Executive Summary

Introduction

The steel industry has been a crucial pillar of India's economic growth, playing an essential role in generating both direct and indirect employment opportunities.The National Steel policy has set a target of achieving 300 million tons of steel production by 2030-31, with a focus on strengthening the sector to address domestic demand and contribute to the nation's economic prosperity. The demand for steel is expected to grow steadily in the short to medium term, with an annual increase driven by domestic consumption and infrastructure projects.

M/s. IMIPL has taken the initiative to set up an Integrated Steel Plant tomeetproduction requirements while contributing to the achievement of the targets outlined in the National Steel Policy. This project will not only bridge the demand-supply gap but also stimulate economic growth by providing jobs and driving infrastructure development

The project proponent M/s. Indermani Mineral India Private Limited with a futuristic view to diversify the business, have envisaged to establish an integrated steel plant at Rajghatta village, Kharsia tehsil, Raigarh district in Chhattisgarh.

PROJECT DESCRIPTION

The proposed project falls under 3(a)-Metallurgical industries (Ferrous & Non-Ferrous under **Category 'A'** and requires prior Environmental Clearance (EC) to be obtained from Ministry of Environment, Forest and Climate Change (MoEF&CC)

The proposed project involves installation of iron ore grinding and beneficiation plant, pellet plant, coal gasifier for pellet plant, sponge iron plant, ferro alloys plant, steel melting shop (SMS), rolling mills and captive power plant.

SIZE OR MAGNITUDE OF OPERATION

Sr.No	Facilities	Capacity
1	Iron ore Beneficiation	30,00,000 TPA
2	Sponge Iron Plant	6,00,000 TPA
3	Iron ore Pelletization	16,00,000 TPA
4	Induction Furnace/Steel Melting Plant	3,80,000 TPA
5	Rolling Mill	3,80,000 TPA
6	Oxygen plant (of 100 TPD)	Dropped
7	Ferro Alloys	66,000 TPA
8	Captive Power Plant (WHRB 42 MW & FBC 24 MW)	72 MW

The proposed plant is based on advanced process technology and equipped with the most efficient auxiliary sub-systems, material handling facilities along with pollution control equipment.

Project Location

The proposed activity will be taken up at Rajghatta village, Kharsia tehsil, Raigarh district, Chhattisgarh. The geographical co-ordinates of the plant lies between

latitude 210 00' 2.46 "N to 220 00' 31.33"N and longitude: 83.90 9.0'9.55"E to 83.00 10.0'8.35"E.

Resource Requirement

The capital cost of the proposed project is about **Rs. 1100 Crores**

Land Requirement

Total land requirement of the proposed steel plant is 81.746 ha (202 acres). Project is envisaged on 60.9 ha (150.5 acres) and the remaining 20.8 ha (51.5 acres) left vacant for future use

Water Requirement

The estimated water requirement for the proposed project is 5,510 KLD, out of which 4975 KLD is fresh water and the balance 535KLD is treated waste water recycled.

Power Requirement

The estimated power requirement of proposed plant will be about 75.2 MW. In order to meet the power requirement for the proposed plant, a Captive Power Plant (CPP) of capacity 3 x 16 MW of WHRB and 1 x 24 MW FBC has been envisaged. In addition to CPP, IMPL proposes to source 3.2 MW of standby power from Chhattisgarh State Electricity Board to run the utilities in case of plant shut down

Manpower requirement

The proposed plant shall generate direct employment of 750 No under direct employment of company during operation phase. During the construction phase of the 100-200 employment shall be generated. In addition to direct employment indirect employment of about 5000 persons shall be generated.

Raw Material Requirement

Major raw materials are available within Chattisgarh. WITHIN 100 KM RANGE

Brief Process Description

Iron Ore Beneficiation: Beneficiation is the process, where ore is reduced in size and separated from the ore.

Pelletization Plant: Iron ore fines from the Beneficiation Plant are agglomerateintopellets and then indurated using a furnace to create iron ore pellets. These are fed to a DRI plant as part of the process to make steel.

