



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

Jim Justice, Governor
Austin Caperton, Cabinet Secretary
www.dep.wv.gov

December 21, 2017
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

SWN PRODUCTION COMPANY, LLC
POST OFFICE BOX 12359

SPRING, TX 773914954

Re: Permit Modification Approval for DANIEL DURIG WTZ 201H
47-103-03187-00-00

Modifying Casing

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: DANIEL DURIG WTZ 201H
Farm Name: DANIEL DURIG (REMAINDERMAN), ARTHUR DURIG & SHIRLEY
U.S. WELL NUMBER: 47-103-03187-00-00
Horizontal 6A / New Drill
Date Issued: December 21, 2017

Promoting a healthy environment.

12/22/2017

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

1) Well Operator: SWN Production Co., LLC

<u>494512924</u>	<u>103- Wetzel</u>	<u>12-Proctor</u>	<u>681-Wileyville</u>
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Operator ID County District Quadrangle

2) Operator's Well Number: Daniel Durig WTZ 201H Well Pad Name: Daniel Durig WTZ Pad

3) Farm Name/Surface Owner: Daniel Durig Public Road Access: Macedonia Ridge Road

4) Elevation, current ground: 1400.9' Elevation, proposed post-construction: 1400.9'

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

(b) If Gas Shallow Deep _____
Horizontal _____

6) Existing Pad: Yes or No yes *DMDH 12/21/17*

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Target Formation- Marcellus, Target Top TVD- 7221, Target Base TVD-7268', Anticipated Thickness- 37', Associated Pressure- 4720

8) Proposed Total Vertical Depth: 7232' at the heel

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 14,071'

11) Proposed Horizontal Leg Length: 3916.00'

12) Approximate Fresh Water Strata Depths: 427'

13) Method to Determine Fresh Water Depths: Salinity Profile

14) Approximate Saltwater Depths: 1664'

15) Approximate Coal Seam Depths: 1155'

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: _____

18)

CASING AND TUBING PROGRAM

<u>TYPE</u>	<u>Size (in)</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft. (lb/ft)</u>	<u>FOOTAGE: For Drilling (ft)</u>	<u>INTERVALS: Left in Well (ft)</u>	<u>CEMENT: Fill-up (Cu. Ft.)/CTS</u>
Conductor	20"	New	H-40	94#	100'	100'	CTS
Fresh Water	13 3/8"	New	H-40	54.5#	527'	527'	502 sx/CTS
Coal	9 5/8"	New	J-55	40#	2711'	2711'	1044 sx/CTS
Intermediate	7"	New	HCP-110	20#	If Needed	If Needed	If Needed/As Needed
Production	5 1/2"	New	HCP-110	20#	14071'	14071'	Least 943 on 100 1028 on 102 1044 on 102
Tubing	2 3/8"	New	HCP-110	4.7#	Approx. 7232'	Approx. 7232'	
Liners							

DMD 12/21/17

<u>TYPE</u>	<u>Size (in)</u>	<u>Wellbore Diameter (in)</u>	<u>Wall Thickness (in)</u>	<u>Burst Pressure (psi)</u>	<u>Anticipated Max. Internal Pressure (psi)</u>	<u>Cement Type</u>	<u>Cement Yield (cu. ft./k)</u>
Conductor	20"	30"	0.25	2120	0.020	Class A	1.19/50% Excess
Fresh Water	13 3/8"	17.5"	0.380	2740	0.020	Class A	1.19/50% Excess
Coal	9 5/8"	12 1/4"	0.395	3950	0.020	Class A	1.19/50% Excess
Intermediate	7"	8 3/4"	0.317	4360	0.020	Class A	1.20/15% Excess
Production	5 1/2"	8 3/4"	0.361	12360	0.020	Class A	1.20/15% Excess
Tubing	2 3/8"	4.778"	0.190				
Liners							

