

## EXECUTIVE SUMMARY OF EIA

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### 1.1 INTRODUCTION

The purpose of EIA is to evaluate the potential environmental effects and is a planning tool for assessing the environmental concerns of the project at an early stage of project planning and design. EIA should be carried out as early as the project planning stage so that it can assure the project will be environmentally feasible. Detailed baseline data as per the CPCB guidelines has been collected within 10 km radius of the study area. The baseline data has been collected for pre project environmental status during December 2007- February 2008.

As per MoEF's EIA notification 2006 prior environmental clearance will be required for mining projects with increase in either lease area or production capacity beyond the threshold limit prescribed under schedule to the notification.

The future production scenario of the project is anticipated to be 0.60 MTY and projected target for next five years is also going to be above the sanctioned capacity. As such Environmental Clearance for enhanced production up to 0.60 MTY is required for the balance period of the mine life.

To meet the increased demand of coal in country the Behraband Underground project will increase its production to 0.6 MTY from its existing consented capacity of 0.4 MTY. Hence, EIA/ EMP of Behraband Underground project has been prepared for seeking environmental clearance from Central Government in terms of the MoEF's EIA notification 2006.

### 1.2 DESCRIPTION OF PROJECT

The project is classified as category "A" under the MoEF notification dated 14th September 2006 and involves mining of coal with an area of 770.36 Ha. Behraband mine Block is located in the eastern part of Sohagpur coalfield in the Anuppur district of Madhya Pradesh. The area is bounded between latitude  $23^{\circ} 17' 01''$  and  $23^{\circ} 18' 45''$  N and longitudes  $82^{\circ} 5' 25''$  and  $82^{\circ} 7' 8''$  E, in the survey of India, sheet no. 64 I/3 (RF 1:50000).

### 1.3 DESCRIPTION OF THE ENVIRONMENT

To assess the impact of mining operation on different components of environment of Behraband mine block, the study was carried out to generate baseline data w.r.t. air, water, noise and soil quality, land use pattern, hydrology, flora & fauna,

socio-economic aspects during the winter season( December 2007 to February 2008). The environmental status of the different monitored parameters is discussed briefly in the following paragraphs.

### **1.3.1 Physical Resources**

#### **Air Environment**

Air pollution parameters like Respirable Particulate Matters (RPM), Suspended Particulate Matters (SPM), Sulphur Dioxide (SO<sub>2</sub>), Nitrogen Oxides (NO<sub>x</sub>) and Carbon Monoxide (CO) were identified as related to the project activities for representing baseline status of ambient air quality within the study area. To assess the base line ambient quality six air quality monitoring locations were selected two in core and four in buffer zone area.

Air quality monitored data for the Behraband mine block reveals that the SPM values ranges from 115 to 387 µg/m<sup>3</sup>, RPM value varies from 54 to 188 µg/m<sup>3</sup>. Similarly SO<sub>2</sub> and NO<sub>x</sub> values are range from 15 to 35 µg/m<sup>3</sup> and 19 to 41 µg/m<sup>3</sup> respectively. All the values are within prescribed limit of National Ambient Air Quality Standard. The concentration of CO is found below the detectable limit.

#### **Meteorology (Climate)**

The area experiences a tropical climate with three distinct seasons and hot summer from March to June with occasional dust storms, a good monsoon season spreading from June to September, mild pleasant Winter between October and February characterize the climate.

#### **Topography and Drainage**

The area has a gently undulating topography with small ridges and shallow depressions. The western and northern part of the Block is rugged, consisting mounts of highly ferruginous sand stones. The average elevation of the area is about 550 m and the general slope is towards south and east.

#### **Drainage**

The area is drained by western flowing Kanai nala which discharges into Kewai river, a tributary of sone.

#### **Water Environment**

To assess the impact of mining on water quality eleven samples have been collected from different locations in January 2008. These comprise of six surface water samples. All the water samples have been collected and analyzed as per

standard method prescribed in APHA (1992) and compared with inland surface water quality (IS:2296, 1982) and CPCB Standard and drinking water quality (IS:10500, 1993).

### Surface Water

All the values of physico-chemical parameters were found to be well within the prescribed limits.

In general, the surface water quality within the study area is suitable for agriculture and other domestic requirements as also for sustainability of Aquatic life.

