

Well Operator's Report of Well Work



Where energy meets innovation.

Well Number: 514382

API: 47-103 - 02869

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 03/22/16

03/25/2016

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

API 47-103-02869 County Wetzel District Grant  
Quad Pine Grove Pad Name PNG129 Field/Pool Name N/A  
Farm name COASTAL LUMBER COMPANY Well Number 514382  
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 4,378,091 Easting 530,868  
Landing Point of Curve Northing 4,377,679 Easting 520,833  
Bottom Hole Northing 4,376,998 Easting 521,438

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 14.0 ppg barium sulfate, sodium chloride, xanthan gum, polyanionic cellulose, modified starch, sodium hydroxide, phosphonates and alkyl phosphates, glutaraldehyde solution, calcium hydroxide,  
partially hydrolyzed polyacrylamide/polyacrylate, potassium chloride, sodium carbonate, ground walnut shells, alcohol and modified fatty acid, ferrochrome lignosulfonate, calcium carbonate, fibrous cellulose

Date permit issued 5/29/2013 Date drilling commenced 8/27/2013 Date drilling ceased 12/16/2013  
Date completion activities began 10/24/2014 Date completion activities ceased 10/8/2014  
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:

03/25/2016

API 47-103 - 02869

Farm name COASTAL LUMBER COMPANY

Well number 514382

Amended 1/2016

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"	948'	New	54.5#/ft	191/437	Y
Coal							
Intermediate 1	12-3/8"	9-5/8"	3379'	New	40#/ft	1222, 3287	Y
Intermediate 2							
Intermediate 3							
Production	8-1/2"	5-1/2"	11345'	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>2</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	1493	0	8
Intermediate 2							
Intermediate 3							
Production	Class A/Class H	930/475	15/15.6	1.21/1.83	1994.6	2894'	8
Tubing							

Drillers TD (ft) 11345'

Loggers TD (ft) N/A

Deepest formation penetrated Marcellus

Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 5268

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 950,592,270

Intermediate-bow spring centralizers set at 3401,2936,2472,1925,1420,913,535

Production-composite centralizer ran on every joint from 1d up to 3635'

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 \_\_\_\_\_





Final Formations Well #514382 47-103-02869

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	1	1	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	2,183.00
Maxton	2,183.00	2,183.00	2,419.00	2,419.00
Big Lime	2,419.00	2,419.00	2,658.00	2,657.90
Weir	2,658.00	2,657.90	2,856.00	2,855.90
Gantz	2,856.00	2,855.90	2,972.00	2,971.90
Fifty foot	2,972.00	2,971.90	3,045.00	3,044.90
Thirty foot	3,045.00	3,044.90	3,092.00	3,091.90
Gordon	3,092.00	3,091.90	3,212.00	3,211.90
Forth Sand	3,212.00	3,211.90	3,347.00	3,346.90
Bayard	3,347.00	3,346.90	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	5,372.90
Benson	5,374.00	5,372.90	5,805.00	5,740.50
Alexander	5,805.00	5,740.50	7,511.00	7,042.50
Middlesex	7,511.00	7,042.50	7,561.00	7,080.60
Genesee	7,561.00	7,080.60	7,682.00	7,162.80
Geneseo	7,682.00	7,162.80	7,725.00	7,188.10
Tully	7,725.00	7,188.10	7,766.00	7,209.90
Hamilton	7,766.00	7,209.90	7,950.00	7,286.60
Marcellus	7,950.00	7,286.60	11,345.00	7,351.71



## **EQT Production - Marcellus**

**Wetzel County, WV**

**Wetzel County 514382**

**Well 514382**

API # 47-103-02869

**Main Wellbore**

**Survey: 514382 MWD**

## **Standard Survey Report**

16 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 514382
Company:	EQT Production - Marcellus	TVD Reference:	KB @ 1346.0usft (Original Well)
Project:	Wetzel County, WV	MD Reference:	KB @ 1346.0usft (Original Well)
Site:	Wetzel County 514382	North Reference:	Grid
Well:	Well 514382	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	As Drilled Surveys		

Project: Wetzel 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		Using geodetic scale factor

Site: Wetzel County 514382					
Site Position:		Northing:	385,153.00 usft	Latitude:	39.55
From:	Map	Easting:	1,678,303.00 usft	Longitude:	-80.64
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.73 °

Well: Well 514382						
Well Position	+N/-S	0.0 usft	Northing:	385,153.00 usft	Latitude:	39° 33' 6.703 N
	+E/-W	0.0 usft	Easting:	1,678,303.00 usft	Longitude:	80° 38' 27.220 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	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:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0		171.68

Survey Program		Date	12/16/2013	
From (')	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	5,107.0	514382 Gyros (Main Wellbore)	GYD_DP_MS	Gyrodata gyro-compassing and drop
0.00	11,345.0	514382 MWD (Main Wellbore)	MWD	MWD - Standard

