

05/10/2019



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

Tuesday, May 7, 2019
PERMIT MODIFICATION APPROVAL
Horizontal 6A / New Drill

ARSENAL RESOURCES LLC
6031 WALLACE ROAD EXTENSION
SUITE 603
WEXFORD, PA 15090

Re: Permit Modification Approval for PRITT SOUTH 207
47-033-05911-00-00

Revised for the TMD and TVD due to a change in anticipated thickness of formation.

ARSENAL RESOURCES 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: PRITT SOUTH 207
Farm Name: IRA & LAURA PRITT
U.S. WELL NUMBER: 47-033-05911-00-00
Horizontal 6A New Drill
Date Modification Issued: 05/07/2019

Promoting a healthy environment.

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

1) Well Operator: Arsenal Resources 494519412 Harrison Simpson Brownton
Operator ID County District Quadrangle

2) Operator's Well Number: Pritt South 207 Well Pad Name: Pritt South

3) Farm Name/Surface Owner: Ira and Laura Pritt Public Road Access: County Route 17

4) Elevation, current ground: 1,341.70' Elevation, proposed post-construction: 1,345.90'

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

Other _____

(b) If Gas Shallow Deep _____ *SDW*

Horizontal *3/12/2019*

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus Shale, 7645.0ft (TVD Heel) - 7645.0ft (TVD Toe), 90ft, 0.5 psi/ft Base of Marcellus Shale, 7735.0ft (TVD Heel) - 7735.0ft (TVD Toe)

8) Proposed Total Vertical Depth: 7,783ft

9) Formation at Total Vertical Depth: Marcellus Shale

10) Proposed Total Measured Depth: 19,485 ft

11) Proposed Horizontal Leg Length: 10,630 ft *ok*

12) Approximate Fresh Water Strata Depths: 6', 36', 81', 210', 248', 291', 306', 336', 376'

13) Method to Determine Fresh Water Depths: Offsetting wells reported water depths (033-00660, 033-00950, 033-00960, 033-00976, 033-00980, 033-03262)

14) Approximate Saltwater Depths: 1391'

15) Approximate Coal Seam Depths: Bakerstown 483', Brush Creek 582', Upper Freeport 643', Lower Freeport 703', Upper Kittanning 778', Middle Kittanning 838', Lower Kittanning 851'

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
MAR 14 2019
WV Department of Environmental Protection

18)

CASING AND TUBING PROGRAM

TYPE	<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	24	New	H-40	94	80	80	CTS
Fresh Water	13.375	New	J-55	54.5	450	450	CTS
Coal							
Intermediate	9.625	New	J-55	40	1500	1500	CTS
Production	5.5	New	P-110	20	19,485	19,485	TOC @ 1,350'MD
Tubing							
Liners							

*SDW
3/12/2019*

TYPE	<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	24	36			0	Class A, 3% CaCl2	1.20
Fresh Water	13.375	17.5	0.38	2730	900	Class A, 3% CaCl2	1.20
Coal							
Intermediate	9.625	12.25	0.395	3,950	1500	Class A, 3% CaCl2	1.29
Production	5.5	8.5-8.75	0.361	12,640	9500	Class A, 50:50 Poz	1.29/1.34
Tubing					5000		
Liners					N/A		

PACKERS

Kind:				
Sizes:				
Depths Set:				

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

The well will be started with a conductor rig drilling a 36" hole to Conductor programmed depth then running 24" casing and circulate cement back to surface. The conductor rig will move out and the drilling rig will move in and rig up. The drilling rig will then spud a 17 1/2" hole and drill to fresh water casing (Surface) to the programmed depth, Run 13- 3/8" casing and cement to surface. The rig will continue drilling a 12- 1/4" intermediate hole to the programmed depth, run 9- 5/8" casing and cement to surface. The rig will then continue to drill an 8- 3/4" hole to a designed KOP. We will then start drilling the curve and lateral section to the programmed total measured depth, run 5 1/2" casing and cement according to the program.

