April 03, 2014

WELL WORK PERMIT

Horizontal 6A Well

This permit, API Well Number: 47-5101732, issued to NOBLE ENERGY, INC., 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: MND 6 HHS
Farm Name: CONSOLIDATION COAL COMP
API Well Number: 47-5101732
Permit Type: Horizontal 6A Well
Date Issued: 04/03/2014
PERMIT CONDITIONS

West Virginia Code § 22-6-11 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. 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 § 22-6-20, 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.

2. Pursuant to 35 CSR § 4-19.1.a, at the request of the surface owner all water wells or springs within 1000 feet of the proposed well that are actually utilized for human consumption, domestic animals or other general use shall be sampled and analyzed.

3. Pursuant to 35 CSR § 4-19.1.c, if the operator is unable to sample and analyze any water well or spring within one thousand (1,000) feet of the permitted well location, the Office of Oil and Gas requires the operator to sample, at a minimum, one water well or spring located between one thousand (1,000) feet and two thousand (2,000) feet of the permitted well location.

4. All pits must be lined with a minimum of 20 mil thickness synthetic liner.

5. In the event of an accident or explosion causing loss of life or serious personal injury in or about the well or while working on the well, the well operator or its contractor shall give notice, stating the particulars of the accident or explosion, to the oil and gas inspector and the Chief within twenty-four (24) hours.

6. During the surface casing and cementing process, in the event cement does not return to the surface, or any other casing string that is permitted to circulate cement to the surface and does not return to the surface, the oil and gas inspector shall be notified within twenty-four (24) hours.

7. Well work activities shall not constitute a hazard to the safety of persons.

8. Hydraulic Fracturing of the Cochran # 4H (API: 47-015-02897) must not exceed 3500 PSI and abide by the terms of the Fracking Plan Addendum attached to this permit.

9. Notification must be given to the local inspector at least five (5) days before fracturing and it must include a copy of the Cochran # 4H Hydraulic Fracturing Plan.
**STATE OF WEST VIRGINIA**  
**DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS**  
**WELL WORK PERMIT APPLICATION**

Operator ID: 494501907  
County: Marshall  
District: Franklin  
Quadrangle: Powhatan Point

2) Operator’s Well Number: MND 6 HHS  
Well Pad Name: MND 6

3) Farm Name/Surface Owner: Consolidated Coal Company  
Public Road Access: CR 7/4-Fish Creek Rd

4) Elevation, current ground: 722'  
Elevation, proposed post-construction: 721'

5) Well Type:  
(a) Gas  
(b) If Gas: Shallow  
Other  
Horizontal

6) Existing Pad: Yes or No: No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):  
Marcellus at 5895' and 55' in thickness. Anticipated pressure at 3927#.

8) Proposed Total Vertical Depth: 5940'  
9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 18,882'

11) Proposed Horizontal Leg Length: 12,142'

12) Approximate Fresh Water Strata Depths: 128' and 265'

13) Method to Determine Fresh Water Depths: Offset well data

14) Approximate Saltwater Depths: None noted in offsets

15) Approximate Coal Seam Depths: 284' to 294'

16) Approximate Depth to Possible Void (coal mine, karst, other): None anticipated, drilling in pillar-mine maps attached

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: 1082' to nearest active mining  
Depth: Base at 294' at deepest point  
 Seam: Pittsburgh  
Owner: Murray American Energy (Previously Consol)

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**RECEIVED**  
Office of Oil and Gas  
MAR 18 2014  
WV Department of Environmental Protection  
04/04/2014
### CASING AND TUBING PROGRAM

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<tr>
<th>TYPE</th>
<th>Size</th>
<th>New or Used</th>
<th>Grade</th>
<th>Weight per ft (lb/ft)</th>
<th>FOOTAGE: For Drilling</th>
<th>INTERVALS: Left in Well</th>
<th>CEMENT: Fill-up (Cu. Ft)</th>
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<tr>
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<td>LS</td>
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<tr>
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<td>5 1/2&quot;</td>
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<td>P110</td>
<td>20#</td>
<td>18,882'</td>
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<tr>
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### Wellbore and Thickness

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<tr>
<th>TYPE</th>
<th>Size</th>
<th>Wellbore Diameter</th>
<th>Wall Thickness</th>
<th>Burst Pressure</th>
<th>Cement Type</th>
<th>Cement Yield (cu. ft/k)</th>
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<td>3520</td>
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<td>8 3/4&quot; &amp; 8 1/2&quot;</td>
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### PACKERS

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<td>Depths Set:</td>
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*Signature:* 3/11/14

*Signature:* 3/11/14

*Signature:* 8/2014

*Signature:* 04/04/2014

*WV Department of Environmental Protection*
19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill the vertical depth to the Marcellus at an estimated total vertical depth of approximately 6,913 feet. Drill horizontal leg stimulate and produce the Marcellus Formation. If we should encounter an unanticipated void we will install casing at a minimum of 20' below the void but not more than 100' below the void, set a basket and grout to surface.

