

APPROVED

NAME: *Jul 9 Jan*

DATE: *2/10/2016*

Well Operator's Report of Well Work



Where energy meets innovation.

Well Number: 513146

API: 47 - 170 - 6460

Submission: Initial Amended

Notes: Flowback complete

Correction to Production Cement Top
(MD)

RECEIVED
Office of Oil and Gas

DEC 21 2015

WV Department of
Environmental Protection

AX 04/01/16
04/01/2016

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

API 47-017-6460 County DODDRIDGE District WEST UNION
Quad OXFORD 7.5' Pad Name OXFORD 157 Field/Pool Name _____
Farm name JUSTIN L. HENDERSON ET AL Well Number 513146
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 4,343,004 Easting 520,175
Landing Point of Curve Northing 4,343,082 Easting 520,345
Bottom Hole Northing 4,344,918 Easting 519,452

Elevation (ft) 970 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 13.0 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 04/18/2014 Date drilling commenced 08/18/2014 Date drilling ceased 12/24/2014
Date completion activities began 4/18/2015 Date completion activities ceased 4/24/2015
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 144 Open mine(s) (Y/N) depths N
Salt water depth(s) ft - Void(s) encountered (Y/N) depths N
Coal depth(s) ft 337 Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by: _____

04/01/2016

API 47-017 - 6460 Farm name JUSTIN L. HENDERSON ET AL Well number 513146

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"	63'	NEW	A-500 40LB/FT	NONE	Y
Surface	17.5"	13.375"	950'	NEW	J-55 54.5LB/FT	236'	Y
Coal							
Intermediate 1	12.375"	9.625"	5020'	NEW	P-110 40LB/FT	1221',2938',4020'	Y
Intermediate 2							
Intermediate 3							
Production	8.5"	5.5"	13,031'	NEW	P-110 20LB/FT	NONE	N
Tubing							
Packer type and depth set							

Comment Details _____

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	CLASS A	61	15.6	1.18	71.98	0	8
Surface	CLASS A	790	15.6	1.19	940.1	0	8
Coal							
Intermediate 1	CLASS A / CLASS A	360 / 340	14.2 / 15.6	1.28 / 1.18	862	0	8
Intermediate 2							
Intermediate 3							
Production	Class A / Class H	325 / 815	14.2 / 15.2	1.26 / 1.97	2016	4,637'	72
Tubing							

Drillers TD (ft) 13,054' Loggers TD (ft) N/A

Deepest formation penetrated Marcellus Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 5,089'

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: 1,12,21

INTERMEDIATE- RAN AT LEAST EVERY 500' FEET JOINTS: 1,12,24,36,48,60,72,84,96,108,124

PRODUCTION- Composite body centralizers every joint from 5,800' to 5,000'

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 - 6460 Farm name JUSTIN L. HENDERSON ET AL Well number 513146

Drilling Contractor Patterson UTI (Rig 252)
Address 207 Carlton Drive City Eighty Four State PA Zip 15330

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

Logging Company _____
Address _____ City _____ State _____ Zip _____

Cementing Company _____
Address _____ City _____ State _____ Zip _____

513146 Final Formations API#47-017-06460

Formation Name	Final Top MD (ftGL) (ft)	Final Top TVD (ft)	Final Btm MD (ftGL) (ft)	Final Btm TVD (ft)
FRESH WATER ZONE	1		154	
SAND/SHALE	1		347	
PITTSBURGH COAL SEAM	347		351	
SAND/SHALE	351		1,599.00	
BIG LIME	1,599.00		1,884.00	
WEIR	1,884.00		2,089.00	
BEREA	2,089.00		2,093.00	
GANTZ	2,093.00		2,204.00	
50F	2,204.00		2,294.00	
30F	2,294.00		2,349.00	
GORDON	2,349.00		2,438.00	
4TH	2,438.00		2,660.00	
BAYARD	2,660.00		2,933.00	
WARREN	2,933.00		3,010.00	
SPEECHLEY	3,010.00		3,499.00	
BALLTOWN A	3,499.00		4,146.00	
RILEY	4,146.00		4,596.00	
BENSON	4,596.00		4,849.00	
ALEXANDER	4,849.00		6,122.00	6,008.60
SONYEA	6,122.00	6,008.60	6,362.00	6,179.60
MIDDLESEX	6,362.00	6,179.60	6,398.00	6,202.00
GENESEE	6,398.00	6,202.00	6,512.00	6,268.30
GENESEO	6,512.00	6,268.30	6,604.00	6,315.00
TULLY	6,604.00	6,315.00	6,661.00	6,339.30
HAMILTON	6,661.00	6,339.30	6,740.00	6,366.30
MRC 3	6,740.00	6,366.30		

EQT Production - Marcellus

Doddridge County, WV Grid

Doddridge County 513146

Well #513146

Main Wellbore

Design: 513146 As Drilled Surveys

Standard Survey Report

26 December, 2014

Phoenix Technologies

Survey Report

Database: EDM 5000.1 Single User DD Company: EQT Production - Marcellus Project: Doddridge County, WV Grid Site: Doddridge County 513146 Well: Well #513146 Wellbore: Main Wellbore Design: 513146 As Drilled Surveys	Local Co-ordinate Reference: TVD Reference: MD Reference: North Reference: Survey Calculation Method:	Site Doddridge County 513146 KB @ 991.0usft KB @ 991.0usft Grid Minimum Curvature
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Project Doddridge County, WV Grid		
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 Doddridge County 513146					
Site Position:		Northing:	270 601 00 usft	Latitude:	39.24
From: Map		Easting:	1 641 295 00 usft	Longitude:	-80 77
Position Uncertainty:	0 0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0 81 °

Well Well #513146					
Well Position	+N/-S	0 0 usft	Northing:	270 601 00 usft	Latitude: 39° 14' 9 665 N
	+E/-W	0 0 usft	Easting:	1 641 295 00 usft	Longitude: 80 45' 59 039 W
Position Uncertainty		0 0 usft	Wellhead Elevation:	usft	Ground Level: 968 0 usft

Wellbore Main Wellbore					
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010_14	12/15/2014	-8 49	66 72	52,205

