



west virginia department of environmental protection

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

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

PERMIT MODIFICATION APPROVAL

August 05, 2013

CHESAPEAKE APPALACHIA, L.L.C.
POST OFFICE BOX 6070
CHARLESTON, WV 25362

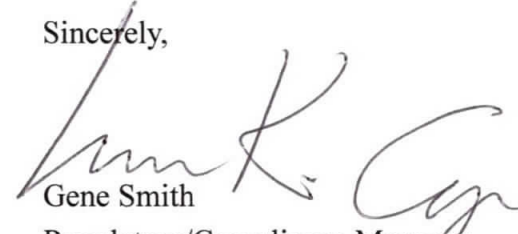
Re: Permit Modification Approval for API Number 5101606 , Well #: FORK RIDGE MSH 201H
shortened lateral

Oil and Gas Operator:

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.

Please call James Martin at 304-926-0499, extension 1654 if you have any questions.

Sincerely,

for 
Gene Smith
Regulatory/Compliance Manager
Office of Oil and Gas

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
W.VA. CODE §22-6A - WELL WORK PERMIT APPLICATION

1) Well Operator: Chesapeake Appalachia, LLC 494477557 51-Marshall 1-Cameron 370-Glen Easton
Operator ID County District Quadrangle

2) Operator's Well Number: Fork Ridge MSH 201H Well Pad Name: Fork Ridge MSH Pad
API# 47-051-01606

3 Elevation, current ground: 1391' Elevation, proposed post-construction: 1391'

4) Well Type: (a) Gas Oil _____
 Other _____
 (b) If Gas: Shallow Deep _____
 Horizontal

5) Existing Pad? Yes or No: Yes

6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):
Target formation-Marcellus, Target top TVD- 6787', Target base TVD-6838', Anticipated thickness- 51', Associated Pressure -4276

7) Proposed Total Vertical Depth: 6804'

8) Formation at Total Vertical Depth: Marcellus

9) Proposed Total Measured Depth: 12,600'

10) Approximate Fresh Water Strata Depths: 661'

11) Method to Determine Fresh Water Depth: From the DE Contour Map

12) Approximate Saltwater Depths: 1047'

13) Approximate Coal Seam Depths: 961'

14) Approximate Depth to Possible Void (coal mine, karst, other): None that we are aware of.

15) Does land contain coal seams tributary or adjacent to, active mine? yes

16) Describe proposed well work:
Drill and stimulate any potential zones between and including the Benson to the 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. Run casing not less than 20' below void nor more than 50' below void.
(*If freshwater is encountered deeper than anticipated it must be protected, set casing 50' below and cts)

17) Describe fracturing/stimulating methods in detail:
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.
The well is produced through surface facilities consisting of high pressure production units, vertical separation units, water and oil storage tanks.

18) Total area to be disturbed, including roads, stockpile area, pits, etc, (acres): 10.6

19) Area to be disturbed for well pad only, less access road (acres): 5.5

20)

CASING AND TUBING PROGRAM

TYPE	Size	New or Used	Grade	Weight per ft.	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill -up (Cu. Ft.)
Conductor	20"	New	J-55	94#	100'	100'	✓ CTS
Fresh Water	13 3/8"	New	J-55	54.5#	761'	761'	✓ 700 SX/CTS
Coal	9 5/8"	New	J-55	40#	2460'	2460'	✓ 920 SX/CTS
Intermediate	7"	New	P-110	20#	If Needed	If Needed	If Needed/As Needed
Production	5 1/2"	New	P-110	20#	12,600'	12,600'	✓ Lead 1080 sx Tail 1060 sx/100' inside intermediate
Tubing	2 3/8"	New	N-80	4.7#	Approx. 7274'	Approx. 7274'	
Liners							

