

EXECUTIVE SUMMARY
ENVIRONMENTAL IMPACT ASSESSMENT
REPORT

OF



JAYASWAL NECO INDUSTRIES LIMITED

Expansion & Modernization of Existing Steel Plant
at
Siltara Industrial Growth Center,
Siltara, Sankra, Girod, Dhaneli (V) Raipur (D & T), C.G

Submitted to

CHHATTISGARH ENVIRONMENT CONSERVATION BOARD

Prepared by



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1.0 PROJECT DESCRIPTION

JAYASWAL NECO INDUSTRIES LIMITED (JNIL) is operating Integrated Steel Plant at Siltara Industrial Growth Center, Siltara, Raipur, Chhattisgarh. Existing plant has obtained Environment Clearance from MoEF&CC vide F. No. J-11011/809/2007-IA-II (I) dated 08-09-2008 and 26.09.2014 (Validity Extension) and EC obtained for Renovation and Modernization vide F. No. J-11011/883/2008-IA-II (I) dated 26-03-2009 & CTE issued by the CECB for adjoining 1 x 350 TPD DRI kiln, 1 x 500 TPD DRI kiln in other companies' name. Later both the plants demerged from those respective company and merged with M/s. Jayaswal Neco Industries Limited.

Existing plant have obtained CTO for Steel complex from the Chhattisgarh Environment Conservation Board (CECB) vide order no. **7303/TS/CECB/2022** dated 12/01/2022 (Valid upto **31/12/2024**), obtained **CTO for Pellet plant capacity enhancement** vide no. **8386/TS/CECB/2022 (valid up to 31/12/2024)** obtained **CTO for 350 TPD (1,20,000 TPA) DRI unit** vide order no. **3761/TS/CECB/2020 DATED 07-08-2021 (valid up to 31-07-2022)** & obtained **CTO for 500 TPD (1,50,000 TPA) DRI unit** vide order no. **5575/TS/CECB/2020 DATED 24-09-2020 (valid upto 30-09-2022)**.

Now it is proposed to go for expansion of existing units i.e., Blast Furnace – 0.75 MTPA to 2.00 MTPA, Sinter Plant – 0.80 MTPA to 2.80 MTPA, Pellet Plant –1.5 MTPA to 3.0 MTPA, Coke Oven –0.20 MTPA to 1.10 MTPA, Air Separation unit (Oxygen Plant) – 510 TPD to 1500 TPD, SMS -1.20 MTPA to 2.40 MTPA, Rolling Mill – 1.20 MTPA to 2.40 MTPA, DRI- 0.27 MTPA to 0.35 MTPA, Cement Grinding unit – 2.40 MTPA, Producer Gas Plant-1,16,000 Nm³/hr & Power Plant – 56 MW to 160 MW.

Existing plant including the CTE obtained units is located and total land earmarked for the entire project is 481.292 Ha. (1189.3 Acres).

The total land earmarked for the Existing Steel Complex including the CTE obtained DRI units is **481.292 Ha. (1189.3 Acres)**. Land allotted by **CSIDC 417.350 Hectare** (Lease - 99 years) comprising of two lease deeds of 369.704 and 47.646 executed with CSIDC.

Over and above the land allotted by CSIDC, the company is in possession of 63.942 Ha. Additional private land, which comes by way of acquisition and merger. (Additional private land acquired subsequently 28.221 Hectares and 35.721 Hectare transferred to JNIL due to merger of both CTE obtained DRI units).

As per the Ministry of Environment, Forests & Climate Change, New Delhi notification, dated 14th September, 2006 and its subsequent amendments, all Primary metallurgical processing industries are classified under Category 'A'. The Ministry of Environment, Forests & Climate Change, New Delhi has accorded Standard Terms of Reference (TOR) for the proposed project issuance of Consolidated Environmental Clearance (duly incorporating the Two units under CTE) along with Expansion & Modernization of Existing Steel Plant. The EIA Report has been prepared by incorporating the Standard ToR stipulated by the Hon'ble MoEF&CC, New Delhi.

Pioneer Enviro Laboratories & Consultants Private Limited, Hyderabad, which is accredited by NABET, Quality Council of India, vide certificate No. **NABET/ EIA/ 1922/ SA 0148, valid up to 21st September 2022** for preparing EIA report for Metallurgical Unit, have prepared Draft Environmental Impact Assessment (EIA) report for the proposed expansion project by incorporating the TOR approved by Ministry of Environment, Forests & Climate Change, New Delhi. The report contains detailed description of the following:

- Characterization of status of environment with in an area of 10 km radius from the plant for major environmental components including air, water, noise, soil, flora, fauna and socio-economic environment.
- Assessment of air emissions, liquid waste and solid waste from the proposed expansion project along with the noise level assessment.
- Environmental Management Plan comprising of emission control measures proposed to be adopted in the proposed project, solid waste management, Greenbelt development.
- Post Project Environmental Monitoring & Budget for Environmental Protection Measures.

