EXECUTIVE SUMMARY

1 PURPOSE OF THE REPORT

M/s. Hira Power & Steels Ltd. (HPSL) is situated in Urla Industrial Complex of Raipur city and Chhattisgarh state. The company has been manufacturing Ferro Alloys since 25 years with a total production capacity of 63000 TPA and the manufacturing facilities are located in Central India. Furthermore, the company is proposing to erect another Ferro Alloys plant in Mahuroomkala Village, Rajnandgaon District, of Chhattisgarh State.

The demand for Ferro Alloys as a raw material has been increasing enormously due to the significant growth of steel and stainless steel industries. Furthermore, riding on strong growth for steel demand, the steel manufacturing facilities were in constant need of raw materials like Ferro Alloys. In order to cater the demand of Ferro Alloys, both from steel and stainless steel industries, the company is proposing to install 1 x 36 MVA & 4 x 9 MVA capacity of Submerged Arc Furnace.

As per EIA notification Serial No. 1533, issued on 14th September, 2006 and its subsequent amendments the proposed project is falling under Project / Activity 3(a) – Metallurgical Industries (Ferrous & Non Ferrous) and Category A – Primary metallurgical industry - all projects, and require Environmental Clearance from Expert Appraisal Committee (EAC), MOEF, New Delhi. Hira power & Steel Ltd. has submitted Form 1 application for obtaining Terms of Reference (TOR) from EAC.

The proposal was considered by the Expert Appraisal Committee during its 18th Meeting of the Expert Appraisal Committee (Industry-1) held during January 24th & 25th, 2011 for determination of the Terms of Reference for undertaking detailed EIA Study in accordance with the provisions of the EIA notification dated September 14, 2006. The EAC has given Terms of Reference vide its Letter No. J-11011/6/2011-IA-II (I) dated: 14th March 2011.

2 IDENTIFICATION OF PROJECT & PROJECT PROPONENT

2.1 Project

The proposed Ferro Alloys manufacturing plant consists of 1 x 36 MVA & 4 x 9 MVA Submerged Arc Furnace. The details of the proposed project are given in **Table 2.1 (A).**

Table 2.1 (A)

Details of the proposed project

S. No	Type of the project	Capacity
1	Ferro Alloys (Ferro Manganese & Silicon Manganese) – Submerged Arc Furnace (1 x 36 MVA & 4 x 9 MVA)	1.5 Lakhs MTPA

2.2 Proponent

HPSL is a company of **Hira Group** that operates in eight business sectors viz. Sponge Iron (DRI), Steel, Power, Ferro alloys, Cement, Coal Washery, Pellets, and Mining. The group is well established in India and is expanding operations in International market. The total revenue of this group is $ 440 Million (around 2000 Crores) in 2009-10 and has more than 6000 employees working for the group. The group is a conglomeration of 13 companies across India.

Currently, HPSL is having 26 MVA Furnance, a Captive Power Plant of 20 MW (with Coal linkage), and mines located in Madhya Pradesh. **HPSL** has also acquired seven prospecting rights for Manganese Ore in South Africa. Three of the seven rights are located at close proximity to the world famous Kalahari Manganese basin.

Table 2.2 (A)

Salient Features of the Proposed Site

S. No	Particulars	Details
1	Location	Mahuroomkala Village, Rajnandgaon District, Chhattisgarh State
2	Geographical Positions	Longitude - 81°02'51.8"E to 81°03'13.6"E Latitude - 21°14'16.30"N to 21°14'29.10"N
3	Elevation	344 m
4	Land required for the Activity	41.8 Acres (16.9 Ha)
5	Present Land use	Private Land
6	Nature of Terrain	Rocky
7	Major Crops	Paddy
8	Predominant Wind direction	North
9	Nearest Highway	NH 6 – 15 km, South
10	Nearest Major railway station	Rajnandgaon R.S 20 km, South East
11	Nearest Airport	Mana (Raipur) 80 km, East
12	Nearest Port	Vishakhapatnam (~488 km) South South East
13	Nearest Village	Mahuroomkala Village – 0.5 km, North

14	Nearest Town/City	Rajnandgaon 20 km, South East
15	Nearest River	Aurda Nadi – 5.7 km North East Bhiha Nadi – 6.5 km North West
16	Nearest Water Body	Tilai – 4km W
17	Topography	Undulated with some rocky exposures
18	Monuments	Nil
19	Archaeologically important places	None
20	National Parks	None
21	Forests	None
22	Seismicity	Zone II
23	Rehabilitation & Resettlement	None