DMH 12-28-12

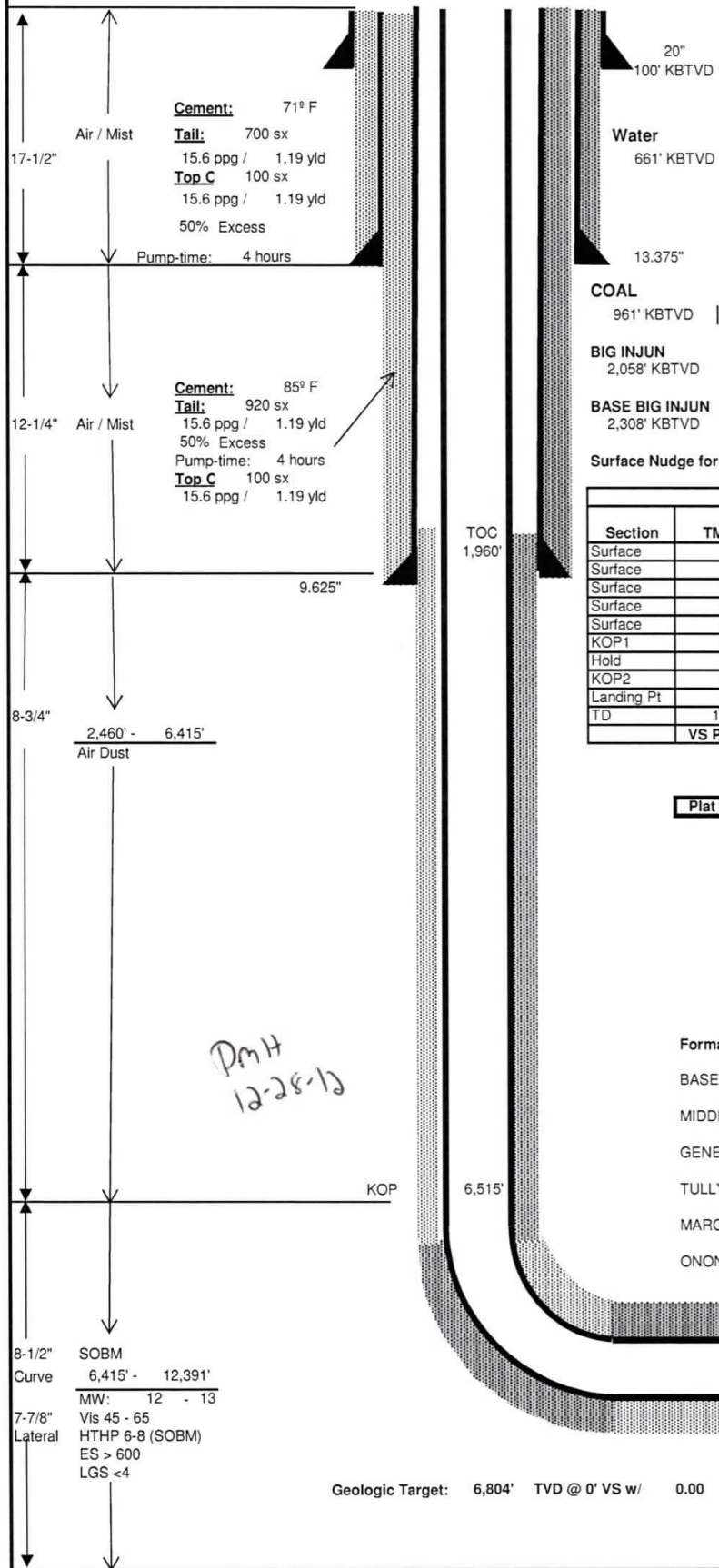
TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield
Conductor	20"	30"	0.25"	2120	15.6 ppg	✓ 1.19/50% Excess
Fresh Water	13 3/8"	17.5"	0.380	2740	15.6 ppg	✓ 1.19/50% Excess
Coal	9 5/8"	12 1/4"	0.395	3950	15.6 ppg	✓ 1.19/50% Excess
Intermediate	7"	8 3/4"	.0317	4360	15.6 ppg	✓ 1.20/15% Excess
Production	5 1/2"	8 3/4"	0.361	12360	15.6 ppg	✓ 1.20/15% Excess
Tubing	2 3/8"	4.778"	0.190			
Liners						

PACKERS

Kind:	10K Arrowset AS1-X		
Sizes:	5 1/2"		
Depths Set:	Approx. 6,197'		

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		Well Name: Fork Ridge MSH 201H	Drilling Rig: N/A
Drilling Engineer: TBD	Formation: Marcellus	Directional Drilling: N/A	Drilling Mud: N/A
Superintendent: N/A	County, State: Marshall, WV	Cement Surface: N/A	Cement Longstrings: N/A
Asset Manager: N/A	Surface Latitude: 39.871443	Surface Longitude: -80.638635	Wellhead: N/A
Geologist: N/A	BH Latitude: 39.884579	BH Longitude: -80.650197	AFE #: N/A
Land: N/A	KB Elevation: 1411'	Ground Elevation: 1391'	



