



**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

February 04, 2015

**WELL WORK PERMIT**

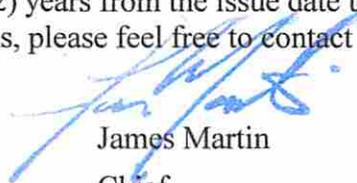
**Horizontal 6A Well**

This permit, API Well Number: 47-6101691, issued to NORTHEAST NATURAL ENERGY 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: BOGGESS 9H  
Farm Name: BOGGESS, BLAKE R. & H. PRES  
**API Well Number: 47-6101691**  
**Permit Type: Horizontal 6A Well**  
Date Issued: 02/04/2015

**Promoting a healthy environment.**

## 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

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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.



4706101691

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west virginia department of environmental protection

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Oil and Gas Conservation Commission  
601 57<sup>th</sup> Street, SE Charleston, WV 25304  
(304)926-0499, Ext 1656

Earl Ray Tomblin, Governor  
Randy C. Huffman, Cabinet Secretary  
dep.wv.org

January 15, 2015

Department of Environmental Protection  
Office of Oil and Gas  
Charleston, WV 25304

RE: Application for Deep Well Permit – API #47-061-01691

COMPANY: Northeast Natural Energy LLC

FARM: Blake Boggess – Boggess #9H

COUNTY: Monongalia DISTRICT: Clay QUAD: Osage

The deep well review of the application for the above company is **APPROVED – HELDERBERG FOR MARCELLUS COMPLETION.** If operator wishes to drill deeper than the HELDERBERG, additional approval must be obtained from the OGCC.

The applicant has complied with the provision of Chapter 22C-9, of the Code of West Virginia, nineteen hundred and thirty-one (1931), as amended, Oil and Gas Conservation Commission as follows:

1. Provided a certified copy of duly acknowledged and recorded consent and easement form from all surface owners; yes
2. Provided a tabulation of all deep wells within one mile of the proposed location, including the API number of all deep wells, well name, and the name and address of the operator; none
3. Provided a plat showing that the proposed location is a distance of 492 feet from the nearest lease line or unit boundary and showing the following wells drilled to or capable of producing from the objective formation within 3,000 feet of the proposed location.

Sincerely,

Cindy Raines  
Executive Assistant

**To avoid enforcement action and per 39CSR1.4.6 and 4.10 filing of wells logs and directional surveys are due within 90 days of completion of a deep well.**

4706101691

WW-6B  
(9/13)

STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
WELL WORK PERMIT APPLICATION

3 256

1) Well Operator: Northeast Natural Energy LLC 494498281 Monongalia Clay Blacksville  
Operator ID County District Quadrangle

2) Operator's Well Number: Boggess 9H Well Pad Name: Boggess

3) Farm Name/Surface Owner: Blake R. & H. Preston Boggess Public Road Access: Mason Dixon Hwy (State Rt 7)

4) Elevation, current ground: 1296' Elevation, proposed post-construction: 1268'

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

(b) If Gas Shallow  Deep   
Horizontal

6) Existing Pad: Yes or No No

*MDK 9/25/2014*

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):  
Marcellus ; 7,993' ; 103' , 3,470 psi

8) Proposed Total Vertical Depth: Pilot: 8,400' ; Horizontal: 7,993'

9) Formation at Total Vertical Depth: Pilot: Helderburg ; Horizontal: Marcellus

10) Proposed Total Measured Depth: 16,505'

11) Proposed Horizontal Leg Length: 7,066'

12) Approximate Fresh Water Strata Depths: 65' , 1,100'

13) Method to Determine Fresh Water Depths: Driller's Log from Offset Wells

14) Approximate Saltwater Depths: 1,400' , 2,250'

15) Approximate Coal Seam Depths: 600' , 950'

16) Approximate Depth to Possible Void (coal mine, karst, other): N/A

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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Office of Oil and Gas

OCT 08 1114

WW-6B  
(9/13)

4706101691

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	24"	New	STD	94.71	60'	60'	GTS
Fresh Water	13 3/8"	New	J-55	54.5	1,265'	1,250'	CTS
Coal							
Intermediate	9 5/8"	New	J-55	40	2,430'	2,400'	CTS
Production	5 1/2"	New	P-110	20	16,505'	16,475'	3,605 cu. ft.
Tubing	2 3/8"	New	J-55	4.7		8,750'	NA
Liners							

\*Northeast Natural Energy LLC will not set Freshwater Casing beyond elevation without the prior approval from the WV DEP Office of Oil and Gas Management.

