

**SUMMARY OF
ENVIRONMENT IMPACT ASSESSMENT/
ENVIRONMENTAL MANAGEMENT PLAN**

(As per para 2.2 APPENDIX IV, of S.O.1533(E) dated 14 September 2006)

**OF
LAION DONGARI IRON ORE DEPOSIT**
(Area 14.40 Ha) Near Village Barbaspur, Tahsil Bhanupratappur,
District Kanker, Chhattisgarh

**SUBMITTED TO
CHHATTISGARH ENVIRONMENT
CONSERVATION BOARD**

**Project Proponent
M/S JAYASWAL NECO INDUSTRIES LTD.
Nagpur**

CONSULTANT: SRUSHTI SEWA

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INTRODUCTION

M/s **Jayaswal Neco Industries Limited** (JNIL) belongs to the well-known industrial group of Central India viz. **NECO GROUP** having annual turnover exceeding Rs. 2000 Crores. The GROUP operates from Corporate Office at Nagpur with operations spread Chhattisgarh and Maharashtra. The **NECO GROUP** is primarily engaged in Iron & Steel Industry since 1972 and is recognized as a “MASTER CASTER” in Indian Ferrous Industries. It consists of several well-established companies in various diversified fields like Steel making through Integrated Steel Plant, Mining, Highway Construction on BOT Basis, Iron & Steel Casting, Ceramics etc. The group manufactures and exports a wide spectrum of core sector products to fulfill the need of Automotive Industries, Petrochemical Industries, Construction Industries, Iron & Steel Industries, Railways etc.

In order to cater the need for iron ore the company applied for the mining lease in Laion

Dongri Iron Ore Deposit, District Kanker, Chhatisgarh.

The applied mining lease area over **14.40 hectares** is located in Kanker district, Chhatisgarh.

The entire area applied is covered under Government forest land (9.50 Ha) and undemarcated forest land (4.90 Ha.) near

Village Barbaspur,

Forest Range Korar, Tahsil Bhanaupratapur, District Kanker, Chhatisgarh.

It is proposed to produce **0.06 million tonnes / annum of iron ore** from this mine. The iron ore mined from this lease shall be utilized as a **captive source** for raw material of Integrated Iron Plant at Raipur, Chhatisgarh.



Location Details : Figure 1.1 in EIA/EMP gives the location of proposed Iron Ore Deposit along with roads and major towns of area. The applied M.L. area over 14.40 hectares is covered within the Survey of India toposheet No. 64 H/3 on a scale of 1:50,000 and is bounded by the latitude 20°16' 09.03" to N 20°16' 24.05" N and longitude 81°13'02.95" E to 81°13'22.10" E.

Accessibility - The Laion Dongri Iron Ore deposit is approachable from Raipur via Kanker, on Kanker-Bhanupratappur road at a distance of 168 Kms from Raipur. On Kanker – Bhanupratappur road there is diversion to the South by fair weather road and Kuchcha Road up to village Barbuspur and the area under question.

STATUS OF REGULATORY CLEARANCES

Government of Chhattisgarh has in principle agreed to grant of mining lease to JNIL. The Mining Plan with Progressive Mine Closure Plan has been approved Indian Bureau of Mines. Vide letter No KNK/FE/MPLN-1027/NGP; dated 11.06.2009. Forest clearance under Forest Conservation Act, 1980 vide Letter No 6-MPC 059/2008-BHO/626 dated 15.04.2010 has been granted by Regional Office (Western Region) MoEF.

An application for obtaining Environmental Clearance was made to the Chhattisgarh State Level Expert Appraisal Committee (SEAC) in 03.12.2008 in accordance with the Notification of MoEF S.O. 1533 dated 14.09.2006 . The project was appraised by SEAC during 32nd meeting dated 31/01/2009 and prescribed Terms of Reference (TOR) dated 14.01.2010. Further, the SEAC directed to review the submitted EIA/EMP by incorporating fresh baseline environmental data in 10 Km radius vide their letter dated 13.07.2010. Accordingly, fresh environmental baseline data generation was carried out in the core and buffer zone of the proposed mine during 11.10.2010 to 10.01.2011. The same is incorporated in the present EIA/EMP report.