1.1 ENVIRONMENTAL SETTING WITHIN 10 Km. RADIUS OF THE PLANT SITE

The following is the environmental setting within the 10 Km. radius of the Plant site:

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
1.	Type of Land	Existing Steel Plant & DRI units (Industrial land) Additional Land (Private Land)
2.	National Park/ Wild life sanctuary / Biosphere reserve / Tiger Reserve / Elephant Corridor / migratory routes for Birds	There are no notified National Park/ Wild life sanctuary / Biosphere reserve / Tiger Reserve/ migratory routes for Birds with in 10 Km. radius of the plant.
3.	Historical places / Places of Tourist importance / Archeological sites	Nil
4.	Critically polluted area as per CPCB study conducted in 2018.	Proposed project area falls in Raipur area which is severely polluted area as categorized by CPCB with CEPI of – 79.94.
5.	Defence Installations	Nil
6.	Nearest village	Siltara Village – 0.1 kms. (N) Sankra Village – 0.15 Kms. (W) Dhaneli Village – 0.45 Kms. (SSW) Giroud Village – 0.5 Kms. (SSE)
7.	No. of Villages in the Study Area	56 nos.
8.	Nearest Hospital	Siltara Village – 0.1 kms. (N) Sankra Village – 0.15 Kms. (W) Dhaneli Village – 0.45 Kms. (SSW) Giroud Village – 0.5 Kms. (SSE)
9.	Nearest School	Siltara Village – 0.1 kms. (N) Sankra Village – 0.15 Kms. (W) Dhaneli Village – 0.45 Kms. (SSW)

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
		Giroud Village – 0.5 Kms. (SSE)
10.	Forests	Nil
11.	Water body	Kharoon River – 5.0 Kms. (NW) Chhokra Nala – 1.5 KM (S) Mandhar Branch Canal – 0.3 kms. (E) Pond, Siltara Village – 0.35 Kms. (N) Pond, Giroud village – 0.7 Kms. (S) Pond, Dhaneli – 0.6 Kms. (S) Pond, mandhar Village – 0.5 Kms. (SE) Pond, Sankara Village – 0.15 Kms. (W) A Canal is passing in Southern boundary of JNIL. & few other seasonal are flowing within 10 Km. radius of the plant site. Few ponds exist within 10 Km. Radius.
12.	Nearest Highway	NH # 30 (Raipur to bilaspur) – Adjacent to the plant.
13.	Nearest Railway Station	Mandhar R.S. – 2.0 Kms. (Railway siding available within the Plant premises)
14.	Nearest Port facility	Nil
15.	Nearest Airport	None within 10 Kms. [Raipur Airport -18 kms.]
16.	Nearest Interstate Boundary	Nearest interstate boundary is Odisha at a distance of 87 kms. from the plant .
17.	Seismic zoneas per IS-1893	Seismic zone – II
18.	R & R	Not applicable as there are no habitations in the additional land proposed for expansion.
19.	Litigation / court case is pending against the proposed project / proposed site and or any direction passed by the court of law against the project	Nil

1.2 Plant Configuration and Production Capacity

Following is Existing & proposed plant configuration and production capacities

S. No	Facility (Product)	Existing Capacity (Under operation)	Proposed Capacity	Capacity after Expansion
1	Blast Furnace & BF Gas based Power Plant (Pig iron/Hot Metal) (Electricity) Associated BF Gas based power plant (Additional 30 TPH AFBC Boiler Standby boiler	0.65 MTPA (750 M ³)	0.35 to 1.00 MTPA (0.1 MTPA upgrade in 2009 + 0.25 to be upgrade under modernization) 1x 1000 M ³	2.0 MTPA (750 M ³ + 1000 M ³)
		8 MW + 6 MW (BF Gas Based)	04+24 MW (BF Gas Based)	42 MW (BF Gas Based)

S. No	Facility (Product)	Existing Capacity (Under operation)	Proposed Capacity	Capacity after Expansion
2	Sinter plant (Sinters)	0.8 MTPA (2 x36 M ²)	2.0 MTPA (5 x36 M ²)	2.8 MTPA (2 x36 M ² + 5 x36 M ²)
3	Pellet Plant (Pellets)	# 1.5 MTPA (under NO INCREASE IN POLLUTION LOAD)	1.5 MTPA	3.0 MTPA (2 x 1.5 MTPA)
4	Coke Oven & Power Plant (Coke) (Electricity)	0.2 MTPA 4 set of batteries consisting of 11 ovens	0.9 MTPA 18 set of batteries consisting of 11 ovens	1.10 MTPA 22 set of batteries consisting of 11 ovens
		12 MW (WHRB) 2 x 6 MW	76 MW (WHRB) 6 x 6 MW 2 x20 MW	88 MW (WHRB) 8 x 6 MW 2x 20 MW
5	Oxygen plant (Oxygen)	510 TPD	990 TPD	1500 TPD
6	Steel Melting Shop (Hot Billets / MS Billets / Slabs)	1.2 MTPA (1 x 50 TPH+ 1 x 80 TPH)	1.2 MTPA (2 x 70 T)	2.4 MTPA (1 x 50 TPH 1 x 80 TPH 2 x 70 TPH)
7	Rolling Mill (Bright Bar / BSM/ Wire Rod/ Rolled Products)	1.2 MTPA 1 x 25 TPH 1 x 50 TPH 1 x 90 TPH	1.2 MTPA (2 x 90 TPH)	2.4 MTPA 1 x 25 TPH 1 x 50 TPH 2 x 90 TPH
8	DRI & Power Plant (Sponge Iron) (Electricity turbine 2 x15 MW)	0.12* + 0.15** MTPA (350 TPD + 500 TPD)	0.08 (Process Optimization)	0.35 MTPA
		1 x 7.5 MW WHRB* 1 x 7.5 MW FBC* 1 x 12 MW WHRB**	-----	30 MW (Turbine 2 x15 MW)
9	Cement Grinding Unit (Cement)	-----	2.4 MTPA	2.4 MTPA
10	Gasifier (Producer Gas plant) (as a fuel, substitute of FO)	-----	1,16,000 Nm ³ /hrs (29 x 4000 Nm ³ /hrs)	1,16, 000 Nm ³ /hrs (29 x 4000 Nm ³ /hrs)

*The Permission to Establishment "CTE" issued by the CECB for 1 x 350 TPD DRI kiln + 15 MW Power Generation in the name of M/s. Abhijeet Infrastructure Ltd vide letter dated 31.08.2005.

