

Well Operator's Report of Well Work



Where energy meets innovation.

Well Number: 514380

API: 47 - 103 - 02868

Submission:  Initial  Amended

Notes:

Correction to Production Cement Top  
(MD)

RECEIVED  
Office of Oil and Gas

FEB 02 2016

WV Department of  
Environmental Protection

AXWS 03/24/16

03/25/2016

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

API 47 - 103 - 02868 County Wetzel District Grant  
 Quad Pine Grove Pad Name PNG129 Field/Pool Name \_\_\_\_\_  
 Farm name COASTAL LUMBER COMPANY Well Number 514380  
 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 4,378,086 Easting 530,869  
 Landing Point of Curve Northing 4,377,954 Easting 531,098  
 Bottom Hole Northing 4,377,195 Easting 531,515

Elevation (ft) 1330 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 14.3 ppg barium sulfate, sodium chloride, xanthan gum, polyanionic cellulose, modified starch, sodium hydroxide, phosphonates and alkyl phosphates, glutaraldehyde solution, calcium hydroxide,  
 partially hydrolyzed polyacrylamide/polyacrylate, potassium chloride, sodium carbonate, ground walnut shells, alcohol and modified fatty acid ferrocchrome lignosulfonate, calcium carbonate, fibrous cellulose

Date permit issued 5/22/2013 Date drilling commenced 8/27/2013 Date drilling ceased 12/6/2013  
 Date completion activities began 10/9/2014 Date completion activities ceased 10/12/2014  
 Verbal plugging (Y/N) n/a 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 734' Open mine(s) (Y/N) depths N  
 Salt water depth(s) ft 2016', 2365' Void(s) encountered (Y/N) depths N  
 Coal depth(s) ft 686', 968', 1038', 1052', 1080' Cavern(s) encountered (Y/N) depths N  
 Is coal being mined in area (Y/N) N

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

API 47-103 - 02868 Farm name COASTAL LUMBER COMPANY Well number 514380

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	28"	26"	40'	New	82.6#/ft	n/a	Y
Surface	17-1/2"	13-3/8"	959'	New	54.5#/ft	243, 484	Y
Coal							
Intermediate 1	12-3/8"	9-5/8"	3401'	New	40#/ft	1222, 1728	Y
Intermediate 2							
Intermediate 3							
Production	8-1/2"	5-1/2"	10610'	New	20#	N/A	N
Tubing							
Packer type and depth set							

Comment Details N/A

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	Class A	49	15.6	1.18	57.82	0	8
Surface	Class A	845	15.6	1.19	1005	0	8
Coal							
Intermediate 1	Class A	1265	15.6	1.18	1492.7	0	8
Intermediate 2							
Intermediate 3							
Production	Class A/Class H	580/420	15/15.6	1.21/1.83	1470.4	4190	72
Tubing							

Drillers TD (ft) 10612' Loggers TD (ft) N/A  
 Deepest formation penetrated Marcellus Plug back to (ft) N/A  
 Plug back procedure N/A

Kick off depth (ft) 6419'

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-N/A  
Surface-bow spring centralizers set at 918', 637', and 233'  
Intermediate-bow spring centralizers set at 3358, 2894, 2388, 1883, 1421, 914, 535  
Production-composite centralizer ran on every joint from td up to 4970'

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- 103 - 02868 Farm name COASTAL LUMBER COMPANY Well number 514380

**PERFORATION RECORD**

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

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)
								See Attachment

Please insert additional pages as applicable.

API 47- 103 - 02868 Farm name COASTAL LUMBER COMPANY Well number 514380

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
<u>Marcellus</u>	<u>7300.3</u>	<u>TVD</u>	<u>7619</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 1150 psi Bottom Hole NA psi DURATION OF TEST 70 hrs

OPEN FLOW Gas 5342 mcfpd Oil 0 bpd NGL 7.15 bpd Water 449 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 <sub>2</sub> S, ETC)
	<u>0</u>		<u>0</u>		

Please insert additional pages as applicable.


Drilling Contractor Savanna Drilling  
Address 2204 Timberloch Place Suite 230 City Woodlands State TX Zip 77380

Logging Company Hoss Co. Services LLC  
Address 614 Trotters Lane City Charleston State WV Zip 25312

Cementing Company Halliburton Energy Services  
Address 121 Champion Way City Canonsburg State PA Zip 15317

Stimulating Company FTS International Services, LLC  
Address 301 East 18th St City Cisco State TX Zip 76437

Please insert additional pages as applicable.

Completed by Brad Maddox Telephone 412-395-7053  
Signature  Title Director of Drilling Date 01/20/2016

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

## 514380 Final FormationsAPI: 47-103-02868

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	734	734
Sand / Shale	0	0	686	686
Coal	686	686	688	688
Sand / Shale	688	688	968	968
Coal	968	968	969	969
Sand / Shale	969	969	1,038.00	1,038.00
Coal	1,038.00	1,038.00	1,045.00	1,045.00
Sand / Shale	1,045.00	1,045.00	1,052.00	1,052.00
Coal	1,052.00	1,052.00	1,054.00	1,054.00
Sand / Shale	1,054.00	1,054.00	1,080.00	1,080.00
Coal	1,080.00	1,080.00	1,086.00	1,086.00
Sand / Shale	1,086.00	1,086.00	2,183.00	2,182.90
Maxton	2,183.00	2,182.90	2,419.00	2,418.90
Big Lime	2,419.00	2,418.90	2,658.00	2,657.80
Weir	2,658.00	2,657.80	2,856.00	2,855.80
Gantz	2,856.00	2,855.80	2,972.00	2,971.80
Fifty foot	2,972.00	2,971.80	3,045.00	3,044.80
Thirty foot	3,045.00	3,044.80	3,092.00	3,091.80
Gordon	3,092.00	3,091.80	3,212.00	3,211.80
Forth Sand	3,212.00	3,211.80	3,347.00	3,346.80
Bayard	3,347.00	3,346.80	3,763.00	3,762.80
Warren	3,763.00	3,762.80	3,889.00	3,888.80
Speechley	3,889.00	3,888.80	4,763.00	4,762.80
Riley	4,763.00	4,762.80	5,374.00	5,373.70
Benson	5,374.00	5,373.70	5,742.00	5,741.70
Alexander	5,742.00	5,741.70	7,145.00	7,050.40
Middlesex	7,145.00	7,050.40	7,199.00	7,090.50
Genesee	7,199.00	7,090.50	7,321.00	7,171.00
Geneseo	7,321.00	7,171.00	7,365.00	7,197.10
Tully	7,365.00	7,197.10	7,408.00	7,220.60
Hamilton	7,408.00	7,220.60	7,619.00	7,300.30
Marcellus	7,619.00	7,300.30	7,337.75	10,612.00

03/25/2016



## **EQT Production - Marcellus**

**Wetzel County, WV**

**Wetzel County 514380**

**Well 514380**

**API: 47-103-02868**

**Main Wellbore**

**Design: As Drilled Surveys**

## **Standard Survey Report**

**09 December, 2013**



Where energy meets innovation.