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

The well will be completed using a plug and perforation method and stimulated with a slickwater and sand slurry. The anticipated maximum rate will be 90 bpm and the maximum pressure will be 9,500 psi.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 29.78

22) Area to be disturbed for well pad only, less access road (acres): 9.15

23) Describe centralizer placement for each casing string:

24" - No centralizers 13 3/8" - one bow spring centralizer on every other joint 9 5/8" - one bow spring centralizer every third joint from TD to surface 5 1/2" - one semi rigid centralizer on every joint from TD of casing to end of curve. Then every other joint to KOP. Every third joint from KOP to 1,600'; there will be no centralizers from 1,600' to surface.

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

24" will be circulated to surface. The 13 3/8" casing will be cemented to surface with Class A cement and no greater than 3% CaCl (calcium chloride). The 9 5/8" casing will be cemented to surface with Class A cement, & no greater than 3% calcium chloride. The 5 1/2" production string will be cemented back to 1,350' (+/- 150' above the casing shoe for the 9 5/8") with Class A and 50/50 Poz cement retarded (to extend pumpability) cellophane flaked for fluid loss, Bentonite gel as an extender (increased pumpability and fluid loss), a defoaming agent to decrease cement foaming during mixing to insure the cement is of proper weight to placement and possibly gypsum gas blocking additive to aid in blocking/gas migration (in combination with other additive mentioned here, helps cement achieve a "right angle" set) during the plastic phase of the cement set-up.

25) Proposed borehole conditioning procedures:

Top holes will be drilled with fresh water KOP. At KOP, the wellbore will be loaded with synthetic oil based mud, barite-weighted mud system with such properties as to build a filter-cake on the face to the bore-hole. This will provide lubricity as well as stabilizing the well bore. We will begin rotating the drill string and mud will be circulated upon reaching TD until no further cuttings are observed coming across the shaker screens. Once clean mud is circulated back to surface, we will pull three stands of drill pipe, load the hole, pull three strands and load the hole. The weight indicator on the rig will be monitored for any occurrences of drag and if any are noticed, we will re-run the previous stand of pipe pulled across and circulate 2x bottoms up while watching shakers for signs of cuttings. Once at the base curve, the string will be continuously rotated while pumping 2x bottoms up. We will pull three stands and fill the hole until we reach the vertical section of the well.

*Note: Attach additional sheets as needed.

