



TAMIL NADU POLLUTION CONTROL BOARD

PUBLIC NOTICE

Whereas as per Environmental Impact Assessment Notification, 1994, as amended on 14/09/2006, Public Hearing has been made as mandatory for all the projects covered in Schedule-1 of the said Notification.

Whereas Public Hearing has to be conducted by State Pollution control Board as per Sub Para (i), (ii) of paras (1) and (2) of Schedule – IV of Environmental Impact Assessment Notification, 1994 as amended on 14/09/2006.

Whereas as required under Sub-para (1) of para (2) of Schedule – IV of Environmental Impact Assessment Notification, 1994, as amended on 14/09/2006, public hearing is to be conducted by Tamil Nadu Pollution Control Board for 2 x 660 MW Super Critical Thermal Power Plant proposed to be set up by M/s. Ind-Bharath Power Madras Limited at Sasthavinallur and Pallakurichi villages in Sattankulam Taluk of Thoothukudi District on the date, time and place as mentioned below:

Location of the Project	Date	Time	Place
M/s. Ind-Bharath Power Madras Limited, Sasthavinallur & Pallakurichi villages, Sattankulam Taluk, Thoothukudi District.	06/04/2010	11.00 AM	Office of the District Collector, Collectorate, Palayamkottai Road, Korampallam, Thoothukudi.

In this connection, it is informed that executive summary of the project is made available in the following places.

1. Secretary to Government,
Environment & Forest Department,
St. George Fort, Secretariat, Chennai- 600 009.
2. Office of the District Collector,
Thoothukudi District,
Palayamkottai Road,
Korampallam,
Thoothukudi.
3. District Industries Centre,
Thoothukudi District,
By-pass road junction,
Thoothukudi- 628 101.
4. The Member Secretary,
Tamil Nadu Pollution Control Board,
No. 76, Mount Salai, Guindy,
Chennai- 600 032.

5. Office of the District Environmental Engineer,
Tamilnadu Pollution Control Board,
C7 & C9, SIPCOT Industrial Complex,
Meelavittan,
Thoothukudi - 628 008.

6. Commissioner,
Sattankulam Panchayat Union,
Sattankulam Taluk, Thoothukudi District.

Suggestions, views, comments and objections from the public are invited within 30 days from the date of publication of this notice by the District Environmental Engineer, Tamil Nadu Pollution Control Board, Thoothukudi.

All persons including bonafide resident, Environmental groups and others can participate in the public hearing and they can also make Oral / Written suggestions to the District Environmental Engineer, Tamil Nadu Pollution Control Board, Thoothukudi on the above subject.

District Environmental Engineer,
Tamilnadu Pollution Control Board,
C7 & C9, SIPCOT Industrial Complex,
Meelavittan, Thoothukudi – 628 008.

EXECUTIVE SUMMARY OF THE EIA REPORT

for 2 x 660 MW Super Critical Thermal Power Plant
at Sasthavinallur & Pallakkurichi Villages, Sattankulam Taluk,
Tuticorin District

Prepared for
IND-BARATH POWER MADRAS LTD
Chennai



AMBA RECYCLER PRIVATE LIMITED,B-3,R.M.Towers,108,Chamiers Road,Chennai-600018

EXECUTIVE SUMMARY

1. INTRODUCTION

IND-BARATH POWER INFRA PRIVATE LIMITED (IBPIL) is a successful infra structure development company with main focus on establishment of power projects of different capacities and utilizing different fuels spread over the country. IBPIL as the holding company provides equity support to its SPV subsidiaries for development of power projects which are again of different categories such as Group captive, merchant plant and hybrid of both.

IND-BARATH POWER MADRAS LTD [IBPML] a SPV of IBPIL is proposing to Install a Super Critical Thermal Power Plant using 100% indigenous coal with total capacity of 1320 MW consisting of 2 units of 660 MW each.

2. LOCATION AND DESCRIPTION OF SITE ENVIRONMENT

The proposed 2 x 660 MW coal based Thermal Power Plant will be located at Sasthavinallur & Pallakkurichi Villages, Sattankulam Taluk, Tuticorin District. The location of which is shown in **Fig.1.0**.

