



BMRC GEOMINING SOLUTIONS PVT LTD

**PROPOSAL FOR RECONNAISSANCE SURVEY (G4 STAGE) FOR
TIN & NIOBIUM IN SHANKARPUR AREA, BALRAMPUR
DISTRICT, CHHATTISGARH UNDER NMEDT**

(Commodity – Sn & Nb)

Part of Toposheet – 64M/10

By

BMRC GEOMINING SOLUTIONS Pvt. Ltd.
Notified Private Exploration Agency by Ministry of Mines
Reference no. QCI/NABET/AEA/ACO/25/015

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PROPOSAL FOR RECONNAISSANCE SURVEY (G4 STAGE) FOR TIN & NIOBIUM IN SHANKARPUR AREA, BALRAMPUR DISTRICT, CHHATTISGARH UNDER NMEDT

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Proposal For Reconnaissance Survey (G4 Stage) For Tin & Niobium in Shankarpur Area, Balrampur District, Chhattisgarh Under NMEDT

GENERAL INFORMATION ABOUT THE BLOCK

Sr. No.	Features	Details
1	Block ID	Shankarpur Block
2	Current Exploration Agency	BMRC GEOMINING SOLUTIONS Pvt Ltd
3	Previous Exploration Agency	Geological Survey of India (GSI)
4	G4 stage Geological Report (Previous stage Geological Report)	Report On Reconnaissance Survey for Graphite in Jogni-Sonhara Area, Balrampur District, Chhattisgarh (Stage: G-4) – Year 2023-24
5	Commodity	Sn & Nb
6	Mineral Belt	Chotanagpur Gneissic Complex
7	Completion Period with entire time schedule to complete the project	10 Months
8	Objectives	The present exploration program (G4) has been formulated to fulfil the following objectives: • Geological mapping on 1:12,500 scale to delineate Sn & Nb mineralization and other lithological units in the area. • Delineation of the potential subsurface mineralized zones by Geophysical Surveys (Magnetic survey & SP Survey). • Trenching will be carried out to expose the anomalous bedrock zones. • Based on the outcome of the geological mapping and surface sampling, scout boreholes will be planned with vertical depth of 30 m • Detailed Geological report and Resource estimation in 334 class of UNFC classification.
9	Whether the work will be carried out by the proposed agency or through outsourcing and details of Components to be outsourced and name of the outsource agency	The work will be carried out by proposed agency.
10	Name/ Number of Geoscientists	Field Geologist: Two numbers HQ Geologist: One number
11	Expected Field days (Geology, Geophysics, Surveyor)	Item execution duration 10 Months and actual field days of field geologist 180 days for two Geologists and 60 days for HQ.

1. Location				
	Location	Point Id	Latitude	Longitude
		A	23.653935°	83.501384°
		B	23.652834°	83.607994°
		C	23.614821°	83.567455°
		D	23.615427°	83.501138°
	Villages	Shankarpur, Sonhara, Javrahi, Maheshpur		
	Tehsil/ Taluk	Balrampur		
	District	Balrampur		
	State	Chhattisgarh		
2. Area (hectares/ square Kilometres)				
	Block Area	37.7 sq. km.		
	Forest Area	Information Not available		
	Government Land Area	Information Not available		
	Private Land Area	Information Not available		
3. Accessibility				
	Nearest Rail Head	Ambikapur Railway Station		
	Road	NH-343		
	Airport	Swami Vivekananda Airport, Raipur, Chhattisgarh		
4. Hydrography				
	Local Surface Drainage Pattern (Channels)	Dendritic to sub-dendritic pattern		
	Rivers/ Streams	Sendur River, Berhi and their tributaries		
5. Climate				
	Mean Annual Rainfall	1270 mm		
	Temperatures	Minimum - 5°C Maximum - 46°C		
6 Topography				
	Toposheet Number	64M/10		
	Morphology of the Area	The study area is characterized mainly by rugged hilly topography and has moderate to dense forests and human settlements. The Maximum elevation is 760 m above Mean sea level (MSL) and minimum Elevation is 440 m. The area is characterized by undulating to moderately rugged terrain with low to moderate hills, ridges, and intervening valleys. The elevation varies gradually, forming a dissected plateau landscape. Drainage is mainly dendritic to sub-dendritic and controlled by local topography. The hill slopes are generally gentle to moderate, while valley portions are covered by soil and weathered material. The area is largely accessible through village roads and forest tracks		

7	Availability of baseline geoscience data	
	Geological Map (1:50K/ 25K)	Available (1:12500)
	Geochemical Map	Available
	Geophysical Map	Available
8	Justification for taking up G4stage mineral exploration	
	Justification	1. REGIONAL GEOLOGY SETTING The proposed area, falling under 64M10 is a part of Chhotanagpur Gneissic Complex. The Chhotanagpur Granite Gneissic Complex (CGGC) is an ENE–WSW trending high-grade metamorphic terrain of the eastern Central Indian Tectonic Zone (CITZ), covering ~80,000 km² across West Bengal, Jharkhand, Bihar, Odisha, Uttar Pradesh, Madhya Pradesh, and Chhattisgarh. It comprises mainly gneisses, migmatites, metasedimentary enclaves, metabasic, anorthositic, and granitic intrusions, recording multiple phases of deformation and metamorphism. The E–W to ENE–WSW structural trend is related to the Satpura Orogeny and reflects a complex polyphase tectonic history. 2. FIELD OBSERVATION Recently team of geologists of BMRC GSPL visited the area in search of Graphite and Tungsten based on GSI's work. The team has collected few samples during their Reconnoitry traverses in 6.47 sq.km. but the analytical values of 8 samples show the presence of tin in the in the rock exposed in the area are given below. Sn- 11.86-390.33 ppm Nb-13.6-220.98 ppm The analytical result shows the anomalous values of Tin and Niobium in Pegmatite and contact of Pegmatite and Calc Silicate/ Biotite Gneiss. Based on the above observation during the field traverses and analytical result shows the presence of proposed commodity in the host rock Pegmatite and contact of Pegmatite and Calc Silicate/ Biotite Gneiss. BMRC is optimistic the area is worth for G4 stage of investigation.

1. Block Summary

1.1. Physiography

The Shankarpur Block is characterized mainly by rugged hilly topography and has moderate to dense forests and human settlements. The Maximum elevation is 760 m above Mean sea level (MSL) and minimum Elevation is 440 m. The area is characterized by undulating to moderately rugged terrain with low to moderate hills, ridges, and intervening valleys. The elevation varies gradually, forming a dissected plateau landscape. The hill slopes are generally gentle to moderate, while valley portions are covered by soil and weathered material. The area is largely accessible through village roads and forest tracks. The area is mainly drained by the

Sendur River, Berhi and Joribahara. The drainage forms part of the Kanhar River sub basin of the Sone River master basin. Drainage is mainly dendritic to sub-dendritic and controlled by local topography.

1.2. Background Geology

1.2.1. Regional Geology

The study area (toposheet no. 64M/10) lies in Chhotanagpur Gneissic Complex (CGC). It is a slightly arcuate belt bordered by Singhbhum Mobile Belt in south, Gangetic Alluvium in north, Gondwana Group of rocks, Singhbhum granitoids, Vindhyan Supergroup and Mahakoshal Group of rocks in west and Rajmahal basalt in east (Fig: 5.1.2a). It extends over a vast land mass of more than 1,00,000 sq. km. area. Geologically, the CGC is an extension of the Satpura Range of Central India, referred from the continuation of the ENE-WSW strike of the CGC rocks.

The Ramanujganj–Balrampur sector is predominantly represented by metamorphosed pelitic and psammopelitic rocks interlayered with calc-silicate bands. These metasedimentary sequences are intruded by older biotite-bearing granitoids and younger pink granites. The rocks have undergone multiple phases of deformation, metamorphism and magmatic activity, resulting in complex folding, shearing and development of gneissic fabrics.

Structurally, the area exhibits predominantly ENE–WSW to E–W trends with local variations caused by folding and shearing. Numerous shear zones, granitoid intrusions and pegmatite bodies occur within the complex. The CGC has experienced several phases of magmatism, ranging from mafic-ultramafic intrusions to syn-tectonic and late-tectonic granitic intrusions, providing favourable conditions for pegmatite-hosted rare metal mineralization.

