

SUMMARY ENVIRONMENT IMPACT ASSESSMENT REPORT

Expansion of Steel Plant

village Taraimal, Tehsil Ghargoda

District Raigarh (Chhattisgarh)

PROJECT PROMOTER

NALWA STEEL & POWER LIMITED

RAIGARH, CHHATTISGARH

OCTOBER 2009

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1.0 Project Description

1.1 Introduction: Nalwa Steel & Power Limited (NSPL) is operating a steel plant at village Taraimal, tehsil Gharghoda, District Raigarh, Chhattisgarh. The expansion proposal of Nalwa Steel & Power Limited includes iron and steel making, steel rolling and sinter plant. Waste heat and char will be used for captive power generation.

The activity falls under Category A Serial 3 (a) of EIA Notification 2006. The Terms of Reference for the EIA study was approved by the Ministry of Environment & Forests, Government of India (MOEF) vide letter No.J.11011/1108/ 2007/ IA-I dated 12th March 2008. The draft EIA report has been prepared for public hearing as per the TOR.

1.2 Project Cost: The estimated cost of expansion project is Rs.1325 crores.

1.3 Land Requirement: 91 acres adjacent non-forest land will be acquired for the expansion project. No displacement of human settlement is involved.

1.4 Water Requirement: 800 kl/hour (19200 m³/day) water will be required for the expansion project, which will be taken from Mahanadi River and transported by pipelines that will follow the road route.

1.5 Raw Materials: Raw Materials like coal, coke, quartzite, limestone and dolomite will be transported by road. Iron ore will be transported from Raigarh to site by road.

1.6 The name and capacity of existing and proposed units are given below:

	Name of Existing Units	Name of Proposed Units
1.	6 × 100 tons per day (TPD) DRI rotary kilns for sponge iron (180000 TPA)	2 × 500 TPD DRI rotary kilns for sponge iron (330000 TPA)
2.	16 MW Captive Power Plant (WHRB based using waste heat from DRI kiln)	25 MW Captive Power Plant using (WHRB based using waste heat from DRI kiln)
3.	8 MW Captive Power Plant (AFBC based using char and coal middlings)	51 MW Captive Power Plant (AFBC based using char and coal middlings)
4	Steel Making Shop (140000 TPA) 4 × 12-ton induction furnaces 1 × 26-ton ladle refining furnace 1 × 3 strand billet caster	Steel Making Shop (336000 TPA) 50 ton electric arc furnace 50 ton ladle refining furnace 1 × 3 strand continuous billet caster
5	250000 TPA Rolling Mill	200000 TPA Rolling Mill
6.	Producer Gas Plant 12000 Nm ³ /hr	--
7.	Oxygen Plant 100 Nm ³ /hr	--
8	Coal Washery 200 TPH	--
9	--	Sinter Plant - 408100 TPA
10	--	Blast Furnace - 318500 TPA

TPA : Tons per annum

The brief manufacturing process is described below:

Sponge Iron Plant: Crushed raw materials (Iron ore, coal & dolomite) are fed to the kiln. Coal provides the source of heat and also acts as reducing material to turn iron ore into iron. Sponge iron produced is separated from waste materials in magnetic separator, screened and sent to steel making shop.

Blast Furnace: It is a vertical furnace. Sinter, iron ore, coke are charged from furnace top that slowly travels down and comes in contact with upcoming hot air. Coke reduces iron ore to iron and also supplies heat. Iron ore gets converted to iron and impurities are converted to slag, which is taken out at regular intervals. Blast furnace

gas will be used as fuel in the stoves. The molten iron is converted to pigs or directly taken to steel melting shop.

Steel Melting Shop: Pig iron, sponge iron, lime and ferroalloy is charged from the top of Electric Arc Furnace. Arcing melt the contents. Oxygen blowing is done. Steel is tapped and chemistry correction is done in ladle refining furnace. Liquid steel is casted into billets in continuous casting machine. Slag is taken out from slag tap hole.

Rolling Mill : Steel billet is rolled into different products in the Structural Mill. Blast furnace gas will be used as fuel in the reheating furnace.

Sinter Plant: Sintering process recovers iron from waste materials that would otherwise be dumped. Iron ore fines and dust containing iron, mill scales, limestone and coke and coal fines are mixed, converted to nodules and sintered in sintering furnace. Blast furnace gas will be used as fuel in the sintering furnace.

