

Well Operator's Report of Well Work



Where energy meets innovation.

Well Number: 514746

API: 47 - 049 - 02347

Submission: Initial Amended

Notes: Resubmitted for your records

APPROVED

NAME: *Sara Ward*

DATE: *8/23/2017*

RECEIVED
Office of Oil and Gas

OCT 25 2016

WV Department of
Environmental Protection

09/15/2017

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

API 47-049-02347 County MARION District MANNINGTON
Quad GLOVER GAP. WV Pad Name GLO76 Field/Pool Name _____
Farm name ROBERT E. TONKERY Well Number 514746
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 4,379,500 Easting 543,857
Landing Point of Curve Northing 4,379,372 Easting 544,403
Bottom Hole Northing 4,378,634 Easting 544,796

Elevation (ft) 1424' GL Type of Well New Existing Type of Report Interim Final
Permit Type Deviated Horizontal Horizontal 6A Vertical Depth Type Deep Shallow
Type of Operation Convert Deepen Drill Plug Back Redrilling Rework Stimulate
Well Type Brine Disposal CBM Gas Oil Secondary Recovery Solution Mining Storage Other _____
Type of Completion Single Multiple Fluids Produced Brine Gas NGL Oil Other _____
Drilled with Cable Rotary

Drilling Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
Production hole Air Mud Fresh Water Brine

Mud Type(s) and Additive(s)

Water base Mud 12.4 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 10/15/2014 Date drilling commenced 7/16/2015 Date drilling ceased 12/8/2015
Date completion activities began 2/3/2016 Date completion activities ceased 2/7/2016
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 263 Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1883,2123,2438 Void(s) encountered (Y/N) depths N
Coal depth(s) ft 652,808,1067,1166 Cavern(s) encountered (Y/N) depths N

Is coal being mined in area (Y/N) _____

APPROVED

NAME: Sam Ward

DATE: 8/23/2017

Reviewed by: _____

09/15/2017

API 47-049 - 02347

Farm name ROBERT E. TONKERY

Well number 514746

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	N/A	Y
Surface	17 1/2"	13 3/8"	960'	NEW	J-55	121'	Y
Coal							
Intermediate 1	12 3/8"	9 5/8"	3,055'	NEW	A-500	1969'	Y
Intermediate 2							
Intermediate 3							
Production	8 1/2"	5 1/2"	11,387'	NEW	P-110	NA	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	751	15.6	1.20	901.2	0	8
Coal							
Intermediate 1	CLASS A / CLASS A	936 / 194	15.6 / 15.6	1.18 / 1.20	1,337.28	0	8
Intermediate 2							
Intermediate 3							
Production	CLASS H / CLASS H	1,617 / 420	15.2 / 15.6	1.07 / 1.84	2,503	2,293'	24+
Tubing							

Drillers TD (ft) 11,398' Loggers TD (ft) N/A
 Deepest formation penetrated MARCELLUS Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 5,570'

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: 3 CENTRALIZERS EVERY 500'
INTERMEDIATE: 7 CENTRALIZERS EVERY 500'
PRODUCTION: Composite body spiral centralizers installed every joint from bottom to 2,969 ft.

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- 049 - 02347 Farm name ROBERT E. TONKERY Well number 514746

PERFORATION RECORD

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

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

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

Please insert additional pages as applicable.

API 47- 049 - 02347 Farm name ROBERT E. TONKERY Well number 514746

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
MARCELLUS	7,721.60	TVD 8,469.00 MD
_____	_____	_____
_____	_____	_____
_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 2,135 psi Bottom Hole N/A psi DURATION OF TEST 54.00 hrs

OPEN FLOW Gas 10,055 mcfpd Oil N/A bpd NGL 0.0 bpd Water 849 bpd GAS MEASURED BY Estimated Orifice Pilot

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

Please insert additional pages as applicable.

Drilling Contractor ALPHA HUNTER DRILLING (RIG 6)
Address P.O. BOX 430 City RENO State OH Zip 45773

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

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

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

Please insert additional pages as applicable.

Completed by Jim Helmick Telephone (412) 395-5518
Signature  Title VP Completions Date 10/24/2016

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

API 47- 049 - 02347 Farm name ROBERT E. TONKERY Well number 514746

Drilling Contractor Pioneer Drilling Services
Address 1083 North 88 Road City Rices Landing State PA Zip 15357

Logging Company Pro Directional
Address 750 Conroe Park North Dr. City Conroe State TX Zip 77303

Logging Company _____
Address _____ City _____ State _____ Zip _____

Cementing Company C&J Energy Services (Nabors)
Address 2504 Smith Creek Road City Waynesburg State PA Zip 15370

514746 Final Formations (API #47-04902347)

Formation Name	Final Top MD (ftGL) (ft)	Final Top TVD (ft)	Final Btm MD (ftGL) (ft)	Final Btm TVD (ft)
SAND/SHALE	1	1	662	662
WASHINGTON	662	662	664	664
SAND/SHALE	664	664	818	818
WAYNESBURG	818	818	820	820
SAND/SHALE	820	820	1,077.00	1,077.00
SEWICKLEY	1,077.00	1,077.00	1,080.00	1,080.00
SAND/SHALE	1,080.00	1,080.00	1,176.00	1,176.00
PITTSBURGH	1,176.00	1,176.00	1,183.00	1,183.00
SAND/SHALE	1,183.00	1,183.00	2,146.00	2,146.00
MAXTON	2,146.00	2,146.00	2,183.00	2,183.00
SAND/SHALE	2,183.00	2,183.00	2,293.00	2,293.00
BIG LIME	2,293.00	2,293.00	2,362.00	2,362.00
SAND/SHALE	2,362.00	2,362.00	2,457.00	2,457.00
BIG INJUN	2,457.00	2,457.00	2,612.00	2,612.00
SAND/SHALE	2,612.00	2,612.00	2,730.00	2,730.00
WEIR	2,730.00	2,730.00	2,750.00	2,750.00
SAND/SHALE	2,750.00	2,750.00	2,938.00	2,938.00
GANTZ	2,938.00	2,938.00	3,097.00	3,097.00
50F	3,097.00	3,097.00	3,253.00	3,253.00
GORDON	3,253.00	3,253.00	3,381.00	3,381.00
BAYARD	3,381.00	3,381.00	3,863.00	3,863.00
WARREN	3,863.00	3,863.00	4,084.00	4,084.00
SPEECHLEY	4,084.00	4,084.00	4,446.00	4,446.00
BALLTOWN A	4,446.00	4,446.00	4,969.00	4,969.00
RILEY	4,969.00	4,969.00	5,528.00	5,528.00
BENSON	5,528.00	5,528.00	5,914.00	5,914.00
ALEXANDER	5,914.00	5,914.00	7,156.00	7,156.00
RHINESTREET	7,156.00	7,156.00	7,218.00	7,218.00
SONYEA	7,218.00	7,218.00	7,380.00	7,380.00
MIDDLESEX	7,380.00	7,380.00	7,433.00	7,433.00
GENESSEE	7,433.00	7,433.00	8,124.00	7,563.70
GENESE0	8,124.00	7,563.70	8,175.00	7,594.80
TULLY	8,175.00	7,594.80	8,222.00	7,621.50
HAMILTON	8,222.00	7,621.50	8,469.00	7,721.60
MARCELLUS	8,469.00	7,721.60		



Where energy meets innovation.

