PROPOSAL FOR PRELIMINARY (G-3) EXPLORATION FOR COPPER, LEAD, ZINC AND ASSOCIATED MINERALS INSALAIYA PHATAK BLOCK, DISTRICT- KATNI & UMARIA, MADHYA PRADESH

COMMODITY: COPPER, LEAD, ZINC AND ASSOCIATED MINERALS

BY

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PLACE: NAGPUR
DATE: 16.05.2024

Summary of the Block for G3 Level Exploration
GENERAL INFORMATION ABOUT THE BLOCK

	Features	Details
	Block ID	SALAIYA PHATAK BLOCK
	Exploration Agency	Mineral Exploration And Consultancy Limited (MECL)
	Commodity	Copper, Lead, Zinc and associated minerals
	Mineral Belt	Mahakoshal
	Completion period with entire Time schedule to complete the project	11 months
	Objectives	1. To check the strike continuity of polymetallic mineralization in the south of imaliya area by channeling, trenching and systematic drilling up to 1st and 2nd level intersection. 2. Further west, near Salaiyaphatak area, delineate parallel polymetallic mineralization by channeling, trenching and systematic drilling up to 1st and 2nd level intersection. 3. To estimate preliminary mineral resource (333) and grade for Copper, Lead, Zinc and associated minerals as per UNFC and MEMC- 2015. 4. To facilitatethe State government to auction the block as a composite lease.
	Whether the work will be carried out by the proposed agency or through outsourcing	Work will be carried out by the proposed agency(MECL).
	Name/Number of Geoscientists	Two no. Geoscientists
	Expected Field days	Geologist Party days:150 days at field 90 days at HQ
1.	**Location**	
	Block boundary corner points	
	Villages	Salaiyaphatak, imaliya

Cardinal Points	Easting(m)	Northing(m)	Latitude	Longitude
A	423069.0068	2608654.234	23° 35' 11.535" N	86° 14' 45.731" E
B	424763.5138	2609118.909	23° 35' 26.93" N	86° 15' 45.428" E
C	425943.0252	2610426.242	23° 36' 9.635" N	86° 16' 26.808" E
D	426353.9576	2610145.593	23° 36' 0.577" N	86° 16' 41.357" E
E	423989.6772	2607897.784	23° 34' 47.095" N	86° 15' 18.35" E

	Tehsil/Taluk	Sleemnabad
	District	Katni&Umaria
	State	Madhya Pradesh
2.	**Area**	
	Block Area	1.86 Sq. Km.
	Forest Area	Open forest
	Government Land Area	Data not available
	Charagaha	Data not available
	Private Land Area	Most of the area is open forest
3.	**Accessibility**	
	Nearest Rail Head	Sleemnabad Road (7 Km)
	Road	The area can be accessed via National Highway 7, State Highway 48
	Airport	Jabalpur in SW Direction (60 km)
4.	**Hydrography**	
	Local Surface Drainage Pattern (Channels)	Small seasonal nalas originating from ENE-WSW running hill ranges flow through the plains in a north to north-west direction.
5.	**Climate**	
	Mean Annual Rainfall	The annual average rainfall recorded is about 1560 mm
	Temperatures (December) (Minimum) Temperatures (June) (Maximum)	Minimum temperatures $5^{O}C$. Maximum temperatures up to $46^{O}C$.
6.	**Topography**	
	Toposheet Number	64A/02& 64A/06
	Morphology of the Area	The terrain of the block has rugged topography, comprising high undulating flat topped hillocks, v-shaped valleys, sinuous water bodies. The lowest valley floors at an altitude of 411 metres from the MSL and the highest ridge top has the maximum elevation of 510 meters above the MSL.
7.	**Availability of baseline geosciences data**	
	Geological Map	Geological map on 1:12500 scale (Source: MECL)

	(1:50K/25K)	
	Geochemical Map	NGCM Map (Source: Bhukosh, GSI)
	Geophysical Map (Aeromagnetic, ground geophysical, Regional as well as local scale GP maps)	Gravity and Magnetic Map (Source: Bhukosh,GSI)
8.	**Justification for taking up G3 level Exploration**	1. The area belongs to the Mahakoshal Group which is well known for various mineral resources including Iron, Manganese, base metals& Gold. 2. Occurrence of polymetalic mineralisation of in imaliya is well known and GSI & DGM, MP have been exploring this region since 1952. 3. It has been established that the polymetalic mineralization of imaliya area primarily associated with brecciated, iron-stained, ramifying quartz veins that follow predominantly NNW-SSE set of fractures across the regional strike of the country rocks. 4. Similar geological setup with surface sulphide mineralization has been encountered 2Km west of imaliya area, near salaiya phatak, during Reconnaissance Survey (G4) of Salaiya block. One sample from the iron stained sheared quartz vein of the salaiya phatak area have been analysed 0.88% Cu value. 5. During FS 2016-17, near Salaiyaphatak rail track, arsenopyrite within blackchert and jasper bands have analyzed 0.4ppm gold. In addition, quartz porphyry to the south of imaliya area analyzed gold up to 5 ppm. 6. GSI during various field seasons, have concentrated study and delineated 325m long mineralized zone in the imaliya area and targeted gossanized zones encountered in old workings and trench sections. Further south of imaliya area, there are several gossanized zones along with quartz porphyry present which also warrants detailed investigation, along with salaiya phatak area. 7. MECL, in its Reconnaissance survey (G4) report of Salaiya block, recommended for systematic exploration along with drilling in this block to upgrade in G3 level and estimate resource in inferred category. This will also help the state government to auction the block in CL (Composite lease) category.

PROPOSAL FOR PRELIMINARY (G-3) EXPLORATION FOR COPPER, LEAD, ZINC AND ASSOCIATED MINERALS IN SALAIYA PHATAK BLOCK, DISTRICT- KATNI & UMARIA, MADHYA PRADESH

1.1.0 INTRODUCTION

1.1.1 Copper, known for its excellent conductivity and malleability, serves as a vital component in electrical wiring, electronics, and telecommunications infrastructure. Its versatility extends to plumbing, heating systems, and architectural applications. With the rise of renewable energy technologies like solar and wind power, copper's demand has surged, further solidifying its importance in the transition to a sustainable future.

1.1.2 Lead, though its applications have diversified over time, remains essential in industries such as automotive manufacturing, battery production, and construction. Lead-acid batteries power vehicles, backup power systems, and serve as energy storage solutions for renewable sources, underscoring lead's enduring relevance in modern society.

