

ENVIRONMENTAL IMPACT ASSESSMENT REPORT & ENVIRONMENT MANAGEMENT PLAN of

Executive Summary English

M/s B. M. Minerals (Kodwa Dolomite Quarry)

at

Village: Kodwa, Tehsil: Berla, District: Bemetara, C.G.,

Area: 1.76 ha at

Khasra no. 317, Area: 1.76 ha Capacity –42,120 Tons per annum

Proposal No. SIA/CG/MIN/69975/2021.

Applicant

Shri yagdutt Sharma

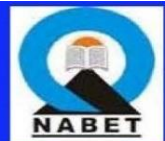
M/s B. M. Minerals (Kodwa Dolomite Quarry)



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EXECUTIVE SUMMARY

INTRODUCTION

Environment Impact Assessment (EIA) is a process used to identify the environmental, social & economic impacts of a project prior to decision making. It aims to predict environmental impacts at an early stage of project planning & design, find ways & means to reduce adverse impacts. By using EIA, we can decide the suitable mitigation measures for implementation to maintain healthy working environment and contain pollution within permissible limits.

The mining lease is located in Village – Kodwa, Tehsil - Berla, District- Bemetara , State – Chhattisgarh Geo-graphically the ML area extends from Latitude: 21°37'11.04"N to 21°37'10.42"N Longitude: 81°22'30.66"E to 81°22'31.93"E

The study area of the proposed project comprises of 10 km radius around the mining lease boundary, the map showing the core zone (QL area) and buffer zone (10 km radius from the lease boundary).

The life of the mine is anticipated at 12 years based on the level of exploration and reserve established as per UNFC classification and expecting the market demand will remain at 42,120TPA

Location

The mining lease is located in Village – Kodwa, Tehsil - Berla, District- Bemetara , State – Chhattisgarh Geo-graphically the ML area extends from Latitude: 21°37'11.04"N to 21°37'10.42"N Longitude: 81°22'30.66"E to 81°22'31.93"E

Connectivity

The QL Area Can Be Approached From (NH-12A) about 20 km Simga-Kawrdha. The Nearest Bhilai Power House about 45 km. Swami Vivekananda International Airport about 64km.

Mailing/ Correspondence Address of Project Proponent:

M/s BM Minerals, Shri Yagdutt Sharma
137, Near Anusta Residency SBI Colony,
Junwani, Bhilai, District- Durg (C.G.)

Size of the Project

The total Mine Lease areas considered is (1.76 ha). The proposed production is 42,120TPA

Anticipated Life of Project and Cost of the Project

On the basis of the mineable reserve and average production of five years i.e. 42,120 TPA, and the Mineable reserve is in lease area= 4, 60,200 TPA. On the basis of 10-year production plan Max. Production during five years 42, 120 TPA (Average Production 39522.6 TPA). So the anticipated life of mine calculated is $4,60,200/39522.6 = 11.64$ year or say 12 years.

MINING

Opencast semi mechanized method of mining will be adopted in the lease area. The excavation will be carried out usually by manual labour and small machines with the use of jack hammer, compressor, etc. and loaded into tractor/truck/tipper. The Limestone will be suitably blended to be supplied in market. Rest is inner burden.

Production Plans for Five Years

Summary of Proposed Production of Mine for 1st Fiver year

Year	Cross-Section	Av. Bench (RL)	X Sectional Area (sqm)	Distance between X-Section(m)	Volume (Cum)	B.D.	Producti on (ROM)	Production Recovery (90%)
First	C₁ C₁	279.5 to 265 mRL	450	30	13500	2.6	35,100 T	315920 T
Second	C₂ C₂	278.5 to 265 mRL	540	30	16200	2.6	42,120 T	37908 T
Third	C₃ C₃	278.5 to 274 mRL	518	30	15540	2.6	40404 T	36363.6 T
Fourth	C₃ C₃	274 to 269 mRL	256	30	15780	2.6	41028 T	36925.2 T
Fifth	C₃ C₃	269 to 264 mRL	478	30	14340	2.6	37284 T	33555.6 T
Total	TOTAL				75360		1,95,936T	1,76,342.4 T

