SUMMARY ON

ENVIRONMENTAL IMPACT ASSESSMENT

REPORT

OF

SHREE NAKODA PIPE IMPEX PVT. LTD.

(Proposed Expansion of Steel Plant)

at

Khamaria Village, Tilda Tehsil, Raipur (D), Chhattisgarh

Submitted to

CHHATTISGARH ENVIRONMENT CONSERVATION BOARD

1.0 PROJECT DESCRIPTION

SHREE NAKODA PIPE IMPEX PVT. LTD. (SNPIPL) has obtained Consent from CECB for manufacturing **MS Black Pipe, ERW precision Tube unit of 1,20,000 TPA & GI Pipe unit of 1,20,000 TPA** at Khamaria Village, Tilda Tehsil, Raipur (D), Chhattisgarh and obtained CTE vide no. 3917 / RO / TS / CECB /2019 dated 28-12-2019. The plant is under implementation. **We have not obtained Environmental Clearance for MS Black Pipe, ERW precision Tube unit & GI Pipe unit as it does not come under E.C. purview as per EIA Notification, 2006 & its amendments. Accordingly Consent has been obtained from CECB.**

Now it is proposed to go for expansion by installing additional facilities in the existing land & adjoining additional land at Khasra nos. 30/22, 31/1, 31/25, 31/27, 31/28, 31/29, 31/31, 31/34, 31/37, 31/38, 519/8 of Khamaria Village, Tilda Tehsil, Raipur (D), Chhattisgarh.

Now it is proposed to establish additional facilities consisting of I/O beneficiation plant of 0.8 mtpa capacity, Pelletization plant of 0.6 mTPA, 4x100 TPD DRI Kilns to produce Sponge Iron of 1,20,000 TPA, Induction Furnace of 2 x 20 T to produce Hot Billets / M.S.Billets of 1,20,000 TPA, Rolling Mill to produce TMT bars / Wire Rod / Strips of 1,20,000 TPA through Hot Charging, manufacturing Ferro Alloy plant of 2x6 MVA capacity to produce 27,360 TPA of Fe Mn (or) 20,520 TPA of Si Mn (or) 10,260 TPA of FeSi (or) 41,040 TPA of Pig Iron, Power generation through WHRB of DRI Kilns -10 MW, through FBC of 15 MW & 60,000 nos. of Fly Ash Brick making unit in the existing plant premises & adjacent additional land. **Total extent of land area is 40.230 Acres (16.281 Ha.).** The project cost envisaged for the proposed expansion project is **Rs. 483 Crores.**

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 **Terms of Reference (TOR)** for the proposed expansion project vide letter no. **J-11011/99/2021-IA-II(I), dated 26th March 2021.** The EIA Report has been prepared by incorporating the TOR stipulated by the Hon'ble EAC.

***Pioneer Enviro Laboratories & Consultants Private Limited**, Hyderabad*, which is accredited by NABET, Quality Council of India, vide certificate No. NABET/ EIA/ 1922/ RA 0149, 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 expansion 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 Project site:

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
1.	Type of Land	Partly Industrial & partly agricultural land
2.	National Park/ Wild life sanctuary / Biosphere reserve / Tiger Reserve / Elephant Corridor / migratory routes for Birds	Nil
3.	Historical places / Places of Tourist importance / Archeological sites	Nil
4.	Critically polluted area as per MoEF&CC Office Memorandum dated 13th January 2010	None And also the Plant area does not fall in the areas given in Hon'ble NGT order issued vide dated 10th July 2019.
5.	Defence Installations	Nil
6.	Nearest village	Nakti Khapri Village – 0.8 kms. Hamlet of Nakti Khapri Village – 0.4 Kms. Khamaria Village – 1.0 Km.

