

Chapter – 5

ENVIRONMENTAL MANAGEMENT PLAN

5.1 INTRODUCTION ;

The proposed distillery project will have a net positive impact; the adverse impacts will be only marginal, particularly after the installation of the modern and environmental friendly control system as an integral part of the manufacturing process. The proposed grain based distillery management is quiet conscious of its responsibilities for maintaining clean environment. The management will install proper pollution control equipments for proper treatment an control of pollutants before discharging gaseous pollutants into atmosphere an no liquid waste water will be discharged outside the project premises as the unit will adopt 'ZERO DISCHARGE CONCEPT'.

5.2 POST PROJECT OPERATIONS ;

Detailed study of the project commissioning environment an also the likely (and predicted) implications after the plant commissioning suggests that the following preventive / control measures are considered necessary and sufficient to reduce the adverse impact to the utmost practicable limit.

5.3 AIR ENVIRONMENT ;

1. Gaseous emission from fuel burning, which consist of common pollutants like SO₂, NO_x and SPM, should be discharged into atmosphere through stacks of suitable height.

2. Stacks attached to the Boiler will be equipped with Bag Filters to reduce the emission of pollutants.
3. Implementation of green belt within the premises of the plant will help in attenuating the pollutants emitted by the plant.
4. Ambient Air Quality and Stack Emission will be regularly monitored to ensure that ambient air quality standards and suggested limits on stack emission loads are met honestly all the time.

5.4 **WATER ENVIRONMENT** ;

1. Water requirement of the plant is around 1550 m³/day. Water requirement of the plant will be met by bore wells, but efforts should be made to conserve as much water as possible through recycling and reusing.
2. The Spent wash generation from proposed distillery project would be maximum at the out let of Analyser / beer column as 8.8 – 9 lt./lt. of Alcohol production. Out of which about 2.5 – 2.8 lt./lt. o alcohol will be recycled back to the fermentation section & balanced 6 – 6.5 lt./lt. of alcohol, would be sent to the Evaporation Plant. This evaporation plant is installed to replace the conventional ETP system. Due to this evaporation process we get wet cake, which is again mixed with the wet cake of Decanter and then sold in the market. The evaporated water is further taken for the treatment.
3. Liquid effluent being suitable for green belt plantation should be utilized for irrigation.

5.5 **LAND ENVIRONMENT** ;

Land environment will not be adversely affected due to the reason that in no case waste water will be discharged on the land.

5.6 **NOISE ENVIRONMENT** ;

There is no danger of noise pollution from the proposed project. The green belt will help in reducing noise levels and as a result attenuates the noise generated due to plant operations and transportation.

5.7 GREEN BELT DEVELOPMENT ;

Green Belt planning has been done with ecological perspectives for proposed distillery project, taking into consideration the nature of pollutants, availability of space and dominant wind directions. Recommendations given on plantation requirements in the premises of the plant must be fully implemented as early as possible. This will help in reducing the concentration of pollutants and will also be effective in attenuating noise levels.

Proposed distillery project has social obligation to recreate the environmental status by providing thick canopy cover to suppress fugitive emission and provide aesthetic beauty. Trees form an important part of the biosphere in the Eco-system. The ecological belt maintains the natural balance of the area.

A green belt or tree plantation around the proposed distillery project shall help to arrest the particulate matter in the area and hence attenuate the pollution to a great extent.

5.8 Eco SYSTEM ;

Environment, which is the sum of both nonliving & living factors existing at a place, interacts and influences the ecology of the area. Ecology is an important component comprising of flora (Vegetation & micro plant species) and fauna (Wildlife and terrestrial micro organisms).

The abiotic or physical factors include topography, soils, climate etc. that are influenced by natural perils and / or pollution. On the other hand, biotic factors include living things such as flora, fauna, wildlife and human beings. A change in the physical factors can bring about a change in the biotic factors thereby changing the ecology of the area.

Living things are generally adapted to a particular setting (habitat or ecosystem) and are organized into natural groupings (communities) with mutual dependencies among their members. An ecosystem comprises of both plant and animal populations that involve total nutrient and energy economics associated with the entire system organisms, whereas natural community is just a recognizable association of plant and animal populations in an area. A

series of recognizable ecosystem alterations, called ecological successions, may occur due to certain imposed changes in the natural community.

Living things show various responses and sensitivities to outside influences resulting in an ecological imbalance or change in habitat or ecosystem. Moreover, changes in pollution levels due to proposed project activities may also alter the ecology of the environment. Proposed project activities may also alter the ecology of the environment. Proposed project activities may produce adverse ecological impact of direct or indirect nature, which can be either short term or long term, depending on the nature of action. Although every impacted environment has some recovery potential but the extent of recovery would depend on the type, degree and location of the impact as well as on mitigative measures initiated to achieve recovery.

Generally, short-term impacts are immediate and direct, environmental changes may occur at the inspection of the proposed project. These changes may be self-corrective through recovery processes, after the completion of the construction phase. On the other hand, long-term impacts result from major indirect environmental changes, which are caused during the operational phase of a project.

