

APPROVED

NAME: *Chad A. Felt*

DATE: 2/10/2016

Well Operator's Report of Well Work



Where energy meets innovation.

Well Number: 513701

API: 47 - 017 - 06506

Submission: Initial Amended *2nd try*

Notes: Correction to Production Cement Top (MD)

RECEIVED
Office of Oil and Gas

DEC 21 2015

WV Department of
Environmental Protection

02/12/2016

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

API 47 - 017 - 06506 County DODDRIDGE District Southwest
Quad OXFORD 7.5' Pad Name OXFORD 159 Field/Pool Name _____
Farm name JUSTIN L. HENDERSON ET AL Well Number 513701
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 4,339,877.3 Easting 520,551.1
Landing Point of Curve Northing 4,340,331.3 Easting 520,667.5
Bottom Hole Northing 4,342,739.4 Easting 519,495.3

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 w/o Flowback
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 11/21/2014 Date drilling ceased 4/1/2015
Date completion activities began 7/11/2015 Date completion activities ceased 7/28/2015
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:
02/12/2016

API 47-017 - 06506 Farm name JUSTIN L. HENDERSON ET AL Well number 513701

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 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	1,604', 3,195', 4,306'	Y
Intermediate 2							
Intermediate 3							
Production	8.5"	5.5"	16,605'	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	38	15.6	1.18	44.84	0	8
Surface	CLASS A	833	15.6	1.20	999.6	0	8
Coal							
Intermediate 1	CLASS A / A / A	397 / 368 / 1,118	14.2 / 15.6 / 15.6	1.24 / 1.18 / 1.18	2,245.76	0	8
Intermediate 2							
Intermediate 3							
Production	Class A 50/50 POZ / H	545 / 1155	14.2 / 15.2	1.26 / 1.97	2962	3,896'	8
Tubing							

Drillers TD (ft) 16,618' Loggers TD (ft) N/A

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

Plug back procedure N/A

Kick off depth (ft) 5,980'

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

INTERMEDIATE- RAN AT LEAST EVERY 500' FEET JOINTS: 1, 13, 25, 37, 49, 61, 73, 85, 97, 109, 121

PRODUCTION- Ran every joint from 16604' 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 - 06506 Farm name JUSTIN L. HENDERSON ET AL Well number 513701

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 (bbbls)	Amount of Nitrogen/other (units)
						Please	see	attached

Please insert additional pages as applicable.

API 47- 017 - 06506 Farm name JUSTIN L. HENDERSON ET AL Well number 513701

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
<u>Marcellus</u>	<u>6,757.40</u>	<u>TVD</u>	<u>7,590.00</u> <u>MD</u>
_____	_____	_____	_____
_____	_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface _____ psi Bottom Hole _____ psi DURATION OF TEST _____ hrs

OPEN FLOW Gas _____ mcfpd Oil _____ bpd NGL _____ bpd Water _____ bpd GAS MEASURED BY Estimated Orifice Pilot

<u>LITHOLOGY/ FORMATION</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>TOP</u>	<u>BOTTOM</u>	<u>DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H₂S, ETC)</u>
	<u>DEPTH IN FT NAME TVD</u>	<u>DEPTH IN FT TVD</u>	<u>DEPTH IN FT MD</u>	<u>DEPTH IN FT MD</u>	
	<u>0</u>		<u>0</u>		

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 1432 Route 519 City Eighty Four State PA Zip 15330

Please insert additional pages as applicable.

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

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

02/12/2016

API 47- 017 - 06506 Farm name JUSTIN L. HENDERSON ET AL Well number 513701

Drilling Contractor Patterson UTI
Address 207 Carlton Drive City Eighty Four State PA Zip 15330

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

Logging Company Gyro Data Inc.
Address 601 Mayer St. City Bridgeville State PA Zip 15017

Cementing Company Nabors
Address 2504 Smith Creek Road City Waynesburg State PA Zip 15370

Well #513701 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	4,137.30
BALLTOWN A	4,139.00	4,137.30	4,253.00	4,250.80
SAND/SHALE	4,253.00	4,250.80	4,338.00	4,335.50
RILEY	4,338.00	4,335.50	4,484.00	4,481.00
SAND/SHALE	4,484.00	4,481.00	5,009.00	5,004.10
BENSON	5,009.00	5,004.10	5,049.00	5,044.00
SAND/SHALE	5,049.00	5,044.00	5,180.00	5,174.70
ALEXANDER	5,180.00	5,174.70	6,211.00	6,194.40
RHINESTREET UPPER	6,211.00	6,194.40	6,362.00	6,316.00
RHINESTREET	6,362.00	6,316.00	6,470.00	6,384.30
SONYEA	6,470.00	6,384.30	6,862.00	6,536.30
MIDDLESEX	6,862.00	6,536.30	7,008.00	6,587.90
GENESSEE	7,008.00	6,587.90	7,204.00	6,656.10
GENESEO	7,204.00	6,656.10	7,352.00	6,705.50
TULLY	7,352.00	6,705.50	7,470.00	6,736.70
HAMILTON	7,470.00	6,736.70	7,590.00	6,757.40
MARCELLUS	7,590.00	6,757.40		

02/12/2016



PHOENIX
TECHNOLOGY SERVICES USA INC

EQT Production - Marcellus

Doddridge County, WV Grid

Doddridge County 513701

Well #513701

Main Wellbore

Design: 513701 As Drilled

Standard Survey Report

01 April, 2015



Where energy meets innovation.

02/12/2016

Database:	US State Plane 1927 (Exact solution)	Local Co-ordinate Reference:	US State Plane 1927 (Exact solution)
Company:	US State Plane 1927 (Exact solution)	TVD Reference:	Mean Sea Level
Project:	US State Plane 1927 (Exact solution)	MD Reference:	Mean Sea Level
Site:	US State Plane 1927 (Exact solution)	North Reference:	Mean Sea Level
Well:	US State Plane 1927 (Exact solution)	Survey Calculation Method:	US State Plane 1927 (Exact solution)
Wellbore:	US State Plane 1927 (Exact solution)		
Design:	US State Plane 1927 (Exact solution)		

Project	US State Plane 1927 (Exact solution)		
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	US State Plane 1927 (Exact solution)				
Site Position:		Northing:	260,320.80 usft	Latitude:	39 12
From:	Map	Easting:	1,642,356.60 usft	Longitude:	-80.76
Position Uncertainty:	0 0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0 80 °

Well	US State Plane 1927 (Exact solution)					
Well Position	+N/-S	0 0 usft	Northing:	260,320 80 usft	Latitude:	39° 12' 28 211 N
	+E/-W	0 0 usft	Easting:	1 642,356 60 usft	Longitude:	80° 45' 43 713 W
Position Uncertainty		0 0 usft	Wellhead Elevation:	usft	Ground Level:	1,252 0 usft

Wellbore	US State Plane 1927 (Exact solution)				
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	3/16/2015	-8 45	66 70	52,146

Design	US State Plane 1927 (Exact solution)				
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Audit Notes:

Version:	1 0	Phase:	ACTUAL	Tie On Depth:	0 0
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Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0 0	0 0	0 0	340 71

Survey Program	From (f)	To (usft)	Survey (Wellbore)	Tool Name	Description
	0 00	5,655 2 513701	VES Gyro (Main Wellbore)	InFlex Gyro-VES 01-12-15	Triaxial Continuous Gyro Model
	0 00	16,618 0 513701	PHX MWD (Main Wellbore)	MWD+IGRF	MWD+IGRF v3 standard declination

Survey	US State Plane 1927 (Exact solution)										
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Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0 0	0 00	0 00	0 0	-1,275 0	0 0	0 0	0 0	0 00	0 00	0 00
110 0	0 34	250 37	110 0	-1 165 0	-0 1	-0 3	0 0	0 31	0 31	0 00
210 0	0 36	235 94	210 0	-1 065 0	-0 4	-0 8	-0 1	0 09	0 02	-14 43
310 0	0 23	255 48	310 0	-965 0	-0 6	-1 3	-0 1	0 16	-0 13	19 54
410 0	0 21	272 56	410 0	-865 0	-0 7	-1 7	-0 1	0 07	-0 02	17 08
510 0	0 11	287 70	510 0	-765 0	-0 6	-2 0	0 1	0 11	-0 10	15 14
610 0	0 18	253 22	610 0	-665 0	-0 6	-2 2	0 1	0 11	0 07	-34 48
710 0	0 15	245 62	710 0	-565 0	-0 7	-2 5	0 1	0 04	-0 03	-7 60