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
7.	No. of Villages in the Study Area	53 nos.
8.	Forests	Khaulidabri P.F. (8.5 Kms.)
9.	Water body	Jalso / Kirna tank (2.0 Kms.), Dhumma Nala (3.3 Kms.), Bhatapara Branch Canal (2.4 kms.) Jamuniya Nala (1.8 Kms.) Kumahari Tank (8.2 Kms.) & few other seasonal are flowing within 10 Km. radius of the plant site. Few ponds exist within 10 Km. Radius.
10.	Nearest Highway	NH # 130(B) (Raipur-Kharora) – 8.4 Kms.
11.	Nearest Railway Station	Baikunth R.S. - 4.4 Kms.
12.	Nearest Port facility	Nil with in 10 Km. Radius.
13.	Nearest Airport	None within 10 Kms. [Raipur Airport (32 kms.)]
14.	Nearest Interstate Boundary	Nil (Nearest interstate boundary is Odisha at a distance of 85 kms. from the plant)
15.	Seismic zoneas per IS-1893	Seismic zone – II
16.	R & R	There is no rehabilitation and resettlement issue, as there are no habitations present in the site area.
17.	Litigation / court case is pending against the proposed expansion 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 the proposed plant configuration and proposed production capacities

TABLE NO. 11.1.1: EXISTING & PROPOSED PLANT CONFIGURATION & PRODUCTION CAPACITIES

S. No.	Unit (Product)	CTE permitted capacities vide dated 28/12/2019	Present Expansion proposal	Production capacity (in TPA)
1.	MS Black Pipe / ERW precision Tube	1,20,000 TPA (under construction)	---	1,20,000 TPA
2.	GI Pipe unit	1,20,000 TPA (under construction)	---	1,20,000 TPA
3.	I/O beneficiation unit	---	0.8 mtpa	0.8 mtpa
4.	Pellet Plant (pellets)	---	0.6 mtpa	0.6 mtpa
5.	DRI Kiln (Sponge Iron)	---	1,20,000 TPA (4 x 100 TPD)	1,20,000 TPA (4 x 100 TPD)
6.	Induction furnace with CCM & LRF (Hot Billets / M.S.Billets)	---	1,20,000 TPA (2 x 20 T)	1,20,000 TPA (2 x 20 T)
7.	Rolling Mill through Hot charging (TMT bars/Wire	---	1,20,000 TPA (400 TPD)	1,20,000 TPA (400 TPD)

S. No.	Unit (Product)	CTE permitted capacities vide dated 28/12/2019	Present Expansion proposal	Production capacity (in TPA)
	Rod/Strips)			
8.	Ferro Alloy Unit (Fe Mn (or) Si Mn (or) FeSi (or) Pig Iron)	---	2 x 6 MVA Fe Mn 27,360 TPA/ Si Mn 20,520 TPA/ FeSi 10,260 TPA / Pig Iron 41,040 TPA	2 x 6 MVA Fe Mn 27,360 TPA/ Si Mn 20,520 TPA/ FeSi 10,260 TPA / Pig Iron 41,040 TP
9.	Power generation through WHRB (Electricity)	---	10 MW	10 MW
10	Power generation through AFBC Boiler (Electricity)	---	15 MW	15 MW
11	Fly Ash brick making unit	---	60,000 bricks /day	60,000 bricks /day

1.3 RAW MATERIAL REQUIRMENT

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

RAW MATERIAL REQUIREMENT, SOURCE & MODE OF TRANSPORT

Raw Material		Quantity (TPA)	Sources	Mode of Transport
For manufacturing I/O concentrate – 8,00,000 TPA				
Iron ore		8,00,000	NMDC, Bacheli, CG Keonjhar, odisha	By rail & road (through covered trucks)
For manufacturing Pellets – 6,00,000 TPA				
Iron ore Concentrate		6,60,000	Inhouse generation	By Covered Conveyor
Bentonite		4,800	Raipur, Chhattisgarh	By Road (Covered Trucks)
Lime powder		36,000	Raipur, Chhattisgarh	By Road (Covered Trucks)
Coal (Bituminous)		6,000	Raipur, Chhattisgarh	By Road (Covered Trucks)
Fuel (Anthracite Coal) or LDO / LSHS*		26,400 8,000 KL/year	Raipur, Chhattisgarh	By Road (Covered Trucks) By Road (in tankers)
For manufacturing Sponge Iron – 1,20,000 TPA				
Iron Ore (or) Iron ore Pellets		1,92,000 (or) 1,68,000	NMDC, CMDC, Keonjhar, odisha (or) In-house generation	By rail & road (through covered trucks) By Covered Conveyor
Coal	Indian	1,56,000	SECL Chhattisgarh / MCL Odisha	By rail & road (through covered trucks)

