

**SUMMARY ON
ENVIRONMENTAL IMPACT ASSESSMENT
REPORT**

OF

MVK INDUSTRIES PVT. LTD.

(Expansion Project)

at

Amartal & Kirari (V), Akaltara (T), Janjgir-Champa (D), C.G

Submitted to

CHHATTISGARH ENVIRONMENT CONSERVATION BOARD

1.0 PROJECT DESCRIPTION

MVK Industries Private Limited proposed to go for expansion in the existing Biomass based Power Plant at Amartal & Kirari Villages, Akaltara Tehsil, Janjgir–Champa District, Chhattisgarh.

CTE & CTO is obtained in the name of **M/s. KVK Bio Energy Pvt. Ltd.** for setting up of **15.0 MW biomass based power plant** at villages - Amartal & Kirari, Tehsil - Akaltara, District - Janjgir-champa, Chhattisgarh.

Now this plant has been taken over by **MVK Industries Pvt. Ltd.** Accordingly **CECB** has **transferred** the **CTO** in the name of **M/s. MVK Industries Pvt. Ltd.**

The total land earmarked is **13.055 Ha. (32.26 Acres)**, out of which existing land is 9.30 Ha.(23 Acres) and additional land of 3.75 Ha. (9.26 Ac) proposed for the expansion project.

Khasra No. of **CSIDC land** are 221, 226, 228, 232 which is taken on lease.

Khasra No. of Private land are 222, 223/1, 223/2, 223/3, 223/4, 223/5, 224, 225, 227, 229/1, 229/2, 231, 1216/4, 1216/5, 1216/6, 1216/7, 1217/1, 1217/2, 1217/3, 1218, 1219/2 which is under possession of the management.

Now as part of expansion, **M/s. MVK Industries Pvt. Ltd** has proposed to establish Steel plant partly in the existing power plant premises and remaining in the additional land already acquired. The proposed expansion project involves Establishment of Pellet Plant 0.4 MTPA, 1 x 350 TPD DRI Kilns (Sponge iron- 1,15,500 TPA), 1 x 15 MVA Ferro Alloys Unit (FeMn-40,300 TPA / SiMn-28,215 TPA / Pig Iron – 56,400 TPA.), Fly ash Brick making plant of 8.6 million Bricks per Annum (26,000 bricks/day) by forward integration in the existing 15 MW Biomass based power plant premises & Conversion of existing 15 MW Biomass based power plant to 8.0 MW WHRB & 7.0 MW Dolochar & Coal based power plant. The proposed expansion will be taken up mostly in the existing plant premises & remaining in the adjoining land already acquired. **The estimated project cost for the proposed project is Rs. 193 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. **IA-J-11011/341/2021-IA.II (IND-1)**, dated **27th September, 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	Industrial Land Existing land is 9.30 Ha.(23 Acres) and 3.75 Ha. (9.26 Ac) is adjoining additional land proposed for Greenbelt development & Truck Parking.
2.	National Park/ Wildlife sanctuary / Biosphere reserve / Tiger Reserve / Elephant Corridor / migratory routes for	Nil

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
	Birds	
3.	Historical places / Places of Tourist importance / Archeological sites	Nil
4.	Critically polluted area as per MoEF&CC Office Memorandum dated 13 th January 2010	None And also the Plant area does not fall in the areas given in Hon'ble NGT order issued vide dated 10 th July 2019.
5.	Defence Installations	Nil
6.	Nearest village	Amartal Village – 0.16kms. (E)
7.	Forests	Nil
8.	Water body	Hasdeo Branch Canal - 1.0 Km. (W) Amartal Pond – 0.3 Kms (N) Kirari Pond - 1.1 Kms. (SW) ChhirkNala – 2.7 Kms. (NE) KanjNala – 5.0 Kms. (E) PawaiNala – 1.2 Kms. (S) & few other seasonal are flowing within 10 Km. radius of the plant site. Few ponds exist within 10 Km. Radius.
9.	Nearest Highway	NH # 49 (adjacent) (N)
10.	Nearest Railway Station	Kapan R.S. – 4.5 Kms.(NE)
11.	Nearest Port facility	Nil with in 10 Km. Radius.
12.	Nearest Airport	None within 10 Kms. [Raipur Airport (36kms.)]
13.	Nearest Interstate Boundary	Nearest interstate boundary is Madhya Pradesh at a distance of 85 kms. from the plant .
14.	Seismic zone as per IS-1893	Seismic zone – II
15.	R & R	There is no rehabilitation and resettlement issue, as there are no habitations present in the additional land proposed..
16.	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 the proposed plant configuration and proposed production capacities