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. See attached list. Maximum pressure not to exceed 10,000 lb.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 9.6

22) Area to be disturbed for well pad only, less access road (acres): 7.3

23) Describe centralizer placement for each casing string:

No centralizers will be used with conductor casing. Surface casing will have bow spring centralizers on first 2 joints then every third joint to 100' from surface. Intermediate casing will have bow spring centralizers on first 2 joints then every third joint to 100' from surface. Production string will have a rigid bow spring every joint to KOP, rigid bow spring every third joint from KOP to top of cement.

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

Conductor-1.15% CaCl *Surface and Coal (Intermediate)- Class A Portland Cement CaCl 2%, 2% Accelerator, 0.2% Antifoam and 0.125#/sk Flake. Excess Yield=1.18 Production- 14.8 ppg class A 25:75:0 System +2.6% Cement extender, 0.7% Fluid Loss additive, 0.45% high temp retarder, 0.2% friction reducer 15% Excess Yield=1.27 TOC greater or equal to 200' above 9,625' shoe.

*Surface and Coal string WVDEP approved variance attached.

25) Proposed borehole conditioning procedures:

Conductor-The hole is drilled w/air and casing is run on air. Apart from insuring the hole is clean via air circulation at TD, there are no other conditioning procedures. Surface-The hole is drilled w/air and casing is run on air. Fill with KCl water once drilled to TD. Once casing is at setting depth, circulate a minimum of one hole volume prior to pumping cement Coal-The hole is drilled and cased w/air or on Freshwater based mud. Once casing is at setting depth, the hole is filled w/KCl water and a minimum of one hole volume is circulated prior to pumping cement. Once cemented, intermediate casing is set and cemented, intermediate hole is drilled either on air or SOBM and filled with KCl water once drilled to TD. Production-The hole is drilled with SOBM and once to TD, circulated at maximum allowable pump rate for at least 6x bottom's up. Once on bottom with casing, circulate a minimum of one hole volume prior to pumping cement.

*Note: Attach additional sheets as needed.
STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS

FLUIDS/CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name: Noble Energy, Inc.

Operator's Well No. MND 8 HHS

API Number 47-051-073475

Watershed (HUC 10): Fish Creek Undefined (HUC 10)

Elevation: 721' Post Construction

County: Marshall

District: Franklin

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

Will a pit be used? Yes [ ] No [X]

If so, please describe anticipated pit waste: Closed Loop-No pit will be utilized

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 TBD-Next anticipated well)
- [ ] Off Site Disposal (Supply form WW-9 for disposal location)
- [ ] Other (Explain)

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 thru coal string, then SOBM

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

Additives to be used in drilling medium? Please see attached

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

- If left in pit and plan to solidify what medium will be used? (cement, lime, sawdust)
- Landfill or offsite name/permit number? Please 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 ________________________________

Company Official (Typed Name) Jessica Leska

Company Official Title Regulatory Technician

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Office of Oil and Gas

Subscribed and sworn before me this 15th day of December, 2013, to be received this 1st day of January, 2014.

Laura L. Wilkins

Notary Public

My commission expires November 23, 2015

04/04/2014
Noble Energy, Inc.

Proposed Revegetation Treatment:

- Acres Disturbed: 9.6 acres
- Prevegetation pH

- Lime: 2 to 3 Tons/acre or to correct to pH
- Fertilizer type: 10-20-20
- Fertilizer amount: 500 lbs/acre
- Mulch: Hay or straw at 2 Tons/acre

### Seed Mixtures

<table>
<thead>
<tr>
<th>Temporary</th>
<th>Permanent</th>
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<tbody>
<tr>
<td>Seed Type</td>
<td>lbs/acre</td>
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<tr>
<td>Tall Fescue</td>
<td>40</td>
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<tr>
<td>Ladino Clover</td>
<td>5</td>
</tr>
<tr>
<td>See site plans for full list</td>
<td>See site plans for full list</td>
</tr>
</tbody>
</table>

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: Jim Nicholson WVOOG State Inspector

Comments:
- Occupied Dwelling Structures 625' from center of pad require Surface Owner Waiver recorded with County Clerk.
- Due to proximity to Graysville community, I would like to see construction of sound barrier around well pad.