Regional stratigraphy of the area is given in **Error! Reference source not found.**

Table 1-1: Stratigraphy of toposheet no. 64M/10,

Era / Period	Group / Formation	Lithology
Cenozoic	Deccan Trap	Laterite, Basalt flows and related basic
Upper Cretaceous - Palaeocene	Lameta Group	Cherty limestone, Sandstone
Upper Cretaceous		
Unconformity (?)		
Permian - Upper Carboniferous	Upper Talchir Fm. (Marine?)	Greyish white sandstone; Fine to med. grained pinkish feldspathic sandstone; Green silty shale; Polymictic boulder conglomerate
Unconformity (?)		
Precambrian	Granitoids	Veins of pegmatite, syenite, aplite and quartz; Pink alkali granite, leucogranite.
Intrusive contact		
	Grey granite gneiss migmatite complex	Coarse to med grained Leucogranite; Grey & pink coarse grained augen gneiss; Med. to coarse grained grey biotite gneiss and migmatite
Gradational contact		
	Older Metamorphic	Calc-silicate rocks and calc marble, graphite schist, banded garnetiferous quartzite, mica schist, Quartz muscovite-feldspar-sillimanite schist, quartz-biotite plagioclase-garnet schist, Fine grained banded gneiss, quartzite, amphibolite

(PROPOSED BY B.K. MISHRA AND MANOJ KUMAR (REPORT ON RECONNAISSANCE SURVEY FOR GRAPHITE IN JOGNI-SONHARA AREA, BALRAMPUR DISTRICT, CHHATTISGARH (STAGE: G-4))

1.2.2. Geology of the area

The area forms the western part of CGC, older metasediments (part of BRS belt) are occurring as enclaves within variety of gneisses. Lava flows and basic intrusive are representing Deccan volcanism in the area

1.2.3. Description of the lithological units

Granite Gneiss/ Porphyritic Granite Gneiss

The gneisses of CGC are the dominant lithology of the study area covering most of the part. Younger granite has an intrusive relation with the porphyritic granite gneiss and granite gneiss in the area. The gneisses are migmatized at places. The gneisses show an E-W to ESE- WSW trend with high angle dip (65°-90°).

Schistose quartzite

The schistose quartzite is occurring as a long band of almost 5 km strike length and 1km width with an E-W trend. It is exposed NE, SE of Sonhara, north of Maheshpur. At places intercalated with quartz mica schist. It shows two set of foliation and steep dipping, vertical dip at places. The schistose quartzite is in the north of quartz mica schist and in the southern side granite gneiss was there. Fine-medium grained sandstone

Quartz Mica Schist

A hillock of quartz mica schist was observed in the area. It was highly foliated and weathered. It contains some biotite grains with muscovite layers.

Calc-Silicate:

The calc-silicate rocks are well exposed in the area. They are white greyish to greenish coloured and exposed as bands of length of 5m to 1km and width of 1m to 100m. Their trend varies from E-W to NNE- SSW and N-S, the latter trend is found in the central and southern part of the mapped area. They are structurally deformed and metamorphosed

Pegmatite

The last stage intrusions of the granitic magmatism are well visible through-out the area in the form of pegmatites. The pegmatites are cross cutting all the major lithologies. The pegmatites form linear ridges and isolated flat-topped hillocks. These pegmatites have a E-W to NW-SE trend almost parallel to the foliation. The pegmatites associated with the intrusion of large alkali feldspar crystals and development of large tourmaline crystals. The width of the pegmatite varies from 0.5m to even 12m. In the southern part of the study area, pegmatite veins of various trend (E-W, NE-SW, NW-SE) having width of 0.5cm to 1m. and length up to 30m was observed. These pegmatite veins intruded in to the gneisses and migmatites in the southern part.

Quartz veins of different generations are found in the area cutting across various lithologies. Small quartz veinlets intruded in to granite in the northern part and intruded in to graphite mica schist in the central part of the study area.

Granodiorite/Granite:

It is light grey to greyish white coloured rock which is found to be intruded into the older gneisses. It is a medium grained equigranular, hypidiomorphic texture. The single foliation developed is a crude one defined by the presence of biotite. Essentially the rock is composed

of quartz, plagioclase, and alkali feldspar, biotite. Granodiorite shows very feeble alignment of mineral grains almost negligible foliation. North part of the study area shows silicification and highly intrusion of quartz vein in the pink color granite. It looks like boxwork mineralization. It may be prone to get some economical prospect, it follows EW trend which is parallel to Tatapani shear zone.

Augen Gneiss:

Augen gneiss is leucocratic, medium to coarse grained rock. It is characterised by the presence of augen structure which are mainly composed of K- feldspar porphyroblasts. It consists of quartz, K-feldspar, plagioclase feldspar, muscovite and garnet. Augen gneiss is exposed through-out the area.

Biotite Gneiss(?):

Biotite gneiss is a medium- to high-grade metamorphic rock in which biotite mica is the dominant dark-colored mineral. It exhibits a characteristic gneissic banding formed by alternating light and dark mineral layers.

During field investigations, the location marked as graphite-bearing zones in the earlier GSI report (Report On Reconnaissance Survey for Graphite in Jogni-Sonhara Area, Balrampur District, Chhattisgarh (Stage: G-4) – Year 2023-24) were not observed by BMRC. The exposed rock is predominantly biotite gneiss, and no significant graphite mineralization was observed.

1.3. Mineral potentiality based on geology, geophysics, ground geochemistry etc.

The proposed block lies in Chhotnagpur Gneissic Complex and is predominantly occupied by Granite Gneiss/Porphyritic Granite Gneiss with localized occurrences of pegmatite bodies. Such felsic lithologies are considered favourable hosts for Sn-Nb mineralization, particularly where late-stage pegmatitic differentiation has occurred.

Available NGCM data indicate Sn and Nb values are low, without any pronounced regional anomaly.

Geophysical interpretation (NGPM): Integrated geophysical studies indicate that K/Th radiometric ratio anomalies, coinciding with low magnetic structures, delineate potential hydrothermal alteration zones favourable for tin–tungsten mineralization, whereas electromagnetic time-channel maps show only broad conductivity variations due to the non-conductive nature of the target minerals. The identified altered zones, particularly prospective for tin mineralization, are recommended for detailed geological mapping and close-interval

sampling in Phase-I, followed by targeted ground geophysical surveys in Phase-II based on geochemical results.

Previous exploration in the area was primarily focused on graphite mineralization and did not report any significant Sn-Nb mineralization.

During the present investigation, several pegmatite bodies were identified within the granitic terrain. Geochemical analysis of collected samples yielded Sn values ranging from 11.86 to 390.33 ppm and Nb values ranging from 13.60 to 220.98 ppm. The highest values are associated with pegmatitic lithologies.

In granitic systems, barren granites generally contain 3-5 ppm Sn, whereas evolved granites typically contain 10-30 ppm Sn. The Sn values obtained during the present study are significantly higher than these background ranges and indicate localized enrichment of tin. Similarly, the Nb values obtained are higher than the regional NGCM background and suggest enrichment associated with pegmatitic phases.

Although the available data are insufficient to delineate an economically significant mineralized zone, the occurrence of pegmatites within granite gneiss/porphyritic granite gneiss and the observed enrichment of Sn and Nb indicate favourable conditions for localized Sn-Nb mineralization. Therefore, detailed geological mapping, systematic channel sampling, and further geochemical investigation of pegmatite bodies are recommended to evaluate the extent and continuity of mineralization.

1.4. Objectives

The present exploration program (G4) has been formulated to fulfil the following objectives:

- Geological mapping on 1:12,500 scale to delineate Sn & Nb mineralization and other lithological units in the area.
- Delineation of the potential subsurface mineralized zones by Geophysical Surveys (Magnetic survey and SP survey).
- Trenching will be carried out to expose the anomalous bedrock zones.
- Based on the outcome of the geological mapping and surface sampling, scout boreholes will be planned with vertical depth of 30 m.
- Detailed Geological report and Resource estimation in 334 class of UNFC classification

2. Previous Work

GSI has submitted the geological report of G4 stage on Reconnaissance Survey for Graphite in Jogni-Sonhara Area, Balrampur District, Chhattisgarh (Stage: G-4) – Year 2023-24.

