Input-Form Data for the U.S. Geological Survey Assessment of the Mississippian Barnett Shale of the Bend Arch–Fort Worth Basin Province, 2015


Open-File Report 2016–1097

U.S. Department of the Interior
U.S. Geological Survey
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Introduction

In 2015, the U.S. Geological Survey (USGS) released an updated assessment of undiscovered, technically recoverable shale gas and shale oil resources of the Mississippian Barnett Shale in north-central Texas (Marra and others, 2015). The Barnett Shale was assessed using the standard continuous (unconventional) methodology established by the USGS for two assessment units (AUs): (1) Barnett Continuous Gas AU, and (2) Barnett Mixed Continuous Gas and Oil AU. A third assessment unit, the Western Barnett Continuous Oil AU, was also defined but was not quantitatively assessed because of limited data within the extent of the AU. The purpose of this report is to provide supplemental documentation of the quantitative input parameters applied in the Barnett Shale assessment.

Assessment Methodology

The USGS uses two distinct peer-reviewed methodologies to assess for conventional and continuous resource accumulations. While both methodologies result in probabilistic estimates of undiscovered petroleum resources, each require specific input parameters. Conventional resources are defined where oil or natural gas is buoyant upon water and where petroleum resources have migrated into structural and (or) stratigraphic traps. The primary input data are related to the numbers and sizes of undiscovered conventional accumulations (Klett and others, 2005). In contrast, a continuous resource accumulation is defined as oil and (or) natural gas that has been generated from a thermally mature source rock and has remained within or adjacent to the source rock. The continuous resource assessment methodology is primarily focused on the uncertainties regarding the average drainage area of wells and the average estimated ultimate recoveries (EURs) of wells, as well as the projection of future success ratios (Charpentier and Cook, 2012). These methodologies are summarized in more detail in multiple published reports (Klett and Charpentier, 2003; Crovelli, 2005; Klett and Schmoker, 2005; Klett and others, 2005; Schmoker, 2005; Schmoker and Klett, 2005; Charpentier and Cook, 2012).

For the Barnett Shale assessment, the statistically based summary input data form for continuous resources was used for both quantitatively assessed AUs to document the descriptive information used in the resource calculation for each defined assessment unit (Charpentier and Cook, 2012). For the Barnett Mixed Continuous Oil and Gas AU, a modification was made to
the continuous input data form for “sweet spot” areas to incorporate both oil and gas production within the AU (line 4 on the form), as the assessment unit type was characterized as both gas and oil. A “sweet spot” is generally defined as an area with favorable geologic characteristics for petroleum resource production, including an adequate thermal history, gas content, and matrix rock properties. In this case, the percentage of untested assessment-unit area in sweet spots (given in percent) was modified to represent the percent of undrilled wells that could potentially be oil wells (also given in percent). Subsequently, the section for estimated ultimate recovery distributions per well in sweet spot areas (lines 5a and 5b) and nonsweet spot areas (lines 6a and 6b) was changed to reflect the future success ratio and average EUR distributions for oil wells and for gas wells, respectively. In addition, data for the coproduct ratios and ancillary data section were provided for both oil and gas wells.

**Summary Data-Input Forms for Assessment**

The data-input forms for the two quantitatively assessed Barnett Shale AUs are provided in tables 1 and 2.

**References Cited**


Table 1. (following 13 pages) Input parameters for the Barnett Continuous Gas Assessment Unit (50450161), Bend Arch–Fort Worth Basin Province. [bcfg, billion cubic feet of gas; mmcfg, million cubic feet of gas, cfg, cubic feet of gas; mmbo, million barrels of oil; bo, barrel of oil, bliq, barrel of liquid; bngl, barrel of natural gas liquids; m, meters; AU, assessment unit; EUR, estimated ultimate recovery]
**USGS U.S. PETROLEUM RESOURCES ASSESSMENT**
**INPUT DATA FORM FOR CONTINUOUS ACCUMULATIONS** (version 1.3, April 29, 2015)

### IDENTIFICATION INFORMATION

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<td>Bend Arch-Fort Worth Basin</td>
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**Notes from Assessor:**

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### CHARACTERISTICS OF ASSESSMENT UNIT

