

EXECUTIVE SUMMARY

FOR

GANUA IRON & MANGANESE ORE MINE

VILLAGE –MANDAJODA, TEHSIL-KOIRA, DISTRICT-
SUNDERGARH, ODISHA.

OF

SRI BIRAT CHANDRA DAGARA

Prepared By



Centre for Envotech and Management Consultancy Pvt. Ltd.

AN ISO: 9001: 2015, OSHAS 18001: 2007 & ISO: 14001: 2015 certified company,
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As Category "A" Consultant Organization

Regd. Off: N5/305, IRC Village, Bhubaneswar, Odisha Tele: 0674-2360344,

E-mail: cemc_consultancy@yahoo.co.in, cemc122@gmail.com

Website: www.cemc.in

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INTRODUCTION

Sri Birat Chandra Dagara proposes for obtaining environmental clearance for production of iron ore @ 6,00,000 TPA from Ganua Iron & Manganese Ore Mine located over mining lease area of 12.08 Ha. at Village –Mandajoda, Tehsil-Koira, District-Sundergarh, Odisha.

Initially, the mining lease of Ganua Iron & Manganese Ore Mine has been granted in favour of Sri B.C Dagara for a period of 20 years vide letter no. III(B)SM.4/99/8714/SM dated 03.08.2000. Tenure of the lease was scheduled to expire on 24.04.2025. In view of section 8A of amended Mines and Minerals (Development and Regulation) Act, 2015, the period of lease has been deemed to be extended up to 24.04.2055. The lease was executed earlier on 25.04.2005. Mining plan for the financial year 2021/22 to 2025/26 has been approved by Regional Controller of Mines, IBM vide letter no-RMP/A/45-ORI/BHU/2020-21, dated 01.02.2021.

The mines site is a part of Survey of India Toposheet No. 73G/5 on a scale of 1: 50,000 and is bounded by the latitudes $21^{\circ}54' 09.16''$ to $21^{\circ}54' 24.41831''$ N & longitudes $85^{\circ}21' 01.31884''$ to $85^{\circ}21' 15.01179''$ E.

Total lease area falls under DLC forest. Forest Diversion Proposal was prepared and submitted to the Chief Conservator of Forest (Nodal), Bhubaneswar on 16.03.2009. Proposed project comes under 'B1' category project. SEAC has granted TOR vide Letter no. 1090/SEAC-177 dated 14.12.2018 for conducting EIA/EMP study.

PROJECT DESCRIPTION

Iron ore will be produced @ 6,00,000 TPA from Ganua Iron & Manganese Ore Mine located over mining lease area of 12.08 Ha. Out of this, 10.08 Ha. will be utilized at the end of 5 year plan period. Out of which, 6.2 Ha. will be utilized for excavation, 2.08 Ha for overburden dump, 0.6 Ha. for green belt in safety zone and rest land will be utilized for mineral storage, infrastructure facilities, sorting & sizing, road etc. The average grade of ROM is (+55%Fe) & Tonnage Factor of Saleable ore is 3 T/ cum.

Top soil generation is observed to be nil. Waste will be predominantly laterite, Limonite which will be 30% of the total RoM. During Plan period, a total of 3,60,465 Cu.m waste will be generated. Out of which about 50% i.e. 1,80,232.5 Cum will be utilized for construction and maintenance of road and balance 50% i.e. 1,80,232.5 Cum will be utilized for dumping. Total mineral rejects ore during plan period will be 3,00,387.5 Ton, out of which 20% will be blended and will be sold. Geological reserve & mineable reserve are estimated as 96,15,217.5 Ton and 51,70,715 Ton. Based on the available reserve, life of mine is around 10 years.

The mine will be operated by Category 'A' Fully Mechanized open cast mining method. In order to achieve the production target, various capacities of machineries (Drill, excavator, loader, dumper, crusher, screen etc.) will be deployed in this mine. In addition to this screening & crushing of ROM ore will be kept continued for augmentation of production. To provide employment to local inhabitants, part of the mining activity like sorting, sizing of ore will be done by manual method. The hard massive ore will be loosened by drilling and blasting.

