

## EXECUTIVE SUMMARY

### INTRODUCTION

Chapra bauxite & Laterite mine is situated in village Chapra, Tehsil - Bahoriband, District Katni of Madhya Pradesh State. The mining lease was earlier sanctioned for a period of 10 years w.e.f 20.06.1984 to 19.06.1994. The mine lease has deemed renewal between 20.06.1994 to 19.06.2014. The mining plan has been approved by IBM Nagpur vide letter no. MP/Katni/Bauxite/MPLN/R-12/07-08/Nagpur dated 14.02.2008 for the targeted production of 50,000 tonnes of bauxite per annum.

### Location

The mine lease area is located within the jurisdiction of Chapra, Tehsil - Bahoriband, District Katni of Madhya Pradesh State. Geographically the ML area falls under following co-ordinates:

|           |   |  |
|-----------|---|--|
| Latitude  | : | N 23 <sup>0</sup> 36' 14" to 23 <sup>0</sup> 36' 30" |
| Longitude | : | E 80 <sup>0</sup> 11' 04" to 80 <sup>0</sup> 11' 17" |

### PROJECT DESCRIPTION

#### Topography & Drainage

The mining lease area is undulating with general slope towards SW. The highest elevation of the lease area is towards north is 420 AMSL and the lowest elevation is 413 AMSL towards south west direction.

The main drainage of the area is through different seasonal water courses originating from north east and moving south west which ultimately confluences into Hiran nadi.

#### Salient Features of Mining

- Mining is proposed by manual method.
- Estimated Mineable Reserves
  - Bauxite : 3,65,762 tonnes
  - Laterite : 68,580 tonnes
- Maximum rate of production will be around 50,000 tonnes per annum.

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- Anticipated life of mine is 13 years.
- Drilling has been proposed with jack hammer or by hand hole.
- Blasting will be done with gun powder and safety fuse.
- Tippers will be used for loading and dumping of waste material and ore.
- Quantum of waste is expected to be around 15,000 tonnes per year
- The total man power will be around 76.

### DESCRIPTION OF THE ENVIRONMENT

Meteorology (Pre Monsoon 2008)

| Sl. No. | Parameters                                 | Data            |
|---------|--|-----------------|
| 1       | Maximum temperature ( $^{\circ}\text{C}$ ) | 43.2            |
| 2       | Minimum temperature ( $^{\circ}\text{C}$ ) | 16.0            |
| 3       | Maximum Relative Humidity (%)              | 91.0            |
| 4       | Minimum Relative Humidity (%)              | 3.0             |
| 5       | Total Rainfall (mm)                        | Nil             |
| 6       | Predominant wind direction                 | From South West |

#### Ambient Air Quality

The ambient air quality with respect to the study zone of 10 km radius around the mine site forms the baseline information. The various sources of air pollution in the region are dust rising from unpaved roads, domestic fuel burning and vehicular traffic.

The summary of Ambient Air Quality test results monitored during study period are given below.

| Name of sampling location                                    | SPM     | RPM     | SO <sub>2</sub> | NO <sub>X</sub> |
|--|---------|---------|-----------------|-----------------|
| Mine Lease Area  | 132.6   | 40.6    | 8.0             | 11.4            |
| Padwar   | 155.6   | 48.3    | 9.6             | 13.8            |
| Amoch  | 151.1   | 48.2    | 9.7             | 13.6            |
| Chapra   | 160.6   | 52.1    | 10.4            | 15.0            |
| Ghughari   | 123.1   | 39.6    | 7.8             | 11.0            |
| Nimas  | 133.6   | 40.9    | 8.1             | 11.5            |
| *NAAQ Standard for industrial area Annual Average / 24 Hrs   | 360/500 | 120/150 | 80/120          | 80/120          |
| **NAAQ Standard for residential area Annual Average / 24 Hrs | 140/200 | 60/100  | 60/80           | 60/80           |

