

# **PRE FEASIBILITY REPORT**

**RADHA RAMAN MINERALS**

**M. L. AREA – 64.00 HA**

**VILL – BAIDYANATHPUR, MANGRATOLI &  
KUSUMTOLI  
P.S. – BIRAMITRAPUR, DIST - SUNDERGARH  
ORISSA**

**LESSEE – M/S RADHARAMAN MINERALS  
SRI GOKUL CHANDRA NAG (PROPRIETOR)**

## **1. INTRODUCTION OF THE PROJECT / BACKGROUND INFORMATION**

### **i. Identification of the project and project proponent:**

M/s Radharaman Minerals intend towards excavation of lime stone and dolomite ore over an area of 64.00 Ha in located in the village Kusumatoli, Baidyanathpur & Mangratoli under Biramitrapur P.S of Sundargarh district, Orissa.

The Applicant is a “proprietorship firm Mr. Shri G.C. Nag being the sole proprietor. He involved in the process of mining of Limestone and Dolomite. The state Govt. of Orissa has shown its intention to grant the area under M.L. area for limestone and dolomite for a period of 20 years. The mining lease area of 64.00 Ha was granted in favour of Mr. Gokul Chandra Nag on 09.11.2000 and the lease will expire on 08.11.2020. The letter for grant of lease has been attached as *Annexure – I*.

### **ii. Brief Description and Nature of the Project:**

Lime stone and Dolomite ore mines located in village Kusumatoli, Baidyanathpur & Mangratoli under Biramitrapur P.S. of Sundargarh district, Orissa.

### **iii. Need of the Project and Importance to Country & Region:**

Limestone is a calcareous sedimentary rock composed of mineral calcite ( $\text{CaCO}_3$ ), which on calcination yields lime ( $\text{CaO}$ ) for a wide range of industrial uses. In its purest form, limestone should contain 56%  $\text{CaO}$  and 44%  $\text{CO}_2$ . Dolomite is a double carbonate of calcium and magnesium containing 30.4%  $\text{CaO}$ , 21.7%  $\text{MgO}$  & 47.9%  $\text{CO}_2$  in its purest form. Both limestone and dolomite also contain silica, alumina, iron oxides, alkalies, Phosphorous, Sulphur etc.

Orissa has vast resources of limestone occurring in three distinct geological settings, namely Gangpur group, Vindhya and Eastern Ghats, where as dolomite is mostly confined to Gangpur and Vindhyan Groups. These deposits are confined to Sundergarh, Koraput, Baragarh and Malkangiri.

The lime stone produced from the mines will be sold to steel plants, pig iron plants located in Orissa, Jharkhand and West bengal. The lime stone and dolomite produced in the state are being utilized mainly in the production of iron and steel, cement, ferro alloys and sponge iron. Minor quantity limestone used in the state include manufacture of lime in small scale by burning of

limestone and lime shells and as chips in the building construction. The project will help to supplement the need of the state and country in various industrial sectors.

**iv. Domestic/ Export markets:**

The cement industries of the state is dominated by plants of Orissa Cement Limited at Rajgangpur and IDCOL cement Limited near Bargad. Besides as many as 24 mini cement plants of capacities ranging from 30 to 300 TPD have come up in the state out of which 21 are located in Sundergarh district. So there is a good market of the ore in the state.

**v. Employment Generation (Direct/ Indirect) due to project:**

The project generate employment oportunteies for 114 personnels which includes 7 no. Of professionals, 6 no of skilled labour, 6 no of semi skilled and 95 no of unskilled labour.

## **2. PROJECT DESCRIPTION**

### **i. Project Location:**

Radha Raman Minerals over an area of 64.00 Ha is located in the village Kusumatoli, Baidyanathpur & Mangratoli under Biramitrapur P.S of Sundargarh district, Orissa. The nearest railway station is at Rourkela located at a distance of about 25 Km. State highway connecting Rourkela & Biramitrapur lies at a distance of about 500m towards south of the area. There are three different kuccha roads passing through the area and all of these are village road. The area of ML is located in the Survey of India Topo sheet no. 73B/15. The latitude of the area is 22° 24' 17" -22° 24' 45"N and longitude 84° 50' 29"- 84° 51' 16" E.

