

Well Operator's Report of Well Work



Where energy meets innovation.

Well Number: 513760

API: 47 - 085 - 10136

Submission:  Initial  Amended

Notes: -Revised Plat  
-Revised "As Drilled" Coordinates

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WV Department of  
Environmental Protection

**APPROVED**

NAME: *Michael Laff*

DATE: *12-21-2016*

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

API 47-085-10136 County RITCHIE District UNION  
Quad OXFORD 7.5' Pad Name OXF163 Field/Pool Name \_\_\_\_\_  
Farm name HAROLD K. PIERCE Well Number 513760  
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 4,331,879.3 Easting 513,593.3  
Landing Point of Curve Northing 4,331,531.7 Easting 513,253.7  
Bottom Hole Northing 4,329,393.8 Easting 513,986.7

Elevation (ft) 1159 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)  
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 9/22/2014 Date drilling commenced 12/3/2014 Date drilling ceased 7/15/2015  
Date completion activities began 9/22/2015 Date completion activities ceased 10/16/2015  
Verbal plugging (Y/N) N Date permission granted N/A Granted by \_\_\_\_\_

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Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug  
Freshwater depth(s) ft 176',453',517' Open mine(s) (Y/N) depths N  
Salt water depth(s) ft 1156' Void(s) encountered (Y/N) depths N  
Coal depth(s) ft N/A Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) N

Reviewed by: \_\_\_\_\_

API 47-085 10136 Farm name HAROLD K. PIERCE Well number 513760

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	24"	20"	40'	NEW	A-500 78.7LB/FT	NONE	Y
Surface	17.5"	13.375"	1057'	NEW	J-55 54.5LB/FT	760'	Y
Coal							
Intermediate 1	12.375"	9.625"	3032'	NEW	A-500 40LB/FT	1812'	Y
Intermediate 2							
Intermediate 3							
Production	8.5"	5.5"	14804'	NEW	P-110 20LB/FT	NONE	N
Tubing							
Packer type and depth set							

Comment Details N/A

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	38	15.6	1.18	44.84	0	8
Surface	CLASS A	803	15.6	1.20	963.6	0	8
Coal							
Intermediate 1	CLASS A	1031	15.6	1.18	1218.5	0	8
Intermediate 2							
Intermediate 3							
Production	Class A / Class H	730/990	14.2 / 15.2	1.23 / 1.95	2828.4	3,020' MD	72
Tubing							

Drillers TD (ft) 14,819' 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) 4,855' MD

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: 1,11, 21  
 INTERMEDIATE- RAN AT LEAST EVERY 500' FEET  
 PRODUCTION- 258 Composite Centralizers. One on every joint from TD to 4,000 MD

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WAS WELL COMPLETED AS SHOT HOLE  Yes  No DETAILS

WV Department of Environmental Protection

WAS WELL COMPLETED OPEN HOLE?  Yes  No DETAILS

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





API 47- 085 - 10136 Farm name HAROLD K. PIERCE Well number 513760

Drilling Contractor Savanna Drilling  
Address 2204 Timberloch Place Suite 230 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 C&J Energy Services  
Address 1650 Hackers Creek Rd City Jane Lew State WV Zip 26378

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API 47-085-10136

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	520	520
SAND/SHALE	0	0	1,774	1,774
MAXTON	1,774	1,774	1,955	1,955
BIG LIME	1,955	1,955	2,244	2,244
WEIR	2,244	2,244	2,472	2,472
GANTZ	2,472	2,472	2,567	2,567
50F	2,567	2,567	2,653	2,653
30F	2,653	2,653	2,715	2,715
GORDON	2,715	2,715	2,803	2,803
4TH	2,803	2,803	2,959	2,959
BAYARD	2,959	2,959	3,299	3,298
WARREN	3,299	3,298	3,352	3,351
SPEECHLEY	3,352	3,351	3,846	3,845
BALLTOWN A	3,846	3,845	4,430	4,429
RILEY	4,430	4,429	4,767	4,766
BENSON	4,767	4,766	5,100	5,059
ALEXANDER	5,100	5,059	6,639	6,215
SONYEA	6,639	6,215	6,828	6,348
MIDDLESEX	6,828	6,348	6,902	6,395
GENESSEE	6,902	6,395	7,034	6,465
GENESE0	7,034	6,465	7,138	6,507
TULLY	7,138	6,507	7,174	6,518
HAMILTON	7,174	6,518	7,208	6,528
MARCELLUS	7,208	6,528	14,819	6,556

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API 47-085-10136

**PHOENIX**  
TECHNOLOGY SERVICES



## **EQT Production - Marcellus**

**Ritchie County, WV**

**Ritchie County 513760**

**Well #513760**

**Main Wellbore**

**Design: 513760 As Drilled Surveys**

## **Standard Survey Report**

**15 July, 2015**



**Where energy meets innovation.**





# Phoenix Technology Services

## Survey Report



<b>Database:</b> EQT Survey - Eagle Mountain <b>Company:</b> EQT Production - Marcellus <b>Project:</b> Phoenix Center - PHX <b>Site:</b> Phoenix Center 113760 <b>Well:</b> Well 8712700 <b>Wellbore:</b> Main Wellbore <b>Design:</b> PHX+OWSG MWD + HDGM	<b>Local Co-ordinate Reference:</b> Phoenix Center 113760 <b>TVD Reference:</b> Mean Sea Level <b>MD Reference:</b> Phoenix Center 113760 <b>North Reference:</b> NAD 1927 <b>Survey Calculation Method:</b> Minimum Curvature	
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<b>Project:</b> Phoenix Center - PHX			
<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> Phoenix Center - PHX					
<b>Site Position:</b>		<b>Northing:</b>	234,456.00 usft	<b>Latitude:</b>	39.14
<b>From:</b>	Map	<b>Easting:</b>	1,619,086.00 usft	<b>Longitude:</b>	-80.84
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	-0.86 °

<b>Well:</b> Phoenix Center - PHX						
<b>Well Position</b>	<b>+N/-S</b>	0.0 usft	<b>Northing:</b>	234,456.00 usft	<b>Latitude:</b>	39° 8' 9.250 N
	<b>+E/-W</b>	0.0 usft	<b>Easting:</b>	1,619,086.00 usft	<b>Longitude:</b>	80° 50' 34.402 W
<b>Position Uncertainty</b>		0.0 usft	<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b>	1,159.0 usft

<b>Wellbore:</b> Phoenix Center - PHX					
Magnetics	Model Name	Sample Date	Declination (")	Dip Angle (")	Field Strength (nT)
	HDGM	6/22/2015	-7.72	66.57	52,059

<b>Design:</b> Phoenix Center - PHX					
<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	171.87	

<b>Survey Program:</b> Phoenix Center - PHX					
		<b>Date:</b> 7/15/2015			
From (')	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	4,571.0	513760 Gyrodata Gyros (Main Wellbore)	GYD_DF_MS	Gyrodata gyro-compassing and drop	
0.00	14,819.0	513760 PHX MWD (Main Wellbore)	PHX+MWD+HDGM	PHX+OWSG MWD + HDGM	