Phoenix Technology Services  
Survey Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Site Wetzel County 514380
Company:	EQT Production - Marcellus	TVD Reference:	KB @ 1346 0usft
Project:	Wetzel County, WV	MD Reference:	KB @ 1346 0usft
Site:	Wetzel County 514380	North Reference:	Grid
Well:	Well 514380	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	As Drilled Surveys		

**Project** Wetzel County, WV

<b>Map System:</b>	US State Plane 1927 (Exact solution)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD 1927 (NADCON CONUS)		
<b>Map Zone:</b>	West Virginia North 4701		Using geodetic scale factor

**Site** Wetzel County 514380

<b>Site Position:</b>		<b>Northing:</b>	385,139.00 usft	<b>Latitude:</b>	39.55
<b>From:</b>	Map	<b>Easting:</b>	1,678,304.00 usft	<b>Longitude:</b>	-80.64
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	-0.73 °

**Well** Well 514380

<b>Well Position</b>	<b>+N-S</b>	0.0 usft	<b>Northing:</b>	385,139.00 usft	<b>Latitude:</b>	39° 33' 6.564 N
	<b>+E-W</b>	0.0 usft	<b>Easting:</b>	1,678,304.00 usft	<b>Longitude:</b>	80° 38' 27.205 W
<b>Position Uncertainty</b>		0.0 usft	<b>Wellhead Elevation:</b>	usft	<b>Ground Level:</b>	1,330.0 usft

**Wellbore** Main Wellbore

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010_14	12/10/2012	-8.57	67.14	52,595

**Design** As Drilled Surveys

**Audit Notes:**

<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N-S (usft)</b>	<b>+E-W (usft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	144.85	

Survey Program	Date	From (')	To (usft)	Survey (Wellbore)	Tool Name	Description
	12/9/2013	0.00	6,263.0	514380 Gyrodata Gyro (Main Wellbore)	GYD_DP_MS	Gyrodata gyro-compassing and drop
		0.00	10,612.0	514380 MWD (Main Wellbore)	MWD	MWD - Standard

**Survey**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	-1,346.0	0.0	0.0	0.0	0.00	0.00	0.00
103.0	0.60	206.10	103.0	-1,243.0	-0.5	-0.2	0.3	0.58	0.58	0.00
203.0	0.51	208.31	203.0	-1,143.0	-1.4	-0.7	0.7	0.09	-0.09	0.21
303.0	0.45	205.60	303.0	-1,043.0	-2.1	-1.0	1.1	0.06	-0.06	-0.71
403.0	0.12	171.02	403.0	-943.0	-2.6	-1.2	1.4	0.36	-0.33	-34.58
503.0	0.08	162.68	503.0	-843.0	-2.7	-1.1	1.6	0.04	-0.04	-8.34
603.0	0.07	188.66	603.0	-743.0	-2.9	-1.1	1.7	0.04	-0.01	25.98
703.0	0.03	239.58	703.0	-643.0	-2.9	-1.2	1.7	0.06	-0.04	50.92