Raw Material		Quantity (TPA)	Sources	Mode of Transport
	Imported	99,840	Indonesia / South Africa / Australia	Through sea route, rail route & by road
Dolomite		7,200	Own Generation	---
For manufacturing Hot Billets / MS Billets – 1,20,000 TPA				
Sponge Iron		1,20,000	In plant generation	By Conveyor
Pig iron / Scrap		28,200	In plant generation / Bhilai, CG	By conveyor / By road (through covered trucks)
Ferro Alloys		1,320	In plant generation Raipur, Chhattisgarh	By Conveyor By road (through covered trucks)
For manufacturing Rolled Products – 1,20,000 TPA				
Hot Billets/ MS Billets MS Billets (purchased)		1,20,000 6,900	In house generation Siltara, Raipur, CG	Covered Conveyor By road (through covered trucks)
LDO / LSHS*		3,925 KL	Raipur, Chhattisgarh	By Road through tanker
* 100% consumption in worst-case scenario				
For Power Generation –FBC power plant of 15 MW				
Coal	Indian	1,18,800	SECL Chhattisgarh / MCL Odisha	By Rail & Road through covered trucks
	Imported	76,040	Indonesia / South Africa (vizag port)	Through sea route, rail route & by road
Dolochar		24,000	In plant generation /	Covered Conveyor
For Ferro Alloys : 2 x 6 MVA [SiMn (or) FeMn (or) FeSi (or) Pig Iron]				
(i) For manufacturing Silico Manganese - 20,520 TPA				
Manganese Ore		33,450	Balaghat, MP	By Rail & Road through covered trucks
FeMn Slag		12,680	In house generation	Covered Conveyor
LAM Coke		7,900	Dhanbad, jharkand Imported (from Vizag port)	By Road through covered trucks Through sea route, rail route & by road
Quartz		4,100	Gondia, Maharastra	By Road through covered trucks
Bag filter dust		2,050	In house generation	Pipeline
(OR)				
(ii) For manufacturing Ferro Manganese – 27,360 TPA				
Manganese Ore		62,250	Balaghat, MP	By Rail & Road through covered trucks

Raw Material	Quantity (TPA)	Sources	Mode of Transport
LAM Coke	9,985	Dhanbad, jharkand Imported (from Vizag port)	By Road through covered trucks Through sea route, rail route & by road
Quartz	820	Gondia, Maharastra	By Road through covered trucks
Bag filter dust	1,640	In house generation	Pipeline
(OR)			
(iii) For manufacturing Ferro Silicon – 10,260 TPA			
Quartz	15,600	Gondia, Maharastra	By Road through covered trucks
Mill Scale	8,000	In house generation	conveyor
M.S. Scrap	360	Raipur, Chhattisgarh	By Road through covered trucks
LAM Coke	5,750	Dhanbad, jharkand Imported (from Vizag port)	By Road through covered trucks Through sea route, rail route & by road
Bag filter dust	615	In house generation	pipeline
(OR)			
(iv) For manufacturing Pig Iron – 41,040 TPA			
HG Iron ore	60,535	Chhattisgarh/ Orissa	By Rail & Road through covered trucks
LAM Coke	20,110	Dhanbad, jharkand Imported (from Vizag port)	By Road through covered trucks Through sea route, rail route & by road
Lime stone	16,825	Chhattisgarh/ MP	By Road through covered trucks

1.4 MANUFACTURING PROCESS

1.4.1 Iron Ore Beneficiation

Beneficiation is a process which removes the gang particle like Alumina, Silica from the Iron Ore. Basically, it separates Fe_2O_3 or Fe_3O_4 from other impurities in the iron ore. In this process the Fe content is improve to maximum possible extent. The highest can be 70% i.e. purest form.

1.4.2 Pelletization

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.

1.4.3 Manufacturing of Sponge Iron (DRI)

The proposal consists of 4 x 100 TPD of DRI kilns to produce 1,20,000 TPA of Sponge iron with 4x2.5 MW WHRB facility. Refractory lined rotary kilns will be used for reduction of iron ore in solid state.