<b>Survey:</b> Phoenix Center - PHX										
Measured Depth (usft)	Inclination (")	Azimuth (")	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate ("/100usft)	Build Rate ("/100usft)	Turn Rate ("/100usft)
0.0	0.00	0.00	0.0	-1,175.0	0.0	0.0	0.0	0.00	0.00	0.00
103.0	0.36	110.32	103.0	-1,072.0	-0.1	0.3	0.2	0.35	0.35	0.00
203.0	0.35	105.39	203.0	-972.0	-0.3	0.9	0.4	0.03	-0.01	-4.93
303.0	0.36	105.89	303.0	-872.0	-0.5	1.5	0.7	0.01	0.01	0.50
403.0	0.28	122.38	403.0	-772.0	-0.7	2.0	1.0	0.12	-0.08	16.49
503.0	0.25	116.78	503.0	-672.0	-0.9	2.4	1.2	0.04	-0.03	-5.60
603.0	0.21	125.34	603.0	-572.0	-1.1	2.7	1.5	0.05	-0.04	8.56
703.0	0.17	132.40	703.0	-472.0	-1.3	3.0	1.7	0.05	-0.04	7.06

Database:	COMPASS 5000.1 Build 73	Local Co-ordinate Reference:	NA 83 North Zone 18 UTM
Company:	EQT Energy - Michigan	TVD Reference:	Height of 114.000m
Project:	COMPASS 5000.1	MD Reference:	Height of 114.000m
Site:	WELLBORE 01000	North Reference:	NA 83 North Zone 18 UTM
Well:	WELLBORE 01000	Survey Calculation Method:	Minimum Curvature
Wellbore:	WELLBORE 01000		
Design:	WELLBORE 01000		

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	0.16	71.36	803.0	-372.0	-1.4	3.2	1.8	0.17	-0.01	-61.04
903.0	0.15	73.67	903.0	-272.0	-1.3	3.5	1.8	0.01	-0.01	2.31
1,003.0	0.17	78.72	1,003.0	-172.0	-1.2	3.8	1.8	0.02	0.02	5.05
1,103.0	0.37	78.32	1,103.0	-72.0	-1.1	4.2	1.7	0.20	0.20	-0.40
1,203.0	0.57	90.50	1,203.0	28.0	-1.1	5.0	1.8	0.22	0.20	12.18
1,303.0	0.71	94.11	1,303.0	128.0	-1.1	6.2	2.0	0.15	0.14	3.61
1,403.0	0.77	96.72	1,403.0	228.0	-1.3	7.4	2.3	0.07	0.06	2.61
1,503.0	0.87	96.65	1,503.0	328.0	-1.4	8.9	2.7	0.10	0.10	-0.07
1,603.0	0.95	99.39	1,602.9	427.9	-1.6	10.4	3.1	0.09	0.08	2.74
1,703.0	1.14	105.08	1,702.9	527.9	-2.0	12.2	3.7	0.22	0.19	5.69
1,803.0	1.48	114.23	1,802.9	627.9	-2.8	14.4	4.8	0.40	0.34	9.15
1,903.0	1.54	114.93	1,902.9	727.9	-3.9	16.8	6.2	0.06	0.06	0.70
2,003.0	1.56	117.19	2,002.8	827.8	-5.1	19.2	7.8	0.06	0.02	2.26
2,103.0	1.61	116.92	2,102.8	927.8	-6.4	21.6	9.4	0.05	0.05	-0.27
2,203.0	1.67	117.97	2,202.8	1,027.8	-7.7	24.2	11.0	0.07	0.06	1.05
2,303.0	1.69	118.20	2,302.7	1,127.7	-9.1	26.8	12.8	0.02	0.02	0.23
2,403.0	1.58	119.47	2,402.7	1,227.7	-10.4	29.3	14.5	0.12	-0.11	1.27
2,503.0	1.52	121.52	2,502.6	1,327.6	-11.8	31.6	16.2	0.08	-0.06	2.05
2,603.0	1.39	119.87	2,602.6	1,427.6	-13.1	33.8	17.8	0.14	-0.13	-1.65
2,703.0	1.33	120.66	2,702.6	1,527.6	-14.3	35.8	19.2	0.06	-0.06	0.79
2,803.0	1.31	119.99	2,802.5	1,627.5	-15.5	37.8	20.7	0.03	-0.02	-0.67
2,903.0	1.29	121.24	2,902.5	1,727.5	-16.6	39.8	22.1	0.03	-0.02	1.25
3,003.0	1.20	125.21	3,002.5	1,827.5	-17.8	41.6	23.5	0.12	-0.09	3.97
3,103.0	1.14	134.60	3,102.5	1,927.5	-19.1	43.2	25.0	0.20	-0.06	9.39
3,203.0	1.03	135.79	3,202.5	2,027.5	-20.5	44.5	26.5	0.11	-0.11	1.19
3,303.0	0.88	137.01	3,302.4	2,127.4	-21.7	45.6	27.9	0.15	-0.15	1.22
3,403.0	0.67	138.82	3,402.4	2,227.4	-22.7	46.6	29.0	0.21	-0.21	1.81
3,503.0	0.52	142.62	3,502.4	2,327.4	-23.5	47.2	29.9	0.16	-0.15	3.80
3,603.0	0.45	145.17	3,602.4	2,427.4	-24.1	47.7	30.6	0.07	-0.07	2.55
3,703.0	0.37	128.43	3,702.4	2,527.4	-24.7	48.2	31.2	0.14	-0.08	-16.74
3,803.0	0.30	129.45	3,802.4	2,627.4	-25.0	48.6	31.7	0.07	-0.07	1.02
3,903.0	0.07	112.36	3,902.4	2,727.4	-25.2	48.9	31.9	0.23	-0.23	-17.09
4,003.0	0.16	341.34	4,002.4	2,827.4	-25.1	48.9	31.8	0.21	0.09	-131.02
4,103.0	0.33	330.94	4,102.4	2,927.4	-24.7	48.7	31.4	0.18	0.17	-10.40
4,203.0	0.70	339.09	4,202.4	3,027.4	-23.9	48.4	30.5	0.38	0.37	8.15
4,303.0	0.70	335.95	4,302.4	3,127.4	-22.8	47.9	29.3	0.04	0.00	-3.14
4,403.0	0.91	333.83	4,402.4	3,227.4	-21.5	47.3	28.0	0.21	0.21	-2.12
4,503.0	1.14	330.26	4,502.4	3,327.4	-19.9	46.5	26.3	0.24	0.23	-3.57
4,571.0	1.41	322.82	4,570.4	3,395.4	-18.7	45.6	24.9	0.46	0.40	-10.94
4,571.3	1.41	322.82	4,570.7	3,395.7	-18.7	45.6	24.9	0.00	0.00	0.00
4,655.0	1.80	316.80	4,654.3	3,479.3	-17.0	44.2	23.1	0.30	0.23	-7.19
4,686.0	3.20	274.70	4,685.3	3,510.3	-16.6	43.0	22.5	7.36	5.16	-135.81



Database:	LOT 1000 - 10000000	Local Co-ordinate Reference:	Lot 1000 - 10000000
Company:	LOT 1000 - 10000000	TVD Reference:	Lot 1000 - 10000000
Project:	LOT 1000 - 10000000	MD Reference:	Lot 1000 - 10000000
Site:	LOT 1000 - 10000000	North Reference:	Lot 1000 - 10000000
Well:	LOT 1000 - 10000000	Survey Calculation Method:	Lot 1000 - 10000000
Wellbore:	LOT 1000 - 10000000		
Design:	LOT 1000 - 10000000		

