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

October 22, 2013

CNX GAS COMPANY LLC
ONE ENERGY DRIVE
JANE LEW, WV 26378

Re: Permit Modification Approval for API Number 103287 , Well #: AUD3DHS
Extend Intermediate Casing, Conductor and Lateral Bore

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

10/25/2013

MOD 47-001-03287

WW - 6B
(3/13)

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	Philippi	Audra
		Operator ID	County	District	Quadrangle

2) Operator's Well Number: AUD3DHS Well Pad Name: AUD3HS

3 Elevation, current ground: 1554' Elevation, proposed post-construction: 1536'

4) Well Type: (a) Gas ■ Oil ■ Underground Storage

Other

(b) If Gas: Shallow ■ Deep

Horizontal ■

5) Existing Pad? Yes or No: NO

6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):

Formation - Marcellus, Depth - 7925', Thickness - 90', Pressure - 4000#

7) Proposed Total Vertical Depth: 7925'

8) Formation at Total Vertical Depth: Marcellus

9) Proposed Total Measured Depth: 19925'

10) Approximate Fresh Water Strata Depths: 330', 370'

11) Method to Determine Fresh Water Depth: Offset Wells

12) Approximate Saltwater Depths: None Anticipated

13) Approximate Coal Seam Depths: 270', 410', 450'

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

15) Does proposed well location contain coal seams directly overlying or adjacent to an active mine? If so, indicate name and depth of mine: No

16) Describe proposed well work: Drill & stimulate new horizontal Marcellus well. Well to be drilled to a TMD of 19925'. Well to be drilled to a TVD of 7925', formation @ TVD - Marcellus. Well will be plugged back to an approximate depth of 7200' (approximate due to exact Kick of 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. Well bore will not be drilled any deeper than 100' into the Onondaga Group, nor will there be any production, perforation, or stimulation of any formations below the target formation.

17) Describe fracturing/stimulating methods in detail:

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.

18) Total area to be disturbed, including roads, stockpile area, pits, etc, (acres): 16.2 Acres

19) Area to be disturbed for well pad only, less access road (acres): 8.42 Acres

Received
OCT 16 2013
Office of Oil and Gas
WV Dept. of Environmental Protection

10/25/2013

WW - 6B
(3/13)

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"	N	L.S.	81.3#	79	79	Grout to surface
Fresh Water	13 3/8"	N	J-55	54.5#	500	500	CTS w/ approved Class A Type Cement
Coal					Bryan Harris 8-14-13		
Intermediate	9 5/8"	N	J-55	36#	4180	4180	CTS w/ approved Class A Type Cement
Production	5 1/2"	N	P-110	20#	19925	19925	2400 cu. ft. w/ 50/50 POZ Lead & Class A Tail
Tubing	2 3/8"	N	J-55	4.7#	7750	7750	
Liners							

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield
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 1/4"	0.352	3520	Class A Type	1.18
Production	5 1/2"	8 3/4" and 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			

WW - 6B
(3/13)

