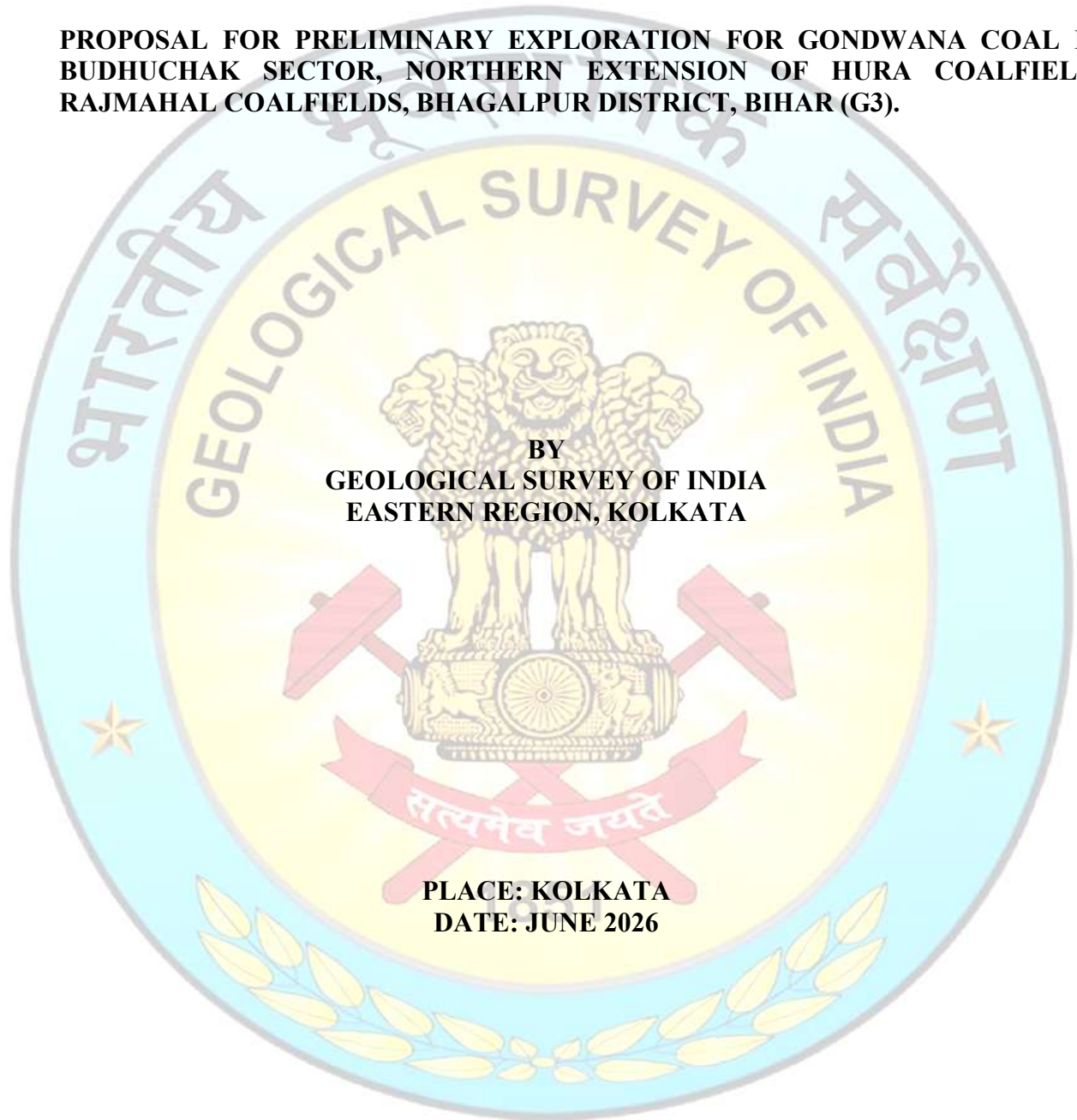


COMMODITY: COAL AND LIGNITE

**PROPOSAL FOR PRELIMINARY EXPLORATION FOR GONDWANA COAL IN
BUDHUCHAK SECTOR, NORTHERN EXTENSION OF HURA COALFIELD,
RAJMAHAL COALFIELDS, BHAGALPUR DISTRICT, BIHAR (G3).**



**BY
GEOLOGICAL SURVEY OF INDIA
EASTERN REGION, KOLKATA**

**PLACE: KOLKATA
DATE: JUNE 2026**

Summary of the Block for G3 Level Exploration

GENERAL INFORMATION ABOUT THE BLOCK

Feature	Details
Block ID	BUDHUCHAK SECTOR
Exploration Agency	Geological Survey of India, Eastern Region, Kolkata
Commodity	Coal and Lignite
Mineral Belt / Geological Domain	Northern extension of Hura Coalfield, Rajmahal Coalfield
Block Area	23 sq km
Completion Period	One year
Objectives	1. To establish the continuity of the regional coal seam zones of Barakar Formation to the north of the already explored Shrimatpur Area and Shivnarayanpur Area and within Khawaspur Area in Northern extension of Hura Coalfield, Rajmahal Coalfields 2. To decipher the structure and disposition pattern of the coal seams. 3. Resource assessment of coal.
Projected Outcome	Preliminary exploration data for resource appraisal and further advancement of the block.
Personnel	Two Geoscientists
Expected Field Days	Officer-1: 45 days(PT); Officer-2: 45 days(PT); Supervisory Officer: 7 days
Toposheet / Degree Sheet	72O/7
District / State	Bhagalpur, Bihar

1. Location

BLOCK

Cardinal Points	Latitude	Longitude
A	25°19'58.01"N	87°19'11.47"E
B	25°22'37.08"N	87°23'38.55"E
C	25°21'17.33"N	87°23'39.19"E
D	25°21'17.56"N	87°22'00.36"E
E	25°19'57.13"N	87°21'59.33"E
F	25°21'41.24"N	87°19'11.81"E
Tehsil/Taluk	Pirpainti	

Cardinal Points	Latitude	Longitude
District	Bhagalpur	
State	Bihar	

2. Area

Block Area	23 sq. km.
Forest Area	NIL
Government Land Area	No major infrastructure project is falling within the proposed block
Private Land Area	Data not available

3. Accessibility

Nearest town	Pirpainti town, about 12.5 km to the southeast
District headquarters	Bhagalpur, about 60 km West of Budhuchak
Nearest Rail head	Pirpainti, about 12.5 km to the southeast
Nearest Airport	Patna, 270km

4. Hydrography: Ganga river (North of block)

5. Climate: sub tropical

6. Topography: Plains.

7. Availability of baseline geoscience data

Geological map	Large-scale geological mapping and earlier G4 & G3 investigations by GSI in and around the block
Geochemical data	NIL
Geophysical data	NIL

8. Justification for taking up G3 level exploration

In FS 2024-25, the regional exploration for coal in the Khawaspur Area was taken under the G4 stage during F.S. 2024-25. After a detailed study, critical correlation of adjacent borehole data, and interpretation of underground structural data of earlier explored coal exploration blocks, 2 numbers of boreholes have been drilled within a 30 sq km area. Cumulative coal thicknesses for borehole numbers RBKA-1 & 2 are 47.43m & 83.07m respectively. The drilling meterage of 1295m with a cumulative coal thickness of 130.50m in two completed boreholes (RBKA-1 and 2) in the Khawaspur area. Sub-surface drilling data reveal the presence of four major coal seam zones, namely coal seam zones A, B, C & D. First borehole RBKA-1 of Khawaspur Area closed at a

depth of 550.00m after intersecting of four coal seam zones. Thickness of individual seam zone varies from 105.6m (Zone-D, RBKA-1) to 18.1m (Zone-B, RBKA-1) within the depth range of 154.9m to 532.95m with thickest coal seam section of 6.70m (Zone-A, RBKA-1) at a roof depth of 474m. Second borehole RBKA-2 of Khawaspur Area closed at a depth of 745.00m after intersecting all coal seam zones (Viz. A, B, C & D). Thickness of individual coal seam zone varies from 169.45m (Zone-D, RBKA-2) to 20m (Zone-B, RBKA-2) within the depth range of 283.20m to 700.80m with thickest coal seam section of 10.55m at a roof depth of 780.80m in RBKA-2. Therefore, **Budhuchak Sector** is proposed to be taken up for exploration under G3 stage in FS 2026-27 to establish the strike & dip continuity of regional Barakar coal seams and also to delineate the northern extension of the Hura Coalfield.