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)
6,766.0	45.60	212.60	6,305.1	5,130.1	-580.8	-1,075.9	422.9	9.09	2.81	-12.19
6,797.0	46.30	208.90	6,326.7	5,151.7	-599.9	-1,087.3	440.2	8.87	2.26	-11.94
6,829.0	48.00	205.70	6,348.5	5,173.5	-620.8	-1,098.1	459.3	9.05	5.31	-10.00
6,860.0	50.20	202.20	6,368.8	5,193.8	-642.2	-1,107.6	479.2	11.10	7.10	-11.29
6,892.0	51.90	199.90	6,388.9	5,213.9	-665.4	-1,116.5	500.9	7.71	5.31	-7.19
6,923.0	54.10	198.00	6,407.5	5,232.5	-688.8	-1,124.5	523.0	8.62	7.10	-6.13
6,955.0	56.40	195.90	6,425.8	5,250.8	-714.0	-1,132.2	546.8	8.98	7.19	-6.56
6,986.0	59.10	193.70	6,442.3	5,267.3	-739.3	-1,138.9	570.9	10.58	8.71	-7.10
7,017.0	61.90	192.60	6,457.6	5,282.6	-765.6	-1,145.0	596.1	9.55	9.03	-3.55
7,049.0	64.50	190.50	6,472.0	5,297.0	-793.6	-1,150.7	622.9	10.02	8.13	-6.56
7,080.0	66.40	188.10	6,484.9	5,309.9	-821.4	-1,155.3	649.9	9.34	6.13	-7.74
7,111.0	68.30	185.90	6,496.8	5,321.8	-849.8	-1,158.8	677.5	8.97	6.13	-7.10
7,143.0	69.90	182.90	6,508.3	5,333.3	-879.6	-1,161.0	706.6	10.08	5.00	-9.38
7,174.0	72.30	180.00	6,518.3	5,343.3	-908.9	-1,161.8	735.6	11.76	7.74	-9.35
7,206.0	73.50	178.10	6,527.7	5,352.7	-939.5	-1,161.3	765.9	6.80	3.75	-5.94
7,238.0	75.50	176.10	6,536.3	5,361.3	-970.3	-1,159.7	796.6	8.68	6.25	-6.25
7,269.0	78.20	173.60	6,543.3	5,368.3	-1,000.3	-1,157.0	826.7	11.73	8.71	-8.06
7,300.0	81.70	171.60	6,548.7	5,373.7	-1,030.6	-1,153.1	857.3	12.95	11.29	-6.45
7,332.0	84.50	169.30	6,552.6	5,377.6	-1,061.9	-1,147.8	889.0	11.29	8.75	-7.19
7,363.0	87.20	166.50	6,554.8	5,379.8	-1,092.1	-1,141.3	919.9	12.53	8.71	-9.03
7,394.0	90.00	164.40	6,555.6	5,380.6	-1,122.1	-1,133.5	950.6	11.29	9.03	-6.77
7,405.7	90.57	163.78	6,555.5	5,380.5	-1,133.4	-1,130.3	962.2	7.19	4.85	-5.31
7,458.0	93.10	161.00	6,553.8	5,378.8	-1,183.2	-1,114.5	1,013.8	7.19	4.84	-5.31
7,520.0	93.10	160.70	6,550.5	5,375.5	-1,241.7	-1,094.2	1,074.6	0.48	0.00	-0.48
7,583.0	91.80	160.30	6,547.8	5,372.8	-1,301.0	-1,073.2	1,136.3	2.16	-2.06	-0.63
7,646.0	89.00	161.20	6,547.3	5,372.3	-1,360.5	-1,052.4	1,198.1	4.67	-4.44	1.43
7,709.0	88.00	161.40	6,549.0	5,374.0	-1,420.1	-1,032.2	1,260.0	1.62	-1.59	0.32
7,772.0	88.60	161.10	6,550.9	5,375.9	-1,479.8	-1,012.0	1,321.9	1.06	0.95	-0.48
7,835.0	88.90	160.80	6,552.2	5,377.2	-1,539.3	-991.4	1,383.7	0.67	0.48	-0.48
7,898.0	89.70	161.50	6,553.0	5,378.0	-1,598.9	-971.1	1,445.6	1.69	1.27	1.11
7,961.0	90.60	163.60	6,552.8	5,377.8	-1,659.0	-952.2	1,507.8	3.63	1.43	3.33
8,024.0	90.90	163.30	6,552.0	5,377.0	-1,719.4	-934.2	1,570.1	0.67	0.48	-0.48
8,087.0	91.20	163.50	6,550.9	5,375.9	-1,779.8	-916.2	1,632.4	0.57	0.48	0.32
8,149.0	91.70	162.90	6,549.3	5,374.3	-1,839.1	-898.3	1,693.7	1.26	0.81	-0.97
8,212.0	91.70	161.90	6,547.4	5,372.4	-1,899.1	-879.3	1,755.8	1.59	0.00	-1.59
8,275.0	90.90	160.80	6,546.0	5,371.0	-1,958.8	-859.1	1,817.7	2.16	-1.27	-1.75
8,338.0	89.90	159.50	6,545.6	5,370.6	-2,018.0	-837.8	1,879.4	2.60	-1.59	-2.06
8,401.0	89.20	160.20	6,546.1	5,371.1	-2,077.2	-816.1	1,941.0	1.57	-1.11	1.11
8,464.0	91.00	162.50	6,545.9	5,370.9	-2,136.9	-795.9	2,002.9	4.64	2.86	3.65
8,527.0	90.20	162.90	6,545.3	5,370.3	-2,197.0	-777.2	2,065.1	1.42	-1.27	0.63



