Executive Summary of Hira Energy Limited EIA/EMP Report

1.0 Introduction

Hira Group is one of the leading business conglomerates in the state of Chhattisgarh. The group is having predominant interest in Power Generation, Sponge Iron, Steel Making, Steel Rolled Products, Ferro Alloys, Cement, Coal Washeries, and Coal & Iron Ore mining. The group has embarked upon the project of Hira Energy Limited (HEL).

HEL has proposed to establish a steel plant at Charmar village, Gharghoda tehsil, Raigarh district, Chattisgarh. The total land requirement for the project is 54.43 ha.

The following units are proposed in this steel pant.

Sl. No	**Product**	**Capacity**
1	Steel Plant	2,50,000 TPA
2	Ferro Alloys	70,000 TPA
3	Power	74 MW (2X37)

Anacon Laboratories Pvt Limited, Nagpur, have prepared Draft Environmental Impact Assessment report for the proposed Steel Plant by incorporating the TOR approved by Ministry of Environment & Forests, New Delhi. The report contains detailed description of the following:

- Charecterisation of status of environment within an area of 10 kms radius from the project site 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
- Pollution control measures to be adopted in the proposed plant
- Environmental Management Plan

2.0 Project Description

- The plant site is located at Charmar village, Gharghoda tehsil, Raigarh district, Chattisgarh
- The nearest railway facility is available at Kharsia, which is about 25 km from the proposed project site
- The power generated in the plant will be utilised for plant internal requirement
- Total land requirement is 54.43 ha.
- The average annual rainfall in this area is 1150 mm.
- There are no national parks/wild life sanctuaries within 10 km radius of project site
- There are two industries located within 10 km radius, which are Mahavir Coal Washery, (0.7 Km, NE) and SECL Mines at Chhal (8.0 Km, W)
- There is no place which is of historical/ touristic/ archaeological interest in the study area.

3.0 Details of the Project

3.1 Raw Materials

The following table presents the raw material requirement for the proposed steel plant.

Sr. No.	Particulars	Source	Quantity (TPA)
1	**Steel Plant**		
	Solid Scrap	Local Industries/Suppliers	30,500
	Pig Iron		30,500
	Sponge Iron		2,44,000
2	**Ferro Alloys**		
	Manganese Ore	Orissa Mining Corp.	1,82,000
	Coke	Raigarh	42,000
	Dolomite & Aluminium	Local Suppliers	7,000
3	**Power Plant**		
	Coal	SECL, Raigarh	5,20,000

3.2 Manufacturing Process

The manufacturing process of different units is presented in **Figures 1-3**.

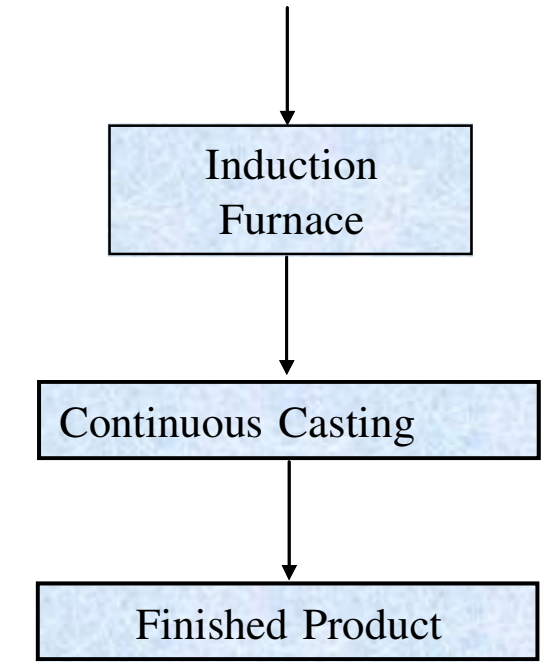

Figure 1
Process Flow Diagram (Steel Plant)