Wellhead Equipment	
Tree Description	Blanking Cap
Tubing Head **	11" x 5M x 7-1/16" 10M
'B' Section	9-5/8" SOW x 11" 5M
'A' Section	

** Space out such that Blanking Cap is no more than 30" above grade.

Casing Detail						
	Size	Wt	Grd	Conn.	From:	To:
Surface	13.375	54.5 #	J-55	STC	0'	761'
Intern	9.625	40 #	J-55	LTC	0'	2,460'
Prod	5.5	20 #	P-110	GBCD	0'	12,391'

Report any water or gas flows. Catch liquid sample if possible.

Casing Design						
	Size	ID	Coil	Burst	Tens	MU torq
Surface	13.375	12.615	1130	2740	514	5140
Intern	9.625	8.835	2570	3950	520	5200
Prod	5.5	4.778	12200	12360	641	8530

Surface Nudge for Anti-Collision purposes.

Directional Drilling Details								
Section	TMD	Inc.	Azimuth	TVD	BUR	DLS	+N-S	+E-W
Surface	0.00'	0.00	0.00	0.00'	0.00	0.00	0.0'	0.0'
Surface	500'	0.00	0.00	500'	0.00	0.00	0.0'	0.0'
Surface	1,000'	0.00	0.00	1,000'	0.00	0.00	0.0'	0.0'
Surface	1,500'	0.00	0.00	1,500'	0.00	0.00	0.0'	0.0'
Surface	2,000'	0.00	0.00	2,000'	0.00	0.00	0.0'	0.0'
KOP1	2,558'	0.00	0.00	2,558'	0.00	0.00	0.0'	0.0'
Hold	3,482'	18.48	246.66	3,466'	2.00	2.00	-58.5'	-135.7'
KOP2	6,515'	18.48	246.66	6,343'	0.00	0.00	-439.4'	-1,018.4'
Landing Pt	7,274'	90.00	339.97	6,804'	9.43	12.00	-43.6'	-1,326.5'
TD	12,391'	90.00	339.97	6,804'	0.00	0.00	4,764.3'	-3,079.3'
VS Plane	339.97						VS Length	5,530.82'

Lateral Length ==> 5,117.50'

Plat Date 11/12/12

Logging Program		
Run	Log Type	Interval
1	TBD	TBD
2	TBD	TBD

Mudlogger operational at Surface

Formation Depths (TVD)	
BASE BIG INJUN	2,308'
MIDDLESEX	6,569'
GENESEO	6,651'
TULLY	6,670'
MARCELLUS	6,791'
ONONDAGA	6,842'

Cement: 123° F
Lead: 1,080 sx
 15.6 ppg / 1.20 yld
Tail: 1,060 sx
 15.6 ppg / 1.20 yld
 15% Excess
 Pump-time: 5 hours

PBHL: 5.5"
TMD: 12,391'
TVD: 6,804'
Inclination: 90.00 deg

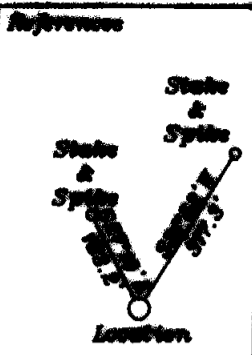
Gyro the 1st well on the pad at KOP. Ensure all Surveys are referenced to Grid North!!

