OKLAHOMA CORPORATION COMMISSION

Oil and Gas Conservation Division

CoalBed Methane Fact and Future In Oklahoma

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Outlines:

1. Fact and figures about Coal bed methane
2. Regulation for Unconventional Gas Wells
3. Activities on Conventional Gas Wells
4. Incentive Program, Senate Bill 535
5. Horizontal Completion in Counties
6. Question / Answer
Facts and Figures:

Location:

- North East Oklahoma Shelf
- Arkoma Basin

Geological Age:

- Desmoinesian (Middle Pennsylvanian)

Remaining Resources:

- 8 Billions Ton
Area of Coverage

. 8000 square miles in 19 counties

Production:

. Total 280 Millions Short Ton (End of 2001)

Ash Percentage:

. Minimum 4%, Hartshorne in Leflore
. Maximum 15%, Hartshorne in Leflore
Depth of Completion

- Minimum 175 ft, Hartshorne in Leflore
- Maximum 3651 ft, Booch in Pitsburg

SCF/Ton

- Minimum 79, Hartshorne in Leflore
- Maximum 547, Hartshorne in Leflore
Coal Bed Methane Resources

- Proved Reserves: 167 Tcf (13.9%)
- Coalbed Methane Resources: 141.4 Tcf (11.7%)
- Conventional Resources: 896.1 Tcf (74.4%)
Location of Coal Bed Methane Resources

Figure 2: U.S. Lower-48 States Coalbed Methane Resources (map after Wood and Bour, 1988)
Area of Oklahoma Coal bed Activity
( Courtesy Oklahoma Geological Survey)
Coal Production in Oklahoma, 1873-2002

(Courtesy Oklahoma Geological Survey)
CBM Well Completions in Oklahoma

Number of Wells

Year


- Northeast Oklahoma Shelf
- Arkoma Basin

(Courtesy Oklahoma Geological Survey)
Regulation:

The Coalbed Methane activities are regulated similarly to Minimum Unallocated Gas Well. Different aspect of activities reviewed as:

**Testing:**

- Form 1016 to report shut in pressure to obtain Minimum allowable
- Form 1030 to adjust the allowable in case the WOR is over 3:1
- Form 1022 to report the flaring or venting of the gas

**Drilling:**

- Intent to Drill, From 1000, Rule 165:10-3-1
- Surface Casing, 50 ft below treatable water level, Rule 165:10-3-4
Geology/ Engineering:

Reserve Calculation will be based on gas content of the rock and not on material balance or volumetric technique.

Increase density will be reviewed based on reserve calculation or geological limitations.

Commingling application, Form 1023 required for production of more than one zone.

Completion Report, Form 1002A, 1002C required for any completion or recompletion.
Incentive Program

The Senate bill 535 is the only incentive program applicable to coal bed methane activity in Oklahoma.

The production from Coal bed methane will be exempted from gross production. It has three different options:

Option One:

Twenty Four Month Exemption, prior to July 1994
For any incremental production which results from a horizontally drilled well producing prior to July 1, 1994

Option Two:

Twenty Four Month Exemption, prior to July 1, 2002
For any horizontally drilled well producing prior to July 1, 2002, which production commenced after July 1, 1995
Option Three

Forty-Eight month exemption, prior to July 1, 2006

For any horizontally drilled well, which production commenced after July 1, 2002
Completion Activity Comparison in Each Year

Year 2000 Completion Type

Year 2001 Completion Type

Year 2002 Completion Type

Year 2003 Completion Type
## Five Years Completion Activity in Oklahoma

<table>
<thead>
<tr>
<th>Year</th>
<th>Deep Well</th>
<th>Horizontal Hole</th>
<th>Straight Hole</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>126</td>
<td>69</td>
<td>2738</td>
<td>2936</td>
</tr>
<tr>
<td>2001</td>
<td>171</td>
<td>100</td>
<td>2729</td>
<td>3000</td>
</tr>
<tr>
<td>2002</td>
<td>104</td>
<td>123</td>
<td>2137</td>
<td>2534</td>
</tr>
<tr>
<td>2003</td>
<td>163</td>
<td>268</td>
<td>2845</td>
<td>3276</td>
</tr>
<tr>
<td>2004</td>
<td>160</td>
<td>311</td>
<td>2137</td>
<td>2608</td>
</tr>
</tbody>
</table>
Five Years Completion Activity In Oklahoma

![Bar Chart](chart.png)

**Total Completions**

- **Number of wells:** 0 to 3500

The chart shows the number of completions for each year from 2000 to 2004.
Five Years Horizontal Completion In Oklahoma

Horizontal Hole Completion

Name of Wells

<table>
<thead>
<tr>
<th>Years</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50</td>
<td>75</td>
<td>100</td>
<td>250</td>
<td>300</td>
</tr>
</tbody>
</table>

Years
Five Years Vertical Completion in Oklahoma

Straight Hole Completion

Number of Wells

2000 2001 2002 2003 2004

Years

2000 2001 2002 2003 2004
Five Years Deep Well Activity in Oklahoma

![Bar chart showing deep well completion from 2000 to 2004. The number of wells increases from 2000 to 2004.](chart.png)
Horizontal Completion in Counties

Number of Horizontal Hole
Year 2000

Number of Wells

Garvin | Harper | Haskell | Latimer | Leflore | Lincoln | Pittsburg | Pushnataha | Stephens | Texas

0 5 10 15 20 25 30
Horizontal Completion in Counties

Number of Horizontal Hole
Year 2001

Number of Wells

Beaver
Beckham
Caddo
Coal
Garvin
Haskell
Kingfisher
Leflore
Lincoln
Noble
Okmulgee
Pittsburg
Pottawatomi
Stephens
Texas
Tulsa
Horizontal Completion in Counties

Number of Horizontal Hole
Year 2002

Number of Wells

- Caddo
- Haskell
- Leflore
- Lincoln
- Logan
- McIntosh
- Payne
- Pittsburg
- Seminole
- Stephens
- Texas
- Tulsa
- Washington
Horizontal Completion in Counties

Number of Horizontal Hole
Year 2003

Number of Wells

Beaver  Caddo  Ellis  Harper  Haskell  Hughes  Jackson  Latimer  Leflore  Lincoln  Logan  McClain  Oklahoma  Payne  Pittsburg  Pottawatomie  Roger Mills  Texas
Horizontal Completion in Counties

Number of Horizontal Hole
Year 2004

Number of Wells

Coal  Ellis  Haskell  Hughes  Jackson  Latimer  Leflore  Lincoln  Logan  McIntosh  Noble  Oklahoma  Payne  Pittsburg  Pottawatomie  Roger Mills  Seminole
Location of Hartshorne Producer in Oklahoma
Hartshorne Gas Production in Oklahoma

Hartshorne Producer

Number of Wells

Haskell | Hughes | Latimer | Leflore | McIntosh | Pittsburg

0 50 100 150 200 250
Haskell Horizontal Completion

Number of Wells

2000 2001 2002 2003 2004
Total Amount Claimed

- **Total Amount Claimed**
- **Amount Refunded**
  - 2000: $10,000,000
  - 2001: $20,000,000
  - 2002: $30,000,000
  - 2003: $50,000,000
  - 2004: $60,000,000

- **Year**
  - 2000
  - 2001
  - 2002
  - 2003
  - 2004
Category of wells claimed in Year 2000

No 3D Seismic claim for year 2000
Category of wells claimed in Year 2004

Categories Claimed

Percentage

- Inactive
- Enhancement
- Deep
- New Discovery
- 3-D Seismic
- Horizontal
Comparison Between Categories claimed in 2000 and 2004
Question/Answers: