

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

API 47-033-05743 County Harrison District Union
Quad Mount Clare 7.5 Pad Name Maxwell Field/Pool Name _____
Farm name Lynch Farm, LLC Well Number 5HM
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 4,341,882 Easting 554,662
Landing Point of Curve Northing 4,342,156 Easting 554,867
Bottom Hole Northing 4,344,193 Easting 554,087

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 12/3/2014 Date drilling ceased 12/3/2014
Date completion activities began 1/17/2015 Date completion activities ceased 2/7/2015
Verbal plugging (Y/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 302', 369', 396', 429' Open mine(s) (Y/N) depths _____
Salt water depth(s) ft 628', 1261' Void(s) encountered (Y/N) depths _____
Coal depth(s) ft 361', 540' Cavern(s) encountered (Y/N) depths _____
Is coal being mined in area (Y/N) Y

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Reviewed by:
JR
JK 10/30/2015

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Well number 5HM

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"	24"	65'	New	94.00	N/A	Y
Surface	17.5"	13 3/8"	519'	New	54.50	N/A	Y
Coal							
Intermediate 1	12 1/4"	9 5/8"	2840'	New	40.00	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8 3/4" & 8 1/2"	5 1/2"	14938'	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 ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	Grout						
Surface	Class A 2% CaCl ₂	415	15.60	1.20	498	Surface	8
Coal							
Intermediate 1	Gas Block 2% CaCl ₂	603/172	14.50/15.70	1.55/1.29	934.65/221.88	Surface	8
Intermediate 2							
Intermediate 3							
Production	Type 1 4% Gel/Type 1 2% Gel	728/1548	13.8/15.00	1.64/1.32	1193/2043	2700	8
Tubing							

Drillers TD (ft) 14938' MD

Loggers TD (ft) 14938' MD

Deepest formation penetrated Marcellus

Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 7019' 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

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS 1,360 shots of 22.7gr 0.56" diameter

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	1/18/15	14639	14805	40	Marcellus
2	1/18/15	14449	14599	40	Marcellus
3	1/19/15	14261	14411	40	Marcellus
4	1/19/15	14073	14223	40	Marcellus
5	1/20/15	13885	14035	40	Marcellus
6	1/20/15	13697	13847	40	Marcellus
7	1/21/15	13509	13659	40	Marcellus
8	1/21/15	13321	13471	40	Marcellus
9	1/22/15	12918	13080	40	Marcellus
10	1/22/15	12718	12880	40	Marcellus
11	1/23/15	12518	12680	40	Marcellus
12	1/24/15	12318	12480	40	Marcellus
13	1/24/15	12118	12280	40	Marcellus
14	1/25/15	11918	12080	40	Marcellus
15	1/25/15	11718	11880	40	Marcellus
16	1/26/15	11518	11680	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	53	8904	9645	4487	184920	5953	0
2	1/18/15	54	8760	7345	4957	193100	5197	0
3	1/19/15	50	7923	6148	5050	248740	8340	0
4	1/19/15	53	8212	6030	4531	392120	9456	0
5	1/20/15	69	7659	6151	4646	369390	8768	0
6	1/20/15	60	8417	5311	4917	397300	8661	0
7	1/21/15	54	7804	5450	5611	380020	7401	0
8	1/21/15	56	8262	5693	4467	383810	8175	0
9	1/22/15	56	8026	5558	4427	402269	8838	0
10	1/22/15	61	7585	5579	4864	400540	7713	0
11	1/23/15	68	8169	5633	4369	385660	9619	0
12	1/24/15	70	7740	5640	6856	381300	6771	0
13	1/24/15	73	7455	5661	5114	395760	6874	0
14	1/25/15	75	7345	5754	5350	398460	6852	0
15	1/25/15	79	7799	5690	6276	398100	6826	0
16	1/26/15	79	7346	5550	5357	400730	6728	0

