

PROPOSAL FOR GENERAL EXPLORATION (G-2)
FOR BAUXITE IN THE SARAIPANI-DADAR BLOCK,
TEHSIL-PANDARIA, DISTRICT - KABIRDHAM, CHHATTISGARH

SYNOPSIS

Mineral	Bauxite
Location	The proposed area is located about 6 km north of Amaniya village in the Pandaria Tehsil of Kabirdham District of Chhattisgarh. The proposed area is connected to the state capital, Raipur by the National Highway No. 12A and to Kawardha, District headquarters, by state highway, the Pandaria-Kui-Kakdur road. Raipur is the nearest railway station of the busy Mumbai-Howrah Railway route of the South Eastern Railway about 86 kms from Pandaria town. The block is included in the Survey of India Toposheet No. 64 F/7.
Total Area	0.80 Sq. km.
Background information	The Saraipani-Dadar Block in Pandaria Tehsil of Kabirdham district of Chhattisgarh, earlier surveyed (G4 level) by the Directorate of Geology and Mines, Chhattisgarh was proposed for G2 level of exploration through NMET Fund as per the Minerals (Evidence of Mineral Contents) Rules, 2015 to facilitate State Government of Chhattisgarh, for auctioning of the property. The proposal of Saraipani Dadar Block, Tehsil-Pandaria, District-Kabirdham, Chhattisgarh was put up for Technical Evaluation in the 1st Meeting of Technical Committee of NMET held on 01-04-2016 & 02-04-2016 at GSI, Central Region, Nagpur. The Committee discussed the proposal in detail and in view of insufficient data suggested that G-4 exploration should be taken up instead of G-2 level by carrying out Geological Mapping & Topographical Survey on 1: 10000 scale, collecting surface samples and drilling five scout boreholes to know the presence of Bauxite Zones and its quality. The future course of exploration in the block will be decided based on the outcome of G-4 level exploration. MECL accordingly modified the proposal and put up for approval in the 2nd meeting of Technical Committee held on 5th May 2016 at GSI, TI, Hyderabad. On recommendations of Technical committee the proposal was approved in the 2nd Executive Committee held on 09.05.2016 at Ministry of mines, New Delhi. On receipt of financial sanction for Rs 44.66 Lakh from National Mineral Exploration Trust, Ministry of Mines vide letter no F.No.6/1/NMET-2015 dated 18/08/2016, MECL commenced the field work in Saraipani Dadar Block including survey, geological mapping, exploratory drilling, sampling etc. in February-2017 and geological report was submitted to DGM, Chhattisgarh in August-2017.

	As an outcome of (G-4) exploration, it is evident that Bauxite zone-II is well developed in the western part but missing in the eastern part of the block. This may be due to irregular, discontinuous, pockety/bouldery nature of Bauxite. In such type of irregular deposit, the continuity of Bauxite zone from one exploration point to adjacent point is not certain even for the short distance. Therefore, on request of DGM, Chhattisgarh, to confirm the presence of bauxite zone-II in the eastern part of the block & to upgrade the Bauxite resource at G-2 level, the General exploration (G-2) with borehole spacing at 100 m X 100 m grid interval is recommended and the proposal for G-2 level exploration is being put up in the meeting of the Technical Committee of NMET.
<u>Regional Geology</u>	The rock formation of the proposed area comprises Archaean-Cainozoic age. The plateau has an elevation of >900mts MSL. Deccan Trap of Cretaceous to Paleocene age (65-60 m.y.) occurs in the western and northern part of the area. The Deccan Trap is represented by the unclassified basalt in major part of the area. However, the basalt exposed at few places in the west central part of the area is grouped under Linga Formation. Linga Formation comprises mostly non-porphyrific basaltic lava flows. The Deccan Trap plateau at higher altitude is often capped by laterite of Cainozoic age. The Basalt and Bauxite with Laterite occurs at plateau top. The basalts are extensively weathered giving rise to wide spread occurrences of laterite and bauxite. Bauxite occurs in the form of pocket with various dimensions. The laterite shows variation in colour from dark grey to yellowish brown. It is spongy and pisolitic in nature with calcareous concretions at places. Laterite occurring in the northern part of the area contains irregular tabular lensoidal bodies of bauxite.
<u>Objectives</u>	The following are the objectives of proposed exploration: 1. To prove existence of bauxite both along the longer axis and the shorter axis of the plateau at right angle to each other. 2. To know the quality and the thickness of Bauxite Horizons to upgrade the Bauxite resources at G-2 level in the block both quantitatively & qualitatively. 3. In case the outcome of present exploration is encouraging it will facilitate for Auctioning of Blocks by Chhattisgarh State Government.
Time Schedule	8 Months
Cost Estimate	Rs. 186.660 Lakhs
Exploration Agency	MECL
Date of Commencement	April' 2018

**PROPOSAL FOR GENERAL EXPLORATION (G-2)
FOR BAUXITE IN THE SARAIPANI-DADAR BLOCK,
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1.0.0 INTRODUCTION