*MDK 9/25/2014*

<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	24"	24"	.25	2,200	Grout	NA
Fresh Water	13 3/8"	17 1/2"	.38"	2,760	Class A	1.23
Coal						
Intermediate	9 5/8"	12 1/4"	.395"	3,950	Class A	1.3
Production	5 1/2"	8 3/4"	.361"	12,530	50:50 Poz	1.21
Tubing	2 3/8"	NA	.190"	7,700	NA	NA
Liners						

**PACKERS**

Kind:				
Sizes:				
Depths Set:				

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19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drilling and completion of a horizontal Marcellus well. The well will be drilled on air to an approximate depth of 7,100' TVD/MD. A pilot hole will then continue to be drilled vertically on fluid to an approximate depth of ~8,400' TVD/MD. After logging the section, the well will be plugged back with solid cement to ~7,100'. Once the cement plug has cured, the well will be horizontally drilled on fluid from KOP to approximately 7,993' TVD / 16,505' MD along a 325 degree azimuth.

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

Multi-stage / high-rate slickwater fracture treatment using various size sands as proppant. First stage will be initiated via pressurization against a burst disc ran in the production casing string or perforated with coiled tubing. Subsequent stages will be perforated with pumped down guns ran on wireline. Individual stages will be isolated with composite frac plugs. Maximum pump rate during any stage will be 110 BPM with a maximum allowable surface pressure of 9,500 PSI. Composite bridge plugs will be set at the end of the last stage to isolate the treated formation.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 20.12

22) Area to be disturbed for well pad only, less access road (acres): 9.98

23) Describe centralizer placement for each casing string:

Surface and intermediate casing strings will have bow spring centralizers placed every third joint (~120') from shoe joint to surface. Production casing will have rigid body centralizers placed at a minimum of every fourth joint (~160') from TD to surface.

24) Describe all cement additives associated with each cement type:

Surface string cement will be a Class A + Max 3% bwoc Calcium Chloride Fresh Water blend. Intermediate string cement will be a Class A Cement + Max 3% bwoc Calcium Chloride + Fresh Water. Production string cement will be (50:50) Poz (Fly Ash):Type I Cement with a gas migration additive.

25) Proposed borehole conditioning procedures:

Surface string will use a 25.0 bbls Gel Pill + LCM + 25 lbs Cello Flake + 20 lbs/bbl Bentonite @ 8.4 ppg & 10 bbls fresh water spacer prior to cement. Intermediate string will use a 25.0 bbls Gel Pill + LCM + 25 lbs Cello Flake + 20 lbs/bbl Bentonite @ 8.4 ppg & 10 bbls fresh water spacer prior to cement. Production string will use a 50.0 bbls SealBond 25 + 1 gal/bbl US-40 + 275 lbs/bbl Barite + 1 gal/bbl SS-2 Spacer @ 13.5 ppg prior to cement.

