

EXECUTIVE SUMMARY

For

Rajapur Iron Ore Mine

Of Smt. K.M. Parvathamma, Ballari at ML.No. 2514, Rajapur Village,
Sandur Taluk, Ballery District, Karnataka, India

(43000 TPA-24.82 Ha. Iron Ore Production Capacity)

By

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1.1 Introduction

The Mining lease area over Extent: 61.33 Acres. (24.82 Ha) in that 18.22 Ha Forest Land & 6.6 Ha Government Waste Land. at M.L. No.2514. Other than fully mechanized open cast method with Drilling Blasting Mining is followed. It has been proposed to produce average 43000 tons per year (128666 tons in five years) of iron ore. The nearest habitation is Rajapura is located at a distance of 2.8km due NE from the lease area. The ore reef will be blasted, handled and loaded by excavators into tippers of 10-ton capacity and transported to the crushing / screening plant to produce salable fraction. (-40+10mm & -10mm). The sized ore is then loaded into buyer's trucks of 16 tons for further movement. Haulage road will be maintained with proper alignment/side bunds with an average gradient of 1:16. The area falls in Geological Survey of India Topo Sheet No. D43E12 & D43K9.

First mining plan was approved on 2.11.1992 for a period 1992-93 to 1996-97. Mining plan was approved on 26.02.1998 for a period of 5 years from 1997-98 to 2002-2003. As there was no forest clearance mine was not working later the mining plan was reconsidered from 2000-01 to 2004-05. Mining Scheme for the period 2005-2010 was approved by IBM vide letter No.MS/BLR/Fe-55-SZ date 08.11.2005 for the extent of 31.167 Ha. Then modified Scheme of Mining for the above period (2005-2010) modified under Rule 10(1) of MCDR for area extent 24.91Ha was approved by IBM vide letter No. Ms/BLR/Fe55-Sz dated 18.07.2006. Mining Scheme for the period 2010-2015 prepared and submitted IBM on 23.09.2011. On receipt of SOM submitted by the lessee IBM has advised the lessee to obtain the clearance letter along with duly certified lease sketch of ML area from DMG, Bangalore and resubmit the SOM vide IBM letter No. 279/313/92/BNG/1179 dated 5.5.2015.

Letter of IBM approval letter of previous scheme vide letter no. 279/313/92/BNG/1179 Dated: 05.05.2015.

The Force NOC vide letter No; 4-KRC 1049/2015-BAN/641 dated 18.06.2019.

The proposal was Granted ToR in SEAC meeting held on 22.12.2021 at agenda no.271, amendment to TOR proposal. Based on the recommendation of SEAC, Committee Members has recommended the proposal for applying in Form 2 in EC portal with EIA/EMP report with fresh baseline data. The EIA/EMP report for a Max Production of 43000TPA should include the standard conditions of TOR and other information as mentioned in above

1.2 Project Description

Project Location

The lease area is located in Rajapura Village, Sandur Taluk, Bellary District of Karnataka. over an Extent of 61.33 Acres. (24.82 Ha) as per CEC and 24.82Ha as per Lease Deed. 18.22 Ha falls in the Forest land and remaining 6.6 Ha falls in the khasra no. 6, 7 and 9 of Rajapura Village, Sandur Taluka, Bellary District.

