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 31, 2013

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

Re: Permit Modification Approval for API Number 9703793 , Well #: ALT8DHS
Lateral Extended

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

CONSOL ENERGY

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

October 24, 2013

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

**RE: Well # ALT8DHS**

Dear Ms. LeMasters,

Enclosed, please find the mylar plat for ALT8DHS (47-097-03793) modification as you requested.

If you have any questions, please don't hesitate to contact me. Thank you!

Sincerely,

Kelly Eddy

Kelly Eddy
Permitting Analyst

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OCT 25 2013
WV Department of
Environmental Protection

MOD 97-03793

WW - 6B
(1/12)

# 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: CNX Gas Company LLC

| Operator ID | County | District | Quadrangle |
|---|---|---|---|
| 494458046 | Upshur | Washington | Alton |

2) Operator's Well Number: ALT8DHS Drill Deeper - API# 47-097-3793 Well Pad Name: ALT8HS

3 Elevation, current ground: 2460' Elevation, proposed post-construction: 2460'

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 - Marcellus, Depth - 7490, Thickness - 95', Pressure - 2500#

7) Proposed Total Vertical Depth: 7490'
8) Formation at Total Vertical Depth: Marcellus
9) Proposed Total Measured Depth: 17526'
10) Approximate Fresh Water Strata Depths: None Reported
11) Method to Determine Fresh Water Depth: Offset Well (API# 47-097-01608)
12) Approximate Saltwater Depths: None Anticipated
13) Approximate Coal Seam Depths: 105', 305'
14) Approximate Depth to Possible Void (coal mine, karst, other): None Anticipated
15) Does land contain coal seams tributary or adjacent to, active mine? No
16) Describe proposed well work: Drill & stimulate new horizontal Marcellus well. Well to be drilled to a TMD of 17526'. Well to be drilled to a TVD of 7490', formation @ TVD - Marcellus. Well will be plugged back to an approximate depth of 6800' (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): 10 Acres

19) Area to be disturbed for well pad only, less access road (acres): 10 Acres

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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# | 40' | 40' | CTS w/ 80sks Class A type cement |
| Fresh Water | 13 3/8 | N | J-55 | 54.5# | 667' | 667' | CTS w/ 465sks Class A Type Cement |
| Coal | | | | | | | |
| Intermediate | 9 5/8 | N | J-55 | 36# | 2000' | 2000' | CTS w/ approved Class A Type Cement |
| Production | 5 1/2 | N | P-110 | 20# | 17526' | 17526' | 2200 cu. ft. w/ 50/50 POZ Lead & Class A Tail |
| Tubing | 2 3/8 | N | J-55 | 4.7# | 7250' | 7250' | |
| Liners | | | | | | | |

Bill Hatfield 8/28/13

| 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 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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MOD 97-03793

WW - 6B
(1/12)

21) Describe centralizer placement for each casing string. Conductor - No centralizers userd. 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/Coat - 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.

