

MINERAL EXPLORATION PROJECT PROPOSAL (MEPP)

FOR

G-3 & G-2 LEVEL WORKS FOR LIMESTONE IN REDDIPALAIYAM AMALGAMATED LIMESTONE BLOCK – LOT 02 (KIOCL_19_TN_RALB),

ARIYALUR TALUK and DISTRICT, TAMILNADU.



Date of Submission: 31st Jan, 2020

Submitted by:

**KIOCL LIMITED,
(Notified Exploration Agency)
BLOCK II, KORAMANGALA,
SARJAPURA ROAD,
BANGALURU 560 034.
(www.kioclltd.in)**

To:

**THE CHAIRMAN,
TECHNICAL AND COST COMMITTEE
(NMET),
MISSION II A, CENTRAL REGION,
GSI COMPLEX,
SEMINARY HILLS, NEAR TV TOWER,
NAGPUR, MAHARASHTRA- 440006**

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SUMMARY

BLOCK ID	KIOCL_19_TN_RALB
TITLE OF THE PROJECT	G-2 LEVEL WORKS FOR LIMESTONE IN REDDIPALAIYAM AMALGAMATED LIMESTONE BLOCK- LOT 02 (KIOCL_19_TN_RALB)
CURRENT EXPLORATION AGENCY	KIOCL LIMITED, BANGALORE; <i>Notified Exploration Agency</i>
STATUS OF VARIOUS CLEARANCES (LOCAL/ FOREST / OTHERS)	<p>UNDER THE PROVISIONS OF MINES AND MINERALS (DEVELOPMENT AND REGULATION) ACT, 1957 AND MINERALS (EVIDENCE OF CONTENTS) RULES 2015 AND MINERAL CONCESSION RULES, 1960,</p> <p>DEPTMENT OF GEOLOGY AND MINING, GOVERNMENT OF TAMIL NADU PERMITTED KIOCL LIMITED TO PREPARE AND SUBMIT THE MINERAL EXPLORATION PROJECT PROPOSAL FOR G2 LEVEL OF EXPLORATION IN THE BLOCK (UNDER NMET FUNDING) ON BEHALF OF STATE GOVERNMENT VIDE LETTER NO.5538 / MM 2 / 2019-2 DTD 22.01.2020.</p> <p>NO FOREST LAND IN THE BLOCK</p>
PREVIOUS EXPLORATION AGENCY	GSI DEPTMENT OF GEOLOGY AND MINING, GOVERNMENT OF TAMIL NADU
GEOLOGICAL REPORTS	<p>a. Report on the Detailed Prospecting for Limestone Deposit in Pudupalayam and Reddipalaiyam Villages of Ariyalur Taluk / District-Phase V / 1994 (Annexure –III)</p> <p>b. Report on the Detailed Prospecting (G1 level) for Limestone Deposit in Periyathirukonam, Reddipalaiyam and Edaiyattankundi Villages of Ariyalur Taluk / District over an extent of 74.81ha – 2015-16 (Annexure –IV)</p> <p>c. Report on the Detailed Prospecting (G1 level) for Limestone Deposit in Periyathirukonam Village of Ariyalur Taluk / District over an extent of 32.29.5ha (Annexure –V)</p>
MINERALS TO BE EXPLORED	LIMESTONE

MINERAL BELT	ARIYALUR LIMESTONE BELT
TIME SCHEDULE	07 MONTHS
OBJECTIVE	<p>CARRY OUT MINERAL EXPLORATION (ME) WORKS AS PER MINERALS (EVIDENCE OF MINERAL CONTENTS) RULE- 2015, MINERAL (AUCTION) RULES-2015 AND MMDR AMENDMENT ACT-2015 IN TURN TO FACILITATE THE GOVERNMENT OF TAMIL NADU IN AUCTIONING OF THE BLOCK</p> <p>a. BY DETAILED GEOLOGICAL MAPPING IN 1:4000 SCALE WITH</p> <ol style="list-style-type: none"> BED ROCK / TRENCH SAMPLING, SURVEY WORKS IN 02m CONTOUR INTERVAL DENSITY STUDIES ESTABLISH LIMESTONE ORE ZONES BY DRILLING (@ 800m X 800m grid in G3 level and @400m X 400m grid in G2) CHEMICAL AND PHYSICAL ANALYSIS OF SAMPLES DEMARCATÉ ZONE OF VARIOUS GRADES OF LIMESTONE AND ESTIMATE GRADE WISE RESERVES IN THE STUDY AREA AS PER UNFC NORMS
NAME/NUMBER OF GEOSCIENTISTS	TWO (02) Nos and more from DEPARTMENT of MINERAKL EXPLORATION, KIOCL LIMITED, BANGALORE
EXPECTED FIELD DAYS (GEOLOGY/GEOPHYSICS/ SURVEY / OTHERS)	<p>DETAILED GEOLOGICAL MAPPING (02 months)</p> <p>DRILLING (05 months)</p> <ul style="list-style-type: none"> ➤ Geologist Party Days – 96 days ➤ Survey Party Days - 72 days ➤ Core Sampling Party Days - 62 days ➤ Bulk Sampling Party Days - 15 days
LOCATION(KEY MAP @ PLATE No. 01)	
CO-ORDINATES OF THE BLOCK BOUNDARY POINTS	PART BLOCK A13, A19 & A34 – ANNEXURE 03
VILLAGES	Reddipalaiyam
TALUKA	Ariyalur.
DISTRICT	Ariyalur
STATE	Tamil Nadu

AREA	
BLOCK AREA	REDDIPALAIYAM AMALGAMATED LIMESTONE BLOCK (KIOCL_19_TN_RALB) = 86.55 ha PART BLOCK A13 = 29.08 ha PART BLOCK A19 = 32.59 ha PART BLOCK A34 = 24.88 ha
FOREST AREA	NIL
GOVERNMENT LAND	9.91ha (08.47ha + 0.71ha + 0.73ha)
PRIVATE LAND	78.02ha (20.61ha + 25.55ha +31.86ha)
ACCESSIBILITY	
NEAREST RAIL HEAD	Ariyalur Railway Station
ROAD	NH 136 (Ariyalur – Trichy Main Road) – SH 139 Ariyalur to Reddipalaiyam Village NH 81 (Jayan Kondam-Trichy Main Road) at Reddipalaiyam Village All weather road from Reddipalaiyam Village to the BLOCK (around 02.0km)
AIRPORT	NEAREST AIRPORT TO THE BLOCK -TRICHY (around 75km).
HYDROGRAPHY	
LOCAL SURFACE DRAINAGE PATTERN CHANNELS / RIVERS / STREAMS	Dendritic to sub dendritic Marudaiyar River flowing easterly (around 05.0km from the Block in the South)
CLIMATE	
MEAN ANNUAL RAINFALL	1100mm
TEMPERATURE	WINTER: Around 22.5°C SUMMER: Around 41.0°C
TOPOGRAPHY	
TOPOSHEET NO	58M/04 BLOCK MARKED ON TOPOSHEET – PLATE NO. 02
MORPHOLOGY OF THE AREA	Gentle Slope with elevation between 40m to 50m above MSL
AVAILABILITY OF THE BASELINE GEOSCIENCE DATA	
GEOLOGICAL MAP (1:50 k)	AVAILABLE
GEOCHEMICAL MAP	NOT AVAILABLE
GEOPHYSICAL MAP (Aero/ Ground, Regional/ Local scale)	Aero Geophysical Map available
JUSTIFICATION FOR TAKING UP G24 LEVEL OF MINERAL EXPLORATION	
PREVIOUS WORK:	Report on the Detailed Prospecting for Limestone Deposit in Pudupalayam and

Reddipalaiyam Villages of Ariyalur Taluk / District-Phase V / 1994
Report on the Detailed Prospecting (G1 level) for Limestone Deposit in Periyathirukonam, Reddipalaiyam and Edaiyattankundi Villages of Ariyalur Taluk / District over an extent of 74.81ha – 2015-16
Report on the Detailed Prospecting (G1 level) for Limestone Deposit in Periyathirukonam Village of Ariyalur Taluk / District over an extent of 32.29.5ha
Block is contiguous to the existing mining lease of Pudupalayam Limestone Mine of M/s Chettinad Cement Corporation Private Limited and Pudupalayam Limestone Mine of M/s Madras Cements Limited
Block is near to the existing mining leases of Reddipalaiyam Limestone Mine of M/s. Ramco Cements Limited in the North (G1 level-2015) Periyathirukonam, Reddipalaiyam and Edayattankudi Limestone Mine of M/s. India Cement Limited and to the existing mining lease of Periyathirukonam Limestone Mine of M/s. Chettinad Cement Corporation Private Ltd.

PRELIMINARY FIELD INSPECTION BY KIOCL:

Technical Team of KIOCL visited the various parts around Reddipalayam Village on 05th Nov 2019 to study the site conditions.