Preliminary exploration for Gondwana coal in Budhuchak Sector, Northern extension of Hura Coalfield, Rajmahal Coalfields, Bhagalpur District, Bihar (G3).

1.1.0 INTRODUCTION

Hura Coalfield is the northernmost coalfield in the NNW-SSE trending Rajmahal Group of Coalfields, which includes Hura, Chupervita, Pachwara, Mahuagarhi, Brahmani, and Birbhum coalfields from north to south. These lie along the western fringe of the Rajmahal-Purnea Basin, much of which is buried under Rajmahal Traps, Tertiary sediments, and Gangetic alluvium, making its full structure unclear. The Barakar Formation, the main coal-bearing unit, appears in isolated patches along the western slope of the Rajmahal hills and rests against the Chhotanagpur Gneissic Complex along a major fault.

The proposed programme is designed to generate the geological, geochemical, and drilling data required for preliminary resource appraisal and to guide subsequent exploration.

2.1.0 BACKGROUND INFORMATION

Budhuchak Sector, Bhagalpur district, Bihar covers an area of about 23 sq.km between latitudes 25°19'58.8"N - 25°22'37.2"N and longitudes 87°19'12"E - 87°23'38.4"E (Fig.1&2) and falls under the Survey of India Toposheet No. 72O/7 within already explored G4 block of Khawaspur Area, FS 2024-25. This area has been proposed for coal exploration work under G3 stage in F.S. 2026-27 towards the southern flank of River Ganges. The main objective is to establish the northern continuity of Barakar coal seams in already explored G4 block of Khawaspur Area, North-West of Shrimatpur Area & North of Shivanarayanpur Area beneath the cover of thick Gangetic Alluvium.

3.1.0 LOCATION AND ACCESSIBILITY

Pirpainti is a town and notified area located in the **Bhagalpur district** of Bihar, India. It is situated in the eastern part of the district, along the southern bank of the Ganges River, and lies at an average elevation of 25-45 metres above sea level. As part of the Amrit Bharat Station Scheme, it has undergone major upgrades, including improved station buildings and amenities, and is accessible via NH-33. The area can be accessed from Howrah railway station and Malda station through the Eastern Railway. A new broad-gauge line project (Pirpainti-Jasidih) is currently under development to further improve connectivity between Bihar and Jharkhand, planned for completion by March 2028. Pirpainti is located along National Highway 33 (NH-33), allowing for easy road access to the rail station.

4.1.0 PHYSIOGRAPHY, DRAINAGE AND CLIMATE

The part of Bhagalpur district towards the south of the river Ganga falls in the Badua- Koa Sub-Basin (Plate 2) and the area to the north of the Ganga falls in the Baghmata - Kosi sub-basin. These two sub-basins are part of the Mid-Ganga basin in Bihar. The district is principally drained by the river Ganga, which enters the district at Sultanganj. The northern boundary of the district is marked by the river Kosi

(Ghugri) known to be heavily laden with silt and sand. The river Ganga has two 8 major tributaries joining from south; Badua and Koa. Apart from these, a number of ephemeral streams such as Gahra, Chanan, Kadwa, Gerua and Bhena from the Chotnagpur plateau join the mighty Ganga. Paddy, maize and lentils are the important crops of the district. A large groundwater resource in the district has remained untapped. The summer period begins from March with the peak temperature of 40 – 45°C in May. The months of March and April are the driest months of the year with the relative humidity of 50 – 55 % in the morning and 35 – 40 % in the afternoon. The humidity increases in May and June to 80 % or more. About 80 % of the rainfall is under the influence of the southwest monsoon, which normally breaks in the second fortnight of June.

5.1.0 PREVIOUS WORK

In FS 2021-22, one-year G4 coal item has been carried out in Shivnarayanpur Area where four regional coal seam zones (A to D) have been established in ascending order only in borehole RBSA-5. Seam Zone B has been intersected in most of the boreholes in the studied area within a depth range from 80.40m (RBSA-1) to 333.25m (RBSA-5). The thickness of Seam Zone B varies from 32.00m (RBSA-6) to 88.85m (RBSA-5) while the thickness of individual coal seams/sections varies from 0.50m to 5.00m. The grade of the coal seams ranges in between G6-G16 with moisture and ash content ranging from 4.40% to 11% and 14.50% to 56.80% respectively. Coal petrographic study reveals that rank-wise most of the coal are categorised under Type A-Lignite to Type B-Lignite. Coal petrographic study reveals that most of the coal is categorized under Type A-Lignite to Type B-Lignite type. However, the rank may be suppressed i.e. lower than its true value, due to liptinite remobilisation. Moreover, from the overall analysis with GCV value, the coal samples are showing 2551 Kcal/Kg to 5549 Kcal/Kg and it lies between the non-coking grade of coal classification. A total reconnaissance coal resource of Shivnarayanpur Area for thick seams, estimated within the depth range of 0-600m is 380.86 million tonnes. Out of this 380.86 million tonnes coal resource, 328.28 million tonnes has been assessed within 0-300 m depth and 52.58 million tonnes has been assessed within 300-600 m depth. In addition to that, a reconnaissance coal resource of 67.38 million tonnes has been estimated for thin seams within 0-600m depth. The total assessed coal resource of Shivnarayanpur Area under the reconnaissance category is 428.24 million tonnes.

In FS 2022-23, one-year G4 coal item has been carried out in Shrimatpur area, where three boreholes have been executed. First borehole RBSP-1 of Shrimatpur Area closed at a depth of 799.00m after intersecting of four coal seam zones. The thickness of the individual seam zone varies from 9.35m (Zone-D, RBSP-1) to 40.50m (Zone-A, RBSP-1) within the depth range of 228.75m to 769.95m with thickest coal seam section of 24.80m at a roof depth of 711.20m in RBSP-1. Second borehole RBSP-2 of Shrimatpur Area closed at a depth of 736.00m after intersecting all coal seam zones (Viz. A, B, C & D). Total cumulative coal thickness of 79.05m has been intersected in this borehole. The thickness of individual coal seam zones varies from 12.50m (Zone-D, RBSP-2) to 36.05m (Zone-A, RBSP-2) within the depth range of 228.75m to 718.85m with the thickest coal seam section of 18.70m at a roof depth of 655.70m in RBSP-2. Third borehole RBSP-3 closed at a depth of 722.00m after intersecting three coal seam zones (Viz. B, C & D). A total cumulative coal thickness of 52.05m has been intersected in this borehole within the depth range of 323.10m to 722.00m with the thickest coal seam section of 7.70m at a roof depth of 484.30m in RBSP-3.

