5,107.8	-84.4	97.5	-88.5	7.11	7.08	1.25
5,177.0	37.57	135.75	5,142.8	-102.3	115.0	-107.1	9.45	9.44	0.53
5,221.0	41.43	134.64	5,176.7	-122.1	134.7	-127.7	8.92	8.77	-2.52
5,265.0	42.13	132.92	5,209.5	-142.4	155.9	-148.9	3.05	1.59	-3.91
5,308.0	41.70	131.90	5,241.5	-161.7	177.1	-169.2	1.87	-1.00	-2.37
5,352.0	41.08	131.63	5,274.5	-181.1	198.8	-189.4	1.47	-1.41	-0.61
5,396.0	40.65	134.73	5,307.8	-200.8	219.8	-210.0	4.71	-0.98	7.05
5,439.0	39.81	135.19	5,340.6	-220.4	239.4	-230.5	2.07	-1.95	1.07
5,483.0	39.14	134.17	5,374.6	-240.1	259.3	-251.0	2.12	-1.52	-2.32
5,527.0	38.34	134.14	5,408.9	-259.3	279.1	-271.0	1.82	-1.82	-0.07
5,570.0	39.38	134.68	5,442.4	-278.2	298.4	-290.7	2.54	2.42	1.26
5,614.0	38.61	134.74	5,476.6	-297.6	318.0	-311.0	1.75	-1.75	0.14
5,658.0	39.38	134.39	5,510.8	-317.1	337.8	-331.2	1.82	1.75	-0.80
5,701.0	41.90	134.85	5,543.4	-336.7	357.7	-351.7	5.90	5.86	1.07
5,744.0	44.42	135.48	5,574.8	-357.6	378.4	-373.4	5.95	5.86	1.47
5,786.0	44.45	135.12	5,604.8	-378.5	399.1	-395.2	0.60	0.07	-0.86
5,830.0	43.15	133.14	5,636.5	-399.7	421.0	-417.3	4.29	-2.95	-4.50
5,873.0	42.00	132.61	5,668.2	-419.5	442.3	-438.0	2.80	-2.67	-1.23
5,917.0	40.32	131.27	5,701.3	-438.9	463.8	-458.3	4.31	-3.82	-3.05
5,960.0	39.81	133.78	5,734.2	-457.6	484.2	-477.8	3.94	-1.19	5.84
6,003.0	39.15	134.88	5,767.4	-476.7	503.8	-497.7	2.24	-1.53	2.56
6,046.0	38.79	137.12	5,800.9	-496.1	522.5	-518.0	3.38	-0.84	5.21
6,090.0	40.49	138.72	5,834.7	-517.0	541.4	-539.6	4.51	3.86	3.64
6,134.0	40.53	139.42	5,868.2	-538.6	560.1	-562.0	1.04	0.09	1.59
6,521.0	43.54	135.21	6,155.7	-728.7	735.9	-759.5	1.07	0.78	-1.09
Tie In									
6,537.0	42.82	134.31	6,167.3	-736.4	743.6	-767.5	5.92	-4.50	5.62
First Phoenix MWD Survey									
6,568.0	41.69	133.51	6,190.3	-750.9	758.7	-782.6	4.04	-3.65	2.58
6,593.0	40.53	132.38	6,209.1	-762.1	770.7	-794.3	5.51	-4.63	-4.53
KOP As-Drilled: 6593'MD/6208.9'TVD									
6,600.0	40.21	132.05	6,214.4	-765.1	774.0	-797.5	5.51	-4.60	4.67
6,631.0	37.90	128.89	6,238.5	-777.8	788.9	-810.8	9.84	-7.45	-10.19
6,663.0	35.75	126.14	6,264.1	-789.5	804.1	-823.1	8.46	-6.72	-8.59
6,694.0	34.71	125.03	6,289.4	-799.9	818.6	-834.1	3.94	-3.35	-3.58
6,726.0	32.13	120.73	6,316.2	-809.5	833.4	-844.3	10.94	-8.06	-13.44
6,758.0	30.33	116.16	6,343.5	-817.4	848.0	-852.9	9.30	-5.63	-14.28