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	1/26/15	11318	11480	40	Marcellus
18	1/27/15	11118	11280	40	Marcellus
19	1/27/15	10918	11080	40	Marcellus
20	1/30/15	10718	10880	40	Marcellus
21	1/31/15	10518	10680	40	Marcellus
22	2/1/15	10318	10480	40	Marcellus
23	2/1/15	10118	10280	40	Marcellus
24	2/2/15	9918	10080	40	Marcellus
25	2/2/15	9718	9880	40	Marcellus
26	2/3/15	9518	9680	40	Marcellus
27	2/4/15	9318	9480	40	Marcellus
28	2/4/15	9118	9280	40	Marcellus
29	2/4/15	8918	9080	40	Marcellus
30	2/5/15	8718	8880	40	Marcellus
31	2/6/15	8518	8680	40	Marcellus
32	2/6/15	8318	8480	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	1/26/15	80	7370	5597	5633	394400	6891	0
18	1/27/15	81	7394	5683	5314	410440	6854	0
19	1/27/15	79	7186	5575	4996	399640	6693	0
20	1/30/15	78	7349	5286	5382	316560	5926	0
21	1/31/15	77	7148	5990	5422	317180	6160	0
22	2/1/15	74	7579	5668	5175	366400	7142	0
23	2/2/15	76	7276	5933	5736	335380	6403	0
24	2/2/15	70	6697	5407	4528	404290	6738	0
25	2/3/15	70	7304	5761	5043	375780	8577	0
26	2/3/15	68	7178	5729	4385	404890	8845	0
27	2/4/15	72	7523	5801	6119	374900	6895	0
28	2/4/15	74	7419	5915	5867	404480	7094	0
29	2/5/15	72	7611	6008	6142	402640	8003	0
30	2/5/15	76	7038	5057	6155	394700	6976	0
31	2/6/15	79	6926	5565	5683	390980	6574	0
32	2/7/15	80	6936	5622	6337	403520	6455	0

Please insert additional pages as applicable.

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<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
	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 ₂ S, ETC)
Sands, Silts, and Coals	0	1817	0	1820	Sand, Silt, 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 7255
Tully	7260	7314	7270	7324	Limestone
Mahantango	7314	7449	7324	7458	Shale
Marcellus	7449	7548	7458	14938	Shale-Gas show 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 _____
 Address _____ City _____ State _____ Zip _____

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 L. Miller Telephone 724-940-1202
 Signature Amy L. 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:	1/17/2015
Job End Date:	2/7/2015
State:	West Virginia
County:	Harrison
API Number:	47-033-05743-00-00
Operator Name:	Mountaineer Keystone, LLC
Well Name and Number:	Maxwell 5H
Longitude:	-80.36702500
Latitude:	39.22442100
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	7,499
Total Base Water Volume (gal):	10,669,660
Total Base Non Water Volume:	674,875



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	86.91003	
Sand	J.S. Well Services, LLC	Proppant	Crystalline Silica, quartz	14808-60-7	100.00000	12.32159	
HCL Acid (3% to 7.5%)	J.S. Well Services, LLC	Bulk Acid	Water	7732-18-5	97.00000	0.52096	
			Hydrogen Chloride	7647-01-0	7.50000	0.04677	
WFRA-405	J.S. Well Services, LLC	Friction Reducer	Water	7732-18-5	40.00000	0.03930	
			Anionic Polyacrylamide	Proprietary	40.00000	0.03930	
			Sodium Chloride	7647-14-5	20.00000	0.01965	
			Petroleum Distillates	64742-47-8	20.00000	0.01582	
			Ethoxylated alcohol blend	Proprietary	5.00000	0.00491	
HCL Acid (12.6%-18.0%)	J.S. Well Services, LLC	Bulk Acid	Water	7732-18-5	87.50000	0.03560	
			Hydrogen Chloride	7647-01-0	18.00000	0.00850	
SI-1100	J.S. Well Services, LLC	Scale Inhibitor					