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)
5,107.0	0.84	59.02	5,106.8	3,760.8	-9.3	29.7	13.5	0.00	0.00	0.00
5,115.0	0.70	50.90	5,114.8	3,768.8	-9.3	29.8	13.5	2.21	-1.75	-101.50
5,147.0	0.60	22.80	5,146.8	3,800.8	-9.0	30.0	13.2	1.03	-0.31	-87.81
5,179.0	1.00	324.40	5,178.8	3,832.8	-8.6	29.9	12.8	2.67	1.25	-182.50
5,211.0	1.80	315.20	5,210.8	3,864.8	-8.0	29.4	12.2	2.59	2.50	-28.75
5,247.0	2.20	323.00	5,246.7	3,900.7	-7.1	28.6	11.1	1.34	1.11	21.67
5,278.0	3.30	307.70	5,277.7	3,931.7	-6.0	27.5	10.0	4.24	3.55	-49.35
5,310.0	5.60	287.40	5,309.6	3,963.6	-5.0	25.3	8.6	8.60	7.19	-63.44





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Project:	Wetzel County, WV	MD Reference:	KB @ 1346 0usft (Original Well)
Site:	Wetzel County 514382	North Reference:	Grid
Well:	Well 514382	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)	
5,342.0	8.30	281.70	5,341.4	3,995.4	-4.1	21.6	7.2	8.70	8.44	-17.81	
5,373.0	11.30	285.50	5,371.9	4,025.9	-2.8	16.4	5.2	9.89	9.68	12.26	
5,405.0	14.30	287.30	5,403.1	4,057.1	-0.8	9.6	2.2	9.46	9.38	5.63	
5,437.0	16.90	287.60	5,433.9	4,087.9	1.8	1.4	-1.6	8.13	8.13	0.94	
5,468.0	19.70	288.00	5,463.4	4,117.4	4.8	-7.8	-5.8	9.04	9.03	1.29	
5,500.0	22.70	288.60	5,493.2	4,147.2	8.4	-18.8	-11.0	9.40	9.38	1.88	
5,532.0	26.00	290.30	5,522.3	4,176.3	12.8	-31.3	-17.2	10.54	10.31	5.31	
5,563.0	28.80	290.70	5,549.9	4,203.9	17.8	-44.6	-24.1	9.05	9.03	1.29	
5,595.0	31.70	291.40	5,577.5	4,231.5	23.6	-59.7	-32.0	9.13	9.06	2.19	
5,627.0	34.80	290.50	5,604.3	4,258.3	29.9	-76.0	-40.5	9.81	9.69	-2.81	
5,658.0	37.50	290.10	5,629.3	4,283.3	36.2	-93.2	-49.3	8.74	8.71	-1.29	
5,722.0	42.10	291.00	5,678.4	4,332.4	50.6	-131.5	-69.1	7.24	7.19	1.41	
5,785.0	41.20	288.50	5,725.5	4,379.5	64.7	-170.9	-88.8	3.00	-1.43	-3.97	
5,848.0	43.70	290.70	5,772.0	4,426.0	79.0	-211.0	-108.7	4.61	3.97	3.49	
5,912.0	43.60	291.30	5,818.3	4,472.3	94.9	-252.2	-130.4	0.67	-0.16	0.94	
5,975.0	43.40	294.20	5,864.0	4,518.0	111.6	-292.2	-152.7	3.18	-0.32	4.60	
6,039.0	43.10	292.80	5,910.6	4,564.6	129.1	-332.4	-175.9	1.57	-0.47	-2.19	
6,102.0	44.00	293.10	5,956.3	4,610.3	146.0	-372.4	-198.4	1.47	1.43	0.48	
6,176.0	42.30	291.80	6,010.3	4,664.3	165.4	-419.1	-224.3	2.59	-2.30	-1.76	
6,239.0	43.40	292.10	6,056.5	4,710.5	181.4	-458.9	-245.9	1.78	1.75	0.48	
6,303.0	45.40	295.20	6,102.2	4,756.2	199.4	-499.9	-269.6	4.61	3.13	4.84	
6,366.0	44.70	294.10	6,146.7	4,800.7	218.0	-540.4	-293.9	1.66	-1.11	-1.75	
6,429.0	43.40	292.50	6,192.0	4,846.0	235.3	-580.6	-316.9	2.72	-2.06	-2.54	
6,492.0	43.00	293.10	6,237.9	4,891.9	252.0	-620.4	-339.2	0.91	-0.63	0.95	
6,556.0	41.60	294.50	6,285.3	4,939.3	269.4	-659.8	-362.0	2.64	-2.19	2.19	
6,619.0	42.60	293.40	6,332.0	4,986.0	286.5	-698.4	-384.6	1.97	1.59	-1.75	
6,683.0	44.30	292.80	6,378.5	5,032.5	303.8	-738.9	-407.5	2.73	2.66	-0.94	
6,746.0	43.20	291.00	6,424.0	5,078.0	320.0	-779.3	-429.5	2.64	-1.75	-2.86	
6,809.0	41.60	289.80	6,470.5	5,124.5	334.8	-819.1	-449.9	2.85	-2.54	-1.90	
6,873.0	42.80	292.00	6,517.9	5,171.9	350.2	-859.3	-470.9	2.97	1.88	3.44	
6,936.0	42.10	291.60	6,564.4	5,218.4	366.0	-898.7	-492.2	1.19	-1.11	-0.63	
6,968.0	39.50	287.40	6,588.6	5,242.6	373.0	-918.4	-502.0	11.81	-8.13	-13.13	
6,999.0	37.80	282.80	6,612.8	5,266.8	378.0	-937.1	-509.7	10.77	-5.48	-14.84	
7,031.0	36.30	278.50	6,638.4	5,292.4	381.6	-956.0	-516.0	9.35	-4.69	-13.44	
7,063.0	34.20	272.90	6,664.5	5,318.5	383.5	-974.4	-520.5	12.04	-6.56	-17.50	
7,094.0	34.40	269.20	6,690.1	5,344.1	383.8	-991.9	-523.3	6.76	0.65	-11.94	
7,126.0	32.80	263.30	6,716.8	5,370.8	382.6	-1,009.5	-524.8	11.36	-5.00	-18.44	
7,158.0	31.70	258.00	6,743.9	5,397.9	379.9	-1,026.3	-524.5	9.48	-3.44	-16.56	
7,189.0	30.40	252.80	6,770.4	5,424.4	375.9	-1,041.8	-522.7	9.61	-4.19	-16.77	
7,221.0	29.10	246.70	6,798.2	5,452.2	370.4	-1,056.7	-519.5	10.29	-4.06	-19.06	
7,253.0	29.80	243.30	6,826.1	5,480.1	363.7	-1,070.9	-514.9	5.66	2.19	-10.63	
7,284.0	30.80	238.40	6,852.8	5,506.8	356.1	-1,084.6	-509.4	8.60	3.23	-15.81	





