EXECUTIVE SUMMARY

1. INTRODUCTION

M/s. Indsil Energy & Electro Chemical Ltd plant is situated in Urla Industrial Estate, Raipur, Chhattisgarh. The company is manufacturing Ferro Alloys. Due to massive expansion growth in steel and stainless steel industries, the demand for the company's core products have been strengthened. Since the company's facilities are not adequate enough to cater to the demand both from steel and stainless steel industries, the company is proposed to install 2 x 9 MVA capacity multi product type Ferro alloys furnace and to reduce the power consumption cost and to ensure uninterrupted quality of power it is proposing to install a 30 MW Coal based Power Plant at Patthara Village, Bemetara Tehsil, Durg District, Chhattisgarh.

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

The proposal was considered by the Expert Appraisal Committee during its 14th Meeting of the Expert Appraisal Committee-1 (industry) held during September 23rd to 25th, 2010 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-11011/380/2010-IA-II(I) dated: 20th October 2010

2. IDENTIFICATION OF PROJECT & PROJECT PROPONENT

The proposed Ferro Alloys manufacturing plant consists of 2 x 9 MVA Submerged Electric Arc Furnace and 30 MW Thermal Power Plant. The company has appointed M/s. Ghalsasi Engineering Systems Pvt. Ltd, Pune as Owner's Engineers, supply of main components and execution on turnkey basis for the Ferro Alloys manufacturing unit. And M/s. Cethar Vessels Pvt. Ltd. Trichy for preparing feasibility report for proposed power plant.

The details of the proposed project are given in **Table 2.1,** the site Features of the proposed Project is given in **Table: 2.2.** The Technical Details of the Proposed Project are given in **Table: 2.3**

Table 2.1

Details of the proposed project

S. No	Type of the project	Capacity
1	Ferro Alloys (High Carbon Silico Manganese & Medium Carbon Silico Manganese) – Submerged Electric Arc Furnace (2 x 9 MVA)	30400 TPA
2	Thermal Power Plant	30 MW

Table 2.2

Site Features of the Proposed Project

Soil type	Silty Clay
Ground elevation	The ground elevation of the site is+270 M above MSL.
Available Land	14.92 acres
Cost of the Project	Rs. 9850 Lacs Ferro Alloys : Rs. 2200 Lacs CPP : Rs. 7650 Lacs
Water Requirement	260 KLD
Waste Water Generation	30 m^3/day
Topo sheet No.	64 G/10
Latitude & Longitude	21° 39′ 35″ N & 81° 36′44″ E
Nearest City	Durg at 70 km distance towards SE direction
Seismicity Zone	Earth Quake Zone-II (Least to Moderate) as defined in IS: 1893-2002
Nearest Villages	Dokla Village
Nearest Railway Station	Durg at 70.0 km.
Nearest Highway	NH-12A at 1 km towards South direction
Nearest Air Port	Raipur at a distance of 80km
Nearest River	Seonath River, 3 KM

Table 2.3
Technical Details of the Proposed Project

Equipment	Description
Ferro Alloys:	
Furnace Capacity	2 x 9 MVA
Products	High carbon Silicon Manganese & Medium Carbon Silicon Manganese
Furnace Type	Low hood, Semi Closed, Sub-Merged Electric Arc Furnace.
Max Temperature	1200 to 1300^{0}C
Poll Control Equipment	Bag filter & Heat Exchanger
Cooling system	Copper tubes (inlet water temp 35 to 40^{o}C, Outlet water temp 45 to 50^{o}C)
Owner's Engineers	Ghalsasi Engineering System (P) Ltd, Pune
Captive Power Plant:	
Proposed Capacity of CPP	30 MW Captive Power Plant
Technologies	Steam Turbo Alternator
Capacity of Boiler	100 TPH
Boiler Steam Pressure	110 ata, 520±5°C
Fuel Proposed for Boiler	Coal Grade 'F'
Annual Fuel requirement	231000 MTPA
Ash content	40%
Annual Ash generation	Total ash - 92400 MTPA Fly ash – 73920 MTPA Bottom ash – 18480 MTPA
Annual power generation	142.56 mu/annum
Plant auxiliary power consumption	21.35 mu/annum

3 BASIC REQUIREMENTS

3.1 Land

The proposed land is completely private land, the total land is 14.92 acres and Green belt is 5 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 and Coal for power plant. The details of the main raw materials required are given in **Table 3.2.1**

Table 3.2.1

Details of Raw Materials Requirement

Plant	Raw material	Quantity	Source
Ferro Alloys plant	Manganese ore	76000 TPA	Manganese India Ore Ltd., Ballagaht, MP
	Carbon Reducer	21280 TPA	Baradawar (near Champa) Chhattisgarh
	Dolomite	9120 TPA	
	Quartz	3040 TPA	Raigarh, Chhattisgarh
Power plant	Coal F grade	231000 TPA	Korba, Chhattisgarh
Note: Transportation of all raw materials will be by trucks, all trucks meeting the latest GOI emissions standards will be used			

