

**APPROVED**

NAME: *David R. Fu*

DATE: *2/10/2016*

Well Operator's Report of Well Work



Where energy meets innovation.

Well Number: 514095

API: 47 - 017 - 06507

Submission:  Initial  Amended

Notes: Correction to Production Cement Top  
(MD)

RECEIVED  
Office of Oil and Gas

DEC 21 2015

WV Department of  
Environmental Protection

*AX WS03/25/2016*

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

API 47 - 017 - 06507 County DODDRIDGE District Southwest  
Quad OXFORD 7.5' Pad Name OXFORD 159 Field/Pool Name \_\_\_\_\_  
Farm name JUSTIN L. HENDERSON ET AL Well Number 514095  
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 4,339,877 Easting 520,556  
Landing Point of Curve Northing 4,340,621 Easting 520,865  
Bottom Hole Northing 4,343,758 Easting 519,338

Elevation (ft) 1,252 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)  
Synthetic Oil Base Mud 12.5ppg, aliphatic based non-aqueous drilling fluid, barium sulfate, calcium chloride, organophylic clay, quaternary ammonium clay, gilsonite, blended emulsifier, wetting agent, blended graphite, hydrated lime, calcium carbonate, ground walnut shells, fibrous cellulose

Date permit issued 7/30/2014 Date drilling commenced 2/10/2015 Date drilling ceased 3/21/2015  
Date completion activities began 7/26/2015 Date completion activities ceased 8/19/2015  
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 264, 325, 401 Open mine(s) (Y/N) depths N  
Salt water depth(s) ft 1312, 1379 Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 246, 313, 474, 616, 732, 735 Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) N

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

03/25/2016

API 47-017 - 06507 Farm name JUSTIN L. HENDERSON ET AL Well number 514095

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade w/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	24"	20"	40'	NEW	A-500 40LB/FT	NONE	Y
Surface	17.5"	13.375"	1,100'	NEW	J-55 54.5LB/FT	272	Y
Coal							
Intermediate 1	12.375"	9.625"	5,286'	NEW	P-110 40LB/FT	1,599', 3,142', 4,533'	Y
Intermediate 2							
Intermediate 3							
Production	8.5"	5.5"	20,282'	NEW	P-110 20LB/FT	NONE	N
Tubing							
Packer type and depth set							

Comment Details Cement on 8.5" production hole section brought inside 9 5/8" casing string and 1000' above KOP

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	835	15.6	1.20	1002	0	8
Coal							
Intermediate 1	CLASS A / A / A	381 / 354 / 1,089	14.2 / 15.6 / 15.6	1.24 / 1.18 / 1.18	2,175.18	0	8
Intermediate 2							
Intermediate 3							
Production	Class A 50/50 POZ / H	785 / 1560	14.2 / 15.2	1.26 / 1.96	989 / 3058	3,258'	8
Tubing							

Drillers TD (ft) 20,294' Loggers TD (ft) N/A  
 Deepest formation penetrated Marcellus Plug back to (ft) N/A  
 Plug back procedure N/A

Kick off depth (ft) 5,578'

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, 13, 25

INTERMEDIATE- RAN AT LEAST EVERY 500' FEET JOINTS: 1, 13, 22, 34, 46, 57, 69, 81, 93, 105, 117

PRODUCTION- RAN 1 CENTRALIZER ON EVERY JOINT FROM 45' TO 5254'

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- 017 - 06507 Farm name JUSTIN L. HENDERSON ET AL Well number 514095

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
<u>MARCELLUS</u>	<u>6,765.60</u> TVD	<u>8,400.00</u> MD
_____	_____	_____
_____	_____	_____
_____	_____	_____

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 2,221 psi Bottom Hole N/A psi DURATION OF TEST 147.00 hrs

OPEN FLOW Gas 12,651 mcfpd Oil N/A bpd NGL 52.8 bpd Water 1078.1 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 Vaughn Energy Services  
Address P.O. Box 261021 City Corpus Christi State TX Zip 78246-1021

Cementing Company Allied Services  
Address 1036 East Main Street City Bridgeport State WV Zip 26330

Stimulating Company FTS International  
Address 301 E. 18th Street City Cisco State TX Zip 76437

Please insert additional pages as applicable.

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

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

API 47- 017 - 06507 Farm name JUSTIN L. HENDERSON ET AL Well number 514095

Drilling Contractor Patterson UTI (RIG 252)  
Address 207 Carlton Drive City EIGHTY FOUR State PA Zip 15330

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

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

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

## Well # 514095 Final Formations

Formation Name	Final Top MD (ftGL) (ft)	Final Top TVD (ft)	Final Btm MD (ftGL) (ft)	Final Btm TVD (ft)
FRESH WATER ZONE	1	1	411	411
SAND/SHALE	1	1	256	256
WASHINGTON COAL	256	256	258	258
SAND/SHALE	258	258	323	323
WAYNESBURG A COAL	323	323	325	325
SAND/SHALE	325	325	484	484
UNIONTOWN COAL	484	484	486	486
SAND/SHALE	486	486	626	626
SEWICKLEY	626	626	628	628
SAND/SHALE	628	628	742	742
REDSTONE COAL	742	742	743	743
SAND/SHALE	743	743	745	745
PITTSBURGH COAL	745	745	749	749
SAND/SHALE	749	749	2,030.00	2,029.80
BIG LIME	2,030.00	2,029.80	2,174.00	2,173.80
SAND/SHALE	2,174.00	2,173.80	2,323.00	2,322.80
WEIR	2,323.00	2,322.80	2,437.00	2,436.80
SAND/SHALE	2,437.00	2,436.80	2,531.00	2,530.70
GANTZ	2,531.00	2,530.70	2,608.00	2,607.70
50F	2,608.00	2,607.70	2,684.00	2,683.70
SAND/SHALE	2,684.00	2,683.70	2,730.00	2,729.70
30F	2,730.00	2,729.70	2,765.00	2,764.70
SAND/SHALE	2,765.00	2,764.70	2,779.00	2,778.70
GORDON	2,779.00	2,778.70	2,870.00	2,869.60
4TH SAND	2,870.00	2,869.60	3,051.00	3,050.50
BAYARD	3,051.00	3,050.50	3,151.00	3,150.50
SAND/SHALE	3,151.00	3,150.50	3,388.00	3,387.30
WARREN	3,388.00	3,387.30	3,447.00	3,446.30
SAND/SHALE	3,447.00	3,446.30	3,459.00	3,458.30
SPEECHLEY	3,459.00	3,458.30	3,703.00	3,702.10
SAND/SHALE	3,703.00	3,702.10	4,139.00	4,137.20
BALLTOWN A	4,139.00	4,137.20	4,253.00	4,250.60
SAND/SHALE	4,253.00	4,250.60	4,338.00	4,335.10
RILEY	4,338.00	4,335.10	4,484.00	4,480.10
SAND/SHALE	4,484.00	4,480.10	5,009.00	5,000.00
BENSON	5,009.00	5,000.00	5,049.00	5,039.60
SAND/SHALE	5,049.00	5,039.60	5,180.00	5,169.00
ALEXANDER	5,180.00	5,169.00	6,211.00	6,078.80
RHINESTREET UPPER	6,211.00	6,078.80	6,362.00	6,142.50
RHINESTREET	6,362.00	6,142.50	7,136.00	6,405.50
SONYEA	7,136.00	6,405.50	7,518.00	6,540.20
MIDDLESEX	7,518.00	6,540.20	7,690.00	6,600.60
GENESSEE	7,690.00	6,600.60	7,906.00	6,668.30
GENESE0	7,906.00	6,668.30	8,086.00	6,713.70
TULLY	8,086.00	6,713.70	8,204.00	6,737.30
HAMILTON	8,204.00	6,737.30	8,400.00	6,765.60
MARCELLUS	8,400.00	6,765.60		



## **EQT Production - Marcellus**

Doddridge County, WV Grid

Doddridge County 514095

Well #514095

Main Wellbore

Design: 514095 As Drilled Surveys

## **Standard Survey Report**

20 March, 2015



Where energy meets innovation.



