

Conceptual note


On

Coalmine Methane Project

In Harmony with Opencast Mining,

Moher Sub-Basin,

Singrauli Coalfield, India

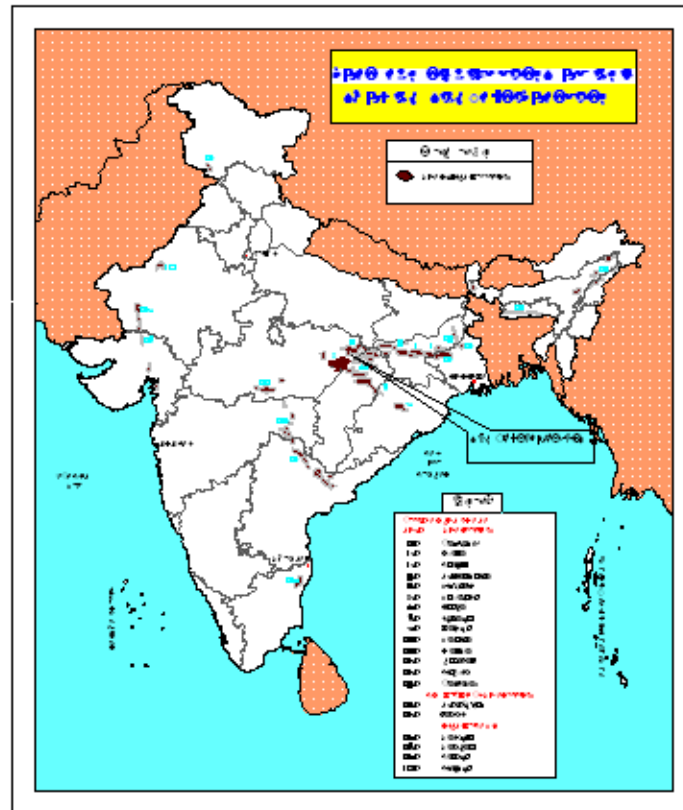


CMM Project in Moher Sub-Basin

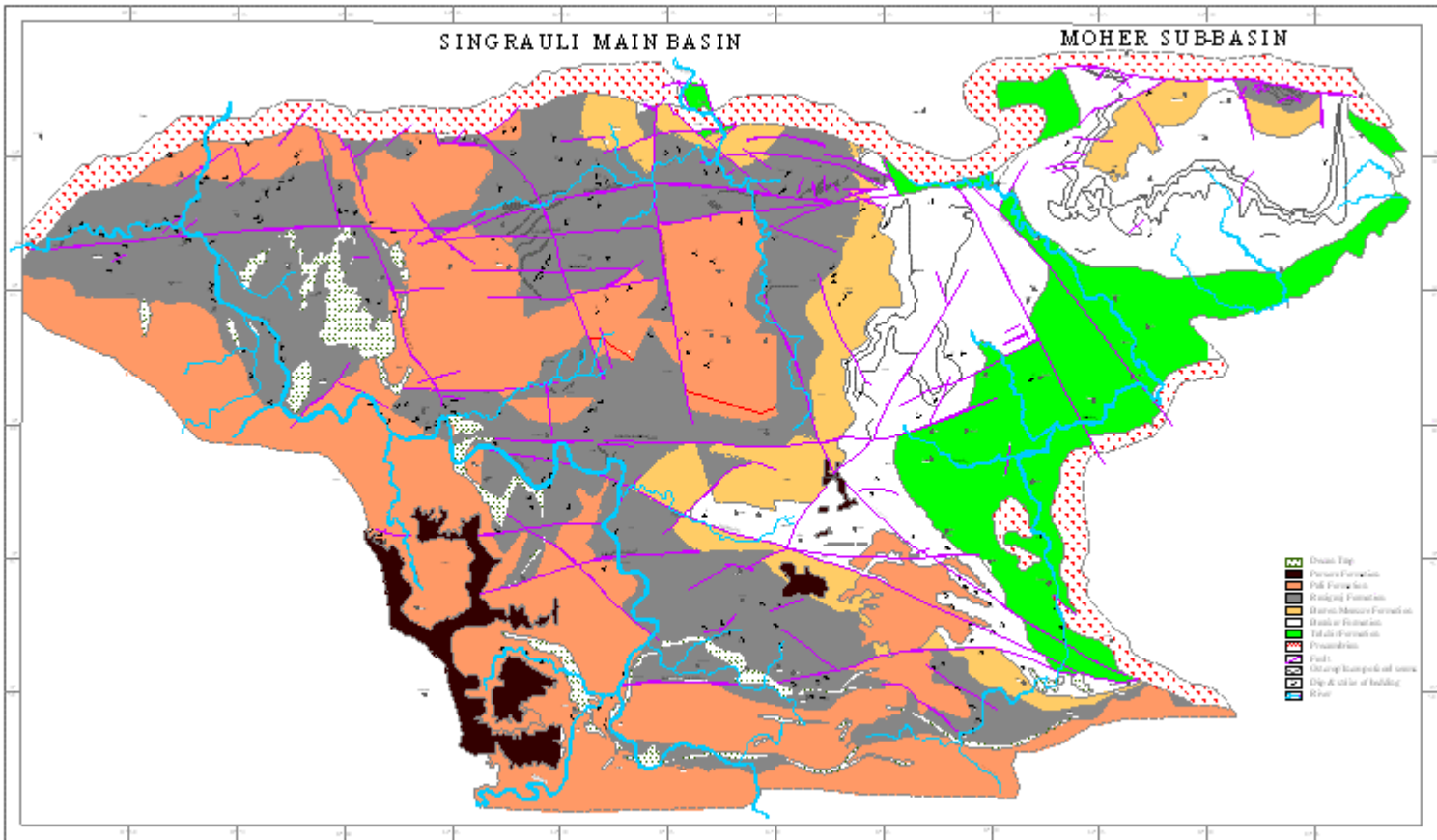
Coal Mine Methane in Indian Scenario

- The present coal production in India is around 400 Million Tonnes.
- The share of opencast mining to the total production is about 85%.
- Under such scenario, there is scope to examine possibility of CMM projects associated with open cast mines.
- One of the areas which appear to be suitable for implementation of CMM is Moher Sub-Basin of Singrauli Coalfield where