SUMMARY ON

ENVIRONMENTAL IMPACT ASSESSMENT

REPORT

OF

Vikas Metaliks And Energy Limited

Proposed to set up an Integrated Steel Plant

at

Bartori Village,Tilda Tehsil, Raipur District, Chhattisgarh

Submitted to

CHHATTISGARH ENVIRONMENT CONSERVATION BOARD

1.0 PROJECT DESCRIPTION

Vikas Metaliks And Energy Limited is proposed to establish Integrated steel plant at Bartori Village,Tilda Tehsil, Raipur District, Chhattisgarh. It has been Proposed to install Sponge Iron Plant of 1,20,000 TPA capacity, Induction furnace with CCM & LRF of 1,35,000 TPA capacity, Rolling Mill of 90,000 TPA capacity, Power Plant through WHRB of 8 MW capacity, Power Plant through FBC Boiler of 8 MW. The proposed project will be taken up in an area of **34.26 acres. The Khasra nos. involved in project site are** 149/5, 6, 8, 9, 10, 15, 16, 20, 21, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 36, 35, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 158/1, 158/3, 180, 181/3,215,217/3.

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 project vide letter no J-11011/80/2008-IA II (I) data 7th February 2017. 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/ 1619/ RA 026, for preparing EIA report for Metallurgical Unit, have prepared Draft Environmental Impact Assessment (EIA) report for the proposed 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 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 Plant Configuration and Production Capacity

The proposed Integrated Steel Plant envisages manufacturing of the following products

S.No.	Details		Plant Configuration	Production Capacity
1.	DRI Kiln for Production of Sponge Iron		4 x 100 TPD	1,20,000 TPA
2.	Induction furnace with CCM & LRF		3 x 15 MT/heat	1,35,000 TPA
3.	Rolling Mill		1 x 300 TPD	90,000 TPA
4.	Power Generation	WHRB	4 x 2 MW	8 MW
		FBC Boiler (40 TPH)	---	8 MW

The proposed Steel Plant will produce the following products:

Unit	:	Description
DRI Kiln	:	Manufacturing of Sponge Iron using Iron Ore, Dolomite, Limestone and Coal as raw materials
Induction Furnace	:	Manufacturing of MS Billets using Sponge Iron, Scrap, Ferro Alloys as raw materials
Rolling Mill	:	Manufacturing of Rolled Product using MS Ingots / Steel Billets. By utilizing Producer Gas / Furnace oil as fuel.
Power generation	:	By utilizing hot waste flue gases from DRI kilns in WHRB. By utilizing coal / Dolochar in FBC boiler as fuel.

1.2 Raw Materials

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

Raw Material		Quantity	Sources	Mode of Transport
For DRI Kilns (Sponge Iron)				
Iron ore		1,92,000	NMDC, Bailadila/ Bachheli & Open Market	By rail & road (through covered trucks)
Coal	Indian	1,56,000	SECL, Chhattisgarh / MCL Odisha	By rail & road (through covered trucks)
	Imported	1,11,000	Indonesia / South Africa / Australia	Through sea route, rail route & by road
Dolomite		6,600	Local area	By road (through covered trucks)
Limestone		9,000	Local area	By road (through covered trucks)

Raw Material		Quantity	Sources	Mode of Transport
For Induction Furnace (MS Billets)				
Sponge Iron		1,20,000	In plant generation	By Road (through covered trucks)
Scrap		35,600	Local area	By road (through covered trucks)
Ferro Alloys		1,350	Local area	By road (through covered trucks)
For Rolling Mill (TMT bars & Structural Steel)				
M.S. Ingots / Steel billets		99,000	In plant generation	through conveyors
Furnace oil		4950	HPCL/IOCL depots	Tankers
Coal		4,500	SECL, C.G. / MCL Odisha	By rail & road (through covered trucks)
Producer gas		8000 m^3/hr	In plant generation	---
For FBC Boiler based power plant				
Dolochar		36,000	In plant generation	through covered conveyors
Coal	Indian	50,400	SECL C.G. / MCL Odisha	By rail & road (through covered trucks)
	Imported	35,840	Indonesia / South Africa / Australia	Through sea route / rail route / by road

1.3 Manufacturing Process

1.3.1 Sponge Iron (DRI)

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^{0}C enters the reduction zone. Temperature of the order of 1050^{0}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^{0}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.

1.3.2 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 3 nos. of Induction Furnaces in the SMS plant, each of 15T capacity. MS Ingots/ MS Billets will be produced in Continuous Casting Machine.

1.3.3 Rolling Mill

In the proposed project, there will 1 X 300 TPD reheating furnaces is proposed for the heating of billets. Furnace will be heated with Producer Gas / Furnace oil. A bar and round mill will be installed in the plant to produce 300 TPD of TMT bars/ Structural steel.

