

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



API 47 - 085 - 10135 County RITCHIE District UNION
Quad OXFORD 7.5' Pad Name OXF163 Field/Pool Name _____
Farm name HAROLD K. PIERCE Well Number 513759
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 4,331,882.6 Easting 513,596.5
Landing Point of Curve Northing 4,331,220.3 Easting 512,854.3
Bottom Hole Northing 4,330,056.1 Easting 513,254.1

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, ferrocchrome lignosulfonate, calcium carbonate, fibrous cellulose

Date permit issued 9/22/2014 Date drilling commenced 01/9/2015 Date drilling ceased 6/2/2015
Date completion activities began 10/5/2015 Date completion activities ceased 10/14/2015
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 176',453',517' Open mine(s) (Y/N) depths _____
Salt water depth(s) ft 1156' Void(s) encountered (Y/N) depths _____
Coal depth(s) ft _____ Cavern(s) encountered (Y/N) depths _____
Is coal being mined in area (Y/N) N

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Reviewed by:

APPROVED

NAME: Michael Gaff
DATE: 6/13/16

AX RIB 2016
12/01/16

API 47-085 - 10135 Farm name HAROLD K. PIERCE Well number 513759

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	469'	Y
Coal							
Intermediate 1	12.375"	9.625"	3037'	NEW	A-500 40LB/FT	1810'	Y
Intermediate 2							
Intermediate 3							
Production	8.5"	5.5"	14,684'	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 ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	CLASS A	38	15.6	1.18	44.84	0	8
Surface	CLASS A	803	15.6	1.18	948.9	0	8
Coal							
Intermediate 1	CLASS A	1031	15.6	1.18	1218.5	0	8
Intermediate 2							
Intermediate 3							
Production	Class H / Class H	995 / 785	14.2 / 15.2	1.26 / 1.97	2800.15	2,550' MD	72
Tubing							

Drillers TD (ft) 14,700' 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) 4,969' 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, 23 _____

INTERMEDIATE- RAN AT LEAST EVERY 500' FEET _____

PRODUCTION- 242 Composite Centralizers. One on every joint from TD to 4,300 MD _____

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 _____

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API 47-085 - 10135

Farm name HAROLD K. PIERCE

Well number 513759

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
					Please See Attached

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
						Please	See	Attached

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Please insert additional pages as applicable.

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<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
<u>MARCELLUS</u>	<u>6,532</u>	<u>TVD</u>	<u>8,737</u> MD
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 1,900 psi Bottom Hole N/A psi DURATION OF TEST 86.00 hrs

OPEN FLOW Gas 11,097 mcfpd Oil N/A bpd NGL 423 bpd Water 788 bpd GAS MEASURED BY Estimated Orifice Pilot

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

Please insert additional pages as applicable.

Drilling Contractor KEANE & SONS DRILLING (RIG 2143)
Address 14235 OLD ROUTE 6 City MANSFIELD State PA Zip 16933

Logging Company Phoenix Technology Services
Address 1805 Brittmoore Road City HOUSTON State TX Zip 77043

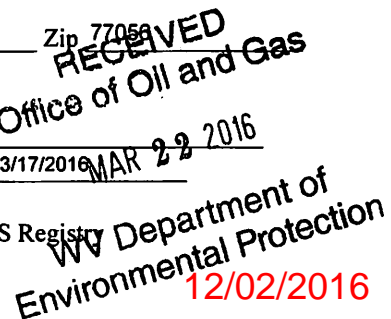
Cementing Company ALLIED CEMENTING SERVICES
Address 333 Technology Drive, Suite 290 City Canonsburg State PA Zip 15317

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

Please insert additional pages as applicable.

Completed by Jim Helmick Telephone 412-395-5518
Signature [Signature] Title VP Completions Date 3/17/2016

Submital of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Register



API 47- 085 - 10135 Farm name HAROLD K. PIERCE Well number 513759

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 - 10135

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	520	520	1,774	1,774
MAXTON	1,774	1,774	1,955	1,955
BIG LIME	1,955	1,955	2,244	2,243
WEIR	2,244	2,243	2,472	2,471
GANTZ	2,472	2,471	2,567	2,566
50F	2,567	2,566	2,653	2,652
30F	2,653	2,652	2,715	2,714
GORDON	2,715	2,714	2,803	2,802
4TH	2,803	2,802	2,959	2,958
BAYARD	2,959	2,958	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	5,096
ALEXANDER	5,100	5,096	7,765	6,222
SONYEA	7,765	6,222	8,134	6,351
MIDDLESEX	8,134	6,351	8,290	6,408
GENESSEE	8,290	6,408	8,475	6,468
GENESE0	8,475	6,468	8,631	6,509
TULLY	8,631	6,509	8,692	6,522
HAMILTON	8,692	6,522	8,737	6,532
MARCELLUS	8,737	6,532	14,700	6,567

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EQT Production - Marcellus

Ritchie County, WV
Ritchie County 513759
Well #513759

Main Wellbore

Design: 513759 As Drilled

Standard Survey Report

01 June, 2015



12/02/2016



PHX
Survey Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Site Ritchie County 513759
Company:	EQT Production - Marcellus	TVD Reference:	KB@18 @ 1175 Duff
Project:	Ritchie County WV	MD Reference:	KB@18 @ 1175 Duff
Site:	Ritchie County 513759	North Reference:	Grid
Well:	Well #513759	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	513759 As Drilled		

Project Ritchie 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		Using geodetic scale factor

Site Ritchie County 513759

Site Position:		Northing:	234,466.60 usft	Latitude:	39.14
From:	Map	Easting:	1,619,096.50 usft	Longitude:	-80.84
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.86 °

Well Well #513759

Well Position	+N/-S	0.0 usft	Northing:	234,466.60 usft	Latitude:	39° 8' 9.356 N
	+E/-W	0.0 usft	Easting:	1,619,096.50 usft	Longitude:	80° 50' 34.271 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	1,159.0 usft

Wellbore Main Wellbore

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	4/21/2015	-7.70	66.58	52,082

Design 513759 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	191.57

Survey Program Date 6/1/2015

From (')	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	4,833.0	Gyrodata Gyro (Main Wellbore)	GYD_DP_MS	Gyrodata gyro-compassing and drop
0.00	14,700.0	513759 PHX MWD (Main Wellbore)	PHX+MWD+HDGM	PHX+OWSG MWD + HDGM

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)
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	0.42	138.13	103.0	-1,072.0	-0.3	0.3	0.2	0.41	0.41	0.00
203.0	0.35	130.21	203.0	-972.0	-0.8	0.7	0.6	0.09	-0.07	-7.92
303.0	0.33	122.23	303.0	-872.0	-1.1	1.2	0.8	0.05	-0.02	-7.98
403.0	0.25	142.64	403.0	-772.0	-1.4	1.6	1.1	0.13	-0.08	20.41
503.0	0.25	155.87	503.0	-672.0	-1.8	1.8	1.4	0.06	0.00	13.23
603.0	0.16	163.87	603.0	-572.0	-2.1	1.9	1.7	0.09	-0.09	8.00
703.0	0.10	163.18	703.0	-472.0	-2.4	2.0	1.9	0.06	-0.06	-0.69



PHX
Survey Report



Database:	EDM 8000 1 Single User (N)	Local Co-ordinate Reference:	Site Ritchie County 513759
Company:	EQT Production - Marshall	TVD Reference:	1,301.6 @ 1115 Dues
Project:	Ritchie County (MA)	MD Reference:	1,801.6 @ 1123 Dues
Site:	Ritchie County 513759	North Reference:	Line
Well:	Well #513759	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	513759 As Drilled		