PROPOSED PROJECT DESCRIPTION :

Land Use: As per the administrative records the Landuse of the Mine is as under;

Forest Division / Tahsil/ District	Forest Range /Near Village	Compartment No.	Area (Ha)
Bhanaupratapur/ Kanker	Korar/ Barbaspur	240	14.40

Geological formations & Ore Reserves: The regional geology of the area constitutes Archaean and Precambrian formations represented by Bengpal group and Bailadila group respectively. The Bengpal group comprises metasedimentary, ultramefic gabbro-anorthosites suite of rocks. The granites are observed to be found in a predominantly gneissic area. This group is co-related with Archaean high grade complexes. Bailadila group mainly comprises meta-sedimentary dominated by banded iron formations, metabasics and granite which has been involved in poly-phase deformations and green-schist to lower amphibolite grade.

The total geological reserves of ore are estimated to be 2.073 million tonnes while the mineable reserves are estimated to be 1.193 million tonnes. As described in geological chapter, the investigation in the area proves the existence of sizeable reserves of iron ore, suitable for its use in blast furnace. Iron ore comprises of massive compact nature with very little laterite/soil capping over the ore body. The geological parameters, topography etc., gives an opportunity to choose the low cost opencast mining for winning of iron ore from this.

The Laion Dongri deposit is mainly characterized by lateritic soil with Float ore that is followed by the continuous slope of the area. The upper elevated area is covered with massive hematite iron ore and lower portion is covered with banded hematite quartzite, float ore with lateritic soils.

The general elevation of the area is around 540 m MSL. The butte type of hillock is covered with radial drainage pattern of first order streams. This hillock forms the central part of the Mining lease area with slopes on NW and SE. The lowest altitude of 480 M is observed along the North corner of the area. The general gradient of the Southeastern side is noted to be 1: 8 and that of Northwest part is observed to be 1: 6. The structural

valley is represented mostly by dry nalas. The lease area is foot hill slopes in the form of pediment type which is covered by thin lateritic soils with small boulders and pebbles of float ore. The thickness of lateritic soil varies from 0.2 m to 0.3 m in the lease area.

Ore Reserves: The geological study shows that iron ore occur mainly as float and massive ore. The physical limit of the ore body, litho logical and structural controls of the mineralization are considered while estimation of ore reserves. The float ore zone occur around the in situ ore body up to 3.0 meters depth has been placed under “Proved” category.

The ore body covers almost 5.0 hectors area. The strike length of the ore body is 250 meters and maximum width is 200 meters dips at very high angle (average dip is 67°). The ore body is starts around 540 meters counter and covers the hill top of 520 meter counter, hence ore zone up to the depth of 10 meters depth have been placed under “Proved” category, while ore to the depth of 1.0 meters beyond the proved limit is placed under “Probable” category. Based on the field observation and adjacent mine workings, the mineable proved reserve has been assumed 95% of geological reserve. The estimated Proved Geological reserves is 2.073 MT. There will be mining losses of 30 % or estimated recovery will be 65%. Available mineral reserves after considering the above factor is 1.193 MT.

Mining Method: Considering the scale of operation, geological setting and the nature of deposit, it is proposed to adopt manual to semi-mechanized method, by opencast mining. The ore will be sorted, sized by manual method and transported to the plant by tippers/ trucks through manual loading. The sub-grade material will be transported to sub-grade stacking yard. The sub-grade ore will be blended with high-grade ore as and when required proportionally. The waste rock and intercalated material will be transported and dumped on the 7.5 meter of non-mining zone along the boundary of the ML as shown in the plan. There will be no top alluvial soil is encountered in first five years.

As proposed mining operation in first year shall be restricted to float ore zone only since development works needed for in-situ mining can be organized. From second year onwards mining for in-situ iron ore shall be commenced from top of the hill through systematic development of benches. The maximum height of the bench would be kept at

5.0 meters in in-situ ore zone (divided in three sub benches of 1.5, 1.5 and 2.0 m) and 3.0 meters in float ore zone, which is maximum depth for float ore. Over all slope of the benches will be 45° to 50°.

