PROPOSAL FOR PRELIMINARY EXPLORATION (G-3 STAGE) FOR COAL

WEST OF CHANO-RIKBA

NMET FUNDED PROJECT

NORTH KARANPURA COALFIELD

DISTRICT– HAZARIBAGH, JHARKHAND

सेन्ट्रल माईन प्लानिंग एण्ड डिजाइन इन्स्टीच्यूट लिमिटेड
(कोल इण्डिया लिमिटेड की अनुषंगी कम्पनी / भारत सरकार का एक लोक उपक्रम)
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PROPOSAL FOR PRELIMINARY EXPLORATION (G3 STAGE) FOR COAL IN WEST OF CHANO-RIKBA COAL BLOCK, NORTH KARANPURA COALFIELD, DISTRICT-HAZARIBAGH, JHARKHAND

1.0 INTRODUCTION

1.1 The North Karanpura Coalfield is the Western most member of the east – west chain of Damodar Valley Gondwana coalfields and forms a vast expanse of coal bearing formations spread over Hazaribagh, Ranchi, Chatra & Latehar districts of Jharkhand state. The coalfield is known primarily for its resources of Non-Coking coals which are characterized by a high percentage of Ash and Moisture content and suitable for power generation. This view has also been supported by GSI and IBM in the course of their exploration activities. The latter organization took up exploration work in Pinderkom-Ganeshpur block in the West, Bachra in the South and Chano-Rikba blocks in the Eastern part of the coalfield. During the course of exploration in Chano- Rikba block the existence of coking coals first came to light in 1960-62. Based on these findings by IBM, this part of the coalfield is now known to contain coals with low moisture%, moderate to high ash% and moderate coking propensities.

'West of Chano-Rikba' Block covers an area of **11.85 sq. km**. The West of Chano-Rikba Block is situated in the south eastern part of the North Karanpura coalfield. It is apparent from surface and sub-surface data that the West of Chano-Rikba Block would have a highly disturbed structure. Chano-Rikba block is located in the north east of the proposed block. The trend of beds in Chano-Rikba in the south east & north east parts of the block is north west- south east the dip in the south eastern part ranges between 23° to 25° towards southwest, where as in north east part it varies between 16° to 18°. The strike swings to an east- west direction in the central part of the block with southerly dips of about 18°. The beds in the western & south western parts also show an east west strike with Southerly dips of 23° to 26°.

1.2 The history of geological work in the North Karanpura Coalfield dates back to 1848 when D.H.Williams carried out reconnoitary traverses and named it as Haharo Coalfield after the Haharo River which meanders through it. The first geological survey of the field was carried out by T.W.H. Hughes in 1867-68. He named it as the North Karanpura coalfield after the 'pargana' in which it was located. Much of our present state of geological knowledge of this coalfield owes to the classical work of A.Jowett who carried out detailed geological mapping on behalf of M/s Bird & Co., in 1915-18. The Geological Survey of India embarked on a programme of regional

drilling in the Bachra Area during 1956-58 which was followed by detailed exploration by I.B.M. in Ganeshpur-Pinderkom (1957-59) and Chano-Rikba Area (1960-62).

Detailed Exploration in adjacent Chano-Rikba Block, lying to the north east of the proposed block, was carried out by CMPDI in two phases, 2005-06 and 2008-09 to 2009-10. Fourteen coal seams and two local seams have been established as belonging to the Barakar Formation and seams K-II and K-I as belonging to the Karharbari Formation. The proposed block is the south western extension of Chano-Rikba and the same seams are expected to be encountered in this block as well. Net Proved Resources amounting to 96.59 MT of coking coal has been reported in the Chano-Rikba block (by MECL and CMPDI) with an area of 8.60 sq. km (including the area explored by MECL) with total Resource of 185.408 MT.

1.3 Earlier 16 boreholes have been drilled by CMPDI (10 BHs-2195.00m) and IBM (6 BHs-922.60m) in the proposed area with a total meterage of 3117.60m. All the boreholes previously drilled in the block are situated in eastern part of block (along the eastern boundary).

Table-1

Details of Boreholes previously drilled in the Block

DRILLING AGENCY	BOREHOLE NO.	METERAGE DRILLED	TOTAL COAL THICKNESS ENCOUNTERED (CORRELATABLE SEAMS)
CMPDI	CNCR-01	274.00	28.96
CMPDI	CNCR-02	209.00	51.95
CMPDI	CNCR-03	167.50	28.12
CMPDI	CNCR-04	233.50	13.98
CMPDI	CNCR-27	117.00	0
CMPDI	CNCR-37	191.00	27.28
CMPDI	CNCR-38	195.00	32.75
CMPDI	CNCR-39	303.00	60.15
CMPDI	CNCR-41	180.00	0
CMPDI	CNCR-44	325.00	42.3
Total of CMPDI	**10 BHs**	**2195.00**	
IBM	CR-06	73.20	0
IBM	CR-26	372.30	42.64
IBM	CR-31	312.60	51.75
IBM	CRX-01	73.95	0
IBM	CRX-02	51.35	6.94

IBM	CRX-04	39.20	0
Total of IBM	**6 BHs**	**922.60**	
Grand Total		**3117.6**	

1.4 Geophysical Gravity data is available from past studies conducted by GSI and the same has been downloaded from BHUKOSH website. Gravity anomaly and residual anomaly map (after regional separation) shows high negative anomaly over most of the block (~3mgal, shades of blue) suggesting potential sedimentary formation and lesser anomaly (less than 1mgal) indicates hard rock formations. Since the block is situated at the south eastern margin of the coalfield, earlier the block boundary was been drawn on the basis of interpretation derived from residual gravity anomaly map. But as per the recommendation of 32nd TCC meeting of NMET held on 10.08.21 and 11.08.21, the boundary has been re-drawn based on the Geological Map of GSI available and present proposal has been modified accordingly.

1.5 CMPDI has prepared a proposal for Preliminary Exploration for coal in West of Chano-Rikba Block involving **2770.00 m** of drilling in **6** boreholes for G3 stage. The boreholes have been proposed at 1600m×1600 m grid. Further **1** borehole involving **700.00 meter** is proposed to be taken up after completion of 6 boreholes and Geological mapping of the said block. That borehole is envisaged considering the Boueger Gravity Anomaly Map of the said block area by GSI and proving of the existence of coal seam beyond the CGGC boundary shown in Geological Map. Thus in total the meterage involved may be **3470.00 meter** in **7** boreholes. (In reference to MoM of 32nd NMET TCC Meeting dated 10.08.21 and 11.08.21).