### **ii. Magnitude of Operation:**

#### **Reserve Estimation**

The lease area is having mineral reserve of Limestone. The reserves have been estimated during the preparation of mining plan and scheme of mining. The reserve was calculated based on cross sectional method. As per the recent estimation the geological and Mineable reserve is found to be 18772000 MT and 15444910 MT respectively. The details of geological and mineable reserve have been given in the table below:

<b>TYPE OF RESERVES</b>	<b>GEOLOGICAL RESERVES (MT)</b>	<b>MINEABLE RESERVES(MT)</b>
Proved	11252800	9543040
Probable	5023200	4006730
Possible	2496000	1895140
<b>TOTAL</b>	<b>18772000</b>	<b>15444910</b>

#### **Proposed Mining Method:**

The mine will be worked by traditional method of open cast mining by benching. Height of the bench maintained by 2.0 and the minimum operating width of the bench will be 6.0 m. Over slope of the bench will be 45°. Shallow jackhammer holes will be drilled and blasted. Hydraulic excavator with back hoe attachment and rear dump combination will be the main equipments in used for loading and transport of lime stone and overburden.

The applicant will have the arrangement with one local supplier of explosive and accessories to deliver the material at site immediately before use. Licence will be obtained for the use of explosive within the area.

The precaution laid down in the relevant provisions of Metalliferous mines Regulations, 1961 will be observed to make blasting operation safe.

**Year wise Production from the ML area:**

<b>Year</b>	<b>Production of Ore (MT)</b>	<b>Inner Burden (m<sup>3</sup>)</b>	<b>Overburden Burden (m<sup>3</sup>)</b>	<b>Total Waste</b>
1 <sup>st</sup> Year	12,01,520	51347	40549	91896
2 <sup>nd</sup> Year	12,00,090	51285	20375	71660
3 <sup>rd</sup> Year	12,10,224	51718	11768	63486
4 <sup>th</sup> Year	12,06,420	51556	12920	64476
5 <sup>th</sup> Year	12,08,332	51638	10840	62478
<b>Total</b>	<b>6026586</b>	<b>257544</b>	<b>96452</b>	<b>353996</b>

**iii. Project description with process details ( a schematic diagram / flow chart showing the project layout, components of the project etc, should be given)**

Semi mechanized system of working will adopted in the mines. Shallow jack hammer holes will be drilled and blasted. Hydraulic excavator with back hoe attachment will be deployed in combination with rear dump trucks of 10 MT pay load capacity. Traditional method of opencast mining by benching will be followed maintaining bench height of 2.0m and minimum operating width of 6m.

**iv. Raw material required along with estimated quantity, likely source, marketing area of final products, Mode of transport of raw Material and Finished product.**

As it is a mining project there is no required of Raw materials.

**v. Availability of water its source, Energy / power requirement and source should be given.**

Mining activity does not need any water. However water will be required for domestic purpose, green belt development and dust suppression. Water requirement in the project will be 12m<sup>3</sup> per day. Water requirement will be met from the bore well present within the ML area. Adequate arrangement will be made to pump out the water to render the working dry. Diesel operated pump will be provided to pump out the accumulated rain water and this water will be discharged into open fallow land. Semi mechanized system of working will be adopted for the mines.

**vi. Quantity of wastes to be generated (liquid and solid) and scheme for their Management / disposal.**

**a. Waste generation & Disposal:**

**Top Soil:**

Part of the area is covered with top soil. The colour of the soil is brownish. The thickness varies from 0.5 to 1.0m. Top soil generated during plan period will be 7150m<sup>3</sup> and during conceptual

period 20800m<sup>3</sup>. Top soil recovered from the working during the plan period will be stored in the site and will be used for plantation programme.