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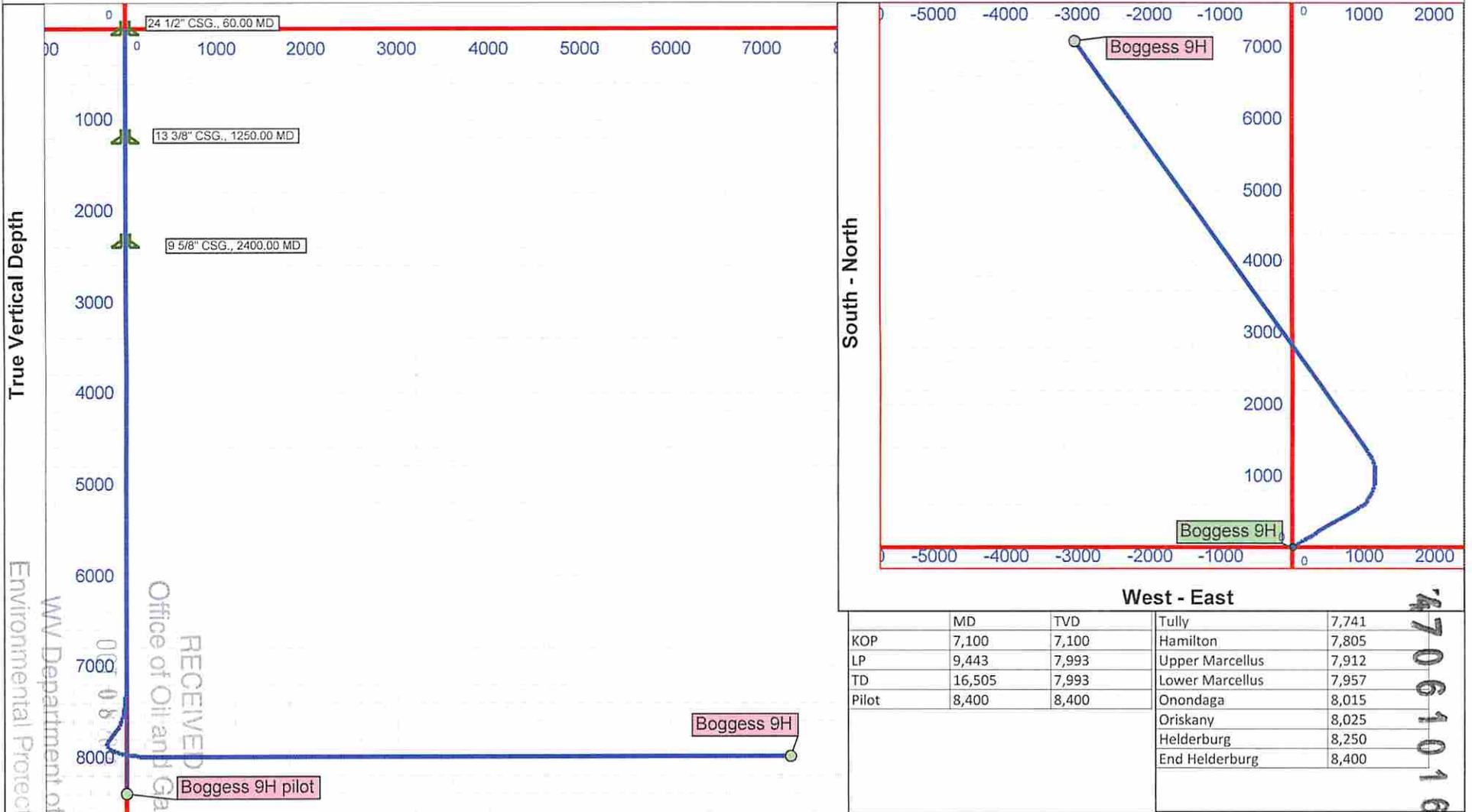
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\*Note: Attach additional sheets as needed.



Job Number:  
 Company: Northeast Natural Energy  
 Lease/Well: Boggess 9H  
 Location: Boggess  
 Rig Name: Pioneer 63  
 State/County: WV/ Mon  
 Country: US  
 API Number:

Elevation (To MSL): 1268.00 ft  
 RKB: 18.00 ft  
 Projection System: US State Plane 1983  
 Projection Group: West Virginia Northern Zone  
 Projection Datum: GRS80  
 Magnetic Declination: -8.96  
 Grid Convergence: -0.37791 W  
 Date: Monday, September 22, 2014



	MD	TVD	Tully	
KOP	7,100	7,100	Hamilton	7,741
LP	9,443	7,993	Upper Marcellus	7,912
TD	16,505	7,993	Lower Marcellus	7,957
Pilot	8,400	8,400	Onondaga	8,015
			Oriskany	8,025
			Helderburg	8,250
			End Helderburg	8,400

Vertical Section (1000 Ft/Div) VSP: 318.22°

470610169

WW-9  
(9/13)

API Number 47 - 4706101691  
Operator's Well No. Bogoss 9H

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Northeast Natural Energy LLC OP Code 494498281

Watershed (HUC 10) Dunkard Creek Quadrangle Osage, WV

Elevation 1,268' County Monongalia District Clay

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.?

