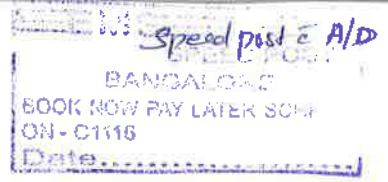




GOVERNMENT OF KARNATAKA



No: DMG/Plan/NMET/Itga/2022-23

12165.12166

Office of the Director,
Dept. of Mines and Geology,
No.49, Khanija Bhavan,R.C. Road,
Bengaluru-560 001. Dated:02.01.2023.

09

To:

The Director,
National Mineral Exploration Trust (NMET),
Ministry of Mines, F-114, 1st Floor,
Shastri Bhavan, New Delhi-110 001.

ಕರ್ನಾಟಕ ಸರ್ಕಾರ
9 JAN 2023
ದಿನಾಂಕ

Sir,

Sub: Submission of Exploration proposal for G3 Level exploration
in Itga Limestone block in Kalburgi District, Karnataka State
under NMET fund-reg.

With respect to the above subject, we are hereby submitting the exploration proposal to take up G3 level exploration in Itga Limestone block of Kalburgi District, Karnataka State over an extent of 10.60sq.km area which will be executed by the Department of Mines and Geology exploration wing.

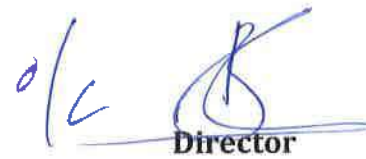
It is to mention that the department has taken the opinion of the Geological Survey of India State Unit, Karnataka on overlapping issues and GSI has opined that, the said block does not show any overlapping with GSI blocks. GSI has recommended to take up the exploration work in this block **(Copy of e-mail enclosed)**.

Hence, kindly accord the approval of NMET to take up the exploration of this project under NMET funding and support the initiative of our inhouse exploration wing of the DMG, Karnataka.

Thanking you,

Enclosure: Hard copy & soft copy of the proposal.

Yours faithfully,


Director

Department of Mines & Geology

Copy to:

The Deputy Director General Geological Survey of India, Operation Karnataka and Goa Unit, Vasudha Bhavan, Kumaraswamy Layout, Bengaluru - 560 078.





Deputy Director PM <ddpmdmg1@gmail.com>

Comments on overlapping issues of Limestone blocks-reg.

1 message

DDG SU K&G BANGALORE <ddg.sukg@gsi.gov.in>

Fri, Nov 4, 2022 at 4:44 PM

To: DMG <dir-mines@karnataka.gov.in>, DMG Plan <ddpmdmg1@gmail.com>

महोदय/महोदया/Sir/Madam,

कृपया संलग्न/ अनुगामी मेल प्राप्त कीजिये।/

With respect to the mail dated 29.10.2022, seeking comments and opinion on

overlapping issues, for the six nos. of Limestone Blocks Proposed by MECL in Gulbarga District and ITGA Limestone block proposed by DMG under NMET fund, this is to inform you that the overlapping issues for the proposed blocks have been cross checked and verified by our end with respect to all the previous/presently ongoing exploration blocks, blocks for upcoming FS 2023-24 and also with GM handed over blocks. **The proposed blocks of MECL and DMG do not show any overlapping with GSI blocks.** Hence it is recommended the blocks can be taken up for exploration work subject to approval from competent authority.

Please find the status of overlap of the proposed limestone blocks by DMG and MECL with GSI exploration and GM blocks are attached herewith.

यह आपके अवलोकनार्थ व आगे की आवश्यक कार्रवाई हेतु भेजा जाता है।/This is for your kind perusal and further necessary action.

भवदीय/Yours faithfully,

निदेशक (तकसम)/Director (TC)

राई: कर्नाटक व गोवा/SU: Karnataka & Goa

भारतीय भूवैज्ञानिक सर्वेक्षण/Geological Survey of India

बेंगलूरु/Bengaluru-560111.

आईपि/IP-07032.

2 attachments

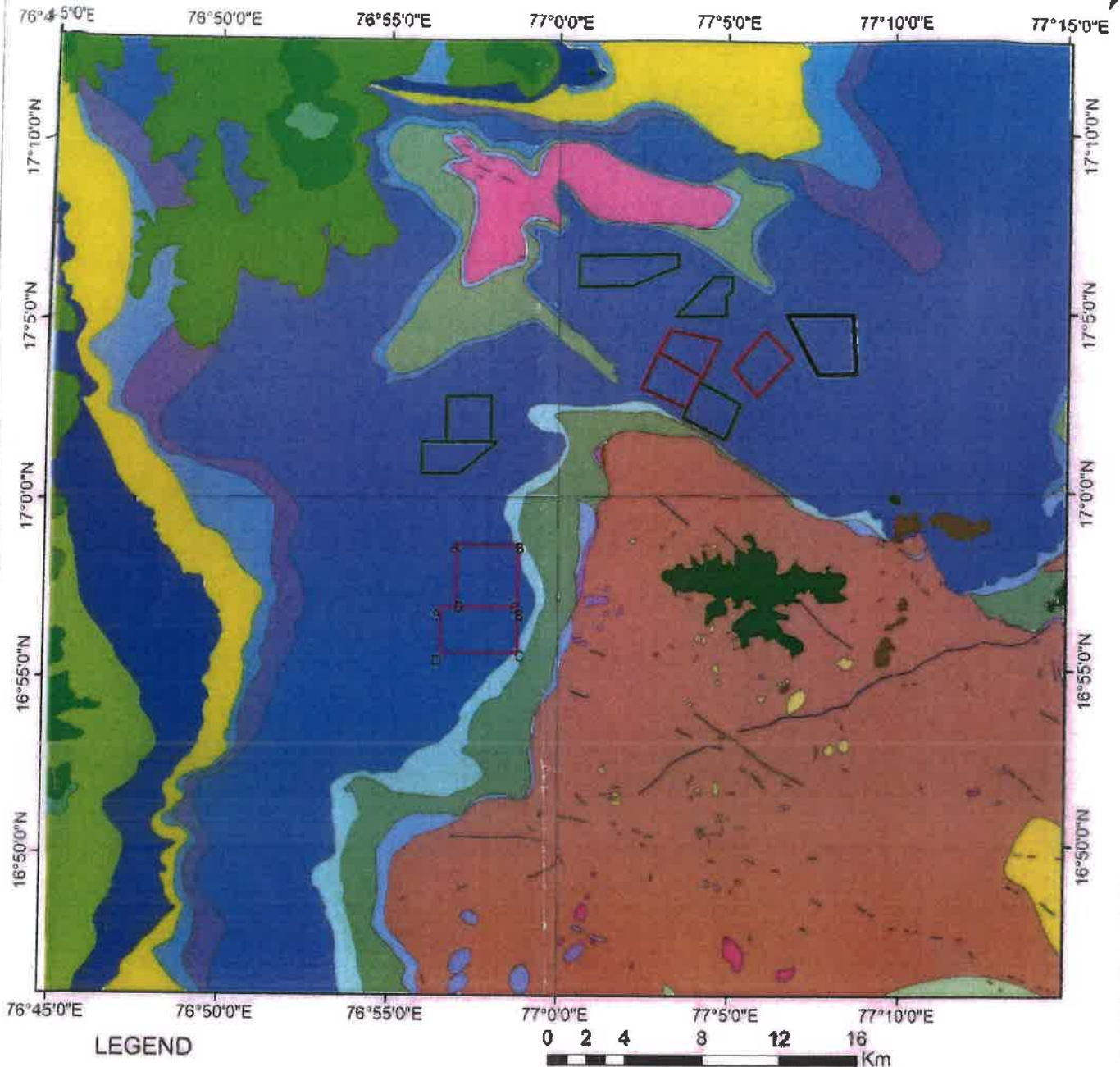


DMG block_overlapping check.jpg
387K



MECL block_overlapping check.jpg
411K

Status of Overlap of Block proposed by DMG based on GSI data





PROPOSAL FOR G-3 LEVEL MINERAL EXPLORATION FOR LIMESTONE IN ITGA BLOCK, KALABURAGI DISTRICT, KARNATAKA STATE

Toposheet No: 56G/4

Commodity: Limestone

**Department of Mines and Geology,
Karnataka.**

**Place: Bengaluru
Date: January 2023**

Table of content		
Sl. No	Description	Page No.s
1	Summary of the Proposed G-3 Level Block	1-4
2	Introduction	5-6
3	Location and accessibility	6-7
4	Physiography and Drainage	7
5	Climate, Flora & Fauna	7
6	Regional Geology	7-10
7	Geology of the Block	10
8	Scope of the proposed Exploration	10-11
9	Observation	11-12
10	Previous Work	12-14
11	Block Description	14
12	Planned Methodology	14-17
13	The Quantum of work proposed	18
14	Manpower Deployment	18
15	Break-up of expenditures	18-29
16	References	30

List of tables

Table 1	General information of the block.	1-4
Table 2	The Stratigraphic Column of the Bhima Group (after GSI).	8-9
Table 3	Revised litho stratigraphy of the Bhima Group.	9-10
Table 4	Boundary Co-ordinates of the Itga Limestone block.	14
Table 5	Proposed borehole Co-ordinates and respective borehole depths.	16
Table 6	Envisaged Quantum of work.	18-19
Table 7	The summary of cost estimation for G-3 level block.	20
Table 8	Estimated cost for G-3 level exploration in Itga Limestone block.	21-27
Table 9	Tentative time schedule/action plan for the proposed G-3 level of exploration for Limestone block.	28-29

List of plates

Plate-1	Location map of proposed Itga limestone block.
Plate-2	Regional Lithological map with surrounding ML's of proposed Itga limestone Block (After GSI).
Plate-3	Lithological plan with proposed borehole location of proposed Itga limestone block.
Plate-4	Sections of proposed Itga limestone block.

Summary of the Proposed G-3 Level Block. General Information of the block.

Table 1: General information of the block.

Features	Details
Block ID	DMG_2022-23_01_KLB_ILB
Exploration Agency	Department of Mines and Geology, Karnataka
Commodity	Limestone
Mineral Belt	Bhima Group
Completion Period with entire Time schedule to complete the project	11 months
Objectives	Based on the available geological information the proposed exploration programme has been formulated with the following objectives 1. To demarcate the extent of mineralised zone (limestone bands) within the proposed block. 2. To delineate the strike, depth continuity and quality parameters of the limestone bands. 3. Carryout G-3 level of mineral exploration to assess the Inferred (333) resources of the Limestone as per the UNFC norms of Minerals (Evidence of Mineral contents) Rule-2015.
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 outsource agency	All the Exploration activities except topographical, DGPS survey, Analysis of external check samples and drilling related activities will be on outsourced.
Name/ Number of Geoscientists	A team of three Geologists from the exploration wing of the Department of Mines and Geology will be deployed for this project and details are as below; 1. Udayaravi M.P 2. Nagaraju M 3. Priya Doddagoudra
Expected Field days (Geology) Geological	Geological mapping (1:5000 scale) - 1 nos. of Geologist 02 months (60 Geologist field party days)

	Party Days	and 30 Geologist HQ party days) Total 90 Geologist party days. Drilling- 03 months 1 nos. of Geologist (90 Geologist field party days and 30 Geologist HQ party days) Total 120 Geologist party days.																					
1	Location																						
	Co-ordinates	<table border="1"> <thead> <tr> <th>Point ID</th><th>Longitude</th><th>Latitude</th></tr> </thead> <tbody> <tr> <td>A</td><td>77° 7' 26.33"</td><td>17° 3' 22.27"</td></tr> <tr> <td>B</td><td>77° 8' 47.50"</td><td>17° 3' 21.42"</td></tr> <tr> <td>C</td><td>77° 8' 48.09"</td><td>17° 4' 13.45"</td></tr> <tr> <td>D</td><td>77° 8' 48.69"</td><td>17° 5' 05.48"</td></tr> <tr> <td>E</td><td>77° 6' 25.90"</td><td>17° 5' 06.98"</td></tr> <tr> <td>F</td><td>77° 6' 56.15"</td><td>17° 4' 14.62"</td></tr> </tbody> </table>	Point ID	Longitude	Latitude	A	77° 7' 26.33"	17° 3' 22.27"	B	77° 8' 47.50"	17° 3' 21.42"	C	77° 8' 48.09"	17° 4' 13.45"	D	77° 8' 48.69"	17° 5' 05.48"	E	77° 6' 25.90"	17° 5' 06.98"	F	77° 6' 56.15"	17° 4' 14.62"
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F	77° 6' 56.15"	17° 4' 14.62"																					
	Village	Itga																					
	Taluk	Chittapur																					
	District	Kalaburagi																					
	State	Karnataka																					
2	Area (Sq Km)																						
	Block Area	10.60																					
	Forest Area	NA																					
	Government Land Area	NA																					
	Private Land Area	10.60																					
3	Accessibility																						
	Nearest Rail Head	Nearest railway station is in Chittapur and it's around 4.20 km away from the block. It can be reached by Chittapur-Diggoan village road which is north of the proposed block or by State Highway 126 i.e., Satnur and Chittapur road which is west of the block.																					
	Road	Block can be approached from State Highway 126 i.e. Satnur and Chittapur road. It is around 90 m west of the proposed block.																					
	Airport	Nearest airport is in Kalaburagi, around 29 km from the block.																					
4	Hydrography																						
	Local Surface Drainage Pattern (Channels)	The area is generally flat with major part covered by cultivated land. The general drainage pattern of the area is dendritic. Main drainage direction is South to North.																					

	Rivers / streams	West flowing Kagna is the main river and is located at about 8.90 Kms North from the proposed block.
5	Climate	
	Mean Annual Rainfall	770-880mm(825mm)
	Temperatures (December) (Minimum)	12 ⁰ C
	Temperatures (June) (Maximum)	43 ⁰ C
6	Topography	
	Top sheet Number	56G/4
	Morphology of the Area	The Block area depicts flat terrain with gentle slope towards North and elevation ranging from 398m to 409m above mean sea level.
7	Availability of baseline geoscience data	
	Geological map (1:50K/25K)	Available.
	Geochemical map	NGCM data of Toposheet no 56G/4 is available
	Geophysical map (Aeromagnetic, ground geophysical, Regional as well as local scale GP maps)	Not Available for the proposed area.
8	Justification for taking up Reconnaissance survey/ Regional Exploration	➤ The Proposed block area has not been scientifically explored in the past. Though the area is known for limestone occurrences, limestone resource potential is not ascertained so far and there is necessity to prove the geological resources. ➤ A team of Exploration Geologists of DMG visited the proposed block during 22nd to 24th of August 2022. During the traverse of the area, geologist could notice few outcrops of massive limestone exposures along the stream sections around Itga, Diggaon and Chittapur villages. 02 nos of bedrock samples were collected in and around the block, and the analysis results depicts average CaO value of 42.11% and MgO value of 1.85%.

	➤ The block is located at a distance of about 2.9 km south of ML no. 2681 of M/s Oriental cement ltd and 7.0 kms North west of ML no. 2674 of M/s Shree Cements where mining activity is in progress and also surrounded by many Lime stone mining leases. ➤ The available regional geological information in the proposed area indicates that the area is comprised of horizontal beds of limestone covered by varying thickness of black cotton soil. Hence, it is proposed to establish the Limestone resources in the proposed block by way of geological mapping, pitting, followed by Core drilling at G-3 level to average depth of 70 m. which will establish the resources of limestone in this block. With the completion of the proposed exploration, the area can be converted in to a good auctionable prospect for exploitation of limestone. This will meet the objective of NMI and help to add mineral resources into inventory of the Nation and will aid in the auctioning of the block. ➤ Opening of new mine would enhance socio-economic development of the backward areas of the district which would also lead to investments into setting up of new cement plants which will results into overall economic progress of the region, employment generation and can meet the ever-growing cement need of the State &Country.
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PROPOSAL FOR G-3 LEVEL MINERAL EXPLORATION FOR LIMESTONE IN ITGA BLOCK, AT KALABURAGI DISTRICTS, KARNATAKA STATE

1. Introduction.

1.1 Limestone is a crucial and versatile low value mineral commodity. It is evident that it has been in use as construction material from the early days of a human civilization. From the Great Pyramids of a Giza to the Golden fort of Jaisalmer, many of the world's most beautiful and historical buildings are made up of lime stones. In the modern time, Lime stone is primarily used to manufacture cement. However, the use of Limestone, now a day is not confined to construction material but due to its versatility and usage by different industries is making it most valuable mineral. In iron & Steel Industry, limestone is used both in blast furnace and steel melting shop (Steel Melting Shop (SMS) receives Hot Metal (HM) from Iron-making units and converts it into various grades of Steel) as a flux. In chemical Industry Lime stone is consumed to produce bleaching powder, toothpaste, calcium carbide etc. It is used as a purifier in the sugar industry. Limestone is also consumed by industries like paper, fertilizer and foundry etc.

1.2 The recent amendment to Evidence of Mineral Contents Rules 2021 enables the State governments to put up the mineral resources blocks with G3 for mining leases. This has led the exploration wing to take up more and more exploration activities in the State.

1.3 After a long time, Department is strengthening the in house exploration team and is proposing to take up the exploration of this block under NMET funds. Further, it is to mention that Karnataka is the leading State having 27% of the total resources of Limestone and stands first in the Country. However, in the production, Karnataka stands at 4th place. To bridge this gap between the available resources and production, the Department is planning to take up detailed exploration of the limestone resource blocks to convert them in to

minable blocks for future. There is a huge demand for limestone as it is one of the basic requirements for cement industries. During the recent auction of Limestone blocks for both Mining Lease and Composite License, State has seen very good response from the bidders. Also in the recent 60th CGPB meeting, it has been recommended to take up exploration of the bulk minerals under NMET funds.

- 1.4 The Department has chosen the Limestone formation in and around the Chittapur taluk of Kalaburagi district for detailed exploration. Limestone being the low value mineral, it would not be viable for merchant mining in our State and it is more dependent on mineral based industries i.e., cement industries. Hence, to make it viable and attract greenfield investors in this sector, the detailed exploration of the limestone block is proposed, which will surely benefit the State in terms of revenue and employment generation.
- 1.5 Accordingly, DMG has prepared the G-3 stage exploration proposal in the Itga block and intend to propose to carry out Geological Mapping (1:5000), Topography Survey using the total station, Bed rock Sampling, pitting and Pit sampling and sample analysis. It is proposed to take up 5 no of bore holes with a quantum of 480 m as core drilling based on the information obtained from the above exploration activities. This will enhance the confidence of the bidders to participate in the auction by ascertaining the quality and quantity of resources available in the block.

2. Location and accessibility.

- 2.1 The location map of the block is shown in Plate No. 1.
- 2.2 The Block is located in Chittapur Taluk of Kalaburagi district and spread over an extent of 10.60 Sq. Km, which can be accessed by State Highway 126 i.e Satnur-chittapur road which is west of the proposed Itga block and also connected by Chittapur- diggoan village road at the north of the block. The Blocks fall in the Survey of India Topo Sheet No. 56 G/4 (1: 50,000).

2.3 The Chittapur broad gauge railway station is in the Chittapur town, which is about 4.2 km away from the block and can be easily approached through State Highway-126 i.e., Satnur and Chittapur road which is 90 m west of the block and also be reached through Chittapur-Diggoan village road which is 1.20 km north of the proposed block. The nearest Airport is at Kalaburagi which is about 29 Kms away from the block.

3. Physiography and Drainage

3.1 The area is generally flat land covered by cultivated crops like green pigeon/congo peas, green grams and sunflower and depicts a flat terrain with gentle slope towards North. Westerly flowing Kagna River is about 10 Km North from the proposed block and its tributaries forms the main drainage. The overall drainage pattern of the block area is dendritic in nature.

4. Climate

- 4.1 The climate of the area is semi-arid and dry climate prevails for most part of the year. December is the coldest month with the mean daily maximum and minimum temperature being 29.5°C and 10°C respectively. During peak summer, temperature raises up to 45°C.
- 4.2 The rainfall in the area varies from 770 -880 mm and the relative humidity varies from 26% in summer and 62% in winter.

5. Flora & Fauna.

- 5.1 No forest, Sanctuaries, National parks etc., exist within the 5km radius of the proposed block boundary. However, it is covered by seasonal crops like sunflower, green gram and pigeon peas etc.,

6. Regional Geology

- 6.1 Bhima basin is the smallest of all Proterozoic basins of India. They do not actually come in contact with the Kaladgi Group but have close resemblance to the Kurnool Group of the Cuddapah Super group. The Bhima basin is bound by latitudes 16° 20' to 17°35' N and longitudes 76°15' to 77°40' E. The

Bhima basin sediments stretch linearly in N-S for about 160 km with varying width and the maximum being 40 km. It extends over an area of 5200 Sq.km. and is situated between the North West of Cuddapah basin and North East of Kaladgi basin.

6.2 Captain New Bold (1842- 1845) was first to record the Talikote flaggy limestone and Muddebihal red sandstone. R. Bruce Foote (1876) had divided the Bhima Group (mainly of limestone) into lower clastic represented by sandstone, shale and upper clastic mainly of limestone and shales. Further, Mahadevan (1947), Janardhana Rao et.al (1973), Mathur (1977). Mudholkar and Kale (1982) and Mishra et.al (1987) have also classified Bhima Group. However, Vivek S. Kale, V.G. Phansalkar et.al (1991) have classified Bhima Group into Rabanapalli (clastic) formation and Shahabad (limestone) formations.

6.3 The Stratigraphic Column of the Bhima Group (after GSI) is furnished in Table below;

The Stratigraphic Column of the Bhima Group (after GSI)

Table 2: The Stratigraphic Column of the Bhima Group (after GSI)

Group	Sub-Group	Formation	Member	Thickness
Bhima Group (upper Proterozoi)	Andola Sub-group in Pulsating basin environment (31-68 m.y)	Harwal-Gogi	Fossil shale member ortho-quartzite chert + pebble conglomerate	5-10m
		Katamdevar halli		10-40m 16-18m
		Halkal		
	-----Para-unconformity-----			
			Flaggy dark grey and argillaceous	4-6m
			Massive dark	8-20m

c) (93-273 M.y)	Sedam Sub-group with quiescent basin regime (62-2.5 m.y)	Shahabad	grey and bluish grey	
			Variegated and siliceous/cherty	20-80m
			Blackish, light grey to: bluish grey L.st	10-15m
			Slabby and flaggy L.st	4-8m
			Purple shale	2-40m
			Green/yellow shale	5-15m
			Siltstone	3-4m
			Quartzite/ Intercalated Sand stone	5-15m
			Conglomerate/grit	1-2m

6.4 Recent classification (1991) of revised litho stratigraphy of the Bhima Group is furnished in Table below;

6.5 Revised litho stratigraphy of the Bhima Group
(After Vivek S. Kale, V.G. Phansalkar et.al 1991)

Table 3: Revised litho stratigraphy of the Bhima Group

Formation	Maximum Thickness	Member	Main Lithological components
Shahabad limestone	<75m		➤ Grey, argillaceous micritic limestones. ➤ Dark, bluish grey, massive limestones ➤ Variegated, siliceous and cherty limestones ➤ Blue-grey, blacky micritic limestones.

			➤ Flaggy (Partly impure argillaceous and cherty) limestones.
----- Gradational and transitional contact -----			
Rabanpalli Clastics	< 70m	Ekmai shale member	Ferruginous shales, with calcareous shales at top.
		Kasturpalli Glaucinitic member	Green, glauconitic bearing fine grained sandstones and siltstones.
		Kundrapalli quartz) arenite member	Quartzitic sandstones (medium to fine grained).
		Adki Hill conglomerate member	Polymictic conglomerates and arkosic, gritty sandstones.

7. Geology of the Block:

7.1 The rocks exposed in the blocks belong to the Shahabad formation of Sedam sub group of Bhima Group (Plate 2). Almost entire area of the blocks is concealed under Quaternary sediments *i.e.* soil cover. Scanty scattered limestone outcrops are seen at places. The beds are horizontally disposed as noticed in nearby areas. Since most of the area is concealed under soil cover, the strike and dip of the limestone beds is not observed in the block. The rock formations within the proposed blocks are horizontally disposed and mostly concealed under top soil. However, at places limestone beds dip 10° to 20° due North (plate 3). The area is geologically undisturbed.

8. Scope of the proposed Exploration:

8.1 The exploration program proposed comprises of Pitting, Bedrock sampling, Geological mapping (1: 5,000 scale), topographical survey, chemical analysis, diamond core drilling, Core logging, Core sampling and Geological report preparation to derive the followings.

- 8.1.1 To demarcate the limestone zones of all grades within the proposed block.
- 8.1.2 To delineate the strike and dip continuity of the limestone mineralization and to establish thickness, grade and quality of limestone zones, drilling has been proposed.
- 8.1.3 Assessment of resources in accordance with MEMC Rules at G-3 stage
- 8.1.4 To determine Silica and MgO and other radicals which are seen in variable proportion in limestone, which play an important role towards its usage as raw feed for cement manufacturing.
- 8.1.5 To Assess the block specific quality and quantity of limestone, which would not be accurate if estimated through interpretation of data from neighbouring ML blocks.

9. Observation.

- 9.1 The proposed block area is located at a distance of about 2.9 km south of ML no. 2681 belonging to M/s Oriental cement ltd and 7.0 km North West of ML no. 2674 of M/s Shree Cements, where mining activity is in progress. A team of Exploration Geologists of the DMG visited the proposed block during 22nd to 24th of August 2022 and collected 02 nos of bedrock samples in and around the block. The analysis results indicate average CaO value of 42.11% and MgO value of 1.85% and Geologically the proposed area comprises of horizontal beds (reveled in nala cutting) of limestone covered by black cotton soil. Though the area is known for limestone occurrences, there is necessity to prove the geological resources in terms of quality and quantity. The resource parameters of the current block not known or ever established by any other exploration agency. Hence, it is proposed to establish the limestone resources of all grades in the proposed block by way of geological mapping, pitting, and followed by Core drilling. If the

resources are established, it enhances the mineral inventory of the Nation and the block can be put up for auction.

10. Previous Work

- 10.1 The area under reference was covered under regional geological mapping by Geological Survey of India (1984) with an aim to establish the geology and stratigraphy of the area.
- 10.2 Directorate of Mining & Geology (DMG), Karnataka explored the adjoining area in detail in the year 1976 with the purpose of proving cement grade limestone in the area. The exploration could establish the occurrence of large resources of cement grade limestone in the area. The results of investigation are given in the report titled "Limestone Deposits immediately to the East of Chittapur, Kalaburagi District of Karnataka".
- 10.3 GSI carried out preliminary investigation for Flux grade Limestone around Wadi, Kalaburagi district Karnataka during the year 1974-75. The area is occupied by Shahabad limestone formation of Bhima Group. Chip samples from vertical faces of the quarries in the area analysed low MgO and showed presence of a few beds of grey to dark grey soft limestone of blast furnace grade along with cement grade limestone. Flaggy to slabby variegated limestone are always siliceous in composition with the insoluble residue around 15%.
- 10.4 During the field season 1976-77, GSI carried out preliminary investigation for Flux grade Limestone near Wadi Kalaburagi district Karnataka. An area of about 16.75 sq. km. was mapped on 1: 7,910 scale using the village maps as base map. A total of 150 samples were collected and analysed. The formations identified are Rabanapalli shale and flaggy limestone, stylolitic limestone and variegated limestone units of Shahabad Limestone formation. All those formations are remarkably horizontal and undisturbed. Generally, stylolitic limestone contains 48% and above CaO and insoluble around 10%.

Hence it was categorized as Blast Furnace Grade and was recommended that the other two units can be utilized in cement manufacture if suitably blended with high grade limestone. An inferred reserve of 96 million tonnes of Blast Furnace grade limestone has been estimated over an area of 4.00 sq.km to a depth of 12 m. Drilling was recommended to explore the depth-wise persistence and lateral extension of the BF grade limestone.

10.5 In the Wadi, Chittapur taluk during the field programme of Gulbarga division in 1969-70, DMG carried out preliminary investigation for assessing the quality and quantity of limestone available in the M/S A.C.C. Area which was mapped on a 1: 660 feet. The limestone of the area is exceptionally good in quality and analysis on an avg. of 48.50% CaO and 0.7% MgO. (DMG Report No.106).

10.6 Limestone deposits in the Mining lease of M/s associated Cement Co. in Bankur, Chittapur Taluk, over an area 883 Acres. The reserves of different grade of Limestone available in the area are assessed at 72MT, out of which cement grade limestone is 64MT, with 47.8%-49.1% of CaO. (DMG report 49)

10.7 During the F.S. 1977-78, GSI carried out preliminary investigation for Flux grade & Cement grade Limestone in Bhima Basin, Kalaburagi district, Karnataka covering an area of 50.5 sq km on 1:10,000 scale using tape and compass. A total of 125 samples were collected, around Wadi and Chitapur. The limestone met with in this area has been classified as fissile limestone stylolitic limestone and variegated limestone. Stylolitic limestone is of Flux grade (Blast Furnace grade) and occupies over an area of 8.5sq.km. Total inferred reserve of B.F. grade limestone has been calculated as 153 million tonnes.

10.8 During the field studies of 1981-82, DMG carried out preliminary investigation of Cement grade of limestone in south of Sedam, Sedam Taluk,

by N.R. Pattabhiramaiah. over an extent of 410 Sq. km. Detail mapping 1:4000 Scale was carried out with 35 Nos of Core boreholes at a grid interval of 500.00m E-W & 400.00m N-S. Cement grade limestone of 685.00 million tons with CaO-46.10%, MgO- 0.89% and siliceous grade ore of 101.00 million tons with CaO-41.70%, MgO- 1.17% has been estimated. (DMG report 263)

10.9 During the field studies of 1982-83, DMG carried out preliminary investigation of Cement grade of limestone, involving geological mapping on 1:4000 and sampling in Nagai, Chittapur Taluk, by N.R. Pattabhiramaiah, covering an area of 2. 484 sq. km. The thickness of the limestone was assumed 30,00m with CaO ranging from 33.00% to 48.00% & MgO from 0.80% to 1.14%. Limestone resources of 116 million tons are estimated in the area. (DMG report 254)

11. Block Description:

11.1 The boundary coordinates of the proposed block are given below;

Table 4: Boundary Co-ordinates of the Itga Limestone block.

Boundary Points	Longitude	Latitude
A	77° 7' 26.33"	17° 3' 22.27"
B	77° 8' 47.50"	17° 3' 21.42"
C	77° 8' 48.09"	17° 4' 13.45"
D	77° 8' 48.69"	17° 5' 05.48"
E	77° 6' 25.90"	17° 5' 06.98"
F	77° 6' 56.15"	17° 4' 14.62"

12. Planned Methodology:

12.1 The exploration program is proposed in accordance with the objective set for Preliminary Exploration (G-3 LEVEL) of the block. The exploration will be carried out as per Mineral (Evidence of Mineral Content) Rule-2015. Accordingly, the following scheme of exploration is formulated in order to

achieve the objective. The details of the exploration in-puts proposed during the exploration are detailed in the subsequent paragraphs.

12.2 Geological mapping: Geological mapping will be carried out in the entire 10.60 Sq km area on 1:5000 scale. During the mapping the lithounits and their structural features will be captured. Surface signatures of the mineralization with their dispositions will be measured and the same will be depicted in the map which will be used as a base for planning future exploration.

12.3 Study and interpretation of available Aero Geophysical, NGPM, NGCM data and maps of the areas including previous Study Reports (if any, to be obtained from GSI or other agencies) for creating a geological Base Map of the Blocks.

12.4 Bed Rock sampling. During the course of geological mapping, it is also proposed to collect 10 no of bed rock samples and same will be subjected to the chemical analysis for major oxides.

12.5 Surveying: Topographical Survey will be carried out in the entire 10.60 Sq km area and DGPS of boundary points & bore holes reduced levels and co-ordinates of the and their collar RLs will be collected.

12.6 Exploratory Pitting: Pitting will be carried out to expose the continuity of mineralisation delineated during the Geological mapping with a dimension of 1m X 1m X 2 m and 1m X 1m X up to 5 m deep to expose the limestone bands, if warranted. In total, a quantum of 50 cu.m of pitting is proposed. The pits will be located by the field geologists based on the results of the geological mapping. A provision of 50 no of pit sample collection is made and same will be subjected to chemical analysis for major oxides.

12.7 Surface Diamond core drilling: Total 5 no of boreholes with a quantum of 480 m of drilling is proposed in the block to establish the limestone resources in the entire area of 10.60 Sq. km of the block with required

confidence level and to test the Glauconite mineralization within the block. The drilling is proposed in NQ size core with average depth of 70 m and borehole no PBH_03 is proposed to a depth of 200 m to intersect the Glauconite zone (plate 4). The tentative borehole locations were marked on plate-3. The boreholes are planned to intersect the Shahabad Limestone, which is the target zone.

Table 5: Proposed borehole Co-ordinates and respective borehole depths.

Proposed Boreholes For Itga Block at G-3 stage				
Sl.No.	Borehole_ID	Latitude	Longitude	Proposed Depth (m)
1	PBH-01	17° 4' 40.32"N	77° 7' 27.25"E	70
2	PBH-02	17° 4' 39.75"N	77° 8' 21.34"E	70
3	PBH-03	17° 4' 14.02"N	77° 7' 54.00"E	200
4	PBH-04	17° 3' 48.28"N	77° 7' 26.66"E	70
5	PBH-05	17° 3' 47.72"N	77° 8' 20.75"E	70
				480

Note: The proposed borehole locations and the depth are tentative which may vary after the completion of the geological mapping. All the boreholes will be vertical.

12.8 Drill Core Logging and Sampling.

12.8.1 Detailed core logging will be done with consideration of weathering, grain size, fossil contents, and colour of various formations, intercalation/parting of shale, stylolite, and structure. On the basis of these parameters, grade of limestone can be broadly visualized and will also be helpful in sampling.

12.8.2 Primary samples will be drawn at 1 m interval subject to change in lithology and core recovery. The following parameters shall be considered while sampling the drill cores

12.8.2.1 Colour, grain size.

12.8.2.2 Fossil variation.

12.8.2.3 Thin intercalations of shale/siltstone.

12.8.2.4 Partially weathered zone.

12.8.3 For preparation of samples the borehole core will be longitudinally split into two equal halves by using core splitter. One half of the cores will be sent for analysis and the other half will be kept for future studies. The powdered material will be mixed thoroughly and about 100 g of samples will be taken for chemical analysis by successive coning and quartering as primary samples and rest of the material will be kept as duplicate half for future reference.

12.8.4 During the investigation a total of 480 no of core samples will be collected and same will be subjected to the chemical analysis for major oxides.

12.9 **Laboratory Studies**

12.9.1 **Chemical Analysis:** In total 480 no primary samples with 5% of primary samples will be analysed as internal check, 10% of primary samples will be sent to NABL external labs as external check samples and 10% of primary samples as composite samples generated shall be subjected to analysis for major oxides and all the analysis will be done by XRF method.

12.9.2 **Petrological Studies:** 05 drill core and surface samples will be carried out for thin section study.

12.9.3 **Specific Gravity Studies:** 05 drill core samples will be analysed for Specific gravity.

12.10 **Exploration report**

12.10.1 Exploration will be carried out over an extent of 10.60 sq. km and to make an auctionable size blocks, the proposed block will be divided into two blocks and for the same two blocks separate Geological reports will be prepared.

13. The Quantum of work proposed:

13.1 Envisaged of Itga Limestone block Quantum of work is detailed in Table 05.

14. Manpower Deployment

14.1 The Manpower deployment details will be provided later.

15. Break-up of expenditures

15.1 The tentative Cost has been estimated based on the Schedule of Charges of projects funded by National Mineral Exploration Trust (NMET) w.e.f. 01/04/2020. The total estimated cost works to Rs. **1,57,97,601/-**. The summary of cost estimation for G-3 level of exploration is given in the Table 6 and details of cost estimate are given in Table 7.

Proposed Quantum of work

Table 6: Envisaged Quantum of work

G3_LEVEL				
Sl No	Stage	Components	Units	Qty
1	Preparation of Exploration Proposal		no	1
2	Geological Mapping (1:12,500)	Geological Mapping (in 1:5000 scale)	Sq km	10.6
3		Bed Rock Samples	no	10
4		Pit samples	no	50
5		Pitting works	cum	50
6	Survey Work	Demarcation of Lease boundary points and borehole points by DGPS.	no	11
7		Total Station Survey	Sq km	10.6
8	Drilling works (soft rock)	No of Bore Holes	no	5
9		Approach Road making	km	5
10		Core Drilling (NQ series 4 borehole of 70m depth and 1 borehole of 200m depth)	m	480
11		Detailed core/ sample logging including supply of core/ sample boxes	m	480

12		Transportation of drill rigs (1 rig , covering of 1200 km to & fro)		km	2400
13		Drill core preservation		m	480
14	Laboratory studies	Primary Analysis	Bed Rock Samples	no	10
15			Pit samples	no	50
16			Drill Core	no	480
17		Internal Check sample analysis (5%)	Bed Rock Samples	no	1
18			Pit samples	no	3
19			Drill Core	no	24
20		Composite sample analysis (10%)	Bed Rock Samples	no	1
21			Pit samples	no	5
22			Drill Core	no	48
23		External Check sample analysis (10%)	Bed Rock Samples	no	1
24			Pit samples	no	5
25			Drill Core	no	48
26	Petrological samples (BH samples)	Preparation of thin section		no	5
27		Study of thin section		no	5
28	Specific gravity study	Specific gravity studies of drill core samples		no	5
29	Geological Report Preparation			no	2

The Summary of Cost estimation for G-3 level block.

Table 7: The summary of cost estimation for G-3 level block.

Sl.No	Item	G3_LEVEL (Rs)
1	Geological Mapping	10,02,600
2	Pitting works	2,51,200
3	Survey works	7,79,360
4	Drilling	56,75,410
5	Analysis	35,52,750
6	Peer review of report	10,000
7	SUB TOTAL	1,12,71,320
8	Preparation of Exploration Project Proposal	2,25,426
9	Exploration Report	11,49,675
10	Tendering process cost	2,25,426
11	Reimbursement of outsourced component	5,15,950
12	Grand Total.	1,33,87,798
13	GST 18%	24,09,804
14	Grand Total (with GST 18%)	1,57,97,601
	Say in Lakh Rs	157.98

The Estimated cost for G-3 level exploration in Itga limestone block.

Table 8: Estimated cost for G-3 level exploration in Itga Limestone block.

Sl. No	Item of Work	Unit	Rates as per NMET SoC			G3 LEVEL	
			SOC Item No	Work/ Activity description	Rates as per SoC	Qty	Amount (Rs)
1	Geological Mapping (1: 5000: 10.60 sqkm)						
1.1	Geologist Party days (1) - Field	Days	1.2	Geological /Traverse mapping	11,000	60	6,60,000
1.2	Geologist Party days (1) - HQ	Days	1.2		9,000	30	2,70,000
1.3	Labour charges	Days	5.7		605	120	72,600
2	Pitting works						
2.1	Excavation of Pit	cum	2.1.2	Upto 2m	3,800	10	38,000
2.2	Excavation of Pit	cum	2.1.3	2 to 5 m	5,330	40	2,13,200
3	Survey works						
3.1	Demarcation of Lease boundary by DGPS. And Fixation of borehole and determination of Co-ordinates and RL of the boreholes by DGPS.(Including charges deployed	Per Point of observation	1.6.2		19,200	11	2,11,200

	for the work)						
3.2	Monitoring in case of outsourcing: Charges of one qualified surveyor with Total Station for monitoring of topographical survey in different RF and surface contouring at different interval. one Surveyor (without labour)	Charges for one Surveyor per day	1.6.1b		8,300	53	4,39,900
3.3	Labour charges	Days	5.7		605	212	1,28,260
4	Drilling						
4.1	Surface Drilling (01 rig - Soft Rock-NQ)	m	2.2.1.1b		5,242	480	25,16,160
4.2	Land/Crop Compensation	Per borehole	5.6	As per actuals as certified by local authorities subject to a maximum of 20,000 per borehole	20,000	5	1,00,000
4.3	Transportation of drill rigs (1 rig covering of 1200 km to & fro)	km	2.2.8		36	1200	43,200

4.4	Drilling camp setting cost			per drill	2.2.9a		2,50,000	1	2,50,000
4.5	Drilling camp winding cost			per drill	2.2.9b		2,50,000	1	2,50,000
4.6	Monthly accommodations charges for drilling camp			Monthly Basis	2.2.9		50,000	3	1,50,000
4.7	Approach road making for Flat terrain			km	2.2.10a		22,020	10	2,20,200
4.8	Construction of Concrete pillar (12"X 12"X30")			per borehole	2.2.7a		2,000	5	10,000
4.9	Borehole plugging by cement (NQ)			m	2.2.7b		150	25	3,750
4.10	Core preservation			m	5.3		1,590	480	7,63,200
4.11	Geologist Party days (1) - Field			Days	1.5.1b		11,000	90	9,90,000
4.12	Geologist Party days (1) - HQ			Days	1.5.1b		9,000	30	2,70,000
4.13	Labour charges			Days	5.7		605	180	1,08,900
5	Analysis								
5.1	Sampler charges			Days	1.5.2		5,100	90	4,59,000
5.2	Labour charges			Days	5.7		605	360	2,17,800
5.3	Sample analysis	Primary	Major oxides	per sample	4.1.15a	XRF analysis for major	4,200	540	22,68,000

5.4		Internal Check (5%)	Major oxides	per sample	4.1.15a	oxides (CaO, MgO, Al2O3, SiO2, Fe2O3, TiO2 LOI, MnO2, K2O, Na2O, SO3,Cl & P2O5)	4,200	27	1,13,400
5.5		Composite (10%)	Major oxides	per sample	4.1.15a		4,200	54	2,26,800
5.6		External Check (10%)	Major oxides	per sample	4.1.15a		4,200	54	2,26,800
5.7	Petrological samples (BH samples)	Preparation of thin section		per sample	4.3.1		2,353	5	11,765
5.8		Study of thin section		per sample	4.3.4		4,232	5	21,160
5.9	specific gravity studies	Of Core samples		per sample	4.8.1		1,605	5	8,025
6	Peer review of report			lump sum	As per EC		10,000	1	10,000
7	Subtotal								1,12,71,320
8	Preparation of Exploration Project Proposal				5.1	2% of approved project cost or 3.8 lakh whichever is lower	2,25,426	1	2,25,426

9	Exploration Report	nos	5.2	For the projects having cost exceeding Rs 50 lakh but less than 150 lakh: A Minimum of Rs. 2.5 lakh or 5% of the value of work whichever is more and 3000/- per each additional copy.	5,74,837	2	11,49,675
10	Tendering process cost	nos	2.3	One time, in case of outsourced components of project work. 2% of the approved project cost or 5 lakh whichever is lower will be paid one time to Exploration Agency.	2,25,426	1	2,25,426

11	Reimbursement of outsourced component	nos	6.0 (iii)	Cost for outsourced component(s) of project work will be reimbursed as per actuals. In addition, Rs.8.75 Lakh plus 5 percent on the balance amount of outsourced cost in excess of Rs 1crore will be paid to Exploration Agency towards operational charges. The maximum ceiling of operational Charges is Rs 15 lakhs. The operational	52,12,670	1	5,15,950
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			charges will be calculated on the cost of total outsourced component or certified actual payment made by the Exploration Agency, whichever is lower.			
12	GRAND TOTAL					1,33,87,798
13	GST 18%					24,09,804
14	Grand Total (with GST 18%)					1,57,97,601

Note: The above cost estimates has been worked out based on the latest NMET SoC approved by Mom dated 31st March 2020.

Tentative time schedule/action plan for the proposed G-3 level of exploration for Limestone.

Table 9: Tentative time schedule/action plan for the proposed G-3 level of exploration for Limestone block.

Sl No	Details of works	Duration in Months	Months										
			1	2	3	4	5	6	7	8	9	10	11
1	Camp Setting	1					Review						
2	Geological Mapping (Includes 10.60 sq km of GM+ 10 no of BRS+ 50 cum pitting+ 50 no of pit samples.	2											
2.1	Geologist Party days-Field (01 Party)	2											
2.2	Geologist Party days-headquarters (01 Party)	1											
2.3	Laboratory works	2											
3	Topographical Survey	2											
4	Surface Drilling [Includes Preparatory work for drilling approach road	3											

