

CHAPTER - 7

SUMMARY OF ENVIRONMENTAL CONCERNS, MANAGEMENT MEASURES AND CONCLUSIONS

7.1 Environmental Impacts and Environmental Concerns

This part of the Environmental Impact Assessment Report deals with impacts which are expected from the proposed distillery expansion, abatement, pollution control and management measures to maintain the environmental components within acceptable levels. The impacts have been assessed with respect to manufacturing process, raw materials, utilities, air quality, surface water & ground water quality, soils, ecology, terrestrial flora & fauna, land use pattern, cropping pattern, socio-cultural and socio economic aspects.

The existing 25 KLPD distillery of Shamli Distillery & Chemical Works (SDCW) is located at Shamli, Tehsil Shamli, Muzaffarnagar district, Uttar Pradesh state using molasses as the feed stock. The plant based on molasses as the feed stock generate 25 KLPD total spirit and after expansion it will generate 80 KLPD total spirit.

One Bottling plant / Hall for bottling of approximately 1 lac cases per month is proposed in the expansion plan.

On the basis of field data collected on different aspects of the environment, assessment of pollutants discharged, their discharge loads, proposed pollution control measures, and field data collected by EST field team and presented in earlier chapters, the major environmental impacts resulting from the operations of distillery are primarily due to generation of high organic bearing effluents. The manifestation of which could be in terms of management of treated effluents. These aspects are examined and presented in the following sections along with suggested mitigative and management measures. The environmental concerns on socio-economy, amenities and socio cultural aspects are secondary and are considered beneficial. The impacts on air quality, meteorology, topography and geology, forestry, archaeology, cultural and religious aspects are either considered minor and insignificant and/or are non-existent.

Spatially, the impact statements focus on the study area viz. 10 km radius around the distillery plant. Overall impacts in the regional context are minimal unless stated otherwise.

7.1.1 Impact on Meteorology

No such emissions are likely, which are known to alter the meteorology in the local or regional context. Therefore, the distillery unit is unlikely to cause any impact on the local and/or regional climate.

7.1.2 Impact on Air Environment and Mitigative Measures

Impact **During Construction** on air quality are limited to fugitive dust generated by civil construction, erection activities and construction vehicles.

Motor vehicle transportation (to, from and around the site) particularly the traffic, material movement into the site by trucks, mechanized equipment used in excavation of foundations will introduce particulates and other exhaust gases into the local ambient air and thus there is some likelihood that during the construction period local air quality gets temporarily affected by these emissions. However, this nuisance shall last only for a limited period of time.

During operation of the distillery:

There are no process emissions from the distillery. Air emission sources are existing boiler and D.G. Sets. The boiler is fired with bagasse and biogas. About 10000 tons per annum bagasse will be fired in the boiler after proposed expansion. The steam generation capacity of the boiler is 12 TPH.

Bagasse is a cleaner fuel as far as gaseous emissions are concerned and the emission loads shall be extremely low. The SO₂ generation from the boiler shall be negligible. The suspended particulate emissions shall remain less than 50 mg/Nm³ (12% CO₂), Multicyclones and bag filters sufficient to achieve the stipulated standards and stack height of 35 m is provided. The ash is collected in hoppers underneath boiler bank/air preheater and dust collection system.

The highlights of monitored ambient air quality are as follows:

Respirable particulate matter monitored in the study area showed the 98th percentile values in the range of 74.9 µg/m³. The highest value of RSPM level 78 µg/m³ was observed at plant site due to plant activities and vehicular movements, villages Kheri Karmu and Tajpur Simbhalka. The RSPM concentration in the study area was found to be within the promulgated NAAQ norms.

SO₂ concentration at various AAQ monitoring stations in study area show that SO₂ concentration values ranged from 5.6 µg/m³ to 8.8 µg/m³. Maximum SO₂ levels (8.8 µg/m³) was observed at plant site. Higher concentration at this location is likely to be influenced by local factors, movement of heavy vehicles on the roads and emissions of SDCW.

A total of 144 samples were collected during the study period. The frequency distribution in different ranges show the 98th percentile value (P98) of SO₂ as 8.0 µg/m³. The above values are far below the CPCB standard for SO₂.

Atmospheric NO_x levels monitored at various AAQ stations in study area ranged from 10.5 µg/m³ to 18.6 µg/m³. The AAQ station of maximum NO_x concentrations was the plant site. The highest average concentration was also observed at plant site.

