

**Regional Exploration Proposal (G-4 level) for Bauxite in
Kasaragod East Block, (Block-ID SR-KRL-03) in an area of
291 Sq km, District: Kasaragod, (Kerala)**

SYNOPSIS

Mineral	Bauxite																								
Location	The North-western part of the block area is on the outskirts of the Kasaragod Township on Eastern and Southern side. The South-western side of the block area is 5 km from the Hosdurg town. The national highway NH-17 and Rail route of Southern Railway passes from the western side of the block area. The western part of the area is traversed by roads and the motorable tracts but the eastern part is not much accessible due to the scarcity of motorable tracts and high stream network. The block is located in the survey of India Toposheet No. 48 P/3. The Co-ordinates of the corner points of the block area is given below and covers 291 sq.km area																								
Bounding coordinates	The corner points of the block are as below <table><thead><tr><th></th><th>Latitude</th><th>Longitude</th></tr></thead><tbody><tr><td>A)</td><td>12⁰ 30' 00" N</td><td>75⁰ 00' 00"E</td></tr><tr><td>B)</td><td>12⁰ 30' 00" N</td><td>75⁰ 15' 00"E</td></tr><tr><td>C)</td><td>12⁰ 25' 05" N</td><td>75⁰ 14' 59"E</td></tr><tr><td>D)</td><td>12⁰ 25' 05" N</td><td>75⁰ 10' 16"E</td></tr><tr><td>E)</td><td>12⁰ 23' 17" N</td><td>75⁰ 07' 02"E</td></tr><tr><td>F)</td><td>12⁰ 21' 37" N</td><td>75⁰ 06' 03"E</td></tr><tr><td>G)</td><td>12⁰ 21' 37" N</td><td>75⁰ 03' 17"E</td></tr></tbody></table> (Survey of India Toposheet No. 48 P/3)		Latitude	Longitude	A)	12 ⁰ 30' 00" N	75 ⁰ 00' 00"E	B)	12 ⁰ 30' 00" N	75 ⁰ 15' 00"E	C)	12 ⁰ 25' 05" N	75 ⁰ 14' 59"E	D)	12 ⁰ 25' 05" N	75 ⁰ 10' 16"E	E)	12 ⁰ 23' 17" N	75 ⁰ 07' 02"E	F)	12 ⁰ 21' 37" N	75 ⁰ 06' 03"E	G)	12 ⁰ 21' 37" N	75 ⁰ 03' 17"E
	Latitude	Longitude																							
A)	12 ⁰ 30' 00" N	75 ⁰ 00' 00"E																							
B)	12 ⁰ 30' 00" N	75 ⁰ 15' 00"E																							
C)	12 ⁰ 25' 05" N	75 ⁰ 14' 59"E																							
D)	12 ⁰ 25' 05" N	75 ⁰ 10' 16"E																							
E)	12 ⁰ 23' 17" N	75 ⁰ 07' 02"E																							
F)	12 ⁰ 21' 37" N	75 ⁰ 06' 03"E																							
G)	12 ⁰ 21' 37" N	75 ⁰ 03' 17"E																							
Total area	291 Sq. Km																								
Background information	Srinivashan, R. (1967-68) carried out systematic geological mapping in the eastern part of Kasaragod taluk. Srinivashan R, Abdul Moghani and Rajagopalan Nair, S. (1970) mapped in parts of Kasaragod and Hosdurg taluks and reported Bauxite, Magnetite, Clay and Building stones in the area outside the southern boundary of the block. Massive or blanket type laterite occurs as capping on hillocks and plateaus. Pisolitic and conglomeratic type laterite occurs in low lying areas and is formed due to consolidation of detrital material. The thickness of laterite varies from few centimeters to 10 meters. Out crops of bed rock are exposed only in deep gullies and streams. Gneisses and pyroxene granulites of Charnockite group are the major rock types of the area.																								

The litho-units exposed in the block area belonging to the Archaean & Proterozoic intrusives forms basement. The rocks of Mio-Pliocene age overlie Archaean group of rocks. The lithounits of Pleistocene and Holocene age overlie conformably in the stratigraphic succession. Pockets of Bauxite along with laterite occur in the block at low lying areas. Bauxite occurs as capping on plateaus & hillocks in massive form. Globules, Nodules and pellets type Bauxite occur below the laterite or bauxitic clays. The Stratigraphic Sequence of lithounits exposed in the block (after GSI) is given below.