Waste Generation and Management: The waste to be generated in the mine can be categorized in two categories; one is from float ore zone and another from insitu ore zone. The waste to be generated has been assumed about 35% of total excavation of insitu ore zone and about 75% of float ore zone. The wastes likely to be generated during mining are mostly laterites and soil. The waste generated during removal of float ore will be backfilled in the fully mined out area simultaneously. Immediately after the completion of the dumping the dumps will be biologically reclaimed by plantation of local tree species.

Topsoil Temporary storage & utilization of : In the mining area the thickness of top soil varies from 0.2m to 0.5m. The top soil cover will be removed and dumped along the 7.5m width of Mining limit zone. In future this can be used for plantation purpose.

Employment Potential:

- Management and Supervisor : 13
- Skilled Workers : 36
- Semi Skilled/ unskilled : 166

Thus, the total employment will be 215 persons. Preference will be given to the local persons of the area as per their eligibility.

Infrastructure Facilities such as sanitation, fuel, restroom, canteen etc. to be will be provided to the labour force including casual workers during construction as well as during operation phase. Arrangement for fresh drinking water will also be made. The domestic effluent from the toilet shall be allowed to settle in septic tank and clear water will be used for plantation activity.

Post Mining Land use : The total 5.0 Ha of insitu ore zone and 4.0 Ha of float ore zone will be mined out upto the life of the mine. After full excavation the float ore are will be backfilled and the further use of plantation and insitu ore area will be reclaimed by plantation;

Sr. No	Description	PROPOSED LANDUSE (m ²)		
		Present	End of 5 year	Up to the life of the mine
1	Mining	Nil	38700	38700+51300=90000
2	Road	Nil	2750	2750
3	Infrastructure	Nil	500	500
4	Soil Dumps	Nil	500	500
5	Sub Grade Dumps	Nil	2000	2000
6	Waste Dumps	Nil	13100	20000
7	Plantation	Nil	2250	2250+6300=8550

Transport of ore: The ore will be sorted, sized by manual method and transported to the plant by tippers/ trucks through manual loading. The sub-grade material will be transported to sub-grade stacking yard.

BASELINE ENVIRONMENTAL STATUS

Baseline environmental data collection was carried out from October 2010 to January 2011 in the study area i.e.; core zone and the buffer zone. The purpose of this investigation is to know the status of present environment in proposed mining lease area (core zone) as well as buffer zones of 10 km radius around the proposed iron ore mine area.

Air Quality : Ambient air quality (AAQ) samples were collected on basis of 24-hour sampling and twice a week at each site. The ambient air quality samples were collected for continuous **13-weeks** beginning from **11 October 2010 to 10th January 2011**. Eight stations were selected for monitoring ambient air quality. Air quality stations are selected in upwind as well as downwind direction of the proposed mine. The selection of monitoring is done taking into consideration of the predominant wind direction, population zone and sensitive receptors.

Samples of revised parameters like PM₁₀, PM_{2.5} and gaseous pollutants i.e. SO₂ and NO_x were taken by 24 hr sampling method. Samples for Ozone (O₃) and Carbon Monoxide (CO) analysis were monitored for one hour sampling procedure randomly.

Overall Ambient Air Quality of proposed mine lease area and its buffer zone is good and there are no any abnormal values recorded. Concentrations of all monitored parameters are within stipulated standards from MoEF AAQ Standards.

Ambient Noise : The noise survey involved determination of noise levels in decibels at 10 locations in the study area. Noise levels are measured once for twenty four hours at the selected locations. Noise levels were recorded for 10 minutes in every clock hour for a continuous 24 hour period. The noise level data in the study area represent typical rural area.

Water : Water Samples have been collected as per IS-2488 (Part I-V). Sampling and analysis of water samples for physical, chemical & heavy metals have been undertaken on seasonal basis. 8 locations for ground water & 4 surface water samples were selected from the 10 Km buffer zone. It is observed that at some locations TDS, Hardness and nitrates are found to be exceeding the prescribed limits. The reason that can be attributed is that this may be due to the dissolution of the salts and the local geological formations. Remaining physical and chemical parameters are within the acceptable range.