EQT PRODUCTION

Marion County, WV

GLO76 Pad

Well #514746- Marcellus

API #47-04902347

Main Wellbore

Design: 514746 As Drilled Surveys

Standard Survey Report

07 December, 2015



09/15/2017

Company:	EQT PRODUCTION	Local Co-ordinate Reference:	Well Well #514746- Marcellus
Project:	Marion County, WV	TVD Reference:	GL 1424 + 23' KB @ 1447.00usft (Pioneer 72)
Site:	GLO76 Pad	MD Reference:	GL 1424 + 23' KB @ 1447.00usft (Pioneer 72)
Well:	Well #514746- Marcellus	North Reference:	Grid
Wellbore:	Main Wellbore	Survey Calculation Method:	Minimum Curvature
Design:	514746 As Drilled Surveys	Database:	Well_Planner1

Project	Marion County, WV		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	West Virginia North 4701		

Site	GLO76 Pad				
Site Position:		Northing:	389,060.60 usft	Latitude:	39° 33' 50.33 N
From:	Map	Easting:	1,721,015.30 usft	Longitude:	80° 29' 22.49 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.63 °

Well	Well #514746- Marcellus					
Well Position	+N-S	0.00 usft	Northing:	389,063.63 usft	Latitude:	39° 33' 50.36 N
	+E-W	0.00 usft	Easting:	1,721,000.64 usft	Longitude:	80° 29' 22.68 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	1,447.00 usft	Ground Level:	1,424.00 usft

Wellbore	Main Wellbore				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	12/1/2015	-8.65	67.03	52,516

Design	514746 As Drilled Surveys				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	10.00
Vertical Section:		Depth From (TVD) (usft)	+N-S (usft)	+E-W (usft)	Direction (°)
		10.00	0.00	0.00	133.58

Survey Program	Date 12/7/2015				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
110.00	5,523.00	Gyrodata Gyro (Main Wellbore)	GYD_DP_MS	Gyrodata gyro-compassing and drop	
5,543.00	7,810.00	514746 PHX MWD (Main Wellbore)	PHX+MWD+HDGM	PHX+OWSG MWD + HDGM	
7,859.00	11,396.00	ProDirectional (Main Wellbore)	MWD+IGRF	MWD+IGRF v3:standard declination	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
110.00	0.29	92.24	110.00	-0.01	0.25	0.19	0.29	0.29	0.00	
210.00	0.14	118.78	210.00	-0.08	0.61	0.50	0.18	-0.15	26.54	
310.00	0.14	118.58	310.00	-0.20	0.83	0.73	0.00	0.00	-0.20	
410.00	0.04	45.63	410.00	-0.23	0.98	0.85	0.13	-0.10	-72.95	
510.00	0.08	313.05	510.00	-0.16	0.93	0.78	0.09	0.04	-92.58	
610.00	0.07	323.94	610.00	-0.06	0.85	0.66	0.02	-0.01	10.89	
710.00	0.07	311.34	710.00	0.03	0.76	0.53	0.02	0.00	-12.60	
810.00	0.11	277.00	810.00	0.08	0.62	0.40	0.07	0.04	-34.34	

Company:	EQT PRODUCTION	Local Co-ordinate Reference:	Well Well #514746- Marcellus
Project:	Marion County, WV	TVD Reference:	GL 1424 + 23' KB @ 1447.00usft (Pioneer 72)
Site:	GLO76 Pad	MD Reference:	GL 1424 + 23' KB @ 1447.00usft (Pioneer 72)
Well:	Well #514746- Marcellus	North Reference:	Grid
Wellbore:	Main Wellbore	Survey Calculation Method:	Minimum Curvature
Design:	514746 As Drilled Surveys	Database:	Well_Planner1

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
910.00	0.19	285.70	910.00	0.14	0.37	0.17	0.08	0.08	8.70
1,010.00	0.32	308.98	1,010.00	0.36	-0.01	-0.25	0.16	0.13	23.26
1,110.00	0.46	312.52	1,109.99	0.81	-0.52	-0.93	0.14	0.14	3.54
1,210.00	0.88	320.98	1,209.99	1.54	-1.19	-1.92	0.23	0.22	8.46
1,310.00	0.77	325.31	1,309.98	2.55	-1.95	-3.17	0.11	0.09	4.33
1,410.00	0.92	330.23	1,409.97	3.80	-2.73	-4.60	0.17	0.15	4.92
1,510.00	1.14	333.10	1,509.95	5.38	-3.58	-6.30	0.23	0.22	2.87
1,610.00	1.36	334.33	1,609.93	7.34	-4.54	-8.35	0.22	0.22	1.23
1,710.00	1.37	332.92	1,709.90	9.47	-5.60	-10.59	0.04	0.01	-1.41
1,810.00	1.41	332.71	1,809.87	11.83	-6.71	-12.88	0.04	0.04	-0.21
1,910.00	1.41	333.55	1,909.84	13.83	-7.82	-15.20	0.02	0.00	0.84
2,010.00	1.14	326.43	2,009.82	15.76	-8.92	-17.32	0.31	-0.27	-7.12
2,110.00	1.17	318.30	2,109.80	17.35	-10.15	-19.31	0.17	0.03	-8.13
2,210.00	1.43	305.71	2,209.77	18.84	-11.84	-21.56	0.38	0.26	-12.59
2,310.00	1.45	306.49	2,309.74	20.32	-13.87	-24.06	0.03	0.02	0.78
2,410.00	1.21	305.50	2,409.71	21.69	-15.75	-26.36	0.24	-0.24	-0.99
2,510.00	0.86	306.99	2,509.70	22.75	-17.20	-28.15	0.35	-0.35	1.49
2,610.00	0.80	307.27	2,609.69	23.63	-18.36	-29.59	0.06	-0.06	0.28
2,710.00	0.78	301.06	2,709.68	24.40	-19.50	-30.94	0.09	-0.02	-6.21
2,810.00	0.60	305.42	2,809.67	25.05	-20.51	-32.13	0.19	-0.18	4.36
2,910.00	0.59	304.08	2,909.66	25.65	-21.36	-33.15	0.02	-0.01	-1.34
3,010.00	0.57	308.99	3,009.66	26.25	-22.17	-34.16	0.05	-0.02	4.91
3,110.00	0.48	315.52	3,109.65	26.86	-22.85	-35.07	0.11	-0.09	6.53
3,210.00	0.49	316.49	3,209.65	27.47	-23.44	-35.92	0.01	0.01	0.97
3,310.00	0.55	319.57	3,309.65	28.14	-24.05	-36.82	0.07	0.06	3.08
3,410.00	0.60	318.86	3,409.64	28.90	-24.70	-37.82	0.05	0.05	-0.71
3,510.00	0.84	305.75	3,509.63	29.73	-25.64	-39.07	0.29	0.24	-13.11
3,610.00	0.92	298.61	3,609.62	30.54	-26.94	-40.57	0.14	0.08	-7.14
3,710.00	0.92	296.27	3,709.61	31.28	-28.37	-42.11	0.04	0.00	-2.34
3,810.00	0.80	293.86	3,809.60	31.92	-29.73	-43.54	0.13	-0.12	-2.41
3,910.00	0.85	291.29	3,909.59	32.47	-31.06	-44.88	0.06	0.05	-2.57
4,010.00	0.86	288.82	4,009.58	32.98	-32.46	-46.25	0.04	0.01	-2.47
4,110.00	0.95	294.96	4,109.58	33.57	-33.92	-47.71	0.13	0.09	6.14
4,210.00	1.00	296.44	4,209.55	34.31	-35.45	-49.33	0.06	0.05	1.48
4,310.00	1.06	297.62	4,309.53	35.13	-37.05	-51.06	0.06	0.06	1.18
4,410.00	1.01	302.25	4,409.52	36.03	-38.62	-52.81	0.10	-0.05	4.63
4,510.00	0.89	305.75	4,509.50	36.95	-39.99	-54.44	0.13	-0.12	3.50
4,610.00	0.88	309.41	4,609.49	37.89	-41.22	-55.98	0.06	-0.01	3.66
4,710.00	0.79	341.42	4,709.48	39.03	-42.03	-57.35	0.47	-0.09	32.01
4,810.00	0.65	9.91	4,809.47	40.24	-42.15	-58.28	0.38	-0.14	28.49
4,910.00	0.63	27.70	4,909.47	41.29	-41.80	-58.74	0.20	-0.02	17.79
5,010.00	0.58	42.26	5,009.46	42.15	-41.20	-58.91	0.16	-0.05	14.56
5,110.00	0.67	47.19	5,109.46	42.92	-40.43	-58.88	0.10	0.09	4.93