For sizing of ore, mobile screening & crushing units of 150TPH each will be installed at site. Ore will be transported from quarry site to screen and crushing site for processing by use of 10/20 ton dumpers whereas waste materials will be dispatched from quarry to dumping site by using dumpers.

Infrastructure such as site office, weigh bridge, rest shelter, First-aid center, blasting shed, security house, magazine etc. are available in the lease area. At the end of conceptual period, quarry bottom will be at 616mRL. Therefore, such depth of mining would not affect the ground water table (at about 588 mRL). During dumping, care will be taken to ensure that the waste is leveled, compacted and terraced. Dump terrace will be stabilized by coir matting and plantation over the slope. The ultimate dump slope shall be maintained at 28^o.

About 75 KLD of water will be utilized for drinking, dust suppression and plantation purposes. This water will be met by ground water and Suna Nala. Power requirement of 1MW for the mine site shall be received from CESU as per requirement. Power will be consumed for office works, illumination in night. There will be a stand by DG set of 125 KVA for emergency purpose. About 100 persons will be engaged within the mine including the managerial and supervisory staff as well as skilled/ semi skilled/ unskilled laborers.

Estimated cost of the project is Rs.2.87 Crore.

DESCRIPTION OF THE ENVIRONMENT

For the EIA study, 10 km radial area around the mines is taken as study area and baseline data has been collected during **March 2020 to May 2020** (Study Period). The study was carried out for land use, Ambient Air Quality, Water Quality, Soil Quality, Noise Levels, Meteorology, Ecology, Socio-economics etc.

Topography

The lease area represents a rugged mountainous topography having highest altitude of 705 mRL is located in the southern part of while as the lowest altitude 620 mRL towards eastern part of the lease hold area. There is no water body in the lease area. Study area around the ML falls under the Bonai sub-division located in the South-East of Sundargarh District, consisting of undulating land of about 700 m in average elevation. The general slope of the area is from North to South. The Study area also comprises of Reserved Forest such as Baitarani RF (N), Sidhamatha RF(N) & Mendhamaruni RF(WNW). No ecologically sensitive area such as National Park/Wildlife Sanctuary/Biosphere Reserve/Tiger Reserve/Elephant Reserve etc. is located in the core and buffer zone of the proposed study area.

Drainage Pattern

There is no river / nala within the ML area. Kakarpani nala flows along eastern part of the lease area (0.55 Km).The 10km radius study area falls within the Baitarani river basin and watershed of the Kundra or Suna river (3.7 Km) which flows towards north in the NE to SW direction ultimately joins the Baitarani river. The drainage pattern is dendritic and the drainage density of the area is moderately high.

Land Use

The study area covers around 31807 Ha., mainly comprises of forest (40.2 %), agriculture land (31 %) and water bodies (0.6%). The balance 28.2 % of the total area covers residential area, shifting cultivable land etc.

Meteorology

During the study period, the temperature varied from 14.46 to 41.12°C and relative humidity varied from 30.62 to 99.93 %. The maximum wind speed observed during the study period was 12.8 m/s with average wind speed of 1.73 m/s.

Ambient Air Quality

To monitor the ambient air quality eight stations were selected in the study area. Care has been taken to select more stations in the predominant downwind direction in the populated residential areas, commercial area. The monitored results show PM10 levels were in the range of 32 µg/m³ to 82 µg/m³, PM2.5 levels were in the range of 14 µg/m³ to 46 µg/m³, SO₂ levels were in the range of 4.2 µg/m³ to 8.5 µg/m³, NO_x levels were in the range of 9.3 µg/m³ to 15.8 µg/m³ & CO remained below detection level. All other parameters remains very less in compare to the National Ambient Air Quality Standard prescribed by Central Pollution Control Board.

Water Quality

Total five numbers of surface water sampling points have been selected and four numbers of ground water sampling points have been selected from various tube wells & bore wells in different habitations.

Ground Water : The levels of total dissolve solids varied from 152 - 270 mg/l, total hardness from 120 - 178 mg/l, chloride from 30.4 – 44.2 mg/l, Sulphate from 19 - 32 mg/l and alkalinity is from 66 - 81mg/l. The analysis results of groundwater samples showed that parameters are well within the prescribed limits as per IS: 10500 standards for drinking water.

Surface Water: In surface water samples, the pH values of are varies from 6.65 to 7.22, the dissolved solids are 84 to 102 mg/l, chlorides are 10.2 to 11.6 mg/l, fluorides are 0.10 to 0.12 mg/l, Sulphate 10.4 to 20.8 mg/l respectively.

Noise Level

Noise levels have been measured at eight locations. The stations have been selected at high noise areas like roads, commercial areas and residential areas. Noise meter has been used to monitor the noise levels; both of the day and night times. Day and night time noise level were observed in the ranges 30.2 to 53.9 in day time and BDL to 45.3 dB(A) in night time respectively. Therefore, we found that the noise level of the study area is less & well within the prescribed noise standard of SPCB limit. Some time it has increased because of the vehicular movement and some human activities at nearby area. However, traffic density monitoring is carried out at suitable points in order to assess the volume of traffic movement.

Soil Quality

From the soil analysis report, it is found that the soil is slightly acidic in nature. The bulk density ranges between 1.36 to 2.08 g/cm³. The soil texture is mostly sandy loam. The soil is fertile for agriculture purpose.

Ecological Study

Flora and fauna studies were carried out in different sites in 10 Km radius area. Flora present in the area includes: Amba, Harida, Jamu, Sala, Kendu, Kusuma, Siali, Satabari etc. There are Schedule-I fauna like elephants found in the buffer zone. Fauna present in the area also includes: Harina, Bilua, Kutura, Neula, Monkey, palm squirrel, Koili, Sua, Naga Sapa, Rana Sapa etc.

Socio-economic Environment

Total population of the study area is 77748 with sex ratio of 938 females per 1000 males. Literacy rate of the study area is 45 %. Occupational pattern shows that 38 % of total population are workers and 62 % are non-workers. The major crop of the area is paddy. Socioeconomic conditions of the people in the area are moderate.

ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

Components like Air, Noise, Water, Land use, Soil & solid waste, Biotic Condition & Socio-Economic Condition have been studied and their impacts have been assessed and respective mitigation measures are suggested.

AIR ENVIRONMENT

Anticipated Impact - Dust will be generated due to drilling, blasting, excavation, loading, dumping of wastes, crushing, screening and transportation activities etc. Gaseous pollutants will also be released due to fuel burning in mining equipments and DG Set.

Mitigation Measures - All mine roads are proposed to be boulder packed. Regular water spraying will be carried out on roads and waste dumps by water tankers / fixed sprinklers to suppress the level of dust levels. Maintenance of mining equipments and vehicles will reduce generation of gaseous pollutants. Overloading of vehicles shall be avoided as spillage generates dust. Speed of Dumper / Tippers / Trucks will be limited within 20 Km/Hr to minimize the dust generated due to friction of vehicle tyres with the surface of road. Plantation in and around the mine will also be taken up to arrest the air borne dust. Water sprinkling arrangement will be made at the dust generation points of the Crusher and screen viz. hopper, transfer points, screen, discharge point etc. Controlled blasting method will be adopted. To minimize the generation of fugitive emission scientific mining method (Fully Mechanized Cat-A) will be adopted and dust suppression arrangement will be made at the dust generating sources. From the air quality modeling it is observed that the pollution load due to mining activity is very less. Moreover, all precaution measures as described above will be adopted to reduce Air pollution.

NOISE ENVIRONMENT

Anticipated Impact- Noise level increases due to mining activities such as excavation, drilling, blasting, handling and transportation of ore & overburden and operation of processing equipments.

Mitigation Measures- Low-noise equipments will be selected from the manufactures. Enclosures will be provided for DG set to reduce noise level. Protective equipments such as ear plugs will be provided to the employees working in the noisy area. Thick green belt will be developed along the mines boundary to confine the noise within the mining area. Delay

detonators will be used in blasting to reduce noise & vibration level.