** The Permission to Establishment "CTE" issued by the CECB for 1 x 500 TPD DRI kiln with 15 MW Power plant + 12 MVA Ferro Alloys in the name of M/s. Corporate Ispat Alloys Limited, vide the letter dated 02.05.2006. 12 MVA Ferro Alloys unit was not implemented & accordingly CTE lapsed. Now dropped the proposal.

Vide High Court Bombay order dated 13-11-2009, Both the plants demerged from those respective company and merged with M/s. Jayaswal Neco Industries Limited.

Pellet plant capacity enhancement from 1.2 MTPA to 1.5 MTPA obtained under No increase in Pollution load as there will not be any additional emissions due to this enhancement. CTO is amended accordingly.

1.3 Raw Materials (For Expansion project)

The following will be the raw material requirement for the proposed expansion project:

S. No.	Name of Raw Material	Quantity in TPA			Source	Mode of Transportation
		Existing	Expansion	After expansion		
A. Blast Furnace						
	Production Capacity	750000 (650000 + 100000)	1250000	2000000		
1	Iron ore	121500	202500	324000	Own Mines (Metabodeli, Chhotedongar iron Ore Mines)	By Rail & Road (covered Trucks)
2	Sinter	791250	1318750	2110000	Own Generation	Closed Conveyor
3	Pellet	304500	507500	812000	Own Generation	By truck / Conveyor
4	Coke	310500	517500	828000	Own Generation	By Truck
5	PCI	87000	145000	232000	Local Market	By Road (covered Trucks)
7	Quartzite	7500	12500	20000	Open Market	By Road (covered Trucks)
8	Air Nm ³ @ 1250 °C	744000	1240000	1984000		
9	Oxygen @ 99.9 % purity (Nm ³)	52500	87500	140000	Own Generation	By Pipe
	TOTAL	2418750	4031250	6450000		
B. Sinter plant						
	Production Capacity	800000	2000000	2800000		
1	Iron Ore fines+ ESP, Bag Filter dust	695280	17,38,200	24,33,480	Own Generation	By truck / Conveyor
2	Coke Fines	71840	179600	251440	Own Generation	By truck / Conveyor
3	Lime	105520	263800	369320	Local Market	By Road (covered Trucks)
	Total	872640	2181600	3054240		
C. Coke Oven						
	Production Capacity	200000	900000	1100000		
1	Coal	290720	1308240	1598960	Indian / Imported Coal	By Ship, By Road (covered Trucks)
D. SMS						
	Production Capacity	1200000	1200000	2400000		
1	Hot Metal	1250400	1250400	2500800	Own Generation	---
2	DRI/Pellet	74640	74640	149280	Own Generation	By truck / Conveyor
	Total	1325040	1325040	2650080		
E. Rolling Mill						
	Production Capacity	1200000	1200000	2400000		
1	Billets	1200000	1200000	2400000	Own Generation	Hot Charge
2	Billets	18000	18000	36000	Local Market	By Road (Covered Trucks)

3	Producer gas/BF Gas	25000 m ³ /hr	25000 m ³ /hr	50000 m ³ /hr	own Plant	---
F. Pellet Plant						
	Production Capacity	15,00,000	15,00,000	30,00,000		
1	Iron Ore/Fines	1637550	1637550	32,75,100	Own Mines (Metabodeli, Chhotedongar iron Ore Mines)	By Rail & Road (covered Trucks)
2	Bentonite	10950	10950	21900	Local Market	By Road (Covered Trucks)
3	Lime Stone	32850	32850	65700	Own Mines	By Road (Covered Trucks)
4	LDO / Coke Breeze/ Producer Gas	23100	23100	34300	Local Market /own Plant	By Road (Covered Trucks)
	Total	1704450	1704450	34,08,900		
G. Cement Grinding Unit						
	Production Capacity	0.0	2400000	2400000		
1	Clinker	-	1560000	1560000	Local Market	By Rail & Road (covered Trucks)
2	Blast Furnace Slag	-	700000	700000	Own Generation	By truck / Conveyor
3	Fly ash	-	51000	51000	Own Generation / local Power Plant	By truck / Conveyor
4	Gypsum +Other Waste	-	96200	96200	Own Generation /Local Plant	By Road (covered Trucks)
	Total	-	2407200	2407200		
H. Power Plant (AFBC)7.5 MW+30 TPH Boiler (Stand by)						
	Production Capacity	7.5 MW		7.5 MW		
1	Char/Dolochar	51000	---	51000	Own Generation	By truck / Conveyor
2	Coal & Coal Fines	120000	---	120000		
I. DRI PLANT						
	Production Capacity	270000	80000	350000		
1	Pellet / iron ore	4,32,000	65,000	4,97,000	Own Generation	By truck / Conveyor By Rail & Road (covered Trucks)
2	Coal (Indigenous & Imported)	3,78,000	----	3,46,500	Import	By ship and Road (covered Trucks)
3	Dolomite	10,800	----	10,500	Local market	By Road (covered Trucks)
J. Producer Gas Plant (NM³/Hrs.)						
	Production Capacity	---	1,16,000	1,16,000		
1.	Coal	--	400000 TPA	400000 TPA	SECL /local	By Rail & Road (covered Trucks)
Note: Railway siding is available at plant						

1.4 Manufacturing Process

11.1.4.1 Manufacturing of Pellets

Iron ore fines will be grinded in Ball mills. The concentrate will be fed to thickener and subsequently to filtering unit. The filter cake will be sent to pellet plant comprising of Travelling grate kiln. Green pellets will be produced from this process. The flue gases from grate kiln will be treated in ESP and discharged through a stack.