**Assessment-unit type:** oil (<20,000 cfg/bo) X gas (>20,000 cfg/bo)

**Well type:** vertical X horizontal

**Major reservoir type (Choose one.):**
- shale X
- low-permeability clastics
- low-permeability carbonates
- diatomite

**Minimum EUR per well:** 0.02 (mmbo for oil AU; bcfg for gas AU)

**Number of tested wells:** 18,922

**Number of tested wells with EUR > minimum:** 16,577

**Historic success ratio, tested wells (%):** 88

**Assessment-Unit Probability:**

What is the probability that at least one well within the AU will have production capacity of at least the minimum EUR? 1.0

---

### NUMBER OF UNDRILLED WELLS WITH POTENTIAL FOR ADDITIONS TO RESERVES

1. **Productive area of accumulation (acres):** (triangular)
   
   calculated mean 6,473,000 minimum 6,000,000 mode 6,419,000 maximum 7,000,000

2. **Uncertainty about average drainage area of wells (acres):** (triangular)
   
   calculated mean 100 minimum 60 mode 100 maximum 140

3. **Percentage of total assessment-unit area that is untested (%):** (triangular)
   
   calculated mean 73 minimum 65 mode 73 maximum 80

4. **Percentage of untested assessment-unit area in sweet spots (%):** (triangular)
   
   calculated mean 28 minimum 15 mode 30 maximum 40
ESTIMATED ULTIMATE RECOVERY (EUR) PER WELL

SWEET SPOTS

5a. Future success ratio (%): (triangular)
   calculated mean 89 minimum 85 mode 90 maximum 92

5b. Uncertainty about average EUR (mmbo for oil; bcfg for gas): (shifted truncated lognormal)
   calculated mean 2.034 minimum 1 median 2 maximum 3

NON-SWEET SPOTS

6a. Future success ratio (%): (triangular)
   calculated mean 73 minimum 60 mode 75 maximum 85

6b. Uncertainty about average EUR (mmbo for oil; bcfg for gas): (shifted truncated lognormal)
   calculated mean 0.956 minimum 0.5 median 0.9 maximum 2

UNCERTAINTY ABOUT AVERAGE COPRODUCT RATIOS FOR UNTESTED WELLS
(triangular)

Oil assessment unit:
Gas/oil ratio (cfg/bo) minimum mode maximum
NGL/gas ratio (bngl/mmcfg) __________ __________ __________

Gas assessment unit:
Liquids/gas ratio (bliq/mmcfg) 0.5 1.3 2

Page 2
### SELECTED ANCILLARY DATA FOR UNTESTED WELLS

(No specified distribution type)

#### Oil assessment unit:

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<tr>
<th></th>
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<tbody>
<tr>
<td>API gravity of oil (degrees)</td>
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<tr>
<td>Sulfur content of oil (%)</td>
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<td>Depth (m) of water (if applicable)</td>
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<td>Drilling depth (m)</td>
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#### Gas assessment unit:

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<td>Inert-gas content (%)</td>
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<td>2.50</td>
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<tr>
<td>CO₂ content (%)</td>
<td>0.10</td>
<td>1.00</td>
<td>5.00</td>
</tr>
<tr>
<td>Hydrogen sulfide content (%)</td>
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<td>0.00</td>
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<tr>
<td>Heating value (BTU)</td>
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<tr>
<td>Depth (m) of water (if applicable)</td>
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<td>Drilling depth (m)</td>
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#### Completion practices:

1. Typical well-completion practices (conventional, open hole, open cavity, other) conventional
2. Fraction of wells drilled that are typically stimulated 1
3. Predominant type of stimulation (none, frac, acid, other) frac
4. Historic fraction of wells drilled that are horizontal 0.72
ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO STATES
Surface Allocations

1. Texas

   Onshore: 100 area % of the AU
   100 mean volume % of the AU

   Offshore: area % of the AU
   mean volume % of the AU

2. 

   Onshore: area % of the AU
   mean volume % of the AU

   Offshore: area % of the AU
   mean volume % of the AU

3. 

   Onshore: area % of the AU
   mean volume % of the AU

   Offshore: area % of the AU
   mean volume % of the AU

4. 

   Onshore: area % of the AU
   mean volume % of the AU

   Offshore: area % of the AU
   mean volume % of the AU

5. 