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	0.13	171.80	803.0	-372.0	-2.5	2.0	2.1	0.03	0.03	8.62
903.0	0.20	106.58	903.0	-272.0	-2.7	2.2	2.2	0.19	0.07	-65.22
1,003.0	0.27	87.39	1,003.0	-172.0	-2.7	2.6	2.2	0.10	0.07	-19.19
1,103.0	0.38	96.13	1,103.0	-72.0	-2.8	3.2	2.1	0.12	0.11	8.74
1,203.0	0.50	101.66	1,203.0	28.0	-2.9	3.9	2.0	0.13	0.12	5.53
1,303.0	0.66	99.77	1,303.0	128.0	-3.1	4.9	2.0	0.16	0.16	-1.89
1,403.0	1.01	100.06	1,403.0	228.0	-3.3	6.4	2.0	0.35	0.35	0.29
1,503.0	1.21	98.07	1,503.0	328.0	-3.6	8.3	1.9	0.20	0.20	-1.99
1,603.0	1.79	100.63	1,602.9	427.9	-4.1	10.9	1.8	0.58	0.58	2.56
1,703.0	2.24	103.95	1,702.9	527.9	-4.8	14.3	1.9	0.46	0.45	3.32
1,803.0	2.27	104.27	1,802.8	627.8	-5.8	18.1	2.0	0.03	0.03	0.32
1,903.0	2.34	106.05	1,902.7	727.7	-6.8	22.0	2.3	0.10	0.07	1.78
2,003.0	2.36	108.61	2,002.6	827.6	-8.1	25.9	2.7	0.11	0.02	2.56
2,103.0	2.32	111.93	2,102.5	927.5	-9.5	29.7	3.3	0.14	-0.04	3.32
2,203.0	2.28	112.50	2,202.4	1,027.4	-11.0	33.5	4.1	0.05	-0.04	0.57
2,303.0	2.29	115.51	2,302.4	1,127.4	-12.6	37.1	4.9	0.12	0.01	3.01
2,403.0	2.20	117.36	2,402.3	1,227.3	-14.4	40.6	5.9	0.12	-0.09	1.85
2,503.0	2.17	118.40	2,502.2	1,327.2	-16.1	44.0	7.0	0.05	-0.03	1.04
2,603.0	2.10	119.20	2,602.1	1,427.1	-17.9	47.2	8.1	0.08	-0.07	0.80
2,703.0	2.01	119.26	2,702.1	1,527.1	-19.7	50.4	9.2	0.09	-0.09	0.06
2,803.0	1.72	121.05	2,802.0	1,627.0	-21.3	53.2	10.2	0.30	-0.29	1.79
2,903.0	1.70	121.89	2,902.0	1,727.0	-22.9	55.7	11.2	0.03	-0.02	0.84
3,003.0	1.42	117.26	3,002.0	1,827.0	-24.2	58.1	12.1	0.31	-0.28	-4.63
3,103.0	1.36	116.41	3,101.9	1,926.9	-25.3	60.3	12.7	0.06	-0.06	-0.85
3,203.0	1.09	121.19	3,201.9	2,026.9	-26.3	62.1	13.3	0.29	-0.27	4.78
3,303.0	0.85	124.13	3,301.9	2,126.9	-27.3	63.6	13.9	0.25	-0.24	2.94
3,403.0	0.48	137.75	3,401.9	2,226.9	-28.0	64.5	14.5	0.40	-0.37	13.62
3,503.0	0.35	139.96	3,501.9	2,326.9	-28.5	64.9	14.9	0.13	-0.13	2.21
3,603.0	0.27	141.89	3,601.9	2,426.9	-28.9	65.3	15.3	0.08	-0.08	1.93
3,703.0	0.14	154.26	3,701.9	2,526.9	-29.2	65.5	15.5	0.14	-0.13	12.37
3,803.0	0.07	184.43	3,801.9	2,626.9	-29.4	65.5	15.7	0.09	-0.07	30.17
3,903.0	0.20	310.96	3,901.9	2,726.9	-29.4	65.4	15.6	0.25	0.13	126.53
4,003.0	0.40	312.92	4,001.9	2,826.9	-29.0	65.0	15.4	0.20	0.20	1.96
4,103.0	0.63	315.98	4,101.9	2,926.9	-28.4	64.4	14.9	0.23	0.23	3.06
4,203.0	0.92	323.92	4,201.9	3,026.9	-27.3	63.5	14.0	0.31	0.29	7.94
4,303.0	1.01	329.40	4,301.8	3,126.8	-25.9	62.6	12.8	0.13	0.09	5.48
4,403.0	1.07	327.21	4,401.8	3,226.8	-24.4	61.6	11.5	0.07	0.06	2.19
4,503.0	1.36	327.39	4,501.8	3,326.8	-22.6	60.5	10.0	0.29	0.29	0.18
4,603.0	1.55	324.49	4,601.8	3,426.8	-20.5	59.1	8.2	0.20	0.19	-2.90
4,703.0	1.92	330.62	4,701.7	3,526.7	-17.9	57.5	6.0	0.41	0.37	6.72
4,803.0	2.37	330.79	4,801.7	3,626.7	-14.7	55.6	3.2	0.45	0.45	0.17
4,833.0	2.57	330.29	4,831.6	3,656.6	-13.5	55.0	2.2	0.67	0.67	-1.67

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COMPASS 5000.1 Build 73

12/02/2016



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Survey Report



Database:	EDM 5000.1 Knappa User DB	Local Co-ordinate Reference:	Site Ritchie County 511759
Company:	EQT Production - Marketing	TVD Reference:	KR2016 1175 Build
Project:	Ritchie County - WV	MD Reference:	KB2016 1175 Build
Site:	Ritchie County 511759	North Reference:	Q101
Well:	Well #519759	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	513759 As Drilled		

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)
4,874.0	2.30	330.30	4,872.6	3,697.6	-12.0	54.1	0.9	0.66	-0.66	0.02
4,937.0	1.90	328.60	4,935.5	3,760.5	-10.0	53.0	-0.8	0.64	-0.63	-2.70
KCR-1920 MD										
4,969.0	2.20	333.00	4,967.5	3,792.5	-9.0	52.4	-1.7	1.06	0.94	13.75
5,000.0	4.90	287.40	4,998.5	3,823.5	-8.1	50.9	-2.3	11.97	8.71	-147.10
5,032.0	9.90	286.10	5,030.2	3,855.2	-6.9	46.9	-2.6	15.63	15.63	-4.06
5,063.0	13.30	294.20	5,060.6	3,885.6	-4.7	41.1	-3.6	12.14	10.97	26.13
5,094.0	15.30	293.80	5,090.6	3,915.6	-1.6	34.1	-5.3	6.46	6.45	-1.29
5,125.0	18.90	285.60	5,120.2	3,945.2	1.4	25.5	-6.5	13.95	11.61	-26.45
5,156.0	21.70	278.40	5,149.3	3,974.3	3.6	15.0	-6.5	12.09	9.03	-23.23
5,188.0	24.80	274.30	5,178.7	4,003.7	4.9	2.5	-5.3	10.92	9.69	-12.81
5,219.0	27.40	274.50	5,206.5	4,031.5	6.0	-11.1	-3.6	8.39	8.39	0.65
5,251.0	30.00	274.90	5,234.6	4,059.6	7.2	-26.4	-1.8	8.15	8.13	1.25
5,283.0	32.10	272.80	5,262.0	4,087.0	8.3	-42.9	0.4	7.38	6.56	-6.56
5,314.0	34.50	270.90	5,287.9	4,112.9	8.9	-59.9	3.3	8.44	7.74	-6.13
5,346.0	36.90	270.90	5,313.9	4,138.9	9.2	-78.6	6.8	7.50	7.50	0.00
5,377.0	38.50	272.90	5,338.4	4,163.4	9.8	-97.5	10.0	6.50	5.16	6.45
5,409.0	40.10	273.20	5,363.2	4,188.2	10.9	-117.8	13.0	5.04	5.00	0.94
5,440.0	43.20	272.40	5,386.4	4,211.4	11.9	-138.3	16.1	10.15	10.00	-2.58
5,472.0	47.00	273.00	5,408.9	4,233.9	13.0	-161.0	19.6	11.95	11.88	1.88
5,503.0	50.50	273.80	5,429.4	4,254.4	14.3	-184.2	22.9	11.46	11.29	2.58
5,535.0	54.90	274.70	5,448.8	4,273.8	16.2	-209.6	26.1	13.93	13.75	2.81
5,566.0	59.30	274.90	5,465.6	4,290.6	18.4	-235.6	29.2	14.20	14.19	0.65
5,597.0	62.90	275.60	5,480.6	4,305.6	20.9	-262.6	32.2	11.78	11.61	2.26
5,629.0	65.80	274.60	5,494.4	4,319.4	23.5	-291.3	35.5	9.49	9.06	-3.13
5,692.0	69.90	273.40	5,518.2	4,343.2	27.5	-349.5	43.1	6.74	6.51	-1.90
5,755.0	70.30	273.30	5,539.6	4,364.6	31.0	-408.6	51.6	0.65	0.63	-0.16
5,818.0	70.60	273.10	5,560.7	4,385.7	34.3	-467.9	60.3	0.56	0.48	-0.32
5,881.0	70.90	273.20	5,581.5	4,406.5	37.6	-527.3	69.0	0.50	0.48	0.16
5,944.0	70.30	273.70	5,602.4	4,427.4	41.1	-586.6	77.4	1.21	-0.95	0.79
6,007.0	70.30	273.50	5,623.6	4,448.6	44.9	-645.8	85.6	0.30	0.00	-0.32
6,070.0	70.30	274.10	5,644.9	4,469.9	48.8	-705.0	93.6	0.90	0.00	0.95
6,132.0	70.20	274.30	5,665.8	4,490.8	53.1	-763.2	101.1	0.34	-0.16	0.32
6,196.0	69.50	273.30	5,687.9	4,512.9	57.1	-823.1	109.2	1.83	-1.09	-1.56
6,258.0	69.10	272.60	5,709.8	4,534.8	60.0	-881.1	117.9	1.24	-0.65	-1.13
6,321.0	69.40	272.70	5,732.1	4,557.1	62.8	-939.9	127.1	0.50	0.48	0.16
6,383.0	69.70	272.40	5,753.8	4,578.8	65.4	-997.9	136.2	0.66	0.48	-0.48
6,447.0	70.00	272.70	5,775.8	4,600.8	68.0	-1,058.0	145.6	0.64	0.47	0.47
6,510.0	70.40	272.40	5,797.2	4,622.2	70.7	-1,117.2	154.9	0.78	0.63	-0.48
6,573.0	70.80	272.50	5,818.1	4,643.1	73.2	-1,176.6	164.3	0.65	0.63	0.16
6,636.0	69.70	273.60	5,839.4	4,664.4	76.4	-1,235.8	173.1	2.40	-1.75	-0.79
6,699.0	69.90	273.70	5,861.1	4,686.1	80.1	-1,294.8	181.3	0.35	0.32	0.16
6,762.0	70.20	273.20	5,882.6	4,707.6	83.7	-1,353.9	189.6	0.89	0.48	0.29