1.1.3 Zinc, often overshadowed by its counterparts, plays a pivotal role in galvanizing steel to prevent corrosion, making it indispensable in the construction, automotive, and infrastructure sectors. Additionally, zinc finds application in the production of alloys, chemicals, and as a nutrient in agriculture, contributing to global food security.

1.1.4 Gold, prized for its rarity, beauty, and intrinsic value, holds a unique place in the industrial landscape as well as culture and finance. While its industrial applications are comparatively limited, gold remains integral in electronics manufacturing, aerospace technology, and medical devices due to its exceptional conductivity, reflectivity, and corrosion resistance. Beyond industry, gold serves as a store of value, a hedge against inflation, and a symbol of wealth and prestige, making it a sought-after commodity in global markets.

1.1.5 India, with its abundant mineral resources including copper, lead, zinc, and gold, possesses a significant advantage in meeting domestic demand and contributing to the global supply chain. Still, during preceding decades, no large-scale metal deposit has been discovered in India.However, the possibility of working of small mineral bodies in proximity to each other, through technological advances and increased operational efficiency cannot be ruled out. Therefore, it is necessary and imperative to locate and explore such small metal deposits in cluster.

2.1.0 BACKGROUND INFORMATION

2.1.1 The Mahakosal Supracrustal belt is known for its mineral potentiality for Iron, Manganese, Gold, Graphite, base metals and Dolomite /Limestone. MECL has conducted desktop studies with the help of the available geoscience data and found the area in and around Sleemnabad of Katni & Umaria district is known for Iron, Bauxite and polymetallic mineralization. This paved the way for the formulation of proposal for

reconnaissance (G4) survey for Iron, Manganese and associated minerals in the Salaiya Block, Madhya Pradesh, spanning Jabalpur, Katni, and Umaria districts. This exploration proposal has been submitted to 50th TCC of NMET for discussion, aims to assess iron and associated mineral deposits, contributing to India's minerals sector and economic growth.

2.1.2 The 50th TCC of NMET approved Reconnaissance Survey (G4) in Salaiya block, Madhya Pradesh and received approval from Executive Committee (EC) of NMET on April 3, 2023. This comprehensive survey, encompassing iron, manganese and associated minerals, was conducted from 20th June, 2023 to 19th October, 2023. After review in 63rd TCC of NMET, the FGR (Final Geological Report) has been submitted in March, 2024.

2.1.3 In the FGR of Reconnaissance Survey (G4) in Salaiya block, an area near salaiya phatak & imaliya village has been delineated for base metal and gold mineralization. It was recommended to take up detailed mapping, channel sampling in this block to delineate the mineralization in the potential area.

2.1.4 Therefore, MECL has prepared Preliminary Exploration (G3) proposal of Salaiya Phatak block, with channel sampling, 470m drilling in 6 boreholes, has been proposed for technical evaluation in 65th TCC of NMET.

3.1.0 LOCATION AND ACCESSIBILITY

3.1.1 The Salaiya Phatak Block encompasses the region delineated in Survey of India Toposheet No. 64A/02& 64A/06, spanning an area of 1.86 square kilometers. This geographical expanse spans across portions of Katni & Umaria district within the state of Madhya Pradesh. The study area conveniently located approximately 60km from Jabalpur on NH-7 and around 30km from Katni & Umaria, also accessible via NH-7. The Sihora Road Railway Station, situated approximately 7 km from the block, serves as the nearest rail link. The Jabalpur airport is the closest air transportation hub.

CARDINAL POINT COORDINATE OF SALAIYA PHATAK BLOCK, DISTRICT: KATNI& UMARIA, MADHYA PRADESH (G-3 LEVEL)

Cardinal Points	Easting(m)	Northing(m)	Latitude	Longitude
A	423069.0068	2608654.234	23° 35' 11.535" N	86° 14' 45.731" E
B	424763.5138	2609118.909	23° 35' 26.93" N	86° 15' 45.428" E
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4.1.0 PHYSIOGRAPHY, DRAINAGE AND CLIMATE

4.1.1 The Salaiya Phatakblock and its surroundings present a diverse topography, characterized by a generally flat terrain with monotonous soil cover. To the south, ENE-WSE trending hill ranges, reaching a maximum height of 510m above MSL, are covered by the Amoch-Chiulapani reserve forests. The terrain becomes uneven north of Amoch, transitioning into a hilly area with long ridges trending ENE-WSW, alternating with valleys and nalas along the margins. The minimum elevation is 411m above M.S.L. To the sleemnabad part, the topography is undulatory, marked by ENE-WSW trending hillocks, with flat terrain mostly covered by dolomite & phyllite.

4.1.2 The Salaiya Phatak block and its surroundings features a diverse drainage pattern influenced by both structure and lithology. Small seasonal nalas originating from ENE-WSW running hill ranges flow through the plains in a north to north-west direction, feeding either small rivers or large tanks common in the region. The rectilinear and joint-controlled flow characterizes nalas from ridges, while flat terrains exhibit sub-parallel to trellis-type drainage.In this area 3rd order Silpuri nala flows south to join Narmada river system. Also minor canals originating from local reservoirs/ water bodies in this area made for irrigation purpose.

4.1.3 The study area is characterized by a subtropical climate, marked by distinct seasonal variations. Winters are relatively cool, with temperatures dropping to as low as 5°C, while summers can be hot and semi-dry, reaching up to 46°C. The region experiences an average annual rainfall of about 1560 mm, with the monsoon active from July to September, contributing significantly to the precipitation.

5.1.0 PREVIOUS WORK

5.1.1 Some of the earliest Memoirs published by Geological Survey of India deal with the geology of this part of Central India (Medlicott, 1860, Oldham, 1860). Hacket carried out systematic geological mapping during the field season 1869-70 and 1870-71 and he called the rocks as Bijawars.In the year 1876, copper and lead occurrence near Sleemanabad was first reported by Mr.Olpherts of GIP Railway, an Engineer of Jabalpur Section.

5.1.2 In 1904–1906, P. C. Dutt of Jabalpur carried out prospecting in Imaliya area near Sleemanabad for basemetals. In 1937, Crookshank and Ray traversed around the Sleemanabad – Niwar area and recommended drilling in Imaliya area.

5.1.3 In year 1961-62 and 1962-63, during the systematic geological mapping by Sharma emphasize copper and lead mineralization in dolomites along the fault zones. Sharma (1963) mapped the southern hilly part and reported additional information of copper mineralisation in Amgaon and Sunehra areas. Subsequently Chande and Bhoskar (1969-70) reported mineralisation of limited extent which occurs in N-S trending shear

fractures. They estimated copper reserves of 0.075 million tonnes of 1.12% copper in Imaliya area for a strike length of 240m. Presence of gold and silver was also identified.