Stratigraphic Sequence of the lithounits of the block (after GSI)			
Age	Group	Formation	Lithounits
Recent	-	-	Soil
Holocene	-	Periyar	Clays, sand (fluvial)
Late Pleistocene		Guruvayur	Clays, sand (Paleo-marine)
Pleistocene	-	-	Laterite
Mio-Pleistocene	-	Warkalli	Clay, Silt, Sandy clay with lignite intercalations
Proterozoic	-	Basic Intrusive	Dolerite dykes
Archaean	Peninsular Gneissic Complex	-	Quartzo-felspathic gneiss
	Charnockite	-	Charnockite, Pyroxene granulite
	Khondalite	-	Garnet-silliminite gneiss, schist with graphite, garnet-biotite gneiss.

Objectives	The basic Geoscience data provided by GSI has been studied and evaluated. Based on the evaluation the present exploration programme has been formulated to fulfill the following objectives i) To carry out geological mapping on 1:12,500 scale and demarcate the Bauxite-bearing formations and lateral disposition of the ore body. ii) To collect surface samples to analyze them for Al_2O_3, Fe_2O_3, SiO_2, TiO_2 & LOI and decide further course of exploration programme. iii) In case, surface samples give positive results supported by Remote sensing studies for mineral targeting then 5 no's scout boreholes shall be drilled in the Kasaragod East Block and other mineralized patches in the 291 sq.km area which in turn will decide the future course of exploration programme at G-3/G-2 category of UNFC. iv) To analyse some samples for REE, Ni, Vanadium & Gallium to the presence of these minerals in the Block. v) To estimate reconnaissance Bauxite resources along with accessory elements as per UNFC norms and minerals (Evidence of Mineral Contents) Rules-2015 at G-4 level.
Time schedule	13 months
Cost estimate	Rs. 147.97 Lakhs
Exploration agency	MECL
Date of commencement	Yet to Commence

Quantum of work of Reconnaissance Survey for Bauxite in Kasaragod East Block, (Block-ID SR-KRL-03), in an area of 291Sq Km, District: Kasaragod, (Kerala)			
Sl. No.	Item of work	Unit (m)	Proposed Quantum of Work
1	Remote Sensing Studies(ASTER Data Analysis freely available) (on 1: 50,000 Scale)	Scene	1 Scene 291 sq. km.
2	Geological Mapping (on 1:12,500 Scale)	Sq. Km	291 sq. km.
3	Topographical Survey* (on 1:12,500 Scale in potential Zone Areas)	Sq. Km	As per requirement
	Bore Hole Fixation* (Scout Boreholes)	Nos	5 Nos
	RL & Coordinate Determination*	Nos	5 N0s
4	Geochemical Sampling (Taken up in Anomalous areas)		
	a) Bed Rock Sampling	N0s.	150 N0s
5	Pitting	Cu. M.	100 Cu. M.
6	Drilling (coring)*	m	250m (5 Bhs)
7	Geological work		
	a) Geological Core Logging, Sample Preparation etc.*	m	250m (5 Bhs.)
8	Laboratory Studies		
	I) Surface Sampling (Primary samples)		
	i) Bed Rock samples		
	a) For Al ₂ O ₃ ,Fe ₂ O ₃ , SiO ₂ , TiO ₂ & LOI	Nos	150 Nos
	b) REE	Nos.	05 nos
	c) Ni	Nos.	05 nos
	d) Vanadium & Gallium	Nos.	100 nos
	ii) Check Samples (Bed Rock)		
	a) For Al ₂ O ₃ ,Fe ₂ O ₃ , SiO ₂ , TiO ₂ & LOI	Nos	15 Nos
	iii) Pit & Check Samples		
	a) For Al ₂ O ₃ ,Fe ₂ O ₃ , SiO ₂ , TiO ₂ & LOI	Nos	110 Nos
	iv) Drill Core *(Primary + Check) Samples		
	a) For Al ₂ O ₃ ,Fe ₂ O ₃ , SiO ₂ , TiO ₂ & LOI	Nos	165 Nos
9	Physical Studies		
	a) XRD – Studies on Composite samples	Nos.	15 Nos
10	Petrological Samples (Surface & Bh Core Samples)		
	a) Preparation of Thin Section	Nos	10 Nos
11	Whole Rock Analysis*		
	For SiO ₂ , Al ₂ O ₃ , Fe ₂ O ₃ , TiO ₂ , MnO, CaO, Na ₂ O, K ₂ O+H ₂ O, MgO, P ₂ O ₅ , CO ₂ , & S.	Nos	10 Nos
12	Specific gravity Determination	Nos.	10 Nos
13	Report Preparation [As per Minerals (Evidence of Mineral Contents) Rules-2015]	Nos	1
* The 2 nd Level of work to be decided after Review of Geological Mapping & Geochemical Sampling			