2.0 OBJECTIVES

2.1 The G3 stage of Exploration in the block is proposed to fulfil following objectives-

- To establish the existence and continuity of probable coking coal seams occurring in the block as significant coal resources present in adjoining block such as Chano - Rikba.
- To know the whole Gondwana sedimentary column of the said proposed area.
- To establish the lay, disposition of coal seams.
- To assess the coal resource in Inferred category.

3.0 LOCATION, COMMUNICATION AND ACCESSIBILITY

3.1 The area falls in the Hazaribagh district of Jharkhand. The block is connected to Gidi

township, 12-14 kms to the South, by an all-weather motor able road bifurcating from coal trunk route near village Chumba, the block can also be approached by an non-metalled road from Mandu (located on NH 33), at a distance of about 16-18km to the East of the block.

3.2 The nearest railway stations are at Patratu, Hazaribagh. The nearest airport is located in Ranchi, the state capital of Jharkhand, at a distance of about 100km from the block.

3.3 West of Chano-Rikba block is located in the south eastern part of North Karanpura CF District Hazaribagh. The area is covered under the Survey of India Topo-sheet no - 73 E/5 and 73 E/6. The geographical co-ordinates of the block defined are as follows:

Latitude	**23° 44' 31.024" N**	**23° 46' 13.08" N**
Longitude	**85° 18' 36.468" E**	**85° 23' 11.414" E**

4.0 BLOCK BOUNDARY:

Boundary description of the proposed block is as follows:

North	Chano-Rikba Block & Metamorphics
South	Metamorphic Basement.
East	Chano-Rikba Block.
West	Rohne Coal Block and Indratoli Dome.

5.0 PHYSIOGRAPHY, DRAINAGE

5.1 A major part of the block covered by a gently undulating topography having a generalized easterly slope. The area has a rugged topography in the west and is more or less flat in the rest of the block with an easterly slope. The block is dissected by Maramgarha Nala flowing flow west to east and several seasonal streams drain into it. The ground elevation is expected to varybetween 350m and 430m.

6.0 CLIMATE AND VEGETATION

6.1 The proposed area falls in the tropical zone and the maximum temperature during summer season (March-May) varies from 40-45°C. The minimum temperature during the same period is around 22°C. The winter (November-February) is normally cold with a minimum recorded of about 1°C. The average rainfall in the region is generally 1200mm and the relative humidity is about 51%.

6.2 5-8% of the proposed block area is covered by forest as per the FSI plan available. (Plan enclosed).

7.0 BROAD GEOLOGICAL SET UP

7.1 Stratigraphic Sequence

The geological succession in this coalfield as per published report of GSI, CMPDI and MECL is given below:

TABLE - 2

STRATIGRAPHIC SUCCESSION OF THE COALFIELD

Period	Group	Sub-Group	Formation	Lithology
Recent	-	-	Alluvium	Detrital & alluvial soil & sub-soil
Jurassic	-	Equivalent to Rajmahal Trap	Igneous Intrusive	Dolerite and Mica Peridotite
Triassic	Upper Gondwana	-	Mahadeva	Massive coarse to conglomeratic Feldspathic, ferruginous sandstone with shale intercalations.
Upper Permian to Lower Triassic	Lower Gondwana	-	Panchet	Yellowish to white coarse grained sandstone red, chocolate-colored plastic clays. In the upper part, yellowish friable sandstone whereas lower part is greenish yellow.
Upper Permian	-	Damuda	Raniganj	Fine to medium grained Quartzo-feldspathic and Quartzitic sandstone often Micaceous and matured, inter-banded shale and sandstone, carbonaceous shale and thin coal seams.
			Barren Measures	Dark shale, sandy micaceous shale with sideritic interbanded shale and sandstone.
			Barakar	Sandstone, shale and sandstone intercalation, siltstone and shale, carbonaceous shale, fire clay, coal seams.
			Karharbari	Gritty sandstone occasional shale bands, fireclay, chocolate-coloured clays and coal seams.
Permo-Carboniferous	-	-	Talchir	Rikba plant beds, boulders, conglomerates, varvites, sandstone, tilloids and tillites.
UNCONFORMITY				
Precambrian	-	-	Metamorphic	Granite, Gneisses ,Pegmatite, Phyllites, Mica Schist, Chromite bearing rocks, Amphibolite and Quartzite.

TABLE - 3

STRATIGRAPHIC SUCCESSION OF THE BLOCK AS EXPECTED TO BE ENCOUNTERED IN WEST OF CHANO RIKBA BLOCK.

Age	Formation	Lithology
Upper Permian	Raniganj	Medium to coarse grained sandstone, shale and coal seams.
Upper Permian	Barren Measure	Grey to dark Grey Shale.
Middle Permian	Barakar	Medium to coarse grained sandstone, argillaceous sandstone, shale, arenaceous shale, Intercalation of shale and sandstone, carbonaceous shale and coal seams.
Lower Permian	Karharbari	Very coarse grained sandstone, silicified sandstones, coal seams and stringers of coal.
Permo-Carboniferous	Talchir	Green to Buff colored arenaceous shale.
----------UNCONFORMITY.....		
Precambrian	Metamorphic	Granitic gneiss and Quartzite.

8.0 REGIONAL STRUCTURE:

The present structural set-up of the coalfield indicates that it has undergone substantial modification mainly due to faulting which took place after sedimentation. The southern boundary of the coalfield is characterized by east west trending major fault between Khalari and Mahuamilan villages. It has brought the Raniganj Formation at places in direct juxtaposition with Metamorphics. The northern boundary of the coalfield is also faulted at places. There are several step faults which cause repetition of the outcrops of Barakar / Karharbari / Talchir Formations. Besides, above there are two more important structural features viz, Karkata-Piparwar anticline in the south-central part and Indertoli - Rohsouth west dome south western Ronhe block in the eastern part of the coalfield. The Karkata - Piparwar anticline is a WNW plunging anticline whose southern limb is steeper (3^{o} to 9^{o}dip.) than the northern limb (almost sub horizontal). The Manki Colliery is situated almost on the axis of this anticline. The axial region of this anticline can be seen in the cuttings of Jaindih village where both the limbs are clearly exposed. The Indratoli - Rohne dome in the eastern part of the coalfield exhibits a metamorphic core at the center with qua-qua- versal centrifugal dips of Gondwana rocks, It is dissected by numerous radial faults. This dome separates Chano- Rikba block from Rohne block.

