Proposal for Northwest of Boro Lakhindong Block, Dima-Hasao District, Assam State for Preliminary Exploration (G3 Stage) under NMET.

Commodity: Limestone

By

Maheshwari Mining Private Ltd.

Place: Kolkata
Date: 09/02/2024

Summary of the Block for Preliminary Exploration
(G3 Stage) GENERAL INFORMATION ABOUT THE BLOCK

	Features	Details
	Block ID	Northwest of Boro Lakhindong Block
	Exploration Agency	Maheshwari Mining Pvt Ltd.
	Commodity	Limestone
	Mineral Belt	Sylhet Limestone Member of Shella formation of Tertiaries of Assam
	Completion Period with entire Time schedule to complete the project	12months
	Objectives	1. To map limestone bearing zones along with other lithologies and study of its nature of mineralization. 2. Assessment of resource in G3 stage of investigation and the grade of limestone.
	Whether the work will be carried out by the proposed agency or through outsourcing and details thereof. Components to be outsourced. and name of the outsourced agency	Work will be carried out by Maheshwari Mining Private Ltd.
	Name/ Number of Geoscientists	In field: Two Geologists At Headquarters: 2Geologists
	Expected Fielddays (Geology) Geological Party Days	In field: 210 man days for Geologists; 90 days for 1 Surveyor. At Headquarters: Geologists (150 mandays)
1.	**Location**	

Block Corner points Cardinal Points	**Latitude**	**Longitude**
A	$25^0$28’45.23’’	$92^0$35’37.65’’
B	$25^0$28’41.67’’	$92^0$37’40.45’’
C	$25^0$27’52.99’’	$92^0$32’21.28’’
D	$25^0$27’57.37’’	$92^0$36’00.95’’
E	$25^0$28’12.31’’	$92^0$35’51.37’’
F	$25^0$28’16.26’’	$92^0$35’36.92’’

	Villages	Boro Lakhindong
	Tehsil/ Taluk	Umrangso sub division/block
	District	Dima-Hasao district
	State	Assam
2.	**Area (hectares/square kilometers)**	
	Block Area	4.82 sqkm
	Forest Area	sq km
	Government Land Area	Not available
	Private Land Area	
3.	**Accessibility**	
	Nearest Rail Head	Lanka Railway Station lies on Guwahati-Lumding NorthEastern Frontier Railway Section.
	Road	

	Airport	Guwahati
4.	**Hydrography**	
	Local Surface Drainage Pattern (Channels)	The tributaries to main rivers form a dendritic pattern.
	Rivers/Streams	Main river of this area is Kopili River which is flowing along the southwestern corner of the block. Lokdung Nadi is another drainage system which flows from southeast to northwest along the eastern part of the area.
5.	**Climate**	
	Mean Annual Rainfall	Area experiences subtropical monsoon climate. Heavy rains occur from May to September due to southwest monsoons. The district receives average annual rainfall of 2200-2700mm.
	Temperatures (December) (Minimum) Temperatures (June) (Maximum)	Dry weather prevails during November to March.
6.	**Topography**	
	Toposheet Number	83C/11
	Morphology of the Area	Numerous low mounds scattered all around. Extensive dissolution of limestone has led to the development of karst topography in the area. Sinkholes, caves, gully like features are common in the limestone.
7	**Availability of baseline geosciences data**	
	Geological Map(1:50K/25K)	1:50K map is available.
	Geochemical Map	1:50K Geochemical Map is available.
	Geophysical Map (Aeromagnetic, ground geophysical, Regional as well as local scale GP maps)	Not Available
8	**Justification for taking up G3 stage of Exploration**	The vast tract of Assam and Meghalaya is occupied with a package of Cretaceous-Tertiary sedimentary sequence. The proposed block area is occupied by Upper Sylhet Limestone Member of Shella Formation. This formation belongs to Jaintia Group of Palaeocene-Eocene of Assam. Upper Sylhet Limestone is underlain by Upper Sylhet Sandstone and overlain by Kopili Formation. Upper Sylhet Sandstone member is composed of medium grained grey sandstone with coal streaks, dark shale and specks of pyrite. Upper Sylhet Limestone is constituted of light grey to dark grey highly fossiliferous compact limestone and Kopili Formation is composed of grayish shale, marl and reddish brown sandstone with phosphatic nodules in the lower part. To the south of this block North Boro Hundong