- 1.1.0 The properties of metallic aluminium of being good conductor, light weight and amenable to get moulded in various shapes and sizes; make the metal very useful and important for various domestic and industrial consumptions. It has wide application in various areas such as transport, building, architectural sectors, food packaging, chemical industries, consumer durables, electrical sectors, machinery & equipment, solar panels, lithographic (offset) plates as required in printing technology, car industry and so on.
- 1.1.1 Bauxite consisting of hydrated oxides of aluminium in the form of diasporite and boehmite, $\text{Al}_2\text{O}_3 \cdot \text{H}_2\text{O}$ (Al_2O_3 -85%; Al-45%), gibbsite or hydrargillite, $\text{Al}_2\text{O}_3 \cdot 3\text{H}_2\text{O}$ (Al_2O_3 -65.4%; Al-34.6%) is the main source of aluminium. It is basically an aluminous rock containing the said hydrated aluminous oxides as the main constituents along with iron oxides like haematite and or goethite, silica as clay and or free quartz and titania as leucosene or rutile in various proportions.
- 1.1.2 Resources of bauxite in the country as on 1.4.2010 as per UNFC system stand at 3480 m.t. including 593 m.t. as bauxite reserves. Odisha alone accounts for 52% of the country's total Bauxite resources, followed by Andhra Pradesh (18%), Gujarat (7%), Chhattisgarh & Maharashtra (5% each) and Madhya Pradesh & Jharkhand (4% each). The production of bauxite is placed at 21.666 m.t. in 2013-14, 30% more from the previous year. Out of 64, ten principal producers having 32 mines, contributed 81% of the total production. The contribution of the Panchpatmali mine of NALCO was 29% of the total. The share of public sector mines was about 31% of the total national production.
- 1.1.3 The Saraipani-Dadar Block in Pandaria Tehsil of Kabirdham district of Chhattisgarh, earlier surveyed (G4 level) by the Directorate of Geology and Mines, Chhattisgarh was proposed for G2 level of exploration through NMET Fund as per the Minerals (Evidence of Mineral Contents) Rules, 2015 to facilitate State Government of Chhattisgarh, for auctioning of the property.

- 1.1.4. The proposal of Saraipani Dadar Block, Tehsil-Pandaria, District-Kabirdham, Chhattisgarh was put up for Technical Evaluation in the 1st Meeting of Technical Committee of NMET held on 01-04-2016 & 02-04-2016 at GSI, Central Region, Nagpur. The Committee discussed the proposal in detail and in view of insufficient data suggested that G-4 exploration should be taken up instead of G-2 level by carrying out Geological Mapping & Topographical Survey on 1: 10000 scale, collecting surface samples and drilling five scout boreholes to know the presence of Bauxite Zones and its quality. The future course of exploration in the block will be decided based on the outcome of G-4 level exploration. MECL accordingly modified the proposal and put up for approval in the 2nd meeting of Technical Committee held on 5th May 2016 at GSI, TI, Hyderabad. On recommendations of Technical committee the proposal was approved in the 2nd Executive Committee held on 09.05.2016 at Ministry of mines, New Delhi.
- 1.1.5. On receipt of financial sanction for Rs 44.66 Lakh from National Mineral Exploration Trust, Ministry of Mines vide letter no F.No.6/1/NMET-2015 dated 18/08/2016, MECL commenced the field work in Saraipani Dadar Block including survey, geological mapping, exploratory drilling, sampling etc. in February-2017 and geological report was submitted to DGM, Chhattisgarh in August-2017.
- 1.1.6 As an outcome of (G-4) exploration, it is evident that Bauxite zone-II is well developed in the western part but missing in the eastern part of the block. This may be due to irregular, discontinuous, pockety/bouldery nature of Bauxite. In such type of irregular deposit, the continuity of Bauxite zone from one exploration point to adjacent point is not certain even for the short distance. Therefore, on request of DGM, Chhattisgarh, to confirm the presence of bauxite zone-II in the eastern part of the block & to upgrade the Bauxite resource at G-2 level, the General exploration (G-2) with borehole spacing at 100 m X 100 m grid interval is recommended and the proposal for G-2 level exploration is being put up in the meeting of the Technical Committee of NMET.

2.0.0 LOCATION AND COMMUNICATION

2.1.0 The block is included in the Survey of India Toposheet No. 64 F/7 and marked by lines joining the cardinal points from P to S whose co-ordinates are as follows:

Block Boundary Point	WGS-84		UTM (m)	
	Latitude	Longitude	Northing	Easting
P	22° 29' 33.2884"	81° 19' 46.6974"	2487387.631	533906.905
Q	22° 29' 33.2888"	81° 20' 19.8330"	2487389.756	534853.679
R	22° 28' 38.4536"	81° 20' 19.8337"	2485703.666	534857.513
S	22° 28' 38.4532"	81° 19' 46.6981"	2485701.542	533910.635

2.1.1 The proposed area is located about 6 km north of Amaniya village in the Pandaria Tehsil of Kabirdham District of Chhattisgarh. The proposed area is connected to the state capital, Raipur by the National Highway No. 12A and to Kawardha, District headquarters, by state highway, the Pandaria-Kui-Kakdur road. Raipur is the nearest railway station of the busy Mumbai-Howrah Railway route of the South Eastern Railway about 86 kms from Pandaria town.

2.2.0 PHYSIOGRAPHY AND DRAINAGE

2.2.1 Physiographically the area around the block exhibit landforms of pediments/pediplain with denudational plateau & slope and regions of high level and middle level plateau of extrusive origin. The area lies on top of a plateau with altitudes ranging from 964m (max.) to 954m (min.) from the Mean Sea Level (MSL). The highest elevation point is 964.08 m (BH. No. MSPB-3) in the central part and lowest elevation point is 953.95 m (BH. No. MSPB-1). The plateau is irregular in shape and surrounded by Bijora Reserve Forest and is separated from Sendurkhar plateau by a narrow north-south depression. Eastern part of the plateau has bounded by scarp sections with steep slopes. The gradient in most of the area is towards south-east direction. The plateau top is free from forest cover. The tributaries of Banjara and Shivnath Rivers constitute the surface drainage system of the area. The drainage mainly consists of nalas and flows in all direction away from the plateau

3.0.0 PREVIOUS WORK

3.1.0 The area has been surveyed (G-4 level) by the Directorate of Geology and Mines (DGM), Chhattisgarh during 2006-07. The rock formation of the proposed area belongs to Archaean-Cainozoic age. The rock exposures on the plateau - top comprise of basalt, laterite and bauxite. Bauxite is reportedly of pockety nature with various dimensions. It is pisolitic to massive in nature and occurs in various colours like pale yellow, cream, brown as reported by the DGM, Chhattisgarh. DGM also carried out surface sampling of the area and Al_2O_3 is reported to range from 40% to 60%. Bauxite of the area is of metallurgical grade as observed by the DGM during its investigation.