### Ground Water

In the case of ground water quality, the analytical result for 25 parameters are furnished. The data reveals that the pH values are in the range of 7.87 to 8.05.. Total dissolved solids are in the range of 448 to 456 mg/l. The total hardness were observed to be in the range of 226 to 248 mg/l. the values of chloride and fluoride are found in the range of 42 to 46 mg/l and 0.39 to 0.42 mg/l respectively.

All the parameters are well within the drinking water standards (IS:10500, 1993). The ground water quality within the study area of project site is satisfactory. The water is suitable for drinking, agriculture and other domestic purposes.

### Noise Environment

Noise level was measured at four locations in the human settlements around the proposed study site by using precision sound level meter. Detailed analysis of noise has revealed that there is no noticeable impact of noise in the surrounding environment. During day time, average values range from 46.4 to 68.3 and night time 38.25 to 62.4. The noise levels during both day time and night time were well within the corresponding threshold limit value, as prescribed by CPCB.

### Land Environment

The total area of the mining project is 770.13 Ha; and details thereof are tabulated as below:

| Sl.No. | Particulars       | Area (in ha.) |
|--------|-------------------|---------------|
| 1      | Agricultural land | 439.453       |
| 2      | Forest            | -             |
| 3      | Government Land   | 330.677       |
|        | <b>TOTAL</b>      | <b>770.13</b> |

The buffer zone includes the aforesaid core zone and area situated within 10 kms. radius from the periphery of the core zone.

The detailed land use map is prepared based on the toposheets and then supplemented by information collected from the Forest department, Revenue department and Mouza maps of the neighbouring villages.

The census data of 2001 has been collected and utilised for knowing the landuse pattern in the buffer zone. The summarised details are as follows:-

| Sl.No. | Land Use                           | Area (in ha.)   | % of total area |
|--------|------------------------------------|-----------------|-----------------|
| a      | Forest land                        | 7215.08         | 19.99           |
| b      | Irrigated agricultural land        | 299.57          | 0.83            |
| c      | Unirrigated agricultural land      | 14570.92        | 40.37           |
| d      | Cultivable Waste land              | 4760.72         | 13.19           |
| e      | Area not available for cultivation | 9247.14         | 25.62           |
|        | <b>TOTAL</b>                       | <b>36093.46</b> | <b>100.00</b>   |

The data reveals that, out of total study area of **36093.46** Ha. around 19.99 % is forest land, 41.20% is agricultural land, 13.19 % is cultivable waste land and 25.62 % is not available for cultivation.

### Soil Environment

Analysis of soil samples reveals that there is no wide variation in the natural material. Particle size analysis shows that the texture of the soil is of sandy loam to sandy clayey loam in nature. The bulk density was found to vary from 1.48 to 1.58 g/cm<sup>3</sup> showing compactness while moisture content ranged from 4.66 % to 6.38 %. All the samples showed moderate water holding capacity ranging from 26 % to 31.56 %. The soils are slightly acidic to basic (pH 6.2 to 8.32) and non-saline. Electrical conductivity measurement of the soil samples suggests that total soluble solid concentration is in the normal range. The values of EC ranged from 0.21 to 0.89  $\mu$ s/cm. The values of organic carbon of all studied samples were found in medium range.

### 1.3.2 Ecological Resources

In the buffer zone, the forest cover is 7215.08 Ha which is only 19.99%. The flora and fauna presented is based on the information available from South Shahdol and Korea forest divisions and discussions held with the local forest

officials upto grass root level regarding availability of flora and fauna in buffer zone of the project.

## FLORA

The forests of Shahdol division in the study area fall under sal and mixed forests type. The sal forests of the area are further classified as high level and low level moist deciduous forest and southern dry mixed deciduous forest. The top canopy comprised of sal (Shorea Robusta), Bahara(Terminalies balerica), Bijasal (Petrocarpus marsupium), Harra (Terminalies Chebula), Seja (Lagerstoemis parviflora), Mahua (Madhuca indica), Haldu (Adina cardofloia), Tendu (Diospyrs malanoxyton). The wild species Amaltas (Cassia fistula) and sagon (Tectona garndis) on the hillocks are true representative of the tropical dry deciduous forests. In the forest useful shrubs like fodder for animals, herbs of medicinal value, grass species for grazing are also found.

## FAUNA

Fauna are identified by forest deptt. officials adopting four methods viz; signs of faecal droppings, siting appearance of pug marks and signs of grazing/browsing. Inventory of animals, birds and reptiles is made in compartment history on prescribed format of Forest Department.