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Site Doddridge County 514095
<b>Company:</b>	EQT Production - Marcellus	<b>TVD Reference:</b>	KB@23 ft @ 1275.0usft
<b>Project:</b>	Doddridge County, WV Grid	<b>MD Reference:</b>	KB@23 ft @ 1275.0usft
<b>Site:</b>	Doddridge County 514095	<b>North Reference:</b>	Grid
<b>Well:</b>	Well #514095	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Main Wellbore		
<b>Design:</b>	514095 As Drilled Surveys		

**Project** Doddridge County, WV Grid

<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

**Site** Doddridge County 514095

<b>Site Position:</b>		<b>Northing:</b>	260,320.20 usft	<b>Latitude:</b>	39.21
<b>From:</b>	Map	<b>Easting:</b>	1,642,371.60 usft	<b>Longitude:</b>	-80.76
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	-0.80 °

**Well** Well #514095

<b>Well Position</b>	<b>+N/-S</b>	0.0 usft	<b>Northing:</b>	260,320.20 usft	<b>Latitude:</b>	39° 12' 28.207 N
	<b>+E/-W</b>	0.0 usft	<b>Easting:</b>	1,642,371.60 usft	<b>Longitude:</b>	80° 45' 43.522 W
<b>Position Uncertainty</b>		0.0 usft	<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b>	1,252.0 usft

**Wellbore** Main Wellbore

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	2/2/2015	-8.45	66.71	52,159

**Design** 514095 As Drilled Surveys

**Audit Notes:**

<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	343.54

**Survey Program** Date 3/20/2015

From (')	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	5,231.0	514095 Gyrodata Gyro (Main Wellbore)	GYD_DP_MS	Gyrodata gyro-compassing and drop
0.00	20,294.0	514095 PHX MWD (Main Wellbore)	MWD+IGRF	MWD+IGRF v3:standard declination

**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	-1,275.0	0.0	0.0	0.0	0.00	0.00	0.00
23.0	0.00	0.00	23.0	-1,252.0	0.0	0.0	0.0	0.00	0.00	0.00
123.0	0.59	249.48	123.0	-1,152.0	-0.2	-0.5	0.0	0.59	0.59	0.00
223.0	0.25	235.52	223.0	-1,052.0	-0.5	-1.1	-0.1	0.35	-0.34	-13.96
323.0	0.20	245.43	323.0	-952.0	-0.7	-1.5	-0.2	0.06	-0.05	9.91
423.0	0.16	231.02	423.0	-852.0	-0.8	-1.8	-0.3	0.06	-0.04	-14.41
523.0	0.29	268.43	523.0	-752.0	-0.9	-2.1	-0.3	0.19	0.13	37.41
623.0	0.30	266.13	623.0	-652.0	-1.0	-2.6	-0.2	0.02	0.01	-2.30



PHX  
Survey Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Site Doddridge County 514095
<b>Company:</b>	EQT Production - Marcellus	<b>TVD Reference:</b>	KB@23 ft @ 1275.0usft
<b>Project:</b>	Doddridge County, WV Grd	<b>MD Reference:</b>	KB@23 ft @ 1275.0usft
<b>Site:</b>	Doddridge County 514095	<b>North Reference:</b>	Grid
<b>Well:</b>	Well #514095	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Main Wellbore		
<b>Design:</b>	514095 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)
723.0	0.29	265.23	723.0	-552.0	-1.0	-3.1	-0.1	0.01	-0.01	-0.90
823.0	0.28	276.13	823.0	-452.0	-1.0	-3.6	0.1	0.06	-0.01	10.90
923.0	0.14	253.61	923.0	-352.0	-1.0	-4.0	0.2	0.16	-0.14	-22.52
1,023.0	0.48	272.18	1,023.0	-252.0	-1.0	-4.5	0.3	0.35	0.34	18.57
1,123.0	0.44	272.01	1,123.0	-152.0	-1.0	-5.3	0.6	0.04	-0.04	-0.17
1,223.0	0.59	264.60	1,223.0	-52.0	-1.0	-6.2	0.8	0.16	0.15	-7.41
1,323.0	0.92	277.27	1,323.0	48.0	-1.0	-7.5	1.2	0.37	0.33	12.67
1,423.0	1.12	276.49	1,423.0	148.0	-0.8	-9.3	1.9	0.20	0.20	-0.78
1,523.0	1.22	269.04	1,522.9	247.9	-0.7	-11.3	2.6	0.18	0.10	-7.45
1,623.0	1.06	262.26	1,622.9	347.9	-0.8	-13.3	3.0	0.21	-0.16	-6.78
1,723.0	1.00	264.96	1,722.9	447.9	-1.0	-15.1	3.3	0.08	-0.06	2.70
1,823.0	1.06	272.59	1,822.9	547.9	-1.0	-16.9	3.8	0.15	0.06	7.63
1,923.0	1.10	276.26	1,922.9	647.9	-0.9	-18.8	4.5	0.08	0.04	3.67
2,023.0	1.10	275.89	2,022.8	747.8	-0.7	-20.7	5.2	0.01	0.00	-0.37
2,123.0	1.14	288.44	2,122.8	847.8	-0.3	-22.6	6.1	0.25	0.04	12.55
2,223.0	1.14	295.70	2,222.8	947.8	0.5	-24.4	7.4	0.14	0.00	7.26
2,323.0	1.14	293.50	2,322.8	1,047.8	1.3	-26.2	8.7	0.04	0.00	-2.20
2,423.0	1.23	291.81	2,422.8	1,147.8	2.1	-28.1	10.0	0.10	0.09	-1.69
2,523.0	1.29	300.70	2,522.7	1,247.7	3.1	-30.1	11.5	0.20	0.06	8.89
2,623.0	1.51	298.74	2,622.7	1,347.7	4.3	-32.2	13.2	0.23	0.22	-1.96
2,723.0	1.57	298.10	2,722.7	1,447.7	5.5	-34.6	15.1	0.06	0.06	-0.64
2,823.0	1.64	296.92	2,822.6	1,547.6	6.8	-37.1	17.1	0.08	0.07	-1.18
2,923.0	1.79	293.71	2,922.6	1,647.6	8.1	-39.8	19.1	0.18	0.15	-3.21
3,023.0	1.93	296.18	3,022.5	1,747.5	9.5	-42.7	21.2	0.16	0.14	2.47
3,123.0	1.88	295.71	3,122.5	1,847.5	10.9	-45.7	23.4	0.05	-0.05	-0.47
3,223.0	2.11	292.41	3,222.4	1,947.4	12.4	-48.9	25.7	0.26	0.23	-3.30
3,323.0	2.17	295.97	3,322.4	2,047.4	13.9	-52.3	28.1	0.15	0.06	3.56
3,423.0	1.99	291.59	3,422.3	2,147.3	15.4	-55.6	30.5	0.24	-0.18	-4.38
3,523.0	2.16	297.30	3,522.2	2,247.2	16.9	-58.9	32.9	0.27	0.17	5.71
3,623.0	2.06	293.21	3,622.2	2,347.2	18.4	-62.2	35.3	0.18	-0.10	-4.09
3,723.0	2.10	303.59	3,722.1	2,447.1	20.2	-65.4	37.9	0.38	0.04	10.38
3,823.0	2.57	300.33	3,822.0	2,547.0	22.3	-68.9	40.9	0.49	0.47	-3.26
3,923.0	3.27	299.22	3,921.9	2,646.9	24.8	-73.3	44.6	0.70	0.70	-1.11
4,023.0	4.54	301.51	4,021.6	2,746.6	28.3	-79.2	49.6	1.28	1.27	2.29
4,123.0	5.50	300.91	4,121.3	2,846.3	32.8	-86.6	56.0	0.96	0.96	-0.60
4,223.0	6.06	300.90	4,220.7	2,945.7	38.0	-95.3	63.4	0.56	0.56	-0.01
4,323.0	6.23	301.46	4,320.2	3,045.2	43.5	-104.4	71.3	0.18	0.17	0.56
4,423.0	6.66	302.96	4,419.5	3,144.5	49.5	-113.9	79.8	0.46	0.43	1.50
4,523.0	7.15	303.41	4,518.8	3,243.8	56.1	-124.0	88.9	0.49	0.49	0.45
4,623.0	7.67	307.74	4,618.0	3,343.0	63.6	-134.5	99.1	0.76	0.52	4.33
4,723.0	8.05	310.69	4,717.0	3,442.0	72.3	-145.1	110.4	0.55	0.38	2.95
4,823.0	8.15	313.62	4,816.0	3,541.0	81.7	-155.5	122.4	0.42	0.10	2.93

Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Site Doddridge County 514095
Company:	EQT Production - Marcellus	TVD Reference:	KB@23 ft @ 1275.0usft
Project:	Doddridge County, WV Grid	MD Reference:	KB@23 ft @ 1275.0usft
Site:	Doddridge County 514095	North Reference:	Grid
Well:	Well #514095	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	514095 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)	
4,923.0	8.56	316.01	4,915.0	3,640.0	92.0	-165.8	135.2	0.54	0.41	2.39	
5,023.0	8.54	317.77	5,013.9	3,738.9	102.8	-176.0	148.5	0.26	-0.02	1.76	
5,123.0	8.89	320.58	5,112.7	3,837.7	114.3	-185.9	162.3	0.55	0.35	2.81	
5,223.0	9.20	322.91	5,211.5	3,936.5	126.6	-195.6	176.9	0.48	0.31	2.33	
Gyro Tie In= 5231' MD											
5,231.1	9.21	323.24	5,219.5	3,944.5	127.7	-196.4	178.1	0.67	0.11	4.10	
5,296.0	9.29	325.88	5,283.5	4,008.5	136.2	-202.4	187.9	0.67	0.13	4.06	
5,389.0	8.60	332.60	5,375.4	4,100.4	148.5	-209.8	201.9	1.35	-0.74	7.23	
5,421.0	8.10	343.00	5,407.1	4,132.1	152.8	-211.6	206.5	4.96	-1.56	32.50	
5,452.0	8.40	354.60	5,437.7	4,162.7	157.2	-212.4	210.9	5.45	0.97	37.42	
5,484.0	8.40	5.20	5,469.4	4,194.4	161.8	-212.4	215.4	4.83	0.00	33.13	
5,515.0	9.00	13.40	5,500.0	4,225.0	166.4	-211.7	219.6	4.44	1.94	26.45	
5,546.0	9.30	21.10	5,530.7	4,255.7	171.1	-210.2	223.7	4.06	0.97	24.84	
5,578.0	11.30	33.00	5,562.1	4,287.1	176.2	-207.6	227.8	9.09	6.25	37.19	
5,609.0	14.40	37.70	5,592.4	4,317.4	181.8	-203.6	232.0	10.55	10.00	15.16	
5,641.0	17.10	40.50	5,623.2	4,348.2	188.5	-198.1	236.9	8.76	8.44	8.75	
5,672.0	18.30	41.40	5,652.7	4,377.7	195.6	-191.9	242.0	3.97	3.87	2.90	
5,704.0	20.00	42.90	5,682.9	4,407.9	203.4	-184.8	247.4	5.53	5.31	4.69	
5,735.0	21.00	43.50	5,712.0	4,437.0	211.3	-177.4	252.9	3.30	3.23	1.94	
5,767.0	23.50	43.90	5,741.6	4,466.6	220.1	-169.0	258.9	7.83	7.81	1.25	
5,798.0	26.40	42.40	5,769.7	4,494.7	229.6	-160.1	265.6	9.57	9.35	-4.84	
5,830.0	29.50	42.50	5,797.9	4,522.9	240.7	-150.0	273.3	9.69	9.69	0.31	
5,861.0	31.30	42.50	5,824.7	4,549.7	252.2	-139.4	281.4	5.81	5.81	0.00	
5,892.0	31.10	41.90	5,851.2	4,576.2	264.1	-128.6	289.7	1.19	-0.65	-1.94	
5,924.0	33.10	43.40	5,878.3	4,603.3	276.6	-117.1	298.5	6.73	6.25	4.69	
5,955.0	34.90	45.40	5,904.0	4,629.0	289.0	-104.9	306.9	6.84	5.81	6.45	
5,987.0	37.00	47.10	5,929.9	4,654.9	302.0	-91.4	315.5	7.27	6.56	5.31	
6,019.0	39.40	47.80	5,955.0	4,680.0	315.4	-76.8	324.2	7.62	7.50	2.19	
6,050.0	43.30	47.80	5,978.3	4,703.3	329.1	-61.6	333.1	12.58	12.58	0.00	
6,082.0	46.60	48.90	6,001.0	4,726.0	344.1	-44.7	342.7	10.59	10.31	3.44	
6,113.0	49.90	48.00	6,021.6	4,746.6	359.5	-27.4	352.5	10.86	10.65	-2.90	
6,145.0	52.50	46.30	6,041.6	4,766.6	376.5	-9.1	363.6	9.12	8.13	-5.31	
6,176.0	55.70	45.20	6,059.8	4,784.8	394.0	8.8	375.3	10.72	10.32	-3.55	
6,208.0	58.50	45.30	6,077.2	4,802.2	412.9	27.9	388.1	8.75	8.75	0.31	
6,239.0	61.80	45.50	6,092.6	4,817.6	431.8	47.1	400.7	10.66	10.65	0.65	
6,271.0	64.50	46.10	6,107.1	4,832.1	451.7	67.5	414.0	8.60	8.44	1.88	
6,302.0	66.70	47.20	6,119.9	4,844.9	471.0	88.1	426.8	7.80	7.10	3.55	
6,396.0	70.40	46.30	6,154.3	4,879.3	531.0	151.8	466.2	4.04	3.94	-0.96	
6,490.0	71.60	46.40	6,184.9	4,909.9	592.3	216.1	506.8	1.28	1.28	0.11	
6,584.0	71.50	45.70	6,214.6	4,939.6	654.2	280.3	548.0	0.71	-0.11	-0.74	
6,678.0	69.70	45.40	6,245.8	4,970.8	716.3	343.6	589.6	1.94	-1.91	-0.32	
6,773.0	70.80	45.80	6,277.9	5,002.9	778.9	407.4	631.5	1.22	1.16	0.42	
6,868.0	69.20	43.30	6,310.4	5,035.4	842.5	470.1	674.7	2.99	-1.68	-2.63	



PHX  
Survey Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Site Doddridge County 514095
<b>Company:</b>	EQT Production - Marcellus	<b>TVD Reference:</b>	KB@23 ft @ 1275.0usft
<b>Project:</b>	Doddridge County, VW Grid	<b>MD Reference:</b>	KB@23 ft @ 1275.0usft
<b>Site:</b>	Doddridge County 514095	<b>North Reference:</b>	Grid
<b>Well:</b>	Well #514095	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Main Wellbore		
<b>Design:</b>	514095 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)
6,962.0	70.30	43.90	6,343.0	5,068.0	906.3	530.9	718.7	1.31	1.17	0.64
7,056.0	68.20	44.10	6,376.3	5,101.3	969.6	591.9	762.1	2.24	-2.23	0.21
7,151.0	69.10	44.30	6,410.8	5,135.8	1,033.0	653.6	805.4	0.97	0.95	0.21
7,245.0	68.40	45.20	6,444.9	5,169.9	1,095.2	715.3	847.6	1.16	-0.74	0.96
7,340.0	70.10	45.20	6,478.6	5,203.6	1,157.8	778.3	889.8	1.79	1.79	0.00
7,434.0	69.20	45.70	6,511.3	5,236.3	1,219.6	841.1	931.3	1.08	-0.96	0.53
7,529.0	70.70	45.90	6,543.8	5,268.8	1,281.8	905.1	972.8	1.59	1.58	0.21
7,623.0	68.70	47.10	6,576.4	5,301.4	1,342.5	969.1	1,012.9	2.44	-2.13	1.28
7,655.0	68.80	47.30	6,588.0	5,313.0	1,362.8	990.9	1,026.1	0.66	0.31	0.63
7,686.0	69.00	47.30	6,599.2	5,324.2	1,382.4	1,012.2	1,038.9	0.65	0.65	0.00
7,718.0	69.10	45.40	6,610.6	5,335.6	1,403.0	1,033.8	1,052.6	5.55	0.31	-5.94
7,749.0	70.20	40.90	6,621.4	5,346.4	1,424.2	1,053.7	1,067.3	14.06	3.55	-14.52
7,780.0	71.10	37.10	6,631.7	5,356.7	1,447.0	1,072.1	1,083.9	11.92	2.90	-12.26
7,812.0	72.00	34.90	6,641.8	5,366.8	1,471.5	1,089.9	1,102.4	7.10	2.81	-6.88
7,843.0	73.00	32.20	6,651.2	5,376.2	1,496.2	1,106.3	1,121.4	8.91	3.23	-8.71
7,875.0	74.40	29.10	6,660.1	5,385.1	1,522.6	1,121.9	1,142.3	10.28	4.38	-9.69
7,906.0	75.10	26.50	6,668.3	5,393.3	1,549.0	1,135.9	1,163.7	8.40	2.26	-8.39
7,937.0	75.20	23.80	6,676.2	5,401.2	1,576.1	1,148.6	1,186.1	8.42	0.32	-8.71
7,969.0	74.40	21.60	6,684.6	5,409.6	1,604.6	1,160.5	1,210.0	7.09	-2.50	-6.88
8,000.0	74.60	19.50	6,692.9	5,417.9	1,632.6	1,171.0	1,233.9	6.56	0.65	-6.77
8,032.0	75.80	18.20	6,701.1	5,426.1	1,661.9	1,181.0	1,259.1	5.43	3.75	-4.06
8,063.0	76.70	16.30	6,708.5	5,433.5	1,690.6	1,189.9	1,284.2	6.62	2.90	-6.13
8,095.0	77.20	14.40	6,715.7	5,440.7	1,720.7	1,198.2	1,310.7	5.99	1.56	-5.94
8,127.0	78.00	12.00	6,722.6	5,447.6	1,751.1	1,205.3	1,337.8	7.74	2.50	-7.50
8,158.0	79.00	10.10	6,728.7	5,453.7	1,780.9	1,211.1	1,364.8	6.82	3.23	-6.13
8,190.0	79.30	7.70	6,734.8	5,459.8	1,812.0	1,216.0	1,393.2	7.43	0.94	-7.50
8,221.0	80.10	5.00	6,740.3	5,465.3	1,842.3	1,219.4	1,421.3	8.95	2.58	-8.71
8,252.0	81.10	2.70	6,745.4	5,470.4	1,872.8	1,221.4	1,450.0	8.00	3.23	-7.42
8,284.0	81.80	0.50	6,750.1	5,475.1	1,904.4	1,222.3	1,480.0	7.14	2.19	-6.88
8,316.0	81.50	358.20	6,754.8	5,479.8	1,936.1	1,221.9	1,510.5	7.17	-0.94	-7.19
<b>Top of Marecillus@6758' TVD</b>										
8,338.2	81.78	356.48	6,758.0	5,483.0	1,958.0	1,220.9	1,531.8	7.77	1.28	-7.74
8,347.0	81.90	355.80	6,759.3	5,484.3	1,966.7	1,220.3	1,540.3	7.77	1.31	-7.74
8,379.0	83.30	353.60	6,763.4	5,488.4	1,998.3	1,217.4	1,571.5	8.10	4.38	-6.88
8,410.0	84.80	350.50	6,766.6	5,491.6	2,028.8	1,213.1	1,602.0	11.06	4.84	-10.00
8,442.0	86.10	348.80	6,769.1	5,494.1	2,060.2	1,207.4	1,633.7	6.67	4.06	-5.31
8,473.0	87.00	346.90	6,771.0	5,496.0	2,090.5	1,200.9	1,664.5	6.77	2.90	-6.13
8,504.0	87.50	343.70	6,772.5	5,497.5	2,120.4	1,193.0	1,695.5	10.44	1.61	-10.32
8,536.0	87.70	340.50	6,773.8	5,498.8	2,150.8	1,183.2	1,727.4	10.01	0.63	-10.00
8,568.0	87.10	337.90	6,775.3	5,500.3	2,180.7	1,171.9	1,759.3	8.33	-1.88	-8.13
8,599.0	85.80	335.00	6,777.2	5,502.2	2,209.1	1,159.5	1,790.0	10.24	-4.19	-9.35
8,662.0	86.00	335.00	6,781.7	5,506.7	2,266.0	1,132.9	1,852.1	0.32	0.32	0.00
8,756.0	90.60	336.40	6,784.5	5,509.5	2,351.6	1,094.3	1,945.2	5.11	4.89	1.49