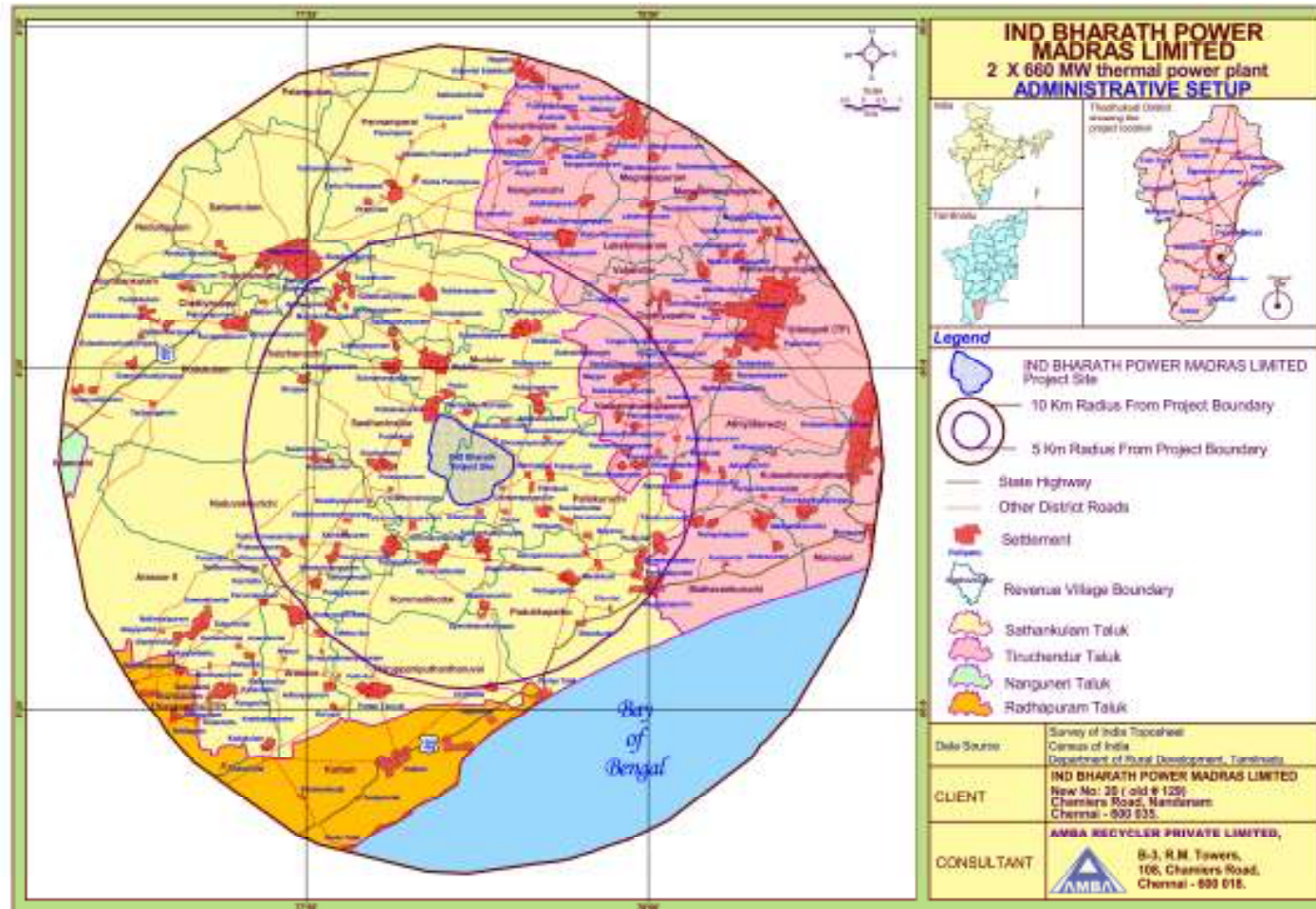
3. NEED FOR THE PROJECT

Thermal Power Plant

The power demand in the country is on the rise due to rapid economic and industrial growth warranting extensive infrastructure developments. As per the national electricity plan, the energy demand is likely to increase by 35.6% in 2011-12 from its 2006-07 value and by another 35.2% in 2016-17. The capacity addition at the present rate will not be able to meet the projected demand and would result in a huge power deficit. To mitigate the gap between demand and supply, the Government of India (GoI) is facilitating large scale capacity additions at shorter time through public private partnership. GoTN has approved the setting up of merchant power plants in Tamil Nadu with a total generating capacity of 16,000 MW and is in the process of permitting up to 30,000 MW of capacity addition on merchant basis.

