

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 considered during the project designing.

Geo-graphically the ML area extends from Longitude E81°32'27.99" to E 81°32'20.17".East and Latitude N 21° 15' 30.66" to 21° 15' 27.21".North. The study area of the proposed project comprises of 10 km radius around the mining lease boundary, the map showing the core zone (ML area) and buffer zone (10 km radius from the lease boundary).

The life of the mine is anticipated at 17 years based on the level of exploration and reserve established as per UNFC classification and expecting the market demand will remain at 3992.73 CUM/yr or 3799321tnos of Bricks/yr

Location

The mining lease is located in village of Kumhari; Tehsil Dhamdha District- Durg(C.G.) Geo-graphically the ML area extends from Longitude E81°32'27.99" to E 81°32'20.17".East and Latitude N 21° 15' 30.66" to 21° 15' 27.21". North. The study area of the proposed project comprises of 10 km radius around the mining lease boundary, the map showing the core zone (ML area) and buffer zone (10 km radius from the lease boundary).

Connectivity

The lease area is about 3 kms from Raipur.. The ML area can be approached from National Highway 06 which is at a distance of 290m South Direction. The Nearest Railway Station is Sarona Railway Station at 3.5 Km SW Direction. The Nearest Airport is Swami Vivekanand Airport at a distance of 22.20 Km SW Direction.

Mailing/ Correspondence Address of Project Proponent:

Shri Narendra Kumar Pritwani

A/o Late ShrichandPritwani

Lakhe Nagar City Raipur, Pin Code 492001

Tehsil & District Raipur, Chhattisgarh.

Project: Kumhari Brick Earth Clay Quarry Mine

Applicant: Shri Narendra Kumar Pritwani

Size of the Project

The total Mine Lease areas considered is 4.625 ha. The proposed production is 3992.73CUM/yr or 3799321nos of Bricks/yr.

Anticipated Life of Project and Cost of the Project

The life of the mine is anticipated at 17 years based on the level of exploration and reserve established as per UNFC classification and expecting the market demand will remain at

3992.73CUM/yr or 3799321nos of Bricks/yr.

MINING

Opencast manual method of mining will be adopted in the lease area. The excavation will be carried out usually by manual labour with the use of pick-axes, crowbars, chisels; sledge hammers etc. and loaded into tractor/truck/tipper. The brick will be supplied in market.

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Year wise Production details

Production Plan for Second Five years -

Yrs.	Bench	Soil Bench 1	Soil Bench 2	Mine Waste 10% (cum.)	Soil + Fly Ash = Clay Mix for Raw Brick (cum)	Stripping Ratio	Gross Raw Brick Production (in Nos)	Rejected Bricks in Nos. (5%)	Salable Bricks Production in Nos.
6 th Year	Area of excavation(sqm)	2261.4	2175.0	443.6	Clay =	1: 0.11	3999285	199964	3799321
	Av. bench Height (m)	1.0	1.0		3992.73				
	Volume (cum)	2261.4	2175.0		Fly Ash =				
	Production (cum)	2035.3	1957.5		3999.29				
	O.B./Waste (cum)(10%)	226.1	217.5		Total Mix=				
	Av. Reduced level(m)	274.0	273.0		7992.02				
7 th Year	Area of excavation(sqm)	2261.4	2175.0	443.6	Clay =	1: 0.11	3999285	199964	3799321
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Summary of Land use at different stage will be as follows (inHa):

Sno.	Head	Land use at the end of 5 yrs in hectare	Land use at the end of 10 yrs in hectare
	Lease Area	4.625	4.625
	Quarrying & allied		
1	Area under Pit	1.131	2.261
2	Area for Dumping	0.108	0.108
3	Area for road		
4	Area for infrastructure		
5	Plantation	0.108	0.108
6	Non mineable Area	0.297	0.297
7	Processing unit	0.300	0.300
8	Unused Area	2.790	1.659

Systematic working will be done 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:** -The top soil is proposed to be generated during the ensuing ROM period will be used for plantation .
- (2) OB and Mine waste:** - About 10% mineral waste will be generated and the waste generated as topsoil will be used for plantation purpose at safety zone.

Method and manner of disposal of waste rock: Top soil. From surface will be dumped at safety barriers around the lease area and will be used for plantation purpose at safety zone.

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Use of Mineral

Bricks are basic material for civil construction works like buildings etc. for construction of walls. Chhattisgarh is a new state in the map of India. Considering the growth, State Government has divided the state in 28 districts. In addition to these various civil constructions, Building projects in all district. In addition to these various civil constructions, Buildings & colonies development projects are coming up in Private sectors and are under implementations, all above civil works require bricks which is in huge demand.

