

Well Operator's Report of Well Work



Where energy meets innovation.

Well Number: 513831

API: 47 - 103 - 02989

Submission:  Initial  Amended

Notes: Correction to Production Cement Top  
(MD)

RECEIVED  
Office of Oil and Gas

DEC 21 2015

WV Department of  
Environmental Protection

04/01/2016

State of West Virginia  
Department of Environmental Protection - Office of Oil and Gas  
Well Operator's Report of Well Work

API 47 - 103 - 02989 County WETZEL District GRANT  
Quad BIG RUN Pad Name BIG176 Field/Pool Name \_\_\_\_\_  
Farm name JOHN W. AND FLORENCE E. KILCOYNE Well Number 513831  
Operator (as registered with the OOG) EQT Production Company  
Address 625 Liberty Ave. EQT Plaza, Suite 1700 City Pittsburgh State PA Zip 15222

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 4,379,092 Easting 537,757  
Landing Point of Curve Northing 4,379,313 Easting 538,563  
Bottom Hole Northing 4,380,647 Easting 537,968

Elevation (ft) 860 GL Type of Well  New  Existing Type of Report  Interim  Final  
Permit Type  Deviated  Horizontal  Horizontal 6A  Vertical Depth Type  Deep  Shallow  
Type of Operation  Convert  Deepen  Drill  Plug Back  Redrilling  Rework  Stimulate  
Well Type  Brine Disposal  CBM  Gas  Oil  Secondary Recovery  Solution Mining  Storage  Other \_\_\_\_\_  
Type of Completion  Single  Multiple Fluids Produced  Brine  Gas  NGL  Oil  Other \_\_\_\_\_  
Drilled with  Cable  Rotary

Drilling Media Surface hole  Air  Mud  Fresh Water Intermediate hole  Air  Mud  Fresh Water  Brine  
Production hole  Air  Mud  Fresh Water  Brine  
Mud Type(s) and Additive(s) (Intermediate Hole Only)

Water base Mud 12.5 ppg barium sulfate, sodium chloride, xanthan gum, polyanionic cellulose, modified starch, sodium hydroxide, phosphonates and alkyl phosphates, glutaraldehyde solution, calcium hydroxide, partially hydrolyzed polyacrylamide/polyacrylate, potassium chloride, sodium carbonate, ground walnut shells, alcohol and modified fatty acid, ferrochrome lignosulfonate, calcium carbonate, fibrous cellulose

Date permit issued 05/30/2014 Date drilling commenced 06/30/2014 Date drilling ceased 11/25/2014  
Date completion activities began 1/26/2015 Date completion activities ceased 3/3/2015  
Verbal plugging (Y/N) N Date permission granted N/A Granted by N/A

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 135 Open mine(s) (Y/N) depths N  
Salt water depth(s) ft 1457,1459,1390,1521 Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 109,174,239,495,602 Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) N

Reviewed by:  
DMH

04/01/2016

API 47-103 - 02989 Farm name JOHN W. AND FLORENCE E. KILCOYNE Well number 513831

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	28"	26"	80'	NEW	A-500 40LB/FT	NONE	Y
Surface	24"	20"	287'	NEW	J-55 94LB/FT	NONE	Y
Coal							
Intermediate 1	17.5"	13.375"	830'	NEW	J-55 54.5LB/FT	205'	Y
Intermediate 2	12.375"	9.625"	2404'	NEW	A-500 40LB/FT	NONE	Y
Intermediate 3							
Production	8.5"	5.5"	13,228'	NEW	P-110 20LB/FT	NONE	N
Tubing							
Packer type and depth set							

Comment Details \_\_\_\_\_

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	CLASS A	98	15.6	1.18	115.64	0	8
Surface	CLASS A	545	15.6	1.19	648.55	0	8
Coal							
Intermediate 1	CLASS A	715	15.6	1.19	850.85	0	8
Intermediate 2	CLASS A / CLASS A	475 / 390	15.6 / 15.6	1.18 / 1.19	1124.6	0	8
Intermediate 3							
Production	CLASS A / CLASS H	955 / 645	14.2 / 15.2	1.26 / 1.97	2,473	2,513'	72
Tubing							

Drillers TD (ft) 13,236' MD \_\_\_\_\_ Loggers TD (ft) N/A \_\_\_\_\_  
 Deepest formation penetrated Marcellus \_\_\_\_\_ Plug back to (ft) N/A \_\_\_\_\_  
 Plug back procedure N/A \_\_\_\_\_

Kick off depth (ft) 3,490' \_\_\_\_\_

Check all wireline logs run  caliper  density  deviated/directional  induction  
 neutron  resistivity  gamma ray  temperature  sonic

Well cored  Yes  No  Conventional  Sidewall Were cuttings collected  Yes  No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING CONDUCTOR- NONE

SURFACE- JOINTS: 1, 6

INTERMEDIATE- JOINTS: 1, 12

INTERMEDIATE 2- RAN AT LEAST EVERY 500' FEET JOINTS: 1, 12, 25, 38, 49

PRODUCTION- 240 Composite bodied centralizers on every joint from TD up to 3,500'

WAS WELL COMPLETED AS SHOT HOLE  Yes  No DETAILS \_\_\_\_\_

WAS WELL COMPLETED OPEN HOLE?  Yes  No DETAILS \_\_\_\_\_

WERE TRACERS USED  Yes  No TYPE OF TRACER(S) USED \_\_\_\_\_



API 47- 103 - 02989 Farm name JOHN W. AND FLORENCE E. KILCOYNE Well number 513831

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
Marcellus	7,024'	TVD	8,291' MD
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 3,488 psi Bottom Hole N/A psi DURATION OF TEST 59 hrs

OPEN FLOW Gas 8,972 mcfpd Oil 0 bpd NGL 0 bpd Water 889 bpd GAS MEASURED BY  Estimated  Orifice  Pilot

LITHOLOGY/ FORMATION	TOP	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H <sub>2</sub> S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
	0		0		

Please insert additional pages as applicable.

Drilling Contractor ALPHA HUNTER DRILLING (RIG 5)  
Address P.O. BOX 430 City RENO State OH Zip 45773

Logging Company HOSSCO SERVICES, LLC  
Address 814 TROTTERS LANE City CHARLESTON State WV Zip 25312

Cementing Company NABORS CEMENTING SERVICES  
Address 2504 SMITH CREEK ROAD City WAYNESBURG State PA Zip 15370

Stimulating Company Keane  
Address 2121 Sage Road City Houston State TX Zip 77056

Please insert additional pages as applicable.

Completed by Brad Maddox Telephone 412-395-7053  
Signature *Brad Maddox* Title Director of Drilling Date 12/9/2015

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

API 47- 103 - 02989 Farm name JOHN W. AND FLORENCE E. KILCOYNE Well number 513831

Drilling Contractor Savanna Drilling  
Address 2204 Timberloch Place Suite City Woodlands State TX Zip 77380

Logging Company GyroData  
Address 601 MAYER ST City BRIDGEVILLE State PA Zip 15017

Logging Company \_\_\_\_\_  
Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Cementing Company \_\_\_\_\_  
Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Mud Type(s) and Additive(s) (Production Hole Only)

SBM 12.5 ppg powdered hydrocarbon resin, calcium carbonate, ground almond hulls, barium sulfate, calcium chloride, lecithin liquid, organophilic clay, partially hydrolyzed polyacrylamide/polyacrylate, potassium chloride, sodium carbonate, ground walnut shells, alcohol and modified fatty acid, ferrochrome lignosulfonate, calcium carbonate, fibrous cellulose

