



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

March 13, 2015

WELL WORK PERMIT

Horizontal 6A Well

This permit, API Well Number: 47-103353, 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: BROW3AHS
Farm Name: STOUT, STEPHEN ET AL
API Well Number: 47-103353
Permit Type: Horizontal 6A Well
Date Issued: 03/13/2015

Promoting a healthy environment.

03/13/2015

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)

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#	80'	80'	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							
Intermediate	9 5/8"	N	J-55	36#	2600'	2600'	CTS w/ Class A Type Cement
Production	5 1/2"	N	P-110	20#	13684'	13684'	2200 cu. ft. w/ 50/50 POZ Lead & Class A
Tubing	2 3/8"	N	J-55	4.7#	7500'	7500'	
Liners							

Thomas J. Reynolds
10-15-14

<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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WW-5B
(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 13684'. Well to be drilled to a TVD of 7890', formation at TVD - Oriskany Sand. 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 bb/min.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 16.51

22) Area to be disturbed for well pad only, less access road (acres): 6.99

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 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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Cement Additives

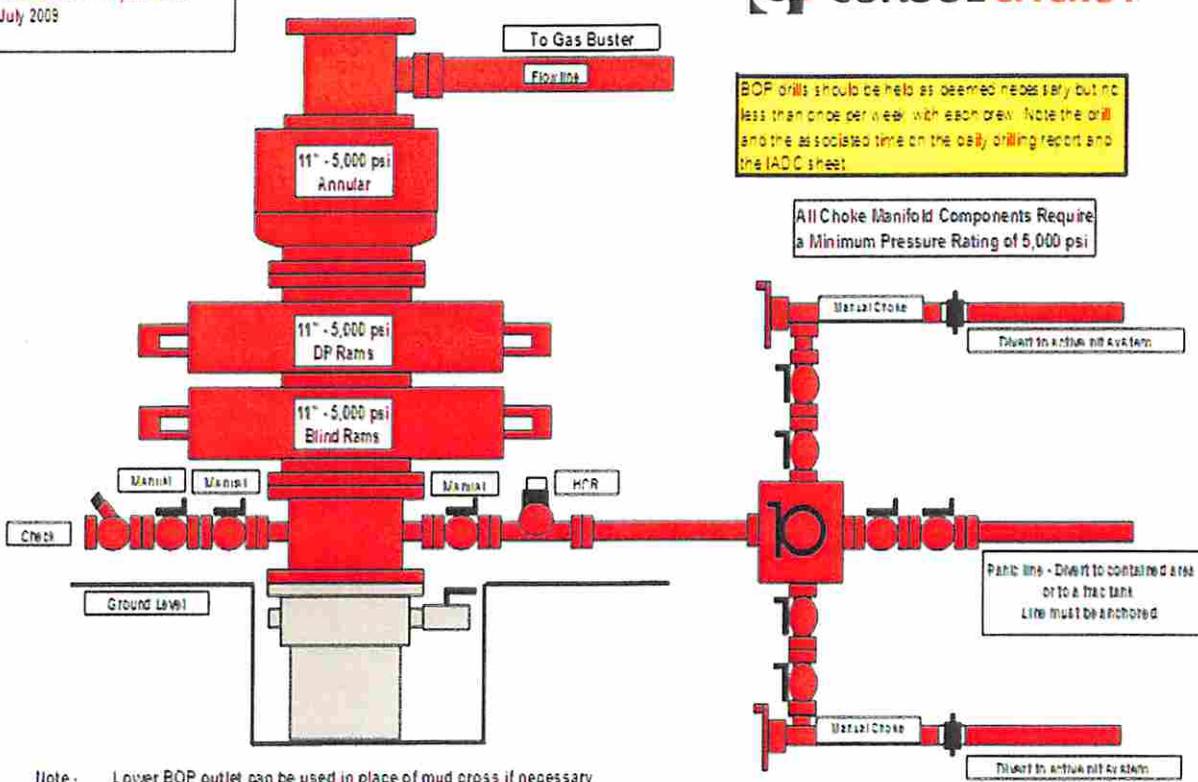
- Conductor – 2% CaCl₂
- Freshwater/Coal – 2% CaCl₂
- Intermediate - 2% CaCl₂
- Production -
 - 2.6% Cement extender
 - 0.7% Fluid Loss Additive
 - 0.5% High Temperature Retarder
 - 0.2% Friction Reducer

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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 week with each crew. Note the drill and the assisted 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 Cofflex 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)