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Survey Report



Company:	EQT PRODUCTION	Local Co-ordinate Reference:	Well Well #515110 -MRC - Slot 515110
Project:	Wetzel County, WV	TVD Reference:	KB @23' @ 1022.0usft
Site:	BIG 360	MD Reference:	KB @23' @ 1022.0usft
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Wellbore:	Main	Survey Calculation Method:	Minimum Curvature
Design:	515110 As Drilled	Database:	Compass 5000 NER

Survey										
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6,789.0	29.16	111.84	6,370.4	-823.7	862.0	-859.7	7.87	-3.77	-13.94	
6,821.0	28.47	110.55	6,398.5	-829.3	876.4	-865.9	2.90	-2.16	-4.03	
6,852.0	27.95	109.82	6,425.8	-834.3	890.1	-871.5	2.01	-1.68	-2.35	
6,883.0	27.23	108.73	6,453.3	-839.1	903.7	-876.9	2.84	-2.32	-3.52	
6,915.0	26.04	102.61	6,481.9	-842.9	917.5	-881.3	9.34	-3.72	-19.13	
6,946.0	25.02	95.34	6,509.9	-845.0	930.7	-884.0	10.62	-3.29	-23.45	
6,978.0	24.25	87.76	6,539.0	-845.4	944.0	-884.9	10.16	-2.41	-23.69	
7,009.0	24.44	81.50	6,567.2	-844.2	956.7	-884.3	8.34	0.61	-20.19	
7,041.0	24.83	74.57	6,596.3	-841.4	969.7	-882.1	9.10	1.22	-21.66	
7,072.0	25.08	66.79	6,624.4	-837.1	982.0	-878.3	10.61	0.81	-25.10	
7,104.0	25.87	60.45	6,653.3	-831.0	994.3	-872.7	8.87	2.47	-19.81	
7,135.0	26.71	52.96	6,681.1	-823.5	1,005.8	-865.6	11.03	2.71	-24.16	
7,167.0	27.78	47.31	6,709.6	-814.1	1,017.0	-856.7	8.74	3.34	-17.66	
7,198.0	29.00	42.06	6,736.8	-803.6	1,027.3	-846.7	8.96	3.94	-16.94	
7,229.0	30.67	37.43	6,763.7	-791.7	1,037.2	-835.3	9.17	5.39	-14.94	
7,261.0	32.08	33.84	6,791.1	-778.2	1,046.9	-822.2	7.31	4.41	-11.22	
7,292.0	33.98	29.59	6,817.0	-763.8	1,055.7	-808.2	9.66	6.13	-13.71	
7,323.0	36.05	26.38	6,842.4	-748.1	1,064.1	-792.9	8.94	6.68	-10.35	
7,355.0	37.53	23.92	6,868.1	-730.8	1,072.2	-775.9	6.53	4.63	-7.69	
7,386.0	39.66	21.17	6,892.3	-712.9	1,079.6	-758.3	8.82	6.87	-8.87	
7,418.0	42.13	17.99	6,916.5	-693.2	1,086.6	-738.9	10.09	7.72	-9.94	
7,449.0	44.75	15.25	6,939.0	-672.8	1,092.7	-718.8	10.41	8.45	-8.84	
7,481.0	47.64	11.09	6,961.1	-650.3	1,097.9	-696.5	13.02	9.03	-13.00	
7,512.0	50.40	6.24	6,981.5	-627.1	1,101.4	-673.6	14.79	8.90	-15.65	
7,544.0	53.32	3.80	7,001.2	-602.1	1,103.6	-648.6	10.92	9.13	-7.63	
7,575.0	57.15	0.96	7,018.9	-576.6	1,104.7	-623.3	14.46	12.35	-9.16	
7,607.0	60.90	359.19	7,035.4	-549.2	1,104.7	-595.9	12.64	11.72	-5.53	
7,638.0	64.00	357.35	7,049.7	-521.8	1,103.9	-568.4	11.30	10.00	-5.94	
7,669.0	66.74	356.51	7,062.6	-493.6	1,102.4	-540.2	9.18	8.84	-2.71	
7,701.0	69.13	354.63	7,074.7	-464.1	1,100.1	-510.6	9.24	7.47	-5.88	
7,732.0	71.83	352.92	7,085.0	-435.0	1,096.9	-481.4	10.14	8.71	-5.52	
7,763.0	75.35	351.74	7,093.8	-405.5	1,092.9	-451.8	11.93	11.35	-3.81	
7,795.0	78.05	350.01	7,101.1	-374.8	1,088.0	-420.9	9.94	8.44	-3.10	
7,826.0	80.30	349.05	7,107.0	-344.9	1,082.4	-390.7	7.87	7.26	-1.29	
7,858.0	82.74	348.23	7,111.7	-313.8	1,076.2	-359.5	8.04	7.63	-0.06	
7,889.0	85.11	347.83	7,115.0	-283.7	1,069.8	-329.1	7.75	7.65	-0.06	
7,921.0	87.53	347.81	7,117.0	-252.5	1,063.1	-297.6	7.56	7.56	-0.06	
LP As-Drilled: 7921'MD/7116.8'TVD - Cherry Valley Target										
8,015.0	88.05	347.30	7,120.6	-160.7	1,042.8	-205.1	0.77	0.55	-0.54	
8,110.0	89.53	347.90	7,122.6	-68.0	1,022.4	-111.6	1.68	1.56	0.63	
8,204.0	89.38	347.52	7,123.5	23.9	1,002.4	-19.0	0.43	-0.16	-0.40	
Deepest Point @ 8204'MD/7123.3'TVD										
8,298.0	91.07	346.85	7,123.2	115.5	981.6	73.5	1.93	1.80	-0.71	
8,392.0	90.91	346.40	7,121.5	206.9	959.8	165.8	0.51	-0.17	-0.48	