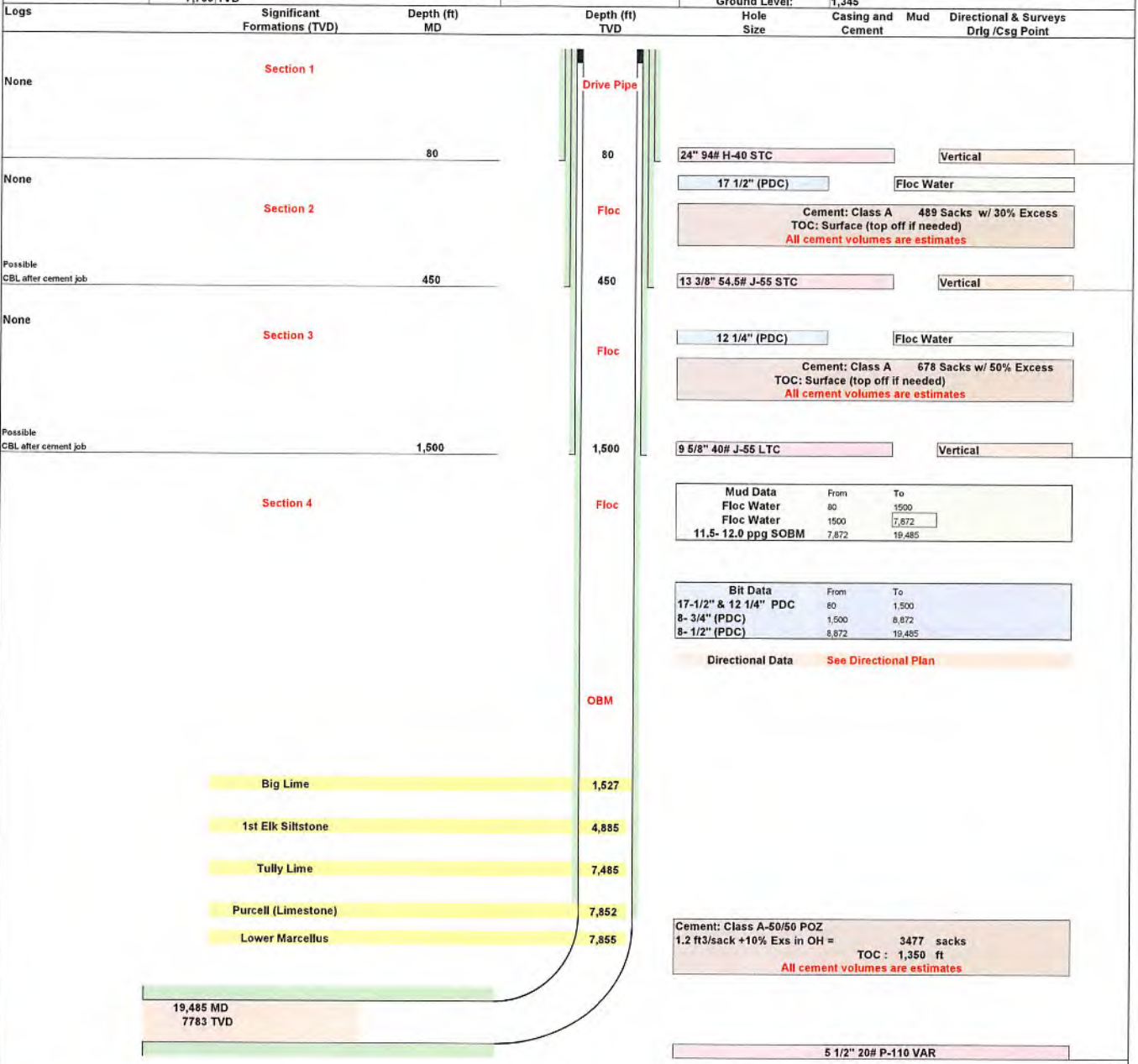


Arsenal Resources
 Pritt South 207
 Casing Design
 Directional Plan # 6 QES

05/10/2019

Other Names:	N/A
Surface Location:	TBD
Bottom Hole Location:	TBD
Total Depth:	19,485 MD (ft) 7,783 TVD

County:	Harrison
State:	West Virginia
AFE #:	XX
RKB:	27
Ground Level:	1,345



Revision 1

Note: Not drawn to scale

Cement Outside Casing Seal Assembly in Annulus

Date Last Revised: 11-Mar-19
 Jarrett Toms

ARSENAL RESOURCES PRITT SOUTH 207

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)

NAD'83 S.P.C.(FT) N. 272,405.8 E. 1,779,902.5
NAD'83 GEO. LAT-(N) 39.245857 LONG-(W) 80.187121
NAD'83 UTM (M) N. 4,344,375.0 E. 570,144.9

