



---

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

Austin Caperton, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

Friday, December 4, 2020  
PERMIT MODIFICATION APPROVAL  
Horizontal 6A / New Drill

SWN PRODUCTION COMPANY, LLC  
POST OFFICE BOX 12359

SPRING, TX 773914954

Re: Permit Modification Approval for STATE OF WV DNR A BRK 206H  
47-009-00299-00-00

**Cement Yield Calculation WW-6B**

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.

A handwritten signature in blue ink, appearing to read 'James A. Martin', is positioned above the printed name and title.

James A. Martin  
Chief

Operator's Well Number: STATE OF WV DNR A BRK 206H  
Farm Name: STATE OF WEST VIRGINIA, BUREAU OF COMME  
U.S. WELL NUMBER: 47-009-00299-00-00  
Horizontal 6A New Drill  
Date Modification Issued: 12/04/2020

Promoting a healthy environment.

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 009- Brooke 02-Cross 620-Steubenville  
Operator ID County District Quadrangle

2) Operator's Well Number: State of WV DNR A BRK 206H Well Pad Name: State of WV DNR A BRK

3) Farm Name/Surface Owner: State of WV, Bureau of Commerce, DNR Public Road Access: Putney Ridge Road

4) Elevation, current ground: 1140' Elevation, proposed post-construction: 1140'

5) Well Type (a) Gas  Oil  Underground Storage   
Other

(b) If Gas Shallow  Deep   
Horizontal

6) Existing Pad: Yes or No Yes *C. J. SLO 11-6-20*

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):  
Target Formation- Marcellus, Down-Dip well to the South, Target Top TVD- 5668', Target Base TVD- 5734', Anticipated Thickness- 66', Associated Pressure- 3727

8) Proposed Total Vertical Depth: 6007'

9) Formation at Total Vertical Depth: Marcellus RECEIVED Office of Oil and Gas

10) Proposed Total Measured Depth: 31,558' **NOV 12 2020**

11) Proposed Horizontal Leg Length: 25261.61 WV Department of Environmental Protection

12) Approximate Fresh Water Strata Depths: 542'

13) Method to Determine Fresh Water Depths: Salinity Profile from DNR A BRK 8H logs (API 47-009-00125) open-hole logs

14) Approximate Saltwater Depths: 692' Salinity Calculations from the DNR A BRK 8H (API 47-009-00125) logs

15) Approximate Coal Seam Depths: 99'

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: \_\_\_\_\_  
Depth: \_\_\_\_\_  
Seam: \_\_\_\_\_  
Owner: \_\_\_\_\_

WW-6B  
(04/15)

API NO. 47-009 - 00299  
 OPERATOR WELL NO. State of WV DNR A BRK 206H  
 Well Pad Name: State of WV DNR A BRK

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	H-40	94#	125'	125'	CTS
Fresh Water	13 3/8"	New	H-40	48#	642'	642'	602 sx/CTS
Coal	See	Conductor	Casing				
Intermediate	9 5/8"	New	J-55	36#	1443'	1443'	541 sx/CTS
Production	6"	New	HCP-110	24#	0'	5000'	lead 813sx/Tail 5882sx/ 100' Inside Interval
Production	5 1/2"	New	HCP-110	20#	5000'	31,558'	
Liners							

*C. 750 11.6.20*

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	Conductor	Casing				
Intermediate	9 5/8"	12 1/4"	0.352	3520	1768	Class A	1.19/40% Excess
Production	6"	8 1/2"	0.400	14580	10500	Class A	1.30/5% Excess
Production	5 1/2"	8 1/2"	0.361	14360	10500	Class A	1.30/5% Excess
Liners							

**PACKERS**

RECEIVED  
Office of Oil and Gas

NOV 12 2020

WV Department of  
Environmental Protection

Kind:				
Sizes:				
Depths Set:				