On the basis of above, DGM Chhattisgarh suggested that this area seems to be promising for further exploration work.

3.2.0 On request of DGM, Chhattisgarh MECL put up the proposal for G-4 level exploration for Bauxite in Saraipani Dadar block in the Technical Committee meeting of NMET and on approval from Technical/Executive Committee of NMET, MECL commenced G-4 level exploration in Saraipani-Dadar block in February-2017 and geological report was submitted to DGM, Chhattisgarh in August-2017.

3.3.0 As the result of reconnaissance survey (G-4) in the Saraipani-Dadar Bauxite block, it was established that one Bauxite zone (Zone-II) delineated at (+) 40% Al_2O_3 & (-) 8% SiO_2 cut-off and three zones (Zone-I, III & IV) delineated at (+) 30% Al_2O_3 (Threshold Value) occurs in the block.

3.4.0 The thickness of the all bauxite zones in Saraipani-Dadar Bauxite block show wide variation and exhibit pinching & swelling nature (pockety/bouldery type of deposit). The Bauxite zone-II is restricted to the western part and is missing in the eastern part of the block. The thickness of Bauxite zone-II varies from 1.70 to 3.50 m. The average grade of Bauxite is 43.89% Al_2O_3 , 6.86% SiO_2 at (+) 40% Al_2O_3 & (-) 8% SiO_2 cut-off.

3.5.0 A total 1.29 million tonnes net in-situ reconnaissance category (G-4) Bauxite resource with an average grade of 43.89% Al_2O_3 , 6.86% SiO_2 , 18.53% Fe_2O_3 , 5.63% TiO_2 & 24.00% LOI at (+) 40% Al_2O_3 & (-) 8% SiO_2 cut-off for zone-II have been estimated. Similarly a total 1.55 million tonnes net in-situ reconnaissance category (G-4) Bauxite resource with an average grade of 34.45% Al_2O_3 , 14.73% SiO_2 , 27.44% Fe_2O_3 , 4.69% TiO_2 & 18.58% LOI at (+) 30% Al_2O_3 (Threshold Value) for zone-I, III & IV have been estimated.

4.0.0 GEOLOGY OF THE AREA

The rock formation of the proposed area comprises Archaean-Cainozoic age. The plateau has an elevation of >900mts MSL. Deccan Trap of Cretaceous to Paleocene age (65-60 m.y.) occurs in the western and northern part of the area. The Deccan Trap is represented by the unclassified basalt in major part of the area. However, the basalt exposed at few places in the west central part of the area is grouped under Linga Formation. Linga Formation comprises mostly non-porphyrific basaltic lava flows.

The Deccan Trap plateau at higher altitude is often capped by laterite of Cainozoic age. The Basalt and Bauxite with Laterite occurs at plateau top. The basalts are extensively weathered giving rise to wide spread occurrences of laterite and bauxite. Bauxite occurs in the form of pocket with various dimensions. The laterite shows variation in colour from dark grey to yellowish brown. It is spongy and pisolitic in nature with calcareous concretions at places. Laterite occurring in the northern part of the area contains irregular tabular lensoidal bodies of bauxite.

5.0.0 PROPOSED EXPLORATION PROGRAMME

5.1.0 Objectives: The main objectives of the proposed general exploration (G-2) are as follows:

1. To prove existence of bauxite both along the longer axis and the shorter axis of the plateau at right angle to each other.
2. To know the quality and the thickness of Bauxite Horizons to upgrade the Bauxite resources at G-2 level in the block both quantitatively & qualitatively.
3. In case the outcome of present exploration is encouraging it will facilitate for Auctioning of Blocks by Chhattisgarh State Government.

6.0.0 EXPLORATION SCHEME

6.1.0 Topographic Survey: The proposed area of the Saraipani Dadar Block (0.80 sq. km Area) will be covered by triangulation. Contouring will be carried out at 2m interval on 1:2000 scale. Reduced level of the various stations and boreholes will be determined with reference to the Survey of India "Bench Mark" available at the plateau top. All the boreholes, pits etc. will be connected in the survey triangulation network. Boreholes proposed will be fixed on the cross section lines at required interval. The coordinates and reduced level of all the boreholes and triangulation stations will be determined. The Block Boundary will be surveyed by DGPS & Total Station in WGS-84 datum.

6.2.0 Detailed Geological Mapping: Geological mapping has been carried out on 1:2000 scale in the block during G-4 reconnaissance survey. The geological mapping will be further carried out in details prior to the remaining exploration activities. The available rock exposures of laterite bauxite, basalt, etc. left if any will again be mapped carefully with details of foliation, joints etc. marked on a plan before taking up further exploration activities like detail drilling. A representative geological map superimposed on a topographical plan on 1:2000 scale will be prepared.

6.3.0 Drilling:

As the result of reconnaissance survey (G-4) in the Saraipani-Dadar Bauxite block, one Bauxite zone (Zone-II) delineated at (+) 40% Al_2O_3 & (-) 8% SiO_2 cut-off and three zones (Zone-I, III & IV) delineated at (+) 30% Al_2O_3 (Threshold Value) found to occurs in the block. The thickness of the all bauxite zones show wide variation and exhibit pinching & swelling nature (pockety/bouldery type of deposit). As an outcome of (G-4) exploration, it is evident that Bauxite zone-II is well developed in the western part but missing in the eastern part of the block. The Bauxite deposit is irregular, discontinuous, pockety/bouldery nature. The continuity of Bauxite zone from one exploration point to adjacent point is not certain even for the short distance because of the irregular type (pockety/bouldery) Bauxite deposit. Therefore, to confirm the presence of bauxite zone-II in the eastern part of the block & to upgrade the Bauxite resource of entire block at G-2 level, the General exploration (G-2) with borehole spacing at 100 m X 100 m grid interval is recommended.