Design 513146 As Drilled Surveys					
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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	340 24

Survey Program		Date			
From (')	To (usft)	Survey (Wellbore)	Tool Name	Description	
0 00	5 040 0	513146 Gyrodata Gyros (Main Wellbore)	GYD_DP_MS	Gyrodata gyro-compassing and drop	
0 00	13 054 0	513146 PHX MWD (Main Wellbore)	MWD+IGRF	MWD+IGRF v3 standard declination	

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	-991.0	0 0	0 0	0 0	0 00	0 00	0 00
110 0	0 19	157.49	110.0	-881.0	-0.2	0.1	-0.2	0.17	0.17	0.00
210 0	0 33	188.70	210.0	-781.0	-0.6	0.1	-0.6	0.19	0.14	31.21
310 0	0 29	210 69	310 0	-681 0	-1 1	-0.1	-1.0	0.12	-0.04	21.99
410 0	0 32	219 87	410 0	-581 0	-1 5	-0.4	-1 3	0.06	0.03	9 18
510 0	0 24	219.69	510.0	-481.0	-1.9	-0.7	-1 6	0 08	-0 08	-0 18
610 0	0 22	226.31	610.0	-381.0	-2.2	-1.0	-1 7	0 03	-0 02	6 62
710 0	0 28	238 90	710 0	-281 0	-2 5	-1 3	-1 9	0 08	0 06	12 59

Phoenix Technologies

Survey Report

Database: EDM 5000.1 Single User Db Company: EQT Production - Marcellus Project: Doddridge County, WV Grid Site: Doddridge County 513146 Well: Well #513146 Wellbore: Main Wellbore Design: 513146 As Drilled Surveys	Local Co-ordinate Reference: TVD Reference: MD Reference: North Reference: Survey Calculation Method:	Site Doddridge County 513146 KB @ 891.0usft KB @ 991.0usft Grid Minimum Curvature
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Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
810.0	0.30	246.16	810.0	-181.0	-2.7	-1.8	-1.9	0.04	0.02	7.26
910.0	0.27	254.50	910.0	-81.0	-2.9	-2.2	-1.9	0.05	-0.03	8.34
1,010.0	0.60	249.03	1,010.0	19.0	-3.1	-3.0	-1.9	0.33	0.33	-5.47
1,110.0	0.81	255.46	1,110.0	119.0	-3.5	-4.1	-1.9	0.22	0.21	6.43
1,210.0	0.85	251.78	1,210.0	219.0	-3.9	-5.5	-1.8	0.07	0.04	-3.68
1,310.0	0.91	254.65	1,310.0	319.0	-4.3	-7.0	-1.7	0.07	0.06	2.87
1,410.0	0.92	255.60	1,409.9	418.9	-4.7	-8.5	-1.6	0.02	0.01	0.95
1,510.0	0.89	261.56	1,509.9	518.9	-5.1	-10.1	-1.4	0.10	-0.03	5.96
1,610.0	0.83	263.39	1,609.9	618.9	-5.3	-11.6	-1.0	0.07	-0.05	1.83
1,710.0	0.88	258.97	1,709.9	718.9	-5.5	-13.0	-0.8	0.06	0.05	-4.42
1,810.0	0.77	257.82	1,809.9	818.9	-5.8	-14.4	-0.6	0.11	-0.11	-1.15
1,910.0	0.68	253.97	1,909.9	918.9	-6.1	-15.7	-0.4	0.10	-0.09	-3.85
2,010.0	0.64	255.70	2,009.9	1,018.9	-6.4	-16.8	-0.3	0.04	-0.04	1.73
2,110.0	0.60	252.43	2,109.9	1,118.9	-6.7	-17.8	-0.3	0.05	-0.04	-3.27
2,210.0	0.53	235.78	2,209.9	1,218.9	-7.1	-18.7	-0.4	0.18	-0.07	-16.65
2,310.0	0.51	225.28	2,309.9	1,318.9	-7.7	-19.4	-0.7	0.10	-0.02	-10.50
2,410.0	0.48	222.35	2,409.9	1,418.9	-8.3	-20.0	-1.0	0.04	-0.03	-2.93
2,510.0	0.53	210.33	2,509.9	1,518.9	-9.0	-20.5	-1.5	0.12	0.05	-12.02
2,610.0	0.54	207.74	2,609.9	1,618.9	-9.8	-21.0	-2.1	0.03	0.01	-2.59
2,710.0	0.54	201.30	2,709.9	1,718.9	-10.7	-21.4	-2.8	0.06	0.00	-6.44
2,810.0	0.58	189.27	2,809.8	1,818.8	-11.6	-21.6	-3.6	0.12	0.04	-12.03
2,910.0	0.65	176.52	2,909.8	1,918.8	-12.7	-21.7	-4.6	0.15	0.07	-12.75
3,010.0	0.64	177.74	3,009.8	2,018.8	-13.6	-21.6	-5.7	0.02	-0.01	1.22
3,110.0	0.63	176.12	3,109.8	2,118.8	-14.9	-21.5	-6.7	0.02	-0.01	-1.62
3,210.0	0.68	178.27	3,209.8	2,218.8	-16.1	-21.5	-7.8	0.06	0.05	2.15
3,310.0	0.68	178.46	3,309.8	2,318.8	-17.2	-21.5	-9.0	0.00	0.00	0.19
3,410.0	0.71	178.17	3,409.8	2,418.8	-18.5	-21.4	-10.1	0.03	0.03	-0.29
3,510.0	0.79	180.92	3,509.8	2,518.8	-19.8	-21.4	-11.4	0.09	0.08	2.75
3,610.0	0.90	195.74	3,609.8	2,618.8	-21.2	-21.6	-12.6	0.24	0.11	14.82
3,710.0	0.93	206.26	3,709.8	2,718.8	-22.7	-22.2	-13.8	0.17	0.03	10.52
3,810.0	0.99	224.11	3,809.8	2,818.8	-24.0	-23.2	-14.8	0.30	0.06	17.85
3,910.0	1.08	244.47	3,909.7	2,918.7	-25.1	-24.6	-15.3	0.38	0.09	20.36
4,010.0	1.17	260.24	4,009.7	3,018.7	-25.6	-26.5	-15.2	0.32	0.09	15.77
4,110.0	1.41	270.99	4,109.7	3,118.7	-25.8	-28.7	-14.6	0.34	0.24	10.75
4,210.0	1.54	278.00	4,209.7	3,218.7	-25.6	-31.3	-13.5	0.22	0.13	7.01
4,310.0	1.75	289.72	4,309.6	3,318.6	-24.9	-34.0	-11.9	0.40	0.21	11.72
4,410.0	1.96	298.23	4,409.6	3,418.6	-23.6	-37.0	-9.7	0.35	0.21	8.51
4,510.0	2.25	304.68	4,509.5	3,518.5	-21.6	-40.1	-8.8	0.37	0.29	6.45
4,610.0	2.52	309.99	4,609.4	3,618.4	-19.1	-43.4	-3.3	0.35	0.27	5.31
4,710.0	2.74	313.54	4,709.3	3,718.3	-16.0	-46.8	0.7	0.27	0.22	3.55
4,810.0	3.32	317.16	4,809.2	3,818.2	-12.3	-50.5	5.5	0.61	0.58	3.62
4,910.0	3.96	319.98	4,909.0	3,918.0	-7.5	-54.7	11.4	0.66	0.64	2.82

Phoenix Technologies

Survey Report

Database:	EDM 5000.1 Single User DB	Local Co-ordinate Reference:	Site Doddridge County 513148
Company:	EDT Production - Maize, Pa	TVD Reference:	KB @ 991.0usft
Project:	Doddridge County, WV Grid	MD Reference:	KB @ 991.0usft
Site:	Doddridge County 513148	North Reference:	Grid
Well:	Well #513148	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	513148 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)
5 010 0	4 19	323.19	5,008.7	4,017.7	-1.9	-59.1	18.2	0.32	0.23	3.21
<i>Gyro Tie In=5048' MD</i>										
5 040 0	4 37	322.67	5,038.6	4,047.6	-0.2	-60.5	20.3	0.61	0.60	-1.73
5 080 0	4 70	316.00	5,078.5	4,087.5	2.2	-62.5	23.3	1.55	0.83	-16.68
5 112 0	7 80	296.90	5,110.3	4,119.3	4.2	-65.4	26.0	11.54	9.69	-59.69
5 144 0	12 00	294.00	5,141.8	4,150.8	6.5	-70.4	29.9	13.21	13.13	-9.06
5 175 0	13 40	295.20	5,172.1	4,181.1	9.3	-76.6	34.7	4.60	4.52	3.87
5 206 0	12 40	292.00	5,202.3	4,211.3	12.1	-82.9	39.4	3.96	-3.23	-10.32
5 238 0	11 70	289.70	5,233.6	4,242.6	14.5	-89.1	43.8	2.65	-2.19	-7.19
5 270 0	11 30	286.80	5,265.0	4,274.0	16.5	-95.2	47.7	2.20	-1.25	-9.06
5 301 0	10 40	292.60	5,295.4	4,304.4	18.5	-100.7	51.4	4.56	-2.90	18.71
5 333 0	8 80	308.10	5,327.0	4,336.0	21.1	-105.3	55.4	9.46	-5.00	48.44
5 365 0	7 60	321.30	5,358.6	4,367.6	24.2	-108.5	59.5	6.95	-3.75	41.25
5 396 0	8 30	343.30	5,389.3	4,398.3	28.0	-110.5	63.7	10.01	2.26	70.97
5 428 0	9 10	3 50	5,421.0	4,430.0	32.7	-111.0	68.3	9.81	2.50	63.13
5 459 0	9 30	21.60	5,451.6	4,460.6	37.5	-109.9	72.4	9.32	0.65	58.39
5 491 0	9 20	42.90	5,483.2	4,492.2	41.8	-107.2	75.6	10.64	-0.31	66.56
5 523 0	10 30	61.00	5,514.7	4,523.7	45.0	-103.0	77.2	10.13	3.44	56.56
5 554 0	11 30	67.70	5,545.2	4,554.2	47.5	-97.7	77.8	5.17	3.23	21.61
5 585 0	13 60	67.10	5,575.4	4,584.4	50.1	-91.5	78.1	7.43	7.42	-1.94
5 617 0	16 60	66.10	5,606.3	4,615.3	53.4	-83.9	78.6	9.41	9.38	-3.13
5 648 0	19 60	66.80	5,635.8	4,644.8	57.3	-75.1	79.3	9.70	9.68	2.26
5 680 0	23 20	68.60	5,665.6	4,674.6	61.7	-64.3	79.8	11.43	11.25	5.63
5 712 0	25 50	69.80	5,694.7	4,703.7	66.4	-51.9	80.0	7.35	7.19	3.75
5 743 0	28 60	69.60	5,722.3	4,731.3	71.3	-38.7	80.1	10.00	10.00	-0.65
5 774 0	31 60	67.30	5,749.2	4,758.2	77.0	-24.3	80.6	10.37	9.68	-7.42
5 806 0	35 20	68.30	5,775.9	4,784.9	83.6	-8.0	81.4	11.38	11.25	3.13
5 838 0	38 50	69.90	5,801.5	4,810.5	90.5	10.0	81.8	10.74	10.31	5.00
5 869 0	42 70	71.50	5,825.0	4,834.0	97.1	29.0	81.6	13.96	13.55	5.16
5 901 0	45 10	74.10	5,848.1	4,857.1	103.7	50.2	80.6	9.38	7.50	8.13
5 932 0	44 80	74.30	5,870.0	4,879.0	109.6	71.3	79.1	1.07	-0.97	0.65
5 964 0	44 70	73.90	5,892.7	4,901.7	115.8	92.9	77.6	0.93	-0.31	-1.25
5 995 0	43 90	73.40	5,914.9	4,923.9	121.9	113.7	76.3	2.82	-2.58	-1.61
6 027 0	43 20	72.80	5,938.1	4,947.1	128.3	134.8	75.2	2.54	-2.19	-1.88
6 058 0	42 90	69.10	5,960.8	4,969.8	135.2	154.8	74.9	8.20	-0.97	-11.94
6 090 0	41 50	63.00	5,984.5	4,993.5	143.9	174.4	76.4	13.53	-4.38	-19.06
6 121 0	40 50	57.70	6,007.9	5,016.9	153.9	192.1	79.9	11.67	-3.23	-17.10
6 152 0	40 80	53.10	6,031.4	5,040.4	165.4	208.7	85.1	9.71	0.97	-14.84
6 184 0	40 70	49.70	6,055.7	5,064.7	178.4	225.0	91.8	6.94	-0.31	-10.63
6 215 0	41 30	46.40	6,079.1	5,088.1	192.0	240.2	99.5	7.25	1.94	-10.65
6 246 0	43 40	44.30	6,102.0	5,111.0	206.7	255.0	108.3	8.17	6.77	-6.77
6 278 0	46 30	40.90	6,124.7	5,133.7	223.3	270.3	118.8	11.76	9.06	-10.63
6 309 0	48 50	36.90	6,145.6	5,154.6	241.1	284.6	130.7	11.85	7.10	-12.90