Database:	ITM 68800 Single Section	Local Co-ordinate Reference:	API Blockhead Center 5.5
Company:	Oil Pipe Tech. Mustang	TVD Reference:	API 21 00 475 000
Project:	Madagascar N. Africa	MD Reference:	API 21 00 475 000
Site:	Madagascar County 117107	North Reference:	API 21 00 475 000
Well:	API 21 00 475 000	Survey Calculation Method:	API 21 00 475 000
Wellbore:	API 21 00 475 000		
Design:	API 21 00 475 000		

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	0.14	258.02	810.0	-465.0	-0.8	-2.7	0.1	0.03	-0.01	12.40
910.0	0.23	265.01	910.0	-365.0	-0.9	-3.0	0.2	0.09	0.09	6.99
1,010.0	0.32	280.66	1,010.0	-265.0	-0.8	-3.5	0.4	0.12	0.09	15.65
1,110.0	0.65	271.79	1,110.0	-165.0	-0.8	-4.3	0.7	0.34	0.33	-8.87
1,210.0	0.69	285.29	1,210.0	-65.0	-0.6	-5.5	1.3	0.16	0.04	13.50
1,310.0	0.90	280.90	1,310.0	35.0	-0.3	-6.8	2.0	0.22	0.21	-4.39
1,410.0	1.02	276.86	1,410.0	135.0	0.0	-8.5	2.8	0.14	0.12	-4.04
1,510.0	1.12	274.20	1,509.9	234.9	0.2	-10.4	3.6	0.11	0.10	-2.66
1,610.0	1.07	275.86	1,609.9	334.9	0.3	-12.3	4.4	0.06	-0.05	1.66
1,710.0	1.07	273.18	1,709.9	434.9	0.5	-14.1	5.1	0.05	0.00	-2.68
1,810.0	1.11	281.85	1,809.9	534.9	0.7	-16.0	6.0	0.17	0.04	8.67
1,910.0	1.20	281.69	1,909.9	634.9	1.1	-18.0	7.0	0.09	0.09	-0.16
2,010.0	1.11	291.98	2,009.8	734.8	1.7	-19.9	8.2	0.23	-0.09	10.29
2,110.0	1.17	292.24	2,109.8	834.8	2.5	-21.7	9.5	0.06	0.06	0.26
2,210.0	1.19	296.70	2,209.8	934.8	3.3	-23.6	10.9	0.09	0.02	4.46
2,310.0	1.20	298.05	2,309.8	1,034.8	4.3	-25.5	12.4	0.03	0.01	1.35
2,410.0	1.26	299.45	2,409.8	1,134.8	5.3	-27.3	14.0	0.07	0.06	1.40
2,510.0	1.26	301.79	2,509.7	1,234.7	6.4	-29.2	15.7	0.05	0.00	2.34
2,610.0	1.29	302.74	2,609.7	1,334.7	7.6	-31.1	17.5	0.04	0.03	0.95
2,710.0	1.50	299.65	2,709.7	1,434.7	8.9	-33.2	19.3	0.22	0.21	-3.09
2,810.0	1.65	296.34	2,809.6	1,534.6	10.2	-35.6	21.4	0.18	0.15	-3.31
2,910.0	1.71	300.63	2,909.6	1,634.6	11.6	-38.2	23.5	0.14	0.06	4.29
3,010.0	1.78	301.04	3,009.6	1,734.6	13.1	-40.8	25.9	0.07	0.07	0.41
3,110.0	1.87	298.61	3,109.5	1,834.5	14.7	-43.6	28.3	0.12	0.09	-2.43
3,210.0	1.98	295.85	3,209.4	1,934.4	16.2	-46.6	30.7	0.14	0.11	-2.76
3,310.0	1.93	300.44	3,309.4	2,034.4	17.8	-49.6	33.2	0.16	-0.05	4.59
3,410.0	2.04	300.05	3,409.3	2,134.3	19.6	-52.6	35.9	0.11	0.11	-0.39
3,510.0	2.05	302.26	3,509.3	2,234.3	21.4	-55.6	38.6	0.08	0.01	2.21
3,610.0	2.08	298.90	3,609.2	2,334.2	23.3	-58.7	41.4	0.12	0.03	-3.36
3,710.0	2.10	302.04	3,709.1	2,434.1	25.1	-61.9	44.1	0.12	0.02	3.14
3,810.0	2.29	301.33	3,809.1	2,534.1	27.1	-65.1	47.1	0.19	0.19	-0.71
3,910.0	3.07	300.63	3,909.0	2,634.0	29.5	-69.1	50.7	0.78	0.78	-0.70
4,010.0	4.42	300.04	4,008.7	2,733.7	32.8	-74.8	55.7	1.35	1.35	-0.59
4,110.0	4.95	299.66	4,108.4	2,833.4	36.9	-81.9	61.9	0.53	0.53	-0.38
4,210.0	5.16	302.99	4,208.0	2,933.0	41.5	-89.4	68.7	0.36	0.21	3.33
4,310.0	5.06	303.32	4,307.6	3,032.6	46.3	-96.8	75.7	0.10	-0.10	0.33
4,410.0	4.83	306.10	4,407.2	3,132.2	51.2	-103.9	82.7	0.33	-0.23	2.78
4,510.0	4.94	310.13	4,506.9	3,231.9	56.5	-110.6	89.9	0.36	0.11	4.03
4,610.0	5.10	315.20	4,606.5	3,331.5	62.4	-117.0	97.6	0.47	0.16	5.07
4,710.0	5.07	318.68	4,706.1	3,431.1	68.9	-123.1	105.7	0.31	-0.03	3.48
4,810.0	4.82	319.66	4,805.7	3,530.7	75.4	-128.7	113.7	0.26	-0.25	0.98
4,910.0	4.52	323.89	4,905.4	3,630.4	81.8	-133.8	121.4	0.46	-0.30	4.23

Database:	COMPASS 5000 Single User .LIC	Local Co-ordinate Reference:	State Plane North Carolina 5117.0
Company:	Phoenix Technology Services USA Inc	TVD Reference:	NAVD83 86 1275.0usft
Project:	6038 Edge County, WA 317	MD Reference:	NAVD83 86 274.0usft
Site:	6038 Edge County 5137.0	North Reference:	3189
Well:	6038 5137	Survey Calculation Method:	Minimum Curvature
Wellbore:	6038 5137		
Design:	1010: A-2000-1		