3. Block description

The proposed Shankarpur Block, encompassing an area of about 37.7 sq. km, falls within the Survey of India toposheet numbers 64M/10, in Balrampur district. The co-ordinates of the cardinal points of the area are given in **Table 3-1**

4.0 Lab	4.8 Geotechnical Laboratory	4.8.3 Bulk density - Dry / Saturated	Not Applicable	Per Sample	5	1	12500.00	ON	
4.0 Lab	4.5 Mineral Physics Studies	4.5.2 XRD analysis for identification of	4.5.2	Per Sample	10	1	40000.00	ON	
1.0 Geo	1.2 Other Geological Work/Activities	1.2.1b Sample processing work includi	Not Applicable	Not Applicable	60	1	471000.00	OFF	
5.0 Misc	5.8 Charges for engaging skilled, ser	Not Applicable	Not Applicable	As per rates p	240	1	129840	OFF	
Total Charges/Cost (₹)					3161.70	-	20668790.00		
Total Drilling Cost (Rule 2.2.9) (Rule 2 Applied)					For Drilling Component	-	1265000.00		
Tendering Process Cost					-	-	103970.00		
Technical supervision cost					906.00	-	519850.00		
Total					-	-	22557610.00		
Peer review charge(Fixed)					-	-	30000.00		
Preparation of Exploration Proposal					Rule 5.1	-	451152.00		
Geological Report Preparation					Rule 5.2 (iii)	-	750000.00		
Total Estimated Cost without GST (₹)					-	-	23788762.00		
Provision for GST (18% of I) (₹)					-	-	4281977.00		
Total Estimated Cost with GST (₹)					-	-	28070739.00		

Table 3-1 Cardinal points of proposed reconnaissance exploration (G4) in Shankarpur Block

Point Id	Latitude	Longitude
A	23.653935°	83.501384°
B	23.652834°	83.607994°
C	23.614821°	83.567455°
D	23.615427°	83.501138°

In accordance with the objectives set for reconnaissance exploration (G4 level of exploration) in Shankarpur Block, Balrampur of Chhattisgarh, geological mapping in 1:12500 scale, trenching, geophysical magnetic and SP survey, one phase exploratory drilling, chemical analysis of the samples (BRS, PT and core samples), petrological and mineralogical studies are proposed in the block. The exploration will be carried out as per Minerals (Evidence of Mineral contents) Rules, amended in 2021. Accordingly, the details of different activities to be carried out are presented in subsequent columns.

4. Planned Methodology

Exploration work will be carried out in two phases, first phase will consist of Detailed Geological Mapping, Systematic Sampling and Trenching. Based on the outcome of the first phase, drilling will be carried out in the block at first level.

a) First phase of exploration

4.1. Geological Mapping

Detailed geological mapping on 1:125000 scale in the area (37.7 Sq. Km) will be carried out by taking geological traverses. The contacts of different lithologies, structural features, etc. will be noted in detail. The detailed geological map on 1:12500 scale will be generated as an outcome.

4.2. Geophysical Survey

Geophysical surveys will be used primarily for delineation of concealed pegmatite bodies, lithological contacts, and structural features controlling mineralization. The geophysical results will be integrated with geological and geochemical data to identify potential Sn-Nb bearing zones and to optimize locations for detailed exploration.

Ground magnetic survey will be carried out to map subsurface geological structures, intrusive bodies, and possible extensions of pegmatite zones beneath soil and weathered cover. Self-Potential (SP) survey will be carried out over selected target areas to delineate subsurface

structural features, lithological contacts, fracture zones, and possible alteration zones that may have controlled the emplacement of pegmatite bodies. The SP data, when integrated with geological mapping and geochemical results, will assist in identifying favourable zones for detailed investigation.

4.3. Trenching

Volume of 200 m³ of trenching will be excavated at the zones showing anomalous Sn and Nb values.

b) Second phase of exploration

4.4. Core Drilling

4.4.1. Borehole Plan

Based on the Geology of the Area and after studying the anomalous zones Scout Drilling in which inclined borehole at 45° will be proposed (1st Level borehole). 1st Level borehole will be drilled in 200m spacing with 30m of vertical intersection. The meterage of core drilling for 1st level Borehole will be proposed based on the outcome from Trenching and Sample analysis.

4.4.2. Core Logging

The drill cores would be logged systematically viz. details of litho-units, colour, structural feature, texture, mineralization, besides the recovery, rock quality designation and type of ore deposit would be recorded.

4.4.3. Core Sampling

The drill core will be split into two equal halves, and one part would be preserved in the core box. The other half will be powdered to 70 micron (200 mesh size) and the same would be divided into four parts (250 g each) through coning and quartering. One part of the sample will be sent to chemical laboratory for proximate analysis, second part to be preserved in the camp as duplicate sample, third part to be sent for chemical analysis of minor and trace elements by ICPMS and the fourth part would keep as either check sample or sample to be used for any other specific purpose.

4.5. Petrographic and petrochemical Studies

Thin section studies of the outcrop samples and the core samples will be studied for detailed petrographic and mineralogical characteristics. These samples will be collected from ore zones and associated rocks. A provision of 10 nos. specimens for both petrographic and petrochemical studies will be kept for the proposed area.

4.6. Bulk Density Determination

In addition, Bulk density determination of 5 Nos samples will be carried out for the Proposed block.

5. Nature and Quantum of Work

Nature and Quantum of work proposed in Shankarpur Block (G4stage) is given below in Table 5-1.

Table 5-1 Nature and Quantum of work for Reconnaissance Exploration (G4 Stage) for Shankarpur area, Balrampur district, Chhattisgarh

Quantum of work for Reconnaissance Exploration (G4 Stage) for Shankarpur area, Balrampur district, Chhattisgarh	
Components	G4-stage
Geological Survey	1:12,500 scale for 37.7 sq km area.
	Identification of lithology, structure, surface mineralization, borehole core studies and old history of mining, if any.
Trenching	150 cu m
Geochemical Survey	Bedrock/ Channel samples:150nos Trench samples: 150 nos
Scout drilling	6 boreholes -500m
Petrographic and mineragraphic studies	(10PS+10PCS) representative samples from all bed rocks to carry out petrographic studies (PS) and petro-chemistry (PCS).
Core sample	300 borehole core samples Length 1m.
Analysis for Sn and Nb (ICPMS 14 elements) with 10% External Check	150BRS/Channel+150PT+300CS=600 + 60 External Check Total Sample=660
Major oxide (WD XRF) - (oxides+Traces - 24 elements) with 10% External Check	200+20=220
Synthesis of all available data	Integration of regional geophysical, geological, and geochemical data. Synthesis of all available data and Report writing

6. Time schedule

The proposed exploration program is scheduled over a strict 10-month timeline, incorporating structured review periods to monitor progress. Initial field preparation and surface investigations-including camp setup, detailed mapping, bed rock sampling, geophysical surveys, and trenching/pitting will be executed during the first 6 months, followed by a mid-term review. Systematic first-level drilling, core sampling, and initial chemical analysis will then take place from Month 6 to Month 10.

Consequently, the entire exploration project, from initial mobilization to final reporting, will be completed within a total duration of 10 months, as detailed in the project schedule in Table 6-1.

Table 6-1 Tentative Time schedule/action plan for Reconnaissance Exploration (G4 Stage) for Shankarpur area, Balrampur district, Chhattisgarh- 37.7 sq.km (Schedule timeline- 10 months Review: After 6 months)