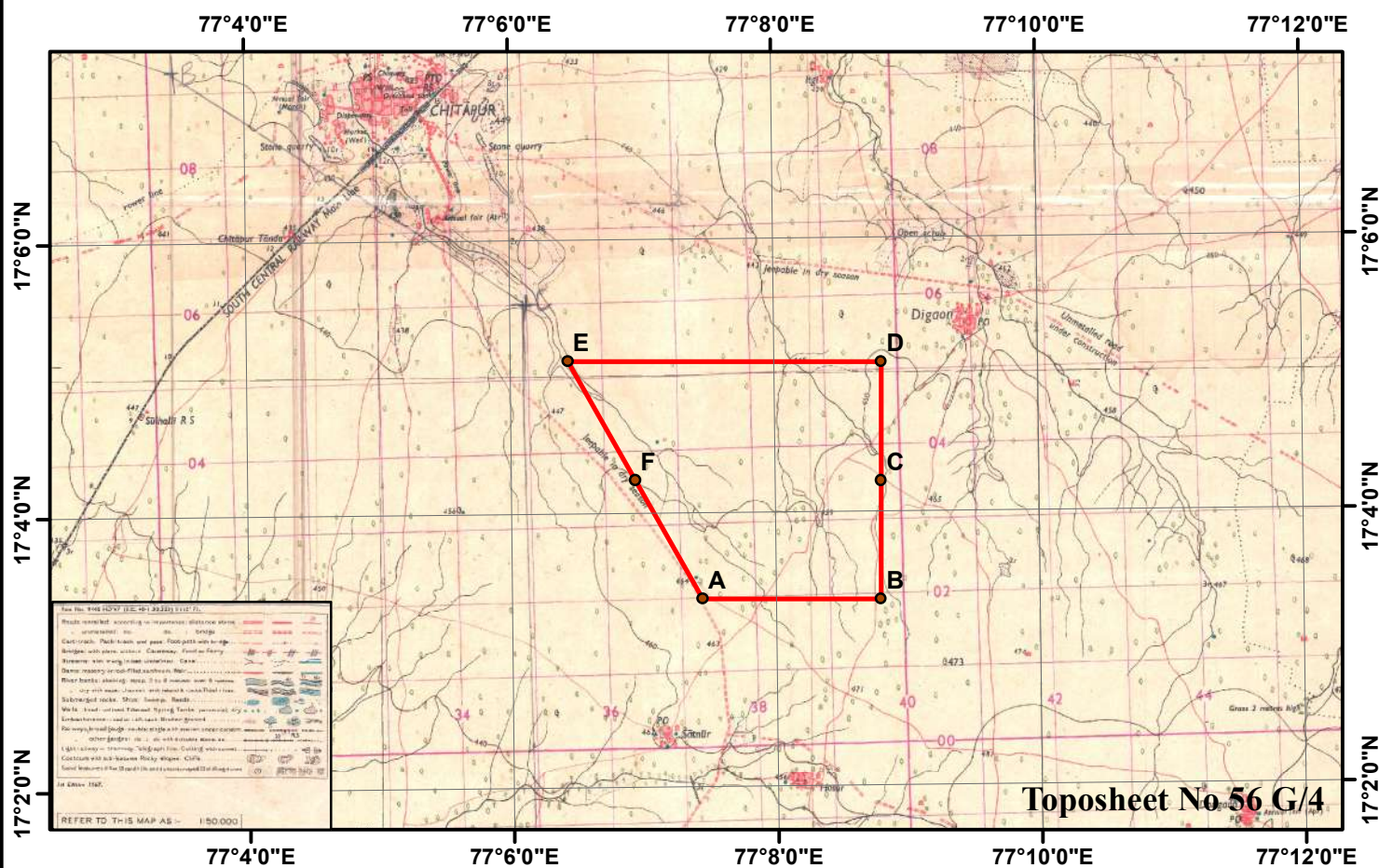
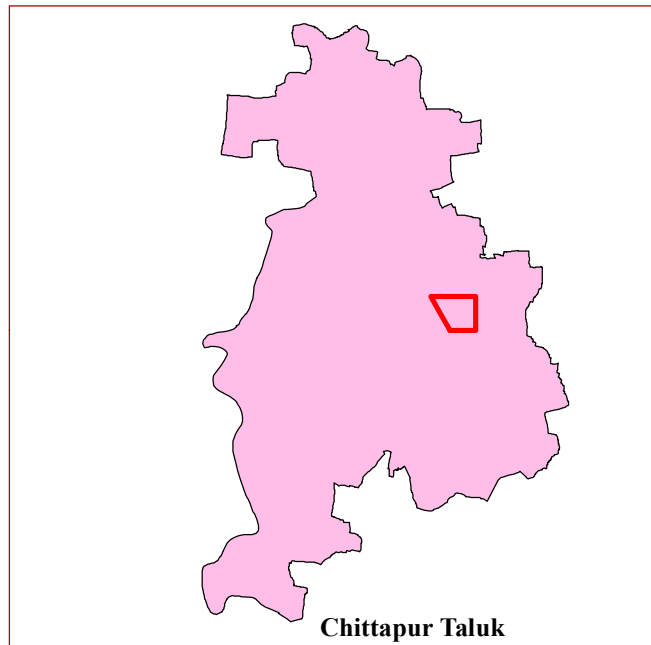
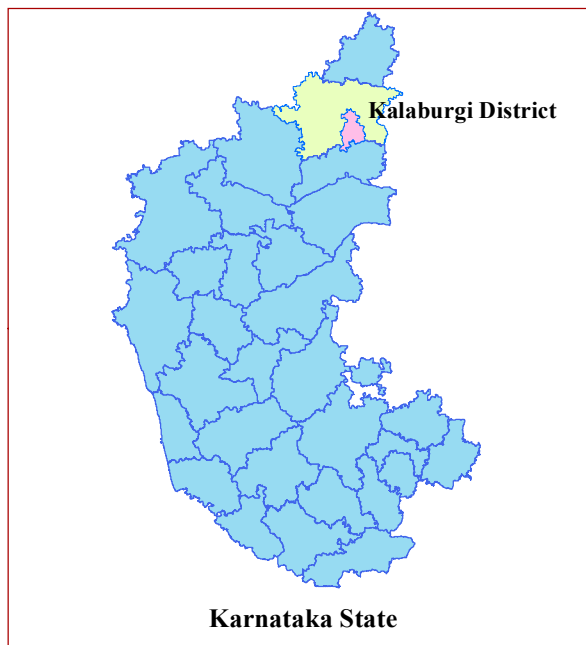
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Note:

1. Commencement of project may be reckoned from the day the exploration acreage is available along with all statutory clearances.
2. Time loss on account of monsoon/agricultural activity/forest clearance/local law & order problem may be additional to above time line.

16. References:

- Geological Survey of India (1984), regional geological mapping of Chittapur and surrounding area, Kalaburagi District of Karnataka.
- Department of Mining & Geology Karnataka (1976), "Limestone Deposits immediately to the East of Chittapur, Kalaburagi District of Karnataka.
- Geological Survey of India (1974-75), preliminary investigation for Flux grade Limestone around Wadi, Kalaburagi district Karnataka.
- Geological Survey of India (1976-77), preliminary investigation for Flux grade Limestone around Wadi, Kalaburagi district Karnataka.
- Geological Survey of India (1969-70), preliminary investigation for assessing the quality and quantity of limestone available in the M/S A.C.C. Area.
- Geological Survey of India (1977-78), preliminary investigation for Flux grade Cement grade Limestone in Bhima Basin, Kalaburagi district, Karnataka.
- Department of Mining & Geology Karnataka (1981-82), preliminary investigation of Cement grade of limestone in south of Sedam, Sedam Taluk, by N.R. Pattabhiramaiah.
- Department of Mining & Geology Karnataka (1982-83), preliminary investigation of Cement grade of limestone in Nagai, Chittapur Taluk, by N.R. Pattabhiramaiah.



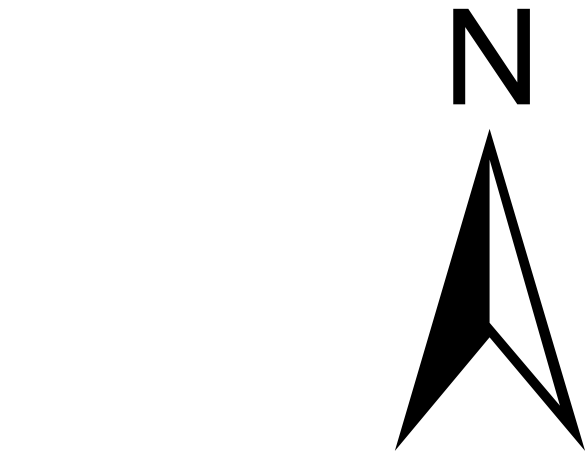
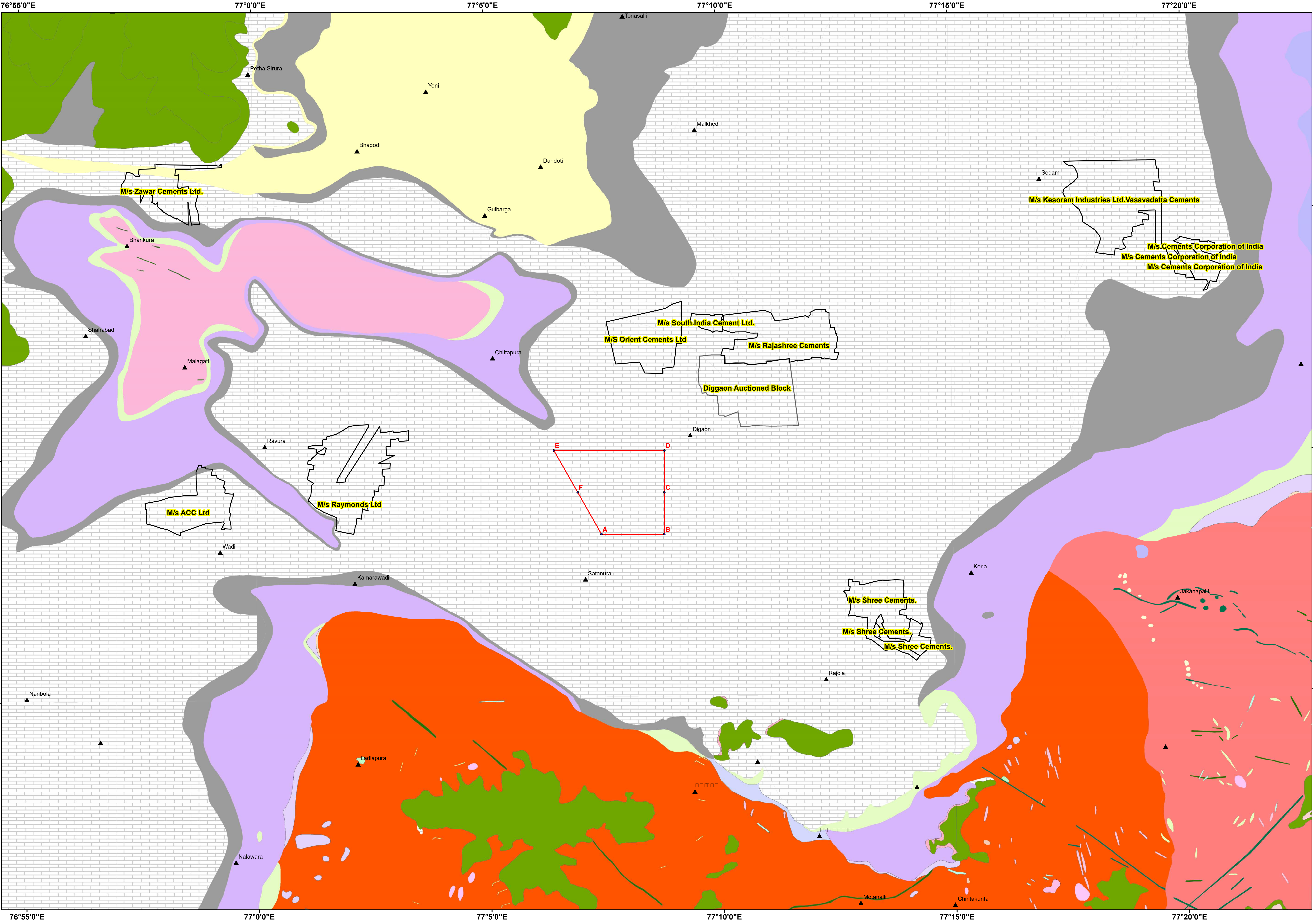
Itga Proposed Limestone Block