   Onshore: area % of the AU
   mean volume % of the AU

   Offshore: area % of the AU
   mean volume % of the AU
ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO STATES
(continued)

6. __________________________________________________________________

Onshore: __________ area % of the AU
________ mean volume % of the AU

Offshore: __________ area % of the AU
________ mean volume % of the AU

7. __________________________________________________________________

Onshore: __________ area % of the AU
________ mean volume % of the AU

Offshore: __________ area % of the AU
________ mean volume % of the AU

8. __________________________________________________________________

Onshore: __________ area % of the AU
________ mean volume % of the AU

Offshore: __________ area % of the AU
________ mean volume % of the AU

9. __________________________________________________________________

Onshore: __________ area % of the AU
________ mean volume % of the AU

Offshore: __________ area % of the AU
________ mean volume % of the AU

10. __________________________________________________________________

Onshore: __________ area % of the AU
________ mean volume % of the AU

Offshore: __________ area % of the AU
________ mean volume % of the AU
### ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO PROVINCES

**Surface Allocations**

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5. Number: Name: ____________________________

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</table>
ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO PROVINCES
(continued)

6. Number: __________ Name: _____________________________________________
   Onshore: __________ area % of the AU
   __________ mean volume % of the AU
   Offshore: __________ area % of the AU
   __________ mean volume % of the AU

7. Number: __________ Name: _____________________________________________
   Onshore: __________ area % of the AU
   __________ mean volume % of the AU
   Offshore: __________ area % of the AU
   __________ mean volume % of the AU

8. Number: __________ Name: _____________________________________________
   Onshore: __________ area % of the AU
   __________ mean volume % of the AU
   Offshore: __________ area % of the AU
   __________ mean volume % of the AU

9. Number: __________ Name: _____________________________________________
   Onshore: __________ area % of the AU
   __________ mean volume % of the AU
   Offshore: __________ area % of the AU
   __________ mean volume % of the AU

10. Number: __________ Name: ___________________________________________
ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO GENERAL LAND OWNERSHIPS

Surface Allocations

1. Federal Lands is 2.95% of the AREA of the AU
   mean VOLUME % in entity 1.5

2. Private Lands is 0.01% of the AREA of the AU
   mean VOLUME % in entity 0

3. Tribal Lands is % of the AREA of the AU
   mean VOLUME % in entity

4. Other Lands is 96.88% of the AREA of the AU
   mean VOLUME % in entity 98.33

5. Texas State Lands is 0.17% of the AREA of the AU
   mean VOLUME % in entity 0.17

6. ___________________________ is _________% of the AREA of the AU
   mean VOLUME % in entity

7. ___________________________ is _________% of the AREA of the AU
   mean VOLUME % in entity

8. ___________________________ is _________% of the AREA of the AU
   mean VOLUME % in entity

9. ___________________________ is _________% of the AREA of the AU
   mean VOLUME % in entity

10. ___________________________ is _________% of the AREA of the AU
    mean VOLUME % in entity
ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO GENERAL LAND OWNERSHIPS
(continued)

11. _______________________________ is ________% of the AREA of the AU
   mean VOLUME % in entity __________

12. _______________________________ is ________% of the AREA of the AU
   mean VOLUME % in entity __________

13. _______________________________ is ________% of the AREA of the AU
   mean VOLUME % in entity __________

14. _______________________________ is ________% of the AREA of the AU
   mean VOLUME % in entity __________

15. _______________________________ is ________% of the AREA of the AU
   mean VOLUME % in entity __________

16. _______________________________ is ________% of the AREA of the AU
   mean VOLUME % in entity __________

17. _______________________________ is ________% of the AREA of the AU
   mean VOLUME % in entity __________

18. _______________________________ is ________% of the AREA of the AU
   mean VOLUME % in entity __________

19. _______________________________ is ________% of the AREA of the AU
   mean VOLUME % in entity __________

20. _______________________________ is ________% of the AREA of the AU
   mean VOLUME % in entity __________
1. Bureau of Land Management (BLM) is % of the AREA of the AU
   mean VOLUME % in entity

2. BLM Wilderness Areas (BLMW) is % of the AREA of the AU
   mean VOLUME % in entity

3. BLM Roadless Areas (BLMR) is % of the AREA of the AU
   mean VOLUME % in entity

4. National Park Service (NPS) is % of the AREA of the AU
   mean VOLUME % in entity

5. NPS Wilderness Areas (NPSW) is % of the AREA of the AU
   mean VOLUME % in entity

6. NPS Protected Withdrawals (NPSP) is % of the AREA of the AU
   mean VOLUME % in entity

7. US Forest Service (FS) is 0.31 % of the AREA of the AU
   mean VOLUME % in entity

8. USFS Wilderness Areas (FSW) is % of the AREA of the AU
   mean VOLUME % in entity

9. USFS Roadless Areas (FSR) is % of the AREA of the AU
   mean VOLUME % in entity

10. USFS Protected Withdrawals (FSP) is % of the AREA of the AU
    mean VOLUME % in entity
11. US Fish and Wildlife Service (FWS) is  % of the AREA of the AU
   mean VOLUME % in entity