Time Schedule: Reconnaissance Exploration (G4 Stage) for Tin, Niobium and associated mineral in Shankarpur area, Balrampur district, Chhattisgarh BH: 300 (5 Scout borehole)																
Total area:37.7 sq km, Period of Completion: 10 months, Review - After 4 months and 8Months																
S. No	Item of Work *	Unit *	Qty .	Sep-26	Oct-26	Nov-26	Dec-26	Review	Jan-27	Feb-27	Mar-27	Apr-27	Review	May-27	Jun-27	
i)	Geological mapping, (1:12,500 scale), Satellite imagery/Aerial photo interpretation, Trenching/pitting and sampling (BRS/PCS/Chip/Grab/Soil/SSS)	per Sq Km	37.7	15	15	7.7										
	a. Charges for Geologist per day (Field) for geological mapping with Sampling	day	100	25	25	10	5		10	15	10					
	b. Labours Charges	day	200	50	50	20	10		20	30	20					
	c. Charges for Geologist per day (HQ)	day	30							5	5	10			5	5

	a. Excavation of Trenches upto 2.0m depth	per cu.m	150		75	75									
	Drilling in / Drilling in Hard rock/ Strata: HQ size borehole upto 400m Depth and NQ Size beyond 400m depth in case NQ size drilling is done before 400m depth, the rate shall decrease by 20%	Per m	300						150	150					
	Construction of concrete Pillar (12"x12"x30")	Per borehole	5								5				
	Land Crop compensation	Per borehole	5				5								
	Drill Core Preservation	Per m	100								100				
	a. Demarcation of lease boundary, Fixation of borehole and determination of co-ordinates & Reduced Level (RL) of the boreholes by DGPS (including charges for labours deployed for the work) - use of CORS Network system for all DGPS is compulsory	Per point of observation	5								5				
1	Analysis of one rock/soil sample for quantitative analysis of 14 REE elements + 9 trace element (U, Ta, Ge, Be, Hf, Sn, As, Rb,Th) by ICP-MS (sequential technique) with 10 % External Check	Per Sample	165		10	10	20				125				
	Major oxide (WD XRF) - (oxides+Traces - 24 elements) with 10% external	Per samples	165		10	10	20				125				
i	Preparation of standard thin section of rock	Nos.	10			5				5					
ii	Complete petrographic /ore microscopic study/mineragraphic report of rock sample (along with 5 nos. digital photo micrographs)	Nos.	10			5				5					
	b. Bulk Density - Dry / Saturated	Per Sample	0												

	XRD study	per Sample	20						10				
	EPMA	Per Hours	10										
I	Sampler Charges	Days	45		3	3	5			34			
	Labour	Days	180		12	12	20			136			

7. Manpower deployment

Two geologists, one geophysicist, one surveyor with required labourers and two drilling rigs with drilling crew will be deployed as per the requirement of the time schedule chart.

8. Break-up of expenditure

Table 8-1 Cost Estimate Reconnaissance Exploration (G4 Stage) for Shankarpur area, Balrampur district, Chhattisgarh

Estimated cost for Reconnaissance Exploration (G4 Stage) for Shankarpur area, Balrampur district, Chhattisgarh							
Total area:37.7 sq km, Period of Completion: 10 months, Review - After 4 months and 8Months							
			Rates as per NMET SoC		Estimated Cost of the Proposal		
S. No.	Item of Work *	Unit *	SoC-Item No.*	Rates as per SoC *	Qty.	Total Amount (Rs)	Remarks
PHASE-I							
A	Geological Mapping and Other Geological Work						
i)	Geological mapping, (1:12,500 scale), Satellite imagery/Aerial photo interpretation, Trenching/pitting and sampling (BRS/PCS/Chip/Grab/Soil/SSS)	per Sq Km	1.1	₹ 18,300.00	37.7	689910	

	a. Charges for Geologist per day (Field) for geological mapping with Sampling	day	1.2.1a	14500	100	1450000	
	b. Labours Charges	day	5.8	556	200	111200	
	c. Charges for Geologist per day (HQ)	day	1.2.1a	10500	30	315000	
	d. Sampler Charges	Days	1.2.1b	7850	38	298300	
	e. Labour	Days	5.8	556	152	84512	
	a. Demarcation of lease boundary, Fixation of borehole and determination of co-ordinates & Reduced Level (RL) of the boreholes by DGPS (including charges for labours deployed for the work) - use of CORS Network system for all DGPS is compulsory	Per point of observation	1.3.2	24000	5	120000	6 Borehole
	Sub Total- A					3068922	
B	Trenching/Pitting						
	a. Excavation of Trenches upto 2.0m depth	per cu.m	2.1.1	4125	150	618750	
	Sub Total- B					618750	
C	1st Level Drilling						
	Drilling in / Drilling in Hard rock/ Strata: HQ size borehole upto 400m Depth and NQ Size beyond 400m depth in case NQ size drilling is done before 400m depth, the rate shall decrease by 20%	Per m	2.2.1.1d	10000	300	3000000	
	Construction of concrete Pillar (12"x12"x30")	Per borehole	2.2.7	2000	5	10000	

	Miscellaneous Charges (Transportation of Drilling Rig, Accommodation for Drill Camp, Camp setting and winding, construction of Approach Road a. For Drilling cost more than 50 lakhs and less than 1 Crores: 20% of the Drilling Cost with a maximum ceiling of ₹ 15 lakh.	Lumpsum	2.2.9			750000	
	Land Crop compensation	Per borehole	5.6	30000	5	150000	
	Drill Core Preservation	Per m	5.3	1590	100	159000	
	Borehole plugging by cement	Per borehole	2.2.8	10000	5	50000	
	Sub-Total- C					4119000	
D	LABORATORY STUDIES						
	Analysis of one rock/soil sample for quantitative analysis of 14 REE elements + 9 trace element (U, Ta, Ge, Be, Hf, Sn, As, Rb,Th) by ICP-MS (sequential technique) with 10 % External Check	Per Sample	4.1.15	7400	150	1110000	150 BRS/Channel sample+150PT+300CS=600+60 External Check
	Check samples (10%)	Per Sample	4.1.15	7400	15	111000	
	Major oxide (WD XRF) - (oxides+Traces - 24 elements) with 10% external	Per samples	4.1.17a	4200	150	630000	
	Check samples (10%)	Per samples	4.1.17a	4200	15	63000	
	Sub Total- D					1914000	
E	Physical & Petrological Studies						
i	Preparation of standard thin section of rock	Nos.	4.3.1	500	10	5000	
ii	Complete petrographic /ore microscopic study/mineragraphic report of rock sample (along with 5 nos. digital photo micrographs)	Nos.	4.3.4	2800	10	28000	
	Sub-total-E					33000	
F	Mineral Physics Study						

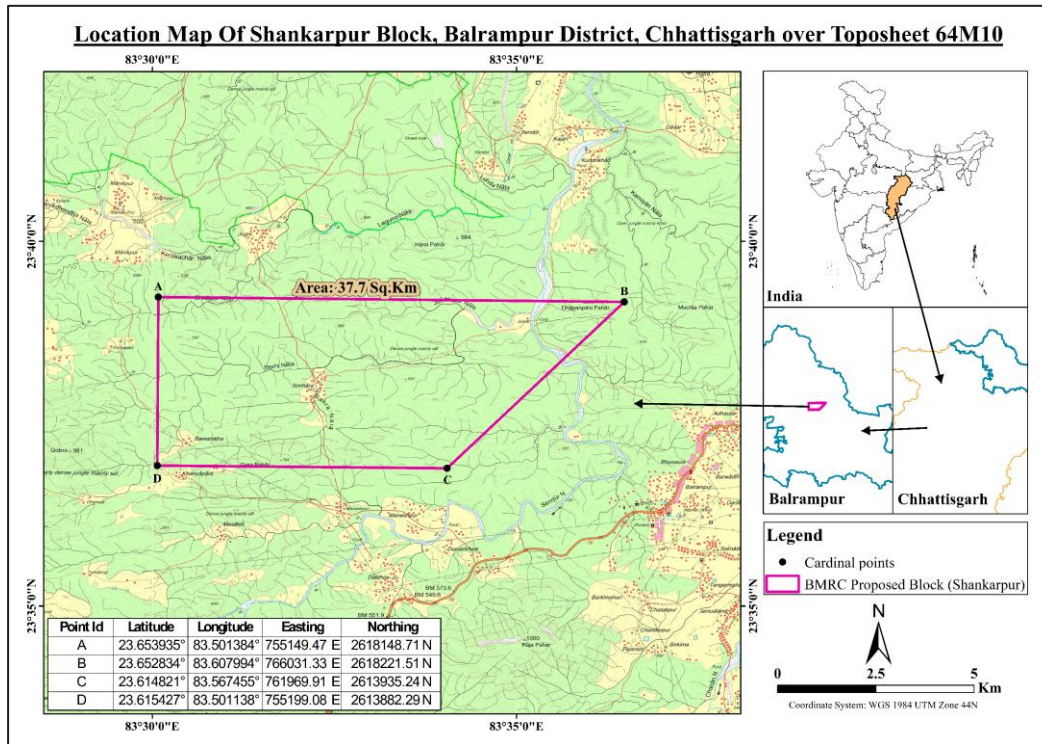
	XRD study	per Sample	4.5.2	4000	20	80000	
	EPMA	Per Hours	4.4.1	10500	10	105000	
	Subtotal -F					185000	
G	Total A to F					9938672	
H	Preparation of Exploration Proposal	soft copy	5.1			198773.44	2% of approved project cost or 5 lakh whichever is lower
I	Geological Report Preparation	soft copy	5.2			250000	
J	Peer Review					30000	
K	Total Estimated Cost without GST					10417445.44	
L	Provision for GST (18% of I)					1875140.179	
M	Total Estimated Cost with GST					12292585.62	
N	Total Estimated Cost with GST IN Lakhs					122.9258562	