03/25/2016





Phoenix Technology Services  
Survey Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Site Wetzell County 514380
Company:	EQT Production - Marcellus	TVD Reference:	KB @ 1348.0usft
Project:	Wetzell County, WV	MD Reference:	KB @ 1346.0usft
Site:	Wetzell County 514380	North Reference:	Grid
Well:	Well 514380	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	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)		
803.0	0.04	234.84	803.0	-543.0	-3.0	-1.2	1.7	0.01	0.01			-4.74
903.0	0.04	229.06	903.0	-443.0	-3.0	-1.3	1.7	0.00	0.00			-5.78
1,003.0	0.06	105.47	1,003.0	-343.0	-3.0	-1.3	1.8	0.09	0.02			-123.59
1,103.0	0.19	91.90	1,103.0	-243.0	-3.1	-1.0	1.9	0.13	0.13			-13.57
1,203.0	0.27	104.06	1,203.0	-143.0	-3.1	-0.6	2.2	0.09	0.08			12.16
1,303.0	0.34	107.36	1,303.0	-43.0	-3.3	-0.1	2.6	0.07	0.07			3.30
1,403.0	0.34	105.47	1,403.0	57.0	-3.4	0.4	3.1	0.01	0.00			-1.89
1,503.0	0.44	107.17	1,503.0	157.0	-3.6	1.1	3.6	0.10	0.10			1.70
1,603.0	0.46	111.16	1,603.0	257.0	-3.9	1.8	4.2	0.04	0.02			3.99
1,703.0	0.62	124.61	1,703.0	357.0	-4.3	2.7	5.1	0.20	0.16			13.45
1,803.0	0.83	125.84	1,803.0	457.0	-5.1	3.7	6.3	0.21	0.21			1.23
1,903.0	1.15	123.83	1,903.0	557.0	-6.1	5.1	7.9	0.32	0.32			-2.01
2,003.0	1.18	123.96	2,002.9	656.9	-7.2	6.8	9.8	0.03	0.03			0.13
2,103.0	1.11	124.25	2,102.9	756.9	-8.3	8.5	11.7	0.07	-0.07			0.29
2,203.0	1.03	124.41	2,202.9	856.9	-9.4	10.0	13.4	0.08	-0.08			0.16
2,303.0	0.84	122.75	2,302.9	956.9	-10.3	11.4	14.9	0.19	-0.19			-1.66
2,403.0	0.80	124.21	2,402.9	1,056.9	-11.1	12.5	16.3	0.05	-0.04			1.46
2,503.0	0.81	123.98	2,502.9	1,156.9	-11.8	13.7	17.6	0.01	0.01			-0.23
2,603.0	0.77	128.90	2,602.8	1,256.8	-12.7	14.8	18.9	0.08	-0.04			4.92
2,703.0	0.72	130.03	2,702.8	1,356.8	-13.5	15.8	20.1	0.05	-0.05			1.13
2,803.0	0.65	129.77	2,802.8	1,456.8	-14.3	16.7	21.3	0.07	-0.07			-0.26
2,903.0	0.67	129.42	2,902.8	1,556.8	-15.0	17.6	22.4	0.02	0.02			-0.35
3,003.0	0.67	129.29	3,002.8	1,656.8	-15.7	18.5	23.5	0.00	0.00			-0.13
3,103.0	0.77	128.73	3,102.8	1,756.8	-16.5	19.5	24.7	0.10	0.10			-0.56
3,203.0	0.79	131.04	3,202.8	1,856.8	-17.4	20.6	26.1	0.04	0.02			2.31
3,303.0	0.81	132.05	3,302.8	1,956.8	-18.3	21.6	27.4	0.02	0.02			1.01
3,403.0	0.84	128.96	3,402.8	2,056.8	-19.3	22.7	28.8	0.05	0.03			-3.09
3,503.0	0.64	128.22	3,502.8	2,156.8	-20.1	23.7	30.1	0.20	-0.20			-0.74
3,603.0	0.37	126.13	3,602.8	2,256.8	-20.6	24.4	30.9	0.27	-0.27			-2.09
3,703.0	0.20	113.51	3,702.8	2,356.8	-20.9	24.8	31.3	0.18	-0.17			-12.62
3,803.0	0.18	105.73	3,802.8	2,456.8	-21.0	25.1	31.6	0.03	-0.02			-7.78
3,903.0	0.10	82.67	3,902.8	2,556.8	-21.0	25.4	31.8	0.10	-0.08			-23.06
4,003.0	0.04	188.43	4,002.8	2,656.8	-21.0	25.4	31.8	0.12	-0.06			105.76
4,103.0	0.06	310.34	4,102.8	2,756.8	-21.0	25.4	31.8	0.09	0.02			121.91
4,203.0	0.02	182.90	4,202.8	2,856.8	-21.0	25.4	31.8	0.07	-0.04			-127.44
4,303.0	0.05	5.35	4,302.8	2,956.8	-21.0	25.4	31.8	0.07	0.03			-177.55
4,403.0	0.06	57.19	4,402.8	3,056.8	-20.9	25.4	31.7	0.05	0.01			51.84
4,503.0	0.20	90.16	4,502.8	3,156.8	-20.9	25.6	31.8	0.15	0.14			32.97
4,603.0	0.27	81.55	4,602.8	3,256.8	-20.9	26.0	32.0	0.08	0.07			-8.61
4,703.0	0.38	72.19	4,702.8	3,356.8	-20.7	26.6	32.2	0.12	0.11			-9.36
4,803.0	0.56	57.37	4,802.8	3,456.8	-20.4	27.3	32.4	0.22	0.18			-14.82
4,903.0	0.55	58.59	4,902.8	3,556.8	-19.8	28.1	32.4	0.02	-0.01			1.22



Phoenix Technology Services  
Survey Report



Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Site Wetzel County 514380
Company:	EQT Production - Marcellus	TVD Reference:	KB @ 1346 Dusst
Project:	Wetzel County, WV	MD Reference:	KB @ 1346 Dusst
Site:	Wetzel County 514380	North Reference:	Grid
Well:	Well 514380	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	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)
5,003.0	0.59	56.27	5,002.8	3,656.8	-19.3	29.0	32.5	0.05	0.04	-2.32
5,103.0	0.61	55.06	5,102.7	3,756.7	-18.7	29.8	32.5	0.02	0.02	-1.21
5,203.0	0.59	63.40	5,202.7	3,856.7	-18.2	30.7	32.6	0.09	-0.02	8.34
5,303.0	0.55	73.39	5,302.7	3,956.7	-17.8	31.7	32.8	0.11	-0.04	9.99
5,403.0	0.58	73.87	5,402.7	4,056.7	-17.5	32.6	33.1	0.03	0.03	0.48
5,503.0	0.51	88.01	5,502.7	4,156.7	-17.4	33.5	33.5	0.15	-0.07	14.14
5,603.0	0.39	78.02	5,602.7	4,256.7	-17.3	34.3	33.9	0.14	-0.12	-9.99
5,703.0	0.38	73.96	5,702.7	4,356.7	-17.1	35.0	34.1	0.03	-0.01	-4.06
5,803.0	0.31	72.90	5,802.7	4,456.7	-17.0	35.5	34.3	0.07	-0.07	-1.06
5,903.0	0.40	70.65	5,902.7	4,556.7	-16.8	36.1	34.5	0.09	0.09	-2.25
6,003.0	0.44	82.59	6,002.7	4,656.7	-16.6	36.8	34.8	0.10	0.04	11.94
6,103.0	0.61	109.47	6,102.7	4,756.7	-16.7	37.7	35.4	0.29	0.17	26.88
6,203.0	0.62	131.36	6,202.7	4,856.7	-17.3	38.6	36.4	0.23	0.01	21.89
<b>Gyro Tie In MD=6263'</b>										
6,263.0	0.59	142.14	6,262.7	4,916.7	-17.7	39.1	37.0	0.20	-0.05	17.97
6,292.0	0.50	141.10	6,291.7	4,945.7	-17.9	39.2	37.3	0.31	-0.31	-3.59
6,356.0	0.40	129.30	6,355.7	5,009.7	-18.3	39.6	37.7	0.21	-0.16	-18.44
6,387.0	0.40	111.10	6,386.7	5,040.7	-18.4	39.8	37.9	0.41	0.00	-58.71
6,419.0	1.80	99.20	6,418.7	5,072.7	-18.5	40.4	38.4	4.41	4.38	-37.19
6,450.0	5.80	114.90	6,449.6	5,103.6	-19.3	42.3	40.1	13.21	12.90	50.65
6,482.0	9.80	112.00	6,481.3	5,135.3	-21.0	46.3	43.8	12.56	12.50	-9.06
6,514.0	11.10	112.70	6,512.8	5,166.8	-23.2	51.6	48.7	4.08	4.06	2.19
6,545.0	12.00	112.50	6,543.2	5,197.2	-25.6	57.4	53.9	2.91	2.90	-0.65
6,577.0	13.80	110.60	6,574.3	5,228.3	-28.2	64.0	59.9	5.78	5.63	-5.94
6,608.0	16.10	108.70	6,604.3	5,258.3	-30.8	71.5	66.4	7.58	7.42	-6.13
6,640.0	18.80	109.00	6,634.8	5,288.8	-33.9	80.6	74.2	8.44	8.44	0.94
6,672.0	20.00	107.30	6,665.0	5,319.0	-37.3	90.7	82.7	4.14	3.75	-5.31
6,703.0	21.60	103.30	6,694.0	5,348.0	-40.1	101.3	91.2	6.90	5.16	-12.90
6,735.0	23.60	99.20	6,723.5	5,377.5	-42.5	113.4	100.1	7.95	6.25	-12.81
6,767.0	25.70	97.90	6,752.6	5,406.6	-44.5	126.6	109.3	6.78	6.56	-4.06
6,798.0	26.80	98.90	6,780.4	5,434.4	-46.5	140.2	118.7	3.82	3.55	3.23
6,830.0	30.20	102.00	6,808.5	5,462.5	-49.3	155.2	129.6	11.58	10.63	9.69
6,862.0	33.80	104.50	6,835.7	5,489.7	-53.2	171.7	142.3	11.99	11.25	7.81
6,893.0	37.50	105.90	6,860.9	5,514.9	-57.9	189.1	156.2	12.22	11.94	4.52
6,925.0	40.70	106.70	6,885.7	5,539.7	-63.6	208.5	172.0	10.12	10.00	2.50
6,957.0	42.50	106.30	6,909.6	5,563.6	-69.6	228.8	188.7	5.69	5.63	-1.25
6,988.0	42.40	105.40	6,932.5	5,586.5	-75.4	248.9	204.9	1.99	-0.32	-2.90
7,020.0	42.20	104.30	6,956.2	5,610.2	-80.9	269.8	221.4	2.40	-0.63	-3.44
7,052.0	41.70	103.80	6,980.0	5,634.0	-86.1	290.5	237.6	1.88	-1.56	-1.56
7,083.0	41.00	102.50	7,003.2	5,657.2	-90.7	310.5	252.9	3.57	-2.26	-4.19
7,115.0	40.30	101.60	7,027.5	5,681.5	-95.1	330.8	268.2	2.85	-2.19	-2.81
7,147.0	40.10	103.40	7,051.9	5,705.9	-99.6	351.0	283.5	3.68	-0.63	5.63
7,178.0	42.50	107.20	7,075.2	5,729.2	-105.0	370.7	299.3	11.20	7.74	12.26

