

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

API 47-103-02727 County Wetzel District Grant  
Quad Big Run Pad Name Big 190 Field/Pool Name \_\_\_\_\_  
Farm name Coastal Forest Resources Co. Well Number 513504  
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 4,378,165.74 Easting 533,886.49  
Landing Point of Curve Northing 4,378,001.40 Easting 533,948.49  
Bottom Hole Northing 4,375,908.87 Easting 534,475.74

Elevation (ft) 1472 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 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 3/12/2012 & 7/20/2015 Date drilling commenced 10/16/2013 Date drilling ceased 10/27/2015  
Date completion activities began 5/11/2016 Date completion activities ceased 5/20/2016  
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 662', 667', 734' Open mine(s) (Y/N) depths N  
Salt water depth(s) ft N/A Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 411', 417', 1166', 1174', 1208', 1212' Cavern(s) encountered (Y/N) depths N

Is coal being mined  Yes  No

**APPROVED**

NAME: Derek M. Haight

DATE: 9-23-16

Office of Oil and Gas  
Reviewed by:

AUG 16 2016

**10/28/2016**

WV Department of Environmental Protection  
Office of Oil and Gas

API 47-103 02727

Farm name Coastal Forest Resources Co. Well number 513504

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	30"	26"	40'	NEW	A-500	N/A	Y
Surface	17 1/2"	13 3/8"	838'	NEW	J-55	105' & 146'	Y
Coal							
Intermediate 1	12 3/8"	9 5/8"	2737'	NEW	A-500	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8 1/2"	5 1/2"	15433'	NEW	P-110	N/A	Y
Tubing							
Packer type and depth set							

Comment Details \_\_\_\_\_

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	57.8	0	8
Surface	CLASS A	790	15.6	1.19	940.1	0	8
Coal							
Intermediate 1	CLASS A	1075	15.6	1.18	1268.5	0	8
Intermediate 2							
Intermediate 3							
Production	50:50 Poz Mix / Class H	630 / 1035	15.2 / 15.6	1.07 / 1.84	2578.5	4284	8
Tubing							

Drillers TD (ft) <sup>15445'</sup> \_\_\_\_\_ Loggers TD (ft) <sup>15422'</sup> \_\_\_\_\_

Deepest formation penetrated MARCELLUS Plug back to (ft) \_\_\_\_\_

Plug back procedure \_\_\_\_\_

Kick off depth (ft) <sup>5866'</sup> \_\_\_\_\_

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: 6 CENTRALIZERS 1 EVERY 150'  
INTERMEDIATE: 16 CENTRALIZERS 1 EVERY 150'  
PRODUCTION: 130 Centralizers 1 every joint from 15408' - 5775' then 1 every 1000' from 5775' to 2516'

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 - 02727 Farm name Coastal Forest Resources Co. Well number 513504

Drilling Contractor Pioneer Drilling Services (Rig 72)  
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 Hoss Co. Services LLC  
Address 614 Trotters Lane City Charleston State WV Zip 25312

Cementing Company C&J  
Address 2504 Smith Creek Road City Waynesburg State PA Zip 15370

**513504 Final Formations API #47-103-02727**

Formation Name	Final Top MD (ftGL) (ft)	Final Top TVD (ft)	Final Btm MD (ftGL) (ft)	Final Btm TVD (ft)
SAND/SHALE	1	1	411	411
MAPLETOWN COAL	411	411	417	417
SAND/SHALE	417	417	1208	1208
COAL	1166	1166	1174	1174
SAND/SHALE	1174	1174	2272	2272
PITTSBURGH COAL	1208	1208	1213	1213
SAND/SHALE	1213	1213	1166	1166
MAXTON	2272	2272	2428	2428
BIG LIME	2428	2428	2557	2557
BIG INJUN	2557	2557	2834	2834
WEIR	2834	2834	3001	3001
GANTZ	3001	3001	3036	3036
50F	3036	3036	3265	3265
GORDON	3265	3265	3507	3507
BAYARD	3507	3507	3889	3889
WARREN	3889	3889	4087	4087
SPEECHLEY	4087	4087	4457	4457
BALLTOWN A	4457	4457	4915	4915
RILEY	4915	4915	5558	5558
BENSON	5558	5558	5923	5923
ALEXANDER	5923	5923	5972	5971
ELKS	5972	5971	7234	7130
SONYEA	7234	7130	7394	7272
MIDDLESEX	7394	7272	7461	7325
GENESEE	7461	7325	7569	7400
GENESEO	7569	7400	7623	7432
TULLY	7623	7432	7657	7451
HAMILTON	7657	7451	7952	7547
MARCELLUS	7952	7547		