**Inner burden & Overburden:**

Apart from the top soil, the waste generated will be over burden and inner burden. The waste generated will be duped over the non mineralized zone of the ML area. The details of waste generated during the proposed plan period has been given in the table below:

**Year Wise Generation of Waste**

Year	Inner Burden (m <sup>3</sup> )	Overburden Burden (m <sup>3</sup> )	Total Waste
1 <sup>st</sup> Year	51347	40549	91896
2 <sup>nd</sup> Year	51285	20375	71660
3 <sup>rd</sup> Year	51718	11768	63486
4 <sup>th</sup> Year	51556	12920	64476
5 <sup>th</sup> Year	51638	10840	62478
<b>Total</b>	<b>257544</b>	<b>96452</b>	<b>353996</b>

**Sub grade Generation:**

The lime stone containing less than 42% CaO and more than 34% CaO will be treated as sub grade and stored separately for future blending with lime stone containing more than 42%CaO. Assuming that 10% of the total tonnage of limestone recovered will be treated as sub grade. The sub grade generated will be dumped temporarily and latter used for blending.

**4. SITE ANALYSIS**

**i. Connectivity**

There is no such structure within a radius of 5 km all around the ML area. However, there are three village roads passing through the area. Nearest railway station is Rourkela located at a distance of about 25 km from the area. State Highway connecting Rourkela and Biramitrapur lies at a distance of about 500 m towards south of area.

**ii. Land Form, Land use and Land ownership.**

The lease area occupies 64.00 ha of land which constitutes agricultural land only. The area within the zone of 500m radius consists of agricultural Land . About 10% of the area is occupied by Pattipahal Reserved Forest. Total area of 64.00Ha belongs to the state Govt. and lease has been granted for 20 years with effect from 09.11.2000 in favour of Gokul Chandra Nag. for excavation of Dolomite ore. The land schedule of the ML area has been given as **Annexure – 2.**

**iii. Topography (along with map).**

The area is bounded by narrow elongated hill ranges and small mounds on North & South with a valley in between which extends for a considerable distance in east-west direction. It exhibits a gentle undulating topography occasionally with dome shaped isolated hillocks composed of quartzites, carbonaceous phyllites and epidiorites. The target area which comes under the valley portion is almost a plain land containing limestone, shale and phyllite. The peak of Pattipahal 389m represents the maximum elevation above MSL which is isolated in the NE part of the area. The topographical map of the area has been given as **Annexure - 3** Khatma Nadi which flows almost EW direction controls the drainage pattern of the area which joins Deo Nadi towards South-East of the area. The drainage pattern of the area seems to be dendritic. The drainage map of the 10km radius of the project area has been given as **Annexure - 4**

**iv. Existing land use pattern { agriculture, non-agriculture, forest, water bodies (including area under CRZ)}, shortest distances from the periphery of the project to periphery of the forest, national park, wild life sanctuary, eco sensitive areas, water bodies (distance from the HFL of the river), CRZ. In case of notified industrial area, a copy of the Gazette notification should be given.**

Existing pattern of the land use within the area and within a radius of 500m all around in the applied ML area is based on agricultural land only. About 10% of the area is occupied by Pattipahal Reserved Forest. There are sixteen reserve forest within the 10km radius of the project area. The details of the forest and rivers existing within the ML area has been given in the table below:

SL. NO	NAME OF THE FOREST	DIRECTION	DISTANCE (KM)	NAME OF THE RIVER	DIRECTION	DISTANCE (KM)
1	Beura PF	SSE	9.48	Khatma Nadi	S	1.8
2	Harapal PF	SSW	7.36	Deo Nadi	E	5.6
3	Jatia PF	SE	5.62	Potob Nadi	NE	3.62
4	Pattipahar RF	NE	0.28	Orang Nadi	NE	5.76
5	Dumagada RF	SW	2.8	Bankoba River	NW	4.5