Professional Directional Survey Report



Company:	EQT PRODUCTION	Local Co-ordinate Reference:	Well Well #514746- Marcellus
Project:	Marion County, WV	TVD Reference:	GL 1424 + 23' KB @ 1447.00usft (Pioneer 72)
Site:	GL076 Pad	MD Reference:	GL 1424 + 23' KB @ 1447.00usft (Pioneer 72)
Well:	Well #514746- Marcellus	North Reference:	Grid
Wellbore:	Main Wellbore	Survey Calculation Method:	Minimum Curvature
Design:	514746 As Drilled Surveys	Database:	Well_Planner1

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,210.00	0.63	57.99	5,209.45	43.61	-39.54	-58.71	0.13	-0.04	10.80
5,310.00	0.67	78.08	5,309.44	44.02	-38.50	-58.24	0.23	0.04	20.09
5,410.00	0.58	98.49	5,409.44	44.07	-37.43	-57.49	0.24	-0.09	20.41
5,510.00	0.38	99.98	5,509.43	43.94	-36.60	-56.80	0.20	-0.20	1.49
5,523.00	0.27	120.74	5,522.43	43.91	-36.53	-56.74	1.23	-0.85	159.69
5,543.00	0.10	92.70	5,542.43	43.89	-36.47	-56.68	0.94	-0.85	-140.20
5,586.00	1.70	27.90	5,585.43	44.45	-36.14	-56.82	3.86	3.72	-150.70
5,629.00	5.40	22.40	5,628.34	46.89	-35.07	-57.73	8.63	8.60	-12.79
5,672.00	8.90	27.90	5,671.00	51.70	-32.74	-59.36	8.28	8.14	12.79
5,716.00	11.20	43.70	5,714.33	57.80	-28.19	-60.27	8.11	5.23	35.91
5,759.00	14.60	54.40	5,756.24	63.97	-20.90	-59.24	9.63	7.91	24.88
5,802.00	18.20	60.20	5,797.49	70.47	-10.66	-56.30	9.19	8.37	13.49
5,845.00	21.50	66.60	5,837.93	76.94	2.40	-51.30	9.18	7.67	14.88
5,888.00	25.10	72.20	5,877.42	82.66	18.33	-43.84	9.82	8.37	13.02
5,931.00	27.70	79.10	5,915.95	87.54	36.83	-33.66	9.34	6.05	16.05
5,974.00	28.80	86.50	5,953.84	90.06	56.99	-20.80	8.53	2.56	17.21
6,017.00	31.50	91.40	5,991.02	90.42	78.57	-5.42	8.49	6.28	11.40
6,060.00	35.10	94.60	6,028.96	89.15	102.13	12.52	9.31	8.37	7.44
6,103.00	39.10	96.60	6,061.25	86.60	127.93	32.98	9.72	9.30	4.65
6,146.00	42.90	96.80	6,093.69	83.31	155.95	55.54	8.84	8.84	0.47
6,189.00	42.60	96.60	6,125.27	79.90	184.93	78.89	0.77	-0.70	-0.47
6,232.00	42.10	96.70	6,157.05	76.55	213.71	102.04	1.17	-1.16	0.23
6,275.00	42.20	97.50	6,188.93	72.98	242.34	125.24	1.27	0.23	1.86
6,318.00	42.90	98.00	6,220.61	69.06	271.15	148.82	1.81	1.63	1.16
6,361.00	42.40	98.70	6,252.23	64.83	299.98	172.62	1.80	-1.16	1.63
6,404.00	41.90	98.10	6,284.11	60.61	328.52	196.20	1.49	-1.16	-1.40
6,447.00	41.80	99.20	6,316.14	56.30	356.89	219.72	1.72	-0.23	2.56
6,490.00	41.40	98.00	6,348.30	52.03	385.11	243.11	2.07	-0.93	-2.79
6,533.00	42.10	98.30	6,380.38	47.97	413.46	266.44	1.69	1.63	0.70
6,577.00	42.80	98.30	6,412.85	43.68	442.84	290.69	1.59	1.59	0.00
6,620.00	43.90	98.50	6,444.11	39.37	472.04	314.81	2.58	2.56	0.47
6,663.00	44.10	98.30	6,475.05	35.01	501.59	339.23	0.57	0.47	-0.47
6,706.00	43.30	97.90	6,506.13	30.82	531.00	363.42	1.97	-1.86	-0.93
6,749.00	42.40	97.10	6,537.66	27.00	560.00	387.05	2.45	-2.09	-1.86
6,792.00	41.70	97.20	6,569.59	23.42	588.57	410.23	1.64	-1.63	0.23
6,835.00	40.80	98.30	6,601.92	19.60	616.66	433.21	2.66	-2.09	2.56
6,878.00	40.50	97.90	6,634.54	15.65	644.40	456.02	0.92	-0.70	-0.93
6,921.00	41.10	100.20	6,667.09	11.23	672.14	479.17	3.76	1.40	5.35
6,964.00	42.60	100.60	6,699.12	6.05	700.35	503.18	3.54	3.49	0.93
7,007.00	42.80	101.30	6,730.72	0.51	728.98	527.74	1.20	0.47	1.63
7,050.00	42.30	101.50	6,762.40	-5.24	757.49	552.35	1.20	-1.16	0.47
7,093.00	42.90	98.70	6,794.06	-10.34	786.14	576.62	4.62	1.40	-6.51
7,136.00	43.30	95.70	6,825.46	-14.02	815.28	600.26	4.86	0.93	-6.98

