



---

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, October 30, 2020  
PERMIT MODIFICATION APPROVAL  
Horizontal 6A / New Drill

SWN PRODUCTION COMPANY, LLC  
POST OFFICE BOX 12359  
SPRING, TX 773914954

Re: Permit Modification Approval for BW EDGE MSH 3H  
47-051-02342-00-00

**Expedited Modification Request - Updated Casing Plan - Cement Yield**

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.

James A. Martin  
Chief

Operator's Well Number: BW EDGE MSH 3H  
Farm Name: WILLIAM F EDGE JR & BARBARA EDGE  
U.S. WELL NUMBER: 47-051-02342-00-00  
Horizontal 6A New Drill  
Date Modification Issued: 10/30/2020

Promoting a healthy environment.

WW-6B  
(04/15)

API NO. 47- 051 - 02342  
OPERATOR WELL NO. BW Edge MSH 3H  
Well Pad Name: BW Edge MSH

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-Marshall Sand Hill Wheeling  
Operator ID County District Quadrangle

2) Operator's Well Number: BW Edge MSH 3H Well Pad Name: BW Edge MSH

3) Farm Name/Surface Owner: William F. Edge, Jr. & Barbara Edge Public Road Access: Big Wheeling Creek Road

4) Elevation, current ground: 1254' Elevation, proposed post-construction: 1254'

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

(b) If Gas Shallow  Deep \_\_\_\_\_

Horizontal  *JM* 10/9/2020

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- 6346', Target Base TVD- 6398', Anticipated Thickness- 52', Associated Pressure- 4159

8) Proposed Total Vertical Depth: 6382'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 16170'

11) Proposed Horizontal Leg Length: 9324.80'

12) Approximate Fresh Water Strata Depths: 615'

13) Method to Determine Fresh Water Depths: Nearby Water Well

14) Approximate Saltwater Depths: 1386' Salinity Profile Analysis

15) Approximate Coal Seam Depths: 741'

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: \_\_\_\_\_

RECEIVED  
Office of Oil and Gas  
OCT 20 2020  
WV Department of  
Environmental Protection

WW-6B  
(04/15)

API NO. 47- 051 - 02342  
 OPERATOR WELL NO. BW Edge MSH 3H  
 Well Pad Name: BW Edge MSH

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	54.4#	800'	800'	636 sx/CTS
Coal	See	Surface	Casing				
Intermediate	9 5/8"	New	J-55	36#	2032'	2032'	639 sx/CTS
Production	5 1/2"	New	P-110 HP	20#	16170'	16170'	Tail 2867sx/ 100' Inside Intermediate
Tubing							
Liners							

*JM* 10/9/2020

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	Surface	Casing				
Intermediate	9 5/8"	12 1/4"	0.352	3520	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

OCT 20 2020

WV Department of  
Environmental Protection

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill and stimulate any potential zones between and including the Benson to Marcellus. \*\*If we should encounter a void place basket above and below void area- balance cement to bottom of void and grout from basket to surface or run external casing packer/cementing stage tool above void interval and perform 2 stage cementing operation dependent upon depth of void. Run casing not less than 20' below void nor more than 75' below void. (\*If freshwater is encountered deeper than anticipated it must be protected, set casing 50' below and cts.)

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

Well will be perforated within the target formation and stimulated with a slurry of water, sand, and chemical additives at a high rate. This will be performed in stages with the plug and perf method along the wellbore until the entire lateral has been stimulated within the target formation. All stage plugs are then drilled out and the well is flowed back to surface. In some instances, additional toe prep may be performed by pumping additional water in the toe of the well prior to perforating and pumping Stage 1 to ensure that the toe guns/toe sleeves are fully open prior to pumping stage 1. The well is produced through surface facilities consisting of high pressure production unites, horizontal separation units, water and oil storage tanks. Max press and anticipated max rate- 9000 lbs @ 100 barrels a minute.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 13.88

22) Area to be disturbed for well pad only, less access road (acres): 6.58

23) Describe centralizer placement for each casing string:

All casing strings will be ran with a centralizer at a minimum of 1 per every 3 joints of casing.

24) Describe all cement additives associated with each cement type:

See Attachment \*\*\*

25) Proposed borehole conditioning procedures:

All boreholes will be conditioned with circulation and rotation for a minimum of one bottoms up and continuing until operator is satisfied with borehole conditions.

\*Note: Attach additional sheets as needed.

RECEIVED  
Office of Oil and Gas

OCT 20 2020

WV Department of  
Environmental Protection



SWN Production Company, LLC  
1300 Fort Pierpont Dr, Ste 201  
Morgantown, WV 26508  
Tel: 304 884 1610  
Fax: 304 471 2497  
www.swn.com

October 19, 2020

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

Expedited  
Mod

ck# 0001053061

\$5000<sup>00</sup>

Date: 10/13/20

RE: Proposed Expedited Modification: BW Edge MSH-~~HH~~ 3H

Dear Ms. Adkins

Enclosed please find a modification for the above captioned well. We made changes to the cement yield on page two of the 6B per the DEP inspector's request. This well is situated on the Edge's property, in Sand Hill District, Marshall 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

OCT 20 2020

WV Department of  
Environmental Protection

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