		Block is located which is explored by Thakur and Jayaswal(2019-20) and a resource of 474.8 million tonnes limestone established. Resource of limestone was estimated with the help of eight boreholes, in which the thickness of intercepted limestone varies from 36.36m to 95.54m. Out of total estimated resource of 474.8 million tonnes 178.53 million tonnes categorized under portland cement[CaO:44-52% and MgO:3.5%(max)], and 195.4 million tonnes under Blendable/Beneficiable cement [(CaO:38-44% and MgO:4%(max)] and rest quantum is under 'Unclassified'. Team of geologists from MMPL recently studied the Northwest of Boro Lakhindong Block and collected some samples from the fossiliferous limestone. The analytical results of eleven samples show range of CaO: 49.28 to 53.08%, MgO: 0.89 to 1.33%, SiO2: 1.61 to 3.65% and LOI: 40.33 to 42.75%. Keeping in view the highly encouraging values a G3 stage of investigation for the limestone is proposed in this block.

Detailed description on the following titles to be made in the proposal.

1. Block Summary

Physiography:

The geological set up of the area controls the physiography of the area. Numerous low mounds scattered all around and a few small hillocks are there. Extensive dissolution of limestone has led to the development of karst topography in the area. Sinkholes, caves, gully like features are common in the limestone.

(Regional Geology, Geology of the Block):

The area under investigation is part of Meghalaya Plateau, which is considered to be an uplifted horst like feature bounded by the East-West Dawki and Brahmaputra Fault. The plateau consists of rocks of Assam-Meghalaya Gneissic Complex, metasedimentary rocks of Shillong Group, mafic igneous rocks, Pan-African Granite plutons, Sylhet Traps, alkaline-carbonatite-ultramafic complex (Barpung-Tarapung, Samchampi, Jashora and Sam Teran in Assam and Sung Valley and Mawpyut in Meghalaya) and Cretaceous-Tertiary sediments.

Regional stratigraphic succession of the area is as follows:

Age	Group	Formation	Lithology
Holocene	Unclassified	Barpeta-II Fmn.	Grey loose sand, silt, clay, cobbles and gravels
		Barpeta-I Fmn.	Grey silt, clay and sand
		Hauli Fmn.	Semi consolidated sand, silt and clay
Middle to Upper Pleistocene	Unclassified	Sorbhog Fmn.	Sand, clay, gravel, pebble, boulder bed
		Chapar Fmn.	Sand, clay, gravel, pebble, boulder deposit
-----------------------------------Unconformity/tectonic contact----------------------------------			
Pliocene and Pleistocene	Siwalik Group	Kimin Fmn.	Sandstone with claystone
		Subansiri Fmn.	Micaceous sandstone
Pliocene	Dihing Group	Dihing Fmn.	Pebble bed, soft sandy clay, gritty sandstone
Mio-Pliocene	Dupitila Group	Dupitila Fmn. (Surma Valley)	Sandstone,mottled clay, grit and conglomerate
		Namsang Fmn. (Upper Assam)	Coarse gritty poorly consolidated sandstone and conglomerate of coals and pebbles
	Tipam Group	Girujan clay Fmn.	Mottled clay
		Tipam sandstone	Bluish grey to greenish, coarse to gritty, ferruginous sandstone
---Unconformity--			
Miocene	Surma Group	Bokabil Fmn.	Shale, sandy shale, siltstone,mudstone and lenticular coarse ferruginous sandstone
		Bhuban Fmn.	Alteration of sandstone and sandy shale and thin conglomerate
----------------------------Unconformity/Tectonic contact---------------------------			
Eocene-Oligocene	Barail Group	Renji Fmn.	Massive bedded

