July 02, 2014

WELL WORK PERMIT

Horizontal 6A Well

This permit, API Well Number: 47-5101765, 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 MHS
Farm Name: CONSOLIDATION COAL COMPA
API Well Number: 47-5101765
Permit Type: Horizontal 6A Well
Date Issued: 07/02/2014

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

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

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operator ID</td>
<td>494501907</td>
</tr>
<tr>
<td>County</td>
<td>Marshall</td>
</tr>
<tr>
<td>District</td>
<td>Franklin</td>
</tr>
<tr>
<td>Quadrangle</td>
<td>Powhatan Point</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2) Operator's Well Number:</th>
<th>MND 6 MHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well Pad Name:</td>
<td>MND 6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3) Farm Name/Surface Owner:</th>
<th>Consolidation Coal Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Road Access:</td>
<td>CR 7/4-Fish Creek Rd</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4) Elevation, current ground:</th>
<th>722'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevation, proposed post-construction:</td>
<td>721'</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5) Well Type</th>
<th>(a) Gas</th>
<th>Oil</th>
<th>Underground Storage</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>(b) If Gas</th>
<th>Shallow</th>
<th>Deep</th>
<th>Horizontal</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>6) Existing Pad: Yes or No</th>
<th>No-but has been permitted</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marcellus at 5895' and 55' in thickness. Anticipated pressure at 3927#.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>8) Proposed Total Vertical Depth:</th>
<th>5940'</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>9) Formation at Total Vertical Depth:</th>
<th>Marcellus</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>10) Proposed Total Measured Depth:</th>
<th>13,804'</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>11) Proposed Horizontal Leg Length:</th>
<th>4,490'</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>12) Approximate Fresh Water Strata Depths:</th>
<th>128' and 265'</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>13) Method to Determine Fresh Water Depths:</th>
<th>Offset well data</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>14) Approximate Saltwater Depths:</th>
<th>None noted in offsets</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>15) Approximate Coal Seam Depths:</th>
<th>284' to 294'</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>16) Approximate Depth to Possible Void (coal mine, karst, other):</th>
<th>None anticipated, drilling information in pillar-mine maps attached</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine?</th>
<th>Yes</th>
</tr>
</thead>
</table>

(a) If Yes, provide Mine Info: | Name: 1082' to nearest active mining |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth:</td>
<td>Base at 294' at deepest point</td>
</tr>
<tr>
<td>Seam:</td>
<td>Pittsburgh</td>
</tr>
<tr>
<td>Owner:</td>
<td>Murray American Energy (Previously Consol)</td>
</tr>
</tbody>
</table>

---

Page 1 of 3

07/04/2014
### CASING AND TUBING PROGRAM

<table>
<thead>
<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>
</tr>
</thead>
<tbody>
<tr>
<td>Conductor</td>
<td>20&quot;</td>
<td>New</td>
<td>LS</td>
<td>117#</td>
<td>40'</td>
<td>40'</td>
<td>CTS</td>
</tr>
<tr>
<td>Fresh Water</td>
<td>13 3/8&quot;</td>
<td>New</td>
<td>LS</td>
<td>94#</td>
<td>694'</td>
<td>694'</td>
<td>CTS</td>
</tr>
<tr>
<td>Coal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production</td>
<td>5 1/2&quot;</td>
<td>New</td>
<td>P110</td>
<td>20#</td>
<td>13,804'</td>
<td>13,804'</td>
<td></td>
</tr>
<tr>
<td>Tubing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liners</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### TYPE

<table>
<thead>
<tr>
<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>
</tr>
</thead>
<tbody>
<tr>
<td>Conducto</td>
<td>20'</td>
<td>26&quot;</td>
<td>.375</td>
<td>Type 1/Class A</td>
<td>1.2</td>
</tr>
<tr>
<td>Fresh Water</td>
<td>13 3/8&quot;</td>
<td>17 1/2&quot;</td>
<td>.380</td>
<td>Type 1/Class A</td>
<td>1.2</td>
</tr>
<tr>
<td>Coal</td>
<td>13 3/8&quot;</td>
<td>17 1/2&quot;</td>
<td>.380</td>
<td>Type 1/Class A</td>
<td>1.2</td>
</tr>
<tr>
<td>Intermediate</td>
<td>9 5/8&quot;</td>
<td>12 3/8&quot;</td>
<td>.352</td>
<td>Type 1/Class A</td>
<td>1.19</td>
</tr>
<tr>
<td>Production</td>
<td>5 1/2&quot;</td>
<td>8 3/4&quot; &amp; 8 1/2&quot;</td>
<td>.361</td>
<td>Type 1/Class A</td>
<td>1.27</td>
</tr>
<tr>
<td>Tubing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liners</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### PACKERS