API Number 47 - _____ - _____
Operator's Well No. BROW3AHS

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) Stonecoal Run Quadrangle Brownton

Elevation 1368.6' County Barbour District Elk

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: _____

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

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)

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

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

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

Additives to be used in drilling medium? See Attached

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? See Attached

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) Kelly Eddy

Company Official Title Permitting Supervisor

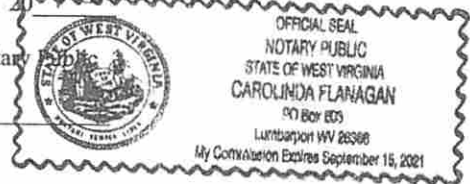
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FEB 27 2015

WV Department of
Environmental Protection

Subscribed and sworn before me this 26TH day of FEB., 2015

[Signature]
My commission expires 9/15/2021

Notary



03/13/2015

WW-9 – Attachment for Comments

Closed Loop - Yes, Cuttings will be removed from drilling fluid utilizing shale shakers. Drilling fluid will be treated via centrifuge and re-used down hole. All solid waste will be disposed of at an approved landfill.

Drilling Medium - The vertical portion will be drilled on air. Fresh water may be added in misting the surface section. Mist/soap will be added in the intermediate section after surface casing is set. The production section will be drilled utilizing synthetic based mud.

Additives to drilling medium - Surface-None; Intermediate-Soap & Chlorides; Production-Bactericide, Barite, Chlorides, Lime, Polymers

Landfills - Waste Management Meadowfill Landfill #SWF1032, MAX Environmental Yukon Landfill #301071, and MAX Environmental Bulger Landfill #301359

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FEB 27 2015

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Environmental Protection

03/13/2015

CNX Gas Company LLC

Proposed Revegetation Treatment: Acres Disturbed 16.51 Prevegetation pH 6.5

Lime ^{according to pH test} Tons/acre or to correct to pH 7.0

Fertilizer type 10-20-20 or equivalent

Fertilizer amount 500 lbs/acre

Mulch hay or straw @ 2 Tons/acre

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
Orchard Grass	25	Orchard Grass	25
Birdsfoot Trefoil	15	Birdsfoot Trefoil	15
Ladino Clover	10	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: *Ernest J. Szymanski*