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Where energy meets innovation.

Phoenix Technology Services LP

Survey Report



Company:	EQT PRODUCTION	Local Co-ordinate Reference:	Well Well #515110 -MRC - Slot 515110
Project:	Wetzel County, WV	TVD Reference:	KB @23' @ 1022.0usft
Site:	BIG 360	MD Reference:	KB @23' @ 1022.0usft
Well:	Well #515110 -MRC	North Reference:	Grid
Wellbore:	Main	Survey Calculation Method:	Minimum Curvature
Design:	515110 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)
8,486.0	90.52	346.22	7,120.4	298.3	937.6	258.0	0.46	-0.41	-0.19
8,581.0	89.73	345.23	7,120.2	390.3	914.2	351.0	1.33	-0.83	-1.04
8,675.0	90.82	347.46	7,119.7	481.7	892.0	443.2	2.64	1.16	2.37
8,769.0	90.75	348.33	7,118.4	573.6	872.3	535.8	0.93	-0.07	0.93
8,863.0	90.85	348.29	7,117.1	665.6	853.2	628.6	0.11	0.11	-0.04
8,957.0	90.28	348.18	7,116.2	757.6	834.1	721.3	0.62	-0.61	-0.12
9,051.0	90.59	347.52	7,115.5	849.5	814.3	814.0	0.78	0.33	-0.70
9,146.0	90.50	347.33	7,114.6	942.2	793.6	907.5	0.22	-0.09	-0.20
9,240.0	90.45	347.18	7,113.8	1,033.9	772.9	1,000.0	0.17	-0.05	-0.16
9,335.0	90.79	347.44	7,112.8	1,126.6	752.0	1,093.5	0.45	0.36	0.27
9,429.0	91.11	346.18	7,111.2	1,218.1	730.6	1,185.8	1.38	0.34	-1.34
9,524.0	91.62	346.51	7,108.9	1,310.4	708.1	1,279.0	0.64	0.54	0.35
9,618.0	90.18	345.84	7,107.5	1,401.6	685.7	1,371.1	1.69	-1.53	-0.71
9,713.0	90.47	349.43	7,106.9	1,494.4	665.3	1,464.7	3.79	0.31	3.78
9,807.0	89.78	349.40	7,106.7	1,586.8	648.1	1,557.7	0.73	-0.73	-0.03
9,901.0	87.78	344.93	7,108.7	1,678.4	627.2	1,650.1	5.21	-2.13	-4.76
9,996.0	89.75	343.68	7,110.8	1,769.9	601.5	1,742.6	2.46	2.07	-1.32
10,090.0	89.09	345.33	7,111.7	1,860.4	576.4	1,834.1	1.89	-0.70	1.76
10,184.0	90.62	344.43	7,112.0	1,951.2	551.9	1,925.8	1.89	1.63	-0.96
10,279.0	91.55	346.02	7,110.2	2,043.0	527.7	2,018.6	1.94	0.98	1.67
10,373.0	91.33	347.93	7,107.8	2,134.6	506.5	2,111.0	2.04	-0.23	2.03
10,467.0	91.53	346.43	7,105.4	2,226.2	485.6	2,203.4	1.61	0.21	-1.60
10,562.0	91.13	346.68	7,103.2	2,318.6	463.5	2,296.7	0.50	-0.42	0.26
10,656.0	91.62	345.53	7,101.0	2,409.8	441.0	2,388.8	1.33	0.52	-1.22
10,750.0	91.51	346.10	7,098.4	2,500.9	418.0	2,480.8	0.62	-0.12	0.61
10,845.0	91.85	345.34	7,095.6	2,592.9	394.5	2,573.7	0.88	0.36	-0.80
10,939.0	90.22	345.78	7,093.9	2,683.9	371.1	2,665.6	1.80	-1.73	0.47