<table>
<thead>
<tr>
<th>Kind:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sizes:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depths Set:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Received by:
Office of Oil and Gas
MAY 8, 2014

WV Department of Environmental Protection

Page 2 of 3

07/04/2014
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 5,940 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. Stawkwater 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-1.16% CaCl₂ Surface and Coal (Intermediate)- Class A Portland Cement CaCl₂ 2.0% Accelerator 0.5% Antifoam and 0.125% Feather. Excess Yield=1.18 Production- 14.8 ppg class A 25:75:0 System +2% cement extender, 0.7% Fluid Loss additive, 0.45% high temp retarder, 0.2% friction reducer 15% Excess Yield=27 TOC greater or equal to 200' above 6.25" shoe.
*Surface and Coal string WVDEP approved variance attached.

25) Proposed borehole conditioning procedures:
Conductor-The hole is drilled while 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 while 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 while 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. Intermediate-Once surface 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 3x bottoms up. Once on bottom with casing, circulate a minimum of one hole volume prior to pumping cement.

*Note: Attach additional sheets as needed.
October 31, 2013

Schlumberger
Attn: Daniel L. Sikorski
4600 J Barry Court
Suite 200
Canonsburg, PA 15317

RE: Cement Variance Request

Dear Sir:

This agency has approved a variance request for the cement blend listed below to be used on surface and coal protection casing only. The variance cannot be used without an oil and gas operator requesting its use on a permit application and approved by this agency:

- 2% Accelerator (S001)
- 0.2% Antifoam (D046)
- 0.125 lb/sk Polyester Flake (D0130)

If you have any questions regarding this matter feel free to contact me at 304-926-0499, ext. 1653.

Sincerely,

James Peterson
Environmental Resources Analyst

Promoting a healthy environment.
BEFORE THE OFFICE OF OIL AND GAS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
STATE OF WEST VIRGINIA

IN THE MATTER OF A VARIANCE FROM 
REGULATION 35 CSR § 4-11.4/11.5/14.1 
AND 35 CSR § 8-9.2,h, 4/5/6/8 OF THE 
The OPERATIONAL 
REGULATIONS OF CEMENTING OIL 
AND GAS WELLS 

ORDER NO. 2013-78

REPORT OF THE OFFICE

Schlumberger requests approval of a different cement blend for use in cementing surface and coal protection casing of oil and gas wells.

FINDINGS OF FACT

1.) Schlumberger proposes the following cement blend:

- 2% Accelerator (S001)
- 0.2% Antifoam (D046)
- 0.125 lb/sk Polyester Flake (D130)

2.) Schlumberger laboratory testing results indicate that the blend listed in Fact No. 1 will achieve a 500 psi compressive strength within 5 hours, 22 minutes and a 1200 psi compressive strength within 10 hours. 29 minutes.

Promoting a healthy environment.

07/04/2014
CONCLUSIONS OF LAW

Pursuant to Articles 6 and 6A, Chapter 22 of the Code of West Virginia, the Office of Oil and Gas has jurisdiction over the subject matter embraced in said notice, and the persons interested therein, and jurisdiction to promulgate the hereinafter prescribed Order.

Pursuant to 35 CSR § 4-11.5 and 35 CSR § 8-9.2.h.8 the Chief of the Office of Oil and Gas may approve different cement blends upon the well operator providing satisfactory proof that different cement types are adequate.

ORDER

It is ordered that Schlumberger may use the cement blend listed in Findings of Fact No.1 for the cementing of surface and coal protection casing of oil and gas wells in the State as may be requested by oil and gas operators. The waiting time on the cement blend shall be 8 hours. The cement blend shall be mixed in strict accordance with the specifications for each blend and weight measurements made on-site to assure the cement slurries meet the minimum weight specifications. A sample shall be collected and, if after 8 hours the cement is not set up, additional time will be required. Schlumberger shall keep a record of cement blend jobs in which the cement blend approved under this order is to be used and made available to the Office of Oil and Gas upon request.