SURFACE WATER ENVIRONMENT

Anticipated Impacts - There is no water body (pond/river/ nala) inside the lease area. Suna river is flowing at a distance of 3.7 km(West) from the lease area. Mining process does not require any water. Hence, no waste water will be generated from mining process. However, wash off from the dump and mining area, Surface runoff in rainy season if not properly managed, may cause increase in suspended particles and silt in the surrounding water bodies.

Mitigation Measures- The rain water collected at the quarry bottoms shall be pumped out and discharged to a pit at the top of the quarry to allow the suspended solids to settle down. Garland drains shall be maintained around quarry and dumps. Storm water will be collected at the catch pits through a network of garland drains. Settling pits and drains shall be cleaned periodically. Check dam & garland drain will be developed around the waste dump to check the flow of surface run-off water and to prevent the washing of waste materials while there is rain. Domestic wastewater will be treated in STP and treated wastewater will be used for dust suppression in mine and green belt development.

GROUND WATER ENVIRONMENT

Anticipated Impact - At the end of conceptual period, quarry bottom will be at 616mRL. Such depth of mining would not affect the ground water table (at about 588 mRL), which is 7m below the ground level in pre monsoon and 10m below the surface in post monsoon. Hence, proposed mining activities are not proposed to touch the ground water table.

Mitigation Measures- Rain Water Harvesting will be carried out to recharge the ground water table in the area. Ground water quality in the area will be tested periodically as per CPCB guidelines As requirement of water for domestic use in the mine is very less (i.e. 15 KLD), impact on ground water will be marginal.

LAND ENVIRONMENT

Anticipated Impacts - There will be impact on the land use of the ML area, as total lease area is DLC forest land. There is no agricultural land, grazing land, fisheries etc. in the lease area. As the proposed mining operation will be undertaken through open cast fully mechanized method; exploitation of land environment is marginal. An area of 0.05 hectares has already been utilized

for trial pit and road. At the end of scheme period, degraded / utilized area will be of the order of 10.8 hectares.

Mitigation Measures - It has been planned to carry out plantation over an area of 0.60Ha of Safety Zone during ensuing scheme period. Further, an area of 1.00 ha safety zone will be utilized for plantation in the conceptual period. Besides these, the dead end slopes of the waste dumps and road side plantation will be done with adequate number of saplings to avoid soil erosion and air pollution. During Scheme period, none of the mined out land will be reclaimed. In the Conceptual Period, Reclamation of mined out land will be done both by means of back-filling and plantation, over the dead benches. A total of 7.48 Ha will be utilized for mining during whole life of the mine. At the end of life of mine, total lease area will be developed with plantation.

SOIL & SOLID WASTE

Anticipated Impact - Wash offs from dumps in the rainy season may pollute the nearest surface water bodies. Air pollution is envisaged if proper care will not be taken during dumping of wastes. Mismanaged stacking of wastes will have impact on aesthetics and land use of the mines area.

Mitigation Measures- Top soil will not be generated due to rocky topography. During Plan period, a total of 3,60,465 Cu.m waste will be generated. Out of which about 50% i.e. 1,80,232.5 Cum will be utilized for construction and maintenance of road and balance 50% i.e. 1,80,232.5 Cum will be utilized for dumping. The waste generated from the mines shall be dumped in the non-mineralized area of the mine. Terrace of dumps will be stabilized by coir matting and plantation over the slope. The ultimate dump slope shall be maintained at 28°. Catch drain of terraces, garland drain around dump and settling pond will be cleaned up by the help of shovel / JCB periodically.

BIOLOGICAL ENVIRONMENT

Anticipated Impact - Total ML area of 12.08 Ha. will be diverted for utilization for mining and allied activities. Tree felling will be carried out. Due to loss of native species, biodiversity of the area will be affected. No wastewater will be discharged from the ML area to outside. Thus, no major impact is envisaged on biological environment of the area. Activities related to mining like

blasting, vehicular transportation, dust generation, illumination at night etc. may create nuisance to biological environment of the area.