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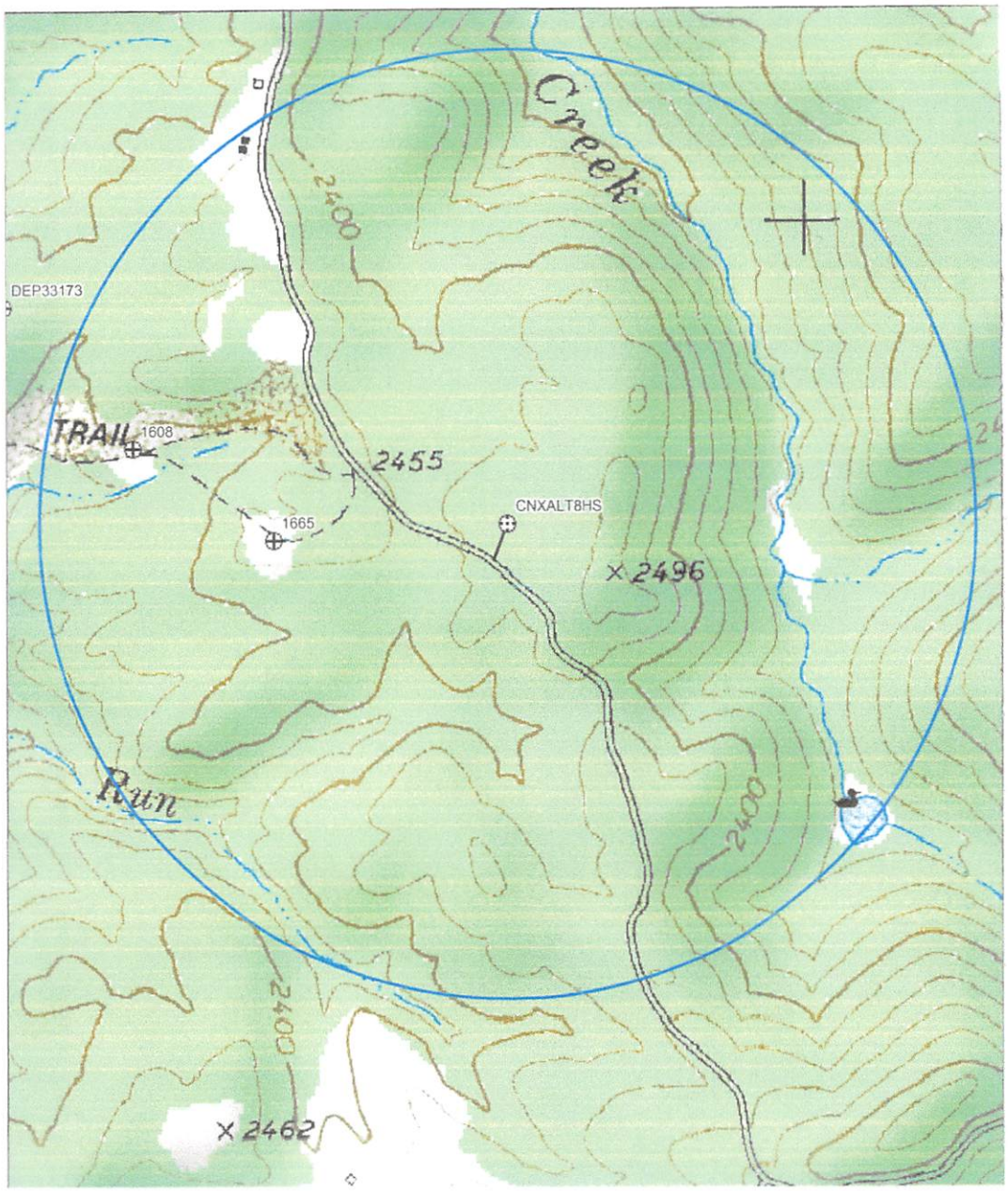
97-3790 ✓ CXC




1, 103904.680, 1810138.211, 2272.115, "n end pond"

