

EXECUTIVE SUMMARY

INTRODUCTION

The M.P. State mining corporation limited is a public limited company wholly owned undertaking of the state of Madhya Pradesh registered under companies Act-1956. Profession and nature of business of company is mining, processing and trading of minerals.

The proposal of M.P. State mining corporation limited is for enhancement of production of bauxite from 0.125 MTPA to 0.5 MTPA of Chachandeeh bauxite mine.

Chachandeeh bauxite mine is situated in village chachandeeh, Tehsil pushparajgarh, Dist-Anuppur of M.P state.

Location

The mine lease area is located in Chachandeeh village, Pushparajgarh, Anuppur district of M.P state within following co-ordinates.

Latitude : N 22° 49' 49" to 22° 50' 57"
Longitude : E 81° 36' 46" to 81° 37' 53"

PROJECT DESCRIPTION

Topography

The topography of the applied area is peneplane. It is mostly situated on the top of the Garhi Dadar hillock in the form of plateau with slope at places. The highest elevation is about 1100 m AMSL. on the top of the plateau & the lowest elevation is about 1060m AMSL. The general slope of the area is towards west direction.

Drainage

The general slope as mentioned above is towards west direction. There are natural water courses seasonal in nature which drains the water of the applied area. They discharge mainly into pandri pani nalla situated in north and west side which discharges into samarar nadi at a distance of about 7 kms towards southwest direction. This ultimately discharges into narmada river which is situated at 12 kms distance from the applied area in southwest direction.

The water from the eastern escarp flows towards northern side and discharges into johila river situated at 5 kms from the applied area in northwest direction.

Salient Features of Mining

- Mining is proposed by semi-mechanized opencast method.
- Estimated Mineable Reserves: 2.11 million tonnes
- Maximum rate of production will be around 0.5 million tonnes/annum.

EIA/EMP for Chachandeeh Bauxite Mine of The M.P. State Mining Corporation Ltd.

- Anticipated life of mine is 19 years.
- A maximum bench height of 3.0 mtr would be maintained. The width of the bench will be 1.5 m.
- The ultimate pit slope will be 45°.
- Blasting will be done only in the harder pitches which cannot be directly excavated by excavator.
- Manual loading and mechanised unloading practice with Hydraulic tipper will be carried out. 10t tippers will be used for transportation of waste material and ore.
- Total quantum of waste is expected to be around 1,33,522 m³.
- Total man power requirement of Chachandeeh bauxite mine is around 560 for targeted annual production of 5,00,000 tonnes/annum.

DESCRIPTION OF THE ENVIRONMENT

Meteorology (Pre Monsoon 2008)

| Sl.No | Parameters | Data |
|-------|--------------------------------------|------|
| 1 | Hourly Maximum Temperature (°C) | 44.5 |
| 2 | Hourly Minimum Temperature (°C) | 13.4 |
| 3 | Hourly Maximum Relative Humidity (%) | 94 |
| 4 | Hourly Minimum Relative Humidity (%) | 9 |
| 5 | Predominant Wind Direction from | NW |
| 6 | Total Rainfall (mm) | 1.22 |

Ambient Air Quality

Two monitoring locations within mine lease area and six locations in buffer zone were selected 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 | SO ₂ | NO _x |
|---|----------------|----------------|-----------------|-----------------|
| 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 | 71-126 | 18-38.4 | 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 |

Noise Level

A preliminary survey was undertaken at 6 locations i.e. 2 locations in mine lease area and six 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 | N-8 |
|------------------------|-------------------------------------|-----------|-----------|-----------|-----------------------|------------------------------|-----------|-----------|
| Min | 39.2 | 38.9 | 38.0 | 39.1 | 38.6 | 38.1 | 37.5 | 38.1 |
| Max | 61.5 | 62.0 | 57.8 | 58.3 | 58.0 | 58.0 | 58.2 | 58.2 |
| L_d | 55.6 | 55.9 | 53.7 | 54.4 | 54.0 | 53.8 | 53.2 | 53.0 |
| Standard | 75 | 75 | 55 | 55 | 55 | 55 | 55 | 55 |
| L_n | 40.7 | 40.9 | 39.5 | 40.7 | 40.9 | 40.9 | 38.6 | 38.1 |
| Standard | 70 | 70 | 45 | 45 | 45 | 45 | 45 | 45 |
| L_{dn} | 54.5 | 54.7 | 52.7 | 53.5 | 53.2 | 53.0 | 58.0 | 58.0 |
| L_{Min} | Minimum Noise Level Recorded | | | | L_d | Day Equivalents | | |
| | | | | | L_n | Night Equivalents | | |
| L_{Max} | Maximum Noise Level Recorded | | | | L_{dn} | 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.