Formation Name	Final Top MD (ftGL) (ft)	Final Top TVD (ft)	Final Btm MD (ftGL) (ft)	Final Btm TVD (ft)
FRESH WATER ZONE	0	0	138	138
SAND/SHALE	0	0	112	112
WAHINGTON COAL	112	112	114	114
SAND/SHALE	114	114	177	177
WAYNESBURG A COAL	177	177	178	178
SAND/SHALE	178	178	242	242
WAYNESBURG COAL	242	242	244	244
SAND/SHALE	244	244	498	498
SEWICKLY COAL	498	498	500	500
SAND/SHALE	500	500	605	605
PIITSBURGH COAL	605	605	611	611
SAND/SHALE	611	611	1,710	1,710
MAXTON	1,710	1,710	1,842	1,842
SAND/SHALE	1,842	1,842	1,866	1,866
BIG LIME	1,866	1,866	1,958	1,958
SAND/SHALE	1,958	1,958	1,967	1,967
BIG INJUN	1,967	1,967	2,125	2,125
SAND/SHALE	2,125	2,125	2,262	2,262
WEIR	2,262	2,262	2,361	2,361
SAND/SHALE	2,361	2,361	2,412	2,412
GANTZ	2,412	2,412	2,421	2,421
SAND/SHALE	2,421	2,421	2,462	2,462
50F	2,462	2,462	2,508	2,508
SAND/SHALE	2,508	2,508	2,555	2,555
30F	2,555	2,555	2,579	2,579
SAND/SHALE	2,579	2,579	2,680	2,679
GORDON	2,680	2,679	2,730	2,729
SAND/SHALE	2,730	2,729	3,463	3,462
FORTH SAND	2,772	2,771	2,784	2,783
SAND/SHALE	2,784	2,783	2,928	2,927
BAYARD	2,928	2,927	3,111	3,110
SAND/SHALE	3,111	3,110	3,309	3,308
WARREN	3,309	3,308	3,358	3,357
B-5	3,358	3,357	3,463	3,462
SPEECHLEY	3,463	3,462	3,887	3,870
BALLTOWN A	3,887	3,870	4,510	4,340
RILEY	4,510	4,340	5,360	4,986
BENSON	5,360	4,986	5,825	5,327
ALEXANDER	5,825	5,327	5,914	5,391
ELKS	5,914	5,391	7,411	6,492
SONYEA	7,411	6,492	7,732	6,733
MIDDLESEX	7,732	6,733	7,806	6,786
GENESEE	7,806	6,786	7,934	6,870
GENESEO	7,934	6,870	7,992	6,904
TULLY	7,992	6,904	8,036	6,928
HAMILTON	8,036	6,928	8,291	7,024
MARCELLUS	8,291	7,024	13,236	7,042

# **EQT Production - Marcellus**

Wetzel County, WV

Wetzel County 513831

Well #513831

Main Wellbore

Design: As Drilled Surveys

## **Standard Survey Report**

26 November, 2014



# Phoenix Technologies

## Survey Report

<b>Database:</b> EDM 5000.1 Single User Db <b>Company:</b> EGT Production - Marcellus <b>Project:</b> Weizel County WV <b>Site:</b> Weizel County 513831 <b>Well:</b> Well #513831 <b>Wellbore:</b> Main Wellbore <b>Design:</b> As Drilled Surveys	<b>Local Co-ordinate Reference:</b> <b>TVD Reference:</b> <b>MD Reference:</b> <b>North Reference:</b> <b>Survey Calculation Method:</b>	<b>Site Weizel County 513831</b> KB @ 876.0usft KB @ 876.0usft Grid Minimum Curvature
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<b>Project</b> Weizel County WV		
<b>Map System:</b> US State Plane 1927 (Exact solution)	<b>System Datum:</b> Mean Sea Level	
<b>Geo Datum:</b> NAD 1927 (NADCON CONUS)		
<b>Map Zone:</b> West Virginia North 4701		Using geodetic scale factor

<b>Site</b> Weizel County 513831					
<b>Site Position:</b>	<b>Northing:</b> 388,059.70 usft	<b>Latitude:</b> 39.56			
<b>From:</b> Map	<b>Easting:</b> 1,700,962.16 usft	<b>Longitude:</b> -80.56			
<b>Position Uncertainty:</b> 0.0 usft	<b>Slot Radius:</b> 13-3/16 "	<b>Grid Convergence:</b> -0.68 °			

<b>Well</b> Well #513831					
<b>Well Position</b>	<b>+N/-S</b> 0.0 usft	<b>Northing:</b> 388,059.70 usft	<b>Latitude:</b> 39° 33' 38.174 N		
	<b>+E/-W</b> 0.0 usft	<b>Easting:</b> 1,700,962.16 usft	<b>Longitude:</b> 80° 33' 38.388 W		
<b>Position Uncertainty</b> 0.0 usft		<b>Wellhead Elevation:</b> usft	<b>Ground Level:</b> 860.0 usft		

<b>Wellbore</b> Main Wellbore					
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010_14	10/31/2014	-8.70	66.96	52,363

<b>Design</b> As Drilled Surveys					
<b>Audit Notes:</b>					
<b>Version:</b> 1.0	<b>Phase:</b> ACTUAL	<b>Tie On Depth:</b> 0.0			
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	8.77	

<b>Survey Program</b>		<b>Date</b> 11/25/2014			
<b>From (')</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
0.00	3,273.0	513831 Gyrodata Gyro (Main Wellbore)	GYD_DP_MS	Gyrodata gyro-compassing and drop	
0.00	13,236.0	Phoenix MWD (Main Wellbore)	MWD+IGRF	MWD+IGRF v3.standard declination	

<b>Survey</b>											
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	-876.0	0.0	0.0	0.0	0.00	0.00	0.00	
103.0	0.46	215.48	103.0	-773.0	-0.3	-0.2	-0.4	0.45	0.45	0.00	
203.0	0.46	136.50	203.0	-673.0	-1.0	-0.2	-1.0	0.59	0.00	-78.98	
303.0	0.62	121.75	303.0	-573.0	-1.5	0.5	-1.4	0.21	0.16	-14.75	
403.0	0.21	145.38	403.0	-473.0	-2.0	1.1	-1.8	0.44	-0.41	23.63	
503.0	0.21	219.96	503.0	-373.0	-2.3	1.1	-2.1	0.25	0.00	74.58	
603.0	0.19	228.62	603.0	-273.0	-2.5	0.8	-2.3	0.04	-0.02	8.66	
703.0	0.03	197.41	703.0	-173.0	-2.6	0.7	-2.5	0.17	-0.16	-31.21	

## Phoenix Technologies Survey Report

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Site Wetzel County 513831
Company:	EQT Production - Marcellus	TVD Reference:	KB @ 876.0usft
Project:	Wetzel County WV	MD Reference:	KB @ 876.0usft
Site:	Wetzel County 513831	North Reference:	Grid
Well:	Well #513831	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	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	0.04	147.79	803.0	-73.0	-2.7	0.7	-2.6	0.03	0.01	-49.62
903.0	0.23	119.07	903.0	27.0	-2.8	0.9	-2.7	0.20	0.19	-28.72
1,003.0	0.19	124.95	1,003.0	127.0	-3.0	1.2	-2.8	0.05	-0.04	5.88
1,103.0	0.17	125.05	1,103.0	227.0	-3.2	1.5	-2.9	0.02	-0.02	0.10
1,203.0	0.19	120.33	1,203.0	327.0	-3.4	1.8	-3.1	0.02	0.02	-4.72
1,303.0	0.29	87.15	1,303.0	427.0	-3.4	2.1	-3.1	0.17	0.10	-33.18
1,403.0	0.28	91.72	1,403.0	527.0	-3.4	2.6	-3.0	0.02	-0.01	4.57
1,503.0	0.32	89.17	1,503.0	627.0	-3.4	3.2	-2.9	0.04	0.04	-2.55
1,603.0	0.22	103.21	1,603.0	727.0	-3.5	3.6	-2.9	0.12	-0.10	14.04
1,703.0	0.27	115.10	1,703.0	827.0	-3.6	4.0	-3.0	0.07	0.05	11.89
1,803.0	0.32	123.70	1,803.0	927.0	-3.9	4.5	-3.1	0.07	0.05	8.60
1,903.0	0.62	116.90	1,903.0	1,027.0	-4.3	5.2	-3.4	0.30	0.30	-6.80
2,003.0	0.84	109.60	2,003.0	1,127.0	-4.8	6.4	-3.7	0.24	0.22	-7.30
2,103.0	1.44	101.82	2,102.9	1,226.9	-5.3	8.3	-3.9	0.62	0.60	-7.78
2,203.0	1.97	92.40	2,202.9	1,326.9	-5.6	11.2	-3.8	0.60	0.53	-9.42
2,303.0	2.48	78.23	2,302.8	1,426.8	-5.2	15.1	-2.9	0.75	0.51	-14.17
2,403.0	3.21	60.77	2,402.7	1,526.7	-3.4	19.6	-0.4	1.13	0.73	-17.46
2,503.0	3.06	54.97	2,502.6	1,526.6	-0.5	24.3	3.2	0.35	-0.15	-5.80
2,603.0	1.96	48.39	2,602.5	1,726.5	2.1	27.7	6.4	1.14	-1.10	-6.58
2,703.0	1.37	46.92	2,702.4	1,826.4	4.1	29.9	8.6	0.59	-0.59	-1.47
2,803.0	0.93	40.64	2,802.4	1,926.4	5.5	31.3	10.2	0.46	-0.44	-6.28
2,903.0	0.46	17.11	2,902.4	2,026.4	6.5	31.9	11.3	0.54	-0.47	-23.53
3,003.0	0.34	357.38	3,002.4	2,126.4	7.2	32.0	12.0	0.18	-0.12	-19.73
3,103.0	0.27	344.29	3,102.4	2,226.4	7.7	32.0	12.5	0.10	-0.07	-13.09
3,203.0	0.44	334.44	3,202.4	2,326.4	8.3	31.7	13.1	0.18	0.17	-9.65
3,273.0	0.58	322.18	3,272.4	2,396.4	8.8	31.4	13.5	0.25	0.20	-17.51
Gyro Tie In = 3291' MD										
3,291.0	0.50	323.40	3,290.4	2,414.4	9.0	31.3	13.6	0.45	-0.44	6.78
3,323.0	0.70	321.70	3,322.4	2,446.4	9.2	31.1	13.9	0.63	0.63	-5.31
3,354.0	1.40	310.50	3,353.4	2,477.4	9.6	30.7	14.2	2.34	2.26	-36.13
3,386.0	2.30	308.60	3,385.4	2,509.4	10.3	29.9	14.7	2.82	2.81	-5.94
3,417.0	3.40	306.60	3,416.3	2,540.3	11.2	28.7	15.5	3.56	3.55	-6.45
3,449.0	4.30	303.60	3,448.2	2,572.2	12.4	26.9	16.4	2.88	2.81	-9.38
3,480.0	5.30	301.00	3,479.1	2,603.1	13.8	24.7	17.4	3.30	3.23	-8.39
3,511.0	6.20	299.20	3,510.0	2,634.0	15.4	22.0	18.6	2.96	2.90	-5.81
3,543.0	4.80	312.90	3,541.8	2,665.8	17.1	19.5	19.9	5.97	-4.38	42.81
3,574.0	3.80	346.90	3,572.7	2,696.7	19.0	18.3	21.6	8.67	-3.23	109.68
3,606.0	4.10	29.10	3,604.7	2,728.7	21.1	18.7	23.7	8.92	0.94	131.88
3,638.0	6.40	63.50	3,636.6	2,760.6	22.8	20.8	25.8	11.88	7.19	107.50
3,669.0	9.60	76.90	3,667.2	2,791.2	24.2	24.9	27.7	11.88	10.32	43.23
3,701.0	12.60	83.00	3,698.6	2,822.6	25.2	30.9	29.7	10.06	9.38	19.06
3,732.0	16.00	87.30	3,728.7	2,852.7	25.9	38.6	31.4	11.48	10.97	13.87
3,764.0	19.50	87.20	3,759.2	2,883.2	26.3	48.3	33.4	10.94	10.94	-0.31