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Survey											
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7,316.0	31.80	232.80	6,880.2	5,534.2	346.7	-1,098.3	-502.1	9.61	3.13	-17.50	
7,348.0	32.10	225.00	6,907.4	5,561.4	335.6	-1,111.0	-492.9	12.93	0.94	-24.38	
7,379.0	32.30	217.10	6,933.6	5,587.6	323.2	-1,121.8	-482.2	13.59	0.65	-25.48	
7,411.0	32.90	210.90	6,960.6	5,614.6	308.9	-1,131.5	-469.4	10.60	1.88	-19.38	
7,443.0	33.50	202.90	6,987.4	5,641.4	293.3	-1,139.4	-455.1	13.81	1.88	-25.00	
7,474.0	35.50	196.20	7,012.9	5,666.9	276.8	-1,145.2	-439.6	13.83	6.45	-21.61	
7,506.0	37.90	193.00	7,038.6	5,692.6	258.3	-1,150.0	-422.0	9.59	7.50	-10.00	
7,538.0	40.60	189.00	7,063.3	5,717.3	238.4	-1,153.9	-402.9	11.56	8.44	-12.50	
7,569.0	42.40	186.00	7,086.6	5,740.6	218.0	-1,156.5	-383.2	8.65	5.81	-9.68	
7,601.0	45.90	181.70	7,109.5	5,763.5	195.8	-1,158.0	-361.4	14.39	10.94	-13.44	
7,633.0	48.00	179.40	7,131.4	5,785.4	172.4	-1,158.2	-338.3	8.40	6.56	-7.19	
7,665.0	50.70	177.10	7,152.2	5,806.2	148.2	-1,157.5	-314.2	10.05	8.44	-7.19	
7,696.0	53.10	175.90	7,171.3	5,825.3	123.8	-1,156.0	-289.9	8.32	7.74	-3.87	
7,728.0	56.60	174.40	7,189.8	5,843.8	97.8	-1,153.8	-263.7	11.59	10.94	-4.69	
7,760.0	59.10	173.20	7,206.8	5,860.8	70.8	-1,150.8	-236.7	8.43	7.81	-3.75	
7,791.0	60.80	171.40	7,222.3	5,876.3	44.2	-1,147.2	-209.8	7.44	5.48	-5.81	
7,823.0	63.40	170.50	7,237.3	5,891.3	16.3	-1,142.8	-181.6	8.50	8.13	-2.81	
7,855.0	65.80	169.10	7,251.0	5,905.0	-12.1	-1,137.7	-152.7	8.48	7.50	-4.38	
7,886.0	67.70	168.00	7,263.3	5,917.3	-40.1	-1,132.0	-124.2	6.94	6.13	-3.55	
7,918.0	67.90	167.00	7,275.3	5,929.3	-69.0	-1,125.6	-94.7	2.96	0.63	-3.13	
7,950.0	70.90	164.80	7,286.6	5,940.6	-98.0	-1,118.3	-64.9	11.37	9.38	-6.88	
7,981.0	73.40	163.20	7,296.1	5,950.1	-126.4	-1,110.1	-35.7	9.44	8.06	-5.16	
8,013.0	76.20	161.40	7,304.5	5,958.5	-155.8	-1,100.8	-5.2	10.30	8.75	-5.63	
8,045.0	78.70	159.20	7,311.4	5,965.4	-185.2	-1,090.2	25.4	10.30	7.81	-6.88	
8,076.0	81.90	157.00	7,316.7	5,970.7	-213.5	-1,078.8	55.1	12.47	10.32	-7.10	
8,108.0	84.30	154.10	7,320.5	5,974.5	-242.5	-1,065.7	85.6	11.71	7.50	-9.06	
8,140.0	85.10	154.10	7,323.5	5,977.5	-271.1	-1,051.8	116.0	2.50	2.50	0.00	
<b>514382 LP 120° VS</b>											
8,144.6	85.14	153.97	7,323.9	5,977.9	-275.2	-1,049.8	120.3	2.90	0.82	-2.79	
8,201.0	85.60	152.40	7,328.4	5,982.4	-325.4	-1,024.4	173.7	2.90	0.82	-2.79	
8,264.0	87.10	152.90	7,332.4	5,986.4	-381.3	-995.5	233.1	2.51	2.38	0.79	
8,360.0	90.10	152.20	7,334.8	5,988.8	-466.4	-951.3	323.8	3.21	3.13	-0.73	
<b>514382 Plat LP</b>											
8,394.9	90.85	152.31	7,334.5	5,988.5	-497.3	-935.0	356.7	2.17	2.14	0.32	
8,486.0	92.80	152.60	7,331.6	5,985.6	-578.0	-892.9	442.7	2.17	2.14	0.32	
8,613.0	92.50	152.20	7,325.7	5,979.7	-690.5	-834.2	562.4	0.39	-0.24	-0.31	
8,740.0	89.90	152.00	7,323.1	5,977.1	-802.7	-774.7	682.0	2.05	-2.05	-0.16	
8,866.0	88.50	153.80	7,324.8	5,978.8	-914.8	-717.4	801.3	1.81	-1.11	1.43	
8,993.0	89.80	154.20	7,326.7	5,980.7	-1,028.9	-661.7	922.3	1.07	1.02	0.31	
9,120.0	91.60	152.70	7,325.1	5,979.1	-1,142.5	-604.9	1,042.9	1.84	1.42	-1.18	
9,183.0	92.30	152.70	7,323.0	5,977.0	-1,198.5	-576.1	1,102.5	1.11	1.11	0.00	
9,246.0	91.60	152.50	7,320.9	5,974.9	-1,254.4	-547.1	1,162.0	1.16	-1.11	-0.32	
9,310.0	90.80	151.70	7,319.5	5,973.5	-1,310.9	-517.1	1,222.2	1.77	-1.25	-1.25	