9. References

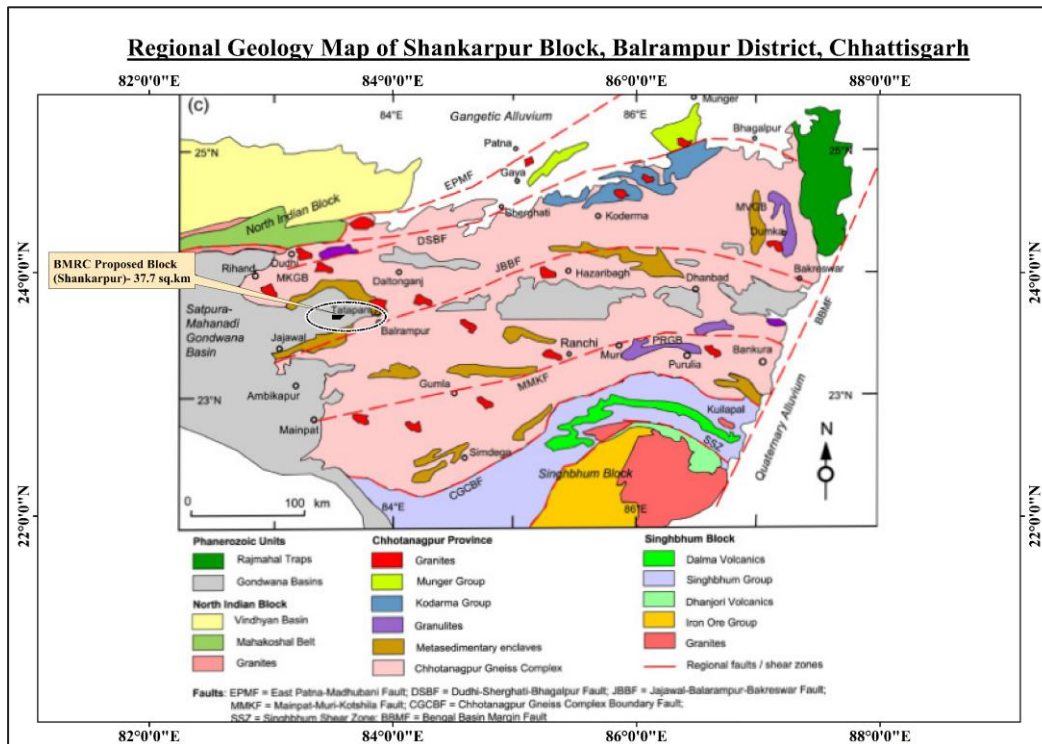
Report On Reconnaissance Survey for Graphite in Jogni-Sonhara Area, Balrampur District, Chhattisgarh (Stage: G-4) – Year 2023-24

PLATES

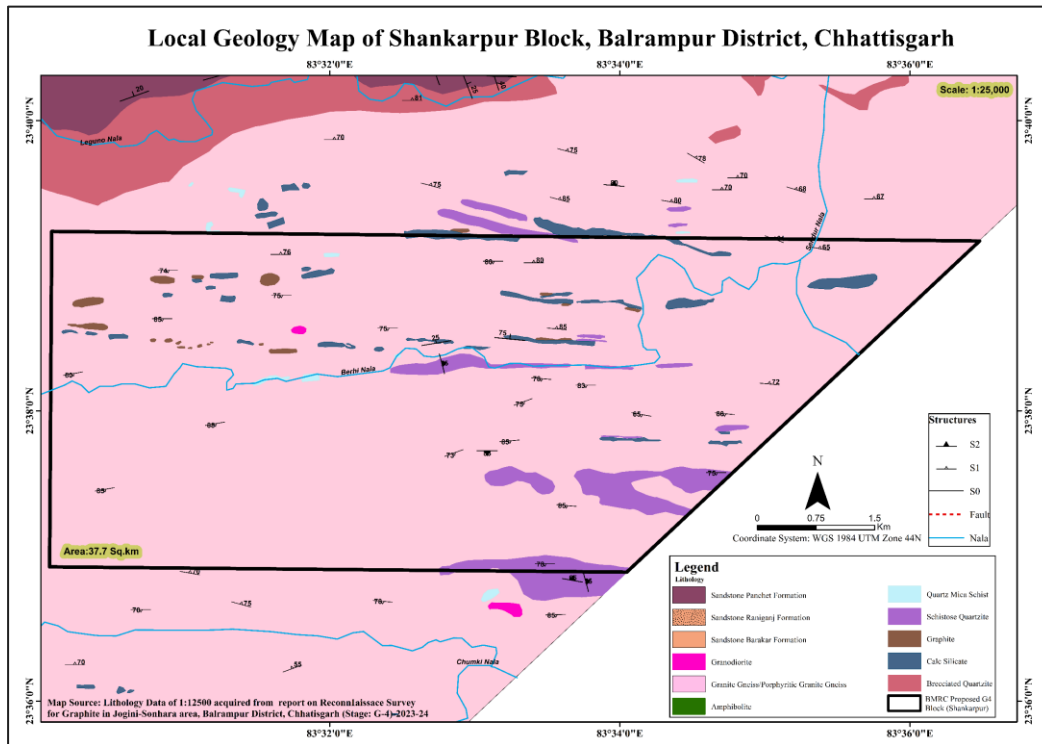
A. Location Map of the proposed block (Shankarpur Block G4- stage)



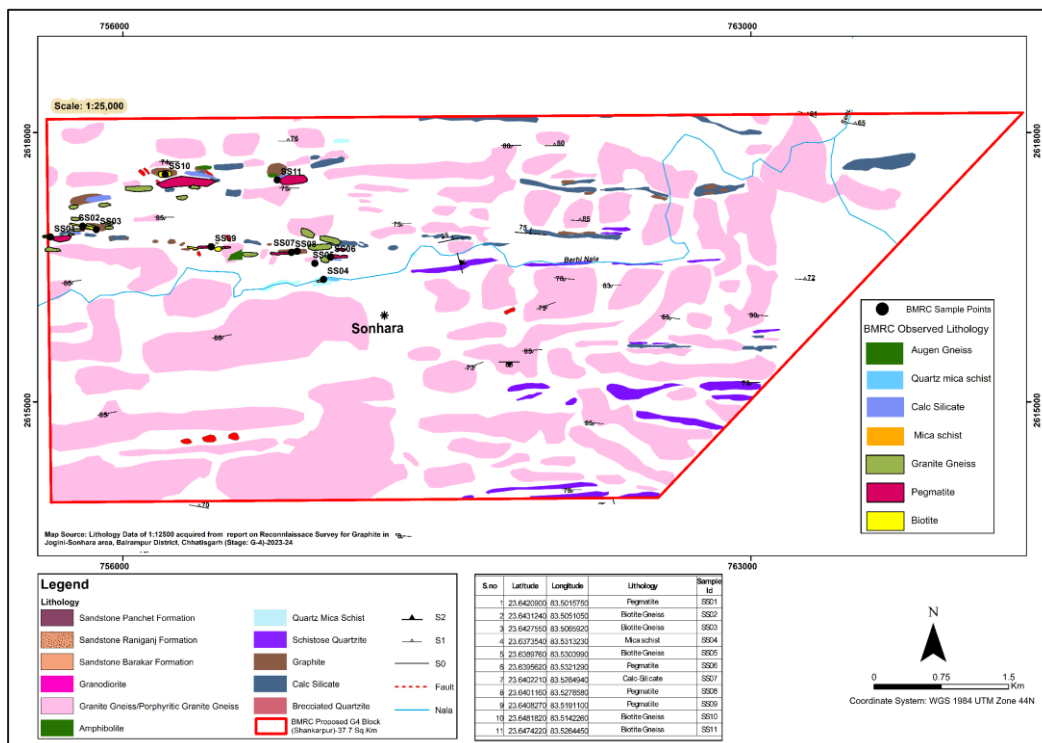
B. Regional Geology of the proposed Block