<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Site Doddridge County 514095
<b>Company:</b>	EQT Production - Marcellus	<b>TVD Reference:</b>	KB@23 ft @ 1275.0usft
<b>Project:</b>	Doddridge County, WV Grid	<b>MD Reference:</b>	KB@23 ft @ 1275.0usft
<b>Site:</b>	Doddridge County 514095	<b>North Reference:</b>	Grid
<b>Well:</b>	Well #514095	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Main Wellbore		
<b>Design:</b>	514095 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)
8,844.0	90.90	334.40	6,783.3	5,508.3	2,431.6	1,057.7	2,032.3	2.30	0.34	-2.27
8,938.0	90.90	334.50	6,781.9	5,506.9	2,516.4	1,017.1	2,125.1	0.11	0.00	0.11
9,033.0	90.90	334.53	6,780.4	5,505.4	2,602.2	976.3	2,218.9	0.03	0.00	0.03
9,127.0	90.81	334.27	6,779.0	5,504.0	2,687.0	935.6	2,311.7	0.29	-0.10	-0.28
9,221.0	90.90	335.06	6,777.6	5,502.6	2,771.9	895.4	2,404.6	0.85	0.10	0.84
9,316.0	90.82	334.84	6,776.1	5,501.1	2,858.0	855.2	2,498.5	0.25	-0.08	-0.23
9,412.0	90.90	335.77	6,774.7	5,499.7	2,945.2	815.1	2,593.5	0.97	0.08	0.97
9,506.0	90.72	333.56	6,773.4	5,498.4	3,030.1	774.9	2,686.4	2.36	-0.19	-2.35
9,600.0	90.54	334.84	6,772.3	5,497.3	3,114.7	734.0	2,779.1	1.38	-0.19	1.36
9,695.0	90.81	334.84	6,771.2	5,496.2	3,200.7	693.6	2,873.0	0.28	0.28	0.00
9,789.0	90.90	334.45	6,769.8	5,494.8	3,285.7	653.3	2,965.9	0.43	0.10	-0.41
9,884.0	90.81	334.75	6,768.4	5,493.4	3,371.5	612.6	3,059.7	0.33	-0.09	0.32
9,978.0	90.81	335.37	6,767.1	5,492.1	3,456.7	573.0	3,152.7	0.66	0.00	0.66
10,072.0	90.81	334.67	6,765.7	5,490.7	3,541.9	533.3	3,245.6	0.74	0.00	-0.74
10,167.0	90.81	334.75	6,764.4	5,489.4	3,627.8	492.7	3,339.5	0.08	0.00	0.08
10,262.0	90.90	334.53	6,763.0	5,488.0	3,713.6	452.0	3,433.3	0.25	0.09	-0.23
10,356.0	90.72	334.45	6,761.6	5,486.6	3,798.4	411.5	3,526.1	0.21	-0.19	-0.09
10,450.0	90.99	336.16	6,760.2	5,485.2	3,883.8	372.3	3,619.2	1.84	0.29	1.82
10,545.0	91.12	334.36	6,758.5	5,483.5	3,970.1	332.5	3,713.2	1.90	0.14	-1.89
10,639.0	91.60	336.03	6,756.3	5,481.3	4,055.4	293.1	3,806.1	1.85	0.51	1.78
10,734.0	91.78	334.67	6,753.5	5,478.5	4,141.7	253.5	3,900.1	1.44	0.19	-1.43
10,828.0	91.91	335.86	6,750.4	5,475.4	4,227.0	214.2	3,993.1	1.27	0.14	1.27
10,923.0	91.78	335.15	6,747.4	5,472.4	4,313.4	174.8	4,087.1	0.76	-0.14	-0.75
11,017.0	91.30	335.46	6,744.8	5,469.8	4,398.8	135.6	4,180.1	0.61	-0.51	0.33
11,112.0	91.30	335.15	6,742.7	5,467.7	4,485.1	95.9	4,274.1	0.33	0.00	-0.33
11,206.0	91.30	335.06	6,740.6	5,465.6	4,570.3	56.3	4,367.1	0.10	0.00	-0.10
11,300.0	91.38	335.15	6,738.4	5,463.4	4,655.6	16.8	4,460.0	0.13	0.09	0.10
11,395.0	91.78	334.75	6,735.7	5,460.7	4,741.6	-23.5	4,553.9	0.60	0.42	-0.42
11,489.0	91.91	335.63	6,732.7	5,457.7	4,826.9	-62.9	4,646.9	0.95	0.14	0.94
11,583.0	91.91	334.93	6,729.6	5,454.6	4,912.2	-102.2	4,739.8	0.74	0.00	-0.74
11,678.0	91.69	335.06	6,726.6	5,451.6	4,998.3	-142.3	4,833.7	0.27	-0.23	0.14
11,772.0	91.30	334.53	6,724.1	5,449.1	5,083.3	-182.3	4,926.6	0.70	-0.41	-0.56
11,866.0	91.38	335.94	6,721.9	5,446.9	5,168.6	-221.7	5,019.6	1.50	0.09	1.50
11,961.0	91.38	336.25	6,719.7	5,444.7	5,255.4	-260.2	5,113.8	0.33	0.00	0.33
12,055.0	91.38	334.93	6,717.4	5,442.4	5,341.0	-299.0	5,206.8	1.40	0.00	-1.40
12,149.0	91.30	335.55	6,715.2	5,440.2	5,426.4	-338.4	5,299.8	0.66	-0.09	0.66
12,243.0	91.38	335.15	6,713.0	5,438.0	5,511.8	-377.6	5,392.8	0.43	0.09	-0.43
12,337.0	91.30	335.15	6,710.8	5,435.8	5,597.0	-417.0	5,485.8	0.09	-0.09	0.00
12,431.0	91.38	336.43	6,708.6	5,433.6	5,682.7	-455.6	5,578.9	1.36	0.09	1.36
12,525.0	91.38	335.94	6,706.3	5,431.3	5,768.7	-493.5	5,672.1	0.52	0.00	-0.52
12,619.0	91.38	334.75	6,704.1	5,429.1	5,854.1	-532.7	5,765.1	1.27	0.00	-1.27
12,713.0	91.52	335.37	6,701.7	5,426.7	5,939.3	-572.3	5,858.1	0.68	0.15	0.66