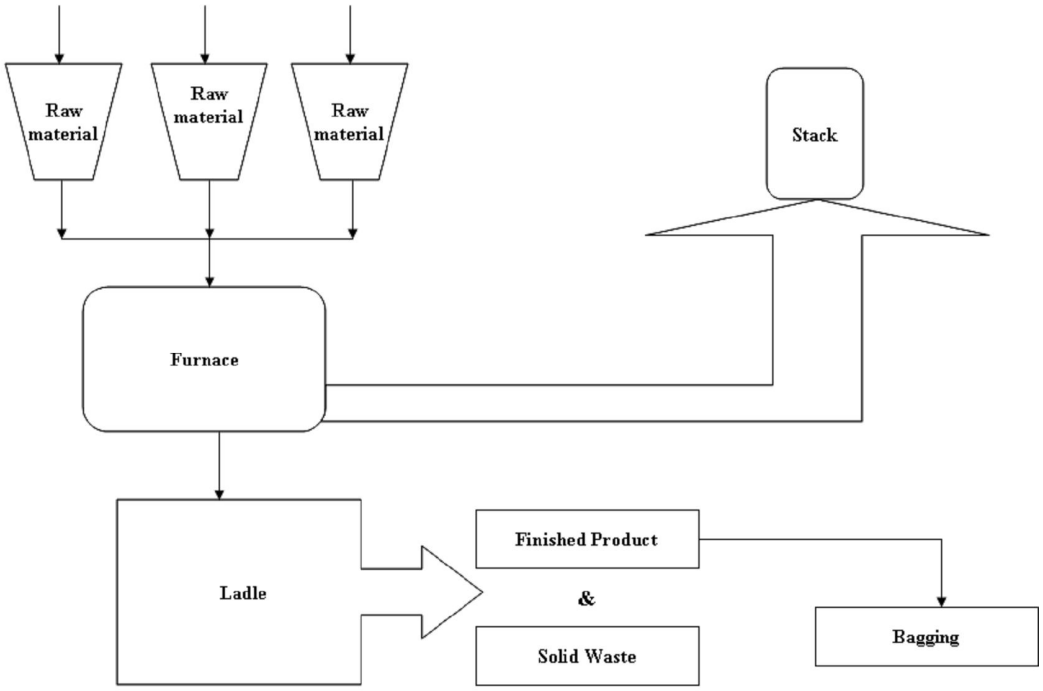

Figure 2
Process Flow Diagram (Ferro Alloys)