**Regional Exploration Proposal (G-4 level) for Bauxite in
Kasaragod East Block, (Block-ID SR-KRL-03) in an area of 291 Sq
km, District: Kasaragod, (Kerala)**

1.0.0 Introduction:

- 1.1.1 Bauxite has played a vital role in the industrial growth of a nation. The increasing demand of Bauxite has been accorded high priority in the XIIth Plan document.
- 1.1.2 For the industrial growth of the states in the country, minerals are to be explored within the state to avoid high transport cost of ore for metal industry. Bauxite is one of those ores. During the last three decades, no large Bauxite deposit has been discovered in India. However, the possibility of working of small mineral bodies in proximity to each other, through technological advances and increased operational efficiency, cannot be ruled out. Therefore, it is necessary to locate and explore such small sized deposits in clusters.
- 1.1.3 In view of the MMDR amendments act – 2015, Mineral (Evidence of Mineral Contents) Rule 2015 and Mineral Auction Rule – 2015, Ministry of Mines, GSI identified the block for exploration & MECL decided to take up the block for G-4 level of exploration under NMET funding. MECL requested Ministry of Mines, Government of India to reserve the block to carry regional exploration.
- 1.1.4 Ministry of Mines, Govt. of India allotted 30 Regional Mineral Exploration Blocks for G-4 exploration from the 100 reports handed over by GSI to MoM. The Regional Exploration for Bauxite in Kasargod East block (Block ID SR-KRL-03) in 291Sq. Km., District- Kasargod (Kerala) is one of the blocks allotted to MECL. Accordingly MECL prepared proposal for regional exploration and being put up for approval of Technical Committee of NMET.

1.2.0 Location of the Block:

- 1.2.1 The North-western part of the block area is on the outskirts of the Kasaragod Township on Eastern and Southern side. The South-western side of the block area is 5 km from the Hosdurg town. The national highway NH-17 and Rail route of Southern Railway passes from the western side of the block area. The western part of the area is traversed by roads and the motorable tracts but the eastern part is not much accessible due to the scarcity of motorable tracts and high stream network. The block is located in the survey of India Toposheet No. 48 P/3. The Co-ordinates of the corner points of the block area is given below and covers 291 sq.km area.

- | | |
|----------------------------------|----------------------------------|
| A) 12°30' 00" N and 75°00' 00"E | B) 12°30' 00" N and 75°15' 00"E |
| C) 12° 25' 05" N and 75°14' 59"E | D) 12° 25' 05" N and 75°10' 16"E |
| E) 12° 23' 17" N and 75°07' 02"E | F) 12° 21' 37" N and 75°06' 03"E |
| G) 12° 21' 37" N and 75°03' 17"E | |

1.3.0 Physiology and Drainage:

- 1.3.1 The western portion of the block is of undulating terrain with isolated hillocks and is the part of coastal plains ranging from 4.6 to 16.4 m from mean sea level. The Eastern portion of the block area is of hilly terrain. The highest peak is in the middle of Northern portion of the block, north of Chandragiri River, having reduced level of 234 m from mean sea level.
- 1.3.2 The streams of the area show dendritic drainage pattern forming Nalas contributing to the tributary system of the westerly flowing Chandragiri River falling into the LakshaDweep Sea at the western boundary of the block.