LANDING POINT

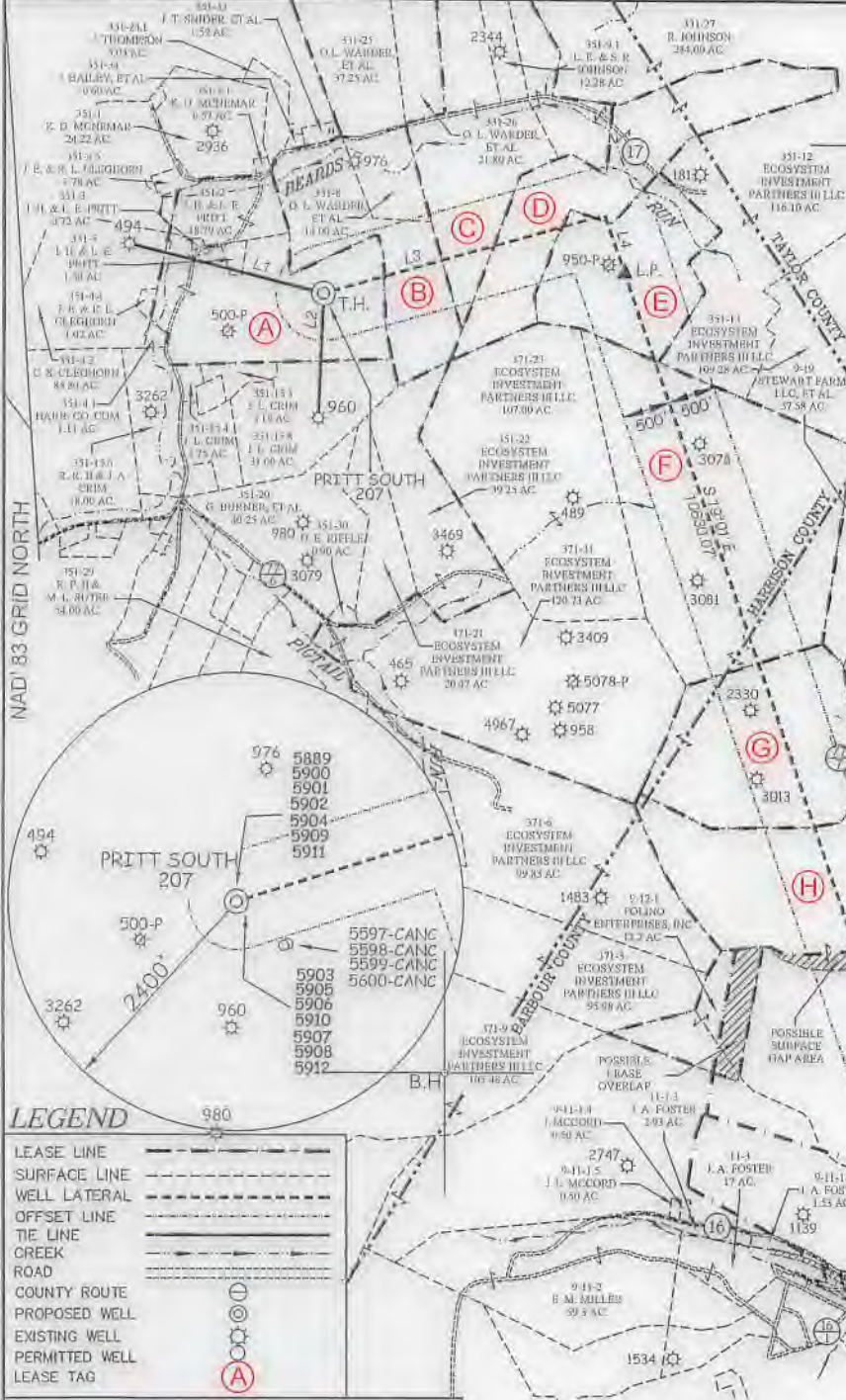
NAD'83 S.P.C.(FT) N. 272,641.8 E. 1,777,072.9
NAD'83 GEO. LAT-(N) 39.246571 LONG-(W) 80.187121
NAD'83 UTM (M) N. 4,344,462.9 E. 571,109.6

BOTTOM HOLE

NAD'83 S.P.C.(FT) N. 262,591.9 E. 1,780,536.7
NAD'83 GEO. LAT-(N) 39.219050 LONG-(W) 80.163440
NAD'83 UTM (M) N. 4,341,418.6 E. 572,215.8