General Features

I) Surface Drainage Pattern

The lease area is drained by southerly flowing on-perennial rivers. The surface water courses within 10 Km are as under –

- Kharun River at 130 m in East
- Nala at 1.80 km towards south

ii). Vehicular Traffic Density

The lease area is about 3 kms from Raipur.. The ML area can be approached from National Highway 06 which is at a distance of 290m. The Nearest Railway Station is Sarona Railway Station at 3.5 Km SW Direction. The Nearest Airport is Swami Vivekanand Airport at a distance of 22.20 Km SW Direction.

Existing Traffic Scenario & LOS

Road	V (Volume in PCU/hr)	C (Capacity in PCU/hr)	Existing V/C Ratio	LOS
Kumhari Rd	79	1100	0.07	A

Note: V= Volume in PCU's/hr & C= Capacity in PCU's/ hr

The existing Level of Service near Village is "A" i.e. excellent and at NH is "A" i.e. excellent

During Mine Operation

Total Capacity of mine	: 3992.73 cum per annum
No. of working days	:240
Extraction & Transportation of mineral	: 16.63cum/day
Working hours per day	: 8 hour
Tractor Capacity	: 2 cum
Frequency of trucks/tractor deployed/day	:1
No. of trucks/tractor deployed/day to and fro 1*2 trucks	=2 trucks

Modified Traffic Scenario & LOS

Road	Increased PCU'S- Kumhari Rd	V	C	Modified V/C Ratio	LOS
Kumhari Rd	79+6	85	1100	0.077	A

The LOS value from the proposed mine may be “Excellent”. So the additional load on the carrying capacity of the concern roads is not likely to have any significant adverse affect.

iii) Water demand

The water required is mainly for clay molding, dust suppression, green belt development, drinking and other domestic purpose during mining operations. The total requirement will be 9.67 KLD. Water required during operation phase will be procured from bore well in the lease area and sump.

Manpower Requirement

About 71 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)

S.N.	LAND USE TYPE	AREA (in ha)
1	OPEN LAND	750.65
2	STONY QUARRY/BRICK QUARRY	25.5
3	SETTLEMENT	1500.6
4	WATERBODIES	315.85
5	AGRICULTURE LAND	29814.05
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 6.91 to 7.58 showing the saline property of soil. High electrical conductivity (387 to 436 $\mu\text{S}/\text{cm}$) is observed in the analysis report showing soil electrical behavior and dissolved solids in soil. The presence of Nitrogen content varies from 0.065 to 0.084 %. 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.

(b) WATER ENVIRONMENT

The results of Ground water samples are collected at eight locations in the Post-monsoon 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 7.02 – 7.12. The TDS were found to be in the range of 320-512 mg/l. Total Hardness is in range of 171.72 – 191.42 mg/l. The analysis results indicate that pH of the surface water to be in range of 7.32– 7.65. The TDS is found to be in the range of 483-512 mg/l. Total Hardness is in range of 624-582 mg/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

(c) AMBIENT AIR QUALITY

The Ambient Air Quality Monitoring reveals that of Ten monitoring stations the minimum concentrations of $\text{PM}_{2.5}$ are 21.09 $\mu\text{g}/\text{m}^3$ at AQ8 and maximum 42.54 $\mu\text{g}/\text{m}^3$ at AQ1 (Core Zone). The results of PM_{10} reveal that the minimum concentration of 40.09 $\mu\text{g}/\text{m}^3$ at AQ8 while maximum concentration of 65.63 $\mu\text{g}/\text{m}^3$ is found at AQ2. These values for PM_{10} and $\text{PM}_{2.5}$ are within prescribed CPCB limit of 100 $\mu\text{g}/\text{m}^3$ and 60 $\mu\text{g}/\text{m}^3$ respectively for residential and rural areas at all stations.

The gaseous pollutants SO_2 and NO_2 are 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 SO_2

were found to be 8.11 $\mu\text{g}/\text{m}^3$ at AQ5 & 15.34 $\mu\text{g}/\text{m}^3$ at AQ10 respectively. The minimum & maximum concentrations of NO_2 are found to be 10.42 $\mu\text{g}/\text{m}^3$ at AQ8 & 16.34 $\mu\text{g}/\text{m}^3$ at AQ10 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 66.2 dB(A) at NQ2(Industrial Zone) and 42.4 dB(A) at NQ8 (Silent Zone) and maximum & minimum noise levels at night time were recorded in the range of 56.4 dB(A) at NQ2(Industrial Zone) and 37.3 dB(A) at NQ6 (Residential Zone), 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 37702. Of this 50.27 percent are male and the remaining 49.73percent are female. Further 15.13 percent of the total population belongs to 0-6 age group. About 47.12 percent of them are male and the remaining 52.88 percent are female.

