



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

March 06, 2015

CNX GAS COMPANY LLC
POST OFFICE BOX 1248
JANE LEW, WV 26378

Re: Permit Modification Approval for API Number 3305815 , Well #: KST5BHS

Extend 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,

Gene Smith
Assistant Chief of Permitting
Office of Oil and Gas

47 03 305815



Carolinda Flanagan
Permitting Analyst
P.O. Box 1248
Jane Lew, WV 26378
(304) 884-2057



February 24, 2015

West Virginia Department of Environmental Protection
Office of Oil & Gas
Attn: Laura Adkins
601 57th Street, SE
Charleston, WV 25304-2345

RE: KST5BHS - API# 47-033-05815 (Modification to Extend Lateral – extending 970.46' more)

Dear Laura,

Enclosed, please find a modification for the KST5BHS to extend the lateral due to additional leasing being obtained. I have attached an updated casing plan, mylar plat, and lease breakdown. The lateral has been extended 970.46' as shown on the mylar plat into lease C and G.

Should you need any further information, please contact me at (304) 884-2057 or by email at carolindaflanagan@consolenergy.com. Thank you!

Sincerely,


Carolinda Flanagan

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03/06/2015

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

1) Well Operator: CNX Gas Company LLC 494458046 Harrison Union West Milford
Operator ID County District Quadrangle

2) Operator's Well Number: KST5BHS Well Pad Name: KST5HS

3) Farm Name/Surface Owner: James Ivan McDonald Public Road Access: Co. Rt. 19/18

4) Elevation, current ground: 1153' Elevation, proposed post-construction: 1136'

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

Other _____

(b) If Gas Shallow X Deep _____

Horizontal X

6) Existing Pad: Yes or No NO

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):
Target - Marcellus, Depth - 6975', Thickness - 95', Pressure - 4500#

8) Proposed Total Vertical Depth: 7170'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 18523

11) Proposed Horizontal Leg Length: 9761

12) Approximate Fresh Water Strata Depths: 40', 811'

13) Method to Determine Fresh Water Depths: Offset Well Information

14) Approximate Saltwater Depths: 1720', 2345'

15) Approximate Coal Seam Depths: 349', 851'

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

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes _____ No X

(a) If Yes, provide Mine Info: Name: _____
Depth: _____
Seam: _____
Owner: _____

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4703305815

WW-6B
(10/14)

API NO. 47- 33 - 05815
OPERATOR WELL NO. KST5BHS
Well Pad Name: KST5HS

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	N	J-55	94	100	100	112.9/ CTS
Fresh Water	13.375	N	J-55	54.5	975	925	481.8/ CTS
Coal							
Intermediate	9.675	N	J-55	36	2500	2450	575.4/ CTS
Production	5.5	N	P-110	20	18523	18473	3082.2
Tubing	2.375	N	J-55	4.7	7000	7000	
Liners							

<u>TYPE</u>	<u>Size (in)</u>	<u>Wellbore Diameter (in)</u>	<u>Wall Thickness (in)</u>	<u>Burst Pressure (psi)</u>	<u>Max. Associated Surface Pressure (psi)</u>	<u>Cement Type</u>	<u>Cement Yield (cu. ft./k)</u>
Conductor	20	26	0.438	2110	0	Class A	1.18
Fresh Water	13.375	17.5	0.380	2730	0	Class A	1.39
Coal							
Intermediate	9.675	12.25	0.352	3520	1417.1	Class A	1.18
Production	5.5	8.75	0.361	14360	6478.7	Class A	1.26
Tubing	2.375	5.5 csg	0.190	7700			
Liners							

PACKERS

Kind:	None		
Sizes:	None		
Depths Set:	None		

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WW-6B
(10/14)

API NO. 47- 33 - 05815
OPERATOR WELL NO. KST5BHS
Well Pad Name: KST5HS

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

Drill and stimulate new horizontal Marcellus well. Well to be drilled to a TMD of 18523'. Well to be drilled to a TVD of 7170', formation at TVD - Onondaga. Well will be plugged back to an approximate depth of 6500' (approximate due to exact kick off point being unknown). Plugging back will be done using the displacement method and Class A Type cement. A solid cement plug will be set from TD to KOP. If an unexpected void is encountered, plan will be to set casing at a minimum of 30' past void and cement to surface with approved Class A type cement. There will not be any production, perforation, or stimulation of any formations below the target formation.