2.0.0 Previous work:

- 2.1.1 Srinivashan, R. (1967-68) carried out systematic geological mapping in the eastern part of Kasaragod taluk. Srinivashan R, Abdul Moghani and Rajagopalan Nair, S. (1970) mapped in parts of Kasaragod and Hosudurg taluks and reported Bauxite, Magnetite, Clay and Building stones in the area outside the southern boundary of the block.
- 2.1.2 Massive or blanket type laterite occurs as capping on hillocks and plateaus. Pisolithic and conglomeratic type laterite occurs in low lying areas and is formed due to consolidation of detrital material. The thickness of laterite varies from few centimeters to 10 metres. Out crops of bed rock are exposed only in deep gullies and streams. Gneisses and pyroxene granulites of Charnockite group are the major rock types of the area.

3.0.0 Geology and Structure:

- 3.1.0 Regional Geology and Structure of the Area.
- 3.1.1 The lithounits exposed in and around the block area belong to Khondalite, Charnockite and Peninsular gneissic complex of Archaean age intruded by dolerite dykes. The formations of Warkalli group of rocks belonging to mio-pliocene age overlie Archaean age of litho-units. The laterite of pleistocene age, clays and sand of late Pleistocene and Holocene age overlie conformably over laterite in succession. The Regional Stratigraphic Sequence of lithounits of area (after GSI, District Resource map) is given below.

Regional Stratigraphic Sequence of the lithounits of the Area (after GSI)

Age	Group	Formation	Lithounits
Recent	-	-	Soil
Holocene	-	Periyar	Clays, sand (fluvial)
		Kudappuram	Clays, sand (marine)
Late Pleistocene	-	Guruvayur	Clays, sand (Paleo- marine)
Pleistocene	-	-	Laterite
Mio-Pliocene	-	Warkalli	Clay, Silt, Sandy clay with lignite intercalations
Proterozoic	-	Basic Intrusive	Dolerite dykes
Archaean	Peninsular Gneissic Complex	-	Quartzo-felspathic gneiss
	Charnockite	-	Charnockite, Pyroxene granulite
	Khondalite	-	Garnet-silliminite gneiss, schist with graphite, garnet-biotite gneiss.

3.2.0 Geology and Structure of the Block:

3.2.1 The litho-units exposed in the block area belonging to the Archaean & Proterozoic intrusives forms basement. The rocks of Mio-Pliocene age overlie Archaean group of rocks. The lithounits of Pleistocene and Holocene age overlie conformably in the stratigraphic succession. Pockets of Bauxite along with laterite occur in the block at low lying areas. Bauxite occurs as capping on plateaus & hillocks in massive form. Globules, Nodules and pellets type Bauxite occur below the laterite or bauxitic clays. The Stratigraphic Sequence of lithounits exposed in the block (after GSI) is given below.

Stratigraphic Sequence of the lithounits of the block (after GSI)

Age	Group	Formation	Lithounits
Recent	-	-	Soil
Holocene	-	Periyar	Clays, sand (fluvial)
Late Pleistocene		Guruvayur	Clays, sand (Paleo-marine)
Pleistocene	-	-	Laterite
Mio-Pleistocene	-	Warkalli	Clay, Silt, Sandy clay with lignite intercalations
Proterozoic	-	Basic Intrusive	Dolerite dykes
Archaean	Peninsular Gneissic Complex	-	Quartzo-felspathic gneiss
	Charnockite	-	Charnockite, Pyroxene granulite
	Khondalite	-	Garnet-silliminite gneiss, schist with graphite, garnet-biotite gneiss.

4.0.0 Objective of the proposed exploration programme:

4.1.1 The basic Geoscience data provided by GSI has been studied and evaluated. Based on the evaluation the present exploration programme has been formulated to fulfill the following objectives

- To carry out geological mapping on 1:12,500 scale and demarcate the Bauxite-bearing formations and lateral disposition of the ore body.
- To collect surface samples to analyze them for Al_2O_3 , Fe_2O_3 , SiO_2 , TiO_2 & LOI and decide further course of exploration programme.
- In case, surface samples give positive results supported by Remote sensing studies for mineral targeting for the extension of the ore body then 5 no's scout boreholes shall be drilled in the Kasaragod East Block and other mineralized patches in the 291 sq.km area which in turn will decide the future course of exploration programme at G-3/G-2 category of UNFC.
- To estimate reconnaissance Bauxite resources along with accessory elements as per UNFC norms and minerals (Evidence of Mineral Contents) Rules-2015 at G-4 level.

