

**EXECUTIVE SUMMARY**

**INTRODUCTION**

Smt Gayatri Devi Bansal resident of village Jaitwara, Tehsil Raghurajnagar and District Satna of Madhya Pradesh was granted 9.47 ha. area at village Gandhigram, Tehsil Sihora, District-Jabalpur to mine Ochre, Laterite & iron ore by Govt. of Madhya Pradesh. The mining lease was sanctioned for 20years up to 20.05.2015.

The lessee has got lawful authority of mining in the lease area. The lease area has not been determined by the State Government &/or the area of part thereof has not been surrendered by the lessee. No restriction has been imposed as on date by any competent authority and no litigation has been imposed as on date by any competent authority and no litigation regarding cancellation or determination of lease area is pending in the court of law.

The mining plan was approved under 24(A) of MCR 1960 on 30.06.1995 vide letter No.M.P./Jabal/Ochre/Mining plan/R-24/1994-95. The mining scheme was later approved under 12(3) of MCDR 1988 on 29.08.2000 vide letter No.M.P./Jabal/ochre/Mining scheme-56/1999-2000. The mining scheme was also modified and approved vide letter No. M.P./Jabal/Ochre/Mining Scheme/Mod.-1/2002-03. The mining scheme was earlier approved under Rule-12(3) of MCDR 1998 for five years period w.e.f. 2000-01 to 2004-05. This mining scheme as such has been prepared incorporating details of 2 year of lapsed period of mining scheme i.e. 2005-06 and 2006-07 and further 3 years period.

This scheme of mining plan has been prepared under Rule-12 (3) of M.C.D.R 1988 and the guide lines applicable to 'B' category of mines has been followed.

**Location**

The mine lease area is located within the jurisdiction of Gandhigram village, Tehsil-Sihora, District Jabalpur(M.P). The mining lease area is a part of the Survey of India toposheet no. 64 A /3. Geographically the ML area falls under following co-ordinates

Latitude	N 23 <sup>0</sup> 21' 19" to 23 <sup>0</sup> 21' 40"
Longitude	E 80 <sup>0</sup> 01' 51" to 80 <sup>0</sup> 02' 09"

**PROJECT DESCRIPTION**

**Topography & Drainage**

The lease area is hilly having general slope towards east & south. The highest elevation of the lease area is 392m. A.M.S.L. in mid direction and the lowest elevation in 380 m A.M.S.L. in east & south direction. The lease area is drained by south westerly flowing non-perennial nallas confluenting in hiran river.

**Salient Features of Mining**

- Mining is proposed by other than fully mechanized opencast method.
- Estimated Mineable Reserves: Ochre- 4,67,331 t, Laterite- 6,98,335 t, Hard iron ore- 7,45,875 & Soft iron ore- 7,45,875 t.
- Maximum rate of production will be around 84,000 tonnes/annum.
- Anticipated life of mine is 50 years.
- A maximum bench height of 3.5 mtr would be maintained. The width of the bench will be in between 1.5-3.5.
- Blasting is proposed for heaving purpose.
- 0.42 Million cum of total waste will be generated during life of mine.
- Concurrent backfilling of solid waste will be carried out. The manner of disposal of waste will be partly manual and partly mechanical. The OB/waste will be loaded manually into the tipper and unloaded mechanically.
- All the mineral transportation from mine head to the destination will be done by trucks. Trucks will be hired by the consumers from local transporters of Jabalpur.
- About 100 people will be engaged as direct employment including managerial staff.

**DESCRIPTION OF THE ENVIRONMENT**

**Meteorology (Pre Monsoon 2008)**

Sl. No.	Parameters	Data
1	Maximum temperature (°C)	44.5
2	Minimum temperature (°C)	13.4
3	Maximum Relative Humidity (%)	94
4	Minimum Relative Humidity (%)	9
5	Total Rainfall (mm)	1.22
6	Predominant wind direction	NW

**Ambient Air Quality**

Seven locations of the study area are monitored for Ambient Air Quality, including two in lease area and 5 locations in buffer zone with due consideration to the wind direction and the distance from the site considering calculated coverage factors 'Ajk'. Pre-calibrated R.D. Samplers have been used for monitoring the existing AAQ status. The summary of Ambient Air Quality test results are given below.