Field Photographs



Panoramic View of the Proposed Block



Working Mines of M/s Ramco Cements Ltd (Pudupalayam) situated in Southern part of proposed Block



Exposure of Fossiliferous Limestone in M/s Ramco Cements Ltd (Reddipalayam) situated in Western part of proposed Block



PFI to M/s Ramco Cements Ltd (Reddipalayam) situated in Western part of proposed Block

Observations:

- General strike of the Limestone bed is NNE to SSW with dipping at an angle of 02° to 10° towards SE direction.
- Over burden consisting of Black Cotton soil / Micaceous Clay and Marl ranging from 01 m to 20 m (Approx) towards down dip direction.
- Following types of limestone beds are observed in the working mines of situated in the vicinity of the Block.
 - i. Shell Limestone (Fossiliferous Limestone)
 - ii. Ferruginous Limestone
 - iii. Limestone
- Observations in the Block
 - i. Block is flat terrain covered by soil cover
 - ii. Agricultural land is observed in the Block
 - iii. 06 no of samples collected from working mines situated in the vicinity of the Block

Sample No	Block No	Distance from the proposed Block (m)	CaO%	MgO%	SiO ₂ %	Al ₂ O ₃ %	LOI
R-01	05 (Chettinad - Putthupalayam)	696	51.87	0.40	2.53	1.21	40.60
R-02	06 (Ramco - Putthupalayam)	914	51.59	0.60	2.34	1.01	40.72

R-03	04 (Ultra Tech - Reddipalayam)	445	53.84	0.20	2.03	1.01	41.35
R-04	03 (Ramco - Reddipalayam)	668	51.17	0.50	4.00	1.92	40.59
R-05	07 (Dalmia - Periyanagalur)	3226	46.54	0.40	3.78	1.94	37.61
R-06		3226	48.51	0.20	6.12	2.15	39.04

DETAILED DESCRIPTIONS:

1. BLOCK SUMMARY:

1.1 Physiography:

Ariyalur District is bounded on the North by Cuddalore, South by Thanjavur, East by Cuddalore and Thanjavur and West by Perambalur and Tiruchirapalli districts. In general, the district has an undulating topography covered by black cotton soil in the Northern and western part, the eastern part covered by red soil and river alluvium in the southern end. Elevation of this area ranges from 40.0m to 50.0m from MSL and the regional slope is towards east. Denudational, structural and fluvial processes mainly control the geomorphic evolution of the area. Mainly the varying resistance of geological formations to those processes has governed the evolution of various landforms. Various land forms occurring in the area such as structural hills, erosional plains, residual hills rolling uplands and pediments of different facies belonging to the denudational and structural land forms. Fluvial landforms caused by the activity of Cauvery, Marudayar and Vellar River systems, include younger flood plains, older flood plains and buried pediments.

The top soil is black in color, fine to medium grained friable and sticky when wet (Black cotton soil) with 0.30m to 3.0m soil cover. In general, the climate is dry. Peak summer is in the month of May, maximum temperature reaching up to 46⁰C. The cold season being December, the temperature falls down to 20⁰ C. The average annual rainfall of the district is 1100mm.

The proposed area is well connected to all major cities by rail/road, and the nearest airport Trichy at a distance of 75km, Chennai airport is about 230km. All basic amenities such as school, Hospital, market, etc. are available. Ariyalur is the nearest city and administrative headquarters around 15km from the proposed block. Power, Water, Fuel, Communication are available in vicinity of the proposed block **(Plate-01)**.

1.2 Back Ground Geology & Regional Geology of the Block:

The limestone deposit of the study area forms a part of Kallankurichi limestone formations of Middle Ariyalur Stage of Cretaceous system in South India. In the Cauvery Basin carbonate rock form a sizable part of the stratigraphic column from the Lower Cretaceous to Recent. These deposits are geologically called the Maestrichian Limestones. This limestone bed is sandwiched between two Sandstone and Marl beds. It can be traced continuously for more than 9.0km in the North - South direction starting from Srinivasapuram in the north through Kairulabad, Ameenabad, Periyanaalur, Hasthinapuram, Kattupiringium, Pudupalaiyam, Nerunchikorai, Vilipiringium and further South up to Idaiyathankudi on the banks of Marudaiyar river. Limestone of Cretaceous and early Tertiary are also exposed in three principal outcrop areas viz. Trichirapalli, Virudhachalam, and Pondicherry along the western margin of the basin. The western margin of these sediments has NE- SW trend. The formation in the east trends NE-SW and changes to NW-SE in the Southern part. The dip also changes accordingly (**Plate-03**).

Brief regional geology outlining the broad geological and structural frame work

Blanford (1862) divided the Cretaceous formations of Tiruchirappalli district into three district groups, viz. Uttattur, Trichinopoly and Ariyalur groups. He divided the Ariyalur Group into three subdivisions. (i) lower fossiliferous beds, (ii) middle unfossiliferous beds and (iii) upper fossiliferous beds. Leveille (1889), while reviewing the geology of the area, proposed to include the upper fossiliferous Ariyalur beds of Blanford into Niniyur stage, corresponding to Danian on the occurrence of *Hercoglossadonica*, a characteristic Danian form. The upper fossiliferous beds (of Ariyalur Group of Blanford) have been recognised as 'Niniyur Group' on the basis of lithological and palaeontological (find of rich algal flora) considerations by Rama Rao (1956) and Rama Rao and Pia (1936)

In recent years extensive work has been done on palaeontology and biostratigraphy by several geologists of G.S.I., Oil and Natural Gas Commission, various universities and institutions. During 1950 to 1965 Sastry et al., mapped Cretaceous basin of Tiruchchirappalli district and worked out biostratigraphy of the basin. They (1972) brought out litho-biostratigraphic classification of Ariyalur Group for the first time. They divided the group into four formations: Sillakkudi, Kallankuruchi, Ottakkovil and Kallamedu formations in the ascending order. The upper fossiliferous beds of Ariyalur Group of Blanford has been mapped as Niniyur Group by them.

Regional Stratigraphy sequence is as follows (after D.K. Paul ET AL (1988))

Age	Sub - group	Formation	Member
Recent – sub Recent		Alluvium	Sand, Clay, Gravel
Mio- Pliocene		-----Unconformity-----	
		Cuddalore	Coarse grained Sandstone with clay and siltstone
		-----Unconformity-----	
Danian/ Paleocene		Niniyur	Sandstone
Cretaceous	ARRIYALAR	Kallamedu	Soft Sandstone with bands and lenses of calcareous sandstone
		Kallankurichchi	Fossiliferous Limestone
		----Unconformity----	
		Sillakkudi	Upper: Sandstone Lower: Limestone/ Calcareous sandstone (locally developed)
	TRICHINOPL OY	----Unconformity----	
		Anaipadi	Upper: Sandstone dominant Lower: Shale dominant
		Kulakkalnattam	
	UTTATTUR	----Unconformity----	
		Karai	Kunnan (Locally developed) Odiyam
		Maruvattur	Upper: Limestone, Mavl & clay Middle: Grey shale (not expose) Lower: Conglomerate
Upper Jurassic to Lower Cretaceous		----Unconformity----	
		Upper Gondwana	
		----Unconformity----	
Archaean		Crystallines	

1.3 Mineral Potentiality based on Geology, Geophysics and Ground Geo Chemistry etc:

Recommendations of earlier investigation works

Limestone deposit of this area is characterized as yellowish brown in colour with prominent and well-preserved shells. The previous study in the nearby area in the same formation establishes that thin sparsely top red soil occurred with thickness ranging from 0.50 m to 3.0m, and sandy clay with thickness ranging from 7.0m to 25.0m followed by fossiliferous limestone. Limestone thickness is ranging from 18 m to 20m with various grades. The strike direction of the limestone deposit is NNE-SSW and dips towards south east with dip angle varying from 3° to 5°. Local variation in dip amount and direction are seen between Kallankurichi and Pudupalaiyam villages.

1.4 Scope for proposed Exploration:

To assess the quantum of limestone reserves in proposed area in order to auction the block for generating revenue to Government exchequer, G2 level exploration is to be carried out in this region.

1.5 Recommendations of G4 level Mineral Exploration Reports:

Directorate of Geology and Mining has carried out Phase V geological investigation during July 1994 to prove additional limestone reserves in Pudupalaiyam and Reddipalayam villages in Ariyalur District which covers the area presently proposed for G2 stage exploration. As per the report, the chemical analysis of the core samples in the subject area indicate that the weighted average of total carbonate content is above 85% and the maximum thickness of limestone encountered in the area is about 18m.

1.6 Objectives:

- a. To assess reserves of cement grade limestone.
- b. To cater the raw material requirement to the cement industry.
- c. ME Works shall be confirming to

- ✓ MMDR Amendment Act-2015
- ✓ Minerals (Evidence of Mineral Contents) Rule- 2015,
- ✓ Mineral (Auction) Rules-2015
- ✓ IBM GUIDELINES
- i. In view of the changing market dynamics and availability of new technologies for upgrading the low grade resources, IBM has revised the THRESHOLD VALUE for the LIMESTONE minerals under provision of Rule 12(7) of "Mineral Conservation and Development Rules, 2017" (MCDR, 2017), vide Notification No: C -284 / 03 / CMG / 2017 dated 25.April 2018, as under:

THRESHOLD VALUE OF MINERALS

Sl No (8) Limestone: CaO- 34% (Min.) and MgO-5% (Max.)

(All resources shall be assessed up to the threshold value and the resources between the threshold value and the cut-off grade shall be reported separately. There will however be no restrictions in estimating resources below the threshold value if there is a ready market of such mineral/ore either directly or after beneficiation)

ii. End Use Grade Classification-Part (Table 01)

Grade	Cement - Portland	Cement - Beneficiable / Blendable	BF	SMS	White Cement
CaO(%)	44 - 52	38 - 44	42.0 min	48.0 min	48.0min
MgO (%)	3.5 max	5.0 max	6.0 max	4.0 max	
SiO ₂ %			4.0 max	4.0 max	
Total Insoluble %			08-12		
Alkalies %			0.4 max		
Al ₂ O ₃ %					1.0max
Fe ₂ O ₃ %					1.0max

2. PREVIOUS WORK:

Block is contiguous to the existing mining lease of Reddipalayam Limestone Mine Tvl. Ultra Tech Cements Ltd, G.O.4(D) No.3 Industries Dept, Dated:20.09.2005 and Tvl. Madras Cements Ltd, G.O.662 Dated:09.10.1998 (**Plate-04**).