Dated this, the 31st day of October, 2013.

IN THE NAME OF THE STATE OF WEST VIRGINIA

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

[Signature]
James Martin, Chief
Office of Oil and Gas

RECEIVED
Office of Oil and Gas
MAY 31 2014

VIV Department of Environmental Protection

07/04/2014
# Laboratory Cement Test Report - 15.6 PPG SURFACE

**Weston District Laboratory**

<table>
<thead>
<tr>
<th>Field No.: WE513-649P</th>
<th>Client: MOBLE</th>
<th>Location/Project: WEST VIRGINIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date: Oct-06-2013</td>
<td></td>
<td>Field: NA</td>
</tr>
</tbody>
</table>

## Job Information
- **Type**: SURFACE
- **BHST**: 83 degF
- **BHTC**: 76 degF
- **Stirring Temp.**: 80 degF
- **Starting Pressure**: 179 psi
- **VTD**: 760.5 ft
- **BOP**: 494 psi
- **Time to Temp.**: 00:30 hr:min
- **Time to Pressure**: 00:30 hr:min
- **Heating Rate**: 0.2 degF/min
- **Schedule**: 6.1 h

## Composition
- **Slurry Density**: 18.80 lb/gal
- **Fluid Viscosity**: 41.4 %
- **Yield Point**: 50.6 %
- **Mix Fluid**: 4.82 gbb/sk
- **Bluff type**: Cementation

## Slurry Manager
- **CM1 - API**: 2000 %WOC
- **CM2**: 2000 %WOC
- **D130**: 6.158 lb/gal

## Rheology
- **Geometer**: RB1@1.0
- **SN 10-1991-003**

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>Uc (gbb/sk)</th>
<th>Dc (gbb/sk)</th>
<th>Average (gbb/sk)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>30.0</td>
<td>23.6</td>
<td>26.8</td>
</tr>
<tr>
<td>10</td>
<td>34.5</td>
<td>31.7</td>
<td>33.1</td>
</tr>
<tr>
<td>5</td>
<td>41.6</td>
<td>36.8</td>
<td>39.2</td>
</tr>
<tr>
<td>3</td>
<td>41.6</td>
<td>36.8</td>
<td>39.2</td>
</tr>
<tr>
<td>1</td>
<td>41.6</td>
<td>36.8</td>
<td>39.2</td>
</tr>
</tbody>
</table>

- **Uc-computed**: Visc: 25.7/22/1.0, Test Point: 25.5/2F/10/02

## UCA Compressive Strength
- **SN 10146**

<table>
<thead>
<tr>
<th>Conditions</th>
<th>UCA (ksi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/22 hrs Lb/psi</td>
<td>659 psi</td>
</tr>
<tr>
<td>10/22 hrs quts Lb/psi</td>
<td>199 psi</td>
</tr>
</tbody>
</table>

## Free Fluid
- **1.8 Ml/20mm, in 2 hrs**
- **17.8 degF, at 9 degF**
- **Soilmoisture**: None

## Comments
- **General Comment:**
  - **Note:** This is a pilot test. Field may differ after testing. Please read field report carefully and complete test to pilot report and load out. Contact the laboratory with any questions or concerns. 2014