Direct Reduced Iron (DRI): DRI also called sponge iron is produced from the direct reduction of iron ore (in the form of lumps, pellets, or fines) into iron by a reducing gas or elemental carbon produced from coal.

Steel Melting Shop (SMS): In Steel Melting Shop (SMS), Sponge Iron will be melted along with melting scrap and fluxes to make pure liquid steel and then to mould it in required size billets

Rolling Mill: The process involves heating of steel billets in a reheating furnace and rolling them through a sequence of rolling stands which progressively reduce the billet to the final size and shape of the reinforcing bar.

Waste Heat Recovery Power Generation: IMPL has planned to generate 48 MW of Electricity by utilization of Waste Heat emanated from the exhaust of the Two Rotary Kilns during the production of Sponge Iron through Waste Heat Recovery Boiler Route

Anticipated Environmental Impacts and Mitigation Measures

Baseline data for the proposed project has been collected during Post Monsoon season i.e., October to December – 2023.

Sources of Pollution and its Mitigation Measures
The various types of pollution from the proposed project are categorized under the following types:

- Air pollution;
- Water pollution;
- Pollution emanating due to solid waste; and
- Noise pollution.
- For the purpose of impact assessment during the operational phase, the following components have been separately considered
- Land use;
- Topography and climate;
- Air quality;
- Traffic;
- Water resources and quality
- Noise levels;
- Ecology; and
- Solid waste management; and
- Socio-economic aspects

Meteorology

An Automatic Weather Station (AWS) was installed near the project site, for a period of three months (October to December, 2023). The Meteorological data, both Primary & Secondary data for project site summarized in below table.

TABLE- SUMMARIZED METEOROLOGY DATA OF PROJECT SITE

Month	Temp. (°C)		RH (%)		Predominant Wind Direction coming from	
	P	S	P	S	P	S
Post Monsoon Season (Oct – Dec, 2023)	9.4 – 33.9	9.9 – 34.7	50-75	51-73	NE, NW, SE	NE, NW, SE

P : Primary data, S : Secondary data

Land Use

As per satellite imagery, forest land occupies 2.81 %, agricultural land is about 36.79 %, and remaining land is either area available for cultivation or cultivable waste land is 60.4 %.

Impact on Land Use and Soil Quality

The elevation of the proposed steel plant is 229-230 m. Location of new units will involve minimal or no overall disturbance to the natural eco-system. About 500 m^3 of soil will be excavated for the installation of proposed units which will be used within the plant premises.

The area over which the new units will be set up are vacant areas which have been earmarked. Due to location of proposed units of IMIPL, there will be no major impact on the land use of the study area.

Topography and Climate

The topography of the project site is slightly undulating (229 m -239 m aMSL) with trees/shrubs present at some places. There will not be much cutting and filling required for the proposed project. The additional structures such as industrial buildings, stacks, waste disposal facilities etc. will be constructed. The general appearance of the site will change into an industrial set-up. The filling requirements will be met through internal cutting only. There will not be any need for any external borrow areas. The ground level will be graded to the required plinth levels. This will be a permanent change at the project site
.
The exit temperatures from the stacks will be maintained in the range of ambient temperature from 50oC to 200oC, which will have nominal impact. By implementing the pollution control measures the impact will be localized. The temperature rise is not likely to have any macro-climatic adverse impacts.
Further, the proposed extensive green belt in the project site will have a moderating impact on the heat conditions in the project site.

Ambient Air Quality

The minimum and maximum concentrations for PM_{10} were recorded as 31.0 $\mu g/m^3$ and 68.5 $\mu g/m^3$. The minimum and maximum concentrations for $PM_{2.5}$ were recorded as 15.6 $\mu g/m^3$ and 32.5 $\mu g/m^3$.

The minimum and maximum SO2 concentrations were recorded as 9.4 $\mu g/m3$ and 19.2 $\mu g/m^3$. The minimum and maximum NO_2 concentrations were recorded as 11.7 $\mu g/m^3$ and 20.8 $\mu g/m^3$. The minimum and maximum CO concentrations were recorded as 188 $\mu g/m^3$ and 340 $\mu g/m^3$.

