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

API 47-091-01265 County Taylor District Fetterman
Quad Gladesville 7.5' Pad Name OES Field/Pool Name Unknown
Farm name Orthodox Educational Society Well Number 2HM
Operator (as registered with the OOG) PDC Mountaineer, LLC
Address 120 Genesis Blvd. City Bridgeport State WV Zip 26330

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4365712.644047 Easting 588794.789265
Landing Point of Curve Northing 4365788.770999 Easting 588453.752729
Bottom Hole Northing 4363933.601592 Easting 589089.558480

Elevation (ft) 1945 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 Frac Fluid
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)
Surface: Air with soap & treated water as needed.

Bottom Hole: Synthetic based mud averaging 12+ ppg & 47 Vis.

Date permit issued 06/18/2012 Date drilling commenced 08/06/2013 Date drilling ceased 08/29/2013
Date completion activities began 10/23/2013 Date completion activities ceased 11/03/2013
Verbal plugging (Y/N) N Date permission granted ----- Granted by -----

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft Est: 245' Open mine(s) (Y/N) depths N
Salt water depth(s) ft Est: 910' Void(s) encountered (Y/N) depths N
Coal depth(s) ft Est: 273', 326', 414', & 468' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

RECEIVED
Office of Oil & Gas

Reviewed by: _____

MAR 24 2014

API 47- 091 - 01265 Farm name Orthodox Educational Society Well number 2HM

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"	20"	105'	New	H-40 / 94#	None	N/A
Surface	17 1/2"	13 3/8"	636'	New	J-55 / 54.5#	63' & 103'	*No
Coal							
Intermediate 1	12 1/4"	9 5/8"	2533'	New	J-55 / 40#	197'	Yes
Intermediate 2							
Intermediate 3							
Production	8 1/2"	5 1/2"	15,120'	New	P-110 / 20#	None	Yes
Tubing							
Packer type and depth set							

Comment Details *13 3/8": Did not circulate cml. Ran Temp log per Inspector and cml top at 150'. Wait 12 hrs and cement via top job thru 1" with 140 sx Class A + 2% CaCl. Circulated cement to surface.

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	N/A						
Surface	Class A	620	15.6	1.18	731	150'	32
Coal	Surface Top Job	140 Class A	15.6	1.18	47	Surface	14.5
Intermediate 1	Class A	881	15.6	1.18	1040	Surface	30
Intermediate 2							
Intermediate 3							
Production	L: Class A / T: Type 1	L: 1273sx / T: 2283 sx	Both: 14.5	Both: 1.18	4196	Surface	N/A
Tubing							

Drillers TD (ft) 15,135' Loggers TD (ft) 15,135'
 Deepest formation penetrated Marcellus Shale Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) Nudge & control surface, begin kick off at 4300'

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 _____

13 3/8" Surface String: Ran a total of 5 centralizers every 1-2 joints starting at Joint #2. Ran 2 baskets at Joints #14 & #18 (103' & 63' from surface).
9 5/8" Intermediate String: Ran a total of 8 centralizers every 220 feet starting at Joint #1. Ran at basket at Joint 53 (depth from surface was 197')
5 1/2" Production String: Cintek centralizers on the first 170 joints (to a depth of 7663' below surface). Bow Spring centralizers every 4 joints after that into surface casing at 2412' depth, total of 29.

