INDIAN SUCROSE LIMITED
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CIN - L15424PB1990PLC010903 ram.chand@yaducorporation.com

Date: 10th February, 2020

To

The Member Secretary,
Ministry of Environment & Forest and
climate change,
Jor Bagh, New Delhi-110003

Subject: Submission of replies for 14th EAC Meeting held on 20th November, 2019 at MoEF & CC, New Delhi for 120 KLPD Molasses based ethanol plant and 4 MW Co-generation power plant by M/s Indian Sucrose Ltd. **Reg- Environment Clearance**.

Reference: 14th MOM of EAC, MoEF&CC, New Delhi, dated 20th November, 2019

Proposal No.:- IA/PB/IND2/116878/2018

Category: 5(g) Molasses based distillery greater than 100 KLD (Category A)

Respected Sir,

This is in reference to the aforesaid subject; we would like to bring into your kind notice that the application for the above said Project was submitted to MoEF&CC at 18.09.2019. The case was taken up in 14th meeting of EAC held on 20.11.2019. During the meeting, case discussed and some observations were given by EAC.

We are hereby submitting the replies of the observations for obtaining Environmental Clearance from EAC (MoEF&CC). Replies are as follows:

S. No.	Observations	Replies
(i)	EIA report to be revised as per the terms of reference granted for the project.	Revised as per ToR issued by MoEF&CC. Attached as annexure-1
(ii)	Incremental GLC of air quality parameters due to the proposed project.	The maximum cumulative GLC concentration of **PM10 wiz. 87.127 ug/m^3 , SO2 wiz. 14.563 ug/m^3 , NOx wiz. 31.207 ug/m^3** was predicted inside the study area. Details are Attached as annexure-2
(iii)	Details of courts/NGT cases, if any, on the project area or against the projects proponent.	The court case initially filed by the previous owner vide petition no. CWP No. 9131of 2012(in High Court of Punjab and Haryana at Chandigarh) against DEBT recovery Appellate Tribunal, was dismissed by the Division Bench of Punjab & Haryana High Court on 24th

		May 2012. Recently Hon'ble Supreme Court of India dismissed curative petition on 19th February, 2019. Thus, there is no court case pending against the project proponent. Undertaking for the same is Attached as annexure-3
(iv)	Details of land area available for the project, proof for occupancy and permission for industrial use.	Subsequent to the sale of Mukerian paper's Land to Indian Sucrose Limited by ARCIL in 2010, the land for project site land is with M/s Indian Sucrose Ltd with ownership rights. The land Papers as well as land use certificate from Tehsildar, Mukerian, that the said land is under industrial use and is not an agricultural land, are attached as Annexure-4.
(v)	Issues raised during public hearing, response by the project proponent, action plan with budgetary allocation. Public hearing proceedings along with Annexures.	Revised Public hearing action plan, response by the project proponent with budgetary allocation updated in chapter 7 of EIA Report. Public hearing proceedings along with Annexures 1 & 2 (Mentioned in Public Hearing Proceedings) attached as annexure- 5
(vi)	Revised layout plan with 33% greenbelt.	Layout plan with 33% greenbelt has been revised. Total land area of project site is 5.26 ha out of which 1.74 ha (33.39%) is greenbelt. Attached as annexure-6.
(vii)	Revised water balance with details of total water and fresh water requirement, and permission from concerned regulatory authority.	Water Balance keeping view of water minimization has been prepared. Fresh water requirement is 853 KLD. The CGWA application is already filed vide letter no. 21-4/4688/PB/IND/2019 which is under process Affidavit has been prepared to state that for the same is attached. Affidavit Attached as annexure-7
(viii)	Details of fuels to be used in the boiler/unit.	Fuel burned in the boiler is the mixture of Bagasse and spent wash. The composition of spent wash is 30-35 %, if the sludge content in the spent wash is 50-60% brix (4000-6000 mg/kg) for the maximum gross value. The quantity of bagasse required will be ~ 20 TPH. Attached as annexure-8
(ix)	As per EIA report (pageno.190) schedule I species reported, however conservation plan for Schedule I species along with budgetary provisions and its approval has not submitted.	Wildlife conservation plan has been approved by Principle Chief Conservator of Forest (Wildlife) & Chief Wildlife Warden, SAS Nagar, Punjab vide letter no. Endst No. 7075-76 dated 23.12.2019. Attached as annexure-9.

(x)	Occupational health plan.	Occupational health plan include Training and Safety Awareness Program, PPE Purchase, Environment Audit and EHS audits etc. has been revised. Total 53 lakhs will spend on OH&S activity. Attached as annexure-10
(xi)	Effluent treatment mechanism with plan for Zero Liquid Discharge.	MEE and CPU technology will use for treatment of waste water. Total waste water generate in the process will be treat and consume within the plant. Details attached as annexure- 11
(xii)	Detailed Plan for Corporate Environmental Responsibility and its implementable schedule with budgetary provision needs to be resubmitted.	Project proponent will provide R.O., Rain water harvesting, Computers, Dispensary to the nearby villages. Total budget 3.2 Crores will spend as CER activity in nearby 5 villages. Details attached as annexure- 12
(xiii)	The onsite emergency plan is not satisfactory as per MSIHC Rules, layout plan of the plant need to be revised.	Onsite emergency plan has been revised as per MSIHC rules. Attached as annexure-13

Thanking You

Yours faithfully

For M/s Indian Sucrose Ltd.



Authorized Signatory

ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN

FOR

120 KLPD MOLASSES BASED ETHANOL PLANT AND 4 MW CO-GENERATION POWER PLANT

AT

VILLAGE-CHAK ALLABAKSH, TEHSIL-MUKERIAN, DISTRICT-HOSHIARPUR PUNJAB

PLOT AREA-5.26 Ha

[ToR LETTER NO: 11011/404/2018-IA-II(I)on dated 7th January, 2019]

STUDY PERIOD: 1ST OCTOBER TO31ST DECEMBER 2018

MONITORING DONE BYM/S. VARDAN ENVIROLAB (NABL ACCREDITATION TC-6299 MOEF&CC NO. S.O. 1783 (E)

[Category-A (Molasses based Distillery greater than 100 KLD, Activity 5(g)]



APPLICANT

M/s Indian Sucrose Limited G. T. Road, Mukerian - 144211
District Hoshiarpur, Punjab, Contact no: 7290072110

ENVIRONMENT CONSULTANT

VARDAN ENVIRONET

(QCI/NABET ACCREDITED NO. NABET/EIA/1619/RA0037)

D-142, SEC. 57GURGAON (HARYANA)

E-MAIL: vardanenviro165@gmail.com

CONTACT: 0124-4291036, 09971684812

DOCUMENT NO.

2018_VI_00029_FINAL_EIA_Rev_01

REVIEW AND REVISION HISTORY

History of revisions of the present report:

Table I: History of the Revisions

S.No.	Rev.	Date	Modifications	Remarks
1.	Rev.00 Final	September,2019	Final EIA /EMP Report	Report has been prepared by Team Vardan and all the comments of reviewers have been incorporated in Final EIA/EMP report.

Document No. 2018_VI_00029

Table II: Record of Review

Rev.	Date	Description	Review-1	Approval
Rev.01	January,2020	Final EIA /EMP Report	Mr. S.K. Sharma	Mr. R.S. Yadav
Rev.00	September,2019	Final EIA /EMP Report	Mr. S.K. Sharma	Mr. R.S. Yadav
-	-	-		

This Report has been prepared by **Vardan EnviroNet** on behalf of and for the use of the **M/s.Indian Sucrose Ltd.** with due consideration and skill as per our general terms and conditions of business and terms of agreement with **M/s. Indian Sucrose Ltd**

DISCLAIMER

Vardan EnviroNet has taken all reasonable precautions in the preparation of this report as per its auditable quality plan. Vardan EnviroNet also believes that the facts presented in the report are accurate as on the date it was written. However, it is impossible to dismiss absolutely, the possibility of errors or omissions. Vardan EnviroNet therefore specifically disclaims any liability resulting from the use or application of the information contained in this report. The information is not intended to serve as legal advice related to the individual situation.

Declaration by Experts contributing to the EIA studies for M/s Indian Sucrose Ltd

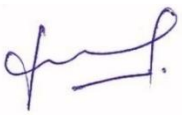
We, hereby certify that we were a part of the EIA report team in the following capacity that developed the above EIA.

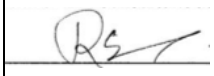
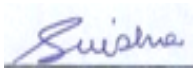
EIA coordinator:

Name:	Mr. S K Sharma
Signature and Date:	
Period of involvement:	September 2018 – January, 2020
Contact information:	Plot No. 82 A, Sector-5, IMT Manesar, Gurgaon (Haryana) Contact – 9971684812
Email Id:	Industry@vardanenvironet.com

Functional area experts:

No	Functional areas	Name of the expert/s	Signature	Involvement (period and task**)
1	AP*	**FAE:** Mr. S K Sharma **Team Member:** Mr. Shubham Tyagi		**October-December, 2018** **a)** Identifying the sources of emissions and mitigation measures. **b)** Inventorisation of point Source Stacks emissions details. **c)** Site-specific micro-meteorology Monitoring and collection of secondary data. **d)** Air quality monitoring – location planning, supervision of AAQ monitoring, sample collection and preservation. e) Laboratory visit during analysis of samples f) Identification of air emission impacts from the project. g) Proposing mitigation measures along with budget for control of air pollution

No	Functional areas	Name of the expert/s	Signature	Involvement (period and task**)
2	WP*	**FAE:** Mr. S K Sharma **Team Member:** Mr. Shubham Tyagi		**October, 2018** **a)** Surface water and ground water quality monitoring, Sampling, Preservation and assessment, impacts on Water environment and mitigations. **b)** Identification, characterisation of effluent streams and treatments there of **c)** Water balance and conservation measures **d)** Budget Allocation
3	AQ*	**FAE:** Mr. Asif Hussain		**December, 2018** a) Processing of site- specific micr meteorological data b) Collection and use inversion/mixing Height data f modelling. c) Air dispersion modelling for prediction of GLCS due to PM10, S02 and NOx
4	NV*	**FAE:** Mr. Asif Hussain **Team Member:** Mr. Shubham Tyagi		**December, 2018** a) Analysis of ambient noise quali data b) Impact due to plant noise and abatement measures
5	EB*	Dr. Niteesh Kumar		**October 2018** a) Biological environment status in respect of terrestrial faun and aquatic eco system b) Impact on ecological environment

No	Functional areas	Name of the expert/s	Signature	Involvement (period and task**)
6	HG*	Mr. R.S. Yadav		**October 2018** a) Ground water resource assessment b) Impact on ground water potential and mitigation measures for avoiding Ground water contamination.
8	SE*	Mr. Shilpa Mishra		**October 2018** a) Determination of demograph profile including socio economy livelihood b) Assessing the changes in socio economic pattern c)Budget Allocation
9	SHW*	Mr. S.K. Sharma		**December, 2018** a) Non-hazardous solid wastes generation, recycling and disposal b) Storage and management of hazardous solid wastes c)Budget Allocation
10	SC*	Mr. S.K. Sharma		**November,2018** a)Sampling, analysis and characterization of soil b) Assessment of fertility/productivity of soil, nutrient availability c) Remediation of soil pollution/contaminated soils d) Controlling degradation of soil/soil conservation
11	LU*	**FAE:** Mr. Ankur Agarwal **FAA:** Mr. Mohammad Anas		**November,2018** a) Analysis of data related to land use pattern b) Land use map development. c) Impact on land environment in respect to land form change

No	Functional areas	Name of the expert/s	Signature	Involvement (period and task**)
12	RH*	**FAE:** Mrs. Anuradha Sharma **FAA:** Mr. Pankaj Kumar		**November,2018** a) Identification of hazardous prone areas b) Environment risk evaluation c) On-site and Off-site emergency planning

Declaration by the Head of the accredited consultant organization

I, R.S. Yadav, hereby, confirm that the above mentioned experts prepared the EIA of **M/s Indian Sucrose Ltd**

I certify that this report has been prepared by **'Vardan Environet'** with all reasonable skill, care and diligence within the terms of the contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.

I also confirm that I shall be fully accountable for any misleading information mentioned in this statement.

Name: **R.S. Yadav**



Signature

Designation: **Managing Director**

NABET Certificate No. & Issue Date: NABET/EIA/1619/RA 0037 issued on 28.03.2017 and valid upto 9.11.2019

No.IA-J-11011/404/2018-IA-II(I)

Goverment of India

Minister of Enviroment,Forest and Climate Change

Impact Assessment Division

***

Indira Paryavaran Bhavan,
Vayu Wing,3rd Floor,Aliganj,
Jor Bagh Road,New Delhi-110003
07 Jan 2019

To,

M/s INDIAN SUCROSE LTD
G.T. road Mukerian-144211, District Hoshiyarpur,Punjab,
Hoshiarpur-144211
Punjab

Tel.No.0124-4291039; Email:indiansucrose2017@gmail.com

Sir/Madam,

This has reference to the proposal submitted in the Ministry of Environment, Forest and Climate Change to prescribe the Terms of Reference (TOR) for undertaking detailed EIA study for the purpose of obtaining Environmental Clearance in accordance with the provisions of the EIA Notification, 2006. For this purpose, the proponent had submitted online information in the prescribed format (Form-1) along with a Pre-feasibility Report. The details of the proposal are given below:

1. Proposal No.:	IA/PB/IND2/87561/2018
2. Name of the Proposal:	120 KLD Molasses based Ethanol plants and 4 MW Co-generation Power plant by M/s Indian Sucrose Ltd at G.T Road, Mukerian, District-Hoshiarpur, Punjab
3. Category of the Proposal:	Industrial Projects - 2
4. Project/Activity applied for:	5(g) Distilleries
5. Date of submission for TOR:	05 Dec 2018

In this regard, under the provisions of the EIA Notification 2006 as amended, the Standard TOR for the purpose of preparing environment impact assessment report and environment management plan for obtaining prior environment clearance is prescribed with public consultation as follows:

5(g): STANDARD TERMS OF REFERENCE FOR CONDUCTING ENVIRONMENT IMPACT ASSESSMENT STUDY FOR DISTILLERIES AND INFORMATION TO BE INCLUDED IN EIA/EMP REPORT

A. STANDARD TERMS OF REFERENCE

1) Executive Summary

2) Introduction

i. Details of the EIA Consultant including NABET accreditation

ii. Information about the project proponent

iii. Importance and benefits of the project

3) Project Description

i. Cost of project and time of completion.

ii. Products with capacities for the proposed project.

iii. If expansion project, details of existing products with capacities and whether adequate land is available for expansion, reference of earlier EC if any.

iv. List of raw materials required and their source along with mode of transportation.

v. Other chemicals and materials required with quantities and storage capacities

vi. Details of Emission, effluents, hazardous waste generation and their management.

vii. Requirement of water, power, with source of supply, status of approval, water balance diagram, man-power requirement (regular and contract)

viii. Process description along with major equipments and machineries, process flow sheet (quantative) from raw material to products to be provided

ix. Hazard identification and details of proposed safety systems.

x. Expansion/modernization proposals:

a. Copy of all the Environmental Clearance(s) including Amendments thereto obtained for the project from MOEF/SEIAA shall be attached as an Annexure. A certified copy of the latest Monitoring Report of the Regional Office of the Ministry of Environment and Forests as per circular dated 30th May, 2012 on the status of compliance of conditions stipulated in all the existing environmental clearances including Amendments shall be provided. In addition, status of compliance of Consent to Operate for the ongoing Iexisting operation of the project from SPCB shall be attached with the EIA-EMP report.

b. In case the existing project has not obtained environmental clearance, reasons for not taking EC under the provisions of the EIA Notification 1994 and/or EIA Notification

2006 shall be provided. Copies of Consent to Establish/No Objection Certificate and Consent to Operate (in case of units operating prior to EIA Notification 2006, CTE and CTO of FY 2005-2006) obtained from the SPCB shall be submitted. Further, compliance report to the conditions of consents from the SPCB shall be submitted.

4) Site Details

i. Location of the project site covering village, Taluka/Tehsil, District and State, Justification for selecting the site, whether other sites were considered.

ii. A toposheet of the study area of radius of 10km and site location on 1:50,000/1:25,000 scale on an A3/A2 sheet. (including all eco-sensitive areas and environmentally sensitive places)

iii. Details w.r.t. option analysis for selection of site

iv. Co-ordinates (lat-long) of all four corners of the site.

v. Google map-Earth downloaded of the project site.

vi. Layout maps indicating existing unit as well as proposed unit indicating storage area, plant area, greenbelt area, utilities etc. If located within an Industrial area/Estate/Complex, layout of Industrial Area indicating location of unit within the Industrial area/Estate.

vii. Photographs of the proposed and existing (if applicable) plant site. If existing, show photographs of plantation/greenbelt, in particular.

viii. Landuse break-up of total land of the project site (identified and acquired), government/ private - agricultural, forest, wasteland, water bodies, settlements, etc shall be included. (not required for industrial area)

ix. A list of major industries with name and type within study area (10km radius) shall be incorporated. Land use details of the study area

x. Geological features and Geo-hydrological status of the study area shall be included.

xi. Details of Drainage of the project upto 5km radius of study area. If the site is within 1 km radius of any major river, peak and lean season river discharge as well as flood occurrence frequency based on peak rainfall data of the past 30 years. Details of Flood Level of the project site and maximum Flood Level of the river shall also be provided. (mega green field projects)

xii. Status of acquisition of land. If acquisition is not complete, stage of the acquisition process and expected time of complete possession of the land.

xiii. R&R details in respect of land in line with state Government policy

5) Forest and wildlife related issues (if applicable):

i. Permission and approval for the use of forest land (forestry clearance), if any, and recommendations of the State Forest Department. (if applicable)

ii. Landuse map based on High resolution satellite imagery (GPS) of the proposed site delineating the forestland *(in case of projects involving forest land more than 40 ha)*

iii. Status of Application submitted for obtaining the stage I forestry clearance along with latest status shall be submitted.

iv. The projects to be located within 10 km of the National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals, the project proponent shall submit the map duly authenticated by Chief Wildlife Warden showing these features vis-à-vis the project location and the recommendations or comments of the Chief Wildlife Warden-thereon

v. Wildlife Conservation Plan duly authenticated by the Chief Wildlife Warden of the State Government for conservation of Schedule I fauna, if any exists in the study area

vi. Copy of application submitted for clearance under the Wildlife (Protection) Act, 1972, to the Standing Committee of the National Board for Wildlife

6) Environmental Status

i. Determination of atmospheric inversion level at the project site and site-specific micro-meteorological data using temperature, relative humidity, hourly wind speed and direction and rainfall.

ii. AAQ data (except monsoon) at 8 locations for PM10, PM2.5, SO2, NOX, CO and other parameters relevant to the project shall be collected. The monitoring stations shall be based CPCB guidelines and take into account the pre-dominant wind direction, population zone and sensitive receptors including reserved forests.

iii. Raw data of all AAQ measurement for 12 weeks of all stations as per frequency given in the NAQQM Notification of Nov. 2009 along with - min., max., average and 98% values for each of the AAQ parameters from data of all AAQ stations should be provided as an annexure to the EIA Report.

iv. Surface water quality of nearby River (100m upstream and downstream of discharge point) and other surface drains at eight locations as per CPCB/MoEF&CC guidelines.

v. Whether the site falls near to polluted stretch of river identified by the CPCB/MoEF&CC, if yes give details.

vi. Ground water monitoring at minimum at 8 locations shall be included.

vii. Noise levels monitoring at 8 locations within the study area.

viii. Soil Characteristic as per CPCB guidelines.

ix. Traffic study of the area, type of vehicles, frequency of vehicles for transportation of materials, additional traffic due to proposed project, parking arrangement etc.

x. Detailed description of flora and fauna (terrestrial and aquatic) existing in the study area shall be given with special reference to rare, endemic and endangered species. If Schedule-I fauna are found within the study area, a Wildlife Conservation Plan shall be prepared and furnished.

xi. Socio-economic status of the study area.

7) Impact and Environment Management Plan

i. Assessment of ground level concentration of pollutants from the stack emission based on site-specific meteorological features. In case the project is located on a hilly terrain, the AQIP Modelling shall be done using inputs of the specific terrain characteristics for determining the potential impacts of the project on the AAQ. Cumulative impact of all sources of emissions (including transportation) on the AAQ of the area shall be assessed. Details of the model used and the input data used for modelling shall also be provided. The air quality contours shall be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any.

ii. Water Quality modelling - in case of discharge in water body

iii. Impact of the transport of the raw materials and end products on the surrounding environment shall be assessed and provided. In this regard, options for transport of raw materials and finished products and wastes (large quantities) by rail or rail-cum road transport or conveyor-cum-rail transport shall be examined.

iv. A note on treatment of wastewater from different plant operations, extent recycled and reused for different purposes shall be included. Complete scheme of effluent treatment. Characteristics of untreated and treated effluent to meet the prescribed standards of discharge under E(P) Rules.

v. Details of stack emission and action plan for control of emissions to meet standards.

vi. Measures for fugitive emission control

vii. Details of hazardous waste generation and their storage, utilization and management. Copies of MOU regarding utilization of solid and hazardous waste in cement plant shall also be included. EMP shall include the concept of waste-minimization, recycle/reuse/recover techniques, Energy conservation, and natural resource conservation.

viii. Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 2009. A detailed plan of action shall be provided.

ix. Action plan for the green belt development plan in 33 % area i.e. land with not less than 1,500 trees per ha. Giving details of species, width of plantation, planning schedule etc. shall be included. The green belt shall be around the project boundary and a scheme for greening of the roads used for the project shall also be incorporated.

x. Action plan for rainwater harvesting measures at plant site shall be submitted to harvest rainwater from the roof tops and storm water drains to recharge the ground water and also to use for the various activities at the project site to conserve fresh water and reduce the water requirement from other sources.

xi. Total capital cost and recurring cost/annum for environmental pollution control measures shall be included.

xii. Action plan for post-project environmental monitoring shall be submitted.

xiii. Onsite and Offsite Disaster (natural and Man-made) Preparedness and Emergency Management Plan including Risk Assessment and damage control. Disaster management plan should be linked with District Disaster Management Plan.

8) Occupational health

i. Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers

ii. Details of exposure specific health status evaluation of worker. If the workers' health is being evaluated by pre designed format, chest x rays, Audiometry, Spirometry, Vision testing (Far & Near vision, colour vision and any other ocular defect) ECG, during pre placement and periodical examinations give the details of the same. Details regarding last month analyzed data of above mentioned parameters as per age, sex, duration of exposure and department wise.

iii. Details of existing Occupational & Safety Hazards. What are the exposure levels of hazards and whether they are within Permissible Exposure level (PEL). If these are not within PEL, what measures the company has adopted to keep them within PEL so that health of the workers can be preserved,

iv. Annual report of heath status of workers with special reference to Occupational Health and Safety.

9) Corporate Environment Policy

i. Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report.

ii. Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? If so, it may be detailed in the EIA.

iii. What is the hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the environmental clearance conditions? Details of this system may be given.

iv. Does the company have system of reporting of non compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism shall be detailed in the EIA report

10) Details regarding infrastructure facilities such as sanitation, fuel, restroom etc. to be provided to the labour force during construction as well as to the casual workers including truck drivers during operation phase.

11) Enterprise Social Commitment (ESC)

i. Adequate funds (at least 2.5 % of the project cost) shall be earmarked towards the Enterprise Social Commitment based on Public Hearing issues and item-wise details along with time

bound action plan shall be included. Socio-economic development activities need to be elaborated upon.

12) Any litigation pending against the project and/or any direction/order passed by any Court of Law against the project, if so, details thereof shall also be included. Has the unit received any notice under the Section 5 of Environment (Protection) Act, 1986 or relevant Sections of Air and Water Acts? If so, details thereof and compliance/ATR to the notice(s) and present status of the case.

13) 'A tabular chart with index for point wise compliance of above TOR.

B. SPECIFIC TERMS OF REFERENCE FOR EIASTUDIES FOR DISTILLERIES

1. List of existing distillery units in the study area along with their capacity and sourcing of raw material.
2. Number of working days of the distillery unit.
3. Details of raw materials such as molasses/grains, their source with availability.
4. Details of the use of steam from the boiler.
5. Surface and Ground water quality around proposed spent wash storage lagoon, and compost yard.
6. Plan to reduce spent wash generation within 6-8 KL/KL of alcohol produced.
7. Proposed effluent treatment system for molasses/grain based distillery (spent wash, spent lees, condensate and utilities) as well as domestic sewage and scheme for achieving zero effluent discharge (ZLD).
8. Proposed action to restrict fresh water consumption within 10 KL/KL of alcohol production.
9. Details about capacity of spent wash holding tank, material used, design consideration. No. of peizometers to be proposed around spent wash holding tank.
10. Action plan to control ground water pollution.
11. Details of solid waste management including management of boiler ash, yeast, etc. Details of incinerated spent wash ash generation and its disposal.
12. Details of bio-composting yard (if applicable).
13. Action plan to control odour pollution.
14. Arrangements for installation of continuous online monitoring system (24x7 monitoring device)

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F. No. IA-J-11011/404/20178IA-II (I)
M/s Indian Sucrose Ltd

Sr. No.	Description	Reply	Citation
A. Standard TOR			
1	Executive Summary of the Project	Executive Summary is Enclosed in the EIA report.	**Annexure I**
2	**Introduction**		
i	Details of the EIA Consultant including NABET accreditation	**Vardan EnviroNet** is an accredited organization by Quality Council of India/NABET certificate no. **NABET/EIA/1619/RA0037 and** NABET accreditation certificate is incorporated in EIA Report.	**(Page No. i-iv)**
ii	Information about the project proponent	Detail of the project proponent is incorporated in **Section 1.3.2, Chapter 1.**	**Chapter-1,Page No. 1, Point no.1.3.2**
iii	Importance and benefits of the project	Benefit related project is incorporated in **Section 1.4.4, Chapter 1.** Also Refer **Chapter 8** (Project Benefits) of EIA Report.	**Chapter 1 Page No. 3 And Chapter 8 page no 177-178**
3	**Project Description**		
i	Cost of project and time of completion.	The total capital cost for the project is **160 Crore**. The project will be completed within 12-18 month after the grant of Environment Clearance.	**Section 2.8.7, Chapter 2, Page No. 26**
ii	Products with capacities for the proposed project.	120 KLPD Fuel Grade ethanol and 4 MW co-generation power plant	**Section 1.4.1, Chapter 1, Page No. 2**
iii	If expansion project, details of existing products with capacities and whether adequate land is available for expansion, reference of earlier EC if any	NA, as this is a new project.	
Iv	List of raw materials required and their source along with mode of transportation.	Raw materials required and their source along with mode of transportation is incorporated in the EIA report	**Chapter 2 Table 2.8.1 Page 22**
V	Other chemicals and materials required	Other chemicals detail is incorporated in the EIA report.	**Chapter 2**

	with quantities and storage capacities		**Table 2.8.1 Page 22**
vi	Details of Emission, effluents, hazardous waste generation and their management	Details of Emission, effluents, hazardous waste generation and their management is incorporated in the EIA report.	**Chapter 4 Item no 4.4.6 Page 126**
Vii	Requirement of water, power, with source of supply, status of approval, water balance diagram, man-power requirement (regular and contract)	**Water Requirement**: Total Water Requirement is 853 KLD Source: Ground Water (CGWA application for the with drawl of Ground water has been applied vide application no 21-4/4688/PB/IND/2019 on dated 14-01-2019.)	**Section 2.8.5, Page 24, 25, Chapter 2**
		Power Requirement : 3100 Kwh **Source:** will be met through its own power plant of capacity	**Section 2.8.2, Page 23, Chapter 2**
		Manpower: 98 nos	**Section 2.8.3, Page 23 Chapter 2**
Viii	Process description along with major equipments and machineries, process flow sheet (quantitative) from raw material to products to be provided	Details process description is incorporate in the EIA report	**Chapter 2 Item no 2.7 Page no 18 to 22**
Ix	Hazard identification and details of proposed safety systems.	Hazard identification is incorporate in the EIA report	**Chapter 7 Table 7.4 Page no 140**
X	Expansion/modernization proposals:	NA	-
A	Copy of all the Environmental Clearance(s) including Amendments thereto obtained for The project from MOEF/SEIAA shall be attached as an Annexure. A certified copy of the latest Monitoring Report of the Regional Office of the Ministry of Environment and Forests as per circular dated 30th May, 2012 on the status of compliance of conditions stipulated in all the existing	NA	--

	environmental clearances including Amendments shall be provided. In addition, status of compliance of Consent to Operate for the ongoing existing operation of the project from SPCB shall be attached with the EIA-EMP report.		
b	In case the existing project has not obtained environmental clearance, reasons for not taking EC under the provisions of the EIA Notification 1994 and/or EIA Notification 2006 shall be provided. Copies of Consent to Establish/No Objection Certificate and Consent to Operate (in case of units operating prior to EIA Notification 2006, CTE and CTO of FY2005-2006) obtained from the SPCB shall be submitted. Further, compliance report to the conditions of consents from the SPCB shall be submitted	NA	--
4	**Site Details**		
I	Location of the project site covering village, Taluka/Tehsil, District and State, Justification for selecting the site, whether other sites were considered.	The project is located at the Village Chak Allabaksh, Tehsil-Mukerian, District-Hoshiarpur, Punjab in around 13 acres. Location Map of the project site is shown in as figure 2.1, Chapter-2 of EIA Report	**Figure 2.1, Chapter-2 Page no 12.**
Ii	A toposheet of the study area of radius of 10km and site location on 1:50,000/1:25,000 scale on an A3/A2 sheet. (including all eco-sensitive areas and environmentally sensitive places)	A top sheet of the study area of radius of 10km and site location on 1:50,000/1:25,000 scale is incorporated in the EIA report	**Chapter 2, figure 2.2 page no 13**
Iii	Details w.r.t. option analysis for selection of site	There will be no transportation cost for the molasses as project will be located adjoining to its existing Sugar Mill. Land area is already acquired by the project proponent	-

iv	Co-ordinates (lat-long) of all four corners of the site.	The center co-ordinate of the project is 31°55'32.53"N Longitude-75°37'34.46"E and the co-ordinate map of the project site is incorporated in the EIA report.	**Chapter -2** **Fig 2.4** **Page 15**
V	Google map-Earth downloaded of the project site	Google Image of the project site is incorporated in the EIA report.	**Chapter -2** **Fig 2.3** **Page 14**
Vi	Layout maps indicating existing unit as well as proposed unit indicating storage area, plant area, greenbelt area, utilities etc. If located within an Industrial area/Estate/Complex, layout of Industrial Area indicating location of unit within the Industrial area/Estate.	Layout map of the proposed project site is incorporated in the EIA report.	**Chapter 2, figure 2.5, page no 16**
Vii	Photographs of the proposed and existing (if applicable) plant site. If existing, show photographs of plantation/greenbelt, in particular	Site photograph of the proposed site is incorporated in the EIA report.	**Chapter 2, figure 2.6, page no 17**
Viii	Landuse break-up of total land of the project site (identified and acquired), government/ private - agricultural, forest, wasteland, water bodies, settlements, etc shall be included. (not required for industrial area)	Land use break-up of the project site is incorporated in the EIA report. Land used for the proposed site is the Pvt land and land document are enclose in the EIA report.	**Chapter 2,** **Table 2.5** **Page no 26**
Ix	A list of major industries with name and type within study area (10km radius) shall be incorporated. Land use details of the study area	There is no major industries found within 15 km of study area.	--
X	Geological features and Geo-hydrological status of the study area shall be included.	Geological features and Geo-hydrological status of the study area is incorporated in the EIA report.	**Chapter3** **Item 3.10, 3.11** **Page no 65-66**
Xi	Details of Drainage of the project upto	Details of Drainage of the project upto 5km radius of study area is	**Chapter 3,**