# Phoenix Technologies

## Survey Report

<b>Database:</b> EDM 5000.1 Single User Db <b>Company:</b> EQT Production - Marcellus <b>Project:</b> Wetzel County, WV <b>Site:</b> Wetzel County 513831 <b>Well:</b> Well #513831 <b>Wellbore:</b> Main Wellbore <b>Design:</b> As Drilled Surveys	<b>Local Co-ordinate Reference:</b> <b>TVD Reference:</b> <b>MD Reference:</b> <b>North Reference:</b> <b>Survey Calculation Method:</b>	<b>Site Wetzel County 513831</b> KB @ 876.0usft KB @ 876.0usft Grid Minimum Curvature
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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)
3,795.0	22.50	88.80	3,788.1	2,912.1	26.7	59.4	35.4	9.85	9.68	5.16
3,827.0	25.80	91.50	3,817.3	2,941.3	26.6	72.5	37.4	10.87	10.31	8.44
3,859.0	29.10	93.00	3,845.7	2,969.7	26.1	87.2	39.1	10.54	10.31	4.69
3,890.0	32.30	92.50	3,872.3	2,996.3	25.3	103.0	40.7	10.36	10.32	-1.61
3,922.0	35.00	93.00	3,899.0	3,023.0	24.4	120.7	42.6	8.48	8.44	1.56
3,953.0	37.90	92.90	3,923.9	3,047.9	23.5	139.1	44.4	9.36	9.35	-0.32
3,985.0	40.70	91.10	3,948.7	3,072.7	22.8	159.4	46.8	9.45	8.75	-5.63
4,048.0	42.80	89.70	3,995.7	3,119.7	22.5	201.3	53.0	3.65	3.33	-2.22
4,111.0	42.10	88.60	4,042.1	3,166.1	23.1	243.9	60.1	1.62	-1.11	-1.75
4,175.0	42.20	90.30	4,089.6	3,213.6	23.6	286.8	67.0	1.79	0.16	2.66
4,238.0	43.00	92.90	4,136.0	3,260.0	22.4	329.4	72.3	3.07	1.27	4.13
4,301.0	42.30	92.00	4,182.3	3,306.3	20.5	372.1	77.0	1.47	-1.11	-1.43
4,364.0	41.60	91.40	4,229.2	3,353.2	19.3	414.2	82.2	1.28	-1.11	-0.95
4,427.0	40.90	90.50	4,276.5	3,400.5	18.6	455.7	87.9	1.46	-1.11	-1.43
4,490.0	41.40	91.90	4,324.0	3,448.0	17.7	497.1	93.3	1.66	0.79	2.22
4,553.0	41.10	91.70	4,371.3	3,495.3	16.4	538.6	98.4	0.52	-0.48	-0.32
4,617.0	39.80	91.60	4,420.0	3,544.0	15.2	580.2	103.5	2.03	-2.03	-0.16
4,680.0	40.60	90.00	4,468.2	3,592.2	14.7	620.8	109.2	2.07	1.27	-2.54
4,743.0	41.80	89.70	4,515.6	3,639.6	14.8	662.3	115.6	1.93	1.90	-0.48
4,806.0	42.40	89.10	4,562.3	3,686.3	15.2	704.5	122.5	1.15	0.95	-0.95
4,869.0	42.30	89.50	4,608.9	3,732.9	15.7	747.0	129.5	0.46	-0.16	0.63
4,932.0	40.40	88.00	4,656.2	3,780.2	16.6	788.6	136.7	3.40	-3.02	-2.38
4,995.0	40.10	90.10	4,704.2	3,828.2	17.3	829.3	143.6	2.21	-0.48	3.33
5,058.0	40.20	91.50	4,752.4	3,876.4	16.7	869.9	149.2	1.44	0.16	2.22
5,122.0	38.50	90.80	4,801.9	3,925.9	15.9	910.5	154.6	2.75	-2.66	-1.09
5,185.0	38.50	91.10	4,851.2	3,975.2	15.3	949.7	160.0	0.30	0.00	0.48
5,248.0	38.60	91.20	4,900.5	4,024.5	14.5	988.9	165.2	0.19	0.16	0.16
5,311.0	41.40	91.90	4,948.7	4,072.7	13.4	1,029.4	170.3	4.50	4.44	1.11
5,374.0	42.70	91.60	4,995.5	4,119.5	12.1	1,071.6	175.4	2.09	2.06	-0.48
5,437.0	42.70	91.30	5,041.8	4,165.8	11.0	1,114.3	180.9	0.32	0.00	-0.48
5,500.0	42.60	90.50	5,088.1	4,212.1	10.3	1,157.0	186.7	0.87	-0.16	-1.27
5,564.0	42.10	89.60	5,135.4	4,259.4	10.3	1,200.1	193.2	1.23	-0.78	-1.41
5,627.0	42.50	90.10	5,182.0	4,306.0	10.4	1,242.5	199.8	0.83	0.63	0.79
5,690.0	42.90	89.30	5,228.3	4,352.3	10.6	1,285.2	206.6	1.07	0.63	-1.27
5,753.0	43.90	89.90	5,274.1	4,398.1	10.9	1,328.5	213.5	1.72	1.59	0.95
5,817.0	44.00	90.80	5,320.2	4,444.2	10.7	1,372.9	220.0	0.99	0.16	1.41
5,874.0	44.60	92.00	5,361.0	4,485.0	9.7	1,412.7	225.1	1.81	1.05	2.11
5,937.0	43.80	90.70	5,406.1	4,530.1	8.6	1,456.6	230.7	1.92	-1.27	-2.06
6,000.0	44.10	92.40	5,451.5	4,575.5	7.5	1,500.3	236.2	1.93	0.48	2.70
6,064.0	43.90	93.30	5,497.5	4,621.5	5.3	1,544.7	240.8	1.03	-0.31	1.41
6,127.0	43.00	91.10	5,543.3	4,667.3	3.6	1,588.0	245.8	2.79	-1.43	-3.49
6,190.0	43.20	92.90	5,589.3	4,713.3	2.1	1,631.0	250.9	1.98	0.32	2.86

# Phoenix Technologies

## Survey Report

<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Site Wetzel County 513831
<b>Company:</b>	EQT Production - Marcellus	<b>TVD Reference:</b>	KB @ 876.0usft
<b>Project:</b>		<b>MD Reference:</b>	
<b>Site:</b>		<b>North Reference:</b>	
<b>Well:</b>		<b>Survey Calculation Method:</b>	
<b>Wellbore:</b>			
<b>Design:</b>			

