



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

November 12, 2014

WELL WORK PERMIT

Horizontal 6A Well

This permit, API Well Number: 47-1706577, issued to CNX GAS COMPANY LLC , is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to all conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas inspector.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

In addition to the applicable requirements of this permit, and the statutes and rules governing oil and gas activity in WV, this permit may contain specific conditions which must be followed. Permit conditions are attached to this cover letter.

Per 35CSR-4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926-0499 ext. 1654.



James Martin
Chief

Operator's Well No: OXFD13DHS

Farm Name: MORRIS, I.L.

API Well Number: 47-1706577

Permit Type: Horizontal 6A Well

Date Issued: 11/12/2014

Promoting a healthy environment.

11/14/2014

PERMIT CONDITIONS

West Virginia Code § 22-6A-8(d) allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. Failure to adhere to the specified permit conditions may result in enforcement action.

CONDITIONS

1. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACE). Through this permit, you are hereby being advised to consult with USACE regarding this proposed activity.
2. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
3. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the moisture content of the fill material shall be within limits as determined by the Standard Proctor Density test of the actual soils used in specific engineered fill, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort, to achieve 95 % compaction of the optimum density. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.
4. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.
5. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations*, 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.
6. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.
7. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.
8. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.
9. Operator shall provide the Office of Oil & Gas notification of the date that drilling commenced on this well. Such notice shall be provided by sending an email to DEPOOGNotify@wv.gov within 30 days of commencement of drilling.

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 Doddridge Southwest New Milton
Operator ID County District Quadrangle

2) Operator's Well Number: OXFD13DHS Well Pad Name: OXFD13HS

3) Farm Name/Surface Owner: I.L. Morris Public Road Access: Co. Rt. 40

4) Elevation, current ground: 1178' Elevation, proposed post-construction: 1152'

5) Well Type (a) Gas Oil Underground Storage
Other

(b) If Gas Shallow Deep
Horizontal

6) Existing Pad: Yes or No NO

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):
Target - Marcellus, Depth - 6950', Thickness - 60', Pressure - 2500#

8) Proposed Total Vertical Depth: 6830'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 10290'

11) Proposed Horizontal Leg Length: 2085'

12) Approximate Fresh Water Strata Depths: 50', 600'

13) Method to Determine Fresh Water Depths: Offset Well

14) Approximate Saltwater Depths: 1250', 1955'

15) Approximate Coal Seam Depths: 600'

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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Page 1 of 3
WV Department of
Environmental Protection

11/14/2014

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	L.S.	81.3#	100'	100'	Grout to surface w/ Class A type cement
Fresh Water	13 3/8"	N	J-55	54.5#	1050'	1050'	CTS w/ Class A Type Cement
Coal							
Intermediate	9 5/8"	N	J-55	36#	2700'	2700'	CTS w/ Class A Type Cement
Production	5 1/2"	N	P-110	20#	10290	10290'	2200 cu. ft. w/ 50/50 POZ Lead & Class A
Tubing	2 3/8"	N	J-55	4.7#	7450'	7450'	
Liners							

*DCN
8-9-2014*

<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	14360	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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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 10290'. Well to be drilled to a TVD of 6830', formation at TVD - Onondaga Group. The well bore will not be drilled any deeper than 100' into the Onondaga Group, nor will there be any perforation, stimulation, or production of any formations below the target formation. Well will be plugged back to an approximate depth of 6000' (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.

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): 16.4 Acres

22) Area to be disturbed for well pad only, less access road (acres): 10.6 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% 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

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 fluid 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.

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*Note: Attach additional sheets as needed.

JOSH DALTON
Drilling Design Engineer

Mr. Douglas Newlon
WV Department of Environmental Protection
Office of Oil and Gas
601 57th Street – SE
Charleston, WV 25304

August 11, 2014

Re: Oxford-13 Extended Surface Casing

Dear Mr. Newlon:

This letter is intended to justify the extension of our surface casing on Oxford (OXFD-13) pad (5 wells). The 13-3/8" surface casing will be exceeding the 150' beyond the deepest known fresh water zone located near 600'.