C. Local Geology of the proposed block at 12500 scale.

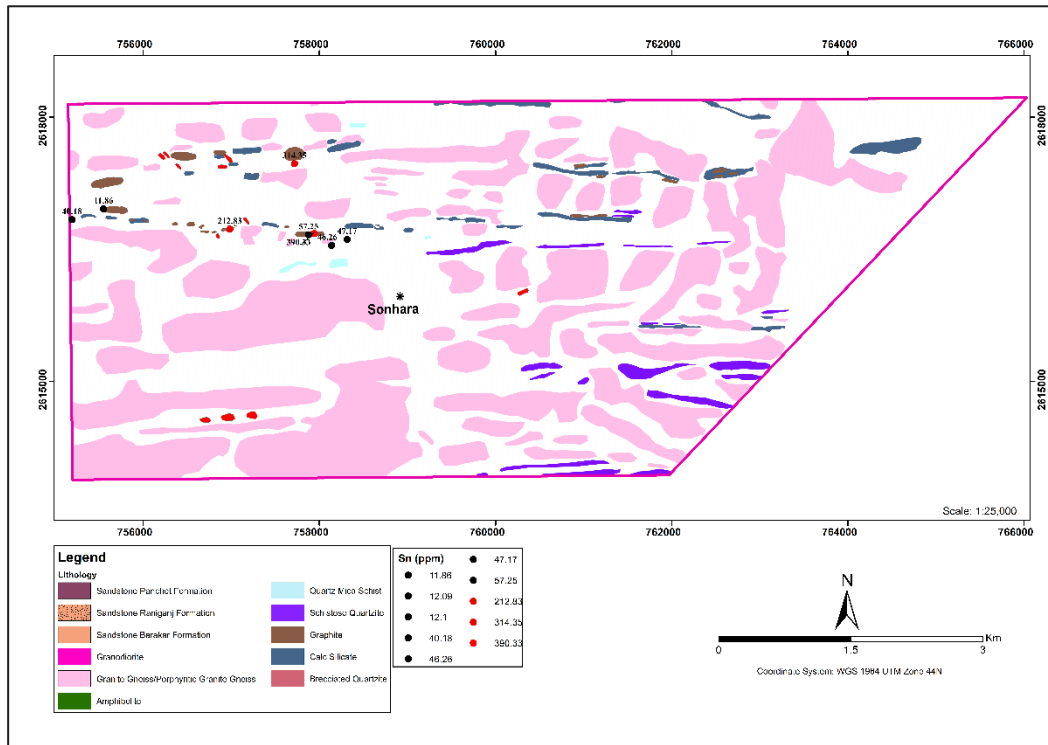


D. Observed Lithology by BMRC on the Outcrop Map by GSI (2023-234) on 12500 Scale

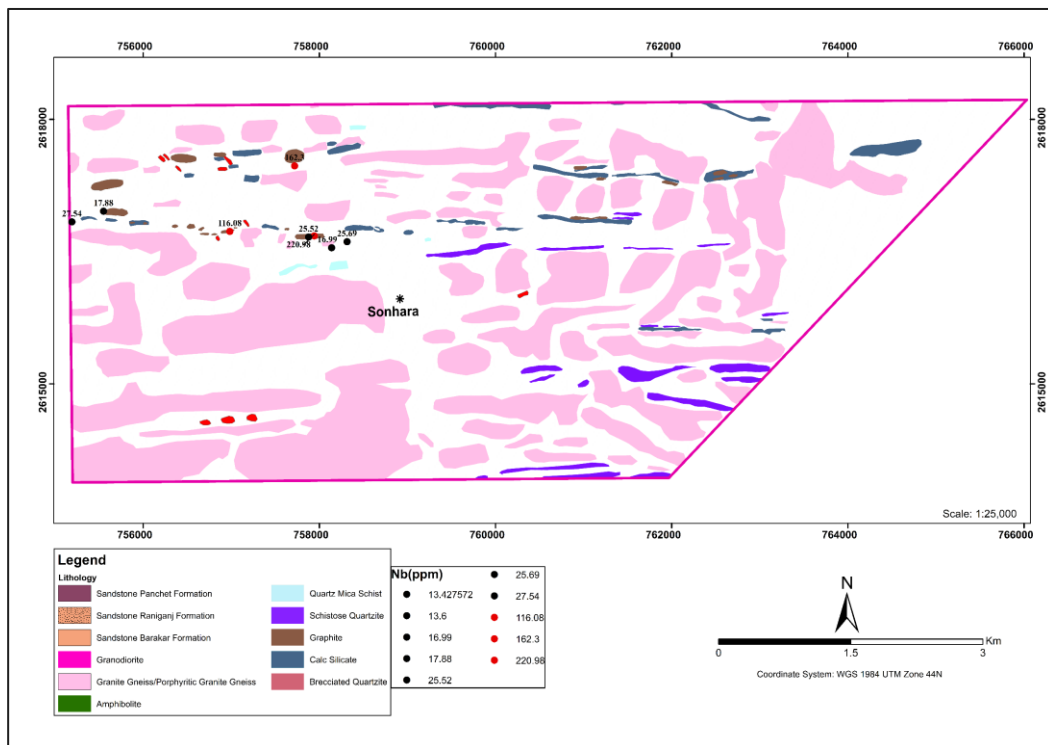


E. Values of Sn and Nb as per BMRC on Outcrop map by GSI (2023-24)

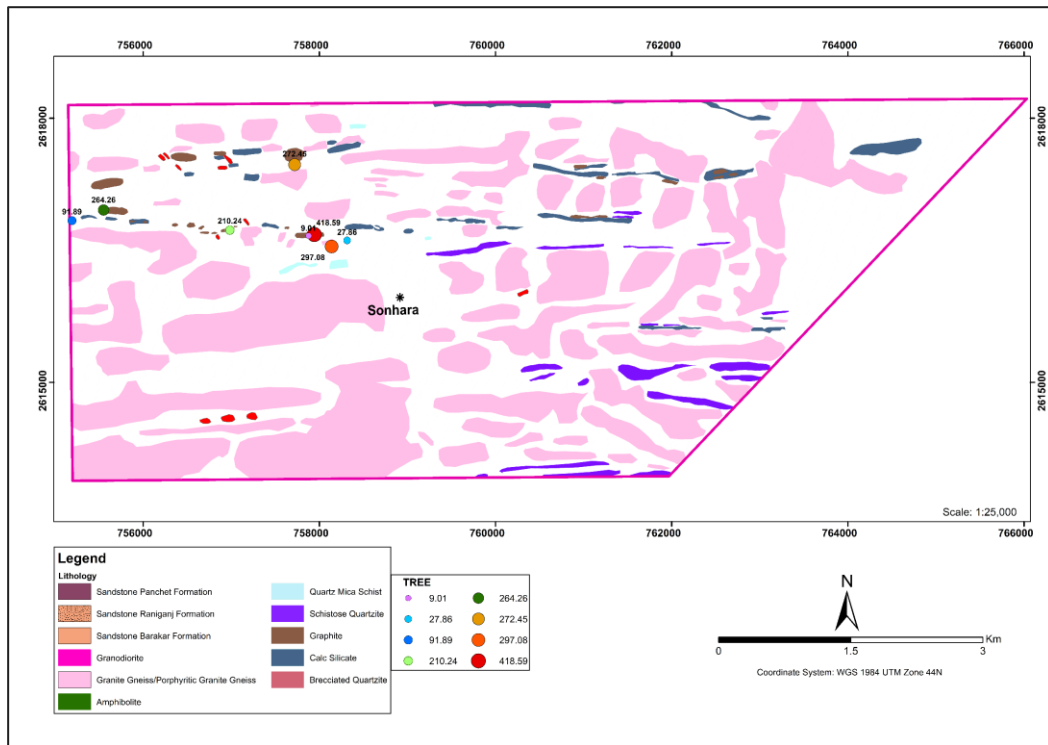
Map showing value of Sn(ppm)