5.1.4 In year 1997-1998 exploration work was carried out in Imaliya block of Sleemanabad by with special emphasis on gold along with silver and other polymetallic mineralisation to assess the potentiality of the block. An area of 1.40 sq km was mapped on 1:2,000 scale and pitting and trenching were carried out to delineate small gossanised zones. Targeting the eastern NNW-SSE trending gossanised shear zone, a total of 1042.60m drilling in 14 boreholes was done covering 600m strike length. During the field season 1999-2000, the project was identified as a “Fast Track Project” and also two years extension was given to complete the work. The work was concluded after completion of 60 boreholes drilled in Imaliya block and entire operational work was completed by date 30.10.2001.

5.1.5 The total Gold resource in Imaliya block was estimated at 466011 ton (Au 1.27g/t) by cross section method. GSI identified gold and sulphide mineralization in the Imliya area, covering a 750m strike with a 2m average width during 1997-2001 and 2016-2017. Notably, sulphide mineralization, including pyrite, chalcopyrite, and galena, was found by MECL during Reconnaissance Survey (G4) in gossanized quartz veins around SalaiyaPhatak. Whole rock samples near Salaiya Phatak revealed a significant 0.88% Cu value within sheared dolomite.

6.1.0 GEOLOGY OF THE AREA

6.1.1 The Salaiya Phatak block falls within the Mahakoshal supracrustal belt, an ENE–WSW to E–W-oriented structure stretching approximately 600 km from southwest Jabalpur to Palamau district. The Mahakoshal Group includes meta-sediments, metabasalt, ultramafic rocks, acid volcanic tuffs, mafic dykes, and granitoids. Nair et al. categorized it into Chitrangi, Agori (Sleemnabad), and Parsoi Formations. The Agori(Sleemnabad) Formation comprises clastic and non-clastic sediments, featuring Banded Iron Formations (BIF) with BHQ/BMQ and ridges trending ENE-WSW. The BIF transitions to chert and brecciated quartzite/jasper along the strike.

6.1.2 The study area within the Mahakoshal Group reveals distinct geological features of Agori (Sleemnabad) formation. Supracrustals are distributed around Chhapra, Amoch, Nimas, Sleemnabad, and Mahagwan, with intervening spaces covered by Quaternary alluvial deposits or laterite. Prominent ferruginous quartzite ridges, in the north of the study area, transit into cherty quartzite, brecciated quartzite, and banded quartzite jasper with Manganese. Dolomite mines are present north of the ridges, covered by laterite. The tops and slopes of the ferruginous ridges are covered by a substantial layer of laterite, presenting a diverse color spectrum from yellow to greyish-white, transitioning to light to dark brown with increasing ferruginous content. Moving south, phyllite exposures and metabasalt occurrences are observed, forming discontinuous hillocks. The Amoch area displays a supracrustal sequence, featuring quartzite/chert bands, dolomite,

phyllite(manganiferous in some areas), and banded quartzite chert/jasper. The sedimentary sequence indicates continuous deposition without unconformities.

6.1.3 Sulphide mineralization is primarily structurally controlled, occurring within sheared and brecciated zones in form of quartz veins. These zones exhibit a consistent trend, generally oriented NNW-SSE to N-S, with steep westerly dips. The presence of mineralization along these structural features indicates a relationship between the geological structures and the concentration of sulphides. The mineralization is notably confined to fractures within the quartz porphyry. The fractures are filled with mineralized vein material and generally follow the trend of NNW-SSE to N-S. This suggests that the orientation of fractures plays a crucial role in controlling the distribution of sulphide mineralization.

6.1.4 NNW-SSE trending extensional shears/fractures cut across the regional trend of country rocks in an en echelon pattern. These zones trend N10°W to S10°E with steep westerly or vertical dips. These fractures often host oxidation and gossan zones. Thin fractures in the same direction contain pyrite, chalcopyrite, and limonitic encrustations. Emplacement of quartz porphyry dykes is affected by this fracture system.

6.1.5 **Common rock types**

Metasedimentary litho-units encompass both clastic and non-clastic compositions. The clastic components consist of Quartzite, Phyllite, and BIF, while the non-clastic components are primarily dolomite with minor occurrences of cherts.

Cherty Quartzite/ Ferruginous quartzite/ Banded Quartzite Jasper: The banded quartzite in the area displays yellow to greyish-white colors, often featuring patches of red jasper. As the ferruginous content increases, the quartzite transitions to light to dark brown hues. These quartzites form parallel bands, constituting prominent ridges in the region, occasionally associated with conglomerates. The outcrops are bouldery and lack of penetrative structures. Manganese encrustations within vugs are observed at some locationsand iron-rich laterite occurs as float in specific areas.The quartzite outcrops are generally oriented in an ENE-WSW direction. Some portions of the quartzite show ferruginous characteristics and may be brecciated. Secondary calcite/carbonate infillings are present within vugs. In slopes, the ferruginous quartzite tends to exhibit moderate lateritization. The brecciated segments, being more ferruginous, often contain hematite fragments.

Phyllite: exposures of phyllite are visible in the road section of Dhagawan and north of Hathwai village. Primary banding is rarely observed in these rocks, with only an ENE-WSW trending pervasive foliation present. Garnets are sporadically noticed in these phyllites. The rock is light to dark grey in color, fine-grained, and schistose. It exhibits two different generations of quartz veins, with the first being syngenetic and forming along with the phyllitic deformation. This generation creates alternate phyllite and quartz bands. The second generation quartz vein is post-deformation and fills fractures/joints.

Shearing is evident in the phyllite, manifesting as the development of phyllitic fish and augen-shaped primary quartz. The sense of shearing is sinistral, and a crude crenulation has formed due to this shearing. The attitude of the phyllitic plane strikes at 70° with a 50° dip towards the south.In some areas, the phyllites undergo significant silicification and gradually transition into argillaceous quartzite. Thin quartzite bands are intercalated within the phyllite, and various basic intrusives traverse the rocks as sills.