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection ( UIC Permit Number \_\_\_\_\_ )
- Reuse (at API Number unknown at this time, TBD )
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain \_\_\_\_\_)

Will closed loop system be used? If so, describe: Yes - See Attachment A

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. Air - Vertical/Oil Based-Curve & Horizontal

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

Additives to be used in drilling medium? Organophilic Clay Viscosifiers, Lime, Unsaturated Fatty Acids, CaCl, Barite, Emulsifiers, Mica LCM, Water Loss Agents

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. Removed Offsite - See Attachment A

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

-Landfill or offsite name/permit number? See Attachment A

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 Hollie Medley

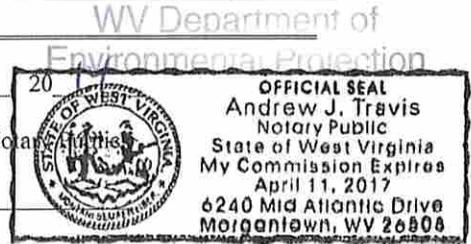
Company Official (Typed Name) Hollie Medley

Company Official Title Regulatory Coordinator

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Subscribed and sworn before me this 1ST day of October

My commission expires April 11, 2017



4706101691

Form WW-9

Operator's Well No. Bogges 9H

Northeast Natural Energy LLC

Proposed Revegetation Treatment: Acres Disturbed 22 Prevegetation pH TBD

Lime 2 Tons/acre or to correct to pH 6.0

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch 2-3 Tons/acre

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
Orchard Grass	8	Orchard Grass	8
Red Clover	2	Red Clover	2
Perennial Rye	8	Perennial Rye	8
Timothy 5, Annual Rye 10		Timothy 5, Annual Rye 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: [Signature]

Comments: Cemetery is 100' +/- from access road. See plan view

Title: Inspector Date: 9/25/2014 RECEIVED Office of Oil and Gas

Field Reviewed? (  ) Yes (  ) No

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Attachment A to WW-9

4706101691

Northeast Natural Energy LLC ("NNE") plans to utilize a closed loop process for its drilling of the Boggess 9H well. Return flow from the well will be separated into its liquid and solid form. Liquids will be held in steel tanks and reused in the drilling and completion process or disposed of at an approved facility listed below. Solids removed from the stream will be diverted to steel half-round tanks where they will be solidified on site and taken to disposal as they are accumulated.

Boggess 9H Drill Cuttings will be taken to disposal at one or more of the following disposal/approved waste facilities, unless listed facilities are no longer approved to accept waste at time of disposal:

- Westmoreland Landfill (Tervita) – Belle Vernon, PA (Permit # 100277)
- Meadowfill Landfill (Waste Management) – Bridgeport, WV (Permit # SWF 103298)
- Max Environmental – Yukon, PA (PAD004835146 and 301071)
- Max Environmental – Bulger, PA (PAD059087072 and 301359)
- Chestnut Valley Landfill (Advanced Disposal) – Export, PA (Permit # 101421)

NNE plans to reuse and recycle all flowback fluid and/or reach out to other operators in the area who may be able to reuse and recycle such fluid. However, in the event that reuse is not obtainable the fluid will be disposed of at one, or multiple, of the following disposal/approved waste facilities unless listed facilities are no longer approved to accept waste at time of disposal:

- Fairmont Brine Processing (WV NPDES #0116408)
- Green Hunter M. E. Elder 1 Disposal Well (Permit # 47-085-05151)
- Green Hunter Mason 1 Disposal Well (Permit #47-085-09721)
- Green Hunter Warren Disposal Well (Permit #34-121-2-3995)
- Green Hunter Travis Unit Disposal Well (Permit #34-121-2-4086)
- Viking Energy Corporation 20320 Disposal Well (Permit#47-039-02210)
- Ohio Oil Gathering Killbuck Disposal Well (Permit #34-075-24527)
- Ohio Oil Gathering Moran Disposal Well (Permit #34-089-24792)
- Ohio Oil Gathering Bells Run Disposal Well (Permit #34-167-29395)
- Ohio Oil Gathering Long Run Disposal Well (Permit #34-167-29658)
- Ohio Oil Gathering Newell Run Disposal Well (Permit #34-167-29685)
- Appalachian Oil Purchaser Greens Run Disposal Well (Permit #2D0732540)
- Appalachian Oil Purchaser BW#4 Disposal Well (Permit # 2D0732523)

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4706101691



northeast  
NATURAL ENERGY

*MSJK  
9/25/2014*

**Bogges 9H  
SITE SAFETY PLAN**

September 22, 2014

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WV Department of  
Environmental Protection