As per schemes of mining approved by Indian Bureau of Mines, the quality of the Limestone deposit in the area confirms cement grade 42.0 to 48.0% CaO; 5.5 to 11.0% SiO₂; 1.5 to 2.5% Fe₂O₃; 0.50 to 0.60% MgO.

The proposed area is also nearer to the existing mining lease of Periyathirukonam, Reddipalayam and Edaiyathankudi limestone mine of M/s. India Cement Limited in the south (**Plate-04**). This area was explored at G1 level by the Directorate of Geology and Mining in the year 2015 as per reported that the average overburden thickness in the area is 11.44 m and cement grade limestone is 17.43 m. The chemical composition of the deposits confirms the average cement grade i.e., 82.19% of CaCO₃, 11.67 % of SiO₂, 2.58% of Al₂O₃, 2.58% of Fe₂O₃ and 1.24% MgCO₃.

3. BLOCK DESCRIPTION:

The boundary coordinates of the proposed block are given in table @ SUMMARY. The block location is also shown on Google Earth image. (**Plate-04**)

4. PLANNED METHODOLOGY

4.1. DETAILED (1: 4000) GEOLOGICAL MAPPING (DGM):

- Study and interpretation of available Aero Geo – physical 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.
- Detailed Geological Mapping and topographic survey using DGPS in 1:4000 Scale with 02 m interval contour.
- Surface / Trench Sampling.
- Density Test for limestone and overburden

- e. Exploratory Drilling @ 400m grid and analysis / interpretation
- f. Detailed Geological Map and Report

4.2. SURVEY WORKS:

- a. RL's and co-ordinates of DGM works, observation points will be marked using handheld GPS units.
- b. DGPS / Total Station Survey will be carried out for fixing up Boundary, Boreholes points and contours(topography) on the ground (by establishing Block Base Station using SOI Ground Control Points / Bench Marks and Triangulation Ref Points etc).

4.3. EXPLORATORY DRILLING:

- a. Since, the topography of proposed area is gentle and the formation is dipping less than 05 degree only, it is preferred to drill vertical bore holes with 400 m X 400 m grid for G2 level works for 60m or 2.0 to 3.0 m below the intersection of limestone bed.
- b. One borehole per Block shall be drilled to 100m depth to establish geo details.
- c. Core drilling with double tube core barrel shall be deployed to ensure maximum core recovery.

TABLE: 02-DRILLING QUANTITIES

Sl	Area	G3		G2		Total	
		No of Holes	Meterage	No of Holes	Meterage	No of Holes	Meterage
1	Part Block A13	01	60	02	160	03	220
2	Part Block A19	02	120	02	120	04	240
3	Part Block A34	01	60	01	100	02	160
4	Total	04	240	05	440	09	620

4.4. LABORATORY STUDIES

a. Chemical Analysis:

- All the Primary samples will be analysed at Mineral Exploration laboratory, KIOCL Limited(BFU), Panambur, Mangaluru,. Details of samples to be analysed are provided below. (Table 03)

Sl	Samples	Nos
1	Primary Samples - 100%	650
2	Internal Check sample analysis 05%	34
3	Composite Sample Analysis 10%	65
4	Total	749

- Sample Analysis will be as per laid down standards.
- Samples shall be analyzed for radicals- CaO, MgO, SiO₂, Al₂O₃, Fe₂O₃, Na₂O K₂O TiO₂, P₂O₅, Cr₂O₃, SO₃, LOI and Acid Insoluble (13 radicals)
- 10% of primary samples will be subjected to analysis at a NABL certified external laboratory as Check Samples.

b. Physical Analysis

- In situ Bulk Density Tests at site for Over Burden and Ore Body
- Moisture absorption & Specific Gravity will be determined on BRS/ Drill core samples (lab scale).

4.5. EXPLORATION REPORT:

- Generate a Geological Report along with Geological Map identifying and establishing quantity and quality of resources worthy to realize an AUCTIONABLE BLOCK.

5. NATURE, QUANTUM AND TARGET

Quantum of work proposed is provided @ Annexure No - 02.

6. TIME LINES

Total period proposed for G3 & G2 level Mineral Exploration works is 08 months

Time Schedule Chart is provided @ Annexure No – 01

7. BREAKUP OF EXPENDITURE:

Total estimated cost is Rs. 155,08,290/- (including GST @ 18%). (Say Rs.155 Lakhs)

8. TERMS OF PAYMENT

- 8.1. KIOCL shall raise invoice for the quantum work executed and completed in accordance with the approved MEPP, as per NMET guidelines, for payment.
- 8.2. Projected cost estimates are as arrived for FY 2018-19 from the respective approved base prices. However, cost of execution will be claimed with appropriate escalation as per procedure.

**TIME SCHEDULE**

SI	Details of Works	Duration Months	Duration 08 months								Cumulative mandays
			1	2	3	4	5	6	7	8	
1	CAMP SETTING	01	↔								
2	DETAILED GEOLOGICAL MAPPING (Includes 0.8655 sqkm of DGM + 30 nos of BRS + Insitue BD test 09 cum)	01		↔							
2.1	Geologist Party days (02 Party)	17 days		↔							34
2.2	Survey Party days (01 Party)	10 days		↔							10
2.3	Bulk Sampling Party days (01 party)	15 days		↔							15
2.4	Laboratory Works	01		↔							
3	Surface Drilling (01 rigs) 620 m	04			↔						
3.1	Geologist Party days (01 Party)	62			↔						62
3.2	Core sampling Party days (01 Party)	62			↔						62
3.3	Survey Party days - DGPS-121 pts (01 Party)	62					↔				62
3.4	Laboratory Works	04				Parallel execution					
4	Camp Winding	01							↔		
5	Preparation of Reports and Maps	02							↔		



Annexure – 02

Block No				A13		A19		A34		Cumulative			
SI	Stage	Components		Unit	G3	G2	G3	G2	G3	G2	G3	G2	G3+G2
1	01 - Detailed Geological mapping	Extent		ha	29.08		32.59		24.88		86.55	-	86.55
2		Detailed Geological Mapping in 1:4000		ha	29.08		32.59		24.88		86.55	-	86.55
3		Topo & Contour (Total Station) Survey in 1:4000 with 2.0m interval contour		ha	29.08		32.59		24.88		86.55	-	86.55
4		Collection of Bed Rock Samples		nos	10		10		10		30	-	30
5	02 - Drilling works	Insitue Bulk Density Test		cum	3		3		3		9	-	9
6		No of Bore Holes # 200m grid		nos	1	2	2	2	1	1	4	5	9
7		DGPS Survey for fixing up of borehole points and Boundary Points		nos	23	2	50	2	43	1	116	5	121
(3+ 1+ 19)					(2)	(3+2+ 45)	(2)	(3+1+ 39)	(2)	-	-	-	
9		Approach Road making		km	0.90	0.50	0.90	0.50	0.80	0.40	2.60	1.40	4.0
10		Drilling depth		m	60	60	60	60	60	60	60	60	60
11		Core Drilling (NQ series or equivalent sizes)		m	60	160	120	120	60	100	240	380	620
12		Detailed core/ sample logging including supply of core/ sample boxes		nos	60	160	120	120	60	100	240	380	620
13		Shifting of Sample / Core boxes from site to Core shed (700 km one way & 300 m core in 01 trip) (KIOCL Core repository)		km	-	-	-	-	-	-	1400	1400	2800
14	Lab Works for Stage 01 & 02	Sample preparation & handling		nos	70	160	130	120	70	100	270	380	650
15		Primary Analysis	BRS	nos	10		10		10		30		30
16			Drill Core	nos	60	160	120	120	60	100	240	380	620
17		Internal Check sample analysis (5%)	BRS	nos	1.0		1.0		1.0		3.0	-	3
18			Drill Core	nos	3.0	8.0	6.0	6.0	3.0	5.0	12.0	19	31
19		Composite sample analysis (10%)	BRS	nos	1		1		1		3		3
20			Drill Core	nos	6	16	12	12	6	10	24	38	62
21		External Check sample analysis (10%)	BRS	nos	1	-	1	-	1	-	3	-	3
22			Drill Core	nos	6	16	12	12	6	10	24	38	62
23		Moisture absorption & Specific Gravity determination		nos	2	-	2	-	2	-	6	0	6
24	Report preparation			nos	-	-	-	-	-	-	1	1	2

Annexure – 03

COST ESTIMATES

S.N	Item of Work		Unit	Base Rate as on 01-04-1990	Financial Year (2019-20)			Total Amount in Rs
					Escalated Rate (18-19)	Qty	Amount (Rs)	
(a)	(b)		(c)	(d)	(e)	(f)	(g)=(e)*(f)	(h)
1	DRILLING							60,11,468
1.1	Surface Drilling (01 Rig)		m.	1,714	7,427	620	46,04,740	
1.2	Transportation (01 Rig for 700 km - One way)		Km.	8.8	35	1,400	49,000	
1.3	Accommodation		One time/ Drill	1,85,925	7,33,958	1	7,33,958	
1.4	Camp Setting / Winding		Drill/ month	68,606	2,70,829	2	5,41,658	
1.5	Road Making (Flat Terrain)		Km	5,200	20,528	4	82,112	
2	GEOLOGICAL WORK (0.8655 sqkm)							14,79,516
2.1	Geologist Party days (1 party)	DGM(0.8655 sqkm)+ Collection of BRS (30) - 30days	days	1,541	8,590	96	8,24,640	
		Insitue BD test 09 cum (04 manday)						
		Drilling works (620m) - 62 mandays						
2.2	Survey Party Days (1 party)	DGM(0.8655 sqkm)+ Collection of BRS (30) - 10days	days	1,180	6,445	72	4,64,040	
		DGPS Survey:Boundary + Drilling points - (121 pts) - 62 days @ 02 pts per day						
2.3	Core Sampling Party days(1 party)		days	525	3,078	62	1,90,836	
3	TRENCHING /PITTING WORKS							2,37,984
3.2	Trenching/ pitting for Insitu Bulk Density		cum	395	1,856	9	16,704	
3.3	Bulk Sampling Party days		days	2,566	14,752	15	2,21,280	
4	Preservation of Cores							4,08,000
4.1	Gl core boxes		nos	0	2,000	155	3,10,000	
4.2	Transportation (2 trips * 1400 km per trip @ 300m of core per trip)		km	8.8	35	2,800	98,000	