Power Plant: In power plant high pressure steam is produced using pressurized boilers, which are fed to turbines for generating electricity. Coal fines, kiln char are fuel for AFBC boilers. Waste heat from DRI Kiln gas and surplus blast furnace gas is the fuel for WHRB.

2.0 Description of the Environment

Baseline environmental data generation of study area was carried out during the period December 2008 to February 2009. Data was generated by following the standards / approved procedures of the Ministry of Environment & Forests and the Central Pollution Control Board. Study area of 10 km radial distance around the site has been considered for environmental baseline data generation.

2.1 Micro-Meteorological Environment: Met station has been established inside NSPL premises. Historic met data was collected from India Meteorological Department. The predominant wind direction is from northwest sector. The average wind speed ranges from 2.9 to 4.1 kmph. Daily mean temperature varied from 13.3°C to 31.6°C. The relative humidity varied from 30 - 62%. The annual rainfall is 1602 mm.

2.2 Air Quality: The SPM, RSPM, SO₂ and NO₂ levels were monitored at eight locations in the study area. The observed mean levels are as follows; SPM:105 to 182 µg/m³, RSPM 40 to 62 µg/m³, SO₂ 4.0 to 7.8 µg/m³ and NO₂ 9.0 to 15.2 µg/m³. The baseline air quality levels are within the National Ambient Air Quality Standards prescribed for residential area (Standards are 200, 100, 80 and 80 µg/m³ for SPM, RSPM, SO₂ and NO₂ respectively).

2.3 Noise Quality: Ambient noise levels were monitored at 8 locations in the study area. The observed Leq levels for day range from 46.2 to 53.6 dB (A) and night time ranges from 40.3 to 43.4 dB (A). The baseline noise levels are well within the National Standards for residential area (Standards are 55 dBA-day time and 45 dBA-night time).

2.4 Water Quality: Eight surface water samples and eight groundwater samples were collected from the study area for chemical and biological analysis. The surface water quality and groundwater quality of the study area are satisfactory. The groundwater quality is fit for potable use. No metallic or bacterial contamination was found in the water quality.

2.5 Soil Quality: Eight soil samples were collected from the study area and analyzed. The texture of soil is sandy loam. The organic matter, nitrogen, potassium and phosphorus content of the soil are moderate. The pH and conductivity of all the soil samples are within the acceptable range.

2.6 Ecology Quality: The canopy of the forests is dominated by sal, mahua, beeja, tendu, saja, etc are the dominant plant species of the study area. Mongoose, porcupine, jungle cat, cobra, krait, and variety of birds are the common animals of the study area. No endangered species of plants and animals are found in the study area.

2.7 Sensitive Ecosystem: Within 10 km distance of the project site, no plant or animal species were found to be on the endangered list. No ecologically sensitive area like biosphere reserve, national park, wildlife sanctuary, archaeological monuments are present within 10 km distance of the project site.

2.8 Socioeconomic Data: The study area falls in Tamnar block and Gharghoda tehsil. In Tamnar block 59.8 %, of land is under net shown are, 10.8 % of the land is fallow land, 4.85% of the land is forest land and rest of the land is under different uses. The total population of Gharghoda tehsil is 148903 (District Statistics Handbook 2007). The literacy rate of Gharghoda tehsil is 70%. Agriculture, collection of forest produce and industrial workers dominate the occupation structure of the study area. Several sponge iron plants, induction furnaces, rolling mills, ferroalloy plants, brick kilns, power plants, and other small units are present in the study area.

3.0 Anticipated Environmental Impact & Mitigation Measures

3.1 Air Quality: Particulate Matter emissions from DRI plant and Sinter Plant will be controlled using Electrostatic Precipitators and the outlet emission will be restricted within 50 mg/Nm³. Particulate Matter emissions from SMS will be controlled using Fume Extraction System connected to Bag Filters and the outlet emission will be restricted within 50 mg/Nm³. Particulate Matter emissions from Blast Furnace will be controlled using dust catcher followed by two stage wet venturi scrubber and the outlet emission will be restricted within 10 mg/Nm³.