03/25/2016



Phoenix Technology Services  
Survey Report



Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Site Wetzel County 514380
Company:	EQT Production - Marcellus	TVD Reference:	KB @ 1346 0usft
Project:	Wetzel County, WV	MD Reference:	KB @ 1346 0usft
Site:	Wetzel County 514380	North Reference:	Gnd
Well:	Well 514380	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	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)
7,210.0	45.60	111.30	7,098.2	5,752.2	-112.3	391.7	317.4	13.16	9.69	12.81
7,242.0	47.50	113.90	7,120.2	5,774.2	-121.3	413.2	337.0	8.37	5.94	8.13
7,273.0	49.70	117.10	7,140.7	5,794.7	-131.3	434.1	357.3	10.50	7.10	10.32
7,305.0	51.30	119.60	7,161.1	5,815.1	-143.0	455.9	379.4	7.83	5.00	7.81
7,337.0	53.00	122.10	7,180.7	5,834.7	-156.0	477.5	402.5	8.14	5.31	7.81
7,368.0	55.50	124.50	7,198.9	5,852.9	-169.8	498.6	425.9	10.22	8.06	7.74
7,400.0	57.90	126.20	7,216.4	5,870.4	-185.3	520.4	451.1	8.72	7.50	5.31
7,432.0	59.80	128.70	7,233.0	5,887.0	-201.9	542.1	477.2	8.94	5.94	7.81
7,464.0	62.20	130.20	7,248.5	5,902.5	-219.7	563.7	504.2	8.55	7.50	4.69
7,495.0	65.50	133.00	7,262.2	5,916.2	-238.2	584.5	531.3	13.38	10.65	9.03
7,527.0	69.50	134.80	7,274.4	5,928.4	-258.7	605.8	560.3	13.54	12.50	5.63
7,559.0	72.50	137.20	7,284.8	5,938.8	-280.4	626.8	590.2	11.75	9.38	7.50
7,590.0	75.50	139.80	7,293.4	5,947.4	-302.8	646.5	619.8	12.59	9.68	8.39
7,622.0	77.10	143.00	7,300.9	5,954.9	-327.0	665.9	650.8	10.93	5.00	10.00
7,654.0	78.50	144.80	7,307.7	5,961.7	-352.3	684.4	682.1	7.03	4.38	5.63
7,685.0	80.50	144.90	7,313.4	5,967.4	-377.2	701.9	712.6	6.46	6.45	0.32
7,717.0	83.50	146.50	7,317.8	5,971.8	-403.4	719.8	744.2	10.60	9.38	5.00
7,749.0	85.30	149.90	7,320.9	5,974.9	-430.5	736.5	776.0	11.98	5.63	10.63
7,813.0	89.20	151.20	7,324.0	5,978.0	-486.1	768.0	839.6	6.42	6.09	2.03
7,876.0	90.80	152.80	7,324.0	5,978.0	-541.8	797.5	902.1	3.59	2.54	2.54
7,940.0	90.90	153.10	7,323.0	5,977.0	-598.7	826.6	965.5	0.49	0.16	0.47
8,003.0	91.60	153.50	7,321.7	5,975.7	-655.0	854.9	1,027.8	1.28	1.11	0.63
8,067.0	91.50	153.30	7,319.9	5,973.9	-712.2	883.6	1,091.1	0.35	-0.16	-0.31
8,130.0	90.30	152.20	7,319.0	5,973.0	-768.2	912.4	1,153.4	2.58	-1.90	-1.75
8,193.0	90.30	152.50	7,318.6	5,972.6	-824.0	941.7	1,215.9	0.48	0.00	0.48
8,257.0	90.20	153.40	7,318.3	5,972.3	-881.0	970.8	1,279.3	1.41	-0.16	1.41
8,320.0	90.10	153.50	7,318.2	5,972.2	-937.4	998.9	1,341.6	0.22	-0.16	0.16
8,383.0	88.90	153.70	7,318.7	5,972.7	-993.8	1,026.9	1,403.8	1.93	-1.90	0.32
8,447.0	88.80	153.70	7,320.0	5,974.0	-1,051.2	1,055.3	1,467.0	0.16	-0.16	0.00
8,510.0	88.10	153.40	7,321.7	5,975.7	-1,107.6	1,083.3	1,529.3	1.21	-1.11	-0.48
8,573.0	87.90	153.10	7,323.9	5,977.9	-1,163.8	1,111.7	1,591.6	0.57	-0.32	-0.48
8,637.0	86.70	151.90	7,326.9	5,980.9	-1,220.5	1,141.2	1,654.9	2.65	-1.88	-1.88
8,700.0	86.80	152.00	7,330.5	5,984.5	-1,276.0	1,170.8	1,717.4	0.22	0.16	0.16
8,764.0	88.30	151.90	7,333.2	5,987.2	-1,332.4	1,200.8	1,780.8	2.35	2.34	-0.16
8,827.0	91.50	151.90	7,333.3	5,987.3	-1,388.0	1,230.5	1,843.3	5.08	5.08	0.00
8,890.0	91.50	151.50	7,331.7	5,985.7	-1,443.4	1,260.4	1,905.8	0.63	0.00	-0.63
8,954.0	90.80	150.80	7,330.4	5,984.4	-1,499.5	1,291.2	1,969.4	1.55	-1.09	-1.09
9,017.0	90.50	151.30	7,329.7	5,983.7	-1,554.6	1,321.7	2,032.1	0.93	-0.48	0.79
9,081.0	90.80	151.70	7,329.0	5,983.0	-1,610.8	1,352.3	2,095.6	0.78	0.47	0.63
9,144.0	90.80	151.40	7,328.1	5,982.1	-1,666.2	1,382.3	2,158.2	0.48	0.00	-0.48
9,207.0	89.40	150.70	7,328.0	5,982.0	-1,721.4	1,412.8	2,220.8	2.48	-2.22	-1.11
9,271.0	89.00	150.60	7,328.9	5,982.9	-1,777.1	1,444.1	2,284.5	0.64	-0.63	-0.16
9,334.0	87.50	150.10	7,330.8	5,984.8	-1,831.9	1,475.3	2,347.2	2.51	-2.38	-0.79



