

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

API 47 - 033 - 05741 County Harrison District Union  
Quad Mount Clare 7.5 Pad Name Maxwell Field/Pool Name \_\_\_\_\_  
Farm name Lynch Farm, LLC Well Number 3HM  
Operator (as registered with the OOG) PDC Mountaineer, LLC  
Address 6031 Wallace Road Extension, Suite 300 City Wexford State PA Zip 15090

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 4,341,883 Easting 554,653  
Landing Point of Curve Northing 4,341,938 Easting 554,298  
Bottom Hole Northing 4,343,443 Easting 553,722

Elevation (ft) 1462' 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)  
Synthetic Oil-based Mud

Date permit issued 7/9/2013 Date drilling commenced 11/1/2014 Date drilling ceased 11/23/2014  
Date completion activities began 1/18/2015 Date completion activities ceased 2/7/2015  
Verbal plugging (Y/N) \_\_\_\_\_ Date permission granted \_\_\_\_\_ Granted by \_\_\_\_\_

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

Freshwater depth(s) ft 429' Open mine(s) (Y/N) depths N  
Salt water depth(s) ft 628', 1261' Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 361', 540' Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) Y

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Reviewed by:  
[Signature]  
10/30/2015  
10/15/15

API 47-033 - 05741 Farm name Lynch Farm, LLC Well number 3HM

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	36"	20"	65'	New	94.00	N/A	Y
Surface	17.5"	13 3/8"	660'	New	54.50	N/A	Y
Coal							
Intermediate 1	12 1/4"	9 5/8"	2926'	New	40.00	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8 3/4" & 8 1/2"	5 1/2"	13439'	New	20.00	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	Grout						
Surface	Class A 2% CaCl <sub>2</sub>	525	15.6	1.18	620	Surface	8
Coal							
Intermediate 1	Class A	1050	15.6	1.18	1239	Surface	8
Intermediate 2							
Intermediate 3							
Production	Type 1 4% Gel/Type 1 2% Gel	591/1468	13.8/15.0	1.64/1.32	969/1938	2700'	8
Tubing							

Drillers TD (ft) 13450' Loggers TD (ft) 13450'

Deepest formation penetrated Marcellus Plug back to (ft) 5900'

Plug back procedure Cement kick off plug (17.0#/gal, 1.04ft<sup>3</sup>/sk) after pilot hole was drilled. Set through 2 7/8" tubing. Plug used to assist with kicking off wellbore to drill curve.

Kick off depth (ft) 6152' MD

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": 1 bow spring centralizer placed on every joint  
 9 5/8": 1 bow spring centralizer placed on every third joint  
 5 1/2": 1 rigid poly centralizer every joint in the lateral, 1 rigid poly centralizer every other joint through the curve, 1 rigid poly centralizer every third joint from kick off point to estimated TOC

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WAS WELL COMPLETED AS SHOT HOLE  Yes  No DETAILS 1,000 shots of 22.7gr 0.56" Titan Charges

WAS WELL COMPLETED OPEN HOLE?  Yes  No DETAILS

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WERE TRACERS USED  Yes  No TYPE OF TRACER(S) USED

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Well number 3HM

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
1	1/17/15	13130	13297	40	Marcellus
2	1/19/15	12932	13090	40	Marcellus
3	1/23/15	12736	12894	40	Marcellus
4	1/23/15	12540	12698	40	Marcellus
5	1/25/15	12344	12502	40	Marcellus
6	1/26/15	12148	12306	40	Marcellus
7	1/26/15	11952	12110	40	Marcellus
8	1/26/15	11756	11914	40	Marcellus
9	1/27/15	11560	11718	40	Marcellus
10	1/28/15	11364	11522	40	Marcellus
11	1/30/15	11168	11326	40	Marcellus
12	1/31/15	10972	11130	40	Marcellus
13	2/1/15	10776	10934	40	Marcellus
14	2/2/15	10580	10738	40	Marcellus
15	2/2/15	10384	10542	40	Marcellus
16	2/3/15	10188	10346	40	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 (bbls)	Amount of Nitrogen/other (units)
1	1/18/15	73	7877	9538	4300	244480	6015	0
2	1/19/15	79	8096	6924	6044	381700	7641	0
3	1/23/15	58	7883	6870	5178	385660	7574	0
4	1/24/15	68	7882	6512	5668	380920	7234	0
5	1/25/15	75	7205	6266	5665	400410	6815	0
6	1/26/15	78	7547	5862	5465	386370	6704	0
7	1/26/15	81	7367	5804	5436	397360	6609	0
8	1/26/15	80	7292	6033	5779	406000	6760	0
9	1/27/15	81	7419	6387	5236	396360	6709	0
10	1/28/15	80	7428	6452	6087	393700	6979	0
11	1/31/15	79	7514	6416	6208	370720	7081	0
12	1/31/15	79	7530	6090	6316	396220	7967	0
13	2/1/15	68	7624	6183	5640	319820	6755	0
14	2/2/15	75	7259	7221	6616	371520	7202	0
15	2/2/15	71	7002	6137	5744	399780	7057	0
16	2/3/15	70	6950	6158	5422	407190	7069	0

