Keg River Oil and Gas Assessment Unit 52430102

Geologic Summary

Detailed map of this assessment unit

Exploration/Discovery-History Data
Plots of Known Field Sizes
Tables

Assessment Input Data

Assessment Results
Assessment Unit Summary
Detailed Assessment Results
Undiscovered Field-Size Distributions
USGS PROVINCES: Alberta Basin and Rocky Mountain Deformed Belt (5243 and 5245)

GEOLOGIST: M.E. Henry

TOTAL PETROLEUM SYSTEM: Keg River-Keg River (524301)

ASSESSMENT UNIT: Keg River Oil and Gas (52430102)

DESCRIPTION: This oil and gas assessment unit includes the northwestern part of the Alberta Basin and a small part of the east-central deformed belt. The area is generally bounded by the Tathlina High to the north and the Peace River Arch to the south. The eastern boundary is the estimated extent of potential reservoir rocks and the western boundary is the Keg River Gas assessment unit.

SOURCE ROCKS: The principal source rocks are organic-rich, fine-grained rocks of the Middle Devonian Keg River Formation.

MATURATION: The western half of this unit lies in the area where probable source rocks are expected to be mature with respect to liquid petroleum generation.

MIGRATION: The distribution of oil and gas pools assigned to this unit in relation to the estimated distribution of mature source rocks indicates that long distance lateral migration is not required.

RESERVOIR ROCKS: Virtually all reservoirs occur in dolomite, the majority of which developed in pinnacle reefs and many in patch reefs.

TRAPS AND SEALS: The most common trap types are stratigraphic followed by structural and combination in the approximate proportion of 20 to five to one respectively. Evaporite deposits are the primary seals for pools in this assessment unit.

REFERENCES:
Keg River Oil and Gas
Assessment Unit - 52430102

EXPLANATION

- Hydrography
- Shoreline
- Geologic province code and boundary (5243)
- Country boundary
- Gas pool centerpoint
- Oil pool centerpoint

Assessment unit code and boundary (52430102)

**SEVENTH APPROXIMATION**

**NEW MILLENNIUM WORLD PETROLEUM ASSESSMENT**

**DATA FORM FOR CONVENTIONAL ASSESSMENT UNITS**

Date: 7/14/99  
Assessment Geologist: M.E. Henry  
Region: North America  
Province: Alberta Basin  
Priority or Boutique: Priority  
Total Petroleum System: Keg River-Keg River  
Assessment Unit: Keg River Oil and Gas  
* Notes from Assessor: Combined Keg River and Horn River Basin petroleum systems into one system. Data were not grown. Assessing pools, not fields to conform to NRG data set.

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**CHARACTERISTICS OF ASSESSMENT UNIT**

<table>
<thead>
<tr>
<th>Oil (&lt;20,000 cfg/bo overall)</th>
<th>Gas (&gt;20,000 cfg/bo overall)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil</td>
<td>Oil</td>
</tr>
</tbody>
</table>

What is the minimum field size?  
0.5 mmboe grown (>1mmboe)  
(the smallest field that has potential to be added to reserves in the next 30 years)

<table>
<thead>
<tr>
<th>Number of discovered fields exceeding minimum size:</th>
<th>Oil: 198</th>
<th>Gas: 56</th>
</tr>
</thead>
<tbody>
<tr>
<td>Established (&gt;13 fields)</td>
<td>X</td>
<td>Frontier (1-13 fields)</td>
</tr>
</tbody>
</table>

Median size (grown) of discovered oil fields (mmboe):  
1st 3rd 1.7  
2nd 3rd 0.7  
3rd 3rd 1

Median size (grown) of discovered gas fields (bcfg):  
1st 3rd 5.5  
2nd 3rd 4.9  
3rd 3rd 8.2

**Assessment-Unit Probabilities:**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Probability of occurrence (0-1.0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. CHARGE: Adequate petroleum charge for an undiscovered field ≥ minimum size</td>
<td>1.0</td>
</tr>
<tr>
<td>2. ROCKS: Adequate reservoirs, traps, and seals for an undiscovered field ≥ minimum size</td>
<td>1.0</td>
</tr>
<tr>
<td>3. TIMING OF GEOLOGIC EVENTS: Favorable timing for an undiscovered field ≥ minimum size</td>
<td>1.0</td>
</tr>
</tbody>
</table>

**Assessment-Unit GEOLOGIC Probability** (Product of 1, 2, and 3): 1.0

| 4. ACCESSIBILITY: Adequate location to allow exploration for an undiscovered field ≥ minimum size | 1.0 |

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**UNDISCOVERED FIELDS**

**Number of Undiscovered Fields:** How many undiscovered fields exist that are ≥ minimum size?  
(uncertainty of fixed but unknown values)

<table>
<thead>
<tr>
<th>Oil fields:</th>
<th>min. no. (&gt;0)</th>
<th>10</th>
<th>median no.</th>
<th>40</th>
<th>max no.</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas fields:</td>
<td>min. no. (&gt;0)</td>
<td>10</td>
<td>median no.</td>
<td>50</td>
<td>max no.</td>
<td>100</td>
</tr>
</tbody>
</table>

**Size of Undiscovered Fields:** What are the anticipated sizes (grown) of the above fields?  
(variations in the sizes of undiscovered fields)