**Phoenix Technology Services**  
Survey Report



Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Site Wetzel County 514380
Company:	EQT Production - Marcellus	TVD Reference:	KB @ 1346.0usft
Project:	Wetzel County, WV	MD Reference:	KB @ 1346.0usft
Site:	Wetzel County 514380	North Reference:	Grid
Well:	Well 514380	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	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)
9,398.0	88.50	150.90	7,333.0	5,987.0	-1,887.5	1,506.8	2,410.8	2.00	1.56	1.25
9,461.0	89.10	151.00	7,334.4	5,988.4	-1,942.6	1,537.4	2,473.5	0.97	0.95	0.16
9,524.0	89.40	151.20	7,335.2	5,989.2	-1,997.7	1,567.8	2,536.1	0.57	0.48	0.32
9,588.0	90.10	151.30	7,335.5	5,989.5	-2,053.9	1,598.6	2,599.7	1.10	1.09	0.16
9,651.0	90.20	152.20	7,335.3	5,989.3	-2,109.3	1,628.4	2,662.2	1.44	0.16	1.43
9,715.0	88.60	153.10	7,336.0	5,990.0	-2,166.2	1,657.8	2,725.6	2.87	-2.50	1.41
9,778.0	89.30	153.40	7,337.1	5,991.1	-2,222.4	1,686.2	2,787.9	1.21	1.11	0.48
9,841.0	89.80	153.30	7,337.6	5,991.6	-2,278.7	1,714.4	2,850.2	0.81	0.79	-0.16
9,905.0	90.40	153.00	7,337.5	5,991.5	-2,335.8	1,743.3	2,913.6	1.05	0.94	-0.47
9,968.0	90.30	153.00	7,337.1	5,991.1	-2,392.0	1,771.9	2,975.9	0.16	-0.16	0.00
10,031.0	89.00	153.40	7,337.5	5,991.5	-2,448.2	1,800.3	3,038.3	2.16	-2.06	0.63
10,095.0	89.50	153.80	7,338.3	5,992.3	-2,505.5	1,828.8	3,101.5	1.00	0.78	0.63
10,158.0	90.30	153.50	7,338.5	5,992.5	-2,562.0	1,856.8	3,163.8	1.36	1.27	-0.48
10,221.0	90.90	153.60	7,337.8	5,991.8	-2,618.4	1,884.8	3,226.0	0.97	0.95	0.16
10,285.0	90.70	152.60	7,336.9	5,990.9	-2,675.4	1,913.8	3,289.4	1.59	-0.31	-1.56
10,348.0	88.90	151.20	7,337.1	5,991.1	-2,731.0	1,943.4	3,351.9	3.62	-2.86	-2.22
10,411.0	89.60	151.50	7,337.9	5,991.9	-2,786.3	1,973.6	3,414.5	1.21	1.11	0.48
10,474.0	90.00	150.90	7,338.2	5,992.2	-2,841.5	2,004.0	3,477.1	1.14	0.63	-0.95
10,538.0	90.10	150.40	7,338.1	5,992.1	-2,897.3	2,035.4	3,540.8	0.80	0.16	-0.78
<b>Final Survey MD=10556'</b>										
10,556.0	90.30	150.40	7,338.0	5,992.0	-2,912.9	2,044.2	3,558.7	1.11	1.11	0.00
<b>Projection to Bit MD=10612'</b>										
10,612.0	90.30	150.40	7,337.7	5,991.7	-2,961.6	2,071.9	3,614.4	0.00	0.00	0.00