	5km radius of study area. If the site is within 1 km radius of any major river, peak and lean season river discharge as well as flood occurrence frequency based on peak rainfall data of the past 30 years. Details of Flood Level of the project site and maximum Flood Level of the river shall also be provided. (mega green field projects)	incorporated in the EIA report.	**Fig: 3.12 Page no 64**
Xii	Status of acquisition of land. If acquisition is not complete, stage of the acquisition process and expected time of complete possession of the land.	Land is already acquired by the proponent and land document are enclosed in the EIA report.	**Annexure-IV**
xiii	R&R details in respect of land in line with state Government policy	Not Applicable.	--
5	Forest and wildlife related issues (if applicable):		--
I	Permission and approval for the use of forest land (forestry clearance), if any, and recommendations of the State Forest Department. (if applicable)	The project will be situated in the private land and no forest land is involved in the core area.	--
ii	Land-use map based on High resolution satellite imagery (GPS) of the proposed site delineating the forestland (in case of projects involving forest land more than 40 ha)	Land-use map based on High resolution satellite of 10km study area is incorporated in the EIA report.	**Chapter 3, Fig: 3.9 Pagr no-61**
iii	Status of Application submitted for obtaining the stage I forestry clearance along with latest status shall be submitted	NOC from the DFO will be applied after Draft EIA submission.	--
iv	The projects to be located within 10 km of the National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors	There are no eco-sensitive areas such as national park / wildlife sanctuary /biosphere reserves within 10 km radius of project area.	-

	of Wild Animals, the project proponent shall submit the map duly authenticated by Chief Wildlife Warden showing these features vis-à-vis the project location and the recommendations or comments of the Chief Wildlife Warden-thereon		
V	Wildlife Conservation Plan duly authenticated by the Chief Wildlife Warden of the State Government for conservation of Schedule I fauna, if any exists in the study area	Only one Schedule-I species (INDIAN PEAFOWL) was recorded during the study period and Conservation Plan has been submitted for approval.	--
vi	Copy of application submitted for clearance under the Wildlife (Protection) Act, 1972, to the Standing Committee of the National Board for Wildlife	Not Applicable	--
6	**Environmental Status**		
I	Determination of atmospheric inversion level at the project site and site-specific micrometeorological data using temperature, relative humidity, hourly wind speed and direction and rainfall.	A metrological station was set-up at the project site and micro meteorological data for three months period (***1st October 2018 to 31st December 2018***) is Incorporated in the EIA report.	**Chapter 3, Table No-3.3, page no 54**
Ii	AAQ data (except monsoon) at 8 locations for PM10, PM2.5, SO2, NOX, CO and other Parameters relevant to the project shall be collected. The monitoring stations shall be based CPCB guidelines and take into account the pre-dominant wind direction, population zone and sensitive receptors including reserved forests.	AAQ data (post monsoon season) for PM_{10}, $PM_{2.5}$, SO_2, NO_X, CO was collected at 8 different location for the period 1st October to 31st December 2018. The eight different locations are choosing as per the MoEF guidelines.	**Chapter 3, table no – 3.8, page no - 33**
iii	Raw data of all AAQ measurement for 12 weeks of all stations as per frequency given in the NAQQM Notification of Nov. 2009 along with - min., max., average	The min., max., average and 98% values for each of the AAQ parameters of all the eight locations is incorporated in the EIA report.	**Chapter 3, table no – 3.5, page no –37 Annexure V**

	and 98% values for each of the AAQ parameters from data of all AAQ stations should be provided as an annexure to the EIA Report.		
Iv	Surface water quality of nearby River (100m upstream and downstream of discharge point) and other surface drains at eight locations as per CPCB/MoEF&CC guidelines.	Surface water samples at 8 diff location were collected for the analysis and detailed analyses result are incorporated in EIA report.	**Chapter 3, table no 3.12, page no 53.** **Annexure V**
V	Whether the site falls near to polluted stretch of river identified by the CPCB/MoEF&CC, if yes give details.	No	
Vi	Ground water monitoring at minimum at 8 locations shall be included	Ground water samples at 8 diff location were collected for the analysis and detailed analyses results are incorporated in EIA report.	**Chapter 3, table no 3.11, page no 51.** **Annexure V**
Vii	Noise levels monitoring at 8 locations within the study area.	Ambient noise levels were measured using integrated sound level meter at 8 locations and results are incorporated in the EIA report.	**Chapter 3, Table no 3.6, Page no 41**
viii	Soil Characteristic as per CPCB guidelines.	For studying the soil types and soil characteristics, 8 sampling locations were selected to assess the existing soil conditions representing various land use conditions and geological features and result are incorporated in the EIA report.	**Chapter 3, table no – 3.13, page no – 57** **Annexure V**
ix	Traffic study of the area, type of vehicles, frequency of vehicles for transportation of materials, additional traffic due to proposed project, parking arrangement etc	Traffic study of the area, type of vehicles, frequency of vehicles for transportation of materials, additional traffic due to proposed Project is incorporated in the EIA/EMP report.	**Chapter 3, item no 3.6, page no 44 to 46**
x	Detailed description of flora and fauna (terrestrial and aquatic) existing in the study area shall be given with special reference to rare, endemic and endangered species. If Schedule-I fauna are found within the study area, a	The detail of flora and fauna (terrestrial and aquatic) present in the study area is given in the EIA/EMP report.	**Chapter 3 item no 3.13, page no – 90 to 105**

	Wildlife Conservation Plan shall be prepared and furnished.		
xi	Socio-economic status of the study area.	The detailed Socio-Economic Study for the study area is incorporated in the EIA report.	**Chapter 3 item no 3.12, page no – 66 to 90**
7	Impact and Environment Management Plan		
i	Assessment of ground level concentration of pollutants from the stack emission based on site specific meteorological features. In case the project is located on a hilly terrain, the AQIP Modelling shall be done using inputs of the specific terrain characteristics for determining the potential impacts of the project on the AAQ. Cumulative impact of all sources of emission (including transportation) on the AAQ of the area shall be assessed. Details of the model used and the input data used for modelling shall also be provided. The air quality contours shall be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any.	The project is not located on a hilly terrain. Air quality Modeling has been done for determining cumulative impact of all sources of emission using ISCST3 (US-EPA approved) Model. The details are incorporated in EIA report.	**Chapter 4. item no 4.4.1.2, page no 116 to 123**
ii	**Water Quality modeling** - in case of discharge in water body	Not applicable as the proposed project has adopted "Zero liquid Effluent Discharge (ZLD)".	--
iii	Impact of the transport of the raw materials and end products on the surrounding environment shall be assessed and provided. In this regard, options for transport of raw materials and finished products and wastes (large quantities) by rail or rail-cum road	Impact on environment due to transportation of the raw materials and final products on the surrounding environment is given in the EIA/EMP report.	**Chapter 3, item no 3.6, page no 44 to 46**

	transport or conveyor cum- rail transport shall be examined.		
Iv	A note on treatment of waste water from different plant operations, extent recycled and reused for different purposes shall be included. Complete scheme of effluent treatment. Characteristics of untreated and treated effluent to meet the prescribed standards of discharge under E(P) Rules.	Spent wash will be treated in the Multiple effect evaporator and Spent less water will be treated in the Condensate polishing unit.	**Chapter 2, Section 2.9, Page 27**
V	Details of stack emission and action plan for control of emissions to meet standards.	Details of Stack Emission are given in the EIA report and to control the particulate emission ESP will be installed.	**Chapter 4, Table 4.3 Page no 118**
vi	Measures for fugitive emission control	Fugitive control measure is incorporated in the EIA report.	**Chapter 4**
vii	Details of hazardous waste generation and their storage, utilization and management. Copies of MOU regarding utilization of solid and hazardous waste in cement plant shall also be included. EMP shall include the concept of waste-minimization, recycle/reuse/recover techniques, Energy conservation, and natural resource conservation.	Used oil which will be in minimum quantity will be given authorized vendor for the disposal.	**Section 2.9, Chapter 2, Page 26**
viii	Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 2009. A detailed plan of action shall be provided.	Boiler ash will be collected and will be given to authorized vendor for the Brick manufacturing	**Chapter 2, Section 2.9, Page 27**
ix	Action plan for the green belt development plan in 33 % area i.e. land with not less than 1,500 trees per ha. Giving details of species, width of plantation, planning schedule etc. shall be included. The green belt shall be around the project boundary and a	1.7 Ha land will be utilized for the Green belt and ~4250 plants will be planted in the project premises.	**Chapter 10 Item no 10.4 Page no 181 to182**

	scheme for greening of the roads used for the project shall also be incorporated.		
x	Action plan for rainwater harvesting measures at plant site shall be submitted to harvest rainwater from the roof tops and storm water drains to recharge the ground water and also to use for the various activities at the project site to conserve fresh water and reduce the water Requirement from other sources.	Rain water harvesting plan is incorporated in the EIA report.	**Chapter 4** **Item no 4.5** **Page no 130 to 132**
Xi	Total capital cost and recurring cost/annum for environmental pollution control measures shall be included.	Total capital cost is 9.61 Crore and recurring cost/annum for environmental pollution control measures is 4.36 lakhs	**Section 10.5, Chapter 10, Page 187**
xii	Action plan for post-project environmental monitoring shall be submitted.	Action plan for post-project environmental monitoring is incorporated in the EIA report.	**Chapter 6, table 6.2** **Page no 136**
xiii	Onsite and Offsite Disaster (natural and Man-made) Preparedness and Emergency Management Plan including Risk Assessment and damage control. Disaster management plan should be linked with District Disaster Management Plan.	Onsite and Offsite Disaster (natural and Man-made) Preparedness and Emergency Management Plan including Risk Assessment and damage control is incorporated in the EIA report.	**Section, 7.18 Chapter 7, Page 173**
8	**Occupational health**		
I	Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers	Rs 53 lakhs will be allocated as the Occupational Health & Safety Budget.	**Chapter 7, Table no 7.10, Page no 176**
Ii	Details of exposure specific health status evaluation of worker. If the workers' health is being evaluated by pre designed format, chest x rays, Audiometry, Spirometry, Vision testing (Far & Near vision, colour vision and any	Rs 53 lakhs will be allocated as the Occupational Health & Safety Budget.	**Chapter 7, Table no 7.10, Page no 176**

	other ocular defect) ECG, during pre placement and periodical examinations give the details of the same. Details regarding last month analyzed data of above mentioned parameters as per age, sex, duration of exposure and department wise.		
Iii	Details of existing Occupational & Safety Hazards. What are the exposure levels of hazards and whether they are within Permissible Exposure level (PEL). If these are not within PEL, what measures the company has adopted to keep them within PEL so that health of the workers can be preserved,	Rs 53 lakhs will be allocated as the Occupational Health & Safety Budget.	**Chapter 7, Table no 7.10, Page no 176**
iv	Annual report of health status of workers with special reference to Occupational Health and Safety.	Annual report of health status of workers with special reference to Occupational Health and Safety will be maintained once project is in operation phase.	**Complied**
9	**Corporate Environment Policy**		
I	Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report.	Yes company have a well laid down environment policy	**Complied**
Ii	Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms /conditions? If so, it may be detailed in the EIA.	Yes company have a well laid down environment policy	**Complied**
Iii	What is the hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the	The Hierarchical system of the Environment Management cell is incorporate in the EIA report.	**Chapter 10, Fig 10.1 Page 180**

	environmental clearance conditions? Details of this system may be given.		
iv	Does the company have system of reporting of non compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism shall be detailed in the EIA report	Yes the companies have the well laid down Environment management cell for the reporting of non compliances / violations of environmental norms.	**Chapter 10, Fig 10.1 Page 180**
10	Details regarding infrastructure facilities such as sanitation, fuel, restroom etc. to be provided to the labour force during construction as well as to the casual workers including truck drivers during Operation phase.	Temporary shelter will be provided to the labor's during the construction work. Infrastructure is shown in layout plan.	**Figure 2.5, Chapter 2, Page 16**
11	**Enterprise Social Commitment (ESC)**		
i	Adequate funds (at least 2.5 % of the project cost) shall be earmarked towards the Enterprise Social Commitment based on Public Hearing issues and item-wise details along with time bound action plan shall be included. Socio-economic development activities need to be elaborated upon.	As per the OM dated 1st May 2018, proposed CER budget for the project is 3.2 crores. This budget will be used to meet the issue raised during Public hearing and for Social need assessment.	**Chapter 8, Item no 8.5 Page no: 182**
12	Any litigation pending against the project and/or any direction/order passed by any Court of Law against the project, if so, details thereof shall also be included. Has the unit received any notice under the Section 5 of Environment (Protection) Act, 1986 or relevant Sections of Air and Water Acts? If so, details thereof and compliance/ATR to the notice(s) and	NA	--

	present status of the case.		
13	A tabular chart with index for point wise compliance of above TOR.	Complied	**Attached with EIA report**
A	**Specific ToR**		
1	List of existing distillery units in the study area along with their capacity and sourcing of raw material.	There is not any existing unit in the study area.	
2	Number of working days of the distillery unit.	330 days	--
3	Details of raw materials such as molasses/grains, their source with availability.	Details of raw materials such as molasses/grains, their source with availability are incorporated in the EIA report.	**Chapter 2 Table 2.3 Page 22**
4	Details of the use of steam from the boiler.	Steam will be used for the power generation.	**Chapter 2 Table 2.3 Page 22**
5	Surface and Ground water quality around proposed spent wash storage lagoon, and compost yard.	Surface and Ground water quality report enclosed in the EIA report.	**Annexure-v**
6	Plan to reduce spent wash generation within 6-8 KL/KL of alcohol produced.	The Project is based on the ZLD Scheme.	**Section 2.9, Chapter 2, Page 27**
7	Proposed effluent treatment system for molasses/grain based distillery (spent wash, spent lees, condensate and utilities) as well as domestic sewage and scheme for achieving zero effluent discharge (ZLD).	Spent wash will be treated in the Multiple effect evaporator and Spent less will be treated in the Condensate polishing unit. Domestic waste water will be treated in the Septic tank.	**Section 2.9, Chapter 2, Page 27**
8	Proposed action to restrict fresh water consumption within 10 KL/KL of alcohol Production.	Fresh Water is consumed @ 7KL/KL of alcohol production	**Section 2.8.5, Chapter 2, Page 27**
9	Details about capacity of spent wash holding tank, material used, design consideration. No. of Piezometers to be proposed around spent wash holding		**Section 2.5 & 2.7, Chapter 2, Page 17 & 18**

	tank.		
10	Action plan to control ground water pollution.	Rain Water Harvesting Scheme shall be adopted to supplement the ground water recharge.	**Section 3.7, Chapter 3, Page 55**
11	Details of solid waste management including management of boiler ash, yeast, etc. Details of incinerated spent wash ash generation and its disposal.	Incorporated in Chapter 2 of EIA report.	**Section 2.9, Chapter 2, Page 27**
12	Details of bio-composting yard (if applicable).	Not Applicable	--
13	Action plan to control Odour pollution.	Action plan to control Odour pollution.	**Chapter 4, Item 4.4.5 Page no 126**
14	Arrangements for installation of continuous online monitoring system (24x7 Monitoring device).	Online stack monitoring station will be installed for the proposed project.	**Complied**

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CHAPTER-1 : INTRODUCTION

1.1 INTRODUCTION

Indian Sucrose Limited (ISL) is an integrated conglomerate, primarily engaged in manufacture of sugar and allied products. ISL is one of the fastest and most progressive Companies in India. From a humble beginning in 1990, ISL today is a multi-faceted, fast growing Company with a strong presence in diversified fields such as sugar manufacturing and power generation. Company belongs to Yadu Corporation, a well known name in Manufacturing, Marketing and Trading of Sugar.

Our plant is located in Hoshiarpur district of Punjab- an area with focused concentration of cane production on highly fertile land.

The ISL proposed to Setting up of 120 KLD Molasses based ethanol plant and 4 MW co-generation power plants.

The aggregated capital investment for the integrated project has been estimated at **Rs. 160.00 Crore**.