<table>
<thead>
<tr>
<th>Oil in oil fields (mmbo): min. size</th>
<th>0.5</th>
<th>median size</th>
<th>1</th>
<th>max. size</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas in gas fields (bcfg): min. size</td>
<td>3</td>
<td>median size</td>
<td>8</td>
<td>max. size</td>
<td>400</td>
</tr>
</tbody>
</table>
### AVERAGE RATIOS FOR UNDISCOVERED FIELDS, TO ASSESS COPRODUCTS
(uncertainty of fixed but unknown values)

<table>
<thead>
<tr>
<th></th>
<th>minimum</th>
<th>median</th>
<th>maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Oil Fields:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gas/oil ratio (cfg/bo)</td>
<td>500</td>
<td>1000</td>
<td>1500</td>
</tr>
<tr>
<td>NGL/gas ratio (bngl/mmcfg)</td>
<td>30</td>
<td>60</td>
<td>90</td>
</tr>
<tr>
<td><strong>Gas fields:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liquids/gas ratio (bngl/mmcfg)</td>
<td>10</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>Oil/gas ratio (bo/mmcfg)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SELECTED ANCILLARY DATA FOR UNDISCOVERED FIELDS
(variations in the properties of undiscovered fields)

<table>
<thead>
<tr>
<th></th>
<th>minimum</th>
<th>median</th>
<th>maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Oil Fields:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>API gravity (degrees)</td>
<td>26</td>
<td>37</td>
<td>55</td>
</tr>
<tr>
<td>Sulfur content of oil (%)</td>
<td>0.5</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Drilling Depth (m)</td>
<td>1300</td>
<td>1600</td>
<td>3000</td>
</tr>
<tr>
<td>Depth (m) of water (if applicable)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Gas Fields:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inert gas content (%)</td>
<td>0.1</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>CO$_2$ content (%)</td>
<td>0</td>
<td>3</td>
<td>19</td>
</tr>
<tr>
<td>Hydrogen-sulfide content (%)</td>
<td>0</td>
<td>0.6</td>
<td>15</td>
</tr>
<tr>
<td>Drilling Depth (m)</td>
<td>800</td>
<td>1800</td>
<td>3400</td>
</tr>
<tr>
<td>Depth (m) of water (if applicable)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### ALLOCATION OF UNDISCOVERED RESOURCES IN THE ASSESSMENT UNIT TO COUNTRIES OR OTHER LAND PARCELS (uncertainty of fixed but unknown values)

1. **Canada** represents 100 areal % of the total assessment unit

   **Oil in Oil Fields:**
   - Richness factor (unitless multiplier):\[\ldots]\[\ldots]\[\ldots]\[\ldots]
   - Volume % in parcel (areal % x richness factor):\[100]\[\ldots]\[\ldots]\[\ldots]
   - Portion of volume % that is offshore (0-100%):\[0]\[\ldots]\[\ldots]\[\ldots]

   **Gas in Gas Fields:**
   - Richness factor (unitless multiplier):\[\ldots]\[\ldots]\[\ldots]\[\ldots]
   - Volume % in parcel (areal % x richness factor):\[100]\[\ldots]\[\ldots]\[\ldots]
   - Portion of volume % that is offshore (0-100%):\[0]\[\ldots]\[\ldots]\[\ldots]

2. **Province 5243** represents 98 areal % of the total assessment unit

   **Oil in Oil Fields:**
   - Richness factor (unitless multiplier):\[\ldots]\[\ldots]\[\ldots]\[\ldots]
   - Volume % in parcel (areal % x richness factor):\[98]\[\ldots]\[\ldots]\[\ldots]
   - Portion of volume % that is offshore (0-100%):\[0]\[\ldots]\[\ldots]\[\ldots]

   **Gas in Gas Fields:**
   - Richness factor (unitless multiplier):\[\ldots]\[\ldots]\[\ldots]\[\ldots]
   - Volume % in parcel (areal % x richness factor):\[95]\[\ldots]\[\ldots]\[\ldots]
   - Portion of volume % that is offshore (0-100%):\[0]\[\ldots]\[\ldots]\[\ldots]

3. **Province 5245** represents 2 areal % of the total assessment unit

   **Oil in Oil Fields:**
   - Richness factor (unitless multiplier):\[\ldots]\[\ldots]\[\ldots]\[\ldots]
   - Volume % in parcel (areal % x richness factor):\[2]\[\ldots]\[\ldots]\[\ldots]
   - Portion of volume % that is offshore (0-100%):\[0]\[\ldots]\[\ldots]\[\ldots]

   **Gas in Gas Fields:**
   - Richness factor (unitless multiplier):\[\ldots]\[\ldots]\[\ldots]\[\ldots]
   - Volume % in parcel (areal % x richness factor):\[5]\[\ldots]\[\ldots]\[\ldots]
   - Portion of volume % that is offshore (0-100%):\[0]\[\ldots]\[\ldots]\[\ldots]
Keg River Oil and Gas, AU 52430102
Undiscovered Field-Size Distribution

Minimum field size: .5 MMBO
Mean number of undiscovered fields: 43.3
Keg River Oil and Gas, AU 52430102
Undiscovered Field-Size Distribution

Minimum field size: 3 BCFG
Mean number of undiscovered fields: 51.5

GAS-FIELD SIZE (BCFG)

UNDISCOVERED GAS FIELDS (No.)