# Phoenix Technology Services

## Survey Report



Where accuracy counts

<b>Database:</b> 111000 540 Well Survey <b>Company:</b> EQT Production - Marcellus <b>Project:</b> Marcellus Corridor, 111 <b>Site:</b> Marcellus Corridor, 111000 <b>Well:</b> Well #111-200 <b>Wellbore:</b> Marcellus <b>Design:</b> 111000 540 Well Survey	<b>Local Co-ordinate Reference:</b> 111000 540 Well Survey <b>TVD Reference:</b> 111000 540 Well Survey <b>MD Reference:</b> 111000 540 Well Survey <b>North Reference:</b> 111000 540 Well Survey <b>Survey Calculation Method:</b> Minimum Curvature	<b>Survey:</b> 111000 540 Well Survey
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Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,590.0	89.80	162.20	6,545.3	5,370.3	-2,257.1	-758.3	2,127.3	1.28	-0.83	-1.11
8,653.0	91.10	162.70	6,544.8	5,369.8	-2,317.2	-739.3	2,189.4	2.21	2.06	0.79
8,716.0	91.20	162.00	6,543.5	5,368.5	-2,377.2	-720.2	2,251.5	1.12	0.16	-1.11
8,779.0	88.70	160.70	6,543.6	5,368.6	-2,436.9	-700.0	2,313.5	4.47	-3.97	-2.08
8,842.0	91.30	163.00	6,543.8	5,368.6	-2,496.7	-680.4	2,375.5	5.51	4.13	3.65
8,905.0	92.40	162.60	6,541.5	5,366.5	-2,556.9	-661.8	2,437.7	1.86	1.75	-0.63
8,967.0	90.50	162.90	6,540.0	5,365.0	-2,616.1	-643.4	2,498.9	3.10	-3.06	0.48
9,031.0	89.10	163.80	6,540.2	5,365.2	-2,677.4	-625.0	2,562.2	2.45	-2.19	1.09
9,093.0	89.40	163.40	6,541.0	5,366.0	-2,736.8	-607.4	2,623.5	0.58	0.48	-0.32
9,157.0	90.90	164.30	6,540.8	5,365.8	-2,798.3	-589.6	2,686.9	2.73	2.34	1.41
9,220.0	90.10	161.30	6,540.3	5,365.3	-2,858.5	-570.9	2,749.1	4.93	-1.27	-4.76
9,283.0	87.90	159.40	6,541.4	5,366.4	-2,917.8	-549.8	2,810.8	4.61	-3.49	-3.02
9,346.0	88.00	159.80	6,543.6	5,368.6	-2,976.8	-527.8	2,872.3	0.65	0.16	0.63
9,409.0	88.00	159.30	6,545.8	5,370.8	-3,035.8	-505.8	2,933.8	0.79	0.00	-0.79
9,472.0	88.40	159.30	6,547.8	5,372.8	-3,094.7	-483.6	2,995.3	0.63	0.63	0.00
9,534.0	89.30	159.20	6,549.1	5,374.1	-3,152.6	-461.6	3,055.7	1.46	1.45	-0.16
9,597.0	90.70	159.60	6,549.1	5,374.1	-3,211.6	-439.4	3,117.3	2.31	2.22	0.63
9,660.0	93.90	158.60	6,546.5	5,371.5	-3,270.4	-417.0	3,178.6	5.32	5.08	-1.59
9,723.0	94.50	157.80	6,541.9	5,366.9	-3,328.8	-393.7	3,239.7	1.58	0.95	-1.27
9,786.0	93.80	159.50	6,537.4	5,362.4	-3,387.3	-370.8	3,300.9	2.91	-1.11	2.70
9,849.0	92.20	160.80	6,534.1	5,359.1	-3,446.4	-349.4	3,362.5	3.27	-2.54	2.06
9,912.0	91.30	163.20	6,532.1	5,357.1	-3,506.3	-330.0	3,424.5	4.07	-1.43	3.81
9,975.0	90.50	163.60	6,531.2	5,356.2	-3,566.7	-312.0	3,486.8	1.42	-1.27	0.63
10,038.0	87.90	163.10	6,532.0	5,357.0	-3,627.0	-293.9	3,549.1	4.20	-4.13	-0.79
10,101.0	88.80	163.70	6,533.8	5,358.8	-3,687.4	-275.9	3,611.4	1.72	1.43	0.95
10,164.0	91.30	163.40	6,533.8	5,358.8	-3,747.8	-258.1	3,673.7	4.00	3.97	-0.48
10,227.0	91.10	163.00	6,532.5	5,357.5	-3,808.1	-239.9	3,736.0	0.71	-0.32	-0.63
10,290.0	90.30	164.30	6,531.7	5,356.7	-3,868.6	-222.2	3,798.3	2.42	-1.27	2.06
10,353.0	90.80	164.00	6,531.1	5,356.1	-3,929.2	-204.9	3,860.7	0.93	0.79	-0.48
10,416.0	90.40	164.40	6,530.4	5,355.4	-3,989.8	-187.8	3,923.2	0.90	-0.63	0.63
10,479.0	89.70	165.10	6,530.4	5,355.4	-4,050.6	-171.2	3,985.7	1.57	-1.11	1.11
10,542.0	90.20	165.90	6,530.4	5,355.4	-4,111.5	-155.4	4,048.3	1.50	0.79	1.27
10,605.0	90.40	164.80	6,530.1	5,355.1	-4,172.5	-139.5	4,110.9	1.77	0.32	-1.75
10,668.0	90.90	164.30	6,529.4	5,354.4	-4,233.2	-122.7	4,173.4	1.12	0.79	-0.79
10,731.0	91.70	164.20	6,528.0	5,353.0	-4,293.8	-105.6	4,235.8	1.28	1.27	-0.16
10,795.0	91.00	163.50	6,526.5	5,351.5	-4,355.3	-87.8	4,299.1	1.55	-1.09	-1.09
10,858.0	89.80	163.30	6,526.0	5,351.0	-4,415.7	-69.8	4,361.5	1.93	-1.90	-0.32
10,920.0	90.50	164.40	6,525.9	5,350.9	-4,475.2	-52.6	4,422.8	2.10	1.13	1.77
10,983.0	90.50	165.00	6,525.3	5,350.3	-4,536.0	-36.0	4,485.4	0.95	0.00	0.95
11,046.0	88.70	162.10	6,525.7	5,350.7	-4,596.4	-18.1	4,547.7	5.42	-2.86	-4.60
11,109.0	88.60	160.10	6,527.2	5,352.2	-4,656.0	2.3	4,609.5	3.18	-0.16	-3.17
11,172.0	88.90	160.00	6,528.6	5,353.6	-4,715.2	23.8	4,671.2	0.50	0.48	-0.16
11,235.0	89.40	159.70	6,529.5	5,354.5	-4,774.3	45.5	4,732.8	0.93	0.79	-0.48

Database:	COMPASS 5000.1 Build 73	Local Co-ordinate Reference:	North American Datum 83 (NAD 83)
Company:	EQT Production Services	TVD Reference:	True Vertical Depth
Project:	Winn-Dixie 101	MD Reference:	Measured Depth
Site:	Winn-Dixie 101	North Reference:	North
Well:	Winn-Dixie 101	Survey Calculation Method:	Minimum Curvature
Wellbore:	Winn-Dixie 101		
Design:	Winn-Dixie 101		