Company:	EQT PRODUCTION	Local Co-ordinate Reference:	Well Well #514746- Marcellus
Project:	Marion County, WV	TVD Reference:	GL 1424 + 23' KB @ 1447.00usft (Pioneer 72)
Site:	GLO78 Pad	MD Reference:	GL 1424 + 23' KB @ 1447.00usft (Pioneer 72)
Well:	Well #514746- Marcellus	North Reference:	Grid
Wellbore:	Main Wellbore	Survey Calculation Method:	Minimum Curvature
Design:	514746 As Drilled Surveys	Database:	Well_Planner1

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,179.00	42.30	95.20	6,857.01	-18.79	844.36	623.24	2.46	-2.33	-1.16
7,222.00	41.20	94.30	6,889.09	-19.17	872.90	645.55	2.91	-2.56	-2.09
7,265.00	40.30	95.10	6,921.66	-21.46	900.87	667.40	2.42	-2.09	1.86
7,308.00	40.80	96.40	6,954.34	-24.27	928.68	689.48	2.28	1.16	3.02
7,351.00	41.50	97.40	6,986.71	-27.67	956.77	712.17	2.23	1.63	2.33
7,394.00	41.30	96.70	7,018.97	-31.16	984.99	735.02	1.17	-0.47	-1.63
7,437.00	41.80	95.90	7,051.15	-34.29	1,013.34	757.71	1.70	1.16	-1.86
7,480.00	40.60	94.80	7,083.50	-36.93	1,041.54	779.96	3.26	-2.79	-2.56
7,523.00	39.50	95.00	7,116.42	-39.29	1,069.11	801.56	2.58	-2.56	0.47
7,566.00	41.40	94.90	7,149.14	-41.70	1,096.90	823.36	4.42	4.42	-0.23
7,609.00	42.10	96.10	7,181.22	-44.45	1,125.40	845.89	2.47	1.63	2.79
7,652.00	41.60	95.60	7,213.25	-47.37	1,153.94	868.58	1.40	-1.16	-1.16
7,695.00	40.60	96.60	7,245.65	-50.37	1,182.04	891.01	2.78	-2.33	2.33
7,714.00	39.80	95.90	7,260.17	-51.71	1,194.23	900.77	4.84	-4.21	-3.68
7,810.00	39.80	95.90	7,333.90	-58.00	1,255.40	949.41	0.00	0.00	0.00
Tie into Surveys at 7810'MD									
7,859.00	38.30	97.20	7,371.95	-61.52	1,286.07	974.05	3.49	-3.06	2.65
First ProMWD at 7859'MD									
7,890.00	38.30	96.90	7,396.28	-63.87	1,305.13	989.49	0.60	0.00	-0.97
7,922.00	39.30	96.10	7,421.22	-66.14	1,325.06	1,005.48	3.50	3.13	-2.50
7,953.00	40.70	98.30	7,444.97	-68.64	1,344.82	1,021.53	6.42	4.52	7.10
7,985.00	42.50	102.30	7,468.90	-72.45	1,365.71	1,039.29	10.02	5.63	12.50
8,017.00	44.50	106.10	7,492.12	-77.87	1,387.06	1,058.48	10.29	6.25	11.88
8,048.00	46.50	108.60	7,513.84	-84.47	1,408.15	1,078.31	8.64	6.45	8.06
8,080.00	48.60	111.60	7,535.44	-92.59	1,430.32	1,099.97	9.53	6.56	9.38
8,111.00	50.70	114.30	7,555.52	-101.81	1,452.06	1,122.08	9.48	6.77	8.71
8,143.00	52.10	116.60	7,575.48	-112.56	1,474.64	1,145.84	7.12	4.38	7.19
8,174.00	53.80	119.00	7,594.16	-124.10	1,496.52	1,169.65	8.26	5.48	7.74
8,206.00	55.80	122.10	7,612.61	-137.40	1,519.03	1,195.12	10.08	6.25	9.69
8,237.00	58.20	124.80	7,629.49	-151.73	1,540.71	1,220.71	10.64	7.74	8.71
8,269.00	61.10	127.50	7,645.66	-168.02	1,563.00	1,248.09	11.62	9.06	8.44
8,300.00	63.80	130.10	7,660.00	-185.25	1,584.41	1,275.47	11.45	8.71	8.39
8,332.00	65.40	132.80	7,673.73	-204.38	1,606.07	1,304.35	9.12	5.00	8.44
8,363.00	66.70	135.90	7,686.32	-224.19	1,626.32	1,332.68	10.05	4.19	10.00
8,395.00	69.00	138.40	7,698.38	-245.92	1,646.47	1,362.25	10.20	7.19	7.81
8,427.00	71.40	140.50	7,709.22	-268.79	1,666.04	1,392.20	9.71	7.50	6.58
8,458.00	73.60	141.80	7,718.54	-291.82	1,684.58	1,421.50	8.15	7.10	4.19
8,490.00	75.60	143.60	7,727.04	-316.36	1,703.27	1,451.96	8.27	6.25	5.63
8,521.00	77.80	145.50	7,734.17	-340.93	1,720.77	1,481.57	9.27	7.10	6.13
8,553.00	79.60	147.70	7,740.44	-367.13	1,738.04	1,512.14	8.78	5.63	6.88
8,584.00	81.60	149.80	7,745.51	-393.27	1,753.90	1,541.66	9.29	6.45	6.77
8,616.00	84.20	151.10	7,749.46	-420.89	1,769.56	1,572.04	9.07	8.13	4.06
8,648.00	86.60	152.40	7,752.03	-448.99	1,784.65	1,602.35	8.52	7.50	4.06
8,711.00	87.50	154.00	7,755.27	-505.15	1,813.02	1,661.61	2.91	1.43	2.54
8,805.00	86.20	152.00	7,760.44	-588.77	1,855.63	1,750.12	2.53	-1.38	-2.13
8,900.00	89.40	153.10	7,764.08	-673.00	1,899.36	1,839.88	3.56	3.37	1.16

Company:	EQT PRODUCTION	Local Co-ordinate Reference:	Well Well #514746- Marcellus
Project:	Marion County, WV	TVD Reference:	GL 1424 + 23' KB @ 1447.00usft (Pioneer 72)
Site:	GLO76 Pad	MD Reference:	GL 1424 + 23' KB @ 1447.00usft (Pioneer 72)
Well:	Well #514746- Marcellus	North Reference:	Grid
Wellbore:	Main Wellbore	Survey Calculation Method:	Minimum Curvature
Design:	514746 As Drilled Surveys	Database:	Well_Planner1