6.3.1 The boreholes need to be deepened sufficiently up to ungraded zone-I or three meter in lithomarge clay below bauxite zone-I. A total of 55 nos. of coring boreholes at 100m x100m. Grid involving a total Meterage of 825m (@15m/borehole) has been proposed. The present exploration will be of G-2 Level.

6.4.0 Geological core logging: Geological core logging will be carried out to differentiate the overburden from the bauxite zones encountered in the borehole as well as to mark the floor of the Bauxite zone at the bottom. The overburden is generally marked by presence of soil / alluvium, laterite or ferruginous rock rich in haematite/goethite; while the bottom is marked by the weathered basement rock i.e. basalt or lithomarge. While carrying out geological core logging, colour, physical nature, lithology, structural details, mineralogy etc. need to be carefully recorded. Visual estimates for the ore zones encountered are to be labeled for each drill run so that primary delineation of the roof and floor of the bauxite zones can be marked for each borehole. On receipt of chemical analysis the same may be confirmed based on the specification laid down for ore at 40% or more Al_2O_3

and <5% SiO₂ and the thickness & grade of the bauxite column can also be determined.

6.5.0 Core Sampling:

(Primary, Internal & External Check): The drilled cores and cuttings of every “drilled run” need to be sampled after marking the different litho units. Except the visually confirmed overburden in the form of soil or alluvium at the top as well as the basement rock or lithomarge at the bottom of the borehole, nearly the entire drilled cores/cuttings are to be crushed to (-) 120mesh initially and thereafter the crushed (-) 120 mesh materials should be reduced to a 500gm representative homogenous sample by gradual coning & quartering method. This sample will further be crushed and reduced by the said methodology to prepare three representative samples of (-) 200 mesh weighing 100gm, 100gm & 300gm respectively.

At the top as well as in the bottom of the ore zones, length of samples needs to be adjusted according to the length of overburden in the form of soil / laterite. However, the zones of different grade as per the concentration of ore minerals like boehmite etc. may be sampled separately when the length may differ. The sample length should not exceed 1m in any condition. In case of a non-bauxite zone encountered within an ore zone, similar adjustment will have to be made to sample the non-ore zone separately. The other packet of 100gm may be used for check analysis while the remaining (third part) will be preserved for preparation of composite samples. The left out sample of (-) 120 mesh will be stored as duplicate sample. A total 715 nos primary drill core samples are likely to be generated and analyzed for five radicals during the G-2 level exploration. Around 70 nos and 35 nos primary drill core samples (10% and 5% of the total primary samples) will be selected randomly from the primary drill core samples and analyzed as internal and external check samples for five radicals at MECL, Chemical Laboratory, Nagpur and any NABL accredited Laboratory respectively.

6.6.0 **Composite Samples:** For each of the bauxite horizons of the boreholes, composite sample will be prepared by combining all the constituent primary samples in proportion of their lengths they represent. A total 220 nos of composite samples will be generated.

6.7.0 Chemical Analysis

(Primary Samples): All the drill core primary samples (715Nos) samples from boreholes will be subjected to analysis of 5 radicals viz. Al₂O₃, SiO₂, Fe₂O₃, TiO₂ & LOI at MECL, Chemical Laboratory, Nagpur.

6.8.0 Check Samples (Internal & External Check): Around 70 nos primary drill core samples (10% of the total primary samples) selected randomly from the primary drill core samples will be analyzed for five radicals in the Chemical Laboratory, MECL, Nagpur

35 no total primary drill core samples (5% of Total primary samples) selected randomly will be analyzed by a third party NABL accredited / or Department of Science & Technology (DST) / BIS recognized laboratories or government laboratories for assessing the acceptable levels of accuracy as per the Minerals (Evidence of Mineral contents) Rules, 2015.

6.9.0 (Composite Samples)

All the composite samples around 220 Nos prepared by combining the primary samples in their length proportions for each of the bauxite zones encountered in boreholes are to be analyzed for 7 radicals viz. Al_2O_3 , SiO_2 , Fe_2O_3 , TiO_2 , LOI, V_2O_5 & P_2O_5 and 20 nos composite samples are to be analyzed for 14 radicals viz. CaO , MgO , Al_2O_3 , SiO_2 , Fe_2O_3 , SO_3 , P_2O_5 , V_2O_5 , Mn_2O_3 , TiO_2 , K_2O , Na_2O , LOI & organic carbon.

6.10.0 Analysis for Reactive Silica and “Total Available Alumina” Content: 20 Nos of composite samples will be analyzed for “Total available alumina” and Reactive Silica content. The samples should be selected in such a manner that the entire bauxite bearing areas are represented by them.

6.11.0 X-Ray Diffraction Studies: A total of 20 No bauxite samples representing the Saraipani-Dadar Bauxite deposit will be subjected to X-Ray Diffraction studies to know about the general distribution pattern of the constituent minerals of the ore. The samples should be selected from the borehole composite samples in a pattern to represent the bauxite ore of the whole Saraipani-Dadar deposit.

6.12.0 Trace Element Studies by ICP-MS (Sequential technique): The distribution of trace element in bauxite zones will be studied by ICP-MS method. Fourteen number trace elements i.e. Pb, Zn, Ni, Co, Mo, Sn, V, Ga, Zr, Cr, As, Sb, Bi & Ge will be quantitatively estimated for the same set of samples as selected for analysis for Total Available Alumina & Reactive Silica content as mentioned in Para 6.10.0.

6.13.0 REE Studies: The samples from Saprolite zone (lithomarge clay) will be subjected to REE studies which includes fourteen REE elements for which provision of 110 samples has been done in the block.