In FS 2024-25, the regional exploration for coal in the Khawaspur Area (Report under progress)

was taken under the G4 stage during F.S. 2024-25. After a detailed study, critical correlation of adjacent borehole data, and interpretation of underground structural data of earlier explored coal exploration blocks, 2 numbers of boreholes have been drilled within a 30 sq km area. Cumulative coal thicknesses for borehole numbers RBKA-1 & 2 are 47.43m & 83.07m respectively. The drilling meterage of 1295m with a cumulative coal thickness of 130.50m in two completed boreholes (RBKA-1 and 2) in the Khawaspur area. Sub-surface drilling data reveal the presence of four major coal seam zones, namely coal seam zones A, B, C & D. First borehole RBKA-1 of Khawaspur Area closed at a depth of 550.00m after intersecting of four coal seam zones. Thickness of the individual seam zone varies from 105.6m (Zone-D, RBKA-1) to 18.1m (Zone-B, RBKA-1) within the depth range of 154.9m to 532.95m with the thickest coal seam section of 6.70m (Zone-A, RBKA-1) at a roof depth of 474m. Second borehole RBKA-2 of Khawaspur Area closed at a depth of 745.00m after intersecting all coal seam zones (Viz. A, B, C & D). Thickness of individual coal seam zone varies from 169.45m (Zone-D, RBKA-2) to 20m (Zone-B, RBKA-2) within the depth range of 283.20m to 700.80m with thickest coal seam section of 10.55m at a roof depth of 780.80m in RBKA-2.

Shale and carbonaceous shale are potential sources of rare earth elements (REEs), especially heavy REEs (HREEs). Based on findings from both Indian and international coalfields, the CGPB Committee V decided that coal and associated shale samples from each exploration block will be tested for REEs, trace elements, and heavy metals. In the Hura coalfield, significant REE concentrations have been reported in various rock types across different blocks. Notable values include 915 ppm in carbonaceous shale and 730 ppm in claystone in Shivnarayanpur, 1673 ppm in grey siltstone in Lakshmipur North, and over 999 ppm in different lithologies in Hatmarwa. As part of the 2024–25 field season, 20 samples from coal seams will be analysed for REEs, Ge, and Li. A geological map at a 1:50,000 scale is also available for the area.

6.1.0 GEOLOGY OF THE AREA

Hura Coalfield is the northernmost coalfield in the NNW-SSE trending Rajmahal Group of Coalfields, which includes Hura, Chupervita, Pachwara, Mahuagarhi, Brahmani, and Birbhum coalfields. These lie along the western fringe of the Rajmahal-Purnea Basin, much of which is buried under Rajmahal Traps, Tertiary sediments, and Gangetic alluvium, making its full structure unclear. The Barakar Formation, the main coal-bearing unit, appears in isolated patches along the western slope of the Rajmahal hills and rests against the Chhotanagpur Gneissic Complex along a major fault. Rock beds strike NNW-SSE and 3°-7° dip eastward, steepening near faults.

7.1.0 OBJECTIVES OF THE PROPOSED EXPLORATION PROGRAMME

1. To establish the continuity of the regional coal seam zones of Barakar Formation to the north of the already explored Shrimatpur Area and Shivnarayanpur Area and within Khawaspur Area in Northern extension of Hura Coalfield, Rajmahal Coalfields
2. To decipher the structure and disposition pattern of the coal seams.
3. Resource assessment of coal.

8.1.0 PROPOSED SCHEME OF EXPLORATION

The proposed G3 exploration programme comprises large scale geological mapping on a 1:10,000 scale, systematic drilling, borehole geophysical logging, sample processing, and laboratory studies. The depth continuity, grade and thickness of coal seam/zone will be checked by drilling in 4 vertical boreholes with borehole spacing between 800m to 1600m and depths ranging from 500m to 650m with a total meterage of 2200m.

Borehole logging, core sampling, and laboratory analyses will support interpretation and preliminary resource appraisal. Selected samples will also be analysed for REE & Trace elements.

9.1.0 QUANTUM OF WORK

Nature of Work		Total workload envisaged	a) Expected year of completion b) Circulation of final report	Work already completed	Work proposed for FS: 2026-2027
1.	Geological Survey LSM 1:10,000 (Sq. Km.)	23 sq. km.	a) January, 2027 b) June, 2027	New Item	23 sq. km.
2.	Technological				
	a) Subsurface exploration				
	i) Drilling (m)	2200m			2200m
	ii) Core Samples (m)	120m			120m
3.	Geophysical Survey	1100m			1100m
	a) GP: BHLOG				
4.	Petrographic studies				
	a) CPS	10 Nos.			10 Nos.
	b) PS	10 Nos.			10 Nos.
5.	REE Study and other trace elements including Ge, Li	40 Nos.			40 Nos.
6.	Resource Assessment	As necessary			As necessary

10.1.0 COST

Summary of the Cost estimates

Sl. No.	Item	Total Estimated Cost (Rs.)	Funding
1	Geology and Survey	0	By GSI
2	Drilling	1,75,45,000/-	NMEDT
3	Survey work	0-	By GSI
4	Laboratory studies	0	By GSI
5	Geologist at HQ	0	By GSI
	Sub Total (1to 4)	1,75,45,000/-	
6	Exploration Report Preparation	0	By GSI
7	Proposal Preparation	0	By GSI
8	Peer review charges	0	By GSI
9	Sub Total (1to8)	1,75,45,000/-	By GSI
10	GST18%	3,158,100/-	
	Total:	20,703,100/-	
	Say Rs. In Lakh	207.03/-	

Item of Work		Unit	SoC-Item -Sl No. NMEDT	Rates as per NMET SoC 2025	Estimated Cost		
					Qty.	Total Amount (Rs)	
D. Drilling - OUT SOURCED							
18.a	DRILLING	Drilling in/ Drilling in Soft rock/ Strata: HQ size borehole upto 400m Depth and NQ Size beyond 400m depth in case of NQ size drilling is done before 400m depth, the rate shall decrease by 20%	m	2.2.1.1c	5,500.00	0	₹ 0.00
18.b		Drilling in/ Drilling in Hard rock/ Strata: HQ size borehole upto 400m Depth and NQ Size beyond 400m depth in case of NQ size drilling is done before 400m depth, the rate shall decrease by 20%	m	2.2.1.1d	10,000.00	0	₹ 0.00
18.c		Drilling in/ Drilling in Very Hard rock/ Strata: HQ size borehole upto 400m Depth and NQ Size beyond 400m depth in case of NQ size drilling is done before 400m depth, the rate shall decrease by 20%	m	2.2.1.1e	12,650.00	0	₹ 0.00
18.d		Drilling for Lignite	m	2.2.1.1a	4,783.00	0	₹ 0.00
18.e		Drilling for Coal	m	2.2.1.1b	7,975.00	2200	₹ 17,545,000.00
18.a		Mechanised Auger Drilling for soft strata upto 30m depth	m	2.2.2.1	4,760.00	0	₹ 0.00
18.b		Hand Auger drilling in soft strata upto 30 m depth	m	2.2.2.2	3,808.00	0	₹ 0.00

18.c		RC Drilling	m	2.2.3		8,870.00	0	₹ 0.00
18.d		Non coring drilling	m	2.2.4		4,000.00	0	₹ 0.00
19	DRILLING RELATED EXPENDITURE HEADS	Borehole Deviation Survey by Multishot survey tool (interval 6m; azimuth and inclination to be recorded)	per shot	2.2.5		330.00	0	₹ 0.00
20		Land / Crop Compansation (in case the BH falls in agricultural Land)	per BH	5.6		30,000.00	0	₹ 0.00
21		Construction of concrete Pillar (12"x12"x30")	per borehole	2.2.7a		2,000.00	0	₹ 0.00
22		Borehole plugging with cement	per borehole	2.2.8		10,000.00	0	₹ 0.00
23		Miscellaneous Charges (Transportation of Drilling Rig, accommodation for Drilling Camp, Camp setting and winding, construction of approach road)	Lumpsum	0	2.2.9.4	For Drilling cost >2 Cr: 10 % of the Drilling Cost with a maximum ceiling of Rs.25 Lkh	0	₹ 0.00
24		Drill Core Preservation- One complete BH plus mineralised cores of all the BHs of the block/ prospect to be preserved in GI Core boxex and subsequently transported to the notified core repository.	per m	X		1,590.00		₹ 0.00
Total Cost D- outsourced								₹ 1,75,45,000.00
Total Cost of the project (Survey Work + Drilling Work)								₹ 1,75,45,000.00
GST @18%								₹ 31,58,100.00
NMEDT Funding requested								₹ 2,07,03,100.00
								~2.070 Cr

The work programme is proposed for FS 2026–27, with field, laboratory, reporting, and circulation milestones as summarised below.