5	LABORATORY STUDIES						
5.1	Primary analysis for 13 radicals (CaO,MgO,SiO ₂ ,Al ₂ O ₃ ,Fe ₂ O ₃ , LOI, TiO ₂ , R ₂ O(Na ₂ O & K ₂ O),SO ₃ ,P ₂ O ₅ ,Cr ₂ O ₃ and Acid Insolubles)	Nos	642 '(110+76X12)	5,919	650	38,47,350	48,20,526
5.2	Internal Check sample analysis for 13 radicals - 5%	Nos	642 '(110+76X12)	5,919	34	2,01,246	
5.3	Composite sample analysis for 13 radicals - 10%	Nos	1022 '(110 + 76X12)	5,919	65	3,84,735	
5.4	External Check (NABL) samples analysis for 13 radicals - 10%	Nos	642 '(110+76X7)	5,919	65	3,84,735	
5.5	Moisture absorption & Specific Gravity determination	Nos	64	410	6	2,460	
6	STUDY AND INTERPRETATION OF AERO GEOPHYSICAL DATA					55,000	55,000
7	EXPLORATION REPORT - 1% of (Total (1+2+3+4+5+6)) (1,30,125	1,30,125
8	GRAND TOTAL (1 to 7)					131,42,619	131,42,619
9	GST 18%					23,65,671	23,65,671
10	Grand Total (with GST 18%)					155,08,290	155,08,290
							or say Rs. 155 Lakhs

Note :

1. Revised Rates of Promotional Work done by MECL on behalf of Govt. of India Vide letter No. 37(I) /2006-M.I. dated- 02-07-2014 and based on actual escalation as per RBI indices as on 31-03-2018.
2. Procurement of Aero geophysical maps, Data, Fees & Levies on actual to be reimbursed.

Annexure – 04

Boundary Co-Ordinates of the Block

A13 –Reddipalayam – 29.80.0 ha		
LABEL	LATITUDE N	LONGITUDE E
1	11 ⁰ 05' 53.97 "	79 ⁰ 09' 33.67 "
2	11 ⁰ 05' 56.30 "	79 ⁰ 09' 34.61 "
3	11 ⁰ 06' 1.26 "	79 ⁰ 09' 36.11 "
4	11 ⁰ 06' 5.39 "	79 ⁰ 09' 35.94 "
5	11 ⁰ 06' 12.06 "	79 ⁰ 09' 35.44 "
6	11 ⁰ 06' 15.54 "	79 ⁰ 09' 35.55 "
7	11 ⁰ 06' 15.95 "	79 ⁰ 09' 32.59 "
8	11 ⁰ 06' 20.14 "	79 ⁰ 09' 31.43 "
9	11 ⁰ 06' 28.30 "	79 ⁰ 09' 41.42 "
10	11 ⁰ 06' 31.96 "	79 ⁰ 09' 48.31 "
11	11 ⁰ 06' 26.56 "	79 ⁰ 09' 46.96 "
12	11 ⁰ 06' 20.81 "	79 ⁰ 09' 47.14 "
13	11 ⁰ 06' 18.34 "	79 ⁰ 09' 46.76 "
14	11 ⁰ 06' 13.35 "	79 ⁰ 09' 46.71 "
15	11 ⁰ 06' 8.26 "	79 ⁰ 09' 46.30 "
16	11 ⁰ 06' 8.31 "	79 ⁰ 09' 41.40 "
17	11 ⁰ 05' 55.76 "	79 ⁰ 09' 40.80 "
18	11 ⁰ 05' 55.57 "	79 ⁰ 09' 38.95 "
19	11 ⁰ 05' 53.70 "	79 ⁰ 09' 35.73 "

KUDREMUKH

A19 -Reddipalayam – 26.26.50 ha						
LABEL	LATITUDE N	LONGITUDE E		LABEL	LATITUDE N	LONGITUDE E
1	11° 05' 39.5"	79° 09' 07.0"		23	11° 05' 32.6"	79° 09' 16.6"
2	11° 05' 39.4"	79° 09' 07.2"		24	11° 05' 29.5"	79° 09' 15.9"
3	11° 05' 39.4"	79° 09' 08.9"		25	11° 05' 29.3"	79° 09' 16.9"
4	11° 05' 39.3"	79° 09' 12.6"		26	11° 05' 28.6"	79° 09' 19.9"
5	11° 05' 38.0"	79° 09' 16.8"		27	11° 05' 27.7"	79° 09' 19.8"
6	11° 05' 38.2"	79° 09' 17.0"		28	11° 05' 27.5"	79° 09' 20.9"
7	11° 05' 38.1"	79° 09' 18.2"		29	11° 05' 27.2"	79° 09' 20.8"
8	11° 05' 38.2"	79° 09' 20.3"		30	11° 05' 26.9"	79° 09' 22.9"
9	11° 05' 37.6"	79° 09' 20.3"		31	11° 05' 24.3"	79° 09' 22.8"
10	11° 05' 37.7"	79° 09' 21.8"		32	11° 05' 23.4"	79° 09' 22.8"
11	11° 05' 36.3"	79° 09' 21.7"		33	11° 05' 19.2"	79° 09' 21.6"
12	11° 05' 36.3"	79° 09' 20.5"		34	11° 05' 17.2"	79° 09' 21.3"
13	11° 05' 36.3"	79° 09' 20.1"		35	11° 05' 16.3"	79° 09' 21.9"
14	11° 05' 35.9"	79° 09' 20.0"		36	11° 05' 16.4"	79° 09' 16.5"
15	11° 05' 35.8"	79° 09' 20.4"		37	11° 05' 15.5"	79° 09' 16.3"
16	11° 05' 34.3"	79° 09' 20.3"		38	11° 05' 16.4"	79° 09' 12.1"
17	11° 05' 34.3"	79° 09' 20.0"		39	11° 05' 20.5"	79° 09' 10.2"
18	11° 05' 33.3"	79° 09' 20.0"		40	11° 05' 20.8"	79° 09' 10.1"
19	11° 05' 33.2"	79° 09' 21.2"		41	11° 05' 23.4"	79° 09' 08.5"
20	11° 05' 33.1"	79° 09' 21.2"		42	11° 05' 27.3"	79° 09' 07.5"
21	11° 05' 32.2"	79° 09' 21.1"		43	11° 05' 29.8"	79° 09' 07.2"
22	11° 05' 32.2"	79° 09' 20.6"		44	11° 05' 31.2"	79° 09' 07.1"
				45	11° 05' 36.5"	79° 09' 06.8"

KUDREMUH

A 34 - Reddipalayam – 32.59.70 ha		
LABEL	LATITUDE N	LONGITUDE E
1	11° 05' 36.2"	79° 09' 40.1"
2	11° 05' 36.1"	79° 09' 43.4"
3	11° 05' 41.1"	79° 09' 46.1"
4	11° 05' 45.7"	79° 09' 49.9"
5	11° 05' 45.7"	79° 09' 48.7"
6	11° 05' 47.4"	79° 09' 48.5"
7	11° 05' 47.4"	79° 09' 49.5"
8	11° 05' 48.4"	79° 09' 49.8"
9	11° 05' 50.4"	79° 09' 49.9"
10	11° 05' 52.3"	79° 09' 49.2"
11	11° 05' 52.2"	79° 09' 50.8"
12	11° 05' 54.9"	79° 09' 51.2"
13	11° 05' 58.2"	79° 09' 51.6"
14	11° 06' 01.3"	79° 09' 51.1"
15	11° 06' 02.2"	79° 09' 51.0"
16	11° 06' 02.0"	79° 09' 55.0"
17	11° 06' 02.7"	79° 09' 55.0"
18	11° 06' 02.8"	79° 09' 50.9"
19	11° 06' 06.2"	79° 09' 50.6"
20	11° 06' 07.5"	79° 09' 50.5"
21	11° 06' 07.6"	79° 09' 48.9"
22	11° 06' 06.3"	79° 09' 48.9"
23	11° 06' 06.4"	79° 09' 46.4"
24	11° 06' 07.9"	79° 09' 46.4"
25	11° 06' 08.2"	79° 09' 41.7"
26	11° 06' 06.7"	79° 09' 41.7"
27	11° 06' 04.8"	79° 09' 41.6"
28	11° 06' 04.5"	79° 09' 44.2"
29	11° 06' 02.6"	79° 09' 44.1"
30	11° 06' 03.0"	79° 09' 41.6"
31	11° 05' 57.2"	79° 09' 40.9"
32	11° 05' 54.9"	79° 09' 39.3"
33	11° 05' 53.1"	79° 09' 35.2"
34	11° 05' 47.7"	79° 09' 34.3"
35	11° 05' 47.3"	79° 09' 36.0"
36	11° 05' 46.5"	79° 09' 35.9"
37	11° 05' 46.9"	79° 09' 34.2"
38	11° 05' 45.6"	79° 09' 34.1"
39	11° 05' 41.7"	79° 09' 34.1"

Annexure – IV

Co-Ordinates of the Proposed Boreholes (DATUM-WGS84)

Block	G3			G2		
	Proposed Borehole No	Longitude	Latitude	Proposed Borehole No	Longitude	Latitude
A13	PBH(2)-01(G3)	299171	1228081	PBH(2)-01(G2)	299184	1228389
				PBH(2)-02 (G2)	299112	1227734
A34	PBH(2)-02(G3)	298734	1227414	PBH(2)-03 (G2)	298496	1227425
	PBH(2)-03(G3)	298316	1227175	PBH(2)-04(G2)	298574	1227080
A19	PBH(2)-04(G3)	298430	1226514	PBH(2)-05(G2)	298234	1226779

KUDREMUKH

Annexure –V

Consent letter received from Dept of Geology & Mining, GoTN

DEPARTMENT OF GEOLOGY AND MINING

From
Thiru. E.Saravanelraj, I.A.S.,
Director of Geology and Mining,
Thiru.Vi.Ka.Industrial Estate,
Guindy, Chennai-600 032.