Vibration Study

To prevent the fly rock due to blasting in nearby area, controlled blasting be done. To prevent air blast caused by blasting, number of holes blasted will be less than 16 holes and over charging of holes will be avoided. Air blast is smoke/balloon of air caused by generation of dust due to momentum generated by blasting. Further following precautions will be taken to prevent adverse impact if any.

The following mitigating measures will be adopted to avoid ground vibrations.

- 1) Free face will be sufficiently cleared of any loose material before blasting.
- 2) Number of holes to be blasted at a time will be kept minimum to control the vibration and noise.
- 3) Mostly holes will be fired towards the free face.
- 4) Proper stemming of holes will be always carried out.
- 5) Blasting will be avoided during foggy weather and high wind velocity.
- 6) Over charging will be avoided. The maximum charge per delay will be kept within limit to minimize ground vibration.
- 7) A safe distance of about 500m from centre of blasting will be maintained.
- 8) During blasting other activities in the nearby area will be temporarily stopped.
- 9) Drilling parameters like spacing, burden, depth and diameter of hole will be properly designed and spacing/burden is always more than one.
- 10) Holes will be drilled at 10 degree inclination from vertical so more explosive energy is utilized in productive way as in vertical hole only 50% of energy is utilized in productive way.

Traffic Density

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The characteristics and volume of traffic in the buffer zone was studied during the monitoring period, along road joining Nonghati to Basaniha.

Traffic Density

| Vehicle | Total traffic (in 24 hrs) |
|----------------|---------------------------|
| HMV | 375 |
| LMV | 60 |
| 2 & 3 Wheelers | 38 |
| Total | 473 |

Water Environment

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 | - | 7.5-8.5 | 7.1-7.4 | 6.5 – 8.5 |
| 2 | Total Dissolved Solids | mg/l | 119-128 | 246-502 | 500 |
| 3 | Total Hardness as CaCO ₃ | mg/l | 45-56 | 138-300 | 300 |
| 4 | Chloride as Cl | mg/l | 15-20 | 38.4-45.1 | 250 |
| 5 | Iron as Fe | mg/l | 1.35-1.50 | 0.02 – 0.50 | 0.3 |
| 6 | Fluoride as F | mg/l | 0.1 – 0.3 | 0.22 – 0.29 | 1.0 |
| 7 | Turbidity | NTU | 21-32 | 1-5 | 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 Fe, TDS and Turbidity in few samples.

Land Environment

Land Use

The entire lease area 148.181 ha. is under possession of M.P state mining corporation Ltd. Present mining lease area is a non forest govt. revenue land of village Chachandeeh, Tehsil Pushprajgarh, district Anuppur, Madhya Pradesh.

Present Land use of ML area

| S.No | Land Use | Area (in ha.) |
|------|----------------------------|----------------|
| 1 | Area of Excavation | 2.60 |
| 2 | Agricultural land | 40 |
| 3 | OB dump | 0.25 |
| 4 | Roads/ Infrastructure | 0.60 |
| 5 | Workshop, Office etc | -- |
| 6 | Green belt / Afforestation | 0.20 |
| 7 | Others | 2.20 |
| 8 | Un-utilized area | 102.331 |
| | Total | 148.181 |

Land use in the Study area

| Land use | Area (in ha) | Percentage (%) |
|--------------------------|--------------|----------------|
| Forest land | 4211 | 13.80 |
| Irrigated land | 103 | 0.30 |
| Un irrigated land | 18018 | 59.10 |
| Culturable waste land | 3056 | 10.00 |
| Area N/A for cultivation | 5123 | 16.80 |
| Total | 30511 | 100.00 |

Soil Quality

Soil samples were collected from six 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

The study area has about 14% of forest cover. There is no National Park or Wild Life Sanctuary within 10 km radial distance of lease hold area.

Floral

In general Sejha, lendu and Bhirra, which thrive on loam, sandy loam & sandy soil respectively, are very conspicuous. The other common species to be found are Sal, sat, Katha, Bhelma, Tendu, Khamar, Sejhi, Saja, Harra, Mahua, Aonala, Achar, Haldu and Shisham. There are about forty trees in the lease area.

Fauna

Snail, white ant, read ant, cricket, black ant and toad etc have been noticed. The following birds are common in applied area viz owl, kite, parrot and Indian myna etc. No endemic, rare or endangered appecies have been noticed within the core zone. However an inevitable developmental activity may be undertaken with all the precautionary

measures of ecological sustainability e.g. controlled noise level, controlled air pollution and green belt development.