The closest offset wells are on the OXFD-11 pad (4,200' Southwest) and were surface drilled in the month of July 2014. There was 80' of 20" conductor set and cemented to surface. There was initially 740' of 13-3/8" surface casing set and cemented to surface. Lastly the 9-5/8" intermediate casing was set at 2645' and cemented to surface. The first two of the six wells on OXFD-11 pad resulted in drill string retrieval operations while drilling the 12.25" intermediate section. Severe wellbore instability was experienced around the 900'-1000' depth. Hydrating red clays, or "Swelling Red Rock", was deemed the root cause of the stuck drill string in both cases. After DEP permission, the remaining four wells on the OXFD-11 pad had the 13-3/8" surface casing set between 1200' and 1250', which is 58' to 108' short of the pad elevation. This extension of the surface casing remediated the hydrating clay issue and no further issues were experienced on the pad.

It is our desire to continue with this plan of action by setting 13-3/8" surface casing 50' to 100' short of the pad elevation to proactively eliminate the formation issues.

If you have any questions concerning this request, please contact me at 724-485-3252 or via e-mail at JoshDalton@consolenergy.com.

Sincerely,

Josh Dalton

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Cement Additives

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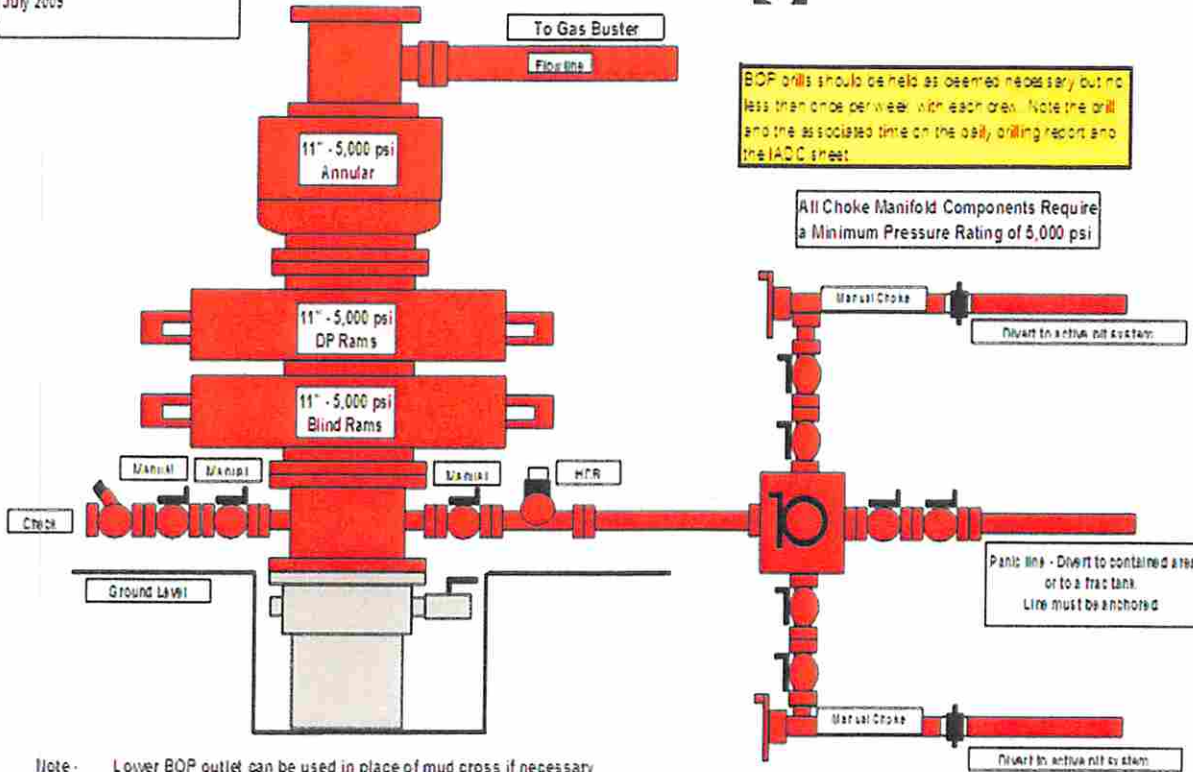
- Conductor – 2% CaCl₂
- Freshwater/Coal – 2% CaCl₂
- Intermediate - 2% CaCl₂
- Production -
 - 2.6% Cement extender
 - 0.7% Fluid Loss Additive
 - 0.5% High Temperature Retarder
 - 0.2% Friction Reducer

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Waynesburg District
Minimum BOP Requirements
July 2009

HORIZONTAL RIG SETUP



BOP drills should be held as opened necessary but no less than once per well with each crew. Note the drill and time as associated time on the daily drilling report and the IADC sheet.