**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)
6,254.0	43.10	93.50	5,636.0	4,760.0	-0.4	1,674.7	255.1	0.66	-0.16	0.94
6,317.0	42.30	91.40	5,682.3	4,806.3	-2.2	1,717.4	259.8	2.59	-1.27	-3.33
6,380.0	41.90	89.50	5,729.0	4,853.0	-2.5	1,759.6	265.9	2.12	-0.63	-3.02
6,443.0	42.10	89.10	5,775.8	4,899.8	-2.0	1,801.8	272.9	0.53	0.32	-0.63
6,506.0	40.80	88.20	5,823.1	4,947.1	-1.0	1,843.5	280.2	2.27	-2.06	-1.43
6,570.0	41.00	89.10	5,871.4	4,995.4	-0.1	1,885.4	287.6	0.97	0.31	1.41
6,633.0	41.10	91.40	5,918.9	5,042.9	-0.2	1,926.7	293.7	2.40	0.16	3.65
6,696.0	42.20	90.70	5,966.0	5,090.0	-1.0	1,968.6	299.3	1.90	1.75	-1.11
6,759.0	42.80	90.60	6,012.5	5,136.5	-1.5	2,011.2	305.3	0.96	0.95	-0.16
6,822.0	43.20	91.50	6,058.5	5,182.5	-2.3	2,054.1	311.1	1.16	0.63	1.43
6,886.0	43.80	92.50	6,105.0	5,229.0	-3.8	2,098.1	316.3	1.43	0.94	1.56
6,949.0	42.90	91.70	6,150.8	5,274.8	-5.4	2,141.4	321.3	1.67	-1.43	-1.27
7,012.0	42.10	90.60	6,197.2	5,321.2	-6.3	2,183.9	327.0	1.73	-1.27	-1.75
7,076.0	42.40	91.50	6,244.6	5,368.6	-7.0	2,226.9	332.8	1.06	0.47	1.41
7,139.0	41.80	92.10	6,291.4	5,415.4	-8.4	2,269.1	337.9	1.15	-0.95	0.95
7,202.0	42.90	90.80	6,337.9	5,461.9	-9.4	2,311.6	343.3	2.23	1.75	-2.06
7,266.0	44.40	90.70	6,384.2	5,508.2	-10.0	2,355.7	349.5	2.35	2.34	-0.16
7,329.0	43.30	88.70	6,429.7	5,553.7	-9.8	2,399.4	356.3	2.81	-1.75	-3.17
7,360.0	42.70	87.70	6,452.3	5,576.3	-9.1	2,420.5	360.2	2.93	-1.94	-3.23
7,392.0	42.40	86.70	6,475.9	5,599.9	-8.1	2,442.1	364.6	2.31	-0.94	-3.13
7,424.0	41.70	84.00	6,499.7	5,623.7	-6.3	2,463.5	369.5	6.06	-2.19	-8.44
7,455.0	41.10	77.30	6,522.9	5,646.9	-3.0	2,483.7	375.9	14.42	-1.94	-21.61
7,487.0	41.30	71.20	6,547.0	5,671.0	2.7	2,503.9	384.6	12.57	0.63	-19.06
7,518.0	41.10	66.10	6,570.3	5,694.3	10.1	2,523.0	394.9	10.85	-0.65	-16.45
7,550.0	39.30	62.50	6,594.8	5,718.8	19.1	2,541.6	406.6	9.18	-5.63	-11.25
7,582.0	39.20	58.40	6,619.6	5,743.6	29.0	2,559.2	419.1	8.11	-0.31	-12.81
7,613.0	40.30	53.70	6,643.4	5,767.4	40.1	2,575.6	432.6	10.32	3.55	-15.16
7,645.0	40.90	48.90	6,667.7	5,791.7	53.1	2,591.8	447.9	9.94	1.88	-15.00
7,676.0	42.00	44.60	6,691.0	5,815.0	67.2	2,606.8	464.1	9.84	3.55	-13.87
7,708.0	43.10	40.40	6,714.5	5,838.5	83.1	2,621.4	482.1	9.52	3.44	-13.13
7,740.0	44.10	39.10	6,737.7	5,861.7	100.1	2,635.5	501.0	4.20	3.13	-4.06
7,771.0	44.40	36.10	6,759.9	5,883.9	117.2	2,648.7	519.9	6.82	0.97	-9.68
7,803.0	45.80	32.50	6,782.5	5,906.5	136.0	2,661.4	540.4	9.09	4.38	-11.25
7,834.0	47.50	28.80	6,803.8	5,927.8	155.4	2,672.9	561.3	10.26	5.48	-11.94
7,866.0	48.80	24.60	6,825.1	5,949.1	176.7	2,683.6	584.0	10.59	4.06	-13.13
7,898.0	50.30	21.40	6,845.9	5,969.9	199.1	2,693.1	607.6	8.94	4.69	-10.00
7,929.0	52.00	18.80	6,865.4	5,989.4	221.7	2,701.4	631.2	8.53	5.48	-8.39
7,961.0	54.40	15.30	6,884.5	6,008.5	246.2	2,708.9	656.6	11.53	7.50	-10.94
7,992.0	55.80	11.70	6,902.3	6,026.3	270.9	2,714.8	681.9	10.54	4.52	-11.61
8,024.0	58.30	7.80	6,919.7	6,043.7	297.4	2,719.4	708.8	12.87	7.81	-12.19
8,056.0	60.60	4.40	6,935.9	6,059.9	324.8	2,722.3	736.3	11.63	7.19	-10.63
8,087.0	62.50	1.40	6,950.7	6,074.7	352.0	2,723.7	763.4	10.49	6.13	-9.68
8,119.0	64.80	358.70	6,964.9	6,088.9	380.7	2,723.7	791.7	10.43	7.19	-8.44



**Phoenix Technologies**  
Survey Report

Database: EDM 5000.1 Single User Db	Local Co-ordinate Reference: Site Waszel County 513831
Company: EQT Production - Marcalitus	TVD Reference: KB @ 878.0usft
Project:	MD Reference:
Site:	North Reference:
Well:	Survey Calculation Method:
Wellbore:	
Design:	

