PROPOSAL FOR GENERAL EXPLORATION (G-2) FOR TUNGSTEN & ASSOCIATED MINERALS IN AMALGAMATED KUHI G2 BLOCK WITH THE AREA BETWEEN KUHI AND KHOBNA BLOCK

(5.39 SQ. KM AREA)

DISTRICT- NAGPUR, MAHARASHTRA

COMMODITY: TUNGSTEN & ASSOCIATED MINERALS

BY

MINERAL EXPLORATION AND CONSULTANCY LIMITED

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PLACE: NAGPUR

DATE: 13 December, 2024

Summary of the Block for General Exploration (G-2)

	Features	Details
	Block ID	Amalgamated Kuhi G2 Block with The Area Between Kuhi And Khobna Block
	Exploration Agency	Mineral Exploration and Consultancy Limited (MECL)
	Commodity	**Tungsten & Associated minerals**
	Mineral Belt	Sakoli Fold Belt,
	Budget & Time schedule to complete the project	1,676.65 Lakhs & 19 months
	Objectives	i. The present exploration program (G2) has been formulated on the basis of the outcomes of previous work to fulfill the following objectives: ii. Geological mapping on 1:2000 scale to demarcate the rock types in the block with the structural features to ascertain the surface manifestations and lateral disposition of tungsten mineralisation. iii. Topographical Contouring on 1:2000 scale, by means of surface contouring at 2 m interval. iv. Delineation of the potential subsurface mineralized zones by Geophysical Surveys. v. To prove the strike and depth continuity of tungsten mineralization within greisen formations intersected in the scout boreholes spaced approximately 800 meters apart—drilled and to investigate geophysical anomalies identified by the Geological Survey of India (GSI)—and to enhance the resource potential of the Kuhi block (explored up to G2 level), it is proposed to integrate this block for inclusion in subsequent auction tranches of critical minerals. vi. To establish the consistency and reliability of the grade of ore zone by drilling over a promising strike length seamlessly G3 level to G2 level up to 180 MRL. vii. Assessment of quality and quantity of the resources (332) in the amalgamated Kuhi G2 Block with The Area Between Kuhi And Khobna Block and grade for Tungsten ore as per UNFC and MEMC- 2015 as per UNFC norms & Minerals (Evidence of Mineral Contents) Rules- 2015. viii. Facilitating the state government to auction the critical mineral block and providing a Mining License (ML) for tungsten ore in the consecutive tranches.

	Whether the work will be carried out by theproposed agency or through outsourcing and details thereof. Components to be outsourced and name of the outsource agency	Work will be carried out by the proposed agency.
	Name/Number of Geoscientists	
	Expected Field days (Geology, Survey)	Geologist Party days: Field -240 days & HQ-60 days
		Survey Party days: 60 days (for Topographic & Geophysical Survey)
		Sampling Party days: 277 days

1.	**Location**	The block is located approximately 45 km South-East of Nagpur (Plate-1). Kuhi can be reached by road from Nagpur via Pachgaon by Sate Highway, SH-9 connecting Nagpur to Pachgaon (23km) on Nagpur-Umred-Chandrapur state highway and Pachgaon to Kuhi (22 km) by State highway SH-254. Khobna is connected to Kuhi by 6 km long tar road. Kuhi is a Tehsil headquarter in Nagpur district of Maharashtra. A part of the Kuhi village is located in the study area. Nagpur-Nagbhir Narrow-Gauge section of South-Eastern Railway passes through Kuhi (40 km). The nearest Airport is located at Nagpur.
	Latitude and Longitude	

POINT	GCS (DMS)		UTM Zone-44N (m)	
	LATITUDE	LONGITUDE	NORTHING	EASTING
A	21º 1' 12.57" N	79º 22' 59.31" E	2325229.78	331967.88
B	21º 1' 43.01" N	79º 22' 26.28" E	2326175.68	331023.68
C	21º 3' 7.61" N	79º 23' 49.82" E	2328752.69	333461.73
D	21º 2' 51.82" N	79º 24' 7.449" E	2328262.14	333965.74
E	21º 3' 12.16" N	79º 24' 28.12" E	2328881.72	334568.78
F	21º 2' 56.09" N	79º 24' 43.83" E	2328382.85	335017.31

	Villages	Kuhi and Khobna
	Tehsil/Taluk	Kuhi Tehsil
	District	Nagpur
	State	Maharashtra
2.	**Area (hectares/ square kilometres)**	
	Block Area	5.39 sq.km
	Forest Area	Non-Forest area.

	Government Land Area (Bilanam)	Data not available
	Charagaha	Data not available
	Private Land Area	Data not available
3.	**Accessibility**	
	Nearest Rail Head	Nagpur-Nagbhir Narrow-Gauge section of South-Eastern Railway passes through Kuhi (40 km).
	Road	A metallic road (23 km) from Pachgaon to Kuhi emanating from Nagpur-Chandrapur State highway (SH-9) serves as the main line of communication for the area. Pachgaon is 22 km from Nagpur. Khobna is connected to Kuhi by 6 km long tar road. Agargaon Tungsten deposit lies 16 km NE of Kuhi and is connected by tar road
	Airport	The nearest Airport is located at Nagpur
4.	**Hydrography**	
	Local Surface Drainage Pattern (Channels)	The relief within the study area is moderate with elevation varying from 260 m to 310 m above msl. The Kuhi prospect occupies a very narrow and low lying ridge trending in NNE-SSW direction otherwise most of the areas are low lying soil covered and cultivated tract.
	Rivers/ Streams	The area is drained by the Nag River which is a tributary of Kanhan River
5.	**Climate**	
	Mean Annual Rainfall	The average annual rainfall is 150cm
	Temperature	Minimum temperatures: 10°C (Dec-Jan), Maximum temperatures: up to 42°C (May-June)
6.	**Topography**	
	Toposheet Number	55O/08
	Morphology ofthe Area	The area forms a part of Deccan Plateau, having subdued topography with very gentle and gradual slope towards South-West. Major landforms identified on this landscape are undulating lands, plains, small ridges with pediments and gently sloping alluvial plains
7.	**Availability of baseline geoscience data**	
	Geological Map (1:50K/25K)	Regional Geological Map (DRM), Geological Map of Area Between Kuhi & Khobna Block (5.39 Sq. Km Area) District- Nagpur, Maharashtra
	Geochemical Map	NGCM (2010-12) data available in Bhukosh

	Geophysical Map (Aeromagnetic, ground geophysical, Regional as well as local scale GP maps)	NGPM Data not available on Bhukosh/NGDR.
8.	**Justification for taking up General Exploration**	• The proposed block comprises the gap area between two established tungsten blocks: Kuhi Sub Block (Zone I), with an estimated resource of 2.046 million tons at an average grade of 0.132% WO_3, and the Khobna Block, with an estimated resource of 3.10 million tons at an average grade of 0.304% WO_3. Both blocks have undergone G2-level exploration. Previously, the Maharashtra State Directorate of Geology and Mining (DGM) offered these blocks for auction; however, due to their relatively small size and limited resources, there was no participation, leading to the annulment of the auctions. • Beneficiation studies conducted by MECL, BRGM, and IBM on the Khobna Block confirmed the ore's suitability for producing marketable scheelite concentrate (65–73% WO_3) with 55–75% recoveries using gravity, flotation, and magnetic separation methods, with scheelite as the primary tungsten mineral. In contrast, beneficiation tests on Kuhi Sub Block (Zone-I) bulk samples showed low recoveries and suboptimal grades (<65% WO_3), attributed to low tungsten content and wolframite's association with iron-bearing minerals like magnetite and hematite, which diluted concentrate quality. Minerographic analysis of 3 samples out of 12 borehole samples from the Kuhi-Khobna-Agargaon Block identified scheelite as main tungsten bearing mineral, indicating mineralization confined to greisen zones with promising beneficiation potential. • Considering the tungsten potentiality and the suggestion from the committee. MECL proposed to take up G2 stage proposal for tungsten (W) in the block. • Establishing the extent and depth continuity of the Tungsten rich greisens along with inferred resources (332) would enable the state government to auction the block, providing a Mining License (ML) for tungsten ore.

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(5.39 SQ. KM AREA)

DISTRICT- NAGPUR, MAHARASHTRA

1.1.0 INTRODUCTION

1.1.1 Tungsten (W) is a steel-grey metallic element that is stable and is very resistant to acids and bases. Tungsten has the highest melting temperature out of all metals (3422° C or 6192 ° F), and the second highest of all elements after carbon. Tungsten ore minerals are wolframite (Fe,Mn)WO4, ferberite (FeWO4), hubnerite (MnWO4) and scheelite (CaWO4). Hubnerite contains over 75% MnWO4 while Ferberite contains under 25% MnWO4 and over 75% FeWO4. Any composition intermediate between Hubnerite and Ferberite is known as wolframite (Fe,Mn)WO4.

1.1.2 Tungsten is a vital metal of strategic importance and is used in manufacturing of tools, automobiles, jet engines, defence equipments. When alloyed in small quantities with steel, tungsten greatly increases the hardness of steel. It is alloyed (mixed) with other metals to make “super alloys” which have special physical properties of high strength and heat resistance. Some of the applications for such super alloys are in turbine engines for jet aircraft and energy generation. It is also used in textile dyes, enamels, paints, and for coloring glass. The strategic importance of the tungsten has led to intense search for it in the country.

1.1.3 Resources of tungsten bearing minerals are mainly distributed in Karnataka (42%), Rajasthan (27%), Andhra Pradesh (17%) and Maharashtra (9%). The remaining 5% resources are in Haryana, Tamil Nadu, Uttarakhand and West Bengal. The total resources of Tungsten ore in the country, as per UNFC system as on 01.04.2015 have been estimated at 87.4 million tonnes containing 142,094 tonnes WO3 content. All these resources are placed under remaining resources category. (Indian Minerals Yearbook, 2017).

