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EXECUTIVE SUMMARY

OF

DRAFT

ENVIRONMENTAL IMPACT ASSESSMENT

AND

ENVIRONMENTAL MANAGEMENT PLAN

FOR

GUMA PAUSARI LIMESTONE MINE
(OPEN CAST)

IN

VILLAGE: GUMA & PAUSARI,
DISTRICT: BALODA BAZAR,
CHHATTISGARH

(EXTENT: 252.552 Ha, PRODUCTION : 2.6 MTPA)

JULY, 2016

(Issue 01, Rev. 0)

Consultants:



Estb. 1983

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EXECUTIVE SUMMARY

1.0 INTRODUCTION

1.1 General background

The proposed Guma Pausari Limestone Mine will have 2.6 million tonnes per annum (MTPA) production. The mine lease area is 252.552 Hectares. The project proponent is Monnet Ispat & Energy Ltd. The lease area is located in parts of Village Guma and Pausari, District Baloda Bazar, Chattisgarh. The estimated geological resource within the lease area is 117.24 million tonnes. Out of which the mineable reserve is 69.96 million tonnes and extractable reserve is 57.61 million tonnes. Mechanised opencast Mining is proposed in the lease. The average stripping ratio will be 1: 0.05 for the period of first 5 years.

1.2 Location and communication

The mine lease falls within the Survey of India Toposheet No.64-K/2. The mine lease is bound by Latitudes 21°35'10.9" to 21°36' 22.9" North and Longitudes 82°03'17.2" to 82°04' 33.2" East. SH-10 (Bhatapara to Baloda Bazar) is passing at a distance of 8.3 km in North east. SH-9 (Baloda Bazar to Kharora) is passing at 9.6 km in east. MG Road (Baloda Bazar to Hathbandh) is passing at 1.3 km in north. Nearest Railway Station is at Hathband on Raipur- Bilaspur section at a distance of 22 km (by road) west from project. Nearest airport is Raipur at a distance of 85 km (by road) from the area. The location of the project can be seen in **Fig 1.1** of Chapter 1.