The concentrations of $PM_{2.5}$, PM_{10}, SO_2, NO_2, O_3, CO, NH_3, Pb, BaP, As, Ni and C_6H_6 are observed to be well within the NAAQ standards prescribed by Central Pollution Control Board (CPCB) for industrial and rural /residential zone.

Water Quality

Surface Water Quality

The analysis results of water samples indicate that the pH value was observed to be 7.18 – 7.32. Electrical conductivity of water samples was observed to be 160 - 220 µS/cm. The total dissolved solids were observed about 101 - 137 mg/l. Total hardness was observed in the range of 60.1 – 73.4 mg/l. Sulphates were found to be in the range of 10.6 – 13.2 mg/l and Nitrates were found to be in the range of 0.9 – 1.2 mg/l. Fluoride concentration was found to be 0.4 - 0.7 mg/l .

Ground Water Quality

The analysis results of ground water samples showed the pH in range of 6.79 – 7.64. Colour of the samples ranged from 1 - 4 Hazen whereas the prescribed limit is 5 to 15 Hazen. Turbidity of the samples ranged from 2 - 5 NTU whereas the prescribed limit is 1 to 5 NTU.

Electrical conductivity of the samples ranged from 674 - 1431 µS/cm. The total dissolved solids of the samples ranged from 420.1 – 891.7 mg/l. Calcium concentrations ranged from 48.7 – 102.9 mg/l. Magnesium concentrations ranged from 24.6 – 56.3 mg/l. The total hardness of the samples ranged from 223.0 – 461.8 mg/l. Range of Chlorides concentrations at all the locations 93.4 – 201.2 mg/l.

Impact on Water Resources

The estimated water requirement for the proposed project is 5,510 KLD, out of which 4975 KLD is fresh water and the balance 535 KLD is treated waste water recycled. The waste water generated in the plant is treated and Reused there by it is a **Zero Liquid Discharge.** The source of water requirement is Mand river

Impact on Surface Water Resources

Water used from the various process of the plant is mainly from indirect cooling circuits which are not normally contaminated with any pollutants. Wastewater generated from process is treated in ETP and reused for plant process. Hence, the impact on the surface water quality is not envisaged. Danthar nala is passing within the site.

Impact on Ground Water Resources

No ground water is abstracted as the required water will be met from Mand river which is about 1.5 km away from the plant. Hence, no impact on ground water is envisaged.

Noise

The major sources of noise generation from the proposed plant are fixed plant installations and external transport movements. The common noise generating sources from the fixed plant installations are blast furnace, screens, vibrators, and conveyors. Apart from these, another noise generating source is DG set which will be generated occasionally.

Adequate protective measures in the form of ear muffs/ear plugs will be provided to the workers working in high noise areas for the proposed project. All the necessary

noise protective equipment's will be supplied to workmen operating near high noise generating sources.
Noise levels recorded within the study area are observed to be well within the NANQS as prescribed by CPCB

Solid Waste / Hazardous Waste Management

Major solid wastes generated from the proposed plant complex would include SMS slag, Dolochar, Slurry, tar, scrap, sludge, iron ore rejects and ash generated from power plant &DRI plant. Solid waste iron ore tailing and ash from shall be reused in cement industries .Pellet plant rejects,Mill scales,end cuttings and slag from ferro alloys plant shall be reused in the plant/process.Ash fro DRI plant shall be reused in brick manufacturing units.Wet scrap sludge,kiln accretion slag,SMS slag shall be used in Road construction /brick manufacturing units.Tar shall be disposed to authorized dealers.Sludge ffrom STP used for manure and ,and from ETP sent to TSDF.

Biological Environment

The impact on terrestrial ecology may occur due to emission of gaseous pollutants like SO_2, PM and NO_2. However, at higher doses, they can be injurious to both vegetation as well as animals.