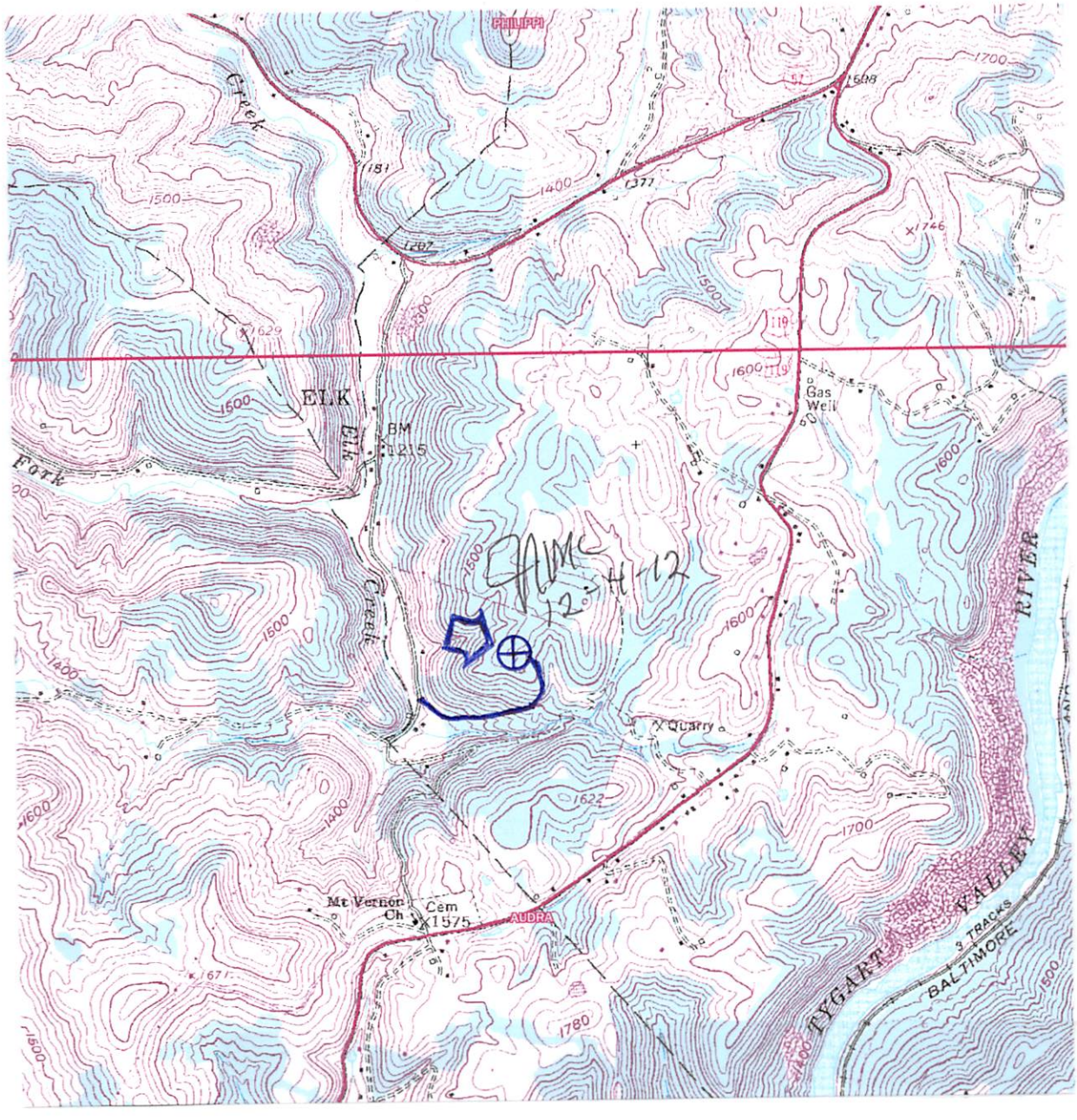
21) Describe centralizer placement for each casing string. Conductor - No centralizers used. Fresh Water & Coal - Bow spring centralizers on first joint then every fourth joint to 100 feet from surface. Intermediate - Bow spring centralizers one on the first two joints and every forth joint until inside 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.)

22) Describe all cement additives associated with each cement type. Conductor - 2% CaCl2. Fresh Water/Coal - 2% CaCl2. Intermediate - 2% CaCl2. Production - 2.6% Cement extender, 0.7% Fluid loss additive, 0.5% High Temperature Retarder, 0.2% Friction Reducer

23) 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 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.