The proposed thermal power plant of IBPML will contribute towards bridging the power supply and demand gap at regional as well as national level. Thus the proposed thermal power project is fully justified for implementation at the earliest possible.

Fig. 1.0 Location Map



4. PROJECT DESCRIPTION

4.1 Thermal Power Plant

The 2 x 660 MW thermal power plant planned with

- Fuel - Indigenous coal is used as fuel. Indigenous coal are sourced from Mahanadi fields (8.3 MTPA)
- Technology - Super Critical technology

The coal-based thermal power plant comprising of following units:

- Steam generator
- Steam turbine
- Coal handling system
- Ash handling system
- Air Cooled Condenser
- ESP
- Power plant stack (2X275 m Height)
- Fuel system
- Utilities and services

4.2 Salient Features of the Proposed Project

S.No	Item	Description
Thermal Power Plant		
1	Capacity	1320 MW
2	Configuration	2 x 660 MW
3	Technology	Super Critical technology
4	Power Evacuation	Power generated at IBTPL will be evacuated at 3 Nos 230 KV TNEB.
5	Fuel	Indigenous Coal (22800 TPD)
6	Sources of Fuel	Mahanadi Coal Mines
7	Fuel Requirement	About 8.3 MTPA
8	Sulphur Content	0.4%
9	Stacks	2 separate chimney of 275 m
General		
1	Land	600 Acres
2	Water Requirement	2000 m ³ /day
3	Source	TWAD / Desalinated water will be sourced from Private suppliers

4	Environmental Aspects	<ul style="list-style-type: none"> ○ Use of low sulphur Indian Coal ○ Super Critical technology to minimize the coal consumption and GHG emissions ○ Use of Air Cooled Condenser to reduce water consumption ○ ESP to minimize the PM emissions ○ Two Stacks of height of 275 m to get better dispersion. ○ Dust Control System to minimize the fugitive dust emission ○ Fire Protection system ○ Dust suppression system
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4.3 Utilities and Services

4.3.1 Water supply

The water requirement of 2000 m³/day is to be met from either TWAD Board or Desalinated water to be sourced from private suppliers. More-over use of Air Cooled Condenser reduces the water consumption.

4.3.2 Wastewater/ waste management

The boiler blow down will be taken to cooling ponds one after the other and then taken to a common guard pond. The D.M. Plant regenerant waste is neutralized, and then taken to a common guard pond, where it is mixed with the boiler blow down and then used for green belt development. The domestic sewage will be treated in Sewage Treatment Plant and then used for green belt development

4.3.3 Fire protection system

An elaborate fire hydrant system covering all the buildings of the proposed power plant as well as outlying areas including coal stockyard would be provided. Rain water will be stored in a tank for further distribution to fire water storage tank and service water overhead tank.

In addition to the fire hydrant system, the following fire protection systems are proposed:

- Automatic High velocity water spray (HVWS) system for the protection of transformers;
- Automatic medium velocity water spray (MVWS) system and foam system for fuel oil tanks;
- Automatic MVWS system for coal conveyors, cable galleries, etc.;
- Automatic sprinkler systems for certain select areas;
- Manual HVWS system for the protection of turbine oil tanks; and

- Portable extinguishers and fire tenders as required

4.4 Project Cost & Implementation Schedule

The cost of the total project is estimated as **Rs.5280 Crores**, which includes **Rs.490 Crores** for environmental protection measures. The project is scheduled to be commissioned in December 2011.

5. Baseline Environment

5.1 Study Area and Period

An area of 10 km radius around the project site was considered for the study. The baseline environmental data was generated during December 2009- February 2010.

5.2 Description of the Environment

The environmental setting of project site is given below.

