

**Executive Summary**

**Environmental Impact Assessment**

*For*

**Kirandul Ordinary Stone Quarry Project,  
Total Area : 2.230 Ha**

**Khasra No. 61, Village – Kirandul, Tehsil - Bade Bacheli,  
Dist. – Dantewada, State – Chhattisgarh**



**Project Proponent:**

**Prop.- Jovins Pappachan  
No-4 Ring Road, Post & Tehsil-Kirandul,  
District-Dantewada, Chhattisgarh**

**Environment Consultant**

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## Executive Summary

### 1.1 INTRODUCTION

**Sri. Jovins Pappachan** has obtained mine lease for Ordinary Stone Quarry at Khasra No. 61, Village-Kirandul, Tehsil – Bade Bacheli, District-Dantewada, State – Chhattisgarh. The Lease deed of quarry leases (Ordinary Stone) for over an area 2.230 Ha issued by DMG, Raipur for a period of 29/11/2004 to 28/11/2034

Mining Plan has been approved in favor of Shri.Jovin Pappachan by Collector Office (Khanij Shakha) District: South Bastar Dantewada, (Chhattisgarh) for Ordinary Stone Mining Project Located at Khasra No. 61, Village – Kirandul, Tehsil – Bade Bacheli, District-Dantewada, State – Chhattisgarh, with A vide order no. Kramank/ 432/ Khanij/2017 Dantewada, Date: 16/08/2017. Maximum Stone Production Capacity is 39,174 t/ year of Ordinary Stone. The expected life of mine is 19.02 years.

As per the EIA Notification of Ministry of Environment Forests and Climate Change, Government of India (MoEF&CC), dated 14<sup>th</sup> September, 2006, as amended from time to time the proposed project falls under project activity 1(a) – Mining of Minerals – Category ‘B1’ and requires to obtain Environmental Clearance from State Environmental Impact Assessment Authority (SEIAA), Chhattisgarh,

### 1.2 PROJECT DESCRIPTION

Kirandul Ordinary Stone Quarry proposes to produce 39174 TPA of Ordinary Stone mining lease area over an extent of 3.00 ha located at Village-Kirandul, Tehsil – Bade Bacheli, District-Dantewada, State – Chhattisgarh

The project planning details are:

Mining Method	– Open Cast Semi Mechanized mining method
Production	- 39174 Tones/Annum (Average Annual Production)
Project cost	- Rs. 15 Lakhs
Man Power requirement	- 11 Nos.
Life of Mine	- 19.02 years

### 1.3. DESCRIPTION OF ENVIRONMENT

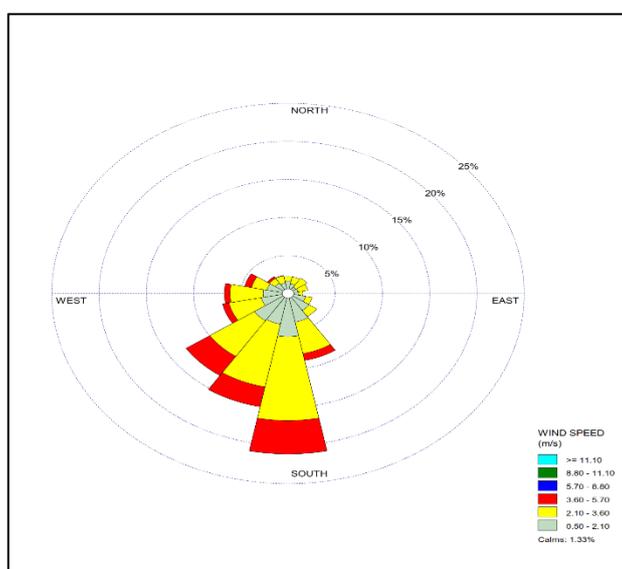
As part of Environmental Impact Assessment study, baseline environmental monitoring was carried out for summer season, covering the months of March. 2024 to May. 2024.

#### 11.3.1 Meteorology

The data collected on wind speed and wind direction was used for computation of wind percentage frequencies in all the sixteen directions is given in **Table 11.1**. The wind rose diagram is shown in **Figure 11.1**.

**Table 11.1: Site Specific Meteorological Data**

Month	Temperature (°C)		Humidity (%)	Atmospheric Pressure (mb)	Cloud Cover
	Min.	Max.	Average		
March 2024	24.8	35.6	60	951.5	3/8
April 2024	28.3	34.2	58	949.2	3/8
May 2024	29.3	34.0	61	945.5	3/8



**Figure 11.1: Windrose Diagram (Site Specific)**

### 1.3.2. Air Environment

The ambient air quality monitoring was carried out at 8 locations. The parameters monitored during the study period were Particulate Matters (PM), Sulphur dioxide (SO<sub>2</sub>) and Oxides of nitrogen (NO<sub>x</sub>).