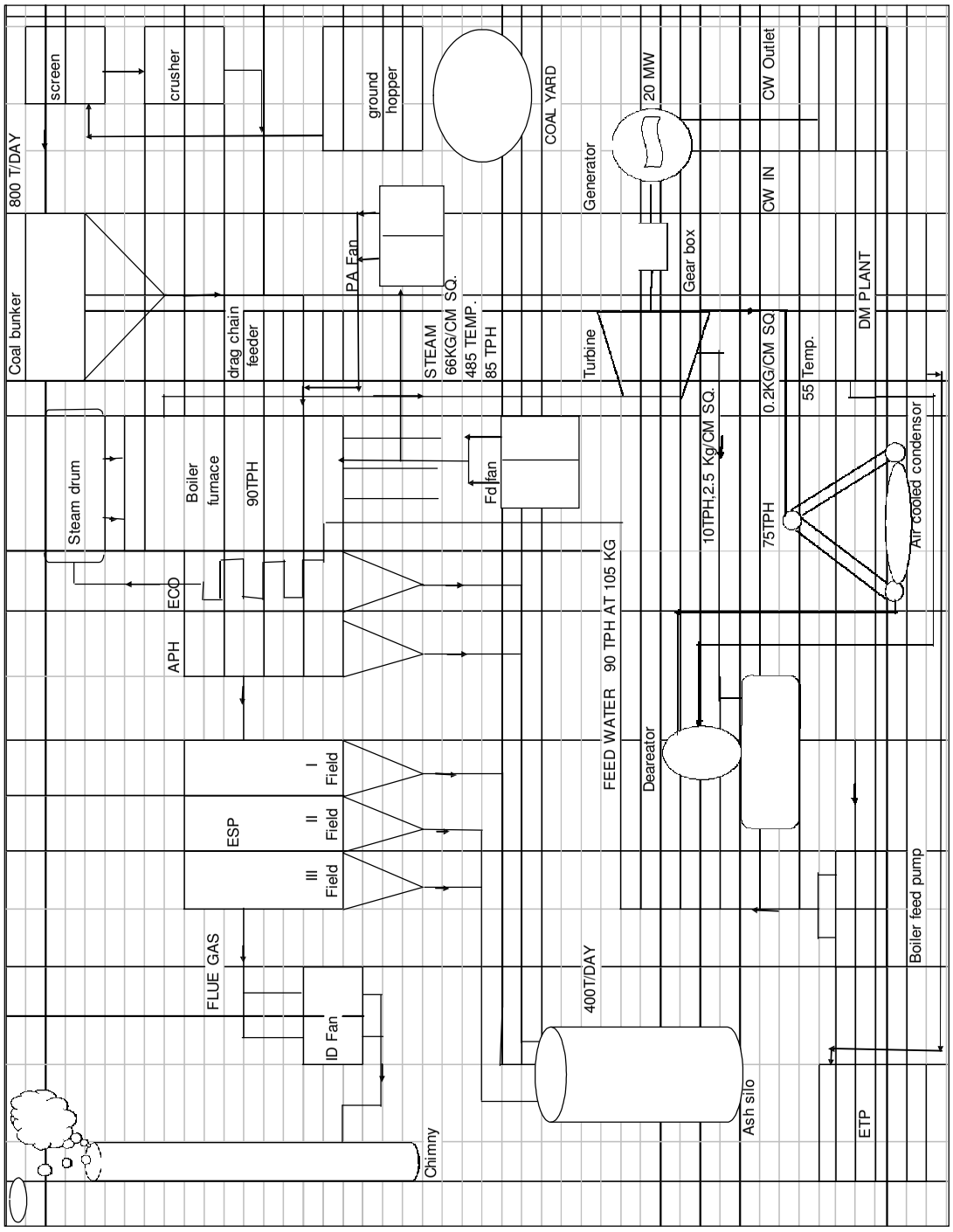

Figure 3
Process Flow Diagram (Power Plant)

3.3 Water Requirement

The total water requirement for the project is 1950 m^3/day. This water will be sourced from the Chini Nala. The detailed water requirement and wastewater generation of the proposed plant is given below:

Water Requirement

Sr. No	Units	Water Requirement (m^3/day)	System Loss / Consumption (m^3/day)	Wastewater generation (m^3/day)
1	Steel Plant	150	140	10
2	Ferro Alloys	125	120	5
3	Power Plant	1675	1625	50
	Total	**1950**	**1885**	**65**

The following flow chart (**Figure 4**) depicts the water requirement and waste water generation in the proposed plant:

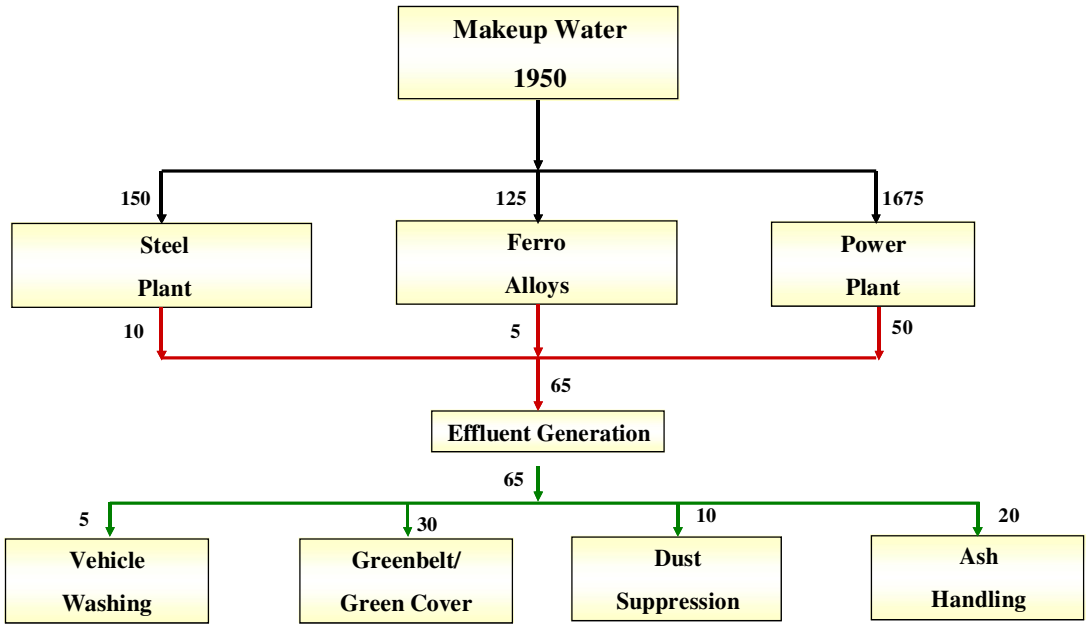

Figure 4
Water Balance Diagram

4.0 Description of the Environment

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

4.1 Ambient Air Quality

The monitoring of air quality has been done during the summer season i.e. March'09 to May'09 for Suspended Particulate Matter (SPM), Respirable Particulate Matter (RPM), SO_2 and NO_X using standard equipments and as per norms of CPCB. Details are presented below:

Pollutant Concentrations

Pollutant	Minimum Concentration (µg/m³)	Maximum Concentration (µg/m³)	Standard (Residential/ Industrial) (µg/m³)
SPM	74.4	148.2	200/500
RPM	22.3	56.4	100/150
SO_2	5.3	8.1	80/120
NO_X	13.8	5.8	80/120

The concentrations of the above five criteria pollutants were observed to be well within the limits promulgated by CPCB for Industrial area.