All internal roads will be made pucca. All roads and shop floors will be cleaned regularly. Fugitive dust from all sources like stock house, day bins, material handling, crushing, screening, etc will be controlled using plant deducting systems comprising suction, ducting and bag filters. Water spraying will be done to suppress the dust generated during construction activity. Mathematical modeling study proved that the maximum incremental ground level concentration of SPM, RSPM, SO₂ and NO_x from the expansion units will not violate the residential ambient air quality standard. The impact of the project will be observed at a distance upto 1.5 – 2.5 km in southeast direction. The ambient air quality will remain well within the prescribed standard hence it will not create any adverse impact on human health and ecology.

3.2 Noise Quality: Unloading and hauling operations and movement of trucks and dumpers will be properly scheduled to minimize construction noise. The air compressors, rotating machines, pumps, ID fans, air blast, blowers, mill operations, turbines, will be the major sources of noise. All activities will be carried out inside sheds and maintenance program for equipment will be routinely followed. Sound absorbing materials will be provided in the room where both the source and receiver are present so that the reflecting sound is absorbed. Greenbelt will further reduce the noise level. In noisy work areas soundproof duty rooms will be provided. Workers working in noisy areas will be given ear plugs. In this manner the noise level will be restricted within the plant boundary to meet the standards of 75 dBA during day time and 70 dBA during night time.

3.3 Water Quality: 800 kl/hour of water will be taken from Mahanadi River. Rainwater harvesting structures will be constructed as per guidelines of Central Ground Water Board. Rooftop rainwater will be diverted towards these structures for recharging the groundwater. Sedimentation pits with oil separator will be constructed to trap the silt-laden water arising from site offices, canteens and other washing facilities at the construction site. The overflow will be reused for dust suppression. Scrubbed water from blast furnace gas cleaning plant will be taken to thickener and

reused for dust scrubbing. Cooling tower blow down water generated during the plant operation will be reused for slag granulation and dust suppression. Domestic wastewater will be treated in Sewage Treatment Plant and reused for gardening. No wastewater will be discharged outside the plant premises. The storm water drain will be kept separate from wastewater drains. The storm water drain will have sedimentation pits and oil-water interceptors, before discharging into nalla. Spent oil and lubricants will be collected in drums and given to authorized recyclers.

3.4 Solid Wastes: The solid wastes like slag will be granulated and sold for cement making. SMS slag will be reused for road making. Sinter plant dust will be recycled. DRI plant char will be mixed with coal fines and middlings and reused for power generation. Ore fines, dust from air pollution control devices and mill scales will be reused in sinter plant. No solid wastes will be dumped outside the plant premises.

3.5 Soil Quality: The soil quality of the site and surroundings is sandy loam. The infiltration rate of the soil is moderate. Air pollution control devices will be installed at all points to trap the dust. Solid wastes generated from the air pollution control devices and process will be reused. No solid wastes will be dumped on land, hence there will be negligible impact on the soil quality.

3.6 Ecology Quality: Dust emission from the plant will be controlled using scrubber, ESP and bag filters. Flue Gas will be dispersed using tall stacks. All air emissions will be kept within the prescribed standards. Wastewater and solid waste will be reused. Greenery development will be intensified, 33% open spaces will be made green. Such measures will be adequate to protect the surrounding ecology.

3.7 Public Health Quality: The national ambient air quality standards prescribe level of air pollutants that will protect public health and vegetation. Air quality dispersion modeling study proved that the ambient air quality of the area will remain within the national air quality standards. Entire wastewater and solid wastes generated from the

plant will be reused. No toxic chemicals or hazardous wastes will be handled in the plant. Hence there will be no risk to public health.

4.0 Environmental Monitoring Plan

4.1 Environmental Management Department : EMD, under the direct control of Chief Executive with environmental laboratory, scientists and engineers exists. The EMD will be strengthened by recruiting scientists, engineers, chemists and field assistants.

4.2 Activities of EMD: The following activities are recommended for EMD.

1. Regular monitoring of stack emissions, fugitive emissions work environment and report any abnormalities for immediate corrective measures.
2. Regular monitoring of ambient air quality at plant boundary and outside the plant in upwind and downwind direction.
3. Regular monitoring of re-circulating water quality, ground water quality and surface water quality.
4. Regular noise monitoring of the work zone, equipments and outside the plant.
5. Green belt plantation, maintenance, development of other forms of greenery like lawns, nursery, gardens, etc. in the plant premises.
6. Regular monitoring of quantity and quality of solid waste and their reuse options.
7. Development of schemes for water conservation, rain water harvesting and reuse of treated wastewater.

