

ENVIRONMENTAL IMPACT ASSESSMENT REPORT & ENVIRONMENT MANAGEMENT PLAN of

Executive Summary English

Belsara Dolomite Mine (M/s Vandana Enterprise)

at

Village: Belsara, Tehsil: Takhatpur, District: Bilaspur, State: Chhattisgarh

Area 1.918 ha at

**Khasra No: - 216/1 Part, 219/2 Part, 216/4, 219/3, 216/2 Part, 216/3 Part, 218/1 Part
218/2 Part, 219/1, 220,**

Capacity: 13,323.75 Tons per annum

Proposal No. SIA/CG/MIN/64481/2021

Applicant

M/s Vandana Enterprises

Prop. Shri Sunil Kumar Agrawal

P & M Solution

NABET/EIA/1922/IA0053

ACCREDITED BY NABET UNDER "A" CATEGORY FOR OPEN CAST MINES

Corp. Office: First Floor C-88 Sector - 65, Noida, UP, Pin code 201301

EXECUTIVE SUMMARY

INTRODUCTION

Environmental Impact Assessment (EIA) is a process, used to identify the environmental, social and economic impacts of a project prior to decision-making. It is a decision making tool, which guides the decision makers in taking appropriate decisions for proposed projects. EIA systematically examines both beneficial and adverse consequences of the proposed project and ensure that these impacts are taken into account during the project designing.

The mining lease is located in village of Belsara, Tehsil- Bilaspur, District- Bilaspur (C.G.) Geo-graphically the QL area extends from Longitude 81°48'17.64"E to 81°48'3.70"E and Latitude 22°15'5.27"N to 22° 15' 6.66"N

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 10 years based on the level of exploration and reserve established as per UNFC classification and expecting the market demand will remain at 13,323.75 tonnes per year.

Location

The mining lease is located in village of Belsara Tehsil- Bilaspur, District- Bilaspur (C.G.) Geo-graphically the ML area extends from Longitude 81°48'7.64"E to 81°48'3.70"E and Latitude 22°15'5.27"N to 22° 15' 6.66"N

Connectivity

The lease area is about 2.08 kms from Pali. NH 53 which is at a distance of 16.8 km at North Direction the Nearest Railway Station Kargi Railway Station 23.01 km. The Nearest Airport is Bilasa Devi Airport at a distance of 42.93 km.

Mailing/ Correspondence Address of Project Proponent:

Sunil Kumar Agrawal

Village/ city- Rama life city, Sakari,\$ Tehsil- Bilaspur

District – Bilaspur (C.G.) Pin code - 495001

Size of the Project

The total Mine Lease areas considered is (1.918 Ha). The proposed production is 13,323.75. Tonnes per year.

Anticipated Life of Project and Cost of the Project

The life of the mine is anticipated at 10 years based on the level of exploration and reserve established as per UNFC classification and expecting the market demand will remain at 13,323.75. tonnes per year.

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 Dolomite will be suitably blended to be supplied in market. Rest is inner burden.

Production Plans for Ten Years

Year of Production	Production of Dolomite stone in Tons
1 st	12516.25
2 nd	12706.25
3 rd	12801.25
4 th	12611.25
5 th	12825.0
6 th	13003.13
7 th	13181.25
8 th	13323.75
9 th	12468.75
10 th	12896.25

Summary of Land use at different stage will be as follows (in ha):

Particulars	Area in hac	Total Area Utilized
Proposed pit area expect mine	1.474 hac	1.474hac

boundary			
Total Area of Proposed mine boundary	0.445 hac		0.445 hac
Total	1.918 hac		1.918 hac

Systematic working will be done by formation of benches as per M.M.R. 1961. All applicable rules of MMR 1961, Mines Act-1952, MCR-2016 and MCDR-1988 will be followed for safe, scientific & systematic working to follow the principles of safety & conservation of human health & mineral.

Disposal of Waste

Nature of waste, its rate of yearly generation and proposals for disposal of waste:

The mine waste is in the form of following:-

- (1) Top soil:** - Only top soil will be removed from the lease area. Total 29470 cum top soil will be generated from the lease area from which 4440 cum soil will be dumped on 4440 m² area and remaining 25030 cum soil will be dumped on other adjacent land. Dumping height would be 1 meter.
- (2) OB and Mine waste:** - The waste generated as topsoil will be used for plantation purpose at safety zone.