4706101691



**northeast**  
NATURAL ENERGY

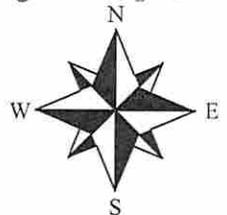
**Bogges 9H**  
**SITE SAFETY PLAN**

January 29, 2015

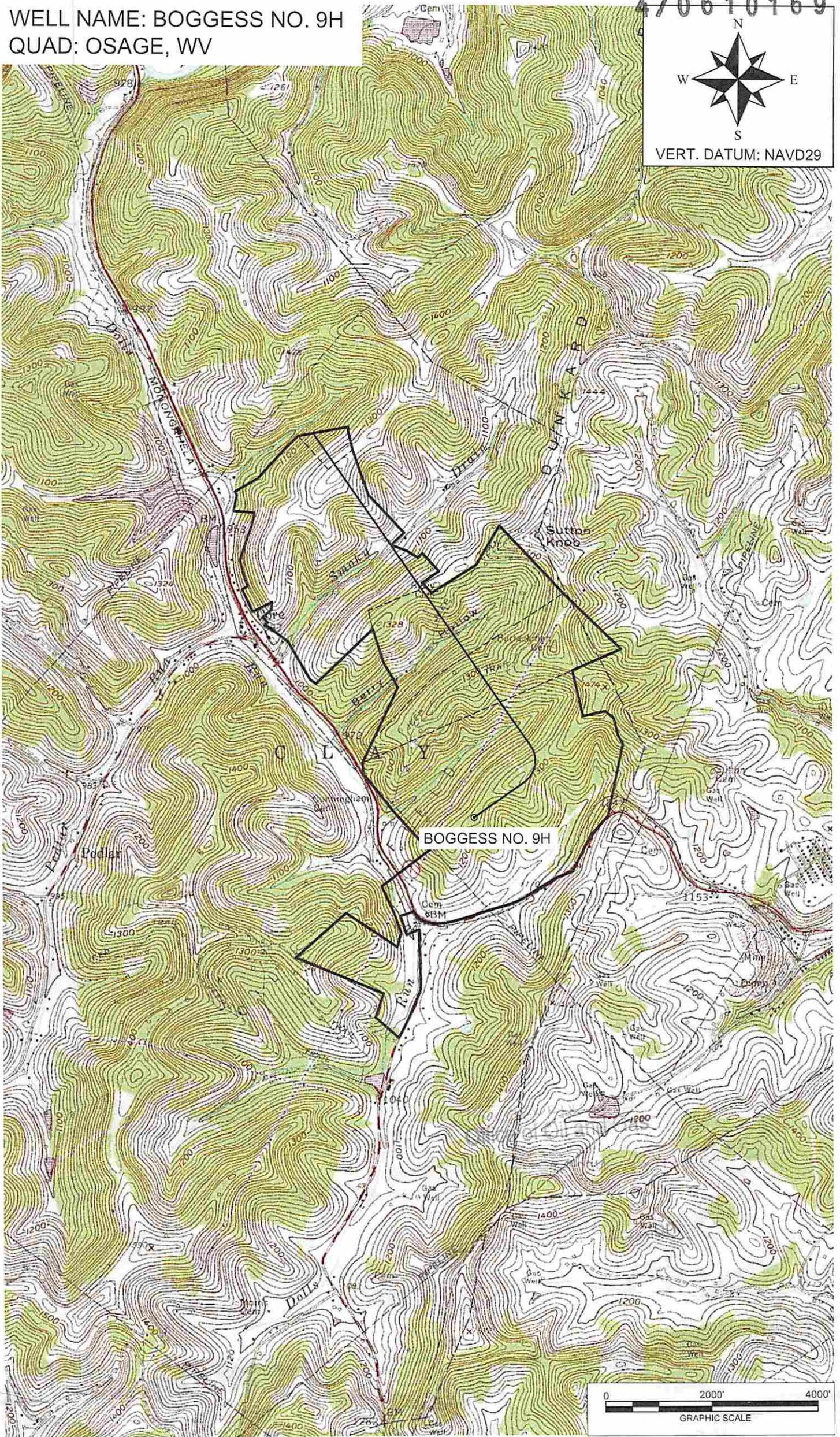
*Revised  
re'd 1/29/2015  
CRANES*

WELL NAME: BOGGESS NO. 9H  