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

S.No.	Units (Products)	Existing Plant capacity	Proposed Expansion	After Proposed Expansion
1.	Biomass Power Plant	15 MW (Biomass Power plant)	Converted to 8.0 MW WHRB Power Plant & 7.0 MW Dolochar / coal based power plant	Converted to 8.0 MW WHRB Power Plant & 7.0 MW Dolochar / coal based power plant

S.No.	Units (Products)	Existing Plant capacity	Proposed Expansion	After Proposed Expansion
2.	Pellet Plant	---	4,00,000 TPA	4,00,000 TPA
3.	DRI Kilns (Sponge Iron)	---	1,15,500 TPA (1 x 350 TPD)	1,15,500 TPA (1 x 350 TPD)
4.	Ferro Alloys Unit (FeMn / SiMn)	---	2 x 7.5 MVA FeMn-40,300 TPA / SiMn-28,215 TPA / Pig Iron – 56,400 TPA	2 x 7.5 MVA FeMn-40,300 TPA / SiMn-28,215 TPA / Pig Iron – 56,400 TPA
5.	Fly ash Brick making plant	---	26,000 bricks/day (8.6 million Bricks per Annum)	26,000 bricks/day (8.6 million Bricks per Annum)

1.3 RAW MATERIAL REQUIRMENT

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

RAW MATERIAL REQUIREMENT, SOURCE & MODE OF TRANSPORT

S.No.	Raw Material	Quantity (TPA)	Sources	Mode of Transport	
1.	For Pellet Plant (Pellets) - 4,00,000 TPA				
a)	Iron Ore Concentrate	4,10,000	Chhattisgarh & Odisha	By rail & road (through covered trucks)	
b)	Bentonite	3,200	Gujarat	By rail & road (through covered trucks)	
c)	Limestone	16,000	Chhattisgarh	By road (through covered trucks)	
d)	Anthracite Coal	17,600	SECL Chhattisgarh / MCL Odisha	By rail & road (through covered trucks)	
2.	For DRI Kilns (Sponge Iron) – 1,15,500 TPA				
a)	Pellets (100 %)	1,73,250	Own generation & purchased from outside	Through covered conveyers & By road (through covered trucks)	
	or				
b)	Iron ore (100%)	1,84,800	Barbil, Orissa NMDC, Chhattisgarh	By rail & road (through covered trucks)	
c)	Coal	Indian	1,50,150	SECL Chhattisgarh / MCL Odisha	By rail & road (through covered trucks)
		Imported	96,096	Indonesia / South Africa / Australia	Through sea route, rail route & by road (through covered trucks)
d)	Dolomite	5,775	Chhattisgarh	By road (through covered trucks)	
3.	For 7.0 MW FBC Power plant				
a)	Dolochar + Indian Coal	Dolochar	23,100	In plant generation	through covered conveyors