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 (SO₂) and Oxides of Nitrogen (NO_x) can be anticipated by diesel operated excavator, loading 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 <14.91µg/m³ within ML area and <1µg/m³ 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

Development of mining machinery and heavy duty vehicles 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 (i.e. at E950 & N550 grid) will be less than 59 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 Chachandeeh 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 88m³/day.
- There is no waste water generation from the mine, hence contamination of surface and ground water quality is not possible.
- Excavation for bauxite mining will be upto a maximum of 8 m bgl and it will not encounter with the ground water table
- Excavated pit will work as water harvesting pit

Water Conservation Measure

To conserve the water following measures are adopted :

- After 3 years of mining the excavated pit will be available for rain water infiltration
- Water sprinkler will be used for dust suppression
- Dry washing of mine machinery will reduce the water consumption

Impact on Land

Around 90% 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

A survey was done to have an overview of the eco-system of the core area. The biodiversity of vegetation in the area is not very high due to intense biotic pressure. The area is predominantly agro-system with poor irrigation facilities. There is no National park or wild life sanctuary with in 10 kms radius of the study area. The soil in the area is low to medium fertile with reference to its agriculture potential. There is no suitable habitat for occurrence ecologically important fauna in the area. No significant endangered species have been reported in the study area. The fauna mostly constitute domesticated animals etc. The mining activity of the proposed project does not change the community structure of the vegetation.

Impact on Socio-Economy

The lessee is a state Govt. undertaking and this project of mining has been planned to achieve the target of upliftment of socio-economic status of the tribals in the region. The human settlement in the region is mainly in form of isolated tolas/settlements comprising of few hutments. It is dominated by mainly schedule caste and tribes. Local people mainly depend on the agriculture/farming for subsistence living. The major cereal crops are Maize, Millet and Kodo. The economic status of the people in the region is backward and poor. Main economic activity is agriculture. Severe unemployment problem exists. Literacy rate is low. Standard of living is very poor. Several people will get employment in mines. In general, socio-economic environment will have positive impact due to the mining project in the area. In order to improve the socio-economic conditions of the people of the area, a

detailed programme for development of the area has been framed. The salient features of the programme are as follows.

- (i) A well-laid plan for employment of the local people has been prepared by giving priority to local villagers.
- (ii) Social welfare programme like provision of medical facilities educational facilities, water supply, recreational amenities for the employees as well as for nearby villagers.
- (iii) Local people will be taken into confidence in all activities to redress their grievances, if any, and to meet their aspirations.
- (iv) Agriculture land used in mining will be backfilled and leveled after carpeting top soil make suitable for agriculture.

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

Total anticipated generation of waste will be around 0.134 million tonnes. 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.

The soil and OB/mine waste will be simultaneously backfilled in the excavated quarry. The area has been suitably selected, as it will not interfere with mining activities in future.

No external dumping will be done. Simultaneous backfilling will be done in the excavated area.

Afforestation

Afforestation is a major thrust area in pollution control of mining. Afforestation is suitable for detecting, recognizing and reducing air pollution effects. Trees function as sinks of air pollutants, besides their bio-aesthetical values, owing to its large surface area. The green belt supplements oxygen to the atmosphere and combat air pollution effectively. It not only improves the aesthetic beauty and landscape resulting in harmonizing and amalgamating the physical structures of the mines with surrounding environment, but also acts as pollution sink as indicated above. Thus afforestation is of paramount

importance. It also checks soil erosion, make the ecosystem more complex and functionally stable and make the climate more conducive.

Following factors will be taken into account while selecting species for plantation:

- Fast growing plant species will be preferred.
- The plant will be of deep rooting system
- The plant will be perennially green to improve the aesthetic beauty of the area.
- The plant species will be adoptable to the local climatic condition.
- Native plant species will be planted.

Total area of plantation will be 108.181 and the total number of trees to be planted will be 2,70,453.

Socio-Economic Benefits

The mining will generate new employment opportunity which will have beneficial impact. The transportation facility and awareness in the region will improve considerably and socio-economic status of the region will definitely improve.

The expansion of chachandeeh bauxite mine will generate vast direct and indirect employment which will improve the local economy and will become a source of livelihood to the households of nearby villages namely chachandeeh, dhaddhi tola, garhi dadar, pathaiti, pipraha, dhangi sordid and many other villages which is close to the proposed site of mining. Hence the mining activity will contribute a lot to improve the living standards of the local people.

Expansion of this mine will also contribute for sustainable use of mineral resources as a raw material for manufacture of aluminium.

The lessee will provide social welfare activities in and around the lease area.

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 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. 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.