1.1.4 The Ministry of Mines has recently listed out 30 critical minerals that are essential for economic development and national security, tungsten is one of them. The total reserves/resources of tungsten ore in the country, as per NMI data, based on UNFC system, as on 1.04.2015 have been estimated at 87.39 million tonnes with WO3 content of 142,094 tonnes. All these resources are placed under 'remaining resources' category. Following states have their share in descending order Karnataka, Rajasthan, Andhra Pradesh and Maharashtra. The proposed block is an attempt for the search of tungsten.

2.1.0 BACKGROUND.

2.1.1 Exploration for strategic, critical, precious, rare earths and PGE are given top priority by Govt. of India, after amendment of MMDR act 2015. Keeping in view, the present proposal is being put up for General Exploration(G-2). Keeping in view General Exploration(G-2) level proposal is been prepared for NMET funding and execution.

2.1.2 Mineral Exploration and Consultancy Limited (MECL) has carried out G4 level exploration, with mapping, bed rock, channel sampling & scout drilling in Kuhi-Khobna-Agargaon Gap Area block on the basis of the geophysical anomaly provided by GSI below the soil cover. The mineralisation is limited to the Greisens mapped in the area. Analytical result of 290 core and 26 surface samples (14 Bedrock and 12 Channel Samples) for W% suggests feable Tungsten mineralization in the area. The analytical values of W encountered in borehole ranges from 0.02 % (200 ppm) to 0.04 % (400 ppm) Maximum values of W in borehole is 0.04 % (400 ppm) (8 samples).

2.1.3 In the G4 survey by MECL, three mentionable patches of greisens have been mapped in the area which are termed as Sector-I (near Kuhi), Sector-II (near Bodkipeth) and Sector-III (south east of Chapegarhi). In each sector, maximum values of W encountered is 0.05% (500 ppm).

2.1.4 Subsequently, a meeting involving GSI, MECL, and SBICAP discussed the status of the 5th tranche of critical and strategic mineral blocks. It was highlighted that the area between Kuhi and Khobna Blocks had been explored at the G4 level and the resource estimation was not done at that stage due to the lower grades but the mineralized zones exhibit promising potential. The promising mineralized zones can be explored further for augmentation of resources and grade at 400ppm cutoff.

2.1.5 The proposal of Area between Kuhi & Khobna block (G-2) was technically reviewed in 71st TCC of NMET held on 24th November, 2024. The committee recommended MECL to prepare a proposal by combining all the three blocks with exploration plan under G2 stage. Further, MECL is advised to attempt ore body modeling to have a comprehensive approach on the mineralization. It was suggested to consolidate the area into a single block, addressing all discussed points, and present it in the next TCC meeting.

2.1.6 On the basis of recommendations MECL has prepared a 3D model through Surpac connecting greisens and mineralisation from the Kuhi Sub Block, Khobna Block & Kuhi-Khobna-Agargaon Gap area block. The screenshot of 3D model is given below

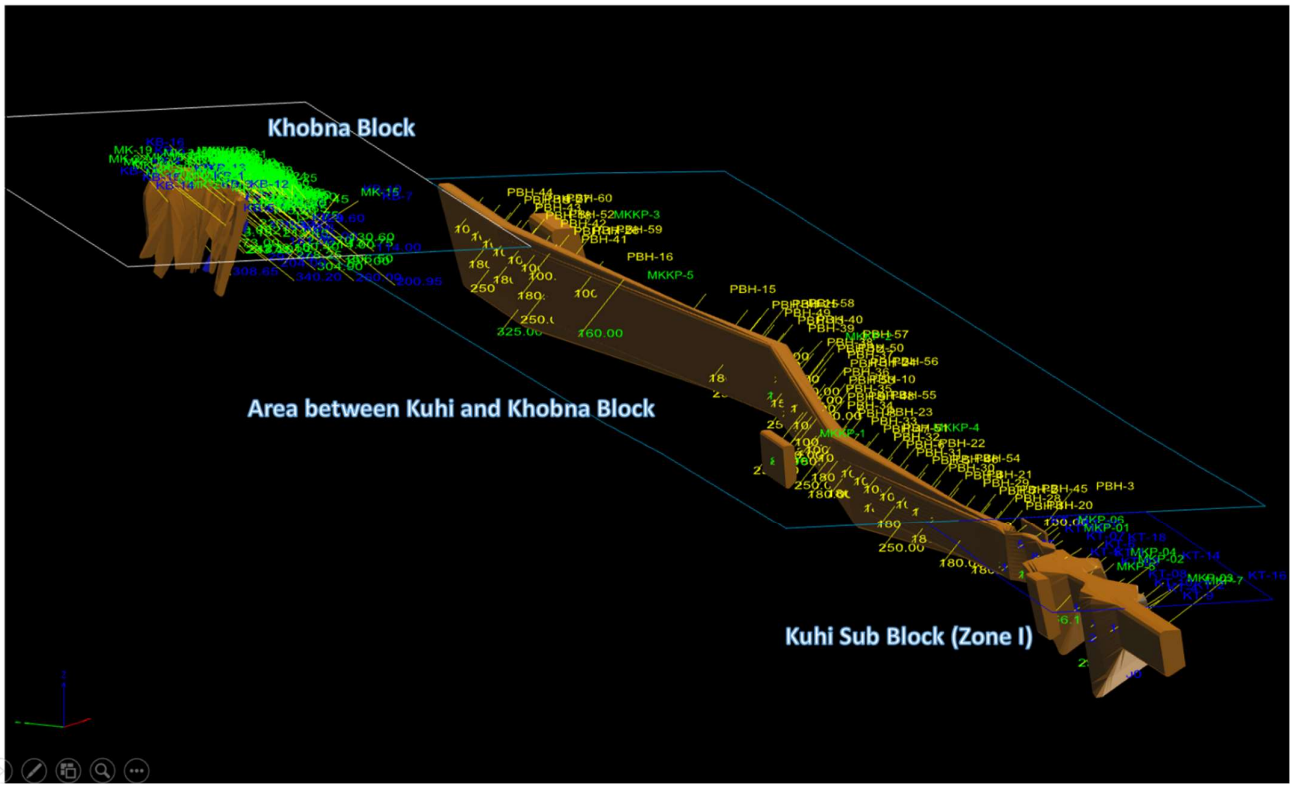

Fig. 3D Surpac model showing greisen body in Kuhi Sub Block (Zone I), Khobna Block and area between Kuhi & khobna Block with drillied borehole By GSI (Blue), MECL (Green and proposed borehole (yellow)

2.1.7 Considering the intersected tungsten mineralisation and zones in the drilled boreholes in the G4 exploration were demarcated at 300 ppm cutoff and the proposed block may be amalgamated with Kuhi Sub block (Zone I) to provide a bigger block with good amount of resource to auction, the proposal for Preliminary Exploration for tungsten in Area between kuhi & khobna block over an extent of 5.39 sq km is prepared and submitted for discussion. The details of the proposal are described in the following paragraphs.

3.1.0 LOCATION AND ACCESSIBILITY

3.1.1 The block is located approximately 45 km South-East of Nagpur (Plate-1). Kuhi can be reached by road from Nagpur via Pachgaon by Sate Highway, SH-9 connecting Nagpur to Pachgaon (23km) on Nagpur-Umred-Chandrapur state highway and Pachgaon to Kuhi (22 km) by State highway SH-254. Khobna is connected to Kuhi by 6 km long tar road. Agargaon Tungsten deposit lies 16 km NE of Kuhi and is connected by tar road. Kuhi is a Tehsil headquarter in Nagpur district of Maharashtra. A part of the Kuhi village is located in the study area. Nagpur-Nagbhir Narrow-Gauge section of South-Eastern Railway passes through Kuhi (40 km). The nearest Airport is located at Nagpur.

3.1.2 The block falls in the Survey of India Toposheet No.55 O/8 covering an area of 5.39 sq km. The co-ordinates of the corner points of the block are given below (Table 3.1).

Table 3.1

Coordinates of Corner Points of Proposed area, Nagpur, Maharashtra

POINT	GCS (DMS)		UTM Zone-44N (m)	
	LATITUDE	LONGITUDE	NORTHING	EASTING
A	21º 1' 12.57" N	79º 22' 59.31" E	2325229.78	331967.88
B	21º 1' 43.01" N	79º 22' 26.28" E	2326175.68	331023.68
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F	21º 2' 56.09" N	79º 24' 43.83" E	2328382.85	335017.31

4.1.0 PHYSIOGRAPHY AND DRAINAGE

4.1.1 The study area, part of the Deccan Plateau, features a gentle south-west slope, with landforms such as undulating lands, plains, ridges with pediments, and gently sloping alluvial plains. Elevation ranges from 260 to 310 meters above sea level. The Kuhi prospect lies on a narrow, low ridge running NNE-SSW, while most of the area is low-lying, soil-covered, and cultivated. The Nag River, a Kanhan River tributary, flows SW-NE along the north-western boundary, while Wagh Nala drains the central block eastwards, displaying a dendritic pattern with streams primarily flowing east.

5.1.0 CLIMATE

5.1.1 The area experiences warm and dry climate during most part of the year, except in Monsoon, when it is humid. The maximum relative humidity during summer ranges from 35% to 60% and in Monsoon varies from 50% to 90%. The maximum temperature remains more than 42º C and at times it may reach up to 47ºC during May-June whereas it drops to about 10ºC in winters (December and January). Occasionally wind storms occurs in the area during summer. The average annual rainfall is 150cm, which is mainly distributed during the monsoon period between June to September.

6.1.0 FLORA AND FAUNA

6.1.1 The block has sparse vegetation, with dense shrubs and mixed jungle in the northwest making it unsuitable for cultivation. The region has thin soil with poor moisture retention and low humus content. Major flora includes Tendu, Palash, Lendi, Mahua, Bamboo, Char, Neem, Teak, and various shrubs. Fauna in the area includes Deer, Monkey, Neelgay, Fox, Mongoose, and Peacock, with birds like Parrot, Sparrow, Crane, Maina, and Pigeon. Domestic animals commonly found are Cow, Buffalo, Pig, and Goat.