5.0.0 Proposed scheme of Exploration:

5.0.1 In accordance to the objective set for the block, the exploration programme is proposed. The exploration shall be carried out as per minerals (Evidence of Mineral Content) Rules-2015. Accordingly, the following scheme of exploration is formulated in order to achieve the objective. The details of different activities to be carried out are presented in subsequent paragraphs.

5.1.0 Remote Sensing:

5.1.1 The entire 291sq km area will be subjected for Remote Sensing Studies to identify the lineaments and other structural features and any mineral bearing areas other than Bauxite through mineral targeting process.

5.2.0 Geological mapping:

5.2.1 Geological Mapping will be done in 291sq km area on 1:12,500 scales. Rock types, their contact, structural features will be mapped. Surface manifestations of the ore bodies available along with their surface disposition will be marked on map. Surface samples of various litho-units for petrological studies and from ore bodies for Al_2O_3 , Fe_2O_3 , SiO_2 , TiO_2 & Lol assay with accessory minerals will be taken during the course of geological mapping.

5.3.0 Geochemical Sampling

5.3.1 Surface sampling (Bed Rock Samples)

During the course of Geological mapping the Bed rock samples shall be collected from the out crops covered area respectively. A total of 150 no's bed rock samples shall be collected, prepared and analyzed for Al_2O_3 , Fe_2O_3 , SiO_2 , TiO_2 & Lol assay. 05 nos samples each will be analyzed for REE & Ni and 100 nos samples will be analyzed for Vanadium & Gallium. 15 nos check samples will also be analyzed for Al_2O_3 , Fe_2O_3 , SiO_2 , TiO_2 & Lol assay

5.3.2 Stream Sediment Sampling

The stream sediment samples need not to be collected from the entire study area.

5.4.0 Surveying:

5.4.1 The block boundary will be surveyed by DGPS and total station in WGS-84 datum for demarcation of block boundary points. Survey party will be associated with stream sediment sample and Bed rock sample collection by taking up the points and plotting its location on map for proper interpretation of the sample data. Survey party will also be associated with Geological Mapping. Rock types, their contact, structural features etc will be observed during Geological mapping and the Litho-contacts will be plotted for finalization of Geological map on 1:12,500 scale. During drilling scout borehole fixation and determination of reduced level and Co-ordinates of the boreholes only will be undertaken. If mineralized zones are identified, contouring of the surrounding areas of ore bodies would be done on 2 m contour intervals along with survey of surface features.

5.5.0 Exploratory Mining

5.5.1 Trenching / Pitting:

Trenching and pitting shall be carried out in the potential zones identified based on the results of geological mapping & Geochemical sampling. A provision of shallow trenching of 100 cu. m. is kept. Pitting shall be done for correlation of mineralized zones on the surface up to a depth of 1 m after removal of soil/weathered column in the area. Locations of the pits & trenches on ground will be decided by field geologist based on field observations. A provision of 110 no primary & check trench/pit samples is kept for analysis for Al_2O_3 , Fe_2O_3 , SiO_2 , TiO_2 & LOI. The pit & trench walls will be mapped on 1:200 scale. Thus 100 cu. M. of shallow trenching & pitting work along with associated

5.6.0 Core Drilling:

5.6.1 The remote sensing studies and Geophysical survey will be helpful in adding new area in the block in the strike continuity. Hence 5scout boreholes involving 250 m of drilling will be undertaken.

5.7.0 Drill Core Logging:

5.7.1 The drill core will be logged for rock types, structural features, textures, intersection of ore zones, type of mineralization and occurrence of various are minerals. The logging for determining the Rock quality designation will also be undertaken.

5.8.0 Drill Core Sampling

5.8.1 During the geological logging of drill core, samples in mineralized zones will be marked on concentration wise and lithology wise. 165 no's of samples (primary + Check) will be analyzed for Al_2O_3 , SiO_2 , Fe_2O_3 , TiO_2 & LOI assay. 20 no's composite samples will be analyzed for Cao, MgO, Al_2O_3 , SiO_2 , Fe_2O_3 , SO_3 , P_2O_5 , Mn_2O_3 , TiO_2 , K_2O , Na_2O & LOI assay.