**513504 47-103-02727-0000 - Perforations**

Stage Number	Perforation Date	Top Perf Depth (ftKB)	Bottom Perf Depth (ftKB)	Number of Shots	Formation
Initiation Sleeve	3/24/2016	15,432	15,433	10	MARCELLUS
1	5/11/2016	15,280	15,372	32	MARCELLUS
2	5/12/2016	15,130	15,252	40	MARCELLUS
3	5/12/2016	14,980	15,102	40	MARCELLUS
4	5/12/2016	14,830	14,952	40	MARCELLUS
5	5/12/2016	14,680	14,800	40	MARCELLUS
6	5/13/2016	14,530	14,652	40	MARCELLUS
7	5/13/2016	14,380	14,502	40	MARCELLUS
8	5/13/2016	14,230	14,352	40	MARCELLUS
9	5/13/2016	14,080	14,198	40	MARCELLUS
10	5/13/2016	13,930	14,052	40	MARCELLUS
11	5/14/2016	13,780	13,902	40	MARCELLUS
12	5/14/2016	13,630	13,752	40	MARCELLUS
13	5/14/2016	13,480	13,602	40	MARCELLUS
14	5/14/2016	13,330	13,452	40	MARCELLUS
15	5/14/2016	13,180	13,302	40	MARCELLUS
16	5/15/2016	13,030	13,152	40	MARCELLUS
17	5/15/2016	12,880	13,002	40	MARCELLUS
18	5/15/2016	12,730	12,852	40	MARCELLUS
19	5/15/2016	12,580	12,702	40	MARCELLUS
20	5/15/2016	12,430	12,552	40	MARCELLUS
21	5/15/2016	12,280	12,402	40	MARCELLUS
22	5/16/2016	12,130	12,252	40	MARCELLUS
23	5/16/2016	11,980	12,102	40	MARCELLUS
24	5/16/2016	11,830	11,952	40	MARCELLUS
25	5/16/2016	11,680	11,800	40	MARCELLUS
26	5/16/2016	11,530	11,652	40	MARCELLUS
27	5/16/2016	11,380	11,502	40	MARCELLUS
28	5/17/2016	11,230	11,352	40	MARCELLUS
29	5/17/2016	11,080	11,202	40	MARCELLUS
30	5/17/2016	10,930	11,052	40	MARCELLUS
31	5/17/2016	10,780	10,902	40	MARCELLUS
32	5/17/2016	10,630	10,752	40	MARCELLUS
33	5/17/2016	10,480	10,602	40	MARCELLUS
34	5/18/2016	10,330	10,452	40	MARCELLUS
35	5/18/2016	10,180	10,302	40	MARCELLUS
36	5/18/2016	10,030	10,152	40	MARCELLUS
37	5/18/2016	9,880	10,002	40	MARCELLUS
38	5/18/2016	9,730	9,852	40	MARCELLUS
39	5/18/2016	9,580	9,702	40	MARCELLUS
40	5/19/2016	9,430	9,552	40	MARCELLUS
41	5/19/2016	9,280	9,402	40	MARCELLUS
42	5/19/2016	9,130	9,252	40	MARCELLUS
43	5/19/2016	8,980	9,102	40	MARCELLUS
44	5/19/2016	8,830	8,952	40	MARCELLUS
45	5/19/2016	8,680	8,800	40	MARCELLUS
46	5/19/2016	8,530	8,652	40	MARCELLUS
47	5/19/2016	8,380	8,502	40	MARCELLUS
48	5/20/2016	8,230	8,352	40	MARCELLUS
49	5/20/2016	8,080	8,202	40	MARCELLUS