6.14.0 Mineragraphic and Petrographic Studies: To know about the mineralogical composition and interrelation among the constituent minerals 25 rock specimens from the block will be taken up for Petrographic studies. 25 nos. of specimens from the bauxite zones will also be studied in polished section to know about the constituent ore minerals, their mode of occurrence, textures and other mineragraphic characteristics of bauxite.

6.15.0 Specific Gravity and Porosity determination: Apparent specific gravity values need to be determined for lump samples by the wax-coating method with a Walker's Steel Yard balance. The same specimens after crushing to (-) 100 mesh size will have to be used for determination of their true specific gravity by Pycnometry using Kerosene. The porosity values need to be calculated from the apparent and true specific gravity values. In all 30 Nos of samples each are to be subjected for determinations of specific gravity & porosity respectively.

6.15.0 **Quantum of Work:** Proposed exploration work has been quantified in the table below:

TABLE SHOWING DETAILS OF PROPOSED QUANTUM OF WORK IN SARAIPANI-DADAR BLOCK, KABIRDHAM, CHHATTISGARH

Sl. No.	Item of Work	Unit	Quantum of Proposed Work
I.	Topographic Survey (with contour interval of 5m.) 1:2000 scale	Sq. Km.	0.80
II.	Geological mapping on 1:2000 scale	Sq. Km	0.80
III.	Core drilling	m	(55 BHS) 825.00 m
IV.	Laboratory Studies		
	A. Chemical Analysis		
	a) Drill Core Primary samples for 5 radicals viz. Al_2O_3 , SiO_2 , Fe_2O_3 , TiO_2 , LOI	Nos	715
	b) Internal Check samples for 5 radicals viz. Al_2O_3 , SiO_2 , Fe_2O_3 , TiO_2 , LOI.	Nos	70
	c) External Check Samples from NABL Labs for 5 radicals viz Al_2O_3 , SiO_2 , Fe_2O_3 , TiO_2 , LOI	Nos	35
	d) REE Studies on Primary Samples	Nos	110
	e) Composite Samples For 7 radicals (Al_2O_3 , SiO_2 , Fe_2O_3 , TiO_2 , P_2O_5 , V_2O_5 & LOI.)		220
	f) Composite Samples For 14 radicals (Al_2O_3 , SiO_2 , Fe_2O_3 , TiO_2 , CaO, MgO, SO_3 , P_2O_5 , V_2O_5 , Mn_2O_3 , K_2O , Na_2O , LOI & Organic Carbon)	Nos	20
	g) Composite Samples For Total Available Alumina & Reactive Silica	Nos	20
	B. Physical Analysis		
	a) Trace Element studies of Composite Samples for 14 trace elements by ICP-MS method viz. Pb, Zn, Ni, Co, Mo, Sn, V, Ga, Zr, Cr, As, Sb, Bi, Ge	Nos	20
	b) X-RD Studies on Composite samples	Nos	20
	C. Petrographic Studies	Nos	20 nos.
	D. Mineragraphic Studies	Nos	20 nos
	E. Specific gravity & porosity determination	Nos	30 nos.
V.	Geological Report preparation { As per Mineral (Evidence of mineral contents) Rule-2015 } (Digital Format)	Nos	1 no.

6.0.0 Time Schedule and Cost Estimates:

6.1.0 Time Schedule: The proposed exploration programme is planned such a way that the activities like, camp setting, topographical survey, geological Mapping, surface sampling, drilling, camp winding and laboratory work will be completed within 5 month's time. Report writing (including Peer Review) will take another 4 months time with overlapping of one month laboratory studies. Thus the total duration of the project shall be 8 months from the date of commencement of the project.

6.2.0 Cost Estimate: Cost has been estimated based on actual and provisional escalation as per RBI indices as on 31-03-17 and same has been considered for the subsequent years. The total estimated cost is **Rs 168.660 Lakhs**. The details of cost estimates are given in Table 6.2 and summary is given below;

Summary of Cost Estimates

Sl. No.	Item	Total Estimated Cost (Rs.)
1	Drilling	8510340/-
2	Geology	1433670/-
3	Laboratory	3774600/-
4	Core Preservation Charges (GI Core Boxes)	423250/-
5	Report Preparation	141419/-
6	Peer Review	10000/-
7	Sub Total	14293279/-
8	GST @ 18%	2572790/-
9	Grand Total	16866079/-

Say Rs 168.660 Lakhs

7.0.0 Justification

- i) In view of MMDR Amendment Act and Mineral Auction Rule 2015, DMG Chhattisgarh has requested MECL to take up the exploration in this block. MECL decided to take up the work under NMET funding. Technical Committee of NMET advised to take up the work in G-4 level.
- ii) MECL carried out G-4 level exploration in the block and submitted the geological report (G-4) in August-2017.
- iii) As the result of reconnaissance survey (G-4) in the Saraipani-Dadar Bauxite block, it is established that one Bauxite zone (Zone-II) delineated at (+) 40% Al_2O_3 & (-) 8% SiO_2 cut-off and three zones (Zone-I, III & IV) delineated at (+) 30% Al_2O_3 (Threshold Value) occurs in the block.
- iv) A total 1.29 million tonnes net in-situ reconnaissance category (G-4) Bauxite resource with an average grade of 43.89% Al_2O_3 , 6.86% SiO_2 , 18.53% Fe_2O_3 , 5.63% TiO_2 & 24.00% LOI at (+) 40% Al_2O_3 & (-) 8% SiO_2 cut-off for zone-II have been estimated. Similarly a total 1.55 million tonnes net in-situ reconnaissance category (G-4) Bauxite resource with an average grade of 34.45% Al_2O_3 , 14.73% SiO_2 , 27.44% Fe_2O_3 , 4.69% TiO_2 & 18.58% LOI at (+) 30% Al_2O_3 (Threshold Value) for zone-I, III & IV have been estimated.
- v) As an outcome of (G-4) exploration, it is evident that Bauxite zone-II is well developed in the western part but missing in the eastern part of the block. This may be due to irregular, discontinuous, pockety/bouldery nature of Bauxite. In such type of irregular deposit, the continuity of Bauxite zone from one exploration point to adjacent point is not certain even for the short distance. In view of this consideration, DGM Chhattisgarh insisted to upgrade the deposit to G-2 level. Therefore, to confirm the presence of bauxite zone-II in the eastern part of the block & to upgrade the Bauxite resource at G-2 level, the General exploration (G-2) with borehole spacing at 100 m X 100 m grid interval is recommended and the proposal for G-2 level exploration is being put up in the meeting of the Technical Committee of NMET.