12. USFWS Wilderness Areas (FWSW) is % of the AREA of the AU
   mean VOLUME % in entity

13. USFWS Protected Withdrawals (FWSP) is % of the AREA of the AU
   mean VOLUME % in entity

14. Wilderness Study Areas (WS) is % of the AREA of the AU
   mean VOLUME % in entity

15. Department of Energy (DOE) is % of the AREA of the AU
   mean VOLUME % in entity

16. Department of Defense (DOD) is 2.63 % of the AREA of the AU
   mean VOLUME % in entity

17. Bureau of Reclamation (BOR) is / % of the AREA of the AU
   mean VOLUME % in entity

18. Tennessee Valley Authority (TVA) is % of the AREA of the AU
   mean VOLUME % in entity

19. Other Federal is % of the AREA of the AU
   mean VOLUME % in entity

20. ________________________________ is % of the AREA of the AU
   mean VOLUME % in entity
1. Blackland Prairies (BLPR) is 0.17% of the AREA of the AU
   mean VOLUME % in entity 0.00

2. Cross Timbers and Prairie (CRTP) is 83.85% of the AREA of the AU
   mean VOLUME % in entity 95.00

3. Edwards Plateau (EDPT) is 15.99% of the AREA of the AU
   mean VOLUME % in entity 5.00

4. ___________________________ is ________% of the AREA of the AU
   mean VOLUME % in entity ________

5. ___________________________ is ________% of the AREA of the AU
   mean VOLUME % in entity ________

6. ___________________________ is ________% of the AREA of the AU
   mean VOLUME % in entity ________

7. ___________________________ is ________% of the AREA of the AU
   mean VOLUME % in entity ________

8. ___________________________ is ________% of the AREA of the AU
   mean VOLUME % in entity ________

9. ___________________________ is ________% of the AREA of the AU
   mean VOLUME % in entity ________

10. ___________________________ is ________% of the AREA of the AU
    mean VOLUME % in entity ________
ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO ECOSYSTEMS
(continued)

11. ____________________________ is _________ % of the AREA of the AU
    mean VOLUME % in entity _________

12. ____________________________ is _________ % of the AREA of the AU
    mean VOLUME % in entity _________

13. ____________________________ is _________ % of the AREA of the AU
    mean VOLUME % in entity _________

14. ____________________________ is _________ % of the AREA of the AU
    mean VOLUME % in entity _________

15. ____________________________ is _________ % of the AREA of the AU
    mean VOLUME % in entity _________

16. ____________________________ is _________ % of the AREA of the AU
    mean VOLUME % in entity _________

17. ____________________________ is _________ % of the AREA of the AU
    mean VOLUME % in entity _________

18. ____________________________ is _________ % of the AREA of the AU
    mean VOLUME % in entity _________

19. ____________________________ is _________ % of the AREA of the AU
    mean VOLUME % in entity _________

20. ____________________________ is _________ % of the AREA of the AU
    mean VOLUME % in entity _________
Table 2. (following 13 pages) Input parameters for the Barnett Mixed Continuous Gas and Oil Assessment Unit (50450162), Bend Arch–Fort Worth Basin Province. [bcfg, billion cubic feet of gas; mmcfg, million cubic feet of gas, cfg, cubic feet of gas; mmbo, million barrels of oil; bo, barrel of oil, bliq, barrel of liquid; bngl, barrel of natural gas liquids; m, meters; AU, assessment unit; EUR, estimated ultimate recovery]
### IDENTIFICATION INFORMATION

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<td>9/2/2015</td>
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<td>IHS (2015)</td>
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Notes from Assessor:  

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### CHARACTERISTICS OF ASSESSMENT UNIT

**Assessment-unit type:**  
- oil (<20,000 cfg/bo) X  
- gas (>20,000 cfg/bo) X  
- heavy oil (<10 API)  

**Well type:**  
- vertical  
- horizontal X  

**Major reservoir type (Choose one.):**  
- shale X  
- low-permeability clastics  
- coal  
- low-permeability carbonates  
- diatomite  