10/28/2016

**513504 47-103-02727-0000 - Stimulated Stages**

Stage Number	Stimulation Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbbls)	Amount of Nitrogen/other (units)
Initiation Sleeve	5/11/2016	15.6	7,997	8,580	5,284	0	797	0
1	5/12/2016	86.6	8,679	8,849	4,133	254,940.00	8,064	0
2	5/12/2016	97.2	9,016	9,176	4,682	247,020.00	6,538	0
3	5/12/2016	96.3	9,160	9,293	4,731	248,580.00	6,224	0
4	5/12/2016	92.8	8,989	9,106	4,657	250,630.00	6,082	0
5	5/12/2016	93.6	8,944	9,103	4,619	249,360.00	6,188	0
6	5/13/2016	89.1	8,912	9,001	4,870	246,920.00	7,304	0
7	5/13/2016	93	9,013	9,208	4,835	250,320.00	6,115	0
8	5/13/2016	95.7	9,024	9,215	4,646	254,700.00	6,273	0
9	5/13/2016	93.9	8,688	9,305	4,869	252,880.00	6,896	0
10	5/13/2016	95.2	9,004	9,144	4,417	250,080.00	6,485	0
11	5/14/2016	94.7	8,932	9,055	5,206	254,000.00	6,463	0
12	5/14/2016	90.6	9,053	9,244	4,975	247,300.00	6,123	0
13	5/14/2016	94.6	9,029	9,212	4,745	250,800.00	6,624	0
14	5/14/2016	97.2	8,948	9,158	4,634	251,860.00	6,079	0
15	5/14/2016	98.4	8,942	9,119	4,835	255,140.00	6,042	0
16	5/15/2016	96.2	8,838	9,049	4,629	253,600.00	6,582	0
17	5/15/2016	94.7	9,023	9,241	4,602	253,940.00	6,065	0
18	5/15/2016	96.8	9,054	9,217	4,818	253,940.00	5,973	0
19	5/15/2016	95.2	9,056	9,242	4,796	255,680.00	5,908	0
20	5/15/2016	100.1	8,832	9,080	4,664	252,480.00	6,514	0
21	5/15/2016	97.1	8,870	8,982	4,452	253,400.00	6,316	0
22	5/16/2016	99.1	8,989	9,110	4,831	253,340.00	6,366	0
23	5/16/2016	97	9,044	9,222	4,931	249,420.00	5,789	0
24	5/16/2016	96.8	8,991	9,257	4,925	252,040.00	5,814	0
25	5/16/2016	98.9	9,052	9,209	5,119	254,320.00	5,846	0
26	5/16/2016	98.2	8,960	9,138	4,789	252,440.00	6,265	0
27	5/16/2016	98.8	8,961	9,135	4,796	253,020.00	6,276	0
28	5/17/2016	98.2	9,020	9,139	5,017	249,500.00	6,261	0
29	5/17/2016	100.5	9,075	9,250	5,090	248,520.00	6,028	0
30	5/17/2016	100.2	9,010	9,160	5,149	251,460.00	5,734	0
31	5/17/2016	99.8	8,907	9,150	5,302	253,840.00	5,852	0
32	5/17/2016	100.2	8,727	9,153	5,518	252,880.00	7,223	0
33	5/17/2016	100.7	8,486	8,677	4,829	253,400.00	5,911	0
34	5/18/2016	100.3	8,634	8,849	4,836	251,780.00	5,869	0
35	5/18/2016	101.03	8,487	8,626	5,037	249,220.00	6,130	0
36	5/18/2016	100.47	8,924	9,226	5,607	251,680.00	6,141	0
37	5/18/2016	100.56	8,946	9,097	5,067	253,100.00	6,133	0
38	5/18/2016	100.4	8,819	9,054	4,723	249,250.00	5,796	0
39	5/18/2016	100.1	8,908	9,006	5,045	250,770.00	5,879	0
40	5/19/2016	100.1	8,769	9,074	4,705	251,900.00	5,740	0
41	5/19/2016	97.1	8,897	9,051	4,878	251,500.00	5,668	0
42	5/19/2016	100.28	8,756	9,084	5,002	251,460.00	6,163	0
43	5/19/2016	99.31	8,777	9,186	4,750	252,400.00	5,967	0
44	5/19/2016	100.33	8,787	9,179	4,884	249,120.00	5,967	0
45	5/19/2016	101.5	8,725	8,950	4,854	247,520.00	5,760	0
46	5/19/2016	101.2	8,720	8,917	5,212	253,130.00	5,742	0
47	5/20/2016	101.3	8,598	8,935	5,082	252,070.00	5,735	0
48	5/20/2016	101.9	8,450	8,647	4,855	251,960.00	5,776	0
49	5/20/2016	101.47	8,141	9,024	4,781	249,440.00	6,020	0



# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date	5/11/2016
Job End Date	5/20/2016
State	West Virginia
County	Wayne
API Number	47-103-02727-00-00
Operator Name	EQT Production
Well Name and Number	513504
Latitude	39.55242000
Longitude	-80.60576000
Datum	NAD83
Federal Well	NO
Indian Well	NO
True Vertical Depth	7,547
Total Base Water Volume (gall)	12,747,252
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	89.23412	None
Sand (Proppant)	Keane Group	Proppant	Silica Substrate	14808-60-7	100.00000	10.34147	None
MC MX 5-3886	Multi-Chem	Specialty Brine	Calcium nitrate.4H2O	13477-34-4	100.00000	0.10503	None
FFR760	Keane Group	Friction Reducer	Hydrotreated Light Distillate	64742-47-8	30.00000	0.02291	None
			Alkyl Alcohol	Proprietary	10.00000	0.00764	None
			Oxyalkylated alcohol A	Proprietary	5.00000	0.00382	None
Hydrochloric Acid (15%)	Keane Group	Acidizing	Hydrochloric Acid	7647-01-0	15.00000	0.03063	None
MC MX 8-2544	Multi-Chem	Live Culture - Nitrate Reducing Bacteria	Sodium chloride	7647-14-5	100.00000	0.00921	None
			Sodium nitrate	7631-99-4	5.00000	0.00046	None
EG6330A	Keane Group	Scale Inhibitor	Ethylene Glycol	107-21-1	5.00000	0.00149	None



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AI 600	Keane Group	Corrosion Inhibitor	Sodium Phosphate, Tribasic	7601-54-9	5.00000	0.00145	None
			Ethylene Glycol	107-21-1	40.00000	0.00020	None
			Dimethylformamide	88-12-2	20.00000	0.00010	None
			Cinnamialdehyde	104-55-2	15.00000	0.00008	None
			Nonyl Phenol Ethoxylate, Branched	127087-87-0	15.00000	0.00008	None
			Pyridine, alkyl derives, quaternized with benzyl chloride	88909-18-2	15.00000	0.00008	None
			2-Butoxyethanol	111-76-2	5.00000	0.00003	None
			1-Octanol	111-87-5	5.00000	0.00003	None
			1-Decanol	112-30-1	5.00000	0.00003	None
			Methanol	67-56-1	2.50000	0.00001	None
			Triethyl Phosphate	78-40-0	2.50000	0.00001	None
			Alkyl Pyridine	88391-11-7	1.00000	0.00001	None

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

\* Total Water Volume sources may include fresh water, produced water, and/or recycled water  
 \*\* Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.  
 Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