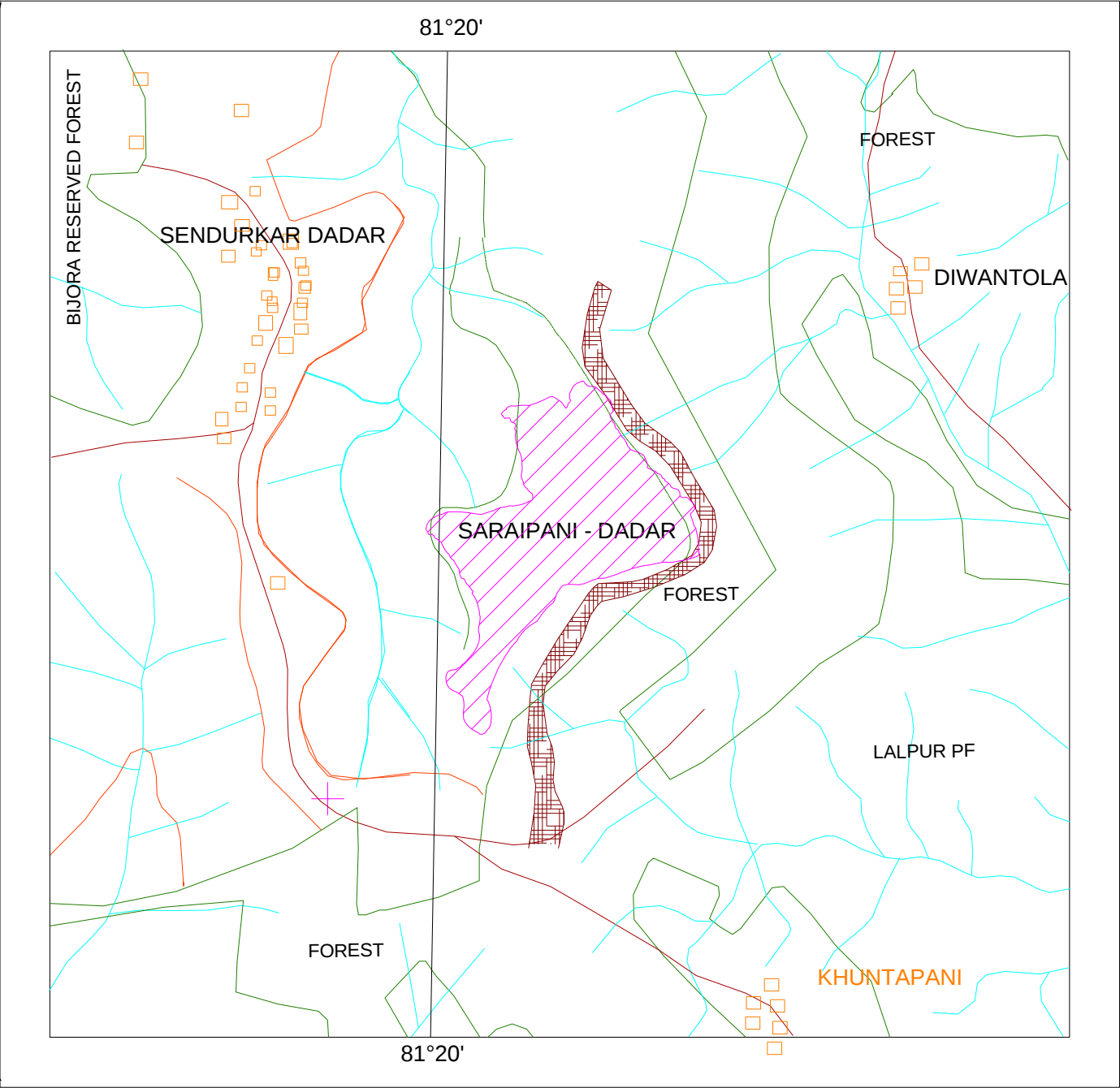
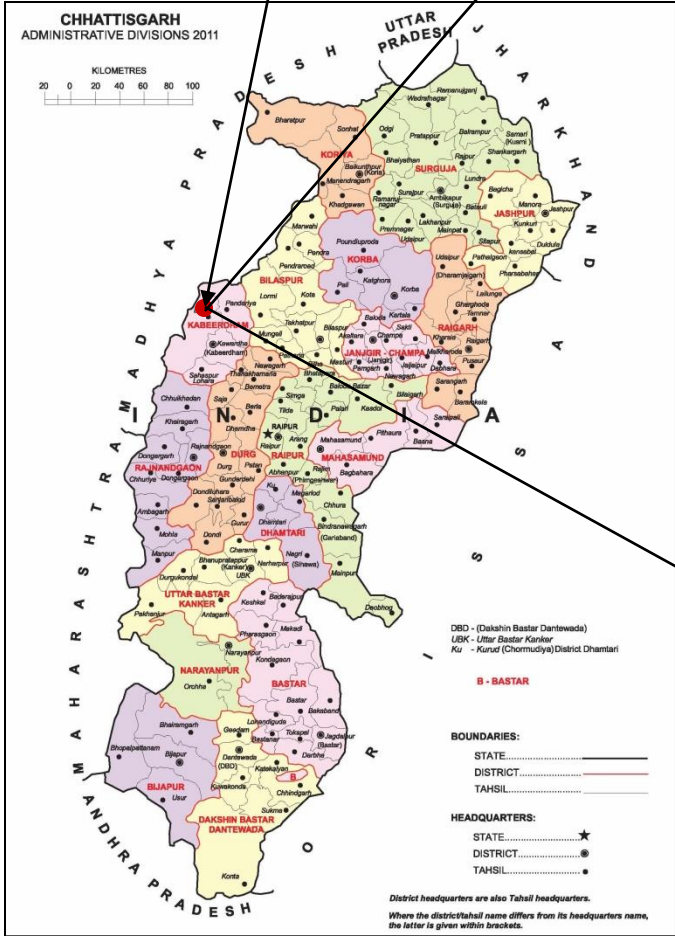
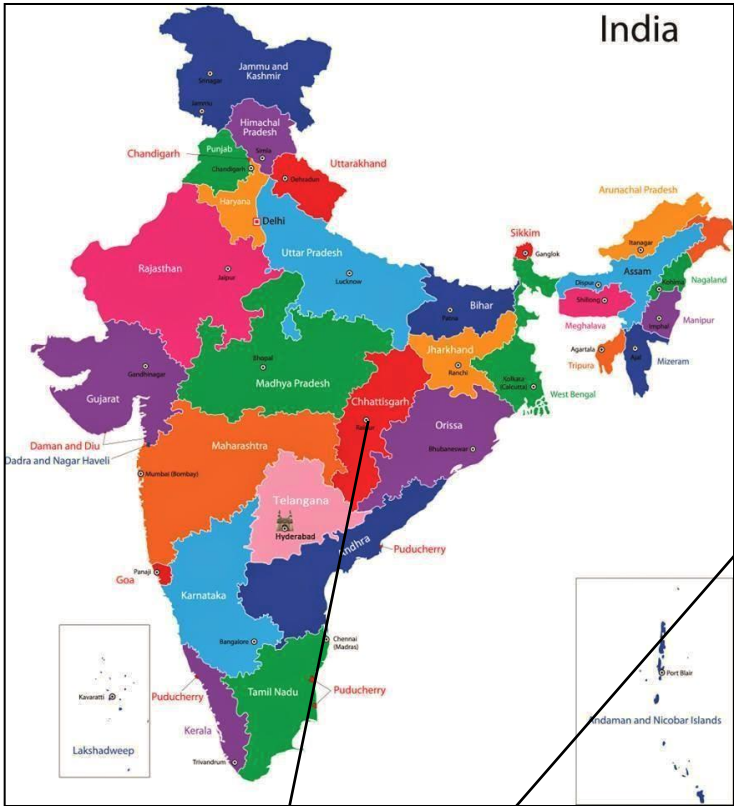
**Table:6.2 COST ESTIMATION FOR GENERAL EXPLORATION (G-2)
FOR BAUXITE IN THE SARAIPANI-DADAR BLOCK,
TEHSIL-PANDARIA, DISTRICT - KABIRDHAM, CHHATTISGARH**