6	Satabhaya RF	SSW	4.35	Diri River	W	4.6
7	Kokerama RF	NW	1.82			
8	Pomia PF	NNW	2.13			
9	Barapani PF	NNE	2.32			
10	Bendupani PF	NNW	6.19			
11	Bongera PF	NW	7.03			
12	Junadihi PF	N	8.22			
13	Janoda PF	NE	5.97			
14	Sarubahar PF	NE	3.92			
15	Dharua Anjan PF	NE	8.19			
16	Jallengbera PF	NW	7.07			

**v. Soil classification**

The target area which comes under the valley portion is almost a plain land containing limestone, shale and phyllite. The colour of the soil is black to brownish. characterized by Lateritic, Sandy and Gravelly type with low amount of water holding capacity. Soil moisture stress condition set early. The major crop suitable for the area are Paddy, Maize, Black gram, Green gram, Arhar, Ground nut, Sunflower and castor etc near drought and plough-suitability is restricted at low or high moisture conditions.

**vi. Climatic data from secondary sources.**

Climate of the area is sub-tropical with annual temperature varying between 12°C in the month of January and 44.2 °C in the month of May. The area witnesses normal rainfall during monsoon months. Mostly, the rainfall is received during the monsoon period i.e. from the months of June to September.

**vii. Social Infrastructure available**

Inhabited sites of village Kusumotoli and Baidyanathpur lie close to the area. Other villages are Kantajhar, Karanjia, Hatibari etc. Financial condition of the inhabitants are very poor. Agriculture is not developed. The agricultural pattern in the area is single cropping.

## 5. PLANNING BRIEF

### i. Planning Concept (type of industries, facilities, transportation etc) Town and Country Planning / Development authority Classification.

The mine will be worked by traditional method of open cast mining by benching. Height of the bench maintained by 2.0 and the minimum operating width of the bench will be 6.0 m. Over slope of the bench will be 45°. Shallow jackhammer holes will be drilled and blasted. Hydraulic excavator with back hoe attachment and rear dump combination will be the main equipments in used for loading and transport of lime stone and overburden.

The applicant will have the arrangement with one local supplier of explosive and accessories to deliver the material at site immediately before use. Liscence will be obtained for the use of explosive within the area.

The precaution laid down in the relevant provisions of Metalliferous mines Regulations, 1961 will be observed to make blasting operation safe.

Screening & crushing unit of 300 TPH capacity will be installed for the beneficiation of lime stone & Dolomite ore.

- Dispatch Trucks and Tippers carrying ore will be covered with tarpaulin.
- Haul roads will be compacted and water sprinkling arrangement will be provided by mobile water tanker to suppress fugitive dust emission.
- Water sprinkling will be made in ore stack yard and other potential dust generation points.

### ii. Population Projection:

The worker in the mines will be from the nearby villages so there will be no permanent increase in population.

### iii. Land use planning (breakup along with green belt etc.)

The land use pattern of the area has been given in table below:

#### Land Use Plan

Type of land use	During Plan period in (m2)	Total area of the conceptual period in(m <sup>2</sup> )
Area under excavation	14,300	41, 600
Area under dump	19,600	--
Infrastructure	154	--

Sub-Grade stack	2500	--
Top soil	900	--
Green belt	5500	30471
<b>Total</b>	<b>42,954</b>	<b>72,071</b>

**iv. Assessment of Infrastructure Demand (Physical & Social).**

Office accommodation will be provided at the nearby village. Rest shelter and first aid station will be provided at the site.

**v. Amenities / Facilities.**

The mine workers will be provided with safety equipments, rest shelter and first aid facility.

**6. PROPOSED INFRASTRUCTURE**

**i. Industrial Area (Processing Area)**

There is no area demarcated for the mineral processing or beneficiation purpose. Limestone raised from the mines will not be subjected to processing. Sizing of the material as per customer's specification will be done by deploying manual labour.