Please insert additional pages as applicable.

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Well number 3HM

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
17	2/3/15	9992	10150	40	Marcellus
18	2/4/15	9796	9954	40	Marcellus
19	2/4/15	9600	9758	40	Marcellus
20	2/5/15	9404	9562	40	Marcellus
21	2/5/15	9208	9366	40	Marcellus
22	2/6/15	9012	9170	40	Marcellus
23	2/7/15	8816	8974	40	Marcellus
24	2/7/15	8620	8778	40	Marcellus
25	2/7/15	8424	8582	40	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 (bbls)	Amount of Nitrogen/other (units)
17	2/3/15	78	7425	6005	6026	403346	7137	0
18	2/4/15	77	7402	6294	5314	404340	7192	0
19	2/4/15	78	7362	6230	5761	401760	7110	0
20	2/5/15	79	6950	7210	4849	396910	6852	0
21	2/6/15	81	7003	5769	6359	398240	6744	0
22	2/6/15	80	6932	6276	5293	394960	6649	0
23	2/7/15	80	7032	6959	6119	395120	6730	0
24	2/7/15	79	6921	7249	5697	393890	6429	0
25	2/7/15	72	6748	6845	6219	358750	5777	0

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PRODUCING FORMATION(S)	DEPTHS	TVD	MD
Marcellus			

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump  
 SHUT-IN PRESSURE Surface \_\_\_\_\_ psi Bottom Hole \_\_\_\_\_ psi DURATION OF TEST \_\_\_\_\_ hrs  
 OPEN FLOW Gas \_\_\_\_\_ mcfpd Oil \_\_\_\_\_ bpd NGL \_\_\_\_\_ bpd Water \_\_\_\_\_ 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)
Sands, Silts, Coals	0	1817	0	1820	Sand, Silt, and Coal
Big Lime	1817	1876	1820	1879	Sandstone
Balltown	3599	3641	3608	3650	Sandstone
Bradford	4332	4361	4341	4371	Sandstone
Benson	4906	4973	4915	4982	Sandstone
Elk	5190	5248	5199	5257	Siltstone
Burkett	7237	7260	7247	7270	Shale- Gas show at 7238'
Tully	7260	7314	7270	7324	Limestone
Mahantango	7314	7449	7324	7458	Shale- Gas show at 7419'
Marcellus	7449	7548	7458	13450	Shale- Gas shows through lateral
Purcell	7511	7514	7521	7524	Limestone
Onondaga	7548	7563	7558	7573	Limestone
Huntersville Chert	7563		7573		Chert
					**Top based off Maxwell 3HM Pilot Hole Tops

Please insert additional pages as applicable.

Drilling Contractor Sidewinder Drilling  
 Address 952 Echo Land, Suite 460 City Houston State TX Zip 77024

Logging Company Baker Hughes  
 Address 2929 Allen Parkway, Suite 2100 City Houston State TX Zip 77019

Cementing Company Universal Well Services  
 Address \_\_\_\_\_ City Buckhannon State WV Zip 26201

Stimulating Company \_\_\_\_\_  
 Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Please insert additional pages as applicable.