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JAN 4 2013

Drawn by: TBD
Date: 12/13/2012

WV Department of Environmental Protection



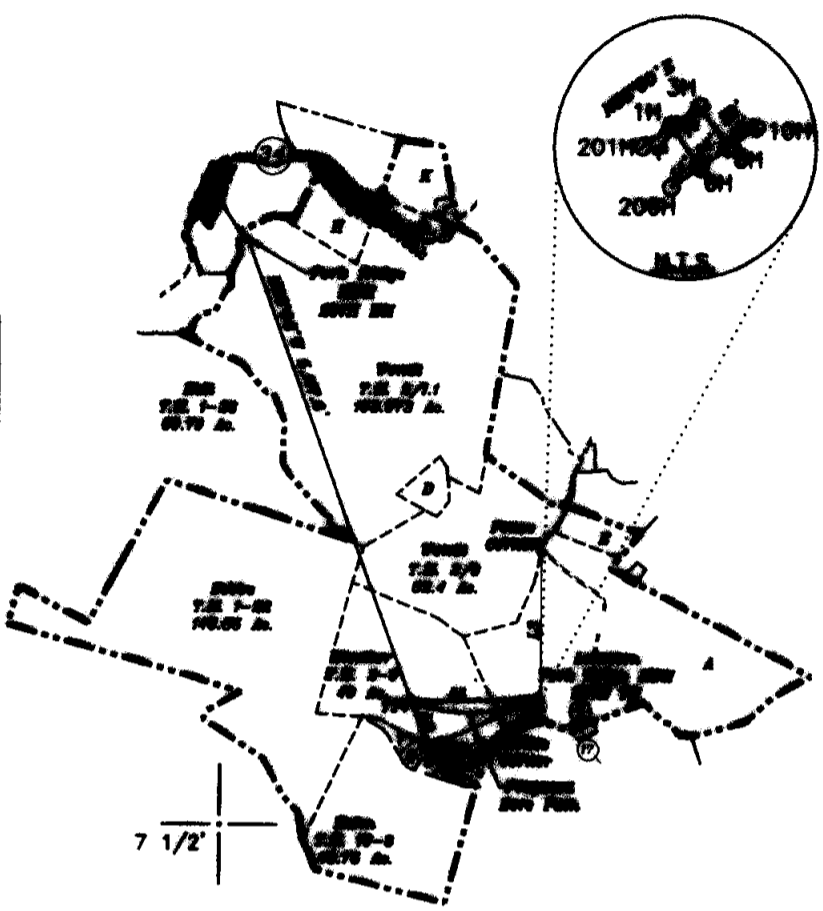
LATITUDE 39-53-30 N (TN)
 LATITUDE 39-55-00 N (DN)

Bottom Hole 7,877'

7 1/2'

- 1- [unclear] [unclear] [unclear] T.E. 2-12 24.07 A.
- 2- [unclear] [unclear] [unclear] A.
- 3- [unclear] [unclear] [unclear] A.
- 4- [unclear] [unclear] [unclear] T.E. 2-12 24.07 A.
- 5- [unclear] [unclear] [unclear] A.
- 6- [unclear] [unclear] [unclear] A.
- 7- [unclear] [unclear] [unclear] A.
- 8- [unclear] [unclear] [unclear] A.
- 9- [unclear] [unclear] [unclear] A.
- 10- [unclear] [unclear] [unclear] A.

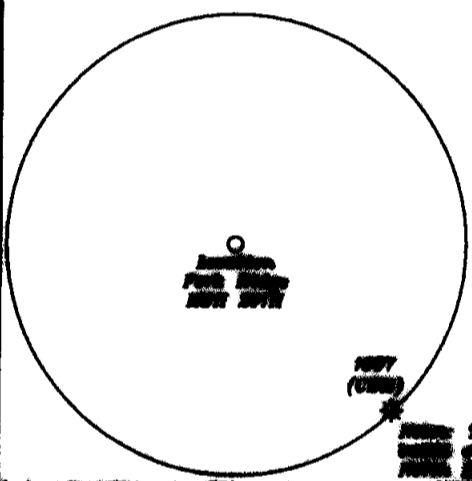
27-30-07145 N, 00-00000 Y 27-30-07145 N, 00-00000 Y 27-30-07145 N, 00-00000 Y	27-30-07145 N, 00-00000 Y 27-30-07145 N, 00-00000 Y 27-30-07145 N, 00-00000 Y
27-30-07145 N, 00-00000 Y 27-30-07145 N, 00-00000 Y 27-30-07145 N, 00-00000 Y	27-30-07145 N, 00-00000 Y 27-30-07145 N, 00-00000 Y 27-30-07145 N, 00-00000 Y
27-30-07145 N, 00-00000 Y 27-30-07145 N, 00-00000 Y 27-30-07145 N, 00-00000 Y	27-30-07145 N, 00-00000 Y 27-30-07145 N, 00-00000 Y 27-30-07145 N, 00-00000 Y



LONGITUDE 80-37-30 W
 Bottom Hole 11,000'

Top Hole 1,247'