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			Di Water	7732-18-5	80.00000	0.01019
			Ethylene Glycol	107-21-1	40.00000	0.00575
			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	0.00164
			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	0.00146
			Acrylic polymer	52255-49-9	5.00000	0.00064
K-BAC 1020	J.S. Well Services, LLC	Anti-Bacterial Agent				
			2,2-dibromo-3-nitropropionamide	10222-01-2	20.00000	0.00797
			Deionized Water	7732-18-5	28.00000	0.00455
AI-301	J.S. Well Services, LLC	Acid Corrosion Inhibitors				
			Diethylene Glycol	111-46-6	30.00000	0.00021
			Methenamine	100-97-0	20.00000	0.00016
			Hydrogen Chloride	7647-01-0	10.00000	0.00007
			Polyethylene polyamine	68603-67-8	10.00000	0.00006
			Coco amine	51791-14-8	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)

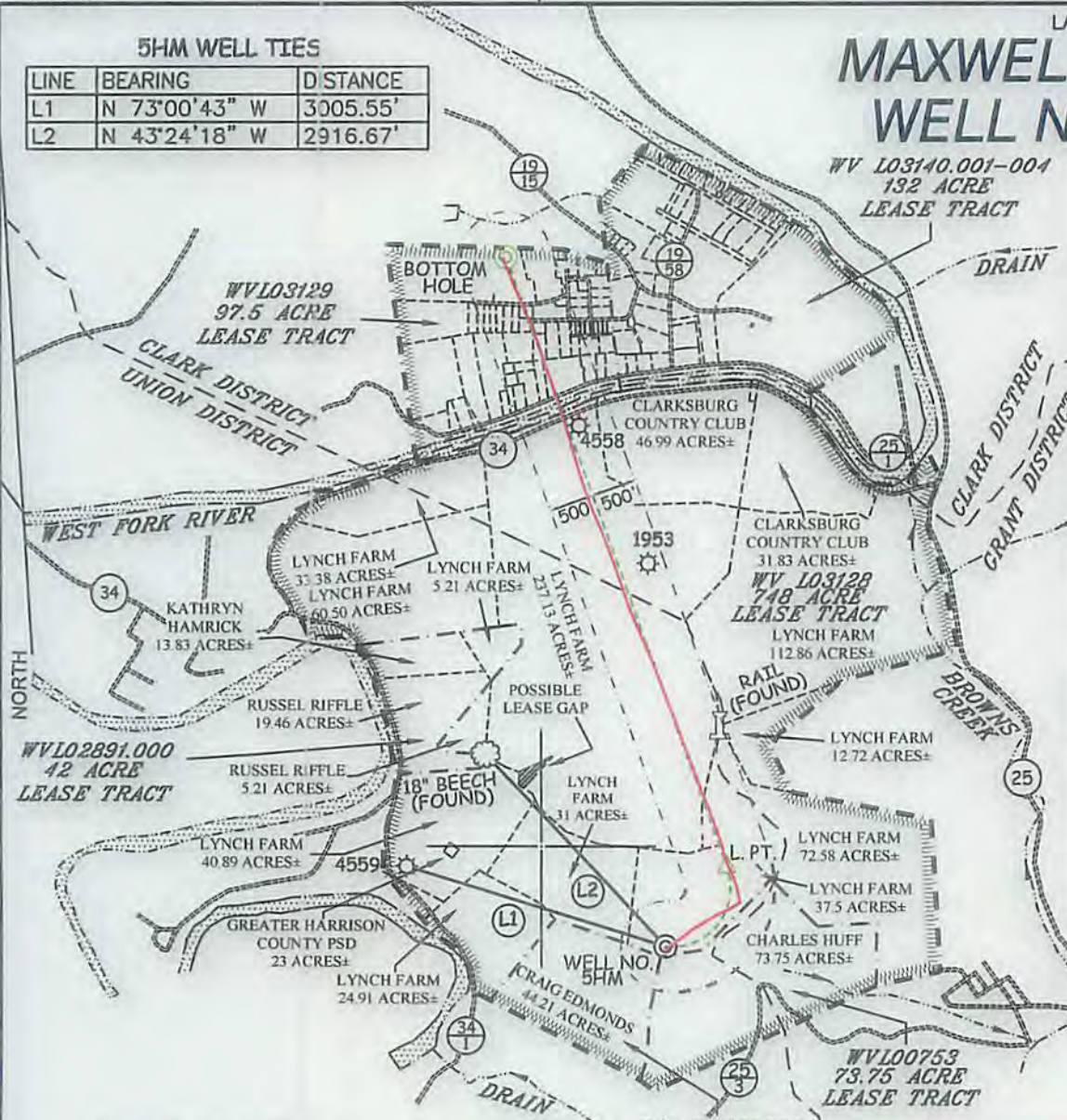
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MAXWELL LEASE WELL NO. 5HM