Completed by Amy Miller Telephone 724-940-1202  
 Signature Amy Miller Title Regulatory Compliance Specialist Date 9-16-2015

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

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### Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	1/18/2015
Job End Date:	2/7/2015
State:	West Virginia
County:	Harrison
API Number:	47-033-05741-00-00
Operator Name:	Mountaineer Keystone, LLC
Well Name and Number:	Maxwell 3H
Longitude:	-80.36682800
Latitude:	39.22424700
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	7,476
Total Base Water Volume (gal):	7,414,894
Total Base Non Water Volume:	510,584



#### 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	Mountaineer Keystone	Base Fluid					
			Water	7732-18-5	100.00000	85.88303	
Sand	J.S. Well Services, LLC	Proppant					
			Crystalline Silica, quartz	14808-60-7	100.00000	13.31228	
HCL Acid (3% to 7.5%)	J.S. Well Services, LLC	Bulk Acid					
			Water	7732-18-5	97.00000	0.53874	
			Hydrogen Chloride	7647-01-0	7.50000	0.04837	
WFRA-405	J.S. Well Services, LLC	Friction Reducer					
			Anionic Polyacrylamide	Proprietary	40.00000	0.03874	
			Water	7732-18-5	40.00000	0.03874	
			Sodium Chloride	7647-14-5	20.00000	0.01937	
			Petroleum Distillates	64742-47-8	20.00000	0.01559	
			Ethoxylated alcohol blend	Proprietary	5.00000	0.00484	
HCL Acid (12.6%-18.0%)	J.S. Well Services, LLC	Bulk Acid					
			Water	7732-18-5	87.50000	0.05062	
			Hydrogen Chloride	7647-01-0	18.00000	0.01209	
SI-1100	J.S. Well Services, LLC	Scale Inhibitor					

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			Di Water	7732-18-5	80.00000	0.01020
			Ethylene Glycol	107-21-1	40.00000	0.00576
			Potassium salt of diethylene triamine penta (methylene phosphonic acid)	15827-60-8	10.00000	0.00172
			2-Phosphonobutane 1,2,4 tricarboxylic salt	37971-36-1	10.00000	0.00165
			hexamethylenediamine tetra (methylene phosphonic acid)	38820-59-6	10.00000	0.00159
			Copolymer of Maleic and Acrylic acid	26677-99-6	10.00000	0.00150
			bis (hexamethylene) tramine penta (methylene phosphonic acid) - phosphate acid	40623-75-4	10.00000	0.00147
			Acrylic polymer	52255-49-9	5.00000	0.00064
K-BAC 1020	J.S. Well Services, LLC	Anti-Bacterial Agent				
			2,2-dibromo-3- nitriopropionamide	10222-01-2	20.00000	0.00793
			Deionized Water	7732-18-5	28.00000	0.00453
AI-301	J.S. Well Services, LLC	Acid Corrosion Inhibitors				
			Diethylene Glycol	111-46-6	30.00000	0.00023
			Methenamine	100-97-0	20.00000	0.00018
			Hydrogen Chloride	7647-01-0	10.00000	0.00008
			Polyethylene polyamine	68603-67-8	10.00000	0.00007
			Coco amine	31791-14-8	5.00000	0.00003

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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# MAXWELL LEASE WELL NO. 3HM

LONGITUDE 80°20'00"

### 3HM WELL TIES

LINE	BEARING	DISTANCE
L1	N 02°08'46" W	4232.05'
L2	N 14°45'23" E	2524.34'



WELL NO. 3HM TOP HOLE	
STATE PLANE COORDINATES (NORTH ZONE NAD '27)	
N. 265,036	E. 1,754,372
TOP HOLE (NAD '27)	
LAT=(N) 39°13'27.9"	LONG=(W) 80°22'01.3"
TOP HOLE (NAD '83)	
LAT=(N) 39°13'28.3"	LONG=(W) 80°22'00.6"
TOP HOLE UTM (NAD '83)	
(N) 4,341,883	(E) 554,653
WELL NO. 3HM LANDING POINT	
STATE PLANE COORDINATES (NORTH ZONE NAD '27)	
N. 265,236	E. 1,753,210
LANDING POINT (NAD '27)	
LAT=(N) 39°13'29.9"	LONG=(W) 80°22'16.1"
LANDING POINT (NAD '83)	
LAT=(N) 39°13'30.1"	LONG=(W) 80°22'15.4"
LANDING POINT UTM (NAD '83)	
(N) 4,341,938	(E) 554,298
WELL NO. 3HM BOTTOM HOLE	
STATE PLANE COORDINATES (NORTH ZONE NAD '27)	
N. 270,207	E. 1,751,400
BOTTOM HOLE (NAD '27)	
LAT=(N) 39°14'18.8"	LONG=(W) 80°22'39.7"
BOTTOM HOLE (NAD '83)	
LAT=(N) 39°14'19.1"	LONG=(W) 80°22'39.0"
BOTTOM HOLE UTM (NAD '83)	
(N) 4,343,443	(E) 553,722