Mitigation Measures - Non-forest area equivalent to the forest area for diversion (12.08 Ha.) will be planted as compensatory afforestation. Green belt which will be developed in and around mine will obstruct the spreading of dust from ML area. Blasting will never be done in night and during strong wind conditions. Controlled and synchronized blasting will be done with non-electric detonators to minimize ground vibrations. As far as possible illumination in night time will be reduced not to have any impact on surrounding fauna species. There will not be any major impact on biodiversity as the ML area does not form a part of eco-sensitive areas like national park / wild life sanctuary / biosphere reserve etc.

Socio Economic Environment

Project authorities shall prefer the local people for employment in the mines. Local youth shall be trained to take-up mining related jobs, such as driving, HEMM operation, equipment maintenance, horticulture activities etc. Project Proponent proposes to provide education facilities for improving the literacy levels of the residents. Mining in the area will result in development of access roads, bringing the community in touch with the external world. Project proponent will organize health check up camps in the nearby villages.

ENVIRONMENTAL MONITORING PROGRAMME

There will be an Environmental Management Cell (EMC) in the mine, which will be responsible for implementation of EMP and environment monitoring. EMC will provide an early warning of any undesirable changes in the natural environment and will act for implementation of effective corrective measures. EMC shall monitor the various factors associated with mining activity like slope failure, land erosion, drainage, plantation programme, occupation health check up, monitoring and implementation of various measures related to air pollution, noise pollution, water pollution, socio-economic development etc on regular basis. Capital cost of environment management in the mine has been estimated as Rs. 14.4 Lakh and Recurring cost estimates for environment management have been estimated at Rs.7.78 Lakh/annum. Rs.5.74 Lakhs will be spent separately for social development activities (CER) based on the issues raised in Public Consultation.

ADDITIONAL STUDIES

In addition to the baseline studies of various environmental attributes, various other studies have been carried out in order to carry out the mining activity in scientific and sustainable manner. Various other studies like Risk Assessment & Disaster Management Plan, Rain Water Harvesting, Occupational Health etc. have been carried out and incorporated in details in EIA/EMP Report.

PROJECT BENEFITS

Proposed mining will meet the raw material requirement of the existing and expanding steel units of the region. Proposed project will increase in revenue in terms of taxes at local, state and national level. About 100 persons will be engaged within the mine. Most of the unskilled and semiskilled labour force will be engaged from local villages. In addition to this, indirect employments will be generated in the field of transportation of raw materials, supply of essential commodities, casual labours etc. Plantation will be undertaken within the leasehold area as well as in the nearby area wherever vacant spaces will be available. Afforestation programme will be carried out mainly with the help of local villagers, which in turn shall generate some income for their livelihood. Proponent shall also extend drinking water facility to the nearby villages. In addition to these, provision of medical facilities, improvement of road network, repair of school building, distribution of books and stationeries etc. shall also be a part of peripheral development programme. Training shall be imparted to the youths of the neighbouring villages for self-employment through various vocational training courses like carpentry, stitching, driving, welding, automobile repairing etc. Proponent shall also conduct training and awareness programmes on environment issues to the neighbouring villages.

ENVIRONMENTAL MANAGEMENT PLAN

A full-fledged environmental monitoring programme and Environmental Management Cell will be formed at the proposed mine for efficient execution of environmental protection measures. Manager-HSE will take the responsibility of Environmental Management, who will be assisted by Field Assistants and labours. Contract will be given to external agency for periodical environmental survey on a part time basis. Apart from these, casual labourers will be employed for plantation, drain cleaning etc. as and when required. In the Mine, training facilities will be provided to cover Awareness regarding Pollution Control and Environmental protection, Operation and maintenance of pollution control equipment, Plantation and post plantation care,

Field monitoring, maintenance and calibration of pollution monitoring instruments., Knowledge of environment norms, regulations and procedures, Occupational health and safety etc. A Corporate Environment Policy has been formulated and approved by the Lessee, to ensure that all aspects of mining operation will be least harmful on the Environment by implementing the Environmental Management system in accordance to prevailing statutory rules / regulations.

CONCLUSION

Mining of Minerals is inevitable to fulfill the market demand of steel industries. The proposal is made considering the current environmental regulations in order to minimize the impacts on the environment to help support sustainable development. Proposed project will benefit to the society by implementing the peripheral development activities in a phased manner.