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 3.3.1**

Table 3.3.1

Water Requirement m3/day

S. No	Description	m^3/day	Source
1	Boiler (Power Plant)	100	Bore well within plant site
2	Cooling Purpose	130	
3	DM Plant/ Ion Exchanger	8	
4	Domestic Purpose	7	
5	Gardening	15	
	Total	**260**	

3.4 Power Evacuation

The total power required will be taken from its proposed coal based power plant. The details of the power required for proposed project are given in **Table 3.4.1.**

Table 3.4.1

Details of Power Requirement

Plant	Power required	Source
Ferro Alloys plant	15 MW	Captive power plant for emergency power will be taken from CSEB
Power plant	3 MW	
Total	**30 MW**	

3.5 Man power Requirement

The man power required for the project will be sourced from near by areas to the maximum extent in case of non availability of skilled persons, they will be engaged from near by areas. The details of the man power during construction period and operation period are given in **Table 3.5.1**.

Table 3.5.1

Manpower Details

Plant	Permanent	Contract	Source
Ferro Alloys plant	50	70	From local villages and neighboring areas
Power plant	20	30	
Total	**70**	**100**	

4. BASELINE ENVIRONMENTAL STATUS

4.1 Meteorology

On site monitoring was undertaken during summer season the winds were predominantly recorded from West closely followed by SW & NW during this time period. Calm conditions prevailed for 9.92% of the total time. Averaged wind speed for the season that is March- May 2010 is 2.14 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: 4.2.1**.

Table: 4.2.1

Ambient Air Quality levels in the study area- µg/m³

S.No	Parameter		Min	Max	CPCB,Limits
1	**SPM**		66	148	---*
2	**RPM**	**$PM_{2.5\mu}$**	13	32	60
3		**$PM_{10\mu}$**	25	55	100
4	**SO_2**		6.1	12.1	80

S.No	Parameter	Min	Max	CPCB,Limits
5	**NO_x**	9.0	18.2	80
6	**O_3**	BDL	BDL	100
7	**Benzene**	BDL	BDL	05

*No Standard for SPM

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 2 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 7.20 to 7.52
- The Total Dissolved Solids are in the range of 178 mg/l to 205 mg/l.
- The chloride values are in the ranges of 22 mg/l to 40 mg/l.
- The fluoride values are in the rage of 0.10 mg/l to 0.22 mg/l.

Surface Water Quality – Observations

- The pH of the surface water is in the range of 7.60 to 7.90
- The Total Dissolved Solids are in the range of 182 mg/l to 190 mg/l
- The Fluoride values are in the range of 0.4 mg/l to 0.6 mg/l
- The Total Hardness is in the order of 67 mg/l to 102 mg/l
- The total chlorides are in the order of 18 mg/l to 39 mg/l

4.5 Soil Quality

Soil quality studies are performed around the project site. Soil samples were collected from 8 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 (7.2 to 7.5)

- Available Nitrogen in the soil observed to be between 563 to 600 kg/ha, Phosphorous levels observed to be between 45 to 50 kg/ha and Potassium observed to be between 114 to 150 kg/ha

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.

Sl. 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, Coal for power plant & 500 KVA DG set. The important air pollutants generated from the plant are Particulate Matter (PM_{10}), Sulphur dioxide (SO_2) and Oxides

of Nitrogen (NO_X). The Stack and Emission Details of Proposed Units **Table: 5.2.1**

Table 5.2.1
Stack and Emission Details of Proposed Units

Details	Units	Ferro Alloys	CPP	DG Set
Plant capacity	-	2X9 MVA	30MW	500 KVA
Fuel Consumption	TPD	-	1200	60 LPH
Height of the stack	M	30	90	10
Dia. of stack	M	2.0	0.6	0.5
Temp of flue gas	^oC	150	134	135
Velocity of flue gas	m/s	18	20	15
Ash content	%	-	40	-
Sulphur Content	%	-	0.5	0.05
SPM Emissions	g/s	0.18	4.4	-
SO_2 Emissions	g/s	-	138.9	0.15
NO_x Emissions	g/s	-	112.5	0.08

Using the above emission data and meteorological data, incremental concentrations of PM_{10}, SO_2 and NOx 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 5.2.2.**

Table: 5.2.2
Post Project Scenario-*Units:* $\mu g/m^3$

Particulars	Particulate Matter (PM_{10})	Sulphur dioxide (SO_2)	Oxides of Nitrogen (NO_X)
Baseline Scenario (Max)	55.0	12.1	18.2
Predicted GLC (Max)	1.36	32.7	28.8
Overall Scenario (Worst Case)	**56.36**	**44.8**	**47.0**
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. 30 m^3/day of wastewater will be generated from the proposed plant. 100% effluent will be treated and reused and impact on natural sources would be negligible.