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

The stimulation will be 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.
Max Pressure - 9500 psi. Max Rate - 100 bbl/min.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 16.3

22) Area to be disturbed for well pad only, less access road (acres): 11.5

23) Describe centralizer placement for each casing string:

Conductor - No centralizers used.
Surface - Rigid Bow spring centralizers on first joint then every third joint to surface.
Intermediate - Rigid Bow spring centralizers one on the first two joints and every third joint to surface.
Production - Rigid bow spring centralizer on first joint then every casing joint (free floating) through the lateral and every other joint in the curve. (Note: cementing the 5 1/2" casing completely in open hole lateral and curve.)

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

Conductor - 2% CaCl2.
Surface - 3% CaCl2 & 1#/sk Celloflake LCM.
Intermediate - 3% CaCl2 & 0.5#/sk Celloflake LCM.
Production - 2.6% Cement extender, 0.7% Fluid loss additive, 0.5% High Temperature Retarder, 0.2% Friction Reducer

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25) Proposed borehole conditioning procedures:

Conductor - The hole is auger drilled w/ air and casing ran in air.
Surface - The hole is drilled w/ air and casing is ran in air. Once casing is on bottom, the casing string will be circulated w/ fresh water prior to cementing.
Intermediate - The hole is drilled w/ air and casing is ran in air. (Note: Drilling soap may be utilized if the hole gets wet/damp during the drilling of all air holes with the exception of the conductor).
Production - The hole will be drilled with synthetic oil base mud. At TD the hole is circulated at optimum pump rate until shale shaker deem the hole is clean. Once casing is ran the hole is circulated for a minimum of one hole volume prior to pumping cement.

*Note: Attach additional sheets as needed.

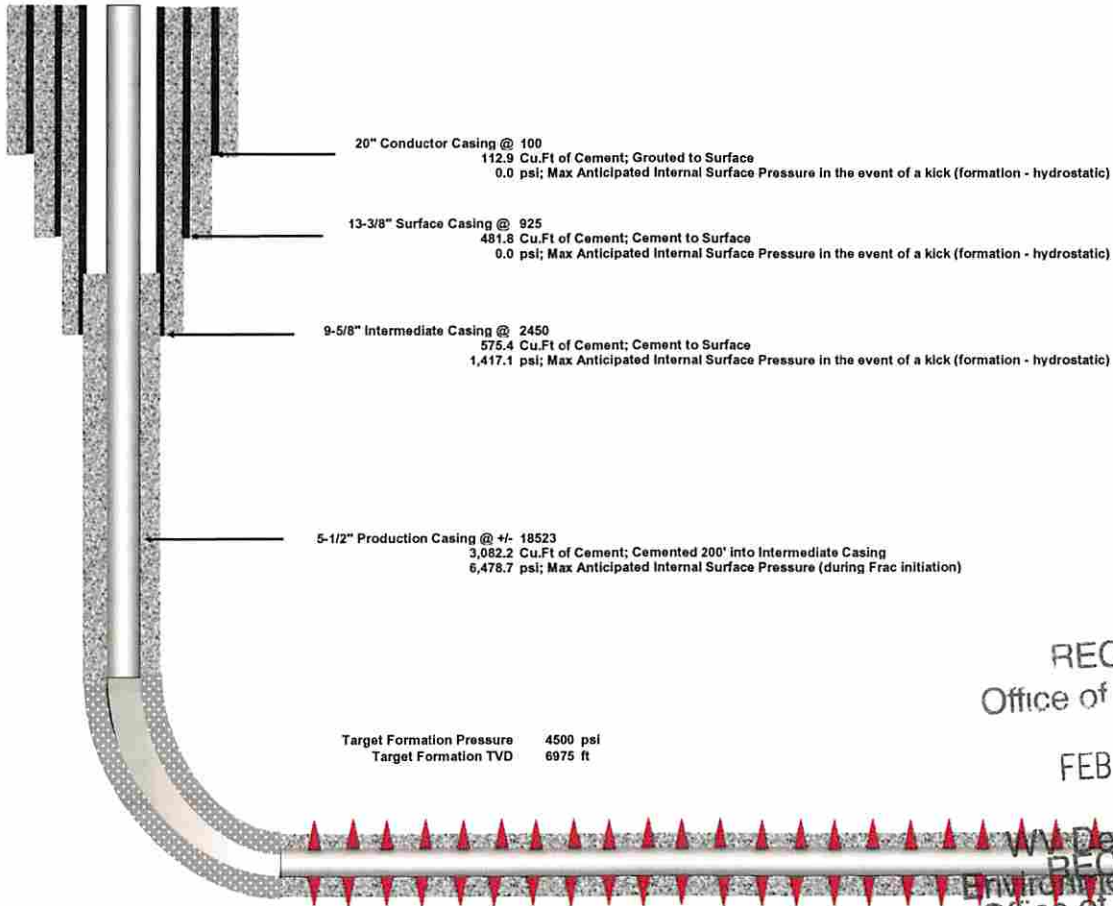
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KST5BHS