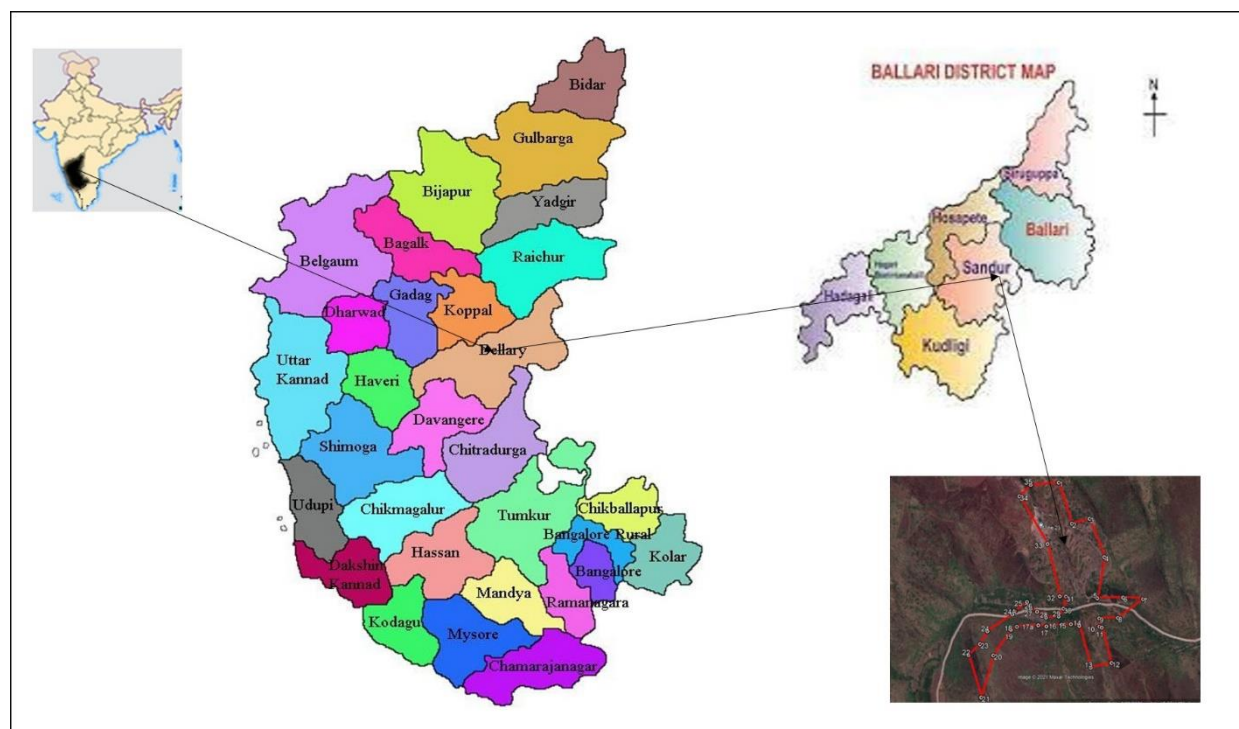


FIGURE -1 SHOWING THE LOCATION OF THE PROJECT SITE

Rajapura Iron Ore Mine ML No.2514 spread over an area of over an Extent of 61.33 Acres.(24.82 Ha) as per CEC and 24.82Ha as per Lease Deed. The mine has about 35,72,010 Tonnes of minable reserves which are with proposed production of 43,000TPA.

The mining operations of Rajapura Iron Ore Mine are fully mechanized open cast that involves drilling, blasting, excavation, loading and hauling. The operations are conducted using HEMM equipment like hydraulic drills, hydraulic excavators, wheel loaders and dumpers/tippers.

The salient features of the Rajapura Iron Ore Mine are given in **Table 1**.

TABLE -ERROR! NO TEXT OF SPECIFIED STYLE IN DOCUMENT.-1 SALIENT FEATURES OF RAJAPURA IRON ORE MINE

Name of the mine	Rajapura Iron Ore Mine (ML No. 2514)
Total Area	24.82 Ha.
Area in Forestland	18.22 Ha
Area in Non-Forest Land	6.6 Ha

Production Capacity	43000 TPA (As per approved Mining Plan)
Lat/long	Latitude : 15° 1'23.68"N Longitude : 76°39'48.34"E
Topo sheet No	D43E12 & D43K9
Date of Grant of Lease	21-09-1953
Period/Expiry Date	Valid up to 21.09.2023
Existence of Public Road/Railway Line, if any, nearby and approximate distance	Road : Bellary Hiriyur Road NH 150A about 20Kms (Aerial Distance) Bellary-Bommaghatta Road 1.8km (Aerial Distance) Railway line- Ranjitpura 7 Kms
Postal Address	Smt. K.M. Parvathamma 18/35, IInd Link road, Parvathinagar, Bellary-583103 Ph: +91-9448291575/ 08392-266385
District	Ballari
State	Karnataka
Type of mine	Open cast mine
Method of mining	Fully mechanized open cast method
Mineable reserves	43,04,358 Tonnes of Iron ore as per approved mining plan
Expected life of mine	2 nd renewal valid up to 21 September 2023 (as per lease deed)
Ore to Waste ratio	1: 0.98(Plan Period)
Average no. of working days	330
Number of shifts	One
Bench height & width	8 m
Top and Bottom Bench	880 mRL and 675mRL
Present working benches	735 mRL to 687mRL (Third Year)
Waste (Plan Period)	1,26,190 TPA
Ultimate pit slope	Not more than 45 degrees
Estimated Power requirement & source	500 units/day , Source - DG sets
Estimated Water requirement & source	24 KLD, Source – Open Wells & Tube Wells
Project Cost (Gross Block cost)	Rs. 258 Lakhs

Mining are carried out by fully mechanized open cast mining method. Drilling and blasting technique are used whenever required to handle hard formation.

