OVERVIEW OF COAL MINE METHANE PROJECT:

Pootkee-Bulliary CMM Project is located in the Pootkee-Bulliary U/G Mine of BCCL in the Jharia Coalfield, near Dhanbad, Jharkhand, India. The CMM block covers an area of 16 km² and has an estimated coal resource of 820 MT. The gas resource is estimated to be 7.0 BCM (247 Bcf). The project area includes 18 regional coal seams (I-XVIII). The Upper seams XVIII to XVI are actively mined by bord & pillar method. The X to II coal seams, which are targeted for CMM recovery, are below seams XVIII to XVI. The coal rank ranges from low to medium volatile bituminous and has an average gas content of over 10 m³/t (353 scf/ton). The commercial CBM project operated by CIL-ONGC near the Pootkee CMM area has proved commercial production on a limited scale and is expected to reach full-scale commercial production by 2013. Data dossiers encompassing all details related to geology, mining history, and gas resource have been prepared.

ESTIMATED ANNUAL EMISSION REDUCTIONS: .995 MMT CO₂E

PROJECT DETAILS

- Name of Project: Pootkee-Bulliary CMM Project
- Name of Mine: Pootkee-Bulliary U/G Mine
- Type of Ownership: Public Sector Undertaking
- Target coal seams: Virgin seams lying below the mined out coal seams

MINE INFORMATION

- Mine owner: Bharat Coking Coals Ltd
- Parent company: Coal India Ltd
- Status and type of mine: Active, underground
- Mining Method: Bord & Pillar

PROJECT FINANCES

- Assumptions: $5-$7/Mcf
- Estimated revenue: $25-30 Million
- Projected capital costs: Approximately $18 Million
HISTORICAL AND PROJECTED MINE DATA

HISTORICAL COAL PRODUCTION

<table>
<thead>
<tr>
<th>YEAR</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal (tonnes/yr)</td>
<td>135,000</td>
<td>170,000</td>
<td>200,000</td>
<td>232,000</td>
<td>125,000</td>
<td>114,000</td>
</tr>
<tr>
<td>Methane (Mm³/yr)</td>
<td>0.461</td>
<td>0.580</td>
<td>0.683</td>
<td>0.792</td>
<td>0.427</td>
<td>0.389</td>
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</thead>
<tbody>
<tr>
<td>Coal (tonnes/yr)</td>
<td>213,000</td>
<td>500,000</td>
<td>500,000</td>
<td>600,000</td>
<td>700,000</td>
<td>750,000</td>
<td>800,000</td>
<td>850,000</td>
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PROJECTED COAL PRODUCTION AND METHANE EMISSIONS

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<td>750,000</td>
<td>800,000</td>
<td>850,000</td>
</tr>
<tr>
<td>Methane (Mm³/yr)</td>
<td>0.727</td>
<td>1.707</td>
<td>1.707</td>
<td>2.049</td>
<td>2.390</td>
<td>2.561</td>
<td>2.732</td>
<td>2.902</td>
</tr>
</tbody>
</table>

GREENHOUSE GAS EMISSION REDUCTIONS

At present there is no system of methane drainage and therefore, there is no utilization of CMM from the project area. There is no existing gas drainage system operational in the mine. To reduce the release of methane into the environment from the operating mine and to make future mining safe, this CMM project has been perceived.

TOTAL VOLUME OF METHANE EXPECTED TO BE RECOVERED/UTILIZED

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<tbody>
<tr>
<td>Total CH₄ recovered and utilized (m³/year)</td>
<td>5</td>
<td>12</td>
<td>25</td>
<td>50</td>
<td>60</td>
<td>70</td>
<td>70</td>
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</tbody>
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COAL PRODUCTION AND METHANE EMISSION CHARTS
MARKET ANALYSIS / DEMAND ANALYSIS

The CMM produced after implementation of the Pootkee-Bulliary CMM Project would have a ready market as it is located close to the developed, industrial area of Bokaro Steel City and Dhanbad. The produced CMM may be utilized in the Bokaro Steel Plant or other steel plants, or in other industries.

TYPE OF ASSISTANCE SOUGHT

Technical Assistance:
• CBM resource assessment in de-stressed coal seams
• Techno-economic evaluations of the project
• Adoption of suitable drilling technology

PROPOSED TECHNOLOGIES

To be adopted after careful examination of existing geo-mining conditions.

FOR MORE INFORMATION, CONTACT:

GM, CBM, CMPDI,
Gondwana Place, Kanke Road
Ranchi- 834008, Jharkhand, India
Tel: +91 651 2230011, Fax: +91 651 2233314
e-mail: gmcbm@cmpdi.co.in, bnprasad54@yahoo.co.in

Bharat Coking coals Ltd,
Koyla Bhavan, Dhanbad-826 005
Jharkhand, India
Tel: +91 326 2230163, 2230133-37, Fax: +91 326 2230153

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