Phoenix Technologies
Survey Report

Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Site Doddridge County 513146
Company:	EQT Production - Mercantix	TVD Reference:	KB @ 991.0usft
Project:	Doddridge County, WV G&W	MD Reference:	KB @ 991.0usft
Site:	Doddridge County 513146	North Reference:	Grid
Well:	Well #513146	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbores		
Design:	513146 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)
6,341.0	50.60	32.80	6,166.4	5,175.4	261.1	298.5	144.8	11.75	6.56	-12.81
6,372.0	51.40	28.80	6,185.9	5,194.9	281.8	310.8	160.1	10.35	2.58	-12.90
6,404.0	52.10	25.20	6,205.7	5,214.7	304.1	322.2	177.3	9.10	2.19	-11.25
6,436.0	53.50	21.40	6,225.1	5,234.1	327.6	332.3	195.9	10.42	4.38	-11.88
6,467.0	55.00	17.70	6,243.2	5,252.2	351.3	340.7	215.4	10.83	4.84	-11.94
6,498.0	56.50	13.90	6,260.7	5,269.7	375.9	347.7	236.2	11.23	4.84	-12.26
6,530.0	57.80	9.50	6,278.0	5,287.0	402.2	353.1	259.2	12.24	4.06	-13.75
6,561.0	59.80	5.70	6,294.1	5,303.1	428.5	356.6	282.7	12.31	6.45	-12.26
6,593.0	61.20	3.40	6,309.8	5,318.8	456.3	358.8	308.1	7.63	4.38	-7.19
6,624.0	64.20	0.40	6,324.1	5,333.1	483.8	359.7	333.7	12.94	9.68	-9.68
6,655.0	66.40	358.20	6,337.0	5,346.0	511.9	359.4	360.3	9.59	7.10	-7.10
6,687.0	69.00	355.70	6,349.2	5,358.2	541.5	357.8	388.6	10.87	8.13	-7.81
6,718.0	71.50	352.60	6,359.6	5,368.6	570.5	354.8	417.0	12.39	8.06	-10.00
6,750.0	73.90	350.60	6,369.1	5,378.1	600.7	350.3	446.9	9.58	7.50	-6.25
6,782.0	76.20	348.80	6,377.4	5,386.4	631.1	344.8	477.4	9.01	7.19	-5.63
6,813.0	77.80	346.90	6,384.4	5,393.4	660.7	338.4	507.3	7.89	5.16	-6.13
6,844.0	79.60	344.60	6,390.4	5,399.4	690.1	331.0	537.6	9.31	5.81	-7.42
6,876.0	81.50	342.70	6,395.7	5,404.7	720.4	322.1	569.1	8.34	5.94	-5.94
6,907.0	83.30	341.00	6,399.8	5,408.8	749.6	312.5	599.8	7.95	5.81	-5.48
6,939.0	84.40	339.00	6,403.2	5,412.2	779.5	301.6	631.6	7.10	3.44	-6.25
6,970.0	86.80	337.50	6,405.6	5,414.6	808.2	290.2	662.5	9.12	7.74	-4.84
LP=7075 MD=108 TVD										
7,076.0	89.70	335.50	6,408.8	5,417.8	905.4	247.9	768.2	3.32	2.74	-1.89
7,171.0	89.80	337.20	6,409.3	5,418.3	992.4	209.8	863.0	1.79	0.11	1.79
7,265.0	90.10	338.60	6,409.3	5,418.3	1,079.5	174.4	956.9	1.52	0.32	1.49
7,360.0	88.50	335.50	6,410.5	5,419.5	1,166.9	137.4	1,051.8	3.67	-1.68	-3.26
7,454.0	89.50	335.80	6,412.1	5,421.1	1,252.6	98.7	1,145.4	1.11	1.06	0.32
7,548.0	89.50	336.50	6,413.0	5,422.0	1,338.5	60.7	1,239.2	0.74	0.00	0.74
7,642.0	89.50	337.60	6,413.8	5,422.8	1,425.1	24.0	1,333.0	1.17	0.00	1.17
7,736.0	89.50	337.20	6,414.6	5,423.6	1,511.9	-12.1	1,426.9	0.43	0.00	-0.43
7,831.0	90.30	334.20	6,414.8	5,423.8	1,598.4	-51.2	1,521.6	3.27	0.84	-3.16
7,926.0	88.90	331.10	6,415.4	5,424.4	1,682.8	-94.8	1,615.8	3.58	-1.47	-3.26
8,020.0	89.50	331.00	6,416.7	5,425.7	1,765.0	-140.3	1,708.6	0.65	0.64	-0.11
8,114.0	89.80	329.30	6,417.3	5,426.3	1,846.6	-187.1	1,801.1	1.84	0.32	-1.81
8,209.0	89.70	329.70	6,417.7	5,426.7	1,928.4	-235.3	1,894.4	0.43	-0.11	0.42
8,303.0	90.30	335.00	6,417.7	5,426.7	2,011.7	-278.9	1,987.5	5.67	0.64	5.64
8,397.0	90.30	334.00	6,417.2	5,426.2	2,096.5	-319.4	2,081.0	1.06	0.00	-1.06
8,491.0	89.60	336.10	6,417.3	5,426.3	2,181.7	-359.1	2,174.6	2.35	-0.74	2.23
8,585.0	86.80	334.60	6,420.3	5,429.3	2,267.1	-398.2	2,268.2	3.38	-2.98	-1.60
8,680.0	87.20	333.90	6,425.3	5,434.3	2,352.5	-439.5	2,362.6	0.85	0.42	-0.74
8,774.0	88.00	336.30	6,429.2	5,438.2	2,437.7	-479.0	2,456.1	2.69	0.85	2.55
8,869.0	90.20	339.50	6,430.7	5,439.7	2,525.7	-514.7	2,551.0	4.09	2.32	3.37
8,963.0	90.60	338.70	6,430.0	5,439.0	2,613.5	-548.3	2,645.0	0.95	0.43	-0.85