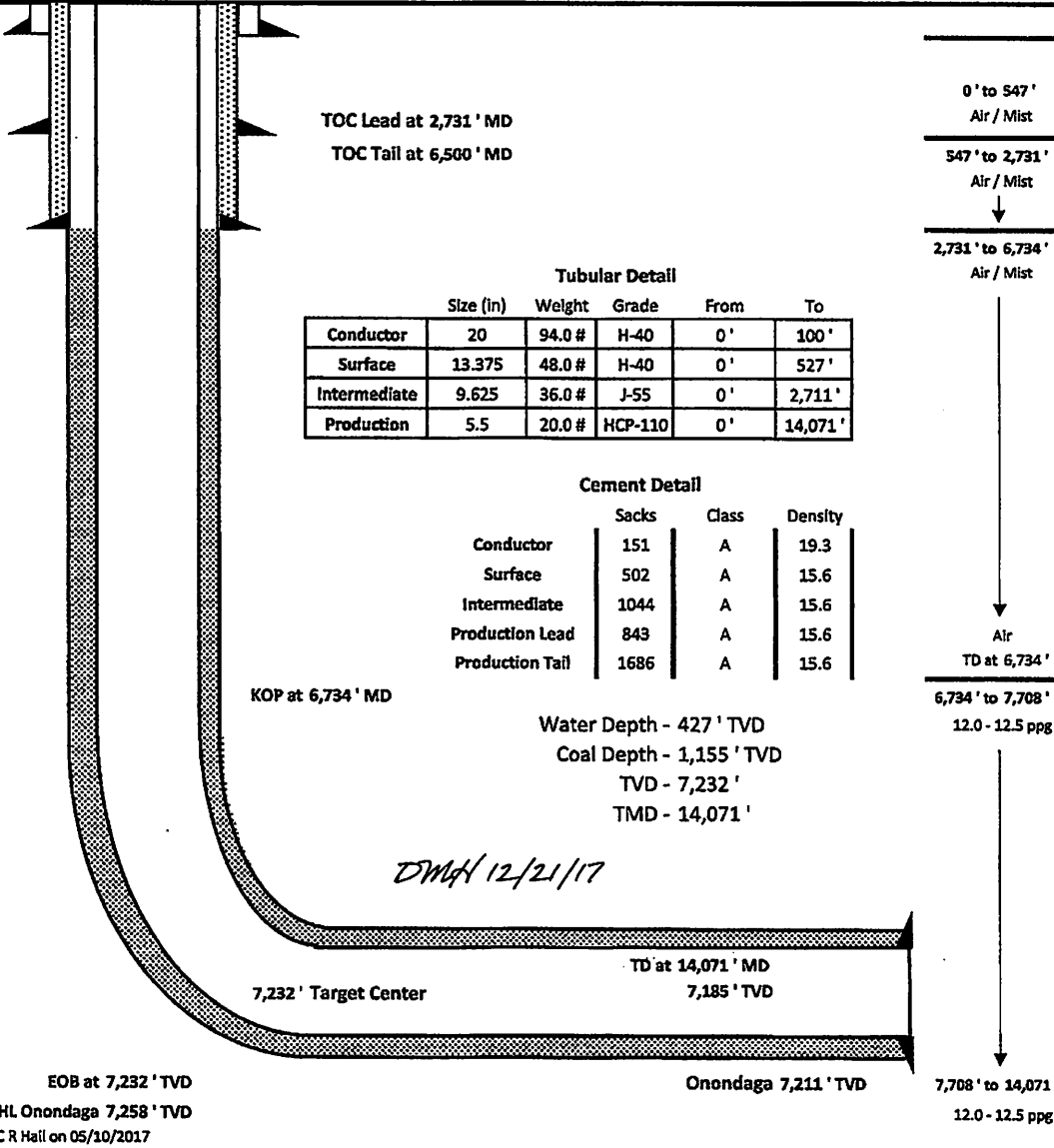
PACKERS

Kind:				
Sizes:				
Depths Set:				

Southwestern Energy Company

Proposed Drilling Program

Well: DANIEL DURIG WTZ 201 Re-entry Rig: TBD
 Field: VICTORY FIELD Prospect: ... VICTORY
 County: WETZEL State: WV
 SHL: 39.7168 Latitude -80.6392 Longitude
 BHL: 39.7265 Latitude -80.6586 Longitude
 KB Elev: 1,427 ft MSL KB: 26 ft AGL GL Elev: 1,401 ft MSL



Created by: C R Hall on 05/10/2017

4706900224

WW-68
(04/15)

API NO. 47-000
OPERATOR WELL NO. Alpha Katabi 001 681
Well Pad Name: Alpha Katabi CW

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#	438'	438'	423 cu/CTS
Coal	9 5/8"	New	J-55	36#	1899'	1899'	771 cu/CTS
Intermediate	7"	New	HCP-110	20#	If Needed	If Needed	If Needed/As Needed
Production	5 1/2"	New	HCP-110	20#	11857'	11857'	
Tubing	2 3/8"	New	P-110	4.7#	Approx. 6317'	Approx. 6317'	
Liners							

E. J. L. 3-6-17

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./ft)
Conductor	20"	30"	0.25	2120	81	Class A	1.18/50% Excess
Fresh Water	13 3/8"	17.5"	0.380	2740	633	Class A	1.18/50% Excess
Coal	9 5/8"	12 1/4"	0.395	3950	1768	Class A	1.18/50% 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:				