1.3.4 Power Generation

1.3.4.1 Through WHRB Boiler

The hot flue gases from DRI kilns will pass through waste heat recovery Boilers to recover the heat and to generate 1 x 8 MW electricity. The gases after heat recovery will pass through ESPs and then discharged through chimneys into the atmosphere for effective dispersion of emissions into the atmosphere.

1.3.4.2 THROUGH AFBC BOILER

Coal (Imported / Indian) and dolochar will be used in AFBC Boilers to generate 8 MW electricity. The flue-gases will be treated in high efficiency ESP and then discharged through stack into the atmosphere.

1.5 Water Requirement

The water requirement for the proposed project will be 450 KLD. This includes Make-up water for DRI Kiln, Induction Furnace, Rolling Mill and Power Plant. Water required for the proposed project will be sourced from Ground Water. Approval from the Central Ground Water Authority will be obtained in due course. Air cooled condensers will be provided to FBC boiler. Hence the net water requirement will be substantially reduced.

The following is the break-up of the water requirement for proposed project.

WATER REQUIREMENT

Sr.No.	Water requirement	Quantity in KLD
1.	DRI kiln	110
2.	Steel melting shop	100
3.	Rolling mill	25
4.	Power Plant (16 MW)	0
	Cooling tower makeup	96
	Boiler make up	74
	DM plant Regeneration	30
5.	Domestic	15
	Total	**450**

1.6 Waste Water Generation

There will be no effluent generation from the operations of DRI plant, Induction Furnace & Rolling mill as closed circuit cooling system will be adopted. 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 septic tank followed by sub-surface dispersion trench.

The following will be the total wastewater & it's break-up.

BREAKUP OF WASTE WATER GENERATION

S.No.	Source	Generation (m^3/day)
1.	Power Plant	
	a) Cooling Tower blow-down	24
	b) Boilers blow-down	22
	c) D.M. plant regeneration water	30
2.	Sanitary Wastewater	12
	Total	**88**

1.7 Wastewater Characteristics

PARAMETER	CONCENTRATION		
	R O Rejects	DM Plant Regeneration	Sanitary waste water
pH	7.5 – 8.0	5.0 – 10.0	7.0 – 8.5
BOD (mg/l)	--	--	200 – 250
COD (mg/l)	--	--	300 – 400
TDS (mg/l)	600	5000 – 6000	800 – 900
Oil & Grease (mg/l)	--	10	--
SS (mg/l)	350	--	--

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 March 2017 to May 2017. The following are the concentrations of various parameters at the monitoring stations:

Parameter		Concentration
$PM_{2.5}$	:	16.4 to 33.4 µg/m^3
PM_{10} *	:	28.9 to 58.5 µg/m^3
SO_2	:	7.2 to 14.5 µg/m^3
NO_X	:	7.0 to 18.9 µg/m^3
CO	:	354 to 758 µg/m^3

* PAH in PM_{10} were analyzed and their concentrations at all monitoring Stations are Below Detectable Level.

2.2 Water Quality

2.2.1 Surface Water Quality

There are no major rivers flowing with in 10 Km. radius of the study area. Jamuniya nala is flowing at a distance of 1.5 Kms. However there is no water available during the study period. Hence a sample from Kirna Tank (3.2 Kms.) & from Batapara Mahanadi Canal (0.7 Kms.) 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

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 39.25 dBA to 59.10 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 predicted max. Incremental PM_{10} concentrations (24 hourly) due to the emissions from operation of proposed project will be 2.3 $\mu g/m^3$ at a distance of 900 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 0.9 $\mu g/m^3$.

Hence the total predicted incremental rise due to the emissions from operation of proposed project and due the vehicular emission will be 2.3 μg/m^3 + 0.9 μg/m^3 = 3.2 μg/m^3.

The predicted max incremental SO_2 concentrations (24 hourly) due to the emissions from operation of proposed project will be 18.2 μg/m^3 at a distance of 900 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 project will be 5.2 μg/m^3 at a distance of 900 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 5.9 μg/m^3.

Hence the total predicted incremental rise due to the emissions from operation of proposed project and due the vehicular emission will be 5.2 μg/m^3 + 5.9 μg/m^3 = 11.1 μg/m^3

The predicted incremental rise in CO concentration due to the Vehicular emission will be 2.3 μg/m^3.

Net Resultant maximum concentrations due to the 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	58.5	14.5	18.9	758
Maximum predicted incremental rise in concentration due to **VMEL**	2.3	18.2	5.2	--
Maximum predicted incremental rise in concentration due to **Vehicular Emissions from the proposed project**	0.9	--	5.9	2.3
Net resultant concentrations during operation of the plant	**61.7**	**32.7**	**30**	**760.3**
National Ambient Air Quality Standards	**100**	**80**	**80**	**2000**

The predicted results show that the net resultant concentration (max. baseline conc. + max. incremental rise in conc.) of PM_{10}, SO_2, and NOx will be well within the National

Ambient Air Quality Standards after commissioning of proposed project. Hence there will not be any adverse impact on air environment due to the proposed 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. **11.3 acres** 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 project.