All Choke Manifold Components Require a Minimum Pressure Rating of 5,000 psi

Note - Lower BOP outlet can be used in place of mud cross if necessary
Choke manifold configuration may vary but must have 2 manual chokes and 5,000 psi rating
The use of Colflex is acceptable

Remote Controls

Remote controls shall be readily accessible to the driller. Remote controls for all systems shall be capable of closing the preventer. Remote controls systems shall be capable of both opening and closing the preventer.

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WW-9
(9/13)

4701706577

API Number 47 - 017 - _____
Operator's Well No. OXFD13DHS

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name CNX Gas Company LLC OP Code 494458046

Watershed (HUC 10) South Fork Hughes River Quadrangle New Milton

Elevation 1,174.4' County Doddridge District Southwest

Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Yes No

Will a pit be used? Yes No

If so, please describe anticipated pit waste: N/A

Will a synthetic liner be used in the pit? Yes No If so, what ml.? N/A

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection (UIC Permit Number _____)
- Reuse (at API Number _____)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain Recycle on other well on same pad or adjacent pads)

*DCN
7-2-14*

Will closed loop system be used? If so, describe: Yes

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. Air and oil based mud

-If oil based, what type? Synthetic, petroleum, etc. Synthetic

Additives to be used in drilling medium? Bactericide, Polymers, and Weighting Agents

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. Landfill

-If left in pit and plan to solidify what medium will be used? (cement, lime, sawdust) N/A

-Landfill or offsite name/permit number? Meadowfill, Northwestern Landfill, Max Environmental Yukon Landfill & Bulger Landfill

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on August 1, 2005, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any term or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment.

Company Official Signature Kelly Eddy

Company Official (Typed Name) Matthew Imach

Company Official Title Designated Agent - District Operations Superintendent, WV Gas Operations

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Subscribed and sworn before me this 4TH day of AUGUST, 2014

Caroline Flanagan
My commission expires 09/15/2021



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Form WW-9

Operator's Well No. OXFD13DHS

CNX Gas Company LLC

Proposed Revegetation Treatment: Acres Disturbed 16.4 Prevegetation pH 6.5

Lime according to pH test Tons/acre or to correct to pH 7.0

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch hay or straw @ 2 Tons/acre

Seed Mixtures

Temporary

Permanent

Seed Type	lbs/acre
Orchard Grass	25
Birdsfoot Trefoil	15
Ladino Clover	10

Seed Type	lbs/acre
Orchard Grass	25
Birdsfoot Trefoil	15
Ladino Clover	10

Attach:

Drawing(s) of road, location, pit and proposed area for land application (unless engineered plans including this info have been provided)