LONGITUDE 80°20'00"

LINE	BEARING	DISTANCE
L1	N 73°00'43" W	3005.55'
L2	N 43°24'18" W	2916.67'



WELL NO. 5HM TOP HOLE	
STATE PLANE COORDINATES (NORTH ZONE NAD 27)	
N. 265,034	E. 1,754,402
TOP HOLE (NAD 27)	
LAT=(N) 39°13'27.9"	LONG=(W) 80°22'00.9"
TOP HOLE (NAD 83)	
LAT=(N) 39°13'28.2"	LONG=(W) 80°22'00.2"
TOP HOLE UTM (NAD 83)	
(N) 4,341,882	(E) 554,662
WELL NO. 5HM LANDING POINT	
STATE PLANE COORDINATES (NORTH ZONE NAD 27)	
N. 265,920	E. 1,755,089
LANDING POINT (NAD 27)	
LAT=(N) 39°13'36.7"	LONG=(W) 80°21'52.3"
LANDING POINT (NAD 83)	
LAT=(N) 39°13'37.1"	LONG=(W) 80°21'51.6"
LANDING POINT UTM (NAD 83)	
(N) 4,342,156	(E) 554,867
WELL NO. 5HM BOTTOM HOLE	
STATE PLANE COORDINATES (NORTH ZONE NAD 27)	
N. 272,648	E. 1,752,640
BOTTOM HOLE (NAD 27)	
LAT=(N) 39°14'43.0"	LONG=(W) 80°22'24.2"
BOTTOM HOLE (NAD 83)	
LAT=(N) 39°14'43.3"	LONG=(W) 80°22'23.6"
BOTTOM HOLE UTM (NAD 83)	
(N) 4,344,193	(E) 554,087

NOTES ON SURVEY

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

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LEGEND

AS DRILLED	
PROPOSED	

AS DRILLED COORDINATES FOR WELL NO. 5HM

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

NAD'27 S.P.C.(FT)	N. 265,034	E. 1,754,402
NAD'27 GEO.	LAT=(N) 39°13'27.9"	LONG=(W) 80°22'00.9"
NAD'83 GEO.	LAT=(N) 39°13'28.2"	LONG=(W) 80°22'00.2"
NAD'83 UTM (M)	N. 4,341,882	E. 554,662
BOTTOM HOLE		
NAD'27 S.P.C.(FT)	N. 272,642	E. 1,752,599
NAD'27 GEO.	LAT=(N) 39°14'42.9"	LONG=(W) 80°22'24.8"
NAD'83 GEO.	LAT=(N) 39°14'43.3"	LONG=(W) 80°22'24.1"
NAD'83 UTM (M)	N. 4,344,191	E. 554,075



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, 2013
 REVISED DATE 09/03/13 & 06/10/15
 OPERATORS WELL NO. MAXWELL 5HM
 API WELL NO. 47 - 033 - 05743H
 STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1/200
 FILE NO. 8450P5HMASDRILLED
 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 HEIRS PROPERTIES, LLC ETAL ACREAGE 748, 42, 44.21, 73.75

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 15,481'

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

10/30/2015