1.2 PURPOSE OF THE REPORT

As per the EIA Notification dated 14th September 2006, as amended from time to time; it is mandatory for distillery projects '5g' to obtain prior Environment Clearance from Ministry of Environment, Forests and Climate Change (MoEF&CC), Government of India, New Delhi. The purpose of the EIA report is to provide a coherent statement of the potential impacts of proposed project and the measures that should be taken to establish the impacts and suggest mitigation measures. It contains essential information for:

- EIA report is prepared to study the existing environment of the study area (10 Km) & its impacts on surrounding environment due to installation & operation of the proposed project.
- Report evaluates proposed tentative impact of Risk to people (Hazard impact zone), Air quality, soil quality, water quality and Socio-Economic parameters.
- Report also focuses preparation of budget for environmental measures, CER, CSR activities, Occupational health measures & budget.

1.3 IDENTIFICATION OF PROJECT & PROJECT PROPONENT

1.3.1 PROJECT DETAILS

The ISL has proposed 120 KLPD Molasses based ethanol plant and 4 MWco-generation power plants. Project will produce fuel ethanol and Extra Neutral Alcohol from molasses as raw materials in Village Chak Allabaksh, Tehsil-Mukerian, District-Hoshiarpur, and Punjab.

1.3.2 PROJECT PROPONENT

1	**Name**	:	Mr. Ved Gupta
	Registered address	:	Sucrose Limited, G. T. Road, Mukerian – 144211,District Hoshiarpur, Punjab
	Mail	:	Ved.gupta@yaducorporation.com
	Mob	:	7290072110
2	**Name**	:	Mr. Deepak Yadav
	Registered address	:	202/47, Thapar Arcade Kalu Sarai, Hauz Khas, Delhi-110016
	Phone	:	+91-7290072111

Mail : Deepak.yadav@yaducorporation

Besides this, the management team comprises of many other senior members. The company is managed by well-qualified persons having progressive attitude and qualification.

1.4 BREIF DESCRIPTION OF NATURE, SIZE, LOCATION OF THE PROJECT AND ITS IMPORTANCE TO THE COUNTRY AND REGION

1.4.1 SIZE OF THE PROJECT

M/s Indian sucrose proposed the 120 KLPD Molasses based ethanol plant and 4 MWco-generation power plants (Extra neutral alcohol 111.6 KLPD, Technical alcohol 8.6 KLD).

1.4.2 NATURE OF THE PROJECT

As per EIA Notification dated 14th Sept., 2006 and amended from time to time, the proposed project falls under Category "A", Project or Activity 5(g) due molasses based distillery greater than 100 KLD.

1.4.3 LOCATION OF THE PROJECT

The project will be located adjoining to its Sugar plant at the Village Chak Allabaksh, Tehsil-Mukerian, District-Hoshiarpur, Punjab in around 13 acres. The project is well connected with the Roads, Railways. The site is well connected to Mukerian Gurdaspur, Amritsar and Hoshiarpur through NH-1A, which is at 0.5 km.The nearest Railway Station, is Mukerian Railway Station approximately 3 km in North from project site.

Table 1.1: Silent Feature of the Project around 10 Km

S. No.	Particulars	Details
1.	**Location**	
a)	Village/ Town/Plot No.	Chak Allabaksh
b)	District	Hoshiarpur
c)	State	Punjab
d)	Latitude	31°55'32.53"N
e)	Longitude	75°37'34.46"E
f)	Toposheet No.	H43D9/I43V12
2.	**Elevation**	256-260m
3.	**Land use at the project site**	Non Industrial
4.	**Climatic Conditions**	
	Temperature Rainfall	Temperature Mean Maximum: 39^0C (May-June) Mean Minimum: 5^0C (January) Normal Annual Rainfall: 938 mm Normal monsoon Rainfall: 720 mm
5.	**Nearest highway**	NH-1A is 0.5 km at a distance in West SH-25 is 2.55 km at a distance in North
6.	**Nearest Railway Station**	Mukerian Railway Station is 3 km (approx) in North from the project site.

7.	**Nearest airport**	Sri Guru Ram Das jee International Airport Amritsar Airport is 95 km (approx) in South-West from the project site.
8.	**Nearest city/settlement**	Mukerian is 3 km (approx) in North direction from the project site.
9.	**Nearest Water bodies**	Beas river is at a distance of 6 km (approx) in South-West from project site. Mukerian Hydel Canal is at a distance of 7 Km (approx) in East from the project site
10.	**Total water Requirement**	885 KLD (Industrial: 840KLD, Domestic:45KLD)
11.	**Total Power Requirement**	3100 Kwh
12.	**Manpower Requirement**	98
13.	**Project Cost**	160 Crore
14.	**Features with 10 km :**	
i)	**Defence installations**	Nil
ii)	**Archaeological important places**	Nil
iii)	**Wild life sanctuaries**	Nil
Iv)	**Reserved/Protected forest**	No Reserved/Protected forest within 10KM of Project unit area.
vi)	**Rivers**	Beas river is at a distance of 6 km (approx) in South-West direction from project site. Mukerian Hydel Canal is at a distance of 7 Km (approx) in East direction from the project site.
vii)	**Hill ranges**	Nil
viii)	**State Boundary**	Nil

1.4.4 IMPORTANT TO COUNTRY & REGION

I. Demand and Supply gap

Demand: In 2016 ethanol demand in India is 2452 million ltr. In 2017, the ethanol demand in India is ~ 2500 million ltr (700 million liters for fuel ethanol and 1.8 billion liters for the industrial and chemical sectors). In the year 2018-19, the demand was further increase and by the end of 2020 the fuel blending rate will increas to 20%.

Supply: Ethanol production in 2016 is 2052 million liters Ethanol production in 2017 is 1900 million liters due to decline in cane planting for second consecutive year. In 2016, India is expected to import upwards of 440 million liters of ethanol. In 2017 Import volumes rise further to 600 million liters in out-year to augment local supply. United States stood as the largest supplier of ethanol to India followed by Brazil.

**Source- FAS/USDA Data*

II. Employment Generation

Form the proposed project 98 personnel will be employed and some of the indirect employment will also be generated from the project.

1.5 SCOPE OF THE STUDY-DETAILS OF REGULATORY SCOPING (AS PER TOR)

M/s Indian Sucrose. Ltd.has entrusted the EIA studies to **M/s Vardan Environet, Gurugram** to carry out the Environmental Impact Assessment (EIA) and preparation of EIA Report in order to obtain Environmental Clearance.

1.5.1 STRUCTURE OF THE REPORT

The entire EIA report is prepared based on the generic structure of EIA document given at APPENDIX III of the Notification No. S.O. 1533 dated 14th September, 2006 at MoEF& CC, New Delhi.

The report has been divided into twelve chapters as described below:

Chapter-1 gives information about the project proponent and the proposed project including its location and justification/importance, brief details around the surrounding area and details about site selection criteria considered. It also outlines the statutory requirement of obtaining prior Environment Clearance, steps to be followed for the same and basic purpose, scope and methodology of EIA study.

Chapter-2 is Project Description and infrastructure facilities incorporating all industrial and environmental activities of the project proponent for setting up of the proposed project for the manufacturing of Ethanol. It also gives information about manufacturing process and raw materials, sources of pollution and details of pollution control facilities to be provided i.e. water and waste water details, air pollution and control system, sludge storage facility, noise control measures etc.

Chapter-3 is Description of the Environment which includes Base Line Environment Study giving details about status of air quality, meteorology, water, noise, land, ecology and socio economic environment of the study area based on information collected through actual field study or from secondary sources.

Chapter-4 is Identification of Impacts (and its mitigation measures), which identifies the impacts of various environmental parameters whether beneficial or deleterious for the construction and operation phase of the project. It also quantifies significant impacts of the proposed project on various environmental components for the construction and operation phase of the project.

Chapter-5 Analysis of Alternatives (Technology and Site) identifies the description of each alternative, Summary of adverse impacts of each alternative, Mitigation measures proposed for each alternative

Chapter-6 is Environmental Monitoring Plan which provides details of monitoring plan of various environmental parameters as well as its frequency of monitoring.

Chapter-7 is Additional Studies which includes Public Consultation, Risk Assessment, Social Impact Assessment, R and R Action Plans

Chapter-8 is Benefits due to the proposed project including improvement in Physical infrastructure, improvement in the social infrastructure, Employment potential –skilled, semi-skilled and others

Chapter -9 is Environmental Cost Benefit Analysis

Chapter-10 Environmental Management Plan (EMP) incorporating measures to be adopted for mitigation of anticipated adverse impacts, if any safety measures, post-project monitoring program for environmental parameters, green belt development etc.

Chapter-11 is the Summary and Conclusion of the proposed Project, includes overall justification of the project

Chapter-12 is profile of consultant engaged for the monitoring and preparation of EIA report.

1.6 SUMMARY OF ENVIRONMENTAL LEGISLATION FOR PROPOSED PROJECT

Legal Channel	Responsible Ministries/Bodies	Objective of Legislation	Action Plan
The Water (Prevention & Control of Pollution) Acts1974/ Rules1975	CPCB, SPCB	The prevention, control and abatement of air pollution n	1. Not to discharge any effluent, not confirming to standards, prescribed by JSPCB into any stream, well, sewers or land 2. Not to discharge air pollutant(s) in excess of standards, prescribed by the State PCB 3. Obtain 'Consent to Establish' prior to establish any process, operation or treatment system 4. Obtain 'Consent to Operate' prior to operation of system which is likely to discharge effluent 5. Apply for renewal of the 'Consent to Operate' before the expiry 6. Comply with conditions as prescribed under consents
The Air (Prevention & Control of Pollution) Acts1981/ Rules1982	CPCB, SPCB	The prevention and control of water pollution and also maintaining or restoring the wholesomeness of water	
The Environment (Protection) Acts1986/Rules 1986 The Environmental Impact	MoEF,CPCB, SPCB	Protection and Improvement of the Environment	1.Prevent discharge or emission of environment pollutants in excess of the prescribed standards 2.Submit 'Environmental Statement' every year 3.Obtain prior "Environmental Clearance' from MoEF&CC in case of new project or for Modernisation / Expansion

Legal Channel	Responsible Ministries/Bodies	Objective of Legislation	Action Plan
Assessment (EIA) Notification, 2006			
Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016	MoEF, CPCB, SPCB, DGFT	Management & Handling of hazardous wastes in line with the Basel convention	1.It is the responsibility of the occupier to identify the hazardous wastes in their units and ensure proper handling and disposal. 2.Sri Venkatesh Iron & Alloys (India) Limited to take all steps to contain contamination, prevent accident and limit consequences on human being and environment 3.Obtain authorization from JSPCB and comply with the conditions. 4.Maintain records of Hazardous Waste generated in Form-3 and submit yearly return for generation, treatment, recycling, disposal etc., to SPCB in Form-4 5.Used Oil to be send / sold to the registered recycler, re-processor, registered authorized facility 6.Shall be transported in accordance with the rule. 7.Site storage is allowed for 90 days only
Factories Act, 1948 (as amended till 1987)	Ministry of Labour, DGFASLI and Directorate of Industrial Safety and Health/Factories Inspectorate	Control of workplace environment, and providing for good health and safety of workers	1.Obtain and renew factory license and obtain permission for the site from State Government or the Chief Inspector of Factories in case of new or extension of any Factory. 2.Ensure health, safety and welfare of all workers while they are at work in the Factory as far as reasonably practicable. 3.Ensure effective and adequate ventilation of work place and adequate measures to be taken to protect workers particularly in the processes involving excessive temperature. 4.Ensure effective and adequate ventilation of work place and adequate measures to be taken to protect workers particularly in the processes involving excessive temperature.
The Central Motor Vehicle	Ministry of Shipping, Road	To consolidate and amend the	1.Ensure compliance to safety provisions in the transport vehicle carrying dangerous and hazardous substances inside works

Legal Channel	Responsible Ministries/Bodies	Objective of Legislation	Action Plan
Rules, 1989	Transport and Highways	law relating to motor vehicles including to regulate the transportation of dangerous goods with a view to prevent loss of life or damage to the environment	2.Display of emergency information panels at front, back and both side of vehicle 3.Every transporter to ensure safe transportation of dangerous/ hazardous goods. 4.Earthing chain for grounding, any prevalent static charge. 5.All motor vehicle entering the works shall have properly maintained brakes, lights, signal system for brakes, blinkers and registration number displayed, and valid Pollution under Control Certificate.
The Solid Waste Management Rules, 2016	CPCB, SPCB	To manage/ utilize the generated solid waste without damaging the environment and surroundings	1.Segregate waste in to three streams, Wet (Biodegradable), Dry (Plastic, Paper, metal, wood, etc.) and domestic hazardous wastes (diapers, napkins, empty containers of cleaning agents, mosquito repellents, etc.) and handover segregated wastes to authorized rag-pickers or waste collectors or local bodies.
Batteries (Management and Handling) Rules, 2001.	SPCB, CPCB and MoEF&CC	To control the hazardous waste generation (lead waste) from used lead acid batteries	1.It is the responsibility of the generator to ensure, used batteries are not disposed of in any manner other than depositing with dealer, manufacturer, importer, re-conditioner registered recycler or at designated collection centre 2.Submit half yearly return for disposal of used batteries to State PCB by 30th June & 31st December, every year 3.In case of auction, ensure batteries are auctioned to the registered recycler only 4.File half yearly return for the auction 5.Maintain record for such auction

Legal Channel	Responsible Ministries/Bodies	Objective of Legislation	Action Plan
E-Waste (Management) Rules, 2016	SPCB, CPCB and MoEF&CC	To recycle/manage the electronic waste from the industry	1. Shall make provisions for collection of e-waste generated from 'end of life' of their products and shall ensure that such e-wastes are channelized to registered dismantler or recycler, In line with the principle of 'Extended Producer Responsibility'. 2. Set-up of collection centres or take back systems either individually or collectively. 3. Finance and organize a system to meet costs involved in the environmentally sound management of e-waste generated from the 'end of life' of its own products. 4. Create Awareness
The Boiler Acts 1923 & Rules 1950	State Government, District magistrate	To register the boilers used in industry	1. Ensure availability and effective functioning of steam vents, safety valve, drain valve, monitoring instruments of critical parameter through regular checks and maintain records for the same. 2. Obtain authorization for boilers and their renewal prior to due date and / or when an accident occurs to the boiler / when any structural alteration / addition / renewal is made. 3. Ensure mandatory registration of boilers. 4. Ensure to obtain prior approval before taking any alteration and renewals to steam pipes after submitting plan and report. 5. Ensure to obtain prior approval before taking structural alteration, addition and renewal to boilers from Chief Boiler Inspectors. 6. Ensure prior examination of boiler by Inspector during & after any repair/shut down and maintain record for the same. 7. Report accident / incident or any severe damage to property, human life within 24 hours giving details of occurrence.
The Fly ash Notification, 1999 as amended in 2016	State/District Board	To re use the fly ash generated from the industry for other purposes	1. At least 20% of dry ESP fly ash shall be made available free of charge to units manufacturing fly ash or clay-fly ash bricks, blocks and tiles on a priority basis over other users and if the demand from such agencies falls short of 20% of quantity, the balance quantity can be sold or disposed of by the power station as may be possible. 2. Ensure 100% utilisation of Fly-ash

Legal Channel	Responsible Ministries/Bodies	Objective of Legislation	Action Plan
Noise Pollution (Regulation and Control) Rules, 2000 and its amendments	CPCB, SPCB, MoEF&CC	To maintain the noise levels with respect to the place/equipment/ industry	1.Noise Quality Monitoring & submission of reports on weekly/monthly basis. 2.Providing Ear plugs and Muffs to the workers working in noise prone areas. 3.Dampening the source noise level or making the noise characteristics less annoying by providing suitable enclosures and barriers.
The Municipal Solid Waste (Management and Handling) Rules, 2016	CPCB,SPCB	To maintain solid waste generated in accordance with the provisions of the Rule relating to collection, segregation, storage, transportation, processing and disposal.	1.Application for authorization to CPCB/SPCB Annual report for management of MSW inside the work premises. 2.Monitoring compliance of air and water quality 3.Collection, Segregation, Storage, disposal of MSW.

CHAPTER-2 : PROJECT DESCRIPTION

2.1 INTRODUCTION

In India Ethanol is produced mainly from the molasses & grain. According to the Department of Food & Public distribution, India has 735 installed sugar factories in the country as on 31.01.2018 and approx 600 Distillery Industries.