The proposed exploration programme is planned in such a way that all the activities like drilling, logging, core sampling and associated geological work and laboratory work will be completed within 12 months. Report writing will take 4 months with 2 months overlapping with laboratory analysis. Thus, the total duration of the project for completion of the above exploration will be 15 months from the date of commencement of the project.

Nature of work/	Targe t	April to October, 26	Novemb er, 26	Decemb er, 26	Janua ry, 27	Febru ary, 27	Marc h, 27	Apr to June 27	July-Sept, 27
LSM	23 sq.km	6 sq.km	7 sq.km	10 sq.km		-	-		
Drilling (NMEDT funding)	2200m	Nil	600m	800m	800m				
Logging & Sample preparatio n	120m	Nil	20m	40m	40m	20m			
Chemical analyses & lab studies	120m + 60 nos.	Nil	Nil	1.Band by band analysis 2. Overall analyses					
Resource assessmen t & Report preparatio n		Nil							After receipt of overall analysis*

*Report Finalization Period: 6 months (February, 2027 to June, 2027) or 3 months after availability of chemical analysis reports of last borehole from Chemical lab, Hyderabad (Whichever is later)

**SCHEDULED TIME LINE FOR GONDWANA COAL IN BUDHUCHAK SECTOR, NORTHERN
EXTENSION OF HURA COALFIELD, RAJMAHAL COALFIELDS, BHAGALPUR DISTRICT,
BIHAR (G3 STAGE)**

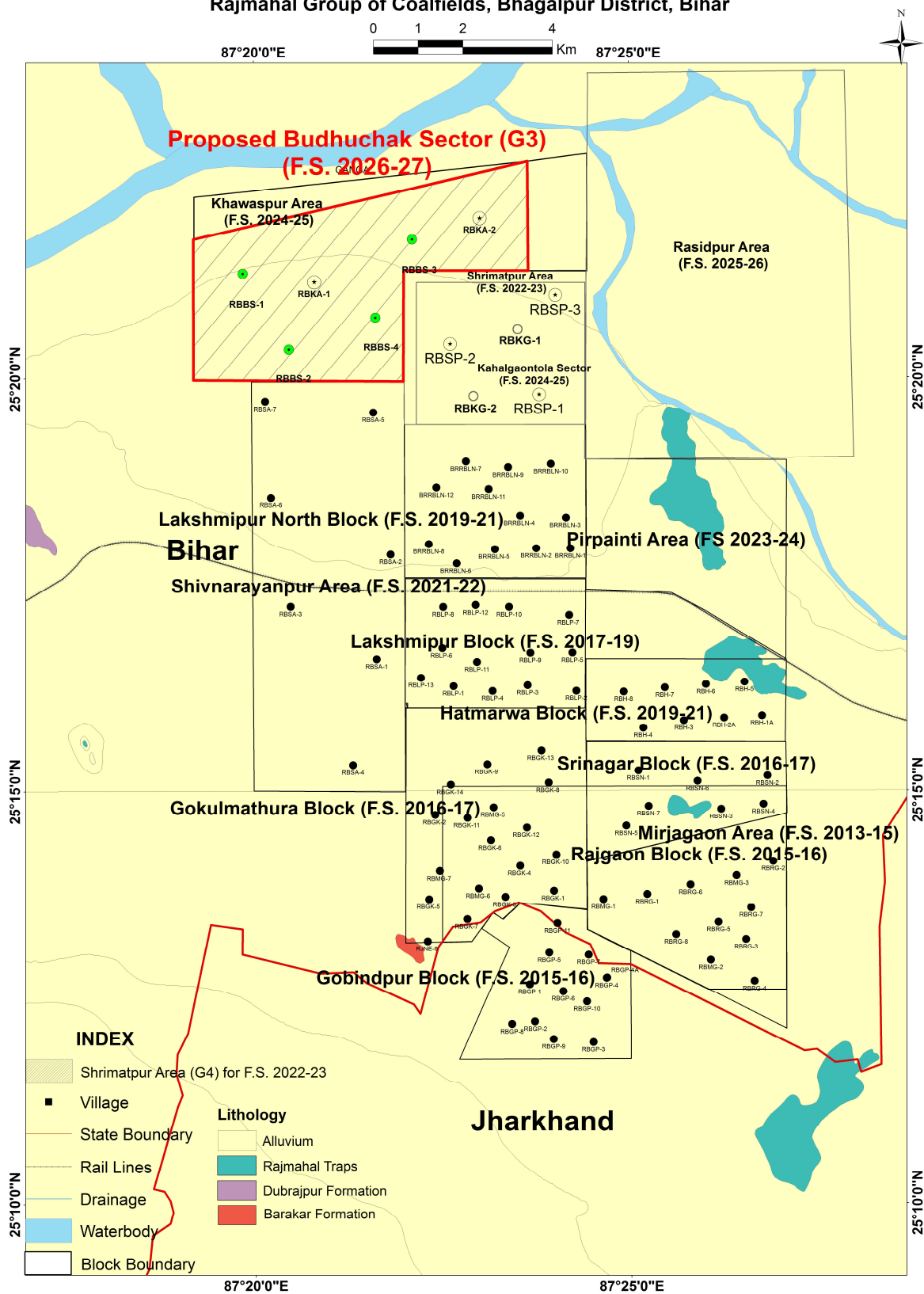
Sl. No.	Activities	Apr. 2026	May. 2026	Jun. 2026	Jul. 2026	Aug. 2026	Sep. 2026	Oct. 2026	Nov. 2026	Dec. 2026	Jan. 2027	Feb. 2027	Mar. 2027
		1	2	3	4	5	6	7	8	9	10	11	12
1	Large Scale Geological Mapping (23 sq km)												
2	Sub-surface Exploration: Core Drilling (2200 m)												
3	Core Logging & Sample Preparation (120m)												
4	Chemical Analyses and Lab Studies												

*Report Finalization Period: 6 Months (Feb., 2027 to Jun., 2027) or 3 months after availability of chemical analysis reports of last borehole from Chemical lab, Hyderabad (whichever is later)

*Time loss on account of monsoon / agricultural activity/ forest clearance/ local law & order problems will be addition to above time line.



Status Map showingf Proposed Budhuchak Sector (G3), Northern Extension of Hura Coalfield, Rajmahal Group of Coalfields, Bhagalpur District, Bihar