Casing Schematic

SCHEMATIC NOT TO SCALE



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Well is located on topo map 13,713 feet south of Latitude: 39° 12' 30"

Well is located on topo map 4,166 feet west of Longitude: 80° 27' 30"

NOTES:

1. There are no water wells or developed springs within 250' of proposed well.
2. There are no existing buildings within 625' of proposed well.
3. Proposed well is greater than 100' from perennial stream, wetland, pond, reservoir or lake.
4. There are no native trout streams within 300' of proposed well.
5. Proposed well is greater than 1000' from surface/groundwater intake or public water supply.
6. It is not the purpose or intention of this plat to represent surveyed locations of the surface or mineral parcels depicted hereon. The location of the boundary lines, as shown, are based on record deed descriptions, field evidence found and/or tax map position, unless otherwise noted.

PARCEL	LESSOR
A	R. C. & M. B. McDONALD
B	A. M. & LYDIA D. McDONALD
C	JAMES S. & SUSANNA LAW
D	GUINN & JANE MINTER
E	W. R. & L. E. NEELY
F	GUINN & JANE MINTER
G	WILLIAM E. & HARRIET BEEGHLEY

LINE	BEARING	DISTANCE
R1	N 72°03'08" W	145.44'
R2	N 20°57'58" W	177.82'
R3	N 44°13'14" E	219.12'
R4	N 19°17'02" W	1302.23'
R5	N 07°11'39" W	2254.37'
R6	N 16°04'49" E	2309.45'

LEGEND

- TOPO MAP POINT
- WELL
- ALL ACRE POINTS UNLESS OTHERWISE NOTED.
- WATER SOURCE
- MINERAL TRACT BOUNDARY
- LESSORS
- PARCEL LINES
- LEASE BOUNDARY
- WELL REFERENCE
- PROPOSED HORIZONTAL WELL
- ROAD
- STREAM CENTER LINE
- WELLS WITHIN 2400'**
- EXISTING WELLS
- PLUGGED WELLS

SURFACE HOLE LOCATION (SHL)
 UTM 17-NAD83
 N:4335850.15
 E:545521.82
 NAD27, WV NORTH
 N:245738.53
 E:1724077.98
 LAT/LON DATUM-NAD83
 LAT:39.170685
 LON:-80.473027