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PHX
Survey Report



Database:	EDM 5000.1 Single Shot Log	Local Co-ordinate Reference:	Site Ritchie County 513759
Company:	EQT Production - Marcellus	TVD Reference:	55015 @ 1175 diam
Project:	Ritchie County WV	MD Reference:	HS@18 @ 1175 diam
Site:	Ritchie County 513759	North Reference:	Geo
Well:	Well #513759	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	513759 As Drilled		

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)
6,825.0	70.40	273.10	5,903.9	4,728.9	86.9	-1,413.1	198.3	0.35	0.32	-0.16
6,888.0	70.60	272.80	5,924.9	4,749.9	90.0	-1,472.4	207.2	0.55	0.32	-0.48
6,951.0	70.60	272.90	5,945.8	4,770.8	93.0	-1,531.8	216.2	0.15	0.00	0.16
7,014.0	69.80	272.30	5,967.2	4,792.2	95.6	-1,591.0	225.5	1.55	-1.27	-0.95
7,077.0	69.90	272.00	5,988.9	4,813.9	97.9	-1,650.1	235.2	0.47	0.16	-0.48
7,140.0	70.40	271.80	6,010.3	4,835.3	99.8	-1,709.3	245.1	0.85	0.79	-0.32
7,203.0	70.10	272.30	6,031.5	4,856.5	101.9	-1,768.6	254.9	0.89	-0.48	0.79
7,266.0	70.10	271.30	6,053.0	4,878.0	103.8	-1,827.8	265.0	1.49	0.00	-1.59
7,329.0	69.80	272.20	6,074.6	4,899.6	105.6	-1,886.9	275.1	1.42	-0.48	1.43
7,392.0	70.10	272.30	6,096.2	4,921.2	107.9	-1,946.1	284.7	0.50	0.48	0.16
7,455.0	70.80	273.00	6,117.3	4,942.3	110.7	-2,005.4	293.9	1.53	1.11	1.11
7,518.0	71.30	272.70	6,137.7	4,962.7	113.6	-2,064.9	302.9	0.91	0.79	-0.48
7,581.0	70.30	273.80	6,158.4	4,983.4	117.0	-2,124.3	311.5	2.29	-1.59	1.75
7,643.0	69.50	274.80	6,179.8	5,004.8	121.4	-2,182.3	318.9	1.99	-1.29	1.61
7,706.0	69.90	274.70	6,201.6	5,026.6	126.3	-2,241.2	325.9	0.65	0.63	-0.16
7,769.0	70.40	274.60	6,223.0	5,048.0	131.1	-2,300.3	333.0	0.81	0.79	-0.16
7,841.0	69.50	273.80	6,247.7	5,072.7	136.0	-2,367.7	341.7	1.63	-1.25	-1.11
7,904.0	70.10	274.10	6,269.4	5,094.4	140.1	-2,426.7	349.6	1.05	0.95	0.48
7,935.0	70.50	274.10	6,279.9	5,104.9	142.2	-2,455.8	353.4	1.29	1.29	0.00
7,967.0	70.20	269.10	6,290.7	5,115.7	143.0	-2,485.9	358.6	14.74	-0.94	-15.63
7,998.0	69.10	264.70	6,301.4	5,126.4	141.5	-2,514.9	365.9	13.77	-3.55	-14.19
8,030.0	68.30	261.00	6,313.1	5,138.1	137.8	-2,544.5	375.5	11.06	-2.50	-11.56
8,061.0	68.10	257.80	6,324.6	5,149.6	132.5	-2,572.8	386.4	9.61	-0.65	-10.32
8,093.0	68.90	254.50	6,336.3	5,161.3	125.3	-2,601.7	399.1	9.91	2.50	-10.31
8,124.0	69.30	250.50	6,347.4	5,172.4	116.6	-2,629.3	413.2	12.12	1.29	-12.90
8,156.0	69.10	248.60	6,358.7	5,183.7	106.2	-2,657.3	429.1	5.59	-0.63	-5.94
8,187.0	67.70	246.00	6,370.2	5,195.2	95.1	-2,683.9	445.3	9.01	-4.52	-8.39
8,219.0	67.80	242.50	6,382.3	5,207.3	82.2	-2,710.6	463.3	10.13	0.31	-10.94
8,250.0	68.70	240.70	6,393.8	5,218.8	68.5	-2,735.9	481.7	6.12	2.90	-5.81
8,282.0	69.80	238.10	6,405.1	5,230.1	53.3	-2,761.7	501.8	8.34	3.44	-8.13
8,313.0	70.70	235.70	6,415.6	5,240.6	37.3	-2,786.1	522.4	7.84	2.90	-7.74
8,345.0	72.20	231.00	6,425.8	5,250.8	19.2	-2,810.5	545.0	14.69	4.69	-14.69
8,376.0	71.70	226.50	6,435.4	5,260.4	-0.2	-2,832.6	568.4	13.90	-1.61	-14.52
8,407.0	70.90	222.90	6,445.3	5,270.3	-21.1	-2,853.3	593.0	11.30	-2.58	-11.61
8,439.0	70.60	219.00	6,455.9	5,280.9	-43.9	-2,873.1	619.3	11.54	-0.94	-12.19
8,470.0	71.30	214.60	6,466.0	5,291.0	-67.3	-2,890.6	645.9	13.60	2.26	-14.19
8,502.0	72.20	210.80	6,476.0	5,301.0	-92.9	-2,907.0	674.2	11.62	2.81	-11.88
8,533.0	74.60	209.00	6,484.9	5,309.9	-118.7	-2,921.8	702.4	9.52	0.74	-5.81
8,564.0	75.40	205.90	6,492.9	5,317.9	-145.2	-2,935.6	731.2	10.00	2.58	-10.00
8,596.0	76.20	202.90	6,500.8	5,325.8	-173.5	-2,948.4	761.4	9.55	2.90	-9.38
8,627.0	77.10	200.00	6,507.9	5,332.9	-201.5	-2,959.5	791.1	9.55	2.90	-9.35
8,659.0	77.50	196.70	6,514.9	5,339.9	-231.2	-2,969.3	822.1	10.14	1.25	-10.31
8,690.0	77.80	195.70	6,521.6	5,346.6	-260.2	-2,977.7	852.3	3.30	0.97	-3.23