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 1000^0C enters the reduction zone. Temperature of the order of 1050^0C 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 160^0C. 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.

1.4.4 Steel Melting Shop

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. The SMS will consist of Induction furnace, Ladles, Cranes & Continuous Casting Machine (CCM). There will be 2 x20 T Induction furnaces to manufacture Hot Billets/ M.S. Billets of 1,20,000 TPA. Either the Hot Billets produced from LRF will be directly sent to Rolling Mill without using Re-heating Furnace through Hot charging method (or) M.S. Billets / M.s. Ingots will be sent to Re-heating Furnace to reheat the Billets and then sent to Rolling Mill to manufacture Rolled Products.

1.4.5 Manufacturing of Rolled products through Rolling Mill

The Hot Billets produced from Induction Furnaces will be directly sent to Rolling Mill to produce Rolled Products (OR) Hot Billets will be cooled and stored will be sent to reheating furnaces for the heating and will be sent to Rolling Mill. Furnace will be heated with LDO / LSHS. A Rolling mill will be installed in the plant to produce 1,20,000 TPA of Rolled Products /TMT Bars / Structural Steels.

1.4.6 Manufacturing of Ferro Alloys through SEAF

2 nos. of Submerged Electric Arc Furnace each of 6.0 MVA will be setup in the proposed plant. Ferro manganese, silicon-manganese will be produced using manganese ore as main raw material. Pig Iron will be produced in SEAF using HG Iron Ore, Limestone & Coke as Raw Materials. Once pig iron is produced, it is teemed or poured into Induction Furnace either to produce an ingot or into a continuous caster to produce a slab, billet or bloom.

1.4.7 Power Generation

Through WHRB Boiler

The hot flue gases from proposed 4 x 200 TPD of DRI kilns will pass through waste heat recovery Boiler to recover the heat and to generate 10 MW (4 x 2.5 MW) electricity. The gases after heat recovery will pass through ESP and then discharged through chimneys into the atmosphere for effective dispersion of emissions into the atmosphere through stacks of adequate height.

Through CFBC Boiler

Coal (Imported / Indian) along with dolochar will be used as fuel in AFBC Boiler to generate 15 MW of electricity. The flue-gases will be treated in high efficiency ESP and then discharged through a stack of adequate height into the atmosphere.

1.5 Water Requirement

The total water requirement after the proposed expansion project will be **2000 KLD.** Water required for process of manufacturing, cooling and domestic purpose which will be met from Jalso (Janjgira) Tank / Shivnath River and any other available source of water. **Permission** for drawl of water from **Water Resources Department of Government of Chhattisgarh will be obtained.** Air Cooled condensers are proposed for Power Plant to minimize the water consumption.

BREAK-UP OF WATER REQUIREMENT

S.No.	Details of water requirement	For CTE permitted units Quantity (KLD)	For proposed units Quantity (KLD)
1	Make-up water for GI pipe / MS pipe unit	200	200
2	Make-up water for I/O beneficiation & Pellet Plant	---	350
3	Make-up water for DRI plant	---	300
4	Make-up water for SMS plant	---	350
5	Make-up water for Rolling mill	---	150
6	Make-up water for Ferro Alloy plant	---	100
7	Captive Power Plant		
	• Cooling Tower Make-up	---	300
	• Boiler make-up	---	175
	• D.M. plant regeneration water	---	25
8	Domestic	---	50
	Total	**200**	**1800**

1.6 Waste Water Generation

- The total net wastewater generation from the proposed expansion project will be 215 KLD.
- The following will be the total wastewater generation& it's break-up.