		Indian Coal	35,228	SECL Chhattisgarh / MCL Odisha	By rail & road (through covered trucks)
	OR				
b)	Dolochar + Imported Coal	Dolochar	23,100	In plant generation	through covered conveyors
		Imported Coal	22,546	Indonesia / South Africa / Australia	Through sea route, rail route & by road (through covered trucks)
4.	For Ferro Alloys (2 x 7.5 MVA) FeMn-40,300 TPA / SiMn-28,215 TPA / Pig Iron – 56,400 TPA				
4 (i)	<i>For Ferro Manganese – 40,300 TPA</i>				
a)	Manganese Ore		91,683	MOIL / OMC	By Rail & Road (through covered trucks)
b)	LAM Coke		14,710	Andhra Pradesh	By road (through covered trucks)
c)	Dolomite		6,851	Chhattisgarh / Andhra Pradesh	By road (through covered trucks)
d)	MS scrap / Mill scales		6,045	Inhouse Generation	By road (through covered trucks)
e)	Electrode paste		524	Maharashtra / West Bengal	By road (through covered trucks)
f)	Bag filter dust		2,015	Inhouse Generation	---
4 (ii)	<i>For Silico Manganese – 28,215 TPA</i>				
a)	Manganese Ore		45,990	MOIL / OMC	By Rail & Road (through covered trucks)
b)	FeMn Slag		23,983	In house generation	----
c)	LAM Coke		10,581	Andhra Pradesh	By road (through covered trucks)
d)	Dolomite		6,348	Chhattisgarh / Andhra Pradesh	By road (through covered trucks)
e)	Electrode paste		564	Maharashtra / West Bengal	By road (through covered trucks)
f)	Quartz		6,772	Chhattisgarh / Andhra Pradesh	By road (through covered trucks)
g)	Bag filter dust		423	Inhouse Generation	---
4 (iii)	<i>For Pig Iron – 56,400 TPA</i>				
a)	HG Iron ore		83,190	Barbil, Odisha NMDC, Chhattisgarh	By road (through covered trucks)
b)	LAM Coke		27,354	Andhra Pradesh	By road (through covered trucks)
c)	Lime stone		7,050	Chhattisgarh / Andhra Pradesh	By road (through covered trucks)
d)	Quartz		3,384	Chhattisgarh / Andhra Pradesh	By road (through covered trucks)
e)	Bag filter dust		1,692	Own generation	---

1.4 MANUFACTURING PROCESS

1.4.1 Pelletization

Iron ore Concentrated / beneficiated Iron Ore 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.

1.4.2 Manufacturing of Sponge Iron (DRI)

The proposal consists of 1 x 350 TPD of DRI kilns to produce 1,15,500 TPA of Sponge iron with 1 x 8 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 1000⁰C enters the reduction zone. Temperature of the order of 1050⁰C 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 160⁰C. 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.

1.4.3 Manufacturing of Ferro Alloys through SEAF

2 nos. of Submerged Electric Arc Furnace each of 7.5 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.

1.4.4 Power Generation

Through WHRB Boiler

The hot flue gases from proposed 1 x 350 TPD of DRI kilns will pass through waste heat recovery Boiler to recover the heat and to generate 8.0 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 FBC Boiler

It is proposed to convert the existing 8 MW Biomass based power plant to Dolochar & coal based power plant for effective utilization of dolochar generated in the premises. The flue-gases will be treated in high efficiency ESP and then discharged through a stack of adequate height into the atmosphere.

1.4.5 BRICK MANUFACTURING UNIT

It is proposed to establish Fly Ash / Slag brick making unit of 26,000 bricks/day capacity. Fly ash (70%), Gypsum (5%), cement (10%) and Stone dust (15%) are manually feed into a pan mixer where water is added to the required proportion for homogeneous mixing. After

mixing, the mixture is allowed to belt conveyor through feed in to automatic block making machine where the blocks are pressed automatically. Then the blocks/ blocks are placed on wooden pallets and kept as it is for two days there-after transported to open area where they are water cured for 10 -15 days.

1.5 Water Requirement

Water required for the proposed forward integration project will be 680 KLD. This includes make up water for Pellet Plant ,DRI Kilns, Ferro Alloys Unit, & Domestic. Total water requirement for existing & expansion project will be 2130 KLD. Water required for proposed project will be sourced groundwater. NOC from CGWA for Water drawl of Groundwater will be obtained.