SL. No.	Item of Work	Unit	Base	Financial Year (2017-18)			Financial Year (2018-19)			Total	
			Rate	Esc.Rate	Qty.	Amount	Esc. Rate	Qty.	Amount	Qty	Amount
			1.4.90	(Rs)		(Rs)			(Rs)		(Rs)
A	DRILLING										
1	Coring Drilling (2 Rigs)	m.	1714	7037	0	0	7294	825	6017550	825	6017550
2	Transportation	Km.	8.8	31	0	0	31	1500	46500	1500	46500
3	Accomodation	One time / Drill	185925	663715	0	0	663715	2	1327430	2	1327430
4	Camp Setting / Winding	Drill/ month	68606	244910	0	0	244910	4	979640	4	979640
5	Road Making (Hilly Terrain)	Km	7800	27844		0	27844	5	139220	5	139220
	Sub Total A									2336	8510340
B	GEOLOGICAL WORK										
1	Survey Party Days (1 party)	day	1180	6135	0	0	6430	60	385800	60	385800
2	Geologist Party days (1 parties)	day	1541	8187	0	0	8572	90	771480	90	771480
3	Core Sampling Party days(1 parties)	day	525	2940	0	0	3071	90	276390	90	276390
	Sub-Total B									240	1433670
C	LABORATORY STUDIES										
a	Chemical Analysis										
1	Primary + Check Samples										
	i) for 5 radicals (Al ₂ O ₃ , SiO ₂ , Fe ₂ O ₃ , TiO ₂ , LOI)	Nos	490 76x5+110)	2282		0	2385	715	1705275	715	1705275
	ii) Internal Check Samples for 5 radicals (Al ₂ O ₃ , SiO ₂ , Fe ₂ O ₃ , TiO ₂ , LOI)	Nos	490 76x5+110)	2282		0	2385	70	166950	70	166950
	iii) External Check Samples for 5 radicals (Al ₂ O ₃ , SiO ₂ , Fe ₂ O ₃ , TiO ₂ , LOI)	Nos	490 76x5+110)	2282		0	2385	35	83475	35	83475
	** iv) REE assay by ICP MS (For ICPMS Studies GSI rate (2014) has been considered (14 Elements)	Nos	3300	4290		0	4620	110	508200	110	508200
2	Composite Samples										
	7 radicals (Al ₂ O ₃ , SiO ₂ ,Fe ₂ O ₃ , TiO ₂ , V ₂ O ₅ , P ₂ O ₅ ,LOI)	Nos		3124		0	3265	220	718300	220	718300
	ii) for 14 radicals (Al ₂ O ₃ , SiO ₂ ,Fe ₂ O ₃ , TiO ₂ , V ₂ O ₅ , P ₂ O ₅ ,LOI, MnO, MgO, CaO, Na ₂ O, K ₂ O, SO ₃ and organic carbon)	Nos	946 (76x11+110)	6071		0	6345	20	126900	20	126900
	* iii) Total Available Alumina & Reactive Silica			6937		0	6937	20	138740	20	138740
b	Physical Analysis										
1	X-RD Studies on composite	Nos	1137	5889		0	6173	20	123460	20	123460
2	Trace element Study by ICP-MS**	Nos		4290		0	4620	20	92400	20	92400
3	Preparation of thin section	Nos	100	562		0	587	20	11740	20	11740
4	Petrographic Studies	Nos	228	1493		0	1550	20	31000	20	31000
5	Preparation of polished section	Nos	100	562		0	587	20	11740	20	11740
6	Mineragraphic Studies	Nos	364	2115		0	2206	20	44120	20	44120
	Specific Gravity & Porosity determination	Nos	32	394		0	410	30	12300	30	12300
	Sub-Total C									1340	3774600
D	Peerversion of Core										
i)	GI Core boxes						2000	200	400000	125	400000
ii)	Transportation of Core Boxes	Km	8.8	31.0		0	31.0	750	23250		23250
	Sub-Total D										423250
	Total A+B+C+D										14141860
E	EXPLORATION REPORT - 1% of (A+B+C+D)										141419
F	PEER REVIEW OF DGR (Lump Sum)	Nos	-	-							1