1-03287



DRAWINGS TO ACCOMPANY FORM WW-9

CNX GAS COMPANY LLC

P. O. BOX 1248

JANE LEW, WV 26378

WATERSHED: ELK CREEK

DISTRICT: PHILIPPI **COUNTY:** BARBOUR

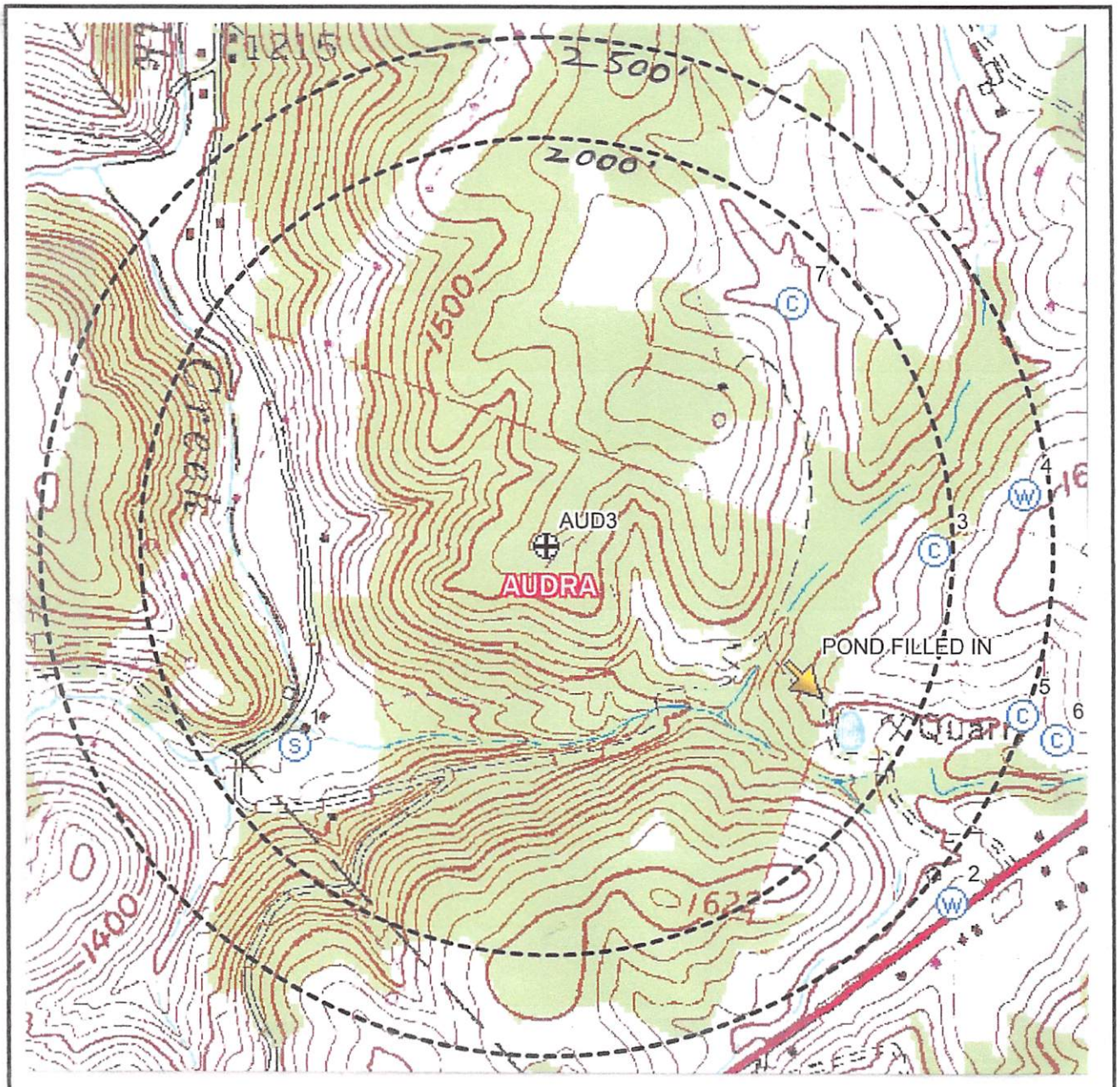
QUADRANGLE: AUDRA **WELL NO.:** AUD3DHS

DATE: 04/16/12 **PAGE** ____ **of** ____

RECEIVED
Office of Oil & Gas
DEC 12 2012
WV Department of
Environmental Protection

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

10/25/2013



CNXAUD3WATPURV

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COORDINATES ARE NAD 27
WV NORTH SPC.

GRID NORTH

CNX GAS COMPANY LLC
P. O. BOX 1248
JANE LEW, WV 26378

PLAT SHOWING WATER PURVEYORS
WITHIN 2500 FEET OF THE AUD3
PAD CENTER

PHILIPPI DISTRICT BARBOUR CO.
WEST VIRGINIA SCALE: 1" = 733.30'