Phoenix Technology Services  
Survey Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Site Wetzel County 514382
Company:	EQT Production - Marcellus	TVD Reference:	KB @ 1346 Dusst (Original Well)
Project:	Wetzel County, WV	MD Reference:	KB @ 1346 Dusst (Original Well)
Site:	Wetzel County 514382	North Reference:	Grid
Well:	Well 514382	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)
9,373.0	89.10	151.50	7,319.6	5,973.6	-1,366.3	-487.2	1,281.4	2.72	-2.70	-0.32
9,437.0	89.20	151.50	7,320.5	5,974.5	-1,422.6	-456.6	1,341.5	0.16	0.16	0.00
9,500.0	88.70	150.90	7,321.7	5,975.7	-1,477.8	-426.3	1,400.5	1.24	-0.79	-0.95
9,563.0	88.60	151.10	7,323.2	5,977.2	-1,532.9	-395.8	1,459.4	0.35	-0.16	0.32
9,627.0	88.70	151.90	7,324.7	5,978.7	-1,589.1	-365.2	1,519.5	1.26	0.16	1.25
9,690.0	89.00	151.90	7,325.9	5,979.9	-1,644.7	-335.6	1,578.7	0.48	0.48	0.00
9,753.0	88.90	151.70	7,327.1	5,981.1	-1,700.2	-305.8	1,638.0	0.35	-0.16	-0.32
9,817.0	89.00	151.60	7,328.3	5,982.3	-1,756.5	-275.4	1,698.1	0.22	0.16	-0.16
9,880.0	89.10	151.40	7,329.3	5,983.3	-1,811.8	-245.4	1,757.2	0.35	0.16	-0.32
9,944.0	88.40	148.30	7,330.7	5,984.7	-1,867.2	-213.2	1,816.6	4.96	-1.09	-4.84
10,007.0	89.60	148.30	7,331.8	5,985.8	-1,920.8	-180.1	1,874.4	1.90	1.90	0.00
10,070.0	91.30	149.40	7,331.3	5,985.3	-1,974.7	-147.5	1,932.5	3.21	2.70	1.75
10,134.0	91.50	149.00	7,329.7	5,983.7	-2,029.6	-114.8	1,991.6	0.70	0.31	-0.63
10,197.0	91.90	149.00	7,327.9	5,981.9	-2,083.6	-82.3	2,049.7	0.63	0.63	0.00
10,261.0	92.80	148.60	7,325.2	5,979.2	-2,138.3	-49.2	2,108.6	1.54	1.41	-0.63
10,324.0	91.60	149.60	7,322.8	5,976.8	-2,192.3	-16.9	2,166.8	2.48	-1.90	1.59
10,387.0	90.90	150.80	7,321.5	5,975.5	-2,247.0	14.4	2,225.4	2.20	-1.11	1.90
10,451.0	90.80	151.20	7,320.5	5,974.5	-2,302.9	45.4	2,285.3	0.64	-0.16	0.63
10,514.0	89.20	152.00	7,320.5	5,974.5	-2,358.3	75.4	2,344.4	2.84	-2.54	1.27
10,577.0	88.80	153.20	7,321.6	5,975.6	-2,414.3	104.4	2,404.0	2.01	-0.63	1.90
10,640.0	86.90	154.20	7,324.0	5,978.0	-2,470.7	132.3	2,463.8	3.41	-3.02	1.59
10,703.0	86.60	154.10	7,327.5	5,981.5	-2,527.3	159.7	2,523.8	0.50	-0.48	-0.16
10,767.0	86.50	154.10	7,331.4	5,985.4	-2,584.8	187.6	2,584.7	0.16	-0.16	0.00
10,830.0	86.90	154.10	7,335.0	5,989.0	-2,641.4	215.1	2,644.7	0.63	0.63	0.00
10,893.0	88.60	154.90	7,337.5	5,991.5	-2,698.2	242.2	2,704.8	2.98	2.70	1.27
10,957.0	89.10	155.40	7,338.8	5,992.8	-2,756.2	269.1	2,766.2	1.10	0.78	0.78
11,020.0	88.20	154.10	7,340.3	5,994.3	-2,813.2	295.9	2,826.4	2.51	-1.43	-2.06
11,083.0	87.90	153.40	7,342.4	5,996.4	-2,869.7	323.8	2,886.3	1.21	-0.48	-1.11
11,147.0	88.20	154.80	7,344.6	5,998.6	-2,927.2	351.7	2,947.3	2.24	0.47	2.19
11,210.0	88.30	154.90	7,346.5	6,000.5	-2,984.2	378.5	3,007.6	0.22	0.16	0.16
11,273.0	87.70	154.50	7,348.7	6,002.7	-3,041.1	405.4	3,067.8	1.14	-0.95	-0.63
<b>Final Survey MD=11285'</b>										
11,285.0	87.60	155.00	7,349.2	6,003.2	-3,052.0	410.5	3,079.3	4.25	-0.83	4.17
<b>Projection to Bit MD=11345' - 514382 TD2</b>										
11,345.0	87.60	155.00	7,351.7	6,005.7	-3,106.3	435.8	3,136.7	0.00	0.00	0.00