The blasted material is excavated by the hydraulic excavators and front-end loaders having various bucket capacities for achieving the planned production. The waste excavation is also met with the machinery deployed as per the excavation plan.

Government of India has an ambitious plan for increasing the domestic steel production capacity from around 115 MTPA to 300 MTPA in next 10 to 15 years. This will necessitate production of 400-450 million tonnes of iron ore annually. Low per capita steel consumption in the country at 74.6 kg vis-a-vis the world average of 208 kg also indicates the huge growth potential of the Indian steel industry. Further, the Government's plan of developing 100 smart cities and housing for all by 2022 will result in a huge demand of steel. To cater the growing demand of steel.

Mining plays an important role in the development of the Region and Country. The iron ore produced from this mine will be used in JSW Steel Plant for making steel. The steel industry contributes 2 % in India's GDP. Steel per capita consumption in India is expected to increase to 160 kgs by 2030-31 whereas the present consumption is 74.6 kgs only. Easy availability of work force and presence of abundant iron ore reserves make India competitive in the global set up. Therefore, to meet the growing demand of steel and to support in country's GDP extraction of raw materials becomes inevitable. In addition, the project leads to development of nearby villages by providing employment and better infrastructure to the local people. It improves the living standard of the people residing near the project. Rajapura Iron Ore Mine has robust CSR policy, which will help in growth of the people in the Directly Impacted Zone (DIZ) of mine.

1.3 Resource Requirement:

Land Requirement

The total Mining lease area is 24.82 Ha. The lease area of 18.22 ha is in forest land and 6.6 Ha is a Patta land.

TABLE -ERROR! NO TEXT OF SPECIFIED STYLE IN DOCUMENT.-2 LAND USE PATTERN - EXISTING & PROPOSED (CONCEPTUAL STAGE)

SL. NO	PARTICULARS	EXISTING/PLAN PERIOD IN HA			CONCEPTUAL PERIOD IN HA		
		FOREST	REVENUE	TOTAL	FOREST	REVENUE	TOTAL
1.	MINING	9.15	0.60	9.75	12.46	0.60	13.06
2.	DUMPING	4.10	0.27	4.37	2.70	0.27	2.97
3.	MINERAL STORAGE	--	1.30	1.30	--	1.30	1.30
4.	TOPSOIL YARD	--	--	--	--	--	--
5.	INFRASTRUCTURE/STAFF TUTORIAL BUILDING	--	0.02	0.02	--	0.02	0.02
6.	SCREENING PLANT	--	0.12	0.12	--	0.12	0.12
7.	ROAD	--	1.00	1.00	--	1.00	1.00
8.	GREEN BELT (SAFETY ZONE)	2.06	1.04	3.10	2.06	1.04	3.10
9.	AREA FOR ENG. MEASURES	--	--	--	--	--	--
10	OTHERS	1.00	--	1.00	1.00	--	1.00
	BIODIVERSITY AREA / AREA UNUSED	1.91	2.25	4.16	--	2.25	2.25
TOTAL		18.22	6.60	24.82	18.22	6.60	24.82

Proposed Land use pattern

Source: Approved Mining Plan

Due to above activities the landscape of the terrain will be modified to some extent. Further impacts due to change in land scenario and land use can affect the land use, top soil and drainage pattern of the surrounding area of mine lease for which mitigation measures are being taken.

Water Requirement:

Total water requirement is 24 KLD for dust suppression, plantation and domestic use.