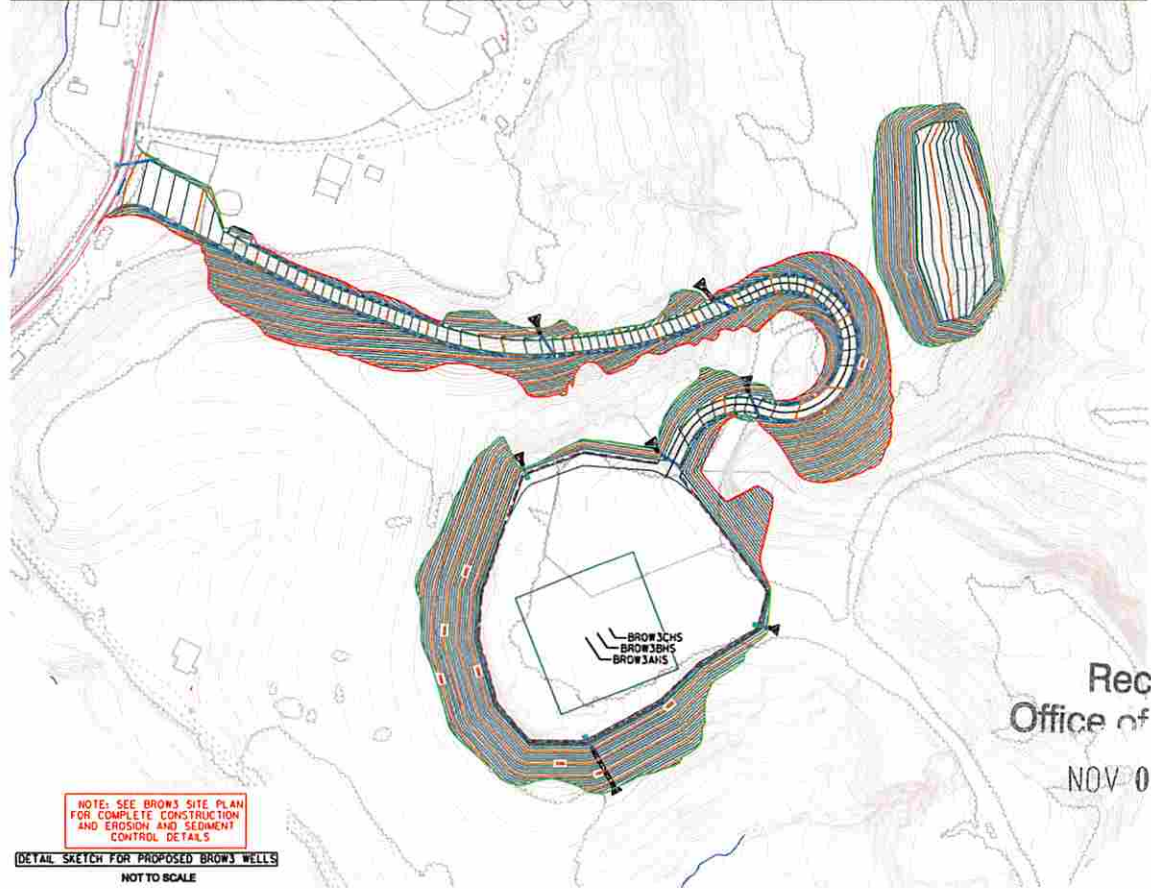
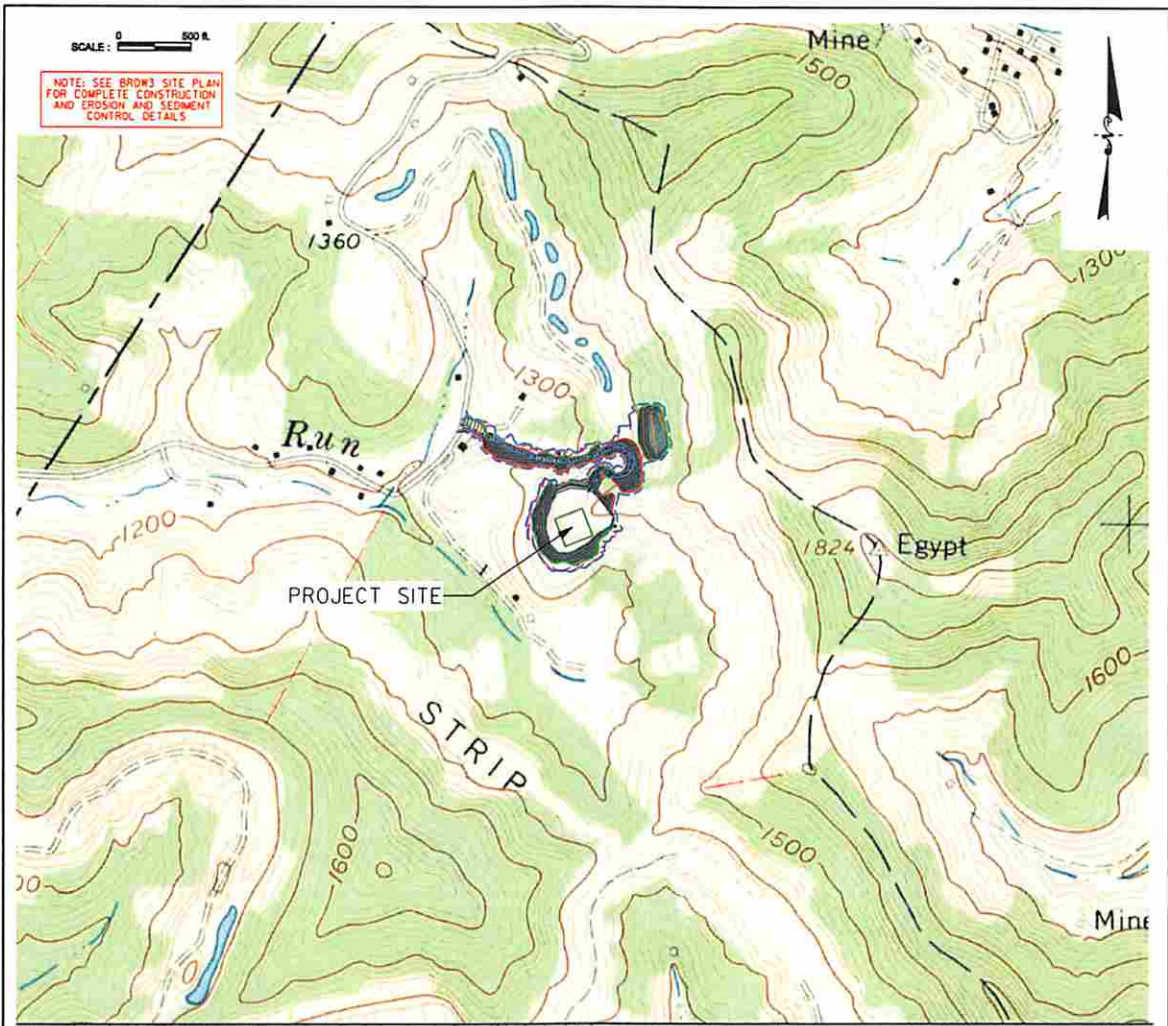
Comments: *RESERVED*