<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Site Doddridge County 514095
<b>Company:</b>	EQT Production - Marcellus	<b>TVD Reference:</b>	KB@23 ft @ 1275.0usft
<b>Project:</b>	Doddridge County, WV Grid	<b>MD Reference:</b>	KB@23 ft @ 1275.0usft
<b>Site:</b>	Doddridge County 514095	<b>North Reference:</b>	Grid
<b>Well:</b>	Well #514095	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Main Wellbore		
<b>Design:</b>	514095 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)
12,808.0	91.38	334.36	6,699.3	5,424.3	6,025.3	-612.7	5,952.0	1.07	-0.15	-1.06
12,902.0	91.30	334.14	6,697.1	5,422.1	6,109.9	-653.5	6,044.7	0.25	-0.09	-0.23
12,997.0	91.38	333.83	6,694.9	5,419.9	6,195.3	-695.2	6,138.4	0.34	0.08	-0.33
13,092.0	91.30	334.75	6,692.6	5,417.6	6,280.9	-736.4	6,232.1	0.97	-0.08	0.97
13,186.0	91.38	333.83	6,690.5	5,415.5	6,365.5	-777.1	6,324.9	0.98	0.09	-0.98
13,280.0	91.30	332.95	6,688.3	5,413.3	6,449.6	-819.2	6,417.4	0.94	-0.09	-0.94
13,375.0	91.20	333.96	6,686.2	5,411.2	6,534.5	-861.7	6,510.9	1.07	-0.11	1.06
13,469.0	91.20	333.83	6,684.2	5,409.2	6,618.9	-903.0	6,603.5	0.14	0.00	-0.14
13,564.0	91.30	334.36	6,682.1	5,407.1	6,704.3	-944.5	6,697.2	0.57	0.11	0.56
13,658.0	91.38	335.77	6,679.9	5,404.9	6,789.6	-984.1	6,790.1	1.50	0.09	1.50
13,752.0	91.52	335.55	6,677.6	5,402.6	6,875.2	-1,022.9	6,883.2	0.28	0.15	-0.23
13,847.0	91.30	335.37	6,675.2	5,400.2	6,961.6	-1,062.3	6,977.3	0.30	-0.23	-0.19
13,942.0	91.52	335.55	6,672.9	5,397.9	7,048.0	-1,101.8	7,071.3	0.30	0.23	0.19
14,036.0	91.78	334.45	6,670.2	5,395.2	7,133.1	-1,141.5	7,164.2	1.20	0.28	-1.17
14,130.0	91.78	335.86	6,667.3	5,392.3	7,218.4	-1,180.9	7,257.2	1.50	0.00	1.50
14,224.0	91.91	335.46	6,664.2	5,389.2	7,304.0	-1,219.7	7,350.2	0.45	0.14	-0.43
14,318.0	90.99	333.74	6,661.9	5,386.9	7,388.9	-1,260.0	7,443.0	2.07	-0.98	-1.83
14,413.0	92.09	333.56	6,659.3	5,384.3	7,474.0	-1,302.1	7,536.6	1.17	1.16	-0.19
14,507.0	92.49	334.53	6,655.5	5,380.5	7,558.4	-1,343.2	7,629.2	1.12	0.43	1.03
14,601.0	92.89	336.03	6,651.1	5,376.1	7,643.7	-1,382.5	7,722.2	1.65	0.43	1.60
14,696.0	92.89	336.34	6,646.3	5,371.3	7,730.5	-1,420.8	7,816.3	0.33	0.00	0.33
14,790.0	92.89	336.56	6,641.6	5,366.6	7,816.6	-1,458.3	7,909.4	0.23	0.00	0.23
14,885.0	92.62	335.06	6,637.0	5,362.0	7,903.1	-1,497.2	8,003.4	1.60	-0.28	-1.58
14,980.0	92.31	336.16	6,633.0	5,358.0	7,989.5	-1,536.4	8,097.4	1.20	-0.33	1.16
15,074.0	91.12	335.21	6,630.1	5,355.1	8,075.2	-1,575.1	8,190.5	1.62	-1.27	-1.01
15,169.0	90.41	335.46	6,628.9	5,353.9	8,161.5	-1,614.7	8,284.5	0.79	-0.75	0.26
15,264.0	90.01	335.06	6,628.5	5,353.5	8,247.8	-1,654.5	8,378.5	0.60	-0.42	-0.42
15,359.0	89.79	335.77	6,628.7	5,353.7	8,334.2	-1,694.0	8,472.6	0.78	-0.23	0.75
15,454.0	89.31	335.46	6,629.4	5,354.4	8,420.7	-1,733.2	8,566.7	0.60	-0.51	-0.33
15,548.0	89.88	335.63	6,630.1	5,355.1	8,506.2	-1,772.1	8,659.8	0.63	0.61	0.18
15,643.0	89.88	336.74	6,630.3	5,355.3	8,593.2	-1,810.5	8,754.0	1.17	0.00	1.17
15,738.0	90.01	336.25	6,630.4	5,355.4	8,680.3	-1,848.4	8,848.3	0.53	0.14	-0.52
15,833.0	90.10	336.43	6,630.3	5,355.3	8,767.3	-1,886.5	8,942.5	0.21	0.09	0.19
15,927.0	90.50	337.13	6,629.8	5,354.8	8,853.7	-1,923.6	9,035.9	0.86	0.43	0.74
16,023.0	88.82	334.75	6,630.4	5,355.4	8,941.3	-1,962.7	9,131.0	3.03	-1.75	-2.48
16,118.0	86.48	334.75	6,634.3	5,359.3	9,027.2	-2,003.2	9,224.8	2.46	-2.46	0.00
16,213.0	87.80	334.45	6,639.0	5,364.0	9,112.9	-2,043.9	9,318.5	1.42	1.39	-0.32
16,307.0	87.98	334.84	6,642.5	5,367.5	9,197.8	-2,084.1	9,411.3	0.46	0.19	0.41
16,402.0	87.40	335.15	6,646.3	5,371.3	9,283.8	-2,124.2	9,505.2	0.69	-0.61	0.33
16,496.0	87.72	335.63	6,650.3	5,375.3	9,369.2	-2,163.3	9,598.2	0.61	0.34	0.51
16,592.0	88.69	335.15	6,653.3	5,378.3	9,456.4	-2,203.3	9,693.2	1.13	1.01	-0.50
16,687.0	89.40	335.55	6,654.9	5,379.9	9,542.7	-2,242.9	9,787.2	0.86	0.75	0.42
16,782.0	89.48	334.36	6,655.8	5,380.8	9,628.8	-2,283.1	9,881.1	1.26	0.08	-1.25