Table 2.2 (B)

Technical Details of Power Plant

S.No	Equipment	Description	
1	Name of the plant	Hira Power and Steels Ltd.	
2	Project Capacity	1.5 Lakhs TPA (Ferro Manganese and Silicon Manganese)	
3	Main Plant	1 x 36 MVA & 4 x 9 MVA – Submerged Arc Furnace	
4	Power Required	60 MW	
5	Water Required	120 KLD	
6	Raw Material Required	Ferro-Manganese (TPA)	Silicon-Manganese (TPA)
	Manganese Ore	337500	255000
	Carbon Paste	4500	4000
	Coke	75000	55000
	Dolomite	42000	3000
	Ferro-Manganese Slag	`-	140000
7	Other fuels	Nil	
8	Effluent Quantity	23 KLD	
9	Total Project cost	Rs. 6297 Lakhs	
	EMP Cost	Rs. 180 Lakhs (Recurring Cost : Rs 18 Lakhs)	

3 BASIC REQUIREMENTS

3.1 Land

The land required for the proposed project was identified at Mahroomkala Village, Khairagarh Thasil, Rajnandgaon District, Chhattisgarh State. The proposed land is completely private land, the total land is 41.8 acres.

3.2 Raw Material

The main raw materials required for the proposed project are Manganese ore, Carbon reducer, Dolomite, Quartz and Carbon electrode paste for Ferro Alloy unit. The details of the main raw materials required are given in **Table 3.2 (A)**

Table 3.2 (A)

Details of Raw Materials Requirement

Raw Material Required	Quantity Required	
	Ferro-Manganese	Silicon-Manganese
Manganese Ore	337500	255000
Carbon Paste	4500	4000
Coke	75000	55000
Dolomite	42000	3000
Ferro-Manganese Slag	`-	140000

3.3 Water

The total water required from the project will be taken from the ground water (borewell) within the plant premises, necessary permission will be obtained from the State Ground water/ Central Ground Water Board. The detailed breakup of the water required for various activities are given in **Table 3.3 (A)**

Table 3.3 (A)

Water Requirement m^3/day

S. No	Description	m^3/day	Source
1	Cooling Purpose	105	Bore well
2	Domestic Purpose	3	
3	Gardening Purpose	12	
	Total	**120**	

3.4 Power Evacuation

The total power required for the proposed plant is 60 MW, which will be supplied by Chhattisgarh State Power Distribution Company Limited.

4 BASELINE ENVIRONMENTAL STATUS

4.1 Meteorology

On site monitoring was undertaken during winter season the winds were predominantly recorded from North to south; closely followed by North East and East during this time period. Calm conditions prevailed for 12.37% of the total time. Averaged wind speed for the study period that is December 2010 – February 2011 is 1.81 m/sec.

4.2 Ambient Air Quality

Ambient Air Quality Monitoring (AAQM) was carried out at 10 locations within 10 km peripheral of the project site. AAQ locations were selected in downwind, cross wind and upwind directions of the proposed plant location. AAQ levels are recorded are given below **Table: 4.2 (A)**.

Table: 4.2(A)

Ambient Air Quality levels in the study area- µg/m^3

S.No	Parameter		Min	Max	CPCB, Limits
1	RPM	$PM_{2.5\mu}$	11	40	60
2		$PM_{10\mu}$	20	66	100
3	SO_2		4.2	19.8	80
4	NO_x		8.1	30.3	80
5	Benzene		BDL	BDL	05

4.3 Noise levels in the study area

Baseline noise levels are monitored at 10 locations in the study area and found that noise levels are within the Residential prescribed limits.

4.4 Water Quality

Ground water samples at 10 locations and surface water samples at 8 locations were collected in the study area and analyzed to assess the water quality.

Ground Water Quality – Observations

- The pH of water samples varied from 7.54 to 8.31
- The Total Dissolved Solids are in the range of 290 mg/l to 400 mg/l.
- The chloride values are in the ranges of 62 mg/l to 80 mg/l.
- The fluoride values are in the rage of 0.45 mg/l to 0.75 mg/l.