7.1.0 REGIONAL GEOLOGY

7.1.1 The block lies in Sakoli belt which is part of the Central Indian Tectonic Zone (CITZ), a Proterozoic mobile belt between the North Indian Cratonic blocks. It lies at the southern margin of CITZ and the northern margin of the Bastar Craton. Bhattacharjee (1937) identified three sets of foliations in the area's rock units, associated with different tectonic styles and termed the area the 'Bhandara Triangle'.

7.1.2 The Sakoli Belt's outcrops form this triangular arrangement, with Sausar series rocks to the north. The Sausar series may be younger than the Sakoli gneisses. The mineralized zone at Kuhi block falls on the western limb of the Sakoli Basin.

7.1.3 The regional geological sequence of litho units exposed in the region is given further in Table 7.1 (After District Resource Map of Nagpur and Bhandara).

Table: 7.1
The Regional litho-stratigraphic sequence of Area (After District Resource Map of Nagpur and Bhandara, GSI)

Age	Supergroup /Group	Formation	Lithounits
QUATERNARY	---	---	Alluvium
CAINOZOIC	---	---	Laterite
CRETACEOUS-PALAEOGENE	Sahyadri Group (Deccan Trap)	---	Intratrappean beds
			Undifferentiated basalt
CRETACEOUS	Lameta group	---	Conglomerate, Sandstone, Shale, Limestone
PERMIAN-TRIASSIC	Gondwana Supergroup	Kamthi	Sandstone and Ferruginous sandstone
CARBONIFEROUS-PERMIAN		Talcher	Boulder Bed, Sandstone, Shale
NEO PROTEROZOIC	Vindhyan Supergroup	---	Sandstone, Shale
MESO PROTEROZOIC	Sausar Group	---	Granite, pegmatite
		Mansar	Muscovite-Biotite Schist with Manganese ore
	Sakoli Group	---	Silicified zone, Quartz reef
		---	Metarhyolite, tuff, felsic volcanic and associated tuff
		---	Mica Schist
		---	Phyllite, Carbonaceous Phyllite
		---	Tourmaline, Coticule
		---	Banded Iron Formation
		---	Gritty Quartzite, meta arkose and conglomerate
ARCHAEAN PALAEO PROTEROZOIC	Amgaon Gneissic Complex	---	Amphibolite
		---	Quartzite (± Kyanite, Sillimanite)
		---	Calc-silicate rock
		---	Granite gneiss with migmatite gneiss
	Tirodi Complex	---	Granitic gneisses with migmatite/granite
			Granulite

Fig 5.1 Map showing The Central Indian Tectonic Zone (CITZ) and location of the survey area (modified after Radhakrishn a and Naqvi; 1986)

KN: Karnataka Nucleus, SN: Singhbhum Nucleus, EPMB: Early Proterozoic Mobile Belt, MPMB: Middle Proterozoic Mobile Belt , ADMB : Aravali Delhi Mobile Belt, CGC: Ch hotanagpur Gneiss Complex, EGMB: Eastern Ghats Granulite Belt, (1): Narmada-Son Lineament, (2): Central Indian Shear Zone-Singhbhum Shear Zone

Legend: 1. Schist belt in nuclei, 2.Tonalitic Gneisses, 3. Granodiorites-granulites of EPMB, 4.K-granites of EPMB, 5.Granulites and gneisses of EPMB, 6. Middle Proterozoic sedimentary basin, 7. Gondwana sediments, 8.Anorthosites, 9.Eastern Ghats-Sukinda-Singhbhum thrust, 10. Deccan Trap

8.1.0 GEOLOGY OF THE BLOCK

8.1.1 The Kuhi area, part of the Middle Proterozoic Sakoli Group, hosts tungsten prospects at Kuhi, Khobna, and Agargaon in the block's southwestern, central, and northeastern parts. The area's rock types include quartz-chlorite-mica schist, mica-schist, chlorite-mica schist with garnet and magnetite, feldspathised schist, and quartzite. These rocks have been altered by granitic activity, forming migmatite and gneisses. Tungsten mineralization occurs in tourmaline-quartz-mica greisens near gneiss contacts. Surface geological mapping and borehole intersections have defined the lithostatigraphic sequence as per GSI's district resource map.

Table 8.1 Litho Stratigraphic sequence of the block (After District Resource Map)

AGE	GROUP	FORMATION	LITHOUNITS
QUATERNARY	---	---	Alluvium
CAINOZOIC	---	---	Laterite
MIDDLE PROTEROZOIC	SAKOLI GROUP	BHIWAPUR FORMATION	Quartz veins / pegmatites
			Greisens and quartz veins (locale of Tungsten mineralization)
			Granite Gneiss, Pegmatite
			Metabasic rock (Amphibolite), quartz chlorite- sericite schist, chlorite mica schist

8.2.0 DESCRIPTION OF ROCK TYPES

8.2.1 **Mica Schist:**

i. The dominant lithology in the Kuhi area consists of medium-grained, foliated rocks with variations in mineral assemblages, primarily comprising chlorite, quartz, muscovite, biotite, sericite, and occasionally talc. Schistose units such as quartz chlorite-sericite schist, quartz chlorite biotite schist, and others show local variations with features like porphyroblasts and tourmaline needles. The schistose units transition into migmatite near granite gneisses, with calcite veins present in some areas. Mica schist lithounits are prevalent in the northern half of the block from Kuhi to various areas, continuing into the southern half but narrowing towards the southwest, separated by soil cover likely derived from granite-gneiss and schist.

8.2.2 **Granite, Granite Gneiss and Migmatite:**

i. Fresh surface exposures of rocks are rarely available in the block where gneiss with feldspathisation occurrences are observed. These rocks are coarse to medium-grained, grey to dark grey, with well-developed gneissosity and parallel arrangement of quartz, feldspar, and mica. The transition phase from schist to gneiss is noted in the cores. Microscopically, quartz appears as anhedral grains, with sericite, chlorite, and biotite

present variably. Granulation is observed, and albite, microcline, orthoclase, and plagioclase occur as medium to coarse anhedral to subhedral grains, indicating most samples are meta-granite with gneiss affinities.

8.2.3 **Quartz reef/vein, pegmatites and quartzites:**

i. Quartz reefs, veins, and pegmatites are concordantly emplaced in mica schist and gneisses along and across foliation, with surface exposures ranging from 1-2 meters to 80 meters in length and 1 meter to 10 meters in width. These are found in patches aligned in a NE-SW corridor, particularly northwest of Kuhi, near Bodkipeth, south of Khobna, and near Chapegarhi, Bidbothli, and Pandegaon. The quartz veins, white and massive in texture, consist of quartz with occasional mica flakes, chloritoid, and tourmaline. Some core samples show pyrite crystals, with smoky quartz also observed in places. Quartzites are occasionally associated with other rock types.

8.2.4 **Laterite**

i. Laterites are observed as patches on surface which are formed by the laterisation of Mica-schist in the area. In north-western part of the block, two large patches of laterites are observed in NE and SW of Bodkipeth. While in the southern half, a big patch of laterite is observed near Bidbothli.

8.2.5 **Amphibolite**

i. Amphibolites are present in the area as intrusive dyke having NE-SW trend at two places in the block. One is in the north of the Khobna and another one is in the NE part of the block exposed near the block boundary on Salwa-Hudpa connecting road.

8.2.6 **Greisen**

i. Greisen, a metasomatic-hydrothermal/pneumatolytic rock, forms from the alteration within schists and consists mainly of tourmaline, quartz, and mica. It hosts tungsten ores like wolframite and scheelite within quartz mica greisens and quartz-tourmaline mica greisens, found in boreholes and observed in several surface patches near Kuhi village and other areas. Microscopically, it is medium to fine-grained, containing quartz, tourmaline, chlorite, and biotite, with features like prismatic tourmaline aggregates, lensoidal quartz pockets, and ferruginous fillings.

8.2.7 **Soil**

i. Major part of the block is covered by soil. Most of the soil is derived from granite-gneiss.

9.1.0 STRUCTURE

i. Most of the area in the block is soil covered, hence the structural data are limited.

9.1.2 Foliation:

i. Attitude of the prominent foliation is NE-SW strike (N10ºE to N80ºE) with steep dip (50º - 80º) towards southeast. There are local swings in the strike of the foliation however majority of them are maintaining the trend of NE-SW.

9.1.3 Fold:

i. In Kuhi, the mineralised zones together with country rocks form a syncline with plunges towards north-East which near Kuhi railway station and is outside of the block. But part of the limbs is present in the block and show a general steep southerly dip.

10.1.0 METAMORPHISM

10.1.1 Presence of Muscovite, Chlorite, sericite minerals and presence of rocks like Phylites and Greisen (resultant of metasomatic activities) shows that the area has undergone low-grade metamorphism of Green-schist facies.

11.1.0 MINERALIZATION:

11.1.1 **TUNGSTEN MINERALISATION IN THE BLOCK**

i. This block is the gap area marked out of the first two tungsten reported areas. The main ore minerals of tungsten are wolframite and scheelite. The quartz mica greisens, quartz-tourmaline mica greisens, quartz biotite mica greisens, quartz and pegmatites etc traversing the country rocks viz. quartz-chlorite,±sericite,±biotite, ±muscovite,±talc mica schist serves as host for tungsten mineralisation i.e., wolframite and scheelite. Widths of the individual greisenised zones vary from a few cms to more than 3m. The mineralized zone extends along NE-SW direction with general southern dips, which is in conformity with the regional trend.

11.1.2 **CONTROL OF MINERALISATION**

i. Kuhi Tungsten mineralisation is controlled by lithology and structure. Tungsten mineralisation is occurring in the greisenised zones of qtz-chlorite mica schist, qtz-chlorite biotite ±muscovite, ±sericite, ±talc schist, chlorite mica schist, pegmatites and veins etc. The NE-SW trending schistosity planes of chlorite mica schist dipping 50-80^{o} due SE have served as passage for pneumatolysis for the formation of greisens.