11.1.4.2 Manufacturing of Sponge Iron (DRI)

The company had two DRI Kiln having capacity of 350 TPD and 500 TPD. With process optimization by usage of high-grade coal and pellets / lump ore the company has proposed the enhancement of capacity of the sponge iron plants from a total capacity of 2,70,000 MT to 3,50,000 TPA.

Refractory lined rotary kilns will be used for reduction of iron ore in solid state. A central Burner located at the discharge end will be used for initial heating of the kiln.

Iron ore will be continuously fed into the kiln along with coal which has dual role of fuel as well as reductant. Dolomite will be added to scavenge the sulphur from the coal. A number of air tubes will be provided along the length of the kiln. The desired temperature profile will be maintained by controlling the volume of the combustion air through these tubes. The Carbon monoxide generated due to the combustion of coal, reduces the iron ore and converts it into sponge iron. The rotary kiln is primarily divided into two zones viz. the pre heating zone and the reduction zone. The preheating zone extends over 30 to 50 % of the length of the kiln and in this the moisture in the charge will be driven off and the volatile matter in the coal will be burnt with the combustion air supplied through the air tubes. Heat from the combustion raises the temperature of the lining and the bed surface. As the kiln rotates, the lining transfers the heat to the charge. Charge material, pre-heated to about 1000°C enters the reduction zone. Temperature of the order of 1050°C will be maintained in the reduction zone, which is the appropriate temperature for solid state reduction of iron oxide to metallic iron.

This hot material will be transferred to Heat exchanger. In Heat exchanger the material will be cooled to 160°C. The cooler discharge material consists of sponge iron lumps, sponge iron fines and char. Magnetic and non-magnetic material will be separated through magnetic separators and stored in separate bins. The hot flue gases will be taken to a Waste Heat Recovery Boilers and after heat recovery they will be treated in high efficiency ESP and discharged into the atmosphere through stack whose height will be in accordance with CPCB norms.

11.1.4.3 Manufacturing Process of Sinters

Sintering is a process agglomeration of fines into solid blocks, in the process of sintering iron ore fines / flue dust / ESP Dust / Mill Scale / GCP Sludge etc. along with Dolomite, Coke fines and limestone are mixed and is fused at a temperature ranging between 900 to 950° C. These fines get converted into blocks known as Sinter. The existing Sinter plant capacity is 2400 TPD and it is proposed to expand the capacity of sinter plant from 2400 TPD to 8400 TPD to meet the in-house requirement of blast furnace after the capacity expansion.

11.1.4.4 Manufacturing Process of Pig Iron / Hot metal through Blast Furnace

The blast furnace shop will comprise of one furnace of 750 m³ working volume. The blast furnace is envisaged to operate with sized lump iron ore, coke, fluxes and additives. The hot metal produced will be cast at pig casting machines to produce cold pigs. The liquid slag will be granulated at cast house granulation unit. The BF top gas will be cleaned in dust catcher and gas cleaning system and distributed to the stoves, burners for runner drying, boilers for process and process steam supply. The excess gas will be supplied to power plant. Total production capacity will be 2.0 MTPA of hot metal.

11.1.4.5 Steel Melting Shop

In Steel Melting Shop (SMS), Hot metal from Blast furnace will be melted along with melting scrap and fluxes to make pure liquid steel and then to mould it in required size billets. The SMS will consist of Electric Arc furnace, Ladles, Cranes & Continuous Casting Machine (CCM). There will be 2 nos. of Electric Arc furnaces in the SMS plant, each of 70 T capacity to produce M.S. Billets / slabs. The Billets produced from LRF will be directly sent to Rolling Mill without using Re-heating Furnace through Hot charging method (OR) Hot Billets will be sent to CCM and thereby M.S. Billets / M.s. Ingots will be produced.

11.1.4.6 Manufacturing of Rolled products through Rolling Mill

The Hot Billets produced in Electric Arc furnaces will be directly sent to Rolling Mill to produce Rolled Products (OR) if M.S. Billets / M.S. Ingots produced in Electric Arc furnace will be sent to reheating furnace for the heating and will be sent to Rolling Mill. Furnace will be heated with Pulverized Coal / Furnace oil. A bar and round mill will be installed in the plant to produce 12,00,000 TPA of Bright Bar / BSM/ Wire Rod/ Rolled Products.

11.1.4.7 Manufacturing of Coke

Coke is the pyrolysis product of imported coking coal, carried out inside a series of oven at temperature of 1200 deg C. Coal cake will be formed by drawing required quantity from coal bunker, through hydraulic stamping on the charging plate. This is taken to Oven by Pusher cum charging car. it will be kept in the Oven for 70 hrs. Coke mass formed will be pushed into the quenching car on other side through Pusher and discharged into hopper after cooling. Coke lumps formed will be cut to size in coke cutter and will be passed through screens.

11.1.4.8 Manufacturing of Cement

The raw materials for manufacturing the Cement are Clinker, Gypsum, Fly Ash & Slag. The process of manufacturing PPC involves grinding of Clinker, Fly Ash and Gypsum in the ratio of 65:30:5, OPC involves grinding of Clinker -Gypsum in the ratio of 95:5 & SPC involves grinding of Clinker-Slag – Gypsum in the ratio of 30:65:5 in the Cement Mill. All ingredients are selected in such a way that they qualify respective BIS specifications.