**ii. Residential Area ( Non Processing Area)**

As the labour in the mines are from nearby locality there will be no residential colony within the ML area.

**iii. Green Belt.**

Mining operation will not involve felling of trees of any kind. However the applicant will undertake tree plantation as a program if land beautification. During the plan period total area of 5500 sq.m will be used for planting of 200 saplings. During the conceptual period an area covering 7.5 m of safety zone will be used for the development of green belt. An area of 30471 sq.m. will be utilized for green belt development.

**iv. Social Infrastructure.**

There will be enhancement of income level among the local people and there will be positive impact on the infrastructural facility of the local area.

**v. Connectivity (Traffic and Transportation Road / Rail /Metro / Water ways etc)**

There is no such structure within a radius of 5 km all around . However, there are three village roads passing through the area. Nearest railway station is Rourkela located at a distance of about 25 km from the area. State Highway connecting Rourkela and Biramitrapur lies at a distance of about 500 m towards south of area

**vi. Drinking Water Management (Source & Supply of water):**

The mining operation does not require any water. In the mining industries water is only required for domestic use, dust suppression and green belt development.

**vii. Sewerage System:**

The domestic sewerage will be disposed to soak pit via septic tank.

**viii. Solid Waste Management.**

The waste generated during the conceptual period will be 12, 30,400 m<sup>3</sup>. Part of the area is covered with top soil. The Top soil recovered from the working during the plan period will be stored in the site and will be used for plantation programme. Apart from the top soil, the waste generated will be over burden and inner burden. The sub grade generated will be dumped temporarily and latter used for blending. The generated waste from the mining during the ensuing plan period will be dumped in the non mineralized zone of the lease area and it will be extended .the dump will be well guarded by construction of retaining wall and garland drain in the first year of the scheme i.e. (2010-11) and will be accompanied by setting tank. The reclamation of the quarry will not start in the proposed plan period. However, the subsequent mining activity will followed by backfilling. The waste generated during the conceptual period will completely used for backfilling. The top soil generated will be spread over the backfilled area and plantation will be done on the area.

**ix. Power Requirement & Supply / Source.**

The mine will be operated by manual means. Hence the requirement of power supply will be not there. The manual labourers required for mining operation will be arranged from the local villages. Around 107nos of semi skilled and unskilled labourers will be employed in the mining. The company itself will provide the skill. Semi-mechanized system of working will be adopted in the mines. Shallow jack hammer holes will be drilled and blasted. Hydraulic excavator with back holes attachment will be deployed in combination will be the main equipment in the use for loading and transport of limestone and overburden. .There is no use of electric power for mining process.

## **7. REHABILITATION AND RESETTLEMENT ( R & R ) PLAN**

- i. Policy to be adopted (Central / State) in respect of the project affected persons including home oustees, land oustees and landless laborers ( a brief outline to be given).**

There is no settlement with in the ML area. So no rehabilitation and resettlement plan is being proposed.

## **8. PROJECT SHEDULE & COST ESTIMATES**

- (i) Likely date of start of construction and likely date of completion (Time schedule for the project to be given).**

The mining lease was granted in favor of M/s Radha Raman Minerals represented by Proprietor Sri. Gokul Chandra Nag and the lease was executed on 12. 06. 2003. The lease will expire on 11.06.2023. Mining operation initiated in the lease are since September 2010 and mine was in operation till Nov. 2010. The mine is closed because of the want of environmental clearance. At the proposed rate of production the life of mines will be 13 years.

- (ii) Estimated project cost along with analysis in terms of economic viability of the project.**

The approximate cost of the project is comes around 2.0 Crores.

## **9. ANALYSIS OF PROPOSAL ( FINAL RECOMMENDATIONS)**

- (i) Financial and social benefits with special emphasis on the benefit to the local people including tribal population, if any, in the area.**
- a) The state Govt. will earn royalty.**
  - b) The Local people will get employment opportunity.**
  - c) There will be positive impact on the infrastructural facilities of the locality**