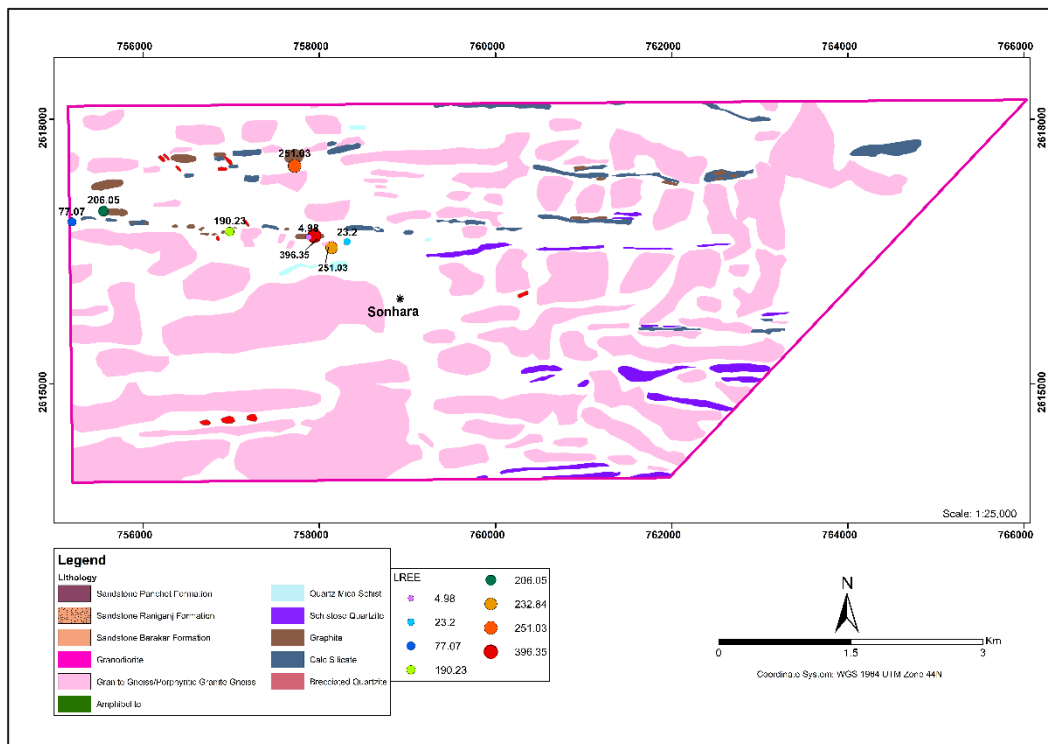
Map showing value of Nb (ppm)