Surface Water Quality – Observations

- The pH of the surface water is in the range of 7.4 to 7.8
- The Total Dissolved Solids are in the range of 232 mg/l to 331 mg/l
- The Fluoride values are in the range of 0.11 mg/l to 0.56 mg/l
- The Total Hardness is in the order of 132 mg/l to 202 mg/l
- The total chlorides are in the order of 57 mg/l to 74 mg/l

4.5 Soil Quality

Soil quality studies are performed around the project site. Soil samples were collected from 10 locations at various depths and physico-chemical characteristics of the collected samples were analyzed.

4.5.1 Soil Quality – Observations

- The soil quality analysis indicates the soils are predominantly in Balkish brown.
- The pH of soil indicates normal to saline nature (7.23 to 7.86)

4.6 Environmental sensitive areas

Study was carried out to identify environmental sensitive areas with in 15 Km peripheral of the project site and found that there are no Sanctuary, Elephant/Tiger reserve (existing as well as proposed), migratory roots within 15 Km of the project site.

S. No.	Features	Existence with in 15 Km of the project site
1	Sanctuary	Nil
2	Elephant/Tiger reserve	Nil
3	Migratory routes	Nil

5 ENVIRONMENTAL IMPACTS OF THE PROPOSED PROJECT

The proposed power plant may cause impact on the environment in two phases.

- During construction phase
- During Operation phase

5.1 Impact during Construction Phase

Increase in SPM, RPM (PM_{10} & $PM_{2.5}$), SO_2, NO_X & CO levels due to construction activities and movement of vehicles. The impact of these activities would be temporary and will be confined within the project boundary.

The impact on water environment during construction phase is likely to be short term and insignificant. The impact of noise due to construction activities is insignificant, reversible and localized in nature. No significant adverse impacts on the soil in the surrounding area are anticipated. No major impacts on the flora and fauna in the region are anticipated during the construction phase. Overall, there will not be any adverse impact on the surroundings during the construction period.

5.2 Impacts during Operation Phase

5.2.1 Impact on Air Quality

The main raw materials required for the proposed project are Manganese ore, Carbon reducer, Dolomite, Quartz and Carbon electrode paste for Ferro Alloy unit. Particulate Matter (PM10) is the only major air pollutant generated from the plant. The Stack and Emission Details of Proposed Units are provided in **Table: 5.2.1 (A)**

Table 5.2.1 (A)

Stack and Emission Details of Proposed Units

Details	Units	Ferro Alloys	DG Set
Plant capacity		1X36 & 4X9 MVA	250 KVA
Fuel Consumption	TPD	-	30 LPH
Height of the stack	M	30	9
Dia. of stack	M	2.0	0.15
Temp of flue gas	^{o} C	150	120
Velocity of flue gas	m/s	18	10
SPM Emissions	g/s	1.8	Nil
SO_2 Emissions	g/s	Nil	0.07
NO_x Emissions	g/s	Nil	0.04

Using the above emission data and meteorological data, incremental concentrations of PM_{10} have been predicted. For predictions of incremental GLCs, USEPA approved ISCST3 model has been used and post project scenario has been assessed as given in **Table 5.2.1 (B)**

Table: 5.2.1 (B)

Post Project Scenario-*Units:* μg/m^3

Particulars	Particulate Matter (PM_{10})	Sulphur Dioxide (SO_2)	Oxides of Nitrogen (NO_X)
Baseline Scenario (Max)	66.0	19.8	30.3
Predicted GLC (Max)	3.2	2.6	1.5
Overall Scenario (Worst Case)	**69.2**	**22.4**	**31.8**
MOEF / CPCB Standards	**100**	**80**	**80**

The predicted ground level concentrations are superimposed on the baseline levels. The post project pollution levels are found to be within the CPCB limits.

5.2.2 Impact on Water Quality

The main source of water for the proposed plant is ground water. 23 m^3/day of wastewater will be generated from the proposed plant. 100% effluent will be treated and reused for greenbelt development.

5.2.3 Slag Generation and its Impact

The slag generated from Ferro alloys unit is 105000 TPA will be used for construction of boundary walls and tiles manufacturing.

5.2.4 Impact on Soil Quality

As the proposed project does not discharge any treated water outside the premises, hence there will be no impact envisaged due to the proposed project on soil quality. The wastewater from domestic and plant services are treated and reused within plant premises for cooling system makeup, greenbelt development, make up for fire, dust suppression, etc., hence the impact on soil quality will be minimum due to the proposed project

5.2.5 Impact on Ecology

The impact of the project on flora and fauna would be negligible.

5.2.6 Demography and Socio-Economics

The impacts of the proposed plant during operation of plant on demography and socio economic conditions would be both positive and negative some of them are as follows.