			sandstone, Tikak Parbat Fmn. In Upper Assam
		Jenam Fmn.	Shale, sandy shale and carbonaceous shale, Bargolas Fmn. In Upper assam
		Laisong Fmn.	Well bedded compact, flaggy sandstone and subordinate shale, Nagaon Fmn. In Upper Assam, hard sandstone and interbedded shale
Eocene	Disang Group		Splintery dark grey shale and thin sandstone
Palaeocene-Eocene	Jaintia Group	Kopili Fmn.	Shale, sandstone and marl
		Shella Fmn.	Fossiliferous Sylhet Limestone, Sylhet Sandstone with thin coal seams
		Langpar Fmn.	Calcareous shale, sandstone and limestone
----------Unconformity/Tectonic Contact----------			
Cretaceous	Sylhet Trap		Basalt, alkali basalt, rhyolite and acid tuff
----------Unconformity----------			
Permo-carboniferous	Lower Gondwana	Karharbari Fmn.	Very coarse to coarse sandstone with conglomerate lenses, shale, carb shale and coal
		Talchir Fmn.	Basalt, tillite, conglomerate with sandstone bands, siltstone and shale
----------Unconformity----------			
Neo- Proterozoic	Granitic plutons		Porhyritic granite, pegmatite,aplite, quartz vein traversed by epidiorite and dolerite
----------Unconformity/Tectonic contact----------			
Palaeo-Meso-Proterozoic	Shillong Group	Quartzite, phyllite, quartz-sericite schist,conglomerate	
----------Unconformity----------			
Archaean-Proterozoic	Gneissic Complex	Complex metamorphic group comprising ortho and para gneisses and schists, migmatites, granulites intruded by basic and acidic rocks	

Present block exposes the sedimentary rocks comprising Shella and Kopili Formations of Jaintia Group of Eocene age. The Upper Sylhet Limestone member of Shella Formation is exposed in approximately 65% of the area. The remaining area is covered by shale, sandstone and marl of Kopili Formation mainly to the eastern part of the block. The contact between the two is gradational.

Lithostratigraphic succession of the proposed area is as follows:

Age	Group	Formation	Member	Lithology
Palaeocene-Eocene	Jaintia Group	Kopili Fmn.		Greyish shale, marl, reddish brown sandstone. Lower part has phosphatic nodules
		Shella Fmn.	Upper Sylhet Limestone	Light grey to dark grey highly fossiliferous compact limestone
			Upper Sylhet Sandstone	Medium grained grey sandstone with coal streaks, dark shale and specks of pyrite

Lower Sylhet Sandstone and Upper Sylhet Sandstone are not exposed on surface but encountered in boreholes (Thakur and Jaiswal, 2021). Upper Sylhet Limestone comprises thickly bedded, light to dark grey, fossiliferous and compact limestone. Extensive dissolution of limestone has led to the development of karst topography in the area.

Mineral potentiality based on geology and ground geochemistry etc.:

Analyses of the samples collected from eight boreholes drilled in North Boro Hundong Block in the adjoining southern part of presently proposed block where thickness of intersected zone of Upper Sylhet Limestone (Prang Limestone) varies from 36.36m to 95.54m with an average thickness of 71.84m. With the help of analytical results distinct zones of limestones of Portland Cement category and Blendable/Beneficiable cement category have been delineated in that block. A total resource of limestone has been estimated as 474.8 million tonnes of which 178.53 million tonnes classified under Portland cement category, 195.4 million tones under Blendable/ Beneficiable category and 100.85 million tonnes under Unclassified category.

Scope for proposed exploration:

Geologists of Maheswari Mining Private Limited collected a few samples from the area during a short field visit. The analytical results of 11 samples collected from the fossiliferous limestone band show the range of CaO: 49.28% to 53.08%, MgO: 0.89% to 1.33%, SiO2: 1.61% to 3.65% and LOI: 40.33% to 42.75% and analyses of 2 samples of siliceous limestone show range of CaO: 34.79% to 37.80%, MgO: 0.80% to 1.19%, SiO2: 18.64% to 19.55% and LOI: 31.07% to 32.24%. Keeping in view the quantum of area as 4.82 sq km and extent of sylhet limestone in the area a G3 stage of investigation is proposed.

2. Previous Work

(Previous Exploration in adjoining area (Regional area); All the sample (bed rock/trench/groove/soil), borehole location should be plotted on the geological map and analytical data should be discussed briefly.
Previous Exploration in the proposed block area: All the sample (bed rock/trench/ groove/soil), borehole location should be plotted on the geological map and analytical data should be discussed briefly).