S. No	Particulars	Details
1	Plant site latitude and longitude	8°24'20.449" N 77°56'55.513"E 8°23'51.604"N 77°56'48.318"E 8°23'11.913"N 77°57'41.691"E 8°23'28'403"N 77°58'10.557"E
2	Plant site elevation above mean sea level (MSL)	12 m
3	Present land use at the site	Dry and vacant land
4	Plant site boundary to coast	7 km
5	Nearest highway	SH176 (East Coast Road)
6	Nearest railway Station	Tiruchendur
7	Nearest airport	Tuticorin
8	Nearest port	52 km - Tuticorin Port
9	Nearest town/village	12 km - Tiruchendur Town
10	Hills/valleys	None
11	Topography	Plain

12	Archeologically important places	None
13	National parks/wild life sanctuaries	None
14	Reserved and protected forests	None
15	Seismicity	The study area falls in Seismic Zone III
16	Defence installations	None

5.3 Baseline Environmental Conditions

Baseline environmental studies for various environmental attributes were carried out during the months December 2009 to February, 2010 covering winter season.

5.3.1 Ambient air quality

Ambient Air Quality Monitoring (AAQM) stations were set up at eight locations. The samples were collected twice in a week for one complete season, suspended particulate matter (SPM), respirable suspended particulate matter (RSPM), oxides of Sulphur (SO₂), oxides of Nitrogen (NO_x) were collected on a 24-hourly basis and CO, HC on an 8-hourly basis. Respective details are given in the table below:

Location	Conc. in $\mu\text{g}/\text{Nm}^3$					
	TSPM			RSPM		
	Min	Max	98%	Min	Max	98%
Proposed plant site	84.0	103.0	103.0	26.0	36.0	36.0
Pallakurichi	86.0	104.0	104.0	22.0	33.0	33.0
Adakalaipuram	74.0	105.0	105.0	22.0	34.0	34.0
Puthukudi	82.0	106.0	106.0	31.0	38.0	37.0
Sokkankudiyiruppu	80.0	102.0	102.0	21.3	33.3	32.5
Mudular	82.0	98.0	98.0	22.4	36.0	34.0
Palayapuram	76.0	93.0	92.0	22.4	31.4	30.8
Katakshapuram	71.0	97.0	96.4	30.0	36.4	35.9
Overall	71.0 – 106.0			21.3 – 38.0		

Location	Conc. in $\mu\text{g}/\text{Nm}^3$					
	SO ₂			NO _x		
	Min	Max	98%	Min	Max	98%
Proposed plant site	9.6	14.5	14.0	12.1	14.5	14.5
Pallakurichi	7.8	11.9	11.5	8.3	15.4	15.4
Adakalaipuram	6.9	11.3	11.0	8.4	13.3	13.0
Puthukudi	6.5	12.1	11.1	9.3	14.4	14.4
Sokkankudiyiruppu	8.3	10.8	10.5	8.7	14.3	14.3
Mudular	8.4	14.1	11.0	9.1	14.1	14.1
Palayapuram	8.0	10.2	10.0	6.5	11.6	11.5
Katakshapuram	8.3	10.5	10.3	7.8	12.3	12.0
Overall	6.5 – 14.5			6.5 – 15.4		

Observations:

The 98th percentile values of SPM, RSPM, Oxides of Sulphur (SO₂), Oxides of Nitrogen (NO_x), Hydrocarbons (HC), Ozone and Carbon Monoxide (CO) were monitored and found to be within the limits prescribed by Central Pollution Control Board (CPCB) for rural areas.

5.3.2. Ambient noise levels

Noise levels were monitored at eight (8) locations for assessing the existing noise levels in and around the project site. The monitoring was carried out once in the season for 24 hours and found to be within the permissible levels.