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
6,263.0	6,262.7	-17.7	39.1	Gyro Tie In MD=6263'
10,556.0	7,338.0	-2,912.9	2,044.2	Final Survey MD=10556'
10,612.0	7,337.7	-2,961.6	2,071.9	Projection to Bit MD=10612'

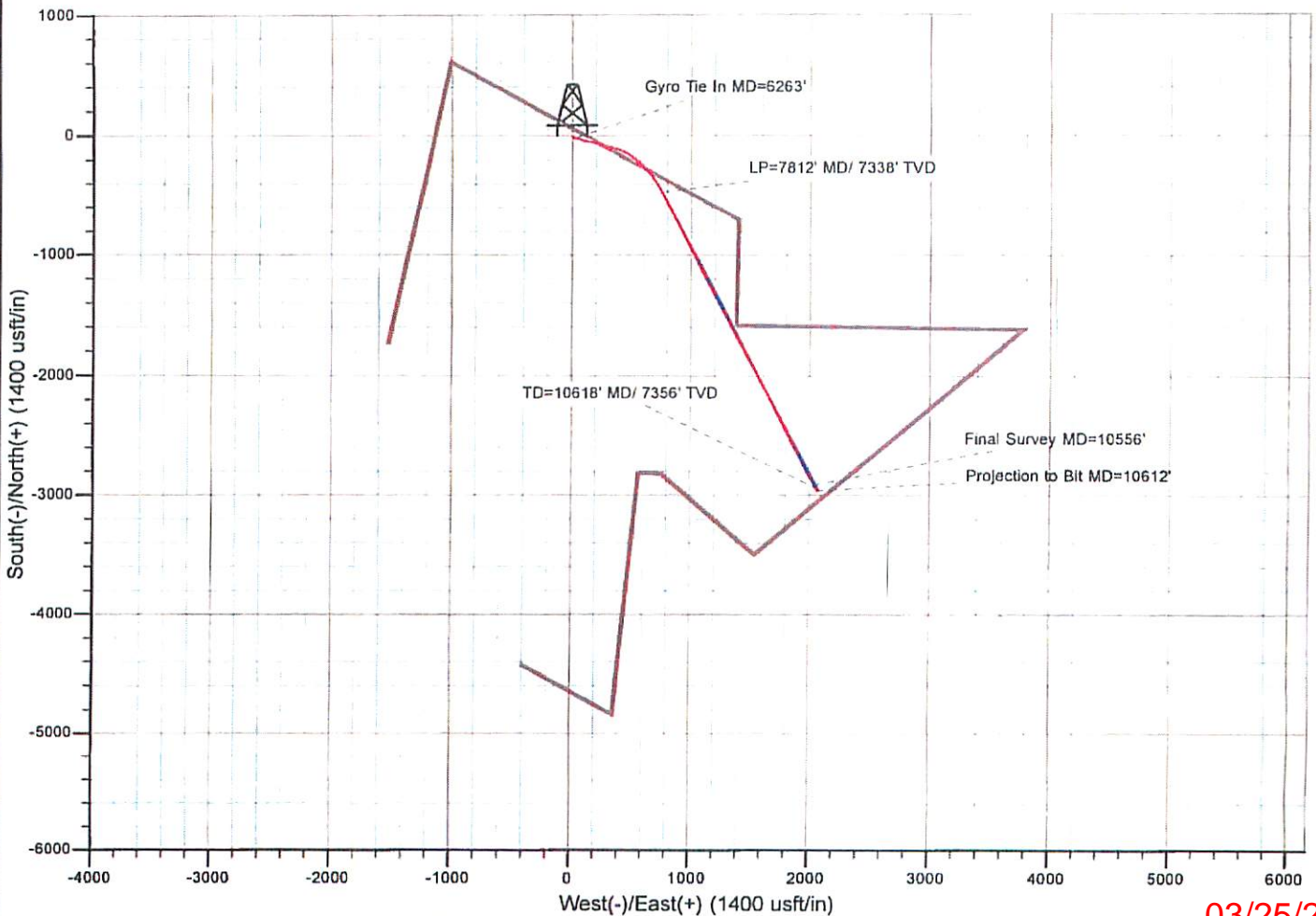
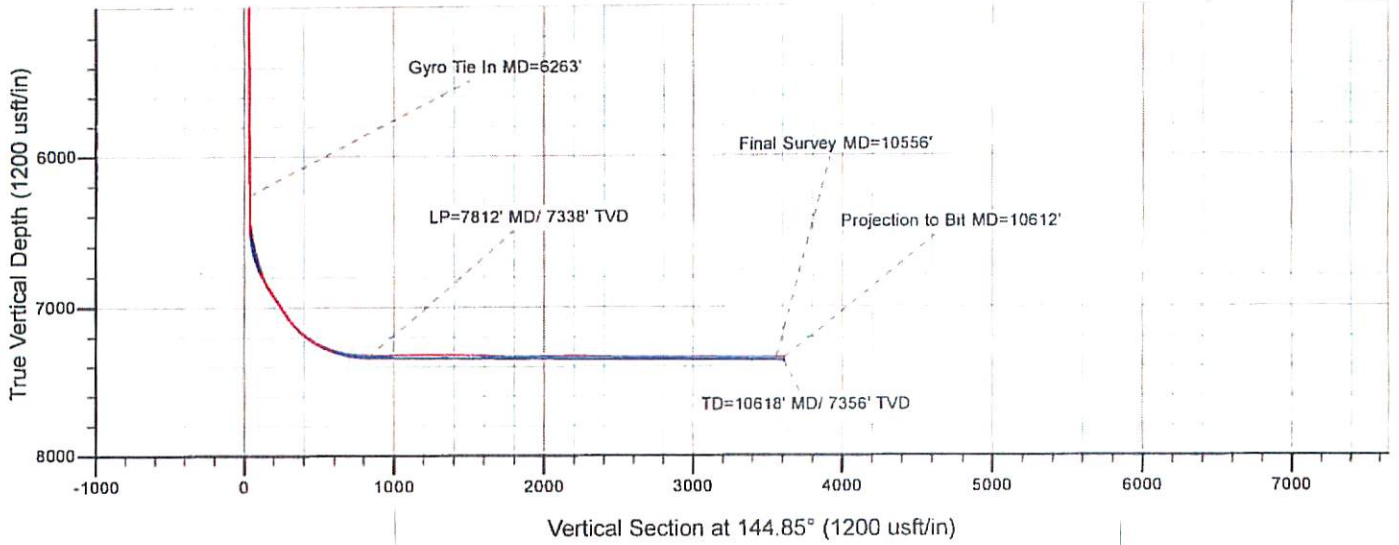
Checked By: _____	Approved By: _____	Date: _____
-------------------	--------------------	-------------