**TABLE NO. 6.1 TIME SCHEDULE FOR GNERAL EXPLORATION OF BAUXITE IN THE SARAIPANI BLOCK,
TEHSIL- PANDARIA, DISTRICT - KABIRDHAM, CHHATTISGARH**

SL. NO	Activities	Unit	Financial year 2018 - 19								Total
			1	2	3	4	5	6	7	8	
			04/18	05/18	06/18	07/18	08/18	09/18	10/18	11/18	
1	Camp Setting	Month	↔								1
4	Drilling (2 rig)	m		↔							825m (55 Bhs)
5	Survey party day (1Party)	Party days		↔							60
6	Geologist party day (1 Party)	Party days		↔							90
7	Drill Core Sampling Party days (1 Party)	Party days		↔							90
8	Laboratory Studies	Nos			↔						1190 Nos
9	Camp Winding	Month				↔					1 month
10	Report writing With PEER review	Month					↔				4 Months

LOCATION MAP OF SARAIPANI DADAR BLOCK DISTRICT
KABIRDHAM (KAWARDHA), CHHATTISGARH



New Delhi, the 19th April, 2018

OFFICE MEMORANDUM

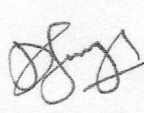
Subject: Approval of mineral exploration projects in 2 blocks to be executed by MECL.

On the recommendation of Technical-cum-Cost Committee (TCC) of NMET, the Executive Committee in its 7th meeting, held on 12th March, 2018 approved mineral exploration projects in 2 blocks to be executed by MECL at an estimated cost of Rs. 440.03 Lakh. The details of the Blocks are given below:

Sl. No.	Name of the Project/Block	Mineral	Estimated cost (in Lakh)
1.	G-2 level exploration of limestone, Naubasta-Kolad Block; Tehsil: Nagod; District: Satna; Madhya Pradesh. (Area: 15 sq km)	Limestone	365.43
2.	G-2 level Exploration for Bauxite in the Saraipani-Dadar Block, Tehsil-Pandaria, District - Kabirdham, Chhattisgarh. (Area: 0.80 sq km)	Bauxite	74.60
		Total	440.03

2. The mineral exploration projects in these 2 blocks will be funded by NMET as per the costing recommended by the TCC and approved by the Executive Committee. MECL shall undertake exploration in these blocks under a Tripartite Agreement between Ministry of Mines (NMET), MECL and the respective State Governments and complete the same as per the approved cost estimates and time schedule, enclosed as **Annexure I & II**.

3. The TCC, NMET shall review the progress of ongoing projects and provide update every six months to the Executive Committee. The Implementing Agencies shall submit progress on six monthly basis to NMET.


(Pradeep Singh)
Director, NMET

To
The Chairman-cum-Managing Director,
Mineral Exploration Corporation Limited,
Dr. Babasaheb Ambedkar Bhawan,
Seminary Hills, Nagpur- 440 006.

Copy for information to:

1. Sh. D. Mohanraj, ADG, NM-II & Chairman, NMET TCC, Geological Survey of India, Seminary Hills, Nagpur- 440 006.
2. The Member Secretary, NMET TCC, MECL, Dr. Babasaheb Ambedkar Bhawan, Seminary Hills, Nagpur- 440 006.

Note:																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	</
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TABLE NO. 6.1 TIME SCHEDULE FOR GENERAL EXPLORATION OF BAUXITE IN THE SARAIPANI BLOCK, TEHSIL- PANDARIA, DISTRICT - KABIRDHAM, CHHATTISGARH

SL. NO	Activities	Unit	Financial year 2018 - 19								Total
			1	2	3	4	5	6	7	8	
			04/18	05/18	06/18	07/18	08/18	09/18	10/18	11/18	
1	Camp Setting	Month	↔								1
4	Drilling (1 rig)	m		↔	↔						280m (14 Bhs)
5	Survey party day (1 Party)	Party days		↔	↔						60
6	Geologist party day (1 Party)	Party days		↔		↔					90
7	Drill Core Sampling Party days (1 Party)	Party days		↔		↔					90
8	Laboratory Studies	Nos			↔			↔			375 Nos
9	Camp Winding	Month				↔					1 month
10	Report writing With PEER review	Month						↔			4 Months

8 months

Return

B. P. Rathuri

member secretary

TCC, nmCT