

PROPOSAL FOR EXPLORATION FOR LIMESTONE IN NAHARDIH MADHAIPUR BLOCK, TEHSIL -TILDA, DISTT.- RAIPUR, CHHATTISGARH

1.0.0. INTRODUCTION

- 1.1.0.** On enactment of MMDR Amendment Act 2015, Mineral (Evidence of Mineral Contents) Rule 2015 and Mineral Auction Rule 2015, Govt. of India directed State Governments to speed up exploration work for different Mineral Commodities in the respective states. Accordingly State Government of Chhattisgarh requested MECL to take up exploration work of Limestone in 2 Blocks in Nahardih-Madhaipur & Ranigaon-Gondaiya Blocks of Raipur & Bilaspur districts respectively and for Bauxite in 2 Blocks in Sendurkhar & Saraipani Blocks, District- Kabirdham (Kawardha) of Chhattisgarh.
- 1.1.2 Accordingly, MECL prepared the proposal for G-3 Level exploration in the proposed areas (Ranigaon-Gondaiya Block Tehsil- Kota, District- Bilaspur, Nahardih-Madhaipur Block, Tehsil- Tilda, District- Raipur for Limestone and Sendurkhar & Saraipani-Dadar Block, District- Kabirdham, Chhattisgarh for Bauxite) and put up for approval of Technical Committee of NMET.
- 1.1.3** Proposed area, lies South East of Tilda Tehsil Town and near to Kumhari Tank.
- 1.1.4. The proposal was put up for Technical evaluation to the Technical Committee of NMET in its first meeting held on 01-04-2016 & 02.04-2016 at GSI, Central Region, Nagpur. The committee has discussed the proposal in detail and in view of non-availability of any exploration inputs the exploration proposal was approved for G-4 level of exploration i.e. Geological Mapping on 1: 10000 scale and collection of surface samples. Accordingly MECL, incorporated the modifications and the proposal is put up for approval of Executive committee of NMET.**

1.2.0 Location and Communication

- 1.2.1 The limestone deposit located in the north east of Kharora village extend mainly in Nahardih, Madhaipur, Chheria, Alesur and Motimpur Khurd villages of Tehsil-Tilda, of Raipur district.
- 1.2.2 The deposit falls within the Survey of India Toposheet No. 64 G/15(1:50,000).
The area is bound by coordinates- Latitude 21°25'56.75" to 21°27'46.27"N and Longitude 81°57'45.86" to 81°58'42.11" E.
The proposed covers an area of about - 5.45 km² (545 Hectare).
- 1.2.3 The proposed are located 6km north east of Kharora village which is at a distance of about 38km from Raipur in north east direction of Raipur, Baloda Bazar road.

2.0.0 REGIONAL GEOLOGY OF THE AREA

2.1.0 The rock formations of the Raipur districts ranges in age from Archaean to Cainozoic (Recent) and are exposed in the area. They oldest rock formation is represented by Eastern Ghat Supergroup and Bengpal Group of Archaean age.

The rocks of Sonakhan group of Palaeo proterozoic age comprising metavolcanics and associated meta-sedimentaries unconformably overlie the gneissic complex and are exposed in the northeastern part of the district. Sonakhan group is classified into three formations i.e. Baghmara, Arjuni and Bilari. The volcano sedimentary sequence of Sonakhan group is intruded by a large gabbroic complex of variable composition like peridotite, pyroxenite, gabbro and anorthositic gabbro.

Bundeli- Dongargarh Granitoids of Palaeo Proterozoic age occupy the southern part of the district. It comprises biotite granite, biotite and hornblende granite, leucogranite, granophyres and mesocratic granite.

Pairi Group of Meso to Neo Proterozoic age is exposed in the south eastern part of the district. It is classified into six formations, i.e. Devdhara, Kulharighat, Neor Ghalighat, Tarjhar and Ling Dongri.

Undeformed and unmetamorphosed sedimentary sequence of rocks belonging to Chhattisgarh Supergroup of Meso to Neo Proterozoic age overlies the granitoids and rocks of Sonakhan Group. The Chhattisgarh Supergroup occupies the Central, Northern and northeastern part of the district and is represented by Chandrapur and Raipur Groups. Chandrapur Group is classified into two formations i.e. Lohardih and Kansapathar in the central part of the district. Raipur Group is classified into six six formations i.e. Charmuria, Gunderdehi, Chandi, Tarenga, Hirri and Miniari Formations.