Summary of Proposed Production of Mine for 2nd Fiver year

Year	Cross-Section	Av. Bench (RL)	X Sectional Area (sqm)	Distance between X-Section(m)	Volum e(cum)	B.D.	Productio n (ROM)	Production Recovery(90%)
Sixth	C 4 C 4	278.5 to 2674 mRL	535	30	16050	2.6	41730 T	37557 T
Seventh	C 5 C 6	277.5 to 265 mRL	530	30	15900	2.6	41340 T	37206 T
Eight	C 4 C 4	274 to 270 mRL	520	30	15600	2.6	40560 T	36504 T
Nineth	C 4 C 4	270 to 265.5 mRL	510	30	15300	2.6	39780 T	35802 T
Tenth	C 4 C 4	265.5 to 261 mRL	460	30	13800	2.6	35880 T	32292 T
Total	TOTAL				76650		1,99,290 T	1,79,361 T

Disposal of Waste

There are total approx. 6425 m³soil/OB generated from the pit area during in plan period. Volume of Soil with 20 % swell factor 7710 m³Soil will be dumped on 3855 m² 7.5 m periphery. Remain 3855 m³ soil will be dumped on adjacent land. There will not be any sub grade mineral generated during mining only temporary stock of Dolomite will be dumped in the suitable place of the mine side. Hence it's staking site and design of stack has not been considered. The mineral rejects like shale and clay will be spread over peripheral dump.

Use of Mineral

Limestone is useful in many industries. Its uses in different industries depend upon its chemical constituent. It is used in iron and steel industries, refractory industries, Ferro alloys, chemical and glass industries, fertilizers, plant and rubber industries. In Chhattisgarh Limestone is mostly used in iron and steel industries. Most of the Limestone is used in Steel plant. To meet the demand of existing Limestone steel industries and industries which are yet to come in future?

General Features

I) Surface Drainage Pattern

Shivnath River lies at a distance of 4.70 km.

ii). Vehicular Traffic Density

The QL Area Can Be Approached From (NH-12A) about 20 km Simga-Kawrdha. The Nearest Bhilai Power House about 45 km. Swami Vivekananda International Airport about 64km.

The mode of transport of mineral and waste will be dumpers or trucks within the QL area. The mineral transportation to the destination industry outside the mining lease area will be by road

iii) Water demand

Water requirement for the proposed project will be provided for the workers for drinking & domestic purpose. Water will also be provided for dust suppression. Fresh water will be only used for drinking purpose. The break up for water requirement is given below:

Manpower Requirement

About 25 persons will be getting direct and indirect employment in this mine. The manpower will be mostly skilled.

DESCRIPTION OF BASELINE-ENVIRONMENT

This section contains the description of baseline studies of the 10 km radius of the area. The data collected has been used to understand the existing environment scenario around the proposed mining project against which the potential impacts of the project can be assessed.

Environmental data has been collected in relation to propose mining for:-

- (a) Land
- (b) Water
- (c) Air
- (d) Noise
- (e) Biological
- (f) Socio-economic

(a) Land Use: Land use involves the management and modification of natural environment or wilderness in to build environment such as settlements and semi-natural habitats such as arable fields, pastures, and managed woods. It also has been defined as "the total of arrangements, activities and inputs that people undertake in a certain land cover type.

Land Use Pattern of the Study Area (within 10 km Buffer)

Land Use Type	Area (Ha.)
Open land	845.33
Stone Quarry	56.21
Settlement	991.38
Water Body	354.20
Agriculture Land	29,431.83
Total	31678.95

There is no National Park, Biosphere reserve, Migratory routes of fauna and National Monument within 10km periphery of the lease area as per secondary data available. There is no habitation within lease area.

Analysis Results of Baseline Environment

(a) Results of Analysis of the Soil.

Samples collected from identified locations indicate the soil is alluvial type and the pH value ranging from 6.74 to 7.93 which shows that the soil is alkaline in nature. Potassium is found to be from 76.31 mg/kg to 85.21 mg/kg. The water holding capacity is found in between 21.31% to 38.07%.