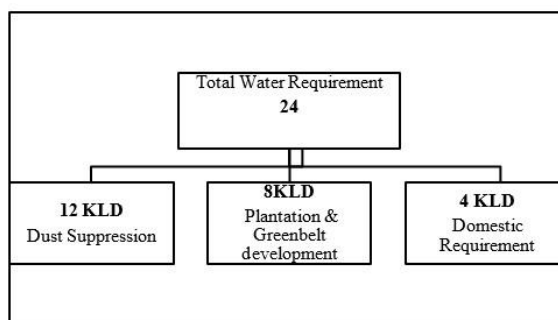


FIGURE -2 WATER BALANCE OF THE PROJECT

Manpower:

As the mine has started its operation, the total employment is 36 (direct employment is 12 and contractual workers are 12 whereas indirect employment are around 12).

Most of the work force employed by the lessee will be for mine supervision, greenbelt development, production and development and implementation of R & R (Rehabilitation & Resettlement) structure.

Power Supply

The requirement of the electric power is fulfilled by DG set. Heavy Earth Moving Machineries are fueled by High Speed Diesel.

1.4 Description of Environment

Environmental monitoring was carried out for base line data generation during October 2021 to December 2021 for 3 Months. Micrometeorology, Ambient air quality, Water quality, Noise level, Soil quality, Socio-economic & Biodiversity study was carried out within 10 km radius of the lease area.

Meteorology

Meteorological data for three months has been procured from the Indian Metrological Department. Calm condition prevailed over 3% of the time of the study period. The predominant wind directions were ESE over 16.7% of the time in which speed of 2 to 4 m/s, 6% of the time in speed of 4-6 m/s was recorded. The next predominant direction was East over 9.6% of the time in which speed of 2 to 4 m/s was recorded. The seasonal wind rose diagrams for 24 hours period is given in figure 3. Installation of Weather monitoring stations are in process and the weather station will be installed in a suitable location without much disturbances near the mine office for regular observation.

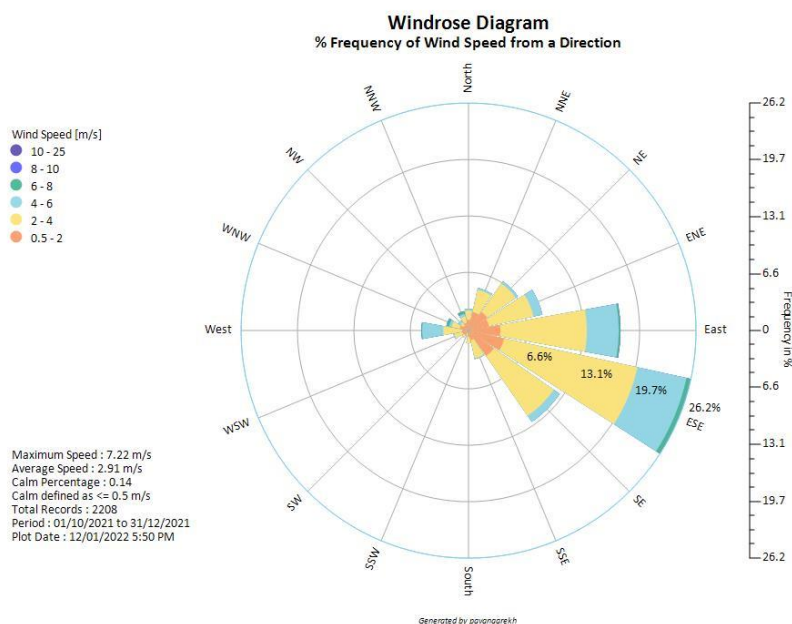


FIGURE -3 WIND ROSE DIAGRAM OF THE STUDY PERIOD

Ambient Air Quality

Ambient Air Quality Monitoring (AAQM) has been carried out at eight locations with a frequency of two days per week for three months during Oct- Dec 2021. The results thus obtained indicate that the concentrations of PM₁₀, PM_{2.5}, SO₂, and NO₂ in the ambient air are within the National Ambient Air Quality (NAAQ) standards for Residential and Rural areas (**Table-3**).