In addition to above, there are many prominent faults trending mostly WNW-ESE. The throw of some of these faults is over 100 meters.

9.0 SEQUENCE OF COAL SEAMS:

9.1 The North Karanpura Coalfield is characterized by the presence of 5 Coal Seams named seam V to I in descending order and their splits belonging to the Barakar Formation, five seams named as K-V to K-I belonging to the Karharbari Formation and a few local seams varying in thickness from 0.10m to 2 m. These co-relatable sections are separated by well-defined parting.

9.2 The sequence of coal seams likely to occur in the proposed block on the basis of boreholes drilled in adjoining blocks mainly comprises 14 seams of the Barakar Formation which in descending order are V(Top and Bottom), IVD, IVC Top, IVC Bottom, IVB, IVA, IV, III Top, III Bottom, II, IB & IA apart from the above there are 2 Local seams, i.e., L1 (lying above seam V) & L2 (lying below seam IA) which are inconsistent in thickness.

The Karharbari formation shows the presence of two seams, namely, K-II & K-I. These seams are in the thickness range of 0.5 – 1.0m but may have potentiality in the down dip side of the block considered in the present area.

TABLE - 4

SEQUENCES OF COAL SEAMS ALONGWITH THICKNESS RANGE AND QUALITY RANGE in CHANO RIKBA BLOCK.

SEAM	DEPTH RANGE		THICKNESS (in meter)	QUALITY
	FROM	TO		
L1	12.39	314.00	0.27-1.80	
Parting			1.02-9.95	
V Top	5.60	317.00	4.10-20.51	UNGR to WG-IV
Parting			1.10-8.70	
V Bottom	16.40	334.46	1.60-12.76	UNGR to WG-III
V Top and V Bottom are splits of seam V				
V	16.08	50.00	10.77-26.58	-
Parting			5.80-27.90	
IV D	9.00	168.85	0.70-7.30	UNGR to WG-I
Parting			1.54-12.62	

SEAM	DEPTH RANGE		THICKNESS (in meter)	QUALITY
	FROM	TO		
IV C Top	12.00	347.05	0.95-4.59	UNGR to WG-II
Parting			1.28-18.21	
IV C Bottom	12.49	354.36	0.66-4.53	UNGR to WG-II
Parting			4.62-29.29	
IV B	6.28	362.12	0.82-8.10	UNGR to WG-II
Parting			3.19-25.29	
IV A	14.10	393.36	0.49-6.73	UNGR to WG-I
Parting			1.13-14.98	
IV	13.00	409.26	1.28-12.30	UNGR to WG-III
Parting			1.47-25.13	
III Top	8.50	195.50	0.21-7.30	UNGR to WG-II
Parting			1.11-20.57	
III Bottom	4.00	420.48	0.30-6.78	UNGR to WG-I
III Top and III Bottom are splits of seam III				
III	97.78	-	9.22	-
Parting			2.00-41.63	
II Top	94.09	182.74	0.91-4.03	-
Parting			1.23-2.40	
II Bottom	96.33	188.00	4.45-14.30	-
II Top and II Bottom are splits of seam II				
II	4.00	431.20	4.90-14.00	UNGR to WG-III
Parting			1.51-30.88	
I B	8.47	440.64	0.40-9.81	UNGR to WG-IV
Parting			1.00-14.68	
I A	9.00	448.69	0.33-4.60	UNGR to WG-III
Parting			3.88-31.17	
L2	10.10	198.00	0.20-2.19	UNG to WG-III
Parting			6.42-74.34	
K-II	40.87	204.82	0.15-2.36	-
Parting			1.31-54.20	
K-I	57.00	217.54	0.06-1.89	-

* W = Washery Grade, UNGR = Ungraded, S = Steal Grade.

9.3 Considering major regional seams of Raniganj, Barakar and Karharbari Formations tentative resource of the block has been estimated is about 1200 million tonne. The

coal seams of the block are expected to be coking in nature as they are in adjacent block.

10.0 EXPLORATION SCHEME

10.1 Drilling:

Initially 2770.00 m of drilling in 6 boreholes for G3 stage are proposed at 1600m×1600 m grid. Further 1 borehole involving 700.00 meter is proposed to be taken up after completion of first 6 boreholes and Geological mapping of the said block. That borehole is envisaged considering the Boueger Gravity Anomaly Map of the said block area by GSI and identification of the existence of coal seam, if any, beyond the CGGC boundary shown in Geological Map. Thus in total the meterage involved may be 3470.00 meter in 7 boreholes. (In reference to MoM of 32nd NMET TCC Meeting dated 10.08.21 and 11.08.21). The details of all the proposed boreholes and their expected depth details with cumulative meterage details are tabulated below.

TABLE-5

PROPOSED BOREHOLES AND EXPECTED DEPTH DETAILS

PROPOSED POINT	EXPECTED RL (M)	EXPECTED FRL OF SEAM-IB (m)	EXPECTED DEPTH UP TO SEAM- I(m)	PARTING B/W SEAM-I AND SEAM- K1 (m)	EXPECTED DEPTH UP TO SEAM- K1(m)	EXPECTED DEPTH(M) UPTO TALCHIR/ METAMORPHIC	REMARKS
Grid Borehole to be taken up.							
P-1	400	230	170	100	270	300	GRID BOREHOLE
P-2	400	150	250	100	350	380	GRID BOREHOLE
P-3	400	265	135	100	235	265	GRID BOREHOLE
P-4	400	-45	445	100	545	575	GRID BOREHOLE
P-5	400	-110	510	100	610	640	GRID BOREHOLE
P-6	400	-80	480	100	580	610	GRID BOREHOLE
					Sub Total	**2770**	
Borehole Proposed to be taken up on completion of above 6 boreholes and Geological Mapping and after review from TCC of NMET.							
P-10	400	-170	570	100	670	700	BH FOR COAL SEAM BEYOND CGGC IDENTIFICATION, IF ANY
					Sub Total	**700**	
					Grand Total	**3470**	

10.2. Target depth of Exploration:

All the boreholes are to be drilled up to the Talchir formation or Basement Metamorphic rock for establishing the full sequences of Gondwana Sedimentary sequences within he proposed block area.