11,033.0	90.22	345.74	7,093.6	2,775.0	348.0	2,757.6	0.04	0.00	-0.04
11,127.0	90.47	345.19	7,093.0	2,866.0	324.4	2,849.6	0.64	0.27	-0.59
11,222.0	90.85	344.47	7,091.9	2,957.7	299.5	2,942.2	0.86	0.40	-0.76
11,316.0	91.10	346.06	7,090.3	3,048.6	275.6	3,034.1	1.71	0.27	0.31
11,410.0	90.25	346.35	7,089.2	3,139.9	253.2	3,126.2	0.96	-0.90	0.26
11,504.0	90.62	346.59	7,088.5	3,231.3	231.2	3,218.5	0.47	0.39	0.24
11,598.0	89.27	346.82	7,088.6	3,322.7	209.6	3,310.8	1.46	-1.44	0.09
11,693.0	89.30	346.91	7,089.8	3,415.3	188.0	3,404.1	0.10	0.03	0.34
11,787.0	89.35	347.23	7,090.9	3,506.9	167.0	3,496.5	0.34	0.05	0.34
11,881.0	90.65	346.74	7,090.9	3,598.4	145.8	3,588.9	1.48	1.38	-0.52
11,976.0	90.71	346.53	7,089.8	3,690.9	123.9	3,682.2	0.23	0.06	-0.22
12,070.0	90.90	346.82	7,088.4	3,782.3	102.2	3,774.5	0.37	0.20	0.31
12,164.0	89.16	345.53	7,088.4	3,873.6	79.7	3,866.7	2.30	-1.85	-1.37
12,258.0	89.33	345.51	7,089.6	3,964.6	56.2	3,958.6	0.18	0.18	-0.02
12,353.0	89.90	346.79	7,090.3	4,056.8	33.5	4,051.7	1.47	0.60	1.35
12,448.0	90.04	346.17	7,090.3	4,149.2	11.3	4,144.9	0.67	0.15	-0.65

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Company:	EQT PRODUCTION	Local Co-ordinate Reference:	Well Well #515110 -MRC - Slot 515110
Project:	Wetzel County, WV	TVD Reference:	KB @23' @ 1022.0usft
Site:	BIG 360	MD Reference:	KB @23' @ 1022.0usft
Well:	Well #515110 -MRC	North Reference:	Grid
Wellbore:	Main	Survey Calculation Method:	Minimum Curvature
Design:	515110 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)
12,542.0	90.01	345.82	7,090.3	4,240.4	-11.5	4,237.0	0.37	-0.03	-0.37
12,637.0	90.24	348.56	7,090.1	4,333.0	-32.5	4,330.5	2.89	0.24	2.88
12,731.0	91.99	348.58	7,088.2	4,425.1	-51.2	4,423.3	1.86	1.86	0.02
12,825.0	92.22	348.79	7,084.8	4,517.3	-69.6	4,516.1	0.33	0.24	0.22
12,920.0	90.19	347.70	7,082.8	4,610.2	-88.9	4,609.8	2.43	-2.14	-1.15
13,014.0	90.05	345.78	7,082.6	4,701.7	-110.5	4,702.2	2.05	-0.15	-2.04
13,108.0	89.99	345.41	7,082.6	4,792.8	-133.9	4,794.1	0.40	-0.06	-0.39
13,202.0	90.22	345.19	7,082.4	4,883.7	-157.7	4,886.0	0.34	0.24	-0.23
13,297.0	90.50	346.05	7,081.8	4,975.7	-181.3	4,978.9	0.95	0.29	0.91
13,391.0	90.24	345.78	7,081.2	5,066.9	-204.2	5,071.0	0.40	-0.28	-0.29
Final Phoenix MWD Survey									
13,468.0	90.24	345.78	7,080.9	5,141.5	-223.1	5,146.4	0.00	0.00	0.00
PTB/As-Drilled TD:13468'MD/7080.6'TVD									