APPROX. LANDING POINT
 UTM 17-NAD83
 N:4335545.37
 E:545216.52
 NAD27, WV NORTH
 N:244755.07
 E:1723059.48
 LAT/LON DATUM-NAD83
 LAT:39.167954
 LON:-80.476581

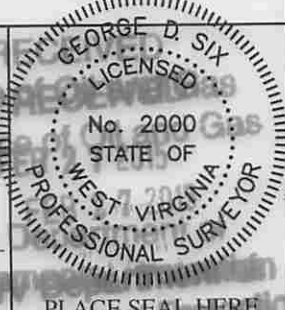
BOTTOM HOLE LOCATION (BHL)
 UTM 17-NAD83
 N:4332741.15
 E:546207.42
 NAD27, WV NORTH
 N:235498.803
 E:1726157.896
 LAT/LON DATUM-NAD83
 LAT:39.142633
 LON:-80.465303

Blue Mountain Inc.
 11023 MASON DIXON HIGHWAY
 BURTON, WV 26562
 PHONE: (304) 662-6486

FILE #: KST5BHS REV. 7
 DRAWING #: KST5BHS REV. 7
 SCALE: 1" = 2000'
 MINIMUM DEGREE OF ACCURACY: 1/2500
 PROVEN SOURCE OF ELEVATION: U.S.G.S. MONUMENT THOMAS 1498.81'

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 DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed: *George D. Six*
 R.P.E.: _____ L.L.S.: P.S. No. 2000



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS WVDEP
 OFFICE OF OIL & GAS
 601 57TH STREET
 CHARLESTON, WV 25304



DATE: FEBRUARY 20, 2015
 OPERATOR'S WELL #: KST5BHS
 API WELL #: 47 33
 STATE COUNTY PERMIT

Well Type: Oil Waste Disposal Production Deep
 Gas Liquid Injection Storage Shallow

WATERSHED: MIDDLE WEST FORK CREEK ELEVATION: 1154.29'±
 COUNTY/DISTRICT: HARRISON / UNION QUADRANGLE: WEST MILFORD, WV 7.5'
 SURFACE OWNER: JAMES IVAN McDONALD ACREAGE: 176.000±
 OIL & GAS ROYALTY OWNER: R. C. McDONALD & M. B. McDONALD; A. M. McDONALD & LYDIA D. McDONALD ACREAGE: 805.050±

DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
 PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG & ABANDON
 CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY): _____

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: TVD: 7,170'± TMD: 18,523'±
 WELL OPERATOR CNX GAS COMPANY LLC DESIGNATED AGENT MATTHEW IMRICH
 Address P.O. BOX 1248 Address P.O. BOX 1248
 City JANE LEW State WV Zip Code 26378 City JANE LEW State WV Zip Code 26378

03/06/2015

Attachment - Form WW-6A-1 for KST5BHS:

<u>Tract ID</u>	<u>Lease</u>	<u>Grantor, Lessor, etc</u>	<u>Grantee, Lessee, etc</u>	<u>Royalty</u>	<u>Book/Page</u>
✓ 2, 8, 9	A FK026533	R.C.McDonald and M.B. McDonald; A.M. McDonald and Lydia D. McDonald Hope Natural Gas Company Consolidated Gas Supply Corporation Consolidated Gas Transmission Corporation CNG Transmission Corporation Dominion Transmission, Inc	Hope Natural Gas Company Consolidated Gas Supply Corporation Consolidated Gas Transmission Corporation CNG Transmission Corporation Dominion Transmission, Inc CNX Gas Company, LLC	1/8 Merger/name change Assignment Merger/name change Merger/name change Farmout Agreement	237/94 903/179 1136/250 51/795 58/362 1522/33
✓ 19	B FK052937	James S. Law and Susanna Law Reserve Gas Company Hope Natural Gas Company Consolidated Gas Supply Corporation Consolidated Gas Transmission Corporation CNG Transmission Corporation Dominion Transmission, Inc	Reserve Gas Company Hope Natural Gas Company Consolidated Gas Supply Corporation Consolidated Gas Transmission Corporation CNG Transmission Corporation Dominion Transmission, Inc CNX Gas Company, LLC	1/8 Merger/Name Change Merger/name change Assignment Merger/name change Merger/name change Farmout Agreement	234/201 Sec. of State Website 903/179 1136/250 51/795 58/362 1522/33
✓ 31	C FK052896 and FK108080	Guinn Minter and Jane Minter Reserve Gas Company Hope Natural Gas Company Consolidated Gas Supply Corporation Consolidated Gas Transmission Corporation CNG Transmission Corporation Dominion Transmission, Inc	Reserve Gas Company Hope Natural Gas Company Consolidated Gas Supply Corporation Consolidated Gas Transmission Corporation CNG Transmission Corporation Dominion Transmission, Inc CNX Gas Company, LLC	1/8 Fee Conveyance Merger/name change Assignment Merger/name change Merger/name change Farmout Agreement	174/203 508/573 903/179 1136/250 51/795 58/362 1522/33
✓ 41, 42	E FK052898	W. R. Neely and L. E. Neely Reserve Gas Company Hope Natural Gas Company Consolidated Gas Supply Corporation Consolidated Gas Transmission Corporation CNG Transmission Corporation Dominion Transmission, Inc	Reserve Gas Company Hope Natural Gas Company Consolidated Gas Supply Corporation Consolidated Gas Transmission Corporation CNG Transmission Corporation Dominion Transmission, Inc CNX Gas Company, LLC	1/8 Fee Conveyance Merger/name change Assignment Merger/name change Merger/name change Farmout Agreement	174/205 508/573 903/179 1136/250 51/795 58/362 1522/33
✓ 47	F FK052752	Guinn Minter and Jane Minter Edward G. Smith and Jessie B. Smith Reserve Gas Company Hope Natural Gas Company Consolidated Gas Supply Corporation Consolidated Gas Transmission Corporation CNG Transmission Corporation Dominion Transmission, Inc Dominion Transmission, Inc	Reserve Gas Company Reserve Gas Company Hope Natural Gas Company Consolidated Gas Supply Corporation Consolidated Gas Transmission Corporation CNG Transmission Corporation Dominion Transmission, Inc CNX Gas Company, LLC CNX Gas Company, LLC	1/8 Fee Conveyance Fee Conveyance Merger/name change Assignment Merger/name change Merger/name change Farmout Agreement Amendment to Farmout Agreement	174/203 77/264 508/573 903/179 1136/250 51/795 58/362 1522/33 1524/491
✓ 46	C FK052896 and FK108080	Guinn Minter and Jane Minter Reserve Gas Company Hope Natural Gas Company Consolidated Gas Supply Corporation Consolidated Gas Transmission Corporation CNG Transmission Corporation Dominion Transmission, Inc	Reserve Gas Company Hope Natural Gas Company Consolidated Gas Supply Corporation Consolidated Gas Transmission Corporation CNG Transmission Corporation Dominion Transmission, Inc CNX Gas Company, LLC	1/8 Fee Conveyance Merger/name change Assignment Merger/name change Merger/name change Farmout Agreement	174/203 508/573 903/179 1136/250 51/795 58/362 1522/33
✓ 48	G FK053258	William E. and Harriet Beeghley Reserve Gas Company Hope Natural Gas Company Consolidated Gas Supply Corporation Consolidated Gas Transmission Corporation CNG Transmission Corporation Dominion Transmission, Inc Consol Energy Holdings LLC	Reserve Gas Company Hope Natural Gas Company Consolidated Gas Supply Corporation Consolidated Gas Transmission Corporation CNG Transmission Corporation Dominion Transmission, Inc Consol Energy Holdings LLC CNX Gas Company, LLC	1/8 Fee Conveyance Merger/name change Assignment Merger/name change Merger/name change Assignment Assignment	68/302 155/202 294/89 425/127 651/318 651/318 651/318

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