5.2.3 Ash/ Slag Generation and its Impact

The total ash expected to be generated will be about 158400 MTPA at an average ash content of 40 % (31680 tones/Anum bottom ash + 126720 tones/anum fly ash). To meet the MoEF guidelines of 100% fly ash utilization all necessary efforts will be made to utilize the fly ash generated. Necessary industries will be identified in and around the proposed project area for utilization of the fly ash & Slag will be used for land filling and tiles manufacturing.

5.2.4 Impact on Soil Quality

As the proposed project does not discharge any treated water into the river, hence there will be no impact envisaged due to the proposed project on soil quality. The major amount of the wastewater generated is from cooling tower blow down and DM Plant will be sent to ETP, and rest of the wastewater coming from domestic and plant services are treated and reused within plant premises for 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 main elements which are generated from the proposed plant which cause air pollution are as follows:

- Dust particulates in flue gas from Chimney and production area
- Nitrogen oxide in flue gas
- Sulphur-di-oxide in the flue gas
- Coal dust particles due to handling of coal
- Fly ash dust particles from ash silos and ash disposal area

The following methods of abatement will be employed for the air pollution control.

- To control and limit particulate matter to 50 mg/Nm^3 in the Ferro Alloys unit cyclone and bag filter is proposed
- To control & limit Particulate matter to 50 mg/Nm^3 in the flue gas, highly efficient (99.9%) ESPs are proposed.
- Chimney of 30m height will be provided for proper dispersion of sulfur dioxide and oxides of nitrogen.
- To reduce NOx emission, steam generators would be fitted with advanced low NOx burners. NOx generation in steam generators would be limited to 750 mg/Nm^3 in accordance with World Bank norms. The NOx emissions would be checked for Ground Level Concentrations (GLC's) as per Indian Emission Regulations.
- Coal dust would be generated generally at the conveyor transfer points, coal unloading area and coal stock pile area. Hence, coal transfer points and coal stock yard would be provided with dust suppression/dust extraction facilities.
- Dust collection system would also be provided in coal bunkers to evacuate dust and hazardous gases like Methane from the coal bunkers. Collected dust would be returned to either the associated belt conveyor or to the coal

bunker. The dust collector outlet emission would be restricted to 50 mg/Nm^3.

- Internal roads will be concreted / asphalted to reduce fugitive emissions
- 100% fly ash utilization will be carried as MOEF guidelines
- 100% dry fly ash will be collected in dry form in silos and will be given to the cement and brick units
- Hydro bins will be provided to collect bottom ash for further disposal to the users.

6.2 Water Quality Management

Details of effluent generation and Water balance are given below **Table 6.2.1**.

Table 6.2.1
Water Balance – m^3/day

Particulars	Raw Water	Waste Water	Loss	Discharge
Boiler (Power Plant)	100	5	95	ETP /reuse
Cooling Purpose	130	11	119	
DM Plant/ Ion Exchanger, etc	8	8	0	
Domestic Purpose	7	6	1	STP/ GB
Gardening	15	-	15	-
Total	**260**	**30**	**230**	

6.3 Ash Utilization plan

Fly ash and bottom ash would be collected and stored in the silos and given to end users for manufacturing cement and bricks. The management would put maximum efforts and ensure bottom ash utilization. 100% ash utilization will be achieved as per MoE&F new notification dated 03-11-2009 in the phased manner as follows.

S. No	Fly ash utilization level	Target date
1.	At least 50% of fly ash generation	One year from the date of commissioning
2.	At least 70% of fly ash generation	Two years from the date of commissioning
3.	90% of fly ash generation	Three years from the date of commissioning
4.	100% of fly ash generation	Four years from the date of commissioning

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 for sulphur dioxide, oxides of nitrogen and particulate matter.

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 MoE&F, GOI.

8. BUDGETARY PROVISION 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 8.1.**

Table 8.1

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 dedusting system	150	15
2	Power Plant – ESP, ETP, Stack, etc	1000	100
3	STP, Rainwater harvesting, storm water drains, etc	40	5
4	Greenbelt development, miscellaneous	10	-
	Total	**1200**	**120**
Capital cost of the project CPP Rs.7650 lakhs + Ferro Alloys Rs. 2200 Lakhs = Total 9850 Lakhs			

9. ORGANIZATIONAL SET UP FOR ENVIRONMENTAL MANAGEMENT

Environment Division headed by an experienced Executive Engineer is direct 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.