5.9.0 Whole Rock Analysis:

5.9.1 10 No of samples shall be subjected to whole rock analysis to check the rock types, their variation in chemical composition, will be done for SiO_2 , Al_2O_3 , Fe_2O_3 , TiO_2 , MnO, CaO, Na_2O , $\text{K}_2\text{O}+\text{H}_2\text{O}$, MgO, P_2O_5 , CO_2 , & S Analysis

5.10.0 Petrological Studies:

5.10.1 During the course of mapping and drill core logging 10 samples from various litho-units from surface and intersected in boreholes will be studied for petrography.

5.11.0 Specific gravity Determination:

5.11.1 For the specific gravity determination 10 samples from the mineralized zones intersected in the boreholes will be sent to lab.

5.12.0 XRD studies:

5.12.1 From the composite samples, 15 samples shall be subjected for XRD studies.

5.13.0 Proposed Quantum of Work:

5.13.1 The detail of proposed work is given in the table below:

7. Quantum of work of Reconnaissance Survey for Bauxite in Kasaragod East Block, (Block-ID SR-KRL-03), in an area of 291Sq Km, District: Kasaragod, (Kerala)			
Sl. No.	Item of work	Unit (m)	Proposed Quantum of Work
1	Remote Sensing Studies(ASTER Data Analysis freely available) (on 1: 50,000 Scale)	Scene	1 Scene 291 sq. km.
2	Geological Mapping (on 1:12,500 Scale)	Sq. Km	291 sq. km.
3	Topographical Survey* (on 1:12,500 Scale in potential Zone Areas)	Sq. Km	As per requirement
	Bore Hole Fixation* (Scout Boreholes)	Nos	5 Nos
	RL & Coordinate Determination*	Nos	5 N0s
Geochemical Sampling (Taken up in Anomalous areas)			
4	a) Bed Rock Sampling	N0s.	150 N0s
5	Pitting	Cu. M.	100 Cu. M.
6	Drilling (coring)*	m	250m (5 Bhs)
7	Geological work		
	a) Geological Core Logging, Sample Preparation etc.*	m	250m (5 Bhs.)
8	Laboratory Studies		
	I) Surface Sampling (Primary samples)		
	i) Bed Rock samples		
	a) For Al ₂ O ₃ , Fe ₂ O ₃ , SiO ₂ , TiO ₂ & LOI	Nos	150 Nos
	b) REE	Nos.	05 nos
	c) Ni	Nos.	05 nos
	d) Vanadium & Gallium	Nos.	100 nos
	ii) Check Samples (Bed Rock)		
	a) For Al ₂ O ₃ , Fe ₂ O ₃ , SiO ₂ , TiO ₂ & LOI	Nos	15 Nos
	iii) Pit & Check Samples		
	a) For Al ₂ O ₃ , Fe ₂ O ₃ , SiO ₂ , TiO ₂ & LOI	Nos	110 Nos
	iv) Drill Core *(Primary + Check) Samples		
	a) For Al ₂ O ₃ , Fe ₂ O ₃ , SiO ₂ , TiO ₂ & LOI	Nos	165 Nos
	v) Composite Samples* for 12 radicals		
	a) For Cao, MgO, Al ₂ O ₃ , Fe ₂ O ₃ , SiO ₂ , SO ₃ , P ₂ O ₅ , Mn ₂ O ₃ , TiO ₂ , K ₂ O, Na ₂ O & Lol	Nos	20 Nos
9	Physical Studies		
	a) XRD – Studies on Composite samples	Nos.	15 Nos
10	Petrological Samples (Surface & Bh Core Samples)		
	a) Preparation of Thin Section	Nos	10 Nos
	b) Study of Thin Section	Nos	10 Nos
11	Whole Rock Analysis*		
	For SiO ₂ , Al ₂ O ₃ , Fe ₂ O ₃ , TiO ₂ , MnO, CaO, Na ₂ O, K ₂ O+H ₂ O, MgO, P ₂ O ₅ , CO ₂ , & S.	Nos	10 Nos
12	Specific gravity Determination	Nos.	10 Nos
13	Report Preparation [As per Minerals (Evidence of Mineral Contents) Rules-2015]	Nos	1
* The 2nd Level of work to be decided after Review of Geological Mapping & Geochemical Sampling			

6.0.0 Time schedule and cost Estimate:

6.1.0 Time schedule

6.1.1 The proposed block area is nearly of 291sq.km. There is possibility of getting sub-surface extension of the ore body already recognized in two no's of areas and some new prospective areas. The details are indicated in bar chart given below:-.