10.3 Core Logging and Coal core Sampling:

Breakup of Core logging, Sampling and Geophysical Logging are given below:

No of BHs	Type of Bhs	Meterage	Logging required	GPL required	Expected Coal Cores/BH	Total Coal Cores	Analysis
6	Coring	2770	2770	2770	70	420	Prox, SOV, Sp. Test
1*	Coring	700	700	700	70	70	
		3470m	**3470m**	**3470m**		**490m**	

* borehole is envisaged considering the Boueger Gravity Anomaly Map of the said block area by GSI and identification of the existence of coal seam, if any, beyond the CGGC boundary shown in Geological Map. Borehole to be taken up in later based on 6 boreholes and geological mapping, on approval based on Mid-Term review of TCC of NMET.

Expected no of samples for Band by Band Analysis per borehole is to be around **2000 in total.**

10.4 Different types of Analysis:

Following test are required to be carried out:

- All the boreholes may be required to be taken up for Band-By-Band Analysis.
- 100% boreholes of above boreholes may be required for Seam Overall Analysis (Proximate Analysis, GCV).
- 10% boreholes (Grid boreholes) for Ultimate Analysis and Special Test including Coking Properties Analysis and Petrographic Analysis.

10.5 Geological Mapping:

Geological Mapping in 1:10,000 scale needs to be carried out.

10.6 Topographical Survey:

Topographical Survey at 2 meter interval is required to be carried out.

10.7 Borehole Survey, RL Survey:

All the proposed boreholes & boundary cardinal points are required to Surveyed using DGPS.

10.8 Geophysical Logging:

100% of the coring boreholes i.e 6 in nos, may be taken up for Geophysical Logging that may involve a total meterage of around **2770.00 meter**. On approval of another borehole, GPL will be taken up.

10.10 Quantum of Work in brief:

TABLE-7

QUANTUM OF WORK

S. No.	Activity	Quantity
1	Geological Mapping	11.85 Sq km. (1:10,000 scale).
2	Drilling	
	i) Boreholes	6 Boreholes. 1 Borehole after mid-term review of TCC)
	ii) Meterage	2770.00 meter (6 BHs) 700.00 meter (1 BH) after review In total 3470.00m.
3.	i) Leveling and Triangulation	As per requirement.
	ii) RL and Co-ordinates	6 Boreholes. 1 Borehole after mid-term review of TCC)
	iii) DGPS Survey	24 points (6 boreholes and 18 boundary cardinal point) in 1st phase 1 point after review.
4.	Drill Core Logging	2770.00 meter (6 BHs) 700.00 meter (1 BH) after review

S. No.	Activity	Quantity
5.	Geophysical Logging • Dual Density • Caliper • Natural Gamma Ray • Single Point Resistance • SP Self Potential • Resistivity Logs. • Sonic Log	6 Boreholes (100%) 1 Borehole after review (100%)
6.	Borehole deviation Survey (boreholes with depth more than 600m)	Two (2) boreholes 1250.00m One (1) borehole 700.00m (after review)
7.	Chemical Analysis:	
	Band by Band	6 BHs – 1200 nos, 1 BH – 200 nos.(after review) In total 7 BHs (All seams). (Samples – 1400 nos).
	Overall Proximate	100% of Band by Band BHs (6BHs). (Samples – 450 nos). 100% of Band by Band BHs (1BH). (Samples – 75 nos). (After review).
	Gross Calorific Value	100% of Band by Band BHs (7BHs). (Samples – 450 nos). 100% of Band by Band BHs (5BHs). (Samples – 75 nos) (After review).
8.	Special & Coking Propensities Tests	10% of the Band by Band BHs (1 BH). (25 samples)
	i) LTGK Coke Type	1 BH (All major seams) (25 samples)
	ii) Swelling Index/CSN	1 BH (All major seams) (25 samples)
	iii) Plastometric Test	1 BH (All major seams) (25 samples)
	iv) Ultimate Analysis	1 BH (All major seams) (25 samples)
	v) Ash Analysis	1 BH (All major seams) (25 samples)
	vi) Phosphorus and Sulphur Distribution	1 BH (All major seams) (25 samples)
	vii) HGI	1 BH (All major seams) (25 samples)
	viii) Total Sulphur	1 BH (All major seams) (25 samples)
	ix) Caking Index	1 BH (All major seams) (25 samples)
	x) Roga Index	1 BH (All major seams) (25 samples)
	xi) Ash Fusion Temperature	1 BH (All major seams) (25 samples)
9.	Petrographic	1 BH - 25 Nos samples.
10.	Geological Report Preparation	1 No.

10.13 Time Schedule:

Expected time of completion of Project is 12 Months.

11. LIMITATIONS:

1. Most of the earlier drilled borehole are falling along the eastern margin of the proposed coal block thus most of the area of the block is devoid of any boreholes. Thus the FCP drawn with respect to adjacent coal blocks and earlier drilled boreholes are very much tentative and the expected depth shown may vary during actual course of action. Thus the envisaged meterage may vary in totality.

2. The Proposed block area are bounded by Metamorphic Basement rock in North-eastern as well as south. Thus boreholes falling around the boundary area may be taken up with utmost care and it is thus proposed to take up the Surface Geophysical Survey for delineation of the boundary at very initial phase of exploration i.e before commencement of drilling work.

3. Some of the boreholes may require shifting due to non-approachability due to presence of hills /gullies/villages/forest cover/agriculture land etc.