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	4.17	327.62	5,005.1	3,730.1	88.1	-138.0	128.7	0.45	-0.35	3.73
5,110.0	3.77	330.12	5,104.9	3,829.9	94.0	-141.6	135.5	0.44	-0.40	2.50
5,210.0	3.86	332.60	5,204.6	3,929.6	99.8	-144.8	142.1	0.19	0.09	2.48
5,310.0	3.97	336.27	5,304.4	4,029.4	106.0	-147.8	148.8	0.27	0.11	3.67
5,410.0	3.35	357.31	5,404.2	4,129.2	112.1	-149.3	155.1	1.47	-0.62	21.04
5,510.0	2.77	33.41	5,504.1	4,229.1	117.0	-148.1	159.4	1.97	-0.58	36.10
5,610.0	3.12	58.63	5,604.0	4,329.0	120.4	-144.4	161.4	1.33	0.35	25.22
5,655.2	3.56	67.02	5,649.1	4,374.1	121.6	-142.1	161.7	1.45	0.97	18.55
5,742.0	4.10	80.40	5,735.7	4,460.7	123.2	-136.6	161.4	1.20	0.62	15.42
5,830.0	3.80	87.10	5,823.5	4,548.5	123.9	-130.5	160.0	0.62	-0.34	7.61
5,893.0	3.10	83.50	5,886.4	4,611.4	124.2	-126.8	159.1	1.16	-1.11	-5.71
5,924.0	2.90	85.10	5,917.3	4,642.3	124.3	-125.1	158.7	0.70	-0.65	5.16
5,956.0	3.40	55.40	5,949.3	4,674.3	124.9	-123.6	158.7	5.26	1.56	-92.81
5,987.0	6.60	37.40	5,980.2	4,705.2	126.9	-121.7	160.0	11.37	10.32	-58.06
6,019.0	9.50	29.90	6,011.8	4,736.8	130.6	-119.3	162.7	9.62	9.06	-23.44
6,050.0	12.20	24.30	6,042.3	4,767.3	135.8	-116.7	166.7	9.34	8.71	-18.06
6,082.0	14.50	23.40	6,073.4	4,798.4	142.6	-113.7	172.1	7.22	7.19	-2.81
6,114.0	16.70	24.60	6,104.2	4,829.2	150.4	-110.2	178.4	6.95	6.88	3.75
6,145.0	19.60	27.60	6,133.7	4,858.7	159.1	-105.9	185.2	9.83	9.35	9.68
6,177.0	22.90	32.10	6,163.5	4,888.5	169.1	-100.1	192.7	11.50	10.31	14.05
6,208.0	26.20	34.70	6,191.7	4,916.7	179.9	-93.0	200.5	11.20	10.65	8.39
6,239.0	30.60	34.80	6,219.0	4,944.0	192.0	-84.6	209.2	14.19	14.19	0.32
6,271.0	34.40	34.70	6,245.9	4,970.9	206.1	-74.8	219.3	11.88	11.88	-0.31
6,302.0	38.10	34.70	6,270.9	4,995.9	221.2	-64.4	230.0	11.94	11.94	0.00
6,334.0	41.50	34.50	6,295.5	5,020.5	238.0	-52.7	242.1	10.63	10.63	-0.63
6,365.0	45.10	33.40	6,318.1	5,043.1	255.7	-40.9	254.8	11.86	11.61	-3.55
6,397.0	48.40	31.70	6,340.0	5,065.0	275.3	-28.3	269.2	11.01	10.31	-5.31
6,428.0	52.00	31.60	6,359.8	5,084.8	295.6	-15.9	284.2	11.62	11.61	-0.32
6,459.0	55.60	32.00	6,378.2	5,103.2	316.9	-2.7	299.9	11.66	11.61	1.29
6,491.0	58.60	31.70	6,395.5	5,120.5	339.7	11.5	316.8	9.41	9.38	-0.94
6,523.0	61.80	32.70	6,411.4	5,136.4	363.2	26.3	334.1	10.36	10.00	3.13
6,554.0	64.50	33.30	6,425.4	5,150.4	386.4	41.4	351.0	8.88	8.71	1.94
6,585.0	66.80	33.40	6,438.2	5,163.2	409.9	56.9	368.1	7.43	7.42	0.32
6,617.0	69.50	33.70	6,450.1	5,175.1	434.7	73.3	386.1	8.48	8.44	0.94
6,680.0	70.70	34.50	6,471.6	5,196.6	483.7	106.5	421.4	2.25	1.90	1.27
6,774.0	68.30	33.80	6,504.5	5,229.5	556.6	155.9	473.8	2.65	-2.55	-0.74
6,869.0	69.40	33.90	6,538.8	5,263.8	630.2	205.3	527.0	1.16	1.16	0.11
6,963.0	69.20	31.20	6,572.0	5,297.0	704.3	252.6	581.3	2.70	-0.21	-2.87
7,058.0	69.50	31.50	6,605.5	5,330.5	780.2	298.8	637.7	0.43	0.32	0.32
7,152.0	69.70	30.80	6,638.3	5,363.3	855.6	344.4	693.8	0.73	0.21	-0.74
7,184.0	69.90	30.80	6,649.3	5,374.3	881.4	359.8	713.0	0.63	0.63	0.00
7,215.0	70.30	30.10	6,659.9	5,384.9	906.5	374.6	731.9	2.48	1.29	-2.26

Database:	SSM 5000 1/Ship.e User.Db	Local Co-ordinate Reference:	Site Deedridge County 513701
Company:	EQT Production - Marcellus	TVD Reference:	KB@23' @ 1275 0usft
Project:	Deedridge County, WV Grid	MD Reference:	KB@23' @ 1275 0usft
Site:	Deedridge County 513701	North Reference:	Grid
Well:	Well #513701	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	13701 As Drilled		

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)
7,246.0	70.00	27.40	6,670.4	5,395.4	932.1	388.6	751.4	8.25	-0.97	-8.71
7,278.0	69.70	23.60	6,681.4	5,406.4	959.2	401.5	772.7	11.19	-0.94	-11.88
7,309.0	71.00	20.50	6,691.8	5,416.8	986.3	412.5	794.6	10.31	4.19	-10.00
7,341.0	71.80	17.70	6,702.1	5,427.1	1,014.9	422.4	818.4	8.66	2.50	-8.75
7,372.0	72.80	14.30	6,711.5	5,436.5	1,043.3	430.5	842.5	10.93	3.23	-10.97
7,403.0	74.10	11.20	6,720.3	5,445.3	1,072.3	437.1	867.7	10.46	4.19	-10.00
7,434.0	75.80	9.30	6,728.4	5,453.4	1,101.7	442.4	893.7	8.07	5.48	-6.13
7,466.0	77.30	7.10	6,735.8	5,460.8	1,132.5	446.9	921.3	8.17	4.69	-6.88
7,498.0	78.00	3.90	6,742.7	5,467.7	1,163.7	449.8	949.7	10.01	2.19	-10.00
7,529.0	79.60	1.10	6,748.7	5,473.7	1,194.0	451.2	977.9	10.25	5.16	-9.03
7,561.0	82.10	358.60	6,753.8	5,478.8	1,225.6	451.1	1,007.8	10.98	7.81	-7.81
7,592.0	83.40	355.20	6,757.7	5,482.7	1,256.3	449.4	1,037.3	11.66	4.19	-10.97
7,624.0	82.60	351.70	6,761.6	5,486.6	1,287.9	445.8	1,068.3	11.14	-2.50	-10.94
7,655.0	82.50	347.90	6,765.6	5,490.6	1,318.1	440.4	1,098.6	12.16	-0.32	-12.26
7,687.0	83.70	344.30	6,769.4	5,494.4	1,348.9	432.7	1,130.2	11.78	3.75	-11.25
7,718.0	84.40	341.50	6,772.7	5,497.7	1,378.4	423.7	1,161.0	9.26	2.26	-9.03
7,750.0	86.20	338.70	6,775.3	5,500.3	1,408.4	412.8	1,192.9	10.38	5.63	-8.75
LP= 7761' MD=7777' TVD										
7,781.0	88.60	337.20	6,776.7	5,501.7	1,437.1	401.2	1,223.8	9.13	7.74	-4.84
Deepest Point of Well= 7815' MD=7777' TVD										
7,813.0	91.00	336.50	6,776.8	5,501.8	1,466.5	388.6	1,255.8	7.81	7.50	-2.19
7,907.0	92.40	335.80	6,774.0	5,499.0	1,552.4	350.6	1,349.4	1.67	1.49	-0.74
7,930.0	92.70	335.70	6,773.0	5,498.0	1,573.4	341.2	1,372.3	1.37	1.30	-0.43
8,024.0	88.90	337.20	6,771.7	5,496.7	1,659.5	303.6	1,466.0	4.35	-4.04	1.60
8,119.0	90.20	338.30	6,772.4	5,497.4	1,747.5	267.7	1,560.9	1.79	1.37	1.16
8,214.0	89.30	338.30	6,772.8	5,497.8	1,835.7	232.5	1,655.8	0.95	-0.95	0.00
8,308.0	92.10	337.60	6,771.7	5,496.7	1,922.8	197.3	1,749.7	3.07	2.98	-0.74
8,403.0	95.00	337.20	6,765.8	5,490.8	2,010.4	160.8	1,844.3	3.08	3.05	-0.42
8,498.0	93.00	335.30	6,759.2	5,484.2	2,097.1	122.7	1,938.8	2.90	-2.11	-2.00
8,592.0	92.40	333.60	6,754.8	5,479.8	2,181.8	82.2	2,032.1	1.92	-0.64	-1.81
8,686.0	91.10	331.70	6,751.9	5,476.9	2,265.3	39.0	2,125.2	2.45	-1.38	-2.02
8,781.0	91.70	334.90	6,749.6	5,474.6	2,350.1	-3.7	2,219.3	3.43	0.63	3.37
8,876.0	90.70	335.00	6,747.6	5,472.6	2,436.1	-43.9	2,313.8	1.06	-1.05	0.11
8,970.0	90.20	333.80	6,746.8	5,471.8	2,520.9	-84.5	2,407.3	1.38	-0.53	-1.28
9,065.0	90.70	336.00	6,746.1	5,471.1	2,606.9	-124.8	2,501.8	2.37	0.53	2.32
9,159.0	89.40	336.10	6,746.0	5,471.0	2,692.8	-163.0	2,595.4	1.39	-1.38	0.11
9,253.0	90.60	336.40	6,746.0	5,471.0	2,778.9	-200.8	2,689.2	1.32	1.28	0.32
9,347.0	91.80	336.80	6,744.0	5,469.0	2,865.1	-238.1	2,782.9	1.35	1.28	0.43
9,442.0	92.10	336.40	6,740.8	5,465.8	2,952.2	-275.8	2,877.6	0.53	0.32	-0.42
9,537.0	91.30	335.70	6,738.0	5,463.0	3,039.0	-314.4	2,972.2	1.12	-0.84	-0.74
9,631.0	94.40	337.80	6,733.3	5,458.3	3,125.3	-351.4	3,065.9	3.98	3.30	2.23
9,726.0	93.90	337.30	6,726.4	5,451.4	3,212.8	-387.6	3,160.5	0.74	-0.53	-0.53
9,820.0	93.50	336.70	6,720.4	5,445.4	3,299.2	-424.3	3,254.1	0.77	-0.43	-0.64