---

**Office of Oil and Gas**

**WV Department of Environmental Protection**

07/04/2014
<table>
<thead>
<tr>
<th>HOLE</th>
<th>CASING</th>
<th>GEOLOGY</th>
<th>TON</th>
<th>BASE</th>
<th>SHL</th>
<th>CEMENT</th>
<th>COMPLIANCE</th>
<th>CONDITIONING</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>22&quot; SHM</td>
<td></td>
<td>45</td>
<td>42</td>
<td>ARI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17 1/2</td>
<td>15-5/8&quot; 5-1/2&quot;</td>
<td>J-65 BTC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pittsburgh Chert</td>
<td></td>
<td>294</td>
<td>284</td>
<td></td>
<td>ARI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Surface Casing</td>
<td></td>
<td>866</td>
<td>866</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 5/8</td>
<td>9-5/8&quot; 2 7/8&quot;</td>
<td>J-65 BTC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Big Lime</td>
<td></td>
<td>1421</td>
<td>1421</td>
<td></td>
<td>ARI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Big Bonneville</td>
<td></td>
<td>1164</td>
<td>1171</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>New Formation</td>
<td></td>
<td>1717</td>
<td>1755</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hi Casing</td>
<td></td>
<td>9357</td>
<td>9311</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6-7/8&quot; Vertical</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Speedyway</td>
<td></td>
<td>3019</td>
<td>3065</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>June</td>
<td></td>
<td>4275</td>
<td>4865</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pipe Clay</td>
<td></td>
<td>4968</td>
<td>4730</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Angola</td>
<td></td>
<td>4782</td>
<td>5034</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Riverbed</td>
<td></td>
<td>5234</td>
<td>5666</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conside</td>
<td></td>
<td>5858</td>
<td>6779</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Midwesto</td>
<td></td>
<td>6277</td>
<td>6792</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>West River</td>
<td></td>
<td>5720</td>
<td>6111</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Butte</td>
<td></td>
<td>5911</td>
<td>5938</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tulli Limestone</td>
<td></td>
<td>5979</td>
<td>5986</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Harrison</td>
<td></td>
<td>5960</td>
<td>5966</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Massif</td>
<td></td>
<td>5965</td>
<td>5960</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TD</td>
<td></td>
<td>12649</td>
<td>13060</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Capping</td>
<td></td>
<td>8052</td>
<td>8052</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Ground Elevation**  722

**Asm**  325°

**MND-6M SHL (Lat/Long)**

(483402.829, 167105.425) (NAD27)

(481892.686, 163488.069) (NAD87)

(487247.186, 1536042.832) (NAD87)

**Compliance**

- Statistics surface shales, Casing casing = 0.45" well thickness
- Statistics surface shales, Casing casing = 0.45" well thickness
- Statistics surface shales, Casing casing = 0.45" well thickness
- Statistics surface shales, Casing casing = 0.45" well thickness
- Statistics surface shales, Casing casing = 0.45" well thickness
- Statistics surface shales, Casing casing = 0.45" well thickness

**Conditioning**

- Statistics surface shales, Casing casing = 0.45" well thickness
- Statistics surface shales, Casing casing = 0.45" well thickness
- Statistics surface shales, Casing casing = 0.45" well thickness
- Statistics surface shales, Casing casing = 0.45" well thickness
- Statistics surface shales, Casing casing = 0.45" well thickness
- Statistics surface shales, Casing casing = 0.45" well thickness

**Comments**

- Statistics surface shales, Casing casing = 0.45" well thickness
- Statistics surface shales, Casing casing = 0.45" well thickness
- Statistics surface shales, Casing casing = 0.45" well thickness
- Statistics surface shales, Casing casing = 0.45" well thickness
- Statistics surface shales, Casing casing = 0.45" well thickness
- Statistics surface shales, Casing casing = 0.45" well thickness

**Usage**

- Statistics surface shales, Casing casing = 0.45" well thickness
- Statistics surface shales, Casing casing = 0.45" well thickness
- Statistics surface shales, Casing casing = 0.45" well thickness
- Statistics surface shales, Casing casing = 0.45" well thickness
- Statistics surface shales, Casing casing = 0.45" well thickness
- Statistics surface shales, Casing casing = 0.45" well thickness

**Production**

- Statistics surface shales, Casing casing = 0.45" well thickness
- Statistics surface shales, Casing casing = 0.45" well thickness
- Statistics surface shales, Casing casing = 0.45" well thickness
- Statistics surface shales, Casing casing = 0.45" well thickness
- Statistics surface shales, Casing casing = 0.45" well thickness
- Statistics surface shales, Casing casing = 0.45" well thickness

**Drilling Well Plan**

**MND-6M HP (Marcellus HQ)**

McAsellus Shale Horizontal

Marshall County, WV

**Drill Rig**

- Area
- Equipment
- Drilling

**Environmental Protection**

07/04/2014
STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name: Noble Energy, Inc.  OP Code: 494501907

Watershed (HUC 10): Fish Creek  Undefined (HUC 10)  Quadrangle: Powhatan Point

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 ☐

Will a pit be used?  Yes ☐ No ☑

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:
- 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?  Yes ☑

Drilling medium anticipated for this well (vertical and horizontal)?  Air, freshwater, oil based, etc. Air thru coal string, then SORB

- 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 these 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: Laura Adkins
Company Official (Typed Name): Laura Adkins
Company Official Title: Regulatory Analyst