5.9 PLANTATION TECHNIQUES ;

The minimum width of 3.5 m. green belt shall be developed all along the periphery of the project so that the density of trees shall be at least 400 trees per hectares of green belt area. Treated waste water will be used for plantation purpose. Proposed distillery project will sow tree species along road around the proposed area. Minimum 2 rows of plantation are required for road side plantation to minimize the pollution effect. Care shall be taken to ensure that the plants in the second row are staggered between the plants of the first row. Plantation of carefully selected tree species should achieve attenuation of the pollutant levels.

5.10 NURSERY DEVELOPMENT ;

Success of afforestation measures at the site is also dependent on investigation of soil, selection of suitable species to be grown and a good

number of plant stocks. For this reason, it is proposed to set up a nursery near the plant area premises.

Plantation of seeds will be done for raising plants in the nursery and afterwards planting saplings at the proposed unit. Nursery will be selected at a place where there is no shading effect and there are facilities for irrigation. The nursery should have seedbeds, nursery beds, working shed, store and office.

5.11 AFTERCARE AND MONITORING ;

Investment on reclamation would be futile without adequate and timely aftercare. Aftercare includes weeding, soil working, mulching and fertilizing and if possible, irrigation to promote better growth of the planted seedlings. The vegetated area should be protected from grazing of animals until the plants are above the level of damage. Wherever necessary, fencing should be erected on the boundaries of reclaimed areas.

Monitoring of the programme is the only way to improve both the long-term and short-term planning. It involves two important aspects, namely site investigation and record keeping.

5.12 LOCATION AND LANDSCAPE ;

Proposed distillery project is located near Vill. Khatkhati, Block Bokajan, Dist. Karbi Anglong, Assam. The rainfall is spread all over the year. The meteorological details are given in the previous chapter.

From the windrose diagram of the proposed distillery project, it is evident that the majority of wind is towards the southwest direction.

5.13 BASELINE DATA & POTENTIAL IMPACTS OF THE STUDY AREA ;

The flora and fauna of an area shows a certain affinity to the existing environmental setting. Due to the proposed facility, there could probably be a change in the environmental surroundings for a short duration due to the construction phase and for a long term due to the operation of the project

activities. Thus, in order to predict the ecological impacts from the proposed project, it is necessary to detail the baseline data.

The baseline data has been generated based on information obtained from district Head Quarter.

As the proposed site lies in Karbi Anglong region, the flora and fauna of the region has been used as the baseline data.

The potential impacts on the ecology of the study area are discussed below ;

- As no waste water from the proposed project will be discharged outside the proposed distillery project premises, there will be no impact on the ecology of the study area due to waste water arisen from the proposed project.
- The flora and fauna of the area could be disturbed if the various air pollutants discharged from the proposed facility would not be maintained within specified permissible limits. But project authority has already mentioned the adequate stack height & air pollution control devices etc. Thus, the potential impact of air emission can be rated as nil.
- Moreover, the proposed green belt would help in reducing the adverse impacts further if any.
- On the periphery of the plant, a series of trees will also be planted.

5.14 **RECOMMENDATIONS FOR GREEN BELT DEVELOPMENT** ;

A green belt or tree plantation around the proposed plant shall help to arrest the effects of particulate matter and gaseous pollutants in the area besides playing a major role in environmental conservation efforts.

For effective control of air pollutants in and around the proposed industry, a suitable green belt is proposed by taking into consideration the following criteria. The green belt should ---

- Mitigate gaseous emissions.
- Have sufficient capability to arrest accidental release.
- Effective in waste water reuse.
- Maintain the ecological balance
- Control noise pollution to a considerable extent.
- Prevent soil erosion
- Improve the Aesthetics

Moreover, keeping in view the characteristics of soil, water quality and topography of the area the following additional aspects have also been considered ---

- Tolerance to inorganic chemicals
- Large leaf area index
- Vertical root development system
- Locally available
- Fast growing and perennial
- Low water requirement

Taking the above mentioned criteria into consideration, the proposed green belt would be covering 33 % of the total area at the site. The green belt would be consisting of shrubs, trees, avenue trees, revenue trees and crops and also potted plants. All the species suggested are pollution tolerant, besides having an aesthetic appeal.

The suggested plant species are ;

| | |
|----------------------|--------------------------------|
| Safed siris | <i>Albizia procera</i> |
| Bandar holla | <i>Duabanga grandiflora</i> |
| Bandicoot berry | <i>Leea indica,</i> |
| Sal | <i>Shorea robusta</i> |
| Areca nut trees | <i>Areca catechu</i> |
| Pithraj tree | <i>Aphanamixis polystachya</i> |
| Java Pulm | <i>Syzygium cumini</i> |
| Hawaiian orchid tree | <i>Bauhinia purpurea</i> |
| Malabar leaf | <i>Cinnamomum tamala</i> |

| | |
|--------------------|----------------------------|
| Cogongrass | <i>Imperata cylindrica</i> |
| Giant Cane | <i>Arundo donax</i> |
| Dillenia pentagyna | <i>Dillenia pentagyna</i> |
| Indian gooseberry | <i>Phyllanthus emblica</i> |

The vegetation of various types has the potentiality to respond to the hazards of pollution. Trees also act as wind breakers and stop the particulate matter from crossing over. The biological role of plant species would be planted in such a way that they are able to control the effects of pollutants. There are strip cultivation, agro-forestry, staggered cultivation, social forestry type of cultivation and the likes.