Northern Coalfields Ltd. (NCL), a subsidiary of Coal India Ltd. (CIL) is operating large mechanized opencast mines.

Coal & Lignite fields of India Showing Singrauli Coalfield



Geological map of Singrauli coalfield



CMM Project in Moher Sub-Basin

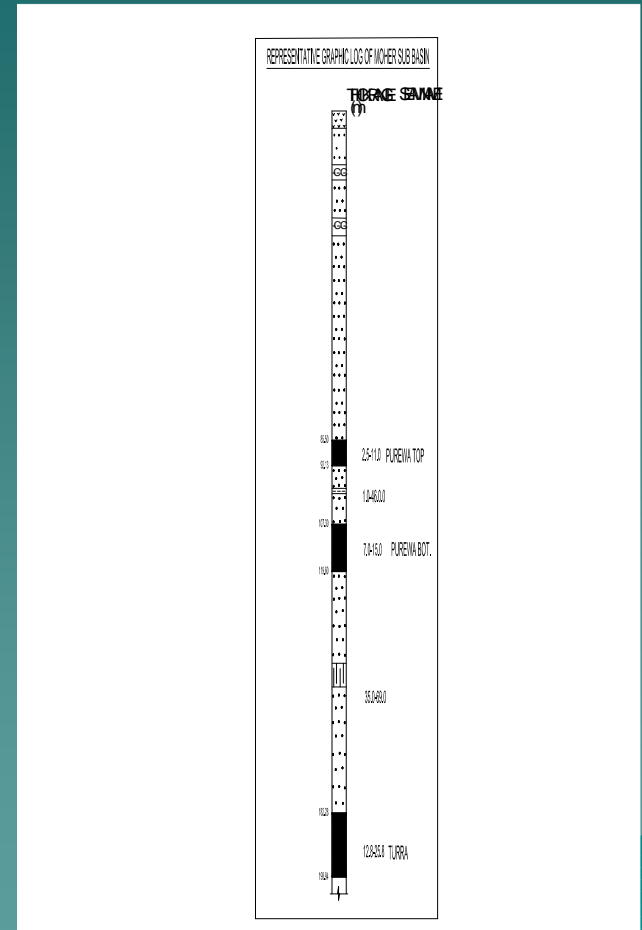
Moher Sub-Basin: Geological details

- Moher Sub Basin (312 Sq. Km) is a part of Singrauli Main Basin (2202 Sq. Km.).
- There are 3 main coal seams occurring in Barakar Formation (Lower Permian) in the area having cumulative thickness of 30m.
- The rank of the coal is High Volatile Bituminous C at present depth of mine working, which improves with depth.

