

5.7 RAIN WATER HARVESTING

5 nos. of Rainwater harvesting structures will be constructed to harvest the run-off water from roof tops by laying a separate storm water drainage system for recharging of ground water in consultation with SGWB.

6.0 PROJECT BENEFITS

Based on the Environment Impact Assessment for different Environment components it can be concluded that the Environment impact due to proposed activities would be marginal. However strategies have been formulated under Environment Management Plan for mitigation of expected impacts and increase the beneficial Impact. The biomass power plant will add significant economic value to the farmers and rural community as well as help the state to come out of power crisis. At the same time generate employment to the local people. The improvement in power scenario will help growth of industry in the region.

The project being a CDM project, likely to receive funds from UNFCCC- CDM-EB this will give foreign exchange earning to the Nation and reduce the Green House Gas Emission. Promote Sustainable Development with Clean Technology.

Oil & Grease	-	< 10 mg/l
Free available chlorine	-	< 1.0 mg/l
Copper	-	< 1.0 mg/l
Iron	-	< 1.0 mg/l
Zinc	-	< 1.0 mg/l
Chromium	-	< 0.2 mg/l
Phosphates	-	< 5.0 mg/l

5.3 NOISE ENVIRONMENT

The major sources of noise will be steam turbine, Boilers will be of reputed make which are designed to meet the latest National / International Standards on noise levels Noise generation will be controlled at source and then arrested through enclosure. The employees working near the noise generating sources will be provided with earplugs. Noise absorbing materials will be used in the construction of roofs, walls and floors. The extensive greenbelt development proposed within the plant premises will help in attenuating the noise levels further. Noise barriers in the form of trees are recommended to be grown around power house, administrative block and other utility units.

5.4 LAND ENVIRONMENT

Effluent will be treated to meet MPPCB standards for on land for irrigation. Extensive greenbelt will be developed in the proposed plant premises. Desirable beautification and landscaping practices will be followed.

5.5 GREENBELT DEVELOPMENT

Green belt development of one third area of total land will further enhance the environment quality through limitation of air emissions, attenuation of noise levels, balancing Eco environment, prevention of soil erosion and creation of aesthetic environment. 4.7 acres of greenbelt will be developed all around the plant.

5.6 POST PROJECT ENVIRONMENTAL MONITORING

Ambient air quality, stack monitoring, effluent analysis, ground water analysis will be carried out and the reports will be submitted to Ministry of Environment & Forests, New Delhi/Madhya Pradesh Pollution Control Board.

RSPM	-	20.7 to 34.6 $\mu\text{g}/\text{m}^3$
SPM	-	70.7 to 98.8 $\mu\text{g}/\text{m}^3$
SO ₂	-	5.3 to 7.5 $\mu\text{g}/\text{m}^3$
NO _x	-	6.2 to 9.2 $\mu\text{g}/\text{m}^3$

4.2 WATER QUALITY

Ground water samples were collected at 8 locations and analysed for various physico - chemical parameters. The water sample shows that they are suitable for potable purpose.

4.3 NOISE LEVELS

Noise levels were measured at 8 stations during day time & night time. The noise levels at the monitoring stations are ranging from 41.35 dBA to 49.71 dBA.

4.4 LAND USE PATTERN

There are no National Parks, Bird Sanctuaries with in the study area.

5.0 ENVIRONMENTAL MANAGEMENT PLAN

5.1 AIR ENVIRONMENT

One ESP's will be provided for Power plant with $< 100 \text{ mg}/\text{Nm}^3$ as per CREP recommendations. The fuel for the boiler of the proposed plant will be Biomass/Coal. The emissions of concern from the proposed plant are SPM, SO₂ and NO_x. Stack height of 41 m will be provided for effective dispersion of SO₂ into the atmosphere. All material transfer points, dust-generating areas in the plant will be provided with bag filters. 4.7 acres of extensive greenbelt proposed to be developed within the plant premises to further mitigate the air emissions in the ambient air.

5.2 WATER ENVIRONMENT

Waste water generated from the project will be treated in Effluent Treatment Plant to meet the MPPCB standards. The treated waste water will be used for Greenbelt development with in the plant premises / reused.