11.1.4.9 Producer Gas plant (Gasifier)

Producer gas plant is proposed to be established for supply fuel to Rolling Mill units. Coal is lifted to the coal storage bin by lifting system; the coal is added in the carbonation stage of two-stage coal gasifier by a programmable control feeding system. Air is blown in the bottom of furnace by air blower, at the same time, low pressure steam goes through the blending

bin and blends with air, becomes the gasification agent, which will carry on the gasification reaction with 1200 Celsius degree semi coke in the gasification stage.

1.4.10 Power Generation

Through WHRB Boiler

Waste hot gases generated from Blast Furnace, coke oven and DRI plant. Captive power Plant of 104 MW capacity is proposed. 28 MW power will be generated from blast furnace gas, 76 MW power will be generated from coke Oven Flue gas using WHRB.

1.5 Water Requirement

The total requirement of water for the operation of entire project is **27,646 KLD** and is sourced from River Kharoon. JNIL has a sanction of 8.0 MGD (36,368 KLD) water from Water Resource Department Government of Chhattisgarh. For the same the company had built an anicut at River Kharoon to store around 16 MCM of water round the year. Out of the same presently the company is drawing around 4.0 MGD of water from the river and is managing the entire operation of the 1.2 MTPA integrated steel plant along with this Expansion and modernization project water requirement will be fulfill the 8.0 MGD sanctioned water. Air Cooled condensers are proposed for Power Plant to minimize the water consumption. The following is the break-up of the water requirement for proposed expansion project.

Break Up of Water Consumption (Existing & Proposed)

S.No.	Name of Unit	Water Requirement (in KLD)			
		Existing Plant	(in KLD)	Expansion project	(in KLD)
1	Blast Furnace	0.65 MTPA	1300	1.35 MTPA	3600 KLD
2.	Sinter Plant	0.8 MTPA	300	1.5 MTPA	500 KLD
3.	Coke Oven	0.20 MTPA	300	0.9 MTPA	600 KLD
4.	Steel Melting Shop	1.2 MTPA	2500	1.2 MTPA	1200 KLD
5.	Rolling Mill	1.2 MTPA	2500	1.2 MTPA	1500 KLD
6.	Pellet Plant	1.5 MTPA	1350	1.5 MTPA	1000 KLD
7.	Oxygen Plant	510 TPD	150	990 TPD	150 KLD
8.	Cement Grinding unit	----	-----	2.4 MTPA	500 KLD
9.	Producer Gas Plant	----	----	1,16,000 Nm ³ /Hrs.	750 KLD
10.	Power Plant	26 MW 8 MW (from BF) 12 MW (from Coke oven) 6 MW (AFBC)	2800	104 MW (28 MW- BF Gas and 76 MW from Coke Oven)	2496 KLD
11.	DRI Plant	0.27 MTPA	700	0.08 MTPA	Nil
12.	WHRB Power Plant (DRI)	19.5 MW	1900	----	Nil
13.	FBC Power Plant	7.5 MW	900	----	Nil
15.	Utilities	Utilities	150		250 KLD
16.	Domestic & Other uses	Domestic & Other uses	150		100 KLD
		TOTAL	15000	TOTAL	12646 KLD

1.6 Waste Water Generation from Proposed Expansion project

- There is / will be no effluent generation in the Pellet Plant, DRI plant, Sinter Plant & SMS Plant as closed-circuit cooling system will be adopted.
- The wastewater generated from the GCP of Blast Furnace is being / will be taken to ETP and the treated water is reused back in the GCP.
- There is no wastewater generation from the Cement Grinding unit as closed-circuit cooling system is proposed.
- Effluent generated from Coke oven plant during Coke quenching is being / will be collected in a settling tank located at the bottom of quenching tower. The water is reused for quenching.
- Direct circulating cooling water used in rolling mill is contaminated with Mill scales and traces of oil. The scales is collected from scale pit and reused in sinter plant. The oil is skimmed from the settling tank using Oil separator periodically and is being / will be sold to approved recyclers.
- Effluent from captive power plant is being / will be treated in ETP and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning, slag granulation and for greenbelt development.
- Phenolic effluent generated from Producer gas plant will be utilized in ABC chamber of DRI kilns.
- Domestic sewage generated is being treated in Septic tank & as part of expansion it is proposed to treat sewage in proposed STP (50 KLD x 4 Nos. or 250 KLD x 01 No.).
- There will not be any effluent discharge outside the premises. Zero discharge is being /will be followed.

BREAKUP OF WASTE WATER GENERATION

S.No.	Source	Quantity (KLD)		
		From Existing units	From Proposed units	After Expansion
1	Blast Furnace	75	100	175
2	Sinter Plant	0	10	10
3	Coke Oven	0	0	0
4	Steel Melting Shop	300	20	320
5	Rolling Mill	450	20	470
6	Pellet Plant	0	15	15
7	Oxygen Plant	10	10	20
8	Cement Grinding unit	-	10	10
9	Producer Gas Plant	-	20	20
10	Power Plant (Coke Oven +BF)	350	250	600
11	DRI Plant	30	0	30
12	WHRB Power Plant (DRI)	100	0	100
13	FBC Power Plant	150	0	150
14	Domestic & Other uses	115	50	165
	TOTAL	1580	505	2085
	Green Belt and dust suppression (only Treated waste Water)	1000		1000

1.7 Wastewater Characteristics

PARAMETER	CONCENTRATION			
	DM plant regeneration	Boiler blowdown	Cooling Tower blowdown	Sanitary waste water
pH	4 – 10	9.5 – 10.5	7.0 – 8.0	7.0 – 8.5
BOD (mg/l)	--	--	--	200 – 250
COD (mg/l)	--	--	--	300 – 400
TDS (mg/l)	5000 -6000	1000	1000	800 – 900
Oil & Grease (mg/l)	--	10	--	--

2.0 DESCRIPTION OF ENVIRONMENT

Base line data has been collected on ambient air quality, water quality, noise levels, flora and fauna and socio economic details of people within 10 km radius of the plant.