TABLE -ERROR! NO TEXT OF SPECIFIED STYLE IN DOCUMENT.-3 AMBIENT AIR QUALIY LEVELS

Sr. No.	Parameters	Values (Range) (µg/m ³)	Limits (µg/m ³)
1	PM2. 5	35-47	60
2	PM10	63-80	100
3	SO2	13-17.9	80
4	NO2	12.33-28.3	80
5	CO	0.59-0.89	2

Water Quality

To assess the physical and chemical properties of water in the region, water samples from four surface and eight ground water locations were collected around the project site. In ground water, the Iron concentrations are found to be in the range of 0.12 to 0.32 mg/l and were observed to be within the desirable limit of 0.30mg/l. The Fluoride is in the range of 0.47 to 1.26 mg/l which is below 1 mg/l limit. Similarly, Nitrate is in the range of 6.6 to 13.2 mg/l which is below 45 mg/l limit. The result shows that all the parameters are well within

the acceptable limit of IS: 10500 except the Hardness which is higher than prescribed limit at one location but below the permissible limit.

In surface waters, the Iron concentrations are found to be BDL (Below detection limit) and were observed to be within the desirable limit of 50.0mg/l. The TDS are in the range of 380.73 mg/l, and is observed to be within the desirable limit of 1500 mg/l. Total Coliform organisms (MPN/100ml) is well below desirable limit of 5000. The results show that all the parameters are well within the prescribed limit of IS: 2296 (Class C).

Noise Levels

Ambient noise levels were measured at eight locations around the existing mine site. The daytime and night time noise levels in all the residential locations were observed to be within the permissible limits. The Leq values are in the range of 36.54 to 48.36 dB (A).

Soil Quality

Eight representative soil samples were collected from core and buffer zone of mine lease area and analyzed to assess the present soil quality of the region. In the core zone, the soil cover is very less to support the vegetation and plant growth. The pH of the soil is neutral to slightly alkaline in nature. The nitrogen, phosphorus and potassium (NPK) values are less, which indicates that the soil is not supportive to plants growth. Based on the results, it is evident that the soils are not contaminated by any pollution sources.

Land Use

The land use pattern of the buffer zone i.e. 10 km radius area has been studied based on satellite data. Further, land cover map has been generated on 1: 50,000 scale using digital classification. Based on the said study major land use/land cover categories are detailed in the **Table No.4**.

TABLE -ERROR! NO TEXT OF SPECIFIED STYLE IN DOCUMENT.-4 MAJOR LAND USE/LAND COVER CATEGORIES IN 10 KM RADIUS

Sl. No.	Category	Area in Ha	% of the Study Area
1	Agricultural Land	411.175	1.26
2	Fallow Land	4416.28	13.59
3	Dense Forest	10015.42	30.84
4	Land with Scrub	5989.675	18.44
5	Degraded Forest	6266.475	19.29
6	Settlements	1780.463	5.48
7	Mining Area	3583.83	11.03
8	Water bodies	11.18	0.034
Total		32474.5	100

Ecological Environment

The presence of Schedule-I species in the core and buffer zone are not reported. Apparently, there is no presence of rare and endangered plants in the study area. There are also no endangered and threatened fish found in the study area.

Social Environment

The study area (10 km radius) area has a total rural population of 47783 according to 2011 census. The Sex ratio of the study area is 990 females per thousand male populations. The percentage of male and female population to the total population is 51% and 49% respectively.

People are positive about the project, provided environment is well taken care of. The project brings in more employment opportunities including supporting jobs resulting in economic & social development of the people & area.

1.5 Summary of Anticipated Environmental Impacts and Mitigation

Rajapura Iron Ore Project is an existing operating mine. The environmental management measures are being implemented. The summary of adverse environmental impacts and mitigation measures are given in **Table No.5**.

TABLE -ERROR! NO TEXT OF SPECIFIED STYLE IN DOCUMENT.-5 ENVIRONMENTAL IMPACTS & MITIGATION

Environmental Component	Project Activities	Impacts	Adverse / Beneficial	Mitigation Measures adopted
Air Quality	Drilling and Blasting	Dust (PM) and gases (NO _x) are produced during drilling and blasting operations	Adverse	<ul style="list-style-type: none"> • Avoid blasting during adverse weather conditions. Development of greenbelt. • Use of wet drilling machine for dust control during drilling operations.
	Overburden removal, extraction of iron ore, loading / unloading of overburden and iron ore, stock piling of iron ore, disposal of overburden at dump site within mine lease area	Increase in PM levels in ambient air due to dust generation and NO ₂ concentration levels in ambient air due to vehicular emissions.	Adverse	<ul style="list-style-type: none"> • Exposed area is limited to the minimum required for mining operations. • Water sprinkling on mine hauls roads. Overburden dumps are re-vegetated as soon as possible. • Use of canon mist / water sprinkler at Dumping yards and stockpile.
	Transportation of overburden and iron ore within mine lease area	Increase in PM level due to dust generation and NO ₂ concentration levels in ambient air due to vehicular emissions.	Adverse	<ul style="list-style-type: none"> • Regular watering on haul and access roads using water sprinkling trucks. • Plantation to act as a barrier for minimizing propagation of dust.
	Iron ore crushing and handling at iron ore storage area	Increase in PM concentration in ambient air.	Adverse	<ul style="list-style-type: none"> • Water sprinkling systems / dry fog dust suppression systems are installed for control of dust emissions from dumper platform at crushing plant.