Wild life found in the buffer zone generally includes Hyaena (Hyaena hyaena) and Jackal (Canis aureus) among the Carnivora and Nilgai (Boselaphus tragocamelus) and hare (Lepus nigricollis) among the herbivora. Other animals found are Langus (Presbytis entellus) and Fox (Vulpes nengalensis).

Common varieties of birds of importance found in the area are Lowwa(Perdicula asiatica), Teetar (Francolinus Pondicerianus), Harial/common Green Pigeon (Treron phoenicoptera) and Fakhta/Spotted Dove (Streptopelia Chinensis). Other birds commonly found are Tota (Psittacula supatria), Bulbul (Pycnonotus cafer), Cattle egret (Bubulcus ibis), Brahminy myna (Sturnus pagodarum), Common king fisher (Alcedo atthis), Red wattled lapwing (Venellus indicus), White backed vultures (Gyps bengalensis) and blue jay (Coracias bengalensis).

Reptiles generally noticed are snakes, i.e. Cobra (Naja naja), Python (Python molurus), Rat Snake (Ptyas mucosus) etc. and monitor Lizard (Varanus sps.)

In the tanks and rivers, variety of fish is found. Commonly found species are Rohu (Labeo rohita), Vam(Mastocembelus armatus), Chital (Notopterus Chitala), Padhin (Waltage Atta), Catla (Catla Catla), Shanwar(Channa Marulies) Manguri (Clarias Batrachus), Singham (Heberos neuster fossilis), Keu (Anabas tertudineus) etc.

Among reptiles, Krait and Rat snakes are the commonest. List of flora & fauna collected from the District Forest Officer, Shahdol .

### 1.3.2 Socio-economic Environment

The Socio economic profile within 10 km. radius of the project is based on 2001 census report. Land use pattern and civic amenities details are based on 1991 census data.

The details of village wise demographic profile is summarised details are as follows :

| Development Parameters                      | Block/ | Total Study Area  |
|---|--------|-------------------|
| Population                                  |        | 159027<br>(100)   |
| Male (% of total population)                |        | 82668<br>(51.98)  |
| Female (% of total population)              |        | 76359<br>(48.02)  |
| Scheduled Caste<br>( % of total population) |        | 15706<br>(9.88)   |
| Scheduled Tribes (% of total population)    |        | 41605<br>(26.16)  |
| Others (% of total population)              |        | 101716<br>(63.96) |
| Literates (% of total population)           |        | 91320<br>(57.42)  |
| Illiterates (% of total population)         |        | 67707<br>(42.58)  |

Note : Figures in parenthesis are in percentage.

Out of 159027 persons, 51.98% are male and 48.02% are female. The Scheduled castes account for 9.88% of total population and the scheduled tribes for 26.16%. About 57.42% population is literate.

The data reveals that 24.66% of the population are main workers and 6.51% are marginal workers, the rest 68.83% are non-workers.

The data reveals that in the study area, 18.63% of main workers are cultivators supported by 5.61% agricultural labourers, 75.76% workers are engaged in household industries and other allied activities like live stock, forestry,

transportation & storage, communication, trade and commerce, manufacturing processing services and repairs etc. .

It has been found that there is a good network of infrastructural facilities of civic amenities within 10 km. radius of Behrabandh UG Project. The present level of availability of the civic amenities may be attributed to the existence of several coal mining projects in the neighbourhood.

Socio-economic study reveals that most of the families in this zone are getting benefits directly or indirectly from the mining industry. Overall the quality of life is below average to average. This project will provide a much-needed boost to improve the quality of life

#### **1.4 ALTERNATIVES**

Coal mining is site specific in nature and the location of the proposed mine is restricted to the geology and coal deposition of the area. Safety, economical and technical constraints determine the mining methods to be employed. Proposed site has the following features

- The site is devoid of any forest area.
- The site is in close proximity to the existing mines of Hasdeo area and as such existing transportation and infrastructure facilities enable easy exploitation of reserves.
- Economically viable in respect of investment and production.

Mechanised Board and Pillar is chosen as the principal method of mining in all the seams for the following advantages-

- Bulk production
- Higher percentage of extraction
- Higher standards of Safety
- Well accepted technology

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

The section summarizes the pollution potential of the proposed Underground mine, it's possible impact on the surrounding environment during pre-operational, and operational phases and the necessary management actions proposed for control and abatement of pollution.