2.1 Ambient air quality

Ambient air quality was monitored for PM_{2.5}, PM₁₀, SO₂, NO_x, CO, O₃, Arsenic, Nickel, Lead, Ammonia, Benzene & BaP at 11 nos. of stations including project site during **15th October 2021 to 15th January 2022**. The following are the concentrations of various parameters at the monitoring stations:

TABLE NO. 11.2.1: AAQ DATA SUMMARY

Parameter		Concentration
PM _{2.5}	:	26.4 to 48.6 µg/m ³
PM ₁₀	:	45.8 to 83.8 µg/m ³
SO ₂	:	9.0 to 24.5 µg/m ³
NO _x	:	10.1 to 38.4 µg/m ³
CO	:	544 to 1658 µg/m ³
Other Parameters such as O₃, Arsenic, Nickel, Lead, Ammonia, Benzene, BaP was found BDL		

2.2 Water Quality

2.2.1 Surface Water Quality

2 nos. of samples (Upstream and Downstream) from Kharoon River, 1 no. of sample from each Giroud village Pond & from Mandhar village Pond have been collected and analyzed for various parameters. The analysis of samples shows that all the parameters are in accordance with BIS-2296 specifications.

2.2.2 Ground Water Quality

10 Nos. of ground water samples from open wells / bore wells were collected from the nearby villages to assess ground water quality impacts and analyzed for various Physico-Chemical parameters. The analysis of samples shows that all the parameters are in accordance with BIS: 10500 specifications.

2.3 Noise Levels

Noise levels were measured at 9 locations during day time & Night time. The noise levels at the monitoring stations are ranging from **49.08 dBA to 65.01 dBA**.

3.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

3.1 Prediction of impacts on air quality

The likely emissions from the proposed project are PM₁₀, SO₂, NO_x & CO. The predictions of Ground level concentrations have been carried out using Industrial Source Complex (ISC-3) model. Meteorological data such as wind direction, wind speed, max. and min. temperatures collected at the site have been used as input data to run the model.

The predicted max. Incremental PM₁₀ concentrations (24 hourly) due to the emissions from operation of proposed project will be **4.0 µg/m³** at a distance of 1400 m from the stack in the down wind direction over the baseline concentrations.

The predicted incremental rise in PM concentration due to the Vehicular emission will be **1.1 µg/m³**.

The predicted max incremental SO₂ concentrations (24 hourly) due to the emissions from operation of proposed project will be **13.4 µg/m³** at a distance of 1400 m from the stack in the down wind direction over the baseline concentrations.

The predicted max incremental NO_x concentrations (24 hourly) due to the emissions from operation of proposed project will be **15.2 µg/m³** at a distance of 1400 m from the stack in the down wind direction over the baseline concentrations.

The predicted incremental rise in NO_x concentration due to the Vehicular emission will be **7.7 µg/m³**.

The predicted incremental rise in CO concentration due to the Vehicular emission will be **4.8 µg/m³**.

NET RESULTANT MAXIMUM CONCENTRATIONS DUE TO PROPOSED PROJECT

Item	PM ₁₀ (µg/m ³)	SO ₂ (µg/m ³)	NO _x (µg/m ³)	CO (µg/m ³)
Maximum baseline conc. in the study area	83.8	24.5	38.4	1658
Maximum predicted incremental rise in concentration due to proposed expansion of JNIL	4.0	13.4	15.2	--
Maximum predicted incremental rise in concentration due to Vehicular Emissions from the proposed expansion of JNIL	1.1	--	7.7	4.8
Net resultant concentrations during operation of the plant	88.9	37.9	61.3	1662.8
National Ambient Air Quality Standards	100	80	80	2000

The net resultant Ground level concentrations during operation of the expansion project are within the NAAQS. Hence there will not be any adverse impact on air environment due to the proposed expansion project.

3.2 Prediction of impacts on Noise quality

The major sources of noise generation in the proposed project will be STG, boilers, compressors, DG set, etc. Acoustic enclosures will be provided to the STG. The ambient noise levels will be within the standards prescribed by MoEF vide notification dated 14-02-2000 under the Noise Pollution (Regulation & Control), Rules 2000 i.e. the noise levels will be less than 75 dBA during day time and less than 70 dBA during night time. **189 Ha. (467 Acres)** of extensive greenbelt has been developed to attenuate the noise levels. Hence there will not be any adverse impact due to noise on population in surrounding areas due to the proposed expansion project.

3.3 Prediction of impacts on Water Environment

- There is / will be no effluent generation in the Pellet Plant, DRI plant, Sinter Plant, Cement grinding unit & SMS Plant as closed-circuit cooling system will be provided.
- The wastewater generated from the GCP of Blast Furnace is being / will be taken to ETP and the treated water is reused back in the GCP.
- Effluent generated from Coke oven plant is during Coke quenching is being / will be collected in a settling tank located at the bottom of quenching tower. The water is reused for quenching.
- Direct circulating cooling water used in rolling mill is contaminated with Mill scales and traces of oil. The scales is collected from scale pit and reused in sinter plant. The oil is skimmed from the settling tank using Oil separator periodically and is being / will be sold to approved recyclers.
- Effluent from captive power plant is being / will be treated in ETP and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning, slag granulation and for greenbelt development.
- Phenolic effluent generated from Producer gas plant will be utilized in ABC chamber of DRI kilns.
- Domestic sewage generated is being treated in Septic tank & as part of expansion it is proposed to treat sewage in proposed STP (50 KLD x 4 Nos. or 250 KLD x 01 No.).
- There will not be any effluent discharge outside the premises. Zero discharge is being /will be followed.