	General equipments operations	Elevate PM and NOx concentrations in ambient air.	Adverse	<ul style="list-style-type: none"> • Regular maintenance of all equipment to minimize particulate matter emissions from diesel engines.
	All activities	Excessive occupational exposures to airborne particulate matter.	Adverse	<ul style="list-style-type: none"> • Occupational exposures to air pollutants are periodically being assessed at regular intervals. • Personal protective equipment are given to all workforce. • Engineering control measures are in place to handle the issue. • Provision & ensuring use of personal protective equipment • Additionally, management control measures are also resorted to as a last control measure.
Noise Levels and Ground Vibrations	Blasting	Community annoyance due to high impulsive noise levels, air overpressure and ground vibrations.	Adverse	<ul style="list-style-type: none"> • Controlled blasting techniques are being practiced. • Use of scientific blasting method and optimizing maximum charge per delay. Not conducting blasting in high wind conditions.
	General activities including machine & transportation of overburden and iron ore within the ML area.	Increase in noise levels Occupational hazard due to noise exposures and increase in ambient noise levels.	Adverse	<ul style="list-style-type: none"> • A detailed review of noise emissions and impacts from project activities will be carried out at regular intervals during the project life. • Service vehicle movement will be limited to day time only. • Occupational noise exposures will be assessed. Locations where Leq (8 hour) noise exposures have the potential to exceed 85 dB (A),

				<p>mitigation through engineered noise controls and management measures or through the provision of personal protective equipment will be implemented.</p> <ul style="list-style-type: none"> • Regular noise monitoring will be carried-out. • Regular maintenance of equipments and use of silencers and lubricants to reduce sound where ever applicable.
Water Resources and Quality	Deepening of ground water	<ul style="list-style-type: none"> • Reduction in groundwater availability for domestic , irrigation and local business purpose.Reduction in groundwater availability for irrigation purposes. 	Adverse	<ul style="list-style-type: none"> • Groundwater abstraction is minimal and is done for drinking and domestic purposes only. • Rainwater collection and harvesting is being practiced. • Ground water quality monitoring is being carried out once in season for 4 seasons in year. • Bio-Engineering measures have been carried out by the erstwhile lessee like construction of gully and check dams. The maintenance of the same is being done by the present lessee.
	Water required for mine (dust suppression systems, workshop, domestic facilities and greenbelt development)	<ul style="list-style-type: none"> • Depletion of natural resource. • Changes to hydraulic regime. 	Adverse	<ul style="list-style-type: none"> • The maximum requirement of water is 50 kld. Water conservation methods are being practiced. • Rainwater collection, Ground water recharge and reuse system has been implemented.
	Waste water generated from domestic usage at	Deterioration in ground water and soil quality when	Adverse	<ul style="list-style-type: none"> • The waste water from the toilets in mine office is discharged in to septic tank followed by soak pit.

	mine.	discharged untreated.		
Hydrogeology and Drainage pattern	Mining and waste dumping	May change regional hydrology and drainage pattern of the area.	Adverse	<ul style="list-style-type: none"> • Proper Drainage system is in place.
Land use and Soil Characteristics	Mining and waste dumping	Existing land use of the core zone will alter.	Adverse	<ul style="list-style-type: none"> • Land reclamation shall be carried out at conceptual stage
Flora and Fauna	Mine development and operations	<p>Displacement of existing flora and fauna.</p> <p>Habitat loss, with consequent potential for adverse changes to species diversity and abundance.</p> <p>Deterioration of habitat values caused by fugitive dust and noise emissions.</p>	Adverse	<ul style="list-style-type: none"> • Native species & fruit bearing species have are planted. Regular plantation is being done.
Environmental Pollution, Health, Safety	Overall Mining operation	Annoyance, sleep disturbance and health impacts from noise emissions that exceed the safe limits.	Adverse	<ul style="list-style-type: none"> • Afforestation on periphery of the mine to act as barriers. • Mining Operation is done in day time only. • Fixed water sprinkling system on Haul Roads, Water sprinklers on transport road, mine haul road, Dry Fog Dust Suppression system near Crushing and Screening unit