Database:	130300117	Local Co-ordinate Reference:	2011 Phoenix County Survey
Company:	Production Services	TVD Reference:	K3723 01273 East
Project:	Phoenix County W. GM	MD Reference:	K3723 01273 East
Site:	Phoenix County Survey	North Reference:	GM
Well:	130300117	Survey Calculation Method:	Miner's Curve
Wellbore:	130300117		
Design:	130300117		

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)
9,914.0	93.20	335.80	6,714.9	5,439.9	3,385.1	-452.1	3,347.6	1.01	-0.32	-0.96
10,008.0	92.70	335.00	6,710.0	5,435.0	3,470.4	-501.1	3,441.1	1.00	-0.53	-0.85
10,103.0	91.40	335.70	6,706.6	5,431.6	3,556.7	-540.7	3,535.6	1.55	-1.37	0.74
10,198.0	90.70	335.90	6,704.9	5,429.9	3,643.4	-579.7	3,630.3	0.77	-0.74	0.21
10,292.0	90.50	335.70	6,703.9	5,428.9	3,729.1	-618.2	3,723.9	0.30	-0.21	-0.21
10,387.0	89.60	335.10	6,703.8	5,428.8	3,815.5	-657.8	3,818.5	1.14	-0.95	-0.63
10,481.0	93.40	334.10	6,701.4	5,426.4	3,900.3	-698.1	3,911.9	4.18	4.04	-1.06
10,576.0	93.00	332.80	6,696.1	5,421.1	3,985.2	-740.4	4,006.0	1.43	-0.42	-1.37
10,670.0	92.40	332.00	6,691.6	5,416.6	4,068.4	-784.0	4,098.9	1.06	-0.64	-0.85
10,765.0	91.30	333.80	6,688.6	5,413.6	4,152.9	-827.2	4,193.0	2.22	-1.16	1.89
10,859.0	92.70	335.30	6,685.3	5,410.3	4,237.7	-867.6	4,286.4	2.18	1.49	1.60
10,953.0	92.00	334.50	6,681.4	5,406.4	4,322.8	-907.4	4,379.8	1.13	-0.74	-0.85
11,048.0	91.30	334.60	6,678.7	5,403.7	4,408.5	-948.2	4,474.2	0.74	-0.74	0.11
11,142.0	90.50	334.80	6,677.2	5,402.2	4,493.5	-988.4	4,567.7	0.88	-0.85	0.21
11,236.0	89.70	334.00	6,677.1	5,402.1	4,578.3	-1,029.0	4,661.1	1.20	-0.85	-0.85
11,331.0	89.00	333.50	6,678.1	5,403.1	4,663.5	-1,071.0	4,755.4	0.91	-0.74	-0.53
11,426.0	91.40	333.90	6,677.8	5,402.8	4,748.6	-1,113.1	4,849.7	2.56	2.53	0.42
11,520.0	91.30	334.60	6,675.6	5,400.6	4,833.3	-1,153.9	4,943.1	0.75	-0.11	0.74
11,615.0	91.70	334.60	6,673.1	5,398.1	4,919.1	-1,194.7	5,037.5	0.42	0.42	0.00
11,709.0	91.40	332.80	6,670.6	5,395.6	5,003.3	-1,236.3	5,130.8	1.94	-0.32	-1.91
11,804.0	94.00	335.30	6,666.1	5,391.1	5,088.6	-1,277.8	5,225.0	3.79	2.74	2.63
11,898.0	93.50	334.70	6,659.9	5,384.9	5,173.6	-1,317.5	5,318.4	0.83	-0.53	-0.64
11,992.0	92.90	334.20	6,654.7	5,379.7	5,258.3	-1,357.9	5,411.7	0.83	-0.64	-0.53
12,087.0	92.70	334.10	6,650.1	5,375.1	5,343.7	-1,399.3	5,505.9	0.24	-0.21	-0.11
12,181.0	91.60	333.00	6,646.5	5,371.5	5,427.8	-1,441.1	5,599.1	1.65	-1.17	-1.17
12,275.0	90.50	333.00	6,644.8	5,369.8	5,511.5	-1,483.8	5,692.3	1.17	-1.17	0.00
12,370.0	89.80	335.90	6,644.6	5,369.6	5,597.2	-1,524.8	5,786.7	3.14	-0.74	3.05
12,464.0	92.40	336.80	6,642.7	5,367.7	5,683.3	-1,562.5	5,880.4	2.93	2.77	0.96
12,558.0	91.40	337.60	6,639.6	5,364.6	5,769.9	-1,598.9	5,974.1	1.36	-1.06	0.85
12,652.0	93.10	337.90	6,635.9	5,360.9	5,856.8	-1,634.4	6,067.9	1.84	1.81	0.32
12,747.0	91.40	334.90	6,632.2	5,357.2	5,943.8	-1,672.4	6,162.6	3.63	-1.79	-3.16
12,841.0	90.90	334.90	6,630.3	5,355.3	6,028.9	-1,712.3	6,256.1	0.53	-0.53	0.00
12,935.0	90.10	333.70	6,629.5	5,354.5	6,113.6	-1,753.1	6,349.5	1.53	-0.85	-1.28
13,029.0	89.50	332.60	6,629.8	5,354.8	6,197.5	-1,795.5	6,442.7	1.33	-0.64	-1.17
13,124.0	89.00	331.60	6,631.1	5,356.1	6,281.4	-1,840.0	6,536.6	1.18	-0.53	-1.05
13,218.0	89.90	333.70	6,632.0	5,357.0	6,364.9	-1,883.2	6,629.7	2.43	0.96	2.23
13,313.0	90.40	336.10	6,631.7	5,356.7	6,450.9	-1,923.5	6,724.2	2.58	0.53	2.53
13,407.0	89.50	335.40	6,631.8	5,356.8	6,536.6	-1,962.1	6,817.8	1.21	-0.96	-0.74
13,502.0	90.30	337.40	6,632.0	5,357.0	6,623.7	-2,000.1	6,912.5	2.27	0.84	2.11
13,597.0	91.20	337.60	6,630.7	5,355.7	6,711.4	-2,036.4	7,007.4	0.97	0.95	0.21
13,691.0	91.30	337.40	6,628.7	5,353.7	6,798.3	-2,072.4	7,101.2	0.24	0.11	-0.21
13,786.0	90.60	336.40	6,627.1	5,352.1	6,885.6	-2,109.7	7,196.0	1.28	-0.74	-1.05

Database:	15612 - 18618 - 5385 - TVD	Local Co-ordinate Reference:	15612 - 18618 - 5385 - TVD
Company:	15612 - 18618 - 5385 - TVD	TVD Reference:	15612 - 18618 - 5385 - TVD
Project:	15612 - 18618 - 5385 - TVD	MD Reference:	15612 - 18618 - 5385 - TVD
Site:	15612 - 18618 - 5385 - TVD	North Reference:	15612 - 18618 - 5385 - TVD
Well:	15612 - 18618 - 5385 - TVD	Survey Calculation Method:	15612 - 18618 - 5385 - TVD
Wellbore:	15612 - 18618 - 5385 - TVD		
Design:	15612 - 18618 - 5385 - TVD		