5.3.3 Water Quality

The baseline data on water in and around the proposed site was generated during the study period. In all 8 water samples were collected in different villages around the site. In total 8 water samples were collected, out this 7 samples are from ground water sources and 1 sample from surface water samples. The water samples were analysed as per Standard Methods for analysis of water and wastewater, American Public health Association (APHA) Publication. The Ph was varying for ground waters from 7.2 to 8.26 and in surface water the pH is observed 7.9. The chloride levels in the ground water

samples collected in the study areas were ranging from 53 mg/l to a maximum of 256 mg/l, where as in surface waters levels are 40 mg/l. In ground water samples collected from the study area, the hardness is varying from 94 mg/l to 481 mg/l. In the ground water samples of study area the fluoride value were in the range of 0.08 to 0.7 mg/l where as in the surface waters the fluoride are 0.09 mg/l

5.3.4 Soil Quality

The soils in general are characterized by high clay content, low drainage capacity, poor nitrate and phosphorus contents, but high potassium and lime contents. The soils are generally clayey in texture and neutral in nature with conductivity of 210 $\mu\text{mhos/cm}$ and 299 $\mu\text{mhos/cm}$ collected from 5 locations. Nutrient and organic matter contents are low; the site soil has lower nutrient status than that of the other locations. For studying soil profile of the region, sampling locations were selected to assess the existing soil conditions in and around the plant area that represent various land use conditions. The physical, chemical, nutrient and heavy metal concentrations were determined. The results are then compared with standard soil classification table for assessment of soil samples in the region.

5.3.5 Flora and Fauna

The dominant plant in the study area is *Prosopis juliflora*, which is found commonly near the nallahs and village wastelands. *Azadirachta* is a common tree near the villages and on the hedge of agricultural field. *Suaeda maritime* of *Chenopodiaceae* family was found to be most common species found at all locations with grasses a having frequency of occurrence at all the locations. *Prosopis specigera* of *mimosoideae* family had a prolific growth and was relatively dominant near proposed site. The study area has good avian diversity due to sufficient food availability in the form of crustaceans and small fish.

5.3.6 Baseline socio-economic conditions

The total population of the Villages in the Taluk is 82614. The literacy level is 75%. The working population is 45% engaged in agriculture, fishing, business with 15% as marginal workers. The area does have moderates to good facilities for Primary and secondary education. There are also primary health centres available.

5.4 Anticipated Environmental Impact and Management Plan

5.4.1 Construction Phase

During construction, activities like soil cutting/filling, grading, concreting, piling and installation of main plant equipment like boilers, turbines etc., will be performed. Temporarily, some of the environmental parameters may get disturbed during the construction phase.

Dust pollution will be minimized by water spraying and maintenance of road. The construction heavy vehicles will be maintained properly to ensure emission within permissible levels and also reducing the noise levels. Adopting good construction and engineering practices will help in mitigating the water pollution. Temporary arrangements will be made for septic tank/pit to get rid of sanitary problem at construction site.

However, these impacts are expected to be temporary in nature that will subside once construction period is over.

Temporary beneficial socio-economic impact in terms of increased jobs and flow of money to the workers and villagers settled nearby is expected during the construction period. Migration of workers population is expected to be minimum, as local workers from the nearby area will be preferred for temporary employment.

5.4.2 Operation Phase

5.4.2.1 Air Environment

The major sources of air pollution from the proposed operation are

- Fuel burning
- Fuel Unloading and storage

The proposed coal based thermal power station will have emission in the form of SO₂, NO_x, and SPM from flue gases of the stacks. The emission from the stack is considered to be constantly distributed throughout the day for the dispersion analysis.

The emission rate and stack details considered for air pollution dispersion analysis is given below.

Stack Emission Characteristics

Sr. No.	Parameters	Units	Flue 1	Flue 2
1	Stack height	m	275	275
2	Total number of flues / boiler	no.	1	1
3	Diameter of each flue	m	7.0	7.0
4	Flue gas velocity	m/sec	22	22
5	Flue gas temperature	oC	140	140
6	Volumetric flow rate (for each boiler)	Nm ³ /sec	831	831
7	Coal consumption rate for 2-Boilers	TPD	22800	
8	Emission Rate (in each flue)			
a]	Sulphur dioxide based on 0.4% Sulphur content)	g/sec	528	528
b]	Oxides of Nitrogen	g/sec	1188	1188
		Kg/ton of coal	9.0	9.0
c]	Suspended Particulate Matter	g/sec	41.55	41.55
		mg/Nm ³	50	50

The sources & process of pollution, the pollutants and their respective control measures proposed are as follows

S.No.	Process of Pollution	Pollutants	Control Measures
1.	Fuel Burning i.e., coal	SO ₂ , NO _x , SPM	ESP / Stack
2.	Fuel unloading and storage	SPM	Water sprinkler & bag filter at transfer points

The following environmental protection or pollution control systems have been proposed to be installed for mitigation of impacts on Air Environment.

