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west virginia department of environmental protection

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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

September 11, 2015

NORTHEAST NATURAL ENERGY LLC  
707 VIRGINIA STREET EAST  
CHARLESTON, WV 25301

Re: Permit Modification Approval for API Number 6101705, Well #: MIP SW

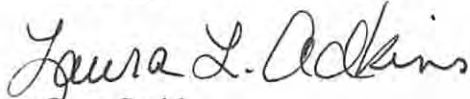
### Modified Casing Diameters

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,

  
Gene Smith  
Assistant Chief of Permitting  
Office of Oil and Gas

*for*

Promoting a healthy environment.

09/11/2015

WW - 2B  
(Rev. 8/10)

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

1) Well Operator: Northeast Natural Energy LLC      494498281      Monongalia      Grant      Morgantown South  
Operator ID      County      District      Quadrangle

2) Operator's Well Number: MIP SW      3) Elevation: 1,072.91'

4) Well Type: (a) Oil \_\_\_\_\_ or Gas X \_\_\_\_\_  
(b) If Gas: Production \_\_\_\_\_ / Underground Storage \_\_\_\_\_  
Deep \_\_\_\_\_ / Shallow X \_\_\_\_\_

5) Proposed Target Formation(s): Onondaga      Proposed Target Depth: 7,672'

6) Proposed Total Depth: 7,672' Feet      Formation at Proposed Total Depth: Onondaga

7) Approximate fresh water strata depths: 50', 450'

8) Approximate salt water depths: 1,600'

9) Approximate coal seam depths: 200', 225'

10) Approximate void depths, (coal, Karst, other): N/A

11) Does land contain coal seams tributary to active mine? No

12) Describe proposed well work and fracturing methods in detail (attach additional sheets if needed)

The MIP SW will be drilled to a depth of 7,672 ft. for the purposes of acquiring various geologic and engineering data and to be used for scientific observation. This well will not be perforated or produced.

13) **CASING AND TUBING PROGRAM**

*MDK 9/10/2015*

TYPE	SPECIFICATIONS			FOOTAGE INTERVALS		CEMENT
	Size	Grade	Weight per ft	For Drilling	Left in Well	Fill -up (Cu. Ft.)
Conductor	24"	NA	52.78	60'	60'	GTS
Fresh Water	13 3/8"	J-55	54.5	530'	500'	CTS
Coal						
Intermediate	7"	J-55	23	1,830'	1,800'	CTS
Production	4 1/2"	J-55	11.6	7,672'	7,642'	920 Cu. Ft.
Tubing			<b>RECEIVED</b> Office of Oil and Gas			
Liners						

Packers: Kind: \_\_\_\_\_  
Sizes: \_\_\_\_\_  
Depths Set \_\_\_\_\_

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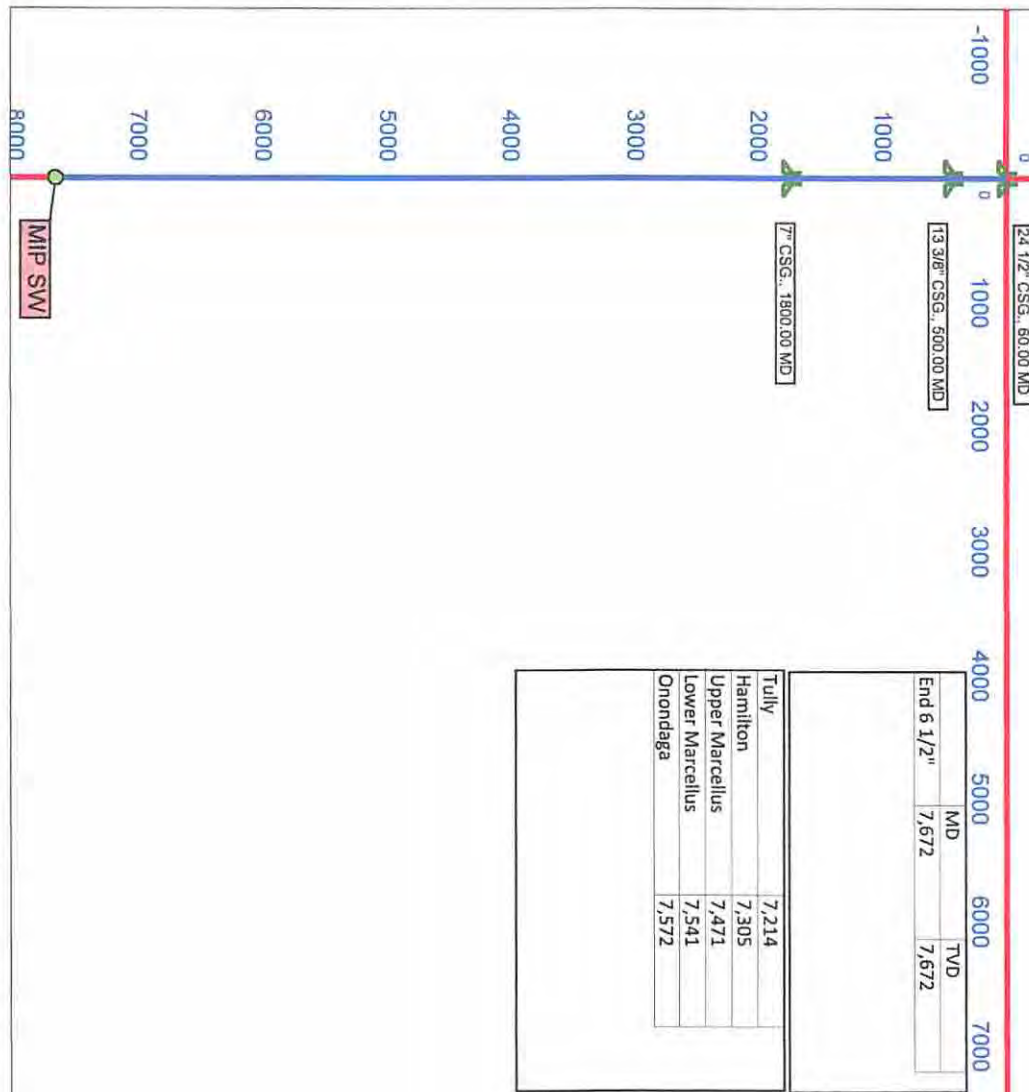
09/11/2015



**Job Number:**  
**Company:** Northeast Natural Energy  
**Lease/Well:** MIP SW  
**Location:** MIP  
**Rig Name:** Patterson 254  
**State/County:** WV/Mon  
**Country:** US  
**API Number:**

**Elevation (To MSL):** 1060.00 ft  
**RKB:** 18.00 ft  
**Projection System:** US State Plane 1983  
**Projection Group:** West Virginia Northern Zone  
**Projection Datum:** GRS80  
**Magnetic Declination:** -8.02  
**Grid Convergence:** -0.30608 W  
**Date:** Monday, August 17, 2015

**True Vertical Depth**



**South - North**



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 Office of Oil and Gas  
**AUG 28 2015**  
 WV Department of  
 Environmental Protection

**Vertical Section (1000 FVDiv) VSP: 324.65°**