

02/10/2023



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

Harold D. Ward, Cabinet Secretary
www.dep.wv.gov

Monday, February 6, 2023
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

HG ENERGY II APPALACHIA, LLC
5260 DUPONT ROAD

PARKERSBURG, WV 26101

Re: Permit Modification Approval for SCHOEN 1205 N-3H
47-033-06007-00-00

Extend Intermediate 2 Casing

HG ENERGY II APPALACHIA, 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: SCHOEN 1205 N-3H
Farm Name: GEORGE & ROSANNE SCHOEN
U.S. WELL NUMBER: 47-033-06007-00-00
Horizontal 6A New Drill
Date Modification Issued: 2/6/2023

Promoting a healthy environment.

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

1) Well Operator: HG Energy II Appalachia, L.P. 494519932 Harrison Grant Mount Clare 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: Schoen 1205 N-3H Well Pad Name: Schoen 1205

3) Farm Name/Surface Owner: George Schoen Public Road Access: McWhorter Road / SR25

4) Elevation, current ground: 1410' Elevation, proposed post-construction: 1407'

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

(b) If Gas Shallow Deep
Horizontal

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus at 7214' / 7315' and 101' in thickness. Anticipated pressure at 4314#.

8) Proposed Total Vertical Depth: 7305'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 24,567'

11) Proposed Horizontal Leg Length: 16,808'

12) Approximate Fresh Water Strata Depths: 135', 480', 640', 728'

13) Method to Determine Fresh Water Depths: Nearest offset well data

14) Approximate Saltwater Depths: 1730, 1780, 2010

15) Approximate Coal Seam Depths: 501, 650', 730', 736' (Surface casing is being extended to cover the coal in the DTI Storage Field)

16) Approximate Depth to Possible Void (coal mine, karst, other): None

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
FEB 06 2023
WV Department of
Environmental Protection

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	30"	New	LS	157.5	120'	120'	Drilled In
Fresh Water/Coal	20"	NEW	J-55	94	1200'	1200'	40% excess, CTS
Intermediate 1	13 3/8"	NEW	J-55 BTC	68	2100'	2100'	40% excess, CTS
Intermediate 2	9 5/8"	NEW	N-80 BTC	40	5225'	5225'	40% excess tail, CTS
Production	5 1/2"	NEW	P-110 HP	23	24567'	24567'	20% excess tail, CTS
Tubing							
Liners							

Kenneth Greynolds Digitally signed by Kenneth Greynolds
 DN: cn = Kenneth Greynolds email = Kenneth.L.Greynolds@wv.gov c = AO US = WVDEP OU = Oil and Gas
 Date: 2023.02.02 09:24:54 -0500

<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	30"	30"	.500				Drilled In
Fresh Water/Coal	20"	24"	.438	2110	1200	Type 1, Class A	40 % excess yield = 1.20, CTS
Intermediate 1	13 3/8"	17 1/2"	.480	3450		Type 1/Class A	Lead 40% excess, Tail 0% excess
Intermediate 2	9 5/8"	12 1/4"	.395	5750		Type 1/Class A	Lead 40% excess, Tail 0% Excess Lead
Production	5 1/2"	8 1/2"	.415	16240	12500	Type 1/Class A	20% excess yield = 1.19, tail yield 1.94
Tubing							
Liners							

RECEIVED
Office of Oil and Gas

FEB 06 2023

WV Department of
Environmental Protection

PACKERS

Kind:				
Sizes:				
Depths Set:				

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

Drill the vertical depth to the Marcellus at an estimated total vertical depth of approximately 7305 feet. Drill horizontal leg to estimated 16,808' lateral length, 24,567' TMD. Hydraulically fracture stimulate and be capable of producing from the Marcellus Formation. Should we encounter an unanticipated void in the coal, we will install a minimum of 20' of casing below the void but not more than 100' below the void, set a basket and grout to surface. We plan to run an ACP above the Gantz/Dominion Storage interval to aid in sealing off and isolating the storage interval.