(b) WATER ENVIRONMENT

- The pH limit fixed for drinking water samples as per IS-10500 Standards is 6.5 to 8.5 beyond this range the water will affect the mucus membrane or water supply system. During the study period, the pH was varying for ground waters from 7.11 to 7.64. The pH values for all the samples collected in the study area during study period were found to be within the limits.
- The desirable limit for total dissolved solids as per IS-10500 Standards is 500 mg/l whereas the permissible limit in absence of alternate source is 2000mg/l. In ground water samples collected from the study area, the total dissolved solids are varying from 356 mg/l to 512 mg/l. The TDS of the samples were within the desirable limit & the permissible limit of 500mg/l & 2000 mg/l respectively.

(c) AMBIENT AIR QUALITY

The Ambient Air Quality Monitoring reveals that of monitoring stations with minimum Concentrations of PM10 were 42.05 $\mu\text{g}/\text{m}^3$ at AQ5 and maximum 69.33 $\mu\text{g}/\text{m}^3$ at AQ8. The result of PM2.5 reveals that the minimum concentration of 24.12 $\mu\text{g}/\text{m}^3$ at AQ5 while maximum concentration of 46.84 $\mu\text{g}/\text{m}^3$ was found at AQ5.

The gaseous pollutants SO₂ and NO_x were within the prescribed CPCB limit of 80 $\mu\text{g}/\text{m}^3$. For residential and rural areas at all stations. The minimum & maximum concentrations of SO₂ were found to be 9.01 $\mu\text{g}/\text{m}^3$ at AQ5 & 15.16 $\mu\text{g}/\text{m}^3$ at AQ8 respectively. The minimum & maximum concentrations of NO_x were found to be 10.02 $\mu\text{g}/\text{m}^3$ at AQ 5 & 21.16 $\mu\text{g}/\text{m}^3$ at AQ8 respectively.

The free silica content in PM10 was found to be minimum 1.03 $\mu\text{g}/\text{m}^3$ and maximum 2.72 $\mu\text{g}/\text{m}^3$ at AQ5 and AQ8 respectively.

(d) NOISE ENVIRONMENT

Noise monitoring reveals that the minimum & maximum noise levels at day time were recorded as 46.09 dB (A) at NQ-05 & 59.54 dB (A) at NQ8 respectively. The minimum & maximum noise levels at night time were found to be 35.31 dB (A) at NQ5 & 48.43 dB (A) at NQ8 respectively.

There are several sources in the 10 km radius of study area, which contributes to the local noise level of the area. On the commencement of the project, the sound from traffic activities will add to the ambient noise level of the area. This will be kept under check by taking proper suggestive measures.

(e) BIOLOGICAL ENVIRONMENT

The biodiversity we see today is the fruit of billions of years of evolution, shaped by natural processes. The vast array of interactions among the various components of biodiversity makes the planet habitable for all species, including humans. There is a growing recognition that, biological diversity is a global asset of tremendous value to present and future generations. At the same time, the threat to species and ecosystems has never been as great as it is today. Species extinction caused by human activities continues at an alarming rate. Protecting biodiversity is in our self-interest.

The biological study was under taken by Ecology & Biodiversity Expert, as a part of the EIA study report to understand the present status of ecosystem prevailing in the study area, to compare it with past condition with the help of available data, to predict

changes in the biological environment as a result of present activities and to suggested measures for maintaining its health.

(f) Socio- economic

Study Area: The proposed project as a center, a radial distance of 10 km is considered as study area for baseline data collection and environmental monitoring. The baseline environment quality was carried out over a radial distance of 10 km around the mining lease area during Pre-Monsoon Season covering the months of March to May, 2022.

QoL: The Quality of Life (QoL) refers to degree to which a person enjoys the important possibilities of his/her life. The 'Possibilities' result from the opportunities and limitations, each person has in his/her life and reflect the interaction of personal and environmental factors. Enjoyment has two components: the experience of satisfaction and the possession or achievement of some characteristic.

Household: A group of persons who normally live together and take their meals from a common kitchen are called a household. Persons living in a household may be related or unrelated or a mix of both. However, if a group of related or unrelated persons live in a house but do not take their meals from the common kitchen, then they are not part of a common household. Each such person is treated as a separate household. There may be one member households, two member households or multi-member households.

Sex Ratio: Sex ratio is the ratio of females to males in a given population. It is expressed as 'number of females per 1000 males.