### Noise Level

Noise level of study area was monitored at 6 locations. One in mine lease area and rest 5 locations were in buffer zone, 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)]

|                  | <b>N-1</b>                   | <b>N-2</b> | <b>N-3</b> | <b>N-4</b> | <b>N-5</b> | <b>N-6</b> |
|------------------|------------------------------|------------|------------|------------|------------|------------|
| L <sub>min</sub> | 37.0                         | 36.7       | 35.8       | 36.9       | 36.4       | 35.9       |
| L <sub>Max</sub> | 59.3                         | 59.8       | 55.6       | 56.1       | 55.8       | 55.8       |
| L <sub>d</sub>   | 53.4                         | 53.7       | 51.5       | 52.2       | 51.8       | 51.6       |
| Standard         | 75                           | 75         | 55         | 55         | 55         | 55         |
| L <sub>n</sub>   | 38.5                         | 38.7       | 37.3       | 38.5       | 38.7       | 38.7       |
| Standard         | 70                           | 70         | 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 is studied during the monitoring period on Katni - Chapra road. Summary of the traffic density is given below.

| Type of Vehicle | Total traffic on Katni - Chapra road (in 24 hrs) |
|-----------------|--|
| HMV             | 75   |
| LMV             | 40   |
| 2 & 3 Wheelers  | 120  |
| Total           | 235  |

Perusal of the above monitored data shows that the traffic load on Katni - Chapra road in a working day is 235.

## Water Environment

### Surface Water

There is no river or perennial nallah in the lease area. Seasonal water courses flow mainly towards south west. The lease area is undulating and as such rarely water accumulates within the pits. Due to unprecedented rains, if required pumping will be done.

### Ground Water

The study area essentially comprises of weathered fractured zone and forms poor aquifers. The water table is about 12m to 15m below the ground level 410 m R.L. The water table varies from 395 m to 398 m RL. Working will be expected to be done 15 m above water table i.e. 413 m RL by the end of 5<sup>th</sup> year of working

## Water Quality

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

| <b>S.No</b> | <b>Parameter</b>                    | <b>Ground Water</b> | <b>Desirable limits as per IS:10500</b> |
|-------------|-------------------------------------|---------------------|---|
| 1.          | pH                                  | 6.9 - 7.8           | 6.5 – 8.5                               |
| 2.          | Total Dissolved Solids              | 213 - 265           | 500                                     |
| 3.          | Total Hardness as CaCO <sub>3</sub> | 244 - 278           | 300                                     |
| 4.          | Chloride as Cl                      | 14 - 23             | 250                                     |
| 5.          | Flouride as F                       | 0.33 - 0.60         | 1.0                                     |
| 6.          | Turbidity                           | 2 – 4               | 5                                       |

Persual of the above table shows that physico-chemical characteristic of the samples analyzed were well within the desirable limits of the prescribed drinking water standards IS: 10500.

## Land Environment

### Land Use

The entire lease area 7.383 ha. It is a government waste land. Land use of mining lease area and study area are given below.

**Present Land use of ML area**

| S.No. | Category             | Land Use (In Ha.) |
|-------|----------------------|-------------------|
| 1     | Excavation           | 0.05              |
| 2     | Over burden dumps    | 0.03              |
| 3     | Storage for top soil | 0.02              |
| 4     | Others               | 0.20              |
| 5     | Undisturbed area     | 7.083             |
| Total |                      | 7.383             |

Village wise land use of the study area is studied based on Census 2001 data. Summary of study area land use is given below

**Land use in the study area**

| Land use                 | Area (in ha) | Percentage (%) |
|--------------------------|--------------|----------------|
| Forest land              | 5145         | 16             |
| Irrigated land           | 4498         | 14             |
| Un irrigated land        | 10774        | 35             |
| Culturable waste land    | 7270         | 23             |
| Area N/A for cultivation | 3713         | 12             |
| Total                    | 31400        | 100            |

**Soil Environment**

**Soil Quality**

Soil samples were collected from three locations, from buffer zone to evaluate the soil quality in the study area. Summary of the test results are given below

**Summary of soil quality test results**

| Sl. No. | Parameters                    | Results   |
|---------|-------------------------------|-----------|
| 1       | pH                            | 6.2-7.0   |
| 2       | Organic Carbon (%)            | 0.39-0.48 |
| 3       | Available Nitrogen (kg/ha)    | 202-258   |
| 4       | Available Phosphorous (kg/ha) | 25.8-34.2 |
| 5       | Available Potassium (kg/ha)   | 123-155   |

Perusal of the above table shows that all the samples are showing moderately fertile nature.