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: W Douglas Newlan

Comments: seed & mulch any disturbed areas

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Title: Oil & Gas Inspector

Date: 7-2-14 AUG 20 2014

Field Reviewed? () Yes () No

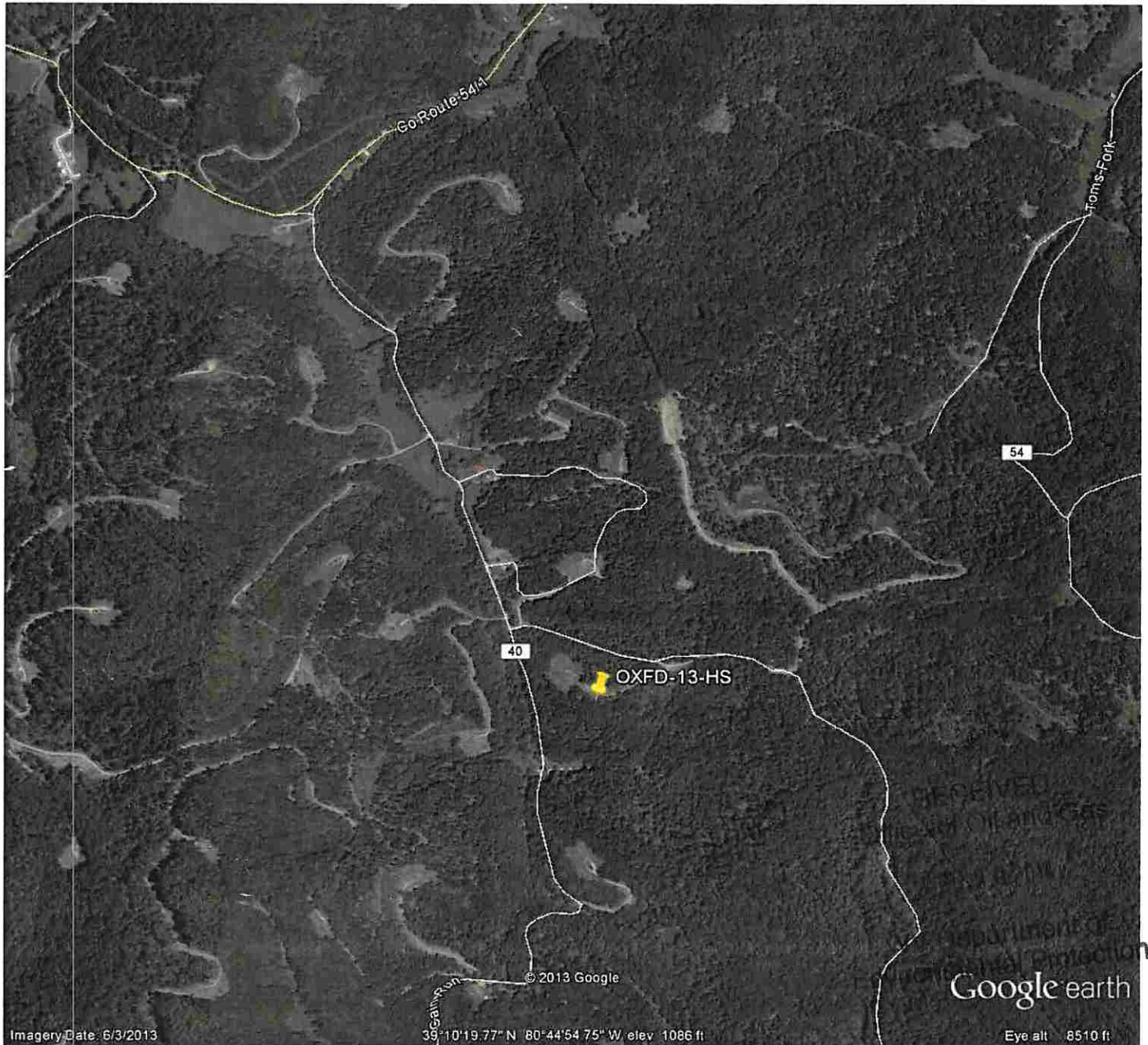
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2 OF 3 11/14/2014

Safety Plan for Well # OXFD13DHS

CNX Gas Company LLC

*DCN
7-2-14*



ROYALTY OWNERS	ACRES	LEASE NO.
SUSAN V. DRENNAN, ET AL	203.0 AC±	131061001, 041996
WILLIAM A. FARR, ET AL	150.17 AC±	245967000; DV011705
SUSAN V. DRENNAN, ET AL	45.02 AC±	246628000

WELL NO. OXFD13DHS

LEGEND

LEASE LINE	---
SURFACE LINE	----
WELL LATERAL	- - - -
OFFSET LINE	----
TIE LINE	----
CREEK	~~~~~
ROAD	====
FENCE LINE	----
COUNTY ROUTE	----
STATE ROUTE	----
PROPOSED WELL	⊙
EXISTING WELL	⊙
PERMITTED WELL	⊙
TAX MAP--PARCEL	00--00

NOTES ON SURVEY

1. TIES TO WELLS, REFERENCES, AND CORNERS ARE BASED ON GRID NORTH FOR THE WV STATE PLANE COORDINATE SYSTEM NORTH ZONE NAD '27.
2. HIGHLIGHTED LEASE BOUNDARY SHOWN HEREON TAKEN FROM DEED BOOK 230 PAGE 307 AND ADJOINING DEEDS.
3. SURFACE OWNER AND ADJOINER INFORMATION TAKEN FROM THE ASSESSOR AND COUNTY CLERK RECORDS OF DODDRIDGE COUNTY IN JULY, 2014.
4. WELL LAT./LONG. ESTABLISHED BY DOPS(SURVEY GRADE).
5. NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250' OF THE CENTER OF PAD IS LESS THAN 625' FROM A DWELLING AND WAIVER IS TO BE OBTAINED.