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)
8,150.0	67.40	357.70	6,977.5	6,101.5	409.0	2,722.8	819.6	8.89	6.39	-3.23
8,182.0	69.10	356.30	6,989.3	6,113.3	438.7	2,721.2	848.7	6.69	5.31	-4.38
8,214.0	71.30	352.90	7,000.2	6,124.2	468.7	2,718.4	877.9	12.13	6.88	-10.63
8,245.0	73.40	350.70	7,009.6	6,133.6	497.9	2,714.2	906.1	9.57	6.77	-7.10
8,277.0	75.70	348.30	7,018.1	6,142.1	528.2	2,708.5	935.2	10.19	7.19	-7.50
8,308.0	77.80	345.30	7,025.2	6,149.2	557.6	2,701.7	963.2	11.60	6.77	-9.68
8,340.0	79.80	341.90	7,031.4	6,155.4	587.7	2,692.8	991.6	12.15	6.25	-10.63
8,372.0	82.30	339.30	7,036.4	6,160.4	617.5	2,682.3	1,019.4	11.20	7.81	-8.13
8,403.0	85.50	339.00	7,039.7	6,163.7	646.3	2,671.3	1,046.2	10.37	10.32	-0.97
8,434.0	88.60	338.50	7,041.3	6,165.3	675.1	2,660.1	1,073.0	10.13	10.00	-1.61
8,442.3	89.07	338.32	7,041.5	6,165.5	682.8	2,657.1	1,080.2	6.04	5.62	-2.19
8,466.0	90.40	337.80	7,041.6	6,165.6	704.8	2,648.2	1,100.6	6.04	5.63	-2.19
8,529.0	90.60	337.30	7,041.0	6,165.0	763.1	2,624.1	1,154.4	0.85	0.32	-0.79
8,592.0	91.40	337.40	7,039.9	6,163.9	821.2	2,599.9	1,208.2	1.28	1.27	0.16
8,602.9	91.28	337.31	7,039.7	6,163.7	831.3	2,595.7	1,217.5	1.37	-1.11	-0.79
8,655.0	90.70	336.90	7,038.8	6,162.8	879.2	2,575.4	1,261.8	1.37	-1.11	-0.79
8,718.0	91.10	336.90	7,037.8	6,161.8	937.2	2,550.7	1,315.3	0.63	0.63	0.00
8,781.0	90.50	336.20	7,036.9	6,160.9	995.0	2,525.6	1,368.6	1.46	-0.95	-1.11
8,845.0	90.70	336.60	7,036.2	6,160.2	1,053.6	2,500.0	1,422.7	0.70	0.31	0.63
8,908.0	89.80	337.20	7,036.0	6,160.0	1,111.6	2,475.3	1,476.2	1.72	-1.43	0.95
8,970.0	89.70	337.50	7,036.2	6,160.2	1,168.8	2,451.4	1,529.1	0.51	-0.16	0.48
9,034.0	90.50	337.80	7,036.1	6,160.1	1,228.0	2,427.1	1,583.9	1.33	1.25	0.47
9,097.0	89.30	337.40	7,036.2	6,160.2	1,286.2	2,403.1	1,637.8	2.01	-1.90	-0.63
9,152.2	89.12	337.84	7,037.0	6,161.0	1,337.3	2,382.1	1,685.0	0.85	-0.32	0.79
9,160.0	89.10	337.90	7,037.1	6,161.1	1,344.5	2,379.1	1,691.7	0.85	-0.32	0.79
9,223.0	90.00	337.50	7,037.6	6,161.6	1,402.8	2,355.2	1,745.6	1.56	1.43	-0.63
9,286.0	90.10	337.40	7,037.5	6,161.5	1,461.0	2,331.1	1,799.5	0.22	0.16	-0.16
9,349.0	90.90	337.30	7,037.0	6,161.0	1,519.1	2,306.8	1,853.2	1.28	1.27	-0.16
9,413.0	90.40	337.30	7,036.3	6,160.3	1,578.1	2,282.1	1,907.8	0.78	-0.78	0.00
9,476.0	89.80	337.00	7,036.2	6,160.2	1,636.2	2,257.6	1,961.4	1.06	-0.95	-0.48
9,539.0	90.30	336.70	7,036.1	6,160.1	1,694.1	2,232.9	2,014.9	0.93	0.79	-0.48
9,602.0	90.90	336.30	7,035.4	6,159.4	1,751.9	2,207.8	2,068.2	1.14	0.95	-0.63
9,665.0	90.90	336.10	7,034.5	6,158.5	1,809.5	2,182.3	2,121.3	0.32	0.00	-0.32
9,728.0	89.80	336.10	7,034.1	6,158.1	1,867.1	2,156.8	2,174.3	1.75	-1.75	0.00
9,791.0	88.50	337.00	7,035.0	6,159.0	1,924.9	2,131.7	2,227.6	2.51	-2.06	1.43
9,854.0	89.40	337.20	7,036.2	6,160.2	1,982.9	2,107.2	2,281.2	1.46	1.43	0.32
9,917.0	90.30	337.80	7,036.3	6,160.3	2,041.1	2,083.1	2,335.0	1.72	1.43	0.95
9,981.0	91.20	338.00	7,035.5	6,159.5	2,100.4	2,059.0	2,389.9	1.44	1.41	0.31
10,044.0	90.60	338.40	7,034.5	6,158.5	2,158.9	2,035.7	2,444.2	1.14	-0.95	0.63
10,107.0	90.20	338.00	7,034.1	6,158.1	2,217.4	2,012.3	2,498.4	0.90	-0.63	-0.63

## Phoenix Technologies Survey Report

Database: EDM 5000.1 Single User D5	Local Co-ordinate Reference: Site Wetzel County 513831
Company: EOT Production - Marcellus	TVD Reference: KB @ 876.0usft
Project: Wetzel County, WV	MD Reference: KB @ 876.0usft
Site: Wetzel County 513831	North Reference: Grid
Well: Well #513831	Survey Calculation Method: Minimum Curvature
Wellbore: Main Wellbore	
Design: 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)
10,170.0	89.80	337.90	7,034.1	6,158.1	2,275.8	1,988.6	2,552.5	0.65	-0.63	-0.16
10,233.0	89.50	337.20	7,034.4	6,158.4	2,334.0	1,954.5	2,606.4	1.21	-0.48	-1.11
10,296.0	90.30	337.40	7,034.5	6,158.5	2,392.1	1,940.2	2,660.1	1.31	1.27	0.32
10,359.0	90.50	335.80	7,034.1	6,158.1	2,450.0	1,915.2	2,713.4	2.56	0.32	-2.54
10,422.0	90.20	335.10	7,033.7	6,157.7	2,507.3	1,889.0	2,766.1	1.21	-0.48	-1.11
10,485.0	91.30	334.90	7,032.9	6,156.9	2,564.4	1,862.4	2,818.4	1.77	1.75	-0.32
10,548.0	91.10	334.60	7,031.6	6,156.6	2,621.3	1,835.6	2,870.6	0.57	-0.32	-0.48
10,611.0	90.10	335.20	7,030.9	6,154.9	2,678.4	1,808.8	2,923.0	1.85	-1.59	0.95
10,675.0	91.10	335.50	7,030.3	6,154.3	2,736.5	1,782.1	2,976.4	1.63	1.56	0.47
10,737.0	91.30	335.90	7,029.0	6,153.0	2,793.0	1,756.6	3,028.3	0.72	0.32	0.65
10,801.0	89.50	335.30	7,028.5	6,152.5	2,851.3	1,730.2	3,081.9	2.96	-2.81	-0.94
10,863.0	89.10	335.90	7,029.3	6,153.3	2,907.8	1,704.6	3,133.8	1.16	-0.65	0.97
10,926.0	88.20	336.20	7,030.7	6,154.7	2,965.3	1,679.0	3,186.7	1.51	-1.43	0.48
10,990.0	89.10	335.80	7,032.3	6,156.3	3,023.8	1,653.0	3,240.5	1.54	1.41	-0.63
11,053.0	93.50	336.00	7,030.8	6,154.8	3,081.2	1,627.3	3,293.4	6.99	6.98	0.32
11,116.0	94.20	335.40	7,026.6	6,150.6	3,138.5	1,601.4	3,346.1	1.46	1.11	-0.95
11,179.0	94.00	335.90	7,022.1	6,146.1	3,195.8	1,575.5	3,398.7	0.85	-0.32	0.79
11,243.0	91.30	336.20	7,019.1	6,143.1	3,254.2	1,549.6	3,452.5	4.24	-4.22	0.47
11,306.0	90.50	337.60	7,018.1	6,142.1	3,312.1	1,524.8	3,506.0	2.56	-1.27	2.22
11,369.0	91.40	338.20	7,017.1	6,141.1	3,370.5	1,501.1	3,560.1	1.72	1.43	0.95
11,432.0	92.40	338.20	7,015.0	6,139.0	3,429.0	1,477.8	3,614.3	1.59	1.59	0.00
11,495.0	91.30	338.40	7,013.0	6,137.0	3,487.5	1,454.5	3,668.5	1.77	-1.75	0.32
11,558.0	90.60	338.30	7,011.9	6,135.9	3,546.0	1,431.2	3,722.9	1.12	-1.11	-0.16
11,621.0	91.20	338.40	7,010.9	6,134.9	3,604.6	1,408.0	3,777.2	0.97	0.95	0.16
11,684.0	90.20	337.00	7,010.2	6,134.2	3,662.9	1,384.1	3,831.1	2.73	-1.59	-2.22
11,747.0	88.80	336.50	7,010.7	6,134.7	3,720.7	1,359.2	3,884.5	2.36	-2.22	-0.79
11,810.0	89.90	337.20	7,011.4	6,135.4	3,778.7	1,334.5	3,938.0	2.07	1.75	1.11
11,873.0	90.40	337.90	7,011.3	6,135.3	3,836.9	1,310.4	3,991.9	1.37	0.79	1.11
11,936.0	90.70	338.40	7,010.7	6,134.7	3,895.4	1,287.0	4,046.1	0.93	0.48	0.79
11,999.0	91.40	337.90	7,009.5	6,133.5	3,953.8	1,263.5	4,100.3	1.37	1.11	-0.79
12,062.0	91.60	337.90	7,007.9	6,131.9	4,012.2	1,239.8	4,154.3	0.32	0.32	0.00
12,125.0	90.50	337.50	7,008.7	6,130.7	4,070.4	1,215.9	4,208.3	1.66	-1.75	-0.63
12,188.0	90.50	336.30	7,006.2	6,130.2	4,128.4	1,191.2	4,261.8	1.90	0.00	-1.90
12,251.0	91.00	336.30	7,005.3	6,129.3	4,186.1	1,165.9	4,314.9	0.79	0.79	0.00
12,314.0	92.30	336.80	7,003.5	6,127.5	4,243.8	1,140.8	4,368.2	2.21	2.06	0.79
12,378.0	91.30	336.40	7,001.5	6,125.5	4,302.5	1,115.4	4,422.3	1.68	-1.56	-0.63
12,441.0	89.70	336.80	7,001.0	6,125.0	4,360.4	1,090.4	4,475.7	2.62	-2.54	0.63
12,504.0	89.60	337.10	7,001.3	6,125.3	4,418.3	1,065.7	4,529.2	0.50	-0.16	0.48
12,567.0	88.70	337.00	7,002.3	6,126.3	4,476.3	1,041.2	4,582.8	1.44	-1.43	-0.16
12,630.0	89.20	337.10	7,003.4	6,127.4	4,534.3	1,016.6	4,636.4	0.81	0.79	0.16
12,693.0	90.90	337.90	7,003.4	6,127.4	4,592.5	992.5	4,690.2	2.98	2.70	1.27
12,756.0	90.30	337.60	7,002.7	6,126.7	4,650.8	968.7	4,744.2	1.06	-0.95	-0.48