Drainage Pattern : There is no nala/ river in the applied lease area except marks of surface run-off of water during monsoons. In eastern side one seasonal nala, which carries surface run-off during monsoons is at a distance of 500 meters in southeastern direction and Amadehra nadi is around 1.8 km distance in southwest direction. The general drainage pattern of this region is observed to be dendritic. The core area is covered by a hillock and received 1500 mm rainfall. The core zone is located on the slope and three small drainages originates as seasonal water courses.

Mine Drainage : As stated above, the mine working are expected to be above water table during proposed mining plan period. Since water table is not likely to be encountered consequently there will be no proposal for pumping arrangement for discharged of mine water. Thus the mine will be zero discharge from core zone with respect to ground water.

Ground water: In buffer zone, depth-to-water level in unconfined aquifer in general varies from 6.5 m to 11.95 m below ground level in pre monsoon season while it is from 1.2 m to 4.5 m bgl in post monsoon period. Water level fluctuation in general is from 3.88 to 7.75 m between two extreme seasons. The proposed excavations are not going to touch the ground water table as it observed to be 12 m. Thus there will not be any contamination of the underground water because of the proposed mining. The water requirement for the proposed mine will be met from the bore well / dug well. There will be no discharge of waste water from the mine.

Groundwater Stage of Development : The stage of groundwater development computation in the present study is 9.02% which can be categorized as 'Safe' with less than 70% value. As per CGWB State report published, the stage of development in Kanker District in which study area is located is 9.22% and classified 'Safe' category.

Soil Sampling : Soil samples were collected at selected locations (3 depths) in the study area to assess the existing soil conditions in and around the proposed mine.

Landuse of the study area : Predominant area of the study area is under forest cover. In this study, the geographical area of all the 40 settlements covered under 10 km radius circle is taken into consideration though a couple of villages are covered partially in the study area. The maximum area is under cultivation 39.72% (irrigated 1.39% and un-irrigated 38.33%), followed by area under forest is 28.13%. While culturable waste land is 19.97%, and the remaining 12.19% of area is not available for cultivation.

Socioeconomic environment : The population is distributed among 5758 households in the study area. The 40 inhabited villages have a population of 28,654 comprising of 14,157 males and 14,497 females. The scheduled caste population of the study area on percentage basis is 3.50% the total population and scheduled tribe population 72.04%. The overall literacy in the 40 villages of the study area was 62.92%. Vocation-wise distribution of the study area is indicate that about 40.90% non working population is dependent on 59.1% working population. The male workers are observed to be more than the female workers.

POST PROJECT MONITORING

Sr. No.	Particulars	Period	Frequency	Parameter
1 Water quality monitoring				
	Water quality	Monthly	Grab simple	IS : 10500
2 Air quality monitoring				
	Ambient air quality	Biweekly	24 hours continuous	PM ₁₀ , PM _{2.5} SO _x , NO _x
3 micro metrology				
	Meteorological data	Daily	Continuous	Temp. RH, wind speed & direction
4 noise measurement				
	Ambient noise	Six monthly	hourly	

Biological Environment : Typical climax vegetation of the area is mixed forest. The area is surrounded by sal forests. The mixed forest is considered to be climax stage in the area. The sal forest succeeds in to mixed forest. The area and its surroundings is covered with forest. The rich deciduous forests of this area has been the major source of bamboo and timber. The terrestrial fauna includes common invertebrates and vertebrates. Wild faunal species like Bear, Fox and Jackal were reported to be more common than other animal species in the area.

National Park / Wildlife Sanctuary: There is no National Park, Wildlife Sanctuary, Biosphere Reserve, Archeological Monuments or sites of historical importance in the 10 Km Buffer zone and also in 15 Km radius.

ENVIRONMENT IMPACT ASSESSMENT

Impact on air quality: The modeling has been carried out to predict the impacts of the proposed mining operations with production capacity of 0.06 million tonnes per annum (MTPA) on the existing environment, using emission factor arrived for the worst case i.e. without control measures.

Impact on surface water course and quality : It is established that high gradient would serve as good media for high surface run off and considerably low ground water

recharge in the core zone. As such surface run-off contribution to the natural drains from the mining area would be minimum thereby very minor change is expected in hydrologic regime of the river system. There will not be any change in quality of river water due to mining.