3.3 Prediction of impacts on Water Environment

There will be no effluent generation in the DRI plant, Induction Furnace & Rolling mill as closed circuit cooling system will be adopted. 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 septic tank followed by sub-surface dispersion trench. 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. **11.3 Acres** of greenbelt will be developed as per guidelines. Hence there will not be any adverse impact on land environment due to the proposed 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 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.	Sanitary waste water	Twice in a month	Grab sampling (24 hourly)	As per EPA Rules1996
2. Air Quality				
A.	Stack Monitoring	Online monitors (WHRB & FBC boiler stacks) Once in a month		PM PM, SO_2 & NOx
B.	Ambient Air quality	Twice a week	24 hours continuously	$PM_{2.5}$, PM_{10}, SO_2 & NOx
C.	Fugitive emissions	Once in a Month	8 hours	PM
3. Meteorological Data				
	Meteorological data to be monitored at the plant.	Daily	Continuous monitoring	Temperature, Relative Humidity, rainfall, wind direction & wind speed.
4. Noise level monitoring				
	Ambient Noise levels	Twice in a year	Continuous for 24 hours with 1 hour interval	Noise levels

5.0 ADDITIONAL STUDIES

No Rehabilitation and Resettlement is involved in the proposed project. 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:

Sr. No.	Source	Control Equipment	Particulate emission at the outlet
1.	DRI kilns with WHRB's	Electro Static Precipitators (ESP)	< 50 mg/Nm^3
2.	Induction Furnaces with CCM	Fume Extraction system with bag filters	< 50 mg/ Nm^3
3.	AFBC Boiler	Electro Static Precipitator (ESP)	< 30 mg/ Nm^3

Note : Apart from the above Fume extraction system with bagfilters, dust suppression system, covered conveyers etc. will also be installed

The following air pollution 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.
- The flue gases from the DRI kiln will pass through Waste Heat Recovery Boiler and after heat recovery the gases will be treated in High efficiency ESPs to bring down the particulate emission in the exhaust gases to below 50 mg/Nm^3 and then discharged into the atmosphere through 2 no. of combined stacks each of 60 m height.

- The Fugitive emissions from the Induction furnaces will be sucked through hoods and will pass through a fume extraction system with bag filters and then the treated gases will be discharged into the atmosphere through 3 nos. of stacks each of 30 m height for effective dispersion of emissions from Induction Furnaces.. The outlet dust emission in the exhaust gases will be less than 50 mg/Nm^3. The dust will be pneumatically carried to covered bins.

- The flue gases from the AFBC boiler will be treated in a high efficiency Electrostatic Precipitator to bring down the particulate emission to less than 30 mg/Nm^3 and will be discharged through a stack of 50 m height for effective dispersion of emissions into the atmosphere.

7.2 Water Environment

There will be no effluent generation in the DRI plant, Induction Furnace & Rolling mill as closed circuit cooling system will be adopted. 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 septic tank followed by sub-surface dispersion trench.

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). 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. Sanitary waste water will be treated in septic tank followed by sub-surface dispersion trench.

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, slag granulation, 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 project.

Solid waste generation and disposal

Sr. No.	Waste / By product	Quantity (TPA)	Method of disposal
1.	Ash from DRI	21,600	Will be used in own brick manufacturing unit and remaining quantity will be given to other brick manufacturers.
2.	DoloChar	36,000	Will be utilized in FBC boiler as fuel
3.	Wet scrapper sludge	54,540	Will be given to other brick manufacturers.
4.	Kiln Accretion Slag	12,720	Will be used in road construction
5.	Slag from SMS	13,500	Slag will be crushed and after recovery of iron, it will be used for road construction.
6.	Mill Scale from Rolling Mill	4,500	Will be reused in SMS
7.	Ash from Power Plant (with Indian coal)	22,680	Will be given to Cement Plants & Brick manufacturers.
8.	Ash from Power Plant (with Imported coal)	5,376	Will be given to Cement Plants & Brick manufacturers.
9.	Ash from Power Plant (with Indian coal + Dolochar)	36,180	Will be given to Cement Plants & Brick manufacturers.

Sr. No.	Waste / By product	Quantity (TPA)	Method of disposal
10.	Ash from Power Plant (with Imported coal + Dolochar)	25,056	Will be given to Cement Plants & Brick manufacturers.

7.5 Greenbelt Development

Greenbelt of 11.3 acres will be developed in the plant premises. **5 to 45 m wide greenbelt** will be developed all around the plant. Capital cost for environment protection for the total project is **Rs. 35 Crores**.

7.6 Implementation of CREP Recommendations

All the CREP recommendations will be strictly followed.

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