Phoenix Technologies

Survey Report

Database: EDM 5000.1 Single User Db Company: EDT Production - Marcellus Project: Dodge County, WV Grid Site: Dodge County 513146 Well: Well #513146 Wellbore: Main Wellbore Design: 513146 As Drilled Surveys	Local Co-ordinate Reference: TVD Reference: MD Reference: North Reference: Survey Calculation Method:	Site Dodge County 513146 KB @ 991.0usft KB @ 991.0usft Grid Minimum Curvature
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Survey											
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (%/100usft)	Build Rate (%/100usft)	Turn Rate (%/100usft)	
9,057.0	90.90	337.50	6,428.8	5,437.8	2,700.7	-583.3	2,738.9	1.32	0.32	-1.28	
9,151.0	88.20	334.90	6,429.5	5,438.5	2,786.7	-621.2	2,832.7	3.99	-2.87	-2.77	
9,246.0	88.90	335.30	6,431.9	5,440.9	2,872.9	-661.2	2,927.3	0.85	0.74	0.42	
9,341.0	87.00	334.50	6,435.3	5,444.3	2,958.8	-701.5	3,021.8	2.17	-2.00	-0.84	
9,435.0	87.30	333.90	6,440.0	5,449.0	3,043.4	-742.4	3,115.1	0.71	0.32	-0.64	
9,530.0	88.50	334.60	6,443.5	5,452.5	3,128.9	-783.6	3,209.6	1.46	1.26	0.74	
9,624.0	88.50	333.30	6,445.9	5,454.9	3,213.3	-824.9	3,303.0	1.38	0.00	-1.38	
9,717.0	88.60	335.60	6,448.3	5,457.3	3,297.2	-865.0	3,395.4	2.47	0.11	2.47	
9,812.0	89.80	333.90	6,449.6	5,458.6	3,383.1	-905.5	3,490.0	2.19	1.26	-1.79	
9,906.0	88.40	334.00	6,451.1	5,460.1	3,467.5	-946.8	3,583.4	1.49	-1.49	0.11	
10,001.0	88.70	334.40	6,453.5	5,462.5	3,553.0	-988.1	3,677.9	0.53	0.32	0.42	
10,095.0	88.50	332.90	6,455.8	5,464.8	3,637.2	-1,029.8	3,771.2	1.61	-0.21	-1.60	
10,190.0	91.20	335.20	6,456.1	5,465.1	3,722.6	-1,071.4	3,865.6	3.73	2.84	2.42	
10,285.0	91.80	335.10	6,453.6	5,462.6	3,808.8	-1,111.3	3,960.2	0.64	0.63	-0.11	
10,379.0	91.40	335.90	6,450.9	5,459.9	3,894.3	-1,150.2	4,053.9	0.95	-0.43	0.85	
10,474.0	88.90	336.50	6,450.7	5,459.7	3,981.2	-1,188.6	4,148.6	2.71	-2.63	0.63	
10,568.0	88.70	337.20	6,452.7	5,461.7	4,067.6	-1,225.5	4,242.4	0.77	-0.21	0.74	
10,662.0	86.50	337.30	6,456.6	5,465.6	4,154.2	-1,261.8	4,336.2	2.34	-2.34	0.11	
10,757.0	86.50	336.80	6,462.4	5,471.4	4,241.6	-1,298.8	4,430.9	0.53	0.00	-0.53	
10,851.0	88.10	335.80	6,466.8	5,475.8	4,327.5	-1,336.5	4,524.6	2.01	1.70	-1.06	
10,946.0	89.50	335.50	6,468.8	5,477.8	4,414.1	-1,375.7	4,619.2	1.51	1.47	-0.32	
11,040.0	89.10	333.60	6,470.0	5,479.0	4,498.9	-1,416.1	4,712.8	2.07	-0.43	-2.02	
11,135.0	88.40	332.80	6,472.0	5,481.0	4,583.7	-1,458.9	4,807.0	1.12	-0.74	-0.84	
11,230.0	88.10	333.20	6,474.9	5,483.9	4,668.3	-1,502.0	4,901.2	0.53	-0.32	0.42	
11,324.0	89.80	334.30	6,476.7	5,485.7	4,752.6	-1,543.6	4,994.6	2.15	1.81	1.17	
11,419.0	90.40	334.70	6,476.5	5,485.5	4,838.3	-1,584.5	5,089.1	0.76	0.63	0.42	
11,514.0	91.00	334.70	6,475.3	5,484.3	4,924.2	-1,625.1	5,183.7	0.63	0.63	0.00	
11,608.0	91.50	334.50	6,473.3	5,482.3	5,009.1	-1,665.4	5,277.2	0.57	0.53	-0.21	
11,703.0	88.70	334.00	6,473.1	5,482.1	5,094.7	-1,706.7	5,371.7	2.99	-2.95	-0.53	
11,797.0	87.60	334.10	6,476.2	5,485.2	5,179.1	-1,747.8	5,465.1	1.18	-1.17	0.11	
11,892.0	89.00	339.00	6,479.0	5,488.0	5,266.2	-1,785.5	5,559.8	5.36	1.47	5.16	
11,987.0	87.70	339.20	6,481.7	5,490.7	5,354.9	-1,819.4	5,654.7	1.38	-1.37	0.21	
12,081.0	88.70	339.80	6,484.7	5,493.7	5,442.9	-1,852.3	5,748.7	1.24	1.06	0.64	
12,176.0	89.80	340.80	6,485.9	5,494.9	5,532.4	-1,884.3	5,843.7	1.56	1.16	1.05	
12,270.0	88.10	338.30	6,487.6	5,496.6	5,620.4	-1,917.2	5,937.6	3.22	-1.81	-2.66	
12,365.0	88.10	337.20	6,490.8	5,499.8	5,708.3	-1,953.1	6,032.5	1.16	0.00	-1.16	
12,460.0	89.60	335.50	6,492.7	5,501.7	5,795.3	-1,991.2	6,127.3	2.38	1.58	-1.79	
12,555.0	89.90	335.60	6,493.1	5,502.1	5,881.8	-2,030.5	6,221.9	0.33	0.32	0.11	
12,649.0	90.10	334.00	6,493.1	5,502.1	5,966.8	-2,070.6	6,315.5	1.72	0.21	-1.70	
12,743.0	89.30	331.70	6,493.6	5,502.6	6,050.5	-2,113.5	6,408.7	2.59	-0.85	-2.45	
Deepest Point of Well= 12638' MD@496' TVD											
12,838.0	89.60	331.00	6,494.5	5,503.5	6,133.8	-2,159.0	6,502.6	0.80	0.32	-0.74	