Selection of Dumping Site:

Total 29470 cum soil will be generated from the area which will be dumped on 4440 m² area adjacent land. OB/Waste material will be generated OB will be temporary stacked along the lease boundary for future use

Method and manner of disposal of waste: Top soil excavated from the height of Max 1 m and will be dumped at safety barriers around the lease area & adjacent land then will be used for plantation purpose at safety zone.

Use of Mineral

Dolomite 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 dolomite is mostly used in iron and steel industries. Most of the dolomite is used in Steel plant. To meet the demand of existing Dolomite steel industries and industries which are yet to come in future?

General Features

I) Surface Drainage Pattern

In the Study area, of 10 km radius Maniyari River (Distance at 3.10 km)

ii). Vehicular Traffic Density

The lease area is about 23 km from Bilaspur. The QL area can be approached from State Highway 10 which is at a distance of 2 km. The Nearest Railway Station is Kota Railway Station about 23 km. The Nearest Airport is Bilasa devi Airport at a distance of 43 km. 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

No processing of mineral will be done in the mine. Only simple sizing and sorting will be done.

Manpower Requirement

About 8 persons will be getting direct and indirect employment in this mine. The man power 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: The land-use is divided into agriculture land, settlement, and river and forest area as shown in the map. The area is fertile and dominated by the proportion of agriculture land.

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

Land use Type	Area (Ha)
Open Land	800.40
Stony Quarry	175.20
Settlement	1500.60

Water Bodies	320.00
Agriculture Land	29610.45
TOTAL	32406.65

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.

The analysis results show that soil is basic in nature as pH value ranges from 7.07 to 7.80 showing the saline property of soil. High electrical conductivity (345 to 440 $\mu\text{S}/\text{cm}$) is observed in the analysis report showing soil electrical behavior and dissolved solids in soil. The presence of Nitrogen content varies from 0.072 to 0.073%. The concentration of Nitrogen, Phosphorus & Potassium are found low value in the soil samples. pH and EC values vary greatly and are affected by several environmental factors including, climate, local biota (plants and animals), bedrock and surficial geology, as well as human impacts are shown in the analysis report.

Low values of EC indicate relatively dilute waters, such as distilled water or glacial melt water and low deposition of TDS. Lowest pH 7.07 and highest pH 7.80 at sample SQ1& SQ8 respectively, Ca, Mg, Na and K levels in different samples, and Sand, Clay and Silt.

Low values of EC indicate relatively dilute waters, such as distilled water or glacial melt water and low deposition of TDS.

(b) WATER ENVIRONMENT

The results of Ground water samples are collected at six locations in the summer season as discussed above for organoleptic & physical parameters, general parameters, toxic and biological parameters. The analysis results at the six ground water locations and two surface water locations are given below:

The analysis results indicate that pH of the groundwater is in range of 7.05 – 7.85. The TDS were found to be in the range of 470-590 mg/l,. Total Hardness is in range of 165.73 – 182.15 mg/l. The analysis results indicate that pH of the surface water to be in range of 7.25 – 7.35. The TDS is found to be in the range of 411-432 mg/l. Total Hardness is in range of 311 -316mg/l. Other parameters like chloride and sulphate are observed within the prescribed limits. The necessary treatment required to minimize the impact is mentioned in Environment Management Plan and cost is born by the Project Proponent.

(c) AMBIENT AIR QUALITY

The Ambient Air Quality Monitoring reveals that of 10 monitoring stations the minimum concentrations of PM_{2.5} are 22.12µg/m³ at AQ9 and maximum 37.31µg/m³ at AQ8 (Max GLC & Transport Convergence zone). The results of PM₁₀ reveal that the minimum concentration of 32.25 µg/m³ at AQ5 while maximum concentration of 50.42 µg/m³ is found at AQ8 (Max GLC & Transport Convergence zone). These values for PM₁₀ and PM_{2.5} are within prescribed CPCB limit of 100 µg/m³ and 60 µg/m³ respectively for residential and rural areas at all stations.

The gaseous pollutants SO₂ and NO₂ are within the prescribed CPCB limit of 80 µg/m³ for residential and rural areas at all stations. The minimum & maximum concentrations of SO₂ were found to be 10.36 µg/m³ at AQ5 & 35.06 µg/m³ at AQ8 ((Max GLC & Transport Convergence zone) respectively. The minimum & maximum concentrations of NO₂ are found to be 9.42 µg/m³ at AQ5 & 29.32 µg/m³ at AQ8 (Max GLC & Transport Convergence zone) respectively.