NORTH



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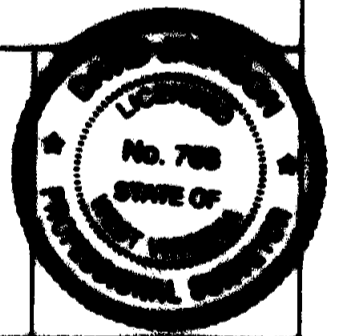
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LOCATED LOCATION OF WELL ON UNITED STATES GEOLOGICAL SURVEY

FILE NO. _____
 DRAWING NO. 1
 SCALE 1" = 2000'
 MINIMUM DEGREE OF ACCURACY 1 IN 2000
 PROVEN SOURCE OF ELEVATION GPS
substantiated well

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAN IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE RULES ISSUED AND ENFORCED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

(SIGNED) [Signature]
 R.P.E. _____ L.L.S. 768

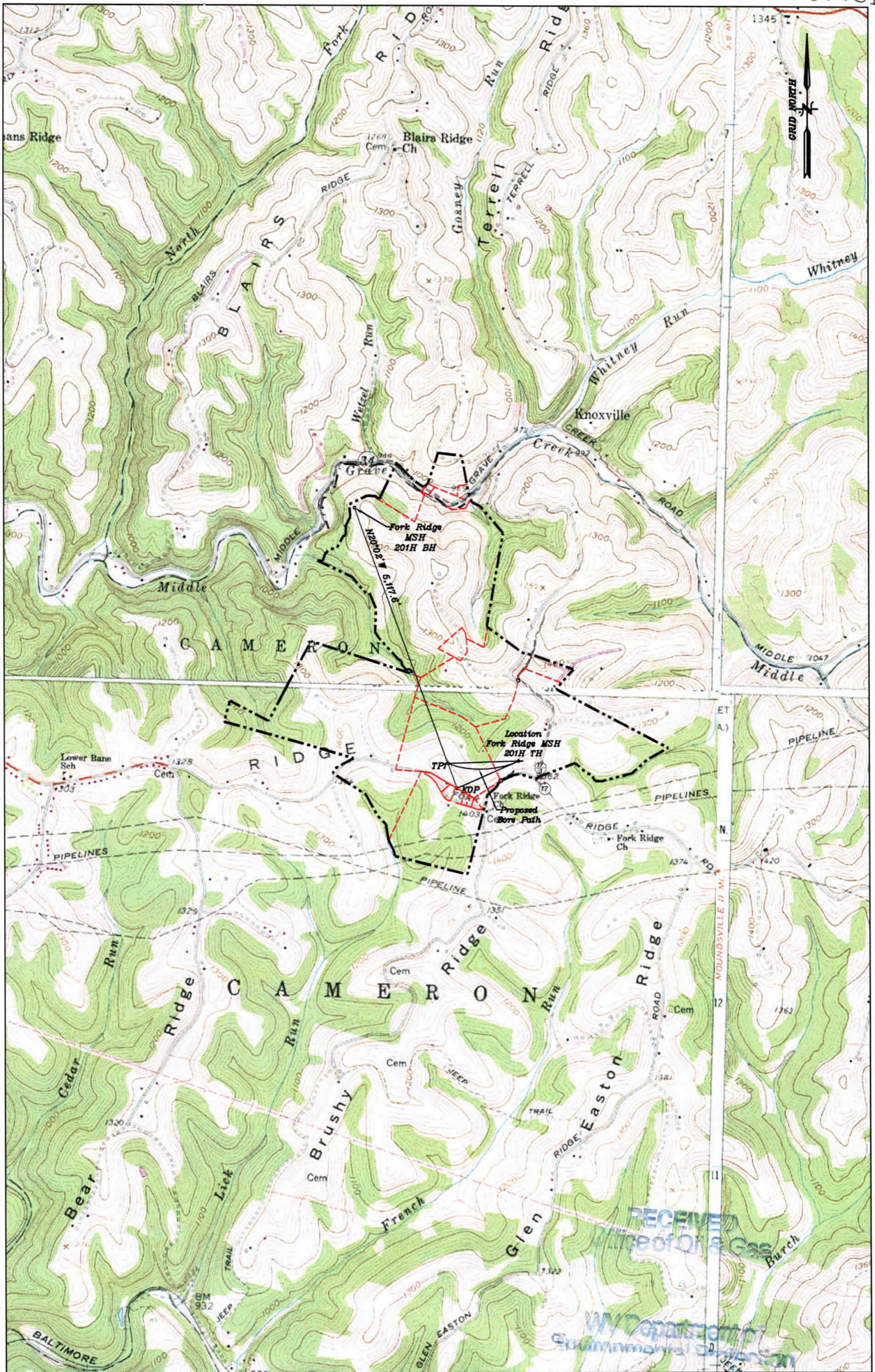


STATE OF WEST VIRGINIA
 Division of Environmental Protection
 OFFICE OF OIL AND GAS