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 _____

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PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
1	10/10/13	14886	15046	50	Marcellus
2	10/13/13	14684	14846	50	Marcellus
3	10/14/13	14486	14646	50	Marcellus
4	10/15/13	14286	14446	50	Marcellus
5	10/16/13	14086	14246	50	Marcellus
6	10/16/13	13890	14046	50	Marcellus
7	10/17/13	13686	13850	50	Marcellus
8	10/17/13	13485	13646	50	Marcellus
9	10/18/13	13286	13446	50	Marcellus
10	10/23/13	13084	13246	50	Marcellus
11	10/24/13	12886	13046	50	Marcellus
12	10/24/13	12686	12846	50	Marcellus
13	10/25/13	12486	12646	50	Marcellus
14	10/25/13	12286	12446	50	Marcellus
15	10/26/13	12086	12246	50	Marcellus
16	10/26/13	11886	12046	50	Marcellus

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbbls)	Amount of Nitrogen/other (units)
1	10/13/13	68	8005	8860	4838	283937	5809	NA
2	10/14/13	65	8557	9098	7265	291585	5511	NA
3	10/14/13	66	8019	9034	6999	291051	5516	NA
4	10/15/13	69	8278	8814	6587	292683	6220	NA
5	10/16/13	67	8222	9068	4973	288984	5346	NA
6	10/17/13	72	7757	8749	5771	292488	5473	NA
7	10/17/13	66	7843	8907	5620	234754	4933	NA
8	10/18/13	71	7746	9079	6105	289769	5415	NA
9	10/19/13	64	8056	9709	5008	256043	5714	NA
10	10/24/13	66	7693	9312	6353	294595	5380	NA
11	10/24/13	67	7424	8084	6170	290448	5280	NA
12	10/25/13	70	7322	8343	5998	293066	5332	NA
13	10/25/13	73	7550	8588	5853	290717	5268	NA
14	10/25/13	72	7695	9055	6086	283319	5219	NA
15	10/26/13	69	7468	8463	6084	294225	5308	NA
16	10/27/13	72	7524	8851	6309	291404	5218	NA

Please insert additional pages as applicable.

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PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
17	10/27/13	11683	11846	50	Marcellus
18	10/27/13	11486	11646	50	Marcellus
19	10/28/13	11286	11446	50	Marcellus
20	10/28/13	11086	11244	50	Marcellus
21	10/29/13	10886	11046	50	Marcellus
22	10/29/13	10686	10846	50	Marcellus
23	10/31/13	10486	10646	50	Marcellus
24	11/01/13	10286	10441	50	Marcellus
25	11/01/13	10086	10246	50	Marcellus
26	11/02/13	9886	10049	50	Marcellus
27	11/02/13	9686	9846	50	Marcellus
28	11/02/13	9486	9646	50	Marcellus
29	11/03/13	9286	9441	50	Marcellus
30	11/03/13	9090	9246	50	Marcellus
31	11/03/13	8886	9046	50	Marcellus
32	11/03/13	8686	8846	50	Marcellus

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbbls)	Amount of Nitrogen/other (units)
17	10/27/13	75	7384	8311	6397	297654	5998	NA
18	10/28/13	77	7681	8393	6232	291929	5318	NA
19	10/28/13	74	7798	8773	6759	289345	6076	NA
20	10/29/13	80	7655	8075	6166	293919	5223	NA
21	10/29/13	76	7681	8816	6024	284556	5965	NA
22	10/29/13	76	7904	9622	6921	292020	6128	NA
23	11/01/13	8	7937	9406	5871	2740	2635	NA
24	11/01/13	83	7874	8343	5684	425286	7399	NA
25	11/02/13	77	7524	7913	6477	301659	5214	NA
26	11/02/13	78	7682	8719	6172	307843	5915	NA
27	11/02/13	77	7256	8429	6049	299617	5096	NA
28	11/03/13	76	7312	8116	6155	304278	5236	NA
29	11/03/13	75	7549	8173	6143	305798	6140	NA
30	11/03/13	76	7542	8502	6601	303960	5396	NA
31	11/03/13	77	7561	9086	6550	295652	5092	NA
32	11/03/13	77	7141	8122	6100	311593	5248	NA

Please insert additional pages as applicable.