- Installation of ESPs of 99.9% efficiency to limit the SPM concentrations below 50 mg/Nm³;
- Provision of 275-m stack for wider dispersion of gaseous emissions;
- Provision of low NO_x burners in the boilers;
- Dust extraction system will be provided at transfer points of conveyor system;
- Conveyor belt will be enclosed to prevent dust generation;
- Provision of water sprinkling system at material handling and storage yard;
- Asphaltting of the roads within the plant area; and
- Developing of Greenbelt around the plant to arrest the fugitive emissions

Air Dispersion Modeling

The incremental increase in ground level concentration using **ISCST3** predicated that the concentration of SO₂, NO_x, SPM remain well within the permissible levels upon the operation of the Power Plant.

The ambient air quality monitoring and prediction of **GLC** for different averaging times depict that 24 hrs/avg, **SO₂**, **NO_x**, & **SPM** remain within the permissible limits of CPCB. As effective Air Pollution Control measures will be ensured for the proposed plant of **IBPML**, there will not be any significant impact on the Air Quality.

Suggested control measures for arresting fugitive dust emissions along with the envisaged pollution control equipment are adequate and will help to have a healthy and cleaner environment inside the plant thereby improve the productivity and the efficiency of the workers as well as that of plant machinery.

5.4.2.2 Water Environment

It is proposed to use Air Cooled Condensers for the condensate/auxiliary cooling thereby save water to a large extent.

The total wastewater generated from the proposed plant would be to the tune of **1469m³/day**. The major sources of wastewater from the power plant are:

- Boiler Blow Down
- D.M. Plant Regenerate Waste
- Domestic Sewage

The details of wastewater from the different operations are as follows:

S. No.	Particulars	Wastewater m³/day
1.	Boiler Blow Down	1350
2.	DM Plant Reject	95
3.	Domestic Sewage	24
	Total:	1469.00

Wastewater Management at Proposed Power Plant

Type of Waste	Significant Parameters	Treatment Proposed
Boiler Blow Down	Temperature	This will be discharged to two successive cooling ponds and then taken to guard pond and then will be used for Green belt development.
DM Plant regeneration Waste	pH (4 to 10) TDS (5000 mg/l)	pH Neutralization and mixing with other effluents in the guard pond and then will be used for Green belt development.
Sanitary Effluents	BOD (200 -250 mg/l) TSS (300-450 mg/l)	The sewage will be treated in a Sewage Treatment Plant

5.4.2.3 Noise Environment

The sources of noise in a power plant are:

- Steam turbine generator
- Other rotating equipments
- Combustion induced noises
- Flow induced noises
- Steam safety valves

Following measures have been recommended to control the noise level below OSHA levels

- The work places like turbine halls, compressor rooms, DG set etc., will be provided with noise dampening materials like thin rubber/lead sheet and surrounded with double walled protection.
- The roofs, walls and floors will be covered with noise absorbing material to reduce the reflected noise.
- Control rooms will be in closed glass enclosures.
- Ear Muffs will be provided to the workers, and it will be ensured that these are used by the workers.

- A thick green belt with species of rich canopy will be developed to control the noise levels at the boundary.
- The specific species of Green Belt that will be used for control of noise emissions.
- Monitoring of noise levels.

In addition to the above mentioned noise control measures, **thick green belt absorbs more than 50%** of the **noise** generated at **IBPML**, and hence abate any impact on the community.

Provision of **50m** wide green belt around the plant will attenuate the noise levels at the plant boundary.

5.4.2.4 Solid Waste Management

The solid waste generated in form of fly ash, and bottom ash is inorganic in nature. The total ash generated will be **10260 TPD** and out of this 20% is bottom ash and remaining will be fly ash, i.e. **8208 TPD** of fly ash, and **2052 TPD** of bottom ash. This waste will be stored in silo, and maximum efforts will be made to sell ash from silos. The excess ash after selling will be stored in ash dykes.