PROPOSED BOREHOLES FOR FS 2026-27

Fig. 1. Status map of Northern extension of Hura Coalfield

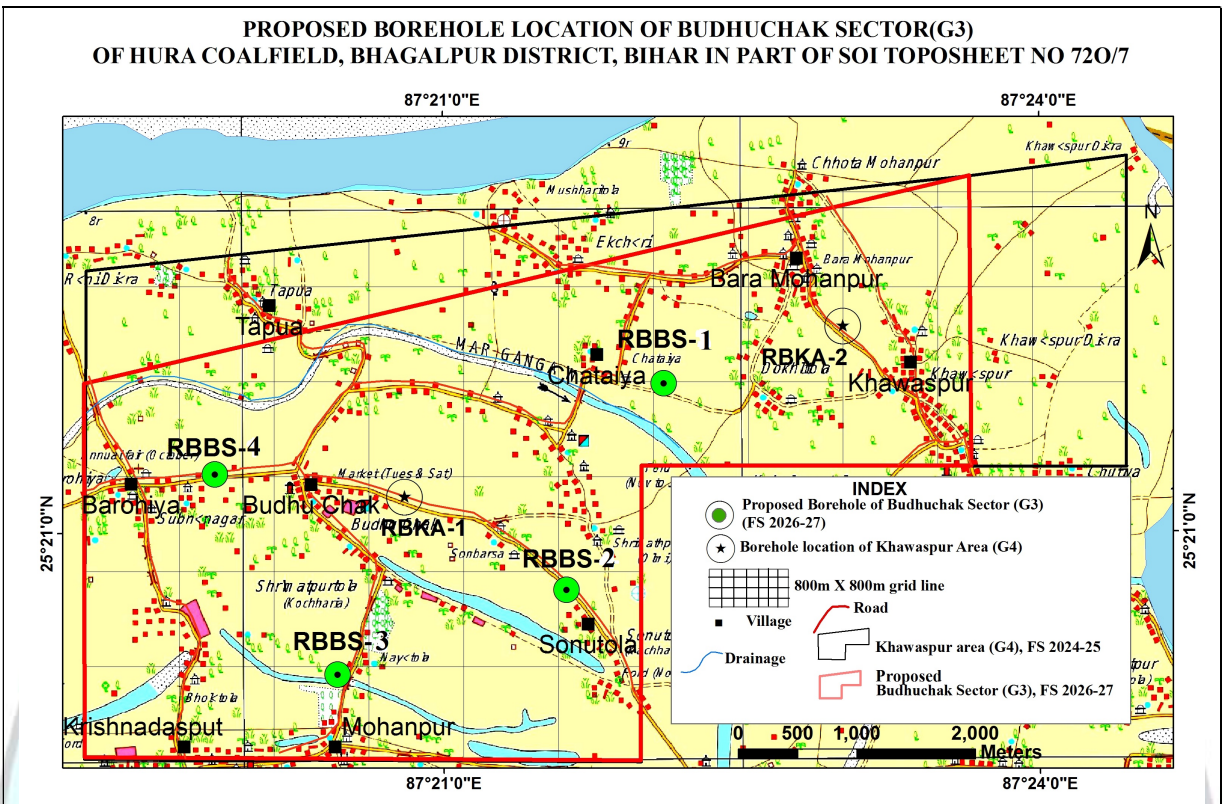


Fig. 2. Proposed location map of Budhuchak Sector (G3) for F.S. 2026-27

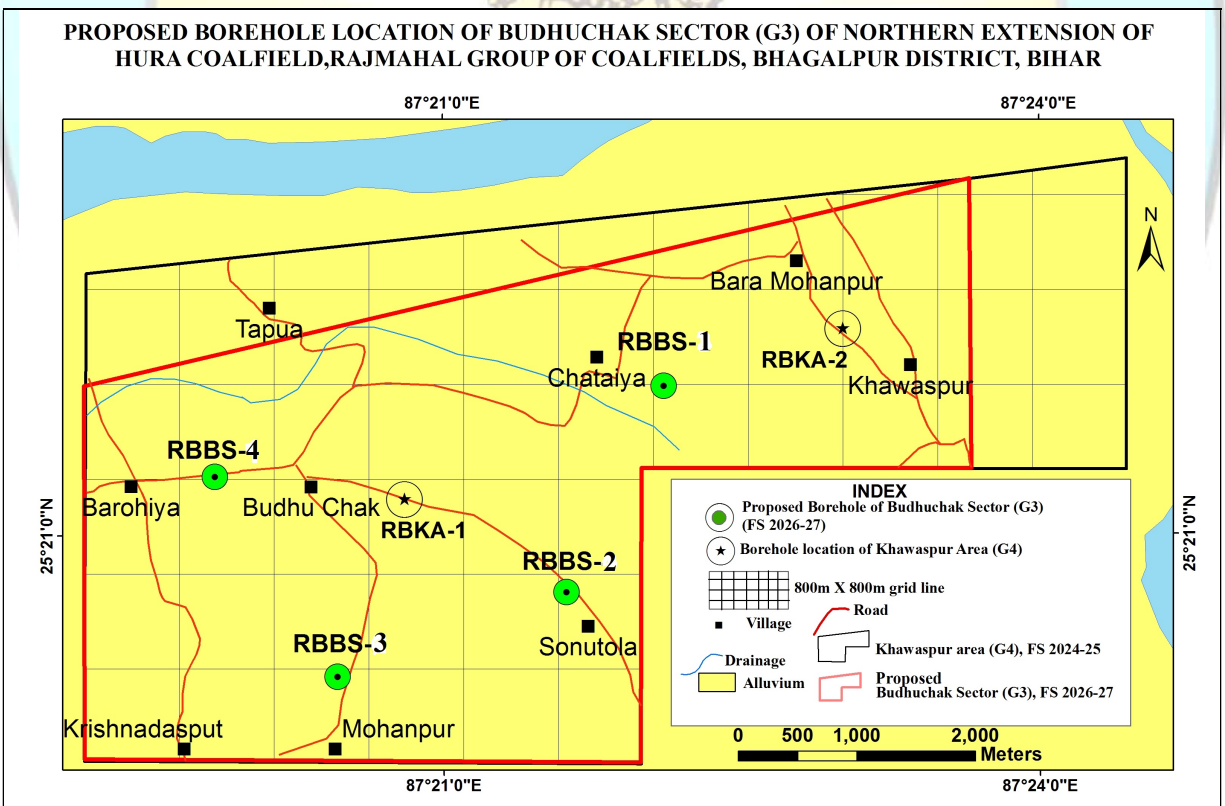


Fig. 3. Proposed block map along with borehole location of Budhuchak Sector (G3) for F.S. 2026-27

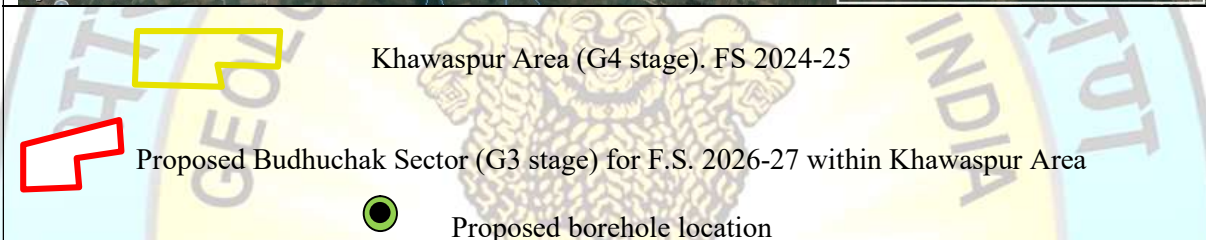
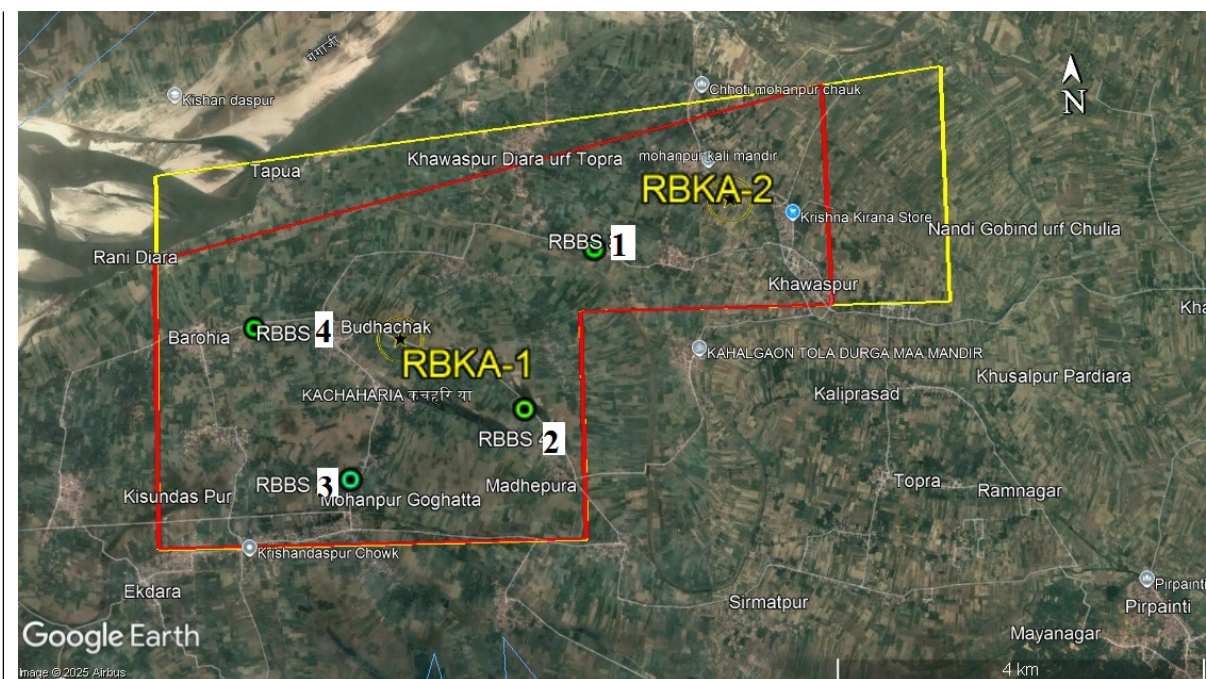