Measured Depth (')	Vertical Depth (')	Local Coordinates		Comment
		+N/-S (')	+E/-W (')	
5,107.0				Gyro Tie In MD=5107'
11,285.0	7,349.2	-3,052.0	410.5	Final Survey MD=11285'
11,345.0	7,351.7	-3,106.3	435.8	Projection to Bit MD=11345'



Phoenix Technology Services  
Survey Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Site Wetzel County 514382
Company:	EQT Production - Marcellus	TVD Reference:	KB @ 1346 0usft (Original Well)
Project:	Wetzel County, WV	MD Reference:	KB @ 1346 0usft (Original Well)
Site:	Wetzel County 514382	North Reference:	Gnd
Well:	Well 514382	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	As Drilled Surveys		

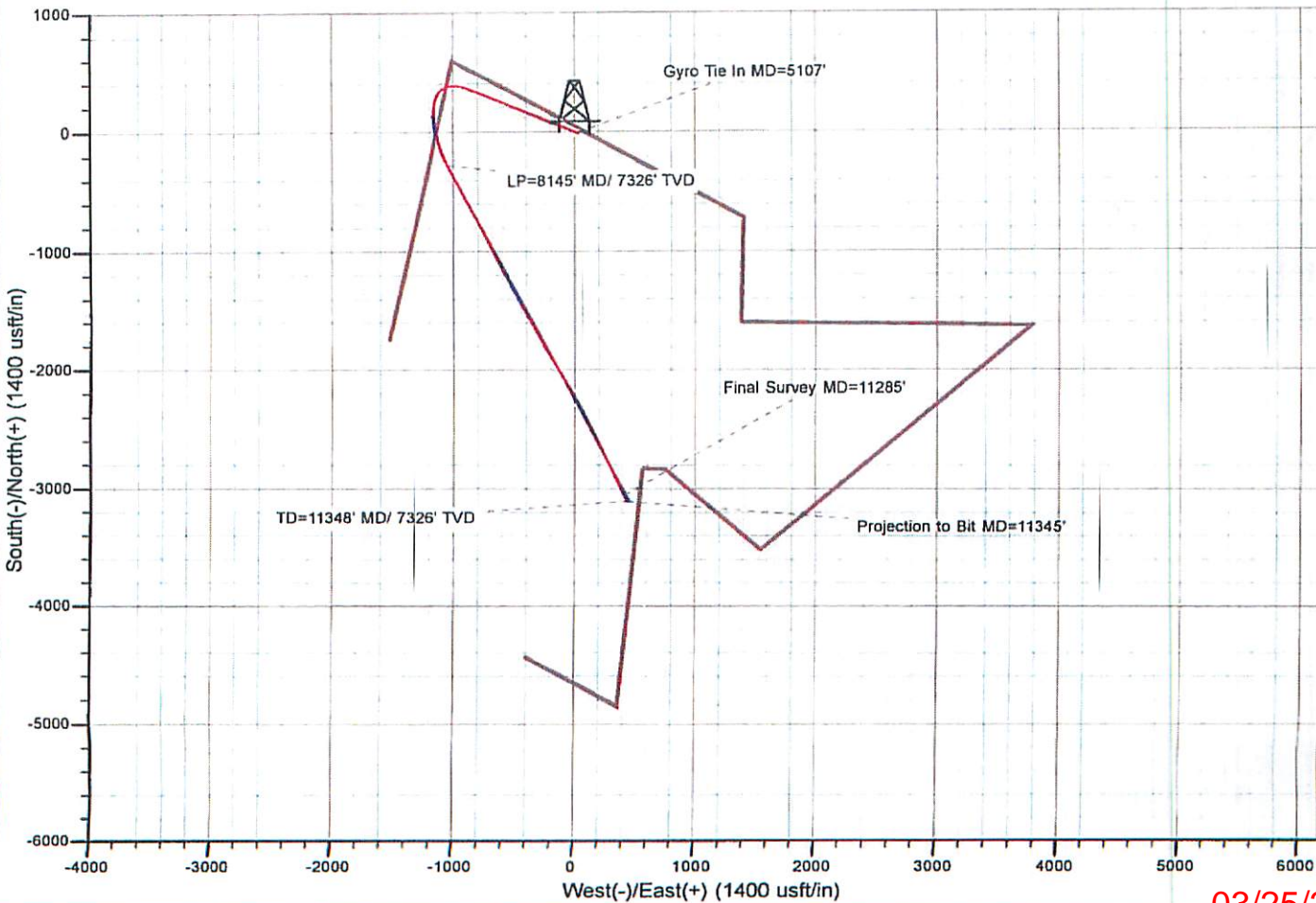
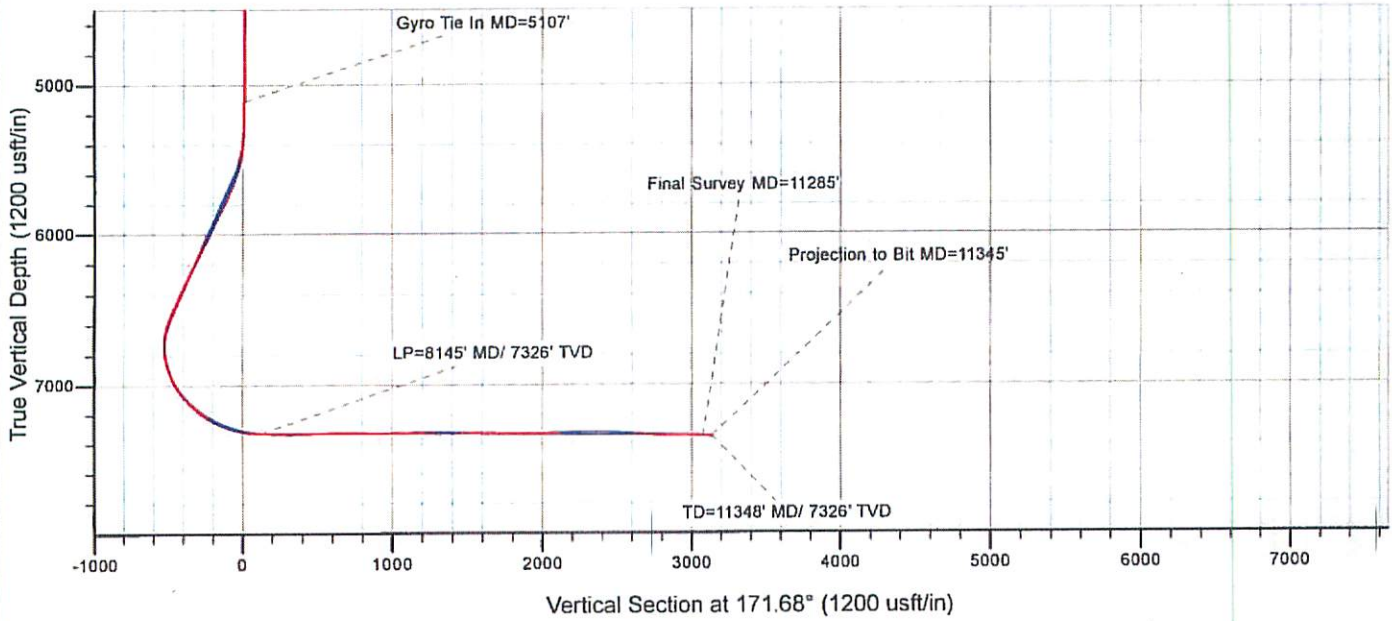
Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_





# EQT Production - Marcellus

Project: Wetzel County, WV  
 Site: Wetzel County 514382  
 Well: Well 514382  
 Wellbore: Main Wellbore  
 Design: As Drilled Surveys