Laterite: Extensive laterite cover dominates the central and southern parts of the mapped area, particularly around the east of Amoch and north of Mahagwan village. Additionally, laterite capping is evident on a low-lying ridge near Majholi and Khalari villages, along with several mounds in the east of Dundi village. The laterite displays a spectrum of colors ranging from yellow to brick-red. Various types of laterites, including massive/laminated, concretionary, vermicular, and vesicular, are observed, showcasing inhomogeneity and density. Thin coatings of Fe/Al oxides and hydroxides are visible in the vesicles or voids. Laterite formations are commonly found alongside banded quartzite jasper at the slopes.

In naked-eye observations, goethite and hematite are discernible, indicating high iron content. Alumina concentration is notable in and around Majholi village. These laterites contain lumps of platy or biscuity hematite, cemented by a minimal ferruginous matrix. The parent rock for these laterites is identified as Banded Hematite Chert (BHC). In specific locations, such as west of Amoch and around Majholi village, yellow ochre pockets are visible in these laterites, commercially exploited for their valuable content. It is plausible that the laterite formation was not uniform but rather pocket-type.

Dolomite: The rock, ranging from pale yellow to milky white colour, is fine to medium-grained. Noteworthy exposures are observed around Salaiya, south of Imalia, southeast of Bhula, and south of Bandhi. Dolomite powder exhibits effervescence when comes in contact with diluted HCl. Its strike is approximately E-W, with a steep dip ranging from 55° to 65° towards the south. Mineral lineation, influenced by preferentially oriented biotite, is evident, along with the persistence of thin quartz veins.

Dolomite near Salaiya Phatak and Imaliya area is reported to have gold and sulphide occurrences. Numerous quartz veins intrude along joint and fracture planes, creating a cross-cutting pattern that results in elephant skin weathering—a characteristic feature of dolomite. In some areas, the intruded quartz veins appear smoky. A dextral sense shear zone with a 10 cm thick sulphide zone has been observed.

Quartz Porphyry: Dolomites are intersected by quartz porphyry dykes, which extend in a NNW-SSE direction. These dykes are noticeable as minor elevations or hillocks, exhibiting greater resistance to weathering compared to the surrounding host rock. The width of the quartz porphyry dykes varies between 2 to 4 meters. These dykes appear as isolated elevations and surface exposures, aligning approximately along the strike direction. The dolomites adjacent to the quartz-porphyry frequently exhibit silicification. A quartz porphyry dyke is found just south of the railway line close to Imalia village. This

dyke is recognized for its robust and compact characteristics, showcasing a pale green color and revealing a prominent porphyritic texture. Within the dyke, rounded to subrounded phenocrysts of quartz are dispersed throughout a cherty, sericitic fine-grained matrix.

7.1.0 OBJECTIVE OF THE PROPOSED EXPLORATION PROGRAMME

The present exploration programme has been formulated to fulfill the following objectives:

1. To check the strike continuity of polymetallic mineralization in the south of imaliya area by channeling, trenching and systematic drilling up to 1st and 2nd level intersection.

2. Further west, near Salaiya phatak area, delineate parallel polymetallic mineralization by channeling, trenching and systematic drilling up to 1st and 2nd level intersection.

3. To estimate inferred mineral resource (333) and grade for Copper, Lead, Zinc and associated minerals as per UNFC and MEMC- 2015.

4. To facilitatethe State government to auction the block as a composite lease.

8.1.0 PROPOSED SCHEME OF EXPLORATION

8.1.1 In accordance with the objectives set for G-3 level exploration in SalaiyaPhatakBlock, the exploration programme is proposed to carry outin two phases. The first phase comprises of detailed mapping, systematic channel sampling & trenching. Based on the outcome of the first phase of the exploration work the second phase with systematic drilling, core sampling, and other associated geological and laboratory work will be performed. The exploration shall be carried out as per Mineral (Evidence & Mineral Contents) Rule -2015, Mineral Auction Rule-2015 and MMDR Amendment Act-2015. The details of different activities to be carried out are presented in subsequent paragraphs.

Phase- I

8.1.2 **Detailed Mapping:**Identified block area of 1.86 Sq. Km will be mapped on 1:2000 scale. Rock types, their contact, structural features will be mapped in detail. Surface manifestations of polymetallic mineralization will be recorded duly. Shear zones, sheared quartz veins, gossanised zoned will be the preffered zones of possible mineralization, hence, careful record and recognition will be done.

8.1.3 **Trenching:** After detailed geological mapping, trenching of around 50 cubic meter will be done to expose mineralized zones within dolomite, across the strike of previously delineated mineralized zones.

8.1.4 **Channel sampling:** Systamatic channel sampling will be performed across the identified possible mineralised zones in surface and exposed zoned in trenches. Samples will be collected after tearing off the weathered part. Around 2 Kg of rock sample will be collected for each sample. The interval of the samples from a channel will be judicially calculated by the field geologist, with strong justification. In this way, 150 nos. of samples will be collected. Out of the 150 samples, 40 samples will be marked for gold analysis.

8.1.5 **Sample processing and chemical analysis:**Each of the collected 150 samples will be entirely powdered to -100 mesh size.Following the initial crushing, representative samples of around 200 grams are drawn through successive reduction using the coning and quartering method, from the initially marked 40 samples for gold. After drawing samples for gold, each of the 150 samples will again be powdered to -200 mesh size. Representative samples of around 100 grams are drawn through successive reduction using the coning and quartering method from the 150 samples. The 40 samples of -100 mesh size will be subjected to gold analysis by fire assay method and 150 samples of -200 size will be subjected to analysis of Cu, Pb, Zn, Ag & Sn by AAS method. Around 10% of the samples, i.e. 15 nos. will be analysed as check samples for Cu, Pb, Zn, Ag & Sn by AAS method.

8.1.6 On getting positive outcome from Phase- I exploration work, Phase- II work will be commenced after reviewing to TCC of NMET.

8.1.7 **Topographic Survey:**The triangulation network would be laid down in the block area with the help of DGPS & Total Station and the same would be tied up with the GTS triangulation station present in the nearby area. Topographical survey will be carried out in the block area in which G-3 stage of exploration is to be carried out. All the surface features will be picked up and marked on a map on1: 2000 scale. The entire area will be covered by doing contouring at 2m interval. The block boundary will be surveyed by DGPS & total station in WGS-84 Datum for demarcation of Block Boundary points and ancillary area to facilitate the State Governments for auctioning of the Block.

8.1.8 **Core Drilling:**The present exploration scheme is prepared by proposing 6 nos. of inclined boreholes based on the geological mapping and channel sampling carried out in the Phase- I exploration programme. Initially, four (04) first level boreholes with possible intersection at 50m vertical depth from the surface will be taken up. Two boreholes at alternate section will be taken up for second level intersection at 100m vertical depth from the surface. The second level boreholes will only be taken up after mineralization is confirmed in the first level boreholes..