Available information on the work carried out in adjoining area has already been discussed under previous point and present area is proposed for the first time to cover under G3 stage of exploration.

3. Block description

Block Corner points Cardinal Points	Latitude	Longitude
m	$25^0$28'45.23''	$92^0$35'37.65''
n	$25^0$28'41.67''	$92^0$37'40.45''
o	$25^0$27'52.99''	$92^0$32'21.28''
p	$25^0$27'57.37''	$92^0$36'00.95''
q	$25^0$28'12.31''	$92^0$35'51.37''
r	$25^0$28'16.26''	$92^0$35'36.92''

4. Planned Methodology: G3stage guideline of MEMC Rule will be followed.

5. Nature Quantum and Target

Nature and Quantum of work proposed.

Components	G3 Stage
Aerial reconnaissance	Nil
Topographic Survey	i) 1:4000 scale in 4.82 sq km area.
Geological Survey	ii) 1:4000 scale in 4.82 sq km area. iii)Identification of lithology, structure, surface mineralization, borehole core studies and old history of mining, if any.
Geochemical Survey	Regional Grab/chip sampling: 50nos.
Geophysical Survey	Nil
Scout drilling /Systematic drilling	Six boreholes with a total of 600m drilling (Six boreholes with 800 m spacing. Three boreholes each will be planned along two east-west trending lines and the horizontal distance between these two E-W lines will be 800m). Sample length from limestone bearing zones:1m each
Grab and Chip sampling	(5PS+5PCS) representative samples from all lithounits to carry out petrographic studies(PS) and petro-chemistry(PCS).

Core sample	500 borehole core samples from limestone bearing zones. Sample length 1m.
Petrographic and mineralographic studies	5nos.principal rock types, mineral assemblage, identification of minerals of interest
Synthesis of all available data	i) Integration of regional geological, and geochemical data. ii) Synthesis of all available data and Report writing (GR).

5 & 6. <u>Manpower deployment and break up of expenditure for Northwest of Boro Lakhindong Block and estimated cost of different work components; Total area: 4.82 sq km, Period of Completion: 12 months</u>

Estimated cost of different work components of Limestone investigation of Northwest of Boro Lakhindong area (G3 Stage)						
Total area: 4.82 sq km, Period of Completion: 12 months, BH: 6 nos. review: after 5 months						
Sl. Nos.	**Item of work**	**Rates as per NMET SoC 2020-21**			**Estimated Cost of the Proposal**	
		Unit	**SoC-Item-Sl No**	**Quantity**	**Rates as per SoC**	**Total**
1	**Geological Mapping (on 1:4000) (4.82 sq km)**					
	(a) Charges for 2 Geologists in field (without labourer)	per day per Geologist	1.2. b	210	11,000	2310000
	(c) Wages for 2 labourers for geologist	per day	5.7	420	504	211680
2	**Land/Crop compensation (as per actual)**	per borehole	5.6	6	20000	120000
3	**Geochemical sampling (Bedrock sampling)**	50 nos				
5	**Survey work**					
	(a) Surveyor Charges (without labourer)	per day	1.6.1a	60	8300	498000
	(b) Labour(4nos) charges for survey work	per day	5.7	240	504	120960
6	**Technological Survey**					
	(a) Trenching	per cu m	2.1.1	0	3330	0
	(b) Drilling	per m in soft rock	2.2.1.4a	600	11500	6900000
	(c) Borehole pillaring (construction of concrete pillar) 12 inches x12 inches x 30 inches	per borehole	2.2.7a	6	2000	12000
	(d) Transportation of Drill Rig and truck(to and from Headquarters or Previous	per km 9	2.2.8	2290	36	82440