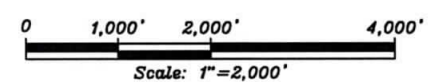
DATE August 18, 2012
 OPERATOR'S WELL NO. 2011024
 API WELL NO. _____

WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___ STATE 47 COUNTY 61 PERMIT 10000000
 (IF "GAS") PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X
 LOCATION: ELEVATION 1500' WATER SHED North Creek
 DISTRICT Greenbank COUNTY Putnam
 QUADRANGLE Greenbank 7 1/2' 100'
 SURFACE OWNER Greenbank Oil Company ACREAGE 2.47
 OIL & GAS ROYALTY OWNER Greenbank Oil Company LEASE ACREAGE 2.47
 LEASE NO. 1-2011-000
 LEASE NO. 1-2011-000
 LEASE NO. _____

PROPOSED WORK: DRILL X CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE X PLUG OFF OLD FORMATION ___ PERFORATE NEW FORMATION X OTHER PHYSICAL CHANGE IN WELL (SPECIFY) _____
 PLUG AND ABANDON ___ CLEAN OUT AND REPLUG ___
 TARGET FORMATION Greenbank ESTIMATED DEPTH 7,877'
 WELL OPERATOR Greenbank Oil Company DESIGNATED AGENT [Name]
 ADDRESS 2011024



Well: Fork Ridge MSH 201H
 Quad: Glen Easton 7 1/2' (TH), Moundsville 7 1/2' (BH)
 District: Cameron
 County: Marshall





Danielle Southall
Regulatory Technician I

January 3, 2013

VIA UPS

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

Re: Proposed New Well Fork Ridge MSH 201H API #47-051-01606

Dear Ms. Cooper:

Enclosed please find a modification request for the above captioned well. We would like to shorten the lateral. This well is situated on the Fork Ridge property, in Cameron District, Marshall County, West Virginia.

If you have any questions or require additional information, please contact me at 304-517-1416 ext. 86024.

Sincerely,

Chesapeake Appalachia, LLC


Dee Southall

Enclosure(s)

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Environmental Protection

**INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
Chapter 22, Article 6A, Section 5(a)(5)
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)**

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

- (1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;
- (2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
Sarah Davis F/K/A Sarah Crow	Chesapeake Appalachia, LLC	18%	722/153
Elizabeth Padden	Chesapeake Appalachia, LLC	14%	685/557
John Padden	Chesapeake Appalachia, LLC	14%	685/558
Amy Toups F/K/A Amy Padden	Chesapeake Appalachia, LLC	14%	685/559
Robert Shutler, Jr.	Chesapeake Appalachia, LLC	18%	718/458

**Acknowledgement of Possible Permitting/Approval
In Addition to the Office of Oil and Gas**

The permit applicant for the proposed well work addressed in this application hereby acknowledges the possibility of the need for permits and/or approvals from local, state, or federal entities in addition to the DEP, Office of Oil and Gas, including but not limited to the following:

- WV Division of Water and Waste Management
- WV Division of Natural Resources WV Division of Highways
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- County Floodplain Coordinator

The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides, replaces, or nullifies the need for other permits/approvals that may be necessary and further affirms that all needed permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

Well Operator: Chesapeake Appalachia, LLC
 By: Danielle Southall
 Its: Regulatory Tech I

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Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
David Crow	Chesapeake Appalachia, LLC	18%	722/157
Margaret Hopkins	Chesapeake Appalachia, LLC	18%	726/230
Terry & Catherine Dobbs	Chesapeake Appalachia, LLC	14%	691/650
James & Deborah Wendt	Chesapeake Appalachia, LLC	14%	688/623
Linda Phillips	Chesapeake Appalachia, LLC	15%	697/75

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Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
Aaron & Janna Parry	Chevron to Chesapeake Appalachia, LLC	18%	668/489
James & Deborah Wendt	Chesapeake Appalachia, LLC	14%	688/620
Nancy Lantz & Jeffrey Whipkey	Chesapeake Appalachia, LLC	16%	700/205

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