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Title: *OLFGAS INSPECTION* Date: *10-15-14*

Field Reviewed? () Yes () No



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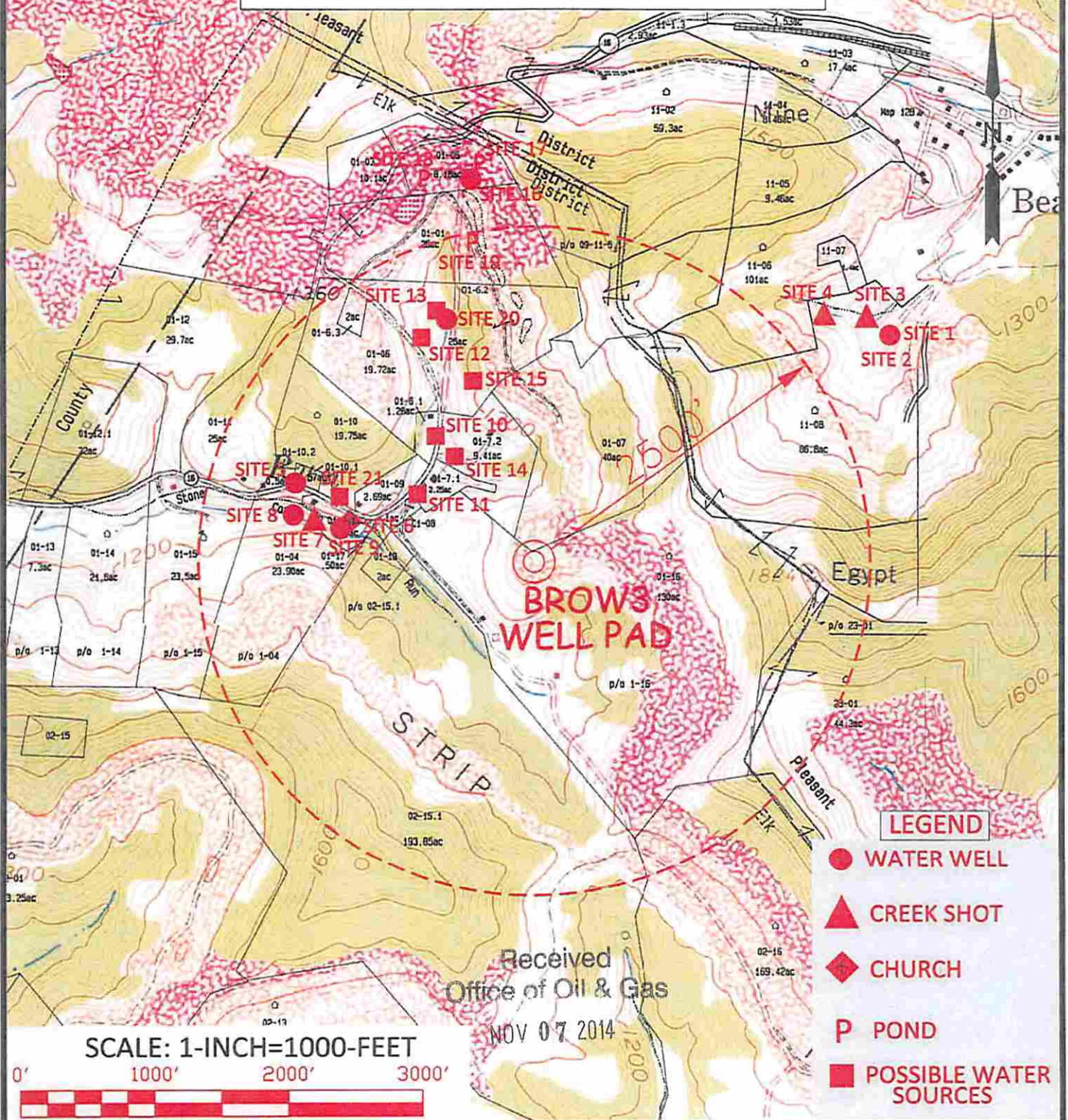
Title FORM WW-9	Project BROW'S WELL SITE	Client CNX GAS COMPANY LLC.	Date SEPTEMBER 2014	Project No. 142921	 DIEFFENBALCH & HRITZ www.dieffenbalch.com	03/13/2015
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Safety Plan for Well BROW3AHS CNX Gas Company LLC