Hence there will not be any adverse impact on environment due to the proposed project.

3.4 Prediction of Impacts on Land Environment

The effluent will be treated to achieve SPCB standards. Zero effluent discharge will be adopted. All the required air pollution control systems will be provided to comply with CPCB / SPCB norms. All solid wastes will be disposed / utilized as per CPCB / SPCB norms. **189 Ha. (467 Acres)** of extensive greenbelt has already been developed. Hence, there will not be any adverse impact on land environment due to the proposed expansion project.

3.5 Socio - Economic Environment

There will be further upliftment in Socio Economic status of the people in the area. Hence, there will be further development of the area due to the proposed expansion project.

Due to this the economic conditions, the educational and medical standards of the people living in the study area will certainly move upwards which will result in overall economic development, improvement in general aesthetic environment and increase in business opportunities.

4.0 ENVIRONMENTAL MONITORING PROGRAMME

Post project monitoring will be conducted as per the guidelines of SPCB and MoEF&CC are tabulated below:

MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS

S.No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
1. Water & Waste water quality				
A.	Water quality in the area	Quarterly once	Grab sampling	As per IS: 10500
B.	Effluent at the inlet & outlet of the ETP	Once in a month	composite sampling	As per EPA Rules, 1996
C.	Sanitary Wastewater (inlet & outlet of STP)	Once in a month	composite sampling	As per EPA Rules, 1996
2. Air Quality				
A.	Stack Monitoring	CEMS (all Stacks)	continuously	PM PM, SO ₂ & NO _x
B.	Ambient Air quality	CAAQMS	continuously	PM _{2.5} , PM ₁₀ , SO ₂ , NO _x & CO
C.	Fugitive emissions	Once in a Month	8 hours	PM
3. Meteorological Data				
A.	Meteorological data to be monitored at the plant.	Daily	Continuous monitoring	Temperature, Relative Humidity, rainfall, wind direction & wind speed.
4. Noise level monitoring				
A.	Ambient Noise levels	Once in a month (Hourly)	Continuous for 24 hours with 1-hour interval	Noise levels

5.0 ADDITIONAL STUDIES

No Rehabilitation and Resettlement is involved as the plant is situated in Industrial Area. Hence no R & R study has been carried out.

6.0 PROJECT BENEFITS

With the establishment of the proposed project employment potential will increase. Land prices in the area will increase. The economic status of the people in the area will improve due to the proposed project. Periodic medical checkups will be carried out. Top priority will be given to locals in employment. Separate Budget will be allocated for Social welfare activities to develop the surrounding villages.

7.0 ENVIRONMENT MANAGEMENT PLAN

7.1 Air Environment

The following are air emission control systems proposed in the proposed project:

Name of Units	Pollution Control Measures	Outlet Particulate matter emission
Blast Furnace	Gas Cleaning Plant Bag Filters in stock & cast house	PM < 10 mg/Nm ³ PM < 30 mg/Nm ³
Pellet Plant	ESP in Indurating Furnace Bag Filters for Plant de-dusting	PM < 30 mg/Nm ³ PM < 30 mg/Nm ³
Sinter Plant	ESP in Main Sintering Machine and Plant De-dusting	PM < 30 mg/Nm ³
Coke Oven Plant	---	PM < 30 mg/Nm ³
SMS	Fume Extraction System and Bag Filters	PM < 30 mg/Nm ³
Rolling Mill	BF gas after passing through Gas Cleaning System will be used in Rolling Mill and will be vented through Stack of suitable heights.	PM < 30 mg/Nm ³
Cement Grinding Unit	Bag Filter	PM < 30 mg/Nm ³
DRI	Existing ESP is sufficient for expansion also	PM < 30 mg/Nm ³
Power Plant	Existing ESP is sufficient for expansion also	PM < 30 mg/Nm ³

Apart from the above the following air emission control systems/ measures are proposed in the Plant:

- All conveyors will be completely covered with G.I. sheets to control fugitive dust.
- All bins will be totally packed and covered so that there will not be any chance for dust leakage.
- All the dust prone points material handling systems will be connected with de-dusting system with bag filters.
- All discharge points and feed points, wherever the possibility of dust generation is there a de-dusting suction point will be provided to collect the dust.

7.2 Water Environment

- There is / will be no effluent generation in the Pellet Plant, DRI plant, Sinter Plant, Cement grinding unit & SMS Plant as closed-circuit cooling system will be provided.
- The wastewater generated from the GCP of Blast Furnace is being / will be taken to ETP and the treated water is reused back in the GCP.
- Effluent generated from Coke oven plant during Coke quenching is being / will be collected in a settling tank located at the bottom of quenching tower. The water is reused for quenching.
- Direct circulating cooling water used in rolling mill is contaminated with Mill scales and traces of oil. The scales is collected from scale pit and reused in sinter plant. The oil is skimmed from the settling tank using Oil separator periodically and is being / will be sold to approved recyclers.
- Effluent from captive power plant is being / will be treated in ETP and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning, slag granulation and for greenbelt development.
- Phenolic effluent generated from Producer gas plant will be utilized in ABC chamber of DRI kilns.
- Domestic sewage generated is being treated in Septic tank & as part of expansion it is proposed to treat sewage in proposed STP (50 KLD x 4 Nos. or 250 KLD x 01 No.).