About **200 Acres** of land is earmarked for the ash dyke. Therefore process solid waste will have no adverse impact on the land environment.

5.4.2.5 Land Environment

One of the activities with large potential effects on soil and groundwater is the disposal of waste on land and in landfill sites. When waste material is disposed off on land, rainwater and surface run-off may percolate through the material and carry contaminants into soil and groundwater. Change in soil surface and soil properties may have impacts on soil micro-organisms, natural and cultivated plants and animals, the visual landscape and amenity and on buildings and other constructions.

The ground level concentrations of the pollutants are predicted to increase by negligible level, more over the ponds and ash dykes are lined with impervious liners resulting in

zero leachete. Hence, the impact on land environment due to the proposed project is marginal, and insignificant.

5.4.2.6 Green Belt Development

IBPML has proposed to develop a green belt of **125 Acres**. Natural features of the plant site will be retained as far as possible to integrate with the buildings to form a harmonious/pleasant environment. The green belt will consist of native perennial green and fast growing trees.

5.4.2.7 Biological Environment

Presently the site is devoid of any extensive agricultural activities and biotic resources. Hence introduction of proposed power plant shall not have any impact on the existing ecosystem.

SPM, NO_x and SO₂ due to operation of the proposed power plants will remain within the National Ambient Air Quality standards. Therefore, the impact of these emissions on the surrounding ecosystem will be insignificant.

5.4.2.8 Socio-economic Environment

Approximately **500 persons** will be employed **directly** and many will be indirectly employed in the plant, when the power plant goes into operation. Indirect benefits will also accrue to a large extent around the project site. Support services in **commerce, transport and ancillary workshops** would further **enhance employment potential**.

The project proponent not only believe in the development of project area and their employees but also in the socio-economic growth of its neighbourhood by taking up several welfare activities which would help improving the environment with significant growth in the socio-economic status.

6.0 Environmental Monitoring Programme

S.No.	Parameter	Frequency
1	Ambient air quality	Twice in a week will be carried out for 24 hours continuously to monitor SPM, RSPM, SO ₂ , NO _x , CO, HC levels.
2	Source emissions	Continuous On-line monitoring will be carried out for SPM, SO ₂ , and NO _x .
3	Ground water quality	Once in a month except for heavy metals which will be monitored quarterly. Monitoring will be carried out for parameters specified under IS:10500, 1991.
4	Wastewater quality	Once in a month will be carried out for 24 hours continuously as per EPA Rules, 1986.
5	Soil sample	Soil samples will be monitored quarterly for parameters specified by TNPCB.
6	Solid waste	Monthly records of fly ash and bottom ash generation, collection, storage and disposal will be maintained as per the MoEF Notification on Fly Ash utilization.
7	Ambient Noise Environment	Ambient noise environment will be monitored once in a season.
8	Work Atmosphere Noise	Noise level monitoring will be carried out within the power plant premises once in a month.
9	Occupational Health and safety	Qualified doctors will carry out pre-employment and periodical medical check-up of all the employees.

7.0 Risk Analysis

Risk assessment study of the proposed power plant was carried out. All equipment vulnerable to explosion or fire are designed to relevant IS codes & statutory regulations. Suitable fire protection system comprising hydrants and spray systems are provided for fire protection.

Comprehensive on-site/off site emergency plan and disaster management plan for the proposed unit is prepared based on Risk Assessment Study.

8.0 Conclusion

The proposed **2 x 660 MW** coal based thermal power plant of **IBPML** being located as per norms of the siting guidelines of MoEF and adoption of extensive pollution control techniques to maintain the emission/discharges within the permissible norms will have least impact on the ambient environment.

- There are no resettlements.
- Terrestrial eco-system will not be affected.
- Almost no impact on air, water, soil and noise environment of the surrounding study area.
- The proposed project will generate direct and indirect employment during construction and operation phase.
- Separate organization set-up will be formulated to take care of all the pollution control steps.
- To prevent the occurrence of any disaster, comprehensive on-site/off site emergency plan and disaster management plan for the proposed unit will be prepared based on Risk Assessment Study.