Fig. 4. Proposed block in Google Earth along with borehole location of Budhuchak Sector (G3) for F.S. 2026-27

Lithological Log of boreholes drilled in Khawaspur area, Hura Coalfield, Bhagalpur District, Bihar

Vertical Scale : 1cm = 10m

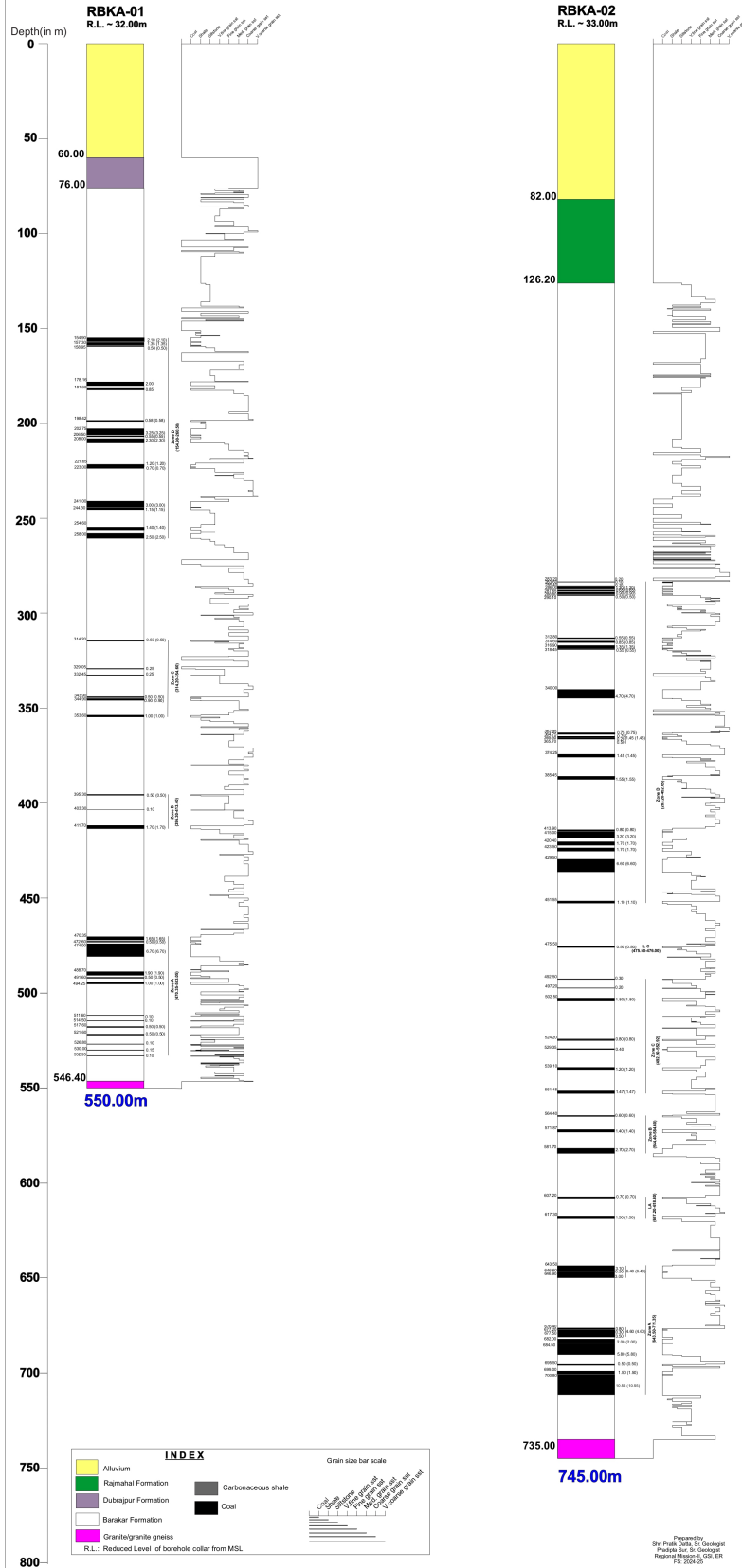


Fig.5 Graphical litholog of Khawaspur Area (G4), FS 2024-25

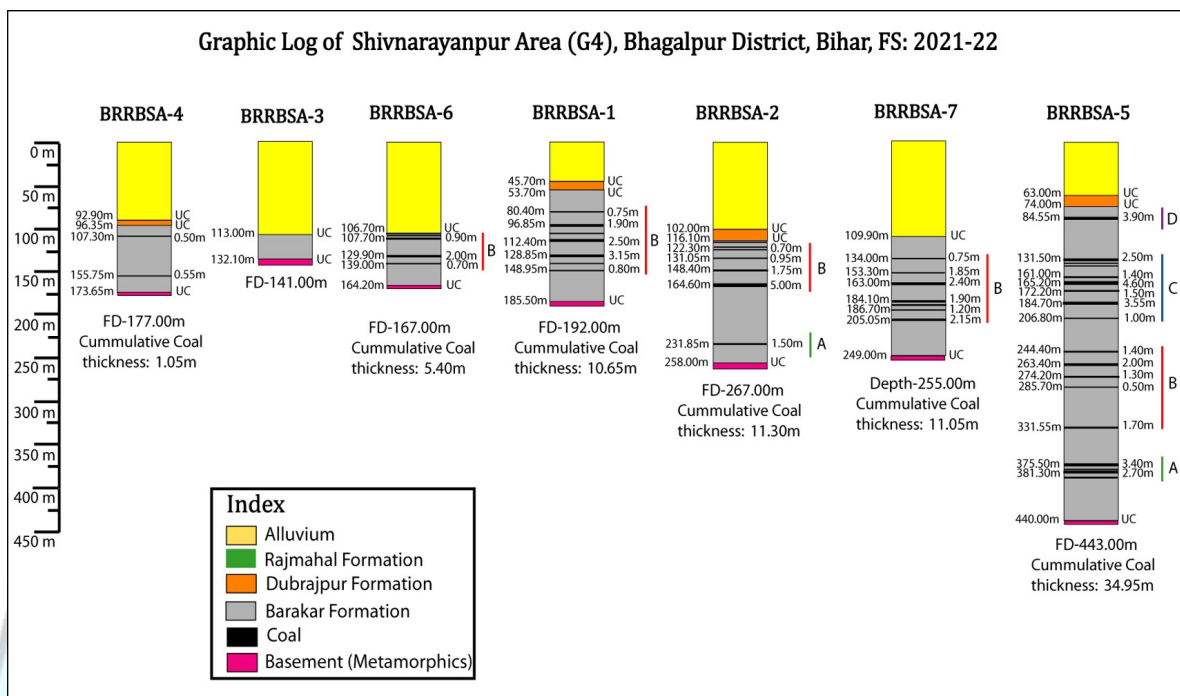


Fig. 6. Graphic Litholog of Shivnarayanpur Area (G4) of F.S. 2021-22