12.1.0 PREVIOUS WORK AND RECOMMENDATION

12.1.1 Extensive Geological investigations has been previously taken up in the different blocks in and around the area to examine the potentiality of tungsten mineralisation which are enumerated in the Table 13.1

Table 13.1 List of previous work taken up by GSI in and around Kuhi-Khobna-Agargaon area

Sl. No.	Block/Area Name, Year and Agency	Worker's Name	Remarks
2	Agargaon, 1965-69, GSI	Lokras et. al., (1969), Chande, V.D. and Bhoskar, K.G. (1965-68).	Reconnaissance Work for Tungsten.
3	Kuhi-Agargaon-Bhandara, 1979-80, GSI	Mohan and Reddy	U, Nb, Ta, Au and pyrochlore reported at Kharbi, Khobna, Bodkipeth and Shahpur.
4	Kuhi (Zone-I), 1981-84, GSI	Mohan and Jain	Geological Mapping in 1.10 sq km (1:2000), Drilling of 24 BH (3573.95m), 15 trenches (724 cu m), 161 groove samples, 187 bulks samples. 2.5 million tonnes tungsten resource with 0.10-0.19% WO_3 estimated with average width 11.47 m and up to 160m depth. Over the part of Kuhi zone-I block, henceforth known as Kuhi Sub-Block (Zone-I), GSI has estimated resource of 1.27million tonnes of WO_3 at 0.1% cut-off.
5	Kuhi (Zone-II), 1985-86, GSI	Mohan M. et. al.,	Drilling in 12 BHs (2061.15 m), 563 BH core samples, Maximum of 0.075% W and 0.05% of Sn. Geological mapping 0.30 sq km (on 1:2000 scale). 6 trenches (232 cu m), groove samples (8 nos.), bulk samples (19 nos.). Mineralisation is poor and uneconomic.
6.	Khobna (zone-I), 1982-85), GSI	Mohan M. et. al	Geological Mapping (0.7 sq km on 1:2000 scale), 15 trenches (1038 cu m), 16 boreholes (3311.70 m), 926 nos. core samples, 77 groove and bulk samples.
7.	Khobna (zone-II), 1984-86, GSI	Mohan M. et. al.,	20 BH (2782.25), 425 core samples, Poor Tungsten content, Sn (0.06%)

Sl. No.	Block/Area Name, Year and Agency	Worker's Name	Remarks
8	North of Kuhi - South of Khobna, 1981-82, GSI	S.S. Jain	Geological Mapping (4.2 sq km on 1;5000 scale), 48 rock chips/channel samples, 388 cu m pitting in 230 pits, 210 nos. of bulk samples. The area further recommended for detailed work by pitting, trenching.
9.	Saongi-Chapegarhi Block, 1985-87, GSI	A. K.Saha et. al.,	Mapping (3.5 sq km on 1:2000 scale), Trenching/pitting (154 cu m), 16 Bulk and Groove samples, 494 core samples, Drilling 2367.80m from 21 BH. Low content of W and Sn. Declared Uneconomical
10.	Pandegaon, Saongi-South and Salwa-Bir Bothli area, 1986-88, GSI	A.K.Saha et. al.,	Detail Mapping (1:5000) of 15.6 sq km, Pitting and trenching (3 to 4 m Depth) of 1396 cu m (200x200m grid)., 282 no of soil, bed rock chip and groove sampling (100x100m grid), no anomalous 'W' values recorded. 'Sn' values up to 50 ppm recorded in a few samples. Area found not promising for Tungsten etc.

12.1.2 MECL's conducted detailed exploration of the Khobna (Zone I) block, involving 55 boreholes (7349.90 m) and 27 non-core boreholes (961 m), revealed mineralization confined to a 16 m wide greisen zone. Scheelite is the primary tungsten mineral, with minor wolframite, chalcopyrite, and molybdenite. Reserves up to a depth of 195 m (80–275 MRL) are estimated at 3.04 million tonnes, grading 0.313% WO_3 (9522 tonnes of contained WO_3, mainly as scheelite). Semi-pilot plant beneficiation studies, along with BRGM and IBM tests, confirmed the ore's suitability for producing marketable scheelite concentrate (65–73% WO_3) with recoveries of 55–75% using standard gravity, flotation, and magnetic separation methods.

12.1.3 MECL in year 2014-2016 conducted detailed exploration in Kuhi Sub Block (Zone I) involving 7 nos. BH (1343.70 m), Geological mapping in 0.50 sq km area, 3 trenches-63.50 Cu m. Reported 2.046 million tonnes resource with 0.132% WO3. Beneficiation tests on bulk samples from the Kuhi Sub Block (Zone-I) indicate low recovery and enrichment, failing to meet the marketable concentrate grade requirement (≥65% WO_3), Bench-scale studies revealed limited beneficiation potential due to the ore's low tungsten content and wolframite's association with other heavy, hard, and magnetic iron-bearing minerals (e.g., magnetite, hematite, pyrite, garnet, and tourmaline), which dilute the

concentrate grade.

12.1.4 MECL has carried out G4 level exploration, with mapping (1:12500 scale), bed rock, channel sampling & scout drilling in Kuhi-Khobna-Agargaon Gap Area block on the basis of the geophysical anomaly provided by GSI below the soil cover. The mineralisation is limited to the Greisens mapped in the area and predominantly consists of scheelite mineral. 290 core and 26 surface samples (14 Bedrock and 12 Channel Samples) for W have been analysed. The tungsten mineralisation encountered in borehole ranges from 0.02 % (200 ppm) to 0.04 % (400 ppm) having maximum values of W of 0.04 % (400 ppm) (8 samples) and in each mapped sector during geological mapping, maximum values of W in surface samples is 0.05% (500 ppm). A summarised table of the W% values ≥0.03% (300 ppm) intersected in boreholes interpreted as mineralisation zones out of the primary core samples are tabulated below.

Summary of mineralised zones interpreted from primary core samples analysis results of scout drilling in Kuhi-Khobna-Agargaon Gap Area block

Sl. No.	Borehole No.	Sample Interval (m)		Measured Thickness (m)	True Thickness (m)	W (%)
		From	To			
1	MKKP-1	53.3	53.8	0.50	0.383	0.03
2		56.8	57.3	0.50	0.383	0.03
3	MKKP-2	103.30	103.80	0.50	0.383	0.03
4		108.80	109.30	0.50	0.383	0.03
5		112.30	112.80	0.50	0.383	0.03
6		120.80	121.30	0.50	0.383	0.03
7		125.80	126.30	0.50	0.383	0.03
8		127.30	128.30	1.00	0.766	0.035
9		137.80	139.30	1.50	1.149	0.03
10		141.30	142.30	1.00	0.766	0.04
11		144.30	145.30	1.00	0.766	0.04
12	MKKP-3	214.05	214.38	0.33	0.270	0.04
13		214.60	215.37	0.77	0.631	0.03
14		217.37	219.21	1.84	1.507	0.035
15		240.30	242.10	1.80	1.474	0.037
16		243.35	244.35	1.00	0.819	0.03
17	MKKP-4	176.25	177.80	1.55	1.270	0.03
18		181.50	182.10	0.60	0.491	0.04
19		184.10	185.60	1.50	1.229	0.037
20		186.30	187.30	1.00	0.819	0.03
21		191.30	192.30	1.00	0.819	0.03
22		193.30	194.50	1.20	0.983	0.03
23		203.50	204.00	0.50	0.410	0.03

13.1.0 GEOPHYSICAL SURVEY CARRIED OUT BY GSI

13.1.1 Geophysical surveys was carried out by GSI in two phases during 1984-86 with the objective of locating zones favourable for Tungsten mineralization in the Kuhi-Agargaon area, which was earlier geologically explored (Lokras et. al., 1969, Reddy, 1980, Jain, 1982; Jain et. al., 1982 etc.).

13.1.2 In the first phase (FS 1984-85), test geophysical surveys were carried out by GSI in the Kuhi-Khobna block, where a few zones of Tungsten mineralization were reported earlier following extensive geological investigations and drilling. These test surveys were aimed at developing a methodology for locating concealed Tungsten ore deposits in the Sakoli Basin by establishing correlation between measured geophysical parameters and mapped geological units in this area.

13.1.3 In the beginning of the second phase (FS 1985-86), GSI carried out surveys employing a variety of geophysical methods in an area of 0.3 sq km over a proved mineralized zone (Khobna zone-I) to examine the utility of these techniques in locating the Tungsten ore. Results of these investigations and the test surveys made in the Kuhi-Khobna area, indicated that a combination of resistivity (gradient array technique) and magnetic methods is adequate to locate greisen zones, which are locations of Tungsten mineralisation. With this observation as the guiding factor, the investigations were continued in the 2nd phase (1985-86) in Kharbi, Chapegarhi and Saongi areas up to Agargaon using resistivity (gradient array) and magnetic methods.

13.1.4 Geophysical surveys (FS 1985-86) brought out several such anomaly zones in the area between Khobna and Agargaon. Noteworthy are two elongated zones, striking over a distance of nearly 3 km each, traced in the Saongi-Agargaon block. All the mineralized zones fall within the schistose rocks, except Zone-II of Kuhi block, which is located within gneisses.

13.1.5 Geophysical investigations in this area were successful in bringing out several anomaly zones (characterized by high resistivity and magnetic associations) which may point to greisenised zones within schists a situation favourable for Tungsten mineralisation.

13.1.6 On the basis of geophysical exploration, GSI has found some geophysical anomalies. On that basis, five scout BHs have been drilled by MECL (2019).

14.1.0 OBJECTIVE OF THE PROPOSED GENERAL EXPLORATION (G-2 STAGE):

14.1.1 Geological mapping on 1:2000 scale to demarcate the rock types in the block with the structural features to ascertain the surface manifestations and lateral disposition of tungsten mineralisation.