Literates: All persons aged 7 years and above who can both read and write with understanding in any language are considered as literate. It is not necessary for a person to have received any formal education or passed any minimum educational standard for being treated as literate. People who are blind but can read in Braille are also treated as literates.

Literacy Rate: Literacy rate of population is defined as the percentage of literates to the total population aged 7 years and above.

Labour Force: The labour force refers to number of people employed and unemployed in a geographical entity. The size of the labour force is the sum total of persons employed and unemployed. An unemployed person is defined as a person not employed

but actively seeking work. Normally, the labour force of a country consists of everyone of working age (commencing from 16 years) and below retirement (65 years) that are participating workers, that is people actively employed or seeking employment. People not counted under labour force are students, retired persons, stay-at home people, people in prisons, permanently disabled persons and discouraged workers.

Work: Work is defined as participation in any economically productive activity with or without compensation, wages or profit. Such participation may be physical and/or mental in nature. Work involves not only actual work but also includes effective supervision and direction of work. The work may be part time or full time or unpaid work in a farm, family enterprise or in any other economic activity.

Worker: All persons engaged in 'work' are defined as workers. Persons who are engaged in cultivation of land or milk production even solely for domestic consumption are also treated as workers.

Main Workers: Those workers who had worked for the major part of the reference period (i.e. 6 months or more in the case of a year) are termed as Main Workers.

Marginal Workers: Those workers who did not work for the major part of the reference period (i.e. less than 6 months) are termed as Marginal Workers.

Work Participation Rate: The work participation rate is the ratio between the labour force and the overall size of their cohort (national population of the same age range). In the present study the work participation rate is defined as the percentage of total workers (main and marginal) to total population.

Birth Rate: The ratio of total live births to total population in a specified community or area over a specified period of time. The birth rate is often expressed as the number of live births per 1,000 of the population per year.

Death Rate: The ratio of total deaths to total population in a specified community or area over a specified period of time. The death rate is often expressed as the number of deaths per 1,000 of the population per year. It is also called fatality rate or mortality rate.

Maternal Mortality Rate: The maternal mortality rate refers to number of maternal deaths per 1,000 women of reproductive age in the population (generally defined as 15-44 years of age).

Infant Mortality Rate: The infant mortality rate refers to number of deaths of children less than 1-year-old per 1000 live births.

8.0 Baseline Data

Baseline data refers to basic information collected before a project/scheme is implemented. It is used later to provide a comparison for assessing impact of the project. Any attempt to collect base line data while undertaking actual impact assessment study is faced with recall error. The baseline data was collected from secondary sources. It consists of demographic particulars and amenities. The data presented in the table below pertains to study area as a whole

ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

Impact on Ambient Air Quality

The mining is proposed to be carried out by opencast semi mechanized method. The air borne particulate matter generated by ore and handling operations as well as transportation is the main air pollutant. The emissions of Sulphur dioxide (SO₂), Oxides of Nitrogen (NO_x) contributed by vehicles plying on haul roads are marginal. Prediction of impacts on air environment has been carried out taking into consideration proposed production and net increase in emissions.

Mitigation Measures

1. Water sprinkling will be done on the haul roads twice in a day.
2. The dust generated during the process will be minimized by water spray at the working faces before and after the activity.
3. Plantation will be carried out on approach roads and in Lease boundary.
4. Planning transportation routes of mined material so as to reach the nearest paved roads by shortest route. (minimize transportation over unpaved road);
5. Personal Protection Equipments (PPE) like dust masks, ear plugs etc. will be provided to mine workers.
6. Rock breaker will be used for breaking over size boulders in order to reduce dust and noise generation, which otherwise would be generated due to secondary blasting.
7. Speed limit will be enforced to reduce airborne fugitive dust from vehicular traffic.
8. Deploying PUC certified vehicles to reduce their noise emission.
9. Haul road shall be covered with gravels
10. Spillage from the trucks will be prevented by covering tarpaulin over the trucks.
11. Ambient Air Quality Monitoring will be conducted on regularly basis to assess the quality of ambient air.
12. Proper maintenance of machines improves combustion process & makes reduction in the pollution.
13. Good maintenance and monitoring of fuel and oil will not allow significant addition in the gaseous emission.