Graphic Log of Shrimatpur Area, Bhagalpur District, Bihar, FS: 2022-23

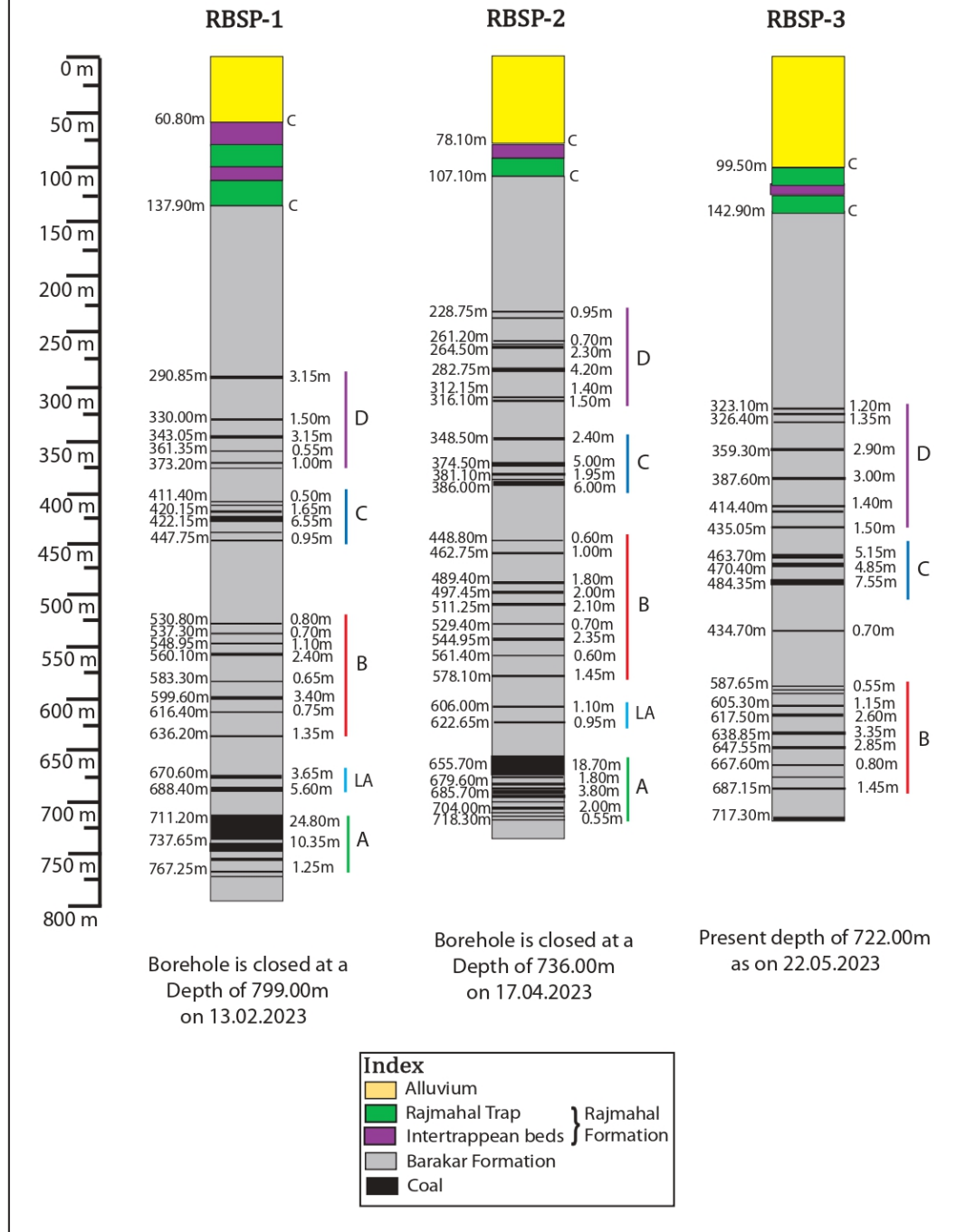


Fig. 7. Graphic Litholog of Shrimatpur Area (G4) of F.S. 2022-23
Proposed boreholes RBBS-1,2,3,4 of Budhuchak sector°

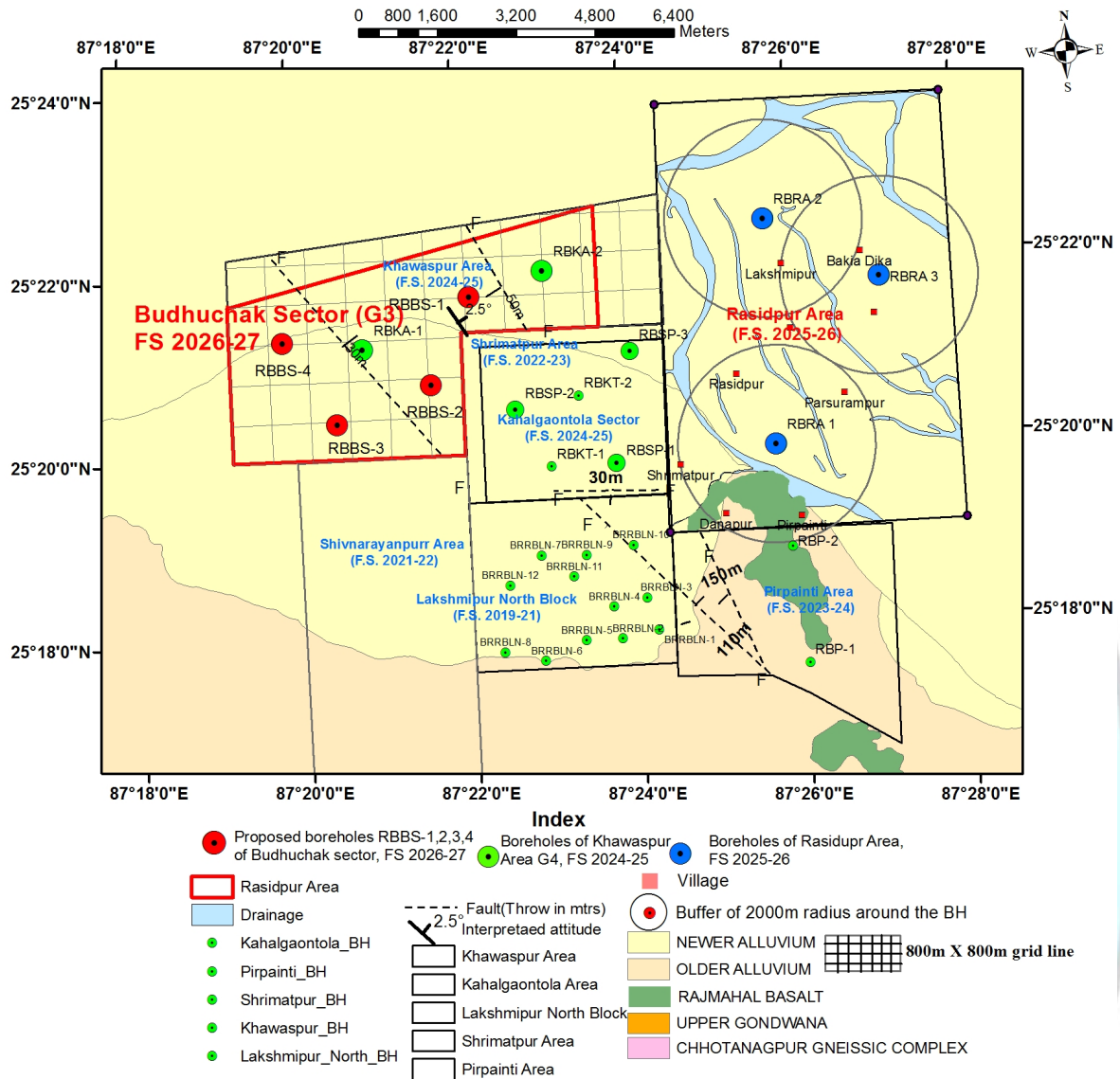


Fig. 8. Status map showing adjoining exploration blocks with borehole locations & faults of proposed Budhuchak Sector (G3) for F.S. 2026-27

