



---

west virginia department of environmental protection

---

Office of Oil and Gas  
601 57<sup>th</sup> Street, S.E.  
Charleston, WV 25304  
(304) 926-0450  
fax: (304) 926-0452

Harold D. Ward, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

Thursday, May 13, 2021  
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 3H  
47-051-02369-00-00

**Modifications Approved: Cement Changes, Update Rig Information, Increase Intermediate Casing Depth**

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.

for  
James A. Martin  
Chief

Operator's Well Number: GLADYS BRIGGS MSH 3H  
Farm Name: GLADYS R. BRIGGS ESTATE  
U.S. WELL NUMBER: 47-051-02369-00-00  
Horizontal 6A New Drill  
Date Modification Issued: May 17, 2021

Promoting a healthy environment.

05/21/2021

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 051-MARsha 4-Liberty 278-Cameron  
Operator ID County District Quadrangle

2) Operator's Well Number: Gladys Briggs MSH 3H Well Pad Name: Gladys Briggs MSH pad

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

4) Elevation, current ground: 1383' Elevation, proposed post-construction: 1383'

5) Well Type (a) Gas  Oil  Underground Storage

Other \_\_\_\_\_

(b) If Gas Shallow  Deep

Horizontal

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Target Formation- Marcellus, Up-Dip well to the North, Target Top TVD- 7144', Target Base TVD- 7187', Anticipated Thickness- 43', Associated Pressure- 4671'

8) Proposed Total Vertical Depth: 7172'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 21109'

11) Proposed Horizontal Leg Length: 13,006.16'

12) Approximate Fresh Water Strata Depths: 732'

13) Method to Determine Fresh Water Depths: Salinity Profile Analysis and offset water wells

14) Approximate Saltwater Depths: 1220' Salinity Profile

15) Approximate Coal Seam Depths: 1099'

16) Approximate Depth to Possible Void (coal mine, karst, other): None that we are aware of.

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

(a) If Yes, provide Mine Info: Name: Marshall County Coal Resources, Inc.  
Depth: 1099'  
Seam: Pittsburgh  
Owner: American Consolidated Natural Resources

RECEIVED  
Office of Oil and Gas

MAY 11 2021

WV Department of  
Environmental Protection

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#	126'	126'	CTS
Fresh Water	13 3/8"	New	H-40	48#	802'	802'	912 sx/CTS
Coal	See	Interm	Casing				
Intermediate	9 5/8"	New	J/K-55	36#/40#	2700'	2700'	1068 sx/CTS
Production	5 1/2"	New	P-110 HP	20#	21109'	21109'	Tall 3623sz/ 100' Inside Intermediate
Tubing							
Liners							

*Susan Harris*  
4-21-21

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	30"	0.25	2120	81	Class A	1.20/30% Excess
Fresh Water	13 3/8"	17.5"	0.380	2730	633	Class A	1.20/30% Excess
Coal	See	Interm	Casing				
Intermediate	9 5/8"	12 1/4"	0.395	3950	1768	Class A	1.19/40% Excess
Production	5 1/2"	8 3/4"-8 1/2"	0.361	14360	10500	Class A	1.19/5% Excess
Tubing							
Liners							

PACKERS

Kind:				
Sizes:				
Depths Set:				

RECEIVED  
Office of Oil and Gas

MAY 11 2021

WV Department of  
Environmental Protection

# Southwestern Energy Company

# Proposed Drilling Program

Well: **GLADYS BRIGGS MSH 3**  
 Field: **VICTORY FIELD WET**  
 County: **MARSHALL**  
 SHL: **39.7671** Latitude **-80.6159** Longitude  
 BHL: **39.7965** Latitude **-80.6422** Longitude  
 KB Elev: **1,409 ft MSL**

Re-entry Rig: **SDC 41**  
 Prospect: **Marcellus Shale**  
 State: **WV**  
 KB: **26 ft AGL**  
 GL Elev: **1,383 ft MSL**