03/25/2016



# EQT Production - Marcellus

Project: Wetzel County, WV  
 Site: Wetzel County 514380  
 Well: Well 514380  
 Wellbore: Main Wellbore  
 Design: As Drilled Surveys



**514380 - 47-103-02868-0000 - Perforations**

<b>Stage Number</b>	<b>Perforation Date</b>	<b>Top Perf Depth (ftKB)</b>	<b>Bottom Perf Depth (ftKB)</b>	<b>Number of Shots</b>	<b>Formation</b>
<b>Initiation Sleeve</b>	10/9/2014	10,584.00	10,586.00	10	MARCELLUS
<b>1</b>	10/9/2014	10,403.00	10,538.00	32	MARCELLUS
<b>2</b>	10/9/2014	10,179.00	10,359.00	40	MARCELLUS
<b>3</b>	10/9/2014	9,954.00	10,134.00	40	MARCELLUS
<b>4</b>	10/10/2014	9,731.00	9,909.00	40	MARCELLUS
<b>5</b>	10/11/2014	9,504.00	9,680.00	40	MARCELLUS
<b>6</b>	10/11/2014	9,279.00	9,459.00	40	MARCELLUS
<b>7</b>	10/11/2014	9,054.00	9,234.00	40	MARCELLUS
<b>8</b>	10/11/2014	8,829.00	9,009.00	40	MARCELLUS
<b>9</b>	10/11/2014	8,604.00	8,784.00	40	MARCELLUS
<b>10</b>	10/12/2014	8,379.00	8,559.00	40	MARCELLUS
<b>11</b>	10/12/2014	8,154.00	8,334.00	40	MARCELLUS
<b>12</b>	10/12/2014	7,929.00	8,109.00	40	MARCELLUS
<b>13</b>	10/12/2014	7,704.00	7,884.00	40	MARCELLUS

**514380 - 47-103-02868-0000 -- Stimulated Stages**

<b>Stage Number</b>	<b>Stimulation Date</b>	<b>Ave Pump Rate (BPM)</b>	<b>Ave Treatment Pressure (PSI)</b>	<b>Max Breakdown Pressure (PSI)</b>	<b>ISIP (PSI)</b>	<b>Amount of Proppant (lbs)</b>	<b>Amount of Water (bbls)</b>	<b>Amount of Nitrogen/other (units)</b>
<b>Initiation Sleeve</b>	10/9/2014	23.30	8,796.00	NA	4,139	0	1,119	0
<b>1</b>	10/9/2014	97.70	7,731.00	8,297.00	4,112	301,321	7,730	0
<b>2</b>	10/9/2014	95.70	8,007.00	8,359.00	4,219	303,734	7,721	0
<b>3</b>	10/10/2014	97.90	8,129.00	8,551.00	4,927	301,542	7,690	0
<b>4</b>	10/11/2014	98.40	7,755.00	8,112.00	4,761	302,286	7,808	0
<b>5</b>	10/11/2014	99.20	7,948.00	8,191.00	4,252	302,235	7,701	0
<b>6</b>	10/11/2014	99.70	7,774.00	7,942.00	4,420	302,497	7,624	0
<b>7</b>	10/11/2014	100.30	7,714.00	7,934.00	4,241	301,405	7,542	0
<b>8</b>	10/11/2014	99.90	7,715.00	8,036.00	4,862	301,102	7,897	0
<b>9</b>	10/11/2014	99.30	7,777.00	8,094.00	7,800	302,863	7,802	0
<b>10</b>	10/12/2014	100.40	7,621.00	8,177.00	5,258	298,422	7,726	0
<b>11</b>	10/12/2014	98.70	7,882.00	8,392.00	4,637	299,599	8,340	0
<b>12</b>	10/12/2014	99.20	7,657.00	8,216.00	4,526	299,314	7,463	0
<b>13</b>	10/12/2014	101.10	7,354.00	7,630.00	4,743	302,021	8,576	0

# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	10/9/2014
Job End Date:	10/12/2014
State:	West Virginia
County:	Wetzel
API Number:	47-103-02868-00-00
Operator Name:	EQT Production
Well Name and Number:	PNG129 - 514380
Longitude:	-80.64070400
Latitude:	39.55189900
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	7,338
Total Base Water Volume (gal):	4,390,092
Total Base Non Water Volume:	191,246



## 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	FTSI	Carrier	Water	7732-18-5	100.00000	90.03344	
Sand	FTSI	Proppant	Crystalline Silica	14808-60-7	100.00000	9.64689	
Hydrochloric Acid 15%	FTSI	Acidizing	Hydrochloric Acid	7647-01-0	15.00000	0.02854	
FRW-600	FTSI	Friction Reducer	Hydrotreated light distillate	64742-47-8	30.00000	0.02147	
			Ammonium acetate	631-61-8	6.00000	0.00429	
HVG-1	FTSI	Gel	Petroleum Distillate	64742-47-8	55.00000	0.00423	
			Guar Gum	9000-30-0	50.00000	0.00384	
			Surfactant	68439-51-0	2.00000	0.00015	
			Clay	14808-60-7	2.00000	0.00015	
B-10	FTSI	Buffer Agent	Potassium carbonate	584-08-7	48.00000	0.00586	
			Potassium hydroxide	1310-58-3	20.00000	0.00244	
ICI-3240	FTSI	Biocide					