Charmuria Formation is dominantly a carbonate facies and is represented by phosphatic, argillaceous, cherty and dolomitic limestone and arenite. **Gunderdehi Formation** is dominantly a calc argillite lithofacies. It comprises calcareous highly friable purple shale associated with stromatolitic Limestone bands and intraformational conglomerate lenses in the upper part. **Chandi Formation** is mostly a Calcareous facies with intra-formational arenite. It comprises stromatolitic Limestone and dolomite with argillaceous intercalations and ferruginous and glauconitic sandstone. **Tarenga Formation** is dominantly a calc argillite facies. It comprises dolomitic argillite, clay and shale with chert intercalations. **Hirri Formation** comprises mostly a dark grey bedded dolomite associated with light grey laminated argillaceous dolomite. **Miniari Formation** is the Closing phase of Chhattisgarh basin and comprises shale with lenses and intercalations of dolomite, dolomitic limestone and gypsum.

Laterite capping of Cainozoic age is observed over the Chandrapur sandstone in the Central; part of Raipur district.

STRATIGRAPHIC SUCCESSION IN DISTRICT - RAIPUR, CHHATTISGARH (DRM-RAIPUR- GSI)

Age		Stratigraphic Status		Units	Lithology
Cainozoic			Laterite	41	Laterite / Bauxitic Laterite
Meso to Neo Proterozoic	Chhattisgarh Supergroup	Raipur Group	Miniari Formation	40	Shale with Dolomite
			Hirri Formation	39	Dolomite & argillaceous Dolomite
			Tarenga Formation	38	Dolomitic argillite, clay chert & shale
			Chandi Formation	37 & 37a	Stromatolitic Limestone and Dolomite with argillaceous intercalations
			Gunderdehi Formation	36	Shale with intercalations of Limestone
			Charmuria Formation	35 & 35a	Limestone phosphatic, argillaceous and dolomitic
		Chandrapur Group	Kansapathar Formation	34b	Glauconitic arenite
			Lohardih Formation	34a	Arenite arkose with conglomerate
Meso to Neo Proterozoic		Piari Group	Ling Dongri Formation	33	Ferruginous sandstone Ortho-quartzite
			Tarjhar Formation	32	Siltstone. Shale, sandstone
			Ghalighat formation	31	Arenitic arkosic gritty sandstone with shale and siltstone
			Neor Formation	30	Shale –siltstone, sandstone interbedded sequence
			Kulharighat Formation	29 & 28	Shale Limestone dolomite Limestone, dolomite, Shale Chert
			Devdhara Formation	27	Conglomerate arkose, sandstone
Meso Proterozoic				QV	Quartz Veins & Reefs
				Bd	Basic Dykes
Palaeo Proterozoic			Bundeli Granitoid= Dongargarh Granite	26 26a 26b	Granite, granophyres, mesocratic granite
			Ultramafic – mafic complex	25 25a	Peridotite, pyroxenite, gabbro, anorthositic gabbro.
		Sonakhan Group	Bilari Formation	24 23 22	Metarhyolite with dacite Metabasalt Meta conglomerate
			Arjuni Formation	21, 20, 19,18, 17, 17a	Metabasalt, Metarhyolite, meta-tuffs, Metabasalt, Meta- argillite, Meta conglomerate
			Baghmara Formation	16, 15	Metarhyolite- tuff, Meta-ultramafic, amphibolite, ferruginous chert
Archaean		Bengpal Group		14	Granodiorite –tonalite gneiss
				13, 13a	Quartzite, amphibolite, banded magnetite quartzite
	Eastern Ghat Supergroup			12 - 1	Quartzite with phyllite, augen gneiss, Mafic-ultramafic granulite, Amphibolite dyke, calc granulite, Khondalite, Charnockite gneiss, Biotite schist/gneiss, leptinite & quartzofelspathic gneiss.

3.0.0 GEOLOGY OF THE PROPOSED STUDY AREA

The rock of the area belongs to the Raipur Group of Chhattisgarh Supergroup from the field observation the rocks have confirmed, the following disposition.

Quarterly Sediment	-	Laterite and soil
Raipur Group	Chandi Formation	Grey pink and pink limestone
	Gunderdehi Formation	Gunderdehi Shale

3.1.0 Shale

The shale is very fine grained and friable in nature, purplish red in colour. The strike direction of the shale is NNE-SSW and dip is 1° to 2° due WNW. Outcrop of shale is exposed around Lotadih (Kesla) village in nala cutting.