BREAKUP OF WASTE WATER GENERATION

S.No.	Source	For CTE permitted units Quantity (KLD)	For Proposed units Quantity (KLD)
1.	GI Pipe / MS pipe unit	25	--
2.	I/O beneficiation plant	---	100 (recycled)
3.	Power Plant		
	a) Cooling tower blowdown	---	45
	b) Boilers blowdown	---	30
	c) D.M. plant regeneration water	---	25
4.	Sanitary Wastewater	---	15
	Total	**25**	**215**

1.7 Wastewater Characteristics

The following are the Characteristics of waste water

CHARACTERISTICS OF EFFLUENT

PARAMETER	CONCENTRATION			
	Cooling Tower blowdown	DM Plant Regeneration	Boiler Blowdown	Sanitary waste water
pH	7.0 – 8.0	5.0 – 10.0	9.5 – 10.5	7.0 – 8.5
BOD (mg/l)	--	--	--	200 – 250
COD (mg/l)	--	--	--	300 – 400
TDS (mg/l)	1000	5000 – 6000	1000 mg/l	800 – 900
Oil & Grease (mg/l)	--	10	--	5 - 10
TSS (mg/l)	--	--	--	150-200

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 $PM_{2.5}$, PM_{10}, SO_2, NOx & CO at 8 stations including project site during **1st March 2021 to 31st May 2021.** The following are the concentrations of various parameters at the monitoring stations:

Parameter		Concentration
$PM_{2.5}$	:	23.1 to 46.2 µg/m^3
PM_{10}	:	40.5 to 69.8 µg/m^3
SO_2	:	6.4 to 12.6 µg/m^3
NO_X	:	8.0 to 33.7 µg/m^3
CO	:	388 to 1357 µg/m^3

2.2 Water Quality

2.2.1 Surface Water Quality

There no major river present within 10 Km. radius of the site. Jalso / Kirna tank (2.0 Kms.), Dhumma Nala (3.3 Kms.), Bhatapara Branch Canal (2.4 kms.), Jamuniya Nala (1.8 Kms.), Kumahari Tank (8.2 Kms.) are present within 10 Kms. of the Plant site. Hence 60 m Upstream & Downstream samples have not collected. 1 no. of Sample each from Jalso / Kirna Reservoir (2.0 Kms.), Bhatapara Branch Canal (2.4 Kms.), Kumhari Tank (8.2 Kms.) have been collected and analyzed for various parameters. No other surface water samples have been collected as the study period. The analysis of samples shows that all the parameters are in accordance with BIS-2296 specifications.

2.2.2 Ground Water Quality

8 No. 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 8 locations during day time & Night time. The noise levels at the monitoring stations are ranging from **45.92 dBA to 57.76 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 PM_{10}, SO_2, NOx & 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 likely emissions from the proposed expansion project are PM_{10}, SO_2, NOx & 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 PM_{10} concentrations (24 hourly) due to the emissions from operation of proposed expansion project will be **1.32 µg/m³** at a distance of 1155 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 **0.99 µg/m³**.

The predicted max incremental SO_2 concentrations (24 hourly) due to the emissions from operation of proposed expansion project will be **7.18 µg/m³** at a distance of 1155 m from the stack in the down wind direction over the baseline concentrations.

The predicted max incremental NOx concentrations (24 hourly) due to the emissions from operation of proposed expansion project will be **1.90 µg/m³** at a distance of 1155 m from the stack in the down wind direction over the baseline concentrations.

The predicted incremental rise in NOx concentration due to the Vehicular emission will be **6.65 µg/m³**.

The predicted incremental rise in CO concentration due to the Vehicular emission will be **4.88 µg/m³**.

NET RESULTANT MAXIMUM CONCENTRATIONS DUE TO PROPOSED PROJECT

Item	PM_{10} (µg/m³)	SO_2 (µg/m³)	NO_X (µg/m³)	CO (µg/m³)
Maximum baseline conc. in the study area	69.8	12.6	33.7	1357
Maximum predicted incremental rise in concentration due to proposed expansion project of **SNPIPL**	1.32	7.18	1.90	---
Maximum predicted incremental rise in concentration due to **Vehicular Emissions from the proposed expansion project**	0.99	---	6.65	4.88
Net resultant concentrations during operation of the plant	**72.11**	**19.78**	**42.25**	**1361.88**
National Ambient Air Quality Standards	**100**	**80**	**80**	**2000**
The net resultant Ground level concentrations during operation of the proposed 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 expansion 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. **13.6 acres (5.5 Ha.)** of extensive greenbelt will be developed to further 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