- Increase in employment opportunities and Reduction in migrants to outside for employment.
- Growth in services sector
- Increase in consumer prices of indigenous produce and services, land prices, house rent rates and Labour prices.
- Improvement in socio cultural environment of the study area.
- Improvement in transport, communication, health and educational services.
- Increase in employment due to increased business, trade and commerce and service sector.

The overall impact on the socio economic environment will be beneficial.

5.2.7 Impact on Health

Adequate air, water and noise pollution control measures will be provided in the proposed project to conform to regulatory standards. The environmental management and emergency preparedness plans are proposed to ensure that the probability of undesired events and consequences are greatly reduced, and adequate mitigation is provided in case of an emergency. The overall impact on Human health would be negligible during operation of plant.

6 ENVIRONMENT MANAGEMENT PLAN

6.1 Air Quality Management

The particulate emissions are the major air pollutants generated from the proposed plant. To control and limit particulate matter to 50 mg/Nm3 in the Ferro Alloys unit cyclone and bag filter is proposed.

6.2 Water Quality Management

The source of water for the proposed plant is ground water from borewell with in the site. The major Part of this water will be used for cooling purpose and the minor part of this water is for domestic requirement.

The wastewater generation from the proposed plant is from cooling system blow down, domestic wastewater, and floor washings etc. the cooling system blow down will be reused for slag cooling. The domestic wastewater will be stores in septic tank followed by soak pit. The treated water from the over flow of the soak pit, if any, will be used for greenbelt

development. Details of effluent generation and Water balance are given below **Table 6.2(A)**.

Table 6.2 (A)

Water Balance – m^3/day

Particulars	Raw Water Required	Waste Water Generated	Loss	Remarks
Cooling Purpose	105	21	84	Reused for Slag Cooling
Domestic Purpose	3	2	1	Reused for GB
Gardening	12	-	12	-
Total	**120**	**23**	**97**	

6.3 Solid Waste Utilization plan

The details of the solid waste (slag) generated from proposed unit and its management measures are given in **Table 6.3 (A).**

Table 6.3 (A)

Details of the Solid Waste Generation and its Management Measures

Activity	Qty	Management measures
Ferro Alloys unit	105000 TPA	Slag will be disposed for local users for construction of boundary walls and tiles manufacturing

6.4 Noise Level Management

Equipment will be designed to 85 dB(A) to meet ambient noise levels as per the OSHA regulations.

6.5 Storm water Management

Proper drainage system will be provided to ensure smooth draining of storm water without water logging problems.

7 Environmental Monitoring

7.1 Stack Gas Monitoring

The emissions from the stack will be monitored continuously using stack monitoring equipment.

7.2 Ambient Air Quality Monitoring

The ambient air quality will be monitored for SPM, RPM (PM_{10} & $PM_{2.5}$), SO_2, NOx, as per the direction of the state pollution control board.

7.3 Monitoring of other parameters

Ground and surface water quality, effluent quality, noise levels monitoring etc will be regularly monitored and reported to local PCB and also MoEF, GOI.

8 BUDGETARY PROVISIONS FOR EMP

In order to comply with the environmental protection measures as suggested in the above sections, the management has made a budgetary provision for Environmental Protection and Safety measures. The estimated cost of the overall project, amount allocated to Environmental Management Cost towards Environmental Mitigation Measures both capital and recurring are given in **Table 8 (A).**

Table 8 (A)

Cost towards Environmental Mitigation Measures

S.No	Particulars	Capital Cost (Rs. in Lakhs)	Recurring Cost (Rs. In Lakhs)
1	Ferro Alloys unit – Bag filter and dust suppression units	120	18
2	STP, Rainwater harvesting, storm water drains, etc	30	
3	Greenbelt development, Environmental Lab miscellaneous	30	
	Total	**180**	**18**
Capital cost of the project Rs.6297 lakhs **CSR Activities (5.2% of the capital Cost 327 Lakhs)**			

9 ORGANIZATIONAL SET UP FOR ENVIRONMENTAL MANAGEMENT

Environment Division headed by an experienced Executive Engineer is directing responsible for Environmental Management of the existing station. The Executive Engineer reports to the Superintending Engineer (Environment) and Chief Engineer (O&M). The environment division has Environmental Engineering and Environmental Chemistry group. The existing Environmental management team will discharge the responsibilities of the proposed unit.