14.1.2 Topographical Contouring on 1:2000 scale, by means of surface contouring at 2 m interval.

14.1.3 Delineation of the potential subsurface mineralized zones by Geophysical Surveys.

14.1.4 To prove the strike and depth continuity of tungsten mineralization within greisen formations intersected in the scout boreholes spaced approximately 800 meters apart—drilled and to investigate geophysical anomalies identified by the Geological Survey of India (GSI)—and to enhance the resource potential of the Kuhi block (explored up to G2 level), it is proposed to integrate this block for inclusion in subsequent auction tranches of critical minerals.

14.1.5 To establish the consistency and reliability of the grade of ore zone by drilling over a promising strike length seamlessly G3 level to G2 level up to 180 MRL.

14.1.6 Assessment of quality and quantity of the resources (332) in the amalgamated KUHI G2 Block with The Area Between Kuhi And Khobna Block and grade for Tungsten ore as per UNFC and MEMC- 2015 as per UNFC norms & Minerals (Evidence of Mineral Contents) Rules- 2015.

14.1.7 Facilitating the state government to auction the critical mineral block and providing a Mining License (ML) for tungsten ore in the consecutive tranches.

15.1.0 PLANNED METHODOLOGY

i. In accordance to the objective set for Exploration from General (G-2) to General (G-2) of the block, the exploration programme is proposed. The Exploration shall be carried out as per Minerals (Evidence of Mineral Contents) Rule-2015. Accordingly, the following scheme of exploration is formulated in order to achieve the objectives. The details of different activities to be carried out are presented in subsequent paragraphs.

15.1.2 **GEOLOGICAL MAPPING**

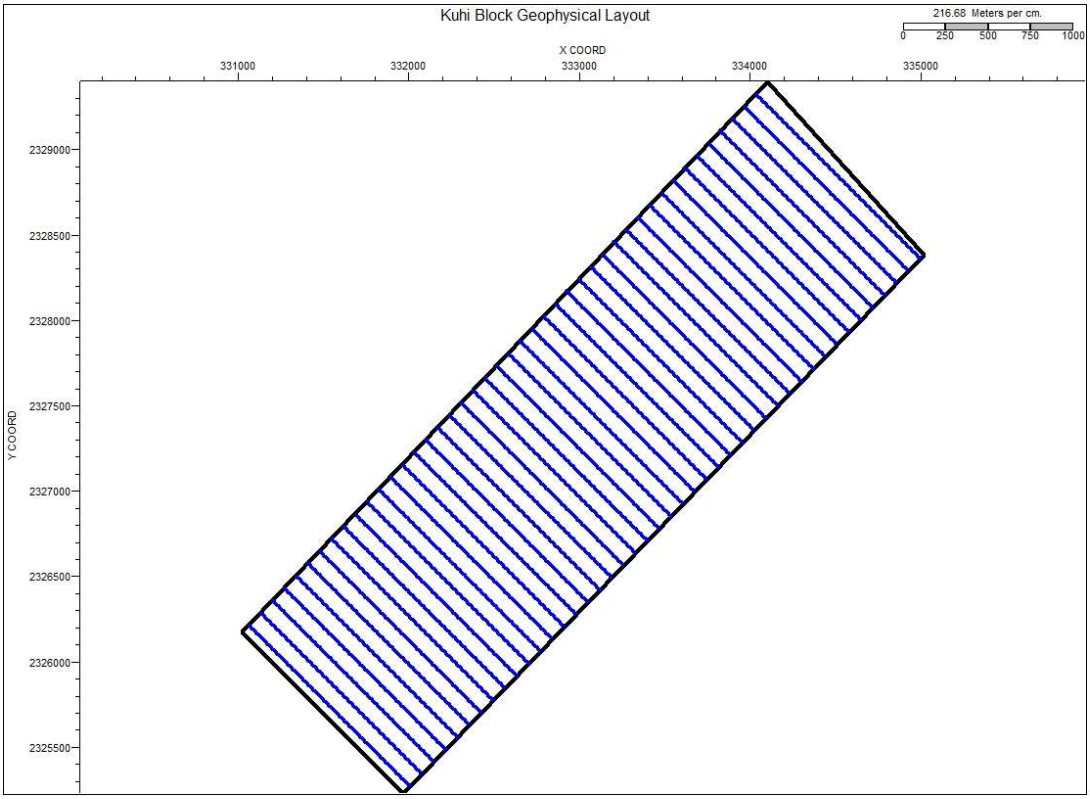
i.Geological mapping will be carried out in the 5.39 sq.km area on 1:2,000 scale. Rock types, their contact, structural features will be mapped. Surface manifestations of the tungsten mineralisation along with their surface disposition will be marked on map.

15.1.3 **SURVEYING**:

i. The block area would be tied up with the triangulation network and contouring/topographical survey will be updated in the block area. The surface features in the block area will be picked up and marked on the map on 1:2000 scale. The reduced levels and co-ordinates of boreholes, trenches and boundary coordinates would be determined. The contouring will be carried out at 2m interval.

15.1.4 **GROUND GEOPHYSICAL SURVEY:**

i. Based on the GSI work in the year 1984-86 and NGPM data Magnetic point anomalies were found in the area supported with Resistivity survey in the above block. The survey was conducted in 1984-86 with 10mts station interval and 200mts Travers interval, Total of 165 Lkm. Ground Geophysical Survey is planned for further detail investigation of the area I.P, Resistivity, S.P and Magnetic survey was planned to carry out in proposed area for identifying and validating mineralization zones in the area of 5.39 Sq. Km. The survey was planned in a grid pattern of 10m x 100m for I.P, Resistivity, S.P and Magnetic survey. Travers was planned in N 135°E (NW-SE) direction with an interval of 100m and station interval of 10mts. A total 60 Lkm were planned for the survey.



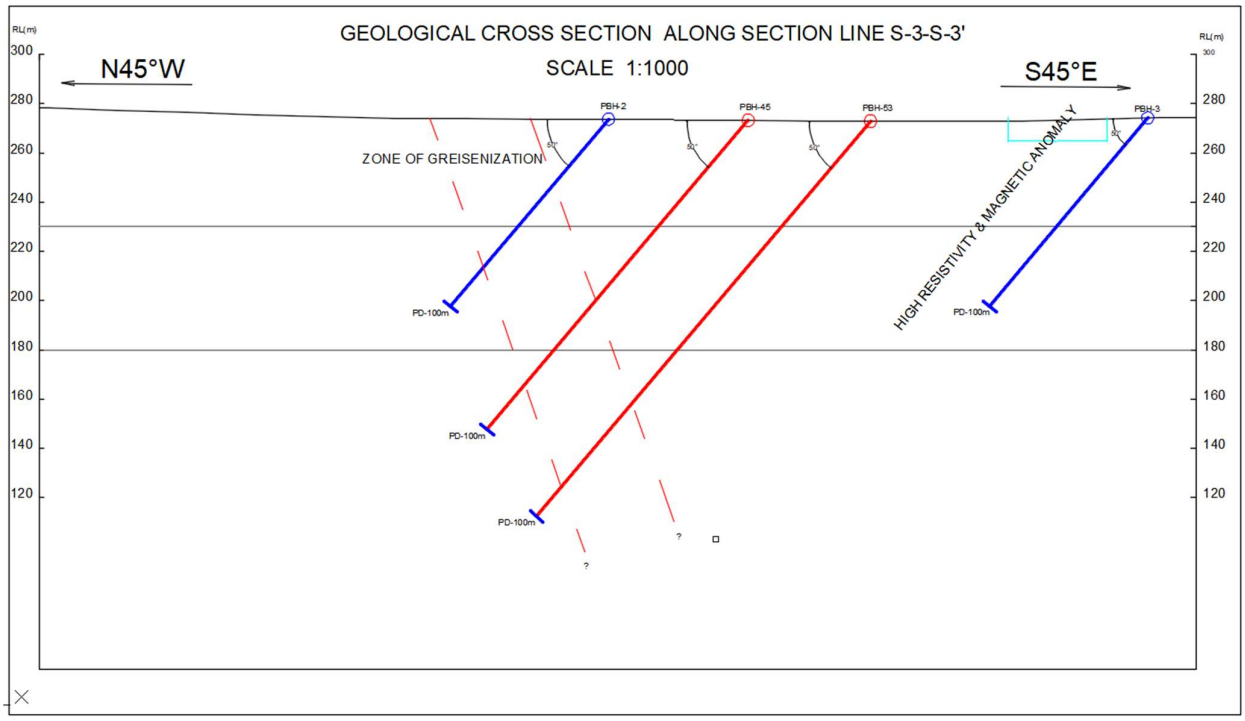
15.1.5 **EXPLORATORY DRILLING**

i. The present exploration scheme is prepared by proposing seamelessly drilling from G3 to G2 level, total 60 nos. of inclined boreholes-based area proposed on the basis of geological mapping, geophysical anomaly by GSI, bed rock & channel sampling and scout drilling carried out in the G4 level exploration programme. For G3 level exploration at 200 m interval boreholes are planned to intersect greisenisation at 230 MRL (Level 1) and at 180 MRL (level 2) in 400 m spacing. Further for G2 level boreholes are spaced at 100 m for greisen intersection at 230 MRL (Level 1) and for 180 MRL (Level 2) at 200 m spacing and at 400 m spacing for 130 MRL (Level 3) intersection. The boreholes will be closed judicially by the field geologist, after complete intersection of the tourmaline quartz mica greisen/ Geophysical anomaly. The proposed location & depth of the borehole is tentative and the final decision regarding taking up borehole, borehole location and closing of borehole will be ascertained by field geologist. Tentative location and depth of borehole have been provided. Proposed Borehole parameters are tentative and may vary subject to the geological and drilling conditions in the study area.