2.0 PROJECT DESCRIPTION

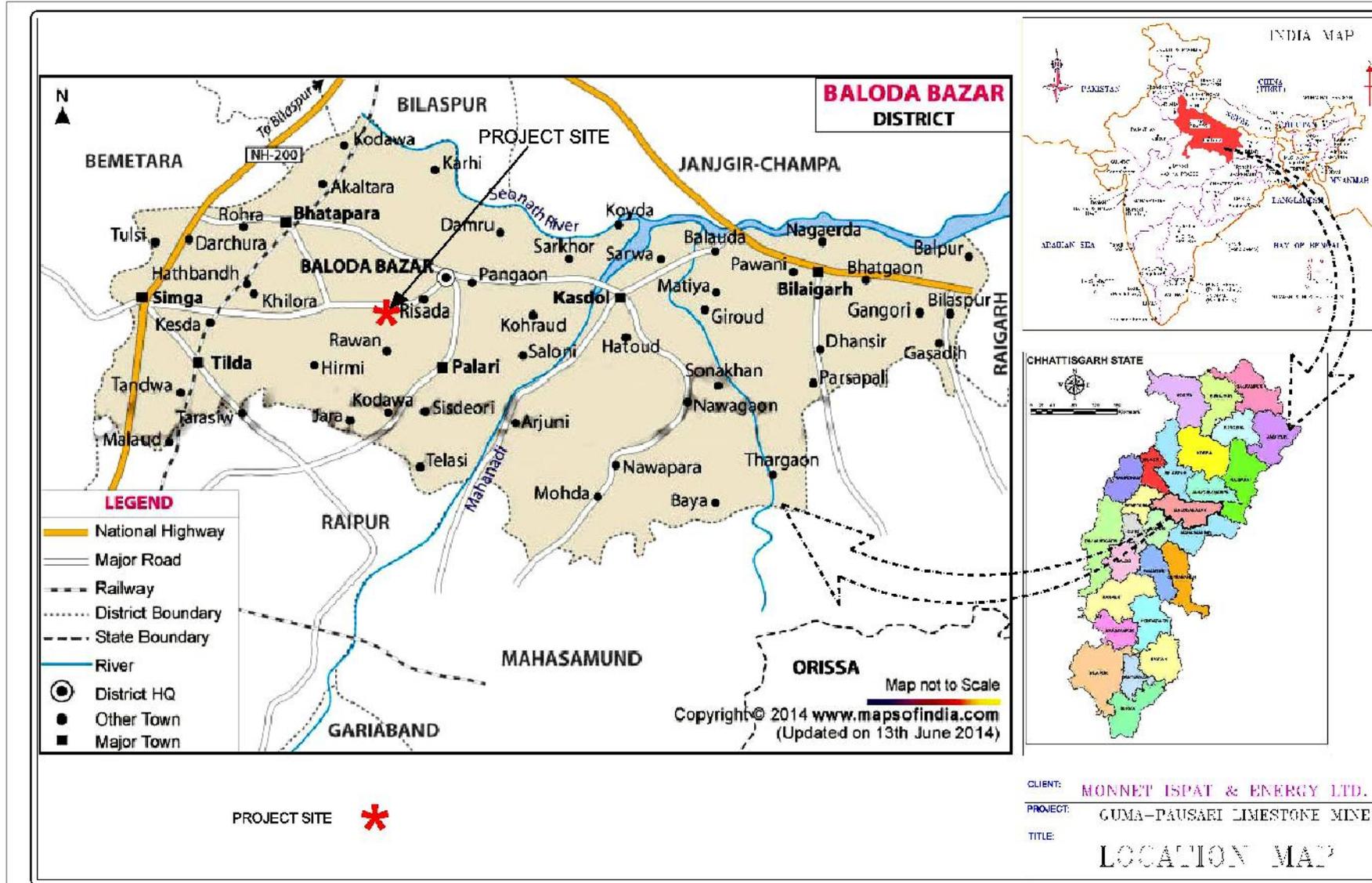
2.1 Geology

The lease area is a small part of the Chhattisgarh basin spanning around 36,000 sq.km. It comprises, limestone and shale of Chandi Formation of the Raipur Group. The general trend of the outcrops is in north east- south west direction and almost horizontal in disposition.

2.2 Reserve and grades

Reserves have been calculated borehole wise by influence method. It is based on the prospecting report of Directorate of Geology and Mining. Estimated mineable reserves from the block are 69.96 million tonnes out of which 57.61 million tonnes can be extracted. At the production rate of 2.6 million tonnes per year, anticipated life of mine shall be approx. 23 years. The average quality of limestone will have 44.05% of CaO, 10.75% of SiO₂, 5.16% of Al₂O₃, 1.54% of MgO and is suitable for cement manufacturing.

FIG 1: LOCATION MAP



2.3 Mining

The targeted production of limestone will be 2.6 million tonnes per annum. This will meet the requirement of raw material for cement plant.

Mining will be done by mechanized open-cast method. It will adopt a system of benches. Bench height will be 10 m. Hydraulic excavators will be deployed for progressing benches and for handling ore/ waste material. Drilling and blasting will be done in hard formations. Dumpers will be used for loading and dumping of waste material/ ore. Limestone will be blasted, handled and loaded by excavators into dumpers of 25 tonnes capacity.

Run of Mine (ROM) will be crushed up to 75 mm in a semi mobile crushing plant. It will then be transported to the proposed cement plant of the company by road or conveyor.

Ultimate pit limit is fixed and final pit slope angle will be 45°. Total excavated area will be 120.31 ha. Ultimate pit depth will be 30 m below ground level.

2.4 Blasting

High explosives of slurry cartridge of 83 mm shall be used as prime charge. Powder factor will be around 8 t/kg of explosives in the entire strata to be blasted. Optimization on powder factor will be achieved after gaining sufficient field experience. Explosives shall be stored in permanent magazine of 10 tonnes capacity.

2.5 Site services

The services such as office, stores, first aid center, canteen, etc. are proposed at the site. A work-shop with machine shop facility will also be provided. Power shall be supplied from Chhattisgarh State Electricity Board from their nearest sub-station. Total water requirement for the mine will be 132 cum/day. Ground water will be used for drinking purpose and mine sump water for the industrial use. The mining operation (production) will be 300 days in a year with two shifts per day.