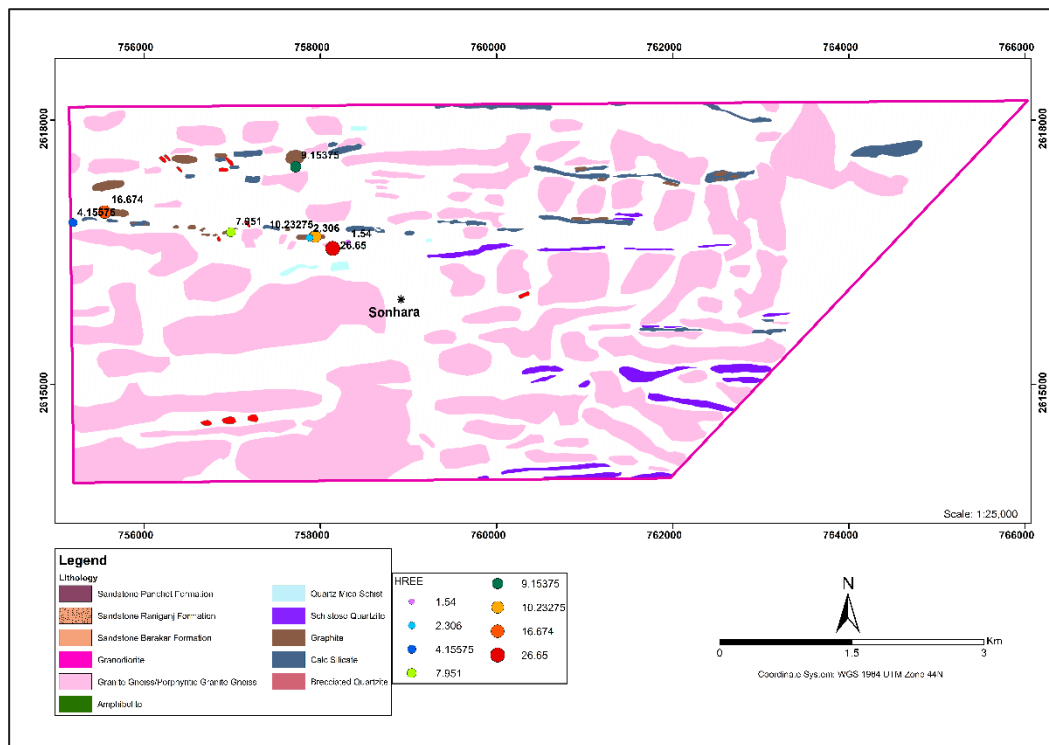
F. TREE Map based on values as per BMRC



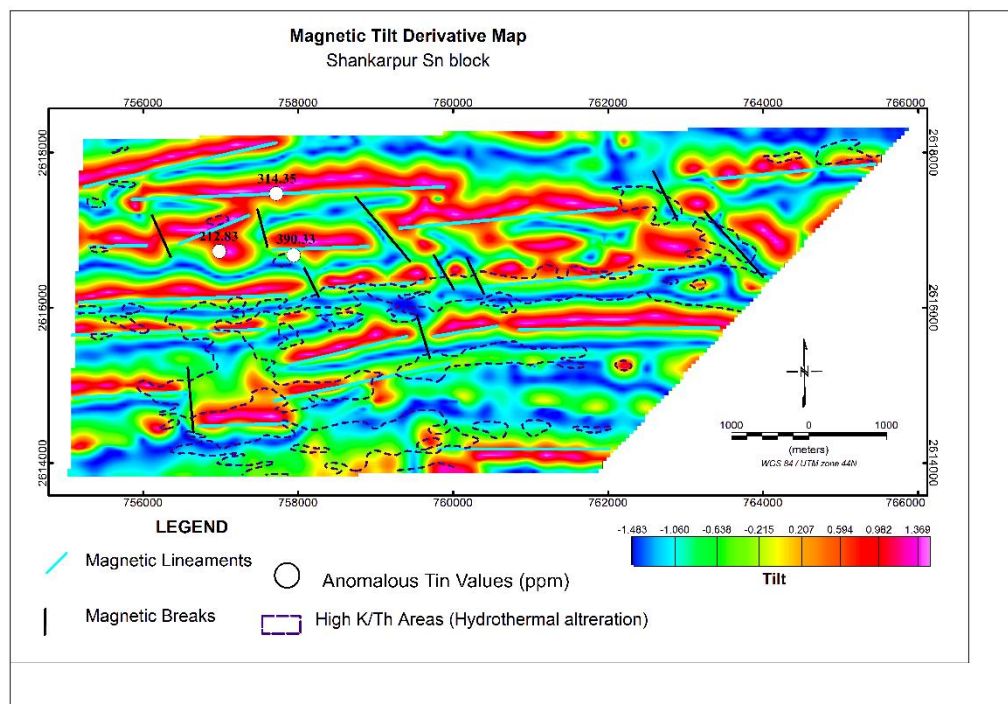
G. LREE Map based on values as per BMRC



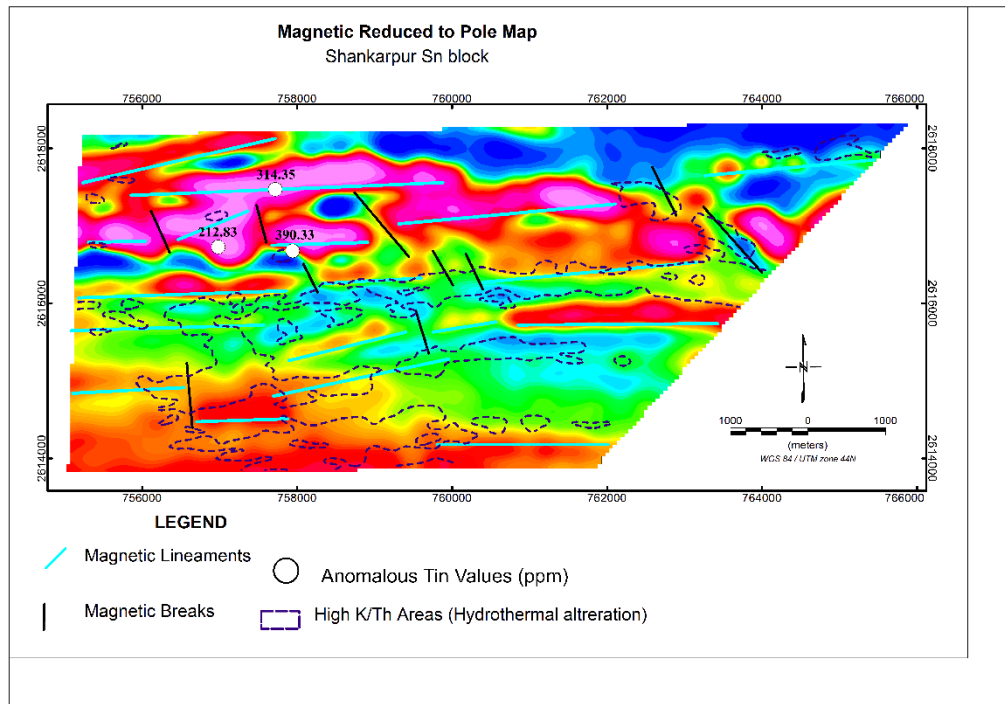
H. HREE Map based on values as per BMRC



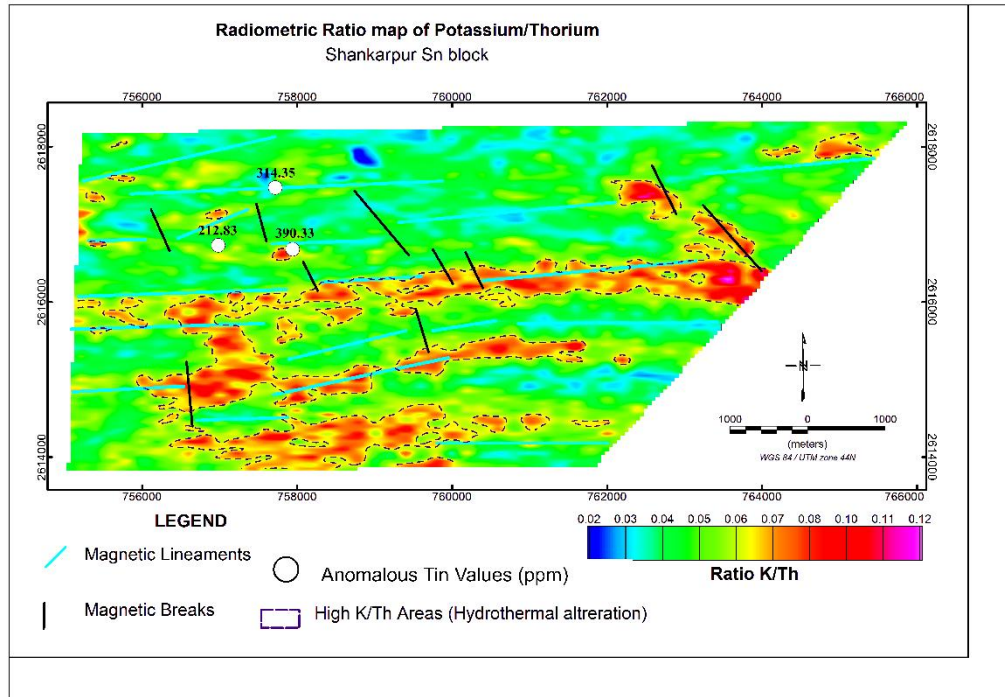
I. Magnetic Tilt Derivative Map



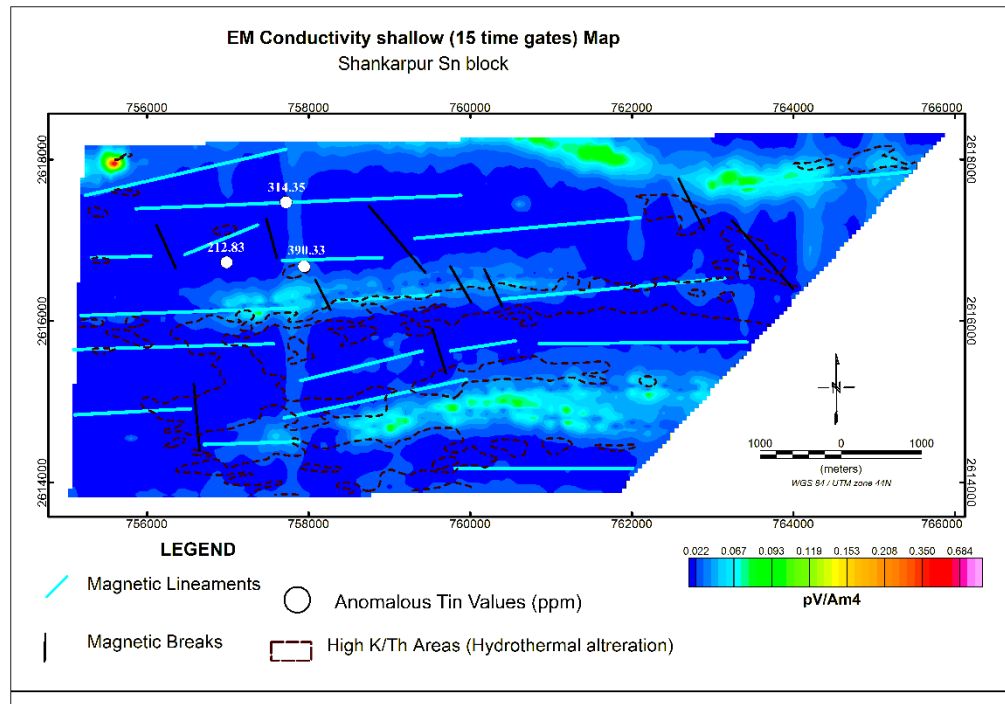
J. Reduced To Pole Map



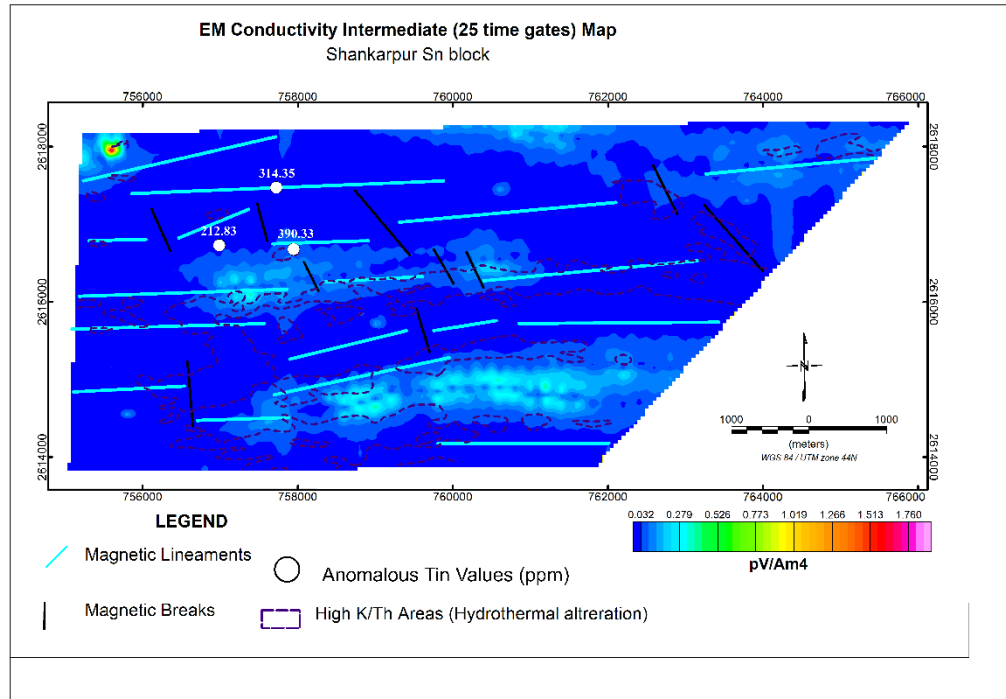
K. Radiometric K/Th Map



L. Electromagnetic Conductivity shallow (15 times gates) Map



M. Electromagnetic Conductivity intermediate (25 times gates) Map



N. Electromagnetic Conductivity deeper (35 times gates) Map