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (%/100usft)	Build Rate (%/100usft)	Turn Rate (%/100usft)
13,880.0	90.60	335.00	6,626.1	5,351.1	6,971.3	-2,148.4	7,289.6	1.49	0.00	-1.49
13,974.0	89.40	332.50	6,626.1	5,351.1	7,055.6	-2,189.9	7,382.9	2.95	-1.28	-2.66
14,068.0	90.50	332.40	6,626.2	5,351.2	7,138.9	-2,233.4	7,475.9	1.18	1.17	-0.11
14,162.0	89.00	330.60	6,626.6	5,351.6	7,221.5	-2,278.3	7,568.7	2.49	-1.60	-1.91
14,256.0	89.10	334.20	6,628.2	5,353.2	7,304.8	-2,321.8	7,661.7	3.83	0.11	3.83
14,351.0	91.50	336.60	6,627.7	5,352.7	7,391.2	-2,361.3	7,756.3	3.57	2.53	2.53
14,445.0	91.20	334.90	6,625.5	5,350.5	7,476.9	-2,399.9	7,849.9	1.84	-0.32	-1.81
14,540.0	90.60	334.60	6,624.0	5,349.0	7,562.8	-2,440.4	7,944.4	0.71	-0.63	-0.32
14,634.0	89.60	334.00	6,623.8	5,348.8	7,647.5	-2,481.2	8,037.8	1.24	-1.06	-0.64
14,728.0	89.00	333.40	6,625.0	5,350.0	7,731.7	-2,522.8	8,131.1	0.90	-0.64	-0.64
14,822.0	88.50	333.50	6,627.0	5,352.0	7,815.8	-2,564.9	8,224.3	0.54	-0.53	0.11
14,916.0	90.70	334.60	6,627.7	5,352.7	7,900.3	-2,606.0	8,317.7	2.62	2.34	1.17
15,011.0	89.90	334.70	6,627.2	5,352.2	7,986.2	-2,646.7	8,412.1	0.85	-0.84	0.11
15,106.0	88.90	334.60	6,628.2	5,353.2	8,072.0	-2,687.3	8,506.6	1.06	-1.05	-0.11
15,201.0	88.10	334.50	6,630.6	5,355.6	8,157.8	-2,728.1	8,601.0	0.85	-0.84	-0.11
15,296.0	91.00	336.70	6,631.4	5,356.4	8,244.3	-2,767.4	8,695.6	3.83	3.05	2.32
15,391.0	90.50	336.40	6,630.1	5,355.1	8,331.4	-2,805.2	8,790.4	0.61	-0.53	-0.32
15,486.0	89.20	335.50	6,630.4	5,355.4	8,418.2	-2,843.9	8,885.0	1.66	-1.37	-0.95
15,581.0	87.80	334.20	6,632.9	5,357.9	8,504.1	-2,884.2	8,979.5	2.01	-1.47	-1.37
15,676.0	87.10	334.20	6,637.1	5,362.1	8,589.6	-2,925.6	9,073.8	0.74	-0.74	0.00
15,771.0	87.00	335.90	6,642.0	5,367.0	8,675.6	-2,965.6	9,168.2	1.79	-0.11	1.79
15,866.0	91.00	337.30	6,643.7	5,368.7	8,762.7	-3,003.3	9,262.9	4.46	4.21	1.47
15,959.0	90.20	336.70	6,642.7	5,367.7	8,848.3	-3,039.6	9,355.7	1.08	-0.86	-0.65
16,054.0	89.00	337.10	6,643.3	5,368.3	8,935.7	-3,076.9	9,450.5	1.33	-1.26	0.42
16,148.0	88.40	336.20	6,645.5	5,370.5	9,022.0	-3,114.1	9,544.2	1.15	-0.64	-0.96
16,244.0	87.80	337.00	6,648.7	5,373.7	9,110.0	-3,152.2	9,639.9	1.04	-0.63	0.83
16,338.0	87.40	335.70	6,652.6	5,377.6	9,196.1	-3,189.9	9,733.6	1.45	-0.43	-1.38
16,433.0	88.50	335.50	6,656.0	5,381.0	9,282.5	-3,229.1	9,828.1	1.18	1.16	-0.21
16,528.0	87.80	335.50	6,659.1	5,384.1	9,368.9	-3,268.5	9,922.7	0.74	-0.74	0.00
Final Survey: 16528 - 18618 - 5385 - TVD										
16,560.0	87.60	335.30	6,660.3	5,385.3	9,398.0	-3,281.8	9,954.5	0.88	-0.63	-0.63
Projection to TD: 18618 - MD: 5385 - TVD										
16,618.0	87.60	335.30	6,662.8	5,387.8	9,450.7	-3,306.0	10,012.2	0.00	0.00	0.00



Phoenix Technologies
Survey Report



Database:	KB-013-0014-0001	Local Co-ordinate Reference:	SRP-D Bridge County 1-07
Company:	Phoenix Technology Services USA Inc	TVD Reference:	KB-013-0014-0001
Project:	SRP-D Bridge County NY 3rd	MD Reference:	KB-013-0014-0001
Site:	Bridge County NY 3rd	North Reference:	SRP-D
Well:	MD/6777	Survey Calculation Method:	Minimum Curvature
Wellbore:	MD/6777		
Design:	TD/6777		

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,655.2	5,649.1	121.6	-142.1	Gyro Tie In=5655' MD
7,781.0	6,776.7	1,437.1	401.2	LP= 7781' MD/6777' TVD
7,813.0	6,776.8	1,466.5	386.6	Deepest Point of Well= 7813' MD/6777' TVD
16,560.0	6,660.3	9,398.0	-3,281.8	Final Survey= 16560' MD/6660' TVD
16,618.0	6,662.8	9,450.7	-3,306.0	Projection to TD= 16618' MD/6663' TVD