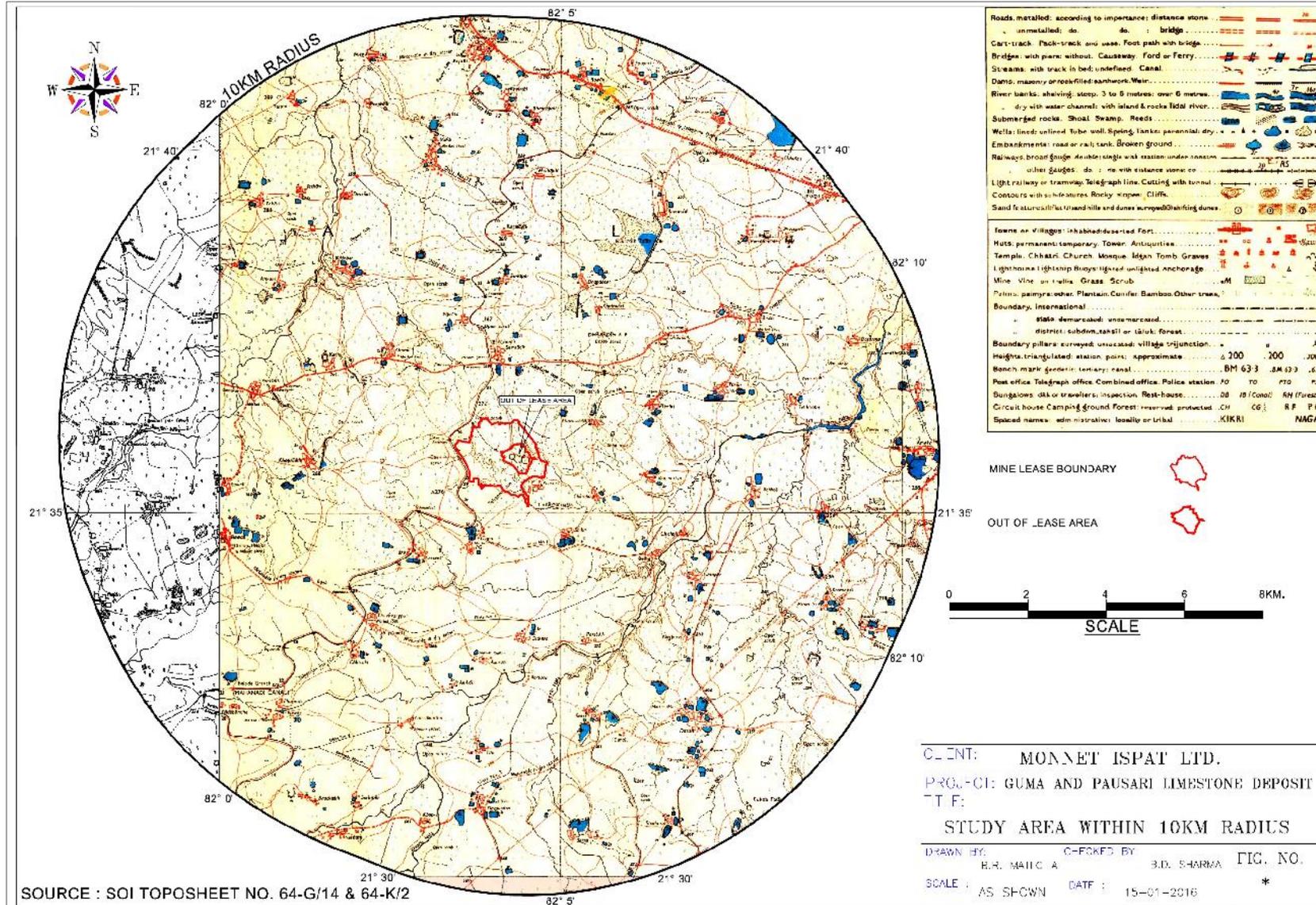
2.6 Manpower

Total employment potential including management and workers will be 89. Persons required will be of both technical and non-technical background.

3.0 PRESENT ENVIRONMENTAL SCENARIO

The mine lease area is the project area. It is referred to as “core zone”. The 10 km radius around the mine lease has been called “buffer zone”. Both core and buffer zone are called “study area”. The map of the study area can be seen in **Fig 3.1** of Chapter 3.