Details of Proposed Boreholes

PROPOSED BH No.	AZIMUTH (°)	INCLINATION ANGLE (°)	PROPOSED DEPTH (m)	INTERSECTION LEVEL (mRL)
Proposed G3 Level				
PBH-1	N45°W	50	100	230
PBH-2	N45°W	50	100	230
PBH-3	N45°W	50	100	230
PBH-4	N45°W	50	100	230
PBH-5	N45°W	50	100	230
PBH-6	N45°W	50	100	230
PBH-7	N45°W	50	100	230
PBH-8	N45°W	50	100	230
PBH-9	N45°W	50	160	230
PBH-10	N45°W	50	100	230
PBH-11	N45°W	50	100	230
PBH-12	N45°W	50	150	230
PBH-13	N45°W	50	100	230
PBH-14	N45°W	50	100	230
PBH-15	N45°W	50	100	230
PBH-16	N45°W	50	100	230
PBH-17	N45°W	50	100	230
PBH-18	N45°W	50	100	230
PBH-19	N45°W	50	100	230
PBH-20	N45°W	50	180	180
PBH-21	N45°W	50	180	180
PBH-22	N45°W	50	180	180
PBH-23	N45°W	50	180	180

PROPOSED BH No.	AZIMUTH (°)	INCLINATION ANGLE (°)	PROPOSED DEPTH (m)	INTERSECTION LEVEL (mRL)
PBH-24	N45°W	50	180	180
PBH-25	N45°W	50	180	180
PBH-26	N45°W	50	180	180
PBH-27	N45°W	50	180	180
Sub Total			**3450**	
Proposed G2 Level				
PBH-28	N45°W	50	100	230
PBH-29	N45°W	50	100	230
PBH-30	N45°W	50	100	230
PBH-31	N45°W	50	100	230
PBH-32	N45°W	50	100	230
PBH-33	N45°W	50	100	230
PBH-34	N45°W	50	100	230
PBH-35	N45°W	50	100	230
PBH-36	N45°W	50	100	230
PBH-37	N45°W	50	100	230
PBH-38	N45°W	50	100	230
PBH-39	N45°W	50	100	230
PBH-40	N45°W	50	100	230
PBH-41	N45°W	50	100	230
PBH-42	N45°W	50	100	230
PBH-43	N45°W	50	100	230
PBH-44	N45°W	50	100	230
PBH-45	N45°W	50	180	180
PBH-46	N45°W	50	180	180
PBH-47	N45°W	50	180	180
PBH-48	N45°W	50	180	180
PBH-49	N45°W	50	180	180
PBH-50	N45°W	50	180	180
PBH-51	N45°W	50	180	180
PBH-52	N45°W	50	180	180
PBH-53	N45°W	50	250	130
PBH-54	N45°W	50	250	130
PBH-55	N45°W	50	250	130
PBH-56	N45°W	50	250	130
PBH-57	N45°W	50	250	130
PBH-58	N45°W	50	250	130
PBH-59	N45°W	50	250	130
PBH-60	N45°W	50	250	130
Sub Total			5140	
Total			**8590**	



15.1.6 **CORE LOGGING**

i. Geological core logging will be carried out systematically by recording carefully the minute details and physical/lithological characters of the rock formations including colour, core recovery, grain size, weathered zone, texture, banding, mineralogical composition, micro-structural/structural details, lithological variations along with visual estimate and under short wave UV light in respect of tungsten ore in boreholes.

15.1.7 **CORE SAMPLING**

For preparation of samples, the borehole core will be split ted into two equal halves by using core splitter. One half will be powdered to (-) 200 mesh size and the other half will be kept for future studies. The powdered material will be mixed thoroughly and about 100 gram of samples will be taken for chemical analysis by successive coning and quartering as primary samples and rest of the material (-200 mesh size) will be kept as duplicate half for future reference. It will generate about 1600 Nos. primary samples and 240 nos. check samples (10%External and 5% Internal check of Primary samples). The sample length towards the roof and floor marked by non-mineralised zone also needs to be adjusted as per variations of the litho-units.

15.1.8 **Chemical Analysis:**

i. All the primary samples and check samples will be analyzed for 7 radicals (W, Cr, Mo, Ta, Nb, V and Sn) which may be variable as per indication of other mineralisation. About 10% of primary samples will be sent to NABL external laboratory,

15.1.9 **Specific Gravity Study**

i. A provision of 10 samples for specific gravity determination has been kept.

15.2.0 QUANTUM OF WORK:

15.2.1 The quantum of work proposed by MECL in Amalgamated Kuhi G2 Block with The Area Between Kuhi And Khobna Block is given in Table 15.1.

Table: 15.1

Proposed Quantum of Exploratory Work in the Amalgamated Kuhi G2 Block with The Area Between Kuhi and Khobna Block, District-Nagpur, Maharashtra.

Sl. No.	Item of Work	Unit	Proposed Quantum of work
1	Geological Mapping (1:2000)	sq. km	5.39
2	Topography Survey (1:2000)	sq. km	5.39
3	Exploratory Drilling	m.	8590
4	Sample Preparation & Chemical Analysis		
	i) Primary Analysis for 7 Radicals W, Cr, Mo, Ta, Nb, V and Sn by AAS method	Nos.	1600
	ii) REE Analysis	Nos.	240
	iii) Gold by Fire Assay	Nos.	120
	iv) External Check sample (10 % of Primary samples) for 7 Radicals W, Cr, Mo, Ta, Nb, V, and Sn by AAS method	Nos.	240
	v) External Check sample (10 % of Primary samples) for REE analysis	Nos.	24
5	ICP-MS Studies	Nos.	25
6	Petrographic Studies	Nos	10
7	Mineragraphic Studies	Nos	10
8	Specific Gravity studies	Nos	10
9	Beneficiation Studies	Nos	2
10	EPMA	Hrs	15
11	XRD	Nos	10
12	Geotechnical Studies	Nos	1
13	Report Preparation (Digital format)	Nos.	1

16.1.0 MANPOWER DEPLOYMENT

16.1.1 Manpower deployment List may be provided later.

17.1.0 TIMELINE AND BREAK-UP OF EXPENDITURE

17.1.1 The proposed exploration programme is planned for General Exploration (G-2). The work activities like camp setting, geological work, drilling, geophysical logging & laboratory work, report writing will be completed within 19 months' time. The bar chart showing activities wise time schedule is placed at Table-17.1.

Table-17.1.

Estimated time schedule for General Exploration (G-2) for Tungsten & Associated Minerals in Amalgamated Kuhi G2 Block with the Area Between Kuhi and Khobna Block, Districts: Nagpur, Maharashtra
[Block area-5.39 sq. km; Schedule timeline- 19 months]

S. No.	Particulars	Months	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	Camp Setting	Months																			
2	Geologist Party days (1 Party)	days																			
3	Geophysist Party days																				
4	Survey Party days (1 Party)	days																			
6	Drilling (2 rig)	m																			
7	Sampling days for Trench & Core Sampling (1 Party)	days																			
8	Camp winding	Months																			
9	Laboratory Studies	days																			
10	Geologist days, HQ	days																			
11	Report Writing with Peer Review	days																			

Review

Review

17.1.2 Tentative cost has been estimated based on Schedule of Charges (SoC) of projects funded by National Mineral Exploration Trust (NMET) w.e.f. 01/04/2020 and the total estimated cost is Rs. 1676.65 Lakh. The summary of tentative cost estimates for General Exploration is given in Table No.-17.2 and details of tentative cost estimates are given as Annexure-I.

Table No.-17.2
Summary of Tentative cost estimates for General Exploration in Amalgamated Kuhi G2 Block with the Area Between Kuhi and Khobna Block

Sl. No.	Item	Total
1	Geological Work	73,96,228
2	Geophysical Survey	88,72,158
3	Drilling	11,40,68,548
4	Laboratory Studies	92,22,245
	Sub total	**13,95,59,179**
5	Report	20,00,000
6	Peer Review	30,000
7	Proposal Prepration	5,00,000.00
	Total	**14,20,89,179**
8	GST (18%)	2,55,76,052.13
Total cost including 18% GST		**16,76,65,231**
SAY, in Lakhs		**1,676.65**

18.1.0 JUSTIFICATION

18.1.1 The proposed block comprises the gap area between two established tungsten blocks: Kuhi Sub Block (Zone I), with an estimated resource of 2.046 million tons at an average grade of 0.132% WO_3, and the Khobna Block, with an estimated resource of 3.10 million tons at an average grade of 0.304% WO_3. Both blocks have undergone G2-level exploration. Previously, the Maharashtra State Directorate of Geology and Mining (DGM) offered these blocks for auction; however, due to their relatively small size and limited resources, there was no participation, leading to the annulment of the auctions.

18.1.2 Beneficiation studies conducted by MECL, BRGM, and IBM on the Khobna Block confirmed the ore's suitability for producing marketable scheelite concentrate (65–73% WO_3) with 55–75% recoveries using gravity, flotation, and magnetic separation methods, with scheelite as the primary tungsten mineral. In contrast, beneficiation tests on Kuhi Sub Block (Zone-I) bulk samples showed low recoveries and suboptimal grades (<65% WO_3), attributed to low tungsten content and wolframite's association with iron-bearing minerals like magnetite and hematite, which diluted concentrate quality. Minerographic analysis of 3 samples out of 12 borehole samples from the Kuhi-Khobna-Agargaon Block identified scheelite as main tungsten bearing mineral, indicating mineralization confined to greisen zones with promising beneficiation potential.

18.1.3 Considering the tungsten potentiality and the suggestion from the committee. MECL proposed to take up G3 stage proposal for tungsten (W) in the block.

18.1.4 Establishing the extent and depth continuity of the Tungsten rich greisens along with inferred resources (333) would enable the state government to auction the block, providing a Mining License (ML) for tungsten ore.