**Phoenix Technologies**  
Survey Report

<b>Database:</b> EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	<b>Site:</b> Wetzel County 513831
<b>Company:</b> EQT Production - Marcellus	<b>TVD Reference:</b>	KB @ 876.0usft
<b>Project:</b> Wetzel County, WV	<b>MD Reference:</b>	KB @ 876.0usft
<b>Site:</b> Wetzel County 513831	<b>North Reference:</b>	Grid
<b>Well:</b> Well #513831	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b> Main Wellbore		
<b>Design:</b> 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)	
12,820.0	88.80	337.40	7,003.2	6,127.2	4,710.0	944.2	4,798.9	2.36	-2.34	-0.31	
12,883.0	89.70	337.60	7,004.0	6,128.0	4,768.2	920.1	4,852.7	1.46	1.43	0.32	
12,946.0	88.70	336.50	7,004.9	6,128.9	4,826.2	895.5	4,906.3	2.36	-1.59	-1.75	
13,009.0	89.70	336.40	7,005.8	6,129.8	4,883.9	870.3	4,959.5	1.60	1.59	-0.16	
13,072.0	90.80	336.60	7,005.5	6,129.5	4,941.7	845.2	5,012.8	1.77	1.75	0.32	
13,135.0	91.40	336.40	7,004.3	6,128.3	4,999.5	820.1	5,066.1	1.00	0.95	-0.32	
Final Survey = 13184' MD/7003' TVD											
13,184.0	90.60	335.00	7,003.5	6,127.5	5,044.1	799.9	5,107.1	3.29	-1.63	-2.86	
513831 Plat TD											
13,232.2	90.60	335.00	7,003.0	6,127.0	5,087.8	779.6	5,147.2	0.00	0.00	0.00	
Projection to TD=13236' MD/7003' TVD											
13,236.0	90.60	335.00	7,002.9	6,126.9	5,091.2	778.0	5,150.3	0.00	0.00	0.00	

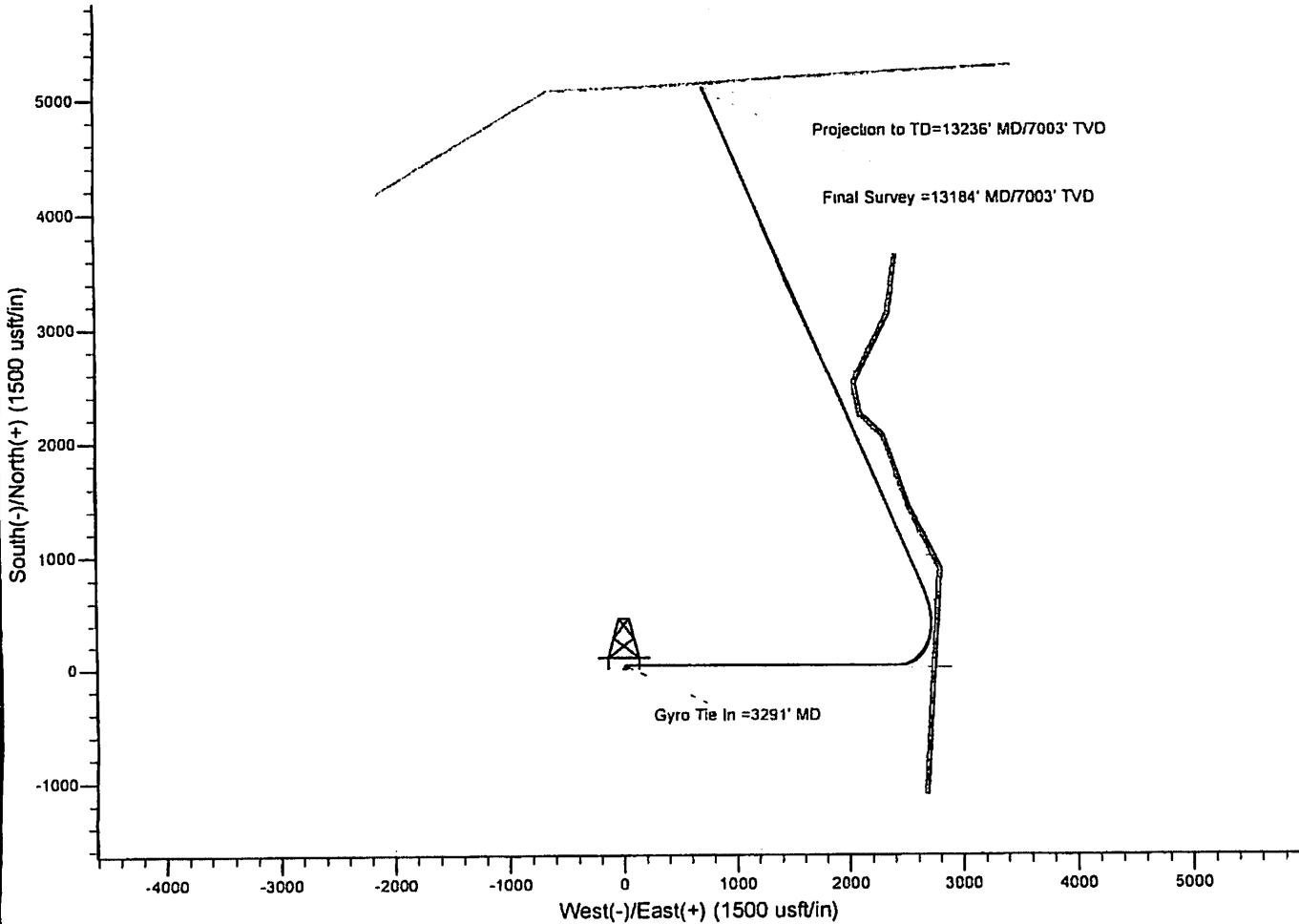
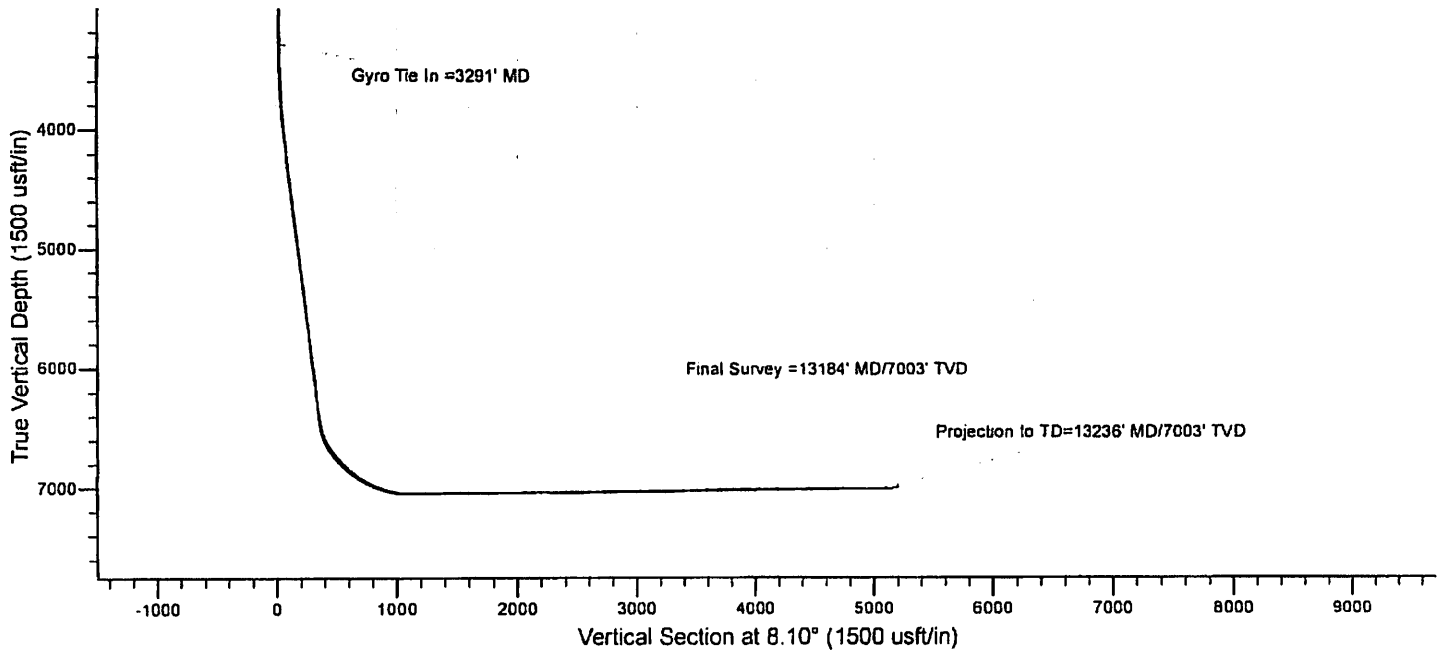
Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			Comment
		+N/-S (usft)	+E/-W (usft)		
3,291.0	3,290.4	9.0	31.3		Gyro Tie In = 3291' MD
13,184.0	7,003.5	5,044.1	799.9		Final Survey = 13184' MD/7003' TVD
13,236.0	7,002.9	5,091.2	778.0		Projection to TD=13236' MD/7003' TVD