FIG 2 : MAP OF STUDY AREA



3.1 Topography & drainage

Core zone: The area represents plain land gently sloping southerly. The average elevation of land varies between 259 to 271 m above mean sea level. Baloda branch of Mahanadi Canal passes near the western boundary of the lease area. Several first order drains and one second order drain flows from the western and central part of the lease towards south and east. One water canal (distributory no. 9) is situated in North Central part of the lease area.

Buffer zone: The buffer zone represents mostly flat to mildly undulating topography with regional slope towards Khorsi Nala in the east and Banjari Nala in the west. The land elevation varies from 238 m in eastern portions of study area to 280 m in west. The study area is drained by Banjari Nala and its tributaries in the western parts and Khorsi Nala in the eastern part. Banjari Nala joins Jamuniya Nadi outside the study area in the north-northwest near village Khamariya. Jamuniya Nadi and Khorsi Nala both meet Sheonath River outside study area, which eventually meets Mahanadi.

3.2 Climate & micro-meteorology

The climate of the study area is tropical wet and dry. The nearest meteorological station of IMD from where data was available is at Raipur. The annual average rainfall during years 1993-2005 in the area was 1170.4 mm. The monsoon season spread over the months of June to September. The average maximum and minimum recorded temperatures were 41.8°C and 13.5°C, respectively. The average relative humidity was found to be 67% at 8:30 hrs and 51% at 17:30 hrs.

The micro-meteorology was monitored at project site from March to May 2016. Temperature was recorded between 21.8°C to 44°C and relative humidity between 5.2% to 85.5%. The wind speed varied between calm to 34.4 km/hr and the predominant wind direction was observed from SW with 25.54% of occurrences.

3.3 Ambient air quality

Ambient air quality was monitored at eight locations, one in the core and seven in the buffer zone. These are at villages Dhabadih (4.1 km, north east), Sarseni (2.1 km, south west), Pausari (0.3 km, south east), Khapradih (3.7 km, West), Khamariya (2.6 km, east), Bharuwadih (1.7 km, East) and Chandi (2.8 km, north west). Twenty four hour average PM₁₀ was found between 55.2 to 67.7 µg/m³, PM_{2.5} was found between 30.8 to 40.3 µg/m³, SO₂ from BDL to 15.7 µg/m³ and NO_x from 9.2 to 20.0 µg/m³. All the values were within the permissible standards at all the locations.

3.4 Water resources

There are several seasonal nalas originating in the study area and flowing into the Banjari Nala in west and Khorsi Nala in east. Village ponds and

reservoirs are the other surface water source in the study area. The groundwater in the area occurs in unconfined conditions within the secondary porosity of limestone which is highly fractured down to a depth of about 20 m below the ground. Ground Water Development in Raipur district is only 36.70%, while in Baloda Bazar Block (now a separate district) it is 45.06% and it falls under safe category.

Water samples were collected from seven surface water sources, namely, Mahanadi Canal near Guma Village, Ponds in villages Guma, Pausari, Champa, Achholi, Sakri and outside lease area near Pausari. Seven ground water samples were collected in villages Guma, Champa, Saiha, Bharuwadih, Semardih, Khapradih and Risda. Water is generally found to be potable with few parameters in some samples sporadically exceeding limits.

3.5 Noise and traffic density

Ambient noise level were studied at eight locations and was found to be between 50.60 and 56.10 dB(A) during day and 40.00 and 45.80 dB(A) during night. The higher levels were near areas of high activity and road traffic.

A traffic density survey was conducted at Baloda Bazar to Noapara road near Semardih village. The total number of vehicles on the road during the monitoring period were found to be 3751 of which 3605 were motorised. Traffic was more during day than night.

3.6 Ecology

25.071 Ha of revenue forest land is present in the mine lease area. There is one reserved forests in study area. The study area is a part of the Raipur Division and forest falls under Thorny Scrub Forest. Vegetation predominantly comprises of *Acacia nilotica*, *Acacia leucophloea*, *Butea monosperma*, *Ziziphus mauritiana*, *Madhuca indica*, *Syzygium cumini*, etc.

Due to scanty vegetation in the study area, the diversity of fauna is poor. There is only one Schedule-I animal, namely, *Python molurus* found in buffer zone. Fauna found in the buffer zone includes Jackal, fox, wild pig, mongoose, bat, hare, krait, cobra, owl, etc.

