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west virginia department of environmental protection

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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

February 09, 2015

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

Re: Permit Modification Approval for API Number 103251 , Well #: PHL10AHS

**Extended 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 00 103251 MOD

Kelly Eddy  
Permitting Supervisor  
P.O. Box 1248  
Jane Lew, WV 26378  
(304) 884-2131



April 18, 2014

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

**RE: PHL10AHS-CHS & PHL10FHS (Permit Modifications)**

Dear Mrs. Cooper,

Enclosed, please find permit modifications for the following wells:

PHL10AHS - API# 47-001-03251  
PHL10BHS - API# 47-001-03252  
PHL10CHS - API# 47-001-03253  
PHL10FHS - API# 47-001-03291

Please note, we have extended the laterals, but have stayed within the same lease on each well listed. I have enclosed an updated casing plan for the modifications for your review.

Should you need any further information, please contact me at (304) 884-2131 or by email at [kellyeddy@consolenergy.com](mailto:kellyeddy@consolenergy.com). Thank you!

Sincerely,

Kelly Eddy  
Permitting Supervisor

RECEIVED  
Office of Oil and Gas

APR 21 2014

WV Department of  
Environmental Protection

02/13/2015

WW-6B  
(9/13)

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 Barbour Pleasant Philippi  
Operator ID County District Quadrangle

2) Operator's Well Number: PHL10AHS Well Pad Name: PHL10HS

3) Farm Name/Surface Owner: Mary Lou Watson Public Road Access: Co. Rt. 6

4) Elevation, current ground: 1619' Elevation, proposed post-construction: 1603'

5) Well Type (a) Gas  Oil  Underground Storage

Other \_\_\_\_\_

(b) If Gas Shallow  Deep \_\_\_\_\_

Horizontal  \_\_\_\_\_

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):  
Target - Marcellus, Depth - 7850', Thickness - 90', Pressure - 4000#

8) Proposed Total Vertical Depth: 7850'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 14223'

11) Proposed Horizontal Leg Length: 3373'

12) Approximate Fresh Water Strata Depths: 305', 575'

13) Method to Determine Fresh Water Depths: Offset Well

14) Approximate Saltwater Depths: 1800'

15) Approximate Coal Seam Depths: 355', 425', 575'

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

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

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WW-6B  
(9/13)

18)

**CASING AND TUBING PROGRAM**

<u>TYPE</u>	<u>Size</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft. (lb/ft)</u>	<u>FOOTAGE: For Drilling</u>	<u>INTERVALS: Left in Well</u>	<u>CEMENT: Fill-up (Cu. Ft.)</u>
Conductor	20"	N	J-55	94#	100'	100'	Grout to surface w/ Class A type cement
Fresh Water	13 3/8"	N	J-55	54.5#	625'	625'	CTS w/ Class A Type Cement
Coal							CTS w/ Class A Type Cement
Intermediate	9 5/8"	N	J-55	36#	2000'	2000'	CTS w/ Class A Type Cement
Production	5 1/2"	N	P-110	20#	14223'	14223'	2200 cu. ft. w/ 50/50 POZ Lead & Class A
Tubing	2 3/8"	N	J-55	4.7#	7790'	7790'	
Liners							

*Kenneth L. Reynolds 4-15-13*

<u>TYPE</u>	<u>Size</u>	<u>Wellbore Diameter</u>	<u>Wall Thickness</u>	<u>Burst Pressure</u>	<u>Cement Type</u>	<u>Cement Yield (cu. ft./k)</u>
Conductor	20"	26"	0.438	2110	Class A Type	1.18
Fresh Water	13 3/8"	17 1/2"	0.380	2730	Class A Type	1.39
Coal						
Intermediate	9 5/8"	12 3/8"	0.352	3520	Class A Type	1.18
Production	5 1/2"	8 3/4" & 8 1/2"	0.361	12640	Class A Type	1.26
Tubing	2 3/8"	5 1/2" Csg	0.190	7700	.....	.....
Liners						

**PACKERS**

Kind:	None			
Sizes:	None			
Depths Set:	None			

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WW-6B  
(9/13)

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 14223'. Well to be drilled to a TVD of 7850', formation at TVD - Marcellus. Well will be plugged back to an approximate depth of 6800' (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): 17.0 Acres

22) Area to be disturbed for well pad only, less access road (acres): 14.0 Acres

23) Describe centralizer placement for each casing string:

Conductor - No centralizers used. Fresh Water & Coal - Bow spring centralizers on first joint then every fourth joint to 100 feet from surface. Intermediate - Bow spring centralizers one on the first two joints and every fourth joint until inside surface casing. Production - Rigid bow spring centralizer on first joint then every 2 casing joints (free floating) through the lateral and 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% CaCl<sub>2</sub>. Fresh Water/Coal - 2% CaCl<sub>2</sub>. Intermediate - 2% CaCl<sub>2</sub>. Production - 2.6% Cement extender, 0.7% Fluid loss additive, 0.5% High Temperature Retarder, 0.2% Friction Reducer

25) Proposed borehole conditioning procedures:

Conductor - The hole is drilled w/ air and casing ran in air. Apart from insuring the hole is clean via air circulation at TD, there are no other conditioning procedures. Fresh Water/Coal - The hole is drilled w/ air and casing is ran in air. Once casing is on bottom, the casing shoe will be cleared with fresh water and gel prior to cementing. Intermediate - The hole is drilled w/ air and casing is ran in air. Once casing is on bottom, the casing shoe will be cleared with fresh water and gel prior to cementing. (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 and once at TD the hole is circulated at a drilling pump rate until 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.