- There will not be any effluent discharge outside the premises. Zero discharge is being /will be followed.

EFFLUENT TREATMENT PLANT

pH of the boiler blowdown will be between 9.5 to 10.5. Hence a neutralization tank will be constructed for neutralizing the boiler blow down. DM plant regeneration water will be neutralized in a neutralization tank. After neutralization, these two effluent streams will be mixed in Holding Tank. Service water will be treated in an oil separator and after treatment it will also be taken to Holding Tank. The treated effluent will be utilized for dust suppression, ash conditioning and for Green belt development. Sanitary waste water will be treated in STP.

TREATED EFFLUENT DISPOSAL

Net Effluent generation after recycling	:	2085 m ³ /day
Effluent quantity to be used for ash handling	:	585 m ³ /day
Effluent to be used for dust suppression in CHP	:	500 m ³ /day
Effluent to be used for Greenbelt development	:	1000 m ³ /day

189 Ha. (467 Acres) of greenbelt will be developed within the plant premises by using the treated effluent. A dedicated pipe distribution network will be provided for using the treated effluent for greenbelt development.

7.3 Noise Environment

The major sources of noise generation in the proposed project will be STG, boilers, compressors, DG set, etc. Acoustic enclosure will be provided. All the machinery will be manufactured in accordance with MoEF&CC norms on Noise levels. The employees working near the noise generating sources will be provided with earplugs. The extensive greenbelt development proposed within the plant premises will help in attenuating the noise levels further. Noise barriers in the form of trees are recommended to be grown around administrative block and other utility units.

7.4 Land Environment

The waste water generated from the proposed project will be treated in the Effluent Treatment Plant to comply with the SPCB standards and will be used for dust suppression, ash conditioning and for greenbelt development. All the required Air emission control systems will be installed and operated to comply with SPCB norms. Solid wastes will be disposed off as per norms. Extensive greenbelt will be developed in the plant premises. Desirable beautification and landscaping practices will be followed. Hence there will not be any impact due to the proposed expansion project. The following is **Solid waste generation and disposal.**

Solid waste generation and disposal

S. No.	Name of Waste	Quantity in TPA		Utilization
		Existing	After expansion	
Blast Furnace				
	Capacity	7,50,000 (6,50,000 +1,00,000)	20,00,000	
1	BF Slag	2,62,500	8,00,000	Will be used as Raw material for cement making in proposed Cement Grinding unit.
2	Flue Dust	7,800	20,800	Is being / will be reused in sinter plant.
3	GCP Sludge	3,450	9,200	
Sinter Plant				
	Capacity	8,00,000	28,00,000	
1	ESP DUST	34,000	1,03,480	Is being / will be reused in Sinter plant
Coke Oven				
	Capacity	2,00,000	11,00,000	
1	Coke Breeze	10,617	43,560	Is being / will be used in pellet plant
2	Coke Dust	4,424	18,150	Is being / will be reused in Sinter plant
Steel Melting Shop				
	Capacity	12,00,000	24,00,000	
1	Slag	1,24,000	2,48,000	After metal recovery it will be utilized as raw material in blast furnace after crushing & used in own fly ash brick making.
3	Flue Dust	31,200	62,400	Is being / will be used in sinter plant
Rolling Mill				
	Capacity	1200000	24,00,000	
1	Mill Scales	12000	24,000	are being / will be reused in Sinter plant
Pellet Plant				
	Capacity	15,00,000	30,00,000	
1	Dust	56,250	1,12,500	Flue dust to be recycled back to pellet plant.
Cement Plant				
	Capacity	0.0	24,00,000	
1	Dust from APCS	--	7200	Will be totally recycled in the process for Cement manufacturing.
Power Plant				
	Capacity	15 MW	--	
1	Bottom Ash	13,247	8,333	Road construction and low laying area felling.
2	Fly Ash	54,247	34,183	Used in own fly ash Brick Making unit & proposed to use in Cement Plant
DRI Plant				
	Capacity	270000	350000	
1	Char/Dolochar	94,500	42,000	Using in AFBC for Power Generation
2	ESP Dust	56,700	42,000	Used in own fly ash Brick Making unit & low laying area filling
Producer Gas Plant				
	Capacity	--	1,16,000 Nm³/Hrs	
1	Ash	--	160000 TPA	For road construction and low laying area.

7.5 Greenbelt Development

- **189 Ha.** Of Greenbelt is already been developed in the plant premises, which is about 39 % of the plant area i.e., **481.292 Ha.**
- JNIL has already planted **4,87,264 nos.** of trees in the premises.
- Width of greenbelt ranges from 10 m to 100 m.

7.6 Cost for Environment Protection

Capital Cost for Environment Protection for proposed plant	: Rs. 122 Crores
Recurring Cost per annum for Environmental protection	: Rs. 16.8 Crores

7.7 Implementation of CREP Recommendations

All the CREP recommendations will be implemented & followed strictly.

- Continuous stack monitoring system is proposed for stack attached to WHRB & FBC Boiler.
- Online Ambient Air Quality Monitoring Stations will be established in consultation with SPCB during operation of the plant.
- Fugitive emission monitoring will be carried out as per CPCB norms.
- Energy meters will be installed for all the pollution control systems.
- Additional Rain water harvesting pits will be constructed outside the plant premises in consultation with CGWB.