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Office of Oil and Gas
MAR 22 2015
WV Department of Environmental Protection

Database:	EDM SMOOT Single User Db	Local Co-ordinate Reference:	Site Ritchie County 513759
Company:	EQT Production - Mercedita	TVD Reference:	KR0216 @ 1175 Buss
Project:	Ritchie County, WV	MD Reference:	KR0216 @ 1175 Buss
Site:	Ritchie County 513759	North Reference:	Mag
Well:	Well #513759	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	513759 A# Drilled		

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)
8,722.0	77.80	193.60	6,528.3	5,353.3	-290.5	-2,985.6	883.6	6.41	0.00	-6.56
Interp @ 8537.0 (Well #513759 Main Wellbore #1175)										
8,731.2	78.06	192.77	6,530.3	5,355.3	-299.3	-2,987.7	892.6	9.31	2.87	-9.05
8,753.0	78.70	190.80	6,534.7	5,359.7	-320.2	-2,992.1	913.9	9.31	2.92	-9.02
8,785.0	80.60	188.10	6,540.4	5,365.4	-351.2	-2,997.2	945.4	10.20	5.94	-8.44
8,816.0	83.40	185.60	6,544.7	5,369.7	-381.7	-3,000.9	975.9	12.06	9.03	-8.06
8,848.0	83.40	182.90	6,548.4	5,373.4	-413.4	-3,003.2	1,007.5	8.38	0.00	-8.44
8,879.0	81.50	180.70	6,552.5	5,377.5	-444.1	-3,004.2	1,037.7	9.33	-6.13	-7.10
8,911.0	81.50	177.70	6,557.2	5,382.2	-475.7	-3,003.8	1,068.7	9.27	0.00	-9.38
8,942.0	83.10	173.90	6,561.4	5,386.4	-506.4	-3,001.5	1,098.2	13.20	5.16	-12.26
8,974.0	84.90	170.30	6,564.7	5,389.7	-537.9	-2,997.1	1,128.2	12.52	5.63	-11.25
LRIDeepst Point of Well#513759 MD 8557 TVD										
9,028.0	89.70	163.50	6,567.2	5,392.2	-590.4	-2,984.9	1,177.2	15.40	8.89	-12.59
513759 LP 1175 vs										
9,033.2	89.92	163.42	6,567.3	5,392.3	-595.4	-2,983.4	1,181.8	4.42	4.13	-1.59
9,091.0	92.30	162.50	6,566.1	5,391.1	-650.6	-2,966.5	1,232.5	4.42	4.13	-1.59
9,154.0	92.50	162.00	6,563.5	5,388.5	-710.6	-2,947.3	1,287.4	0.85	0.32	-0.79
9,217.0	91.20	160.70	6,561.5	5,386.5	-770.2	-2,927.2	1,341.8	2.92	-2.06	-2.06
9,280.0	90.10	160.00	6,560.8	5,385.8	-829.5	-2,906.0	1,395.7	2.07	-1.75	-1.11
9,343.0	90.00	159.60	6,560.7	5,385.7	-888.7	-2,884.2	1,449.2	0.65	-0.16	-0.63
9,406.0	89.80	159.00	6,560.8	5,385.8	-947.6	-2,862.0	1,502.5	1.00	-0.32	-0.95
9,469.0	90.20	158.60	6,560.8	5,385.8	-1,006.3	-2,839.2	1,555.4	0.90	0.63	-0.63
9,532.0	90.80	159.70	6,560.3	5,385.3	-1,065.2	-2,816.8	1,608.6	1.99	0.95	1.75
9,595.0	91.20	161.60	6,559.2	5,384.2	-1,124.6	-2,795.9	1,662.7	3.08	0.63	3.02
9,658.0	90.60	159.80	6,558.2	5,383.2	-1,184.1	-2,775.1	1,716.7	3.01	-0.95	-2.86
9,721.0	89.10	157.90	6,558.3	5,383.3	-1,242.8	-2,752.3	1,769.7	3.84	-2.38	-3.02
9,784.0	88.80	160.20	6,559.5	5,384.5	-1,301.7	-2,729.8	1,822.8	3.68	-0.48	3.65
9,847.0	90.40	162.20	6,559.9	5,384.9	-1,361.3	-2,709.5	1,877.2	4.07	2.54	3.17
9,910.0	90.90	162.50	6,559.2	5,384.2	-1,421.3	-2,690.4	1,932.2	0.93	0.79	0.48
9,973.0	91.20	164.10	6,558.1	5,383.1	-1,481.7	-2,672.3	1,987.6	2.58	0.48	2.54
10,036.0	88.90	162.00	6,558.0	5,383.0	-1,541.9	-2,654.0	2,043.0	4.94	-3.65	-3.33
10,099.0	88.40	162.40	6,559.5	5,384.5	-1,601.9	-2,634.7	2,097.9	1.02	-0.79	0.63
10,162.0	88.50	163.60	6,561.2	5,386.2	-1,662.1	-2,616.3	2,153.2	1.91	0.16	1.90
10,225.0	88.50	163.80	6,562.9	5,387.9	-1,722.5	-2,598.6	2,208.8	0.32	0.00	0.32
10,288.0	88.40	164.20	6,564.6	5,389.6	-1,783.1	-2,581.3	2,264.7	0.65	0.63	0.63
10,351.0	89.00	163.60	6,566.0	5,391.0	-1,843.6	-2,563.8	2,320.4	1.35	0.95	0.95
10,414.0	90.10	163.90	6,566.5	5,391.5	-1,904.1	-2,546.2	2,376.2	1.81	1.75	0.48
10,477.0	91.20	163.10	6,565.8	5,390.8	-1,964.5	-2,528.3	2,431.7	2.16	1.75	-1.27
10,539.0	91.50	162.30	6,564.3	5,389.3	-2,023.7	-2,509.8	2,486.0	1.38	0.48	-1.29
10,603.0	91.70	162.00	6,562.5	5,387.5	-2,084.6	-2,490.2	2,541.7	0.56	0.31	-0.47
513759 Plat LP										
10,654.4	91.29	161.18	6,561.2	5,386.2	-2,133.3	-2,474.0	2,586.3	1.77	-0.79	-1.59
10,666.0	91.20	161.00	6,560.9	5,385.9	-2,144.3	-2,470.2	2,596.2	1.77	-0.79	-1.59



PHX
Survey Report



Database:	COMPASS 5000.1 Single User Edit	Local Co-ordinate Reference:	State Plane Coordinate System
Company:	EQT Production - Marcellus	TVD Reference:	NA 8211.6 to 1173 Build
Project:	Richie County, Wv	MD Reference:	NA 8211.6 to 1173 Build
Site:	Richie County 515799	North Reference:	Grid
Well:	Well #513750	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	515799.kis Drilled		