Time schedule (in months) for Regional Exploration for Bauxite in Kasaragod East Block, (Block-ID SR-KRL-03), in an area of 291Sq Km, District: Kasaragod, (Kerala)													
Item of Work	1	2	3	4	5	6	7	8	9	10	11	12	13
Remote Sensing Studies (ASTER Data Analysis freely available) (on 1: 50,000 Scale)	←			→									
Report on Remote Sensing Studies				←	→								
Geological Mapping (2 Party Days)	←				→								
Bed Rock Sampling	←				→								
Surveying (1 Party Days) for Sampling etc	←				→								
Sample Preparation Bed Rock (1Party Days)			←			→							
Analytical Work				←			→						
Exploratory mining (2 Party) for Trenching / Pitting						←			→				
Geologist Party days for Pitting / Trenching and its Sampling (1 Party)						←			→				
Drilling (250 m)								←	→				
Surveying (1 Party) for drilling, contouring and surface features								←		→			
Sample Preparation (Drill Core) Party Days (1 Party)									←	→			
Geologist Party days for Drilling and Sampling work & report work (1 Party)								←		→			
Analytical Work Drill Core Samples										←	→		
Camp winding										←	→		
Geological Report											←		→

6.2.0 Cost Estimate:

The Project cost with provisional escalation is estimated at say **Rs. 147.97 Lakhs**. The details of item wise cost estimate with inbuilt actual escalation as on 31.3.2016 is given below.

SI No.	Item	Total Estimated Cost (Rs.)
1	Remote Sensing & Report	20,00,000/-
2	Geological, Survey & Sampling Work	70,38,180/-
4	Exploratory Mining	1,85,300/-
5	Drilling	39,61,423/-
6	Laboratory Studies	14,5,380/-
	Subtotal	14650283/-
7	Report	1,46,503/-
	Total	1,47,96,786/-

Or Say Rs. 147.97 Lakhs (Rs. 1.48Crore)

7.0.0 Justification:

- In view of MMDR Amendment & Mineral Auction Rule, 2015, GSI has identified this block for exploration MECL decided to take up the work under NMET funding.
- In the proposed study area, whole area is to be explored for Bauxite & sub-surface continuation in strike & dip directions of bodies. The Remote sensing studies will add to the Geological mapping for targeting the mineralized zone.
- The exploration will be helpful in estimation of reconnaissance resources of Bauxite and accessory minerals in block area.
- The Regional Exploration will help in planning of detailed exploration programme which in turn will facilitate the State govt. for auctioning of block.