This chapter highlights the features of proposed 120 KLD molasses based distillery and 4 MW co-generation power plant with respect to plant configuration, raw material requirement,utilities and services, infrastructural facilities and sources of waste generation, their quantity,treatment and safe disposal of the waste.

2.2 TYPE OF PROJECT

This is the new project apply under the category-A (molasses based distillery greater than 100 KLD), activity 5 (g).

ToR application on the MOEF&CC portal was applied on dated 5th December 2018 and Standard ToR was granted on dated 7th January, 2019.

2.3 NEED & JUSTIFICATION OF THE PROJECT

- Bio-fuels are derived from molasses which is the by-product from the sugar industry and therefore provide a strategic advantage to promote sustainable development and to supplement conventional energy sources.
- Fuel grade ethanol is cleaner fuel as compare to diesel.
- Generation of revenue to the State.
- By product (Molasses, baggase) from our existing Sugar Mill will be sed as the raw material for the production of Fuel grade Ethanol, hence leading to sustainable development.

2.4 LOCATION OF THE PROJECT (MAPS SHOWING GENERAL LOCATION, SPECIFIC LOCATION, PROJECT BOUNDARY AND PROJECT SITE LAYOUT)

The project will be located adjacent to its existing Sugar plant in about 13 acres. The center geographical coordinate for the project site are 31°55'32.53"N Longitude-75°37'34.46"E.No forest land is involved in the project site.

The Location map, Topographic map and Google map are shown in Fig. 2.1, 2.2 and 2.3 respectively.

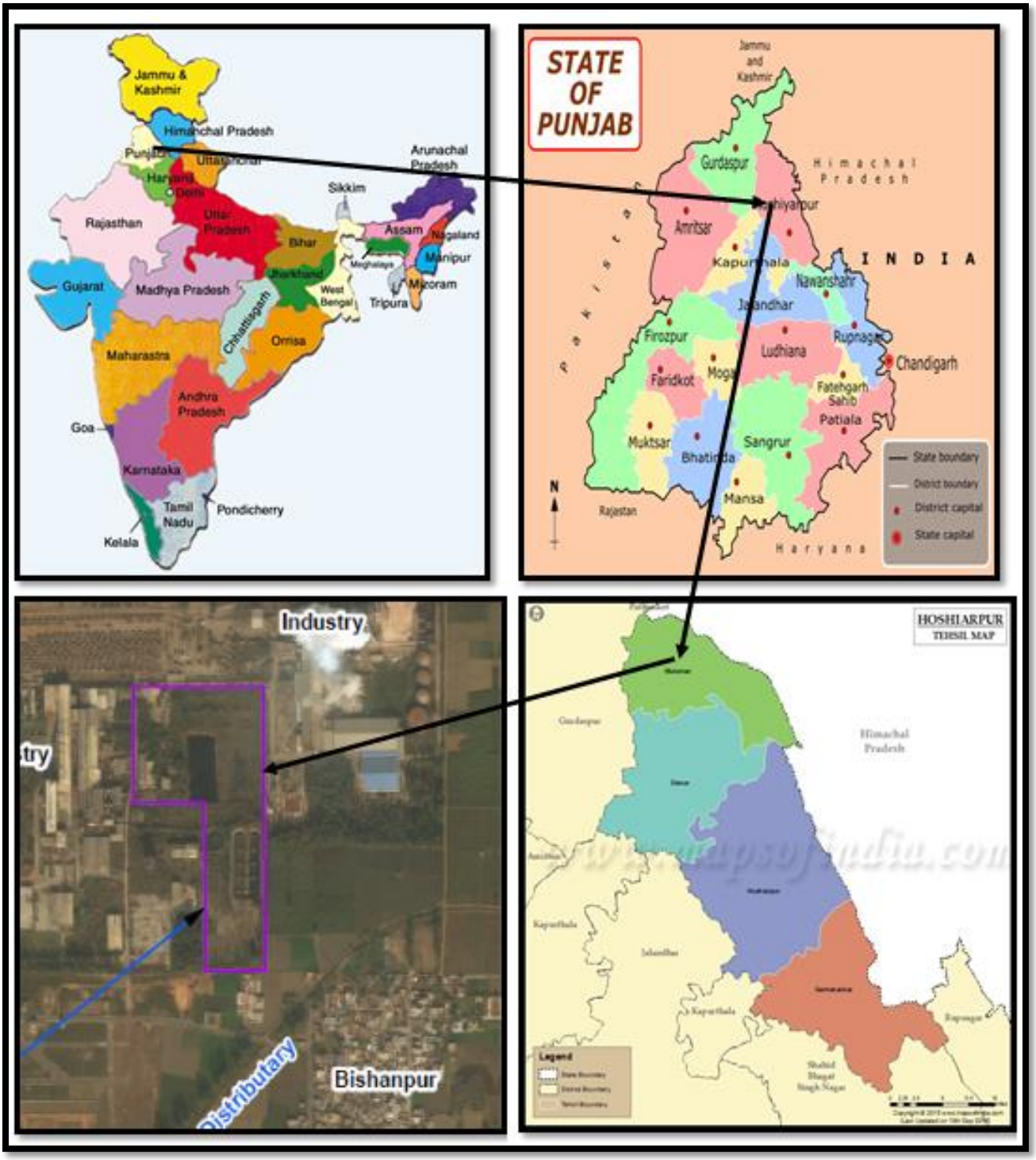


Figure 2-1: Location Map of the Project Site

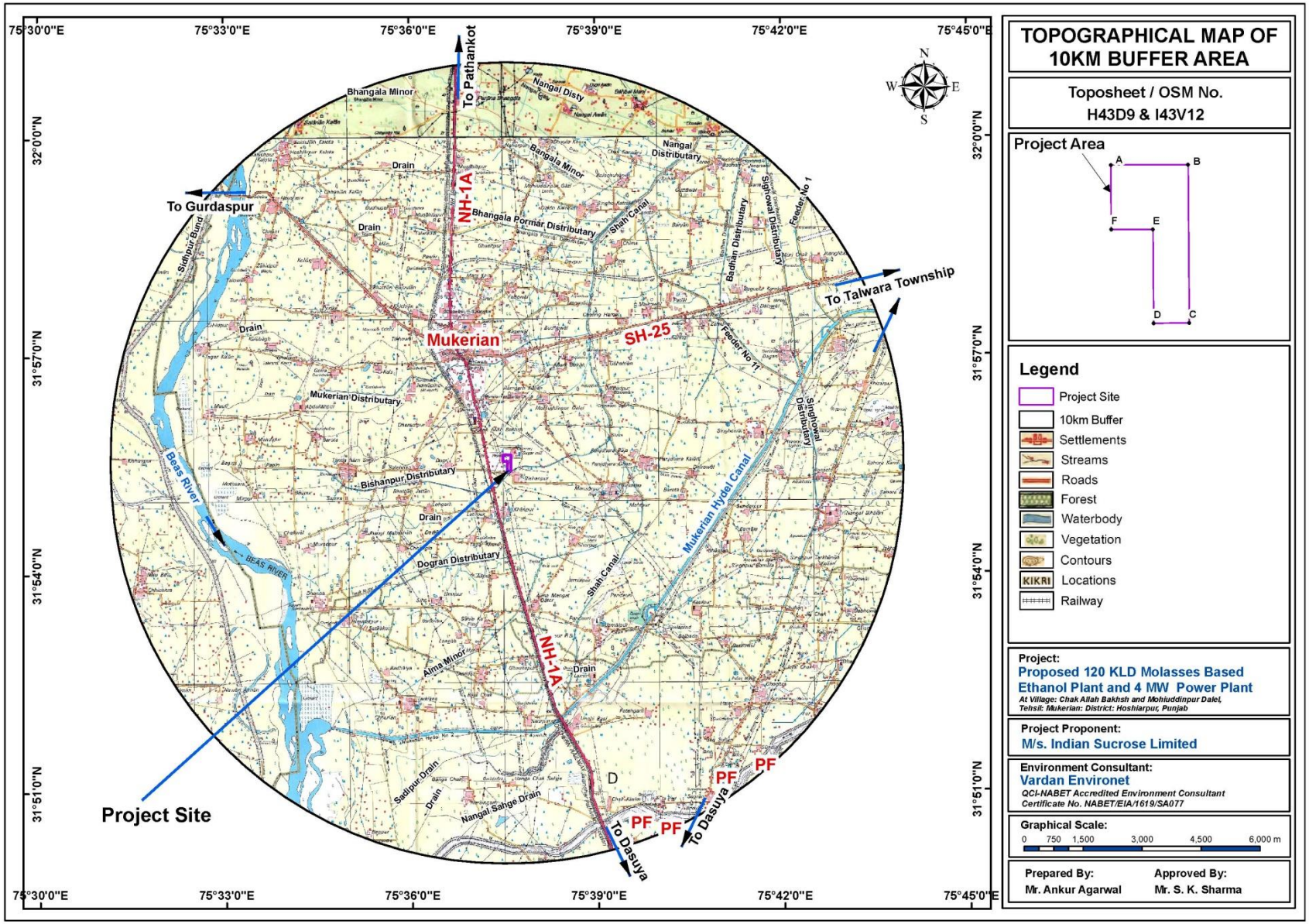


Figure 2-2: Topographic Map of 10 km radius study area.