12. REFERENCES:

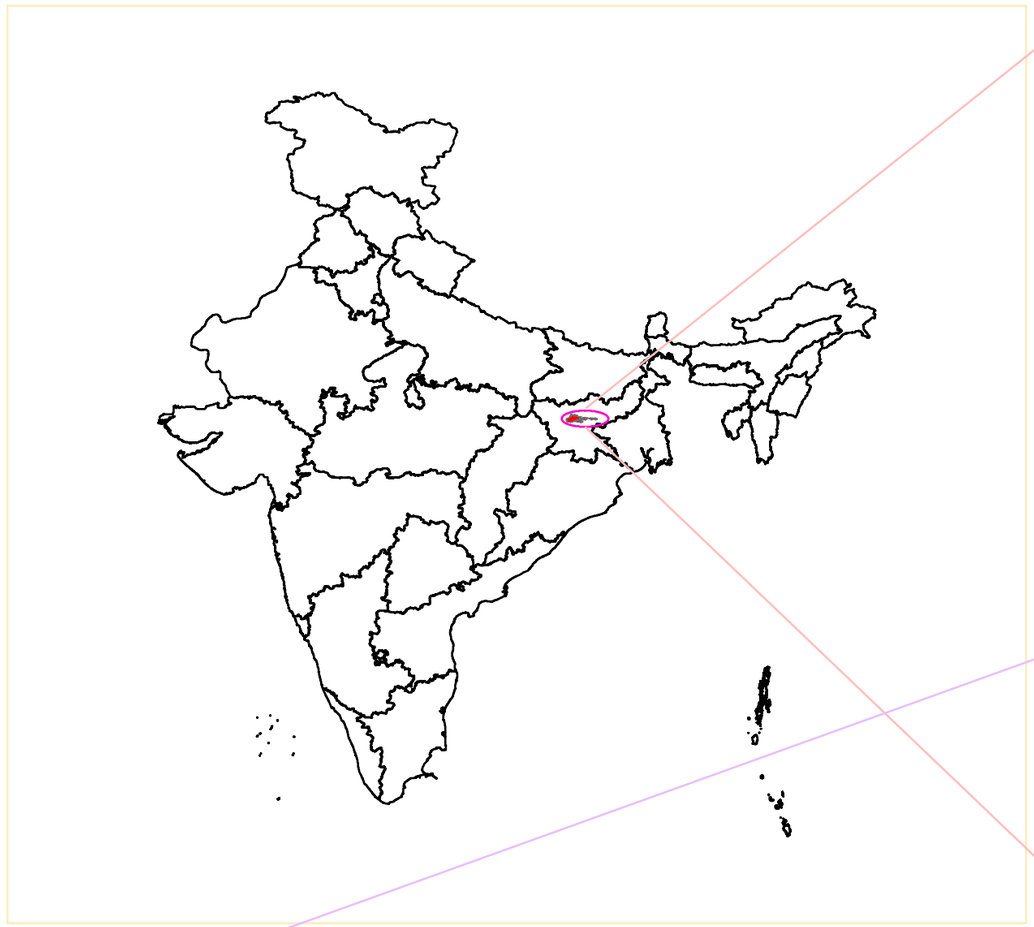
1. Geological Report on Chano Rikba Coal Block, North Karanpura Coalfield, District: Hazaribagh, Jharkhand, CMPDI, March, 2010.

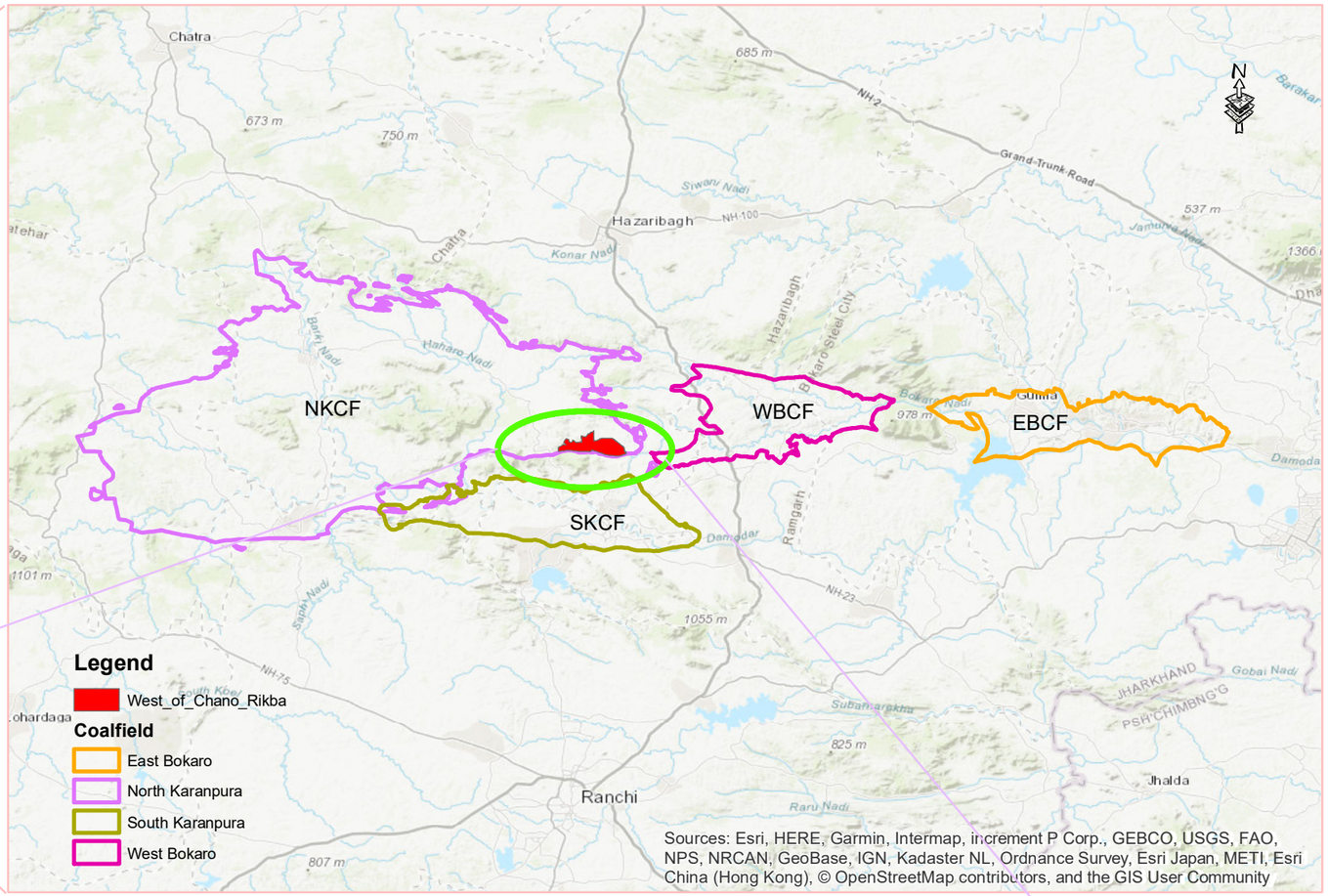
2. Geological Report on Chano Rikba Coal Block, North Karanpura Coalfield, District: Hazaribagh, Jharkhand, MECL, November, 1995.