### **1.5.1 Impact due to Air Pollution and its Management**

The dust pollution control measures suggested are more as preventive measures because the generation or emission is not through stacks but from various mining activities. The following measures are proposed:

- Effective water spraying arrangements in underground working places as well as at coal loading bunkers at pithead on surface.
- Effective water spraying at all coal transfer points.
- Enclosures on coal transfer points.
- Water spraying arrangement along coal transport route within the mine premises.
- Clearing off coal dust heaps on surface.
- Black topping of coal transport route.
- Watering of roads at regular intervals
- Plantation within the mine premises and also along coal transport route
- Proper periodic maintenance of vehicles, etc.
- Trucks carrying coal will be covered with tarpaulin.
- The underground workings of the mine will be well ventilated by adequate ventilation arrangements. The requirements and standards specified in this regard by Director General of Mines Safety (DGMS) would be adhered to.

### **1.5.2 Impact due to Water Pollution and its Management**

There will not be any impact on water environment. Water environment consists of basically three major components viz.

- Mine seepage and storm water
- Workshop effluents
- Domestic effluents.

The following mitigative measures are proposed to reduce the magnitude of the undesirable impacts:

The mine discharge water, which may contain coal fines, needs sedimentation, before discharge into the natural water course/ open land. The treatment facilities such as sedimentation, filtration and chlorination will be provided for mine discharge, so as to conform to the effluent standards as prescribed by Ministry of Environment & Forests.

The service building effluents are proposed to be collected by a sewerage system and treatment by means of septic tanks and soak pits is provided. There will not be any impact as the treated sewage is discharged after treatment.

Conventional method of treating domestic sewage - septic tanks and soak pit has been provided in the common colony of the project.

The industrial wastewater from workshops and vehicle washing will be recycled after treatment in oil and grease trap, sedimentation and filtration.

The excess mine water, which is proposed to be discharged into nearby tanks can be used by local villagers for agricultural purpose. This is also augment recharge of the ground water regime.

The present stage of ground water development within 10 km radius area from the edge of Behraband Project is 51.05%. Also the trend of the phreatic surface is not declining. Based on this information, this area is categorised as "**Safe**".

The impact of under ground mining on local ground water regime depends mainly on mine parameters, groundwater recharge and hydraulic parameters of the aquifer system. In underground mining, the aquifer lying in the immediate roof contributes major inflow and gets affected.

### **1.5.3 Impact due to Noise Pollution and its Management**

The main sources of noise at the proposed project are:

- Exhaust fan (Mine Ventilation Fans)
- Pit-head Coal handling arrangements
- Vehicular movement

The background noise levels would increase due to the above noise generating sources. The mitigation measures proposed are aimed at basically in ensuring that the exposure of human working in different environment is within the acceptable limits.

The following Noise Control Measures would be taken-up.

- The main mechanical ventilators (MV Fans) will be provided with evasee which dampens the noise
- In the high noise intensity working areas / zones earmuffs or earplugs or any other suitable personal protective equipment would be provided to the workmen.
- Regular noise level monitoring would be done periodically for taking corrective action, wherever required.

- Extensive plantation of green belt along the roads and around the offices to create a barrier or screen between the source and the receiver so that the noise is absorbed and the exposure level is minimized.

It is therefore expected with these measures the exposure level will be within the permissible limits.

#### **1.5.4 Impact on Land and its Management**

As mining is underground so there is no impact on land as such.

##### **Subsidence management**

- Care will be taken to divert the surface run off water by making garland drains which will be progressively provided over individual or set of panels commensurate with the panel extraction operations.
- The safety organization of the mine will regularly inspect the subsidence area in order to detect and take necessary steps.
- Subsidence zone will be fenced off during active mining operation to prevent inadvertent entry into the effected area.
- Subsidence will be periodically monitored and record maintained as per the DGMS stipulation.
- Surface cracks will be filled by sand or mud by dozing of the area
- Subsidence area after the mining operations is proposed to be planted with multi species native to the area.