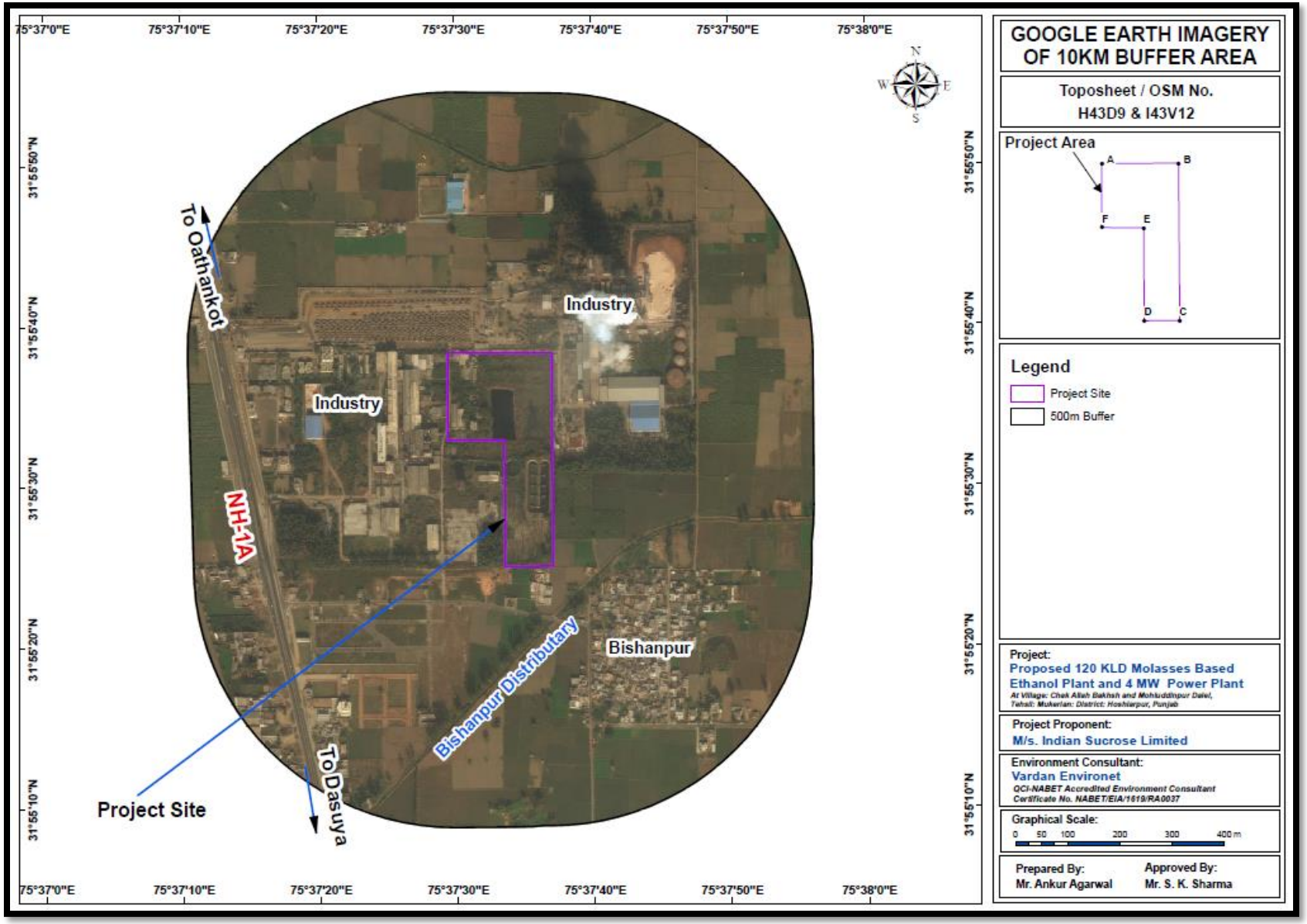


Figure 2-3: Google Image of the project Site

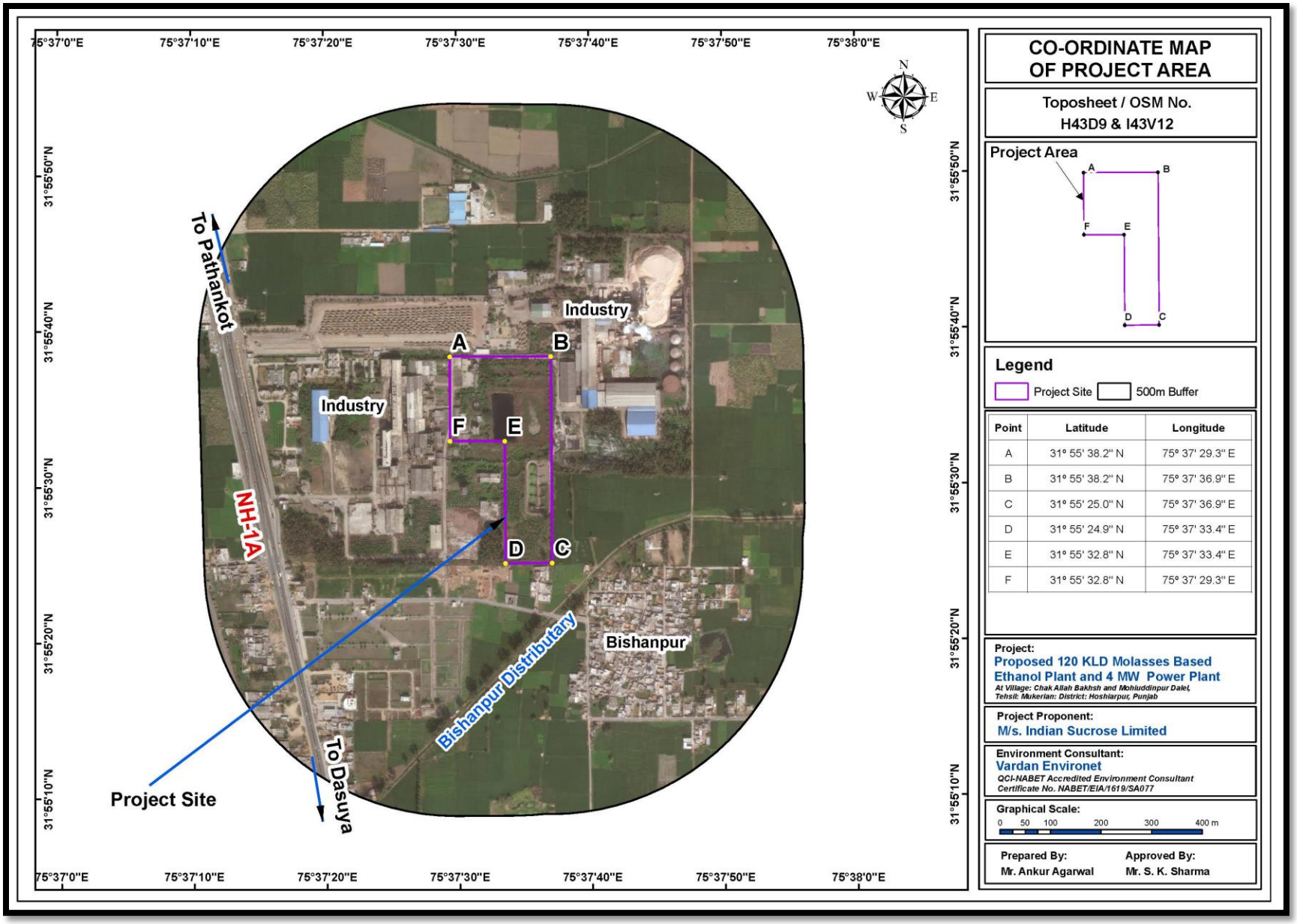


Figure 2-4: Coordinate Map of the Project Site

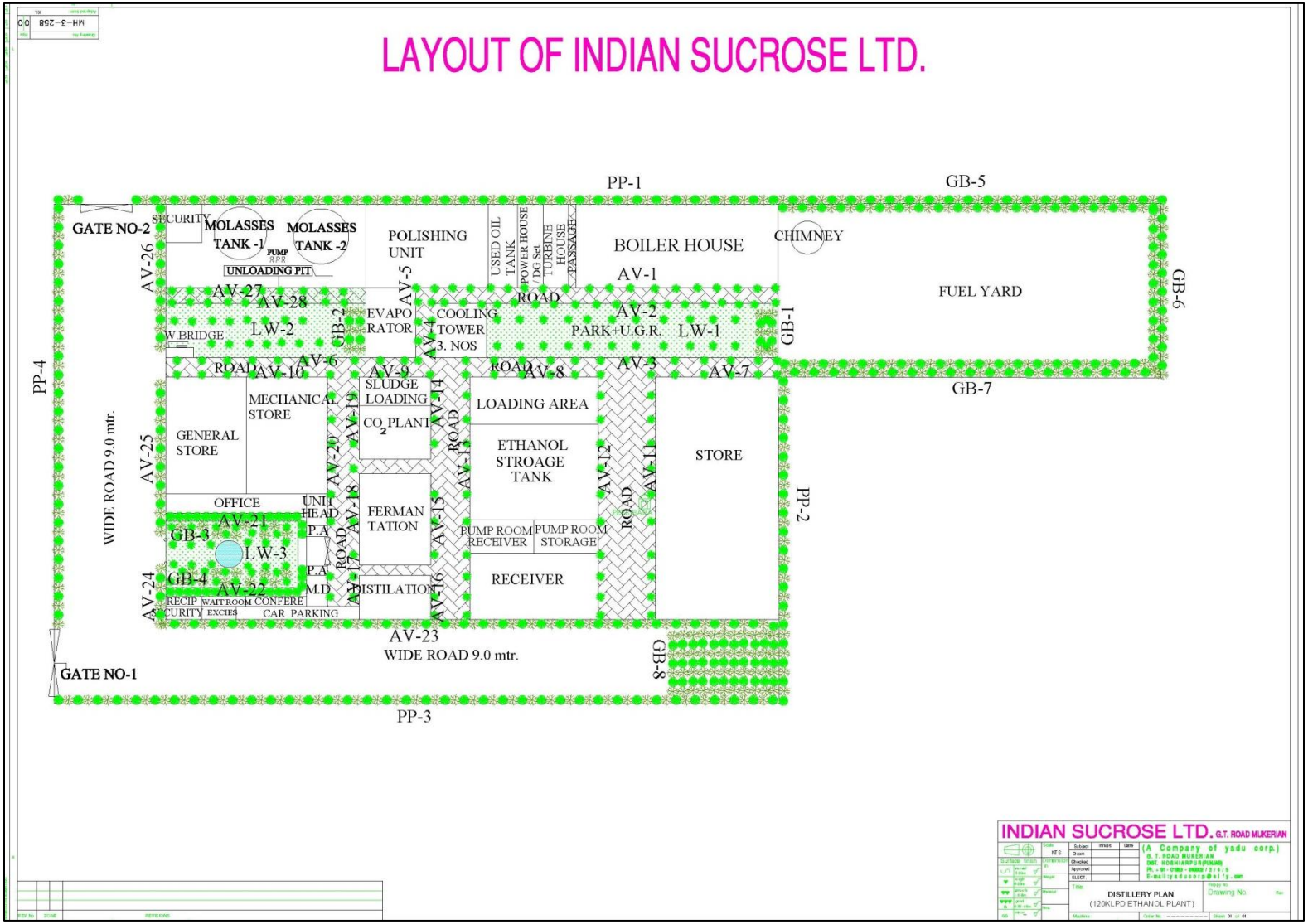


Figure 2-5: layout Map of the Project Site



Figure 2-6: Site Photograph of the Project Site

2.5 SIZE AND MAGNITUDE OF OPERATION

M/s Indian sucrose proposed the 120 KLPD Molasses based ethanol plant and 4 MWco-generation power plants is describe in the below table:

Table 2.1: List of Product & By Product

Product	
Ethanol	120 KLD
By-Product	
CO_2 gas	~ 90 tonn/day
Concentrated spent wash	~ 350tons per day with55 % w/w solids content.

***Note**: Above figures are indicative and will be confirmed after detailed engineering.*

2.6 PROPOSED SCHEDULE FOR APPROVAL AND IMPLEMENTATION

The tentative project schedule for the entire process of obtaining Environmental Clearance is given below:

Table 2.2: Proposed Project Implementation time

Date	Activity
5th Dec.2018	Submission of online application (Form-1 & PFR)
7th Jan.2019	Standard ToR issued by MoEF&CC
Oct-Dec 2018	Baseline Study
January 2019	Draft EIA submission for Public Hearing
11th June 2019	Public Hearing

The implementation of the project will be taken up after Environmental clearance from the Ministry of Environment, Forests and Climate Change (MOEF&CC), Government of India and receipt of Consent to Establish/Consent to Operate from Punjab State Pollution Control Board (PSPCB).

2.7 TECHNOLOGY AND PROCESS DESCRIPTION:

The process envisages use of own as well as procured molasses from nearby sugar factories for manufacture of ethanol during sugar factory season and during off-season days molasses will be purchases from the sister industry.

1. ***Fermentation System***
2. ***Distillation & Fuel Ethanol***
3. ***Effluent treatment system***

Following is a brief description of the process:

1. **Fermentation:** In this process, molasses with solids-content of about 76-90% is diluted up to 20-25% solids and fed to the fermentation tank where it is inoculated with propagated yeast culturewhich can withstand variations in the raw material quality, temperature and other shock loads in about 10 : 1 proportion.Fermentation plant consists of four Fermenter tanks operated one after the other in batch mode with all the accessories like plate heat exchangers for cooling, spargers, broth mixers and air blowers etc. The yeast remains in the fermentation plant throughout and hence it gives tremendous advantages in maintaining the yeast population and in combating the bacterial infection. The purpose of Fermentation is to convert the fermentable sugars into alcohol. During Fermentation, sugars are broken down into alcohol and carbon-dioxide. Significant heat release takes place during Fermentation. The fermenter temperature is maintained at around 30 – 32^{o}C by forced recirculation flow through plate heat exchangers. We have given a provision for spent wash recycled to Fermentation depending on solids concentration in fermented wash. The general chemical reaction involve during the fermentation is as:

$$C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2 + 26 \text{ Calories}$$

The rate of fermentation reaction gradually increases and fermentation completes after 30 to 32 hours. Aftercompletion of reaction the fermented mash is delivered to wash holding tank (Beer well). The fermented mash collected in the mash Tank is then pumped to Analyser column for distillation. The CO2, which is liberated, is scrubbed in water, with the help of CO2 Scrubber. This CO2 contains ethanol, which is recovered by collecting CO2 Scrubber water into mash tank. A closed loop cooling tower system with an induced draft-cooling tower with circulation pumps is also provided to ensurehigher cooling efficiency and to minimize water wastages.

DISTILLATION OPERATION: -

In the Multi-pressure Distillation, the Ethanol is separated, concentrated, purified and then refined by using principal of fractional distillation, based on difference in boiling points of volatilecompounds in the mixture. The Multi-pressure Distillation approximately requires 50 % less steam as compared with the conventional old Atmospheric Distillation Technologies. The Vacuum Distillation Consists of Distillation Columns with High Efficiency Column Trays, Condensers, Reboilers, Vacuum Pumps and Reflux Pumps. A Closed Loop Cooling Tower System with an Induced Draft-Cooling Tower with Circulation Pumps is also proposed to ensure Higher Cooling Efficiency and to minimize the Water Wastages due to evaporation losses.

In this scheme, we are using **SIX** columns viz. Analyser cum, Degasser Column (under vacuum), Prerectifier Column (under Pressure), Hydro column (under Atm), Rectifier column (under pressure), Simmering Column (under atm.) and Recovery Column (under atm.) The Fermented Mash will be preheated first by the Simmering column top vapours till 55 deg. C and then heated to 72 deg. C by the Hydro Purifier column rest vapours. The preheated wash will be then fed to the top tray of

Degasser Column where the wash will flash causing dissolved CO2, some water and ethanol vapours to leave the top of the column. The Degasser column vapours will contain low boiling organic impurities along with the flashed CO2, water and ethanol. These vapours condensed in the degasser condenser and fed into the Recovery column, the CO2 and non-condensable gases will be out from the system through vacuum system. The degassed wash will leave from the bottom of the Degasser Column and fed to Analyser Column.

Analyser Column will be equipped with a Flash tank and a thermo-siphon Reboiler that is heated using an integrated vapour stream produced from Rectifier column. The Vapours generated in the flash tank will be fed to the Analyser Column. These vapours will travel up the column and strip the ethanol off of the Mash feed. The stripped Mash called 'Spent Wash' will leave from the bottom of the column. The spent wash will be pumped to decantation section followed by Evaporation section for further processing. The stripped ethanol and water vapours leaving the top of the Analyser Column will be fed to the first effect of the **Integrated Evaporation**. The integrated Evaporationsection will contain series of Evaporators operating under vacuum. Each effect gets the heat from its previous effect. The Spent wash gets concentrated as it travels in forward direction. In this unit we have two falling film Evaporators and one force effect. The forced circulation (Finisher) Evaporator fed with steam in order to get 30 – 35 % w/w concentration of the spent wash. The vapours generated from the forced effect are used to heat the second falling film evaporator. The second falling film vapours are condensed in a Surface condenser. The condensate is call process condensate and it can be re-used as make-up water after a normal treatment. The Analyser column vapours will be condensed in the first effect and the condensate will be collected in a Condensate Collection tank. Remaining uncondensed vapours will be condensed by a pair of shell & tube condenses operated in series and cooled by cooling tower water. Further remaining uncondensed vapours will be piped to a scrubber where ethanol is recovered before venting to the atmosphere. The Analyser column condensate will be fed to Pre-rectifier column where the ethanol is further purified to produce the Rectified Spirit product.

Pre-rectifier column will be fed low proof ethanol streams i.e. from Analyser column condensate.The Pre-rectifier column will produce 95% v/v ethanol vapour stream from the top. The bottom stream from the column will not contain any ethanol, called Spent Lees. The Analyser column condensate will be preheated using the bottom stream. The Pre-rectifier column will be heated using Steam heated thermo-siphon Reboilers.Two streams from the middle of the column are drawn as LFO and HFO and will be cooled using shell & tube heat exchangers. The draws are combined and fed to a liquid-liquid decanter. Water is blended with thesestreams to produce a two phase liquid that will settle out in the decanter. An upper phase will be rich in Fusel alcohols and this will be sent to the storage section as Fusel oil product. The lower phase from the decanter will contain ethanol and water and will be sent to the Recovery column, which is a downstream distillation column associated with the production of a beverage grade product. The top vapours from Pre-rectifier column will be used to supply heat to the reboiler of Hydro column & Simmering Column. The portion of condensate from first vent condenser

will be diverted to the IS collection tank to purge some low boiling impurities that will be building up in the Pre-rectifier column overheads. The condensate will be pumped back to the top of the Pre-rectifier column as reflux. A 95% v/v liquid stream will be drawn (RS Draw) from the top three trays of the Pre-rectifier Column. Process Water, fed to column, will help drive the organic impurities up to the top of the column. These organic impurities will be concentrated in the overhead vapours and subsequently in condensate stream and then a portion of this condensate will be purged back to the Recovery column.

A stream from the middle of the column will be drawn which will be ester rich stream. This stream is fed further to Recovery column.

Hydro Purifier column will be heated using thermo-siphon Reboiler which gets heat from the top vapours from Pre-rectifier column. The bottom stream of Hydro purifier column will be low proof ethanol that is relatively free from impurities, which will be sent on for further processing to Rectifier column. The stream will be preheated using bottom stream of Rectifier column.

Rectifier column will be operated in much same way as of Pre-rectifier column. A low proof stream of ethanol will be purified to 96% v/v (min.) top stream. Two mid column liquid draw streams will be directly fed to the Recovery column. A 95% v/v (min.) liquid stream will be drawn (ENA Draw) from the top three trays of the ENA Dist. Column. The top vapors of this column will supply heat to Analyser column. Some uncondensed vapours will be vented from the Reboilers which will be condensed by a pair of shell & tube condenses operated in series and cooled by cooling tower water.

The portion of condensate from first vent condenser will be diverted to the IS collection tank asImpure spirit to purge some low boiling impurities that will be building up in the Rectifier columnoverheads. The condensate will be pumped back to the top of the Rectifier column as reflux.The Rectifier column will be heated using Steam heated thermo-siphon Reboiler.The ENA draw from top of the column will be sent directly to

Simmering Column. This column will be used to strip off the additional low boiling organic impurities. These impurities will accumulate in Simmering overheads and subsequent condensate stream. The condensate will sent back to the column as reflux and a portion of this condensate will be sent to the storage as Impure Spirit (or Technical Alcohol).Simmering column will be heated using thermo-siphon Reboiler which gets heat from the top vapours from Pre-rectifier column. The bottom product from the Simmering column will be best quality **Extra Neutral Alcohol** product. This stream will be cooled using shell & tube heat exchanger that is cooled using cooling tower water and then sent to the storage section.

The **Recovery column** will be used to produce a top product that will be rich in ethanol, a bottom product that will be primarily water and a mid-column liquid stream that will contain the fusel alcohols. **Recoverycolumn** will be heated using thermo-siphon Reboiler which gets heat from the steam condensate tank flash vapours (Flash steam).The Recovery column top vapours will be condensed in the shell & tube condenses operated in series and cooled by cooling tower water. The condensate will be sent back to the column as reflux, with a portion sent to the storage section as Impure Spirit (or Technical Alcohol).Two streams from the middle of the column are drawn as LFO and HFO and will be cooled using shell & tube heat exchangers. The draws are combined and fed to a liquid-liquid decanter. Water is blended with these streams to produce a two phase liquid that will settle out in the decanter. An upper phase will be rich in Fusel alcohols and this will be sent to the

storage section as Fusel oil product. The lower phase from the decanter will contain ethanol and water and will be sent to the Recovery column, which is a downstream distillation column associated with the production of a beverage grade product.

The Distillation is operated with **PLC controls** system. This will help in maintaining the parameters consistent and without any fluctuations. Most modern ethanol plants use computer system for controlling their parameters.

INTEGRATED EVAPORATION: -

The same set-up is used to concentrate the spent wash from molasses route. Spent wash generatedfrom Analyser column bottom is fed directly to Integrated Evaporation section. It gets concentratedfrom 12 - 15 % w/w upto 22 - 25 % w/w solids concentration. The first effect gets heat from Analyser vapors and it drives 2nd effect. The vapor from 2nd effects drives 3rd effect. The vapors from last effect are condensed in surface condenser. The concentrated spent was (22 - 25 % w/w) is sentfurther to 'Stand-alone Evaporation' for concentrating it upto 55 - 60 % w/w.