**Minimum EUR per well:** 0.002 MMT (mmbo for oil AU; bcfg for gas AU)

**Number of tested wells:** 3448

**Number of tested wells with EUR > minimum:** 2350

**Historic success ratio, tested wells (%):** 68

**Assessment-Unit Probability:**  
What is the probability that at least one well within the AU will have production capacity of at least the minimum EUR? 1.0

---

### NUMBER OF UNDRILLED WELLS WITH POTENTIAL FOR ADDITIONS TO RESERVES

1. **Productive area of accumulation (acres):** (triangular)  
   - calculated mean 2,019,000  
   - minimum 1,700,000  
   - mode 2,057,000  
   - maximum 2,300,000

2. **Uncertainty about average drainage area of wells (acres):** (triangular)  
   - calculated mean 100  
   - minimum 60  
   - mode 100  
   - maximum 140

3. **Percentage of total assessment-unit area that is untested (%):** (triangular)  
   - calculated mean 84  
   - minimum 75  
   - mode 85  
   - maximum 92

4. **Percentage of untested wells that are oil wells (%):** (triangular)  
   - calculated mean 60  
   - minimum 40  
   - mode 65  
   - maximum 75
### ESTIMATED ULTIMATE RECOVERY (EUR) PER WELL

#### OIL WELLS

5a. Future success ratio (%): (triangular)

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<th>calculated mean</th>
<th>minimum</th>
<th>mode</th>
<th>maximum</th>
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<tr>
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<td>30</td>
<td>45</td>
<td>65</td>
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5b. Uncertainty about average EUR (mmbo for oil): (shifted truncated lognormal)

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<th>minimum</th>
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<td>0.036</td>
<td>0.02</td>
<td>0.035</td>
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#### GAS WELLS

6a. Future success ratio (%): (triangular)

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<th>mode</th>
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<tr>
<td></td>
<td>47</td>
<td>30</td>
<td>45</td>
<td>65</td>
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</table>

6b. Uncertainty about average EUR (bcfg for gas): (shifted truncated lognormal)

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### UNCERTAINTY ABOUT AVERAGE COPRODUCT RATIOS FOR UNTESTED WELLS

(triangular)

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<th>mode</th>
<th>maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Oil assessment unit:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gas/oil ratio (cfg/bo)</td>
<td>7500</td>
<td>8400</td>
<td>8600</td>
</tr>
<tr>
<td>NGL/gas ratio (bngl/mmcfg)</td>
<td>15</td>
<td>30</td>
<td>45</td>
</tr>
<tr>
<td><strong>Gas assessment unit:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liquids/gas ratio (bliq/mmcfg)</td>
<td>15</td>
<td>22</td>
<td>30</td>
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</table>
### SELECTED ANCILLARY DATA FOR UNTESTEST WELLS

(no specified distribution type)

#### Oil wells:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Minimum</th>
<th>Median</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>API gravity of oil (degrees)</td>
<td>35</td>
<td>45</td>
<td>55</td>
</tr>
<tr>
<td>Sulfur content of oil (%)</td>
<td>0</td>
<td>0.01</td>
<td>0.1</td>
</tr>
<tr>
<td>Depth (m) of water (if applicable)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drilling depth (m)</td>
<td>1100</td>
<td>1900</td>
<td>3050</td>
</tr>
</tbody>
</table>

#### Gas wells:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Minimum</th>
<th>Median</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inert-gas content (%)</td>
<td>0.50</td>
<td>2.50</td>
<td>20.00</td>
</tr>
<tr>
<td>CO₂ content (%)</td>
<td>0.10</td>
<td>1.00</td>
<td>5.00</td>
</tr>
<tr>
<td>Hydrogen sulfide content (%)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Heating value (BTU)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depth (m) of water (if applicable)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drilling depth (m)</td>
<td>1100</td>
<td>1900</td>
<td>3050</td>
</tr>
</tbody>
</table>

#### Completion practices:

1. Typical well-completion practices (conventional, open hole, open cavity, other)  
   **conv**
2. Fraction of wells drilled that are typically stimulated  
   **1**
3. Predominant type of stimulation (none, frac, acid, other)  
   **frac**
4. Historic fraction of wells drilled that are horizontal  
   **0.66**
### ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO STATES