Sex Ratio

The overall sex ratio in the study area has been worked out to 989 females per 1000 males, which is less 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 1122 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 more than the density of population for the state, which stands at 236 persons per sq. Kilometre, according to census 2011.

Households

There are 7545 households in the study area and the average household size is four.

Social Structure

In the study area the total number of persons belonging to Scheduled Caste community is 4918, which is 13.04 percent of the total population. The gender wise distribution of schedule caste population indicates male 49.74 percent and female 50.26 percent, registering a sex ratio of 1010 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 2346, which is 6.22 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 30440 with 50.38percent male and 49.62 percent female. The sex ratio of General category population has been worked out to 988 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 25916, which is 68.74 percent of the total population. Of the total number of literate persons 57.6 percent are male and the remaining 42.4 percent are female.

The overall literacy rate in the study area has been worked out to 68.74 percent. The gender wise distribution of literacy rate reveals that 82.12 percent of the literate persons are male and 55.91 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 manual 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), Nitrogen dioxide (NO₂) 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 Equipment (PPE) like dust masks, ear plugs etc. will be provided to mine workers.
6. Speed limit will be enforced to reduce airborne fugitive dust from vehicular traffic.
7. Deploying PUC certified vehicles to reduce their noise emission.
8. Haul road shall be covered with gravels
9. Spillage from the tractor/ trucks will be prevented by covering tarpaulin over the trucks/tractor
10. Ambient Air Quality Monitoring will be conducted on regularly basis to assess the quality of ambient air.
11. Proper maintenance of machines improves combustion process & makes reduction in the pollution.
12. Good maintenance and monitoring of fuel and oil will not allow significant addition in the gaseous emission.

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.	<p>a) Proper maintenance, oiling and greasing of vehicles at regular intervals will be done to reduce the generation of noise.</p> <p>b) Plantation along the sides of approach roads, around office building and mine area will be done to minimize the propagation of noise.</p> <p>c) Personal Protective Equipments (PPE) like earmuffs/earplugs will be provided to all operators and employees working near mining vehicle or at higher noise zone.</p> <p>d) Periodical noise level monitoring will be done</p>
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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 tractor 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 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.
2	Solid waste generation	About 10% brick wastes will be generated. Top Soil will backfilled in the mined out areas on which plantation will be raised.

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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, catchpits 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 376m-374m AMSL. Ultimate depth of mine is up to 372m AMSL. Ground Water table is 25m to 30m AMSL. 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 will be used with soak pit; hence no sewage / liquid effluent will be generated and contamination is also not expected due to percolation.
5	Siltation in nearby agriculture field	The garland drain has been routed through settling tank to remove suspended solids from flowing into storm water.

10.5 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 injured.
- (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.

10.6 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 21 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 Management Plan

Particulars	Capital Cost	Recurring Cost/ year in Rs.
Environmental Protection		
Dust Suppression & Pollution Control	3,75,000	1,00,000
Tarpaulin and cover for stack of ore	1,50,000	50,000
Environmental Monitoring	80,000	75,000
Green Belt	70,000	80,000
Total	6,75,000	3,05,000

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	75,000	50,000
Rest shelter	25,000	15,000
Sanitation (Urinal and Toilet)	1,00,000	35,000
Total	2,00,000	1,00,000

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:

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

Activities under CER	Expenditure	Recurring Cost
Installation of Rain water harvesting system in the school premises (Rs. 80 * 2school)	1,60,000	20,000
Portable drinking water facility Will be installed in the government higher secondary school kumhari & primary school kumhari for drinking purpose (Rs. 15*2)	30,000	5000
Separate water tanks for toilet of boys and girls will be constructed in school (20 * 2)	40 000	5000

Project: Kumhari Brick Earth Clay Quarry Mine

Applicant: Shri Narendra Kumar Pritwani

Plantation along with tree guards (20 * 2)	40,000	10000
Total	2,70,000/-	40000/-

CONCLUSION

As discussed, it is safe to say that the proposed facilities are not likely to cause any significant impact to the ecology of the area, as adequate preventive measures will be adopted to keep the various pollutants within the permissible limits.