Closed loop cooling water system will be adopted in Pellet Plant, DRI, SMS, and Rolling Mill units. Effluent from power plant will be treated and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development. Sanitary waste water will be treated in STP. Treated sewage will be used for Greenbelt development. There will not be any effluent discharge outside the premises. ZLD will be followed. Hence there will not be any adverse impact on environment due to the proposed expansion 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. **13.6 acres (5.5 Ha.)** of extensive greenbelt will be developed as per guidelines. 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 certain upliftment in Socio Economic status of the people in the area & 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	Once in a month except for heavy metals which will be monitored on quarterly basis.	Composite sampling (24 hourly)	As per IS: 10500
B.	Effluent at the outlet of the ETP	Twice in a month	Grab sampling (24 hourly)	As per EPA Rules, 1996
C.	STP Inlet & Outlet	Twice in a month	Grab sampling (24 hourly)	As per EPA Rules1996
2. Air Quality				
A.	Stack Monitoring	Online monitors (all stacks) Once in a month		PM PM, SO_2 & NOx
B.	Ambient Air quality (CAAQMS)	Continuous Quarterly Once	Continuous 24 hours	PM_{10}, SO_2 & NOx $PM_{2.5}$, PM_{10}, SO_2, NOx & CO
C.	Fugitive emissions	Quarterly Once	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	Quarterly Once	Continuous for 24 hours with 1 hour interval	Noise levels

5.0 ADDITIONAL STUDIES

No Rehabilitation and Resettlement is involved in the proposed project as there are no habitations in the project site. 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.

7.0 ENVIRONMENT MANAGEMENT PLAN

7.1 Air Environment

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

S.No.	Source	Control Equipment	Outlet PM emission
1	Pellet Plant (0.6 MTPA)	Electro Static Precipitator (1 no.)	PM < 30 mg/Nm^3
2	DRI kilns with WHRB's (4 x 100 TPD)	Electro Static Precipitators (4 nos.)	PM < 30 mg/Nm^3
3	Induction Furnaces with CCM (2 x 20 T)	Fume Extraction system with PTFE bag filters (2 nos.)	PM < 30 mg/Nm^3
5	Reheating furnace of Rolling Mill	Stack	PM < 30 mg/Nm^3
6	SEAF (2 x 6 MVA)	4th Hole Extraction system with PTFE bag filters (2 nos.)	PM < 30 mg/Nm^3
7	AFBC Boiler (1x15 MW)	Electro Static Precipitators	PM < 30 mg/Nm^3
		Limestone will be used as bed material and act as sulphur absorbent. Lime dosing will also be done	SOx < 100 mg/Nm^3
		Combustion temperature will be around 800-850 ^{0}C, which is not conducive for thermal NOx formation. Low NOx burners with 3-stage combustion, flue gas recirculation and auto combustion control system will be provided.	NOx < 100 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

- Effluent from existing permitted Galvanizing unit which is under construction will be treated using adsorption process for the removal of heavy metals.
- There will be no effluent generation in the Pellet Plant, DRI plant, SMS Plant & Ferro Alloy plant as closed circuit cooling system will be adopted.
- Thickener over flow from I/ O beneficiation process will be recycled along with with makeup water. Thickener under flow will be taken to slime pond & will be treated in settling tank and reused in process.
- Closed loop water system will be implemented in Rolling mill. Hence there will not be any waste water discharge from process and cooling, in which water after cooling will be recycled back.
- Effluent from captive power plant 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.
- Domestic sewage generated will be treated in proposed STP.
- There will not be any effluent discharge outside the premises. Zero discharge is being /will be followed.
- During monsoon the treated effluent after ensuring compliance with norms, will be used as makeup water for Rolling mill & SMS.

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 with Cooling Tower blowdown in a Central Monitoring Basin (CMB). Service water will be treated in an oil separator and after treatment it will be taken to CMB. The treated effluent will be utilized for dust suppression, ash conditioning and for Green belt development. No effluent will be let out of the plant premises. Hence Zero discharge concept will be implemented.