## Biological Environment

### Flora

The observed flora of the study area is typically Dry Deciduous type. Neem, Shisham, Babul, Saja, Dhao, Salai, Tendu and Khair are the common trees present in the study area.

### 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 in the ML area. Mongoose, Fox, Hare, Bat, squirrel, etc. are present within the study area.

## ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

### Impact on Ambient Air Quality

From the proposed mining activity removal, handling, transportation of ore and storage of wastes will cause an additional increase in the concentration of SPM in the atmosphere. Marginal emissions of Sulphur dioxide (SO<sub>2</sub>) and oxides of Nitrogen (NO<sub>X</sub>) 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 139.48 µg/m<sup>3</sup> within ML area and 162.50 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.<br>-Proper maintenance.<br>-Regular water spraying.                                      |
| 2     | Truck Movement | -No overloading of trucks.<br>-Trucks to be covered with tarpaulin while transporting ore.<br>-Enforcing speed limit.                       |
| 4     | Mine pit       | -Regular water sprinkling in working areas.   |
| 5.    | Plantation     | -Native species of the area proposed for the plantation.<br>-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. No additional noise can be anticipated due to proposed mining activities at nearest habitat (about 1400m from ML boundary) of Nimas village.

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

Noise levels will be kept within acceptable limits by:

- 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.

### **Impact on Water Environment**

- Total water requirement is 8 m<sup>3</sup>/day
- There is no waste water generation from the mine; hence contamination of surface and ground water quality is not possible.

### **Water Conservation Measure**

To conserve the water following measures are adopted:

- After life of mine the excavated pit will be afforested.
- Water sprinkler will be used for dust suppression
- Dry washing of mine machinery will reduce the water consumption

### **Impact on Land**

The present land use of the core-zone i.e. mining lease area is mostly broken waste land. There is no agriculture or forest cover. Afforestation has been done near the mine office outside pit limit. Hence every impact on land use will be positive in future by way of afforestation or water reservoir. Backfilling will be done in exhausted portion of the quarry.

In buffer zone no adverse impact is envisaged due to all mining activities being restricted to the core zone only. The intensity of mining is less, most of the area already broken, backfilling proposed & garland drain & bund prepared towards the sloping southern side denies any adverse impact in the buffer zone if any.

### **Impact on Flora & Fauna**

The area is thinly vegetated and with no thick vegetation in the study area. The growth of vegetation is sparsely distributed. The mining activity of the proposed project does not change the community structure of the flora & fauna.

### **Impact on Socio-Economy**

Since there is no village or human settlement within the core zone, therefore there would be no displacement of the human population.

The mining operations will substantially increase gross economic production and infrastructure facilities. Therefore, Socio economic prospects are likely to improve to some extent. Also increase in mining operations will result in some increase in direct and indirect employment and consequently the population in near by villages.

## **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**

Generation of waste will be around 15,000 tonnes per annum. There is no generation of sub-grade ore.

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.

No external dumping will be done in future. Simultaneously backfilling will be done in the excavated area which will be treated as internal dump only. The sides have been sloped to 28° and inactive sides have been vegetated.

### **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 in the study area for longer periods of time. During the Conceptual period an area of 1.253 ha land has been proposed for phased green belt plantation/afforestation. 7.383 ha land will be afforested at the post mining stage of the mine. 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**

The lessee provides social welfare activities in and around the lease area. The social welfare activities are planned in the following areas:-

- Medical assistance
- Primary Education
- Agriculture improvement
- Vocational Training and
- Assistance in utilizing government programs

### **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 called Environment Management Division will be formed under the control of the Mines Manager. The job of this division 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

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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.28 Lakhs and Rs 34 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.