To
The Director (P&P)
KIOCL Limited,
II Block, Koramangala,
Bangalore-560034

Rc.No. 5538/MM2/2019-2, dated 22.01.2020

Sir,

Sub: Mines and Minerals – Permission for carrying out Exploration work for Limestone in Ariyalur district at G2 Level under NMET fund - Regarding.

Ref: 1. DGM letter in Rc.No.5538/CO2/2016 dated 07.08.2019 and 07.11.2019 addressed to Government.
2. Government letter in No. 9641/ MMA2/2019-1 dated 04.08.2019 and 08.11.2019 addressed to the Chairman, TCC, GSI, Nagpur.
3. Minutes of the TCC NMET received through email on 27.11.2019 from NMET Secretariat, New Delhi.
4. Circulation of the Minutes of the Executive committee meeting vide Lr.No.6/2/2015/NMET-252 dated 29.11.2019 from the NMET Secretariat, New Delhi.

-o0o-

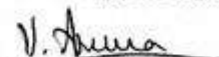
With regard to the Limestone exploration, permission is accorded to KIOCL to present the following proposal at G2 level before the NMET Technical committee after field visit and verification of reports of the state DGM, GSI.

Sl. No.	Block ID	Extent (in Hects)	Toposheet No.	Geological Formation
1	A13_A34_A19-Reddipalayam-86.55.0 ha	86.55.00	58M/4	Kallankurichi

3) The above proposal shall be considered for exploration at G2 level and furnish the exploration report in order to auction the block. Accordingly, the same may be placed before NMET TCC.

Sd/- E.Saravanelraj,
Director of Geology and Mining

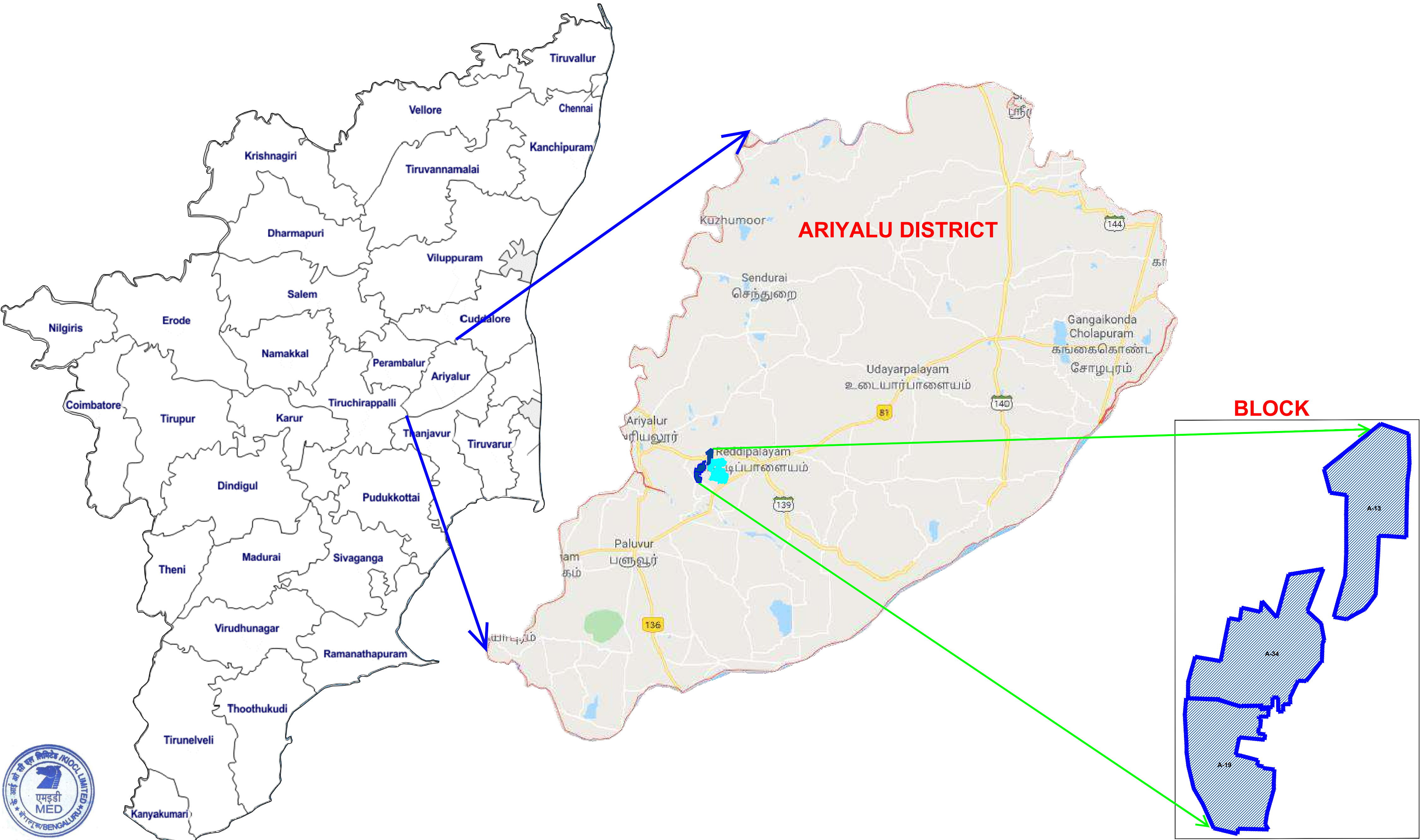
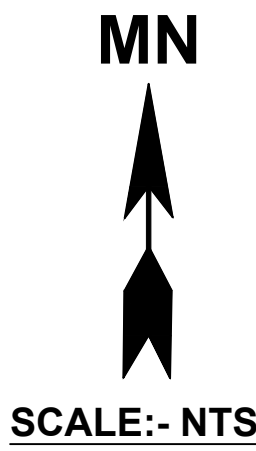
Forwarded / By Order



Joint Director

Copy to:
The Principal Secretary to Government,
Industries Department, Secretariat, Chennai-9.



MEPP - G2 LEVEL MINERAL EXPLORATION IN
REDDIPALAIYAM AMALGAMATED LIMESTONE BLOCK - LOT 02
(KIOCL_19_TN_RALB)



[PLATE No: 01]	
TITLE	KEY MAP
PROJECT	G2 - LEVEL MINERAL EXPLORATION WORKS
BLOCK ID	REDDI PALAIYAM AMALGAMATED LIMESTONE BLOCK (KIOCL_ 19_ TN_RALB)
EXTENT:- 221.035ha	
VILLAGE:- REDDIPALAIYAM	TALUK :- ARIYALUR
DISTRICT: ARIYALUR	STATE :- TAMIL NADU
PROSPECTOR	<div><div>KIOCL LIMITED (Notified Exploration Agency) Regd. Off: BLOCK II, KORAMANGALA, BENGALURU 560 034 (www.kioclltd.in)</div></div>



MEPP - G2 LEVEL MINERAL EXPLORATION IN
REDDIPALAIYAM AMALGAMATED LIMESTONE BLOCK - LOT 02
(KIOCL_19_TN_RALB)



No. C44B4

Scale 1:50,000

C44A15 (58M/4)	C44B3 (58M/4)	C44B7 (58M/4)
C44A16 (58M/4)	C44B4 (58M/4)	C44B8 (58M/4)
C44G18 (58M/4)	C44H (58M/4)	C44I5 (58M/4)

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Buildings: Townships, etc.	Other: etc.