19.1.0 References:

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20.1.0 List of Plates:

i. Plate-I: Location Map of Area Between Kuhi & Khobna Block (5.39 Sq. Km Area) District- Nagpur, Maharashtra

i. Plate-II: Regional Geological Map showing Area Between Kuhi & Khobna Block (5.39 Sq. Km Area) District- Nagpur, Maharashtra (Source: District Resource M, GSI).

ii. Plate-III: Geological Map of Area Between Kuhi & Khobna Block (5.39 Sq. Km Area) District- Nagpur, Maharashtra

iii. Plate-IV: Geological Map with proposed borehole location for Area Between Kuhi & Khobna Block (5.39 Sq. Km Area) District- Nagpur, Maharashtra

iv. Plate-V: Tentative Longitudnal Vertical section for the Area Between Kuhi & Khobna Block (5.39 Sq. Km Area) District- Nagpur, Maharashtra.

21.1.0 List of Annexures:

21.1.1 Estimated Time Schedule and Details of Tenative Cost for General Exploration (G- 3) for Tungsten and associated minerals in Amalgamated Kuhi G2 Block with The Area Between Kuhi And Khobna Block (5.39 Sq. Km Area) District- Nagpur, Maharashtra

329000 332000 335000 338000 341000 342985

2332000 2329000 2326000 2323000 2321750

AGARGAON BLOCK

N

W E

S

KHOBNA BLOCK

AREA BETWEEN KUHI & KHOBNA BLOCK

KUHI SUB-BLOCK (ZONE-I)

KUHI ZONE - II

Chapegarhi

Kharbi

Khobna

Khobna Tungsten Deposit

Bodkipeth

Sawargaon

Salwa

Bhikund

Pandegaon

Chikhalabori

Bhatra

Kuhi

MKKP-1 MKKP-2 MKKP-3 MKKP-4 MKKP-5

MKKP/BR-02 MKKP/BR-09

MKKP/CH-04 MKKP/CH-07

A A' B B' C C' D D' E F

L1 L2 L3 L4 L5 L6 L7 L8 L13 L14 L15

INDEX

- GRANITE GNEISS / SOIL
- MICA SCHIST
- QUARTZ VEIN/ QUARTZ REEF/ PEGMATITE
- AMPHIBOLITE
- LATERITE
- GREISEN
- GEOPHYSICAL ANOMALY
- SECTION LINE
- VILLAGE
- BH-LOCATION (MKKP-1)
- BLOCKS OF PREVIOUS WORK
- FOLDED GREISENISED ZONE
- GSI BOREHOLES
- MECL BOREHOLES
- ROAD
- FOLIATION
- BLOCK BOUNDARY KUHI - KHOBNA- AGARGAON GAP AREA BLOCK
- E CARDINAL POINTS OF THE BLOCK

SCALE

MINERAL EXPLORATION CORPORATION LIMITED

GEOLOGICAL MAP WITH KUHI & KHOBNA BLOCK LOCATION

AREA BETWEEN KUHI & KHOBNA BLOCK FOR TUNGSTEN

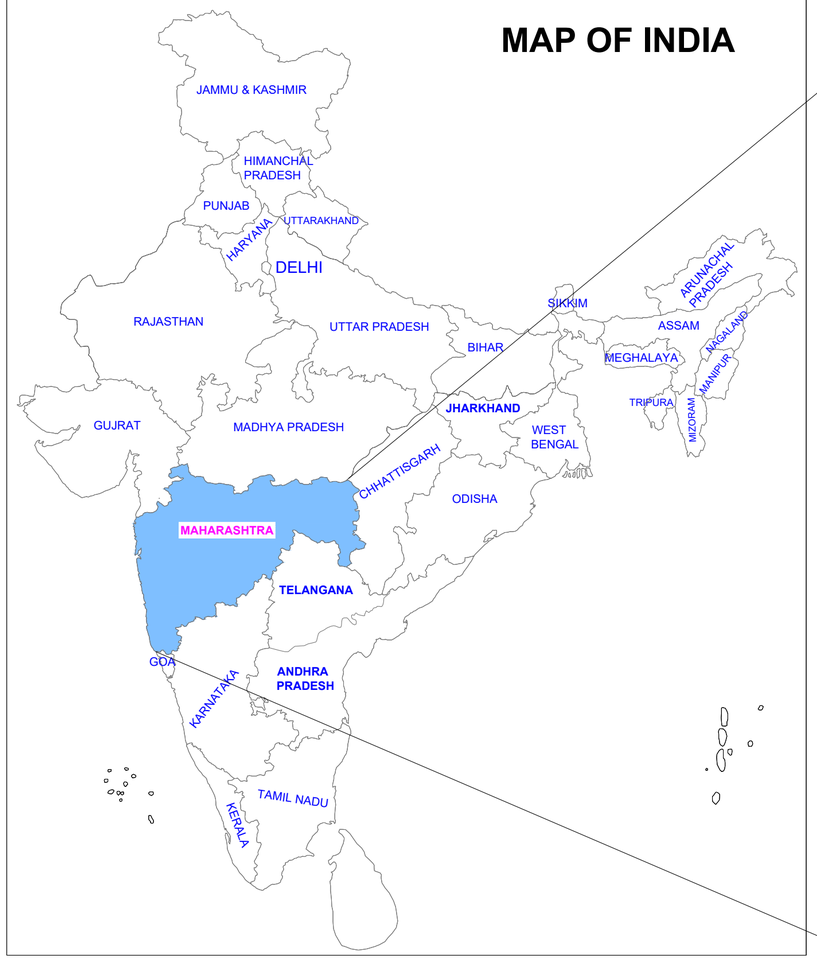
DISTRICT : NAGPUR STATE : MAHARASHTRA

Processed By :

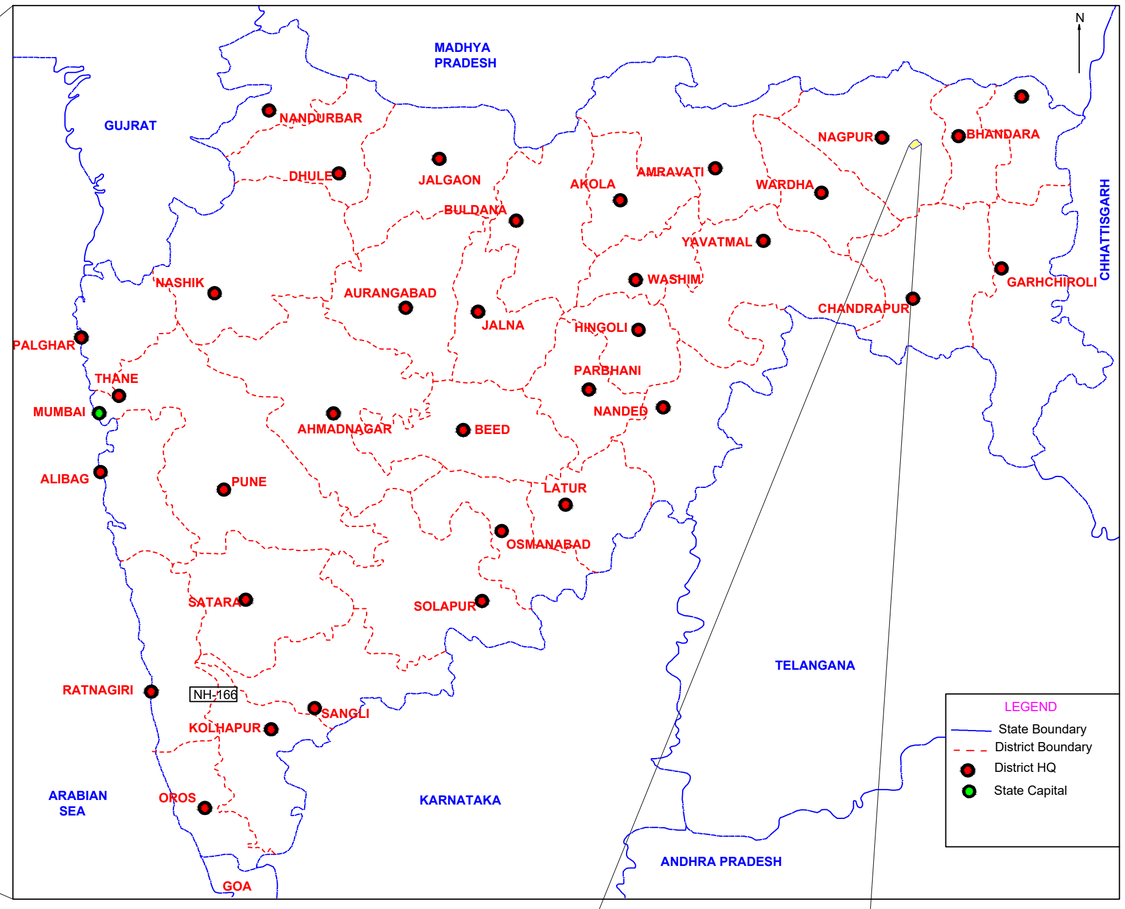
IT Centre,
MECL, Nagpur.