BREAK-UP OF WATER REQUIREMENT

S.No.	Unit	For Existing 15 MW Biomass Power plant (in KLD)	For expansion project (in KLD)
1.	For Pellet Plant (0.4 mtpa)	---	240
2.	For Sponge Iron plant (350 TPD)	---	280
3.	For Ferro Alloys (2x7.5 MVA)	---	150
4.	Power Plant (15 MW)		
	• Cooling Tower blowdown	554	---
	• Boiler blowdown	720	---
	• DM plant regeneration water	166	---
5.	For Domestic	10	10
	Total	1450	680

Note: Water requirement for the existing 15 MW Biomass Power plant is 1440 KLD. It will remain same after conversion of Biomass Power plant to 8.0 MW WHRB + 7.0 MW FBC.

1.6 Waste Water Generation

- The total net wastewater generation from the proposed expansion project will be **473 KLD**. There will be no effluent discharge in the Pellet Plant Pellet plant, Sponge Iron plant, Ferro Alloys unit as closed circuit cooling system will be adopted.
- The following will be the total wastewater generation& it's break-up.

BREAKUP OF WASTE WATER GENERATION

S.No.	Source	Effluent Generation from Existing Biomass Power Plant (in KLD)	Effluent Generation from Expansion (in KLD)
1.	Cooling Tower blowdown	111	---

S.No.	Source	Effluent Generation from Existing Biomass Power Plant (in KLD)	Effluent Generation from Expansion (in KLD)
2.	Boiler blowdown	180	---
3.	DM plant regeneration water	166	---
4.	Sanitary Wastewater	--	16
	Total	457	16

Note: Wastewater generation from the existing 15 MW Biomass Power plant is 457 KLD. It will remain same after conversion of Biomass Power plant to 8.0 MW WHRB + 7.0 MW FBC

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}, PM₁₀, SO₂, NO_x & 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}	:	21.7 to 43.6 µg/m ³
PM ₁₀	:	38.6 to 72.8 µg/m ³
SO ₂	:	7.5 to 18.9 µg/m ³
NO _x	:	8.0 to 23.1 µg/m ³
CO	:	305 to 988 µg/m ³

2.2 Water Quality

2.2.1 Surface Water Quality

There are no river within 10 Km. radius. Chhirk Nala (2.7 Kms.), Kanj Nala (5.0 Kms.), Pawai Nala (1.2 Kms.) are exists within 10 Km. radius of the plant site. No water samples have been collected from these water bodies as the study period is summer season.

However One sample each from Kirari Village Pond (1.1 Km), Tarod Village Pond (3.6 Km) & Banari Village pond (7.2 Km) & One sample from Hasdeo Branch Canal (1.0 Km) have been collected and analyzed.

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 **46.36 dBA to 67.78 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 likely emissions from the proposed expansion 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 expansion project will be **0.77 µg/m³** at a distance of 800 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 **0.32 µg/m³**.

The predicted max incremental SO₂ concentrations (24 hourly) due to the emissions from operation of proposed expansion project will be **5.72 µg/m³** at a distance of 800 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 expansion project will be **4.82 µg/m³** at a distance of 800 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 **2.56 µg/m³**.

The predicted incremental rise in CO concentration due to the Vehicular emission will be **1.65 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	72.8	18.9	23.1	988
Maximum predicted incremental rise in concentration due to proposed project of MVKIPL	0.77	5.72	4.82	Nil
Maximum predicted incremental rise in concentration due to Vehicular Emissions from the proposed expansion project	0.32	Nil	2.56	1.65
Net resultant concentrations during operation of the plant	73.89	24.62	27.92	989.65
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. **4.51 Ha. (11.15 Acres)** of extensive greenbelt will be developed (**inclusive of existing**) 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, and Ferro Alloy 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. **4.51 Ha. (11.15 Acres)** of extensive greenbelt will be developed (**inclusive of existing**) as per the norms. 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	Once in a month	Grab sampling (24 hourly)	As per EPA Rules, 1996
C.	STP Inlet & Outlet	Once in a month	Grab sampling (24 hourly)	As per EPA Rules 1996
2. Air Quality				
A.	Stack Monitoring	Online monitors (all stacks) Once in a month		PM PM, SO ₂ & NO _x
B.	Ambient Air quality (CAAQMS)	Continuous Quarterly Once	Continuous 24 hours	PM ₁₀ , SO ₂ & NO _x PM _{2.5} , PM ₁₀ , SO ₂ , NO _x & 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 expansion project as there are no habitations in the additional land proposed. Hence no R & R study has been carried out.