Effective utilization of pollution reducing technologies, such as air and noise pollution reduction equipment during the operation phase will be of immense help and will aid in reducing the pollution during operation phase of the plant and also appropriate plantation activity plant and using treated sewage water for the purpose of the greenbelt development and gardening activities which are earmarked in the area.

Flora and Fauna

There are no wildlife sanctuaries or National Parks or Biosphere Reserves or Migratory corridors of wildlife or Ramsar Wetlands.

Flora & Fauna of the region	
General flora	Invasive shrubs (Siam weed and *Lantana*), herbs (*Hyptis suaveolens, Malachra capitata, Acanthus ilicifolius*), grasses (*Pennisetum purpureum*) and a forest climber (*Terminalia roxburghii*) are rampant in the whole area.
Live stock	Buffalo, Cow, Goat, Hen
Other fauna	Leopard, Sloth Bear, Peacock, Python and Common Indian monitor

There no rare or endangered or endemic or threatened or Schedule I species within a radius of 5 km from the boundary of project lease.

Social Environment

The baseline data for population and demographic details around the 10 km radius of mine site (according to 2011 census) is given below.

Population (%)		**Occupational structure (%)**		**Literacy (%)**	
SC	15.01	Workers	41.28	Literates	86.94
ST	23.48	Non workers	58.72	Illiterates	13.06

Socio-Economic Environment

The project is expected to result in improvements in the socio-economic levels in the study area.

- Employment potential;
- Increased business opportunity;
- Improvement in health and education facilities;
- Better living standards; and

Access to improved infrastructure facilities.

As per MoEF&CC Office Memorandum dated 30.09.2020, the Corporate Environment Responsibility (CER) will be no more applicable. However, the proponent has allotted a budget of Rs. 10 Crores towards socio-economic development in the surrounding community. The details are provided in **Table.**

3 CSR ACTIVITIES AND BUDGET

Sr. No.	**Sectors**	**Budget**
1	Health & Hygiene	5
2	Education	2.5
3	Community Development	2.5
Total (Rs. In Crores)		**10**

Environmental Monitoring Program

The post project environmental monitoring is important in terms of evaluating the performance of pollution control equipment installed in the project. The sampling and analysis of the environmental attributes will be as per the guidelines of CPCB/ State Pollution Control Board (SPCB). The frequency of air, noise, surface water and ground water sampling and location of sampling will conduct as per the directives of SPCB.

IMIPL proposes to spend about Rs. 10.5 crores towards environmental protection measures with a recurring cost of about Rs. 1.45 crores.

Green belt

Greenbelt will be developed and maintained in 20.90 ha i.e. 33 % of planned area within the plant premises. Plantation will be carried out at the rate of 1500/ ha will be planted as gap filling and maintained.

Project Benefits

The proposed project will result in improvement of infrastructure as well as Overall socio-economic development in the area. The people residing in the nearby areas will be benefited directly and or indirectly due to the project. It is anticipated that the

project will provide benefits to the locals in two phases i.e. during construction phase as well as during operational stage of the plant. The proposed project will generate employment for 750 manpower including those on contractual basis to even more people will engage in trade, commerce, construction and transport and business opportunities in the area, which shall positively impact the income generation activities for local people.

Conclusions

The proposed integrated steel plant will have certain level of negative impacts on the local environment. The all-possible impacts due to the project execution have been identified. The measures will be implemented through Environmental Management Plan to enhance the positive impacts and to minimize the negative impacts. Project proponent proposes to spend about Rs. 10.5 crores towards environmental protection measures with a recurring cost of about Rs. 1.45 crores.

However, development of this project has certain beneficial impact/effects in terms of providing the direct and indirect employment opportunities during the construction phase as well as during operational phase of the project. Increased business opportunity to the local people and improvement in health and education facilities.

Thus, it can be concluded that with the judicious and proper implementation of the pollution control and mitigation measures, the project will be beneficial to the society and will help to reduce the demand – supply gap and will contribute to the economic development of the region in particular and country in general.