3.2.0 Limestone

The upper horizon of limestone exposed is grey to dark grey in colour, massive, hard and compact. Thin veins of calcite are seen in the limestone. This limestone is well within the cement grade.

The lower limestone horizon is pink in colour and is relatively softer than grey limestone. Patches of green clayey material are seen within the limestone. This limestone is mostly of blendable to cement grade with an average CaO% about 40%.

3.3.0 Laterite and Soil

The yellowish red laterite occupies the northern part of the block and forms thick capping over the limestone. It varies in thickness from 0.35mtrs. to as much as 10mtrs.

The grey humous soil is observed in the agricultural fields in the southern part and low lying parts of the block. It varies in thickness from 0.30mtrs, to as much as 3 mtrs.

4.0.0 Objectives: - The following are the objectives of proposed exploration:

- i) To demarcate the Limestone occurrence in the study area by Geological Mapping on 1: 10000 Scale for G-4 level of exploration.
- ii) To collect surface out crop samples and get analysed for six radical to find out the quality & grade of Limestone.
- iii) In case the results of the proposed exploration are encouraging then future exploration can be planned.
- v) To carry out the exploration as per Mineral (Evidence of Mineral Contents) Rule-2015, Mineral Auction Rule-2015 and MMDR Amendment Act-2015 in turn to facilitate the State Govt.(Chhattisgarh) in Auctioning of Blocks.

5.0.0. Methodology of Exploration

5.1.0 Topographic Survey & Geological Mapping.

5.1.1 Triangulation network will be laid down in the proposed study area of 5.75 Sq. Km. Contouring will be done on 1:10000 scale at 5m contour intervals. Borehole will be fixed on the ground. RL's and co-ordinates of survey and exploration points will be determined. Detailed Geological Mapping will be done in the proposed block on 1:10000 scale. All the geological features will be recorded. This map will be used as base map for future work.

5.2.0 Surface Sampling: - Surface / outcrop samples will be collected during Geological Mapping from out crops / exposures of Limestone formations on a systematic 400m x 400m grid interval in an area of 5.45 sq.km. In case outcrops are not available on systematic grid then random samples will be collected from the available outcrops / exposures. On systematic 400m x 400m grid interval approximately 50 number samples will be generated/ collected. These samples will be subjected for 6 radicals i.e. CaO, MgO, Al₂O₃, SiO₂, Fe₂O₃ and LOI.

5.3.0. Laboratory Studies

5.3.1. Chemical Analysis: All the surface / outcrop samples approximately 50 N0s will be analysed for 6 radicals CaO, MgO, Al₂O₃, SiO₂, Fe₂O₃ and LOI.

5.3.2. Petrological Studies: Petrological studies will be done on around 10 Nos. of drill core specimen.

5.3.3 Specific Gravity Determination: Specific Gravity will be determined on 20 Nos drill core specimen.

5.4.0. The Quantum of work proposed is given in Table No.5.

Table No.5 - Quantum of Work Proposed

Sl. No.	Item of Work	Unit	Quantum
1	Topographic Survey on 1:10000 scale.	Sq. Km.	5 .45
2	Geological Mapping on 1:10000 scale.	Sq. Km.	5 .45
3	Surface / Out crop sampling	Nos.	50 numbers in an area of 5.45 Sq. Km
4	Laboratory Studies		
	i) Surface / Out crop Samples for 6 radicals i.e. CaO, MgO, Al ₂ O ₃ , SiO ₂ , Fe ₂ O ₃ and LOI	Nos	50
4	Petrological Studies (Petrographic Studies)	Nos	10
5	Specific Gravity Determinations	Nos	20
6	Report Preparation (Digital format)	Nos.	1 .

5.6.0 **Exploration Report:** Data generated from proposed exploration along with integration of earlier data of GSI will be utilized in Report preparation.

6.0.0 Time Schedule and Cost Estimates:

Time Schedule: The proposed exploration programme is planned for activities like, camp setting, topographic survey and geological mapping and surface sample collection winding and laboratory work will be completed within 3 month's time. Report writing will take another 2 months time including one month overlapping period of one month of laboratory studies. Thus the total duration of project shall be completed in 6 months from the date of commencement of the project.