The frequency distribution in different ranges show that all the samples analysed fall below 20 µg/m³. The 98th percentile value (P98) of NO_x was 16.4 µg/m³ which is far below the CPCB standards.

As there are no process emissions from the distillery and the only emission sources are bagasse based boiler and a standby diesel generator for which 'Adequate Stack Heights' are provided as per the standards laid down by the MoEF and CPCB. Further the SO₂ loads from the boiler are extremely low and hence SPM & NO_x are considered to carry out Air Quality Predictions through Mathematical Modeling which are also reflected in the monitored AAQ of the study area. The sugar mill complex is fairly large and well maintained and hence the impact of the boiler remain within the plant area.

A green belt is maintained for the distillery plant for dust abatement. Control measures for Air Pollution Control, Noise and Odour abatement.

7.1.3 Impact on Water Environment and Mitigative Measures

During construction, drainage pattern of overland water flow will not be changed much as the new plant will be constructed over the existing site. Potential impacts on surface water quality during this phase could arise from dust emissions (from vehicles and disturbance of soil), high suspended solids (from storm water runoff), and sanitary waste.

Suspended solids can be controlled by employing a construction pit to allow the particles to settle down, prior to discharge.

During operation water is required in the processes such as dilution, fermentation, liquefaction and distillation, boiler feeding and non-process uses such as cooling for fermenters and condensers, floor washing, domestic, sanitary, gardening, green belt irrigation, bottle washing and bottling, etc. The water requirement of various units will be 710 m³/day in the process, 600 m³/day soft water makeup for cooling towers, 216 m³ DM water for RS dilution, 40 m³/day make up DM water for boiler, 30 m³/day for bottling of liquor and 60 m³/day for uses such as drinking, Sanitary, Floor/Bottle Wash, etc. Boiler feed water is treated before feeding to the boiler in the DM plant. The water used in heat exchanger is cooled by cooling tower and is recycled. Initially, the process & other requirements including steam generation, Blending & Bottling, domestic use etc. are estimated as 2773 m³ of water, which will be reduced to 1277 m³/day with plant stabilization and recycling. The existing water requirement is 650 m³/day for 25 KLPD grain based plant which shall

increase to 1277 m³/day for 80 KLPD grain based plant and additional 627 m³/day water shall be required after the new 80 KLPD grain distillery is set up. The water requirement will be met from existing tube wells already dug at site.

In the study area ground water is utilized for agricultural and human activities. Rainfall data shows that the area is having sufficient rainfall. Recharging capacity of ground water is good not only due to rainfall but also due to proximity of Canals. Therefore the possibility of depletion of ground water table is low as the additional withdrawal is very small.

Effluent Management in the Existing and Proposed Operation

Liquid effluents from distillery are mainly generated from process and fermenter and to a small extent from washings. The plant shall have anaerobic digestion system for the primary stage of treatment followed by Reverse Osmosis and biocomposting.

The quantity of process wastewater generated will be 12.6 kg or 12 litres for every litre of alcohol produced by the distillery. The spent wash generation from the distillery shall be max. of 1008 MTPD or 960 KLPD for 80 KLPD molasses plant. It will be first treated in a Biomethanation System, which not only reduces the effluent load, but also produces methane rich biogas. Biogas has a high calorific value and is used to produce power in the boiler. The production of extra power from biogas improves the economics of the ethanol project. The effluent after biomethanation will be passed through Reverse Osmosis for volume reduction by 60-70% and used in the bio-composting plant.

The Central Pollution Control Board has issued a Protocol with alternatives for the utilization of distillery spent wash after treatment for biocomposting or burning after evaporation. The molasses distillery after expansion shall generate 272,160 MT/year (1008 MT x 270 days) which will be subjected to biomethanation followed by Reverse Osmosis. After RO about 136,080 MT/year of reject shall be generated which shall require 37143 MT of press mud/biomass/ash with 4 cycles of 60 days each per year. The requirement of press mud/biomass shall be met from two sugar mills which generate 54000 MT of press mud. About 17000 MT press mud is required for biocomposting at Pilkhani plant. The areas required for biocomposting, storage of press mud and finished product, and lagoon for one month storage of spent wash has been worked out as 15 acres.

The floor of land required for Compost area is prepared as per the Specifications laid down in the CPCB Protocol and has arrangement of leachate collection and surface runoff and its pumping to holding lagoon and laying of pipe network for automatic spraying of spent wash. SDCW has procured the Equipment and Machinery required for biocomposting as per the CPCB protocol.

The sewage generated from the sanitary blocks will be treated in septic tanks and applied on to soak pits and used for irrigation.