**514382 - 47-103-02869-0000 - 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>	10/4/2014	11,317.00	11,319.00	10	MARCELLUS
<b>1</b>	10/4/2014	11,136.00	11,271.00	32	MARCELLUS
<b>2</b>	10/4/2014	10,912.00	11,092.00	40	MARCELLUS
<b>3</b>	10/5/2014	10,687.00	10,867.00	40	MARCELLUS
<b>4</b>	10/5/2014	10,462.00	10,642.00	40	MARCELLUS
<b>5</b>	10/5/2014	10,237.00	10,417.00	40	MARCELLUS
<b>6</b>	10/5/2014	10,014.00	10,192.00	40	MARCELLUS
<b>7</b>	10/6/2014	9,787.00	9,967.00	40	MARCELLUS
<b>8</b>	10/6/2014	9,562.00	9,742.00	40	MARCELLUS
<b>9</b>	10/6/2014	9,337.00	9,517.00	40	MARCELLUS
<b>10</b>	10/7/2014	9,112.00	9,292.00	40	MARCELLUS
<b>11</b>	10/7/2014	8,887.00	9,067.00	40	MARCELLUS
<b>12</b>	10/7/2014	8,662.00	8,842.00	40	MARCELLUS
<b>13</b>	10/7/2014	8,437.00	8,617.00	40	MARCELLUS
<b>14</b>	10/7/2014	8,212.00	8,392.00	40	MARCELLUS
<b>15</b>	10/8/2014	7,984.00	8,168.00	40	MARCELLUS

**514382 - 47-103-02869-0000 - 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>
Initiation Sleeve	10/4/2014	12.00	7,682.00	NA	4,236	0	1,216	0
1	10/4/2014	98.30	8,057.00	8,470.00	5,120	298,358	7,750	0
2	10/5/2014	96.50	7,960.00	8,282.00	5,145	301,120	10,855	0
3	10/5/2014	97.20	8,383.00	8,751.00	5,131	301,880	7,805	0
4	10/5/2014	95.20	8,217.00	8,550.00	5,928	288,797	7,472	0
5	10/6/2014	100.20	8,034.00	8,221.00	5,102	304,627	7,805	0
6	10/6/2014	98.20	7,972.00	8,238.00	4,563	303,945	7,696	0
7	10/6/2014	98.30	8,290.00	8,894.00	4,467	262,975	7,145	0
8	10/6/2014	98.50	8,028.00	8,575.00	4,465	303,095	7,454	0
9	10/6/2014	97.80	7,924.00	8,742.00	5,278	307,715	7,785	0
10	10/7/2014	99.70	7,893.00	8,786.00	5,394	302,611	7,836	0
11	10/7/2014	100.10	7,690.00	8,449.00	4,722	308,503	7,662	0
12	10/7/2014	100.20	7,677.00	8,584.00	4,679	304,958	7,635	0
13	10/7/2014	98.10	7,940.00	8,514.00	5,242	304,292	7,715	0
14	10/8/2014	99.20	7,533.00	7,826.00	4,840	303,262	8,473	0
15	10/8/2014	100.10	7,178.00	8,224.00	7,688	250,962	6,417	0

# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	10/4/2014
Job End Date:	10/8/2014
State:	West Virginia
County:	Wetzel
API Number:	47-103-02869-00-00
Operator Name:	EQT Production
Well Name and Number:	PNG129 - 514382
Longitude:	-80.64071400
Latitude:	39.55194400
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	7,352
Total Base Water Volume (gal):	5,101,110
Total Base Non Water Volume:	217,910



## 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	90.22729	
Sand	FTSI	Proppant	Crystalline Silica	14808-60-7	100.00000	9.44289	
Hydrochloric Acid 15%	FTSI	Acidizing	Hydrochloric Acid	7647-01-0	15.00000	0.02923	
FRW-600	FTSI	Friction Reducer	Hydrotreated light distillate	64742-47-8	30.00000	0.02325	
			Ammonium acetate	631-61-8	6.00000	0.00465	
B-10	FTSI	Buffer Agent	Potassium carbonate	584-08-7	48.00000	0.00605	
			Potassium hydroxide	1310-58-3	20.00000	0.00252	
HVG-1	FTSI	Gel	Petroleum Distillate	64742-47-8	55.00000	0.00402	
			Guar Gum	9000-30-0	50.00000	0.00366	
			Clay	14808-60-7	2.00000	0.00015	
			Surfactant	68439-51-0	2.00000	0.00015	
CI-3240	FTSI	Biocide					