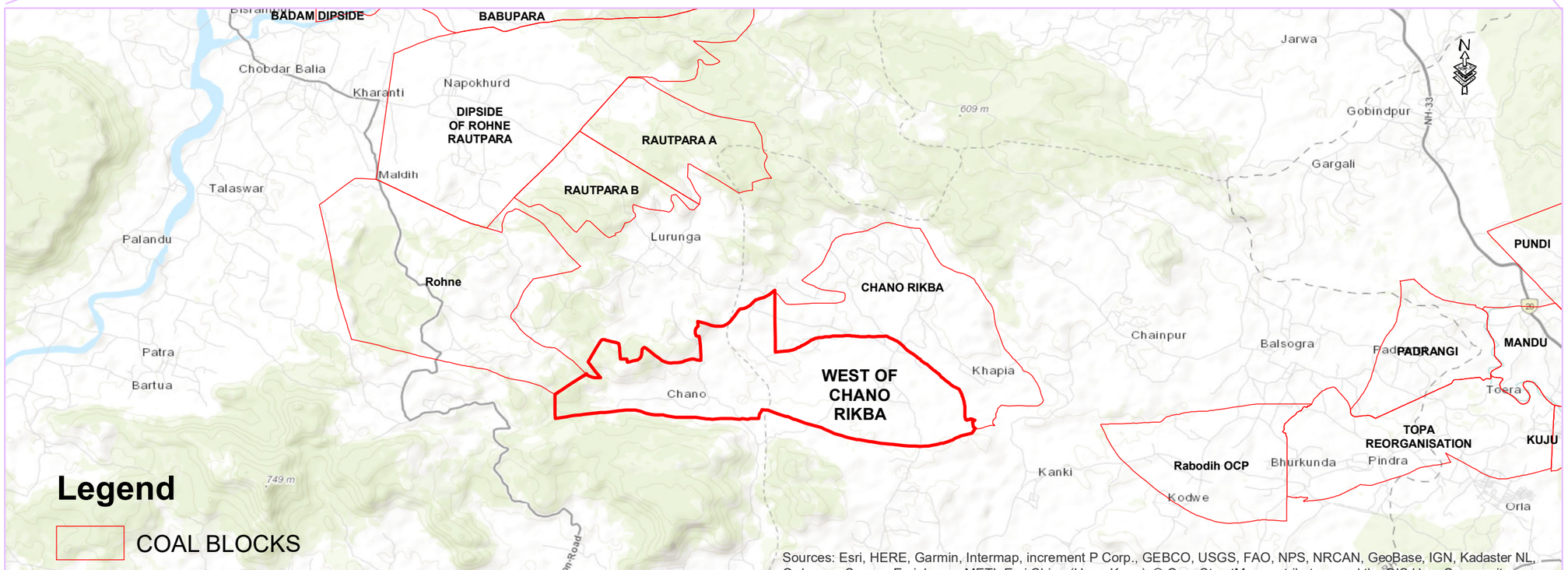
13. LIST OF PLATES:

1. Location Map (Plate I)
2. Geological Map. (Plate II)
3. Litho logs of boreholes.
4. Bouger Anomaly map & Residual Bouger anomaly Map (Plate IV A & IV B)
5. Plan Showing Proposes Borehole location with Floor contour of Seam I. (Plate V)
6. Geophysical Survey Layout Plan. (Plate VI)

