

1. INTRODUCTION

Red Ochre is a natural mineral pigment known to man from his historical past. In ancient times it had been used in colouring earthen-ware, house hold utensils and for decorative purposes.

It occurs in various shades and colours. Depending upon the colour, the ochres are called red ochre, yellow ochre, green earth, sienna, umber and various other names.

The project namely “Bilokalann Ochre Deposit Mine” having an area of 4.0 Ha at Khasra No.- 1211/4 near Village-Bilokalann, Tehsil- Shivpuri, District- Shivpuri, State-Madhya Pradesh belongs to Shree Sudama Bansal S/o Shree B. P. Bansal.

The Red Ochre mining project is under ‘category-B2’ as per EIA Notification dated 14th September 2006 and its subsequent amendments. Mining Plan sanctioned vide letter no. 13292-96/MP/G-3./N.K-02/2018, Bhopal dated 14/08/2018 under Rule no. - 42 of MP MMR, 1996 for lease period of 30 years only in favour of Shree Sudama Bansal.

The Environment Management Plan (EMP) consists of all mitigation measures to minimize adverse environmental impacts resulting from the activities of the project during operation. It also delineates the environmental monitoring plan for compliance of various environmental regulations. It also incorporates the steps to be taken in case of emergency such as accidents at the sites including fire.

The Environment Management Plan (EMP) is a site specific plan developed to ensure that the project is implemented in an environmental sustainable manner where all workers, understand the potential environmental risks arising from the project and take appropriate actions to properly manage that risk. EMP also ensures that the project implementation is carried out in accordance with the design by taking appropriate mitigation actions to reduce adverse environmental impacts during its life cycle. The plan outlines various activities that may adversely impact the environment and recommends corrective measures required.

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**2. MITIGATION MEASURES INCORPORATED INTO THE PROJECT TO
MEET ENVIRONMENTAL STANDARDS**

A. MEASURES FOR MINIMIZING ADVERSE EFFECT ON WATER REGIME

There is no water body in the mine lease area.

Although, mining of red ochre may not lead to noticeable change in quality of water.

Following water pollution control measures are proposed:

GARLAND DRAINAGE/EARTHEN MOUND

- It is an opencast semi-mechanized manual mine, in which the working pits will be open to sky, it is necessary that the rain water falling outside the edge limit of the working pit will not be allowed to enter into the pit.
- Mining activity will not be carried out during monsoon season to minimize water pollution.
- Retaining wall will be provided along the back filled pits to prevent escaping of fine particles alongwith rain water.
- During non-monsoon, due to intermittent rain, there is possibility of mixing of freshly loosened material. As a mitigative measure, toe wall will be constructed along the interburden dump areas.

(i) SURFACE WATER MANAGEMENT

The topography of the area will not be largely changed in view of the proposed concurrent reclamation. During the mining activity period, there is a possibility of mixing of freshly disturbed material with the rain water. To take care of such happenings, retaining walls will be provided along the backfilled pits and toe walls along the interburden dumps.

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(ii) GROUND WATER MANAGEMENT

The water table in hills is usually very deep and does not have any relevance with mining activities. However, concurrent restoration to original topography will not disturb the ground water.

B. AIR POLLUTION CONTROL MEASURES

The method of mining is semi mechanized open cast manual operation which involved controlled blasting and drilling. Hence, it is expected that the ambient air quality may slightly change significantly dust particles get generated during various mining activities when become air borne lead to increase in PM₁₀ & PM_{2.5} level in the ambient air. The major source of dust generation will be from transportation of material. However, following measures will be adopted to minimize fugitive dust emission:

- Dust masks will be provided to the workers engaged at dust generation points like excavations, loading and unloading points.
- The dust suppression measures like water spraying will be done at loading and unloading locations and on kachha roads.
- The transport vehicles will be covered by tarpaulin covers.
- Overloading of trucks will be prevented.
- Ambient Air quality monitoring will be done time to time at project site and near by villages.

C. NOISE POLLUTION CONTROL MEASURES

Mining shall be carried out semi-mechanized open cast manually with some conventional hand tools & controlled drilling & blasting, hence, negligible possibility of vibration. Mineral from

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pit head to road shall be transported manually. Excavator shall be deployed for the removal of overburden & interburden only in day. Therefore, some noise level shall be observed during mining operations and transportation of mineral by trucks.

The following mitigation measures will be adopted to keep the ambient noise levels well within limits:

- Minimum use of horns and speed limit of 10 kmph in the village area.
- Timely maintenance of vehicles and their silencers to minimize vibration and sound.
- Vehicles will be PUC checked.
- Phasing out of old and worn out vehicles.