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

04/01/2016

# EQT Production - Marcellus

Project: Wetzel County, WV  
 Site: Wetzel County 513831  
 Well: Well #513831  
 Wellbore: Main Wellbore  
 Design: As Drilled Surveys





**513831 - 47-103-02989-0000- Stimulated Stages**

<b>Stage Number</b>	<b>Stimulation Date</b>	<b>Ave Pump Rate (BPM)</b>	<b>Ave Treatment Pressure (PSI)</b>	<b>Max Breakdown Pressure (PSI)</b>	<b>ISIP (PSI)</b>	<b>Amount of Proppant (lbs)</b>	<b>Amount of Water (bbls)</b>	<b>Amount of Nitrogen/other (units)</b>
Initiation Sleeve	2/13/2015	12	7,728.00	8,866.00	5,062.00	0	748	0
1:02	2/13/2015	22	8,476.00	9,198.00	6,592.00	0	1537	0
1	2/23/2015	77.4	8,803.00	9,227.00	4,328.00	299,894	8450	0
2	2/24/2015	87.9	8,757.00	9,101.00	5,664.00	319,902	9285	0
3	2/24/2015	92.5	8,673.00	8,953.00	4,623.00	158,755	8071	0
4	2/24/2015	54	8,276.00	9,260.00	6,140.00	182,766	6385	0
4:02	2/25/2015	0	0.00	8,042.00	7,240.00	0	888	0
4:1	2/25/2015	84.9	8,683.00	9,241.00	6,044.00	225,133	5809	0
5	2/25/2015	93.3	8,649.00	9,066.00	6,015.00	304,941	8222	0
6	2/26/2015	92	8,740.00	9,967.00	5,743.00	278,677	8130	0
7	2/26/2015	97.3	8,662.00	8,863.00	5,271.00	299,581	7928	0
8	2/26/2015	95.7	8,609.00	8,981.00	5,450.00	255,576	7754	0
9	2/27/2015	95	8,726.00	9,255.00	5,793.00	301,991	7847	0
10	2/27/2015	95.3	8,828.00	9,072.00	4,902.00	300,528	7693	0
11	2/27/2015	95.3	8,668.00	9,047.00	5,617.00	299,913	9086	0
12	2/28/2015	95.6	8,719.00	9,027.00	6,492.00	299,700	7484	0
13	2/28/2015	96.4	8,877.00	9,088.00	5,613.00	305,400	7869	0
14	2/28/2015	97.2	8,672.00	9,015.00	5,807.00	299,650	8098	0
15	2/28/2015	92.1	8,799.00	9,107.00	5,962.00	283,050	9592	0
16	3/1/2015	100	8,389.00	8,812.00	5,640.00	301,240	7781	0
17	3/1/2015	93.70	8,730.00	8,962.00	5,769	298,951	8,803	0
18	3/2/2015	96.90	8,729.00	9,008.00	5,699	298,356	7,228	0
19	3/2/2015	98.40	8,587.00	8,998.00	6,386	299,807	7,705	0
20	3/2/2015	98.20	8,350.00	8,929.00	5,835	300,162	8,716	0
21	3/2/2015	99.30	8,270.00	8,943.00	5,825	276,628	7,384	0
22	3/3/2015	96.00	8,513.00	8,911.00	4,686	299,936	7,477	0

**513831 - 47-103-02989-0000 - Perforations**

<b>Stage Number</b>	<b>Perforation Date</b>	<b>Top Perf Depth (ftKB)</b>	<b>Bottom Perf Depth (ftKB)</b>	<b>Number of Shots</b>	<b>Formation</b>
Initiation Sleeve	1/26/2015	12,228.00	13,230.00	10	MARCELLUS
1	2/23/2015	13,021.00	13,158.00	32	MARCELLUS
2	2/24/2015	12,797.00	12,977.00	40	MARCELLUS
3	2/24/2015	12,572.00	12,754.00	40	MARCELLUS
4	2/24/2015	12,347.00	12,529.00	40	MARCELLUS
4.1	2/25/2015	12,342.00	12,412.00	24	MARCELLUS
5	2/25/2015	12,124.00	12,302.00	40	MARCELLUS
6	2/25/2015	11,897.00	12,080.00	40	MARCELLUS
7	2/26/2015	11,672.00	11,854.00	40	MARCELLUS
8	2/26/2015	11,447.00	11,629.00	40	MARCELLUS
9	2/27/2015	11,222.00	11,404.00	40	MARCELLUS
10	2/27/2015	10,997.00	11,179.00	40	MARCELLUS
11	2/27/2015	10,772.00	10,954.00	40	MARCELLUS
12	2/28/2015	10,547.00	10,729.00	40	MARCELLUS
13	2/28/2015	10,322.00	10,504.00	40	MARCELLUS
14	2/28/2015	10,097.00	10,279.00	40	MARCELLUS
15	2/28/2015	9,872.00	10,054.00	40	MARCELLUS
16	3/1/2015	9,647.00	9,829.00	40	MARCELLUS
17	3/1/2015	9,422.00	9,604.00	40	MARCELLUS
18	3/2/2015	9,200.00	9,379.00	40	MARCELLUS
19	3/2/2015	8,972.00	9,154.00	40	MARCELLUS
20	3/2/2015	8,747.00	8,929.00	40	MARCELLUS
21	3/2/2015	8,522.00	8,704.00	40	MARCELLUS
22	3/3/2015	8,297.00	8,479.00	40	MARCELLUS

# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	1/26/2015
Job End Date:	3/3/2015
State:	West Virginia
County:	Wetzel
API Number:	47-103-02989-00-00
Operator Name:	EQT Production
Well Name and Number:	513831
Longitude:	-80.56056600
Latitude:	39.56060400
Datum:	NAD83
Federal Tribal Well:	NO
True Vertical Depth:	7,042
Total Base Water Volume (gal):	7,810,740
Total Base Non Water Volume:	0



## Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Keane Group	Carrier/Base Fluid	Water	7732-18-5	100.00000	90.57967	None
Sand (Proppant)	Keane Group	Proppant	Silica Substrate	14808-60-7	100.00000	9.01972	None
MC MX 437-5	Multi-Chem	Calcium nitrate solution	Calcium nitrate	10124-37-5	60.00000	0.05861	None
Hydrochloric Acid (15%)	Keane Group	Acidizing	Hydrochloric Acid	7647-01-0	15.00000	0.03025	None
SL 1072	Keane Group	Friction Reducer	Petroleum distillates, hydrotreated light	64742-47-8	25.00000	0.01874	None
EC6330A	Keane Group	Scale Inhibitor	Sodium Phosphate, Tribasic	7601-54-9	5.00000	0.00124	None
AI 600	Keane Group	Corrosion Inhibitor	Ethylene Glycol	107-21-1	40.00000	0.00021	None
			N, N-Dimethylformamide	68-12-2	20.00000	0.00010	None
			2-Butoxyethanol	111-76-2	15.00000	0.00008	None
			Tar bases, quinoline derivs, benzyl chloride-quaternized	72480-70-7	15.00000	0.00008	None





Welcome Michelle N., Operator - OpNo. E1210363 [ Log Out ]



Submission to FracFocus using Excel Spreadsheets has been turned off.

[FIND A WELL BY STATE](#)

[ABOUT PROJECT PARTNERS](#)

(Note: Clicking the FracFocus, FIND A WELL links will open a new window.)

**Prepare Disclosure for FracFocus Submission**

[Disclosure Lists](#) | [Dashboard](#)

**i** Disclosure has been submitted.

Note: This window expires with 10 minutes of inactivity. After that you will be taken back to the dashboard.