Phoenix Technologies
Survey Report

Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Site Doddridge County 513148
Company:	EQT Production - Marcellus	TVD Reference:	KB @ 991.0usft
Project:	Doddridge County, WV Grid	MD Reference:	KB @ 991.0usft
Site:	Doddridge County 513148	North Reference:	Grid
Well:	Well #513148	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	513148 As Drilled Surveys		

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)
12,932.0	90.40	330.70	6,494.5	5,503.5	6,215.9	-2,204.8	6,595.3	0.91	0.85	-0.32
Final Survey= 13000' MD/6494' TVD										
13,000.0	90.60	329.20	6,493.9	5,502.9	6,274.8	-2,238.8	6,662.2	2.23	0.29	-2.21
Projection to TD= 13054' MD/6493' TVD										
13,054.0	90.60	329.20	6,493.3	5,502.3	6,321.2	-2,266.5	6,715.2	0.00	0.00	0.00

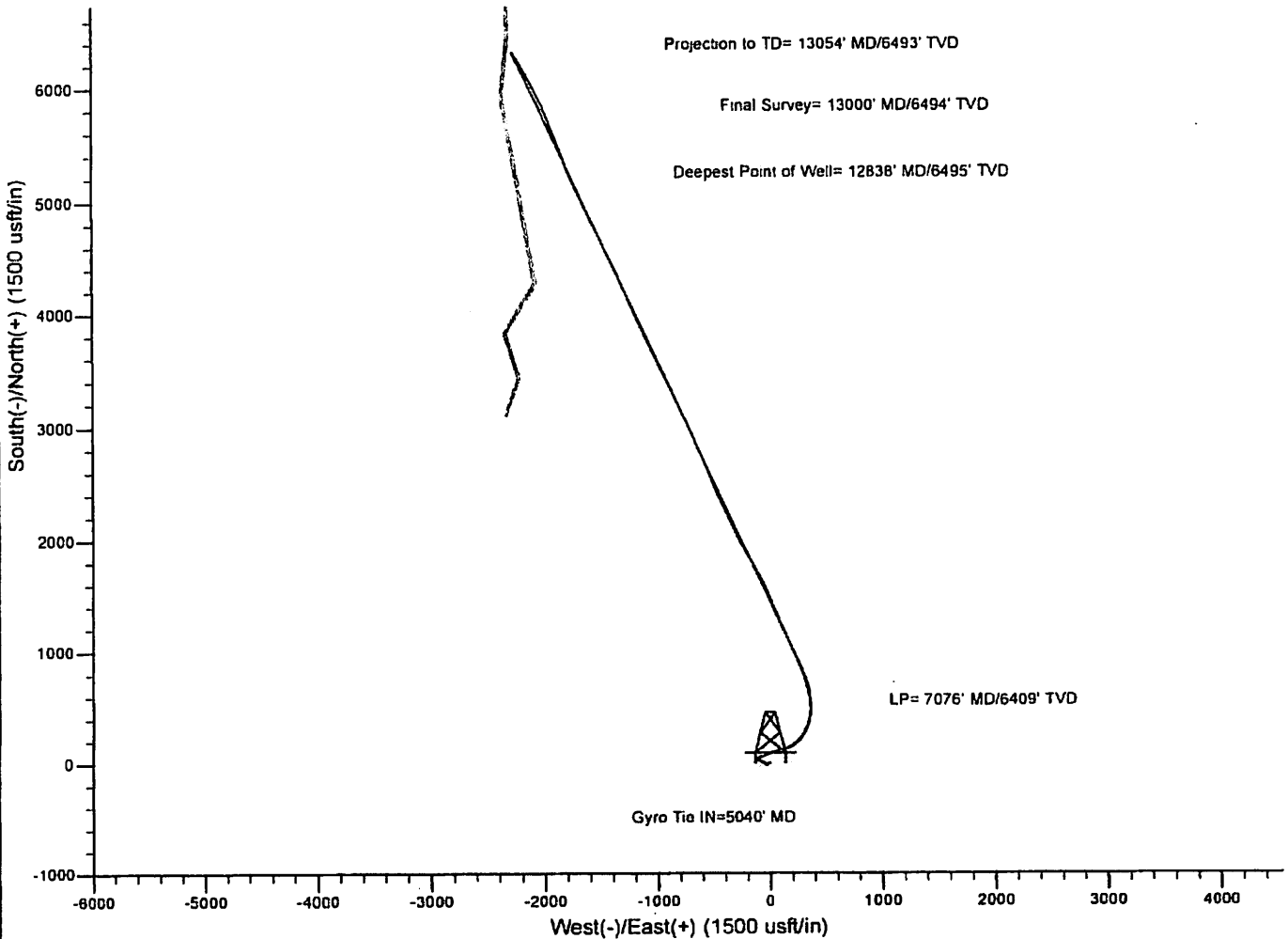
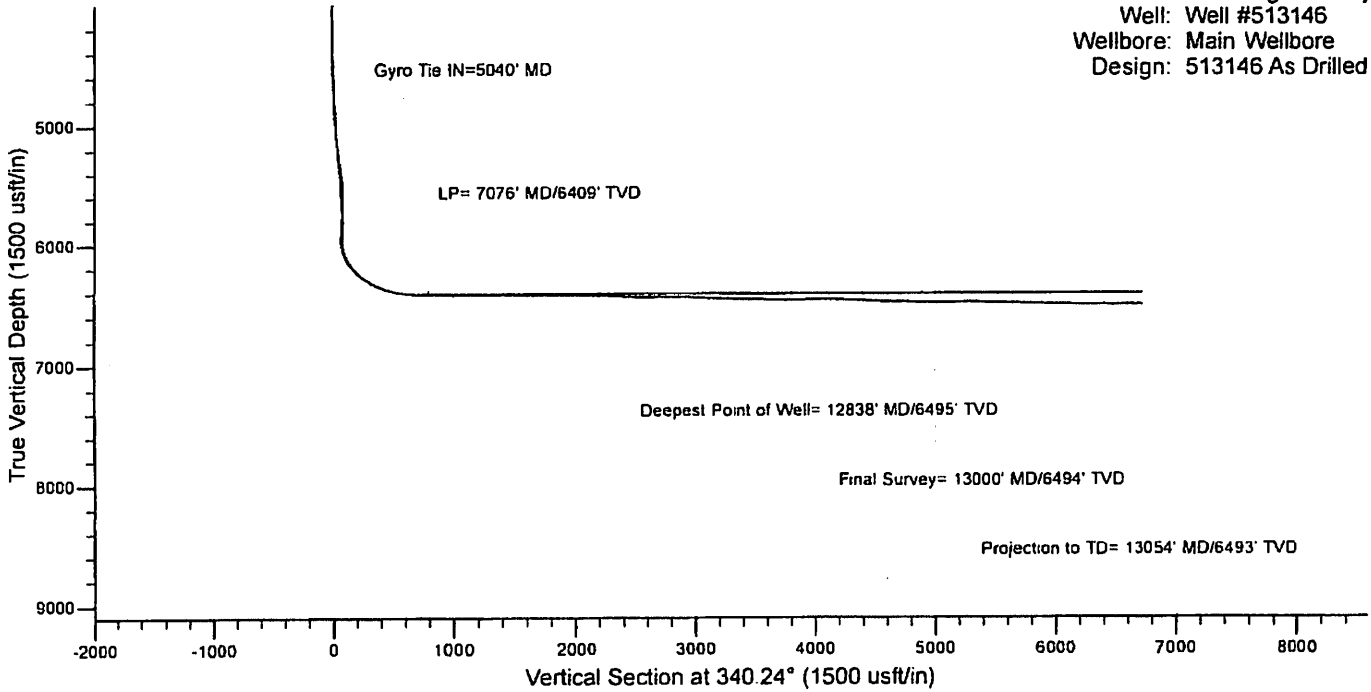
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,040.0	5,038.6	-0.2	-60.5	Gyro Tie IN=5040' MD
7,076.0	6,408.8	905.4	247.9	LP= 7076' MD/6409' TVD
12,838.0	6,494.5	6,133.8	-2,159.0	Deepest Point of Well= 12838' MD/6495' TVD
13,000.0	6,493.9	6,274.8	-2,238.8	Final Survey= 13000' MD/6494' TVD
13,054.0	6,493.3	6,321.2	-2,266.5	Projection to TD= 13054' MD/6493' TVD

Checked By: _____ Approved By: _____ Date: _____

04/01/2016

EQT Production - Marcellus

Project: Doddridge County, WV Grid
Site: Doddridge County 513146
Well: Well #513146
Wellbore: Main Wellbore