WELL REFERENCES:

S12-28-14E, 269.29' TO NAIL IN 12" CHERRY  
N72-23-11E, 268.08' TO NAIL IN 9" W. ASH

NAD 83 UTM ZONE 17 COOR. IN METERS:

PHL10AHS = 4,340,931.13 m 583,170.43 m  
LAND PT. = 4,340,918.88 m 583,776.14 m  
BOT. HOLE = 4,340,032.73 m 584,296.66 m

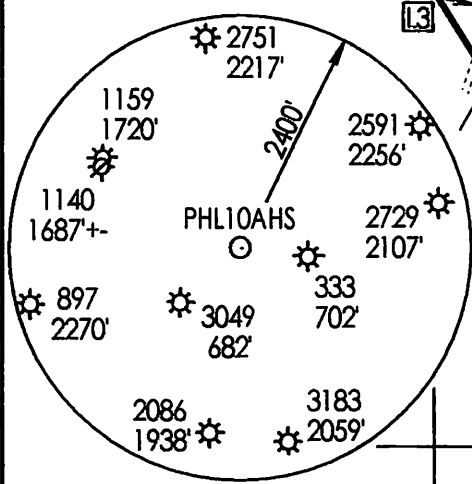
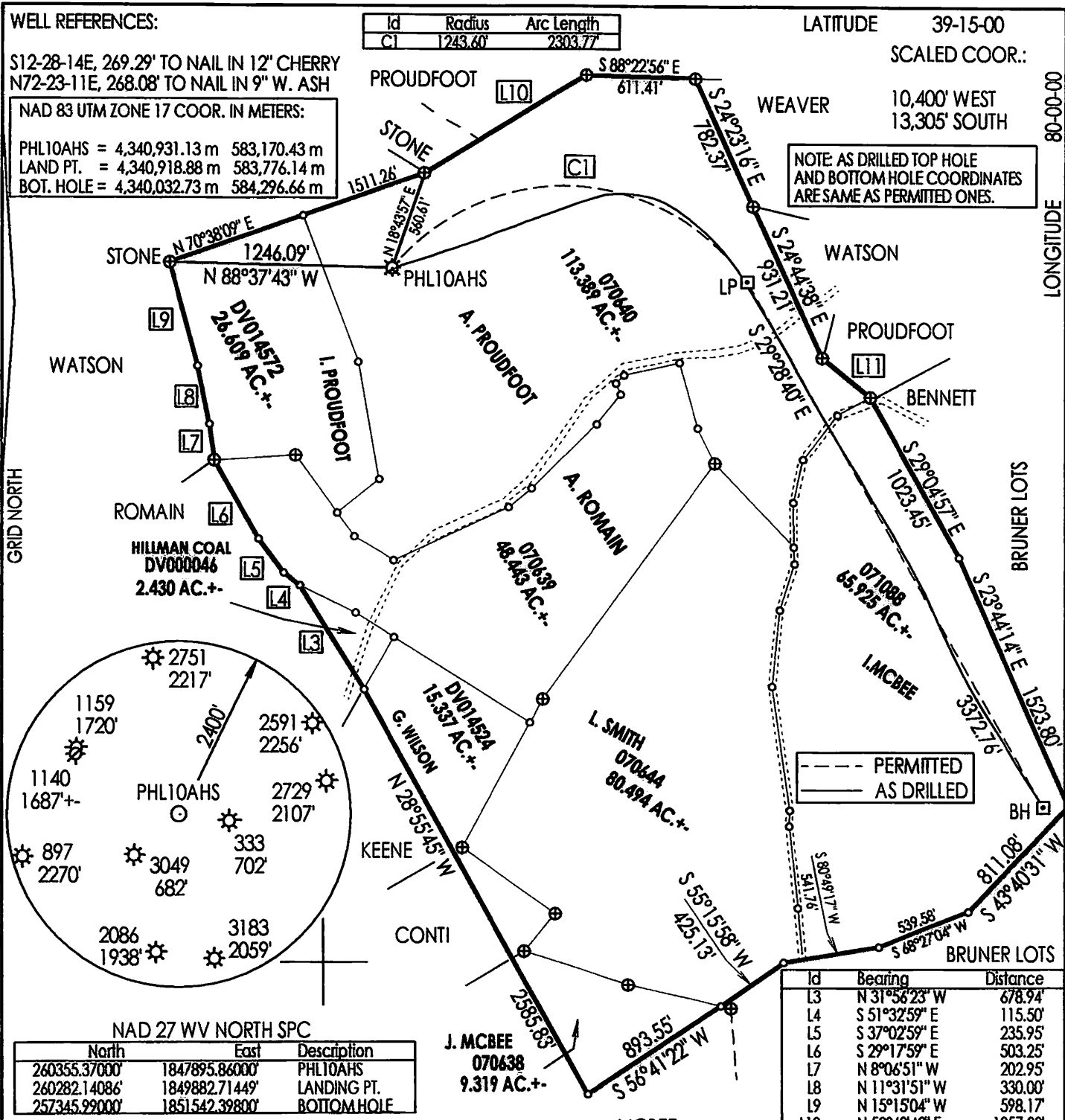
Id	Radius	Arc Length
C1	1243.60'	2303.77'