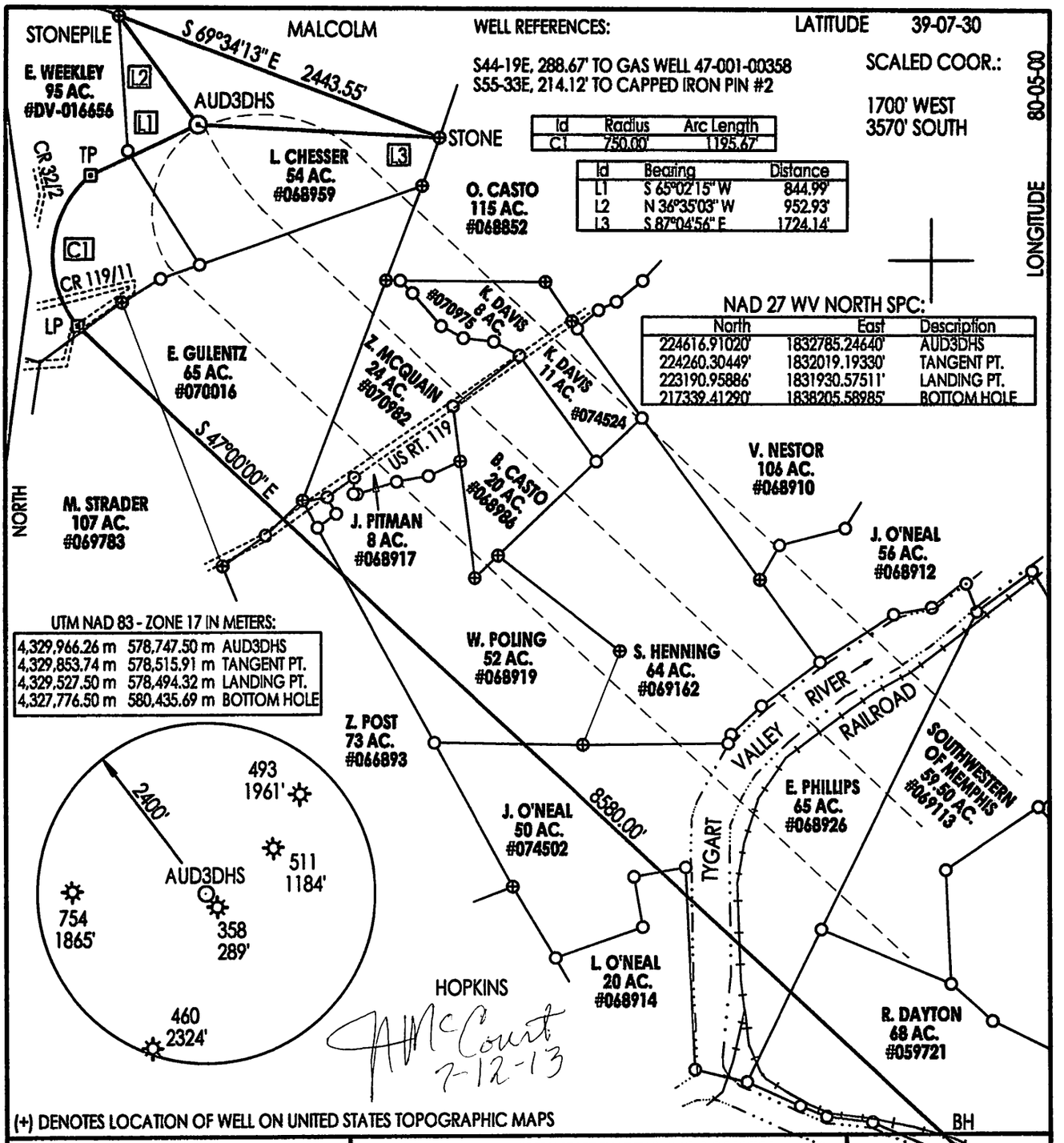
LAND SURVEYING SERVICES
21 CEDAR LANE
BRIDGEPORT, WV 26330
PHONE: 304-842-2018 OR 5762

01-03287 H6A
CNX GAS COMPANY LLC

AUD3DHS

Pad Name: AUD3HS

10/25/2013



FILE NUMBER:
DRAWING NUMBER: CNXAUD3DHSR2.PCS
SCALE: 1" = 1000'
MINIMUM DEGREE OF ACCURACY: SUBMETER
PROVEN SOURCE OF ELEVATION: DGPS SURVEY
RTK 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

PROFESSIONAL LAND SURVEYOR
STEPHEN D LOSH
NO. 674
STATE OF WEST VIRGINIA
PLACE SEAL HERE

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

FORM WW-6

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

DATE: JULY 09, 2013
OPERATORS WELL NO.: AUD3DHS (REV.)
API WELL NO. MOD
47 — 001 — 03287H6A
STATE COUNTY PERMIT

WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___ CBM ___
(IF "GAS") PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X

LOCATION: ELEVATION 1546.00' WATERSHED ELK CREEK
DISTRICT PHILIPPI COUNTY BARBOUR
QUADRANGLE AUDRA LEASE NUMBER AS SHOWN
SURFACE OWNER MIKE ROSS, INC. ACREAGE 52.00 (19-05)
OIL & GAS ROYALTY OWNER LUCILLE CHESSER, ET. AL. LEASE ACREAGE 1120.50

PROPOSED WORK: DRILL X CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE X PLUG OFF OLD FORMATION ___
PERFORATE NEW FORMATION ___ OTHER PHYSICAL CHANGE (SPECIFY) HORIZONTAL
PLUG & ABANDON ___ CLEAN OUT & REPLUG ___

TARGET FORMATION MARCELLUS ESTIMATED DEPTH TVD = 7925' TMD = 19925'
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

COUNTY NAME PERMIT

10/25/2013