**Analysis of baseline concentrations (Units: µg / m3)**

	SPM	RPM	SO2	NOX
Core Zone	185-241	42-77.5	7.9-15.7	8.8-23.1
NAAQ Standard for industrial area Annual Average / 24 Hrs	360/500	120/150	80/120	80/120
Buffer Zone	71 - 122	18 – 37.1	2.9 – 7.3	3.6 – 10.7
NAAQ Standard for residential area Annual Average / 24 Hrs	140/200	60/100	60/80	60/80

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### Noise Level

A preliminary survey was undertaken at 7 locations i.e. two in mine lease area and five locations in buffer zone during study period, to identify the major noise generating sources in the area. Summary of noise level data of different locations are given below.

### Noise Levels during Study Period [Units:dB(A)]

	N-1	N-2	N-3	N-4	N-5	N-6	N-7
L <sub>min</sub>	39.2	38.9	38.0	39.1	38.6	38.1	37.5
L <sub>Max</sub>	61.5	62.0	57.8	58.3	58.0	58.0	58.2
L <sub>d</sub>	55.6	55.9	53.7	54.4	54.0	53.8	53.2
Standard	75	75	55	55	55	55	55
L <sub>n</sub>	40.7	40.9	39.5	40.7	40.9	40.9	38.6
Standard	70	70	45	45	45	45	45
L <sub>min</sub>	Minimum Noise Level Recorded						
L <sub>Max</sub>	Maximum Noise Level Recorded						
L <sub>d</sub>	Day Equivalents						
L <sub>n</sub>	Night Equivalents						
L <sub>dn</sub>	Day-Night Equivalents						

The major noise generating sources are mining related activities, commercial activities, traffic and blasting. The ambient noise level in and around the existing mine area is well within the statutory limits.

### Traffic Density

The characteristics and volume of traffic in the buffer zone was studied during the monitoring period, on Rampur- Raipura NH-7 road. Summary of the traffic study is given below.

Type of Vehicle	Total traffic on Rampur - Raipura NH-7road (in 24 hrs)
HMV	2176
LMV	1088
2 & 3 Wheelers	2143
Total	5407

## WATER ENVIRONMENT

### Water Resources

#### Surface Water

There is no river, nalla or any surface water source within ML area. Besides a network of many seasonal nalla in the study area Heran River passess along NW as perennial water bodies of the study area towards NE direction. The existing seasonal nallahs of

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the study area only help to drain out rain water during monsoons. However, Karthai nallah joins in Heran River in the NW of study area respectively.

### **Ground Water**

The study area essentially comprises of weathered ores at shallow depth and hard ores comparatively at lower depth. In the study area ground water is available both under confined and un-confined conditions. The ground water table in the lease area 32m bgl. In the study area, the general water table in the hilly region ranges between 120m – 150m bgl. The water table on the hill tops is at quite a great depth, where as in plain area it varies between 6m to 16m bgl. Ground water potential of the study area is ranges between 1 to 5 l/s.

### **Water Quality**

Two surface water and five ground water samples were collected and tested to know the water quality of study area. Summary of the water quality test results are given below.

#### **Summary of Water Quality Test Results**

S. No.	Parameter	Unit	Surface Water	Ground Water	Desirable limits as per IS: 10500
1	pH	-	6.9 – 7.1	7.1 – 7.6	6.5 – 8.5
2	Total Dissolved Solids	mg/l	108 – 124	211 – 265	500
3	Total Hardness as CaCO <sub>3</sub>	mg/l	60 – 72	205 – 257	300
4	Chloride as Cl	mg/l	10 – 18	16 – 22	250
5	Fluoride as F	mg/l	0.1 – 0.3	0.15 – 0.55	1.0
6	Turbidity	NTU	46 - 65	2.0 – 15.0	5

Perusal of the above table shows that physio-chemical characteristic of the samples analyzed were well within the desirable limits of the prescribed drinking water standards IS:10500 except some higher concentration of Turbidity in surface water samples.