NOISE ENVIRONMENT

Noise generated at the mine is due to semi mechanized mining operations and truck transportation activities. The noise generated by the mining activity dissipates within the mine. There is no major impact of the mining activity on the nearby villages.

However, pronounced effect of above noise levels is felt only near the active working area.

The impact of noise on the villages is negligible as the villages are far located from the mine workings. Since there is no involvement of major machinery, the impact of noise levels will be minimal.

S. No	Impact Prediction	Mitigation Measures
1	Noise Impact due to mining activities.	The noise levels from all the sources are periodical and restricted to particular operation.
2	Noise impact due to vehicular movement.	Proper maintenance, oiling and greasing of machines at regular intervals will be done to reduce the generation of noise. Plantation along the sides of approach roads, around office building and mine area will be done to minimize the propagation of noise. Personal Protective Equipments (PPE) like earmuffs/earplugs will be provided to all operators and employees working near mining machineries or at higher noise zone. Periodical noise level monitoring will be done

BIOLOGICAL ENVIRONMENT

S. No	Impact Predicted	Suggestive measure
1	Disturbance of free movement/living of wild fauna	Care will be taken that noise produced during vehicles movement for carrying OB and ore materials are within the permissible noise level. Care will be taken that no hunting of animals (birds) carried out by labours. If wild animals are noticed crossing the core zone, it will not be disturbed at all. Laborers will not be allowed to discards food, plastic etc., which

		<p>can attract animals near the core site.</p> <p>Only low polluting vehicle will be allowed for carrying ore materials. All vehicles allowed in the project site area will have to provide pollution under control certificate at the end of three months.</p> <p>Noise level will be within permissible limit (silent zone-50dB during day time) as per noise pollution (regulation and control), rules, 2000, CPCB norms.</p>
2	Harvesting of flora	<p>No tree cutting, chopping, lumbering, uprooting of shrubs and herbs should be allowed.</p> <p>Collections of economically important plants will be fully restricted.</p>

LAND ENVIRONMENT

S. No	Impact Prediction	Mitigation Measures
1	Change in the Topography of the Land / Land Degradation	As an abatement measure restoration of quarry pit is proposed by converting it in a water reservoir and put to an economical use like fish breeding or irrigation.
2	Solid waste generation	About 5% mineral wastes will be generated. Top Soil will backfilled in the mined out areas on which plantation will be raised.
3	Change in Drainage Pattern	Water flow / course will not be obstructed and natural drains or nullahs will not be disturbed. Run-off from mine and mineral stack will be prevented to avoid being discharged to surroundings, particularly to agricultural land. Garland drains and, catch pits has been constructed to prevent run off affecting the surrounding agricultural land. Green belt has been developed in boundary.
4	Impact on the Agricultural	Agriculture activities are practiced nearby areas may impacted because of dust generation but mitigative measures such as

Practice at nearby area due to dust generation	regular water sprinkling on active areas for example haul roads, excavation sites will be strictly followed so that impact is minimized.
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WATER ENVIRONMENT

S.No	Impact Prediction	Mitigation Measures
1	Effect on the Ground Water Table	Highest Elevation: 280 m MSL Lowest Elevation: 278 m MSL The maximum depth of quarry will be 19.5 m deep up to surface level and 10 m above local ground water table (water table 40m deep from the surface level.) Therefore, the mining activity will not intersect with the ground water table.
2	Wash off from the dumps	No dumping has been proposed.
3	Soil Erosion	Reclamation of the mined out area will be done with plantation to avoid the soil erosion
4	Waste Water generation/ Discharge	Portable Bio-toilets will be used; hence no sewage / liquid effluent will be generated and contamination is also not expected due to percolation.
5	Siltation in nearby agriculture field	A Garland drain has been constructed on the sloping side barrier of the ML area. The garland drain has been routed through settling tank to remove Suspended solids from flowing into storm water.

ADDITIONAL STUDIES

DISASTER MANAGEMENT PLAN

In order to avoid any danger in the mine site at the end of life of mine a disaster management cell headed by local authority District Collector will be constituted. Police department health authorities, including doctor, ambulances and so on will have a vital

part to play following a disaster along with the mine management, and they will be an integral part of the disaster management plan.

The disaster management plan is aimed to ensure safety of human life and property and protection of environment Following are the objective of the disaster management plan.