8.1.9 **Core Logging:** 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, shear zones, fracture

system, lithological variations along with visual estimate in respect of sulphide mineralization in the core.

8.1.10 **Core sampling procedure and Chemical analysis:**For preparation of samples, the borehole core will be splitted into two equal halves by using core splitter. One half will be powdered to (-) 100 mesh size and the other half will be kept for future studies. Around 120 nos. of samples will be drawn from the potential part of the core for analysis of Cu, Pb, Zn, Ag &Sn and for gold analysis, 30 nos. of samples from the potential zones i.e. sheared quartz veins, sheared fracture system etc., will be marked. Following the initial crushing, representative samples of around 200 grams are drawn through successive reduction using the coning and quartering method, from the initially marked 30 samples for gold. After drawing samples for gold, each of the 120 samples will again be powdered to -200 mesh size. Representative samples of around 100 grams are drawn through successive reduction using the coning and quartering method from the 120 samples. The 30 samples of -100 mesh size will be subjected to gold analysis by fire assay method and 120 samples of -200 size will be subjected to analysis of Cu, Pb, Zn, Ag &Sn by AAS method. Around 10% of the samples, i.e. 15 nos. will be analysed as check samples for Cu, Pb, Zn, Ag&Sn by AAS method.

8.1.11 **Ore Microscopy**: Ten core samples from the mineralized zones in boreholes will be analyzed to identify ore mineral assemblages at various levels of intersection. These samples will be subjected to mineragraphic studies.

8.1.7 **Determination of Specific gravity:** To calculate the resource, volume of the ore body need to be multiplied with a density factor. Hence, specific gravity will be determined from 10 nos. of core samples selected from the mineralized zones at various intersections.

9.1.0 QUANTUM OF WORK

9.1.1 The following quantum of work has been proposed for G3 level exploration for Cu, Pb, Zn and associated minerals in SalaiyaPhatak block:

Sl. No.	ITEMS OF WORK	UNIT	Proposed Quantum for SalaiyaPhatak Block
			G3
Phase- I			
1	Geological Mapping (1:2000 scale)	Sq. Km	1.86
2	Primary Sample (Channel) for Cu, Pb, Zn, Ag &Sn by AAS method	Nos.	150
3	Primary Sample (Channel) for Au by fire assay method	Nos.	50
4	Check Sample (Channel) for Cu, Pb, Zn, Ag &Sn by AAS method	Nos.	15

5	Excavation (Trenching)	Cu.m	50
6	Ore microscopic Study	Nos.	10
	Phase- II		
7	Topographic Survey (2m contour interval)	Sq. Km	1.86
8	Drilling (Core)	m.	470 (4 first level Bh intersection + 2 second level Bh intersection)
9	Primary Sample (Core) for Cu, Pb, Zn, Ag &Sn by AAS method	Nos.	120
10	Primary Sample (Core) for Au by fire assay method		30
11	Check Sample (Core+Channel) for Au by fire assay method		10
12	Check Sample (Core) for Cu, Pb, Zn, Ag &Sn by AAS method	Nos.	15
13	Determination of specific gravity	Nos.	10
14	**Exploration Report [As per Mineral (Evidence of Mineral Contents) Rule-2015] /UNFC**	Nos.	1

10.1.0 TIME SCHEDULE AND COST ESTIMATES

10.1.1 The proposed exploration programme is planned in such a way that all the activities like, camp setting, mapping, trenching, channel sampling, drilling, logging, core sampling and associated geological work and laboratory work will be completed within 10months' time. Report writing will take 4 months' time with 2 month overlapping with laboratory analysis. Thus, the total duration of the project for completion of the above exploration will be 12 months from the date of commencement of the project. Review will be done after 6 months.

SCHEDULED TIME FOR G-3 LEVEL EXPLORATION OF COPPER, LEAD, ZINC AND ASSOCIATED METALS IN SALAIYA PHATAK BLOCK, DISTRICT- KATNI, MADHYA PRADESH													
S.No.	Activities	MONTHS											
		1	2	3	4	5	6	7	8	9	10	11	12
1	Camp setting						Review						
2	Geological Mapping (1:2000)												
3	Channel sampling												
4	Trenching												
5	Laboratory studies												
6	Core drilling (2 rig)												
7	Geologist days (Field)												
8	Core sampling												
9	Camp winding												
10	Geologist days (HQ)												
11	Report writing/ Peer review												
* Commencement of project will be reckoned from the day the exploration acreage is available along with all statutory clearances													
*Time loss on account of monsoon/agricultural activity/forest clearance/ local law & order problems will be addition to above time line.													

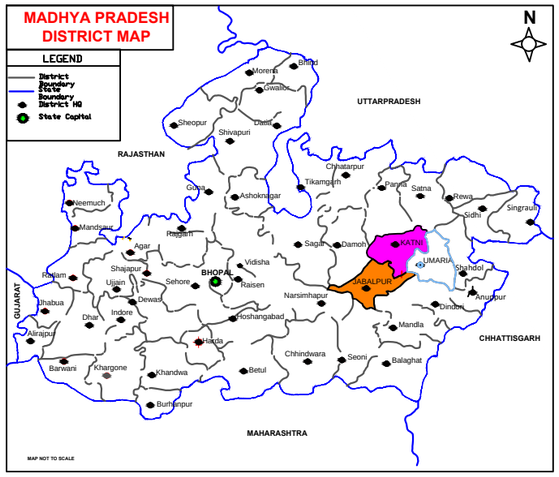
10.1.2 Cost has been estimated based on actual schedule of rates mandated in the circular OM No. 61/1/2018/NMET dated 31st March 2020 for NMET funded Projects. The total estimated cost is Rs. 145.23 Lakhs. The summary of cost estimates for this G3 level exploration is given below:

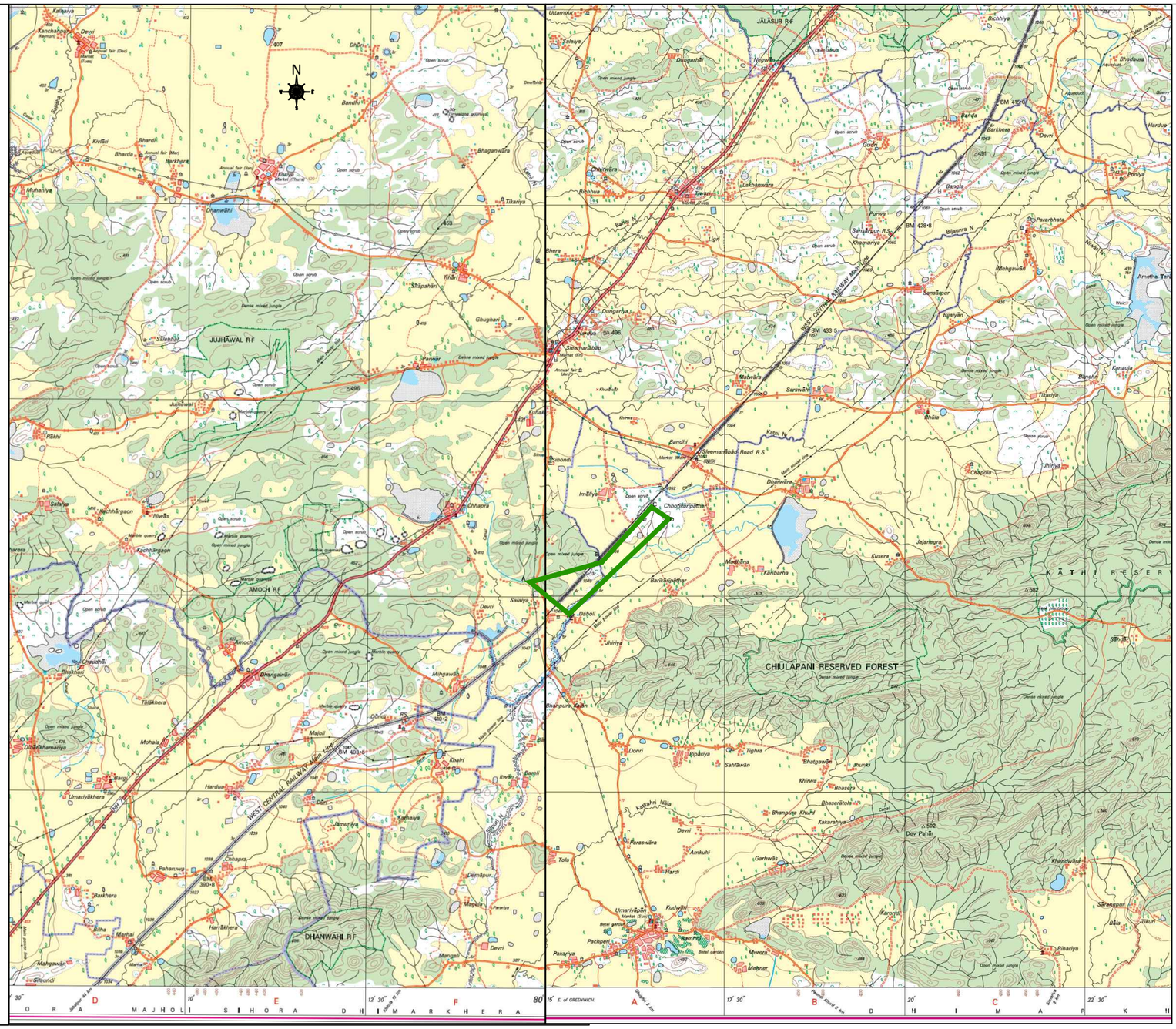
Summary of Cost Estimates

Sl. No.	Item	Total Estimated Cost (Rs.)
1	Geologist mandays Core logging, sampling	27,60,720
2	Excavation	1,66,500
3	Drilling	66,97,540
4	Laboratory studies	10,39,860
5	Geologist at HQ	8,10,000
	Sub Total (1 to 4)	1,14,74,620
5	Exploration Report Preparation	5,73,731
6	Proposal Preparation	2,29,492
7	Peer review charges	30,000
8	Sub Total (1 to 8)	1,23,07,843
9	GST 18%	22,15,412
	Total:	**1,45,23,255**
	Say Rs. In Lakh	**145.23**

Enclosures:

- Location Map of the proposed block
- Regional Geological map showing proposed block
- Geological & borehole location Map
- Cost Sheet





Cardinal Points	Easting	Northing	Latitude	Longitude
A	423069.0068	2608654.234	23° 35' 11.535" N	86° 14' 45.731" E
B	424763.5138	2609118.909	23° 35' 26.93" N	86° 15' 45.428" E
C	425943.0252	2610426.242	23° 36' 9.635" N	86° 16' 26.808" E
D	426353.9576	2610145.593	23° 36' 0.577" N	86° 16' 41.357" E
E	423989.6772	2607897.784	23° 34' 47.095" N	86° 15' 18.35" E

PROPOSED BLOCK BOUNDARY

MINERAL EXPLORATION & CONSULTANCY LIMITED

LOCATION MAP

Priliminary Exploration (G3) for Cu, Pb, Zn and associated metals in Salaiya Phatak Block (1.86 Sq. Km)

DISTRICT : KATNI & Umaria	STATE : MADHYA PRADESH
PART OF TOPOSHEET NO:-64A/02 & 64A/06	NOT TO SCALE

Prepared by :
Survey & map section
Exploration Division, MECL, Nagpur

MECL/CHQ/EXPLORATION/MAY-2024	PLATE NO. I	1

Regional Geological Map of Salaiya Phatak block, Dist- Katni & Umaria, Madhya Pradesh