STAND-ALONE EVAPORATION: -

In Stand-alone Evaporation Spent Wash, Combination of **Falling Film & Forced Circulation Evaporators** are used to concentrate the spent wash upto 55 - 60% w/w. There are total TWO Falling Film Type and THREE Forced Circulation Type Evaporators. Evaporators are in forward feedarrangement. The first effect gets heat from **Steam** at low pressure of **1.5 kg/cm2 (g.)** andtemperature about 125ºC. Vapours of last evaporator get condensed in a surface condenser.Evaporators are provided with CIP system. Forced circulation evaporator are designed in such waythat the flow velocity in the tubes is high, which prevent the choking of the tubes. Water Ring typeVacuum pumps are used to maintain the vacuum throughout the system. All the processcondensates are collected in a tank and send to condensate polishing Unit. Steam condensate iscollected and sent back to boiler feed tank. Final concentrated Spent Wash (55 - 60 % w/w) comesout from last effect and it is send to incineration type boiler as a fuel.

ABSOLUTE ALCOHOL PLANT: -

Absolute Alcohol Plant is based on Pressure Swing Adsorption using Molecular Sieves for Dehydration of ethanol. Alcohol with minimum 94.5 % v/v ethanol content is fed to Absolute Alcohol Plant. It is pre-heated using Feed-preheater against steam condensate. Then it is fed at the top plate of Regeneration Column.

This column gets heat from steam through a reboiler. The vapours from top of the column are passed through a Super-heater where the vapours are superheated using steam. The superheated vapours are then passed through Molecular Sieve Drum, which is filled with Molecular Sieves, which adsorbs the moisture from the superheated alcohol vapours.

Molecular sieves adsorb the moisture under pressurized condition, whereas it desorbs the moisture when subjected to vacuum conditions.

The outlet of molecular sieve drums, under pressure, is dehydrated ethanol vapours. These vapoursare condensed in product condenser. Further, the ethanol is cooled in a product cooler beforesending it to storage section.The outlet of molecular sieve drums, under vacuum, is weak alcohol vapours. These vapours are condensed in regeneration condenser. Once the moisture from the mol. Sieve drum is removed itgets regenerated. It becomes ready for next adsorption cycle. Further, this weal alcohol is

cooled in regeneration cooler and sent back to Regeneration Column.Water Ring type Vacuum pumps are used to maintain the vacuum throughout the system.Steam condensate is collected in a tank and sent back to boiler feed tank.

2. **Multi-Effect Evaporation:** Spent wash from the process is fed into multi effect evaporator. Whole process is under vacuum and vapor generated are compressed and used as steam. Condensate water generated from evaporation will be recycled back into the process; While concentrate spent wash will be incinerated in the proposed spent wash fired boiler.

3. **Condensate Polishing Unit**: The condensate polishing unit is also envisaged to take care of spent less, cooling tower blow down, washing and process condensate from evaporation plant. After treatment all the stream at CPU, water can be recycled to process and as cooling tower make up.

2.8 PROJECT DESCRIPTION

M/s. Indian sucrose Ltd. will make optimum utilization, recycling and reuse. These resources include Land, Fuel, Water and Electricity. Wastewater generated from Boiler and cooling tower blow down will be treated and recycled for further process, domestic & green belt development uses

2.8.1 RAW MATERIAL REQUIREMENT

The total raw material along with estimated quantity, its source and mode of transportation is given in the below table:

Table 2.3: Raw material details

S.no	Particular	Quantity	Source
1.	Molasses	480 TPD	Its own sugar industry & nearby sister industry (Bhawanpur & Bhogpur Sugar Mill)
2.	Steam	30 TPH	Its own boiler of capacity 45 TPH
3.	Yeast (Active Dry Yeast/Distiller's Yeast)	As required	From the market
4.	Sulphuric acid	30 kg/day	From the market
5.	Antifoam Agent	30 kg/day	From the market
6.	DAP / UREA Nutrients - 46 % w/w Nitrogen	60 kg/day	From the market
7.	Bagasse	20 TPH	From the market
8.	Biocides	12 kg	From the market
9.	Diesel	25 ltr/day	From the market

** The total requirement of molasses for the 330 days operation of the proposed distillery plant at optimum level of operation will be around 1,58,400 MT. ISL will use in house produced molasses of 54,000 MT and then balance 1, 04, 400 MT of molasses will be procured from sister unit or nearby sugar factories*

2.8.2 POWER REQUIREMENT

The total electricity requirement for this project is 3100 Kwh, will be met through its own power plant of capacity 4 MW.In case of emergency DG-sets will be used of capacity 600 KVA.

Table 2.4: Power Requirement for the project

Power Requirement	Operating	Connected
Molasses Storage & Handling	100	150
Fermentation	350	380
Distillation	150	300
Dehydration	60	80
Evaporation (Stand-alone)	350	400
Condensate Polishing Unit	100	150
Utilities	580	700
Water Treatment section	50	80
Plant Lighting	15	15
Boiler Section	400	600
Turbine Section	50	75
Alcohol Storage	30	60
Miscellaneous	100	100
Tentative Power Required	**2335**	**3090**

2.8.3 MAN-POWER REQUIREMENT

The total manpower requirement during the operation work will be **98 (approx)** and during construction work will be **50 (Approx).**

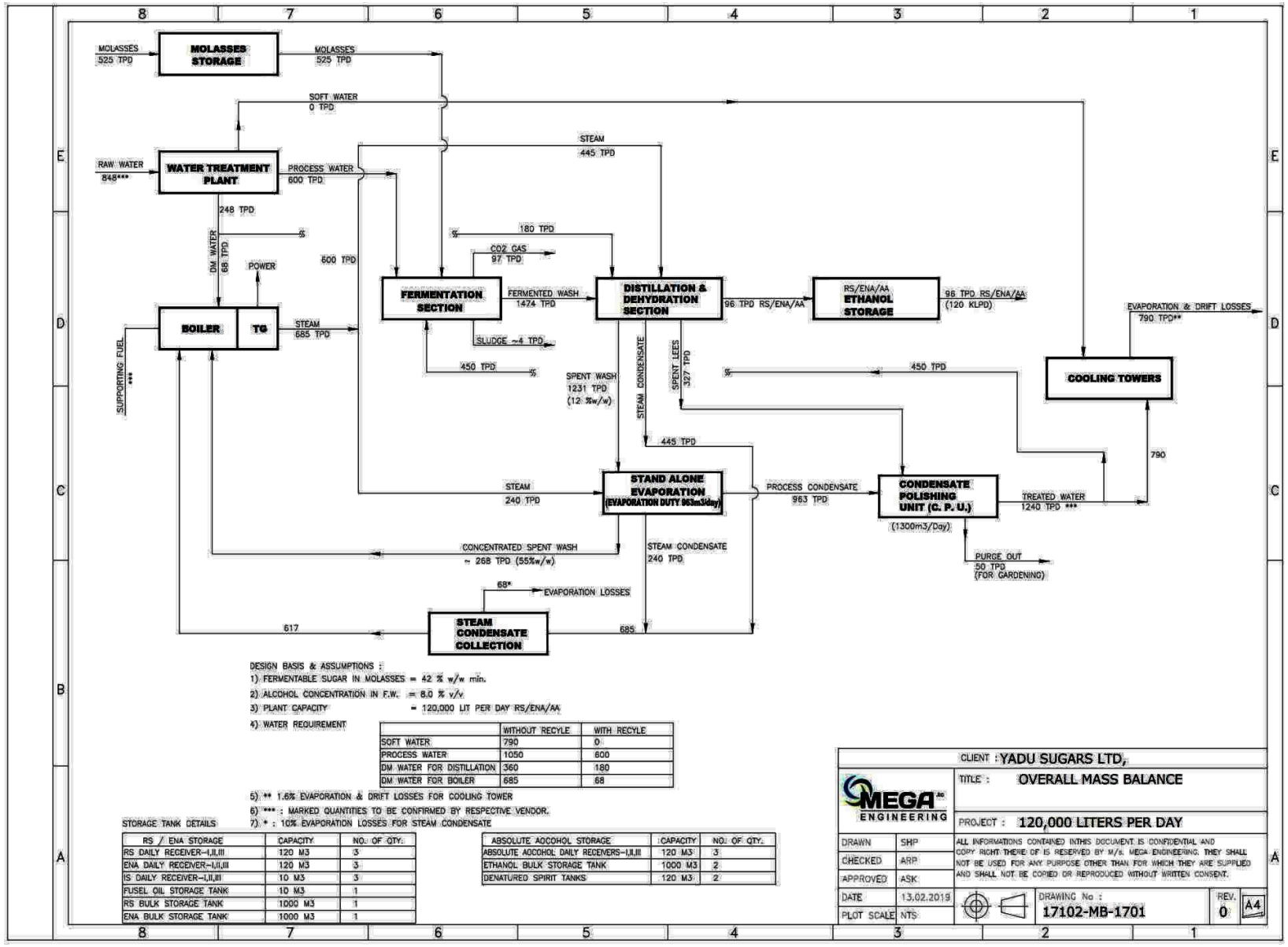
2.8.4 FUEL REQUIREMENT

Fuel quantity for the boiler will depend on the quantity of Stem required. Fuel burned in the boiler is the mixture of Bagasse and spent wash. The composition of spent wash is 30-35 %, if the sludge content in the spent wash is 50-60% brix (4000-6000 mg/kg) for the maximum gross value. The quantity of bagasse required will be ~ 20 TPH.

2.8.5 WATER REQUIREMENT

The water requirement will be about **7 m3 per day** of spirit including process water, boiler feed water, make up water cooling tower, DM water for distillation, which will be sourced from the bore well and ground water approval will be taken before the project setup. This water will be used for both domestic and Industrial purpose. Domestic water requirement for the project is **5 KLD** and Industrial water requirement is ~**848 KLD,** total water requirement will be **853 KLD** and this water will be source form Ground Water.

CGWA application for the withdrawl of Ground waterhas been applied vide application no **21-4/4688/PB/IND/2019** on dated **14-01-2019**. Details of water balance are given in **Fig 2.7.**



	WITHOUT RECYLE	WITH RECYLE
SOFT WATER	790	0
PROCESS WATER	1050	600
DM WATER FOR DISTILLATION	360	180
DM WATER FOR BOILER	685	68

RS / ENA STORAGE	CAPACITY	NO. OF QTY.
RS DAILY RECEIVER-I,II,III	120 M3	3
ENA DAILY RECEIVER-I,II,III	120 M3	3
IS DAILY RECEIVER-I,II,III	10 M3	3
FUSEL OIL STORAGE TANK	10 M3	1
RS BULK STORAGE TANK	1000 M3	1
ENA BULK STORAGE TANK	1000 M3	1

ABSOLUTE ACCOHOL STORAGE	CAPACITY	NO. OF QTY.
ABSOLUTE ACCOHOL DAILY RECEIVERS-I,II,III	120 M3	3
ETHANOL BULK STORAGE TANK	1000 M3	2
DENATURED SPIRIT TANKS	120 M3	2

Figure 2-7: Water Balance for the 120 KLD

2.8.6 LAND REQUIREMENT

The total Land area required for the project is 13 acres. This land is already acquired by the project proponent, which is adjacent to its sugar plant. Land document is enclosed in the EIA report.

This land will be used for the construction of Land Factory Building, Admin Building, Lab, Excise Office, Stores, Weigh bridge, storage, distillery machinery foundations, fermentation, distillation & evaporation, Pipe Racks, Cooling tower civil works (Basin Only), Raw water tank, Treated Water storage tanks, Fire water storage tank, Raw & Concentrated Spentwash holding tank, Condensate Polishing Unit civil work, Boiler foundations, Chimney & Auxiliaries, Turbine foundations, Structural work for Boiler & Turbine, Ash & Fuel handling system foundations. The detailed Land use pattern of the study area is describe in the below table.

Table 2.5: Land use breakup for the Study area

S.No	Land Usage	Area in Acres	Ha
1	Paved Area	1.27	0.52
2	Open area	1.57	0.63
3	Green Belt	4.3	1.74
4	Rooftop Area	5.86	2.37
	Total Area	**13**	**5.26**

2.8.7 PROJECT COST

The estimate capital cost is based on Cost & Prices and Taxes & Duties. The total capital requirement for the proposed project has been estimated is **Rs 160 Crore.** The cost estimates for major plant & equipment are based on indicative prices received from reputed suppliers. The cost of Civil & Structural steel works are based on estimated quantities and the prevailing composite rate of civil & structural work.

Table 2.6: Cost Breakup for the Project

Particulars	Cost (In lakhs)
Land and Site Development	312
Buildings	2040
Indigenous Plant and Machinery	11346
Miscellaneous Fixed Assets	671
Prelim. & Preoperative Expenses	774
Contingencies	597
Working capital margin	260
Total	16000

2.9 DESCRIPTION OF MITIGATION MEASURE INCORPORATED IN TO THE PROJECT TO MEET ENVIRONMENTAL STANDARD, ENVIRONMENTAL OPERATING CONDITION OR OTHER EIA REQUIRENMENT

S.no	Particulars	Mitigation measures to be adopted
1	Air Environment	• Air pollutant from a Ethanol plant is basically from boiler and having PM in the range of 150 mg/Nm^3, Sox & Nox emission will also be there but in very minimum quantity as the Sox percentange is very low in the agro based fuel.

		• These are particulates in the flue coming from fuel *i.e.* bagasse + Spent wash • The control the particulate emissions ESP will be installed and particulate matter value will be maintain less than 50mg/m^3 as per standards of CPCB. • Online stack monitoring system for regular monitoring of (for Particulate Matter) will be installed and transmission of online data to Punjab Pollution Control Board and CPCB will be done.
2	Water Environment	• The proposed Ethanol plant will be based on "Zero Liquid Discharge" (ZLD). • Spent wash from the fermentation tank & Decanter will be treated in the Multiple Effect evaporators. • Spent less water from the distillation column, dehydration, boiler blow down, cooling tank will be treated in the Condensate Polishing Unit (CPU). • Treated water from the CPU will be used as make up water for the boiler, cooling tower and in the back in process again. • Online monitoring station will be installed and results will be transmitted to the PPCB websites to maintain the ZLD. • Rain water harvesting would be proposed by the proponent for the proposed project to maintain the water table.
3	Solid/Hazardous Waste Environment	• Boiler ash will be collected by the mechanical dust collected and given to authorized vendor for the Brick manufacturing. • MEE salt will be burnt in the boiler. • Yeast Sludge from the fermenter tank and decanter will be dried in the lagoon and would be used as the cattle feed. • Used oil which will be in minimum quantity would be given to authorized vendor for disposal. • Other solid waste like plastic container, tank would be sold to authorized vendor.
4	Noise Environment	• All equipment shall be of standard make and equipped with silencer. • Closed rooms shall be provided for all the utilities so as to attenuate the noise pollution. • High noise zone should be marked, and earplugs/earmuffs shall be provided to the workmen near high noise producing equipment. The workmen should be made aware of noise and vibration impacts on their health and mandatory use earplugs. • All pipes and valves (including pressure control valve) shall be one schedule higher than needed by pressure considerations to attenuate noise. • Silent DG sets shall be used. • Regular noise monitoring shall be carried at project site and baseline monitoring stations to check compliance with prevailing rules. • All statutory precautionary measures will be implemented. • Vehicles/machinery shall be regularly maintained (by oiling/greasing)

		to produce less noise. •
5	Odour management	• Maintaining the pH in the range 5_9 and temperature will be maintained for the reaction. • Better housekeeping will maintain good hygiene condition by regular steaming of all fermentation equipment. • Use of efficient bio-cides to control bacterial contamination • Greenbelt with dense trees shall be developed around the periphery of the plant to reduce odour problem.

2.10 ASSESSMENT OF NEW & UNTESTED TECHNOLOGY FOR THE RISK OF TECHNOLOGICAL FAILURE

Molasses based distillation manufacturing technologies are well proven technology all over the world. Hence there will not be any risk of technological failure from this proposed expansion project.

CHAPTER-3 DESCRPITION OF THE ENIRONMENT

3.1 INTRODUCTION

This chapter illustrates the description of the existing environmental status of the study area with reference to the major environmental attributes. The existing environmental setting is considered to establish the baseline conditions which are described with respect to physical environment, air environment, water environment, noise environment, traffic pattern and density, land environment, biological environment and socio economic environment.

The monitoring of environmental parameters has been conducted within the core zone and buffer zone (10 km radial distance) from project site, in accordance with the guidelines issued by the Ministry of Environment, Forests and Climate Change, CPCB, and SPCB during the study period (October to December,2018).