7.1.4 **Impacts due to Solid Waste**

Certain parts of the site area will be used for piling and storage of construction materials, and temporary offices and maintenance of heavy equipment. The land use pattern, outside the proposed site area will not be affected to any extent as the area will be barricaded and surrounded by plantation.

The types of solid wastes which will be generated from the proposed distillery are yeast sludge and boiler ash. Estimated quantities of these solid wastes for the existing and proposed distillery shall be as below:

	Existing	For Expansion
Yeast Sludge	= 0.5 tpd	1.5 tpd
Boiler ash	= 1.2 tpd	0.8 tpd

Yeast sludge is dried and disposed as land fill.
200 tpa Boiler ash shall be used for biocomposting.

None of the solid wastes are hazardous.

The management of solid waste presents no problem as the yeast sludge and boiler will be used as manure, or for biocomposting.

7.1.5 **Impact due to Noise**

The major stationary sources of noise generation in the plant are steam release valves, compressors, blowers and D.G. set.

Proper arrangement are made for the protection of workers who are required to be present there for extended periods of time.

The ambient noise levels presently measured at various locations are below 50 dBA, in rural areas. The impact of Noise from distillery plant at battery limits will remain well within the standards. There is however large buffering area between the habitation and distillery as the area of the campus is large.

7.1.6 **Impact on Soils**

Approx. 3.5 acres land will be available for operation of 80 klpd distillery. In addition to this, about 24 acres land is available for operation of effluent treatment activities like Bio gas plant, Reverse Osmosis Plant, storage & handling of Primary-Spent-wash, Spent wash after bio-methanisation and Spent wash after Reverse Osmosis Plant across the road.

For the activity of Bio composting, presently SDCW has 15 acres land duly prepared as per the guidelines of the Central Pollution Control Board at a distance of about 8 km from the distillery.

About 3.5 acres of land for setting up the distillery is already acquired by the project proponents. The land is converted to industrial after applying to the state govt. Some cut and fill operations shall disturb the soil profile, but the impact will be temporary.

As a part of this EIA study soil samples have been analysed around the biocomposting area. No adverse impact has been observed on the soils in study area and biocomposting area.

7.1.7 Impacts on the Biological Environment

A common apprehension of setting up of a polluting industrial facility at any place is the adverse impact on wild life or ecologically sensitive areas. In the present case there is no ecologically sensitive area or wild life sanctuary in the study area. Adverse impacts from discharge of treated effluents are minimized as the treated effluents shall be used for biocomposting in a confined area. Any accidental discharge will be mitigated by employing a proper management plan.

There are no likely impacts from higher noise levels or emissions during construction on the animals and birds at the project site are already accustomed to.

The existing ambient air quality of the study area is well within the Acceptable Ambient Air Quality Standards for primary pollutants. Even the Noise measurements show that the limits are adequately met. As there is no large source of emissions or noise generation there is no observed impact on terrestrial flora or fauna in the surrounding area of the plant. Moreover, there are ample open spaces in the plant premises which provide sufficient buffer between the plant operations and boundary limits.

The crops suffer from only common diseases which are not harmful to crop yields.

The proposed emissions are likely to be below the level which normally disturb or distract animal life and exert vegetational damage. Since there is no sensitive area, the effects on the existing fauna in this area will be negligible.

7.1.8 Impacts on the Socio-Economic Environment

The constructional phase of the proposed plant will observe migration of some workers to the project site. Since about 150 workers are likely to be engaged during the peak construction period, the economic condition of these limited number of people is likely to improve. The production from

this industrial unit alone is expected to add substantially to the gross economic yield of the state.

Socio-economic impacts as a result of the distillery in nearby areas is expected to be small in terms of employment, housing, educational, medical, transport facilities, economic status, health and agriculture.

There are no historical, biosphere reserve, defence installation of national importance in 10 km radius, therefore, no adverse impact on the same is envisaged.

The Industrial Relations in all the Units of the Company are extremely harmonious due to utmost sense and fair play on the part of the management creating lasting peace with mutual trust and confidence. The Company is making all the statutory dues well in time and in addition, having number of schemes, like free education to the children of the workers upto VIII Class, free medical check up, a hospital with qualified doctors and other adequate Staff, Relief Fund and other Sports & recreational events. There has been no strike or stoppage of work for more than five decades in any unit of the company.