	drill site)					
	(e) Drilling camp setting cost	per drill	2.2.9a	1	250000	250000
	(f) Drilling camp winding cost	per drill	2.2.9a	1	250000	250000
	(g) Monthly accommodation charges for drilling camp	per month	2.2.9	3	50000	150000
	(h) Approach road making to drill site (as oer actual)	per km	2.2.10a	5	22020	110100
	Sampler			45	5100	229500
	Labor			180	504	90720
					TOTAL	11335400
					As this is a programe of Northeastern state	37973590
	(b) Charges for 2 Geologists at Headquarters	per day per Geologist	1.2. a	150	9,000	1350000
7	**Laboratory Studies**					
	(a) Complete analysis for Limestone	per sample	4.1.16	550	3000	1650000
	(a) Complete analysis for Limestone (10% external Check)	per sample	4.1.16	55	3000	165000
	(d) Petrochemical studies (PCS)	per sample	4.1.15a	10	4200	42000
8	**Petrographic studies**					
	(a) Preparation of thin sections	per sample	4.3.1	5	2353	11765
	(b) Study of thin sections	per sample	4.3.4	5	4232	21160
9	**Bulk Density/specific gravity Determination**	per sample	4.8.1	3	1605	4815
10	**Drill core preservation (1 bh+ mineralised zone : as per actual)**	per m	5.3	600	1590	954000
					TOTAL	4198740
					TOTAL (A+B)	42172330
11	**Geological Report preparation (5 hard copies with a soft copy)**	cost per 5 hard copies along with soft copy	5.2			2108617
12	**Peer Review**	lump sump	as per EC decision	1	30000	30000
13	**Preparation of exploration proposal (5 hard copies with a soft copy)**	one number (5 hard copies) along with soft copies	5.1	1	2% of approved project cost or 5 lakh, whichever is lower	843446.6
	Grand Total of estimated cost:					**₹ 4,51,54,393.10**
	Grand Total including 18%GST					**₹ 5,32,82,183.86**
	Grand Total					**₹ 5,32,82,183.86**

References:

(a) Thakur Vijit and Jayaswal Saurabh (2019-20): Preliminary exploration for limestone in North Boro Hundong Block, Dima-Hasao district, Assam (Stage-G_3), Unpublished Progress Report of GSI.

List of plates

Plate 1: Topographic map of the area in 1:50000 scale

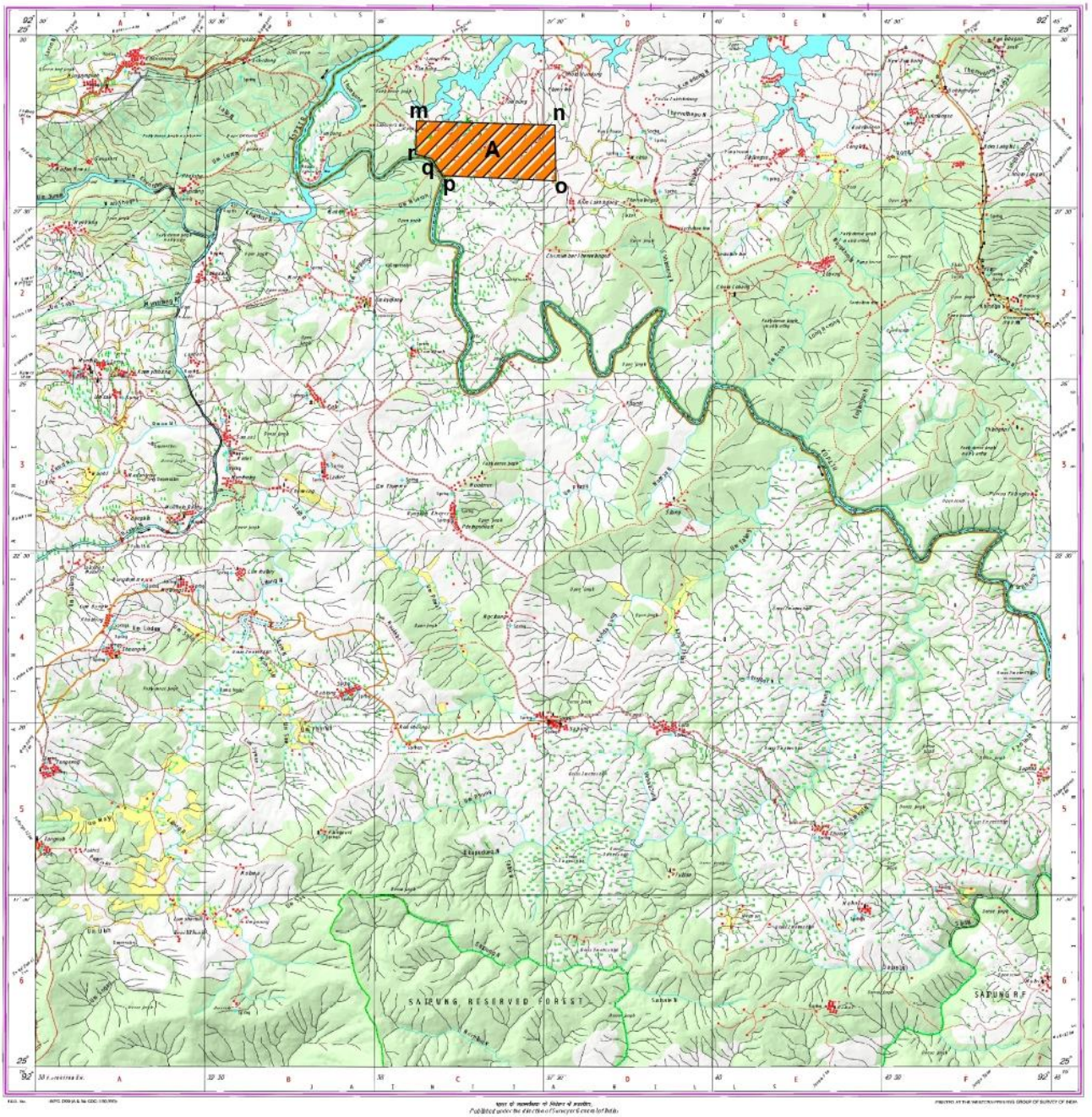
Plate 2: Geological Map of the area in 1:50000 scale

