

Executive Summary

Meghalaya Power Limited (MPL) has proposed an 8 MW bio-mass based Thermal Power Plant at Lumshnong, P.O. Khliehriat, Jaintia Hills, Meghalaya. The proposed project is a green-field project, which is spread in 5 acres land. Owing to geographical advantage and lower per ton of transportation of raw material bamboo the project has been proposed at this site. Considering the demands it is proposed to install 8 MW Power Plant using bio-mass i.e. lops & Tops of Bamboo, which are waste products of Raw Material for Paper Mills and farm bamboo. The Salient features of the site are as follows:

Salient Features of the Project

Nature Of The Project	Industrial Greenfield Project (For the proposed Power Plant)
Size of Project	8 MW Power Plant
Location Of Project	
District & State	Jaintia Hills, Meghalaya
Taluk	Khliehriat
Village	Lumshnong
Land Availability	5 Acres
Nature Of The Area	Barren Land
Latitude	N 25°10'16"
Longitude	E 92°22'52"
General Climatic Conditions	
Maximum Temperature	26°C
Minimum Temperature	9°C
Annual Rainfall	4000 mm
Wind Pattern	Predominantly from SE During Study Period
Surface Elevation	406 m above MSL
Accessibility	
Road Connectivity	NH 44 IS 1KM from the plant site
Rail Connectivity	Badarpur is about 85 kms from plant
Airport	Shillong & Silchar at 145 and 125 kms respectively from Plant
Historical / Important Places	
Archaeological/Historically Important Site	None within 10 km radius of the site
Sensitive Places	None within 10 km radius of the site
Sanctuaries / National Parks	None within 10 km radius of the site

Project Description

The proposed project involves the installation and commissioning of support facilities like storage yard and water treatment facilities and the electric grid. The fuel for the power plant is lops & Tops of Bamboo, which is a waste product of Paper Mill's Raw Material and farm bamboo. The raw material would be sourced from the nearby districts and the water requirements for the industry are met from the nearby perennial streams and bore well water within the premises.

It is estimated that the project approval and implementation process will take approximately 27 months. The proposed independent thermal power plant will consist of one number of Travelling grate boiler and one number condensing steam turbine of nominal capacity of 8 MW (Gross). The Travelling Grate Boiler & Auxiliaries will have following system:

- Firing System
- Air System
- Draft System
- Fuel Handling and feeding System
- Electrostatic Precipitator
- Ash Handling System
- Turbo Generator System
- Water Treatment Plant

Description of Environment

The proposed project is set up near Lumshnong, P.O. Khliehriat, Jaintia Hills district. Rapid Environmental Impact Assessment Study was conducted within a radius of 10 km from the plant site.

Project would come up on a non-agricultural and non-forest land. The project would spread in an area of 5 acres land acquired for this purpose. The surrounding terrain is hilly with undulations.

Climate in the study area is typically tropical. Jaintia Hills district has tropical climate characterized by high rainfall and humidity, generally warm summer and moderately cold winter. Based on site specific monitored data during study period March'07 to May'07 are as follows:

- Predominant wind direction is from SE, ESE and SSE
- Average wind velocity is 0.7 m/s
- Total rainfall is around 1104mm.
- Recorded minimum and maximum temperatures are 9°C–26°C.
- Relative humidity ranges between 45% and 90%.

Air Environment

The minimum and maximum ambient air quality test results observed during study period are given below.

Parameter	Minimum Concentration	Maximum Concentration
SPM	78 µg/m ³	119 µg/m ³
RSPM	17.4 µg/m ³	43.2 µg/m ³
SO ₂	2.8 µg/m ³	9.2 µg/m ³
NO _x	3.7 µg/m ³	13.3 µg/m ³
Note : HC & CO is <1 ppm		

Noise Environment

The observed noise level within the study area ranges between 38.3 dB(A) during night time and 59.3 dB(A) during day time.

Water Environment

Summary of surface and ground water test results of the study area are given below:

Location Code	pH	TDS (mg/l)	Hardness (mg/l)	Fluorides (mg/l)	TC (mpn/100ml)
Lumshnong	7.6	200	150	0.5	Nil
Umlong	7.5	210	140	0.6	Nil
Wahizar	7.8	250	160	0.6	Nil
Thangskai	7.3	130	80	0.45	Nil
Noshning	6.95	34	18	0.25	Nil
Mynkre	7.4	160	110	0.5	Nil
Sialkan	7.6	230	160	0.5	Nil
Tongseng	6.8	60	36	0.3	Nil
Lumtongseng	7.1	38	20	0.25	Nil
Sonapur River	7.4	160	105	0.4	6

Land Environment

Land Use Pattern

Land use of the study area i.e. 10 km radius around the project site is given below :

S.No	Land use	Area (sq km)	%
1	Settlement	4.71	1.5
2	Agriculture	58.14	18.5
3	Forest	216.85	69
4	Grass and Scrub	18.85	6.0
5	Barren land	15.71	5.0
Total		314.28	100.0

The main crops cultivated in the area are paddy, maize, potato, ginger & chillies. Orange and pineapple are dominant fruit bearing commercial agricultural crops.