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
6,521.0	6,155.7	-728.7	735.9	Tie In
6,537.0	6,167.3	-736.4	743.6	First Phoenix MWD Survey
6,593.0	6,209.1	-762.1	770.7	KOP As-Drilled: 6593'MD/6208.9'TVD
7,921.0	7,117.0	-252.5	1,063.1	LP As-Drilled: 7921'MD/7116.8'TVD
7,921.0	7,117.0	-252.5	1,063.1	Cherry Valley Target
8,204.0	7,123.5	23.9	1,002.4	Deepest Point @ 8204'MD/7123.3'TVD
13,391.0	7,081.2	5,066.9	-204.2	Final Phoenix MWD Survey
13,468.0	7,080.9	5,141.5	-223.1	PTB/As-Drilled TD:13468'MD/7080.6'TVD

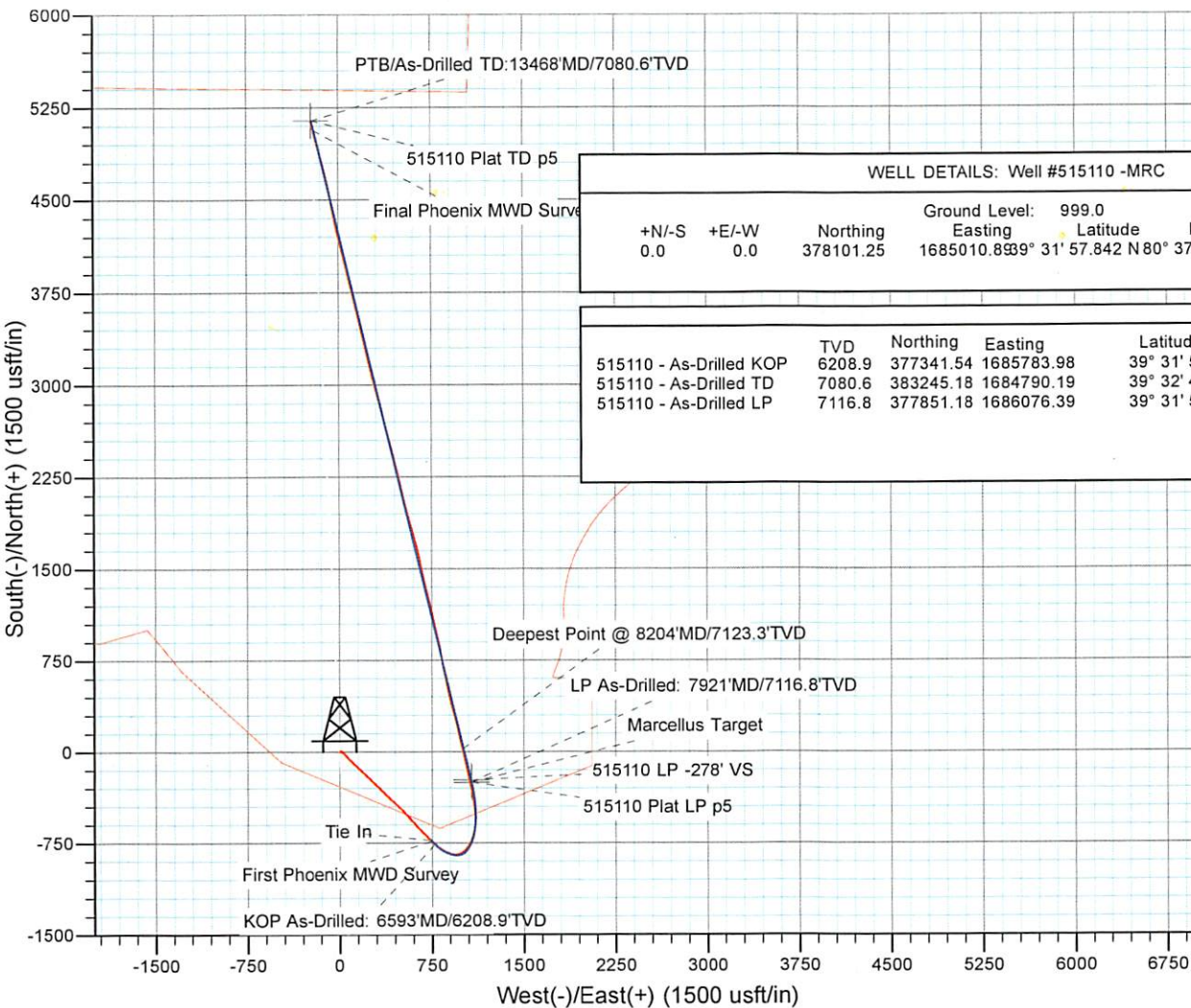
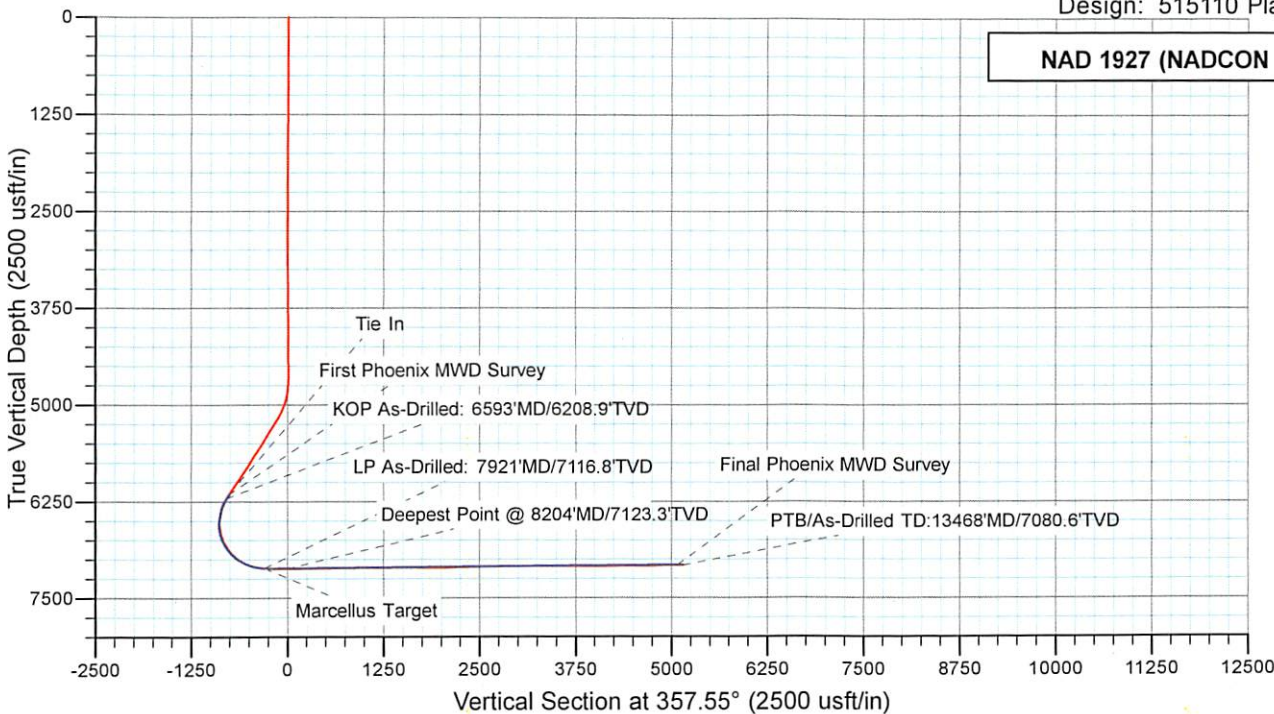
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KB Elevation=1319 FT
Ground Elevation=1296 FT

All Survey Measurements were taken from KB Elevation

Project: Wetzel County, WV
Site: BIG 360
Well: Well #515110 -MRC
Wellbore: Main
Design: 515110 Plan 5