4.2.1 Surface Water Quality

Three surface water samples were collected from various sampling points of the study area. The water samples were analysed for physical, chemical and bacteriological characteristics as per CPCB guidelines and approved methods. The analytical data shows pH 7.2-7.4, Iron 0.04-0.08mg/l, BOD <3mg/l, COD <4.0-4.8 mg/l. Surface water quality of the samples collected conform to the prescribed CPCB standards.

4.2.2 Ground Water Quality

Eight ground water samples were collected from various sampling points of the study area. The water samples were analysed for physical and chemical characteristics as per CPCB guidelines and approved methods. The analytical data show pH 6.57-7.64, Iron 0.06-0.1mg/l, Flouride 0.1-0.8mg/l. Ground water quality of the samples conforms to BIS 10500.

4.3 Noise Level

Noise level has been measured in and around the proposed project site with a frequency of once in a month. A total of eight sampling points were selected to monitor noise levels during day and night. Equivalent continuous sound pressure levels in dB (A) have been calculated over a specified time period. The noise levels in the study area were observed in the range of 44.8-47.8 dB (A) during day and 39.6- 43.2 dB (A) during night, are within the specified standards.

4.4 Climate and Micrometeorology

Weather monitoring station was setup at the project site to monitor the meteorological data. The secondary data was also collected from Indian Meteorological Department (IMD) Raigarh to validate the data collected from the site. The micrometeorological observations made during the study period are presented below:

- Temperature: 18.0-46.8^{0}C
- Relative Humidity 22-43%
- Rainfall : 1.2-11.2 mm

4.5 Land Environment

About 15.16% of the total study area is forest land, 9.71% of the area is not under cultivation,2.88% is irrigated land, 51.29% is un irrigated land and 20.96% is cultivatable land.

4.6 Soil Quality

Soil sampling locations were selected representing various land use conditions and geological features to assess the existing soil conditions. Seven samples were collected in the study area. The soil in the impact zone has clayey structure with moderate water holding capacity. The bulk density of the soil in the study area ranges between 1.2591 to 1.5493 g/cm^3. The pH is in the range of 5.03 to 7.23. Organic matter and nitrogen are in the range of 0.294-0.744% and 39.78-133.66 kg/ha.

4.7 Ecology

There are Ten of reserve forests i.e. Pachped RF, Marpahar RF, Boia RF, Garinbhari RF, Lamikhar RF, Dhumapara RF, Suhai RF, Lotan RF, Endu RF, Robo RF within the study area.

4.8 Flora

The natural vegetation of the project area and its immediate surrounding is restricted mostly to shrubs and grasses. The common species include Mangifera Indica,Emblica Officinalis, Tamarindus indica etc.

4.9 Fauna

The common fauna found in the study area are Common Langur, Common Jungle Cat, Jackal, Bater, Koel, Teetar, Total, Chhipkali, Dhaman and Nag.

5.0 Anticipated Environmental Impact and Mitigation Measures

5.1 Air Quality

Construction Phase: The construction and erection of proposed plants and equipment will generate dust resulting in higher SPM levels in surrounding area. The impact on the air quality during construction phase will be localized, temporary and reversible in nature. The dust generation during construction will be suppressed through intensive water spraying. Proper maintenance of equipment and transport vehicles will reduce generation of gases.

Operation Phase: During operation phase, air quality may deteriorate due to emission of gases and dust from the various units of the plant like, steel melting, , Ferro alloys plant and captive power plant. There will be 3 stacks in the plant.

The results of the modeling study indicated that the maximum increase of GLC is 1.78µg/m^3 with respect to the SPM, 9.6µg/m^3 with respect to the SO2 and 5.4µg/m^3 with respect to NO_x, which is minimal. The GLC predicted at all receptor locations after the proposed expansion are well within the SPM, SO2 and NOx limit prescribed in NAAQS by MoEF.