5.0 Additional Studies

5.1 Risk Mitigation Measures: Necessary risk mitigation measures, including firefighting measures will be implemented. Hazards due to mechanical injury will be reduced by use of standard design and operating procedures. Oil tanks will be located as per recommendation of Chief Controller of Explosives with necessary safety measures. Disaster Management Plan has been prepared in consultation with the District Administration to take care of public health and safety during any untoward incident. No building materials will be extracted from the project site. Excavated earth will be used for leveling and backfilling of civil foundations. It will be ensured that drains and garland drains are constructed conforming to the existing drainage pattern so that alteration is kept to the minimum and flooding does not occur. Above measures will minimize any accidental and soil erosion risks due the plant.

5.2 Rehabilitation: Rehabilitation of project affected persons will be done as per the Policy of Chhattisgarh Government. Financial compensation based on mutually acceptable rate has been paid to land losers. Preference will be given to land losers for employment in the expansion project as well as during construction. They will be absorbed as per their skill and experience.

6.0 Project Benefits

6.1 Direct Benefits: The project will overcome the demand and supply gap of steel product in the country. The project will also generate additional revenue for the State Government. The additional steel availability will boost the infrastructure sector and the overall economic scenario of the country. The project will create additional employment generation for 1000 people during the construction phase of 36 months. About 570 people will be employed during the operational phase. Local people will be preferred for employment during the construction and operation stage.

6.2 Indirect Benefits: Several other types of indirect employment opportunity will be created in the surrounding area due to this project. Transport business, vehicle drivers and attendants, workshops, grocery and retail, hospitality, medical, school, coaching centers, technical institutes, hotel and restaurants, self employed persons like tailors, carpenters, plumbers, electricians, etc will get indirect job opportunity.

7.0 Environmental Management Plan

The EMP will establish a framework for the effective management of environmental impacts and ensure the best overall protection of the environment through appropriate management procedures. Rs.32 crores has been earmarked as capital cost of pollution control systems. The annual recurring cost will be about Rs 6.5 crores. Environmental Management System (ISO 14000) will be instituted in conjunction with this EIA report.

Contractor under the direct supervision of NSPL will do environmental Management during construction phase. NSPL will introduce requisite provisions in the contract documents and the contractor will develop a contract specific plan and designate staff responsible for pollution control. The EMD will supervise the contractor's obligation for mitigating the environmental impact during construction phase.

The EMD will ensure that all air pollution control devices, effluent treatment plants and water re-circulating and reuse schemes are functioning effectively. EMD will also supervise and monitor the handling, transport and disposal of spent oil and lubricants and used batteries as per the approved authorization. EMD will promote use of ozone friendly refrigerants. EMD will quantify the emission rates of greenhouse gases and explore adoption of clean development mechanism.

Greenbelt and greenery development inside and outside the plant premises will be intensified by the EMD. Greenery on 33% land will be ensured. Guidelines issued by

the Central Pollution Control Board (CPCB) on greenbelt development will be followed and district forest department will be consulted for selection of trees.

First aid center will be established inside plant premises, which will be equipped with paramedical staff, medicines, vehicle and other medical equipment. The workers will continue to be periodically checked for any clinical complaints and abnormal symptoms by the in-house medical department. EMD will ensure clean work place and implement use of personnel protective equipment in consultation with the safety department. EMD in association with the safety department will undertake full review of the potential hazard scenarios during plant commissioning. The review will confirm the proposed safeguards for accident prevention and minimisation and update the assessment of consequences.

Regular audits against an EMP will be undertaken to ensure that all actions and procedures are being carried out effectively. As part of the audit, inspection reports will be recorded that form part of the review and revision procedure for the EMP. The monitoring and reporting regimes includes defining responsibilities for implementation of each elements of the EMP, specifications for management procedures, duties of contractors, auditing, checking and implementation of corrective actions, training and awareness building, communication on environmental matters and checking, reviewing and up-dating the EMP document as and when necessary. The implementation of EMP would ensure that all elements of project comply with relevant environmental legislation. With the effective implementation of mitigation measures and Environmental Management Plan during detailed design, construction planning, construction and operation the project will create minimum adverse impacts that will be manageable.