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,298.0	90.50	160.30	6,529.6	5,354.6	-4,833.5	67.0	4,794.5	1.99	1.75	0.95
11,361.0	91.80	161.30	6,528.3	5,353.3	-4,893.0	87.7	4,856.3	2.60	2.06	1.59
11,423.0	92.70	160.70	6,525.9	5,350.9	-4,951.6	107.9	4,917.1	1.74	1.45	-0.97
11,486.0	90.40	160.20	6,524.2	5,349.2	-5,010.9	129.0	4,978.8	3.74	-3.65	-0.79
11,549.0	90.70	160.60	6,523.8	5,348.6	-5,070.3	150.1	5,040.6	0.79	0.48	0.63
11,612.0	89.90	161.50	6,523.3	5,348.3	-5,129.8	170.5	5,102.4	1.91	-1.27	1.43
11,675.0	90.40	162.20	6,523.1	5,348.1	-5,189.7	190.2	5,164.5	1.37	0.79	1.11
11,738.0	91.00	162.80	6,522.3	5,347.3	-5,249.8	209.1	5,226.6	1.35	0.95	0.95
11,801.0	91.10	161.90	6,521.2	5,346.2	-5,309.8	228.2	5,288.8	1.44	0.16	-1.43
11,864.0	90.10	159.70	6,520.5	5,345.5	-5,369.3	248.9	5,350.6	3.84	-1.59	-3.49
11,927.0	88.00	159.90	6,521.8	5,346.6	-5,428.4	270.7	5,412.2	3.35	-3.33	0.32
11,990.0	88.40	160.00	6,523.5	5,348.5	-5,487.6	292.3	5,473.8	0.65	0.63	0.16
12,052.0	89.10	160.20	6,524.9	5,349.9	-5,545.8	313.4	5,534.5	1.17	1.13	0.32
12,115.0	90.30	159.10	6,525.2	5,350.2	-5,604.9	335.3	5,596.0	2.58	1.90	-1.75
12,178.0	91.30	159.40	6,524.3	5,349.3	-5,663.8	357.6	5,657.5	1.66	1.59	0.48
12,242.0	92.40	161.00	6,522.3	5,347.3	-5,724.0	379.3	5,720.1	3.03	1.72	2.50
12,304.0	92.00	160.40	6,519.9	5,344.9	-5,782.5	399.7	5,780.9	1.16	-0.65	-0.97
12,367.0	91.40	160.70	6,518.0	5,343.0	-5,841.9	420.7	5,842.7	1.06	-0.95	0.48
12,430.0	91.60	160.80	6,516.4	5,341.4	-5,901.3	441.5	5,904.5	0.35	0.32	0.16
12,492.0	90.10	162.00	6,515.5	5,340.5	-5,960.1	461.2	5,965.4	3.10	-2.42	1.94
12,555.0	89.90	162.20	6,515.5	5,340.5	-6,020.0	480.6	6,027.5	0.45	-0.32	0.32
12,618.0	89.00	162.80	6,516.1	5,341.1	-6,080.1	499.5	6,089.7	1.72	-1.43	0.95
12,681.0	89.10	163.10	6,517.1	5,342.1	-6,140.3	518.0	6,151.9	0.50	0.16	0.48
12,744.0	89.80	162.90	6,517.7	5,342.7	-6,200.6	536.4	6,214.1	1.16	1.11	-0.32
12,807.0	90.40	163.10	6,517.6	5,342.6	-6,260.8	554.9	6,276.4	1.00	0.95	0.32
12,870.0	89.70	164.90	6,517.5	5,342.5	-6,321.4	572.2	6,338.8	3.07	-1.11	2.86
12,933.0	90.10	164.90	6,517.6	5,342.6	-6,382.2	588.6	6,401.3	0.63	0.63	0.00
12,996.0	90.00	165.50	6,517.6	5,342.6	-6,443.1	604.7	6,463.9	0.97	-0.16	0.95
13,059.0	87.90	164.70	6,518.7	5,343.7	-6,504.0	620.9	6,526.4	3.57	-3.33	-1.27
13,122.0	89.80	167.20	6,520.0	5,345.0	-6,565.1	636.2	6,589.1	4.98	3.02	3.97
13,185.0	91.10	169.40	6,519.5	5,344.5	-6,626.7	649.0	6,651.9	4.06	2.06	3.49
13,248.0	89.90	165.70	6,519.0	5,344.0	-6,688.2	662.6	6,714.7	6.17	-1.90	-5.87
13,311.0	88.50	163.00	6,519.8	5,344.8	-6,748.9	679.5	6,777.2	4.83	-2.22	-4.29
13,374.0	89.90	163.80	6,520.7	5,345.7	-6,809.3	697.5	6,839.5	2.56	2.22	1.27
13,438.0	90.30	164.20	6,520.6	5,345.6	-6,870.8	715.2	6,902.9	0.88	0.63	0.63
13,501.0	89.60	163.10	6,520.7	5,345.7	-6,931.2	732.9	6,965.2	2.07	-1.11	-1.75
13,564.0	89.90	162.20	6,520.9	5,345.9	-6,991.4	751.7	7,027.4	1.51	0.48	-1.43
13,628.0	90.40	159.90	6,520.8	5,345.8	-7,050.0	771.8	7,088.3	3.80	0.81	-3.71
13,690.0	88.50	156.80	6,521.4	5,346.4	-7,109.5	795.4	7,150.5	5.68	-2.97	-4.84
13,754.0	89.40	156.90	6,522.6	5,347.6	-7,168.3	820.6	7,212.3	1.41	1.41	0.16
13,817.0	89.10	155.50	6,523.4	5,348.4	-7,225.9	846.0	7,273.0	2.27	-0.48	-2.22
13,880.0	90.60	157.10	6,523.6	5,348.6	-7,283.6	871.3	7,333.7	3.48	2.38	2.54



**Phoenix Technology Services**  
Survey Report



Where energy meets innovation.

Database:	111700 As-Is Survey	Local Co-ordinate Reference:	111700 As-Is Survey
Company:	EQT Production - Arkansas	TVD Reference:	111700 As-Is Survey
Project:	111700 As-Is Survey	MD Reference:	111700 As-Is Survey
Site:	111700 As-Is Survey	North Reference:	111700 As-Is Survey
Well:	111700 As-Is Survey	Survey Calculation Method:	111700 As-Is Survey
Wellbore:	111700 As-Is Survey		
Design:	111700 As-Is Survey		