#### Particulate Matter – PM<sub>10</sub>

The 98<sup>th</sup> percentile values of particulate matter monitored in the study area are in the range of 64.6 to 78.3 µg/m<sup>3</sup>, which were found to be well within the prescribed limits of NAAQ standards.

#### Particulate Matter – PM<sub>2.5</sub>

The 98<sup>th</sup> percentile values of PM<sub>2.5</sub> monitored in the study area are in the range of 35.4 to 43.4 µg/m<sup>3</sup>, which were found to be well within the prescribed limits of NAAQ standards.

### **Sulphur dioxide - SO<sub>2</sub>**

The 98<sup>th</sup> percentile values of Sulphur dioxide in the study area are in the range of 17.6 to 19.8 µg/m<sup>3</sup>, which were found to be well within the prescribed limits of NAAQ standards.

### **Nitrogen dioxide – NO<sub>2</sub>**

The 98<sup>th</sup> percentile values of Nitrogen oxides in the study area are in the range of 20.6 to 23.7 µg/m<sup>3</sup>, which were found to be well within the prescribed limits of NAAQ standards.

### **Corban Monoxide – CO**

The 98<sup>th</sup> percentile values of CO in the study area are in the range of 0.58 to 0.88 mg/m<sup>3</sup>, which were found to be well within the prescribed limits of NAAQ standards

### **11.3.3 Noise Environment**

The Maximum Noise (day) value was observed 62.6 dB(A) and the minimum noise (day) values was observed 46.7 dB(A). The Maximum Noise (night) value was observed 58.4 dB(A) and the minimum noise (night) values was observed 43.3 dB(A).

### **1.3.4 Water Environment**

Eight Groundwater and four Surface water samples were collected within the study area. The parameters thus analyzed were compared with the drinking water standard of IS 10500:2012.

Summary of ground water quality is given below:

- It is observed that the pH of the ground water samples is in the range of 6.2 to 7.5, which shows that all samples are within the acceptable limits.
- Total dissolved solids were in the range between 147 -270 mg/l, which shows that all 6 samples are above acceptable limits but within the permissible limits.
- Total hardness of the ground water samples was in the range of 70.5 – 162.4 mg/l, all samples are above the acceptable limits but within the permissible limits.
- Chlorides varies from 4.4 mg/l to 9.9 mg/l in the Study Period.
- Fluorides concentration was found to vary between 0.2-0.5 mg/l

Summary of surface water quality is given below:

- Dissolved oxygen is in the range of 5.8 to 6.5 mg/l
- It is observed that the pH of the surface water samples is in the range of 7.2 to 7.8, which shows that all samples are within the acceptable limits.
- Total dissolved solids were in the range between 55.3 -158 mg/l,
- Total hardness of the surface water samples is in the range of 38– 46 mg/l
- Chlorides concentration was found to vary between 5.2-13.5 mg/l

### **11.3.5 Soil Environment**

Soil samples were collected from 6 locations in the study area for assessing the soil quality.

**Soil Texture:** The soil textures refer to proportion of mineral composition of soil i.e., sand, clay and silt present in the soil sample. The most predominant soil texture in the study area is sandy clay found in project site,

**Soil pH:** Soil pH is an important soil property, which affects the availability of several plant nutrients. It is a measure of acidity and alkalinity and reflects the status of base saturation. It measures the -ve logarithm of hydrogen ions activity of soil solution and defines the soil acidity and alkalinity. The soil pH ranges from 6.3 to 7.1 thereby indicating the soils are neutral to slightly alkaline.

**Available Nitrogen:** Nitrogen is an integral component of many compounds including chlorophyll and enzyme essential for plant growth. It is an essential constituent for amino acids which is building blocks for plant tissue, cell nuclei and protoplasm. It encourages the aboveground vegetative growth and deep green color to leaves. Deficiency of Nitrogen decreasing rate and extent of protein-synthesis and result into stunted growth and develop chlorosis. Available nitrogen content in the surface soils in the range of 31.7 to 173 kg/ha thereby indicating soils that are low to medium level as per ICAR standards in available nitrogen content.

**Available Phosphorus:** Phosphorus is important component of adenosine di-phosphate (ADP) and adenosine tri-phosphate (ATP), which involves in energy transformation in plant. It is essential component of deoxyribonucleic acid (DNA), the seat of genetic inheritance in plant and animal. Phosphorous helps in processes like photosynthesis, root development, nitrogen fixation, strengthening straw in cereal crops, crop maturation, etc. The availability of phosphorous is restricted under acidic and alkaline soil reaction mainly due to P-fixation. In acidic condition it gets fixed with aluminum and iron and in alkaline condition with calcium. Available phosphorus content is ranging between 6.4 to 23.1 kg/ha thereby indicating that soils are medium in available phosphorus.