04/04/2014

Title: Oil & Gas Inspector

Date: 3/11/14

Field Reviewed? ( ) Yes ( ) No
DRILLING WELL PLAN
MND-6H-LS (Marcellus HZ)
Macellus Shale Horizontal
Marshall County, WV

Ground Elevation: 722'
Azm: 325°

WELLBORE DIAGRAM

<table>
<thead>
<tr>
<th>Depth</th>
<th>Stage</th>
<th>casing</th>
<th>Geology</th>
<th>MD</th>
<th>TVD</th>
<th>Mud</th>
<th>Cement</th>
<th>Centralizers</th>
<th>Conditioning</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>17 1/2</td>
<td>13-3/8&quot; 54.5&quot; J-55 LTC</td>
<td>Conductor</td>
<td>40</td>
<td>40</td>
<td>A/R</td>
<td>15.0 avg Type 1 + 2% CaCl2, 0.555 lb/Lb CMC</td>
<td>30% Excess Yield = 1.5</td>
<td>Bore Spring on first 2 joints then every third joint to 15&quot; for relief</td>
<td>Fill with NGI water once drilled to TD. Once casing is set at casing depth, circulate a minimum of one hole volume prior to pumping cement.</td>
<td>Intermediate casing = 0.300&quot; wall thickness</td>
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<tr>
<td>12 3/8</td>
<td>9-5/8&quot; 54.5&quot; J-55 LTC</td>
<td>Big Lime</td>
<td>1430</td>
<td>1604</td>
<td>A/R</td>
<td>15.0 avg Class A + 5% RO, 0.15% Disp, 0.2% Acid Slurry, 0.15% Water Slurry (20% Excess Yield = 1.3)</td>
<td>12.00 gpg - 8.00 gpg SDBM</td>
<td>Bore spring, cement strength every third joint to 10&quot; from surface.</td>
<td>Fill with NGI water once drilled to TD. Once casing is set at casing depth, circulate a maximum of one hole volume prior to pumping cement.</td>
<td>Intermediate casing = 0.300&quot; wall thickness</td>
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<tr>
<td>6.75&quot; Vertical</td>
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<td>6.75&quot; - 6.6&quot; Lateral</td>
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Received by the Office of Oil & Gas

DEC 1 9 2013

WV Department of Environmental Protection

04/04/2014
EROSION & SEDIMENT CONTROL PLAN
FOR
MND 6 WELL PAD
FRANKLIN DISTRICT, MARSHALL COUNTY, WV

GENERAL NOTES
1. ALL PREPARATION DRAWINGS FOR THE BASE MAPPING WERE PROVIDED BY WEST VIRGINIA DEPARTMENT OF NATURAL RESOURCES.
2. PROJECT INFORMATION, LIDAR INFORMATION, AND AERIAL PHOTOGRAPHY SHOWN ON THE BASE MAPPING WILL BE ACCORDINGLY UPDATED TO SUIT THE CURRENT REQUIREMENTS.
3. DRAFTEE IS A SOIL EROSION CONTROL PLAN PREPARED BY WEST VIRGINIA DEPARTMENT OF NATURAL RESOURCES.
4. THIS PLAN WAS DESIGNED TO MITIGATE EROSION AND SEDIMENTATION PROBLEMS ARISING FROM CONSTRUCTION ACTIVITIES.

DIRECTIONS TO THE SITE
FROM U.S. HIGHWAY 19 SOUTH, TAKING EXIT 72, TURN LEFT ONTO STATE ROUTE 628.
CONTINUE ON ROUTE 628 FOR 15 MILES TO THE SITE.

DISTURBANCE SUMMARY

LIST OF DRAWINGS
1.  EROSION & SEDIMENT CONTROL PLAN
2.  BASE MAPPING
3.  MONITORING SCHEDULE
4.  CONSTRUCTION SEQUENCE
5.  DETAILED EROSION CONTROL

Electronic Version of These Plans May Be Viewed at: QIOIL GAS/SAV FILES/REVIEWS