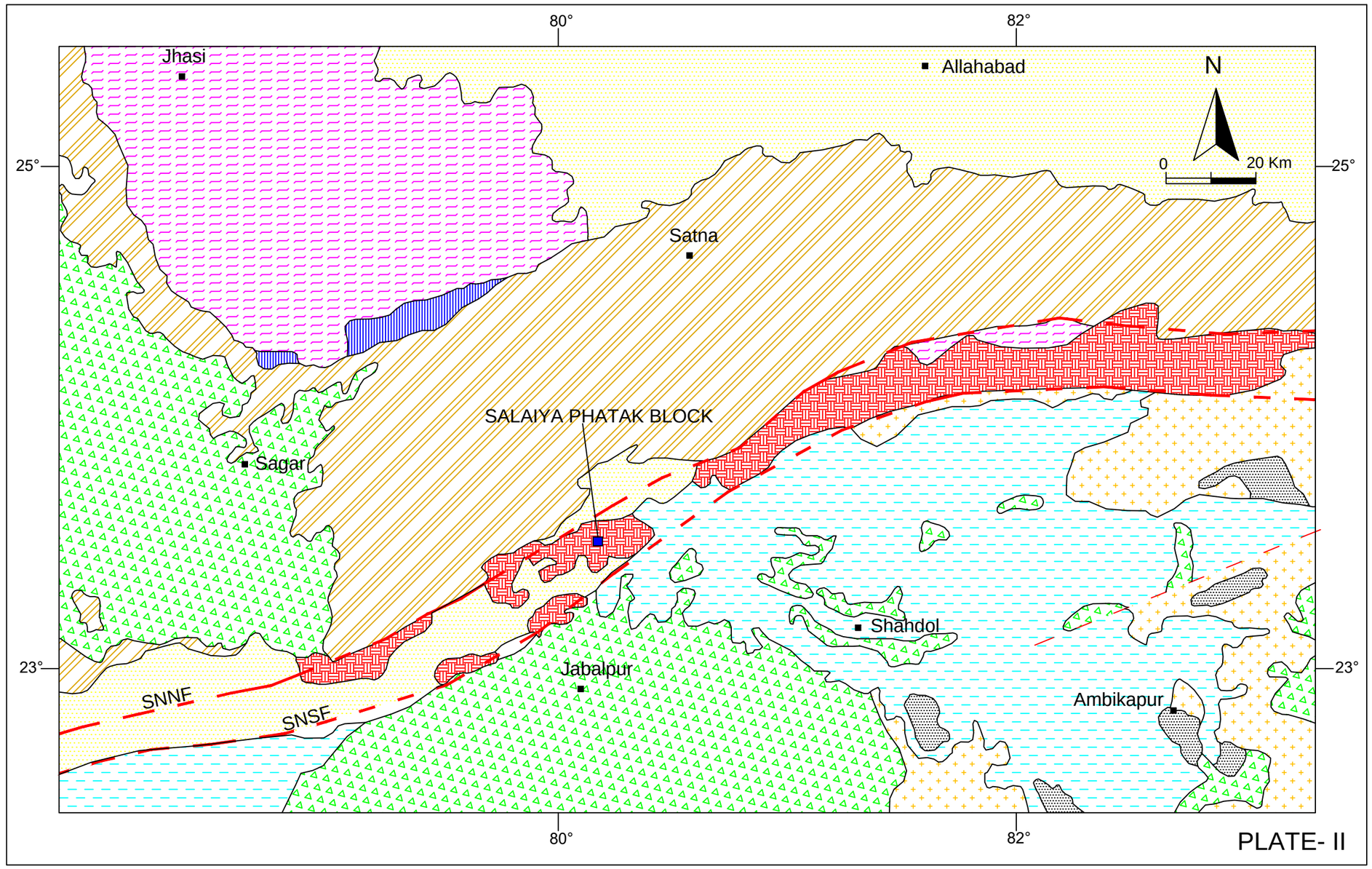


PLATE- II

- Alluvium
- Deccan Trap
- Gondwana Supergroup
- Vindhyan Supergroup
- Unclassified Supracrustal
- Bijawar Group
- Younger Granitoids
- Bundelkhand Granite-gneiss complex
- Mahakoshal Group

SNNF= Son-Narmada North Fault
SNSF= Son-Narmada South Fault

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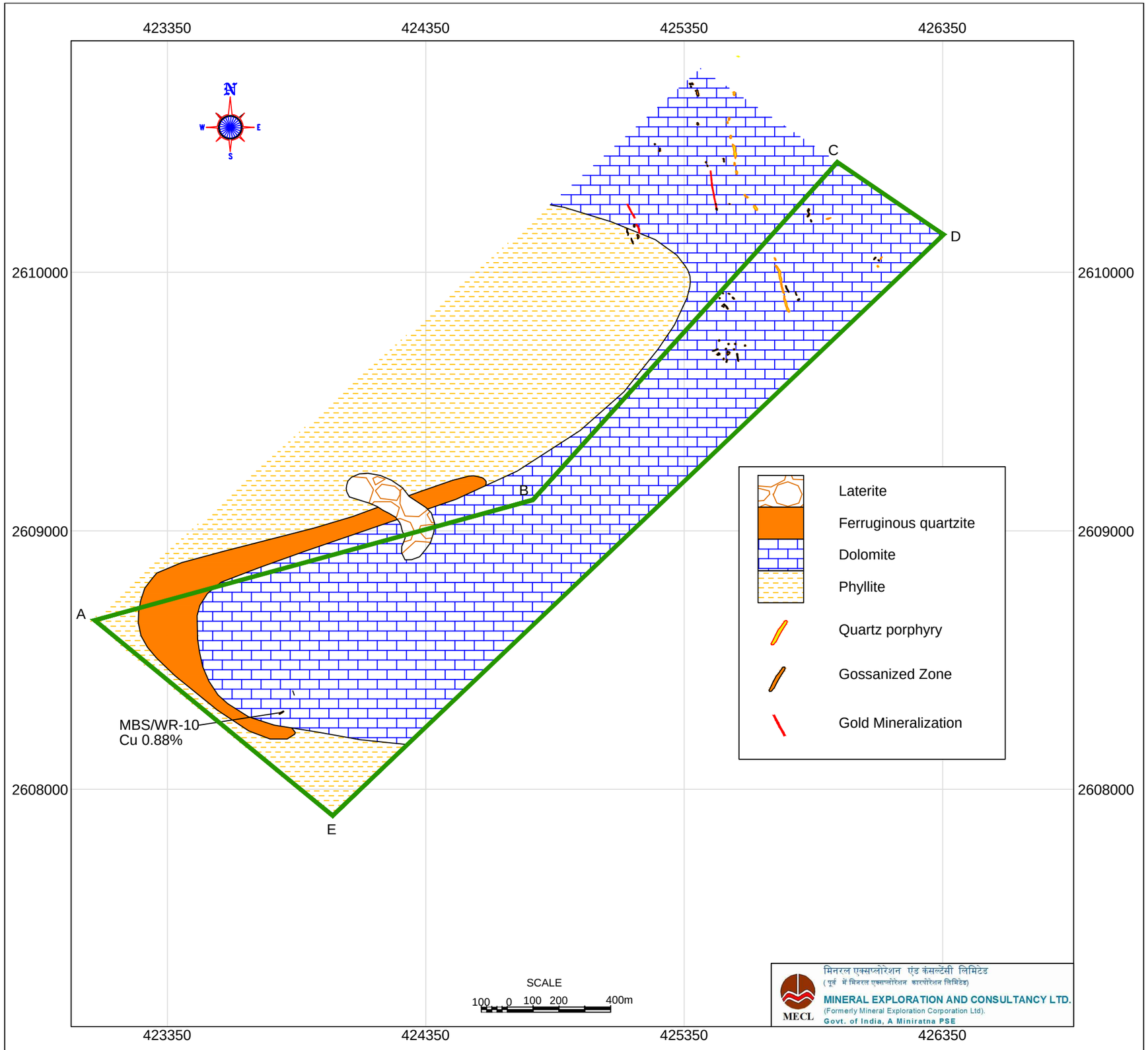
Govt. of India, A Miniratna PSE