Design: 513146 As Drilled Surveys



513146 - 47-017-06460-0000- Perforations

Stage Number	Perforation Date	Top Perf Depth (ftKB)	Bottom Perf Depth (ftKB)	Number of Shots	Formation
Initiation Sleeve	3/28/2015	13,029.00	13,031.00	10	MARCELLUS
1	4/19/2015	12,823.00	12,960.00	32	MARCELLUS
2	4/19/2015	12,599.00	12,781.00	40	MARCELLUS
3	4/19/2015	12,374.00	12,556.00	40	MARCELLUS
4	4/19/2015	12,149.00	12,331.00	40	MARCELLUS
5	4/19/2015	11,924.00	12,106.00	40	MARCELLUS
6	4/20/2015	11,699.00	11,881.00	40	MARCELLUS
7	4/20/2015	11,474.00	11,656.00	40	MARCELLUS
8	4/20/2015	11,249.00	11,431.00	40	MARCELLUS
9	4/20/2015	11,024.00	11,206.00	40	MARCELLUS
10	4/21/2015	10,799.00	10,981.00	40	MARCELLUS
11	4/21/2015	10,574.00	10,752.00	40	MARCELLUS
12	4/21/2015	10,349.00	10,531.00	40	MARCELLUS
13	4/21/2015	10,124.00	10,306.00	40	MARCELLUS
14	4/21/2015	9,899.00	10,081.00	40	MARCELLUS
15	4/22/2015	9,674.00	9,856.00	40	MARCELLUS
16	4/22/2015	9,449.00	9,627.00	40	MARCELLUS
17	4/22/2015	9,224.00	9,406.00	40	MARCELLUS
18	4/22/2015	8,999.00	9,181.00	40	MARCELLUS
19	4/22/2015	8,774.00	8,956.00	40	MARCELLUS
20	4/22/2015	8,549.00	8,727.00	40	MARCELLUS
21	4/23/2015	8,324.00	8,506.00	40	MARCELLUS
22	4/23/2015	8,099.00	8,281.00	40	MARCELLUS
23	4/23/2015	7,874.00	8,058.00	40	MARCELLUS
24	4/23/2015	7,649.00	7,831.00	40	MARCELLUS
25	4/23/2015	7,424.00	7,606.00	40	MARCELLUS
26	4/24/2015	7,199.00	7,381.00	40	MARCELLUS
27	4/24/2015	6,974.00	7,152.00	40	MARCELLUS