LATITUDE 39-15-00

SCALED COOR.:

WEAVER 10,400' WEST  
13,305' SOUTH

NOTE: AS DRILLED TOP HOLE  
AND BOTTOM HOLE COORDINATES  
ARE SAME AS PERMITTED ONES.



NAD 27 WV NORTH SPC

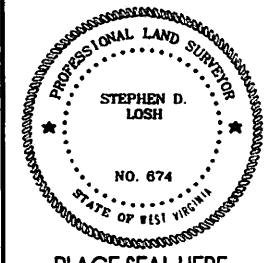
North	East	Description
260355.37000'	1847895.86000'	PHL10AHS
260282.14086'	1849882.71449'	LANDING PT.
257345.99000'	1851542.39800'	BOTTOM HOLE

Id	Bearing	Distance
L3	N 31°56'23" W	678.94'
L4	S 51°32'59" E	115.50'
L5	S 37°02'59" E	235.95'
L6	S 29°17'59" E	503.25'
L7	N 8°06'51" W	202.95'
L8	N 11°31'51" W	330.00'
L9	N 15°15'04" W	598.17'
L10	N 58°49'42" E	1057.23'
L11	S 50°48'31" E	346.55'

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

FILE NUMBER: \_\_\_\_\_  
DRAWING NUMBER: CGCPHL10AASDRIL.PCS  
SCALE: 1" = 800'  
MINIMUM DEGREE OF ACCURACY: SUBMETER  
PROVEN SOURCE OF ELEVATION: DGPS SURVEY  
SUBMETER SYSTEM

I THE UNDERSIGNED, HEREBY STATE 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 ENERGY.  
  
(SIGNED) \_\_\_\_\_  
STEPHEN D. LOSH, P.S. #674



STATE OF WEST VIRGINIA  
DIVISION OF ENVIRONMENTAL PROTECTION  
OFFICE OF OIL AND GAS  
#10 McJUNKIN ROAD  
NITRO, WV 25143-2506

LAND SURVEYING SERVICES  
21 CEDAR LANE, BRIDGEPORT, WV 26330  
PHONE: 304-842-2018 OR 842-5762

DATE: SEPTEMBER 23, 2014  
OPERATORS WELL NO.: PHL10AHS  
API WELL NO.: (AS DRILLED)  
47 - 001 - 03251 MOD  
STATE COUNTY PERMIT

WELL TYPE: OIL \_\_\_ GAS  LIQUID INJECTION \_\_\_ WASTE DISPOSAL \_\_\_ CBM \_\_\_  
(IF "GAS") PRODUCTION  STORAGE \_\_\_ DEEP \_\_\_ SHALLOW   
LOCATION: ELEVATION 1618.50' (493.32 m) WATERSHED TAYLOR DRAIN  
DISTRICT PLEASANT COUNTY BARBOUR  
QUADRANGLE PHILIPPI LEASE NUMBER SEE ABOVE  
SURFACE OWNER MARY LOU WATSON ACREAGE 103.00 (15-30)  
OIL & GAS ROYALTY OWNER A. PROUDFOOT, ET. AL. UNIT LEASE ACREAGE 1024.76  
PROPOSED WORK: DRILL  CONVERT \_\_\_ DRILL DEEPER \_\_\_ REDRILL \_\_\_ FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION \_\_\_  
PERFORATE NEW FORMATION \_\_\_ OTHER PHYSICAL CHANGE (SPECIFY) HORIZONTAL  
TARGET FORMATION MARCELLUS ESTIMATED DEPTH TVD 7850' / TMD 14223'  
WELL OPERATOR CNX GAS COMPANY LLC DESIGNATED AGENT JEREMY JONES  
ADDRESS P. O. BOX 1248 JANE LEW, WV 26378 ADDRESS P. O. BOX 1248 JANE LEW, WV 26378

LONGITUDE 80-00-00  
COUNTY NAME BARBOUR  
PERMIT 02/13/2015