REFERENCE

NOTES

1. The map is based on the Survey of India map No. C44B4 (58M/4) at a scale of 1:50,000.

2. The map is based on the Survey of India map No. C44B4 (58M/4) at a scale of 1:50,000.

Projection: UTM Datum: 1958

Maximum Variation: 2' 30" (at 1:50,000)

Scale: 1:50,000

Scale: 1:50,000

Scale: 1:50,000

Scale: 1:50,000

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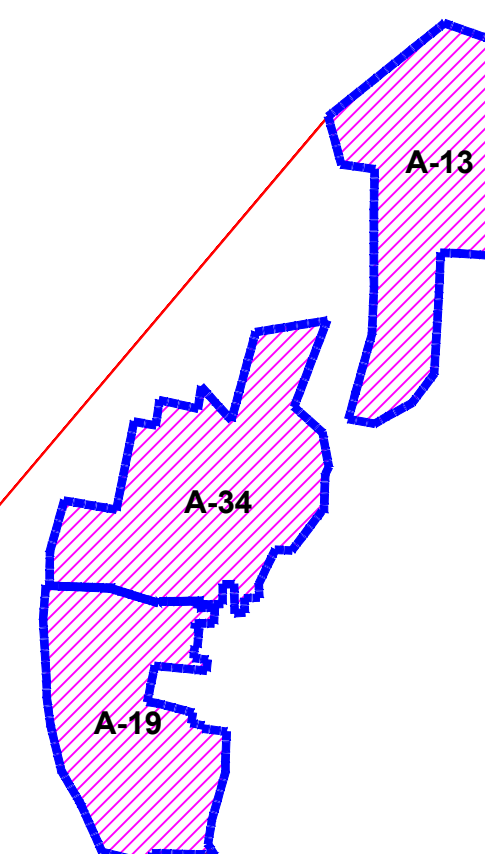
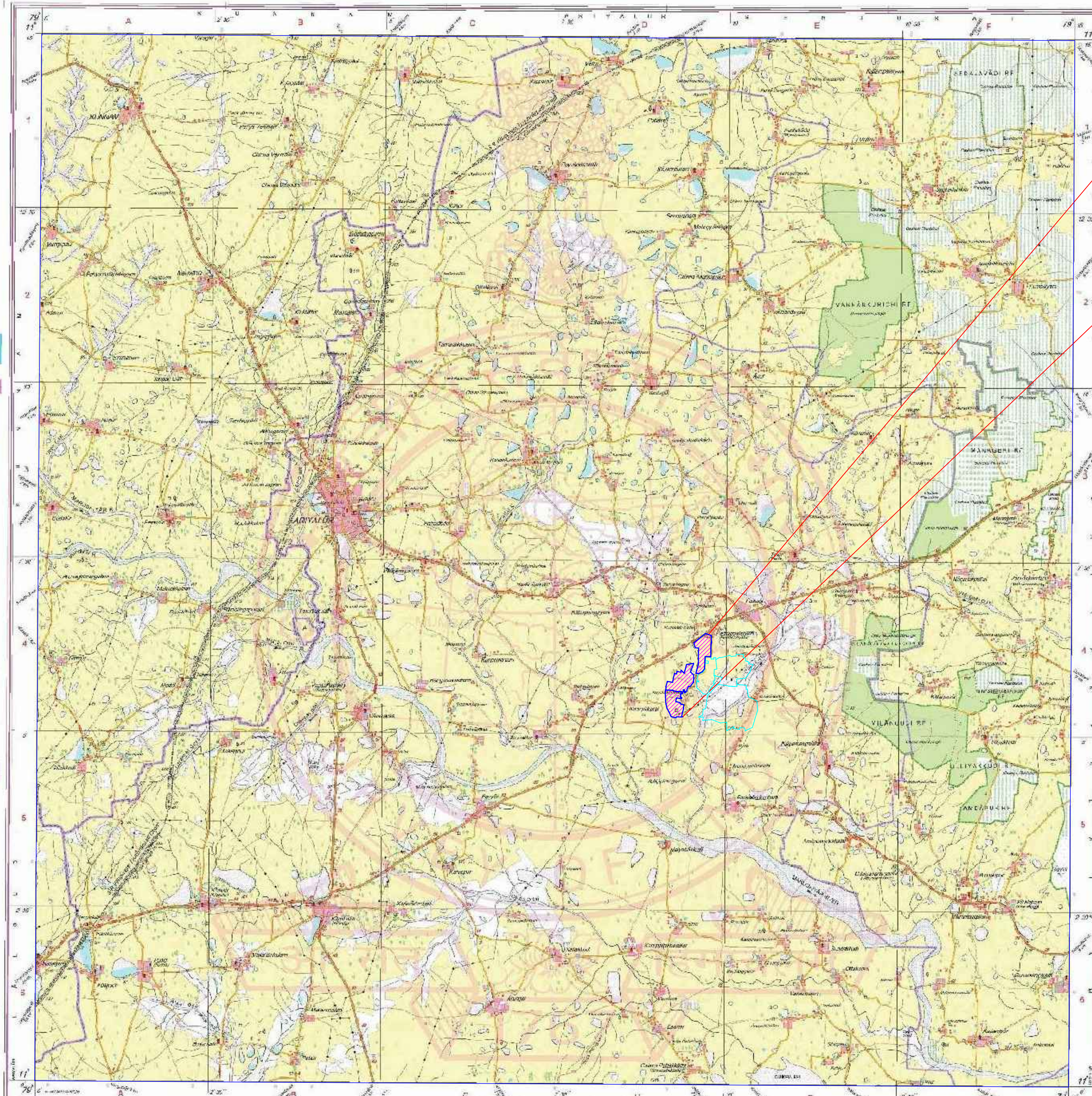
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SCALE:-1: 50,000

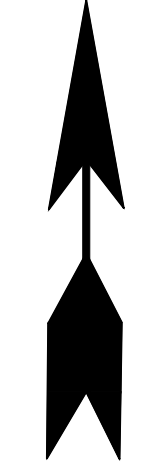
PLATE No: 02

TITLE	BLOCK MARKED ON TOPOSHEET (58M/4)
PROJECT	G2 - LEVEL MINERAL EXPLORATION WORKS
BLOCK ID	REDDIPALAIYAM AMALGAMATED LIMESTONE BLOCK (KIOCL_19_TN_RALB)
	EXTENT:- 221.035ha
VILLAGE:- REDDIPALAIYAM	TALUK :- ARIYALUR
DISTRICT: ARIYALUR	STATE :- TAMIL NADU
PROSPECTOR	KIOCL LIMITED (Notified Exploration Agency) Regd. Off: BLOCK II, KORAMANGALA, BENGALURU 560 034 (www.kioclltd.in)

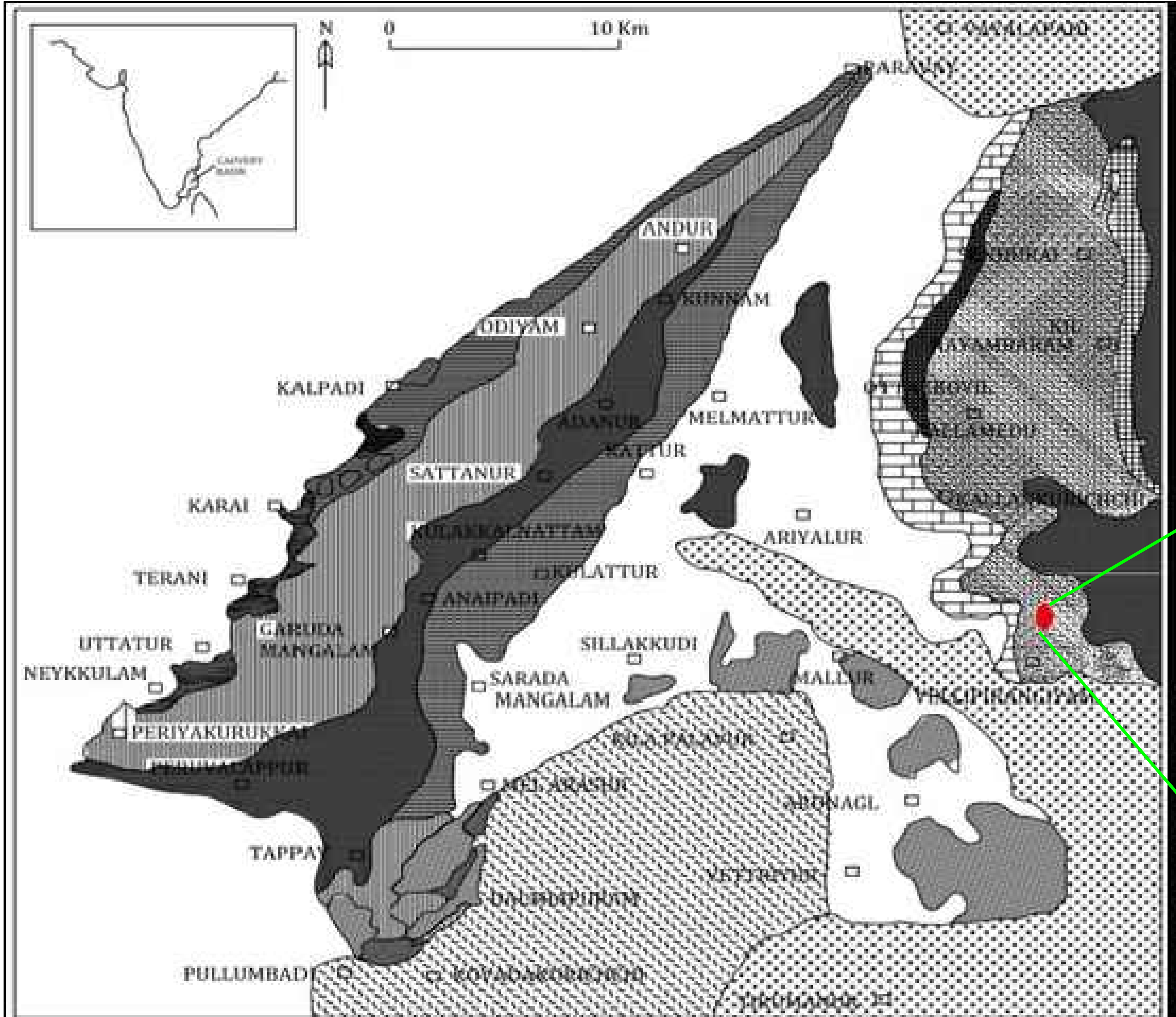


MEPP - G2 LEVEL MINERAL EXPLORATION IN
REDDIPALAIYAM AMALGAMATED LIMESTONE BLOCK - LOT 02
(KIOCL_19_TN_RALB)