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)
10,729.0	90.40	160.90	6,560.0	5,385.0	-2,203.8	-2,449.7	2,650.4	1.28	-1.27	-0.16
10,792.0	90.50	160.40	6,559.5	5,384.5	-2,263.3	-2,428.8	2,704.5	0.81	0.16	-0.79
10,854.0	90.50	160.10	6,559.0	5,384.0	-2,321.6	-2,407.9	2,757.5	0.48	0.00	-0.48
10,918.0	90.10	162.30	6,558.7	5,383.7	-2,382.2	-2,387.2	2,812.7	3.49	-0.63	3.44
10,980.0	90.10	162.30	6,558.6	5,383.6	-2,441.3	-2,368.4	2,866.7	0.00	0.00	0.00
11,043.0	90.10	162.30	6,558.5	5,383.5	-2,501.3	-2,349.2	2,921.7	0.00	0.00	0.00
11,106.0	90.10	162.10	6,558.3	5,383.3	-2,561.3	-2,330.0	2,976.6	0.32	0.00	-0.32
11,169.0	90.00	161.60	6,558.3	5,383.3	-2,621.1	-2,310.3	3,031.3	0.81	-0.16	-0.79
11,232.0	89.90	161.40	6,558.3	5,383.3	-2,680.9	-2,290.4	3,085.8	0.35	-0.16	-0.32
11,295.0	90.20	161.90	6,558.3	5,383.3	-2,740.7	-2,270.5	3,140.4	0.93	0.48	0.79
11,358.0	90.10	163.10	6,558.1	5,383.1	-2,800.7	-2,251.6	3,195.5	1.91	-0.16	1.90
11,421.0	89.80	162.30	6,558.2	5,383.2	-2,860.9	-2,232.8	3,250.7	1.36	-0.48	-1.27
11,484.0	89.50	162.00	6,558.6	5,383.6	-2,920.9	-2,213.5	3,305.5	0.67	-0.48	-0.48
11,547.0	89.80	162.00	6,558.9	5,383.9	-2,980.8	-2,194.1	3,360.3	0.48	0.48	0.00
11,610.0	90.00	161.80	6,559.1	5,384.1	-3,040.7	-2,174.5	3,415.1	0.45	0.32	-0.32
11,673.0	90.50	161.80	6,558.8	5,383.8	-3,100.5	-2,154.8	3,469.8	0.79	0.79	0.00
11,736.0	90.80	161.20	6,558.1	5,383.1	-3,160.2	-2,134.8	3,524.3	1.06	0.48	-0.95
11,799.0	91.60	161.20	6,556.7	5,381.7	-3,219.9	-2,114.5	3,578.6	1.27	1.27	0.00
11,862.0	91.80	161.30	6,554.9	5,379.9	-3,279.5	-2,094.3	3,633.0	0.35	0.32	0.16
11,925.0	91.90	161.50	6,552.8	5,377.8	-3,339.2	-2,074.2	3,687.4	0.35	0.16	0.32
11,988.0	91.00	162.50	6,551.3	5,376.3	-3,399.1	-2,054.7	3,742.2	2.14	-1.43	1.59
12,051.0	91.30	162.30	6,550.0	5,375.0	-3,459.1	-2,035.7	3,797.2	0.57	0.48	-0.32
12,114.0	91.20	161.70	6,548.6	5,373.6	-3,519.0	-2,016.2	3,852.0	0.97	-0.16	-0.95
12,177.0	90.20	161.00	6,547.8	5,372.8	-3,578.7	-1,996.1	3,906.4	1.94	-1.59	-1.11
12,240.0	90.40	161.40	6,547.5	5,372.5	-3,638.3	-1,975.8	3,960.7	0.71	0.32	0.63
12,303.0	90.00	162.00	6,547.3	5,372.3	-3,698.2	-1,956.0	4,015.4	1.14	-0.63	0.95
12,366.0	89.80	161.60	6,547.4	5,372.4	-3,758.0	-1,936.3	4,070.1	0.71	-0.32	-0.63
12,429.0	90.00	161.40	6,547.5	5,372.5	-3,817.7	-1,916.3	4,124.6	0.45	0.32	-0.32
12,492.0	89.80	160.90	6,547.6	5,372.6	-3,877.4	-1,896.0	4,178.9	0.85	-0.32	-0.79
12,555.0	89.80	161.00	6,547.8	5,372.8	-3,936.9	-1,875.4	4,233.1	0.16	0.00	0.16
12,618.0	90.60	161.60	6,547.6	5,372.6	-3,996.6	-1,855.2	4,287.5	1.59	1.27	0.95
12,681.0	91.50	161.60	6,546.5	5,371.5	-4,056.4	-1,835.3	4,342.1	1.43	1.43	0.00
12,744.0	91.30	161.10	6,544.9	5,369.9	-4,116.0	-1,815.2	4,396.5	0.85	-0.32	-0.79
12,807.0	90.60	162.00	6,543.9	5,368.9	-4,175.8	-1,795.3	4,451.0	1.43	1.43	0.00
12,871.0	90.50	163.40	6,543.3	5,368.3	-4,236.9	-1,776.2	4,507.1	2.19	-0.16	2.19
12,933.0	90.10	164.20	6,542.9	5,367.9	-4,296.4	-1,758.9	4,561.9	1.43	-0.63	1.27
12,996.0	89.50	163.80	6,543.2	5,368.2	-4,357.0	-1,741.6	4,617.8	1.14	-0.95	-0.63
13,060.0	89.30	163.80	6,543.8	5,368.8	-4,418.4	-1,723.7	4,674.4	0.31	-0.31	0.00
13,123.0	88.80	163.70	6,544.9	5,369.9	-4,478.9	-1,706.1	4,730.1	0.81	-0.79	-0.16
13,186.0	89.60	165.20	6,545.8	5,370.8	-4,539.6	-1,689.2	4,786.2	0.81	-0.79	-0.16
13,249.0	89.90	164.70	6,546.0	5,371.0	-4,600.4	-1,672.8	4,842.5	0.93	0.48	-0.79
13,312.0	90.90	165.40	6,545.6	5,370.6	-4,661.3	-1,656.6	4,898.9	1.94	1.59	1.11

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PHX Survey Report



Database:	EDM 5000.1 Single User DB	Local Co-ordinate Reference:	Site Ritchie County 513759
Company:	EQT Production - Marcellus	TVD Reference:	KB@16 @ 1175 (usft)
Project:	Ritchie County, WV	MD Reference:	KB@16 @ 1175 (usft)
Site:	Ritchie County 513759	North Reference:	Grid
Well:	Well #513759	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	513759 As Drilled		

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)
13,375.0	90.50	163.80	6,544.8	5,369.8	-4,722.0	-1,639.9	4,955.0	2.62	-0.63	-2.54
13,438.0	89.80	161.80	6,544.7	5,369.7	-4,782.2	-1,621.2	5,010.2	3.36	-1.11	-3.17
13,501.0	90.00	161.60	6,544.8	5,369.8	-4,842.0	-1,601.5	5,064.9	0.45	0.32	-0.32
13,564.0	90.20	161.20	6,544.7	5,369.7	-4,901.7	-1,581.4	5,119.3	0.71	0.32	-0.63
13,627.0	90.20	160.60	6,544.4	5,369.4	-4,961.3	-1,560.7	5,173.5	0.95	0.00	-0.95
13,690.0	90.30	159.70	6,544.2	5,369.2	-5,020.5	-1,539.4	5,227.3	1.44	0.16	-1.43
13,753.0	90.20	159.70	6,543.9	5,368.9	-5,079.6	-1,517.5	5,280.8	0.16	-0.16	0.00
13,815.0	90.10	160.10	6,543.7	5,368.7	-5,137.8	-1,496.2	5,333.5	0.67	-0.16	0.65
13,878.0	90.20	159.70	6,543.6	5,368.6	-5,197.0	-1,474.5	5,387.2	0.65	0.16	-0.63
13,941.0	89.80	159.90	6,543.6	5,368.6	-5,256.1	-1,452.8	5,440.7	0.71	-0.63	0.32
14,004.0	88.80	162.30	6,544.3	5,369.3	-5,315.7	-1,432.4	5,495.0	4.13	-1.59	3.81
14,067.0	89.00	161.80	6,545.5	5,370.5	-5,375.6	-1,413.0	5,549.8	0.85	0.32	-0.79
14,130.0	90.50	164.20	6,545.8	5,370.8	-5,435.9	-1,394.6	5,605.1	4.49	2.38	3.81
14,192.0	90.30	163.10	6,545.4	5,370.4	-5,495.4	-1,377.1	5,659.9	1.80	-0.32	-1.77
14,254.0	90.20	161.90	6,545.1	5,370.1	-5,554.5	-1,358.5	5,714.1	1.94	-0.16	-1.94
14,317.0	90.00	161.00	6,545.0	5,370.0	-5,614.2	-1,338.4	5,768.6	1.46	-0.32	-1.43
14,380.0	89.70	159.40	6,545.2	5,370.2	-5,673.5	-1,317.1	5,822.4	2.58	-0.48	-2.54
14,443.0	89.60	160.00	6,545.6	5,370.6	-5,732.6	-1,295.2	5,875.9	0.97	-0.16	0.95
14,506.0	89.30	160.10	6,546.2	5,371.2	-5,791.8	-1,273.7	5,929.6	0.50	-0.48	0.16
14,569.0	89.70	160.80	6,546.7	5,371.7	-5,851.2	-1,252.6	5,983.5	1.28	0.63	1.11
14,632.0	89.90	160.90	6,546.9	5,371.9	-5,910.7	-1,232.0	6,037.7	0.35	0.32	0.16
Final Survey=14642' MD/ 6547' TVD										
14,642.0	90.00	160.90	6,546.9	5,371.9	-5,920.1	-1,228.7	6,046.3	1.00	1.00	0.00
513759 Plat TD										
14,695.6	90.00	160.90	6,546.9	5,371.9	-5,970.8	-1,211.2	6,092.4	0.00	0.00	0.00
Projection to TD=14700' MD/ 6547' TVD										
14,700.0	90.00	160.90	6,546.9	5,371.9	-5,974.9	-1,209.7	6,096.1	0.00	0.00	0.00