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,995.00	92.10	153.40	7,762.84	-757.82	1,942.13	1,929.32	2.66	2.84	0.32
9,090.00	91.60	151.90	7,759.77	-842.15	1,985.75	2,019.06	1.66	-0.53	-1.58
9,185.00	90.40	151.70	7,758.11	-925.86	2,030.64	2,109.28	1.28	-1.26	-0.21
9,279.00	89.50	151.70	7,758.20	-1,008.62	2,075.20	2,198.61	0.96	-0.96	0.00
9,374.00	90.20	152.60	7,758.44	-1,092.62	2,119.58	2,288.67	1.20	0.74	0.95
9,469.00	90.50	152.00	7,757.86	-1,176.73	2,163.74	2,378.64	0.71	0.32	-0.63
9,563.00	90.80	151.80	7,756.80	-1,259.64	2,208.01	2,467.87	0.38	0.32	-0.21
9,658.00	89.10	153.10	7,756.88	-1,343.87	2,251.95	2,557.76	2.25	-1.79	1.37
9,752.00	89.30	154.30	7,758.19	-1,428.13	2,293.59	2,646.01	1.29	0.21	1.28
9,847.00	88.10	155.50	7,760.35	-1,514.13	2,333.88	2,734.48	1.79	-1.26	1.26
9,941.00	88.40	155.00	7,763.22	-1,599.45	2,373.22	2,821.80	0.62	0.32	-0.53
10,036.00	88.50	155.50	7,765.79	-1,685.70	2,412.97	2,910.05	0.54	0.11	0.53
10,130.00	88.30	152.10	7,768.41	-1,769.99	2,454.45	2,998.21	3.62	-0.21	-3.62
10,225.00	88.70	152.60	7,770.90	-1,854.12	2,498.52	3,088.13	0.67	0.42	0.53
10,320.00	89.90	152.20	7,772.06	-1,938.30	2,542.53	3,178.04	1.33	1.26	-0.42
10,415.00	89.80	151.90	7,772.23	-2,022.22	2,587.05	3,268.15	0.32	0.00	-0.32
10,509.00	90.40	151.40	7,771.98	-2,104.94	2,631.70	3,357.51	0.75	0.53	-0.53
10,604.00	88.70	152.30	7,772.73	-2,188.70	2,676.51	3,447.71	2.02	-1.79	0.95
10,699.00	88.70	151.30	7,774.88	-2,272.40	2,721.39	3,537.93	1.05	0.00	-1.05
10,794.00	89.00	151.00	7,776.79	-2,355.59	2,767.22	3,628.48	0.45	0.32	-0.32
10,889.00	89.50	151.00	7,776.03	-2,438.67	2,813.27	3,719.11	0.53	0.53	0.00
10,983.00	88.70	153.20	7,779.51	-2,521.73	2,857.25	3,808.22	2.49	-0.85	2.34
11,078.00	89.10	152.70	7,781.33	-2,606.32	2,900.45	3,897.83	0.67	0.42	-0.53
11,172.00	88.30	155.40	7,783.47	-2,690.81	2,941.56	3,985.88	3.00	-0.85	2.87
11,267.00	88.70	154.80	7,785.95	-2,776.95	2,981.55	4,074.21	0.76	0.42	-0.63
11,343.00	89.40	155.50	7,787.21	-2,845.91	3,013.48	4,144.88	1.30	0.92	0.92
Last Survey: 11343'MD / 7787.21'TVD									
11,396.00	89.40	155.50	7,787.77	-2,894.13	3,035.46	4,194.04	0.00	0.00	0.00
PTB: 11396'MD									

Company:	EQT PRODUCTION	Local Co-ordinate Reference:	Well Well #514746- Marcellus
Project:	Marion County, WV	TVD Reference:	GL 1424 + 23' KB @ 1447.00usft (Pioneer 72)
Site:	GLO76 Pad	MD Reference:	GL 1424 + 23' KB @ 1447.00usft (Pioneer 72)
Well:	Well #514746- Marcellus	North Reference:	Grid
Wellbore:	Main Wellbore	Survey Calculation Method:	Minimum Curvature
Design:	514746 As Drilled Surveys	Database:	Well_Planner1

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Interp @ 6895.3 (Well #) - actual wellpath misses target center by 20.29usft at 7241.48usft MD (6903.79 TVD, -20.16 N, 885.63 E) - Point	0.00	0.00	6,905.25	0.08	885.59	389,063.70	1,721,886.23	39° 33' 50.45 N	80° 29' 11.37 W
514476 7200' MD - actual wellpath misses target center by 20.29usft at 7241.48usft MD (6903.79 TVD, -20.16 N, 885.63 E) - Point	0.00	0.00	6,905.25	0.08	885.59	389,063.70	1,721,886.23	39° 33' 50.45 N	80° 29' 11.37 W
514746 Plat LP - actual wellpath misses target center by 2545.06usft at 6060.00usft MD (6026.98 TVD, 89.15 N, 102.13 E) - Point	0.00	360.00	7,525.00	-251.53	-1,926.94	388,812.10	1,719,073.70	39° 33' 47.66 N	80° 29' 47.25 W
514746 Plat TD - actual wellpath misses target center by 2909.39usft at 6679.71usft MD (6487.08 TVD, 33.35 N, 513.07 E) - Point	0.00	360.00	7,525.00	-2,280.23	-913.34	386,783.40	1,720,087.30	39° 33' 27.72 N	80° 29' 34.02 W
514746 Plat TD 2 - actual wellpath misses target center by 117.84usft at 11393.67usft MD (7787.76 TVD, -2892.04 N, 3034.45 E) - Point	0.00	0.00	7,670.00	-2,891.53	3,038.54	386,172.10	1,724,039.18	39° 33' 22.11 N	80° 28' 43.48 W
514746 LP @1553' VS - actual wellpath misses target center by 81.77usft at 8574.40usft MD (7744.07 TVD, -385.12 N, 1749.04 E) - Point	0.00	0.00	7,670.00	-378.80	1,783.10	388,684.83	1,722,783.74	39° 33' 46.81 N	80° 28' 59.86 W
514746 Plat LP2 - actual wellpath misses target center by 58.44usft at 8523.64usft MD (7734.75 TVD, -343.06 N, 1722.18 E) - Point	0.00	360.00	7,691.00	-329.60	1,758.52	388,734.03	1,722,759.15	39° 33' 47.29 N	80° 29' 0.18 W
514746 LP 1572' VS p5 - actual wellpath misses target center by 30.94usft at 8813.67usft MD (7749.24 TVD, -418.89 N, 1768.40 E) - Point	0.00	0.00	7,720.00	-426.70	1,762.00	388,636.93	1,722,762.64	39° 33' 46.33 N	80° 29' 0.12 W
514746 Plat TD2 p4 - actual wellpath misses target center by 67.89usft at 11394.20usft MD (7787.77 TVD, -2892.51 N, 3034.67 E) - Point	0.00	360.00	7,720.00	-2,891.53	3,038.54	386,172.10	1,724,039.18	39° 33' 22.11 N	80° 28' 43.48 W
514746 Plat LP2 p4 - actual wellpath misses target center by 41.03usft at 8529.32usft MD (7735.92 TVD, -347.69 N, 1725.30 E) - Point	0.00	360.00	7,720.00	-329.60	1,758.52	388,734.03	1,722,759.15	39° 33' 47.29 N	80° 29' 0.18 W
514746 LP 1553' VS p4 - actual wellpath misses target center by 41.40usft at 8582.56usft MD (7745.32 TVD, -392.07 N, 1753.14 E) - Point	0.00	360.00	7,720.00	-378.80	1,783.10	388,684.83	1,722,783.74	39° 33' 46.81 N	80° 28' 59.86 W
514746 LP 1572' VS p6 - actual wellpath misses target center by 31.24usft at 8814.79usft MD (7749.36 TVD, -419.86 N, 1768.94 E) - Point	0.00	0.00	7,720.00	-426.00	1,762.00	388,635.63	1,722,762.64	39° 33' 46.32 N	80° 29' 0.12 W
BHL 514746 Plat - actual wellpath misses target center by 30.03usft at 11394.60usft MD (7787.77 TVD, -2892.88 N, 3034.84 E) - Point	0.00	360.00	7,758.00	-2,891.53	3,038.54	386,172.10	1,724,039.18	39° 33' 22.11 N	80° 28' 43.48 W
LP 514746 - actual wellpath misses target center by 34.72usft at 8587.34usft MD (7746.01 TVD, -396.15 N, 1755.52 E) - Point	0.00	360.00	7,758.00	-378.80	1,783.10	388,684.83	1,722,783.74	39° 33' 46.81 N	80° 28' 59.86 W