3.7 Soil quality and Land use pattern

Soil samples were collected from five locations i.e. two in core and three in buffer zone. The pH value varied from 6.5 to 7.7 while the electrical conductivity is normal. The soil samples are rich in organic carbon except in Guma and Champa. All the soil samples were deficient in potassium and iron.

Total Mine lease area is 252.552 Ha. Out of this, 202.063 Ha is private land, 25.418 Ha is non-forest government land and 25.071 Ha is revenue forest

land. The study area comprises 92 villages and towns in Baloda Bazar district. Land use pattern based on 2011 Census data shows that the agricultural land (net sown + current fallows + other fallows) account for a major portion i.e. 70.25% of land. This is followed by areas under non agricultural uses (13.85%), Permanent Pastures and Other Grazing Land (8.46%), culturable waste land (3.58%), forest land (0.31%), barren and uncultivable land (1.85%) and Land under miscellaneous tree, crops (1.69%).

3.8 Socio-economic condition

There are no human settlements within mine lease area. The total population within the 10 km radius study area is 1,69,243. There are 84,271 females and 84,972 males. Scheduled castes constitute 22.36% and Scheduled Tribes constitute 9.62% of the total population.

The overall literacy level is moderate (63.81%), out of which 36.45% are males and 27.36% are females. 31.62% of total population are main workers and only 12.17% of population is marginal workers. More than half of the total population (56.22%) are non workers.

3.9 Industries and Places of tourism/ religious/ historical interest

There is no National Park/ Sanctuary and places of tourism/ religious/ historical interest in 10 km radius. Five cement plants & fourteen limestone mines are present or proposed within 10 km radius.

4.0 ENVIRONMENTAL IMPACT ASSESSMENT AND MITIGATION

4.1 Topography and drainage

Impact: Mining, waste handling, infrastructure and transportation will affect the existing land surface over mine lease area. Physiography of the mine will change due to removal of top soil, overburden and excavation for mineral removal. Voids will be created after completion of mining at the end of life of mine. The upper benches where the limestone will get exhausted can be reclaimed by plantation and deeper pits will be used as water reservoirs. Due to excavation of pits, a part of the total rain water run off into the season streams will reduce.

Mitigation: The void after mining shall collect rain water and recharge ground water. Distributory no. 9 of Baloda branch of Mahanadi canal is passing through the northern middle of mine lease. It will not be disturbed. There is no proposal to disturb the first or second order drains flowing within the mine lease area. The three ponds in the centre of the area, surrounded by lease, will also not be disturbed. Safety barriers of 45 m will be left along all of them. There is no other perennial surface course of water or surface water body within the leasehold area.

4.2 Climate

Impact: The climatic conditions including temperature variations, wind direction and speed, rainfall and humidity are governed by regional factors and the monsoons. As such the mining and other allied activities will not influence the climate.

Mitigation: The operations are to be carried out in a limited area, vertically below the ground surface; as a result no climatological impacts are anticipated. Implementation of plantation in green belt, around mine workings and in virgin area will contribute in positive manner.

4.3 Air environment

Impact: The opencast mining operations are generally prone to generation of high levels of Suspended Particulate matter (SPM). Sulphur dioxide, Nitrogen oxide and Carbon monoxide generation is limited due to explosives based blasting and fuel oil consumption by diesel based equipment. SPM will be generated due to excavation, movement of dumpers and crushing activities. Control measures will be required to ensure air pollutants are within permissible limits.

Mitigation: The emission of dust will be restricted by the sprinkling of water. Water spraying system will be carried out at mine face, haul roads, near office, benches and wherever required. Vehicles will be maintained periodically for emission control. Tree plantation along the mine boundary, along the roads, canals and in unutilised virgin land will be carried out. Drills will be equipped with dust collectors. Suitable burden, spacing of blast hole, charge per delay and controlled blasting using short delay detonators shall be implemented. Speed limit of various types of vehicles will be specified and displayed at various locations.

4.4 Water environment

Impact: There will not be any discharge of industrial or domestic effluent from the proposed mine. Thus, no impact envisaged on the surface and ground water quality due to effluent. The canals passing through northern-central part of the mine lease will remain undisturbed. The village ponds are all outside the lease area and a buffer of plantation will be created to ensure that the mining activities do not impact them. None of the seasonal nalas will be disturbed. Mine workings will intersect ground water table. The seepage water will get accumulated in the mine pit. It will be of same quality as the ground water in that area. Therefore evacuation of mine pit water during mining will not be harmful if used for irrigation use. Some amount of oil/ grease is likely to be released from the maintenance workshop for equipment and vehicles washing which will be treated and reused.