**Available Potassium:** Potassium is an activator of various enzymes responsible for plant processes like energy metabolism, starch synthesis, nitrate reduction and sugar degradation. It is extremely mobile in plant and help to regulate opening and closing of stomata in the leaves and uptake of water by root cells. It is important in grain formation and tuber development and encourages crop resistance for certain fungal and bacterial diseases. Available potassium content in the soils ranges between 128 to 436 kg/ha, thereby indicating medium levels in the area.

### **1.3.7 Biological Environment**

There are no ecologically sensitive areas (as defined by the MOEF&CC) such as the biosphere reserves, Wildlife Sanctuaries, National Parks, or Wetlands.

## **1.4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

### **1.4.1 Impact on Air Environment and Mitigation Measures**

The air borne particulate matter is the main air pollutant contributed by opencast mining. Various emission sources are identified from the mining operations for of 39174 TPA of Ordinary Stone.

The mining operations are by adopting Open Cast Semi-Mechanized mining method The source of emissions from the proposed operations will be from active Quarry and its activities like drilling, blasting, loading/unloading, and transportation of materials. The emissions will be mainly Particulate Matter (PM).

#### **Air Pollution Control Measures**

However, to further minimize the pollutant concentration especially Particulate matter, the following control measure should be adopted by the project proponent

- Controlled and Wet drilling and blasting
- Water spray on haul roads to avoid dust generation during transportation.
- Water spray at truck loading and un-loading of materials
- Covering of material when transport through trucks/dumper
- All vehicles above Bharat IV norms should be used.

### **1.4.2 Impact on Noise Environment and Mitigation Measures**

Operation of heavy earth moving machines and allied quarrying operations such as transport, blasting, workshop activities etc. will produce noise pollution.

#### **Noise Pollution Control Measures**

The following control measures will be adopted to keep the ambient noise levels well below the limits:

- Drilling will be carried out with the help of sharp drill bits which will help in reducing noise.
- Controlled blasting will be done to minimize noise, ground vibration, fly rock and air overpressure.
- Proper maintenance, oiling and greasing of machines at regular intervals will be done to reduce generation of noise.
- In order to reduce the effect of noise pollution, ear plugs / earmuffs will be provided to all employees.
- Green belt development around infrastructure and mine areas etc., would minimize adverse impacts

### **1.4.3 Impact Due to Ground Vibrations**

The proposed mine will adopt open cast semi mechanized method for mining with minimum drilling and blasting involved.

By practicing controlled blasting, the problems will be greatly minimized and the impact will also be minimized by using Latest techniques for blasting:

- Blasting operations will be carried out only during daytime as per mine safety guidelines
- Proper warning signals will be used
- Adequate safe distance from site of blasting will be maintained
- Blasting will be done in controlled manner with use of non-electric delay detonator to minimize dust to get air borne and also limit the fly rocks within 50-60 m.
- Competent persons will carry out blasting and precautions laid down under MMR - 1961 circulars and directions of DGMS issued from time to time will be followed.
- Controlled blasting will be done and use of explosives is optimized to reduce gaseous emissions. Besides, the persons working in near vicinity of machines will be provided with PPEs.

#### **1.4.4. Impact on Water Environment and Mitigation Measures**

- There will be no impact on water table due to proposed mining
- There are no rivers in the mining lease area.
- The domestic effluent generated from office will be discharged into soak pit via septic tank.
- The water table in this region is at a depth of 60-75 m bgl. The quarrying in the area is proposed to a maximum depth of 30 m on top of the ridge.
- Garland drains all along the quarry edge keeping a barrier from the surface will be constructed to arrest incoming water to the mine.
- Retention wall will be constructed to prevent the siltation of the dumps and Check dam construction against drainage channels to arrest silt.

#### **1.4.6 Afforestation**

At the conceptual stage, out of the total mining lease area (2.230 ha.), plantation will be on 0.4787 ha (For five years). Greenbelt development to be carried out in consultation with nearest forest and horticulture departments which will help in reducing adverse impact on the flora found in the area. CPCB guidelines will be followed for plantation. It is proposed for plantation of @957 sapling of suitable species per plan period will be done in vicinity and approach roads of mining area as avenue plantation and as per mining plan the remaining plants will be planted as social forestry in nearby villages which is to be undertaken in consultation with the Gram Panchayat and concern authorities with the help of NGO's and local nurseries as a part of green drives.

#### **1.4.7 Socio Economic Environment**

The mine area does not cover any habitation. Hence, the mining activity does not involve any displacement of human settlement. No public buildings, places, monuments etc. exist within the lease area. There will be no resettlement or rehabilitation involved in the project area. Thus, no adverse impact is anticipated.

The mining activity can improve overall economic status of the people around the mine area. Local people will get employment with the continued mining activities and infra-structural facilities will be developed. Hence there is possibility of positive impact on socio- economics of people living in the nearby villages.