7.2 Environmental Management Plan

7.2.1 Introduction

In order to minimise the impact of the proposed distillery expansion on the environment and to keep the air and water quality within the prescribed limits, a comprehensive environmental plan is proposed. SDCW have staff trained in Environmental Management with experts in this field assisted by sufficient qualified staff for maintenance of pollution control equipment, biocomposting and of green belt. The EMP includes formulation, implementation and monitoring of environmental components during and after commissioning of the distillery.

7.2.2 Establishment of Green Belt

Green belt is provided all along the periphery of the plant for the needed abatement and cleaning. The green belt cover an area of distillery to nearly 25% as shown in Fig. 2.1.

Locally available tree species are planted.

A separate plantation scheme along the roads and open spaces in the plant area is recommended to be strengthened as per the availability of open spaces.

7.2.3 Environmental Monitoring

Implementation of the monitoring plan to cover air emissions during operation of the distillery plant shall serve several purposes, viz. the NOC conditions given by UPPCB from time to time and to ensure that the

standards are being met with and no significant adverse impact on any environmental constituent is going to occur. Comprehensive monitoring plan shall include:

- i) Operational source monitoring
- ii) Ambient air quality monitoring

Operational source monitoring involves the periodic verification of emissions and effluents from discrete sources as required by regulatory agencies. The only continuous source, which is to be planned for source sampling and monitoring the relevant parameters is the boiler stack. The parameter required to be regularly monitored is RSPM, SO₂ and NO_x.

Ambient air quality monitoring to assess any changes beyond the battery limits of the proposed distillery plant include ambient air quality determination.

To ensure that boiler which are connected to stacks, are being operated properly and maintained efficiently, emissions from these stacks be monitored for SPM, SO₂ & NO_x once in 3 months. Ambient air quality shall be monitored for RSPM, SO₂ & NO_x once in a season for a period of 2 weeks at three locations in the plant area.

7.2.4 Environmental Management Division

The purpose of the Environmental Management Plan (EMP) is to minimize the potential environmental impacts from the proposed alcohol plant and to keep a vigil on the changes in the environmental components and to mitigate the consequences. Environmental management plan reflects the commitment of the project management for the protection of the environment as well as the neighbouring population.

The plant management have an environmental policy declaring its responsibility and commitment to protect the environment and to ensure public safety. The plant has a provision of staff for environmental compliance and laboratory facilities for the environmentally sound operation of the plant.

7.3 Manpower Requirement

The total manpower requirement for the project has been estimated at 150 consisting of Managers and Supervisors, Assistants, skilled workers, semi-skilled, unskilled and others. The company does not envisage any difficulty in the recruitment of required manpower at an appropriate time.

The environment aspects will be taken care of by the following team under the leadership of Engineering Manager.

7.4 Budgetary Provision For Environment Management

The total cost of the project will be Rs30.00 Crores taking into consideration the use of some of the existing plant and machinery such as

boiler, biogas reactors, lagoons, R.O. Plant, Bio compost plant of the 25 klpd distillery. Since the facilities for biogas plant, area for biocomposting process, Machinery for biocomposting, Lagoon, RO plant and boiler and Air Pollution Control System, Laboratory equipment, green belt are already available at the existing plant a provision of 50 lacs has been kept for additional environmental protection measures.

7.5 Overall Conclusions

It can be seen from the foregoing that there are not going to be any air emissions due to proposed expansion of distillery Plant and hence there would be no adverse impact on air environment. The SPM emissions from the boiler stack will be below 50 mg/Nm³ as per the standards for such small sized boilers. Adequate stack heights and control measures are provided as stipulated by the norms of UPPCB.

The spent wash from the distillery shall be first treated in a Biomethanation System which produces methane rich biogas. Biogas is used to produce power in the boiler. The effluent after biomethanation will be passed through Reverse Osmosis for volume reduction and used in the bio-composting plant. Ground water table also is not expected to be disturbed due to ground water withdrawal as recharge in the area is good. Moreover, the water requirement of the complex shall be met from deep tubewells. The treated domestic effluent and sludge will be utilized for green belt development and horticultural purposes.

The findings, approach of SDCW and conclusions emerging out of the Environmental Impact Assessment study suggest that the distillery plant of SDCW at Shamli, is environmentally compatible and the environmental concerns presented by SDCW shall be adequately taken care of by control measures as high standard of mitigating efforts shall be followed and improved upon with technology available. The distillery plant is expected to have little adverse impact on the surrounding environment with the abatement measures and proposed management steps.

It is therefore recommended that necessary environmental clearance be granted for proposed capacity expansion from 25 klpd to 80 klpd by SDCW with appropriate stipulations, if any.