				<ul style="list-style-type: none">• Creating awareness among employees and villagers regarding the health & healthy life style.• Conducting medical camps.
Socio-economic Aspects	Diversion of Forest Land for mining operations	Loss of land and vegetation	Adverse	<ul style="list-style-type: none">• Regular plantation in the lease area.• Compensatory Afforestation already given by the erstwhile lessee for land & vegetation loss• At conceptual stage the lease area will be rehabilitated
	Mining operations	Increase in employment opportunities both direct and indirect thereby increasing economic status of people of the region.	Beneficial	

1.6 Disaster Management Plan

The objective of the emergency preparedness and Disaster Management Plan is to offset the chance of casualty / minimize damage(s) to man, material and living beings in case there is any emergency. The benefits anticipated for implementation of emergency preparedness and DMP are as follows:

- Provide the rescue and medical treatment of casualties;
- Safeguard other people;
- Minimize damage to property and the environment;
- Initially contain and ultimately bring the incident under control;
- Provide help and assistance to the affected persons;
- Provide authoritative information to the news media;
- Secure the safe rehabilitation of affected area; and
- Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the emergency.

In effect, it is to optimize operational efficiency to rescue rehabilitation and render medical help and to restore normalcy.

1.7 Project Benefits

Social, Economic development

The existing project have imparted social benefits to surrounding population in the form of employment opportunities, educational facilities, roads, communication facilities, transportation, marketing, banking, postal services and health facilities directly or indirectly. The civic amenities have already been developed due to existing mines. The location of the mines has helped to improve the financial resources of the surrounding population by way of petty trade and employment opportunities. The projects had encouraged for setting up of various utility services and petty trade for local people i.e. in and around the mining lease area.

1.8 Environmental Management Plan

The Environmental impacts and their Management Plan have been discussed in the above table. Total Capital Investment proposed for Rajapura Project is about Rs. 258Lakhs . Capital cost for environment management is Rs 25.8 lakhs and the recurring cost per annum is Rs 25.8 Cr.

TABLE 6 : SHOWING THE BIFURCATION OF ENVIRONMENTAL MANAGEMENT PLAN

Sl. No.	Particulars	Capital Cost (in lakhs)	Recurring Cost (in lakhs)
1	Dust suppression through water tankers for mine haul roads	-	5
2	Clearing of Fire Line & Watch Ward (Payment to Forest Dept.)	-	2
3	Afforestation/Greenbelt Development	-	0.5
4	Swachhata Pakhwada &Other Awareness Activities	-	0.5
5	Environmental Monitoring	-	3
6	Solar Wifi Tower (maintenance)	-	1
7	Occupational Health Safety & Measures (Drinking water facilities, Sanitation)	8.0	-
8	Land Use & Land Cover Study	-	0.5
9	Wildlife Management Plan & Implementation	10.0	-
10	Soil-Moisture Conservation Plan	2.8	-
11	Ground Water Study	-	0.5
12	Construction & Maintenance of engineering structures as per approved mine plan.	-	7
13	Maintenance of structures constructed under Reclamation & Rehabilitation Plan	-	4.8
	Total	20.8	25.8

1.9 Reclamation and Rehabilitation of mined out areas

After complete extraction of iron ore in conceptual stage, the mined-out land within the lease area will be fully reclaimed before abandoning the mine. The measures include technical and biological reclamation of mined out areas, plantation with native species on dumps and mined out benches.

1.10 Conclusion

The mine has established environment cell with qualified and experienced staffs from the environmental field and the entire environmental management system is guided by the documented Environmental Policy of the Company. The Company implements best environmental practices and compliances to applicable statutory requirements. The Environmental Clearance (under EIA notification 2006) proposed for the project will encourage the Company towards excellence of environmental practices and development of people around the mine.