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

The stimulation will be completed with multiple stages divided over the lateral length of the well. Stage spacing is dependent upon engineering design. Slickwater fracturing technique will be utilized on each stage using sand, water, and chemicals. See attached list. Maximum pressure not to exceed 12,500 psi.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 29.485 acres

22) Area to be disturbed for well pad only, less access road (acres): 9.246 acres

23) Describe centralizer placement for each casing string:

No centralizers will be used with conductor casing.
Freshwater - centralized every 3 joints to surface.
Coal - Bow Spring on every joint, will also be running ACP for isolating storage zone
Intermediate - Bow Spring on first 2 joints then every third joint to 100' from surface.
Production - Run 1 spiral centralizer every 5 joints from the top of the curve to surface. Run 1 spiral centralizer every 3 joints from the 1st 5.5" long joint to the top of the curve.

RECEIVED
Office of Oil and Gas
FEB 06 2023
WV Department of
Environmental Protection

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

Conductor -N/A. Casing to be drilled in w/ Dual Rotary Rig.
Fresh Water - 15.6 ppg PNE-1 + 3% bwoc CaCl₂ 40% Excess Yield = 1.20, CTS
Intermediate 1 - *Lead: 15.4 ppg PNE-1 + 2.5% bwoc CaCl₂ 40% Excess / Tail: 15.9 ppg PNE-1 + 2.5% bwoc CaCl zero% Excess. CTS*
Intermediate 2 - *Lead: 15.4 ppg PNE-1 + 2.5% bwoc CaCl₂ 40% Excess / Tail: 15.9 ppg PNE-1 + 2.5% bwoc CaCl zero% Excess. CTS*
Production - *Lead: 14.5 ppg POZ:PNE-1 + 0.3% bwoc R3 + 1% bwoc EC1 + 0.75 gal/sk FP13L + 0.3% bwoc MPA170Tail: 14.8 ppg PNE-1 + 0.35% bwoc R3 + 0.75 gal/sk FP13L + 50% bwoc ASCA1 + 0.5% bwoc MPA17020% ExcessLead Yield=1.19Tail Yield=1.94CTS*

25) Proposed borehole conditioning procedures:

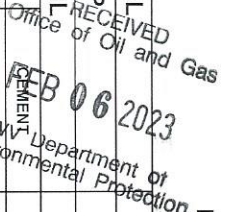
Conductor - Ensure the hole is clean at TD.
Fresh Water - Once casing is at setting depth, circulate a minimum of one hole volume with Fresh Water prior to pumping cement.
Coal - Once casing is at setting depth, Circulate and condition at TD. Circulate a minimum of one hole volume prior to pumping cement.
Intermediate - Once casing is at setting depth, Circulate and condition mud at TD. Circulate a minimum of one hole volume prior to pumping cement.
Production - Once on bottom/TD with casing, circulate at max allowable pump rate for at least 2x bottoms up, or until returns and pump pressures indicate the hole is clean. Circulate a minimum of one hole volume prior to pumping cement.

*Note: Attach additional sheets as needed.

02/10/2023

*** Storage String *** CTS ***
 15.4 ppg Lead - Yield 1.24 - D896 Surface Set 100 lb / sack (Mix of Class A and Gypsum to meet Dominion Requirements)
 B348 - 0.5% BWOB Fluid Loss / D013 - 0.75% BWOB Retarder / D47 - 0.02 gal / sack VBWOB Anti Foam / D202 - 0.15% BWOB Dispersant / D098 1.5 lb per BBL Cement - 60% Excess
 15.9 ppg Tail - Yield 1.17 - D896 Surface Set 100 lb / sack (Mix of Class A and Gypsum to meet Dominion Requirements)
 B160A - 0.15% BWOB Dispersant / B547 - 0.35% BWOB GasBlock / D013 - 0.3% BWOB Retarder / D047 - 0.02 gal / sack Anti Foam / D801 - 0.03 gal / sack Retarder - 0% Excess

1205 N-3H SHL
 1205 N-3H LPL
 1205 N-3H
 1205 N-3H
 Marcellus Shale Horizontal
 Harrison County, WV
 1205 N-3H
 14218790.94N 1824139.21E
 14219001.62N 1823991.43E
 14234867.92N 1818461.74E