PHX  
Survey Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Site Doddridge County 514095
<b>Company:</b>	EQT Production - Marcellus	<b>TVD Reference:</b>	KB@23 ft @ 1275.0usft
<b>Project:</b>	Doddridge County, WV Grid	<b>MD Reference:</b>	KB@23 ft @ 1275.0usft
<b>Site:</b>	Doddridge County 514095	<b>North Reference:</b>	Grid
<b>Well:</b>	Well #514095	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Main Wellbore		
<b>Design:</b>	514095 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)
16,877.0	89.48	335.55	6,656.7	5,381.7	9,714.9	-2,323.3	9,975.0	1.25	0.00	1.25
16,973.0	89.48	336.25	6,657.6	5,382.6	9,802.5	-2,362.5	10,070.2	0.73	0.00	0.73
17,068.0	89.70	334.53	6,658.2	5,383.2	9,888.9	-2,402.1	10,164.2	1.83	0.23	-1.81
17,162.0	88.82	333.74	6,659.4	5,384.4	9,973.4	-2,443.1	10,256.9	1.26	-0.94	-0.84
17,257.0	89.00	334.27	6,661.3	5,386.3	10,058.8	-2,484.7	10,350.6	0.59	0.19	0.56
17,351.0	88.82	334.53	6,663.0	5,388.0	10,143.6	-2,525.3	10,443.4	0.34	-0.19	0.28
17,446.0	89.09	335.15	6,664.8	5,389.8	10,229.5	-2,565.7	10,537.3	0.71	0.28	0.65
17,540.0	88.82	334.75	6,666.5	5,391.5	10,314.7	-2,605.5	10,630.2	0.51	-0.29	-0.43
17,635.0	88.69	334.27	6,668.6	5,393.6	10,400.4	-2,646.4	10,724.0	0.52	-0.14	-0.51
17,730.0	89.22	335.06	6,670.3	5,395.3	10,486.3	-2,687.0	10,817.9	1.00	0.56	0.83
17,825.0	88.82	334.36	6,671.9	5,396.9	10,572.1	-2,727.6	10,911.7	0.85	-0.42	-0.74
17,919.0	89.22	334.27	6,673.5	5,398.5	10,656.8	-2,768.3	11,004.5	0.44	0.43	-0.10
18,014.0	89.88	335.94	6,674.3	5,399.3	10,743.0	-2,808.3	11,098.5	1.89	0.69	1.76
18,109.0	88.91	334.14	6,675.3	5,400.3	10,829.1	-2,848.4	11,192.4	2.15	-1.02	-1.89
18,204.0	89.31	334.84	6,676.7	5,401.7	10,914.8	-2,889.3	11,286.2	0.85	0.42	0.74
18,298.0	89.31	333.83	6,677.9	5,402.9	10,999.6	-2,930.0	11,379.0	1.07	0.00	-1.07
18,393.0	89.22	335.77	6,679.1	5,404.1	11,085.5	-2,970.5	11,472.9	2.04	-0.09	2.04
18,487.0	89.09	336.03	6,680.5	5,405.5	11,171.3	-3,008.9	11,566.0	0.31	-0.14	0.28
18,582.0	89.31	335.55	6,681.8	5,406.8	11,257.9	-3,047.8	11,660.2	0.56	0.23	-0.51
18,677.0	89.48	336.43	6,682.8	5,407.8	11,344.7	-3,086.5	11,754.3	0.94	0.18	0.93
18,772.0	89.09	335.24	6,684.0	5,409.0	11,431.4	-3,125.3	11,848.5	1.32	-0.41	-1.25
18,867.0	89.09	334.14	6,685.5	5,410.5	11,517.3	-3,166.0	11,942.3	1.16	0.00	-1.16
18,962.0	89.40	333.65	6,686.8	5,411.8	11,602.6	-3,207.8	12,036.0	0.61	0.33	-0.52
19,057.0	88.91	333.03	6,688.2	5,413.2	11,687.4	-3,250.4	12,129.4	0.83	-0.52	-0.65
19,152.0	89.22	334.84	6,689.7	5,414.7	11,772.8	-3,292.1	12,223.1	1.93	0.33	1.91
19,247.0	89.09	334.36	6,691.1	5,416.1	11,858.6	-3,332.9	12,316.9	0.52	-0.14	-0.51
19,342.0	89.00	334.36	6,692.7	5,417.7	11,944.2	-3,374.0	12,410.7	0.09	-0.09	0.00
19,436.0	89.00	334.53	6,694.3	5,419.3	12,029.0	-3,414.5	12,503.5	0.18	0.00	0.18
19,531.0	89.00	334.14	6,696.0	5,421.0	12,114.6	-3,455.6	12,597.3	0.41	0.00	-0.41
19,626.0	89.00	334.45	6,697.7	5,422.7	12,200.2	-3,496.8	12,691.0	0.33	0.00	0.33
19,721.0	89.00	334.05	6,699.3	5,424.3	12,285.8	-3,538.1	12,784.8	0.42	0.00	-0.42
<b>Final Survey=19753' MD/ 6700' TVD</b>										
19,753.0	89.00	334.05	6,699.9	5,424.9	12,314.5	-3,552.1	12,816.3	0.00	0.00	0.00
<b>Projection to TD=20294' MD/ 6709' TVD</b>										
20,294.0	89.00	334.05	6,709.3	5,434.3	12,800.9	-3,788.8	13,349.8	0.00	0.00	0.00

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
8,338.1	6,758.0	Top of Marecllus@6758' TVD		0.00	



PHX  
Survey Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Site Doddridge County 514095
<b>Company:</b>	EQT Production - Marcellus	<b>TVD Reference:</b>	KB@23 ft @ 1275.0usft
<b>Project:</b>	Doddridge County, WV Grid	<b>MD Reference:</b>	KB@23 ft @ 1275.0usft
<b>Site:</b>	Doddridge County 514095	<b>North Reference:</b>	Grid
<b>Well:</b>	Well #514095	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Main Wellbore		
<b>Design:</b>	514095 As Drilled Surveys		

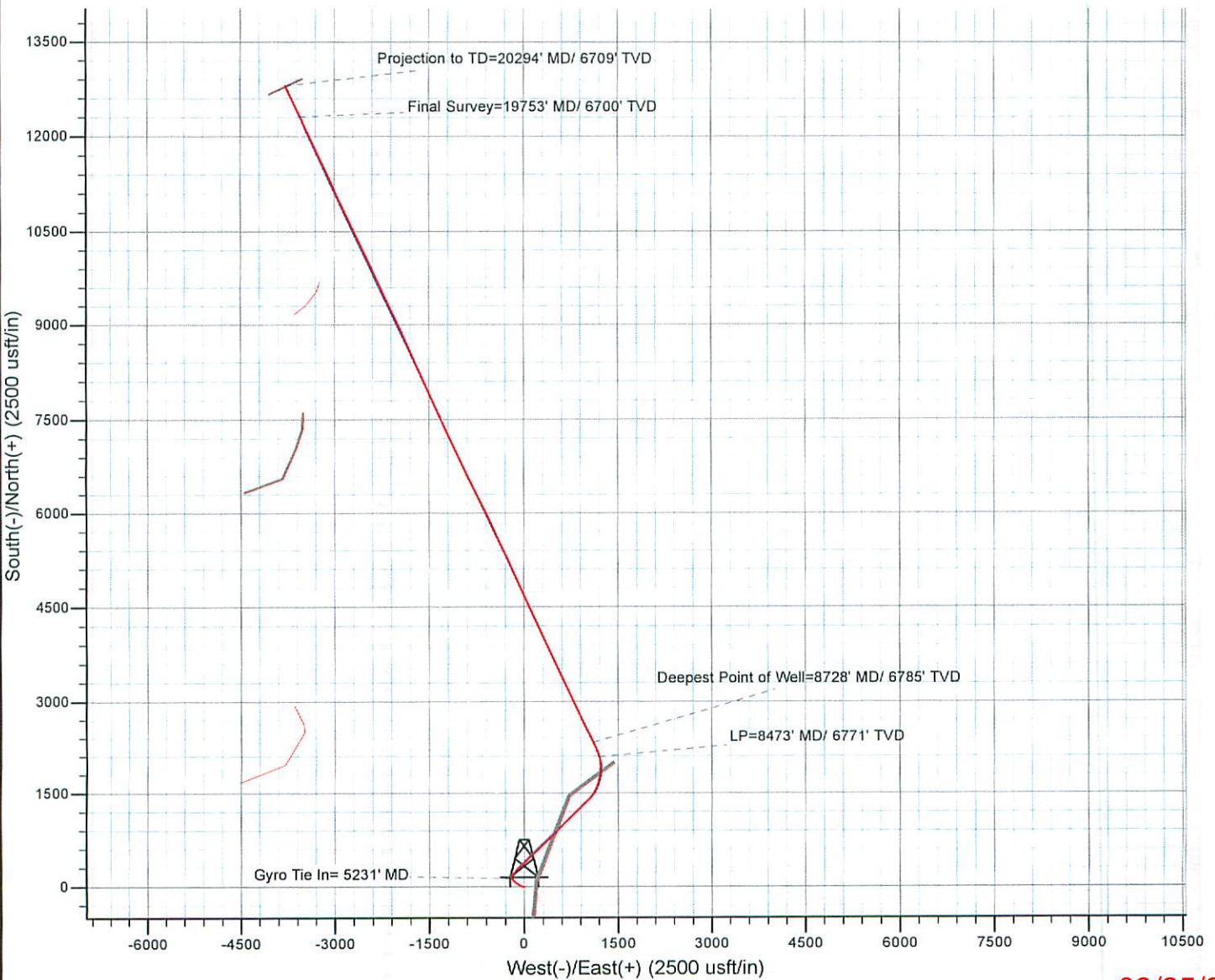
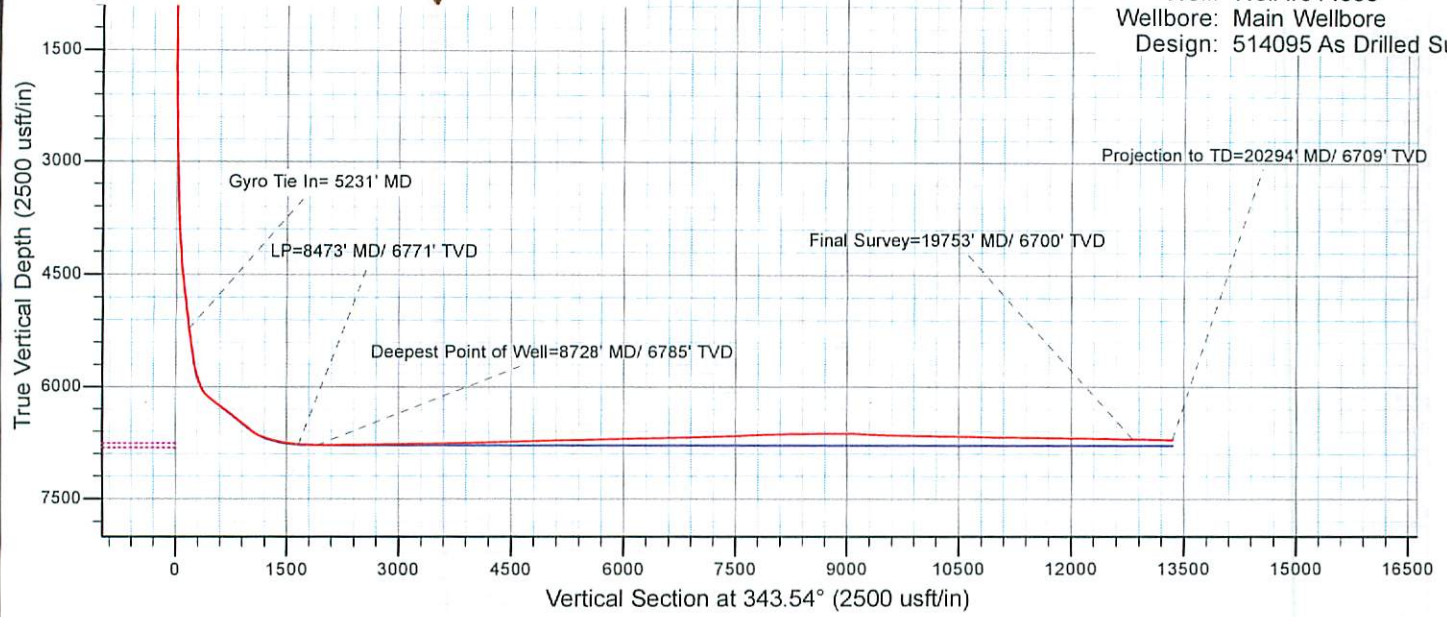
Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,231.1	5,219.5	127.7	-196.4	Gyro Tie In= 5231' MD
19,753.0	6,699.9	12,314.5	-3,552.1	Final Survey=19753' MD/ 6700' TVD
20,294.0	6,709.3	12,800.9	-3,788.8	Projection to TD=20294' MD/ 6709' TVD