Fig. 9. Geological cross section along RBSP-2 of completed borehole of Shrimatpur Area and RBBS-1 proposed borehole of Budhuchak Sector (G3) for F.S. 2026-27

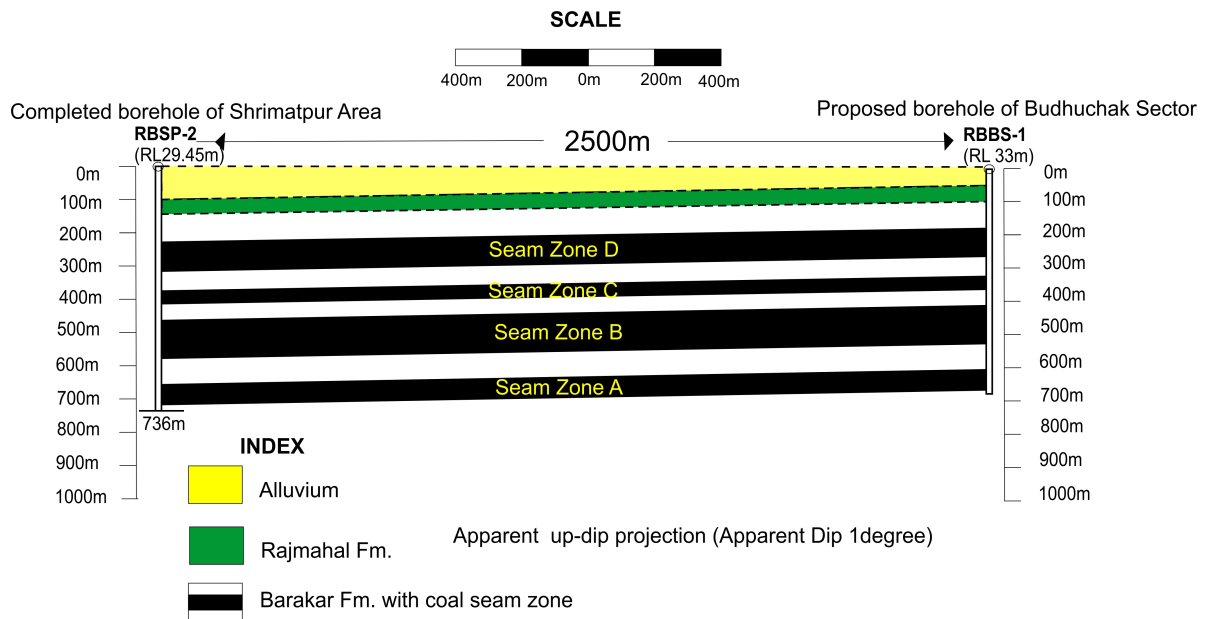


Fig. 10. Geological cross section along RBKA-2 of completed borehole of Khawaspur Area and RBBS-1 proposed borehole of Budhuchak Sector (G3) for F.S. 2026-27



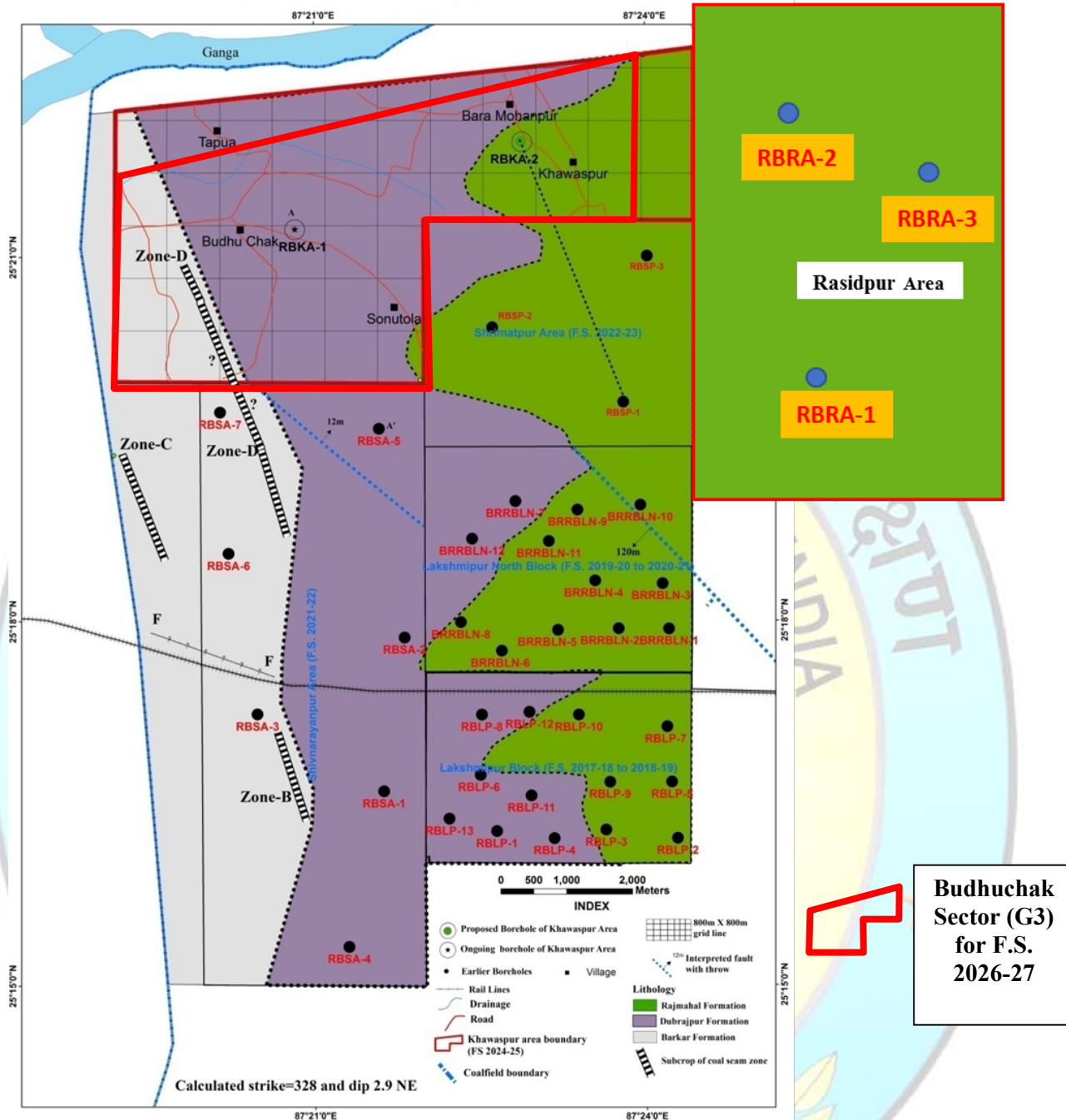


Fig. 11. Interpreted incrop map of neighboring area along with proposed Budhuchak Sector (G3) for F.S. 2026-27, Northern extension of Hura Coalfield