Cost Estimate for G-4 Level of Exploration for Bauxite in Kasaragod East Block, (Block-ID SR-KRL-03), District: Kasaragod, (Kerala)						
Sl. No.	Item of Work	Unit	Base Rate 01-04-1990	Rates (2016-17)	Qty.	Amount
A	Remote Sensing Studies (ASTER Data Analysis on 1:50000Scale)	Scene			1	2000000
B	GEOLOGICAL WORK					
1	Survey Party days					
	a) Survey Party days (1party) For Sampling etc	days	1180	6,146	150	921900
	b) Survey Party days (1 party) For Drilling	days	1180	6,146	90	553140
2	Geologist Party days					
	a) Geological Party days (2 Party) For Geological Mapping etc	days	1541	8,021	300	2406300
	b) Geological Party days (1 Party) For Pitting, Trenching	days	1541	8,021	120	962520
	c) Geological Party days (1 Party) For Drilling, Core Sampling	days	1541	8,021	60	481260
3	Sampling Party days					
	a) Sample Preparation for Bed Rock (1 Partys)	days	525	2,945	120	353400
	b) Sample Preparation Pits/Trenches (1 Party)	days	994	5,733	120	687960
	c) Sample Preparation Drill Cores (1 Party)	days	525	2,945	60	176700
4	Transportation (Light Vehicles, 2 nos)	day	Lumpsum	1,500	330	495000
	Sub-Total B					7038180
C	EXPLORATORY MINING					
1	Excavation (Trenching/Pitting)	Cu. m	395	1,853	100	185300
	Sub-Total C					185300
D	CORE DRILLING (5 BH)					
1	Surface Drilling (1 rigs)	m	1714	7,889	250	1972250
2	Transportations (1 Rigs)	Km	8.8	34	2000	68000
3	Accommodation (One time/ Drill)	Nos	185925	7,28,250	1	728250
4	Camp Setting / Winding	Nos	68606	2,68,723	1	268723
5	Road Making (Hilly Terrain)	Km	7800	30,552	25	763800
6	GI Core Boxes	Nos	Lumpsum	2,000	70	140000
7	Transportation Charges of Core Boxes	Km	8.8	34	600	20400
	Sub Total D					3961423
E	LABORATORY STUDIES					
1	Chemical Analysis					
	i) Surface sampling (Bed Rock Samples)					
	a) Al ₂ O ₃ , Fe ₂ O ₃ , SiO ₂ , TiO ₂ & Lol	Nos.	110(76*4)=414	2,304	150	345600
	b) REE *	Nos.	3300	4290	5	21450
	c) Ni	Nos.	237	1,270	5	6350
	d) V & Ga*	Nos.	1100	1430	100	143000
	ii) Check Samples (Bed rock)					
	a) Al ₂ O ₃ , Fe ₂ O ₃ , SiO ₂ , TiO ₂ & Lol	Nos.	110(76*4)=414	2,304	15	34560
	iii) Pit & Trench, Primary & Check Samples					
	a) Al ₂ O ₃ , Fe ₂ O ₃ , SiO ₂ , TiO ₂ & Lol	Nos.	110(76*4)=414	2,304	110	253440
	iv) BH Core Sampling, Primary & Check samples					
	a) Al ₂ O ₃ , Fe ₂ O ₃ , SiO ₂ , TiO ₂ & Lol	Nos.	110(76*4)=414	2,304	165	380160
	v) Composite Samples for 12 radicals					
	a) Cao, MgO, Al ₂ O ₃ , SiO ₂ , Fe ₂ O ₃ , SO ₃ , P ₂ O ₅ , Mn ₂ O ₃ , TiO ₂ , K ₂ O, Na ₂ O & Lol	Nos	110(76*11)=946	5,304	20	106080

2	Physical Analysis					
	i) Petrographic Studies (BH core + Surface Samples)					
	a) Preparation of thin section	Nos.	100	545	10	5450
	b) Study of thin section	Nos.	228	1,495	10	14950
	iii) Whole rock analysis SiO ₂ , Al ₂ O ₃ , Fe ₂ O ₃ , TiO ₂ , MnO, CaO, Na ₂ O, K ₂ O+H ₂ O, MgO, P ₂ O ₅ , CO ₂ , & S	Nos.	1316	6,386	10	63860
	iv) Specific Gravity Determination (BH)	Nos.	32	198	10	1980
	v) XRD Studies					
	a) X-RD Studies on composite	Nos	1137	5,900	15	88500
	Sub-Total E					1465380
	Total (A+B+C+D +E)					14650283
F	EXPLORATION REPORT - 1% of (A+B+C+D+E)					146503
G	GRAND TOTAL (A+B+C+D+E+F)					14796786
					Say Rs. 147.97 Lakhs	
Note	1- Revised rate of promotional work by MECL on behalf of Govt. of India vide letter no. 37(I)/2006-MI dated 02.07.2014 and based on actual escalation as per RBI indices as on 31.3.16 and provisional escalation of @15% points for drilling and 25% points for Geological & Laboratory Studies for subsequent year.					
	2-Drilling rate for phosphorite has been considered as there is no rates for bauxite in Goel Committee report of MoM Schedule of Rates.					
	3-* Rate taken from GSI Schedule of rates as the same are not available in Goel Committee					