Impact on ground water system : Since the no aquifer exist at mine due to unsaturated zone down to depth of 10 m depth, it is evident that impoundment are commonly formed on opencast mine land that trap the most of the runoff from their drainage area will contribute to deep aquifer through fracture zone. In addition there is a possibility that core zone may likely get recharge the deeper aquifer from the return flow of water being used for industrial purposes. These recharge waterways may seep as ground water runoff to nearby nala.

Impact on Landuse : The impact of mining on the land will be confined to mining lease area. The land will be broken in phase wise manner for different land uses necessary for winning the ore. The land will be broken as below;

- Quarrying :- 29,127 sqm
- Storage:- 2,629 sqm
- Road:- 1,624 sqm
- Infrastructue:- 444 sqm
- Plantation:- 2,250 sqm
- Town ship:- nil

As the current landuse of the land proposed for the mining is forest, necessary permission under Forest Conservation Act, 1980 has been obtained. Forest clearance will be carried out as per the systematic & scientific procedure laid under the FCA. Compensatory afforestation will be carried in lieu of the land to be broken for mining. No impact of mining on the agriculture land, grazing land or water bodies is envisaged by the proposed mining.

Impact on Socio -economics: Mining of iron from this area have significant beneficial impact on social environment. Further some increase in income of local people is expected as some local unskilled, semiskilled and skilled persons may gain direct or indirect employment.

ENVIRONMENT MANGEMENT PLAN

Air Pollution Management :

- a) Haulage roads will be frequently sprinkled with water for which truck mounted water tankers with sprinkler arrangement have been provided in the scheme.
- b) Ore will be covered by tarpaulins to prevent spread of dust from it during transportation.
- c) Regular maintenance of vehicles and machineries will be carried out in order to control emissions. An equipped workshop has been proposed for timely and proper maintenance of all machinery. This proper maintenance will ensure that gaseous exhaust from these are minimum.
- d) Green belt development would be taken up all along the haul roads and overburden dumps.
- e) The dust respirators are provided to all the workers in dusty atmosphere; and
- f) Good house keeping and proper maintenance is practiced which help in controlling the pollution.

Water Pollution Management: The mining project will require continuous supply of water for various purposes during mining, vegetation etc. apart from drinking water supply. The main source of water pollution in opencast mining is the surface run-off due to rainfall. There will not be any mine discharge during dry weather seasons as the proposed mining will be on the escarpment of the hill. There may be small quantity of mine discharge during monsoon season, which contains fine silt. This will be treated in settling tanks followed by desilting tanks and the treated water will be reused for dust suppression and plantation.

Arrangement for Dewatering: It is proposed to create a sedimentation sump of 3000 m³ (100 x 10 x3 m) capacity at the bottom for collection of rainwater during monsoon. The accumulated rain water, will be allowed to remain in the sedimentation sump until pumped out for its reuse in dust suppression and plantation.

Rainwater Harvesting : Check dams with settling ponds should be provided to arrest the silt & suspended solids from surface run-offs along the nallahs at selected sites.

Noise & Vibration Management

- Noise is best abated at source by choosing machinery and equipment suitably, by proper mounting of equipment & ventilation systems and by providing noise insulating enclosures or padding where practicable.
- The equipments to be procured is new and as such as the noise emission will be optimal for their design/operation. Proper maintenance/working should be done which keeps the noise level within limits.
- Boundary walls (Baffle walls), waste banks and dense belt of trees should be erected as acoustic barriers. Planting of bushy trees of rich canopy in and around the mine area to intercept noise transmission. A 50 m wide belt of trees of different heights should be useful to act as noise attenuator in the mining areas. The plant species which are more suitable for noise attenuation.
- Delay detonators with 5 to 10 millisecond delay interval will be used. For keeping the vibrations minimum.

Reclamation of the Land: The float area, after removal of float in will be back filled subsequently with waste material of subsequent year. Medicinal plantation is proposed on this backfilled area.