Subscribed and sworn before me this day of May 2014

My commission expires 9/3/2014

07/04/2014
ChemicalList including CAS#s

Type: Friction Reducer (DWP-612)
Chemical Component as listed on MSDS: Long Chain Polycrylamide
CAS: N/A

Type: Iodide (DWP-944)
1st Chemical Component as listed on MSDS: 2,4-dichloro-2,4-dinitro-2,4,5-tetrazenyl-3-
CAS: 10222-01-2
2nd Chemical Component as listed on MSDS: Polyethylene Glycol Mixture
CAS: 25322-58-3

Type: Scale Inhibitor (DAP-801)
1st Chemical Component as listed on MSDS: Methanol
CAS: 67-56-1
2nd Chemical Component as listed on MSDS: Phosphoric Acid Ammonium Salt
CAS: Trade Secret
3rd Chemical Component as listed on MSDS: Ammonium Chloride
CAS: 1333-82-9
4th Chemical Component as listed on MSDS: Organic Phosphonate
CAS: Trade Secret
5th Chemical Component as listed on MSDS: Amine Salt
CAS: Trade Secret
6th Chemical Component as listed on MSDS: Oleylaminated Polyamine
CAS: Trade Secret

Type: Surfactant (DWP-936)
Chemical Component as listed on MSDS: Soap
CAS: N/A

Type: Hyphatchloric Acid
Chemical Component as listed on MSDS: Hydrochloric Acid
CAS: 7647-01-6

Type: PA breaker (DWP-900)
Chemical Component as listed on MSDS: Hydrogen Peroxide
CAS: Trade Secret

Type: Grit/Murry (DWP-111)
Chemical Component as listed on MSDS: Viscosifier
CAS: N/A

Type: Oxider Breaker (DWP-901)
Chemical Component as listed on MSDS: Ammonium Persulfate
CAS: 7775-56-0

Type: Buffer (DWP-704)
Chemical Component as listed on MSDS: Formic Acid
CAS: 64-18-6
Site Water/Cuttings Disposal

Cuttings
Haul off Company:
Eap Industries, Inc.  DOT # 0876278
1575 Smith Twp State Rd. Atlasburg PA 15004
1-888-294-5227

Disposal Locations:
Apex Environmental, LLC  Permit # 06-08438
11 County Road 78
Amsterdam, OH  43903
740-543-4389

Westmoreland Waste, LLC  Permit # 100277
111 Conner Lane
Belle Vernon, PA  15012
724-929-7694

Sycamore Landfill (Allied Waste) R30-07900105-2010
4301 Sycamore Ridge Road
Hurricane, WV  25526
304-562-2611

Water
Haul off Company:
Dynamic Structures, Clear Creek  DOT # 720485
3790 State Route 7
New Waterford, OH 44445
330-892-0164

Disposal Location:
Solidification
Waste Management, Arden Landfill  Permit # 100172
200 Rangos Lane
Washington, PA 15301
724-225-1589

Solidification/incineration
Soil Remediation, Inc.  Permit # 02-20753
6065 Arnel-Smith Road
Lowelville, OH 44436

MAX Environmental Technology
233 Max Lane
Yukon, PA  25698
PAD004835146

RECEIVED
Office of Oil and Gas
MAY 21 2014
WV Department of
Environmental Protection

07/04/2014
Noble Energy, Inc.

Proposed Revegetation Treatment: Acres Disturbed 9.6 acres

Prevegetation pH

Line: 2 to 3 Tons/acre or to correct to pH

10-20-20

Fertilizer type

Fertilizer amount: 500 lbs/acre

Mulch: Hay or straw at 2 Tons/acre

Seed Mixtures

<table>
<thead>
<tr>
<th>Temporary</th>
<th>Permanente</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed Type</td>
<td>Seed Type</td>
</tr>
<tr>
<td>Tall Fescue</td>
<td>Tall Fescue</td>
</tr>
<tr>
<td>40 lbs/acre</td>
<td>40 lbs/acre</td>
</tr>
<tr>
<td>Ladino Clover</td>
<td>Ladino Clover</td>
</tr>
<tr>
<td>5 lbs/acre</td>
<td>5 lbs/acre</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:

Title: Oil Map Inspector Date: 5/12/14

Field Reviewed? Yes No

RECEIVED
Office of Oil and Gas
MAY 2, 2014
WV Department of Environmental Protection

07/04/2014