##### **Plantation Program**

The plantation program will be designed within the natural constraints of the site and in particular species selection will reflect the flora known to be resistant to the local conditions. The species will be selected as per the recommendations of M.P.Rajya Van Vikas Nigam

Plants will be grown-

- Around fan house
- Along the road sides both in the project and mine complex and in the vacant lands of the residential area
- Within the mine premises and minetake area

SECL has engaged the services of M.P.Rajya Van Vikas Nigam to carry on the afforestation program over the mine take areas and in the residential colonies in all the areas of the company. Greenbelt was already developed in an area of 10

Ha. Greenbelt will be developed in phased manner after acquisition of remaining land.

### **1.5.5 Solid Waste and its Management**

The solid waste generated from this mine mainly consists of shale and sand stone and solid waste generated from colonies and service buildings. This material is dumped in the low-lying areas in the adjoining SECL lands and suitable plantation will be done over it. Hence, it can be said that there will not be any significant impact on the various environmental attributes due to the proposed mining activities.

### **1.5.6 Management of Socio-economic impacts**

The expanded project is expected to yield a positive impact on the socio-economic environment. It helps sustain the development of this area including further development of infrastructural facilities.

It is evident from the past history of SECL that it is putting on continuous efforts and instrumental in enhancing the living conditions of the mining and surrounding communities. Similarly the activities of the local population will bring in additional indirect employment opportunities and will also bring in the medical and communication facilities within their reach. A common central township is provided on non-coal bearing area with facilities like dispensary, schools, recreation clubs, well-lighted internal roads, drinking water supply, sewerage system and dustbins etc

### **1.5.6 ENVIRONMENTAL MONITORING PROGRAM**

Environmental Monitoring Programme has been prepared for the Behrabandh Underground Project for assessing the efficacy of implementation of Environment Management Plan and to take corrective measures in case of any degradation in the surrounding environment. Different activities involved in the proposed underground coal mining project, and their impact on various environmental attributes have been taken in to account while designing a detailed environmental monitoring programmed for the project

#### **Methodology of Monitoring Mechanism**

Implementation of EMP and periodic monitoring is proposed to be carried out at (a) project level and (b) Area level for project and allied activities like coal handling facilities, workshop, mining colony, etc.

Project level environmental protection measures like subsidence monitoring & management, dust suppression, treatment and recycling of waste water, plantation, and noise control in mine premises, house keeping, implementation of EMP and Environmental Clearance conditions will be monitored by the project authorities.

### **Post project monitoring plan**

To monitor the extent of environmental impact of the proposed project, it will be periodically monitor the various pollutant loads generated during mining operations. The detailed post project monitoring plan to be performed and linkages to impacts and mitigation measures identified in the environmental assessment has been prepared using G.S.R. 742(E), Standards for Coal Mines.

## **1.7 ADDITIONAL STUDIES**

### **1.7.1 Disaster Management and Risk Assessment**

Mining and allied activities are associated with several potential hazards to the employees. A worker in a mine should be able to work under conditions, which are adequately safe and healthy. At the same time the environmental conditions should be such as not to impair his working efficiency. This is possible only when there is adequate safety in underground mines. Hence mine safety is one of the most essential aspects of any working mine. Indeed safety of the mine and the employees is taken care of by the provisions of Mines Act 1952.

The Mine manager monitors the emergencies that may occur in underground mining operations and prepares an emergency plan to deal with mine fires, explosions and inundation etc. The emergency plan provide for mock rehearsals at regular intervals.

### **1.7.2 Social Impact Assessment**

The study area falls under Behraband mine Block is located in the eastern part of Sohagpur coalfield in the Anuppur district of Madhya Pradesh. The main occupation of the people of leasehold and adjoining area is cultivation. Besides agriculture, people are engaged in collection of fuel wood. Expansion of the coal mine in the area will create good indirect job prospects for the local people.

Quality of life (QOL) is one of the components to enumerate the status of socio-economic environment of a region. QOL has been determined for the study area in the core and buffer zones of project site. A number of socio-economic indicators

like food, clothing, shelter, sanitation, security, environmental pollution etc. have been considered for the study.

QOL index in most of the villages of the study area is lower than neutral as per the scale discussed in the methodology. Water supply, sanitation, recreation, employment, education are poor in the area. There is lack of basic facilities in most of the villages i.e Irregular power supply, lack of employment, non-availability of higher secondary education institution etc. So the overall quality of life is unsatisfactory. It is desirable that all the basic amenities should be provided and improved from the present level to improve the quality of life. SECL intends to provide basic amenities in neighbouring villages through its CD/ Welfare programme .