## **LAND ENVIRONMENT**

### **Land Use**

The entire lease area 9.47 ha. is under possession of Smt. Gayatri Devi Bansal (The Lessee). Land use of mining lease area and study area are given below.

### **Present Land use of ML area**

<b>S.No.</b>	<b>Category</b>	<b>Land Use (In Ha.)</b>
1	Area to be excavated	3.15
2	Overburden dump	1.25
3	Roads	0.10
4	Plantation	0.10
5	Others (Site Services)	0.005
6	(a)Undisturbed Area (b) Water Reservoir	4.765 -
<b>Total</b>		<b>9.47</b>

### **Land use in the Study area**

<b>Land use</b>	<b>Area (in ha)</b>	<b>Percentage (%)</b>
Forest land	88	1
Irrigated land	1607	19
Un irrigated land	5021	61
Culturable waste land	644	8
Area N/A for cultivation	903	11
<b>Total</b>	<b>8263</b>	<b>100</b>

### **Soil Quality**

Soil samples were collected from four locations from the core and buffer zone to evaluate the soil quality in the study area. All the samples are showing moderately fertile nature.

## **BIOLOGICAL ENVIRONMENT**

### **Floral**

The area has mixed forest, mostly spread over the plateau. Teak and Bamboo can be seen in this plateau. The observed flora of the study area is typically Dry Deciduous type. Saja, Dhao, Salai, Tendu and Khair are the common trees present in the study area. The forest density of the study area ranges between 0.3 and 0.4. It is observed that diversity of vegetation in the study area is not very high due to intense biotic pressure.

### **Fauna**

Faunal population did not show any special feature. Concentration of animals is sparse. Avi-faunal population was also not rich in the forest areas. There is no Schedule I animal

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in the ML area. Predominant wild life mammals of the study area include wild goat, rabbit, jackal, fox, etc. Several types of avi-fauna are found in the forests on the hill slopes, including egret, pigeon, dove, cuckoo, koel, owl, woodpecker, sparrow, mayna, etc.

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

#### **Impact on Ambient Air Quality**

From the proposed expansion activity removal, handling, transportation of ore and storage of wastes will causes an additional increase in the concentration of SPM in the atmosphere. Marginal emissions of Sulphur dioxide (SO<sub>2</sub>) and Oxides of Nitrogen (NOX) can be anticipated by diesel operated equipments and vehicles plying on haul roads. Based on ISC-AERMOD model the maximum predicted concentrations of SPM during pick operation of mining will be <249.9µg/m<sup>3</sup> within ML area and <122 µg/m<sup>3</sup> within study area.

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

S.No.	Dust Source	Control measure
1	Haul Road	-Compaction, gradation and drainage on both sides. -Proper maintenance. -Regular water spraying.
2	Truck Movement	-No overloading of trucks. -Trucks to be covered with tarpaulin while transporting ore. -Enforcing speed limit.
4	Mine pit	-Regular water sprinkling in working areas.
5.	Plantation	-Native species of the area proposed for the plantation. -Fast growing tree species are proposed for plantation on dumps and road sides.

#### **Impact on Noise Level**

Increase in vehicles for transportation and haulage due to increase in production will add some noise level in the present monitoring level of noise specially within the active working area. the anticipated noise level at ML boundary from nearest pit boundary will be less than 55 dB (A), which is less than the prescribed limits for industrial area. No additional noise can be anticipated due to proposed mining activities at nearest habitat (about 500m from ML boundary) of Gandhigram village.

#### **Control Measure of Noise Pollution**

Noise levels will be kept within acceptable limits by:

Impact on Water Environment Limiting of speed of haulage vehicles/tippers

- Restriction of blast hole drilling to only day time hours and usage of sharp drilling bits and delivery of compressed air at optimal pressure during drilling
- Controlled blasting techniques with sequential blasting to reduce noise level and blast induced ground vibrations.
- Use of low density explosives to have a heaving effect than an explosion
- Provision of earmuffs/ear plugs to workers in noise prone zones in the mine.

