Characteristics of Gas Threshold Values & Their Relation to Outburst Management.
Gas Threshold Values of Outbursts

- Section 63 notice issued in 1994
- 9 m³/tonne for 100% CH₄
- 5 m³/tonne for 100% CO₂
- Related to Total Gas Content
- Based on research by Ripu Lama
Seam Gas Threshold Values

- **Remote Mining Operations**
- **Normal Mining Conditions**

Gas Composition (CH$_4$/CO$_2$)

Total Seam Gas Content (m$^3$/tonne)
### Proposed Gas Threshold Values

(Lama, 1995)

<table>
<thead>
<tr>
<th>Country</th>
<th>Type of coal</th>
<th>Range of uniaxial compressive strength, MPa</th>
<th>Depth of occurrence, m</th>
<th>Threshold values (desorbable)</th>
<th>Minimum OB Coeff.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Structure No structure</td>
<td>Coking &amp; Anthracite</td>
<td>4 – 30</td>
<td>350 – 550</td>
<td>350 – 550</td>
</tr>
<tr>
<td>Poland</td>
<td>(i)</td>
<td>(ii)</td>
<td>2 – 4</td>
<td>10 – 20</td>
<td>400 – 600</td>
</tr>
<tr>
<td>Russia</td>
<td>Coking</td>
<td>Anthracite</td>
<td>2 – 7</td>
<td>600 – 1,300</td>
<td>10 – 12</td>
</tr>
<tr>
<td>Germany</td>
<td>Coking</td>
<td>6 – 10</td>
<td>8</td>
<td>00 – 1,300</td>
<td>9</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>Coking</td>
<td>1.2 – 7</td>
<td>250</td>
<td>8</td>
<td>0.42</td>
</tr>
<tr>
<td>China</td>
<td>Coking &amp; Anthracite</td>
<td>1 – 1.1</td>
<td>&gt; 10,000</td>
<td>8</td>
<td>0.40</td>
</tr>
</tbody>
</table>
Significant Characteristics

Statutory conditions vs Lama’s Research

- Based on total gas not desorbable gas
- Assumes presence of structures
- Assumes $Q_3 = 1 \text{ m}^3/\text{tonne}$
What is the impact of Q3?

• Varies from mine to mine
• Varies within a mine from panel to panel
• Varies with coal characteristics
• Is not measured in current sampling practices
• If measured & monitored Q₃ could assist in determining more realistic threshold values.
Are there any structures?

- Based on research, threshold values can increase from 4 to 7 (CO₂) and 8 to 10 (CH₄)
- Need better use of current (real time) drilling information
- Utilise other remote sensing technologies
Utilise drilling Data

• Drilling logs can provide information on seam characteristics, gas content, location of structures etc.

• The reliability of this drilling data must be improved to support any variation to threshold values.
Remote sensing technologies

RIM

- Does work but is not user friendly
- Can detect structures down to 50 mm
- Can detect changes in gas concentrations
- Can detect changes in strength and permeability
- Can provided information for targeted drilling
SUMMARY

• Better understanding of the gas regime for $Q_3$ can enhance outburst management
• Better use of drilling data in a more reliable format can verify structures
• Use RIM to confirm structures and provide drilling targets.
Outburst Seminar 22 June 2005

- This all means realistic threshold values that more accurately reflect seam & mining conditions.
- A more systematic approach to Outburst Management.
- Safe and viable mining.