MN



SCALE:- NTS



BLOCK

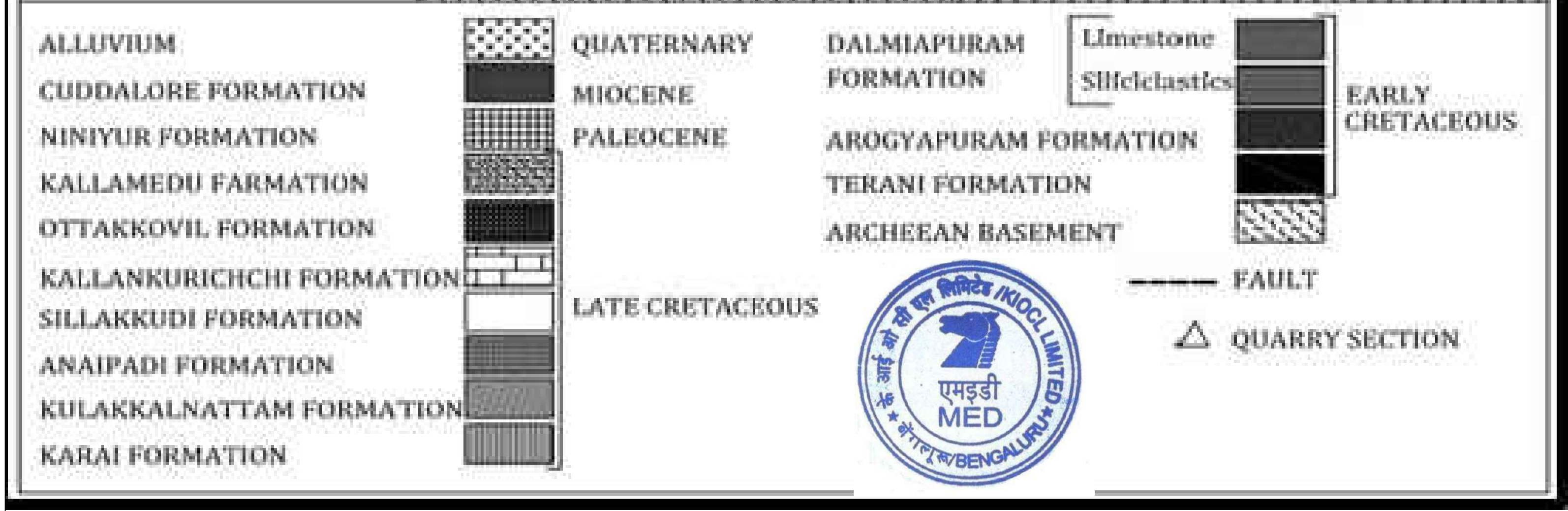
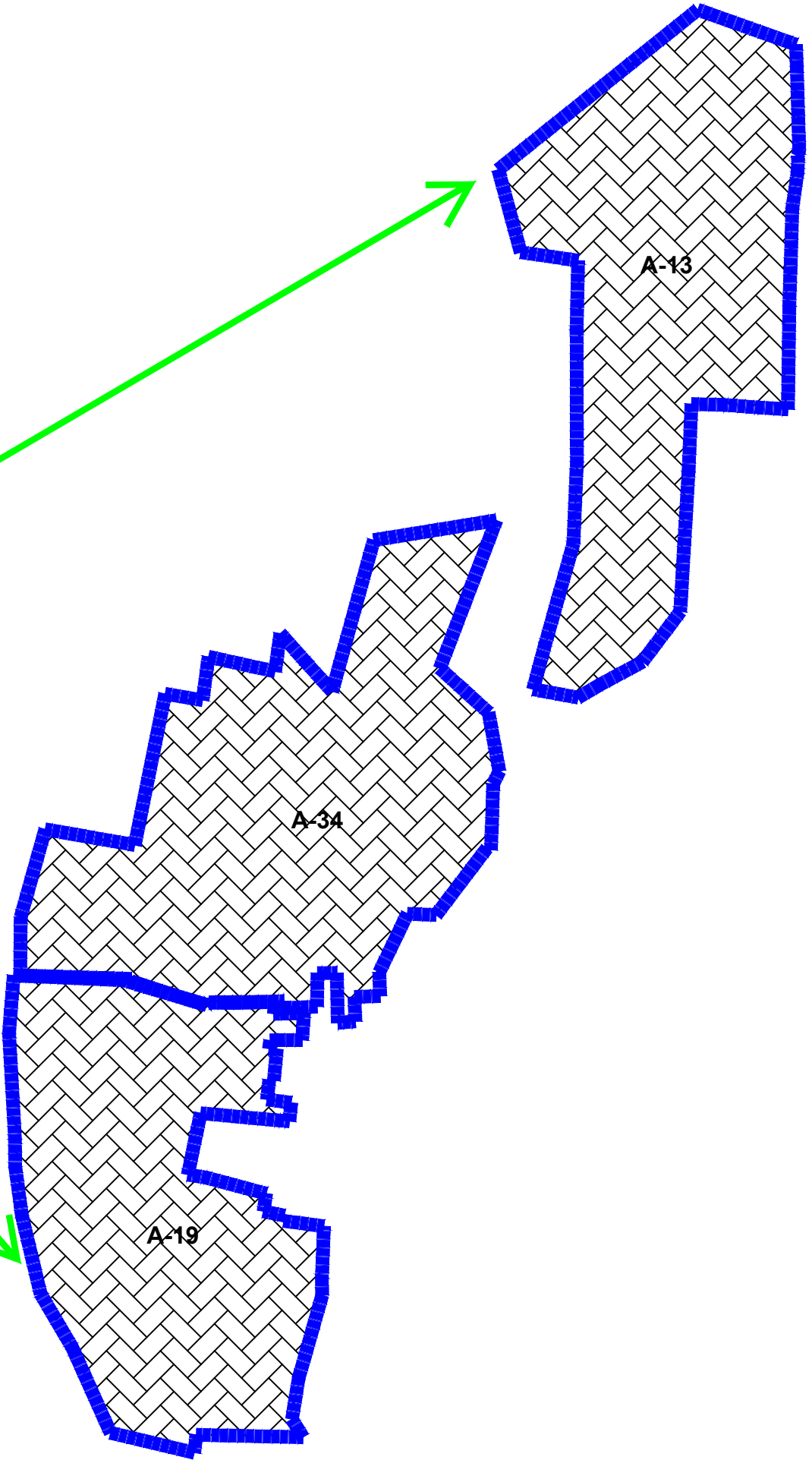

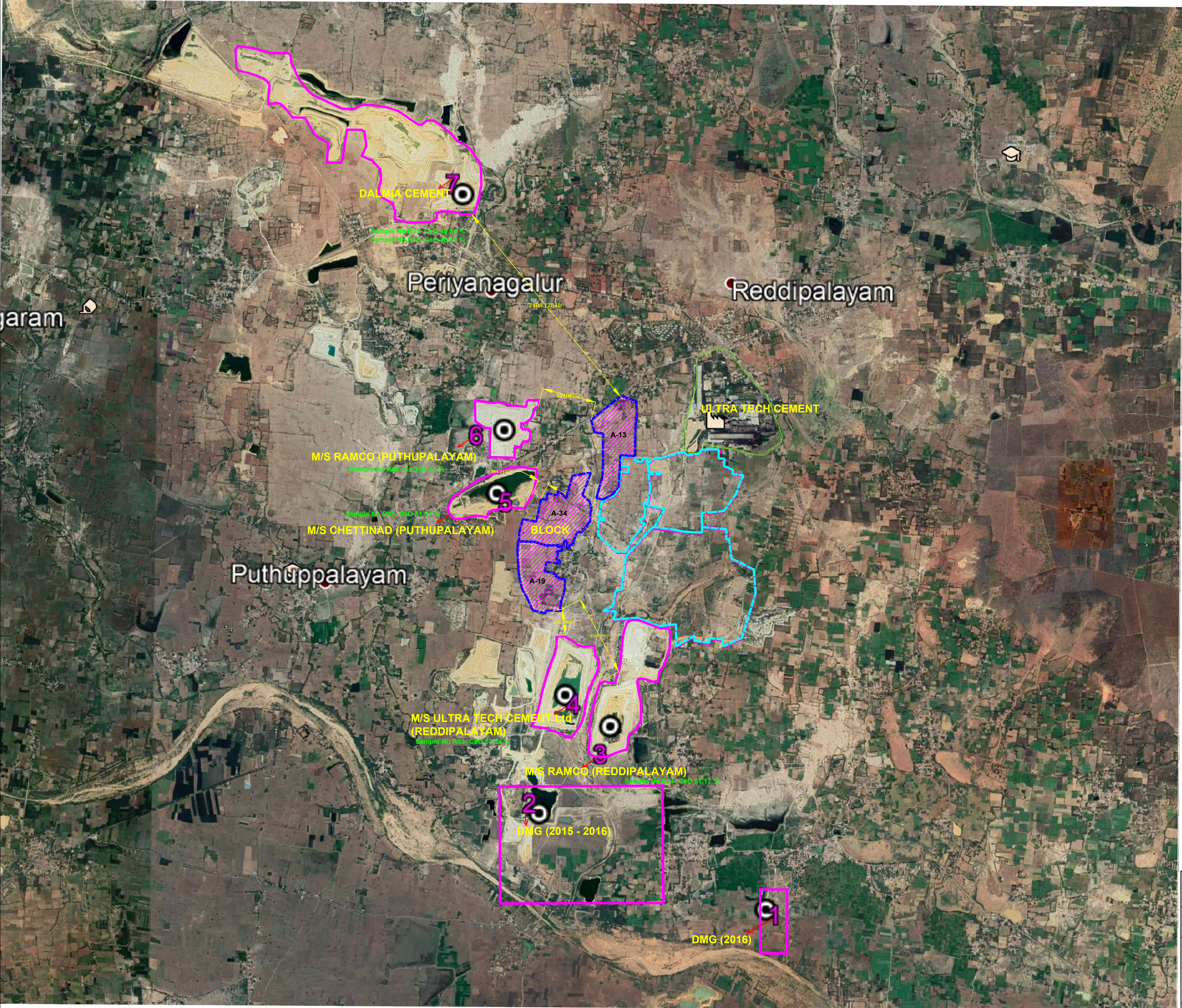
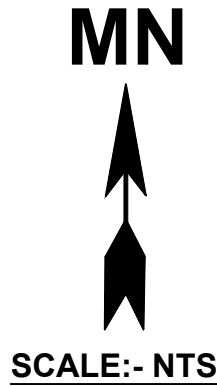