During operation the following facilities will be provided to control air pollution:

Sl No	Unit	Proposed Facilities
1	Raw material storage yard	Dust suppression system
2	Coal Handling Area	Dust suppression system
3	Ferro- Alloy Plant	Dust extraction system with pulse jet type bag filter
4	Power Plant	Dust extraction system with ESP, Chimney etc.
5	Steel Making Shop	Dust extraction system

Apart from above measures, Leakage from the equipment, ducts and transfer points shall be regularly checked and stopped. Green belt will be developed to check air pollution in the area.

5.2 Land Environment

The impact on land environment within core zone will be marginal since most part of the land on which the plant will be set up has been already leased out to the company.
The project area under the Integrated Steel Plant will spread over an area of 54.43 ha of land. During construction phase, parts of the project area will be converted into internal roads, water reservoir, buildings, green belt and plantation, etc. The top soil generated during construction will be preserved and spread over the area identified for development of green belt and afforestation.

5.2.1 Topography and drainage

No major change in topography shall occur on account of construction of the proposed plant, except for minor levelling and slight rise in plinth area. Raw material will temporarily increase elevation in storage area.

5.2.2 Soil Quality

In order that soil quality shall not be adversely affected, suitable preventive measures shall be taken while designing and constructing the solid waste and liquid effluent disposal systems like; solid waste dump yard, ash pond and various ETPs.

5.3 Water Environment

Total fresh water requirement of the proposed plant is estimated as 1950 m^3/hr. This water will be drawn from Chini nala. The proposed water drawal of water will have no significant impact on the surface water resources of the study area. The water requirement during construction phase will be about 150m^3/day and water will be drawn from the nearest water body.

5.3.1 Wastewater generation and mitigation measures:

The characteristics of the different wastewater streams from the different operations, after the implementation of the proposed project, are given below:

Sl. No	Description	Contaminants
1	Power Plant Boiler Blow Down	Dissolved Solids
2	Power Plant Cooling Tower Blow Down	Suspended and Dissolved Solids
3	DM Plant Re-Generation	Acidic and Alkaline Water
4	Soft Water Re-Generation	Acidic and Alkaline Water
5	Ferro Alloys Plant- Cooling Tower Blow Down	Suspended and Dissolved Solids
6	Raw water treatment	Suspended and Dissolved Solids
7	Domestic Wastewater	Biodegradable Solids/ Microorganisms

In addition to the anticipated wastewater generation mentioned in the table above, there may be generation of contaminated water from the following sources.

- Oily effluents and handling area run-off water containing Oil& Grease
- Dust suppression system in coal handling area and dry fly ash handling and retrieval area will leave some water containing coal and ash particles respectively to come out as effluent
- Rainfall run-off from coal pile area will contain suspended solids

5.3.1.1 Mitigation Measures

- Blow downs of cooling towers will be routed through oil and grease trap and settling ponds and reused for green belt development, dust suppression and ash handling.
- Effluent from DM water and Soft Water plants will be treated in neutralization pond and reused for green belt development, dust suppression and ash handling.
- Boiler blow down of power plant will be passed through guard pond and reused for green belt development, dust suppression etc.

- Garland drains will be provided around coal storage yard to take care of the rain water which will be led to settling pond from where it will be discharged out

The plant will be operated with the concept of zero discharge. Hence, no effluent will be discharged to near by systems.

5.4 Solid waste generation and mitigation measures

The facilities of the plant will generate different solid wastes like dust, fly ash, used oil etc. If the solid waste is not disposed properly it will cause ground water contamination, surface water quality degradation and silting of surface water bodies. The exposure to windborne particles will cause respiratory diseases. The details of solid waste generation in the proposed facilities are summarized as below:

Solid Waste Generation and Disposal/Reuse

Sr. No.	Plant & Type of Waste	Waste (TPA)	Mode of Disposal/Reuse
1	Steel Plant (Slag)	55,000	Land Filling and Road Construction
2	Electric Arc Furnace (Silico Manganese Slag)	1,59,845	Granulised and utilized as building materials
3	Power Plant (Fly ash)	1,62,240	Cement industries and bricks manufacturing

5.4.1 Drainage System

The dumping area will be well protected and will be provided with garland drain all around the stacking area. The garland drain will have slope from all sides so that the rainwater can travel by gravity through slope up to collection pit.

The water after primary treatment will go to collection tank to avoid silting. Collection tanks will be periodically cleaned and will also be used for water harvesting particularly during heavy rain precipitation.