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





Project: Doddridge County, WV Grid  
 Site: Doddridge County 514095  
 Well: Well #514095  
 Wellbore: Main Wellbore  
 Design: 514095 As Drilled Surveys



## 514095 - 47-017-06507-0000 - Perforations

Stage Number	Perforation Date	Top Perf Depth (ftKB)	Bottom Perf Depth (ftKB)	Number of Shots	Formation
Initiation Sleeve	7/25/2015	20,278.43	20,280.00	10	MARCELLUS
1	7/29/2015	20,133.00	20,256.00	42	MARCELLUS
2	7/29/2015	19,953.00	20,075.00	42	MARCELLUS
2.1	7/30/2015	19,980.00	20,032.00	28	MARCELLUS
3	7/30/2015	19,773.00	19,893.00	42	MARCELLUS
4	7/30/2015	19,593.00	19,715.00	42	MARCELLUS
5	7/30/2015	19,413.00	19,535.00	42	MARCELLUS
6	7/31/2015	19,233.00	19,355.00	42	MARCELLUS
7	7/31/2015	19,053.00	19,175.00	42	MARCELLUS
8	7/31/2015	18,873.00	18,995.00	42	MARCELLUS
9	8/1/2015	18,693.00	18,815.00	42	MARCELLUS
10	8/1/2015	18,513.00	18,635.00	42	MARCELLUS
11	8/1/2015	18,333.00	18,455.00	42	MARCELLUS
12	8/2/2015	18,153.00	18,275.00	42	MARCELLUS
13	8/2/2015	17,973.00	18,095.00	42	MARCELLUS
14	8/2/2015	17,793.00	17,915.00	42	MARCELLUS
15	8/2/2015	17,613.00	17,735.00	42	MARCELLUS
16	8/2/2015	17,433.00	17,555.00	42	MARCELLUS
17	8/3/2015	17,253.00	17,375.00	42	MARCELLUS
18	8/3/2015	17,073.00	17,193.00	42	MARCELLUS
19	8/3/2015	16,893.00	17,015.00	42	MARCELLUS
20	8/4/2015	16,713.00	16,835.00	42	MARCELLUS
21	8/4/2015	16,533.00	16,655.00	42	MARCELLUS
22	8/4/2015	16,353.00	16,475.00	42	MARCELLUS
23	8/4/2015	16,173.00	16,295.00	42	MARCELLUS
24	8/5/2015	15,993.00	16,115.00	42	MARCELLUS
25	8/5/2015	15,813.00	15,935.00	42	MARCELLUS
26	8/5/2015	15,633.00	15,755.00	42	MARCELLUS
27	8/5/2015	15,453.00	15,573.00	42	MARCELLUS
28	8/6/2015	15,273.00	15,395.00	42	MARCELLUS
29	8/6/2015	15,093.00	15,215.00	42	MARCELLUS
30	8/6/2015	14,913.00	15,035.00	42	MARCELLUS
31	8/7/2015	14,733.00	14,855.00	42	MARCELLUS
31.1	8/7/2015	14,703.00	14,763.00	28	MARCELLUS
32	8/7/2015	14,523.00	14,645.00	42	MARCELLUS
33	8/7/2015	14,343.00	14,465.00	42	MARCELLUS
34	8/8/2015	14,163.00	14,285.00	42	MARCELLUS
35	8/8/2015	13,983.00	14,105.00	42	MARCELLUS
36	8/8/2015	13,803.00	13,925.00	42	MARCELLUS
37	8/8/2015	13,623.00	13,745.00	42	MARCELLUS
38	8/9/2015	13,443.00	13,565.00	42	MARCELLUS
39	8/9/2015	13,263.00	13,388.00	42	MARCELLUS
40	8/9/2015	13,083.00	13,205.00	42	MARCELLUS
41	8/10/2015	12,903.00	13,025.00	42	MARCELLUS
42	8/10/2015	12,723.00	12,845.00	42	MARCELLUS
43	8/10/2015	12,543.00	12,665.00	42	MARCELLUS
43.1	8/11/2015	12,503.00	12,536.60	28	MARCELLUS
44	8/11/2015	12,363.00	12,470.00	42	MARCELLUS
45	8/11/2015	12,183.00	12,305.00	42	MARCELLUS
46	8/12/2015	12,004.00	12,125.00	42	MARCELLUS
47	8/12/2015	11,823.00	11,943.00	42	MARCELLUS
48	8/13/2015	11,643.00	11,765.00	42	MARCELLUS
49	8/13/2015	11,463.00	11,585.00	42	MARCELLUS
50	8/13/2015	11,283.00	11,405.00	42	MARCELLUS
51	8/14/2015	11,103.00	11,223.00	42	MARCELLUS
52	8/15/2015	10,923.00	11,043.00	42	MARCELLUS
53	8/15/2015	10,743.00	10,863.00	42	MARCELLUS
54	8/15/2015	10,563.00	10,683.00	42	MARCELLUS
55	8/15/2015	10,383.00	10,505.00	42	MARCELLUS
56	8/15/2015	10,203.00	10,327.00	42	MARCELLUS
57	8/16/2015	10,023.00	10,145.00	42	MARCELLUS
58	8/16/2015	9,843.00	9,965.00	42	MARCELLUS
59	8/16/2015	9,663.00	9,783.00	42	MARCELLUS
60	8/16/2015	9,483.00	9,603.00	42	MARCELLUS
61	8/16/2015	9,303.00	9,425.00	42	MARCELLUS
61.01	8/17/2015	9,273.00	9,335.00	42	MARCELLUS
62	8/17/2015	9,123.00	9,245.00	42	MARCELLUS
63	8/17/2015	8,943.00	9,065.00	42	MARCELLUS
64	8/17/2015	8,763.00	8,883.00	42	MARCELLUS
65	8/17/2015	8,583.00	8,703.00	42	MARCELLUS
65.1	8/18/2015	8,613.00	8,673.00	42	MARCELLUS
66	8/18/2015	8,403.00	8,523.00	42	MARCELLUS
67	8/19/2015	8,223.00	8,345.00	42	MARCELLUS