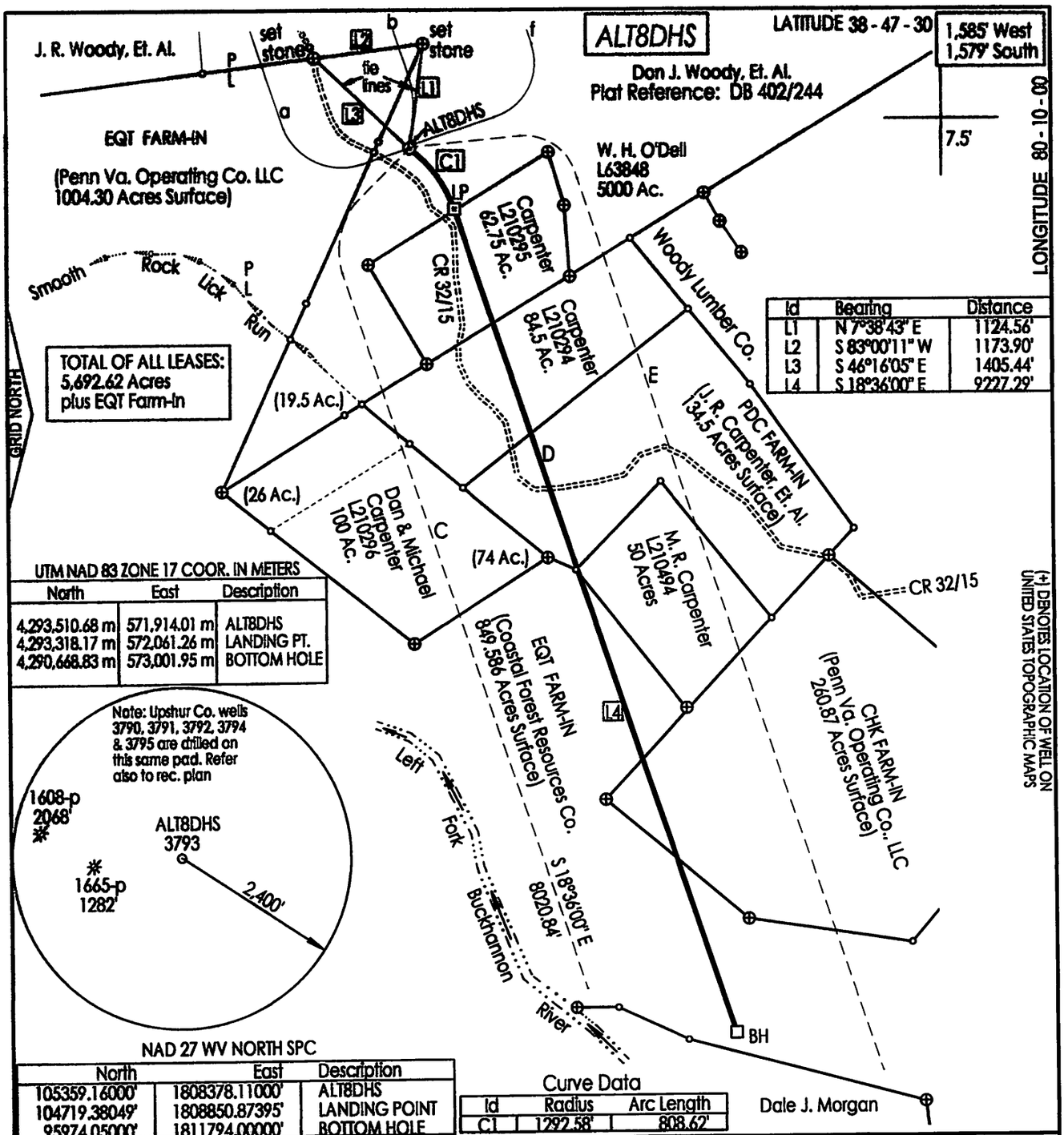
COORDINATE BASIS
NAD27 WV N STATE PLANE

NORTH

RECEIVED APR 04 2013

| CNX Gas Company LLC<br>P. O. Box 1248<br>Jane Lew, WV 26378 | | |
|---|---|---|
| PLAT SHOWING WATER PURVEYORS WITHIN<br>2,500 FEET OF THE ALT8HS PAD CENTER | | |
| DISTRICT<br>Washington | COUNTY<br>Upshur | STATE<br>WV |
| DATE<br>Oct. 22, 2012 | SCALE<br>1" = 733.33 ft. | DWG NO.<br>alt8wtrpur |

LAND SURVEYING SERVICES
21 Cedar Lane
Bridgeport, WV 26330
304-842-2018




| Id | Bearing | Distance |
|---|---|---|
| L1 | N 7°38'43" E | 1124.56' |
| L2 | S 83°00'11" W | 1173.90' |
| L3 | S 46°16'05" E | 1405.44' |
| L4 | S 18°36'00" E | 9227.29' |

UTM NAD 83 ZONE 17 COOR. IN METERS

| North | East | Description |
|---|---|---|
| 4,293,510.68 m | 571,914.01 m | ALT8DHS |
| 4,293,318.17 m | 572,061.26 m | LANDING PT. |
| 4,290,668.83 m | 573,001.95 m | BOTTOM HOLE |

NAD 27 WV NORTH SPC

| North | East | Description |
|---|---|---|
| 105359.16000' | 1808378.11000' | ALT8DHS |
| 104719.38049' | 1808850.87395' | LANDING POINT |
| 95974.05000' | 1811794.00000' | BOTTOM HOLE |

Curve Data

| Id | Radius | Arc Length |
|---|---|---|
| C1 | 1292.58' | 808.62' |

FILE NUMBER: M 6-Q P 10
DRAWING NUMBER: cnxalt8dhsr4.pcs
SCALE: 1" = 1,500
MINIMUM DEGREE OF ACCURACY: Centimeter
PROVEN SOURCE OF ELEVATION: DGPS Survey
RTK Centimeter System

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 ENERGY.

(SIGNED) J. Michael Evans
J. Michael Evans, P. S. #900

PROFESSIONAL LAND SURVEYOR
J. Michael Evans
SURVEYOR
NO. 900
STATE OF WEST VIRGINIA

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: August 1, 2013
OPERATORS WELL NO.: ALT8DHS
API WELL NO. MOD
47 — 097 — 03793
STATE COUNTY PERMIT

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

LOCATION: ELEVATION 2,459.5' (749.66 m) WATERSHED Panther Creek
DISTRICT Washington COUNTY Upshur
QUADRANGLE Alton 7.5' LEASE NUMBER 63848 ... Refer Above
SURFACE OWNER Don J. Woody, Et. Al. ACREAGE 2,534.80
OIL & GAS ROYALTY OWNER W. H. O'Dell 5000. Ac., Et. Al. (refer above) LEASE ACREAGE Refer Above

PROPOSED WORK: DRILL ___ CONVERT ___ DRILL DEEPER X 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 7,490' / TMD17,526'
WELL OPERATOR CNX Gas Company LLC DESIGNATED AGENT Jeremy Jones, Gen. Manager WV Operations
ADDRESS P. O. Box 1248, Jane Lew, WV 26378 ADDRESS P. O. Box 1248, Jane Lew, WV 26378

COUNTY NAME
PERMIT