Checked By _____ Approved By: _____ Date _____

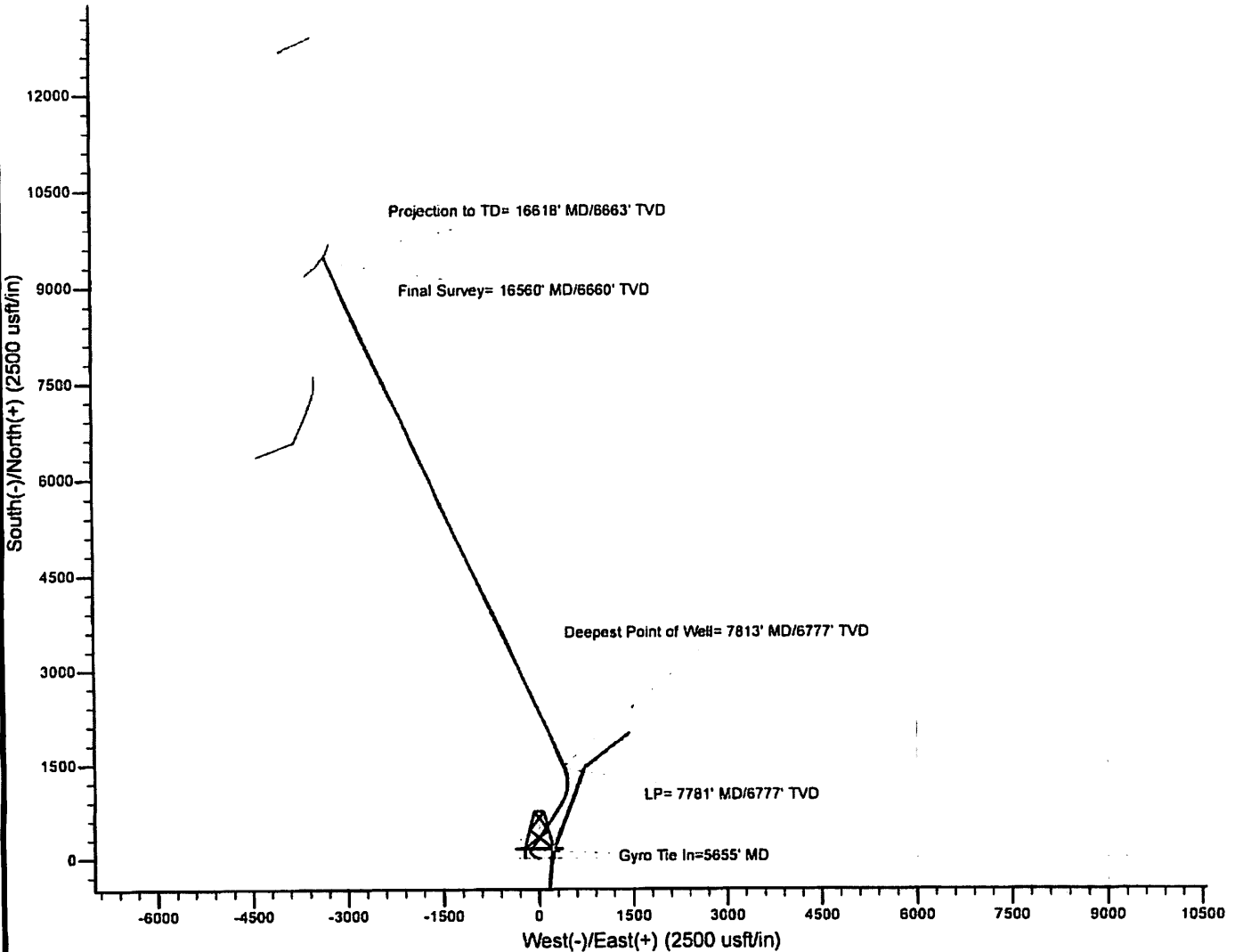
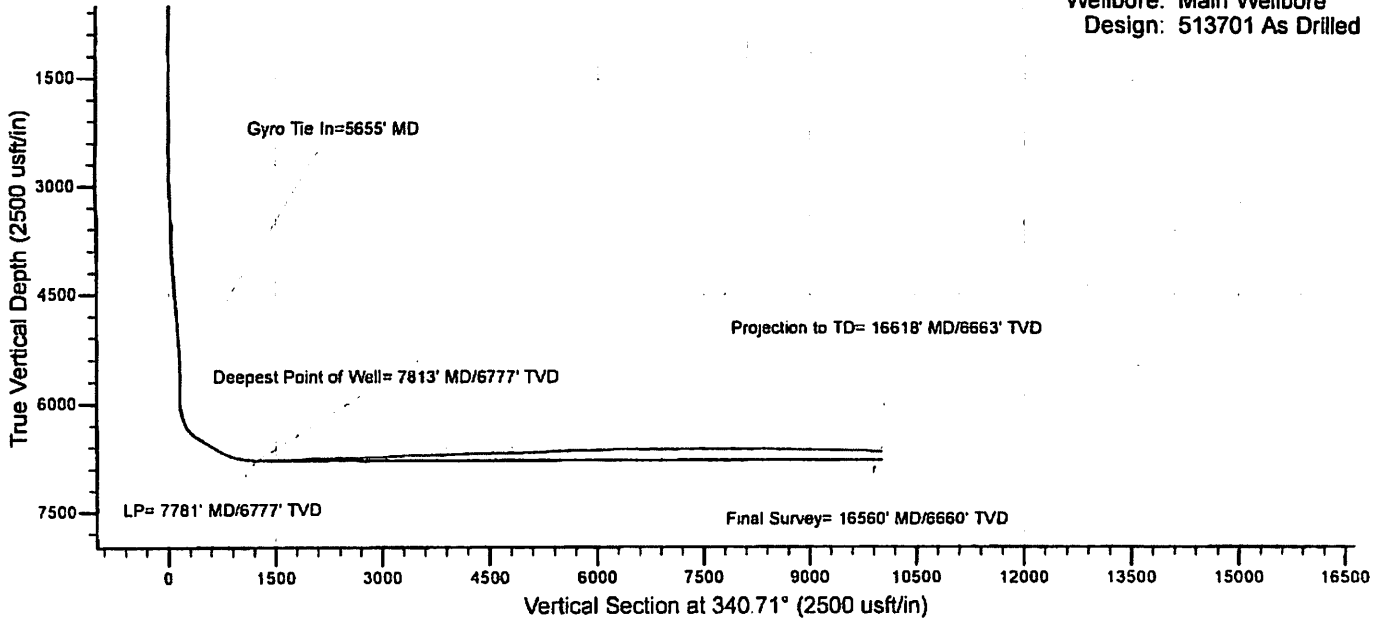
02/12/2016



PHOENIX
TECHNOLOGY SERVICES USA INC

EQT Production - Marcellus

Project: Doddridge County, WV Grid
Site: Doddridge County 513701
Well: Well #513701
Wellbore: Main Wellbore
Design: 513701 As Drilled



02/12/2016

513701 - 47-017-06506-0000 - Perforations

Stage Number	Perforation Date	Top Perf Depth (ftKB)	Bottom Perf Depth (ftKB)	Number of Shots	Formation
Initiation Sleeve	7/11/2015	16,604.00	16,605.00	10	MARCELLUS
1	7/11/2015	16,435.00	16,550.00	42	MARCELLUS
2	7/12/2015	16,271.00	16,393.00	42	MARCELLUS
3	7/12/2015	16,091.00	16,213.00	42	MARCELLUS
4	7/13/2015	15,911.00	16,033.00	42	MARCELLUS
5	7/13/2015	15,731.00	15,853.00	42	MARCELLUS
6	7/13/2015	15,551.00	15,673.00	42	MARCELLUS
7	7/13/2015	15,371.00	15,495.00	42	MARCELLUS
8	7/14/2015	15,191.00	15,313.00	42	MARCELLUS
9	7/14/2015	15,011.00	15,133.00	42	MARCELLUS
10	7/14/2015	14,835.00	14,953.00	42	MARCELLUS
11	7/15/2015	14,651.00	14,773.00	42	MARCELLUS
12	7/15/2015	14,471.00	14,593.00	42	MARCELLUS
13	7/15/2015	14,291.00	14,413.00	42	MARCELLUS
14	7/15/2015	14,111.00	14,233.00	42	MARCELLUS
15	7/15/2015	13,931.00	14,051.00	42	MARCELLUS
16	7/16/2015	13,751.00	13,871.00	42	MARCELLUS
17	7/16/2015	13,571.00	13,693.00	42	MARCELLUS
18	7/16/2015	13,391.00	13,513.00	42	MARCELLUS
19	7/16/2015	13,211.00	13,333.00	42	MARCELLUS
20	7/16/2015	13,031.00	13,152.00	42	MARCELLUS
21	7/17/2015	12,842.00	12,957.00	42	MARCELLUS
22	7/17/2015	12,669.00	12,793.00	42	MARCELLUS
23	7/17/2015	12,491.00	12,613.00	42	MARCELLUS
24	7/17/2015	12,311.00	12,433.00	42	MARCELLUS
25	7/17/2015	12,131.00	12,253.00	42	MARCELLUS
26	7/18/2015	11,951.00	12,073.00	42	MARCELLUS
27	7/18/2015	11,771.00	11,893.00	42	MARCELLUS
28	7/18/2015	11,591.00	11,713.00	42	MARCELLUS
29	7/18/2015	11,411.00	11,537.00	42	MARCELLUS
30	7/18/2015	11,231.00	11,353.00	42	MARCELLUS
31	7/19/2015	11,053.00	11,173.00	42	MARCELLUS
32	7/19/2015	10,871.00	10,993.00	42	MARCELLUS
33	7/19/2015	10,691.00	10,813.00	42	MARCELLUS
34	7/19/2015	10,511.00	10,633.00	42	MARCELLUS
35	7/19/2015	10,331.00	10,453.00	42	MARCELLUS
36	7/20/2015	10,151.00	10,304.00	42	MARCELLUS
37	7/20/2015	9,971.00	10,093.00	42	MARCELLUS
38	7/20/2015	9,791.00	9,915.00	42	MARCELLUS
39	7/20/2015	9,611.00	9,731.00	42	MARCELLUS
40	7/20/2015	9,431.00	9,551.00	42	MARCELLUS
41	7/20/2015	9,251.00	9,373.00	42	MARCELLUS
42	7/21/2015	9,071.00	9,193.00	42	MARCELLUS
43	7/21/2015	8,891.00	9,013.00	42	MARCELLUS
44	7/21/2015	8,711.00	8,831.00	42	MARCELLUS
45	7/21/2015	8,531.00	8,651.00	42	MARCELLUS
46	7/21/2015	8,351.00	8,471.00	42	MARCELLUS
47	7/22/2015	8,171.00	8,293.00	42	MARCELLUS
48	7/22/2015	7,991.00	8,111.00	42	MARCELLUS
49	7/28/2015	7,811.00	7,971.00	42	MARCELLUS
50	7/28/2015	7,629.00	7,751.00	42	MARCELLUS