Company:	EQT PRODUCTION	Local Co-ordinate Reference:	Well Well #514746- Marcellus
Project:	Marion County, WV	TVD Reference:	GL 1424 + 23' KB @ 1447.00usft (Pioneer 72)
Site:	GLO76 Pad	MD Reference:	GL 1424 + 23' KB @ 1447.00usft (Pioneer 72)
Well:	Well #514746- Marcellus	North Reference:	Grid
Wellbore:	Main Wellbore	Survey Calculation Method:	Minimum Curvature
Design:	514746 As Drilled Surveys	Database:	Well_Planner1

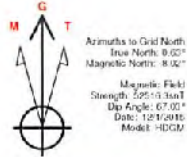
Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
7,714.00	7,260.17	-51.71	1,194.23	Final Survey=7704' MD/7250' TVD
7,810.00	7,333.92	-58.02	1,255.36	PROJ to Bit=7800' MD/7324' TVD
7,859.00	7,371.95	-61.52	1,286.07	First ProMWD at 7859' MD
11,343.00	7,787.21	-2,845.91	3,013.48	Last Survey: 11343'MD / 7787.21'TVD
11,396.00	7,787.77	-2,894.13	3,035.46	PTB: 11396'MD



Where energy meets innovation.

EQT PRODUCTION
 GLO76 Pad
 Marion County, WV
 Well #514746- Marcellus
514746 Plan 7 - AVP FINAL (Grid)
 Pioneer 72
 GL 1424 + 23' KB @ 1447.00usff (Pioneer 72)



Azimuth Corrections

To convert a Magnetic Direction to a Grid Direction, Subtract 8.02°

Geodetic System: US State Plane 1987 (Exact solution)
 Datum: NAD 1987 (NAD83) (GURUS)
 Ellipsoid: Clarke 1866
 Zone: West Virginia North 4701
 System Datum: Mean Sea Level

RKB Elevation: GL 1424 + 23' KB @ 1447.00usff (Pioneer 72)

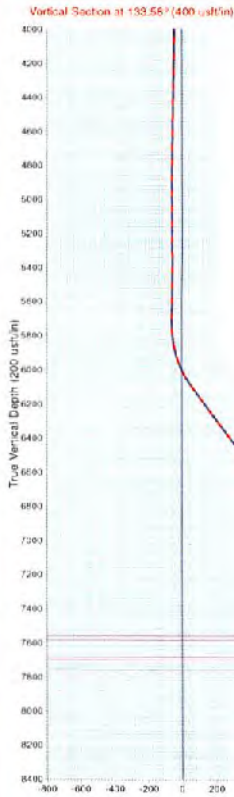
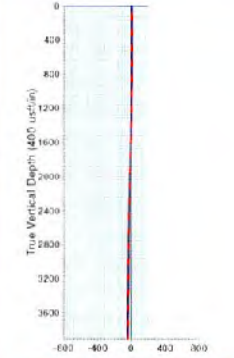
+N-S	+E-W	Northing	Easting	Latitude	Longitude	S of
0.00	0.00	389083.63	1721000.64	39° 33' 50.36" N	80° 29' 22.68" W	

DESIGN TARGET DETAILS

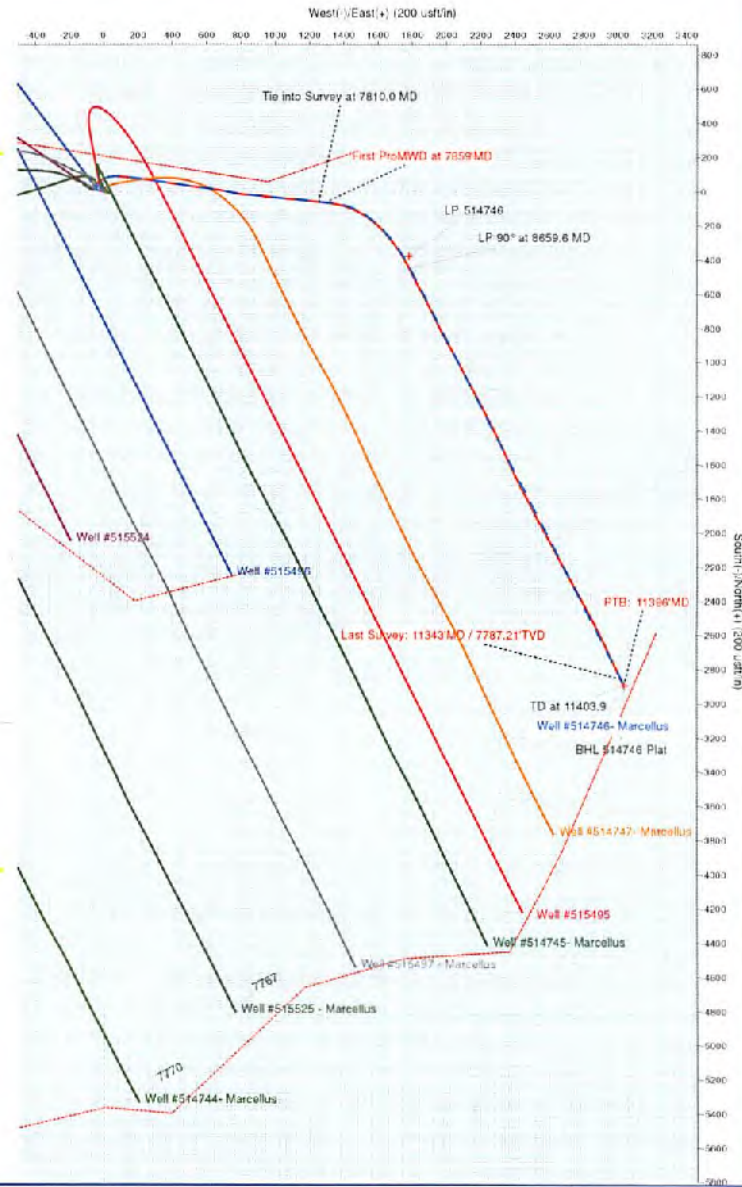
Name	TVD	+N-S	+E-W	Nothing	Nothing	Latitude	Longitude
818-514746 Plat	7758.38	-2811.52	3838.54	380172.13	1724039.18	39° 33' 22.11" N	80° 28' 49.48" W
LP 514746	7758.38	-378.80	1743.10	388654.83	1722783.74	39° 33' 46.81" N	80° 28' 59.88" W