LOCATION MAP WEST OF CHANO RIKBA COAL BLOCK, NORTH KARANPURA COALFIELD, JHARKHAND, INDIA

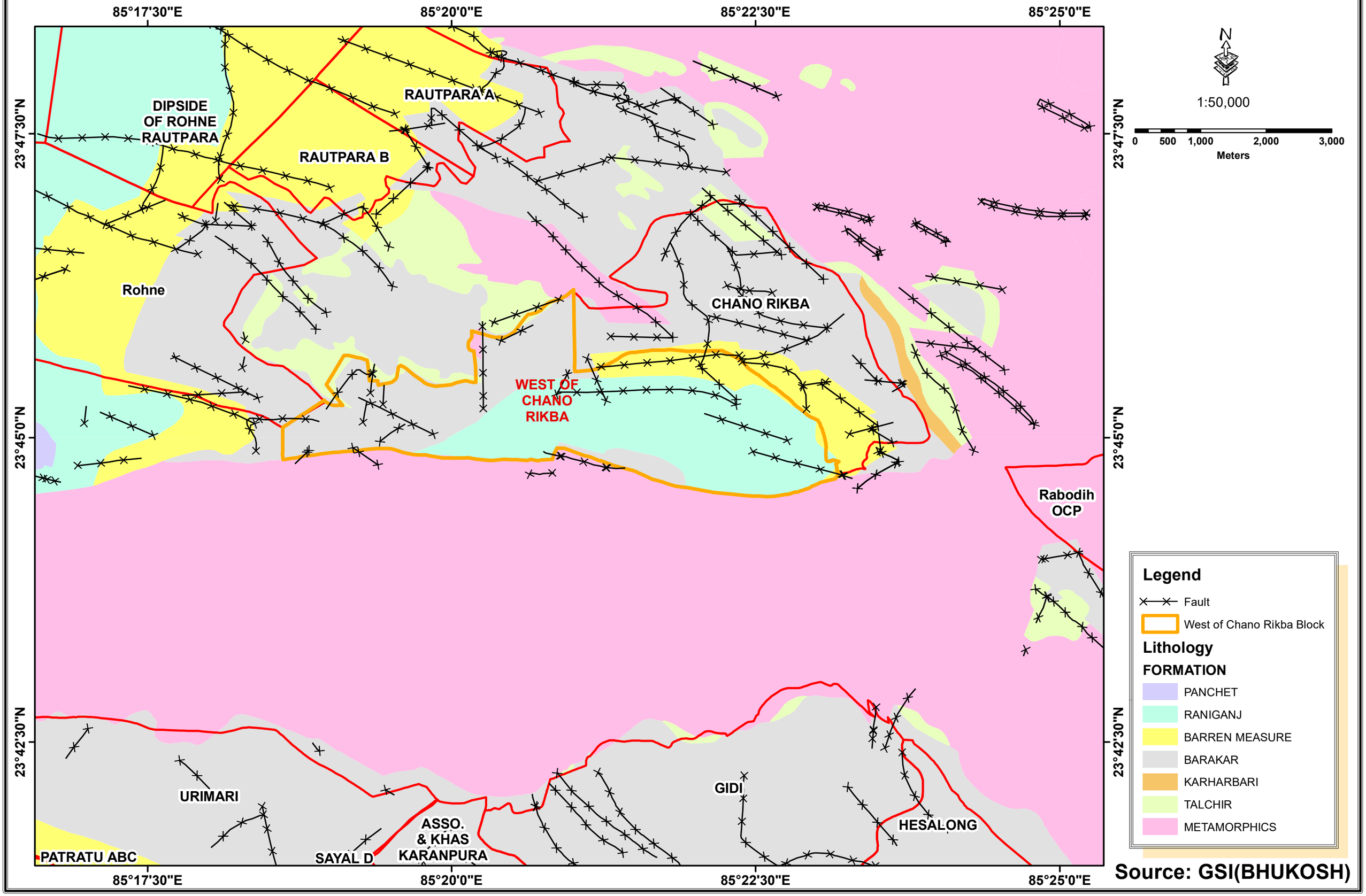




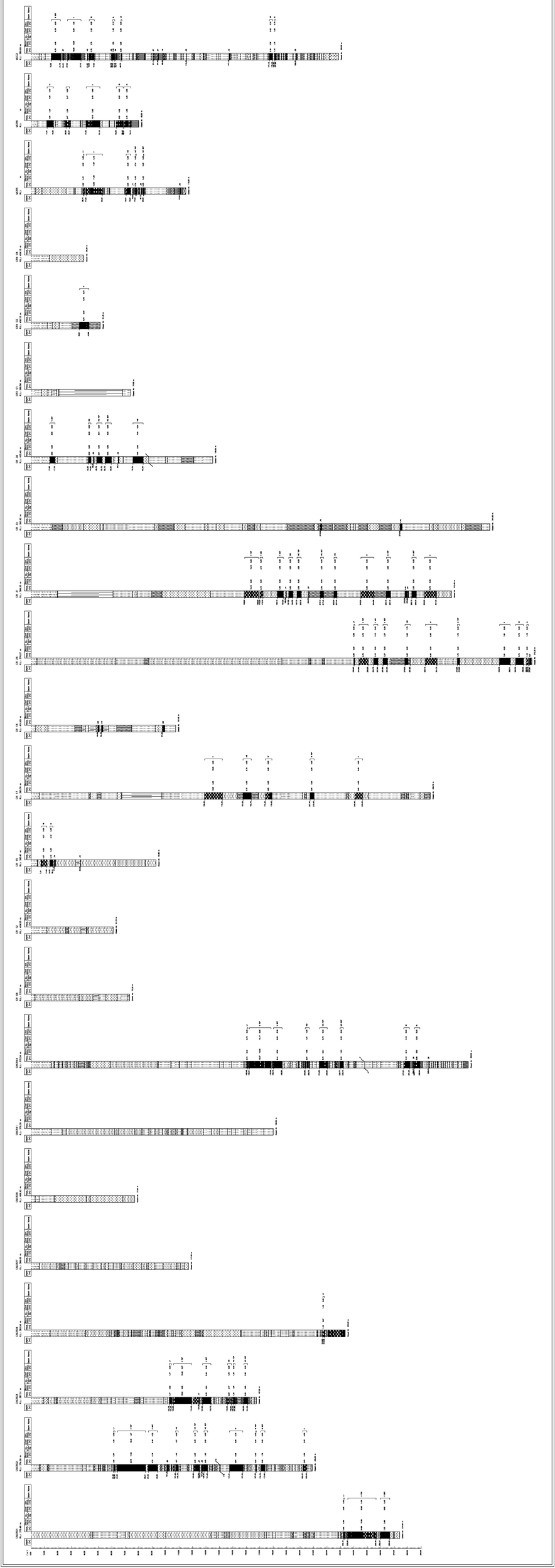


ALL MAPS NOT TO SCALE

GEOLOGICAL MAP OF A PART OF NORTH KARANPURA COALFIELD,JHARKHAND

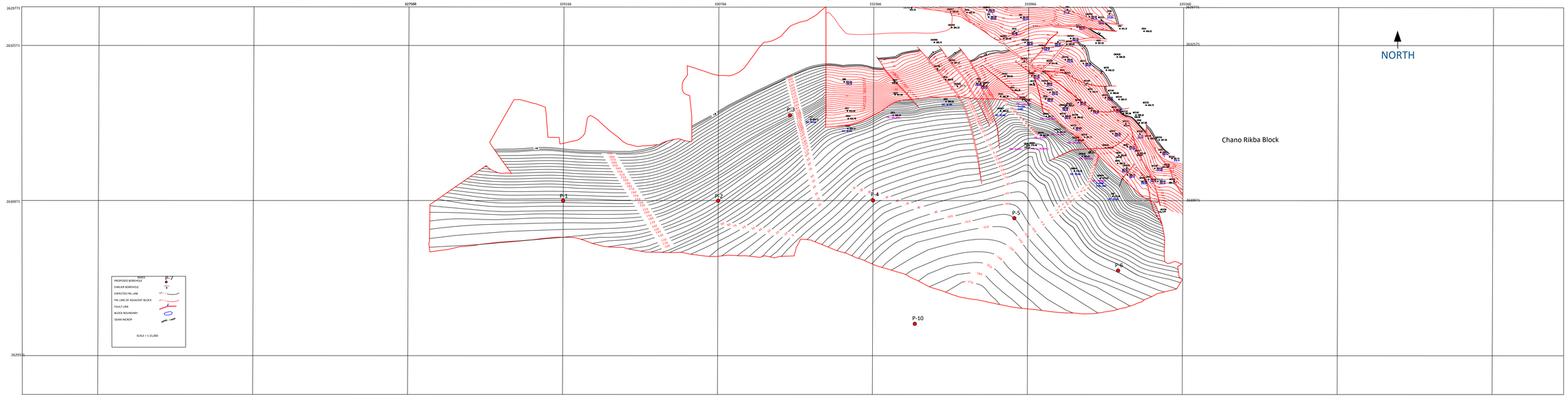


Source: GSI(BHUKOSH)



Propose Borehole Location Plan with Tentative Floor Contour of Seam IB, West of Chano Rikba Block

NORTH KARANPURA COALFIELD, JHARKHAND, INDIA



Project Cost Estimate for General Exploration (G3 Stage) of Coal in West of Chahno Rikba , North Karanpura (Area-11.85 sq.km)