- (i) First Aid to injure.
- (ii) Rescue operation and provision of adequate medical facilities to the injured.
- (iii) Safety of the human life in the buffer zone if needed.
- (iv) Protecting and minimizing damage to property and the environment.
- (v) Initially restrict and ultimately bring the incident under control.
- (vi) Identify any dead.
- (vii) Inform to the administration, DGMS and statutory persons as per Rules.

PROJECT BENEFITS AND COSTS EVALUATION

The project will improve the physical infrastructure, social infrastructure like improvement of road conditions water supply during dry season, drainage, educational institutions and improved environmental conditions, etc. The project also provides direct employment to 50 persons and indirect employment to another 40 persons. It increases economic activities, better living standard, educational facility, health facility and infrastructural development. The project will contribute to district mineral fund which will directly provide aid to the local authority to fund the development projects. The management will provide free saplings of fruit bearing and other trees, etc. to local during rain for plantation. This will increase the consciousness in workers and near-by villagers for greenery. Fruit trees can contribute towards their financial gains.

The CSR activities are increasingly being taken up by the project proponent not only as fulfilling of mandatory provisions but also for the formation or enhancement of brand image. Besides the above, CSR is seen more as a responsibility towards society rather than a business promotion activity.

Year wise allocation of funds for the above activities proposed to be taken up by the project proponent is provided in the table below:

Budget for Environmental Protection

Sl. No	Description	Capital Cost 1 st year (Rs)	Recurring Cost (Rs) 2 nd year	Recurring Cost (Rs) 3 rd year	Recurring Cost (Rs) 4 th Year	Recurring Cost (Rs) 5 th Year
1	Pollution Control & Dust Suppression	1,20,000	1,20,000	1,20,000	1,20,000	1,20,000
2	Pollution Monitoring	-	30,000	30,000	30,000	30,000
3	Plantation and salary for 1 gardener (part time basis).	24,000	24,000	24,000	24,000	24,000
4	Haul road Maintenance	2,00,000	2,00,000	2,00,000	2,00,000	2,00,000

	Cost (100 m)					
5	Occupational health and safety cost	50000	50000	50000	50000	50000
TOTAL (Rs)		3,94,000	4,24,000	4,24,000	4,24,000	4,24,000

Budget for Occupational Health

Particulars	Recurring Cost per (Rs.)	Particulars
For occupational health check	75,000	For occupational health checkup
Total	75,000	Total

Budget for Water, Shelter and Sanitation for Mine Worker

Scheme	Capital Cost (In Rs)	Recurring Cost (In Rs)
Drinking water facility (Water Cooler)	20,000	10,000
Rest shelter	1,00,000	10,000
Sanitation (Urinal and Toilet)	30,000	10,000
Total	1,50,000	30,000

CORPORATE ENVIRONMENT RESPONSIBILITY

2% of capital cost of the project cost will be allotted for the Corporate Environmental Responsibility as per on dated 1st May 2018. Proposed CER budget is **Rs. 1.00 Lakhs**.

For each activity the funds to be earmarked by the proponent will be decided after discussion with the local authority/people and the beneficiaries during Public Hearing. It has been planned to undertake a concurrent evaluation of the activities to be taken up under the CER programme.

Table 8.4: CER Cost

S.no	Project	Total Cost	CER Cost
1	B M Minerals	Rs 50 Lakh	Rs 1.00 Lakhs

Table 8.5: CER Cost

S. No	Activities	Fund in lakhs/ year (Capital Cost in lakh)
1	Mitrawan will be developed in the government land of Kodwa village in association with Gram Panchayat.	1,00,000
TOTAL		1,00,000

CONCLUSION

The project will throw opportunities to local people for both direct and indirect employment. The proposed mining operation in the state will not only fetch income to the state exchequer but also ensure healthy development of proposed mining in the state of Chhattisgarh. Illegal mining and unorganized mining pose a much bigger health hazard whereas organized mining under QL facilities to undergo periodic health check-ups.

At present agriculture is the main occupation of the people living in the study area. Due to mining project the occupational pattern of the people in the area will change making more people engaged in industrial and business activities there by leading to urbanization. It is expected that education, health, housing, water and electricity etc. facility will improve to due to this mining project and associated industrial and business activities.