Mitigation: A garland drain will be provided all along the pit periphery in order to protect the mine working from inflow of storm water. A surface water reservoir is proposed to store the run off water as well as water

pumped out from the mine. Settlement of suspended solids shall take place in the surface reservoir. The accumulated water would be consumed in mine operations. Water would be available for plantation and irrigation in surrounding areas, for recharge of ponds and use of villagers. Excess water will be released into natural streams. To prevent surface and ground water contamination by oil & grease, leak proof containers will be used for storage and transportation. Rain water harvesting structures shall be provided for the office building and similar structures wherefrom the roof top rain water can be directly recharged to the ground water through recharge well.

4.5 Noise, traffic density and ground vibration

Impact: During the proposed mining operation, noise pollution will take place due to machines, vehicles and blasting. Vibration due to blasting can cause damage to nearby structure if safeguards are ignored. There will be increased traffic on public roads due to the movement of the manpower and limestone bearing trucks.

Mitigation: To minimise noise levels, extensive plantation will be done. Periodic maintenance of machinery and vehicles will be carried out. Silencers will be installed on machines. Imposition of speed limit will be there on HEMM near residential areas. The exposure time of workers will be reduced and ear muffs will be provided to them.

4.6 Ecology

Impact: Ecological impacts from open cast mining are generally due to generation of air and water pollutants and deforestation. 25.071 Ha of revenue forest land is present in the mine lease area. Ecological impacts from open cast mining result in loss of vegetation by excavation and dumping. This will affect the species for which such vegetation was the host. Migration of animals to neighboring areas due to noise, vibrations, lights and habitat loss will occur. However, due to low faunal density and variety, the impact will be low.

Mitigation: The precautionary measures taken for control and management of ecology will include construction of boundary or fence along the mine perimeter. The roads leading to and from the mine shall be having boards with caution warning. Drivers shall be sensitized not to hit stray animals on the road. Emissions from the mines shall always be kept within the norms. Care shall be taken that no food or degradable waste is openly disposed. The total proposed area for green belt will be around 98.43 ha. It has been proposed to create and maintain a green belt around the mine. To fulfill the requirements of plants for afforestation, a nursery of native plants shall be established at the site.

4.7 Land Environment

Impact: Land degradation is inevitable during mining, particularly, in open cast mines. The original soil ecosystem and structure are affected within the

core zone. In the mine lease, land is nearly flat. Out of 252.552 ha lease area, 120.31 ha area will be excavated for limestone by end of life of mine. 8.1 ha would be used for soil storage and 4.83 ha for OB dump/ sub grade stacking. Mineral storage would be over 0.7 ha.

Mitigation: The maximum depth of the proposed mine pit will be 30 m at end of life of mine and will be used as water reservoir. It will serve as a rain water harvesting structure. Neighbouring villages can also use the water through a safe access point. Green belt & afforestation is proposed over 98.43 ha area, which will act as a buffer between the mine and surroundings.

4.8 Solid waste

Impact: Five types of solid waste are likely to be generated through mining activities which are overburden (both topsoil and waste), oil & sludge from oil-water separator, sludge created by mine water in settling pond, sludge from domestic waste water treatment facilities and municipal solid waste. 2.3 million cum overburden will be generated from the mine during its entire life.

Mitigation: Topsoil generated during mining will be temporarily stored and utilized in plantation purpose. There shall be 3 soil and 1 waste dump/ subgrade stack. Area of soil dumps shall be 8.1 ha and waste dump/ subgrade stack shall be 4.83 ha. The waste dump will be effectively stabilised by carrying out afforestation. The oil from oil-water separator will be sold to authorised recyclers while sludge will be disposed in impervious pit. Sludge from domestic waste water treatment facilities will be used as manure. Municipal solid waste will be segregated. The organic component will be composted and used for plantation manure, recyclable sold and balance disposed in designated area.

4.9 Socio-economics

Impact: There is no habitation within mine lease area, hence, there is no displacement or resettlement of population. There will be requirement of 252.552 hectare land for mining. There will be land losers, who will have to be rehabilitated as per the Model R&R policy of Govt. of Chhattisgarh. The employment potential of the mine shall be for 89 persons. Activities under Corporate Social Responsibility will aid in improvement of surrounding areas.