QUAD: OSAGE, WV

4706101691



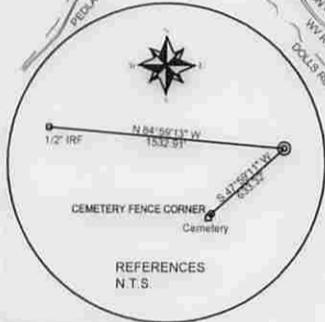
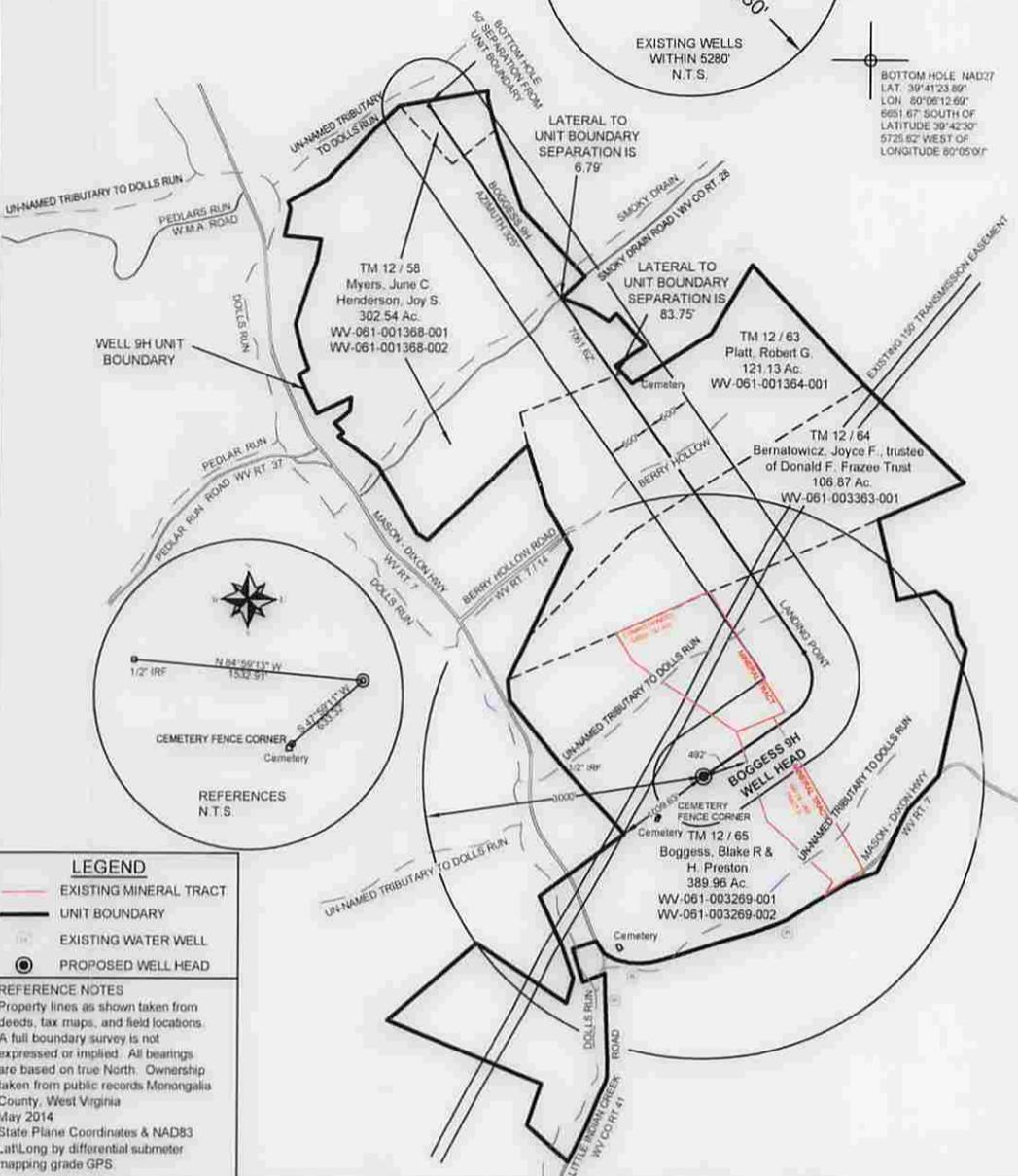
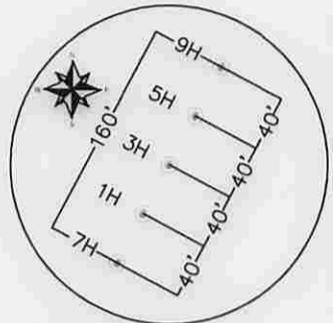
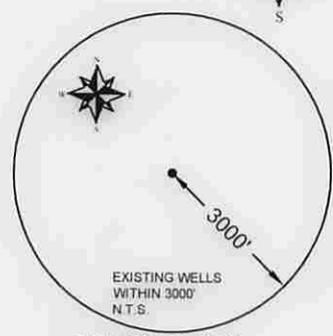
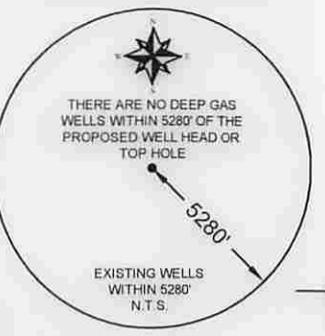
VERT. DATUM: NAVD29