Thomas L. Hayward
10-15-14

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BROW3 WELL PAD EXHIBIT A



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A DIVISION OF SOUTHLAND SURVEYING, INC.

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(NO) 437-5534 www.slsurveyors.com

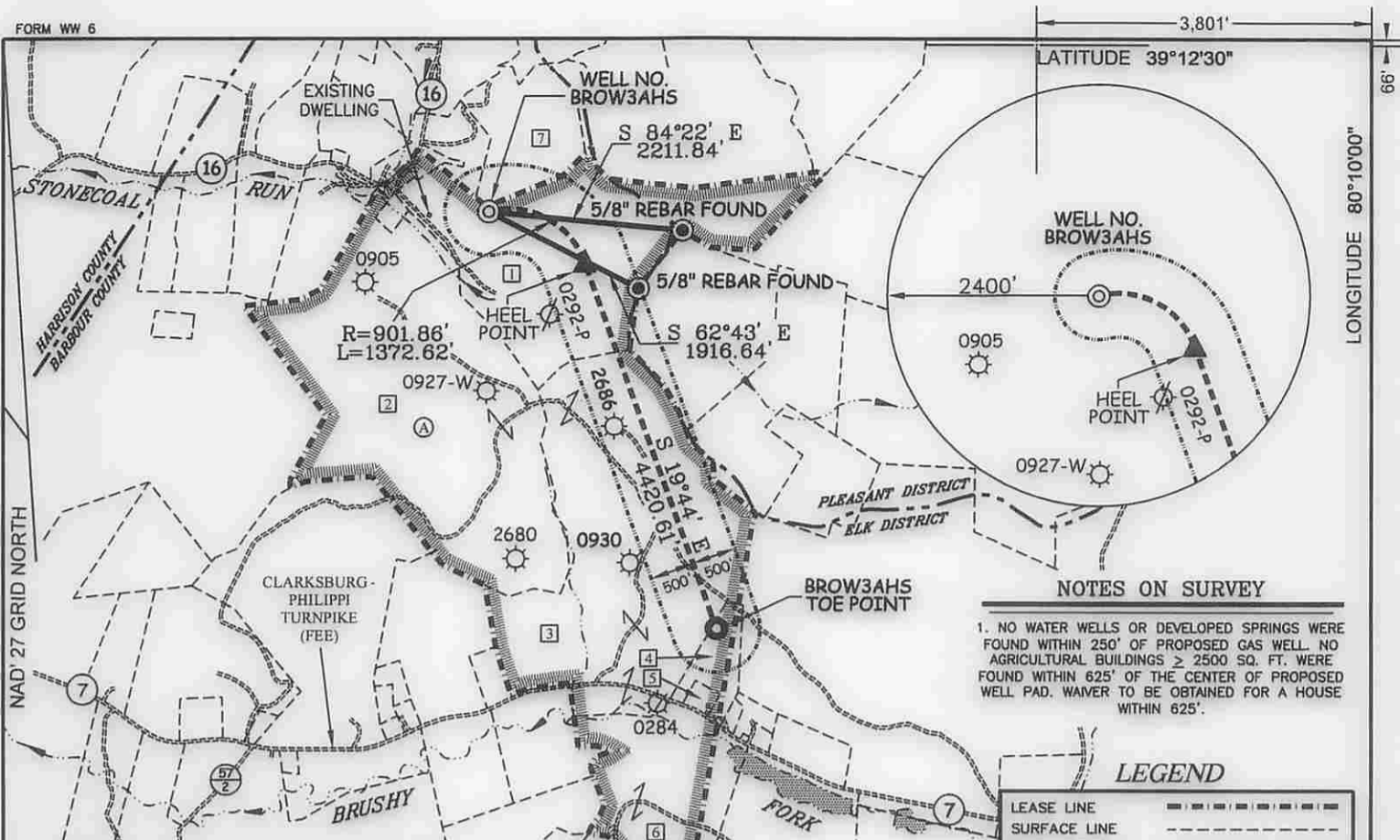
DRAWN BY: FILE NO. DATE CADD FILE:
K.D.W. 8283 10-03-14 8283WSBROW3.dwg

TOPO SECTION OF:
BROWNTON, WV 7.5' QUAD.