GROUND ELEVATION	Azm	340.786°	1407'	1205 N-3H SHL	1205 N-3H LPL	1205 N-3H	1205 N-3H		
WELLBORE DIAGRAM	HOLE	CASING	GEOLOGY	TOP	BASE	MUD	CENTRALIZERS	CONDITIONING	COMMENTS
	30"	30" 157.5# LS	Conductor	0	120	AIR	N/A	Ensure the hole is clean at TD.	Conductor casing = 0.5" wall thickness
	26"	20" 94# J-55	Fresh Water Protection	0	1200	AIR	Centralized every 3 joints to surface	Once casing is at setting depth, circulate a minimum of one hole volume with Fresh Water prior to pumping cement.	Surface casing = 0.438" wall thickness Burst=2110 psi
	17.5'	13-3/8" 69# J-55 BTC	Intermediate 1	0	2100	AIR / KCL - Salt Polymer	Bow Spring on every joint *Will also be running ACP for isolating storage zone*	Once casing is at setting depth, circulate and condition at TD. Circulate a minimum of one hole volume prior to pumping cement.	Intermediate casing = 0.480" wall thickness Burst=3450 psi
	12.25'	9-5/8" 40# N-80 BTC	Intermediate 2	0	Inc: 11.5 deg.	AIR / SOBM	Bow Spring on first 2 joints then every third joint to 100' from surface	Once casing is at setting depth, circulate and condition mud at TD. Circulate a minimum of one hole volume prior to pumping cement.	Intermediate casing = 0.395" wall thickness Burst=5750 psi
	8.5" Curve	5-1/2" 23# P-110 HP CDC HTQ	Rhinestreet	5872	6420	11.5ppg-SOBM	Run 1 spiral centralizer every 3 joints from the top of the curve.	Once on bottom/TD with casing, circulate at maximum allowable pump rate for at least 2x bottoms up, or until returns and pump pressures indicate the hole is clean. Circulate a minimum of one hole volume prior to pumping cement.	Production casing = 0.415" wall thickness Burst=16240 psi Note: Actual centralizer schedules may be changed due to hole conditions
	8.5" Lateral		Cashagua	6420	6740	11.5ppg-SOBM			
			Middlesex	6740	6870	12.5ppg-SOBM			
			West River	6870	7003	12.5ppg-SOBM			
			Burkett	7003	7048	11.5ppg-SOBM			
			Tully Limestone	7048	7149	11.5ppg-SOBM			
			Hanilton	7149	6753	11.5ppg-SOBM			
			Marcellus	7214	7315	11.5ppg-SOBM			
			TMD / TVD (Production)	24567	7305	11.5ppg-SOBM			
			Onondaga	7315		12.5ppg-SOBM			

LP @ 7305' TVD / 7759' MD

8.5" Hole - Cemented Long String
 5-1/2" 23# P-110 HP CDC HTQ

+/-16808' ft. Lateral

TD @ +/-7305' TVD
 +/-24567' MD



HG Energy, LLC
5260 Dupont Road
Parkersburg, WV 26101
(304) 420-1100 - Office
(304) 863-3172 - Fax

CK# 034310
02/10/2023
CK \$ 5,000.00

January 31, 2023

WV DEP
Division of Oil & Gas
Attn: Cragin Blevins
601 57th Street
Charleston, West Virginia 25304

RE: Schoen 1205 N-3H Permit Revision – (47-033-06007)
Grant District, Harrison County
West Virginia

RECEIVED
Office of Oil and Gas
FEB 06 2023
WV Department of
Environmental Protection

Dear Mr. Blevins -

Per our discussions, enclosed are revised forms (WW-6B and casing schematic) and a check for expedited service for the 1205 N-3H well work permit. We request the permit be modified to revise the depth of the Intermediate 2 casing string from 2950 feet TVD to 5225 feet TMD.

Please let me know if you have any questions or require additional information. I can be reached at (304) 420-1119 or dwhite@hgenergyllc.com.

Very truly yours,

Diane White

Diane C. White

Enclosures

cc: Kenneth Greynolds – WV DEP State Inspector