Soil Quality

Soil sampling was carried out at six locations. Ranges of the soil quality test results are given below:

pH	: 5.0 to 6.6
Electrical Conductivity	: 46 to 180 μ S/cm
Texture	: Sandy Loam to Sandy Clay Loam
Organic Carbon	: 0.05% to 0.70%

Biological Environment

Flora

The vegetation of the buffer area can be broadly classified as tropical evergreen forest with elements from tropical moist deciduous and subtropical forest vegetation. The project area has less than 10% canopy cover.

Fauna

As per Wild Life Protection Act 1972 out of 42 vertebrate animals only 2 schedule I species reported from the study area.

Socio economic Environment

Number of villages in the study area is 19. The demography details and occupational pattern based on Census 2001 are given below :

Particulars	Census 2001	Decadal Growth
Total Population	6148	52.7%
Population density (persons per sq.km)	19.58	52.8%

Sex Ratio (nos. of female per thousand males)	947	6.1%
Total Household	1160	47.4%
Schedule Castes Population	3.76%	32.9%
Schedule Tribes Population	89.13%	(-)6.2%
Overall Literacy Rate	37.05%	30.1%
Total Workers		48%

There are no Historical or Archaeological sites present within 10 km radius around the project site.

Anticipated Environmental impacts and mitigation measures

Impact on Air Quality

The project is expected to generate some air pollution in the form of flue gas from the power plant. The effect of the same on ground has been assessed.

24- Hourly Concentrations	SPM ($\mu\text{g}/\text{m}^3$)	SO₂ ($\mu\text{g}/\text{m}^3$)	NO_x ($\mu\text{g}/\text{m}^3$)
Predicted Ground Level Concentration (<i>Max</i>)	0.393	-	1.964
Baseline Scenario (<i>Max</i>)	119	9.2	13.3
Overall Scenario (<i>Worst Case</i>)	119.4	9.2	15.2
<i>CPCB limits for Industrial areas</i>	500	120	120
<i>CPCB limits for rural & residential areas</i>	200	80	80

Impact on Water Resources

As the plant recycles the entire wastewater and reuses, there are no disposals of wastewater from the plant. Hence there is no impact on surface and ground water sources. A water treatment plant will be commissioned to treat the wastewater and the same will be reused in the process.

Impact on Soil

The only solid waste generation in the power plant is Fly ash. The waste generated is described below:

Source of Solid Waste	Quantity in Ton/day
Fly Ash	6.78

MPL will have tie ups with local cement and brick manufactures to dispose off the entire Fly Ash.

Green Belt Development

About 33% of the entire area (1.7 Hectares) is planned to develop the greenbelt with plantations of local species.

Demography and Socio-economics

Anticipated impacts on demography and socio economic condition of the study area due to proposed power plant are as follows :

- Increase in employment opportunities and Reduction in migrants to outside for employment.
- Increase in literacy rate.
- Growth in service sectors
- Development of infrastructure and economic growth

ENVIRONMENTAL MONITORING PROGRAMME

Periodic monitoring of various environmental parameters will be carried out with the current facilities to ascertain the following:

- Status of air, noise, water, land pollution in and around plant

- Micro meteorological parameters will be monitored on hourly basis
- Generate data for predictive or corrective purpose in respect of pollution
- Examine the efficiency of pollution control equipment installed in the plant to assess and monitor environmental impacts periodically

ADDITIONAL STUDIES

Health and Safety

- A comprehensive Occupational Health and Safety management plan will be put in place to address any sort of eventuality.
- Periodic Occupational Health Checks will be conducted

PROJECT BENEFITS

Meghalaya is a power deficit state. Current project would add 8 MW to the total installation capacity in the region. This addition would certainly improve the power situation at Lumshnong to attract the industrial undertakings.

Socio-economic Benefits

A total of 68 personnel would be employed for the plant. The project creates many opportunities for indirect employment.

The industrial development in the region facilitates the improvement of basic amenities like organized water supply, good roads, proper medical facilities and educational facilities.

ENVIRONMENTAL MANAGEMENT PLAN

Meghalaya Power Limited (MPL) is planning to adopt corporate philosophy of eco-friendly development. The management firmly believes in the concept of

sustainable industrial operations. To maintain ecological balance of the area, MPL has proposed to take adequate measures to mitigate all possible adverse impacts by earmarking Rs 1.4 crores for Environmental protection for the proposed project.

CONCLUSIONS

- Rapid Environmental Impact Assessment study reveals that the impact due to the proposed power plant on Air environment, Water quality, Noise and Soil quality is minimal.
- It can be summarized that the industrial development at Lumshnong, P.O. Khliehriat, Jaintia Hills district, Meghalaya shall lead to a sustainable development of the region.