Following measure will be taken to improve the social infrastructure of the study area:

- To control the air pollution all the EMP measures given in Air pollution control measure to be followed strictly.
- Blasting with millisecond delay detonator with control cushion blasting method is to be adopted and all the EMP measures given for blasting and vibration control should be followed.
- No solid waste disposed outside the mine lease area.
- Greenbelt development and regular water sprinkling should be done.
- Preventive medical care and educational facilities for rural population will be promoted.
- Priority will be given to local people for employment.
- Extending general benefit by way of development work in the villages through respective Gram Panchayat.
- Supplementing Govt. efforts in health monitoring camps, social welfare and various awareness programmes among the rural population.
- Assisting social forestry programme.

#### **1.4.8 Occupational Health and Safety**

Health hazards should be interpreted as being harmful dust and noise which is emitted during surface mining operations. The management will strictly follow these guidelines. All necessary first aid and medical facilities will be provided to the workers. The quarry will be well equipped with proper fire protection and firefighting equipment.

All operators and mechanics will be trained to handle fire-fighting equipment's. Further all the necessary protective equipment's such as helmets, safety goggles, earplugs, earmuffs, etc. will be provided to persons as per requirements.

#### **1.5 ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE)**

**Kirandul Ordinary Stone Quarry Project** will adopt the Open Cast Semi-Mechanized mining method involving drilling, blasting, loading and hauling with heavy equipment's.

No alternate sites are selected as the project is site specific and lime stone deposit if found within the mine area.

#### **1.6 ENVIRONMENTAL MONITORING PROGRAM**

To evaluate the effectiveness of environmental management programme, regular monitoring of the important environment parameters will be taken up. The schedule, duration and parameters to be monitored are shown in below **Table 11.2**.

**Table 11.2: Monitoring Schedule for Environmental Parameters**

S. No	Item	Parameters	Methodology	Monitoring Frequency
1.	Ambient Air Quality	PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>2</sub> , CO, Silica, dust fall etc.	PM <sub>10</sub> and PM <sub>2.5</sub> – Gravimetric Method SO <sub>2</sub> – West and Geake Method (Modified) NO <sub>2</sub> – Modified Jacob and Hochheiser CO - Non-Dispersive Infrared (NDIR) Spectroscopy	Once in a month during operation phase
2.	Meteorology	Wind Speed, Wind Direction, Humidity Temperature and Rain Fall	Automatic Weather Monitoring Equipment	Continuous Online
3.	Water Quality	pH, DO, TSS, BOD, COD, Oil & Grease, Sulphate, Phosphate, Chloride, Residual Free chlorine, Ammonical Nitrogen, Kjeldhal nitrogen, Coliforms (Ecoli), MPN.	As per IS 10500 (drinking water quality standard), CPCB / MOEF&CC guidelines	Quarterly
4.	Noise	Equivalent noise level- dB (A)	As per CPCB / MOEF&CC guidelines	Quarterly
5.	Soil	pH, Humidity, Texture, Organic matter, N, P, K, Sulphate, Calcium, Magnesium, C:N ratio.	As per CPCB / MOEF&CC guidelines	Quarterly
6.	Greenbelt	Number of plantation (Units), Number of Survived plants/ trees, Number of weak plants/ Trees	As per CPCB / MOEF&CC guidelines	Ongoing-round the year
7.	Environmental Audit	With Respect to Environment Clearance, Consent conditions and ISO 14001.	As per CPCB / MOEF&CC Guidelines	Once in a Year

### **1.7 ENVIRONMENTAL MANAGEMENT PLAN**

**Kirandul Ordinary Stone Quarry Project** has budgeted an amount of Rs. 1.59 Lakhs for implementation of environmental management plan and recurring cost is about Rs. 1.35Lakhs per annum.

### **1.8 PROJECT BENEFITS**

There will be employment generation for 11 persons for carrying out mining operations and the lessee proposed to give preference to the local people in employment. In addition, there will be indirect employment to many people in the form of contractual jobs, business opportunities, service facilities etc. this will enhance the economic status of the local people.

The impact of mining activity in the area will be positive on the socio-economic environment of the region. The employment directly and indirectly will be increased and better infrastructure and communication facilities will be provided.

### **1.9 CONCLUSION**

The industrial and economic growth of India depends largely on mining where ordinary stone plays a very important role. The demand of ordinary stone has significantly increased in order to meet the requirement of infrastructure. The project will have impacts on the local environment but with proper implementation of the environment management plan and the environmental safeguards as stipulated by MoEF&CC and CECB, the negative impacts can be minimized largely.

**Kirandul Ordinary Stone Quarry Project by Prop. Shri.Jovins Pappachan** will take up various socio-economic development activities to have the positive impact on the surroundings. However, this project accelerates the pace of industrial development and growth of regional economy.

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