6.1.0 **Cost Estimate:** Cost has been estimated based on actual and provisional escalation as per RBI indices as on 31-03-15 and provisional escalation of @ 25% points for Geological and Laboratory Studies for the subsequent years. The total estimated cost is **Rs 27.89 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		
2	Geology	26,26,782/-
3	Laboratory	1,61,920/-
4	Exploration Report	27,887/-
	Total	27,88,702/-

Say Rs 27.89 Lakhs

7.0.0 Justification

- i. In view of MMDR Amendment Act and Mineral Auction Rule 2015 DMG Government of Chhattisgarh has requested MECL to take up the exploration in this block. MECL decided to take up the work under NMET funding.
- ii The exploration work has to be carried out systematically i.e. Geological Mapping, Survey at 400mX400m grid (G-4 level) initially.
- iii. The exploration will help in planning of future exploration programme.

Details enclosed with map**Annexure-1**

i.	Name of Mineral	Limestone
ii.	Name of Block	Nahardih - Madhaipaur
iii.	Location	Latitude : 21°25'56.75" to 21°27'46.27" Longitude : 81°57'45.86" to 81°58'42.11"
iv.	Toposheet No.	64 G/15
v.	Name of villages	Nahardih, Madhaipaur, Chheria, Alesur and Motimpur Khurd (5villages partly covered)
vi.	Tehsil	Tilda
Vii.	District	Raipur
Viii.	Area	5.45 km ² (approximately) (545 Hectare)
ix.	Type of Land	Non-forest, agriculture and bhataland belongs to private and Govt.
x.	Status of Exploration	Partly explored by DGM
xi.	Detailed mapping	5.45 sq. km. in 1:4000 Scale
xii.	Present Category of UNFC	333
xiii.	Total Meterage to be drilled	3000mtrs (approx.)
xiv.	Number of borehole to be drilled	100 nos. (approx.) in a square grid pattern
xv.	Spacing of boreholes	200 Mtr. (borehole to borehole)
xvi.	Depth of borehole	30 Mtr. (approx.) (few borehole to be drilled up to 50 mtr. depth)
xvii.	Category of exploration as per UNFC	331
xviii.	Logging	All the borehole cores (Approx. 3000 Mtr.)
xix.	Sampling	3000 Nos. (Approx.)
xx.	Analysis	DGM Lab.
xxi.	Report Writing	Will be done by Exploration agency

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TABLE NO. 6.1 TIME SCHEDULE / ACTION PLAN, FOR EXPLORATION WORK OF LIMESTONE IN NAHARDIH-MADHAIPUR BLOCK, TEHSIL- TILDA, DISTRICT - RAIPUR, CHHATTISGARH

Sl. NO.	Activities	Unit	MONTHS					Total
				Financial Year 2016-17				
			1	2	3	4	5	
			05 /16	06 /16	07 /16	08 /16	09 /16	
1	Camp Setting	Month	↔					1 month
3	Survey Party days (2 Party)	day		↔				120
4	Geological Party days for Geological Mapping of 5.45 Sq.Km Area (2 Party)	day		↔				120
5	Sampling Party days, Sampling (2 party)	day		↔				120
6	Laboratory Studies	Nos.			↔			90
7	Report Writing	Months				↔		2 months
				8				

	Table:6.2 COST ESTIMATE FOR EXPLORATION WORK OF LIMESTONE IN NAHARDIH-MADHAIPUR BLOCK, TEHSIL- TILDA, DISTRICT - RAIPUR, CHHATTISGARH							
SL. NO.	Item of Work	Unit	Base	Escalated rates (2016-17)			Total	
			Rate	Esc.Rate	Qty.	Amount	Qty	Amount
			01.04.90	(Rs)		(Rs)		(Rs)
A	GEOLOGICAL WORK							
1	Survey Party Days (2 party)	day	1180	6231	120	747720	120	747720
2	Geologist Party days For Geological Mapping & Sampling Work (2 party)	day	1541	8311	120	997320	120	997320
3	Sampling Party days for Sample Collection & Preparation (2 party)	day	525	2982	120	357840	120	357840
4	Camp setting \ winding	month	68606	261951	2	523902	2	523902
	Sub-Total B					2626782		2626782
B	LABORATORY STUDIES							
a	Chemical Analysis							
1	Primary + Check Samples							
	i) for 6 radicals (CaO,MgO,Al ₂ O ₃ ,SiO ₂ ,Fe ₂ O ₃ & LOI)	Nos	490 76x5+110)	2742	50	137100	50	137100
b	Physical Analysis							
3	Preparation of thin section	Nos	100	570	10	5700	10	5700
4	Petrographic Studies	Nos	228	1512	10	15120	10	15120
5	Specific Gravity determination	Nos	32	200	20	4000	20	4000
	Sub-Total B					161920		161920
	Total A+B					2788702		2788702
C	EXPLORATION REPORT - 1% of (A+B+C)					27887	--	27887
	GRAND TOTAL A to C					2788702	--	2788702
						Total	Say Rs 27.89 lakhs	
Note:								
1	Rates of Goel Commiitte based on actual escalation as per RBI index as on 31/3/15 and @20% provisional escalation for drilling and @25% for Geology+Lab.for subsequenet year.							
2	Phoshphorite rates have been considered as there is no rates for Limestone in Goel Committee reportof MoM Schedule of Rates.							
9								