03/25/2016

## 514095 - 47-017-06507-0000- 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)
1	7/29/2015	76.4	8,632.00	8,913.00	4,258.00	300,940	10303	0
2	7/29/2015	0	0.00	0.00	0.00	2,047	4185	0
2.1	7/30/2015	0	0.00	0.00	0.00	0	772	0
3	7/30/2015	80.7	8,249.00	8,804.00	3,658.00	500,422	12058	0
4	7/31/2015	75.6	8,231.00	8,977.00	4,566.00	298,542	8546	0
5	7/31/2015	80.5	8,164.00	8,359.00	3,893.00	303,298	8306	0
6	7/31/2015	83	8,308.00	8,734.00	4,428.00	303,113	7872	0
7	7/31/2015	84.6	8,226.00	9,856.00	3,980.00	300,641	7502	0
8.01	8/1/2015	0	0.00	0.00	0.00	0	3625	0
8	8/1/2015	84.7	8,299.00	8,544.00	4,488.00	301,822	7885	0
9	8/1/2015	84.5	8,277.00	8,836.00	4,279.00	300,507	7771	0
10	8/1/2015	87.5	8,363.00	8,768.00	3,871.00	299,217	7954	0
11	8/2/2015	91.6	8,316.00	8,619.00	4,743.00	299,496	8433	0
12	8/2/2015	88.5	8,025.00	8,563.00	4,990.00	300,737	7819	0
13	8/2/2015	90.7	8,281.00	8,988.00	4,932.00	360,291	9026	0
14	8/2/2015	91.4	8,270.00	8,931.00	5,137.00	357,692	8680	0
15	8/3/2015	88.1	8,270.00	8,641.00	4,176.00	359,366	9008	0
16	8/3/2015	88.3	8,087.00	8,397.00	4,423.00	358,796	8998	0
17	8/3/2015	93.2	8,416.00	8,747.00	5,210.00	360,612	8767	0
18	8/3/2015	91.5	8,237.00	8,609.00	4,501.00	358,086	8722	0
19	8/4/2015	88.9	8,335.00	8,652.00	4,562.00	358,483	8895	0
20	8/4/2015	92.10	8,402.00	8,655.00	5,073	361,159	8,488	0
21	8/4/2015	88.30	8,252.00	8,923.00	5,208	360,002	8,751	0
22	8/5/2015	93.70	8,465.00	8,914.00	4,678	359,769	8,971	0
23	8/5/2015	92.90	8,429.00	8,774.00	4,628	360,231	8,478	0
24	8/5/2015	95.30	8,748.00	9,354.00	4,131	350,268	8,618	0
25	8/5/2015	95.40	8,705.00	9,143.00	3,821	357,433	8,541	0
26	8/5/2015	99.30	8,509.00	8,813.00	3,793	356,280	8,745	0
27	8/5/2015	83.6	8,571.00	9,681.00	7,078.00	359,337	8821	0
28	8/6/2015	90.5	8,719.00	9,228.00	5,097.00	359,111	8967	0
29	8/6/2015	94.9	8,595.00	8,876.00	4,510.00	352,206	8780	0
30	8/7/2015	95.3	8,476.00	8,838.00	4,438.00	360,867	8826	0
31	8/7/2015	91.40	8,635.00	9,121.00	5,028	189,797	7,413	0
31.1	8/7/2015	0.00	0.00	0.00	0	179,877	8,701	0
32	8/7/2015	100.80	8,317.00	8,548.00	5,085	359,060	8,714	0
33	8/8/2015	98.60	8,465.00	8,782.00	5,325	358,619	8,636	0
34	8/8/2015	100.90	8,347.00	9,076.00	5,269	348,307	8,222	0
35	8/8/2015	100.50	8,118.00	9,237.00	4,793	358,331	8,423	0
36	8/8/2015	97.60	8,436.00	9,185.00	4,881	340,302	8,467	0
37	8/8/2015	99.30	8,195.00	8,502.00	4,821	360,376	9,259	0
38	8/9/2015	91.80	8,643.00	9,160.00	5,045	320,152	7,788	0
39	8/9/2015	97.10	8,201.00	8,711.00	4,166	358,602	8,710	0
40	8/10/2015	98.10	8,216.00	8,583.00	4,565	361,813	8,706	0
41	8/10/2015	100.50	8,322.00	8,868.00	4,522	359,332	8,816	0
42	8/10/2015	92.10	8,356.00	9,229.00	5,420	341,904	10,612	0
43	8/10/2015	87.70	8,535.00	9,160.00	5,097	83,960	6,724	0
43.1	8/11/2015	0.00	0.00	0.00	0	109,274	5,034	0
44	8/11/2015	96.30	8,578.00	9,232.00	4,570	361,696	9,555	0
45	8/11/2015	89.10	8,176.00	8,858.00	5,351	364,751	8,741	0
46	8/12/2015	91.80	8,106.00	9,263.00	5,008	359,420	9,442	0
47	8/12/2015	91.40	8,583.00	9,273.00	4,984	344,646	8,590	0
48	8/13/2015	91.30	8,235.00	9,022.00	5,040	353,228	8,619	0
49	8/13/2015	90.80	8,212.00	9,545.00	4,887	312,803	8,505	0
50	8/13/2015	89.90	8,142.00	9,703.00	6,097	322,277	9,854	0
51	8/15/2015	91.40	8,089.00	8,731.00	5,243	346,546	8,163	0
52	8/15/2015	97.30	8,243.00	8,496.00	4,968	358,985	8,466	0
53	8/15/2015	95.80	8,315.00	8,644.00	4,803	358,090	8,436	0
54	8/15/2015	95.50	8,316.00	8,750.00	4,579	361,895	8,471	0
55	8/15/2015	93.70	8,023.00	9,039.00	4,827	295,787	9,255	0
56	8/16/2015	99.70	8,212.00	8,380.00	4,868	361,067	8,381	0
57	8/16/2015	99.50	8,180.00	8,658.00	4,679	361,435	8,563	0
58	8/16/2015	96.90	8,219.00	8,882.00	5,172	358,411	8,493	0
59	8/16/2015	97.00	8,164.00	9,018.00	5,206	335,297	7,837	0
60	8/16/2015	96.40	7,955.00	8,744.00	4,971	360,363	8,131	0
61	8/16/2015	0.00	0.00	0	0	501,565	14,265	0
61.01	8/17/2015	0.00	0.00	0.00	0	0	200	0
62	8/17/2015	99.50	8,208.00	9,205.00	4,609	0	0	0
63	8/17/2015	94.90	8,130.00	8,446.00	4,284	360,576	7,840	0
64	8/17/2015	98.60	7,863.00	8,679.00	4,778	360,839	8,270	0
65	8/17/2015	95.10	7,723.00	9,900.00	5,044	361,954	1,346	0
65.01	8/17/2015	0.00	0.00	0.00	0	0	1,331	0
65.1	8/18/2015	0.00	0.00	0.00	0	0	8,609	0
66.01	8/18/2015	0.00	0.00	0.00	0	0	2,857	0
66	8/19/2015	99.30	7,516.00	7,892.00	5,778	364,729	8,153	0
67	8/19/2015	100.30	7,277.00	8,692.00	5,023	359,070	8,019	0

03/25/2016

# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	7/26/2015
Job End Date:	8/19/2015
State:	West Virginia
County:	Doddridge
API Number:	47-017-06507-00-00
Operator Name:	EQT Production
Well Name and Number:	514095
Longitude:	-80.76208900
Latitude:	39.20783500
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	6,766
Total Base Water Volume (gal):	24,936,660
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	FTS International	Carrier/Base Fluid	Water	7732-18-5	100.00000	89.85999	None
Sand (Proppant)	FTS International	Proppant	Crystalline Silica	14808-60-7	100.00000	9.76598	None
MC MX 437-5	Multi-Chem Group LLC	Calcium nitrate solution	Calcium nitrate	10124-37-5	60.00000	0.05831	None
FRW-900	FTS International	Friction reducer	Hydrotreated light distillate	64742-47-8	30.00000	0.02421	None
			Alkyl Alcohol	Proprietary	10.00000	0.00807	None
			Oxyalkylated alcohol A	Proprietary	5.00000	0.00404	None
Hydrochloric Acid (15%)	FTS International	Acidizing	Hydrochloric Acid	7647-01-0	15.00000	0.02516	None
CS-500-SI	FTS International	Scale inhibitor	Ethylene glycol	107-21-1	10.00000	0.00254	None
HVG-1	FTS International	Water Gelling agent	Petroleum distillate	64742-47-8	55.00000	0.00076	None
			Guar gum	9000-30-0	50.00000	0.00069	None
			Clay	14808-60-7	2.00000	0.00003	None

			Surfactant	68439-51-0	2.00000	0.00003	None
FE-100L	FTS International	Iron control					
			Citric acid	77-92-9	55.00000	0.00056	None
CI-150	FTS International	Acid Corrosion Inhibitor					
			Ethylene glycol	107-21-1	30.00000	0.00009	None
			Organic amine resin salt	Proprietary	30.00000	0.00009	None
			Isopropanol	67-63-0	30.00000	0.00009	None
			Dimethylformamide	68-12-2	10.00000	0.00003	None
			Aromatic aldehyde	Proprietary	10.00000	0.00003	None
			Quaternary ammonium compound	Proprietary	10.00000	0.00003	None
NE-100	FTS International	Non-emulsifier					
			2-Butoxyethanol	111-76-2	10.00000	0.00003	None
			2-Propanol	67-63-0	10.00000	0.00003	None
			Dodecylbenzenesulfonic acid	27176-87-0	5.00000	0.00001	None
APB-1	FTS International	Gel Breaker					
			Ammonium persulfate	7727-54-0	95.00000	0.00002	None

Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-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(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