WELL NO. OXFD13DHS TOP HOLE

STATE PLANE COORDINATES (NORTH ZONE NAD '27)
 N. 246,012.1
 E. 1,646,233.4

TOP HOLE (NAD 27)
 LAT=(N) 39°10'07.9"
 LONG=(W) 80°44'51.9"

TOP HOLE (NAD 83)
 LAT=(N) 39°10'07.6"
 LONG=(W) 80°44'51.3"

TOP HOLE UTM (NAD 83)
 (N) 4,335,637.9
 (E) 521,804.9

WELL NO. OXFD13DHS HEEL POINT

STATE PLANE COORDINATES (NORTH ZONE NAD '27)
 N. 247,061.5
 E. 1,646,903.9

HEEL POINT (NAD 27)
 LAT=(N) 39°10'17.8"
 LONG=(W) 80°44'43.6"

HEEL POINT (NAD 83)
 LAT=(N) 39°10'18.1"
 LONG=(W) 80°44'43.0"

HEEL POINT UTM (NAD 83)
 (N) 4,335,861.0
 (E) 522,003.8

WELL NO. OXFD13DHS TOE POINT

STATE PLANE COORDINATES (NORTH ZONE NAD '27)
 N. 249,020.7
 E. 1,646,190.8

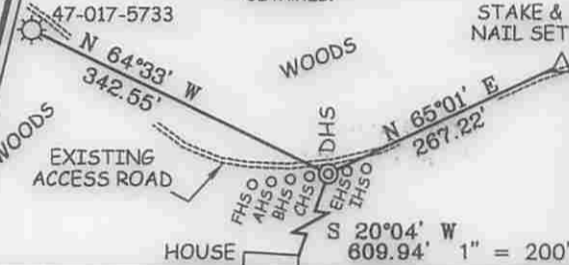
TOE POINT (NAD 27)
 LAT=(N) 39°10'37.1"
 LONG=(W) 80°44'53.0"

TOE POINT (NAD 83)
 LAT=(N) 39°10'37.4"
 LONG=(W) 80°44'52.4"

TOE POINT UTM (NAD 83)
 (N) 4,336,454.3
 (E) 521,776.6

REFERENCES

THE CENTER OF PAD IS LESS THAN 625' FROM A DWELLING AND A WAIVER IS TO BE OBTAINED.



OWNER	ACRES±
A ROBERT K. SWIGER	12.03
B ROBERT K. SWIGER (TRUSTEE)	12.03
C ROBERT K. SWIGER	13.04
D CHARLES ALAN SCHNEIDER	19.39
E MARIE E. HYDE ET AL	13.04
F DEBRA KAY HUDAK	45.03
G TYLER G. & LENORA BUNTING	12.03
H LINEY MCKINNEY	10.86
I KEVIN C. & TERESA A. MULLEN	7.46
J CNX GAS CO. LLC	1.09



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 DIVISION OF ENVIRONMENTAL PROTECTION.

P.S. 2266 *[Signature]*



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

DATE MAY 22, 20 14
 REVISED AUGUST 13, 20 14
 OPERATORS WELL NO. OXFD13DHS

API WELL NO. 47-17-06577
 STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1/200 FILE NO. 7982PDHSR2(457-45)
 PROVEN SOURCE OF ELEVATION DGPS (SURVEY GRADE) SCALE 1" = 2,000'

STATE OF WEST VIRGINIA
 DIVISION OF ENVIRONMENTAL PROTECTION
 OFFICE OF OIL AND GAS

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL IF "GAS" PRODUCTION STORAGE DEEP SHALLOW

LOCATION: EXISTING PROPOSED ELEVATION 1,177.4' 1,152.5' WATERSHED SOUTH FORK HUGHES RIVER

DISTRICT SOUTHWEST COUNTY DODDRIDGE QUADRANGLE NEW MILTON 7.5'

SURFACE OWNER I.L. MORRIS ACREAGE 6603.75±

ROYALTY OWNER SUSAN V. DRENNAN ET AL ACREAGE 203± OF 1427±

PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG AND ABANDON CLEAN OUT AND REPLUG OTHER

PHYSICAL CHANGE IN WELL (SPECIFY) _____ TARGET FORMATION MARCELLUS
 ESTIMATED DEPTH 6,830' TVD / TMD 10,290'

WELL OPERATOR CNX GAS COMPANY, LLC. DESIGNATED AGENT MATTHEW IMRICH
 ADDRESS P.O. BOX 1248 ADDRESS P.O. BOX 1248
JANE LEW, WV 26378 JANE LEW, WV 26378

11/14/2014