### NOTES ON SURVEY

- TIES TO WELLS, REFERENCES, AND CORNERS ARE BASED ON GRID NORTH FOR THE WV STATE PLANE COORDINATE SYSTEM NORTH ZONE NAD '27.
- LEASE BOUNDARY SHOWN HEREON TAKEN FROM DEED BOOK 142 PAGE 484 AND ADJOINING DEEDS.
- SURFACE OWNER AND ADJOINER INFORMATION TAKEN FROM THE ASSESSOR AND COUNTY CLERK RECORDS OF HARRISON COUNTY IN JULY, 2012.
- WELL LAT./LONG. (NAD'27) ESTABLISHED BY DGPS(SURVEY GRADE).
- AS DRILLED INFORMATION PROVIDED BY PDC MOUNTAINEER, LLC.

### LEGEND

AS DRILLED ——  
PROPOSED ----

### AS DRILLED COORDINATES FOR WELL NO. 3HM

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)

NAD'27 S.P.C.(FT)	N. 265,036	E. 1,754,372
NAD'27 GEO.	LAT=(N) 39°13'27.9"	LONG=(W) 80°22'01.3"
NAD'83 GEO.	LAT=(N) 39°13'28.3"	LONG=(W) 80°22'00.6"
NAD'83 UTM (M)	N. 4,341,883	E. 554,653
BOTTOM HOLE		
NAD'27 S.P.C.(FT)	N. 270,174	E. 1,751,335
NAD'27 GEO.	LAT=(N) 39°14'18.4"	LONG=(W) 80°22'40.5"
NAD'83 GEO.	LAT=(N) 39°14'18.8"	LONG=(W) 80°22'39.9"
NAD'83 UTM (M)	N. 4,343,433	E. 553,702



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 DIVISION OF ENVIRONMENTAL PROTECTION.

P.S. 677 *Gregory A. Smith*



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.  
 DATE APRIL 3, 20 13  
 REVISED DATE 09/03/13 & 06/10/15  
 OPERATORS WELL NO. MAXWELL 3HM  
 API WELL NO. 47 - 033 - 05741H  
 STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1/200 FILE NO. 8450P3HMASDRILLED  
 PROVEN SOURCE OF ELEVATION DGPS (SUBMETER MAPPING GRADE) SCALE 1" = 2,000'

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

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

LOCATION: ELEVATION 1,457' WATERSHED WEST FORK RIVER  
 DISTRICT UNION COUNTY HARRISON QUADRANGLE MOUNT CLARE 7.5'  
 SURFACE OWNER LYNCH FARM, LLC ACREAGE 37.5±  
 ROYALTY OWNER WBM PROPERTIES LLC, ET AL ACREAGE 748, 42, 44.21, 73.5, 73.75, 44.21  
 PROPOSED WORK: DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  PERFORATE NEW FORMATION  PLUG AND ABANDON  CLEAN OUT AND REPLUG  OTHER   
 PHYSICAL CHANGE IN WELL (SPECIFY) \_\_\_\_\_ TARGET FORMATION MARCELLUS  
 ESTIMATED DEPTH 7,590' TVD / TMD 13,695'

WELL OPERATOR PDC MOUNTAINEER, LLC DESIGNATED AGENT NATHAN SKEEN  
 ADDRESS 6031 WALLACE ROAD EXTENSION, SUITE 300 WEXFORD, PA 15090 ADDRESS 65 PROFESSIONAL PLACE, SUITE 200 BRIDGEPORT, WV 26330

COUNTY NAME PERMIT