As discussed, it is safe to say that the proposed facility is no likely to cause any significant impact to the ecology of the area, as adequate preventive measures will be adopted to contain the various pollutants within permissible limits. Green belt development around the area would also be taken up an effective pollution mitigative technique, as well as to serve as biological indicators for the pollutants released from the premises of Proposed Distillery Project.

5.15 SOCIO ECONOMIC WELFARE ACTIVITIES ;

- Recognizing that even with best efforts, some gaseous emissions, and noise will eliminate from proposed project. Initially some marginal impacts can occur which will be mitigated in future. The proposed project is in the larger interest of economic and all around development of the area.
- Medical and educational facilities for rural population are poor and proposed distillery project management should make an appropriate contribution towards their improvement.

5.16 RAIN WATER HARVESTING PLAN ;

It is proposed to collect all the Rain Water Falling on the Terrace through the Rain Water downtakes which shall be grouped and taken to a rain water harvesting tank with by pass arrangement for first wash rinse as well as to by

pass into the storm water drain. The surface water of the Ground level shall be grouped to percolate into recharge pits all around the compound wall. The water shall recharge the ground water table.

The above water shall be collected into the Rain Water Harvesting Compartment from where transferred to under ground water tank.

For Harvesting the Rain Water falling on the Plot it is proposed to have Recharge Pits filled with aggregate media for percolation of Rain Water in the aquifer.

Part of this water is expected to percolate down to the groundwater table thus acting as a recharge system. The natural purification process (filtration and adsorption phenomena while percolation through soil) is expected to further enhance the water quality by the time the water reaches the groundwater table.

5.17 **OCCUPATIONAL SAFETY & HEALTH ;**

All precautionary methods will be adopted by the company to reduce the risk of exposure of employees to occupational safety and health hazards.

Pre & post medical check-ups will be done of all the employees. Employees will be regularly examined and the medical records will be maintained for each employee. Pulmonary function test and periodical medical check up shall be done once in every year.

The following tests shall be conducted for each worker :

- Lung Function Test
- Radiology – X-ray
- Pulmonary Function Test
- Audiometric Test
- General clinical examination with emphasis on respiratory system
- Pre employment examinations
- Periodical medical examinations at the time of employment and after completion of employment.

For the safety of workers, personnel protective appliances like hand gloves, goggles, aprons, ear mufflers, nose mask etc. will be provided. Nose mask

will be provided at places, where there is possibility of dust generation. In high noise generation areas ear mufflers will be provided for the workmen.

Proper ventilation system will be provided in the process area.

5.18 POST PROJECT ENVIRONMENTAL MONITORING PROGRAMME ;

To evaluate the effectiveness of environmental management programme, regular monitoring of the important environmental parameters will be taken up. The Schedule, duration and parameters to be monitored are illustrated below in the **Table no. 5.1 ;**

Table 5.1: Environment Monitoring Schedule

| Description | Waste water | Air | Noise |
|------------------------|--|---|--|
| Location and Frequency | Treated Effluent, monthly | Boiler stack, Once in three months | Noise Level near Boiler, Sensitive work zone, office area and residential area, Once in Six months |
| | | Ambient Air Quality Monitoring and Work Zone Quality Monitoring, Once in a month | |
| Parameters | pH, Total Suspended Solids, BOD, COD, Oil & Grease | Stack: Temperature, Exhaust Gas Velocity, Particulate Matters, SO ₂ , NO _x , Ambient Air & Work Zone Monitoring: Suspended SPM, RPM, SO ₂ , NO _x | L _{max} , L _{min} , L _d , L _n , dB(A) |

5.19 ENVIRONMENTAL BUDGET :-

The total fiscal estimation for EMP is indicated to be 1.63 crores, details are given in **Table no. 5.2.**

Table 5.2: Cost of Environmental Protection Measures

| No. | Particulars | Amount in INR, Lakhs |
|-----------------------------------|--|----------------------|
| One Time Installation Cost | | |
| 1 | Installation of Pollution Control System | 150.00 |
| 2 | Green Belt Development | 5.00 |
| | Total | 155.00 |
| Recurring Cost | | |
| 3 | Environmental Monitoring | 2.00 |
| 4 | Running Cost of Pollution Control Equipments | 5.00 |
| 5 | Greenbelt maintenance | 1.00 |
| | Total | 8.00 |
| | Grand Total | 1.63 Crores |

* * * * *