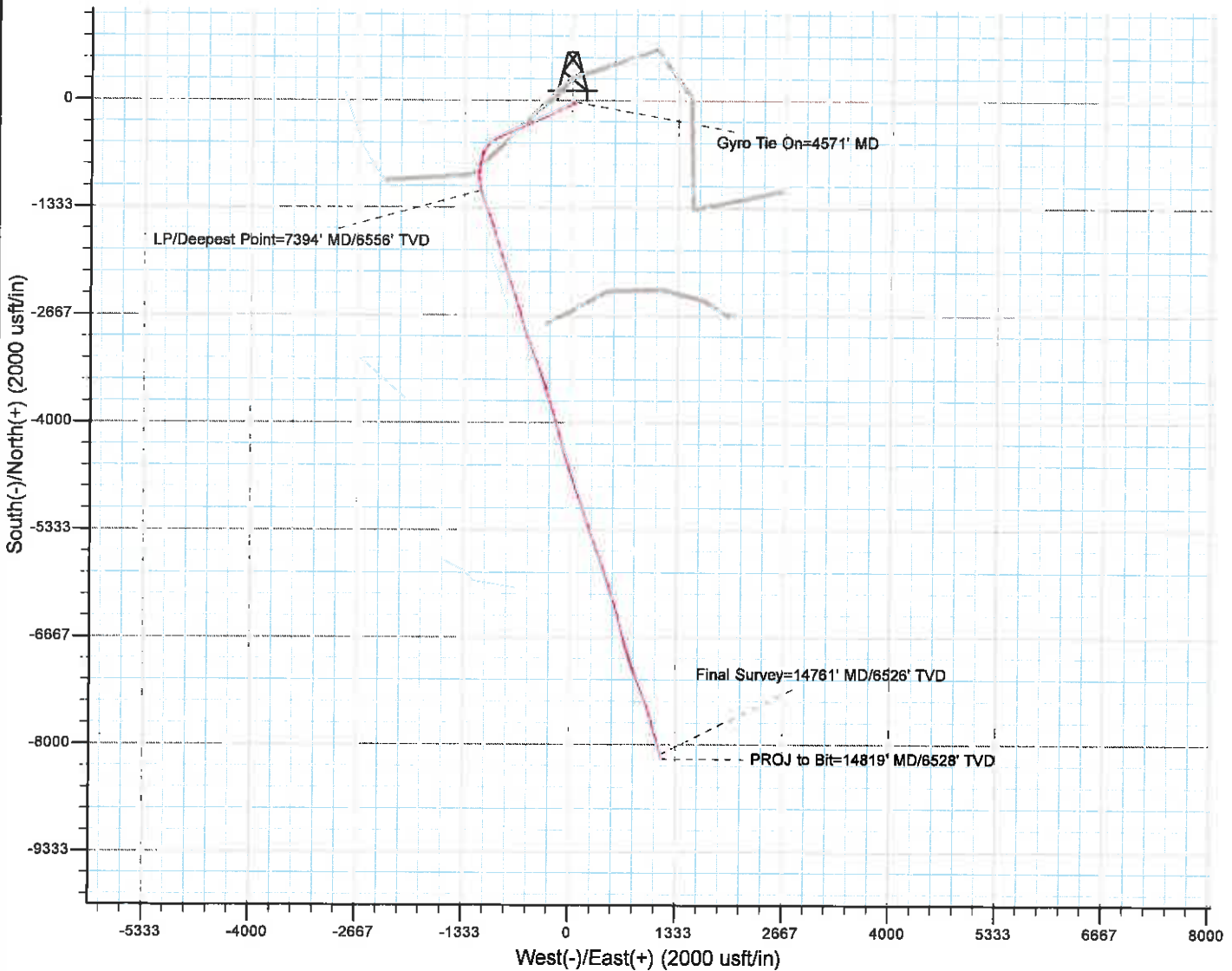
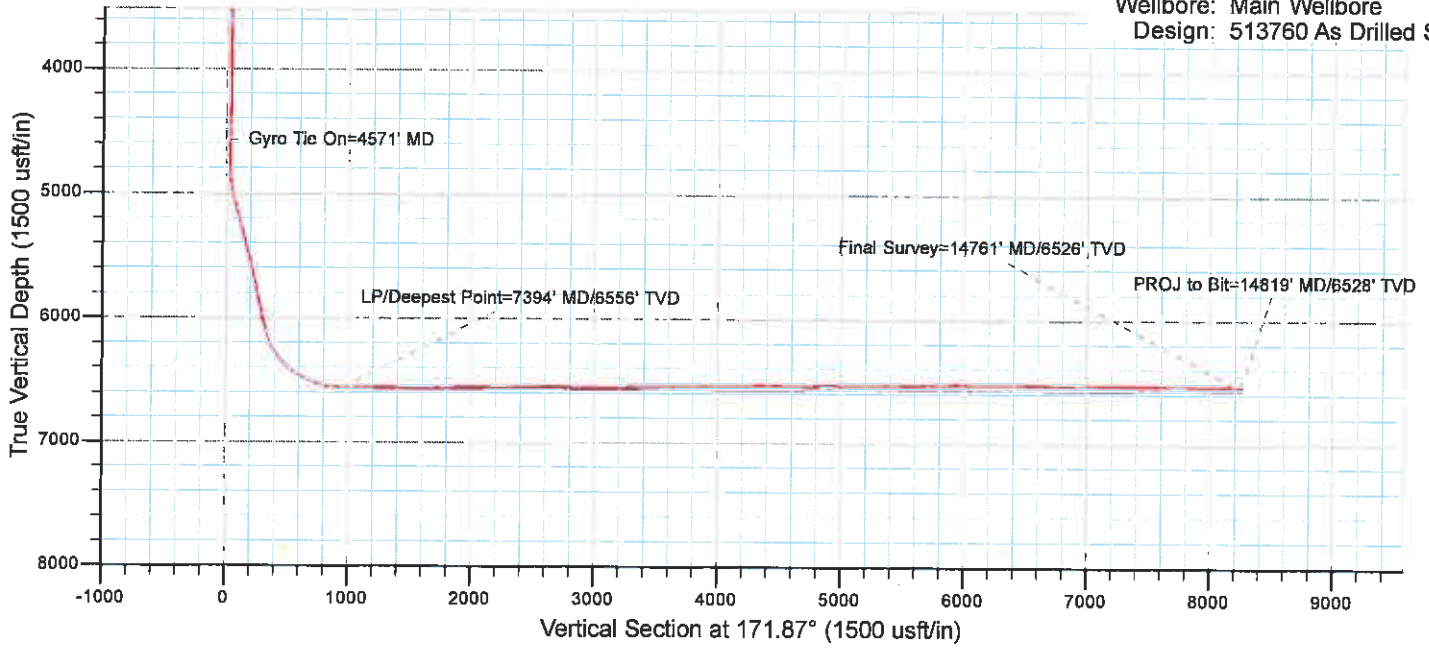
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,943.0	91.30	158.70	6,522.5	5,347.5	-7,342.0	895.0	7,394.8	2.77	1.11	2.54
14,006.0	90.80	160.00	6,521.4	5,346.4	-7,400.9	917.3	7,456.3	2.21	-0.79	2.06
14,069.0	89.10	160.60	6,521.4	5,346.4	-7,460.2	938.5	7,518.0	2.86	-2.70	0.95
14,132.0	89.20	161.10	6,522.4	5,347.4	-7,519.8	959.2	7,579.8	0.81	0.16	0.79
14,194.0	89.30	163.00	6,523.2	5,348.2	-7,578.7	978.3	7,640.9	3.07	0.16	3.06
14,257.0	89.60	163.00	6,523.8	5,348.8	-7,639.0	996.7	7,703.2	0.48	0.48	0.00
14,320.0	90.20	163.40	6,523.9	5,348.9	-7,699.3	1,014.9	7,765.4	1.14	0.95	0.63
14,383.0	90.50	163.30	6,523.5	5,348.5	-7,759.6	1,032.9	7,827.7	0.50	0.48	-0.16
14,446.0	90.80	163.20	6,522.8	5,347.8	-7,820.0	1,051.1	7,890.0	0.50	0.48	-0.16
14,509.0	90.90	163.30	6,521.8	5,346.8	-7,880.3	1,069.2	7,952.3	0.22	0.16	0.16
14,572.0	88.90	163.80	6,522.0	5,347.0	-7,940.7	1,087.1	8,014.6	3.27	-3.17	0.79
14,635.0	89.40	163.70	6,522.9	5,347.9	-8,001.2	1,104.7	8,077.0	0.81	0.79	-0.16
14,698.0	88.40	164.30	6,524.1	5,349.1	-8,061.7	1,122.1	8,139.4	1.85	-1.59	0.95
14,761.0	87.90	164.40	6,526.1	5,351.1	-8,122.4	1,139.1	8,201.8	0.81	-0.79	0.16
14,819.0	87.90	164.40	6,528.3	5,353.3	-8,178.2	1,154.6	8,259.3	0.00	0.00	0.00