# Southwestern Energy Company

# Proposed Drilling Program

**Well:** STATE OF WV DNR A BRK 206      **Re-entry Rig:** TBD  
**Field:** PANHANDLE FIELD WET      **Prospect:** PANHANDLE  
**County:** BROOKE      **State:** WV  
**SHL:** 40.3211 Latitude      -80.5351 Longitude  
**BHL:** 40.3211 Latitude      -80.5351 Longitude  
**KB Elev:** 1,166 ft MSL      **KB:** 26 ft AGL      **GL Elev:** 1,140 ft MSL



*C-780*  
*11.6.20*

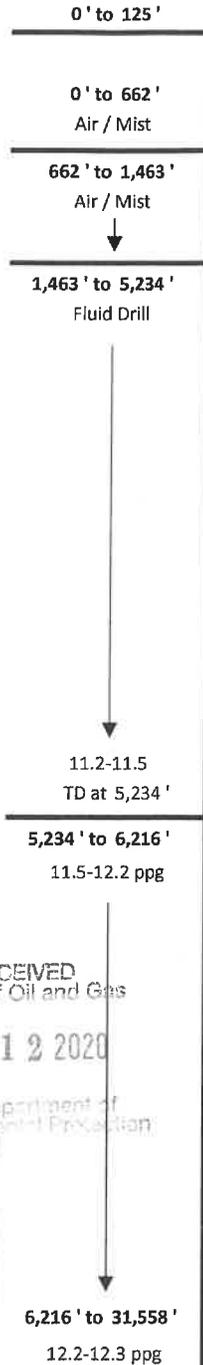
**PROD TOC Lead @ 1,463' MD**  
**PROD TOC Tail @ 5,100' MD**

**TUBULAR DETAIL**

	Size (in)	Weight	Grade	From	To
<b>Conductor/Coal:</b>	20	94.0 #	H-40	0'	125'
<b>Surface:</b>	13.375	48.0 #	H-40	0'	642'
<b>Intermediate:</b>	9.625	36.0 #	J-55	0'	1,443'
<b>Production:</b>	6.0	24.0 #	HCP-110	0'	5000'
<b>Production:</b>	5.5	20.0 #	HCP-110	5000'	31,558'

**CEMENT DETAIL**

	Sacks	Class	Density
<b>Conductor</b>	189	A	19.3
<b>Surface</b>	602	A	15.6
<b>Intermediate</b>	541	A	15.6
<b>Production Lead</b>	772	A	15.0
<b>Production Tail</b>	5098	A	15.0



COAL VOID @ 99'

KOP at 5,234' MD

Freshwater Depth - 542' TVD  
 Coal Depth - 99' TVD  
 Saltwater Depth - 692' TVD  
 TVD - 6,007'  
 TMD - 31,558'

RECEIVED  
 Office of Oil and Gas  
 NOV 12 2020  
 WV Department of  
 Oil and Gas

TD at 31,558' MD  
 6,007' TVD

5,722' Target Center

EOB at 5,722' TVD

Onondaga 6,020' TVD

SHL Onondaga 5,735' TVD

6,216' to 31,558'

12.2-12.3 ppg

November 9, 2020

Ms. Laura Adkins  
Office of Oil & Gas  
601 57<sup>th</sup> Street  
Charleston, WV 25304

**RE: Proposed Expedited Modification: State of WV DNR A BRK 206H**

Dear Ms. Adkins

Enclosed please find a modification for the above captioned well. This modification reflects the cement blend for production that our drilling engineer spoke to Eric Blend about and Mr. Martin approved. This well is situated on the DNR's property, in Cross Creek District, Brooke County, West Virginia.

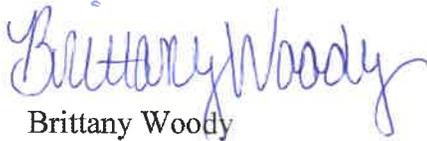
Enclosed documents:

-Updated 6B

If you have any questions or desire additional information, please me at 304-884-1613

Thank you.

Sincerely,



Brittany Woody  
Senior Regulatory Analyst  
Southwestern Energy Production Company, LLC

RECEIVED  
Office of Oil and Gas

NOV 12 2020

WV Department of  
Environmental Protection

CE# 1053184  
Amt \$ 5000  
Date 10/20/20

$\frac{R^2}{A} \rightarrow V^+$