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,969.0	4,967.5	-9.0	52.4	KOP=4969' MD
9,028.0	6,567.2	-590.4	-2,984.9	LP/Deepest Point of Well=9028' MD/ 6567' TVD
14,642.0	6,546.9	-5,920.1	-1,228.7	Final Survey=14642' MD/ 6547' TVD
14,700.0	6,546.9	-5,974.9	-1,209.7	Projection to TD=14700' MD/ 6547' TVD

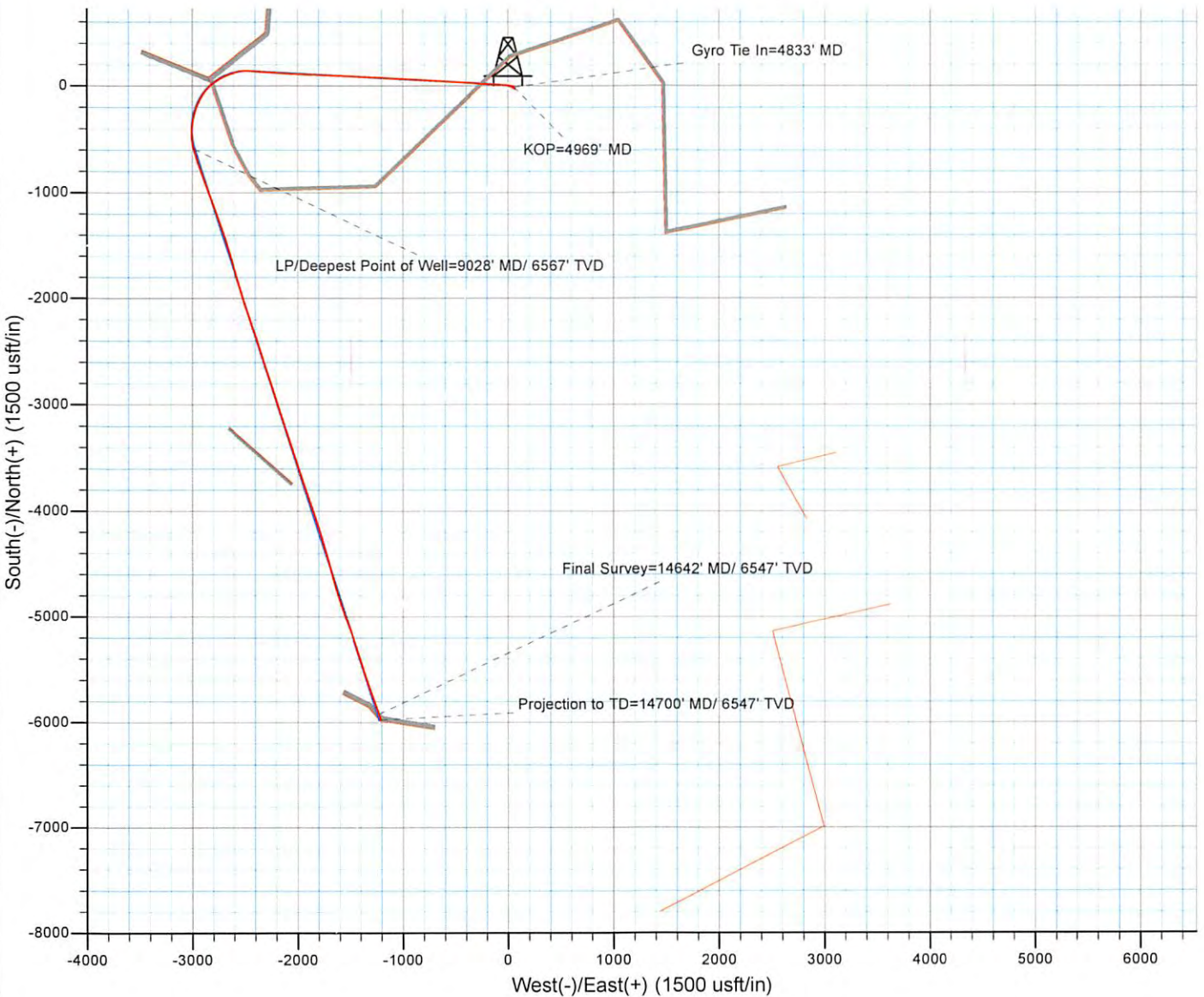
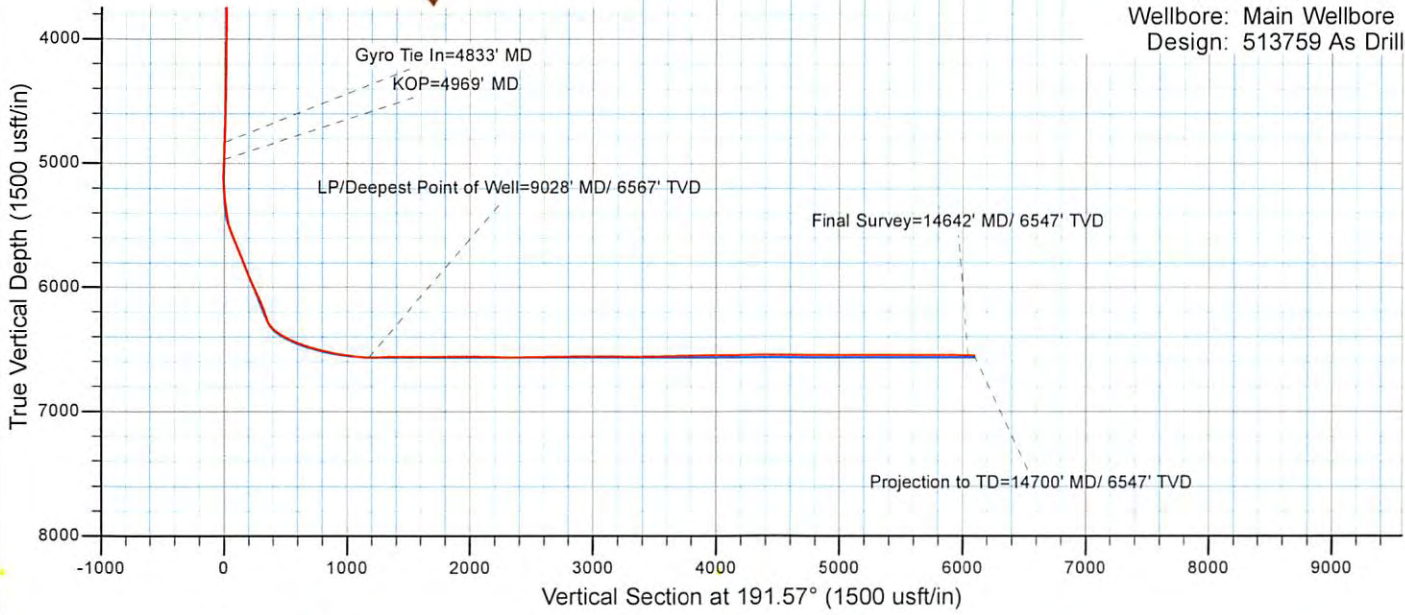
Checked By: _____ Approved By: _____ Date: _____