92°30'0"E 92°45'0"E

Northwest of Boro Lakhindong Block Geological Map

N W E S

25°30'0"N 25°15'0"N



CARDINAL POINTS (In DMS)		
Pt. No.	Latitude	Longitude
m	25°28'45.23"N	92°35'37.65"E
n	25°28'41.67"N	92°37'40.45"E
o	25°27'52.99"N	92°37'41.15"E
p	25°27'57.37"N	92°36'00.95"E
q	25°28'12.31"N	92°35'51.37"E
r	25°28'16.26"N	92°35'36.92"E

CARDINAL POINT (In Decimal Degrees)		
Pt. No.	Easting	Northing
m	25.479230°	92.593791°
n	25.478242°	92.627903°
o	25.464718°	92.628098°
p	25.465936°	92.600264°
q	25.470087°	92.597604°
r	25.471183°	92.593589°

Legend

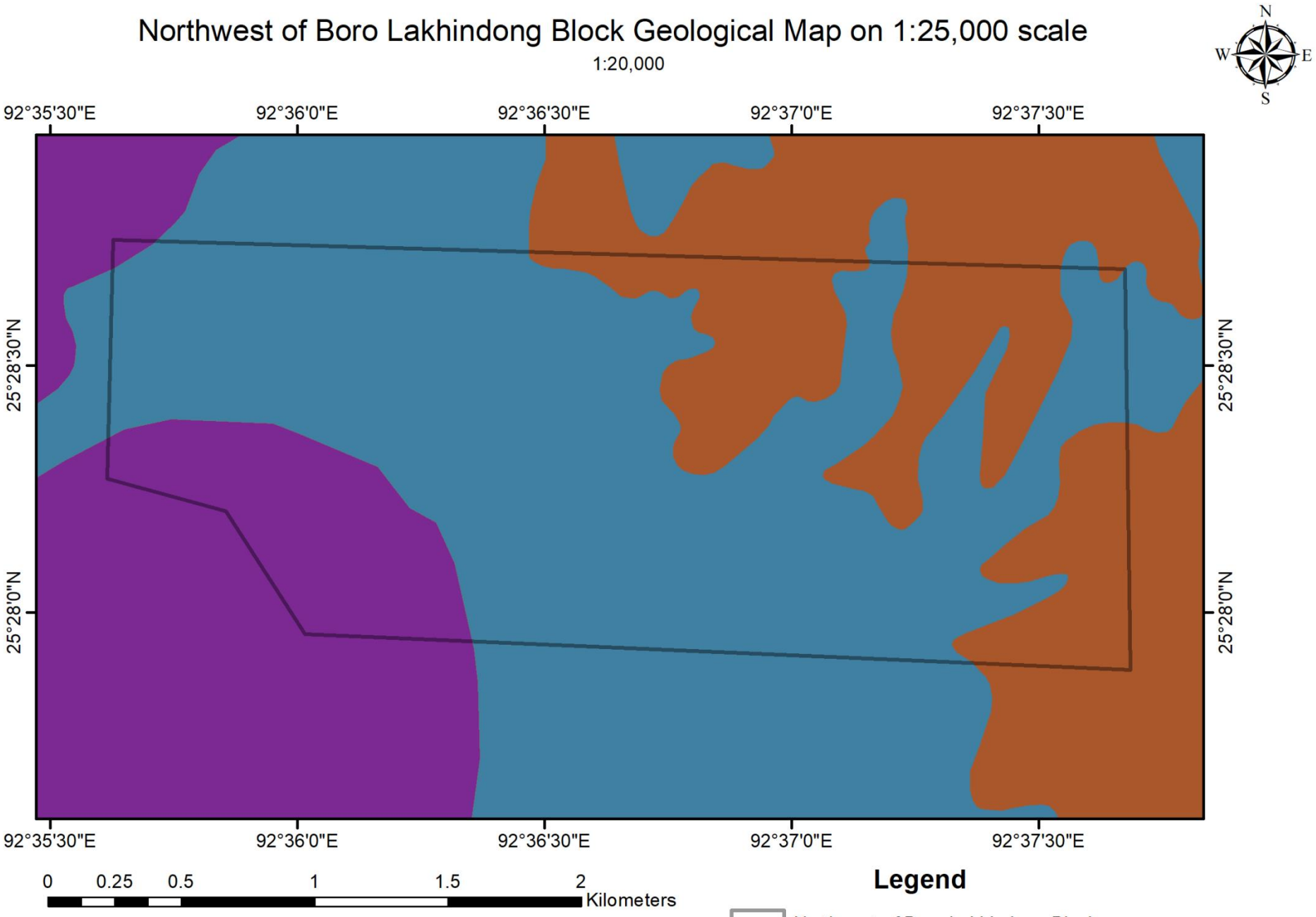
Northwest of Boro Lakhindong Block

0 1.25 2.5 5 7.5 10 Kilometers

92°30'0"E 92°45'0"E

Northwest of Boro Lakhindong Block Geological Map on 1:25,000 scale

1:20,000



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TIMELINE OF THE PROJECT

Proposed Timeline for different work components of Limestone investigation in Northwest of Boro Lakhindong Block, Dima-Hasao District, Assam State													
	Months												
Item of work	**1**	**2**	**3**	**4**	**5**		**6**	**7**	**8**	**9**	**10**	**11**	**12**
Geological Mapping (1:4000)													
Survay Work & Contouring													
Bed rock sampling													
Chemical analysis of surface samples						**REVIEW**							
Drilling													
Core Sampling & its preparation													
Chemical analysis of core samples													