Plantation: It is proposed to select the local tree species with the help of forest department having 3 tier arrangement for implementation all along the mining lease in order to control dispersion of fugitive dust from the mining lease. The plantation is proposed on reclaimed land backfilled after excavation of float ore. It is proposed to plant medicinal plant in this 4 Ha of the land for this purpose it is proposed to undertake consultation/advise of the Forest Department to devise scheme of medicinal plantation. Plantation in the safety zone and other rationalization areas, roadside plantation is also proposed. The local tree species approved by Forest Department will be planted. It is proposed to plant and maintain 500 trees/year

Proposed Plantation Programme

Period	Greenbelt on Safety Area and ML Boundary	
	ha	No. Saplings
At the end of 5th year	2.5	5000
At the end of 10th year	2.5	5000
At the end of 20th year	5	10000
Total	10	20000

Socio-Economic Measures: The socio-economic conditions in the study area indicate the quality of life of the people. The important indicators which decide the quality of life and require to be improved for better living conditions are literacy levels, improved occupational structure, industrial development, infrastructural facilities, transportation, communication linkages, land development and improvement in cropping pattern. The project proponents are envisaging undertaking the following socio-economic measures.

- **Health Care** : These include, family planning and medical camps and aid to the existing and proposed hospitals.
- **Educational Facilities** : These include adult education facilities, financial assistance for higher studies, sponsorship to vocational / professional training institution, computer education camps, vacation training for students and aid to existing/proposed schools and colleges.
- **Civic Amenities**: These include community toilets, support to drinking water facilities like public stand posts, In addition to this participation and support to government efforts in extending communication (post, telegraph, telephones, transport, power supply etc) to the remotest part of the region. Incidentally, all parameters mentioned above are directly or indirectly controlled by various State and Central Government Departments.
- **Employment**: It is proposed to employ the local population wherever possible in the proposed project activities. The work of reclamation of the entire area that will be damaged in mining operations and afforestation through plantation of 2000 trees per ha with survival rate of 80% to 85% has been envisaged. In this, local tribal people would be involved actively including employment and award of contracts for supply of

materials and services. Vocational training programme for unemployed youths will be arranged regularly.

- **Occupational health** : All the mine workers will be sent to Hospital which have the facilities for chest X-ray, pulmonary function test & audiometry, TB, Malaria, HIV etc. once in 5 year. Free Transport will be provided.
 - It is proposed to supply treated water for drinking water for the mine workers.
 - A safety committee will be constituted to implement the proposed OSHA management plan and environment management programme and take proper mitigative measures as per EIA/EMP.
 - Services of Occupational Health Specialist will be arranged regularly.
 - The proponent will bear all the expenditure related to health check up and treatment of the mine workers.
 - Individual health record of every worker will be maintained till the end of service or the end of mining operations. Records will be maintained and corrective action if required, shall be taken by the management Budget has been allocated under Recurring Annual Cost for Environmental protection

Budgetary Provisions: The mitigation measures suggested above shall be implemented so as to reduce the impact on environment due to operations of proposed mining activities. In order to facilitate easy implementation, mitigation measures are phased as per the priority implementation. A separate budgetary allocation of the funds is made for the environmental protection measures. The monitoring of the pollution to know the effectiveness of the applied control measures will be carried out at regular interval. A budgetary provision of Rs 3.00 lakhs as capital investment and recurring expenditure of Rs 4.00 lakhs is made for undertaking various social developmental activities. For environmental protection measures the capital investment is estimated to be Rs 7.00 lakhs and recurring expenditure of Rs 10.00 lakhs /annum is proposed.

AN EPILOGUE

In compliance with the environmental procedure the environmental clearance application is made. Necessary scientific studies have been undertaken as per the guidelines set by the Ministry of Environment and Forests (MoEF). The suggestions/recommendations of all the experts, competent authorities, and government officials are being sought for the impacts of the proposed project. Views and guidance of the local residents, community based organizations, social organizations are extremely important in order to devise a full proof Environment Management Plan for the proposed mining project and also mitigate the damages caused due to the project. Allocation of necessary funds, manpower and machinery will be made to for the protection and conservation of all the components of environment. It is ensured that all mandatory clearances will be sought from respective competent authorities before operating the proposed **Laion Dongri Iron Ore Mine (14.40 Ha)**. We at JNIL are committed to implement the suggestions for the improvement of the environment and assure that every attempt will be made for the conservation and protection of the natural resources to the maximum extent.