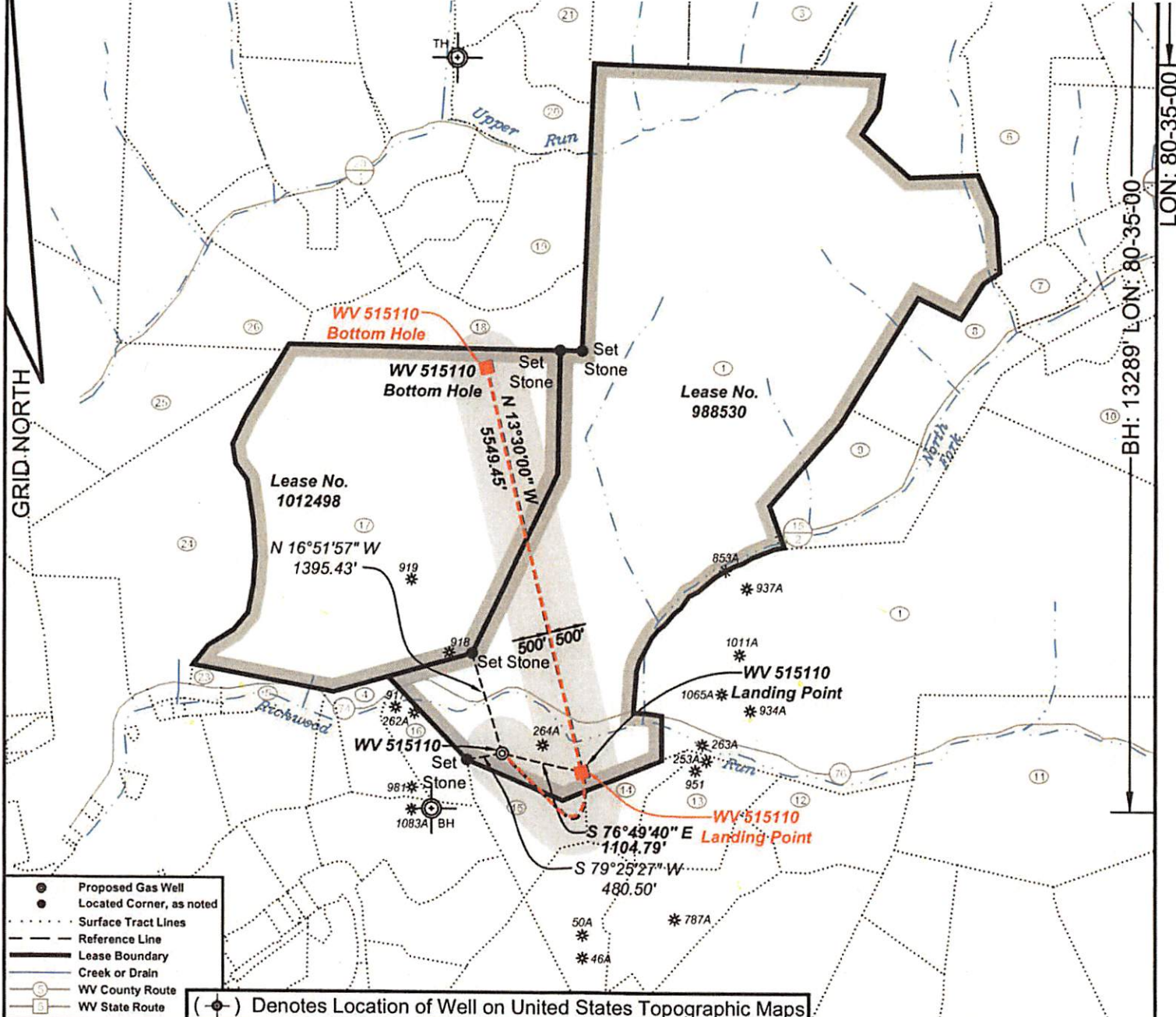
NAD 1927 (NADCON CONUS)



WELL DETAILS: Well #515110 -MRC						
+N/-S	+E/-W	Northing	Ground Level:	999.0	Latitude	Longitude
0.0	0.0	378101.25	Easting	1685010.8939	31° 57.842 N	80° 37' 0.468 W
						Slot
						515110