SECTION DETAILS

Sec	MD	Inc	Act	TVD	+N-S	+E-W	Diag	TFace	VFace	Target	Annotation
1	7812.08	09.88	95.58	7203.92	-58.07	3755.36	0.80	0.00	844.48		Tie into Survey at 7810.0 MD
2	7564.08	09.88	95.58	7452.24	-66.16	1050.41	0.80	0.00	1027.42		
3	8650.80	00.00	182.89	7798.00	448.61	1788.15	10.80	63.48	1604.61		
4	11403.53	00.00	152.89	7758.00	-2891.53	3038.54	0.80	0.00	4194.48	BHL 514746 Plat	TD at 11403.9



60' X 30'



South (+) North (-) (200' usff/in)

WV 514746
EQT Production Company
Bower et al LEASE
111.0 Acres ±

Lease No. Area Owner
300684 76 Richard G. Thorne et al
993296 35 Rosale David Starkey
991826 34.5 Kenneth S. Kettner Jr. et al
993303 108.5 East Resources Inc. et al

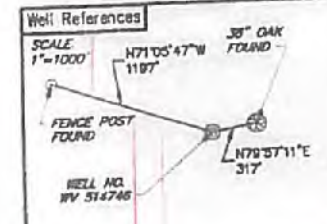
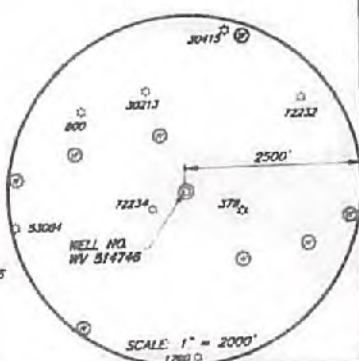
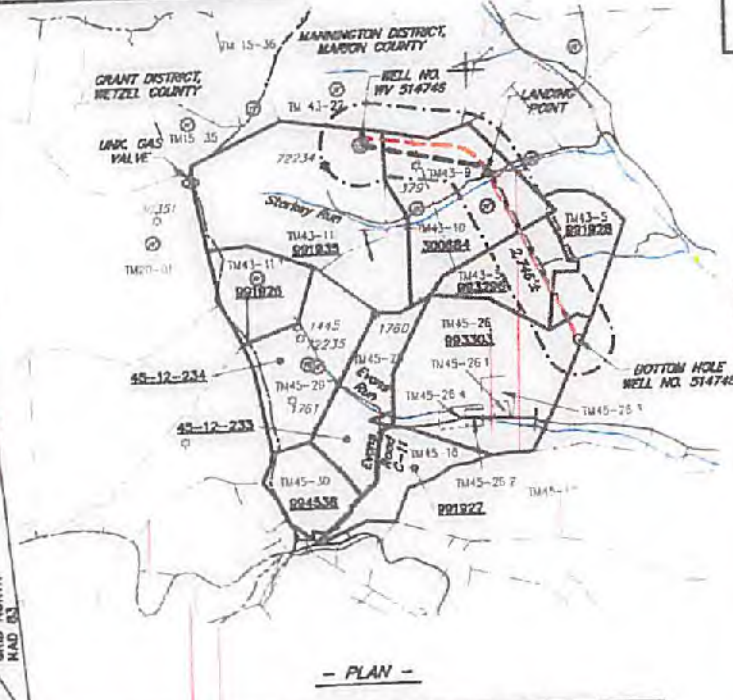
WV 514746 Well Point Coordinates

Well No.	Point	N	E
HAD 27 S.P.C. (PL)	PL	300,389.832	E 1,771,002.437
	LD	300,389.832	E 1,771,002.437
	UTM 17M (PL)	4,378,058.8	E 544,852.3
HAD 23 S.P.C. (PL)	PL	300,389.832	E 1,771,002.437
	LD	300,389.832	E 1,771,002.437
	UTM 17M (PL)	4,378,058.8	E 544,852.3
HAD 21 S.P.C. (PL)	PL	300,389.832	E 1,771,002.437
	LD	300,389.832	E 1,771,002.437
	UTM 17M (PL)	4,378,058.8	E 544,852.3

LEGEND

- EXISTING OIL/GAS WELL
- WATER FEATURE
- WELL HEAD TOP HOLE
- WELL LANDING POINT
- WELL BOTTOM HOLE
- REBAR FOUND
- STONE FOUND
- DRILLED LATERAL LINE
- PERMITTED LATERAL LINE
- LEASE BOUNDARY
- BUFFER
- PROPERTY LINE
- STREAM
- 500' LATERAL COLLECTION

Coordinate Notes
West Virginia Coordinate System of 1927 (North Zone) Based upon Differential GPS Measurements.
Plat orientation, Corner and well ties are based upon the grid north meridian.
Well location references are based upon the grid north meridian.
UTM Coordinates are NAD83 Zone 17 Meters



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

encompass

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 REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION

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

FILE NO.: EES-60835
DRAWING NO.: GLO76 Well Plat
SCALE: 1" = 2000'
MINIMUM DEGREE OF ACCURACY: ±3'
PROVEN SOURCE OF ELEVATION: GPS

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

DATE: APRIL 18, 2016
OPERATORS WELL NO. WV 514748
API WELL NO. 47 049 02347
STATE COUNTY PERMIT

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL (IF GAS) PRODUCTION: STORAGE DEEP SHALLOW
LOCATION, ELEVATION: 1424' (Ground) 1455' (Prop.) WATERSHED: Starkey Run QUADRANGLE: GLOVER GAP, WV
DISTRICT: MANNINGTON COUNTY: Marion ACREAGE: 111.00± AC
SURFACE OWNER: Robert E. Tonkary LEASE NO.: 991835 ACREAGE: 111.00± AC
ROYALTY OWNER: Lynn Ann Brower, et al
PROPOSED WORK: DRILL CONVERT DRILL-DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
 PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY)
 PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 7,649'
WELL OPERATOR: EQT Production Company DESIGNATED AGENT: Reg. C. Roy
ADDRESS: 115 Professional Pl., P.O. Box 280 ADDRESS: Bridgeport, WV 26330