CHARACTERISTICS OF TREATED PROCESS EFFLUENT

Parameter	:	**Maximum Permissible concentration**
pH	:	6.5-8.5
Free available chlorine (mg/l)	:	<1.0
Copper (mg/l)	:	<1.0
Iron (mg/l)	:	<1.0
Zinc (mg/l)	:	<0.2
Oil & Grease (mg/l)	:	<10
TSS (mg/l)	:	<100
Total Chromium (mg/l)	:	<0.2
Phosphates (mg/l)	:	<5.0

TREATED SEWAGE CHARACTERISTICS

Parameters	:	**Maximum Permissible concentration**
pH	:	6.5 – 8.0
BOD (mg/ L)	:	<10
COD (mg/ L)	:	<50
TSS (mg/ L)	:	<20
NH_4-N (mg/ L)	:	<5
N-Total (mg/ L)	:	<10
Fecal Coliform (MPN/100 ml)	:	<100

TREATED EFFLUENT DISPOSAL

Total Net effluent generation from project	**:**	**240 KLD**
Effluent quantity to be used for ash conditioning	:	70 KLD
Effluent to be used for dust suppression	:	100 KLD
Balance effluent to be used for Greenbelt development	:	70 KLD

13.6 Acres (5.5 Ha.) 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. The characteristics of the treated effluent will comply with the SPCB Standards for onland irrigation. Hence there will not be any adverse impact on ground water / surface water due to the proposed expansion project.

7.3 Noise Environment

The major sources of noise generation in the proposed expansion 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 expansion 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.

Solid waste generation and disposal

S.No.	Waste / By product	Quantity (TPD)	Method of disposal
1	Tailings from I/O beneficiation	358 TPD (1,20,000 TPA)	Will be taken to filter press & recovered the water. Cake of tailing will be stored in tailing yard & it will given to nearby Ceramic Unit.
2	Ash from Pellet Plant	18 TPD (5,400 TPA)	Will be utilized own brick making unit.
3	Ash from Bituminous coal	1.0 TPD (300 TPA)	Will be utilized own brick making unit.
4	Ash from DRI	64 TPD (21,600 TPA)	Will be utilized own brick making unit.
5	DoloChar	72 TPD (24,000 TPA)	Used as fuel in captive AFBC boiler
6	Wet scrapper sludge	20 TPD (6,000 TPA)	Will be given to nearby Brick manufacturing
7	Kiln Accretion Slag	4 TPD (1200 TPA)	Used in internal road construction (or) given to road contractors
8	FES & Bag filter dust	18.5 TPD	Will be utilized own brick making unit.
9	Slag from SMS	40 TPD (12,000 TPA)	Slag will be crushed and after recovery of iron, it will be used for road construction / utilised in brick making unit.
10	Mill Scale from Rolling Mill	1.2 TPD (360 TPA)	Will be given to Ferro Alloy plants
11	End Cuttings from Rolling Mill	12 TPD	Will be reused in Induction Furnace.

S.No.	Waste / By product	Quantity (TPD)	Method of disposal
		(3600 TPA)	
12	Slag from SiMn Manufacturing Process	45 TPD (15,046 TPA)	Will be given to Contractors for Road Construction.
	(OR)		
	Slag from FeMn Manufacturing Process	44.6 TPD (14,939 TPA)	Will be used in manufacture of Silico manganese as it contains high MnO_2.
	(OR)		
	Slag from FeSi Manufacturing Process	1.7 TPD (606 TPA)	Will be given to cast iron foundries.
	(OR)		
	Slag from Pig Iron Manufacturing Process	57.7 TPD (17,650)	Will be used in manufacture of cement
13	Ash from Power Plant (with Dolochar & Indian coal)	176.5 TPD (61,789 TPA)	Will be utilized own brick making unit.
Note: Solid wastes such as Dolochar, accretion slag will be stored in designated storage yard. Ash generated will be stored in silos only. There will not be any open storage of fly ash.			

7.5 Greenbelt Development

Greenbelt of **13.6 Acres (5.5 Ha.)** of extensive greenbelt will be developed in the plant premises. **10 to 86 m** wide greenbelt will be developed all around the plant. 2500 plants will be planted per Hectare as per CPCB norms.

7.6 Cost for Environment Protection

Capital Cost for Environment Protection for proposed plant : Rs. 28 Crores

Recurring Cost per annum for Environmental protection : Rs.1.72 Crores

7.7 Implementation of CREP Recommendations

All the CREP recommendations will be strictly followed.

- Continuous stack monitoring system is proposed for major stacks.
- 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.