The following will be treated effluent characteristics:

pH	-	6.5 - 8.5
TSS	-	$< 100 \text{ mg}/\text{l}$

3.3 PREDICTION IMPACTS ON WATER QUALITY

The effluent generated will be treated in the effluent Neutralization cum treatment plant to meet MPPCB standards for on land irrigation. The treated effluent will be used for Coal moistening ash conditioning, dust suppression and for greenbelt development with in the premises. Hence there will not be any adverse impact in water environment in the study area due to the proposed project. Rain water harvesting pits will be constructed to recharge the ground water.

3.4 PREDICTION IMPACTS ON LAND ENVIRONMENT

The effluent generated from the power plants will be treated to achieve MPPCB standards for irrigation on land. All the required Air Pollution control systems such as ESP's , bag filter, dust suppression systems will be provided in the proposed project 100 % waster water will be used within the project. Hence there will not be any adverse impact on land environment due to the proposed project.

3.4 PREDICTION OF IMPACTS ON SOCIO ECONOMIC ENVIRONMENT

With the establishment of the proposed project the employment potential will increase. The economic status of the people will improve with this project. Agro waste and Crop Residue and Biomass prices will increase. Land prices in the area will increase. The company will provide socio-economic development support to the community, Hence these will be only positive impact on socio-economic status.

4.0 BASELINE DATA

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

4.1 AMBIENT AIR QUALITY

Ambient air quality was monitored for RPM, SPM, SO₂ & NO_x at 8 stations for one season as per MoEF guidelines. The following are the concentrations of various parameters at all the monitoring stations.

2.7 SOLID WASTE

The total ash generated from the plant will 56.7 TPD when 100 % biomass is used as fuel and 66.96 TPD when 80% Biomass + 20 % Coal combination is used as fuel. Ash generated will be stored in silo of 80 M3 capacity and will be given to brick manufacturing units.

3.0 PREDICTION OF IMPACTS

3.1 PREDICTION OF IMPACTS ON AIR QUALITY

The emissions of concern from the boiler of the power plant will be SPM, SO₂ and NO_x. The SPM, SO₂ and NO_x emissions from the boiler stack will be 2.1 g/s, 10.1 g/s and 2.1 g/s respectively.

For the purpose of prediction of Ground Level Concentrations the emissions from the 50 TPH boiler are considered. ATDM software is applied for prediction of GLCs. It is observed that the maximum predicted incremental rise in SO₂ concentration after commissioning of power plant will be 3.7 µg/cum, max. Predicted incremental rise in NO_x will be 0.8 µg/cum and that of SPM will be 0.8 µg/cum at a distance of 625 m from the origin stack in the downwind direction.

The predicted results show that the incremental rise over the existing baseline status of ambient air quality will be within the National Ambient Air Quality Standards for residential areas even after commissioning of the Power Plant.

3.2 PREDICTION OF IMPACTS ON NOISE QUALITY

The major noise generating sources are Turbo generator, Boiler and Compressors. The Ambient Noise levels will not exceed the standards prescribed by MoE&F, GOI vide Notification dated 14-02-2000 under the Noise pollution (regulation & control) Rules, 2000 i.e. 75 dBA during day time and 70 dBA during night time. Extensive greenbelt proposed to be developed will further mitigate the noise levels

The effluent generated from the power plant will be treated in the following manner.

The pH of the boiler blowdown will be between 9.5 and 10.5. Hence this effluent stream shall be neutralised before mixing with the other effluent streams. The size of the neutralization tank will be 3m x 2m x 2m. This effluent will be mixed in a Holding tank with the Cooling tower blowdown, Service water, R.O plant rejects. The treated effluent will be utilized for ash conditioning and the remaining will be utilised for greenbelt development. The sanitary waste water will be treated in septic tank followed by soak pit

The quality of effluent after treatment will be as follows:

pH	-	6.5 - 8.5
TSS	-	< 100 mg/l
Oil & Grease	-	< 10 mg/l
Free available chlorine	-	< 1.0 mg/l
Copper	-	< 1.0 mg/l
Iron	-	< 1.0 mg/l
Zinc	-	< 1.0 mg/l
Chromium	-	< 0.2 mg/l
Phosphates	-	< 5.0 mg/l

The characteristics of the treated effluent are will below the characteristics of the Madhya Pradesh Pollution Control Board's Standards for onland irrigation. Hence there will not be any impact on ground water / surface water due to the proposed power plant.

2.6 AIR EMISSIONS

There will be one stack connected to the 50 TPH boiler in the proposed power plant. The fuel for the boiler will be Biomass and coal. The air emissions of concern from the proposed power plant will be SPM, SO₂ and NO_x. A stack height of 41 m will be provided for effective dispersion of Sulphur dioxide emissions into the atmosphere. Bag Filters will be provided to bring down the particulate emission in the exhaust of the boiler to less than 100 mg/nm³.