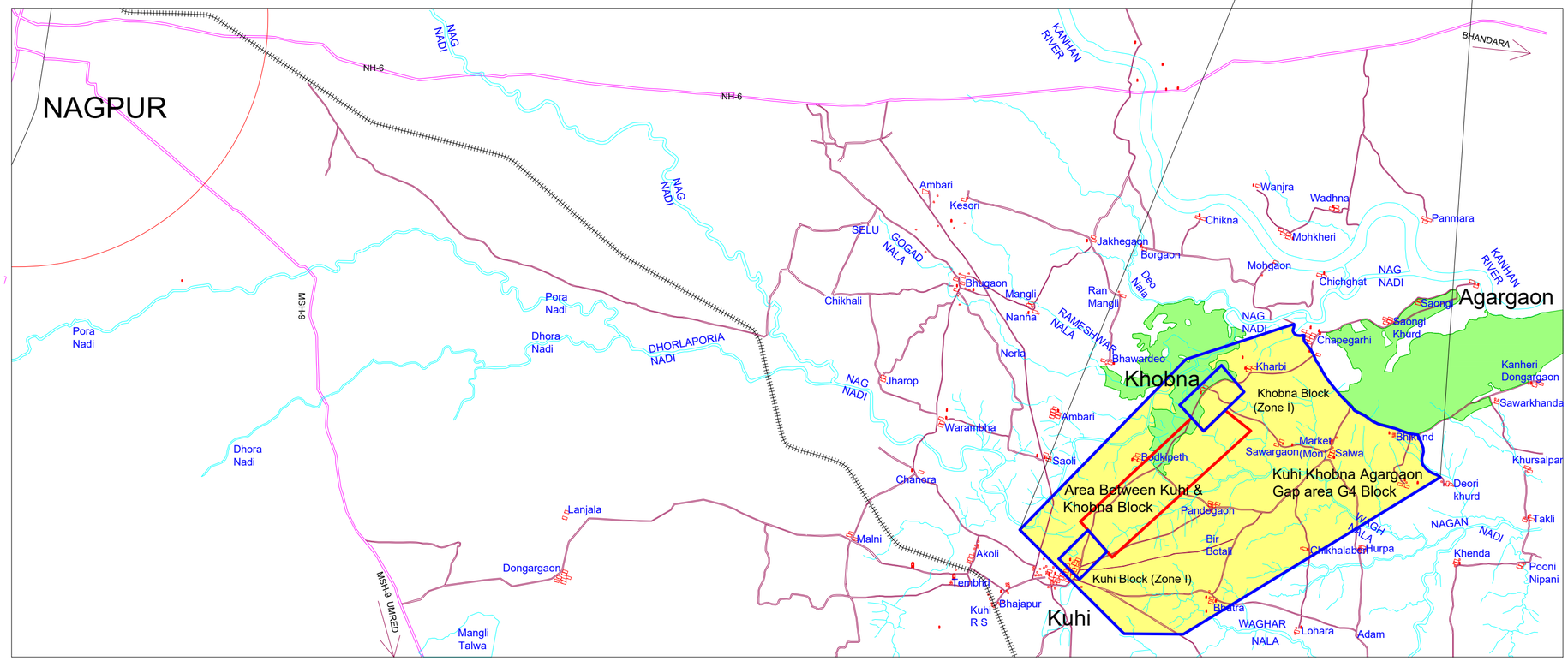
PLATE NO. - III 4

MAP OF INDIA



DISTRICT MAP OF MAHARASHTRA





INDEX

- Area Between Kuhi & Khobna Block
- Drainage
- National/ State Highway
- Village
- Village Road
- Railway Line
- Forest Area

MINERAL EXPLORATION CORPORATION LIMITED	
LOCATION MAP	
AREA BETWEEN KUHI & KHOBNA BLOCK FOR TUNGSTEN	
MAP NOT TO SCALE	
DISTRICT : NAGPUR	STATE : MAHARASHTRA
Processed at : IT Centre, MECL, Nagpur.	
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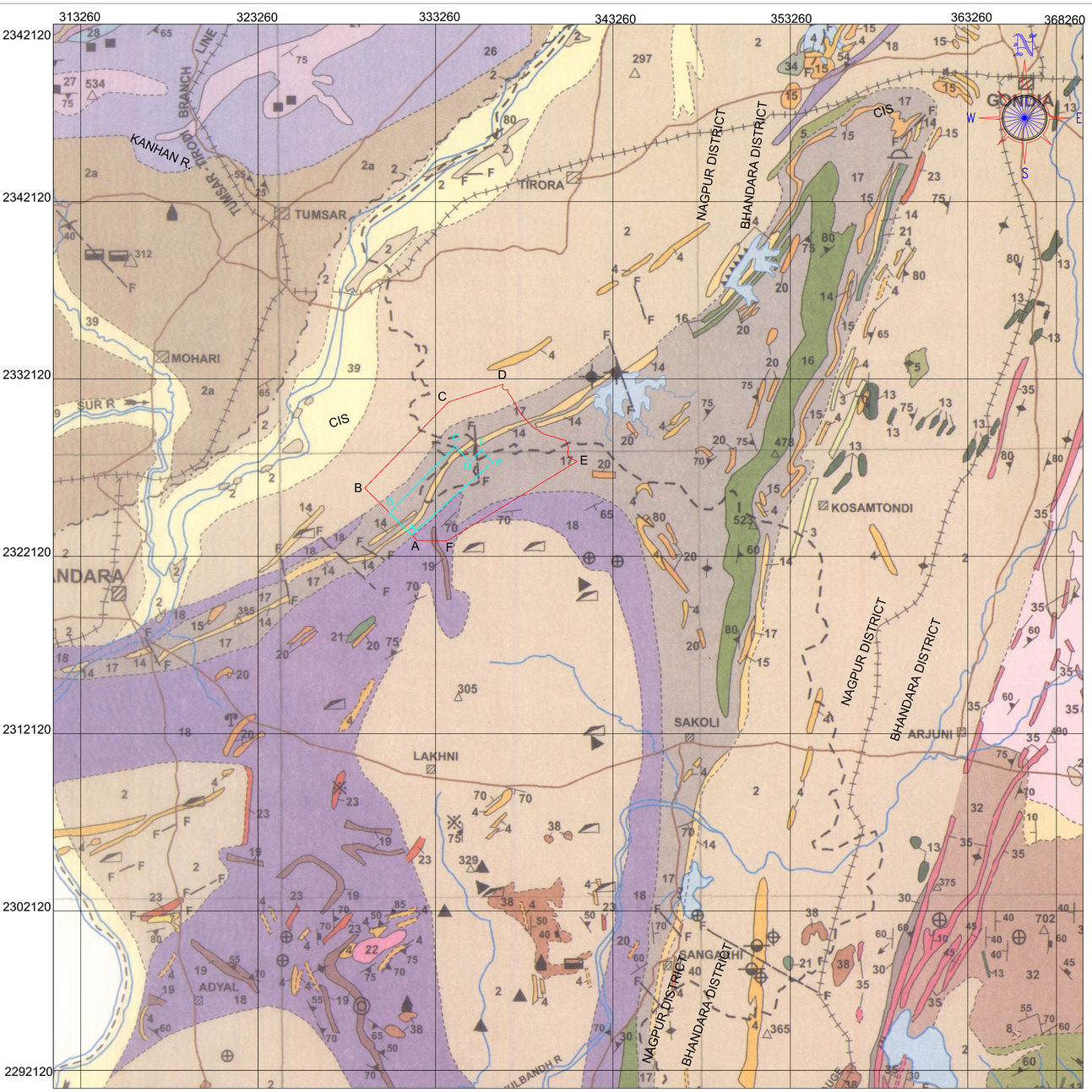

NAGPUR DISTRICT

	LITHOLOGY	STRATIGRAPHIC STATUS		AGE
28	Alluvium			QUATERNARY
24	Intertrappean beds		SAHYADRI GROUP (DECCAN TRAP)	CRETACEOUS-PALAEOGENE
23	Undifferentiated basalt			
22	Conglomerate,sandstone,shale,limestone		LAMETA GROUP	CRETACEOUS
21	Sandstone and ferruginous sandstone	Kamthi Fm	GONDWANA SUPER GROUP	PERMIAN-TRIASSIC
20	Boulder bed,sandstone,shale	Talchir Fm		
19	Granite,pegmatite			
15	Muscovite-biotite schist with manganese ore	Mansar Fm	SAUSAR GROUP	MESO PROTEROZOIC
12	Silicified zone,quartz,reef			
11	Metarhyolite,tuff,felsic volcanics and associated tuff		SAKOLI GROUP	
10	Mica schist			
9	Phyllite,carbonaceous phyllite			
8	Tourmalinite,coticule			
7	Metabasalt with associated tuff			
6	Amphibolite	AMGAON GNEISSIC COMPLEX		ARCHEAN PALAEO PROTEROZOIC
4	Quartzite(±Kyanite,Sillimanite)			
3	Calc-silicate rock			
2	Granite gneiss with migmatite gneiss			
3a	Granite gneiss with migmatite/granite		TIRODI GNEISSIC COMPLEX	
1	Granulite			

BHANDARA DISTRICT

	LITHOLOGY	STRATIGRAPHIC STATUS		AGE
39	Alluvium			HOLOCENE-PLEISTOCENE (QUATERNARY)
38	Laterite			CAINOZOIC
36	Sandstone/Shale	Vindhyan Supergroup (Equivalent)		NEO PROTERZOIC
23	Silcified zone/quartz reef		Sakoli Group	MESO PROTERZOIC
19	Meta-rhyolite/tuff			
18	Mica-schist			
17	Phyllite,tuffaceous phyllite and carbonaceous phyllite			
15	Banded Iron Formation(BIF)			
14	Gritty quartzite,meta-arkose and conglomerate			
4	Quartzite,gritty quartzite	Amgaon Gneissic Complex		
2	Granitic gneisses			
2a	Granitic gneisses with migmatite/granite		Tirodi Gneissic Complex	ARCHAEAN-PALAEO PROTERZOIC
1	Granulite			

STRUCTURAL INDEX

- Confirmed litho-contact
- inferred litho-contact
- Central Indian Shear zone(CIS)
- Attitude of bedding : inclined/vertical
- Attitude of foliation : inclined/vertical
- Attitude of joint : inclined/vertical
- Fault

MINERAL INDEX

- Antimony
- Chromite
- Copper
- Coal
- Gold
- Lead
- Zinc
- Kyanite
- Tungsten

GENERAL INDEX

- District boundary
- Height of triangulation station in m
- Railway Line
- Road
- Settlement
- Drainage with direction of flow
- Reservoir

Block Boundary
KUHI-KHOBNA-AGARGAON GAP AREA BLOCK

Block Boundary
AREA BETWEEN KUHI & KHOBNA BLOCK

MINERAL EXPLORATION CORPORATION LIMITED

REGIONAL GEOLOGY MAP
AREA BETWEEN KUHI & KHOBNA BLOCK
FOR TUNGSTEN & ASSOCIATED MINERALS
MAP NOT TO SCALE

DISTRICT : NAGPUR — STATE : MAHARASHTRA

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