



west virginia department of environmental protection

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

Austin Caperton, Cabinet Secretary
www.dep.wv.gov

March 7, 2018
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

SWN PRODUCTION COMPANY, LLC
POST OFFICE BOX 12359

SPRING, TX 773914954

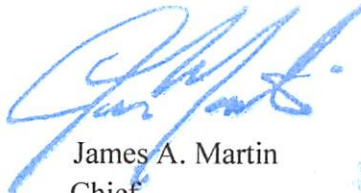
Re: Permit Modification Approval for MARK HICKMAN OHI 10H
47-069-00250-00-00

Modified Surface Casing with Inspector's Approval

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: MARK HICKMAN OHI 10H
Farm Name: LAWRENCE GRANT HICKMAN, CECIL LEE HICKMAN & CAROL
U.S. WELL NUMBER: 47-069-00250-00-00
Horizontal 6A / New Drill
Date Issued: March 7, 2018

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 069-Ohio Triadelphia Valley Grove
Operator ID County District Quadrangle

2) Operator's Well Number: Mark Hickman OHI 10H Well Pad Name: Mark Hickman PAD

3) Farm Name/Surface Owner: Mark Hickman Public Road Access: Dallas Pike

4) Elevation, current ground: 1281' Elevation, proposed post-construction: 1281'

5) Well Type (a) Gas Oil Underground Storage
Other _____
(b) If Gas Shallow Deep
Horizontal

6) Existing Pad: Yes or No Yes *C/O 2-14-18*

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Target Formation- Marcellus, Target Top TVD- 6810' Target Base TVD- 6854', Anticipated Thickness- 44', Associated Pressure- 4440

8) Proposed Total Vertical Depth: 6830'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 15480'

11) Proposed Horizontal Leg Length: 8418.21'

12) Approximate Fresh Water Strata Depths: 563'

13) Method to Determine Fresh Water Depths: from nearby water wells, salinity profile and logs

14) Approximate Saltwater Depths: 918'

15) Approximate Coal Seam Depths: 713'

16) Approximate Depth to Possible Void (coal mine, karst, other): Possible void 713'

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: _____

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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	H-40	94#	100'	100'	CTS
Fresh Water	13 3/8"	New	H-40	48#	810'	810'	748 sx/CTS
Coal	9 5/8"	New	J-55	36#	2163'	2163'	802 sx/CTS
Intermediate	7"	New	J-55	20#	If Needed	If Needed	If Needed/As Needed
Production	5 1/2"	New	HCP-110	20#	15480'	15480'	
Tubing	2 3/8"	New	HCP-110	4.7#	Approx. 6702'	Approx. 6702'	
Liners							