	TVD	Northing	Easting	Latitude	Longitude
515110 - As-Drilled KOP	6208.9	377341.54	1685783.98	39° 31' 50.429 N	80° 36' 50.481 W
515110 - As-Drilled TD	7080.6	383245.18	1684790.19	39° 32' 48.653 N	80° 37' 4.101 W
515110 - As-Drilled LP	7116.8	377851.18	1686076.39	39° 31' 55.502 N	80° 36' 46.830 W

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Environmental Protection



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

(⊙) Denotes Location of Well on United States Topographic Maps



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



SEAL

FILE NO: 174-13
DRAWING NO: 174-13 Big 360 H3
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

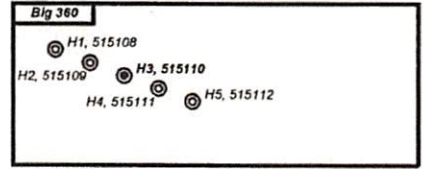
DATE: October 9 20 17
OPERATOR'S WELL NO. 515110
API WELL NO. 47-103
STATE COUNTY PERMIT

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

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03-163
MAR 1 2018
WV Department of Environmental Protection

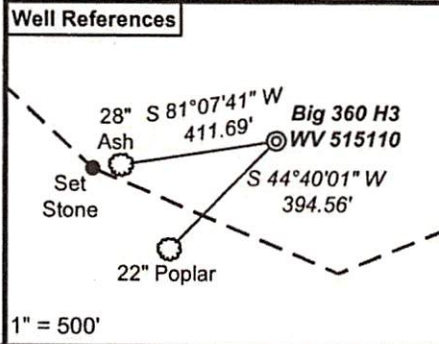
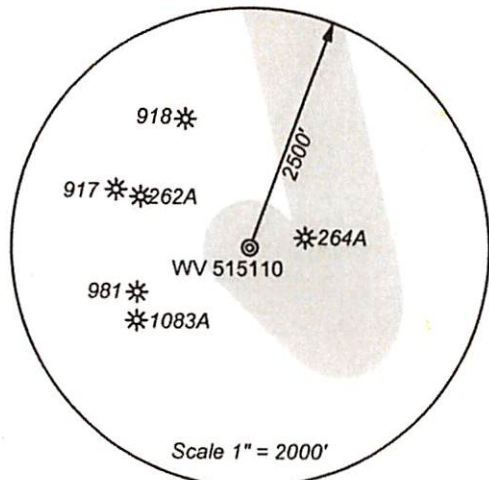
3	12	47	Wetzel	Grant	Coastal Forest Resources Co.	87.50
4	22	12	Wetzel	Grant	James Jones, et al.	18.67
5	22	11	Wetzel	Grant	Mary M. Snodgrass	10.14
6	18	1	Wetzel	Grant	McKinley E. Calvert Heirs	100.00
7	18	14	Wetzel	Grant	Frank M. & Frankie L. Dulaney	9.55
8	18	13	Wetzel	Grant	Ralph G. Dulaney	87.50
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: 383,242.78 E: 1,684,787.78
 NAD 83 UTM N: 4,377,541.97 E: 532,853.65
 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.



Sub Surface	Acres	Owner
Tract 14	16.50	Billy D. Arnolds, Jr.
Tract 15	31.35	Dallison Lumber Inc.

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

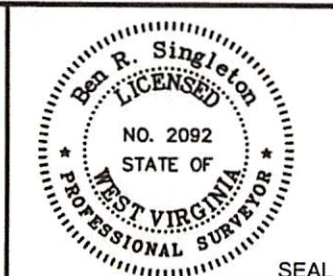


- Proposed Gas Well
- Located Corner, as noted
- Surface Tract Lines
- - - - - Reference Line
- Lease Boundary
- Creek or Drain
- WV County Route
- WV State Route



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



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 DRAWING NO: 174-13 Big 360 H3
 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 9 20 17
 OPERATOR'S WELL NO. 515110
 API WELL NO. 47 - 103 - 03163
 STATE COUNTY PERMIT 2018

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
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 PERFORATE NEW FORMATION OTHER DIVISION CHANGE

RECEIVED
 Office of Oil and Gas
 WV Department of Environmental Protection