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<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
Marcellus Shale	7718' - 8058' TVD	8263' - 15,135' MD

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump
 SHUT-IN PRESSURE Surface N/T psi Bottom Hole N/T psi DURATION OF TEST N/T hrs
 OPEN FLOW Gas 9,097 mcfpd Oil ----- bpd NGL ----- bpd Water 862 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		
Little Lime	1050	1063	1050	1063	Due to air/fluid rotary drilling, fresh water, salt water, & coal are estimated from surrounding wells and reported on page 1.
Big Lime	1085	1308	1085	1308	
Pocono	1320	1412	1320	1412	
Berea	1440	1482	1440	1482	
Gantz	1608	1621	1609	1622	
50 Foot	1645	1690	1646	1691	
30 Foot	1695	1705	1696	1706	
4th Sand	2127	2172	2128	2173	
5th Sand	2265	2300	2266	2301	
Sycamore	6750	6756	7090	7096	
Tully	7437	7520	7868	7965	
Hamilton	7520	7718	7965	8263	
Marcellus	7718	8058	8263	15,135'	Continuous shows of gas while drilling

Please insert additional pages as applicable.

Drilling Contractor Pioneer Energy Services
 Address 1083 N Eighty-Eight Rd City Rices Landing State PA Zip 15357

Logging Company Phoenix Technology Services USA Inc
 Address Foster Plaza 5, Ste. 300, 651 Holiday Drive City Pittsburgh State PA Zip 15220

Cementing Company Baker Hughes
 Address Rt. 2, Box 506, 837 Philippi Pike City Clarksburg State WV Zip 26301

Stimulating Company Baker Hughes
 Address Rt. 2, Box 506, 837 Philippi Pike City Clarksburg State WV Zip 26301

Please insert additional pages as applicable.

Completed by Bob Williamson Telephone 304-808-6296
 Signature [Signature] Title Sr Geologist Date 03/21/2014

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

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	10/13/2013
Job End Date:	11/3/2013
State:	West Virginia
County:	Taylor
API Number:	47-091-01265-00-00
Operator Name:	PDC Energy
Well Name and Number:	OES 2HM
Longitude:	-79.96820200
Latitude:	39.43638700
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	8,000
Total Base Water Volume (gal):	7,619,640
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	PDC	Base Fluid	Water	NA	100.00000	86.83059	None
Sand (Proppant)	Baker Hughes	Proppant	Silica Substrate	NA	100.00000	12.51801	None
Hydrochloric Acid (15%)	Baker Hughes	Acidizing	Hydrochloric Acid	7647-01-0	15.00000	0.06960	None
MaxPerm 20A	Baker Hughes	Friction Reducer	Aliphatic hydrocarbon	Proprietary	30.00000	0.03589	None
			Oxyalkylated alcohol	Proprietary	5.00000	0.00598	None
GasFlo G	Baker Hughes	Surfactant	Methanol	67-56-1	30.00000	0.01216	None
SCW5279	Baker Hughes	Scale Inhibitor	Ethylene glycol	107-21-1	60.00000	0.00875	None
Sodium Hypochlorite 12%	Baker Hughes	Biocide	Sodium chloride	7647-14-5	30.00000	0.00116	None
			Sodium hypochlorite	7681-52-9	30.00000	0.00116	None
Ferrotrol 300L	Baker Hughes	Iron Control	Citric Acid	77-92-9	60.00000	0.00181	None

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GBW 5	Baker Hughes	Frac gel breaker					
			Ammonium persulphate	7727-54-0	100.00000	0.00149	None
Sodium Chlorite	Dupont	Biocide					
			Sodium chlorite	7758-19-2	31.00000	0.00111	None
CI-14	Baker Hughes	Corrosion Inhibitor					
			Methanol	67-56-1	100.00000	0.00070	None
			Polyoxyalkylenes	Proprietary	30.00000	0.00021	None
			Fatty acids	Proprietary	10.00000	0.00007	None
			Propargyl alcohol	107-19-7	5.00000	0.00004	None
			Olefin	Proprietary	5.00000	0.00004	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)

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