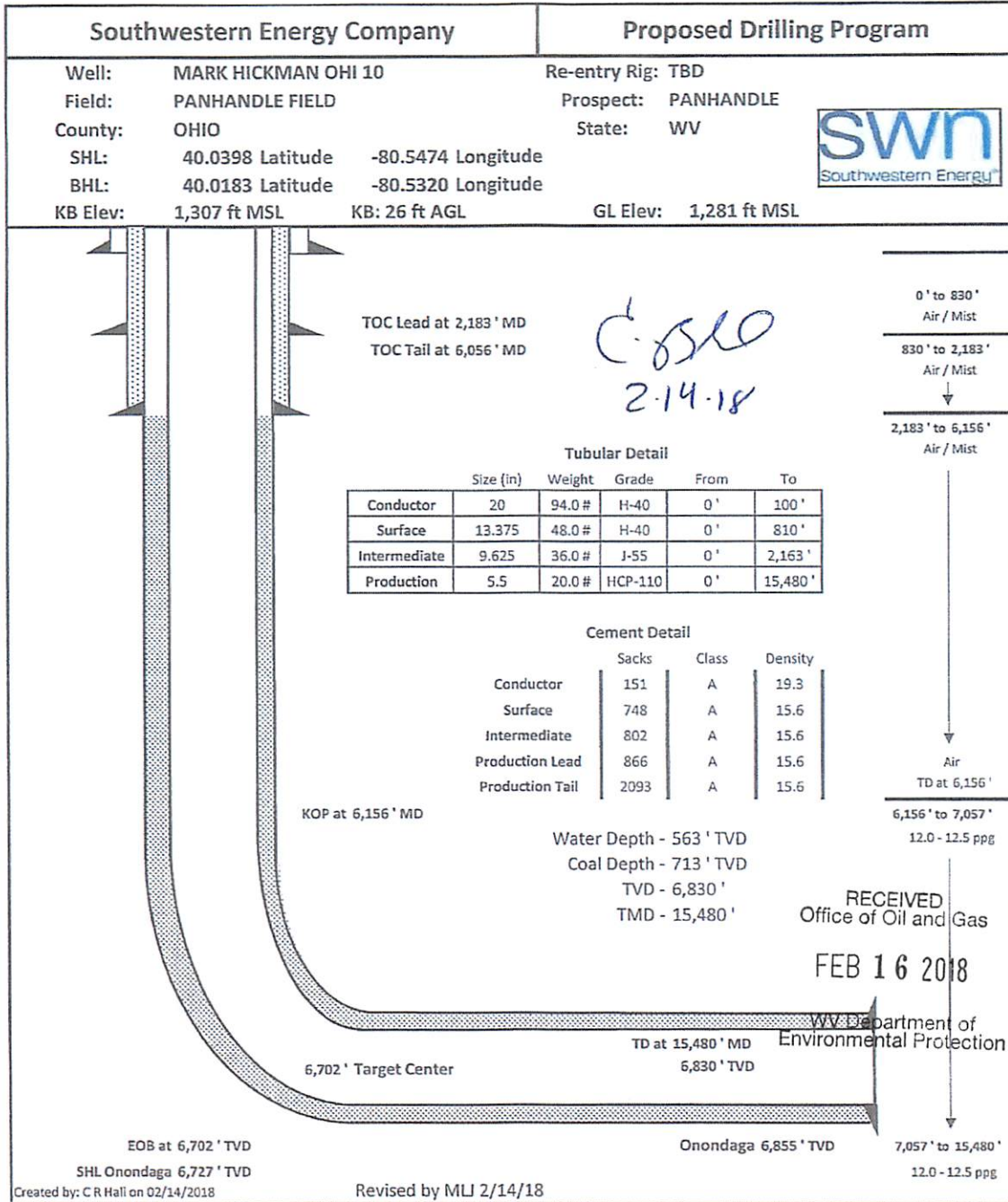
C-250 2-14-18

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	1.19/50% 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	1.20/50% Excess
Production	5 1/2"	8 3/4"	0.361	12360	9500	Class A	1.20/50% Excess
Tubing	2 3/8"	4.778"	0.190	Approx 8193'	Approx 8193'		
Liners							

PACKERS

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

69-00250MD



February 15, 2018

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

RECEIVED
Office of Oil and Gas

FEB 16 2018

WV Department
Environmental Protection

RE: Proposed Modification: Mark Hickman OHI 6H & Mark Hickman OHI 10H

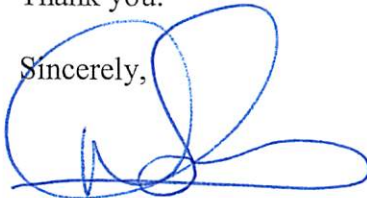
Dear Ms. Adkins

Enclosed please find an updated 6B & WBD for the above captioned wells. We have changed the surface casing. These wells are situated on the Hickman's property, in Triadelphia District, Ohio County, West Virginia.

If you have any questions or desire additional information, please me at 304-884-1614

Thank you.

Sincerely,



Dee Southall
Senior Regulatory Analyst
Southwestern Energy Production Company, LLC

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