(d) NOISE ENVIRONMENT

The values of noise observed in some of the areas are primarily owing to vehicular traffic and other anthropogenic activities. Noise monitoring results reveal that the maximum & minimum noise levels at day time were recorded in the range of 59.13 dB(A) at NQ8 (Commercial) and 40.22 dB (A) at NQ5 (Silent zone) and maximum & minimum noise levels at night time were recorded in the range of 41.34 dB(A) at NQ8 (Commercial zone) and 32.13 dB(A) at NQ5 (Silent zone) in downwind direction respectively.

(e) BIOLOGICAL ENVIRONMENT

The lease area as well as buffer zone area reveals no endangered and endemic species of flora and fauna in the area.

(f) Socio- economic

Population Composition

According to 2011 Population Census the study area has a total population of 73485. Of this 50.42 percent are male and the remaining 49.57 percent are female. Further 22 percent of the total population belongs to 0-6 age group. About 56.32 percent of them are male and the remaining 43.67 percent are female.

Sex Ratio

The overall sex ratio in the study area has been worked out to 990 females per 1000 males, which is more than the national average of 940 females per 1000 males. The highest sex ratio recorded in the study area is 1012 females per thousand of males. Sex ratio of Children belonging to 0-6 age group has been worked out to 937 females per 1000 males.

Density of Population

The overall density of population in the study area has been worked out to 312 persons per sq. Kilometre. This is less than the density of population for the state, which stands at 236 persons per sq. Kilometre, according to census 2011.

Households

There are 17029 households in the study area and the average household size is seven

Social Structure

In the study area the total number of persons belonging to Scheduled Caste community is 14581, which is 19.84 percent of the total population. The gender wise distribution of schedule caste population indicates male 51.38 percent and female 48.61 percent, registering a sex ratio of 1012 females per one thousand males.

Further analysis of data reveals that in the study area, the total number of persons belonging to Scheduled Tribe community is 15854, which is 21.57 percent of the total population. This is nearly same as the total number of persons belonging to Scheduled caste community residing in the study area.

About 80.74 percent of the total population belongs to General category, which includes people belonging to 'Other Backward Castes'. In absolute number the population belongs to this category are 24940 with 51.48 percent male and 48.51 percent female. The sex ratio of General category population has been worked out to 985 females per 1000 males.

The socio-economic development of poor and downtrodden scheduled caste and scheduled tribe people is a continuous process and the governments, both at the centre and the states are constantly making efforts to improve the destiny of these people. Distribution of surplus land to the members of the above categories of people is an important step taken by the government for their economic empowerment. The State Governments have drawn up its own list of socially and educationally backward classes and implementing various developmental schemes for them. These schemes are mainly in the field of education and income generation. All the ongoing schemes are critically examined and modified periodically to cater to the needs of different groups amongst the above communities. The government has also started various schemes to improve the quality of life of the rural poor, especially for the scheduled castes and scheduled tribes by making special provisions for them. 'Sampornma Grameen Rozgar Yojana' (SGRY) is one such programme, which was launched to safeguard the interest of the weaker sections and women by providing them wage employment. The 'Swarnjayanti Gram Swarozgar Yojana' (SGSY), another rural development scheme aims at bringing poor families above the poverty line by providing them with income generating assets through a mixture of credit and subsidy. The SGSY has also made an explicit provision that 50 per cent of the Swarozgaris assisted should be from Scheduled caste and Scheduled Tribe communities.

Over the decades the Scheduled caste and scheduled tribe people are making rapid progress both in economic and social sphere. Today they are no more untouchables. The literate Schedule Caste and Scheduled Tribe people are engaged in trade, commerce & industry, private & government services including police and armed forces.

Literates and Literacy Rate

All persons aged seven years and above, who can both read and write with understanding in any language including Braille are considered as literate. The total

numbers of literate persons in the study area are 25816 which are 35.13 percent of the total population. Of the total number of literate persons 57.82 percent are male and the remaining 42.01 percent are female.

The overall literacy rate in the study area has been worked out to 59.86 percent. The gender wise distribution of literacy rate reveals that 73.30 percent of the literate persons are male and 45.71 percent are female. This creates a gender gap of 26.21 percent.