CMM Project in Moher Sub-Basin

Moher Sub-Basin: Coal seam disposition

Coal seam/ Parting	Thick. range m	M %	Ash %	UVM %
Purewa Top	2.5-11	2.9-10.5	18.9-47.9	37.6-42.7
P	1-46			
Purewa Bot	7-15	4.8-10.8	21.7-48.2	37.7-44.5
P	35-69			
Turra	12.8-25.8	5-9.4	15.2-53.2	33.9-41.9

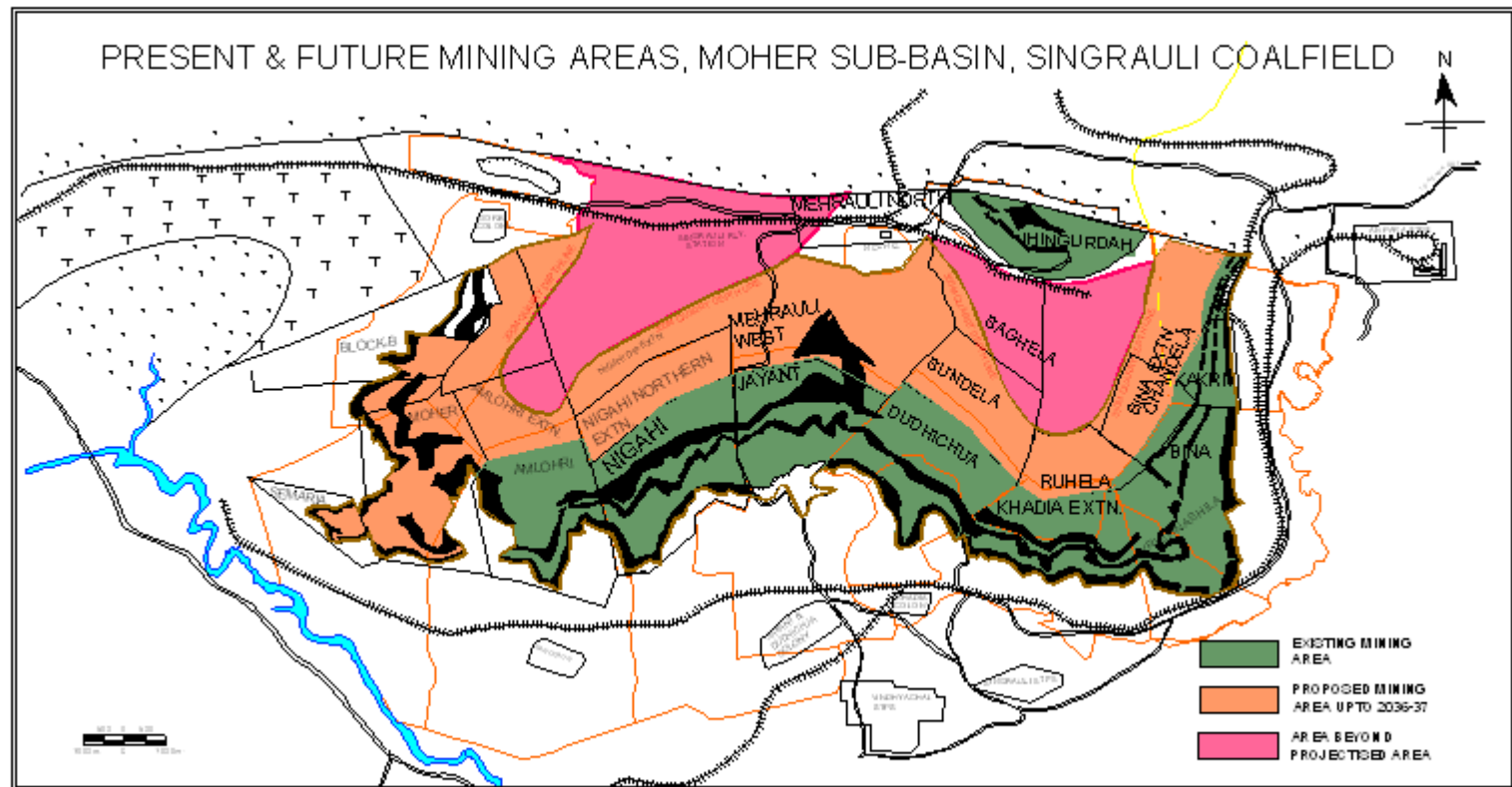


CMM Project in Moher Sub-Basin

Moher Sub-Basin: Mining Scenario

- NCL is operating 8 mechanised opencast mines having capacity varying from 3 MTY to 10 MTY.
- The present coal production is 52 MTY and the present average depth of quarry is about 125m.
- Perspective plans has been drawn up to 2036-37 and increase in the coal production up to 81.5 MTY has been envisaged by
 - ✓ Increasing the capacity of mine (upto 15 MTY)
 - ✓ Dip side extension of the existing mines up to 300m depth
 - ✓ Opening of new mines

Present & Future Mining Areas



CMM Project in Moher Sub-Basin

Methane Content of Coal Seams

- Large volume of data related to routine coal exploration is available for the coalfield.
- Data on direct measurement of methane in coal seams is however not available as the same was not measured during routine exploration.
- Gas content of coal seams have been arrived at by using Eddy's empirical curves and data of direct measurement available for Singrauli main basin.

Depth m	Gas content M3/Tonne
up to 150	1.5
200	1.75
250	2.0
300	2.5
300-600	4

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Methane Emission due to Coal Mining

- The estimated methane emission on account of coal mining is furnished below:

Year	Projected coal production MTY	Average Gas content m ³ /ton	Projected gas emission million m ³
2006	52	1.5	78
2010	68	1.5	102
2013	77.5	1.75	136
2015	79.5	1.75	139
2020	81.5	1.75	143
2025	81.5	2	163
2030	81.5	2.5	204
2035	81.5	2.5	204
2037	81.5	2.5	204

CMM Project in Moher Sub-Basin

Coal Mine Methane Project

- To arrest release of methane in the environment, a CMM project has been conceived in the Moher Sub Basin.