Hydraulic Fracturing Fluid Product Component Information Disclosure

Init Start Date:	4/18/2015
Init End Date:	4/24/2015
State:	West Virginia
County:	Doddridge
API Number:	47-017-06460-00-00
Operator Name:	EQT Production
Well Name and Number:	513146
Longitude:	-80.76640000
Latitude:	39.23601800
Datum:	NAD83
Padena/Orphan Well:	NO
Total Water Depth:	6,366
Total Water Volume (gall):	10,426,080
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	89.60395	None
Sand (Proppant)	Keane Group	Proppant	Silica Substrate	14808-60-7	100.00000	10.08165	None
MC/MX 497-5	Multi-Chem	Calcium nitrate solution	Calcium nitrate	10124-37-5	60.00000	0.05548	None
Hydrochloric Acid (15%)	Keane Group	Acidizing	Hydrochloric Acid	7647-01-0	15.00000	0.01932	None
FFR760	Keane Group	Friction Reducer	Hydrotreated Light Distillate	64742-47-8	30.00000	0.00596	None
			Alkyl Alcohol	Proprietary	10.00000	0.00199	None
			Oxyalkylated alcohol A	Proprietary	5.00000	0.00099	None
FFR730	Keane Group	Friction Reducer	Oxyalkylated alcohol A	Proprietary	5.00000	0.00249	None
EC6330A	Keane Group	Scale Inhibitor	Sodium Phosphate, Tribasic	7601-54-9	5.00000	0.00115	None
AI 600	Keane Group	Corrosion Inhibitor	Ethylene Glycol	107-21-1	40.00000	0.00013	None

		N, N-Dimethylformamide	68-12-2	20.00000	0.00007	None
		2-Butoxyethanol	111-76-2	15.00000	0.00005	None
		Cinnamaldehyde	104-55-2	15.00000	0.00005	None
		Tar bases, quinoline derivs, benzyl chloride-quaternized	72480-70-7	15.00000	0.00005	None
		1-Decanol	112-30-1	5.00000	0.00002	None
		Poly (oxy-1,2-ethanediyl), alpha-(4-nonylphenyl)- omega- hydroxy- branched	127087-87-0	5.00000	0.00002	None
		1-Octanol	111-87-5	2.50000	0.00001	None
		Triethyl Phosphate	78-40-0	2.50000	0.00001	None
		Isopropyl alcohol	67-63-0	2.50000	0.00001	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)

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



Submission to FracFocus using Excel Spreadsheets has been turned off.

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

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Disclosure has been submitted.

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Hydraulic Fracturing Data

[Edit](#)

Job Start Date 4/18/2015	Job End Date 4/24/2015	API Number 47-017-06460-00-00	State & County West Virginia --- Doddridge
Well Name 513146			
Longitude -80.7664	Latitude 39.236018	Datum NAD83	Federal/Tribal Well?
True Vertical Depth (ft) 6366.3	Total Water Vol (gal) 10426080	Total Non Water Vol 0	Total Mass (lbs) 97100221



MSDS Chemical Ingredients

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

	Trade Name	Supplier	Purpose	Ingredients	CAS #	% High Additive	% HF Job	Comments	Ingredient Mass
Edit	Water	Keane Group	Carrier/Base Fluid	Water	7732-18-5	100%	89.6039539548%	None	87005637.6
Edit	Sand (Proppant)	Keane Group	Proppant	Silica Substrate	14808-60-7	100%	10.0816454042%	None	9789300
Edit	MC MX 437-5	Multi-Chem	Calcium nitrate solution	Calcium nitrate	10124-37-5	60%	.0554848111%	None	53875.874
Edit	Hydrochloric Acid (15%)	Keane Group	Acidizing	Hydrochloric Acid	7647-01-0	15%	.0193226595%	None	18762.345
Edit	FFR760	Keane Group	Friction Reducer	Hydrotreated Light Distillate	64742-47-8	30%	.0059578523%	None	5785.088
				Alkyl Alcohol	Proprietary	10%	.0019859508%	None	1928.363
				Oxyalkylated alcohol A	Proprietary	5%	.0009929754%	None	964.181
Edit	FFR730	Keane Group	Friction Reducer	Oxyalkylated alcohol A	Proprietary	5%	.0024944381%	None	2422.105
Edit	EC6330A	Keane Group	Scale Inhibitor	Sodium Phosphate, Tribasic	7601-54-9	5%	.0011514269%	None	1118.038
Edit	AI 600								

Keane Group	Corrosion Inhibitor						
		Ethylene Glycol	107-21-1	40%	.0001325668%	None	128.723
		N, N-Dimethylformamide	68-12-2	20%	.0000662834%	None	64.361
		2-Butoxyethanol	111-76-2	15%	.0000497125%	None	48.271
		Cinnamialdehyde	104-55-2	15%	.0000497125%	None	48.271
		Tar bases, quinoline derivs, benzyl chloride-quatemized	72480-70-7	15%	.0000497125%	None	48.271
		1-Decanol	112-30-1	5%	.0000165708%	None	16.09
		Poly (oxy-1,2-ethanediyl), .alpha.-(4-nonylphenyl) .omega.-hydroxy-, branched	127087-87-0	5%	.0000165708%	None	16.09
		1-Octanol	111-87-5	2.5%	.0000082854%	None	8.045
		Triethyl Phosphate	78-40-0	2.5%	.0000082854%	None	8.045
		Isopropyl alcohol	67-63-0	2.5%	.0000082854%	None	8.045

Non-MSDS Chemical Ingredients

New Ingredients

Trade Name	Supplier	Purpose	Ingredients	CAS #	% High Additive	% HF Job	Comments	Ingredient Mass
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