MAR 22 2015

WV Department of Environmental Protection



Project: Ritchie County, WV
 Site: Ritchie County 513759
 Well: Well #513759
 Wellbore: Main Wellbore
 Design: 513759 As Drilled



513759- 47-085-10135-0000 - Perforations

Stage Number	Perforation Date	Top Perf Depth (ftKB)	Bottom Perf Depth (ftKB)	Number of Shots	Formation
Initiation Sleeve	10/5/2015	14,683	14,684	10	MARCELLUS
1	10/5/2015	14,538	14,630	32	MARCELLUS
2	10/5/2015	14,388	14,510	40	MARCELLUS
3	10/5/2015	14,238	14,360	40	MARCELLUS
4	10/6/2015	14,088	14,210	40	MARCELLUS
5	10/6/2015	13,938	14,060	40	MARCELLUS
6	10/8/2015	13,788	13,910	40	MARCELLUS
7	10/8/2015	13,638	13,756	40	MARCELLUS
8	10/8/2015	13,488	13,610	40	MARCELLUS
9	10/8/2015	13,339	13,460	40	MARCELLUS
10	10/8/2015	13,188	13,310	40	MARCELLUS
11	10/9/2015	13,038	13,160	40	MARCELLUS
12	10/9/2015	12,888	13,010	40	MARCELLUS
13	10/10/2015	12,738	12,860	40	MARCELLUS
14	10/10/2015	12,588	12,710	40	MARCELLUS
15	10/10/2015	12,438	12,560	40	MARCELLUS
16	10/10/2015	12,291	12,410	40	MARCELLUS
17	10/10/2015	12,138	12,260	40	MARCELLUS
18	10/10/2015	11,988	12,110	40	MARCELLUS
19	10/10/2015	11,838	11,956	40	MARCELLUS
20	10/11/2015	11,688	11,810	40	MARCELLUS
21	10/11/2015	11,538	11,660	40	MARCELLUS
22	10/11/2015	11,387	11,510	40	MARCELLUS
23	10/11/2015	11,238	11,360	40	MARCELLUS
24	10/11/2015	11,088	11,210	40	MARCELLUS
25	10/12/2015	10,938	11,058	40	MARCELLUS
26	10/12/2015	10,788	10,910	40	MARCELLUS
27	10/12/2015	10,638	10,760	40	MARCELLUS
28	10/12/2015	10,487	10,610	40	MARCELLUS
29	10/12/2015	10,338	10,460	40	MARCELLUS
30	10/12/2015	10,192	10,310	40	MARCELLUS
31	10/13/2015	10,038	10,160	40	MARCELLUS
32	10/13/2015	9,891	10,010	40	MARCELLUS
33	10/13/2015	9,738	9,860	40	MARCELLUS
34	10/13/2015	9,588	9,710	40	MARCELLUS
35	10/14/2015	9,438	9,560	40	MARCELLUS
36	10/14/2015	9,288	9,410	40	MARCELLUS
38	10/14/2015	8,988	9,110	40	MARCELLUS
37	10/14/2015	9,138	9,260	40	MARCELLUS
39	10/14/2015	8,844	8,958	32	MARCELLUS

WV Department of Environmental Protection

513759-47-085-10135-0000 - Stimulated Stages

Stage Number	Stimulation Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen Other (units)
Initiation Sleeve	10/5/2015	18.6	6,363	7,226	3,910	0	1030	
1	10/5/2015	90.9	8,336	8,951	3,819	250,400.00	6,906.00	
2	10/5/2015	93.1	8,571	8,717	3,991	248,340.00	6,641.00	
3	10/6/2015	96.2	8,710	8,908	4,095	248,980.00	6,565.00	
4	10/6/2015	96.6	8,620	8,901	4,054	244,300.00	7,162.00	
5	10/7/2015	84.2	8,275	8,636	5,120	249,700.00	9,344.00	
6	10/8/2015	99.5	8,752	9,023	4,716	249,180.00	6,689.00	
7	10/8/2015	100.1	8,599	8,728	4,703	252,520.00	6,192.00	
8	10/8/2015	101.4	8,358	8,610	3,742	251,440.00	6,564.00	
9	10/8/2015	101	8,462	8,637	3,910	249,200.00	6,199.00	
10	10/9/2015	101	8,431	8,568	3,665	251,540.00	6,197.00	
11	10/9/2015	100.2	8,476	8,622	4,787	253,220.00	6,215.00	
12	10/9/2015	100.4	8,326	8,419	3,765	253,000.00	6,237.00	
13	10/10/2015	100.3	8,413	8,501	4,381	249,080.00	6,255.00	
14	10/10/2015	100.4	8,378	9,061	4,523	249,740.00	6,136.00	
15	10/10/2015	100.7	8,248	8,417	3,787	252,570.00	6,090.00	
16	10/10/2015	100	8,515	8,758	3,769	254,830.00	6,091.00	
17	10/10/2015	100.2	8,699	8,939	4,312	250,870.00	6,344.00	
18	10/10/2015	100.5	8,277	8,666	3,592	250,174.00	6,281.00	
19	10/11/2015	100.3	8,285	8,500	3,831	249,000.00	6,298.00	
20	10/11/2015	101.2	8,397	8,897	3,650	250,400.00	6,206.00	
21	10/11/2015	99.8	8,507	8,853	3,640	252,060.00	5,954.00	
22	10/11/2015	100.1	8,570	8,980	3,708	251,140.00	6,060.00	
23	10/11/2015	100.2	8,089	8,224	3,254	248,720.00	6,170.00	
24	10/12/2015	99.1	8,592	9,036	3,100	254,600.00	6,528.00	
25	10/12/2015	100.1	8,223	8,600	3,265	249,300.00	6,174.00	
26	10/12/2015	100.6	8,136	8,377	3,416	250,780.00	5,733.00	
27	10/12/2015	100.6	8,026	8,320	3,364	252,040.00	5,647.00	
28	10/12/2015	100.5	8,072	8,419	3,696	249,710.00	5,589.00	
29	10/12/2015	100.1	7,897	8,146	3,481	254,860.00	6,106.00	
30	10/12/2015	100.1	8,023	8,440	3,366	253,850.00	6,029.00	
31	10/13/2015	97.9	8,205	8,998	3,408	249,100.00	6,532.00	
32	10/13/2015	98	7,930	8,317	3,825	248,720.00	5,924.00	
33	10/13/2015	93.1	8,220	9,534	5,712	253,160.00	6,216.00	
33.1	10/13/2015	8.6	4,829	6,672	4,583	0.00	3,113.00	
34	10/13/2015	100	7,783	8,070	3,794	252,860.00	6,043.00	
35	10/14/2015	99.5	7,504	7,821	3,270	248,880.00	6,017.00	
36	10/14/2015	98.8	7,850	8,453	3,842	253,000.00	6,322.00	
37	10/14/2015	99.8	7,264	7,441	3,692	250,960.00	5,651.00	
38	10/14/2015	54.8	6,433	8,704	4,068	67,040.00	5,179.00	
39	10/14/2015	100.8	7,312	7,650	2,912	473,446.00	10,272.00	

Oil and Gas

MAR 22 2016

WV Department of Environmental Protection

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	10/5/2015
Job End Date:	10/14/2015
State:	West Virginia
County:	Ritchie
API Number:	47-085-10135-00-00
Operator Name:	EQT Production
Well Name and Number:	513759
Longitude:	-80.84285300
Latitude:	39.13593200
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	6,532
Total Base Water Volume (gal):	10,621,674
Total Base Non Water Volume:	0