**Control Measure of Water Pollution**

- Total water requirement is 10 m<sup>3</sup>/day (9m<sup>3</sup>/day from Sump and 2m<sup>3</sup>/day from ground)
- There is no waste water generation from the mine, hence contamination of surface and ground water quality is not possible.
- Excavation for mining will be upto a maximum of 25 m bgl and mining will be carried out at a depth of 27m from surface. Hence the proposed mining will intersect the ground water table.
- Excavated pit will work as water harvesting pit

**Water Conservation Measure**

To conserve the water following measures are adopted :

- The excavated pit will be available for rain water infiltration
- Water sprinkler will be used for dust suppression

**Impact on Land**

Around 88% of the ML area will be used for mining and its related activities. The changed land use will be restored back through backfilling and afforestation to maintain proper land during regular mining activity and at the conceptual stage.

**Impact on Flora & Fauna**

The area is thinly vegetated and with no thick vegetation on the plateau top. Sparse growth of vegetation can be seen on the Kaymur plateau area. No wildlife are found in this area. The mining activity of the proposed project does not change the community structure of the vegetation.

**Impact on Socio-Economy**

This project provides the local populace with employment and business entrepreneurial opportunity. Unskilled manual labour will be employed from the local community and they also will have a big opportunity to enter into transport business. The local skilled labour will have additional opportunity to enter into automobile maintenance profession to cater to the needs of the transport trucks.

**ENVIRONMENTAL MANAGEMENT PLAN**

**Air Quality Management**

Drilling & blasting operations which generate maximum quantity of dust are intermittently operated and are restricted to only hard rock portions exposed. Water tankers with spraying arrangement will be used for regular water sprinkling on the haul roads to ensure effective dust suppression. Dust masks will be provided to the workers especially for the drillers and for the workers working in the loading operations.

**Waste Management**

It is estimated that the total quarry waste including soil generated would be around 0.42 million m<sup>3</sup> during the life of mine. The Overburden will be removed in two sages. The soil at the top will be removed first and transported by 10 T tippers for Stacking and later this soil stack shall be reused for spreading over the back filled portions with the overburden and mine wastes.

### **Afforestation**

The mined out areas will be backfilled and reclaimed with dense poly-culture plantation of the local species. Water reservoirs will be created in the abandoned mine pit that shall increase the water availability to surrounding area for longer periods of time. At the end of conceptual stage an area of 0.175 ha. land has been proposed for phased green belt plantation/afforestation. The species to be grown in the areas should be dust tolerant, fast growing and fruit yielding species so that a permanent green belt is created.

### **Socio-Economic Benefits**

- Mining will be done with the vision of leaving a positive impact on socio-economics of people living in the nearby villages.
- Mining operations in the subject area has positive impact by providing job opportunities. There is indirect employment in transportation of ore to destinations.
- Mining activities will benefit the local people due to provision of more infrastructure facilities by the local industry as mining industry boost up the local market.
- A first-aid centre to meet the basic medical needs of employees and surrounding villagers will be provided.

### **ENVIRONMENTAL MONITORING PROGRAMME**

Routine monitoring of all the environmental parameters viz. air, water, noise and soil as per the formulated program based on CPCB and MOEF guidelines every year in order to detect any changes from the baseline status. Monitoring program will be followed till the mining operations continue. For implementation of Environment Management Plan a small unit will be formed under the control of the Mines Manager. The job of this unit will be regular environmental monitoring, preparation and submission of environmental report, green belt development, etc.

### **CONCLUSION**

Based on the EIA study it is observed that there will be an increase in the dust pollution, which will be controlled by sprinkling of water and transportation of ore in closed trucks. There will be an insignificant impact on ambient environment and ecology due to the mining activities moreover the mining operation will lead to direct and indirect employment generation in the area. Monitoring program will be followed till the mining operations continue. Around Rs.8.0 lakhs and Rs 29.5 lakhs as capital and recurring budget for environmental protection have been formulated to achieve the environmental quality as desired. Hence, it can be summarized that the development of the mine will have a positive impact on the socio-economic of the area and lead to sustainable development of the region.