**TOP HOLE** (UTM, NAD83)  
 N) 4391586.93  
 E) 577830.96

**BOTTOM HOLE**  
 N) 4393740.73  
 E) 576886.36

NO DWELLINGS FOUND WITHIN 650' OF THE CENTER OF THE WELL PAD  
 NO WATER WELLS FOUND WITHIN 250' OF THE CENTER OF THE WELL PAD



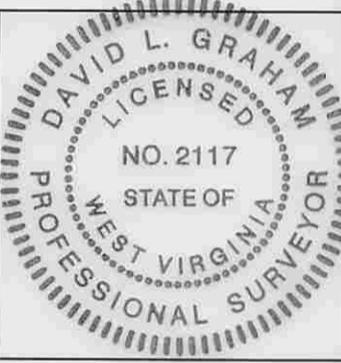
**LEGEND**  
 — EXISTING MINERAL TRACT  
 — UNIT BOUNDARY  
 (H) EXISTING WATER WELL  
 (●) PROPOSED WELL HEAD

**REFERENCE NOTES**  
 Property lines as shown taken from deeds, tax maps, and field locations. A full boundary survey is not expressed or implied. All bearings are based on true North. Ownership taken from public records Monongalia County, West Virginia May 2014. State Plane Coordinates & NAD83 Lat/Long by differential submeter mapping grade GPS.

FILE#: 1438006  
 SHEET#: 1 of 1  
 SCALE: 1" = 2000'  
 TICK SCALE: 1" = 2000'  
 MINIMUM DEGREE OF ACCURACY: 1/200  
 PROVEN SOURCE OF ELEVATION: By differential submeter mapping grade GPS.

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 ENVIRONMENTAL PROTECTION.

Signed: *David L. Graham* 1.07.15  
 P.S. #2117: David L. Graham, P.S.



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS  
 WVDEP  
 OFFICE OF OIL & GAS  
 601 57TH STREET  
 CHARLESTON, WV 25304

DATE: JANUARY 7, 2015  
 OPERATOR'S WELL #: BOGCESS NO. 9H

Well Type:  Oil  Waste Disposal  Production  Deep  
 Gas  Liquid Injection  Storage  Shallow

WATERSHED: DUNKARD CREEK  
 COUNTY / DISTRICT: MONONGALIA \ CLAY  
 SURFACE OWNER: BOGCESS, BLAKE R. & H. PRESTON  
 OIL & GAS ROYALTY OWNER: BOGCESS, BLAKE R. & H. PRESTON  
 LEASE NUMBERS:

ELEVATION: 1268'  
 QUADRANGLE: OSAGE, WV  
 ACREAGE: 389.96  
 ACREAGE: 920.50

DRILL  CONVERT  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE  
 PLUG OFF FORMATION  PERFORATE NEW FORMATION  PLUG & ABANDON  
 CLEAN OUT & REPLUG  OTHER CHANGE SPECIFY:

TARGET FORMATION: MARCELLUS  
 WELL OPERATOR: NORTHEAST NATURAL ENERGY LLC  
 ADDRESS: 707 VIRGINIA STREET, SUITE 1200  
 CITY: CHARLESTON STATE: WV ZIP: 25301

ESTIMATED DEPTH: TVD: PILOT- 8400' HORIZ.: 7993' TMD: 16,505'  
 DESIGNATED AGENT: JOHN ADAMS, V.P. OPERATIONS  
 ADDRESS: 707 VIRGINIA STREET, SUITE 1200  
 CITY: CHARLESTON STATE: WV ZIP: 25301

13770.64'  
 Longitude: 80° 05' 00" (NAD27)

SURFACE HOLE DEC. LAT. = 39° 40' 13.72"  
 SURVEYED LAT. = 39° 40' 13.72"