PROPOSAL FOR G-3 STAGE EXPLORATION OF KODANGAL LIMESTONE BLOCK AT KODANGAL MANDAL, VIKARABAD DISTRICT, TELANGANA STATE.

(For NMET)

(Industrial Mineral)

By

Telangana Mineral Development Corporation Limited

Hyderabad

Place:

Date:

Summary of the Block for G3 stage exploration

	Features	Details
1.	Block ID	Kodangal Limestone Block
2.	Current Exploration Agency	TGMDC Ltd.,
3.	Previous Exploration Agency	GSI
4.	G4 stage Geological Report (Previous stage Geological Report)	G-4 Stage report is completed.
5.	Commodity	Limestone
6.	Mineral Belt/ Basin	Shahabad Basin
7.	Completion Period with entire Time schedule to complete the project	12 months
8.	Objectives	1. To Delineate block boundary with the help of DGPS. 2. To carry out Topographical and Geological Mapping on 1:5000 scale. 3. To assess the quantity & quality of cement grade limestone in the block up to 50m vertical depth.
9.	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	Exploration to be carried out by officers of TGMDC with outsourcing of survey, drilling & chemical analysis components. Outsourcing of components for identifying agencies will be done through e-tendering.
10.	Name/ Number of Geoscientists	02
11.	Expected Field days (Geology, Geophysics, Surveyor)	Geology =300 days (Geological mapping, core logging & sampling) Surveyor = 60 days (Establishing block coordinates, Topographic mapping, & locating boreholes)
12.	**Location**	
	Latitude	17° 6'40.09"N
	Longitude	77°37'20.05"E
	Villages	Angadiraichur, Gandlapalli, Darmapur and Tekalakode
	Tehsil / Taluk	Kodangal
	District	Vikarabad
	State	Telangana
13.	**Area(hectares/square kilometers)**	
A	Block Name	Kodangal Limestone Block
	Block Area	8.65 sq.km
	Forest Area	
	Government Land Area	
	Private Land Area	
14	**Accessibility**	
	Nearest Rail Head	Tandur Railway station
	Road	Kodangal town is 120 km from Hyderabad, lies on NH 163

	Airport	Rajiv Gandhi International Airport, Hyderabad
15	**Hydrography**	
	LocalSurfaceDrainagePattern(Channels)	Dendritic to sub dendritic drainage Pattern
	Rivers/ Streams	The area is drained by the Kagna river.
16	**Climate**	The area experiences tropical wet and dry climate.
	Mean Annual Rainfall	The average annual rainfall is 960 mm
	Temperatures (December) (Minimum) Temperatures (June) (Maximum)	14 ^{0} C Minimum 35^{0} C Minimum
17	**Topography**	
	Toposheet Number	56G/08,56G/12
	Morphology of the Area	The proposed area is part of Shahabad formation
18	**Availability of baseline geoscience data**	
	Geological Map (1:50K/ 25K)	1: 50K available
	Geochemical Map	Not Available
	Geophysical Map (Aero-geophysical, Ground geophysical	Not Available
19	**Justificationfortaking upG-3stage Exploration.**	Geological Survey of India carried out prospecting for geological mapping of a part of mahboobnagar district, Andhara Pradesh during 1985-86 field season and reported Limestone mineral and Systematic Geological mapping in parts of Hayathnagar, Chevella and Tandur talukas of Hyderabad and Rangareddy Districts of Andhara Pradesh during 1986-87 field seasons.

DETAILED DESCRIPTION ON THE FOLLOWING TITLES TO BE MADE IN THE PROPOSAL

1. Block Summary

A. Physiography

Physiographically the area of study represents a pediplain punctuated by numerous small hills and valleys. In and around Gandlepalle and Dharmapur areas the peninsular Gneissic complex is the basement rock and is overlain by Bhima Group of rocks (greenish silty quareite; pink purplish pink dark brownish pink shale and finely to moderately bedded Limestone with yellow, greenish Pink, Khaki green colour shades) and are further succeeded by Deccan basaltic flows. The Limestone along with the underlying shale occurs as linear flat topped linear EW trending ridge rising up to 60m elevation when compared to the adjoining plain country. East of Dharmapur that is 2 to 3km west of Angadi Raichur the Limestone is overlain by 1 to 4 m thick Deccan Basalt flow.

The area is located in the southern part of India in the state of Telangana, features a varied physiography characterized by hills, valleys and plateaus. The region is part of the Deccan Plateau and has a predominantly rocky terrain with elevations that create a scenic landscape. The area is bordered by the Nallamala Hills to the east and the Vikarabad plateau, which is characterized by rolling hills and steep ridges. The region primarily consists of red soils, which are conducive to agriculture, particularly for crops like millet and pulses. There are several small streams and reservoirs, but the area is generally drier compared to other regions in Telangana. Vikarabad experiences a tropical climate, with hot summers, a monsoon season, and mild winters, influencing its vegetation and land use patterns. The hilly terrain supports diverse vegetation, including deciduous forests, which provide habitat for various wildlife species. This unique physiography contributes to the region's agricultural practices, biodiversity, and scenic beauty, making it a notable part of Telangana.

B. Background Geology (Regional Geology & Geology of the Block)

Regional Geology:

The rock types in the area belong to Peninsular Gneissic Complex-II (PGC-II) for Arechean to Paleoproterozoic age, dolerite dykes and gabbro unit of Paleoproterzoic age, Bhima Group of Neoproterzoic age, Deccan traps and associated infra and inter-trappean beds of Late Createceous to paleocene age and laterite of Cenozoic age.

The Peninsular Gneissic Complex (PGC-II) belonging to Archean to Paleoproterzoic age

represented by leuco granite, migmatite gneiss, grey hornblende - biotite gneiss, alkali feldspar granite, pink hornblende boitite granite, grey hornblende granite, grey granite, grey biotite granite, pink granite, pink biotite granite. These are intrused by younger basic dykes and acid intrusives of quartz. The basic dykes include dolerite and gabbro.

The rocks of Peninsular Gneissic Complex (PGC-II) are traversed by Gabbro and dolerite dykes. Dolerite dykes have different trends viz., E-W, ENE-WSW, WNW-ESE, N-S and NE-SW. Based on cross-cutting relationship, the N-S trending dykes appear to be oldest while those trending E-W are considered to be the youngest.

Sedimentary rocks of Bhima Group lie unconformably over the Peninsular Gneissic Complex (PGC-II). The Bhima Group is represented by sandstone and purple shale equivalent of Rabanapalli Formation and Limestone equivalent of Shahbad Formation. Shahbad limestone overlies the purple shale conformably. In the top and basal portions, it is light grey and flaggy with occasional purple shale intercalations. The middle horizon is purple to bluish grey and massive.

The Deccan Trap occurs as sub - horizental basaltic flows forming plateaus in the east central and north eastern parts of the area. It exposes the Sahayadri Group of rocks which is divided into two formations, namely Mahabaleshwar and Purandargarh. Unfosiliferous inter trappean are present in both the formations. The intertrappean comprise chert and ash beds, which are fossilferous. Laterite capping in the form of flat topped plateau with an irregular outline and as small isolated hillocks are scattered all over the Deccan units.

REGIONAL GEOLOGY: Lithostratigraphic Classifications of the Bhima Group

Andola Sub-Group	5. Harwal-Gogi Formation	Shahabad Limestone formation
	4. Katamadevarhalli Formation	Grey micritic impure Limestone
	3. Halkal Formation	Dark blue-grey massive Limestone
	iii) Fissile Shale Member	Variegated, siliceous and cherty limestones
	ii) Ortho quartzite Member	Blue-grey, blocky micritic limestones
	i) Cherpebble Conglomerate	Flaggy impure (cherty / argillaceous) limestones
..... Para-unconformity……..		
Sedam Sub-Group	2. Shahabad Formation (with 5	--Gradational and transitional ---Facies charges---
	1. Rabbanpalli Formation Sub-Group	A) RabbanpalliClastics Formation
	v) Purple Shale member	d) Ekmai Shale Member (ferruginous & calcareous shales)
	iv) Green/yellow Shale Member	c) Kasturpalli Glauconitic Member
	iii) Siltstone Member	b) KundrapalliQuartzarenite Member
	ii) Quartzitic Member	a) Adki Hill Conglomerate

	i) Conglomerate / Grit.	

Geology of the Area:

The area in and around Angadi Raichur, Gandlepalle, Dhamapur, Kasturpalli in general shows undulating topography with isolated hillocks. The highest elevation is 585 above MSL as seen at 05 Km south of Gandlepalle and the lowest elevation is 500 m as seen 2.5 km NE of Kastupalli, 0.5Km East of ananthapur and 0.5 m West of Boipalli. Overall the driange pattern is dendritic and parallel. A prominent stream flowing from SW to NE runes from Indanur in SW and Agandi Raichur in the NE.

The purple shale is conformably overlain by Limestone with various colour shades and is designed as Shahabad formation. Good exposures of Limestone are present all along the WNW-ESE trending flat tapped linear hill running from 2km south of Boipalli in the west to Angadi Raichur in the East. Besides, an arm of above mentioned WNW-ESE trending NE to 1km north of Indanur in the SW. the Limestone and shale sequence of the Bhima Group, in the studied area forms a sickle shaped outcrop pattern. The Limestone is green, purple and cream coloured with a thin cleowable nature. It is fine grained, massive, slabby, blocky and thickly bedded. The Limestone is with concoidal fracture and 3.5 hardness.

The limestone in the investigated area is gently dipping (5^0 to 8^0 south) and occurs as a gently southern slopping flat ground capping the purple faults shale sequence. Because of local faults that is especially along the contact zones with that of granite the Limestone show relatively steep dips (15^0 to 25^0) Drainage in the area is mainly controlled by lithocontacts, shear zones and master joints. The sickle shaped linear hill pattern of the shale-limestone sequence represents a residual hill in the pediplain. On eitherside of the above mentioned hill is marked by emalgamated zone of lithocontact and shear zone.

C. Mineral potentiality based on geology, geophysics, ground geochemistryetc.

Previous study in Kodangal Limestone Block indicated potential area for Cement grade limestone Tentative reconnaissance resources (334) of about 337 million tones has been assessed having average grade of Cao content ranging from 44.5% to 48%, Thus, area has high potential for cement grade limestone.

D. Scope for proposed exploration

As the area have high potential for cement grade limestone, have been identified in the for further detailed exploration. The identified block in the area have to be explore by G-3 stage exploration to assess the quantity & quality of cement grade limestone resources and classify the resources as per UNFC and Minerals (Evidence and Mineral Contents) Rule, 2021 norms.

E. Recommendations of G-4 Stage Mineral Exploration

72nd TCC-1 Technical committee recommended to TGMDCL merge two blocks into a single block focusing exclusively on limestone. Accordingly, we have prepared a G-3 Exploration proposal.

F. Objectives:

1. To Delineate block boundary with the help of DGPS
2. To carry out Topographical and Geological Mapping on 1:5000 scale
3. To Assess the quantity & quality of cement grade limestone in the blocks up to 50m vertical depth

2. Previous Work:

In the year of 1985-86 report prepared by Shri. G. Vijayasarathi, Geological Survey of India on the Geological mapping of a part of Mahaboobnagar District, Telangana. Geological mapping over an extent of 604Sq.Km covering AngadiRaichur, Tekkalkot, Rudraram, burjuTandaBoipalli, Gandlepalli, Dharmapur ,Indanur, Rawalapalli, Kasturapalli, Rabbanapalli and Anantapur is carried out 1:50.000 scale. The area covered in Toposheet No. 56 G/8 &12. Out of 604 Sq. Km he observed that 6.7 Sq. Km area and total thickness of the limestone in the area is above 15 to 25m and the Reserves of limestone are 337 million tonnes.

Based on above mentioned, GSI report, Dr. T. Rajesham, former Director, GSI, has Explored 250 Million Tonnes of Limestone resources for Seetaram Cements Limited (SCL) in Angadi Raichur,Gandlepalli, DharmapurandIndanur villages of Kodangal Mandal Erstwhile Mahaboobnagar District.

3. Block description:

G-3 Stage Kodangal Limestone Block: -

S. No	Latitude	Longitude
1	17°05'34.08"N	77°28'08.94"E
2	17°05'18.14"N	77°31'16.01"E
3	17°04'25.31"N	77°31'12.42"E
4	17°04'29.36"N	77°28'55.96"E
5	17°04'47.24"N	77°28'52.97"E
6	17°04'50.17"N	77°28'49.91"E
7	17°04'51.30"N	77°28'43.25"E
8	17°04'48.18"N	77°28'35.27"E
9	17°05'08.94"N	77°28'10.82"E

4. Planned Methodology

The proposed Kodangal Limestone block shall be explored as Preliminary Exploration stage by detailed topographical, geological mapping, drilling and chemical analysis to assess quantity and quality of cement grade limestone resources. Borehole spacing shall be planned at 800 X 800 meters grid (As per MEMC, 2021).

5. Nature Quantum and Target

Quantum of Work to be Carried by TGMDC Ltd. In Kodangal Block, Koddangal Mandal, Vikarabad District, Telangana State			
S.No	**Item Work**	**Unit**	**Quantum of work Proposed**
1	Topographic Survey (on 1:5000)	sq.km	8.65 sq.km
2	Geological Mapping (on 1:5000)	sq.km	8.65 sq.km
3	Drilling (Core borehole)	m	700m (14 BH)
4	Laboratory Studies		
	1)Chemical Analysis for Primary Check samples for 6 radicals i.e.CaO, MgO, Al_2O_3, SiO_2, Fe_2O_3 and LoI	Nos.	700
	ii) Internal Check Samples (10% of Primary) for 6 radicals i.e. CaO, MgO, Al2O3, SiO2,Fe2O3 and LoI	Nos.	70
	iii) External Check Samples (5% of Primary) for analysis 6 radicals i.e.CaO, MgO, Al2O3, SiO2, Fe2O3 and LoI	Nos.	35
	iv) Composite Samples for 6 radicals (CaO, MgO, Al2O3, SiO2, Fe2O3, and LoI	Nos.	70
5	Physical Studies		
	A. Petrological Studies (Petrographic Studies)	Nos.	7
6	Specific Gravity Determinations	Nos.	14
7	Report Preparation (Digital format)	Nos.	1

6. Exploratory Drilling: (Referred another document on exploratory drilling)

7. Manpower deployment = 2 Geologists

8. Break-up of expenditure

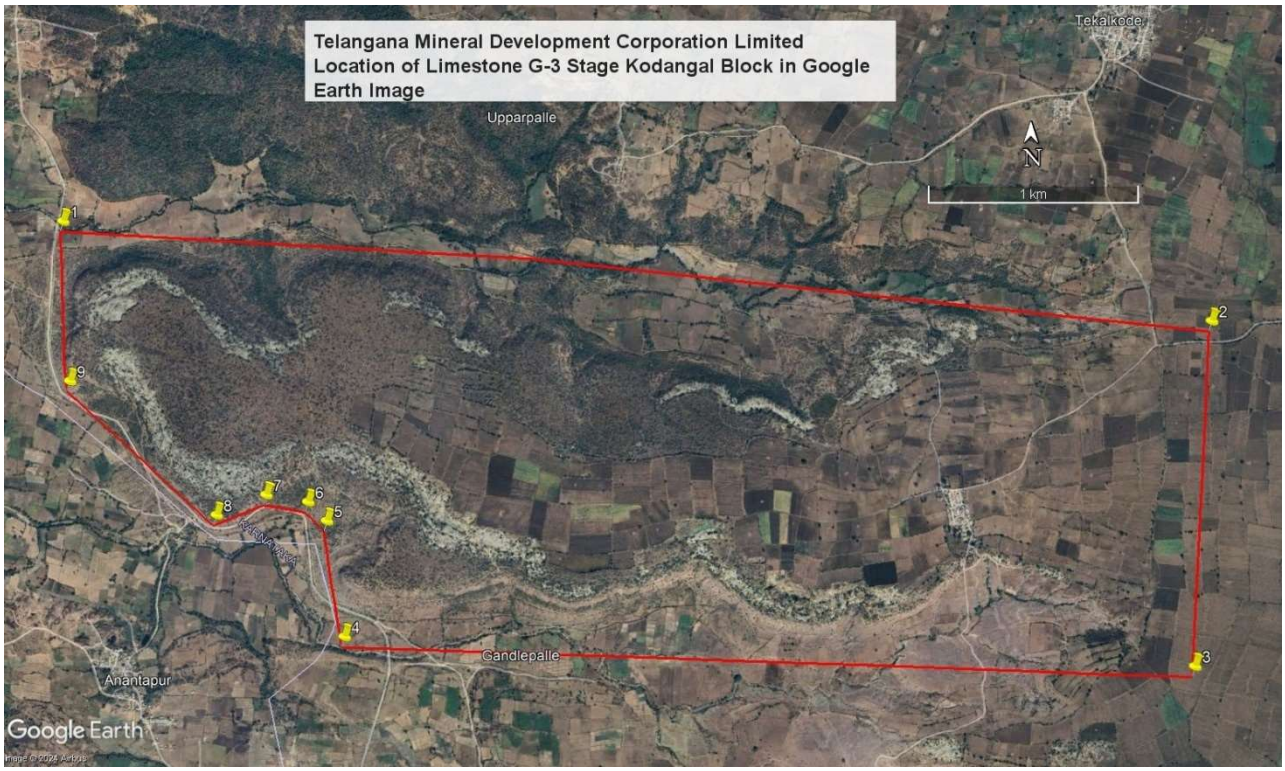
In Kodangal Limestone Block, Kodangal Mandal, Vikarabad District, Telangana.

SUMMARY OF COST ESTIMATES		
S. NO.	**Item**	**Total Estimated cost (Rs)**
A	Geological, Survey & Sampling Work	**4167000.00**
B	Drilling	**7230940.00**
C	Laboratory Studies	**3814150.00**
D	Drill core preservation	**2862000.00**
E	Preparation of Proposal	**361481.80**
F	Report of Exploration Cost	**903704.50**
G	Pre-review	**30000.00**
H	Sub Total (A to G)	**19369276.30**
I	GST @ 18%	**3486469.73**
J	Grand Total	**22855746.03**

S. N0	Item of Work	Unit	Rates as per NMET SoC 2020-21		Estimated Cost of the Proposal	
			SoC-Item- Sl. No.	Rates as per SoC	Quantity	Amount
A	**Geological work**					
1	**Survey, Core logging, Sampling & report writing**					
	a) Survey work	per day	1.6.11a	8,300	30	249000
	b) Demarcation of lease boundary, Fixation of borehole and determination of co-ordinates & Reduced Level (RL) of the boreholes by DGPS	per point of observation	1.6.2	19,200	20	384000
	c) Charges for Geologist party days in field	Per day	1.5.1a	11,000	180	1980000
	d) Charges for Geologist party days (at H Q)	Per day	1.5.1a	9,000	120	1080000
	e) Sample processing work	Sampler per day	1.5.2	5,100	60	306000
	f) 4 labours / Party (Rs 350 / day / labour) (As per rates of Central Labour Commissioner)	day	5.7	1,400	120	168000
	Sub total - A					**4167000**
B	**Drilling**					
1	Surface drilling	Per m	2.2.1.1B	5242	1000	5242000
2	Accommodation	ONE Month	2.2.9	50000	7	350000
3	Appoach road making for flat terrain	Per km	2.2.10a	22020	7	154140
4	Land or Crop Compensation	per bore hole	5.6	20000	7	140000
5	Camp setting	per drill	2.2.9a	250000	1	250000
6	Camp winding	per drill	2.2.9b	250000	1	250000
7	Drilling Tendering process cost	One time	2.3	500000	1	500000
8	Transportation of drill rig & truck associated per drill	K.M	2.2.8	36	1800	64800
9	Vehicle & POL Charges for field	Month	N.A.	40,000	7	280000
	SUB TOTAL B					**7230940**
C	**Laboratory studies**					
1	**Chemical analysis**					
	a) Primary core Samples for 6 radicals i.e. CaO, MgO, Al_2O_3, SiO_2, Fe_2O_3 and LoI	per sample	4.1.9	2841	1000	2841000
	b) Internal Check Samples for 8 radicals i.e. CaO, MgO, Al_2O_3, SiO_2, Fe_2O_3 and LoI	Per sample	4.1.9	3511	100	351100
	c) External Check Samples (5% of Primary) for analysis 6 radicals i.e. CaO, MgO, Al2O3, SiO2, Fe2O3 and LoI	Per sample	4.1.9	2841	50	142050
	d) Composite Samples for 6 radicals CaO, MgO, Al_2O_3, SiO_2, Fe_2O_3, and LoI	Per sample	4.1.9	2841	100	284100

2	**Physical analysis**					0
	a) Preparation of thin sections	Nos.	4.3.1	2353	20	47060
	b) Petrographic studies	Nos.	4.3.4	4232	20	84640
	c) Specific gravity / Bulk density determination	Nos.	4.8.1	1605	40	64200
	SUB TOTAL C					**3814150**
D	**Drill Core Preservation**	**Per m**	5.3	**1590**	**1800**	**2862000**
	TOTAL (A+B+C+D+E)					**18074090**
E	**Preparation of Exploration proposal**		5.1	One Number (5 Hard copies) along with soft copy		**361481.8**
F	**Geological Report Preparation**		5.2	Cost per 5 Hard copies of report along with soft copy		**903704.5**
G	**Peer Review Charges**		**As per EC Decision**			**30000**
	TOTAL (A+B+C+D+E+F+G)					**19369276.30**
H	**GST @ 18%**					**3486469.73**
	GRAND TOTAL					**22855746.03**

List of Plates:



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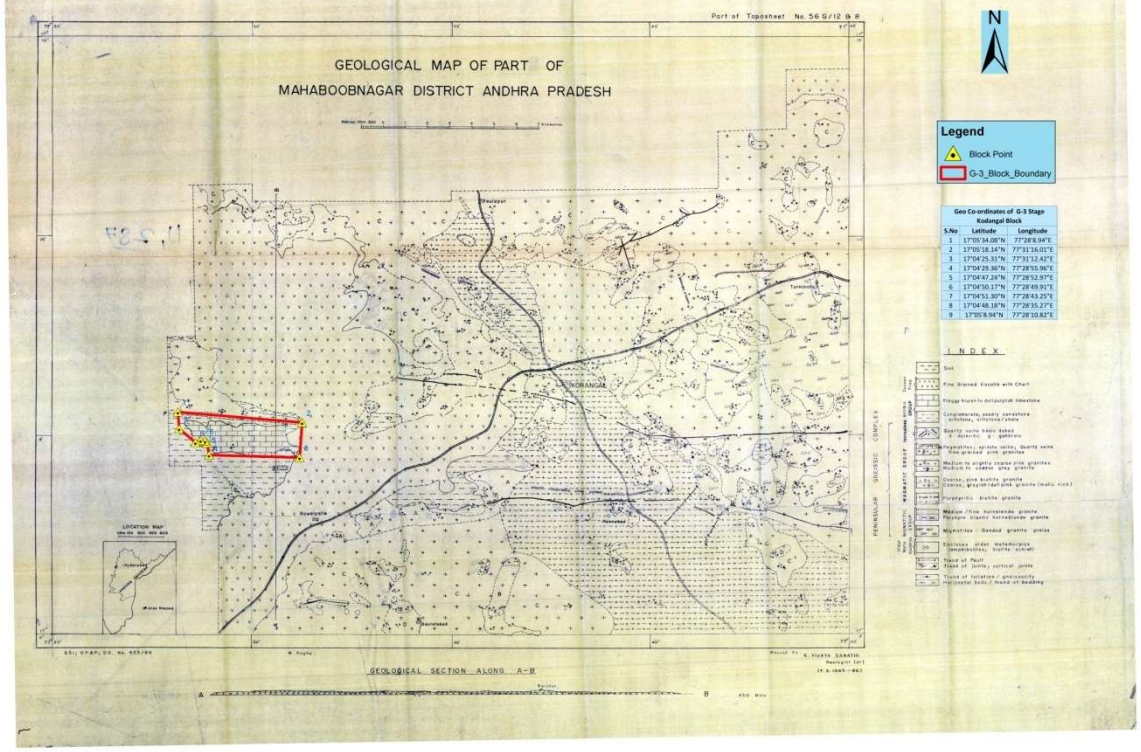
Location Map of G-3 Stage Kodangal Block on the GSI Vijayasarathi Geological map Parts of Toposheet No's 56G/8 & 56G/12.



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Geo Co-ordinates of G-3 Stage Kodangal Block

S.No	Latitude	Longitude
1	17°05'34.08"N	77°28'8.94"E
2	17°05'18.14"N	77°31'16.01"E
3	17°04'25.31"N	77°31'12.42"E
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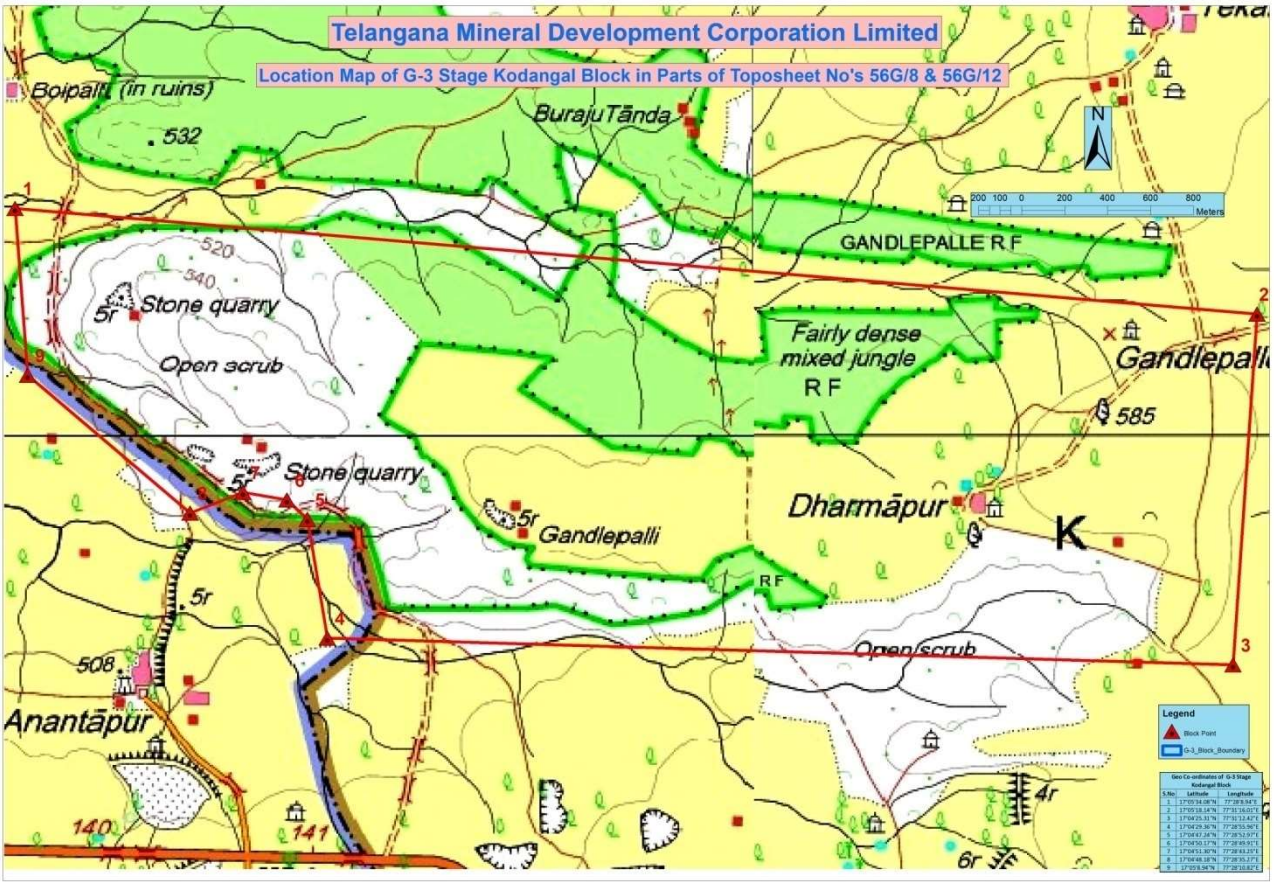

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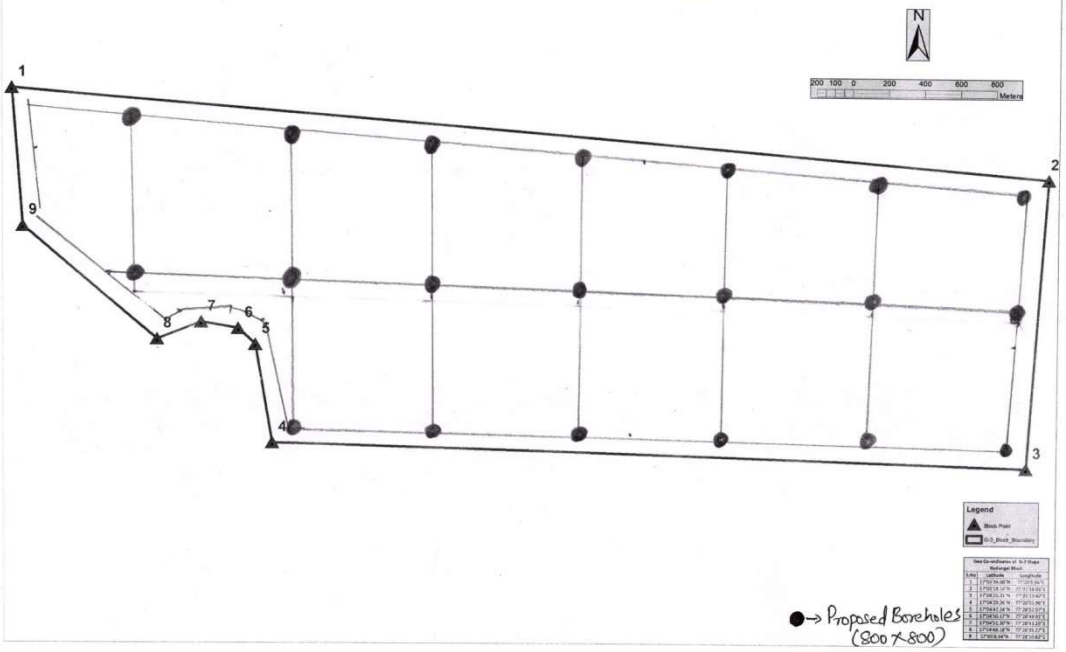
Location Map of G-3 Stage Kodangal Block in Parts of Toposheet No's 56G/8 & 56G/12



Site	Latitude	Longitude
1	17°03'34.08"N	77°19'3.09"E
2	17°03'28.14"N	77°21'44.02"E
3	17°04'23.31"N	77°21'13.42"E
4	17°04'29.26"N	77°20'51.96"E
5	17°05'41.28"N	77°20'52.07"E
6	17°05'39.27"N	77°20'49.82"E
7	17°05'53.39"N	77°20'43.28"E
8	17°05'48.18"N	77°20'35.37"E
9	17°05'8.94"N	77°20'10.84"E

→ Proposed Boreholes (800 x 800)