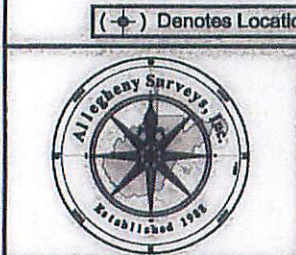
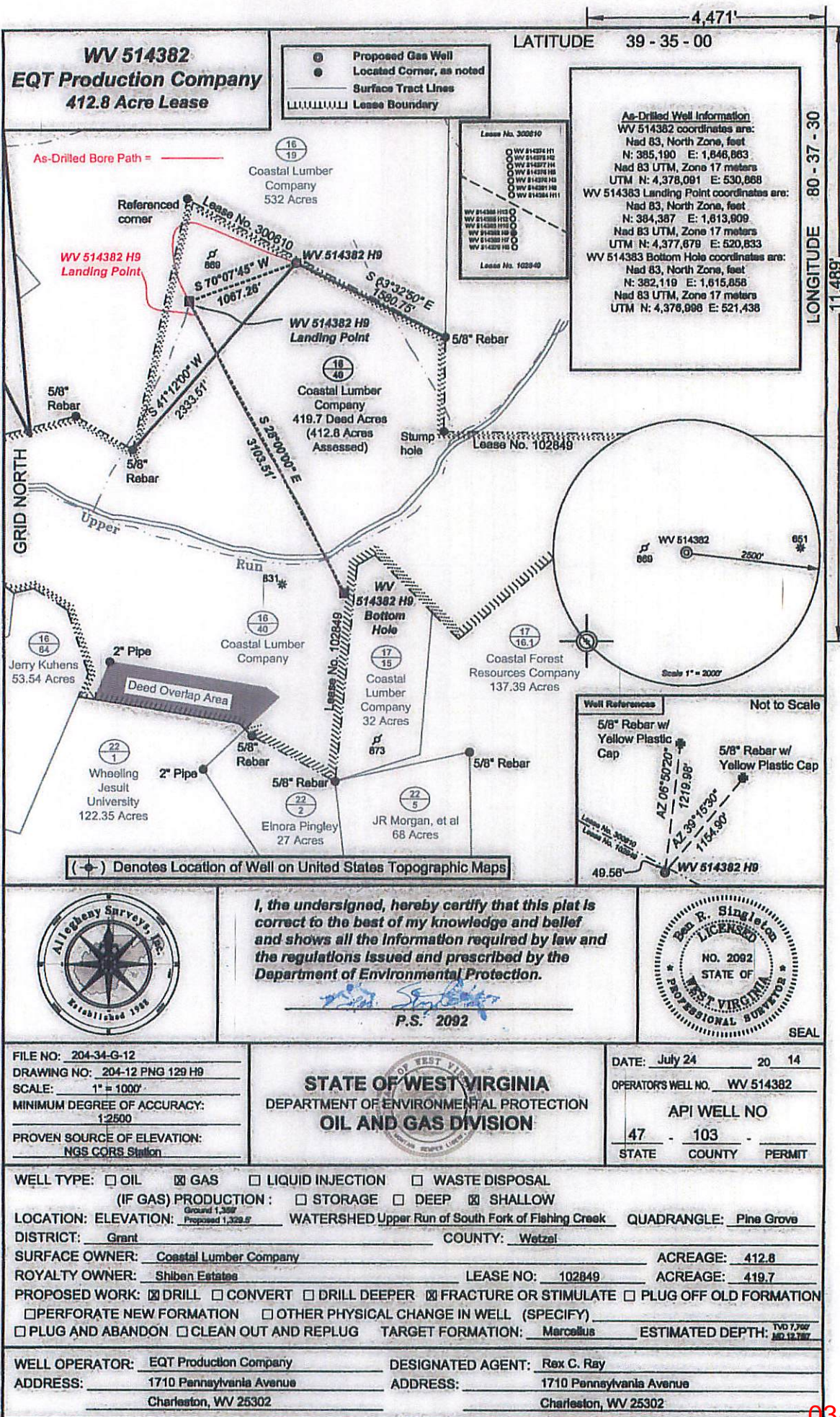
			Dazomet (Tetrahydro-3, 5-dimethyl-2H-1, 3, 5-thiadiazine-2-thione	533-74-4	24.00000	0.00247
			Sodium Hydroxide	1310-73-2	4.00000	0.00041
CS-500-SI	FTSI	Scale Inhibitor				
			Ethylene Glycol	107-21-1	10.00000	0.00252
CIO2	Neptune	Biocide				
			Chlorine Dioxide	10049-04-4	100.00000	0.00060
FE-100L	FTSI	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
			Quaternary ammonium compound	Proprietary	10.00000	0.00003
			Aromatic aldehyde	Proprietary	10.00000	0.00003
APB-1	FTSI	Gel Breaker				
			Ammonium Persulfate	7727-54-0	95.00000	0.00008
NE-100	FTSI	Non-Emulsifier				
			2-Butoxyethanol	111-76-2	10.00000	0.00003
			2-Propanol	67-63-0	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 H9  
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: July 24, 2014  
OPERATOR'S WELL NO. WV 514382  
API WELL NO. 47-103-  
STATE COUNTY PERMIT

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

LOCATION: ELEVATION: Ground 1,399 Proposed 1,329.9 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: TVD 7,767 MD 19,787

WELL OPERATOR: EQT Production Company DESIGNATED AGENT: Rex C. Ray  
ADDRESS: 1710 Pennsylvania Avenue ADDRESS: 1710 Pennsylvania Avenue  
Charleston, WV 25302 Charleston, WV 25302

03/25/2016