5.5 Noise Environment

The noise levels during construction phase will be due to construction machinery which is temporary nature. The unpleasant effects of which will be controlled by appropriate mitigation measures.

During the operation phase, the situation will deteriorate with the generation of excessive noise. Personal protection equipments will be provided to persons who will be operating the machinery or working in the plant.

5.5.1 Mitigation Measures

Noise control measures such as silencer, isolators, soundproof enclosures, sealers etc. will be provided as and where required. Preventive maintenance of various equipments will be carried out and isolation of workers will also be done. The equipments shall be provided with acoustic shield or enclosures to limit the sound level inside the plant.

5.6 Ecology

The core area does not have any forest. There are Ten reserve forests which are mostly scrub forests in the buffer zone of 10 kms radius. These forests have species of flora and fauna which are commonly found. There are no wildlife sanctuaries or fragile ecosystems within the study area. The activities of the plant barring transportation shall be restricted within the boundary of wall of the project site plot. Hence no significant impact on wildlife or fragile ecosystem is envisaged.

5.6.1 Mitigation Measures

In order to promote the ecosystem and prevent pollution of environment due to fugitive emissions, the company has planned to develop greenbelt in an area of 18.0 ha.

5.6.2 Greenbelt Development

Greenbelt development will further help in:

- Limitation of air emissions
- Attenuation of noise levels
- Balancing of Eco-environment
- Prevention of soil erosion
- Creation of aesthetic environment

5.7 Socio Economic Condition

The impact is positive and prosperity will emerge in the area, right from the onset of project work. It is envisaged that in operation phase will require manpower of 373 people. There will be direct and indirect employment generation like transportation of materials and other services associated with project will be carried out through contract.

Majority of the semi-skilled and unskilled persons will be from surrounding villages to reduce the net in-migration of non local people on account of job opportunities.

The company has envisaged various peripheral developmental activities like opening and maintaining educational institutions, primary health centre, ambulance and other health services providing drinking water facilities to nearby villages etc. With the commencement of operation of the plant communication, entertainment and canteen facilities also will improve.

5.8 Control Measures for Occupational Safety and Health

A number of pollution control measures will be built for various facilities which emit dust, gasses and noise so that workers working in the factory area are not exposed to polluted conditions. Drinking water, canteen and medical facilities will be available within the plant. Awareness program shall also be conducted. Occupational health check-up of all workmen working in susceptible areas will be done as per rules in Factories Act. Any worker found to develop symptoms of dust related diseases will be changed over to other jobs in cleaner areas.

6.0 Environmental Monitoring Program

A full fledged environmental management cell (EMC) will function for monitoring different environmental parameters regularly.

The broad aspects that need to be monitored are Meteorology, Ambient Air Quality, and Stack Air Quality etc. The monitoring of AAQ will be done in respect of SPM, RPM, SO_2 and NO_X. Online monitoring of SPM, SO_2,NO_X, CO and CO_2 for each stack will be done.

Regular checking will be done to see that none of the drains are clogged due to accumulation of sludge/sediments. The Oil and Grease trap and catch-pits linked to the storm water drainage system from the plant area will be regularly checked and cleaned to ensure their effectiveness. This checking and cleaning will be rigorous before and during the monsoon season.

Raw water will be monitored once in a month Drinking water quality will be monitored at least once in a month. Effluent water quality will be monitored at least twice in a month.

Noise levels within the plant boundary, equipment& work place will be monitored once in a month.

Soil quality will be monitored once in pre-monsoon and once in post-monsoon season.

7.0 Environmental Monitoring Plan

7.1 Environmental Management Cell

An EMC will be formed to administer the environment aspects. This cell will be responsible environmental monitoring, green belt development, good house keeping practice, statutory compliance as well as creating environmental awareness in the workforce. A well equipped laboratory will be set up for analyzing air, water, effluent, solid wastes. All the CREP recommendations will be strictly followed in the proposed plant. Ambient air quality, stack monitoring and effluent analysis reports will be submitted MoEF & CPCB regularly.

7.2 Budgetary Provision

A total lay of 21.0 Crores has been envisaged for setting up environmental control laboratory which will have revenue expenses of Rs.0.4 crores per annually for chemicals and consumables.

8.0 Conclusion

In view of the above it can be concluded that, the proposed project is in line with the principles of sustainable development. Due to the project there will be appreciable social as well as economic development. The mitigation measures which will be adopted will restrict the adverse impacts well within the tolerable limit.