- The project is expected to be taken up after 5 years from now.
- Till such time the following requisite data would be generated:
 - ✓ Direct assessment of gas content, permeability data etc.
 - ✓ Drilling of exploratory well for techno-economic appraisal
 - ✓ Gas-in-place assessment
 - ✓ If feasible, to be followed up by Pilot Scale studies
 - ✓ Preparation of Feasibility report based on generated data and its approval
 - ✓ Development works start from 2011

CMM Project in Moher Sub-Basin

Coal Mine Methane Project


- The project envisages pre-drainage of methane before advancement of faces within the projectised area of coal production.
- Well life will be considered as 5 years.
- The drained out methane may be utilised for power generation in the pit head power plants or for captive use.
- The captured methane would also attract additional revenues in terms of carbon credits.

CMM Project in Moher Sub-Basin

Year	Yearly Gas recovered Million M ³	Power generation Million KWh	Revenue From power generation Million USD	Expected CERs in Million	Revenue from CERs Million USD	Total Revenue Million USD
Within Projectised area						
2013	109	362	40.2	1.5	7.6	48
2015	111	371	41.2	1.5	7.8	49
2020	114	380	42.3	1.6	8.0	50
2025	130	435	48.3	1.8	9.1	57
2030	163	543	60.4	2.3	11.4	72
2035	163	543	60.4	2.3	11.4	72
2037	163	543	60.4	2.3	11.4	72
Outside Projectised area (VCBM has been conceptualised)						
2697 (Total Recoverable resource)		8991	989			

CMM Project in Moher Sub-Basin

Steps perceived to bring this project on ground

- Project proposal for feasibility study has been conceived
 - Estimated cash outlay is 6.5 million USD
 - If found feasible, a bankable project report for degasification synchronized with open cast mining along with power generation will be formulated.
 - This would be an assistance/collaboration area
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Thank You