Plate No:1

Boundary Points	Lattitude	Longitude
A	17° 3'22.27"	77° 7'26.33"
B	17° 3'21.42"	77° 8'47.50"
C	17° 4'13.45"	77° 8'48.09"
D	17° 5'5.48"	77° 8'48.69"
E	17° 5'6.98"	77° 6'25.90"
F	17° 4'14.62"	77° 6'56.15"

0 1 2 3 4 Kilometers

 DEPARTMENT OF MINES & GEOLOGY GOVERNMENT OF KARNATAKA			
Title	LOCATION MAP OF PROPOSED ITGA LIMESTONE BLOCK		
District	Kalaburagi	State	Karnataka
Stage	G3	Scale	NTS
Prepared by: Geologist, DMG, Karnataka			



LEGEND

- ITGA_BOUNDARY
- SURROUNDING_ML's

LITHOLOGY

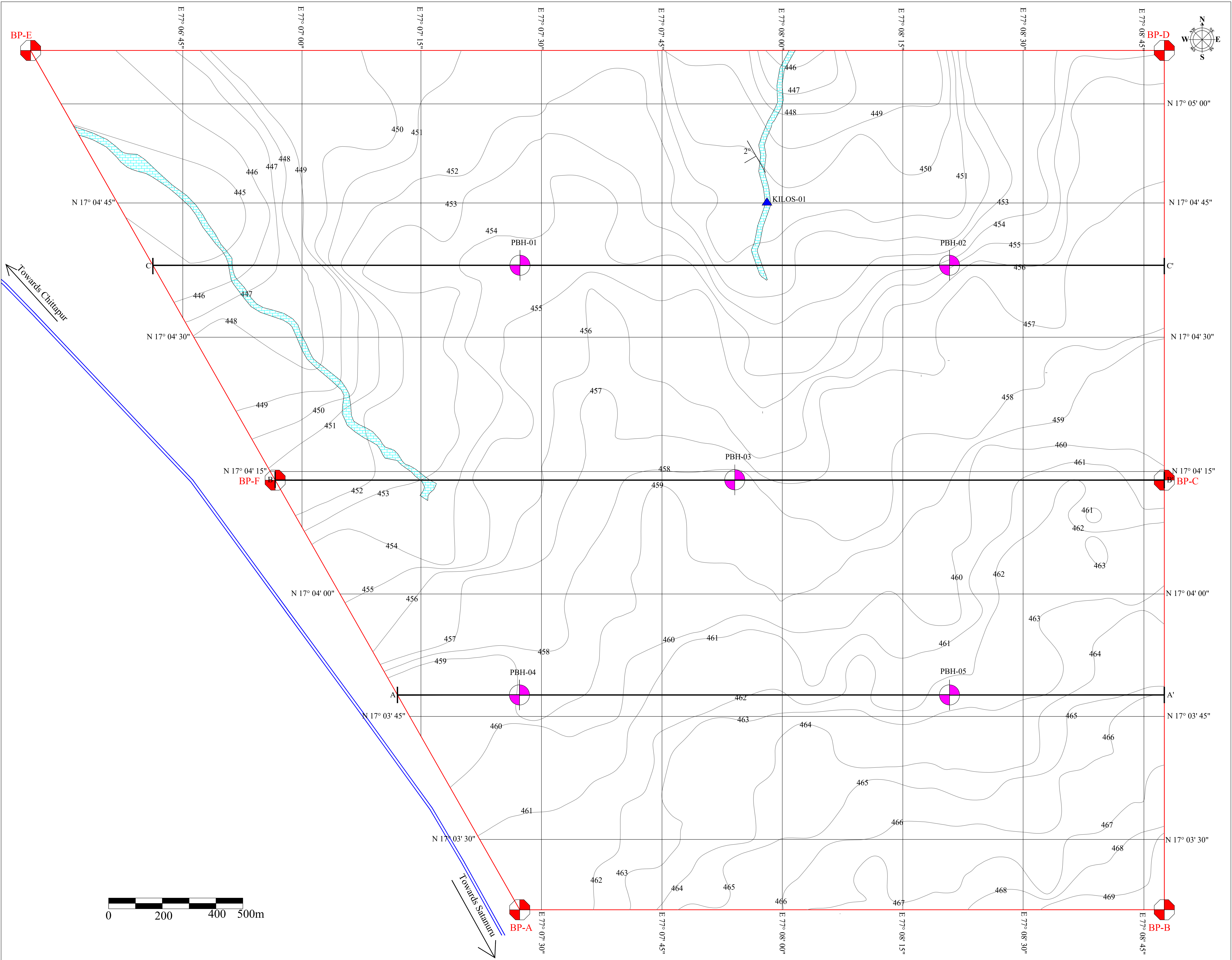
- INFRATRAPPEAN
- BASALT
- INTERTRAPPEAN
- GABBRO
- DOLERITE
- QUARTZ VEIN/REEF
- PEGMATITE
- LIMESTONE
- FLAGGY LIMESTONE
- SHALE
- VARIEGATED SHALE
- GREEN SHALE
- PURPLE SHALE
- SANDSTONE
- CONGLOMERATE
- GREY GRANITE
- GRANITE
- PINK GRANITE
- HORNBLLENDE-BIOTITE GRANITE
- META-BASALT
- GREY BIOTITE GRANITE
- PINK BIOTITE GRANITE
- BIOTITE GRANITE GNEISS
- MIGMATITE GNEISS
- AMPHIBOLITE
- META-PYROXENITE



DATUM: WGS-84

Plate No:2

 DEPARTMENT OF MINES & GEOLOGY GOVERNMENT OF KARNATAKA			
Title	LITHOLOGICAL MAP OF PROPOSED ITGA LIMESTONE BLOCK WITH EXISTING LIMESTONE ML's		
District	Kalaburagi	State	Karnataka
Stage	G3	Scale	1:50000
Prepared by: Geologist, DMG, Karnataka			



LEGEND

Proposed Block Boundary

Black Cotton Soil

Proposed Bore Hole

Strike & Dip

Sample Location

Contour Lines

Limestone

Section Line

Road

DEPARTMENT OF MINES & GEOLOGY
GOVERNMENT OF KARNATAKA

Title

LITHOLOGICAL PLAN WITH PROPOSED BOREHOLES
LOCATION OF ITGA LIMESTONE BLOCK

District

Kalaburagi

State

Karnataka

Stage

G3

Scale

1:5000

Prepared by: Geologist, DMG, Karnataka