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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	89.65604	None
Sand (Proppant)	Keane Group	Proppant	Silica Substrate	14808-60-7	100.00000	9.93554	None
MC MX 437-5	Multi-Chem	Calcium nitrate solution	Calcium nitrate	10124-37-5	60.00000	0.05747	None
Hydrochloric Acid (15%)	Keane Group	Acidizing	Hydrochloric Acid	7647-01-0	15.00000	0.03397	None
FR760	Keane Group	Friction Reducer	Hydrotreated Light Distillate	64742-47-8	30.00000	0.01801	None
			Alkyl Alcohol	Proprietary	10.00000	0.00600	None
			Oxyalkylated alcohol A	Proprietary	5.00000	0.00300	None
EC6330A	Keane Group	Scale Inhibitor	Ethylene Glycol	107-21-1	5.00000	0.00127	None
			Sodium Phosphate, Tribasic	7601-54-9	5.00000	0.00127	None
AI 600	Keane Group	Corrosion Inhibitor	Ethylene Glycol	107-21-1	40.00000	0.00022	None
			Dimethylformamide	68-12-2	20.00000	0.00011	None

			Pyridine, alkyl/phenes, quaternized with benzyl chloride	89909-78-2	15.00000	0.00000	None
			2-Methyl-2-butanol	104-55-2	15.00000	0.00000	None
			2-Butoxyethanol	111-76-2	5.00000	0.00000	None
			1-Octanol	111-87-5	5.00000	0.00000	None
			1-Decanol	112-30-1	5.00000	0.00000	None
			Nonyl Phenol Ethoxylate, Branched	127087-87-0	5.00000	0.00000	None
			Triethyl Phosphate	78-40-0	2.50000	0.00000	None
			Methanol	67-56-1	2.50000	0.00000	None
			Allyl Pyridine	38391-14-7	1.00000	0.00000	None
Breaker- LEB 10 X	Keame Group	Sol Breaker	Ethylene Glycol	107-21-1	30.00000	0.00000	None

Ingredients shown above are subject to 29 CFR 1910.1200 and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Not/MSDS

* Total Water Volume sources may include fresh water, produced water, and/or recycled water

** Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided. Ingredient information for chemicals subject to 29 CFR 1910.1200 and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

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 U.S. Department of
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ROYALTY OWNERS		
CRAIG H. WILLIAMS	243.83 AC.±	LEASE NO. 987447
RUSSELL L. LOCKE	40.00 AC.±	LEASE NO. 987490
J.P. SMITH ET UX	130.00 AC.±	LEASE NO. 107857

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 513759
(OXF163 H4)**

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

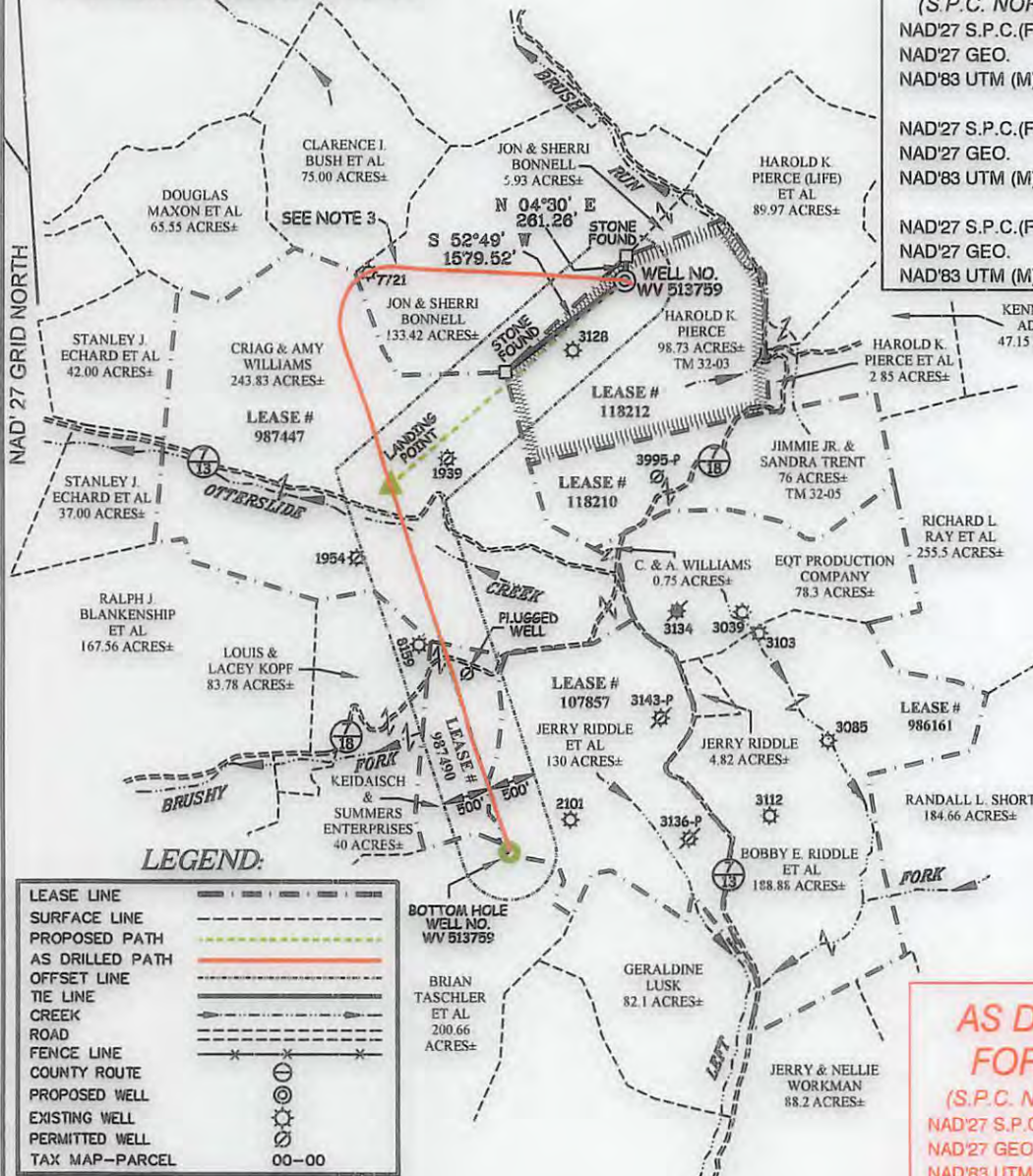
NAD'27 S.P.C.(FT) N. 234,466.6 E. 1,619,096.5
NAD'27 GEO. LAT-(N) 39.135932 LONG-(W) 80.842853
NAD'83 UTM (M) N. 4,331,882.6 E. 513,596.5

LANDING POINT

NAD'27 S.P.C.(FT) N. 232,333.9 E. 1,616,624.6
NAD'27 GEO. LAT-(N) 39.129976 LONG-(W) 80.851453
NAD'83 UTM (M) N. 4,331,220.3 E. 512,854.3

BOTTOM HOLE

NAD'27 S.P.C.(FT) N. 228,491.7 E. 1,617,873.0
NAD'27 GEO. LAT-(N) 39.119479 LONG-(W) 80.846850
NAD'83 UTM (M) N. 4,330,056.1 E. 513,254.1



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

**AS DRILLED COORDINATES
FOR WELL NO. WV 513759**

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

NAD'27 S.P.C.(FT) N. 234,466.6 E. 1,619,096.5
NAD'27 GEO. LAT-(N) 39.135932 LONG-(W) 80.842853
NAD'83 UTM (M) N. 4,331,882.6 E. 513,596.5

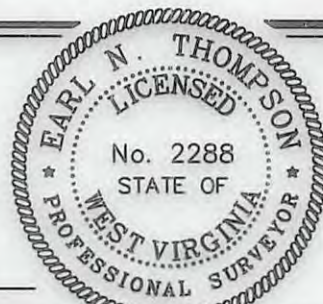
BOTTOM HOLE

NAD'27 S.P.C.(FT) N. 228,491.8 E. 1,617,886.8
NAD'27 GEO. LAT-(N) 39.119480 LONG-(W) 80.846901
NAD'83 UTM (M) N. 4,330,056.2 E. 513,258.3



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 MAY 27, 20 14
REVISED 03/22/14, 10/27/14 & 12/03/15
OPERATORS WELL NO. WV 513759
API WELL NO. 47 - 085 - 10135H
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 7698AD513759
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 X LIQUID INJECTION ___ WASTE DISPOSAL ___ IF "GAS" PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X
LOCATION: ELEVATION 1,174'(GROUND)1,158.5'(PROPOSED) 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 X CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE X 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 TVD 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

COUNTY NAME PERMIT

12/02/2016