05/10/2019

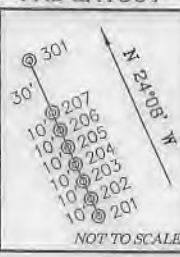
TAG	SURFACE OWNER	TAX MAP PARCEL	ACREAGE
HARRISON COUNTY			
A	IRA H. & LAURA E. PRITT	351-4	69.096±
B	OLAN LEE WARDER, ET AL.	351-7	47.301±
C	RENEE JOHNSON	351-9	97.724±
D	RENEE JOHNSON	351-10	85.004±
E	ECOSYSTEM INVESTMENT PARTNERS III LLC	351-11	52.196±
F	ECOSYSTEM INVESTMENT PARTNERS III LLC	351-24	153.081±
BARBOUR COUNTY			
G	JO ANN V SMITH & GARY M. BROWN, JR.	10-1	70.000±
H	JO ANN V SMITH & GARY M. BROWN, JR.	10-2	98.001±
I	POLINO ENTERPRISES, INC.	11-1	289.51±



PRITT SOUTH 207 WELL TIES

LINE	BEARING	DISTANCE
L1	N 76°02' W	2117.37'
L2	S 02°17' W	1319.24'
L3	N 74°12' E	3079.25'
L4	S 18°01' E	636.68'

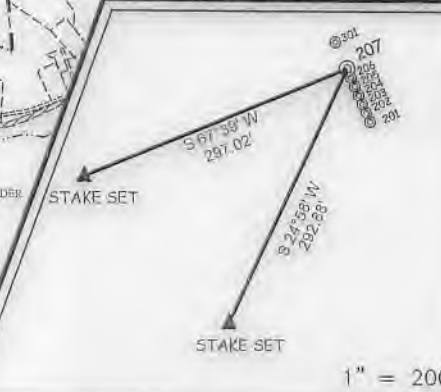
PRITT SOUTH PAD LAYOUT



LEGEND

- LEASE LINE
- SURFACE LINE
- WELL LATERAL
- OFFSET LINE
- TIE LINE
- CREEK
- ROAD
- COUNTY ROUTE
- PROPOSED WELL
- EXISTING WELL
- PERMITTED WELL
- LEASE TAG

REFERENCES



SLS
Land & Energy Development
Solutions from the ground up.
P.O. Box 150 • 42 Vanhook Drive • Clayville, WV 25351 • (304) 462-6634
www.slswe.com

NOTES ON SURVEY

1. NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS > 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.



I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DIVISION OF ENVIRONMENTAL PROTECTION.

P.S. 849 *C. Victor Moyers*

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.
DATE SEPTEMBER 26, 20 17
REVISED 09/04/18, 09/12/18 & 03/11/19
OPERATORS WELL NO. PRITT SOUTH 207
API WELL NO. 47 - 033 - 5911
STATE MD COUNTY 2 PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8383P207R7.dwg
HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2000'

STATE OF WEST VIRGINIA
DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL IF "GAS" PRODUCTION STORAGE DEEP SHALLOW

LOCATION: ELEVATION EXISTING: 1,341.70' / PROPOSED: 1,345.90' WATERSHED BEARDS RUN & PIGTAIL RUN
DISTRICT SIMPSON COUNTY HARRISON QUADRANGLE BROWNTON 7.5'
SURFACE OWNER IRA & LAURA PRITT ACREAGE 69.096±
ROYALTY OWNER IRA & LAURA PRITT ET AL ACREAGE 69.096±
PROPOSED WORK: LEASE NO. 00006622
DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
PERFORATE NEW FORMATION PLUG AND ABANDON CLEAN OUT AND REPLUG OTHER
PHYSICAL CHANGE IN WELL (SPECIFY) _____ TARGET FORMATION MARCELLUS
ESTIMATED DEPTH 19,484.8' TMD / 7,783' TVD

WELL OPERATOR ARSENAL RESOURCES DESIGNATED AGENT WILLIAM VEIGEL
ADDRESS 6031 WALLACE RD. EXT. SUITE 300 ADDRESS 65 PROFESSIONAL PLACE
WEXFORD, PA 15090 BRIDGEPORT, WV 26330

COUNTY NAME
PERMIT