PLATE No: 03

TITLE	BLOCK MARKED ON REGIONAL GEOLOGY MAP		
PROJECT	G2 - LEVEL MINERAL EXPLORATION WORKS		
BLOCK ID	REDDIPALAYAM AMALGAMATED LIMESTONE BLOCK (KIOCL_19_TN_RALB)		
EXTENT:- 221.035ha			
VILLAGE:- REDDIPALAIYAM		TALUK :- ARIYALUR	
DISTRICT: ARIYALUR		STATE :- TAMIL NADU	
PROSPECTOR		KIOCL LIMITED (Notified Exploration Agency) Regd. Off: BLOCK II, KORAMANGALA, BENGALURU 560 034 (www.kioclltd.in)	




MEPP - G2 LEVEL MINERAL EXPLORATION IN
REDDIPALAIYAM AMALGAMATED LIMESTONE BLOCK - LOT 02
(KIOCL_19_TN_RALB)

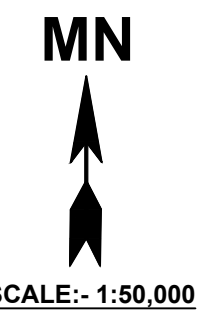



SUB BLOCK No	DETAILS
1	DGM (20116)
2	DGM (2015-16)
3	M/S RAMCO (PUDUPALAYAM)
4	M/SULTRA TECH CEMENT Ltd
5	M/S CHETTINAD (REDUPALAYAM)
6	M/S RAMCO (REDUPALAYAM)
7	DALMIA (PERIYANAGALUR)

PLATE No: 04

TITLE	ADJACENT WORKINGS / PROVEN EXTENTS		
PROJECT	G2 - LEVEL MINERAL EXPLORATION WORKS		
BLOCK ID	REDDIPALAYAM AMALGAMATED LIMESTONE BLOCK (KIOCL_19_TN_RALB)		
EXTENT:- 221.035ha			
VILLAGE:- REDDIPALAIYAM		TALUK :- ARIYALUR	
DISTRICT: ARIYALUR		STATE :- TAMIL NADU	
PROSPECTOR		KIOCL LIMITED (Notified Exploration Agency) Regd. Off: BLOCK II, KORAMANGALA, BENGALURU 560 034 (www.kioclltd.in)	





TITLE		BLOCK MARKED ON 1:50k GSI GEOLOGY MAP	
PROJECT		G2 - LEVEL MINERAL EXPLORATION WORKS	
BLOCK ID		REDDIPALAYAM AMALGAMATED LIMESTONE BLOCK (KIOCL_19_TN_RALB)	
		EXTENT:- 221.035ha	
VILLAGE:- REDDIPALAIYAM		TALUK :- ARIYALUR	
DISTRICT: ARIYALUR		STATE :- TAMIL NADU	
PROSPECTOR		KIOCL LIMITED (Notified Exploration Agency) Regd. Off: BLOCK II, KORAMANGALA, BENGALURU 560 034 (www.kioclltd.in)	



MEPP - G2 LEVEL MINERAL EXPLORATION IN
REDDIPALAIYAM AMALGAMATED LIMESTONE
BLOCK- LOT 02 (KIOCL_19_TN_RALB)

MN
SCALE:- 1:5,000

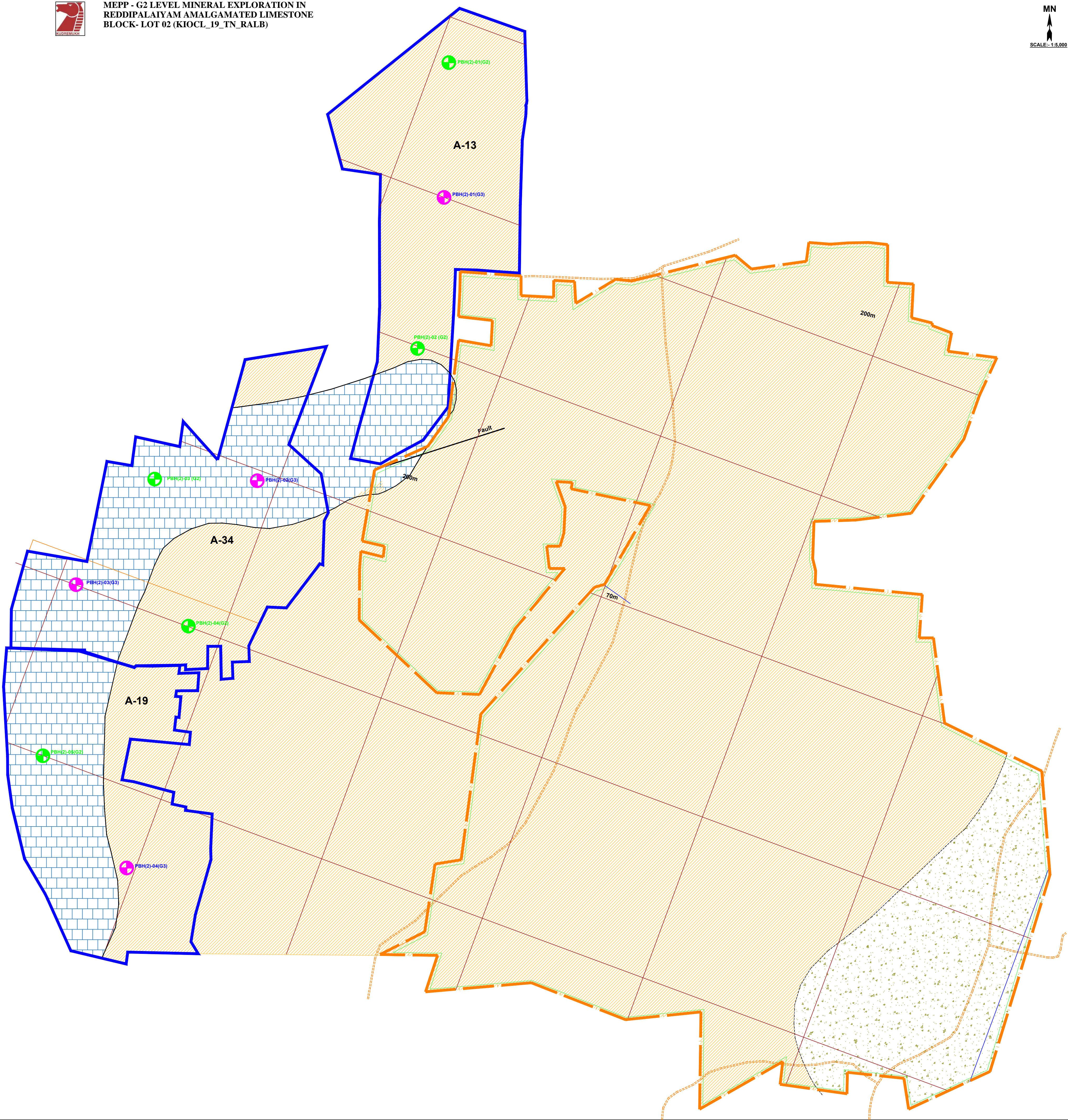


PLATE No: 06


CO-ORDINATES OF PROPOSED BOREHOLES (DATUM WGS 84)

Block	Proposed Borehole No	G3		Proposed Borehole No	G2	
		Longitude	Latitude		Longitude	Latitude
A13	PBH(2)-01(G3)	299171	1228081	PBH(2)-01(G2)	299184	1228389
A34	PBH(2)-02(G3)	298734	1227414	PBH(2)-02(G2)	299112	1227734
A34	PBH(2)-03(G3)	298316	1227175	PBH(2)-03(G2)	298496	1227425
A19	PBH(2)-04(G3)	298430	1226514	PBH(2)-04(G2)	298574	1227080
				PBH(2)-05(G2)	298234	1226779



GENERAL INDEX

	BLOCK BOUNDARY OF PROPOSED EXPLORATION BLOCK - LOT 02 (KIOCL_19_TN_RALB)		PBH(G3) (4 Nos.)
	BLOCK BOUNDARY OF RALB - LOT 01 (KIOCL_16_TN_RALB)		PBH (G2) (7 Nos.)
	CORNER POINTS		ROADS
	LIMESTONE		UTM GRID
	ARGILLACEOUS SANDSTONE		MOTTLED SANDSTONE
			FAULT

TITLE	PROPOSED BOREHOLES ON 1:50k GSI GEOLOGICAL MAP		
PROJECT	G2 - LEVEL MINERAL EXPLORATION WORKS		
BLOCK ID	REDDIPALAYAM AMALGAMATED LIMESTONE BLOCK (KIOCL_19_ TN_RALB)		
EXTENT:- 86.55ha			
VILLAGE:- REDDIPALAIYAM		TALUK :- ARIYALUR	
DISTRICT: ARIYALUR		STATE :- TAMIL NADU	
PROSPECTOR		KIOCL LIMITED (Notified Exploration Agency) Regd. Off: BLOCK II, KORAMANGALA, BENGALURU 560 034 (www.kiocltd.in)	