Sl. No	Item Work	Item no in Soc	Unit	Rates as per SoC of NMET	Rate (Rs)	Qty.	Amount (Rs)
	I- Field operations						
A	**DRILLING**						
1	Drilling (As per MoC Rate 2020-21)	2.2.1.1b	m	5619	5619	3470	19497930
B	**GEOPHYSICAL STUDIES**						
1	Borehole Geophysical logging (As per MoC Rate 2020-21)	3.11	m	656	697	3470	2418590
2							
	Field operations Total (A+B)						**21916520**
	II- Field Study						
A	**GEOLOGICAL WORK**						
1	Survey Work-1 surveyor	1.6.1a	Day	8300	8300	45	373500
2a	Geological Party days-Field (Mapping, Field work)- 1 Geologist	1.5.1a	Day	11000	11000	90	990000
2b	Geological Party days-HQ 1 Geologist	1.5.1a	Day	9000	9000	45	405000
	Sub Total A						**1768500**
B	**GEOPHYSICAL STUDIES**						
2a	Geophysicst Party days-Field - (Resistivity+ Bh Logging)- 1 Geophysict	3.19	Day	11000	11000	10	110000
2b	Geophysicst l Party days-HQ - 1 Geophysict	3.19	Day	9000	9000	7	63000
	Sub Total B						**173000**
	Field Work Total (A+B)						**1941500**
	III-Laboratory Studies						
1	***Band By Band Analysis***						
a	Ash+Moisture	4.2.6	per sample	700	700	1400	980000
b	House Keeping	4.2.1	per sample	115	115	1400	161000
2	***Overall analysis***						
a	Proximate analysis	4.2.7	per sample	935	935	525	490875
b	Moisture at 60% RH & 40C	4.2.8	per sample	1010	1010	525	530250
c	GCV	4.2.11	per sample	1505	1505	525	790125
d	Sample preparation & House Keeping	4.2.3	per sample	795	795	525	417375
3	***Special Test***						
a	Ultimate analysis	4.2.17	per sample	9945	9945	25	248625
b	Total Sulphur	4.2.14	per sample	1900	1900	25	47500
c	Distribution of Sulpher	4.2.15	per sample	3695	3695	25	92375
d	Phosphorus	4.2.21	per sample	2480	2480	25	62000
e	HGI including sample preparation	4.2.18	per sample	3805	3805	25	95125
f	AFT (Ash Fusion Temperature)	4.2.20	per sample	2745	2745	25	68625
g	Ash analysis	4.2.25	per sample	325	325	25	8125
h	Ash sample preparation 800^{o}C from coke for analysis	4.2.5	per sample	875	875	25	21875
i	Roga Index(Instead of caking Index)	4.2.22	per sample	5365	5365	25	134125
j	Swelling Index	4.2.23	per sample	2745	2745	25	68625
k	LTGK coke type	4.2.24		4550	4550	25	113750
4	**Petrographic analysis**						
a	Pellet preparation	4.3.14a	per sample	1160	1160	25	29000
b	Maceral Analysis (with photomicrography)	4.3.14e	per sample	25000	25000	25	625000
c	Microlithotype Analysis (with photomicrography)	4.3.14g	per sample	25000	25000	25	625000
d	Determination of Rank (VRO random %)	4.3.14h	per sample	16345	16345	25	408625
f	Determination of Rank (VRO Min % and Max)	4.3.14i	per sample	21025	21025	25	525625
	Laboratory Studies Total						**6543625**
	IV. Miscellaneous Charges						
a	Preparation of Exploration Proposal	5.1	lump sum	380000	380000		380000
b	Geological Report preparation (3% of work value or 20 Lakh Max)	5.2					1017349
c	Land crop compensation	5.6	Per bh	20000	20000	7	140000
d	DGPS Survey of bundary, borehole points (7 boreholes & 18 boundary point)	1.6.2	per point	19200	19200	25	480000
e	3 D ore body modelling using Minex software	5.4		250000	2500000		2500000
f	Peer review			10000	10000		10000
	Miscellaneous Charges Total						**4527349.35**
	Total (I- Field op +II Field Study +III Lab+ IV Misc)						34928994
	GST (@18%)						6287219
	Grand Total						41216213

Note- 1) Above rate of drilling, GPL, Chemical are budgeted rates.

2) There are numerous items in chemical anlysis.The CIMFR rates will be applied for actual payment.

3)For Drilling & Geophysical the approved rates of MoC for FY 2020-21 has been taken other rates are as per approved SoC rates.

4) GPL rates is Rs 697/- per meter of minimum 8 parameters, the break up is as follow

	Probe	SoC item No	Rate 2020-21 (in Rs)
1	Base Log	3.11a	162
2	Dual Density	3.11d	110
3	Natural Gamma	3.11h	96
4	Caliper	3.11g	20
5	SPR	3.11i	41
6	Sonic	3.11k	131
7	Deviation	3.11m	96
8	Resistivity	3.11c	41
	Total		**697**

5) Rate for Rs 2500000/-is budgeted rate for 3 D ore body modelling using Minex software .

6) Rs 10000/- for Peer review is budgeted rate.

Time Schedule/Action Plan for West of Ramgarh Block-II, Ramgarh Coalfield														
S. No	**Activities**													**Remarks**
		Months	1	2	3	4	5	6	7	8	9	10	11	12	
1	Mobilising	Months	↔												1 months
2	Drilling (Nos of rigs-2 rigs)	Months		<---------->											3470 in 7 Bh
3	Borehole Geophysical logging	Days		<---------->											3470 in 7 Bh
4	Survey Party days (1 Party)	Days		<---------->											45 Days
5	Geologist Party days, Field (1 Party)	Days		<---------->											90 Days
6	Geophysict Party days, Field (1 Party)	Days		<---------->											10 Days
7	Laboratory Studies (Band By Band)	Nos.			<---------->										1400 sample
8	Laboratory Studies (Overall)	Nos.				<---------->									525 Sample
9	Laboratory Studies (Special , Petrography)	Nos.							<------>						25 Sample
10	Geologist Party days, HQ (1 Party)	Days								<---------->					45 Days
11	Geophysict Party days, HQ (1 Party)									<---------->					7 Days
12	3 D Modiliing	Months								<---------->					3 Months
13	Report Writing & Peer Review	Months								<---------->					6 Months

Note: Please add activities accordingly and timelime (months)

Total Time Period of Completion of Project- *12 months from Sanction of Project*

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