NOTE: Air cooled condenser is proposed in this project. Hence water requirement is lower than the conventional water cooled condenser system.

2.4 WASTE WATER GENERATION AND CHARACTERISTICS

The total wastewater generation from the proposed plant will be 102 cum/day and the following will be the break-up of it.

WASTE WATER GENERATION (CUM/DAY)

SOURCE	QUANTITY IN CUM/DAY
Cooling tower blowdown	45
Boiler blowdown	24
DM plant regeneration	20
Service waste water	5
Sanitary waste water	8
TOTAL	102

CHARACTERISTICS OF SANITARY WASTE, COOLING TOWER BLOWDOWN, BOILER BLOWDOWN

S.No.	Characteristics	Sanitary waste water	Cooling tower blow down	Boiler blow down	DM plant & softner regenerati on water
1.	pH	7.0 – 8.5	7.0 – 8.0	9.5 – 10.5	4.0-9.0
2.	T.D.S. (mg/l)	800 – 900	1000	1000	5000-6000
3.	B.O.D. (mg/l)	200 – 250	-----	-----	-----
4.	C.O.D. (mg/l)	300 – 400	-----	-----	-----

2.5 EFFLUENT TREATMENT PROCESS

Waste water generated will be 102 cum/day, which will be treated in Effluent Treatment Plant. It is a totally zero discharge system as per CREP recommendations.

(As per Ministry of Non -conventional Energy Sources (MNES) guidelines coal can also be used as fuel for power generation, subject to a maximum of 20% on annual basis).

2.2 BRIEF POWER GENERATION PROCESS

The whole process comprises of generating heat energy in the boiler by direct combustion of Biomass and then converting this heat energy generated in the Travelling Grate Boiler into Mechanical energy in the turbine and this mechanical energy will drive the turbine to generate 10 MW power.

The biomass is fed into the boiler and the biomass is burnt in the boiler. The combustion of the biomass generates the heat energy in the boiler. This heat energy is transferred to heat transfer area provided in different areas like (Bed coils, water wall, steam drum/mud drum, Bank tubes, Economiser, Super heater, Air-preheater). This heat is transferred to the water, which is passing through, and steam is generated and this steam is further superheated in the Super heater so that dry super heated steam is generated.

A very high efficiency ESP with < 100 mg/Nm³ dust load design will be set up.

2.3 WATER REQUIREMENT

The total water requirement for the proposed plant will be met from abundantly available ground water resources. The total water requirement for the plant will be 325 cum/day and the following is the break-up of it.

WATER REQUIREMENT (CUM/DAY)

SOURCE	QUANTITY(M ³ /day)
Cooling Tower Make-up	170
Boiler make-up	120
D.M. plant regeneration water	20
Service water	5
Domestic water	10
Total	325

EXECUTIVE SUMMARY

1.0 INTRODUCTION

Seoni Renewable Energy Pvt. Ltd. has proposed to establish 10 MW of Biomass based power plant at Raagadaeyee Village, Seoni Tehsil & District, Madhya Pradesh. The raw materials proposed for this plant is Biomass (like Rice husk, Sugarcane trash, Soyabean stalks, Maize & Wheat stalks) or Coal (As per Ministry of Non - conventional Energy Sources (MNES) guidelines coal can also be used as fuel for power generation, subject to a maximum of 20% on annual basis). Total land available for the proposed project is 14.0 acres. Total cost of the project is Rs. 46.00 Crores.

Pioneer Enviro Laboratories & Consultants Pvt. Ltd., Hyderabad has prepared Rapid Environmental Impact Assessment Report for the proposed Biomass Power Plant. The report contains detailed description of the following

- a. Detailed characterization of status of environment in the area of 10 km. radius from the proposed site for major environmental components including air, water, noise, soil, flora, fauna and socio-economic environment.
- b. Assessment of air emissions, liquid waste and solid waste from the proposed industry along with the noise level assessment.
- c. Pollution control measures proposed to be adopted and environmental impact statement.

2.0 PROJECT DETAILS

2.1 RAW MATERIALS

The following will be the raw materials and their requirement

Biomass (like Rice husk, Sugarcane trash,
Soyabean stalks, Maize & Wheat stalks) - 300 TPD

OR

Coal - 225 TPD