Processing of Analytical data													
Preparation of Geological report													

Maheshwari Mining Private Limited
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To
The Director & HoD
National Mineral Exploration Trust (NMET)
Ministry of Mines
F-114, Shastri Bhavan
New Delhi-110001

It is certified that:

1. Project titled "Proposal for Northwest of Boro Lakhindong Block, Dima-Hasao District, Assam state for Preliminary Exploration (G3 Stage) under NMET" along with estimated cost Rs. 5.32 Crores is submitted for consideration of NMET funding.
2. The project proposal is prepared following the guidelines prescribed in Minerals (Evidence of Mineral Contents) Rules, 2015 in case of mineral exploration project proposals.
3. The proposal has been duly examined and concurred by associate finance in accordance with canons of financial propriety.
4. The same project proposal or project proposal with similar objectives has not been submitted to any other funding agency by this organisation and the project proposal bears no duplication with existing work/ ongoing project undertaken by this agency.

MAHESHWARI MINING PVT. LTD. Kolkata

Yours faithfully,

08/01 Signature

[Name & designation of Head of the Organisation]
[DG/Principal Secretary/Secretary (Geology & Mining)/CMD/CEO/MD]

AMBIKA PRASAD SAMANTARAY
President & CEO - Exploration

Date...08.02.24...
Place...Kolkata....