#### Surface Allocations

1. **Texas**
   - **Onshore:**
     - Area % of the AU: 100.00
     - Mean volume % of the AU: 100.00
   - **Offshore:**
     - Area % of the AU:
     - Mean volume % of the AU:

2. ____________
   - **Onshore:**
     - Area % of the AU:
     - Mean volume % of the AU:
   - **Offshore:**
     - Area % of the AU:
     - Mean volume % of the AU:

3. ____________
   - **Onshore:**
     - Area % of the AU:
     - Mean volume % of the AU:
   - **Offshore:**
     - Area % of the AU:
     - Mean volume % of the AU:

4. ____________
   - **Onshore:**
     - Area % of the AU:
     - Mean volume % of the AU:
   - **Offshore:**
     - Area % of the AU:
     - Mean volume % of the AU:

5. ____________
   - **Onshore:**
     - Area % of the AU:
     - Mean volume % of the AU:
   - **Offshore:**
     - Area % of the AU:
     - Mean volume % of the AU:
ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO STATES

(continued)

6. ____________________________

Onshore: __________ area % of the AU

_________ mean volume % of the AU

Offshore: __________ area % of the AU

_________ mean volume % of the AU

7. ____________________________

Onshore: __________ area % of the AU

_________ mean volume % of the AU

Offshore: __________ area % of the AU

_________ mean volume % of the AU

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Onshore: __________ area % of the AU

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Onshore: __________ area % of the AU

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10. ____________________________

Onshore: __________ area % of the AU

_________ mean volume % of the AU

Offshore: __________ area % of the AU

_________ mean volume % of the AU
### ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO PROVINCES

**Surface Allocations**

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Onshore</th>
<th>Offshore</th>
</tr>
</thead>
<tbody>
<tr>
<td>5045</td>
<td>Bend Arch-Fort Worth Basin</td>
<td>100.00%</td>
<td></td>
</tr>
</tbody>
</table>

Area % of the AU

100.00 mean volume % of the AU

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Onshore</th>
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Area % of the AU

mean volume % of the AU

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Area % of the AU

mean volume % of the AU

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mean volume % of the AU

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Area % of the AU

mean volume % of the AU

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Area % of the AU

mean volume % of the AU

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Area % of the AU

mean volume % of the AU
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<th>Name</th>
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<td>Onshore</td>
<td>area % of the AU</td>
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<tr>
<td></td>
<td>mean volume % of the AU</td>
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<tr>
<td>Offshore</td>
<td>area % of the AU</td>
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<tr>
<td></td>
<td>mean volume % of the AU</td>
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<tr>
<td></td>
<td></td>
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<td>area % of the AU</td>
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<tr>
<td>Offshore</td>
<td>area % of the AU</td>
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<tr>
<td></td>
<td>mean volume % of the AU</td>
</tr>
</tbody>
</table>
### ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO GENERAL LAND OWNERSHIPS

#### Surface Allocations

1. Federal Lands
   - is **4.64**% of the AREA of the AU
   - mean VOLUME % in entity **10**

2. Private Lands
   - is **%** of the AREA of the AU
   - mean VOLUME % in entity **%**

3. Tribal Lands
   - is **%** of the AREA of the AU
   - mean VOLUME % in entity **%**

4. Other Lands
   - is **95.32**% of the AREA of the AU
   - mean VOLUME % in entity **89.96**

5. Texas State Lands
   - is **0.04**% of the AREA of the AU
   - mean VOLUME % in entity **0.04**

6. ____________________________
   - is **%** of the AREA of the AU
   - mean VOLUME % in entity **%**

7. ____________________________
   - is **%** of the AREA of the AU
   - mean VOLUME % in entity **%**

8. ____________________________
   - is **%** of the AREA of the AU
   - mean VOLUME % in entity **%**

9. ____________________________
   - is **%** of the AREA of the AU
   - mean VOLUME % in entity **%**

10. ____________________________
    - is **%** of the AREA of the AU
    - mean VOLUME % in entity **%**
11. ___________________________ is ________% of the AREA of the AU
mean VOLUME % in entity ________

12. ___________________________ is ________% of the AREA of the AU
mean VOLUME % in entity ________

13. ___________________________ is ________% of the AREA of the AU
mean VOLUME % in entity ________

14. ___________________________ is ________% of the AREA of the AU
mean VOLUME % in entity ________

15. ___________________________ is ________% of the AREA of the AU
mean VOLUME % in entity ________