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.	a) Proper maintenance, oiling and greasing of machines at regular intervals will be done to reduce the generation of noise. b) Plantation along the sides of approach roads, around office building and mine area will be done to minimize the propagation of noise. c) Personal Protective Equipments (PPE) like earmuffs/earplugs will be provided to all operators and employees working near mining machineries or at higher noise zone. d) Periodical noise level monitoring will be done

BIOLOGICAL ENVIRONMENT

S. No.	Impact Predicted	Suggestive measure
1	Disturbance of free movement/living of wild fauna	<ul style="list-style-type: none"> 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. Labours will not be allowed to discards food, plastic etc., which can attract animals near the core site. 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 Noise level will be within permissible limit (silent zone- 50dB during day time) as per noise pollution (regulation and control), rules, 2000, CPCB norms
2	Harvesting of flora	<ul style="list-style-type: none"> No tree cutting, chopping, lumbering, uprooting of shrubs and herbs should be allowed Collections of economically important plants will be fully restricted

LAND ENVIRONMENT

S. No.	Impact Prediction	Mitigation Measures
1	Change in the Topography of the Land / Land Degradation	The proposed mining activity is carried out in flat region and waste land After removal of ore body, a undulating portion will be created. All the broken area will be reclaimed by systematic backfilling and rehabilitated by afforestation so that landscape of the area is improved. And rest area is used as water reservoir and used for pisciculture
2	Solid waste generation	About 10% mineral wastes will be generated. Top Soil will used on the barrier zone areas on which plantation will be raised.
3	Change in Drainage Pattern	Water flow / course will not be obstructed and natural drains or nallahs 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 Practice at nearby area due to dust generation	Agriculture activities are practiced nearby areas may impacted because of dust generation but mitigative measures such as regular water sprinkling on active areas for example haul roads, excavation sites will be strictly followed so that impact is minimized.

WATER ENVIRONMENT

S. No.	Impact Prediction	Mitigation Measures
1	Effect on the Ground Water Table	Max Elevation of the ML area is 308 m MSL Ultimate depth of mine is up to 306 m MSL. Ground Water table is 35 m - 40 m bgl. 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	Toilets with septic tanks will be used; hence no sewage / liquid effluent will be spread and contamination is also not expected
5	Siltation in nearby agriculture field	Garland drains have 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 6 persons and indirect employment to another 2 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 CER 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, CER 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:

Tentative allocation of funds for the various activities proposed to be taken up by the project proponent under CSR program

S. No	Activities	Tentative allocation of fund					Total
		Year 1	Year 2	Year 3	Year 4	Year 5	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Health awareness and camps for local community	25000	25000	25000	25000	25000	25000

2	Financial Assistance for Construction of separate toilets for boys and girls in schools	4000 0	40000	40000	4000 0	40000	40000
3	Water supply in dry season	1500 0	15000	15000	1500 0	15000	15000
4	Green Belt Development in Buffer Zone	2000 0	20000	20000	2000 0	20000	20000
Total		1 Lacs	1 Lacs	1 Lacs	1 Lacs	1 Lacs	1 Lacs

All the activities listed above are for community development as a whole and not for individual person or a family. Each development initiative will be implemented in close collaboration with the village Panchayat. The Project proponent may avail the services of a NGO for the implementation of the above programme, if felt needed.

Budget for Environmental Protection

Particulars	Capital Cost	Recurring Cost/ year in Rs.
Environmental Protection		
Dust Suppression & Pollution Control	50,000	20,000
Tarpaulin and cover for stack of ore	60,000	20,000
Environmental Monitoring	55,000	30,000
Green Belt	60,000	10,000
Total	2,25,000	80,000

Budget for Occupational Health

Particulars	Capital Cost (Rs.)	Recurring Cost (Rs.)
For routine checkup	--	1,00,000
Infrastructure & PPE's	50,000	50,000

Budget for Water, Shelter and Sanitation for Mine Worker

Scheme	Capital Cost (In Rs)	Recurring Cost (In Rs)/year
Drinking water facility	50,000	20,000
Rest shelter	50,000	20,000
Sanitation (Urinal and Toilet)	1,00,000	30,000
Total	2,00,000	70,000

CORPORATE ENVIRONMENT RESPONSIBILITY

Corporate Environment responsibility (CER) refers to responsibility of a company/ organization to ensure positive impact on environment, consumers, employees, communities, stakeholders and all other members of public sphere. The CER 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, CER is seen more as a responsibility towards Environment & society rather than a business promotion activity. It is the need of the day for expansion of Environment & occupational welfare. This will not only improve the socio-economic status of the people living in the nearby areas but also enhance the reputation of the project proponent among the local people.

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

Activities under CER	Capital cost	Recurring Cost
Installation of Rain water harvesting system in the school premises	80,000	3000
R.O. Will be installed in the school for drinking purpose	20,000	3000
Separate tanks for water supply in toilet for boys and girls will be constructed in school	15,000	2000
Total	1,15,000	8000

Mitra van will be developed in village by taking proper permission from gram panchayat

All the activities listed above are for community development as a whole and not for individual person or a family.

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.