Government of India
Ministry of Mines
National Mineral Exploration Trust

F.No. 6/1/NMET-2015

New Delhi, 16th August, 2016

OFFICE MEMORANDUM

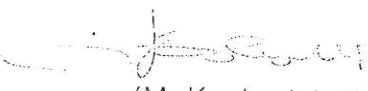
Sub: - Approval of mineral exploration projects in 13 blocks

On the recommendations of the Technical Committee of NMET, the Executive Committee in its second meeting held on 9.5.2016 has approved thirteen (13) mineral exploration projects in six states at a cost of Rs. 2292.16 lakhs.

2. Consequent to dropping of one project of bauxite in Jharkhand on the request of State Government, the number of approved projects under NMET now stands at twelve (12) in five states, at a cumulative cost of Rs. 21,61,29,777.00 (Rupees twenty one crore, sixty one lakhs, twenty nine thousand, seven hundred seventy seven paise).

3. The above exploration projects will be funded by NMET as per the plan recommended by the Technical Committee and approved by the Executive Committee. MECL will undertake exploration in these twelve blocks under Tripartite Agreement among (Ministry of Mines (NMET), MECL and the respective State Governments) and complete the same as per the approved work plan and time schedule.

5. The execution of work will be continuously monitored and periodically reviewed by the NMET Technical Committee and MECL will submit monthly progress report to NMET Secretariat.


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To

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List of Mineral Exploration Projects approved in the 2nd meeting of the Executive Committee held on 09.05.2016

Sl. No.	Name of the Block	Mineral	Area of the Block	Work already done in the block	Work proposed in the block	Estimated cost of the project in Rs. lakh
1.	Jumka-Pathriposhi Block, Distt. Sundargarh, Odisha	Iron	1.71 Sq. Km.	G-3	G-2	772.68
2.	Purheibahal-Chandiposhi Block, Distt. Sundargarh, Odisha	Iron	1.35 Sq. Km.	G-3	G-2	265.33
3.	Mandri-Panchala Block, Distt. Nagpur, Maharashtra	Manganese	2.50 Sq. Km.	Virgin Area	G-4	130.31
4.	Lanjera-Futala Block, Distt. Nagpur, Maharashtra	Manganese	8.00 Sq. Km.	Virgin Area	G-4	148.98
5.	Ranigaon-Gondaiya Block, Distt. Bilaspur, Chhattisgarh	Limestone	5.00 Sq. Km.	G-4	G-3	100.52
6.	Nahardih-Madhaipur Block, Distt. Raipur, Chhattisgarh	Limestone	5.45 Sq. Km.	Virgin Area	G-4	27.89
7.	Sendurkhar Block, Distt. Kabirdham (Kawardha), Chhattisgarh	Bauxite	2.90 Sq. Km.	Virgin Area	G-4	45.13
8.	Saraipani-Dadar Block, Distt. Kabirdham (Kawardha), Chhattisgarh	Bauxite	0.80 Sq. Km.	Virgin Area	G-4	44.66
9.	Ghumchihi Block, Distt. – Satna, Madhya Pradesh	Limestone	5.00 Sq. Km.	Virgin Area	G-4	57.75
10.	Naubasta-Kolard Block, Distt. Satna, Madhya Pradesh	Limestone	15.00 Sq. Km.	Virgin Area	G-4	59.49
11.	Jamodi-Mahanna Block, Distt. Satna, Madhya Pradesh	Limestone	30.00 Sq. Km.	Virgin Area	G-4	65.36
	Total cost					1718.10