6.0 PROJECT BENEFITS

With the establishment of the proposed expansion 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 expansion 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	Emission at the outlet
1.	Pellet Plant	Electro Static Precipitator (ESP) (high performance rigid electrodes with transformer)	PM <30 mg/Nm ³
2.	DRI kilns with WHRB's	Electro Static Precipitators (ESP) (high performance rigid electrodes with transformer)	PM <30 mg/Nm ³
3.	Ferro Alloys	4 th Hole Fume Extraction system with PTFE membrane bag filters	PM < 30 mg/Nm ³
4.	FBC Boiler (existing ESP will be Upgraded to comply with latest emission norms)	Electro Static Precipitator (high performance rigid electrodes with transformer)	PM < 30 mg/Nm ³
		Automatic Lime dosing system	SOx <100 mg/Nm ³
		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

- There will be no effluent generation in the Pellet Plant, DRI plant & Ferro Alloy plant as closed circuit cooling system will be adopted.
- 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 Cooling Tower.

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 Effluent generation from the existing & expansion project	:	473 KLD
Effluent quantity to be recycled for CT makeup	:	328 KLD
Effluent quantity to be used for ash conditioning	:	60 KLD
Effluent to be used for dust suppression in CHP	:	40 KLD
Effluent to be used for Greenbelt development	:	45 KLD

4.51 Ha. (11.15 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. 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 (TPA)	Proposed method of disposal
1.	Ash from Pellet Plant	12,000	Will be utilised in the proposed Brick Manufacturing Unit
2.	Ash from DRI	20,790	Will be utilised in the proposed Brick Manufacturing Unit
3.	Dolochar	23,100	Will be used as fuel FBC power plant (after modification of existing biomass power plant).
4.	Wet scrapper sludge	5,313	Will be utilised in the proposed Brick Manufacturing Unit.
5.	Kiln Accretion Slag	1,040	Will be used in road construction & utilised in the proposed Brick Manufacturing Unit
6.	Ash from Power Plant (with Indian Coal + dolochar)	29,712	Will be utilized in the proposed brick manufacturing unit
7.	Slag from FeMn	24,365	Will be reused in manufacture of SiMn as it contains high SiO ₂ and Silicon.
		or	
8.	Slag from SiMn	23,665	will be used for Road construction / will be given to slag cement manufacturing.
		or	
9.	Slag from Pig iron	24,952	Will be given to slag cement manufacturing.

7.5 Greenbelt Development

- Total trees to be translocated as part of expansion project will be 88 nos.
- Compensatory afforestation will be taken up @ 5 trees/plant is 440 nos.

- Additional greenbelt of 0.35 acres will be developed in addition to 33% greenbelt.
- Total greenbelt will be **11.15 Acres (4.51 ha.)** which amounts to 34.8 %
- Currently 9,600 nos. of Trees exists in the plant premises.
- 1,700 nos. of saplings will be planted as part of expansion project within the plant premise.
- 15 to 64 m wide greenbelt will be developed all around the plant.
- Local DFO will be consulted in developing the green belt.

7.6 Cost for Environment Protection

Capital Cost for Environment Protection for proposed plant : Rs. 13.8 Crores

Recurring Cost per annum for Environmental protection : Rs.1.42 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.