A
Modified
Geological Report
ON
RAJBAR E & D COAL BLOCK
Auranga Coalfield, District Latehar, Jharkhand

TENUGHAT VIDYUT NIGAM LTD.
(A GOVT. OF JHARKHAND UNDERTAKING)

(Volume – I)

Prepared by

Directorate of Geology
Department of Mines & Geology
Government of Jharkhand, Ranchi

03.09.21
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Acknowledgement

In pursuance of the decision taken in the meeting on 22-11-2010, in the chairmanship of Chief Secretary, Govt. of Jharkhand, for the development of Coal Blocks allocated to J.S.E.B./T.V.N.L./J.S.M.D.C. Ltd. and on the request of T.V.N.L, Directorate of Geology, Dept. of Mines & Geology, Govt. of Jharkhand, has undertaken the exploration work of Rajbar E & D Coal Block allocated to T.V.N.L. by MOC, Govt. of India on 2nd August 2006.

As per assignment detail geological exploration viz. - topographical survey and geological mapping on 1:5,000 scale in 17.20 sq. km. allocated area, drilling on 98 bore holes at 400 x 400 m grid intervals considering pre drilled GSI boreholes, collection of core samples for proximate analysis, ultimate analysis, physichomechanical test, washability test and other test as derived in guidelines of MOC for coal exploration have been carried out.

In spite of several constrains and adverse condition, this assignment could be successfully carried out with the guidance of Mr. U. P. Singh and S. Dutta, Senior Geologists, GSI to the Exploration Team in the field as well as in documentation. The present Geological Report of Rajbar E & D Coal Block could be completed with active support of the then Principal Secretary Mines & Geology Shri N.N. Sinha I.A.S. and by the dedicated effort of investigating officers, Shri A. K. Tewary , Asst. Director, Geology, Shri M. P. Sharma, Geologist, Kumar Amitabh, Geologist and Shri R. K. Pandey, Geologist.

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GEOLOGICAL REPORT ON RAJBAR E & D COAL BLOCK
Auranga Coalfield, District Latehar, Jharkhand

TENUGHAT VIDYUT NIGAM LTD.
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Geological Report on Rajbar E & D Coal Block, Auranga Coal Field

PANORAMIC VIEW OF RAJBAR E & D COAL BLOCK

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SALIENT FEATURES

Assignment	Geological Exploration of Coal in Rajbar E & D Coal Block of Auranga Coal Field, Administrative Block – Balumath, District – Latehar, Jharkhand, allocated to Tenughat Vidhyut Nigam Limited by Ministry of Coal, Government of India.
Exploration	On the request of TVNL, Directorate of Geology, Department of Mines & Geology has taken up Detail Exploration of Coal in the Rajbar E & D area during Year 2010-11 & 2011-12
Name of Block	Rajbar E & D Coal Block (Auranga Coal Field)
Area of Block	17.20 sq. km
Mapped Area	17.20 sq. km
Location	
Latitude	$23^0$45'18.8" to $23^0$47'59" N
Longitude	$84^0$37'47.4" to $84^0$40'51.6" E
Toposheet No.	73 A/9
Block Boundaries	North – Sukri River South–Serak PF & Banhardi Coal Block (NH–75 at 15 km) East – Serak & Mastan villages West – Rajbar PF (Sabno Coal Block at 10 km)
Communication	Communication to the Rajbar Coal block is very smooth and it is easily approachable from Latehar as well as from Ranchi. Latehar is situated on National Highway -75 and the coal block area is about 20 km from Latehar conneced by metalled and un-metalled road. Inside the coal block various roads are present which make accessibility of the area much easier.
Environmental Inventory	**i. Population:** As per the 2001 census, the total population of Rajbar area is 1,036. Out of this, 480 are male and 556 are female. **ii. Physiography**: The area exhibits undulating topography. The highest altitude is in the eastern part with maximum height of 500 m above MSL. The average height of the area is 400 m above MSL. **iii. Drainage:** Sukri is the major river flowing east to west which controls the drainage pattern of the area which finally joins the main Auranga River. **iv. Soil:** The Rajbar area is experienced by mixed type of soil viz. sandy, loamy and clayey. **v. Agriculture:** The habitant of the area mainly used to cultivate kharif viz. paddy, maize and pulses. Occasionally cultivation of rabi crops viz. wheat, oil seeds and vegetables are also in paretic.

