



west virginia department of environmental protection

Office of Oil and Gas
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Charleston, WV 25304
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Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

January 3, 2017
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

SWN PRODUCTION COMPANY, LLC
POST OFFICE BOX 12359

SPRING, TX 773914954

Re: Permit Modification Approval for GLADYS BRIGGS MSH 210H
47-051-01885-00-00

Modified 9 5/8" to 36#

SWN PRODUCTION COMPANY, LLC

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

If there are any questions, please feel free to contact me at (304) 926- 0450.


James A. Martin
Chief

Operator's Well Number: GLADYS BRIGGS MSH 210H
Farm Name: RIGGS, GLADYS R.
U.S. WELL NUMBER: 47-051-01885-00-00
Horizontal 6A / New Drill
Date Issued: January 3, 2017

Promoting a healthy environment.

01/06/2017

WW-6B
(10/14)

API NO. 47-~~69~~ - 01885 MOP
OPERATOR WELL NO. Gladys Briggs MSH 210H
Well Pad Name: Gladys Briggs MSH Pad

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL WORK PERMIT APPLICATION

1) Well Operator: SWN Production Co., LLC 494512924 51-Marshall Liberty Cameron
Operator ID County District Quadrangle

2) Operator's Well Number: Gladys Briggs MSH 210H Well Pad Name: Gladys Briggs MSH Pad

3) Farm Name/Surface Owner: Gladys R. Briggs Public Road Access: Fish Creek Road

4) Elevation, current ground: 1382' Elevation, proposed post-construction: 1382'

5) Well Type (a) Gas Oil Underground Storage

Other _____

(b) If Gas Shallow Deep

Horizontal _____

JN 1/3/17

6) Existing Pad: Yes or No yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):
Target Formation- Marcellus, Target Top TVD-7135', Target Base TVD-7168', Anticipated Thickness-35', Associated Pressure-4250

8) Proposed Total Vertical Depth: 7150'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 14,604'

11) Proposed Horizontal Leg Length: ~~480.83'~~ 6609' DS

12) Approximate Fresh Water Strata Depths: 732'

13) Method to Determine Fresh Water Depths: from log analysis and nearby water wells

14) Approximate Saltwater Depths: 1741'

15) Approximate Coal Seam Depths: 1099'

16) Approximate Depth to Possible Void (coal mine, karst, other): _____

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes No

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JAN 03 2017

(a) If Yes, provide Mine Info: Name: McElroy
Depth: 1099'
Seam: Pittsburgh
Owner: Consol Energy

WV Department of
Environmental Protection

WW-6B
(10/14)

API NO. 47- 69 -
OPERATOR WELL NO. Gladys Briggs MSH 210H
Well Pad Name: Gladys Briggs MSH Pad

18)

CASING AND TUBING PROGRAM

| TYPE | Size (in) | New or Used | Grade | Weight per ft. (lb/ft) | FOOTAGE: For Drilling (ft) | INTERVALS: Left in Well (ft) | CEMENT: Fill-up (Cu. Ft.)/CTS |
|--------------|-----------|-------------|-------|------------------------|----------------------------|------------------------------|---------------------------------------|
| Conductor | 20" | New | J-55 | 94# | 100' | 100' | CTS |
| Fresh Water | 13 3/8" | New | J-55 | 54.5# | 793' | 793' | 716 sx/CTS |
| Coal | 9 5/8" | New | J-55 | 36# | 2640' | 2640' | 986 sx/CTS |
| Intermediate | 7" | New | P-110 | 20# | If Needed | If Needed | If Needed/As Needed |
| Production | 5 1/2" | New | P-110 | 20# | 14,604' | 14,604' | Lead 1003 sx 1511 tail sx/1007 inside |
| Tubing | 2 3/8" | New | P-110 | 4.7# | Approx. 7150' | Approx. 7150' | |
| Liners | | | | | | | |

JN 1/3/17

| TYPE | Size (in) | Wellbore Diameter (in) | Wall Thickness (in) | Burst Pressure (psi) | Max. Associated Surface Pressure (psi) | Cement Type | Cement Yield (cu. ft./k) |
|--------------|-----------|------------------------|---------------------|----------------------|--|-------------|--------------------------|
| Conductor | 20" | 30" | 0.25 | 2120 | 81 | Class A | 1.19/50% Excess |
| Fresh Water | 13 3/8" | 17.5" | 0.380 | 2740 | 633 | Class A | 1.19/50% Excess |
| Coal | 9 5/8" | 12 1/4" | 0.395 | 3950 | 1768 | Class A | 1.19/50% Excess |
| Intermediate | 7" | 8 3/4" | 0.317 | 4360 | 3250 | Class A | 1.20/15% Excess |
| Production | 5 1/2" | 8 3/4" | 0.361 | 12360 | 9500 | Class A | 1.20/15% Excess |
| Tubing | 2 3/8" | 4.778" | 0.190 | | | | |
| Liners | | | | | | | |

PACKERS

| | | | | |
|-------------|--------------------|--|--|--|
| Kind: | 10K Arrowset AS1-X | | | |
| Sizes: | 5 1/2" | | | |
| Depths Set: | | | | |

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