3. LAND

Land degradation and ecological disturbances generally occurs in open cast mining. Open cast method of mining causes some land degradation and disturbs the ecology of the area. The environment management plan, emphasis has been laid on restoring the ecology of the area as much as possible. This has been made possible by planning the mine workings in the most systematic, safe and scientific manners. Since the mine is located in plain terrain, the impact on land form or physiography will undergo radical changes due to the open cast mining. Land area is likely to be degraded due to quarrying, dumping, roads, workshop, tailing pond/dam etc. In order to prevent the environmental degradation of leased mine area and its surroundings, the following measures shall be taken;

Mining is proposed by open cast semi-mechanized mining method with controlled blasting & drilling. A total 100 no. of plants will be planted. Minimum land will be used form in mining and allied activities. The planning for mining will be done systematically by bench formation to minimize the land degradation as per approved mine plan.

(i) POST MINING LAND USE

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The area will be restored after fillings the benches by topsoil and waste material and will be restored.

4. SOLID WASTE MANAGEMENT

TOP SOIL MANAGEMENT

There is 1.0 m lateritic top soil (The mature of soil is mixed with very low grade laterite which is not suitable as laterite extraction) and very less mine waste approx. 10 % of total production. OB will stack separately, and will be used for road building material. No toxic and hazardous elements are present in the waste material.

5. BIOLOGICAL ENVIRONMENT

(I). MEASURES TO CONTROL IMPACT ON FLORA

The area is basically plain and it is a fresh mine. Mining activity causes impact on flora due to land degradation, deforestation, etc, however as the mining is restricted to very small area there is no likelihood of any land degradation or deforestation being caused. Since there is no important species in core zone, no adverse impact on flora is anticipated.

(II). MEASURES TO CONTROL IMPACT ON FAUNA

Mining activity causes impact on fauna due to land degradation, deforestation, etc, however as the mining is restricted to very small area there is no likelihood of any land degradation or deforestation being caused. Negligible impact on fauna is anticipated.

6. AFFORESTATION PROGRAMME

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**“Bilokalan Ochre Deposit Mine” at Khasra No.- 1211/4 near
Bilokalan, Tehsil- Shivpuri, District- Shivpuri,
State-Madhya Pradesh**

EMP

The mine lease is spread over an area of 4.0 ha. Plantation will be carried out as per the guideline of CPCB to develop green belt around the lease area. The area (outside of the lease area) proposed to be covered under plantation. During the year, plantation shall be carried out with local trees. Though there will be negligible chances of adverse effect on vegetation but new plantation is proposed a number of 400 plants/year which suits to the local environmental conditions may be planted every year around crusher and lease boundary and proper protection will be given for survival of the plants.

BUDGETARY ARRANGEMENT FOR ENVIRONMENT MANAGEMENT

Afforestation programme shall be started with the commencement of mining operation with simultaneous clearing of land by spreading of clay lumps along 7.5 m barrier of lease boundary. 2.0m X 2.0m spacing with 0.6m depth have been suggested for sapling pits on which local species will be planted as the following -

TABLE NO.-1 : PROPOSED PLANTATION

Year	PROPOSED SITE	SPECIES	No. OF SAPLING
1 st	Along Barrier Zone	Seesam, Mango, Neem, Peepal, Bargad etc.	800
2 nd	Along Barrier Zone	Seesam, Mango, Neem, Peepal, Bargad etc.	800
3 rd	Along Barrier Zone	Seesam, Mango, Neem, Peepal, Bargad etc.	800
4 th	Along Barrier Zone	Seesam, Mango, Neem, Peepal, Bargad etc.	800
5 th	Along Barrier Zone	Seesam, Mango, Neem, Peepal, Bargad etc.	800


Total Rs. 145,000/- will be utilized annually for environment management like Plantation, Water, Sprinkling on transport road, Water sprinkling on stock yard etc. The details are given in table below:

Initially lessee proposes the following budget:

Rs 20,000/- will be spent on tree plantation and their post care management

Rs 10,000/- will be spent on tree guards, Protection covering of trees for safety

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OMPRAKASH YADAV
RQP/DGMMP/007/2013

The lessee will consult Forest Department & other allied departments for further investment for Plantation.

7. OCCUPATIONAL HEALTH AND SAFETY MEASURES

Occupational health and safety (OHS) is a cross-disciplinary area concerned with protecting the safety, health and welfare of people engaged in work or employment. The goal of all occupational health and safety programs is to provide safe work environment. Occupational Health & Safety measures result in improving the conditions under which workers are employed and work. To control and minimize the risks at work place, proponent has been framed Health, Safety and Environment Policy.

(i) SAFETY, HEALTH AND ENVIRONMENT POLICY

Safety of both men and materials is accorded maximum priority in the mine. An occupational health and safety policy has been framed with the following objectives.