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,571.3	4,570.7	-18.7	45.6	Gyro Tie On=4571' MD
7,394.0	6,555.6	-1,122.1	-1,133.5	LP/Deepest Point=7394' MD/6556' TVD
14,761.0	6,526.1	-8,122.4	1,139.1	Final Survey=14761' MD/6526' TVD
14,819.0	6,528.3	-8,178.2	1,154.6	PROJ to Bit=14819' MD/6528' TVD

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



Project: Ritchie County, WV  
Site: Ritchie County 513760  
Well: Well #513760  
Wellbore: Main Wellbore  
Design: 513760 As Drilled Surveys





51760 - 47 025-10126-0000 - Performance

Stage Number	Installation Date	Dist (m) Depth (ft)	Duration of Haul (min)	Number of Buys	Remarks
1	8/27/2015	11.207	11.207	25	MACTEALUS
2	8/27/2015	11.207	11.207	30	MACTEALUS
3	8/27/2015	11.207	11.207	30	MACTEALUS
4	8/27/2015	11.207	11.207	30	MACTEALUS
5	8/27/2015	11.207	11.207	30	MACTEALUS
6	8/27/2015	11.207	11.207	30	MACTEALUS
7	8/27/2015	11.207	11.207	30	MACTEALUS
8	8/27/2015	11.207	11.207	30	MACTEALUS
9	8/27/2015	11.207	11.207	30	MACTEALUS
10	8/27/2015	11.207	11.207	30	MACTEALUS
11	8/27/2015	11.207	11.207	30	MACTEALUS
12	8/27/2015	11.207	11.207	30	MACTEALUS
13	8/27/2015	11.207	11.207	30	MACTEALUS
14	8/27/2015	11.207	11.207	30	MACTEALUS
15	8/27/2015	11.207	11.207	30	MACTEALUS
16	8/27/2015	11.207	11.207	30	MACTEALUS
17	8/27/2015	11.207	11.207	30	MACTEALUS
18	8/27/2015	11.207	11.207	30	MACTEALUS
19	8/27/2015	11.207	11.207	30	MACTEALUS
20	8/27/2015	11.207	11.207	30	MACTEALUS
21	8/27/2015	11.207	11.207	30	MACTEALUS
22	8/27/2015	11.207	11.207	30	MACTEALUS
23	8/27/2015	11.207	11.207	30	MACTEALUS
24	8/27/2015	11.207	11.207	30	MACTEALUS
25	8/27/2015	11.207	11.207	30	MACTEALUS
26	8/27/2015	11.207	11.207	30	MACTEALUS
27	8/27/2015	11.207	11.207	30	MACTEALUS
28	8/27/2015	11.207	11.207	30	MACTEALUS
29	8/27/2015	11.207	11.207	30	MACTEALUS
30	8/27/2015	11.207	11.207	30	MACTEALUS
31	8/27/2015	11.207	11.207	30	MACTEALUS
32	8/27/2015	11.207	11.207	30	MACTEALUS
33	8/27/2015	11.207	11.207	30	MACTEALUS
34	8/27/2015	11.207	11.207	30	MACTEALUS
35	8/27/2015	11.207	11.207	30	MACTEALUS
36	8/27/2015	11.207	11.207	30	MACTEALUS
37	8/27/2015	11.207	11.207	30	MACTEALUS
38	8/27/2015	11.207	11.207	30	MACTEALUS
39	8/27/2015	11.207	11.207	30	MACTEALUS
40	8/27/2015	11.207	11.207	30	MACTEALUS
41	8/27/2015	11.207	11.207	30	MACTEALUS
42	8/27/2015	11.207	11.207	30	MACTEALUS
43	8/27/2015	11.207	11.207	30	MACTEALUS
44	8/27/2015	11.207	11.207	30	MACTEALUS
45	8/27/2015	11.207	11.207	30	MACTEALUS
46	8/27/2015	11.207	11.207	30	MACTEALUS
47	8/27/2015	11.207	11.207	30	MACTEALUS
48	8/27/2015	11.207	11.207	30	MACTEALUS
49	8/27/2015	11.207	11.207	30	MACTEALUS
50	8/27/2015	11.207	11.207	30	MACTEALUS



# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date	9/22/2015
Job End Date	10/16/2015
State	West Virginia
County	Ritchie
API Number	47-085-10136-00-00
Operator Name	EQT Production
Well Name and Number	513760
Longitude	-80.84288900
Latitude	39 13590300
Datum	NAD83
Federal/Tribal Well	NO
True Vertical Depth	6,528
Total Base Water Volume (gal)	12,965,610
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	89.25238	None
Sand (Proppant)	Keane Group	Proppant	Silica Substrate	14808-60-7	100.00000	10.35698	None
MC MX 437-5	Multi-Chem	Calcium nitrate solution	Calcium nitrate	10124-37-5	60.00000	0.05744	None
Hydrochloric Acid (15%)	Keane Group	Acidizing	Hydrochloric Acid	7647-01-0	15.00000	0.03070	None
FR760	Keane Group	Friction Reducer	Hydrotreated Light Distillate	84742-47-8	30.00000	0.0194	None
FR760	Keane Group	Friction Reducer	Alkyl Alcohol	Proprietary	10.00000	0.00647	None
FR760	Keane Group	Scale Inhibitor	Oxyalkylated alcohol A	Proprietary	5.00000	0.00323	None
FR760	Keane Group	Scale Inhibitor	Ethylene Glycol	107-21-1	5.00000	0.00125	None
FR760	Keane Group	Corrosion Inhibitor	Sodium Phosphate, Tribasic	7601-54-9	5.00000	0.00125	None
FR760	Keane Group	Corrosion Inhibitor	Ethylene Glycol	107-21-1	40.00000	0.00020	None
FR760	Keane Group	Corrosion Inhibitor	Dimethylformamide	68-12-2	20.00000	0.00010	None





June 8, 2016

Mr. Gene Smith  
West Virginia Department of Environmental Protection  
Office of Oil and Gas  
601 57th Street SE  
Charleston, WV 25304

Re: Modification of 47-085-10136

Dear Mr. Smith,

Please accept the attached updates for the above referenced permit. Upon inspection of our as-drilled plat, we noted the curve geometry crossed into an additional tract, for which EQT had acquired a subsurface agreement. Enclosed is an updated WW-6A1, WW-6B, mylar plat and rec plan reflecting corrections to update the permit file to be consistent with the as-drilled well bore.

If you have any questions, please do not hesitate to contact me at (304) 848-0076.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Vicki Roark'.

Vicki Roark  
Permitting Supervisor-WV

RECEIVED  
Office of Oil and Gas

AUG 25 2016

WV Department of  
Environmental Protection

Enc.