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**Hydraulic Fracturing Data**

[Edit](#)

Job Start Date 1/26/2015    Job End Date 3/3/2015    API Number 47-103-02989-00-00    State & County West Virginia --- Wetzel

Well Name 513831

Longitude -80.560566    Latitude 39.560604    Datum NAD83    Federal/Tribal Well?

True Vertical Depth (ft) 7042    Total Water Vol (gal) 7810740    Total Non Water Vol 0    Total Mass (lbs) 71959444



**MSDS Chemical Ingredients**

[New Additive](#)    [Select Additive](#)    [Add Additive](#)

	Trade Name	Supplier	Purpose	Ingredients	CAS #	% High Additive	% HF Job	Comments	Ingredient Mass
<a href="#">Edit</a>	Water	Keane Group	Carrier/Base Fluid	Water	7732-18-5	100%	90.5796682617%	None	65180625.3
<a href="#">Edit</a>	Sand (Proppant)	Keane Group	Proppant	Silica Substrate	14808-60-7	100%	9.019715377%	None	6490537
<a href="#">Edit</a>	MC MX 437-5	Multi-Chem	Calcium nitrate solution	Calcium nitrate	10124-37-5	60%	.0586079518%	None	42173.956
<a href="#">Edit</a>	Hydrochloric Acid (15%)	Keane Group	Acidizing	Hydrochloric Acid	7647-01-0	15%	.0302453533%	None	21764.388
<a href="#">Edit</a>	SL 1072	Keane Group	Friction Reducer	Petroleum distillates, hydrotreated light	64742-47-8	25%	.0187405103%	None	13485.567
<a href="#">Edit</a>	EC6330A	Keane Group	Scale Inhibitor	Sodium Phosphate, Tribasic	7601-54-9	5%	.0012393153%	None	891.804
<a href="#">Edit</a>	AI 600	Keane Group	Corrosion Inhibitor	Ethylene Glycol	107-21-1	40%	.000207819%	None	149.545

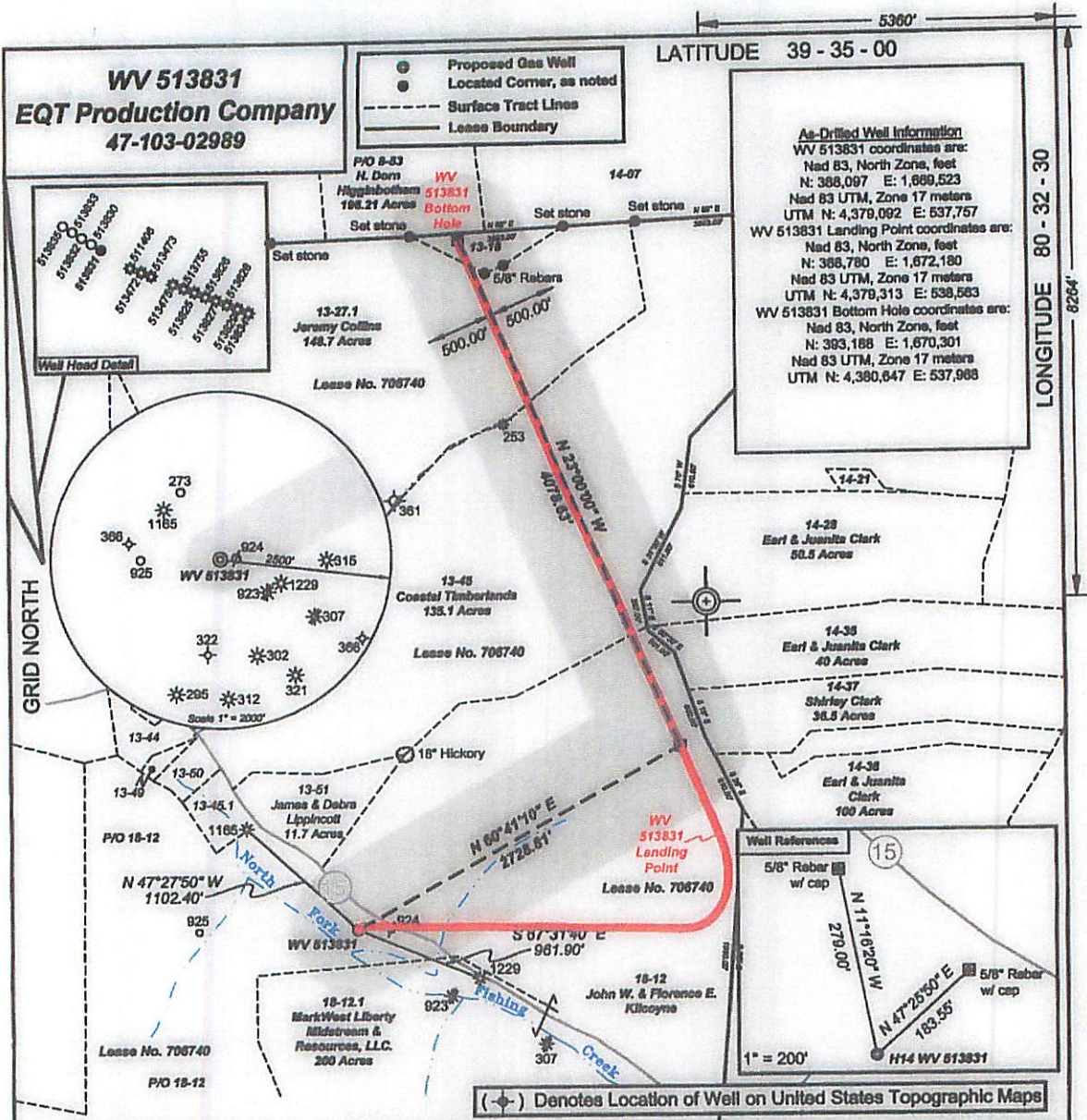
<input type="button" value="Edit"/>	LEB-10X	Keane Group	Gel Breaker	N, N-Dimethylformamide	68-12-2	20%	.0001039095%	None	74.773
				2-Butoxyethanol	111-76-2	15%	.0000779321%	None	56.08
				Tar bases, quinoline derivs, benzyl chloride-quatemized	72480-70-7	15%	.0000779321%	None	56.08
				Cinnamialdehyde	104-55-2	15%	.0000779321%	None	56.08
				Poly (oxy-1,2-ethanediyl), .alpha.-(4-nonylphenyl)-.omega.-hydroxy-, branched	127087-87-0	5%	.0000259774%	None	18.693
				1-Decanol	112-30-1	5%	.0000259774%	None	18.693
				Triethyl Phosphate	78-40-0	2.5%	.0000129887%	None	9.347
				Isopropyl alcohol	67-63-0	2.5%	.0000129887%	None	9.347
				1-Octanol	111-87-5	2.5%	.0000129887%	None	9.347
				Ethylene Glycol	107-21-1	30%	.0003098575%	None	222.972

**Non-MSDS Chemical Ingredients**

<input type="button" value="New Ingredients"/>									
Trade Name	Supplier	Purpose	Ingredients	CAS #	% High Additive	% HF Job	Comments	Ingredient Mass	

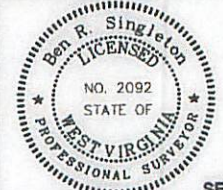
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I, the undersigned, hereby certify that this plat is correct to the best of my knowledge and belief and shows all the information required by law and the regulations issued and prescribed by the Department of Environmental Protection.

*Ben R. Singleton*  
 P.S. 2092



FILE NO: 145-34-G-10  
 DRAWING NO: 145-10 Blg 178 H14  
 SCALE: 1" = 1000'  
 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: December 17 20 14  
 OPERATOR'S WELL NO. 513831  
**API WELL NO**  
 47 - 103 - 02989  
 STATE COUNTY PERMIT

WELL TYPE:  OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL  
 (IF GAS) PRODUCTION:  STORAGE  DEEP  SHALLOW  
 LOCATION: ELEVATION: As-built 860' WATERSHED: North Fork of Fishing Creek QUADRANGLE: Blg Run  
 DISTRICT: Grant COUNTY: Wetzel  
 SURFACE OWNER: John W. and Florence E. Kilcoyne ACREAGE: 377.06  
 ROYALTY OWNER: EQT Production Company, Inc. LEASE NO: 706740 ACREAGE: 1003.75  
 PROPOSED WORK:  DRILL  CONVERT  DRILL DEEPER  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  
 PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE IN WELL (SPECIFY)  
 PLUG AND ABANDON  CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus ESTIMATED DEPTH: 100-1100'

WELL OPERATOR: EQT Production Company DESIGNATED AGENT: Rex C. Ray  
 ADDRESS: 115 Professional Place PO Box 280 ADDRESS: 115 Professional Place PO Box 280  
 Bridgeport, WV 26330 Bridgeport, WV 26330

04/01/2016