16. ___________________________ is ________% of the AREA of the AU
mean VOLUME % in entity ________

17. ___________________________ is ________% of the AREA of the AU
mean VOLUME % in entity ________

18. ___________________________ is ________% of the AREA of the AU
mean VOLUME % in entity ________

19. ___________________________ is ________% of the AREA of the AU
mean VOLUME % in entity ________

20. ___________________________ is ________% of the AREA of the AU
mean VOLUME % in entity ________
<table>
<thead>
<tr>
<th>Assessment Unit (name, no.)</th>
<th>Barnett Mixed Continuous Gas and Oil, 50450162</th>
</tr>
</thead>
</table>

**ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO FEDERAL LAND SUBDIVISIONS**

**Surface Allocations**

1. Bureau of Land Management (BLM) is _________% of the AREA of the AU
   mean VOLUME % in entity

2. BLM Wilderness Areas (BLMW) is _________% of the AREA of the AU
   mean VOLUME % in entity

3. BLM Roadless Areas (BLMR) is _________% of the AREA of the AU
   mean VOLUME % in entity

4. National Park Service (NPS) is _________% of the AREA of the AU
   mean VOLUME % in entity

5. NPS Wilderness Areas (NPSW) is _________% of the AREA of the AU
   mean VOLUME % in entity

6. NPS Protected Withdrawals (NPSP) is _________% of the AREA of the AU
   mean VOLUME % in entity

7. US Forest Service (FS) is 4.64% of the AREA of the AU
   mean VOLUME % in entity

8. USFS Wilderness Areas (FSW) is _________% of the AREA of the AU
   mean VOLUME % in entity

9. USFS Roadless Areas (FSR) is _________% of the AREA of the AU
   mean VOLUME % in entity

10. USFS Protected Withdrawals (FSP) is _________% of the AREA of the AU
    mean VOLUME % in entity
<table>
<thead>
<tr>
<th>Assessment Unit (name, no.)</th>
<th>Barnett Mixed Continuous Gas and Oil, 50450162</th>
</tr>
</thead>
</table>

**ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO FEDERAL LAND SUBDIVISIONS**

(continued)

11. US Fish and Wildlife Service (FWS) is % of the AREA of the AU
   mean VOLUME % in entity __________

12. USFWS Wilderness Areas (FWSW) is % of the AREA of the AU
   mean VOLUME % in entity __________

13. USFWS Protected Withdrawals (FWSP) is % of the AREA of the AU
   mean VOLUME % in entity __________

14. Wilderness Study Areas (WS) is % of the AREA of the AU
   mean VOLUME % in entity __________

15. Department of Energy (DOE) is % of the AREA of the AU
   mean VOLUME % in entity __________

16. Department of Defense (DOD) is 0.00 % of the AREA of the AU
   mean VOLUME % in entity __________

17. Bureau of Reclamation (BOR) is % of the AREA of the AU
   mean VOLUME % in entity __________

18. Tennessee Valley Authority (TVA) is % of the AREA of the AU
   mean VOLUME % in entity __________

19. Other Federal is % of the AREA of the AU
   mean VOLUME % in entity __________

20. ___________________________ is % of the AREA of the AU
   mean VOLUME % in entity __________
## ALLOCATIONS OF POTENTIAL ADDITIONS TO RESERVES TO ECOSYSTEMS
### Surface Allocations

1. **Cross Timbers and Prairie (CRTP)** is 84.44% of the AREA of the AU
   - mean VOLUME % in entity 97

2. **Rolling Plains (RLPL)** is 15.56% of the AREA of the AU
   - mean VOLUME % in entity 3

3. ________________ is ________% of the AREA of the AU
   - mean VOLUME % in entity ________

4. ________________ is ________% of the AREA of the AU
   - mean VOLUME % in entity ________

5. ________________ is ________% of the AREA of the AU
   - mean VOLUME % in entity ________

6. ________________ is ________% of the AREA of the AU
   - mean VOLUME % in entity ________

7. ________________ is ________% of the AREA of the AU
   - mean VOLUME % in entity ________

8. ________________ is ________% of the AREA of the AU
   - mean VOLUME % in entity ________

9. ________________ is ________% of the AREA of the AU
   - mean VOLUME % in entity ________

10. ________________ is ________% of the AREA of the AU
    - mean VOLUME % in entity ________
<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Area or Volume %</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
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