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Environmental Inventory	**vi. Land Use Pattern & Irrigation :** Out of total area of 999 hec., 531.60 hec. is under forest, 37.13 hec. is under cultivable waste, 87.38 hec. is under uncultivable wasteland (area not available for cultivation). The irrigated area is about 10.24 hec. with well (without Electricity), 3.23 hec. with tank, 25.15 hec. with others. **vii. Flora and Fauna:** Most of the parts of Rajbar area is habitated and people living in the area use to do cultivation. Hence most of the area is covered by paddy field and ponds. The area is full of all types of vegetation. Jadiang PF, Rajbar PF, Renchi PF, Serak PF, Gurtur PF and Surli PF are thickly forested areas. Grasses and bushes are present everywhere in the area. These forests and vegetations are shelter of many wild and domestic species like cow, fox, elephant etc. **viii. Meteorology:** The area experiences sub-tropical climate. The temperature rises up to 45^0 C or even more during the summer season. The temperature lower down to as low as 4^0 C during winter season. The monsoon starts from the middle of June and continues up to mid September. There is heavy rainfall during the rainy season. **ix. Rainfall**: The average annual rainfall is 1,335 mms. in the Latehar district as a whole. **x. Industries:** The Rajbar area is not an industrially developed area, only a few brick-kilns and stone chips quarry are working in the area.
Objective	• Topographic Survey of the area on 1:4000 scale • Detailed Geological Mapping of the Coal Block on 1:5000 scale • Bore Hole Plan on 400 m x 400 m grid (Grid Pattern) • Drilling and Core logging • Assessment of Quality & Quantity with Extension of Coal in the area. • Preparation of GR
Status of Exploration	
Period of Investigation	2010-11 & 2011-12 (December 2010 to Nov. 2011)
Geological Mapping	Detailed Geological Mapping (1:5,000) – 17.20 sq. km. of coal block has been carried out in two phases.
Topographic Survey	Topographic survey of Coal block has been carried out on 1:4,000 scale for 17.20 sq. km.

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Number of Bore Holes Drilled		
Agency	**No. of Bore holes Drilled**	**Total Meterage Drilled**
GSI	8	2824.40 m
DGM, Jharkhand through Outsource Agencies	98	26,115.50 m
Total	**106**	**28,939.90** m

Chemical Analysis		
Parameter of Analysis	**Number of bore holes**	**General Analysis Report**
Band by Band Proximate Analysis at 60% RH & 40^0 C Temperature	93	Generally G and F grade of Non-Coking Coal, Some Coal of D and E grade
Overall Proximate Analysis at 60% RH & 40^0 C Temperature	37 (rest are equilibrated)	Generally G and F grade of Non-Coking Coal and Some Coal of C, D and E grade
Ultimate Analysis	4 (BH-29, 32,50,70)	C,H,S,N,O Percent matches with typical Indian Non-Coking Coal
Ash Fusion Temperature	4 (BH-29, 32,50,70)	> 1400^0 C
HGI	4 (BH-29, 32,50,70)	52.50 – 68
Petrography Test	4 (BH-29, 32,50,70)	Maceral (Volume %) is calculated
Physico-mechanical Test	2 (JAR-45 & JAR-65)	PMP of Roof and Floor of Coal Seams determined
Washability Test	3 (JAR-29W, 54 & 72)	Suitable for Thermal Power Plant

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Geology	
Rock Formation in the block	Greenish to yellowish green, often micaceous and calcareous fine to medium grained sandstone, siltstone & thin coal band of Raniganj formation. Greenish medium to coarse grained felspathic sandstone with predominant black shale of Barren Measure formation. Grey to greyish white fine to coarse-grained, cross-bedded and laminated arkosic sandstone, pebble beds, conglomerate and grey to carbonaceous shale, coal seams and fireclay of Barakar formation. Greenish siltstone, sandstone with shale and laminated sandstone of Talchir formation. Granite, granite gneiss with patches of mica-schist and quartz and pegmatite veins of Pre Cambrian.
Geological Sequence	Raniganj Barren Measure Barakar Talchir -------- Unconformity -------- Pre-Cambrian

Structure			
Total No. of Faults	**Name**	**General trend**	**Nature**
07 (SEVEN)	F1-F1	NW-SE	Normal Strike fault
	F2-F2	NW-SE	Normal Strike fault
	F3-F3	NW –SE-SW	Arcuate fault
	F4-F4	NE-SW-SE	Arcuate fault
	F5-F5	N20^{0}W-S20^{0}E-SE	Oblique fault
	F6-F6	NW-SE	Arcuate fault
	F7-F7	EW-SE	Arcuate fault

Sequence of Coal Seams with Grade, Average Thickness and Splits					
Formation	**Coal Seams from top to bottom**	**Average Grade of Coal Seam**	**Class of Coal**	**Average Thickness of Coal seam (In meter)**	**Splits**
Raniganj Seams	**R-2**	G-F	Non-Coking Coal	4.79	No
	R-1	G-E		3.98	No
Barakar Seams	**VII**	G-C		16.40	1-3
	VI	G-A		10.37	1-3
	V	G-C		1.83	No
	IV	G-C		9.20	1-3
	III	G-C		12.37	1-3
	II	G-B		5.76	1-2
	I	G-B		5.53	1-2

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Reserves:	
Grade wise Reserve of Coal in Rajbar E&D Coal block	
Coal Grade	**Total Reserve (In million tonne)**
A	0.013
B	0.208
C	9.987
D	34.223
E	149.577
F	239.163
G	297.937
Total	**731.108**
Depth wise Reserve of Coal in Rajbar E&D Coal block	
Depth (In meter)	**Reserve (In million tonne)**
0-50	0.591
50-100	9.977
100-150	28.035
150-200	48.233
200-250	58.786
250-300	108.109
300-400	224.827
400-500	135.140
500-600	89.797
600-700	27.650
Total	**731.108**

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