- To improve working conditions and environment.
- To propagate safety measures and create safety consciousness among workmen, supervisors and officials.
- To train workmen as well as the supervisors in their respective fields of operations.
- To reduce the scope of accidents and to aim at accident free performance.
- To adopt measures for improvement in health standards.
- To ensure that no long term effects on health due to industrial environment take place.
- To ensure that all statutory provisions relating to safety are followed.

The occupational health hazards at mine site areas under:

- Exposure to dust
- Noise Exposure
- Physical Hazards

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These mainly impact on those working within the mine although health hazards can also impact on local communities.

(ii) IMPLEMENTATION OF OCCUPATIONAL HEALTH AND SAFETY MEASURES

Proponent will implement the following safety measures:

- To depute dedicated safety team.
- Inspection and maintenance of equipment's and accessories.
- Periodic health checkup.
- Removal of unsafe conditions and prevention of unsafe acts.
- Detailed analysis of each and every incident.
- To provide standard PPEs and ensure its uses.
- Periodic inspection by internal and external safety experts.
- Celebrations of various safety events for awareness.
- Medical facilities & first aid boxes in the mine premises.

(iii) DISASTER MANAGEMENT AND RISK ASSESSMENT

The mining will go up to the economical depth and thereafter backfilling will commence to restore the topography of the area. The mining faces shall be dressed properly because any hanging boulders/loose material may create fatal accidents to the laborers while working in the pit.

The area lies seismic zone III, therefore precautionary measures shall be adopted. Tin shaded wooden houses shall be constructed in place of cemented houses in and around the area & lessee shall provide the sufficient amount of funds for these activities. In the land slide prone

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zone area, fast growing soil binding species shall be planted & cemented bunds shall be made at the lower side so that minimum damage could be observed during land slide period.

Some of the aspects to be included in emergency plan are as follow:

- Organizational details including incident controller, site main controller, their duties & other key personnel.
- Emergency Control Centre
- Communication centers & persons involved, call signs & list of telephone numbers.
- Availability of special emergency equipment e.g. heavy lifting gear, bulldozers, trucks, special firefighting equipment.
- Details of voluntary organizations with names of organizers, telephone numbers, resources etc.
- Humanitarian arrangements e.g. transport evacuation centers, emergency feeding, treatment of injured, first aid, ambulances etc.

8. ENVIROMENTAL MONITORING PROGRAM

The project proponent shall set up an Environmental Management Committee (EMC) as laid down below and also proposes the Environmental Monitoring Plan for the regular monitoring of the population load. The EMC has the responsibility for liasoning with state and central governmental environmental authorities for enforcing environmental legislation, environmental protection, and control.

The duties of the EMC will include the following:

- Implementing the Environmental Management Plan.
- Environmental monitoring of the project site and the surrounding area.
- Developing the greenbelt.
- Ensuring that standards for pollution control are well maintained
- Ensuring water use is minimized.
- To ensure proper funding for implementing EMP.

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- Organizing meetings of the Environmental Management Committee.

The proponent will follow the standard methods for monitoring various environmental parameters i.e. air, water, noise, and soil through accredited laboratory and submit the compliance report as per EC conditions applicability.

TABLE NO.-2 : MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS

Particulars	Monitoring frequencies	Important Monitoring parameters
Ground water	Twice in a year	pH, SS, TDS, Iron, Cl, Hardness, Alkalinity, PO ₄
Ambient Air Quality	Twice in a year	PM ₁₀ , PM _{2.5} , SO ₂ & NO _x
Soil Analysis	Twice in a year	pH, Conductivity, SO ₄ , Nitrate, PO ₄ , Texture, Alkalinity
Noise	Twice in a year	Noise Level in dBA

9. SOCIO-ECONOMIC ENVIRONMENT

Social economic condition of area generally improves due to mining activity which create additional employment opportunity for local habitants. Socio economic status of local populace also improves by social activities undertaken by mine owners. Significant improvements occurs in the area towards education, medical facilities and cultural aspects. Plantation undertaken improves environmental conditions in the area and aesthetic beauty of the area.

(i) ECONOMIC REPERCUSSIONS OF CLOSURE OF MINE AND MANPOWER RETRENCHMENTS

However, the closure of mine will have grave repercussion on the expectations of society since the obvious advantages received will cease & the closure will directly affect their livelihood. Land owners will cease to get compensation in lieu of surface rights. The local habitant in general will not feel comfortable due to closure of mine.

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10. CONCEPTUAL MINE CLOSURE PLAN

The mining will commence from the top levels and advance towards lower levels. As the pit shall reach the maximum economical depth, backfilling will commence so that terraced fields will be formed. Reclamation will be undertaken in such a manner that original land use will be restored.