WWW.ENCOMPASSSOFTWARES.COM PLOT DATE: 4/19/2016 CAD FILE: GLO76_WELL_PLAT_2016-04-16.DWG

Hydraulic Fracturing Fluid Product Component Information Disclosure



Job Start Date:	2/3/2016
Job End Date:	2/7/2016
State:	West Virginia
County:	Marion
API Number:	47-049-02347-00-00
Operator Name:	EQT Production
Well Name and Number:	514746
Longitude:	-80.48963300
Latitude:	39.56398900
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	7,722
Total Base Water Volume (gal):	4,800,558
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	89.13235	None
Sand (Proppant)	Keane Group	Proppant	Silica Substrate	14808-60-7	100.00000	10.57296	None
Hydrochloric Acid (15%)	Keane Group	Acidizing	Hydrochloric Acid	7647-01-0	15.00000	0.03328	None
FFR760	Keane Group	Friction Reducer	Hydrotreated Light Distillate	64742-47-8	30.00000	0.02131	None
			Alkyl Alcohol	Proprietary	10.00000	0.00710	None
			Oxyalkylated alcohol A	Proprietary	5.00000	0.00355	None
AI 600	Keane Group	Corrosion Inhibitor	Ethylene Glycol	107-21-1	40.00000	0.00022	None
			Dimethylformamide	68-12-2	20.00000	0.00011	None
			Pyridine, alkyl derives, quaternized with benzyl chloride	68909-18-2	15.00000	0.00008	None
			Nonyl Phenol Ethoxylate, Branched	127087-87-0	15.00000	0.00008	None
			Cinnamialdehyde	104-55-2	15.00000	0.00008	None
			1-Decanol	112-30-1	5.00000	0.00003	None
			2-Butoxyethanol	111-76-2	5.00000	0.00003	None

			11-87-5	5.00000	0.00003	None
			78-40-0	2.50000	0.00001	None
			67-56-1	2.50000	0.00001	None
			68391-11-7	1.00000	0.00001	None
EC6330A	Keane Group	Scale Inhibitor				
			107-21-1	5.00000	0.00006	None
			7601-64-9	5.00000	0.00006	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)

WV 514746
EQT Production Company
Bower et al LEASE
111.0 Acres ±

Lease No.	Acres	Owner
300684	79	Richard G. Thorne et al.
993296	35	Ronnie David Starkey
991928	34.5	Kennis S. Ketterer Jr. et al.
993303	106.5	East Resources Inc. et al.

WV 514746 Well Point Coordinates

Top Hole Coordinates		
NAD 27 S.P.C. (Ft.)	N: 389,963.632	E: 1,721,000.643
NAD 27 GEO	LAT: 39.563988	LONG: 80.489634
NAD 83 UTM 17N (M)	N 4,379,499.8	E: 543,856.9
NAD 83 S.P.C. (Ft.)	N 389,101.3	E: 1,689,561.9
Landing Point Coordinates		
NAD 27 S.P.C. (Ft.)	N: 388,614.661	E: 1,722,785.306
NAD 27 GEO	LAT: 39.562809	LONG: 80.489286
NAD 83 UTM 17N (M)	N 4,379,372.0	E: 544,402.9
NAD 83 S.P.C. (Ft.)	N 388,652.3	E: 1,691,346.6
Bottom Hole Coordinates		
NAD 27 S.P.C. (Ft.)	N: 386,169.552	E: 1,724,036.215
NAD 27 GEO	LAT: 39.556134	LONG: 80.478755
NAD 83 UTM 17N (M)	N 4,378,633.5	E: 544,796.4
NAD 83 S.P.C. (Ft.)	N 386,207.1	E: 1,692,597.4

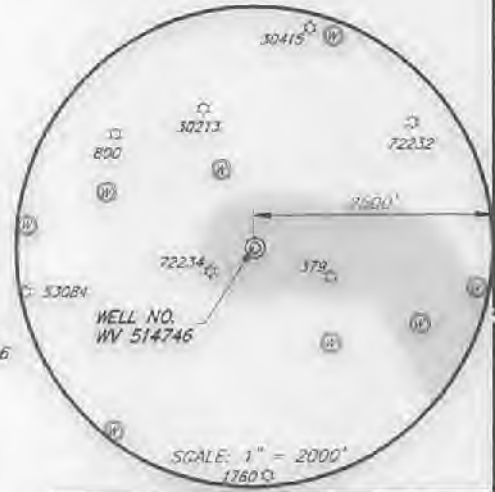
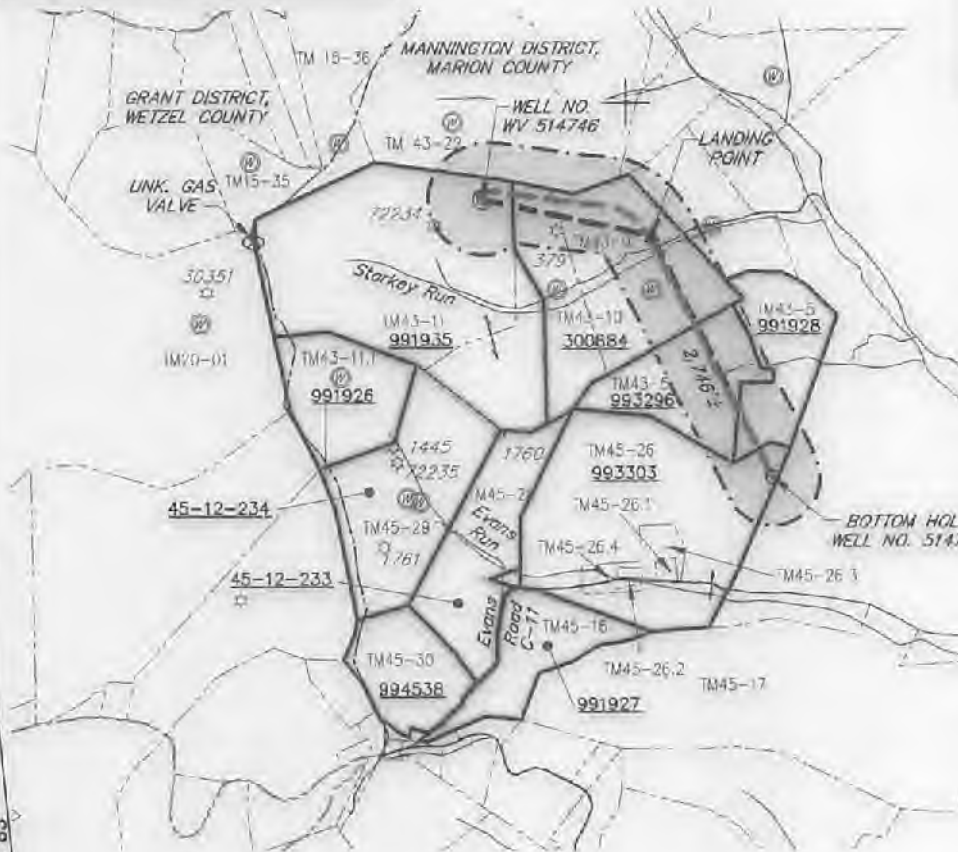
Longitude: 80° 27' 30"

LEGEND

- ⊙ EXISTING OIL/GAS WELL
- ⊙ WATER FEATURE
- ⊙ WELL HEAD TOP HOLE
- ▲ WELL LANDING POINT
- WELL BOTTOM HOLE
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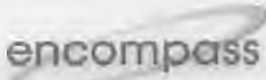
GLO 76



Well References



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS



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[Handwritten Signature]



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 PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 7,649'

WELL OPERATOR: EQT Production Company DESIGNATED AGENT: Rex C. Roy
ADDRESS: 115 Professional Pl. P.O. Box 280 ADDRESS: 115 Professional Pl. P.O. Box 280
Bridgeport, WV 26330 Bridgeport, WV 26330

09/15/2017