Mitigation: As part of CSR various activities will be carried out such as strengthening of approach roads, improvement of common structures like schools, health centre, community centre, panchayat bhawan, temples, ponds, etc. This will benefit the local population. There will be overall positive effect on social life of the local people as they will get direct and indirect job opportunities in mine and related activities. Employment will be provided to land losers according to qualification and capability. Adequate training facilities shall be created to create an industry ready workforce from

the eligible local population. Capacity building activities will be carried out. The Model R&R policy of Govt. of Chhattisgarh will be followed.

4.10 Occupational health

The medical facilities shall be provided for all the manpower of the mine. All workers shall be sent for regular health check up for occupational diseases like Silicosis, Pneumoconiosis, etc., which are prevalent in mining industry. Tests like optometric, blood tests, chest X-rays, sputum test, audiometric test, lung test, cardio-vascular, etc. will be carried out periodically as per the DGMS norms.

5.0 ANALYSIS OF ALTERNATIVE

Mining industry is a site specific. Mineral has to be mined at the place where it exists in economically feasible quantity and quality. The mine is captive for the proposed cement plant of the company since it is having cement grade limestone. Opencast mining method is selected in view of workable thickness and favourable overburden to limestone ratio. Conventional mining technology of drilling, blasting, loading and transportation will be followed.

6.0 ENVIRONMENTAL CONTROL AND MONITORING ORGANIZATION

The management of the company will form an environmental cell for the proposed mines and the cement plant. The responsibility of environmental compliance of mines shall rest with the Project manager (Mines) duly supported by various engineers such as environmental, occupational health & safety, horticulturists, etc.

The total investment on environmental improvement works is envisaged as Rs. 2.15 crores while the recurring expenditure during the stage of production is envisaged as Rs. 1.2 crore per year. Total investment in the project is Rs. 135 Crores approximately.

7.0 DISASTER MANAGEMENT PLAN

Natural/ industrial disasters likely to be encountered during the mining operation are:

- i. Inundation i.e. filling of the mine pit due to excessive rains.
- ii. Disaster due to failure of mine pit slope
- iii. Disaster due to failure of waste dump
- iv. Possible dangers due to storage of explosives in the magazine

No high risk accidents like landslides, subsidence, flood, etc. have been anticipated. All statutory precautions shall be taken for quick evacuation as per the Mines Act 1952, the Mines Rules 1955, Rule of MMR- 1961 and the Rules of MCDR-1988. A team for dealing with emergency shall be in place with defined roles and responsibilities.

8.0 PROJECT BENEFITS

The mine will create direct employment for skilled as well as semi-skilled staff directly or indirectly. There exists an opportunity for a good number of indirect employment once mining operations begin in the area. The general social development of the area shall be due to the improvements in infrastructure and communication system. The company shall undertake various activities under Corporate Social responsibility (CSR) to improve the physical infrastructure (drinking water supply, sanitation, roads, deepening ponds, making new ponds, etc.) and social infrastructure (schools, health care, communication, etc.). The company will undertake social welfare activities such as supporting Youth Groups, sports, womens self-help groups, training on income generation activities, capacity building work, apprentice raining, exposure visit, financial assistance for social welfare, etc. The CSR budget will be as per the Companies Act 2013 wherein the company shall ensure that it spends, in every financial year, at least two percent of the average net profits of the company made during the three immediately preceding financial years in this project.

9.0 DISCLOSURE OF CONSULTANTS ENGAGED

The consultants engaged for the preparation of the EIA/EMP of the project are Min Mec Consultancy Pvt. Ltd. Company. It was registered in July 1983 with the Registrar of Companies, Delhi & Haryana, India. In 1994, Min Mec established a modern R&D Laboratory. Min Mec is ISO 9001: 2008 certified under ANZ-JAS. In June 2006, the laboratory received accreditation from NABL (certificate no. T-1157), which has been renewed as per procedure since. In 2012, lab has been accredited under Environment Protection Act (EPA) by Ministry of Environment & Forests, Government of India (SI. No. 97). Min Mec has prepared the EIA/EMP based on the permission granted from Delhi High Court vide LPA 110/2014 and CM No. 2175/2014 (stay).