			Dazomet (Tetrahydro-3, 5-dimethyl-2H-1, 3, 5-thiadiazine-2-thione	533-74-4	24.00000	0.00245
			Sodium Hydroxide	1310-73-2	4.00000	0.00041
CS-500-SI	FTSI	Scale Inhibitor				
			Ethylene Glycol	107-21-1	10.00000	0.00257
CIO2	Neptune	Biocide				
			Chlorine Dioxide	10049-04-4	100.00000	0.00056
FE-100L	FTSI	Iron Control				
			Citric Acid	77-92-9	55.00000	0.00041
CI-150	FTSI	Corrosion Inhibitor				
			Organic amine resin salt	Proprietary	30.00000	0.00010
			Isopropanol	67-63-0	30.00000	0.00010
			Ethylene Glycol	107-21-1	30.00000	0.00010
			Dimethylformamide	68-12-2	10.00000	0.00003
			Aromatic aldehyde	Proprietary	10.00000	0.00003
			Quaternary ammonium compound	Proprietary	10.00000	0.00003
APB-1	FTSI	Gel Breaker				
			Ammonium Persulfate	7727-54-0	95.00000	0.00009
NE-100	FTSI	Non-Emulsifier				
			2-Propanol	67-63-0	10.00000	0.00003
			2-Butoxyethanol	111-76-2	10.00000	0.00003
			Dodecylbenzenesulfonic acid	27176-87-0	5.00000	0.00001

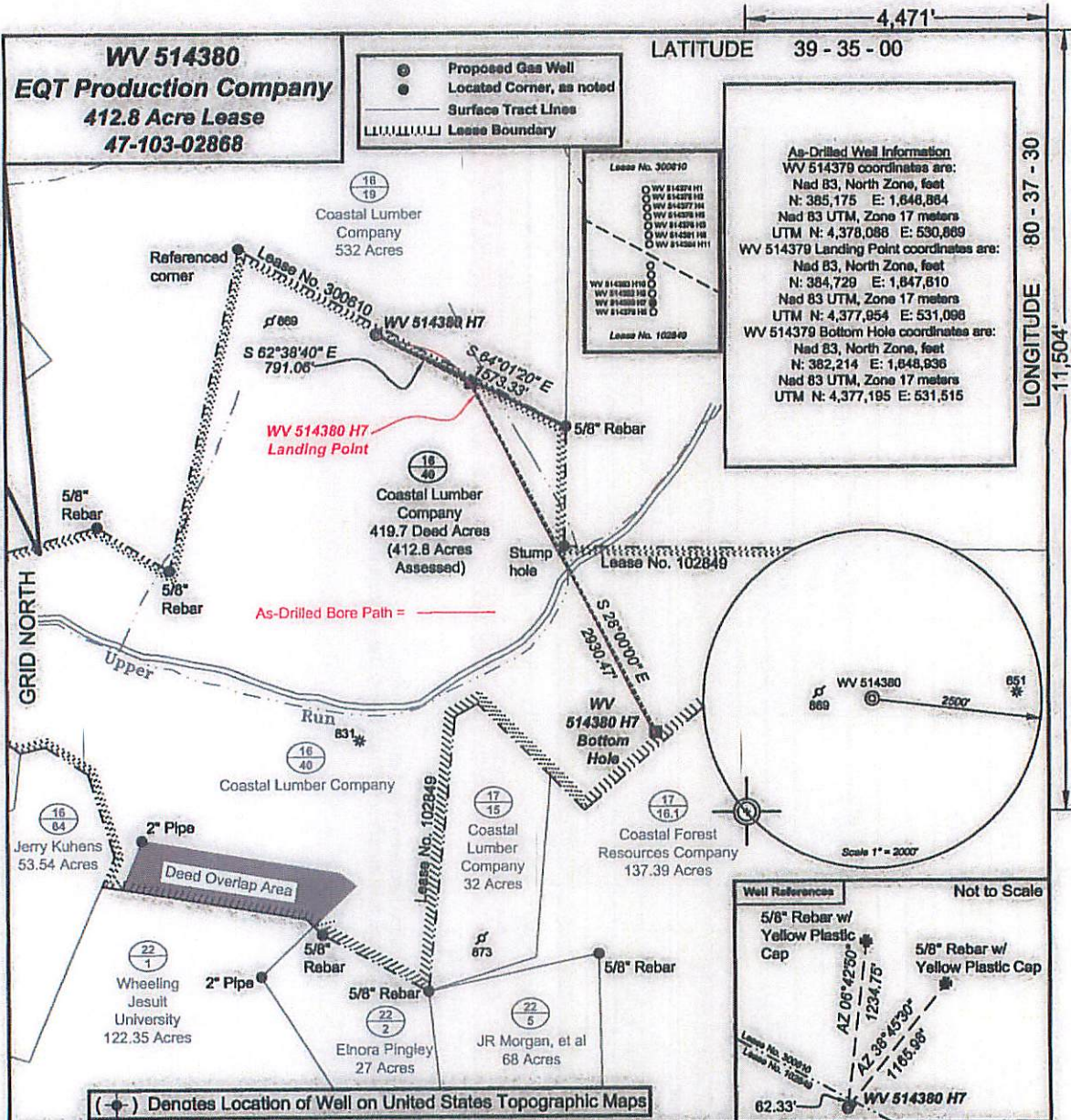
Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.

\* 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)



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 Department of Environmental Protection.

*[Signature]*  
 P.S. 2092



FILE NO: 204-34-G-12  
 DRAWING NO: 204-12 PNG 129 H7  
 SCALE: 1" = 1000'  
 MINIMUM DEGREE OF ACCURACY: 1:2500  
 PROVEN SOURCE OF ELEVATION: NGS CORS Station

**STATE OF WEST VIRGINIA**  
 DEPARTMENT OF ENVIRONMENTAL PROTECTION  
**OIL AND GAS DIVISION**

DATE: June 23 20 14  
 OPERATOR'S WELL NO. WV 514380  
 API WELL NO  
 47 - 103 - 02868  
 STATE COUNTY PERMIT

WELL TYPE:  OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL  
 (IF GAS) PRODUCTION:  STORAGE  DEEP  SHALLOW

LOCATION: ELEVATION: Ground 1,368' Proposed 1,328.5' WATERSHED Upper Run of South Fork of Fishing Creek QUADRANGLE: Pine Grove  
 DISTRICT: Grant COUNTY: Wetzel

SURFACE OWNER: Coastal Lumber Company ACREAGE: 412.8  
 ROYALTY OWNER: Shiben Estates LEASE NO: 102849 ACREAGE: 419.7

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: THO 7,780' MD 12,480'

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

08/25/2016