423350
424350
425350
426350
2610000
2609000
2608000
N
W
E
S
A
B
C
D
E
MBS/WR-10
Cu 0.88%
Laterite
Ferruginous quartzite
Dolomite
Phyllite
Quartz porphyry
Gossanized Zone
Gold Mineralization
SCALE
100 0 100 200 400m
मिनरल एक्सप्लोरेशन एंड कंसल्टेंसी लिमिटेड
(पूर्व में मिनरल एक्सप्लोरेशन कारपोरेशन लिमिटेड)
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ESTIMATED COST FOR G-3 LEVEL EXPLORATION OF COPPER, LEAD, ZINC AND ASSOCIATED METALS IN SALAIYA PHATAK BLOCK, DISTRICT- KATNI, MADHYA PRADESH Total Area - 1.86 Sq. Km; Drilling- 470.00m, Completion Time - 12 Months, Review: after 6 months							
Sl. No.	**Item of Work**	**Unit**	**Rates as per NMET SoC 2020-21**		**Total Cost of the Project**		**Remarks**
			SoC- Item- S. No.	**Rates as per SoC**	**Qty.**	**Total Amount (Rs)**	
1.0	**Geology & Survey**						
1.1	Geologist (Field) man days for core logging/mapping/ Sampling/topographic survey	days	1.3	11,000	150	16,50,000	
1.2	Unskilled Labour (Field) (2 workers per geologist)	per worker	5.7	522	300	1,56,600	Amount will be reimburse as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher
1.3	Survey Party Days for topographic survey	days	1.6.1a	8300	30	2,49,000	
1.4	Unskilled Labour (Survey) (4 workers per Surveyer)	Days	5.7	522	120	62,640	Amount will be reimburse as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher
1.5	Sampling man days - Sampler (core sample,) Labour charge not included	day	1.5.2	5,100	60	3,06,000	
1.6	4 labours/ party (Rs 431/day/labour) (As per rates of Central Labour Commissioner) for sampling work	day	5.7	522	240	1,25,280	Amount will be reimburse as per the notified rates by the Central Labour Commissioner or respective State Govt. whichever is higher
1.7	Determination of co-ordinates and Reduced Level (RL) of boreholes by DGPS including boundary corner points.	Nos.	1.6.2	19200	11	2,11,200	Boreholes 6 Nos. + Block Boundary 5 Nos.
Sub-Total 1						**27,60,720**	
2.0	**Excavation**						
2.1	Trenching	Cu.m	2.1.1	3,330	50	1,66,500	
Sub-Total 2						**1,66,500**	
3.0	**Drilling**						
3.1	Drilling -Hard rock (up to 300m)	m	2.2.1.4a	11,500	470	54,05,000	
3.2	Borehole deviation survey	m	2.2.6	330	470	1,55,100	
3.3	Land / Crop Compansation (in case the BH falls in agreecultural Land)	per BH	5.6	20,000	6	1,20,000	Asper actual
3.4	Construction of concrete Pillar (12"x12"x30")	per borehole	2.2.7a	2,000	6	12,000	
3.5	Transportation of Drill Rig & Truck associated per drill (for 2 rig)	Km	2.2.8	36	700	25,200	700 Km to and fro for one rig
3.6	Monthly Accomodation Charges for drilling Camp (up to 2 Rigs)	month	2.2.9	50,000	3	1,50,000	
3.7	Drilling Camp Setting Cost	Nos	2.2.9a	2,50,000	1	2,50,000	
3.8	Drilling Camp Winding up Cost	Nos	2.2.9b	2,50,000	1	2,50,000	
3.9	Road Making (Rugged-Hilly Terrain)	Km	2.2.10b	22,020	2	44,040	
3.10	Drill Core Preservation	per m	5.3	1,590	180	2,86,200	
Sub-Total 2						**66,97,540**	
4.0	**Laboratory Studies**						
4.1	Primary + Check Sample (Channel) for Cu, Pb, Zn, Ag & Sn by AAS method	per sample	4.1.7a	2,506	300	7,51,800	
4.2	Primary + Check Sample for Au by fire assay method	per sample	4.1.5a	2,380	90	2,14,200	
4.3	Ore microscopy	per sample	4.3.4	4,232	10	42,320	
4.4	Preparation of polished thin section	per sample	4.3.2	1,549	10	15,490	
4.5	Specific gravity determination	per sample	4.8.1	1,605	10	16,050	
Sub-Total 3						**10,39,860**	
5.0	**Geologist man days (1 No.) for geological map & Report (HQ)**	days	1.2	9,000	90	**8,10,000**	
Total (1.0 to 5.0)						**1,14,74,620**	
5.0	**Preparation of Exploration Proposal**	Nos	5.1	2% of the cost or Rs. 5.0 lakh - whichever is lower	1	**2,29,492**	EA has to submit the Hard Copies and the soft copy of the final proposal along with Maps and Plan as suggested by the TCC- NMET in its meeting while clearing the proposal.
6.0	**Geological Report Preparation**	Nos	5.2	For the projects having cost exceeding Rs. 50 Lakhs but less than Rs. 150 Lakhs: A Minimum of Rs.2.5 lakhs or 5% of the value of work whichever is more and Rs. 3000/- per each additional copy.	1	**5,73,731.00**	EA has to submit the final Geological Report in Hard Copies (5 Nos) and the soft copy to NMET.

7.0	**Report Peer Review Charges**	**lumpsum**	**As per EC decision**		**1**	**30,000**	
Total Estimated Cost without GST						**1,23,07,843**	
Provision for GST (18%)						**22,15,412**	GST will be reimburse as per actual and as per notified prescribed rate
Total Estimated Cost with GST						**1,45,23,255**	
					Say Rs. in Lakhs	**145.23**	
Note - ***1. If any part of the project is outsourced, the amount will be reimbursed as per the Paragraph 3 of NMET SoC and Item no. 6 of NMET SoC. In case of execution of the project by EA on its own, a Certificate regarding non outsourcing of any component/project is required.***							