513701--47-017-06506-0000- 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)
1.01	7/12/2015	16.4	5,948.00	6,436.00	3,413.00	0	1030	0
1	7/12/2015	91.1	7,968.00	8,462.00	3,996.00	296,662	8747	0
2	7/12/2015	74.4	7,411.00	7,975.00	3,909.00	276,174	7752	0
3	7/13/2015	70.8	7,091.00	7,718.00	3,755.00	300,727	8054	0
4	7/13/2015	88.7	8,022.00	8,700.00	4,153.00	303,450	8667	0
5	7/13/2015	82.5	8,098.00	8,901.00	4,895.00	260,362	8055	0
6	7/13/2015	79.6	7,448.00	7,894.00	3,827.00	362,033	9099	0
7	7/13/2015	87.4	8,191.00	8,733.00	5,121.00	318,933	9465	0
8	7/14/2015	85.5	7,861.00	8,502.00	4,424.00	309,384	8792	0
9	7/14/2015	80.3	8,108.00	8,894.00	5,194.00	353,378	9146	0
10	7/14/2015	80	7,953.00	8,509.00	5,106.00	359,877	9901	0
11	7/15/2015	83.2	7,818.00	8,260.00	4,859.00	352,921	8838	0
12	7/15/2015	97	8,210.00	9,077.00	5,358.00	361,771	9052	0
13	7/15/2015	97.4	8,123.00	9,079.00	5,335.00	345,936	8707	0
14	7/15/2015	91.6	8,148.00	8,525.00	4,718.00	359,705	8409	0
15	7/15/2015	84.9	7,979.00	8,525.00	4,173.00	360,608	8981	0
16	7/16/2015	84.8	7,990.00	8,512.00	5,121.00	310,925	8210	0
17	7/16/2015	75.2	8,153.00	8,547.00	5,309.00	297,849	8249	0
18	7/16/2015	85.1	7,915.00	8,466.00	5,067.00	357,696	8504	0
19	7/16/2015	86.1	8,306.00	8,848.00	4,818.00	338,151	9163	0
20	7/16/2015	88.8	7,863.00	8,613.00	5,100.00	359,494	8597	0
21	7/17/2015	88.30	7,876.00	8,403.00	5,674	359,899	8,583	0
22	7/17/2015	98.00	8,125.00	8,375.00	5,195	358,607	8,237	0
23	7/17/2015	97.30	8,221.00	8,833.00	5,066	360,224	8,417	0
24	7/17/2015	89.60	7,853.00	8,281.00	5,106	361,010	8,445	0
25	7/17/2015	90.40	7,787.00	8,026.00	4,530	360,180	8,444	0
26	7/18/2015	90.30	7,871.00	8,233.00	4,928	362,172	8,504	0
27	7/18/2015	100.00	8,116.00	8,348.00	4,886	360,844	8,100	0
28	7/18/2015	99.1	8,141.00	8,397.00	4,956.00	361,793	8171	0
29	7/18/2015	93.1	7,973.00	8,750.00	5,170.00	361,074	8435	0
30	7/18/2015	100	8,154.00	8,586.00	5,235.00	359,689	8267	0
31	7/19/2015	99.6	8,307.00	8,854.00	5,155.00	360,077	8260	0
32	7/19/2015	101.30	8,102.00	8,541.00	5,140	358,841	7,928	0
33	7/19/2015	100.10	7,875.00	8,729.00	5,181	360,214	7,850	0
34	7/19/2015	101.00	8,038.00	9,058.00	4,965	360,114	8,187	0
35	7/20/2015	98.40	7,912.00	8,336.00	5,092	361,025	8,783	0
36	7/20/2015	99.40	8,178.00	8,543.00	5,473	358,530	8,115	0
37	7/20/2015	101.50	8,142.00	8,931.00	4,812	361,354	7,830	0
38	7/20/2015	100.30	7,977.00	8,123.00	4,968	360,290	9,012	0
39	7/20/2015	99.30	8,066.00	8,669.00	4,972	359,975	7,910	0
40	7/20/2015	99.90	8,248.00	8,526.00	5,183	361,052	7,956	0
41	7/21/2015	99.00	7,985.00	8,894.00	4,978	361,801	8,219	0
42	7/21/2015	99.90	7,886.00	8,561.00	5,096	360,150	7,841	0
43	7/21/2015	101.20	8,129.00	8,748.00	5,232	292,382	6,969	0
44	7/21/2015	100.70	7,857.00	8,389.00	5,202	361,011	7,994	0
45	7/21/2015	99.90	7,980.00	9,199.00	5,045	353,014	8,246	0
46	7/22/2015	99.30	7,821.00	8,220.00	5,116	361,619	8,292	0
47	7/22/2015	99.70	7,720.00	8,088.00	5,378	351,049	7,850	0
48	7/27/2015	96.40	7,947.00	8,902.00	5,399	362,732	8,852	0
49	7/28/2015	98.00	8,173.00	8,919.00	4,906	347,483	8,663	0
50	7/28/2015	98.70	7,533.00	8,033.00	5,257	362,959	7,687	0

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	7/11/2015
Job End Date:	7/28/2015
State:	West Virginia
County:	Doddridge
API Number:	47-017-06508-00-00
Operator Name:	EQT Production
Well Name and Number:	513701
Longitude:	-80.76214300
Latitude:	39.20783600
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	6,757
Total Base Water Volume (gal):	17,701,530
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	89.13199	None
Sand (Proppant)	FTS International	Proppant	Crystalline Silica	14808-60-7	100.00000	10.44295	None
MC-MX 437-5	Multi-Chem Group LLC	Calcium nitrate solution	Calcium nitrate	10124-37-5	60.00000	0.05713	None
FRW-900	FTS International	Friction reducer	Hydrotreated light distillate	64742-47-8	30.00000	0.02425	None
			Alkyl Alcohol	Proprietary	10.00000	0.00808	None
			Oxyalkylated alcohol A	Proprietary	5.00000	0.00404	None
Hydrochloric Acid (15%)	FTS International	Acidizing	Hydrochloric Acid	7647-01-0	15.00000	0.03233	None
HVG-1	FTS International	Water Gelling agent	Petroleum distillate	64742-47-8	55.00000	0.00372	None
			Guar gum	9000-30-0	50.00000	0.00338	None
			Surfactant	68439-51-0	2.00000	0.00014	None
			Clay	14808-60-7	2.00000	0.00014	None
CS-500-SI	FTS International	Scale inhibitor					

			Ethylene glycol	107-21-1	10.00000	0.00248	None
FE-100L	FTS International	Iron control					
			Citric acid	77-92-9	55.00000	0.00059	None
CI-150	FTS International	Acid Corrosion Inhibitor					
			Isopropanol	67-63-0	30.00000	0.00014	None
			Organic amine resin salt	Proprietary	30.00000	0.00014	None
			Ethylene glycol	107-21-1	30.00000	0.00014	None
			Quaternary ammonium compound	Proprietary	10.00000	0.00005	None
			Aromatic aldehyde	Proprietary	10.00000	0.00005	None
			Dimethylformamide	68-12-2	10.00000	0.00005	None
APB-1	FTS International	Gel Breaker					
			Ammonium persulfate	7727-54-0	95.00000	0.00007	None
NE-100	FTS International	Non-emulsifier					
			2-Propanol	67-63-0	10.00000	0.00003	None
			2-Butoxyethanol	111-76-2	10.00000	0.00003	None
			Dodecylbenzenesulfonic acid	27176-87-0	5.00000	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 Samantha S., Operator - OpNo. E1210363 [Log Out]

Hydraulic Fracturing DISCLOSURE



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Hydraulic Fracturing Data

[Edit](#)

Job Start Date 7/11/2015	Job End Date 7/28/2015	API Number 47-017-06506-00-00	State & County West Virginia --- Doddridge
Well Name 513701			
Longitude -80.762143	Latitude 39.207836	Datum NAD83	Federal/Tribal Well?
True Vertical Depth (ft) 6757.4	Total Water Vol (gal) 17701530	Total Non Water Vol 0	Total Mass (lbs) 165730918



MSDS Chemical Ingredients

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

	Trade Name	Supplier	Purpose	Ingredients	CAS #	% High Additive	% HF Job	Comments	Ingredient Mass
Edit	Water	FTS International	Carrier/Base Fluid	Water	7732-18-5	100%	89.1319915256%	None	147719267.85
Edit	Sand (Proppant)	FTS International	Proppant	Crystalline Silica	14808-60-7	100%	10.4429518653%	None	17307200
Edit	MC MX 437-5	Multi-Chem Group LLC	Calcium nitrate solution	Calcium nitrate	10124-37-5	60%	.0571338439%	None	94688.444
Edit	FRW-900	FTS International	Friction reducer	Hydrotreated light distillate	64742-47-8	30%	.0242476718%	None	40185.889
				Alkyl Alcohol	Proprietary	10%	.0080825573%	None	13395.296
				Oxyalkylated alcohol A	Proprietary	5%	.0040412786%	None	6697.648
Edit	Hydrochloric Acid (15%)	FTS International	Acidizing	Hydrochloric Acid	7647-01-0	15%	.0323264365%	None	53574.9
Edit	HVG-1	FTS International	Water Gelling agent	Petroleum distillate	64742-47-8	55%	.0037184025%	None	6162.543
				Guar gum	9000-30-0	50%	.0033803659%	None	5602.311
				Surfactant	68439-51-0	2%	.0001352146%	None	224.092
				Clay	14808-60-7	2%	.0001352146%	None	224.092