COUNTY	DISTRICT	TAX MAP-PARCEL NO.
BARBOUR	ELK	01-16

OPERATOR:
CNX GAS COMPANY, LLC.
P.O. BOX 1248
JANE LEW, WV 26379

03/13/2015



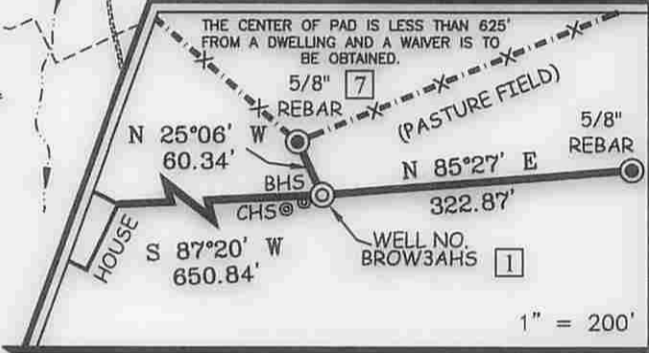
NOTES ON SURVEY

1. NO WATER WELLS OR DEVELOPED SPRINGS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD. WAIVER TO BE OBTAINED FOR A HOUSE WITHIN 625'.

LEGEND

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

REFERENCES



ROYALTY OWNERS	ACRES	LEASE NO.
STATE OF WEST VIRGINIA	CLARKSBURG - PHILIPPI TURNPIKE	
A STEPHEN STOUT, ET AL	557.94 AC±	70138

SURFACE OWNERS	ACRES	TAX MAP/PCL
1 DINO S. COLOMBO, SR.	130.05 AC±	1-16
2 H. WOOD THRASHER, ET AL	193.85 AC±	2-15.1
3 BONARD E. HUDKINS (DEVISEES), ET AL	169.42 AC±	2-16
4 ANTHONY & BEATRICE CHARNOPLISKY	8.80 AC±	2-17
5 WILLIAM E. KELLEY	2.20 AC±	2-17.2
6 DAVID E. HESS	.9676 AC±	2-20
7 TIMOTHY E. & ANNISSA K. DAVIS	37.432 AC±	1-7

BROW3AHS

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)

NAD'27 S.P.C.(FT)	N. 258,653.6	E. 1,807,287.3
NAD'27 GEO.	LAT-(N) 39.208154	LONG-(W) 80.180081
NAD'83 UTM (M)	N. 4,340,206.8	E. 570,806.8
HEEL POINT		
NAD'27 S.P.C.(FT)	N. 258,061.2	E. 1,808,381.1
NAD'27 GEO.	LAT-(N) 39.206550	LONG-(W) 80.176205
NAD'83 UTM (M)	N. 4,340,031.9	E. 571,143.1
TOE POINT		
NAD'27 S.P.C.(FT)	N. 253,900.4	E. 1,809,874.2
NAD'27 GEO.	LAT-(N) 39.195157	LONG-(W) 80.170826
NAD'83 UTM (M)	N. 4,338,771.8	E. 571,619.1

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PROJECT MGMT.

(304) 482-5634
WWW.SLSURVEYS.COM

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.
677 *Gregory A. Smith*



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

DATE SEPTEMBER 2, 20 14

REVISED SEPTEMBER 9, 20 14

OPERATORS WELL NO. BROW3AHS

API WELL NO. 47 - 001 - 03353 *H6A*

STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1 / 2500 FILE NO. 8283BROW3AHSR

HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK) SCALE 1" = 2000'

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: 1,368.6' PROPOSED: 1,365' WATERSHED STONECOAL RUN

DISTRICT ELK COUNTY BARBOUR QUADRANGLE BROWNTON 7.5'

SURFACE OWNER DINO COLOMBO SR. ACREAGE 130.050±

ROYALTY OWNER STEPHEN STOUT, ET AL ACREAGE 557.9375±

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 TVD 7,890' / TMD 13,684'

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

03/13/2015

COUNTY NAME
PERMIT