### **1.8 PROJECT BENEFITS**

Coal mining and agriculture is the basic sector of employment for the local people in this area. The project will lead to indirect employment opportunity. Employment is expected during civil construction period, in trade, garbage lifting, sanitation and other ancillary services, Employment in these sectors will be primarily temporary or contractual and involvement of unskilled labour will be more. A major part of this labour force will be mainly from local villagers who are expected to engage themselves both in agriculture and project activities. This will enhance their income and lead to overall economic growth of the area.

Industrial development and consequent economic development should lead to improvement of environment through better living and greater social awareness. On the other hand, expansion of the project is likely to have several benefits like improvement in Indirect employment generation and economic growth of the area, by way of improved infrastructure facilities and better socio-economic conditions.

### **1.9 ENVIRONMENTAL MANAGEMENT PLAN**

To mitigate the adverse impacts caused due to mining operation at Project and for overall scientific development of local habitat, the Environmental Management Plan (EMP) has been formulated. The EMP is based on the base line environmental status, mining methodology and environmental impact assessment. The EMP has prescribed environmental monitoring and implementation of environmental protection measures during and after mining operations.

### 1.9.1 Final Decommissioning plan

Mining being a temporary venture must be closed after exhaustion of the minerals being exploited. Closing a mine without adequate planning of post mining activities may induce severe negative impacts on environment in the post closure stage. Closing of mining operations involves numerous issues like reclamation and environmental protection, community issues, socio-economic consideration, planning for alternate use of available facilities, cost estimation and asset disposal.

#### Monitoring

The monitoring of the mine closure plan is an essential requirement for review of the efficacy of the mine closure plan and to take corrective actions. The monitoring consists of measuring the Air quality, Water Quality, preservation of landscape, aesthetic and other land use values as prescribed in the mine closure plan.

#### Submission of detailed Mine closure plan

The detailed mine de-commissioning plan will be made 5 years before the actual closure which will be submitted for approval. This plan will also provide the fund provision for the mine closure plan.

### 1.9.2 Fund provision for environment protection and management

In order to implement the environmental protection measures, the cost of for the same is given below:

|                             | Capital      |              | Revenue  |                |
|-----------------------------|--------------|--------------|----------|----------------|
|                             | Existing     | Proposed     | Existing | Proposed       |
| <b>A. ENV. cost</b>         |              |              |          |                |
| 1. Pollution control        | 15.00        | -            | -        | -              |
| 2. Pollution monitoring     |              |              |          |                |
| i) EMP preparation          | -            | 10.00        | -        | -              |
| ii) Peizometer construction | -            | 5.00         | -        | -              |
| iii) Flora & fauna study    | -            | -            | -        | 0.40(One time) |
| iv) Monitoring              | -            | -            | -        | 5.00           |
| 3. Green belt               | 2.50         | 12.50        | -        | -              |
| 4. Subsidence management    | -            | -            | -        | 2.50           |
| 5. Final mine closure       | -            | -            | -        | 1.14           |
| <b>Sub total A</b>          | <b>17.50</b> | <b>27.50</b> | <b>-</b> | <b>9.04</b>    |

|   |              |              |   |             |
|---|--------------|--------------|---|-------------|
| <b>B. Social cost</b>                     |              |              |   |             |
| 1. Occupational health                    | -            | -            | - | -           |
| 2. Community development work in villages | 5.00         | -            | - | -           |
| <b>Sub total B</b>                        | <b>5.00</b>  | -            | - | -           |
| <b>Total cost A+B</b>                     | <b>22.50</b> | <b>27.50</b> | - | <b>9.04</b> |

This expenditure is in-built in the cost of production.

### 1.10 CONCLUSION

The industrial and economic growth of India depends to a large extent on coal, which is the prime source of energy.

The industrial development and consequent economic development should lead to improvement of environment through better living and greater social awareness. As mining cannot be stopped unless we want to revert back to medieval ages, solution lies in advanced planning and environmental management and protection as a part and parcel of the mining system.

From the detailed analysis of the environmental impacts and the remedial measures suggested/ recommended, it can be concluded that no significant deterioration in the eco-system is likely to occur due to the project. On the other hand, expansion of the project is likely to have several benefits like improvement in employment generation and economic growth of the area, by way of improved infrastructure facilities and better socio-economic conditions.

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