ROYALTY OWNERS		
B.M. PIERCE ET UX	84.80 AC±	LEASE NO. 118210
CRAIG H. WILLIAMS	249.83 AC±	LEASE NO. 987447
J.P. SMITH ET UX	130 AC±	LEASE NO. 107867
DONALD SHEETS ET AL	82.10 AC±	LEASE NO. 988339

**NOTES ON SURVEY**

1. NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.
2. AS DRILLED INFORMATION PROVIDED BY EQT.
3. NONPRODUCTIVE SUBSURFACE RIGHT OF WAY

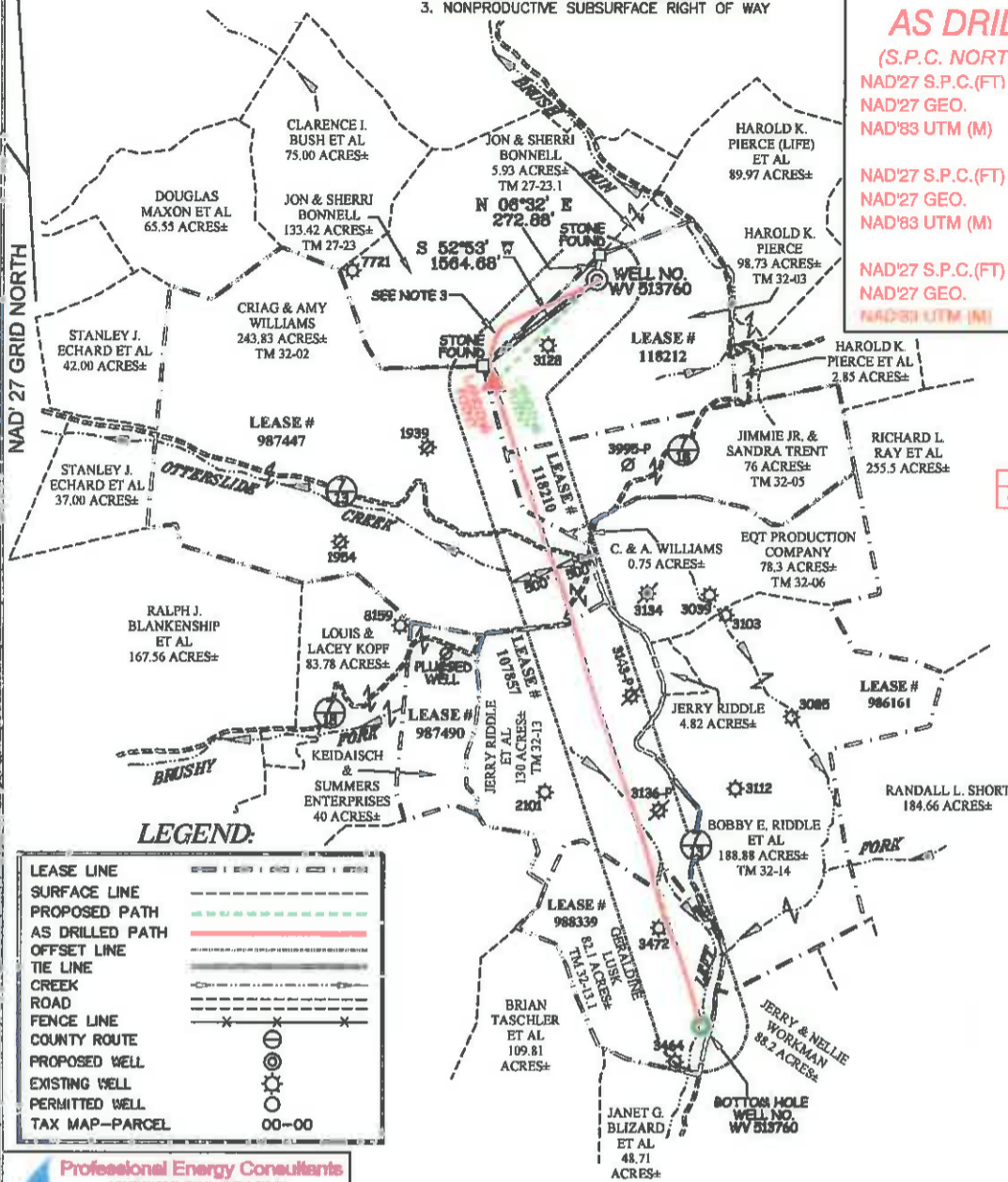
**EQT PRODUCTION COMPANY**  
**J.E. PIERCE ET AL LEASE**  
**108 (98.73±) ACRES±**  
**WELL NO. WV 513760**  
**(OXF163 H5)**

**AS DRILLED COORDINATES**

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)

NAD'27 S.P.C.(FT)	N. 234,456.0	E. 1,619,086.0
NAD'27 GEO.	LAT-(N) 39.135903	LONG-(W) 80.842890
NAD'83 UTM (M)	N. 4,331,879.3	E. 513,593.3
<b>LANDING POINT</b>		
NAD'27 S.P.C.(FT)	N. 233,333.9	E. 1,617,952.5
NAD'27 GEO.	LAT-(N) 39.132776	LONG-(W) 80.846826
NAD'83 UTM (M)	N. 4,331,531.7	E. 513,253.7
<b>BOTTOM HOLE</b>		
NAD'27 S.P.C.(FT)	N. 226,278.0	E. 1,620,240.6
NAD'27 GEO.	LAT-(N) 39.113499	LONG-(W) 80.838390
NAD'83 UTM (M)	N. 4,329,393.8	E. 513,986.7

SUBSURFACE AGREEMENT  
 JOHN M. & SHERRI L. BONNELL 133.42 AC± TM 27-23



**LEGEND:**

LEASE LINE	---
SURFACE LINE	---
PROPOSED PATH	---
AS DRILLED PATH	---
OFFSET LINE	---
TIE LINE	---
CREEK	---
ROAD	---
FENCE LINE	---
COUNTY ROUTE	---
PROPOSED WELL	⊙
EXISTING WELL	⊙
PERMITTED WELL	⊙
TAX MAP-PARCEL	00-00



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 DIVISION OF ENVIRONMENTAL PROTECTION.

P.S. 2288 *Earl N. Thompson*



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.  
 DATE JUNE 3, 20 14  
 REVISED 08/22/14, 10/27/14, 10/31/14, 02/04/15, 05/19/15, 12/03/15, 05/16/16 & 06/03/16  
 OPERATORS WELL NO. WV 513760  
 API WELL NO. 47 - 085 - 10136H  
 STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 7698AD513760R2  
 HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2000'

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

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

LOCATION: PAD ELEVATION 1,158.4' WATERSHED BRUSH RUN OF MIDDLE FORK  
 DISTRICT UNION COUNTY RITCHIE QUADRANGLE OXFORD 7.5'

SURFACE OWNER HAROLD K. PIERCE ACREAGE 98.73±  
 ROYALTY OWNER J.E. PIERCE ET AL ACREAGE 108± (98.73±)  
 PROPOSED WORK: LEASE NO. 118212  
 DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  PERFORATE NEW FORMATION  PLUG AND ABANDON  CLEAN OUT AND REPLUG  OTHER   
 PHYSICAL CHANGE IN WELL (SPECIFY) \_\_\_\_\_ TARGET FORMATION MARCELLUS  
 ESTIMATED DEPTH 6495'

WELL OPERATOR EQT PRODUCTION COMPANY DESIGNATED AGENT REX C. RAY  
 ADDRESS 115 PROFESSIONAL PLACE P.O. BOX 280 BRIDGEPORT, WV 26330 ADDRESS 115 PROFESSIONAL PLACE P.O. BOX 280 BRIDGEPORT, WV 26330

LONGITUDE 80°50'50" PERMIT