No COAL VOID Anticipated

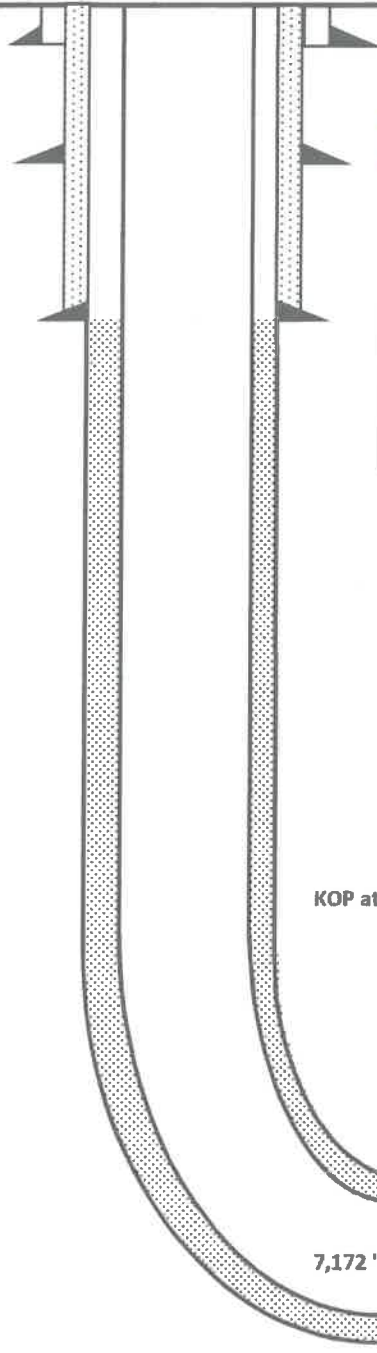
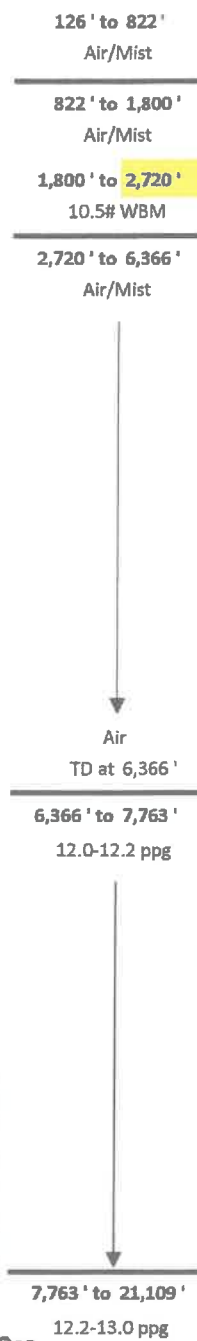
Gas Storage Interval : 1,991' - 2,492' (Maxton, Big Injun)  
**PROD TOC @ 2,800' MD**

### TUBULAR DETAIL

Casing String	Casing Size (in)	Weight (Min)	Grade (Min)	Planned Interval	
				From	To
Conductor	20	94.0 #	J-55	0'	126'
Surface	13.375	48.0 #	H-40	0'	802'
Intm/Coal	9.625	<b>36# / 40#</b>	J/K-55	0'	<b>2,700'</b>
Production	5.5	20.0 #	P-110 HP	0'	21,109'

### CEMENT DETAIL

	Sacks	Class	Density
Conductor:	151	A	19.3
Surface:	<b>912</b>	A	15.6
Intermediate:	<b>1068</b>	A	15.6-16.0
Production:	<b>3823</b>	A	<b>14.5-15.6</b>



KOP at 6,366' MD

Freshwater Depth - 732' TVD  
 Coal Depth - 1,099' TVD  
 Saltwater Depth - 1,220' TVD  
 TVD - 7,172'  
 TMD - 21,109'

TD at 21,109' MD  
 7,086' TVD

7,172' Target Center

EOB at 7,763' MD

SHL Onondaga 7,187' TVD

Onondaga 7,101' TVD

7,763' to 21,109'

RECEIVED  
 Office of Oil and Gas

12.2-13.0 ppg

Created by: Alex Pfeifer on 04/19/2021

MAY 11 2021