<input type="button" value="Edit"/>	CS-500-SI	FTS International	Scale inhibitor	Ethylene glycol	107-21-1	10%	.0024843043%	None	4117.26
<input type="button" value="Edit"/>	FE-100L	FTS International	Iron control	Citric acid	77-92-9	55%	.0005931221%	None	982.987
<input type="button" value="Edit"/>	CI-150	FTS International	Acid Corrosion Inhibitor	Isopropanol	67-63-0	30%	.0001390792%	None	230.497
				Organic amine resin salt	Proprietary	30%	.0001390792%	None	230.497
				Ethylene glycol	107-21-1	30%	.0001390792%	None	230.497
				Quaternary ammonium compound	Proprietary	10%	.0000463597%	None	76.832
				Aromatic aldehyde	Proprietary	10%	.0000463597%	None	76.832
				Dimethylformamide	68-12-2	10%	.0000463597%	None	76.832
<input type="button" value="Edit"/>	APB-1	FTS International	Gel Breaker	Ammonium persulfate	7727-54-0	95%	.0000745184%	None	123.5
<input type="button" value="Edit"/>	NE-100	FTS International	Non-emulsifier	2-Propanol	67-63-0	10%	.000027417%	None	45.439
				2-Butoxyethanol	111-76-2	10%	.000027417%	None	45.439
				Dodecylbenzenesulfonic acid	27176-87-0	5%	.0000137085%	None	22.719

Non-MSDS Chemical Ingredients

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

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LEGEND

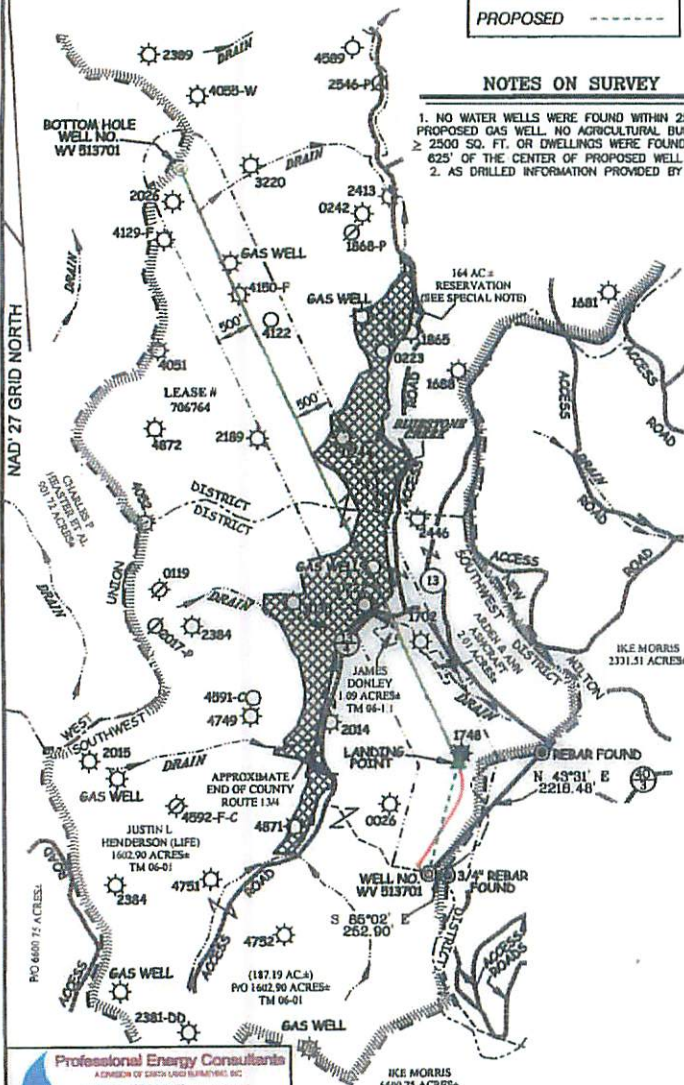
AS DRILLED (solid line)
PROPOSED (dashed line)

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 EGT.

SPECIAL NOTE

THERE IS NO SURVEY OR LEGAL DESCRIPTION DEFINING THE ACTUAL LOCATION OF THE 164 ACRE MEADOWLAND RESERVATION. DUE TO THE PASSAGE OF TIME SINCE THE RESERVATION WAS CREATED IT APPEARS THERE IS NO LIVING PERSON(S) WITH KNOWLEDGE OF ITS TRUE LOCATION. LOCATION OF RESERVATION SHOWN HEREON COMPILED FROM: "A" A MAP TITLED "CARNAGIE NATURAL GAS CO. LEEMAN MAXWELL LEASES, DODDRIDGE COUNTY, WEST VA" "B" PERIMETER OF RESERVATION AS SHOWN BY GLENN TRADER "CARETAKER OF HENDERSONS' PORTION OF MAXWELL LANDS" WHICH WAS LOCATED USING A MAPPING GRADE GPS RECEIVER "C" DETAILS SHOWN ON 1939 USDA AERIAL PHOTOGRAPHY OBTAINED FROM THE WV GEOLOGICAL SURVEY. SLS RECOMMENDS THAT PROPER LEGAL STEPS BE TAKEN TO CONFIRM CONCURRENCE OF ALL APPROPRIATE PARTIES RELATIVE TO THE RESERVATION AS SHOWN HEREON. THIS PLAT IS SUBJECT TO ANY ADDITIONAL INFORMATION (UNDISCOVERED TO DATE) WHICH MAY CHANGE THE LOCATION AND/OR CONFIGURATION OF THE RESERVATION AS SHOWN HEREON.



EQT PRODUCTION COMPANY
LEEMAN MAXWELL LEASE
2,164 ACRES±
WELL NO. WV 513701

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)
NAD'27 S.P.C.(FT) N. 260,320.8 E. 1,642,350.8
NAD'27 GEO. LAT-(N) 39.207836 LONG-(W) 80.762142
NAD'83 UTM (M) N. 4,339,877.3 E. 520,551.1
LANDING POINT
NAD'27 S.P.C.(FT) N. 201,804.3 E. 1,642,783.4
NAD'27 GEO. LAT-(N) 39.211926 LONG-(W) 80.760780
NAD'83 UTM (M) N. 4,340,331.3 E. 520,867.5
BOTTOM HOLE
NAD'27 S.P.C.(FT) N. 269,770.8 E. 1,639,048.0
NAD'27 GEO. LAT-(N) 39.233651 LONG-(W) 80.774288
NAD'83 UTM (M) N. 4,342,739.4 E. 519,465.3

AS DRILLED COORDINATES
FOR WELL NO. WV 513701

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)
NAD'27 S.P.C.(FT) N. 260,320.8 E. 1,642,350.8
NAD'27 GEO. LAT-(N) 39.207836 LONG-(W) 80.762142
NAD'83 UTM (M) N. 4,339,877.3 E. 520,551.1
BOTTOM HOLE
NAD'27 S.P.C.(FT) N. 269,771.2 E. 1,639,050.7
NAD'27 GEO. LAT-(N) 39.233653 LONG-(W) 80.774281
NAD'83 UTM (M) N. 4,342,739.5 E. 519,465.9



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 JANUARY 08 20 14
REVISED 03/24/14 & 04/07/15
OPERATORS WELL NO. WV 513701
API WELL NO. 47-017-06506-H
STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1/200 FILE NO. 7889AD513701
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 INJECTION DISPOSAL "GAS" PRODUCTION X STORAGE DEEP SHALLOW X
LOCATION: ELEVATION 1,278(GROUND) 1,252(PROPOSED) WATERSHED BLUESTONE CREEK
DISTRICT SOUTHWEST COUNTY DODDRIDGE QUADRANGLE OXFORD 7.5'
SURFACE OWNER JUSTIN L. HENDERSON (LIFE) ACREAGE 187.19 OF 1,602.90±
ROYALTY OWNER LEEMAN MAXWELL HRS ACREAGE 2,164±
PROPOSED WORK: 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 6,863'
WELL OPERATOR EQT PRODUCTION COMPANY DESIGNATED AGENT REX C. RAY
ADDRESS 115 PROFESSIONAL PLACE P.O. BOX 280 BRIDGEPORT, WV 26330

COUNTY NAME PERMIT