Baseline Environmental status in and around the M/s Indian Sucrose Ltd., depicts the existing quality of Air, Noise, Water, Soil, Ecology & Biodiversity and Socio-economic environment. Based on the baseline data, environmental impact assessment is carried out and Environmental Management Plan is prepared.

This baseline environmental study reveals information on existing environmental scenario.

- Delineation of project site and study area.
- Delineation of the environmental components and methodology
- Delineation of study period.
- Delineation of the location of the Plant and description of its surroundings based on secondary data.

After delineation of the above for the present case the following studies were conducted:

- Baseline data generation/establishment of baseline for different environmental components
- Baseline status of the existing plant site operating facilities.
- Traffic density at the inter-phase of project site and study area.

3.2 STUDY AREA

Studies of various environmental parameters have been done within 10 km radius area of the proposed project site. The impact identification always commences with the collection of baseline data such as Ambient Air Quality, Micro-Meteorology, Ground and Surface Water Quality, Noise levels, Soil Quality, Land use pattern, Biological Environment and Socio-economic aspects, Solid and Hazardous waste, Risk Assessment, Geology and Hydrology within the study zone of 10 km. radius.

3.3 STUDY PERIOD

The baseline environmental study has been done for the period of October to December 2018 by M/s. Vardan Envirolab, Gurgaon, NABL Accredited Lab, Certificate No. TC-6299 (Certificate enclosed) in accordance with the Guidelines for EIA issued by the Ministry of Environment Forests and Climate Change, Govt. of India and CPCB, New Delhi. Secondary data also collected from different sources.

3.3.1 COMPONENT & METHODOLOGY

The data was collected from both primary and secondary sources. The baseline information on micro-meteorology, ambient air quality, water quality, noise levels, soil quality and floristic descriptions are largely drawn from the data generated by M/s Vardan Enviro Lab, Gurgaon (NABL Accredited Lab). Long term meteorological data recorded at the nearest IMD station, **Kapurthala** (66 km from project site) was taken. Micrometeorological data at site was recorded using automatic weather station. Apart from these, secondary data have been collected from Census Handbook, Revenue Records, Statistical Department, Soil Survey and Land use Organization, District Industries Centre, Forest Department, Central Ground Water Authority, etc.

The studies involved conducting field studies and analyzing various parameters that might be affected due to the industry and conducting socio-economic survey among the people. For reconnaissance survey the sampling locations were identified based on:

- Existing topography and meteorological conditions
- Locations of water intake and waste disposal points.
- Location of human habilitation and other sensitive areas present in the vicinity of the proposed project site.
- Representative areas for baseline conditions.
- Accessibility for sampling.

The scoping and the extent of data generation were formulated based on interdisciplinary team discussions, and professional judgment keeping in view of TOR assigned by MOEF&CC. The baseline studies started with reconnaissance survey and the site visits in the study area for fixing the monitoring locations for collection of the primary data. Various Government and other organizations were approached for getting information for the secondary data generation. The various parameters surveyed and studied for the baseline study are tabulated below.

Table 3.1: Environmental component and their methodologies

S.N.	Environmental components	Parameters	Methodology
1	Air	Meteorology (Temp., RH, WS, WD, RF)	USEPA(Meteorological Monitoring guidance for regulatory modeling applications)
		Ambient Air Quality (PM10, PM2.5, SO2, NOx, CO)	IS-5182, CPCB (guidelines for measurement of Ambient Air Pollutants).
2	Water	Water Quality (Surface & Ground)	Standard limits: Surface-IS:2296 Ground-IS 10500 Sampling Methodology-IS: 3025
3	Noise	Ambient Noise Quality (Lmax, Lmin, Leq)	IS:9989(Assessment of noise with respect to community response)
4	Soil	Soil Quality (pH, EC, BD, Infiltration, Texture, SAR, Key nutrients, OM, OC, Fe, Zn and Cu)	Sampling Methodology and Analysis- IS: 2720
5	Land Use	Land use types, Land	Bhuvan, NRSA

		schedules, Satellite imagery	
6	Ecology	Ecology studies (Floristic diversity, Terrestrial ecosystem sustainability, Green belt development, sinking capacity of pollutants)	Field Study / Secondary Data
7	Socio Economic	Demography and Occupational details, agricultural situation etc.	Census, District report Public Consultation by Questionnaire survey
8	Hydrology & Geology	Geological, hydrological, geomorphologic studies	Geological Survey of India, NRSC
9	Traffic Study	PCU/hr, LOS	IRC 106:1990

3.4 ESTABLISHMENT OF BASELINE FOR VALUED ENVIRONMENTAL COMPONENT, AS IDENTIFIED IN THE SCOPE

The scope of the study is as per TOR letter issued by MoEF&CC vide File no. J-11011/404/2018-IA.II (I) and dated 7th January, 2019.

3.4.1 AIR ENVIRONMENT

Dispersion of different air pollutants released into the atmosphere have significant impacts on the neighborhood air environment of an industrial project and forms an important part of impact assessment studies. The ambient air quality status with respect to the study zone of 10 km radial distance from the plant site will form the base line information over which the predicted impacts due to the proposed expansion plant can be super imposed to find out the net (Final) impacts on air environment. From the final impacts a viable Environmental Management Plan (EMP) can be prepared based on the impact statement for the air environment. The baseline status of the ambient air quality can be assessed thorough scientifically designed ambient air quality monitoring network. The design of monitoring network in the air quality surveillance program has to be based on the following considerations.

- Meteorological conditions on synoptic scale
- Topography of the study area
- Representation of regional background levels
- Representation of plant site
- Representation of cross sectional distribution in the downward direction
- Influence of the existing sources if any, are to be kept at minimum
- Inclusion of major distinct villages to collect the baseline status.

3.4.2 MICRO-METEOROGICAL DATA

Micro-meteorological data within the project area during the air quality survey period is an indispensable part of air pollution study. Assessment of the micro and macro meteorology is important from the standpoint of understanding the nature and extent of air pollution in the study area.

The climate of Hoshiarpur district is classified as tropical steppe, hot and semi-arid which is mainly dry with very hot summer and cold winter except during monsoon season when moist air of oceanic origin penetrates into the district. There are four seasons in a year. The hot season starts from mid March to last week of the June followed by the south west monsoon which lasts

upto September. The transition period from September to November forms the post monsoon season. The winter season starts late in November and remains upto first week of March.
The normal annual rainfall of the district is 938 mm which is unevenly distributed over the area in 38 days. The south west monsoon sets in from first week of July and withdraws in end of September, contributes about 77% of annual rainfall. July and August are the wettest months. Rest 23% rainfall is received during non-monsoon period in the wake of western disturbances and thunder storms. Generally rainfall in the district increases from southwest to northeast.

In the present studies, to understand the site specific meteorological conditions Primary data is collected at site and secondary data is collected from IMD, Amritsar.

Secondary Data

Historical data on meteorological parameters also plays an important role in identifying the general meteorological status of the region. The data generated in the field is compared with the historical data in order to identify changes, which may have taken place during the course of time.
The latest and updated secondary data for 30 years (1981 - 2010) is procured from IMD, New Delhi for observing parameters like Temperature, Relative humidity, Rainfall, Wind speed and Wind direction. The IMD data for Amritsar (~79Km from project site) is given in **Table 3.2.**

Table 3.2: Secondary Metrological data of the Amritsar (1981-2010)

Month	Air Temperature ^{o}C		Humidity %		Monthly Rainfall Total, mm	Mean Wind Speed kmph	Predominant Wind Direction Coming from
	Daily Max.	Daily Min.	Highest	Lowest			
January	18.4	3.4	90	63	26.2	1.7	W,NW,SW
February	21.7	6.3	87	55	38.6	2.4	W,NW,E
March	26.8	10.9	79	49	38.4	2.8	W,NW,N
April	34.2	16.1	59	32	21.4	3.3	W,NW,NE
May	39	24.3	48	28	26.7	3.4	W,NW,E
June	39	21.3	59	39	61.2	3.6	W,SE,E
July	35	25.3	79	64	210.1	2.8	E,SE,NE
August	34.2	24.9	84	69	167.3	2	E,SE,S
September	34.1	22.1	81	61	77.5	1.9	W,NW,E
October	32	15.4	82	50	16.1	1.8	W,NW,E
November	27.1	8.7	87	54	6.3	1.4	W,NW,E
December	21.1	4.1	89	61	**13.6**	1.4	W,NW,E
Annual	**30.2**	**15.2**	**77**	**52**	**703.4**	**2.4**	**W,NW,E**

(Source: Climatological Normals 1981-2010, IMD New Delhi)

Primary Data

The meteorological data recorded during survey period is very useful for proper interpretation of the baseline information as well as for input, to predictive models for air quality impacts.
For collection of Primary data an Automatic Weather Station was installed at the plant site for three months (1st October to 31st December 2018) and it recorded hourly observations for the

parameters like Maximum and minimum Temperatures (ºC), Relative Humidity (%), Wind Speed (km/hr), Wind direction and Rainfall. The hourly-recorded observations (wind velocity and wind directions) during 12 weeks study period are used in computing percentage frequencies and are depicted in the form of **"wind roses" (Fig. 3.1).** The summarized meteorological data is provided in **Table 3.3**.

Table 3.3: Onsite Meteorological Data (1st October to 31st December 2018)

Month	Temperature		Relative Humidity%	Wind Speed (m/sec)
	Max ^{0}C	Min ^{0}C		
October	37.4	15.6	12-78	0.0-6.7
November	36.4	12.8	13-84	0.0-4.9
December	16	6.3	27-86	0.0-4.8

(Source: Automatic Weather Station)

During the study period, wind speed measured on site varied between 0 to 6.7 m/s. The wind rose diagram indicates predominant wind direction is from north - east.

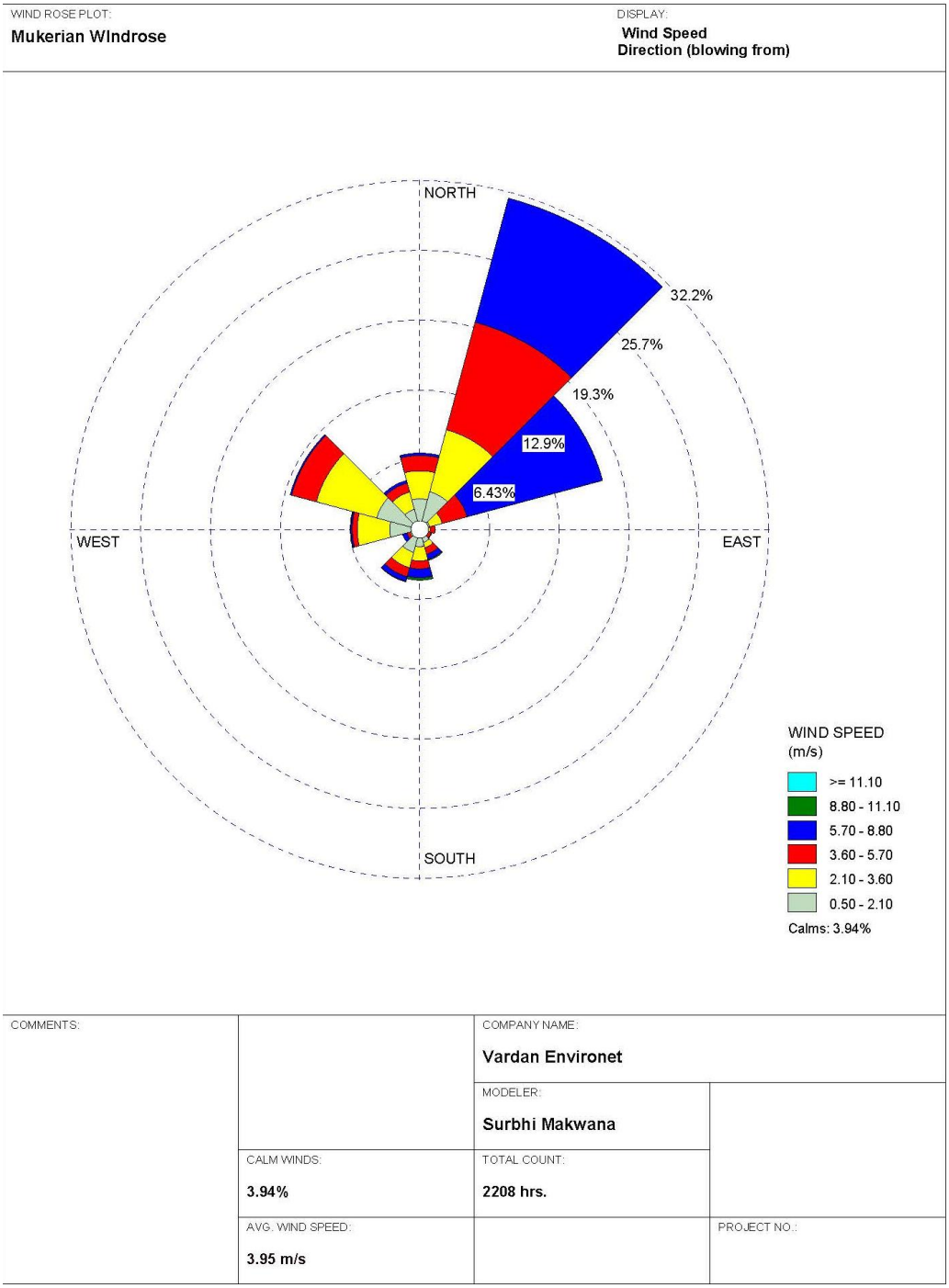


Figure 3-1: Wind Rose Diagram of Study Period (October to December 2018)

Comparison of Primary Meteorological data with IMD data

The meteorological data recorded on site is compared with the available IMD data. The maximum and min temperature for primary data was found to be 37.4 and 6.3^{o}C respectively and follows the similar trends as in secondary data. The average relative humidity was found to be in between 12-86% respectively which is in course with IMD data. The mean wind speed during the study period was observed to be 1.5km/hr. The data obtained when compared with IMD data are found to be fairly consistent.

3.4.2.1 Ambient Air Quality

Ambient air quality monitoring is done to determine the general background concentration levels. The prime objective of the ambient air quality study is to assess the existing air quality of study area and to establish the existing ambient air quality within the study area and its conformity to NAAQS.

Selection of Sampling Locations

The sources of air pollution in the region are industrial emissions, vehicular traffic, dust arising from unpaved village roads and domestic fuel burning.

The due consideration during the selection of sampling locations was given to the likely affected zones during construction and operation of the plant. The location of human habitation and other sensitive areas within the study area were also considered in selection of ambient air quality monitoring locations. Eight (8) numbers of monitoring stations were set up to assess the existing air quality of the study area. One station was located inside the proposed project site (core zone) and the seven others, outside (buffer zone) the proposed project site. The locations of the monitoring stations were based on the frequent wind directions in order to site the stations as close as feasible to the anticipated maximum pollutant deposition areas, moreover, duly considering human habitation and proximity to sensitive zones within the study area. Logistic considerations as ready accessibility, security, availability of reliable power supply etc. were examined while finalizing the monitoring locations. The Ambient Air Quality Monitoring locations have been presented in **Fig. 3.2.**

Stations	Name	Latitude	Longitude	Distance (km)	Direction	Selection Criteria
A1	Project Site	31°55'36.2"N	75°37'32.3"E	--	--	
A2	Bishanpur	31°55'20.9"N	75°37'42.1"E	0.2	SE	500m downward
A3	Mansurpur	31°55'09.7"N	75°39'13.5"E	2.5	ESE	Downward
A4	Sherpur	31°54'27.7"N	75°38'38.5"E	2.3	SE	Cross wind
A5	Dugri	31°55'30.9"N	75°36'34.5"E	1.4	W	Cross wind
A6	Lohgarh	31°54'53.1"N	75°36'20.0"E	2.1	SW	Cross wind
A7	Latifpur	31°54'43.4"N	75°37'11.9"E	1.4	SSW	Downward
A8	Muradpur	31°56'21.2"N	75°39'10.2"E	2.8	NE	Upwind

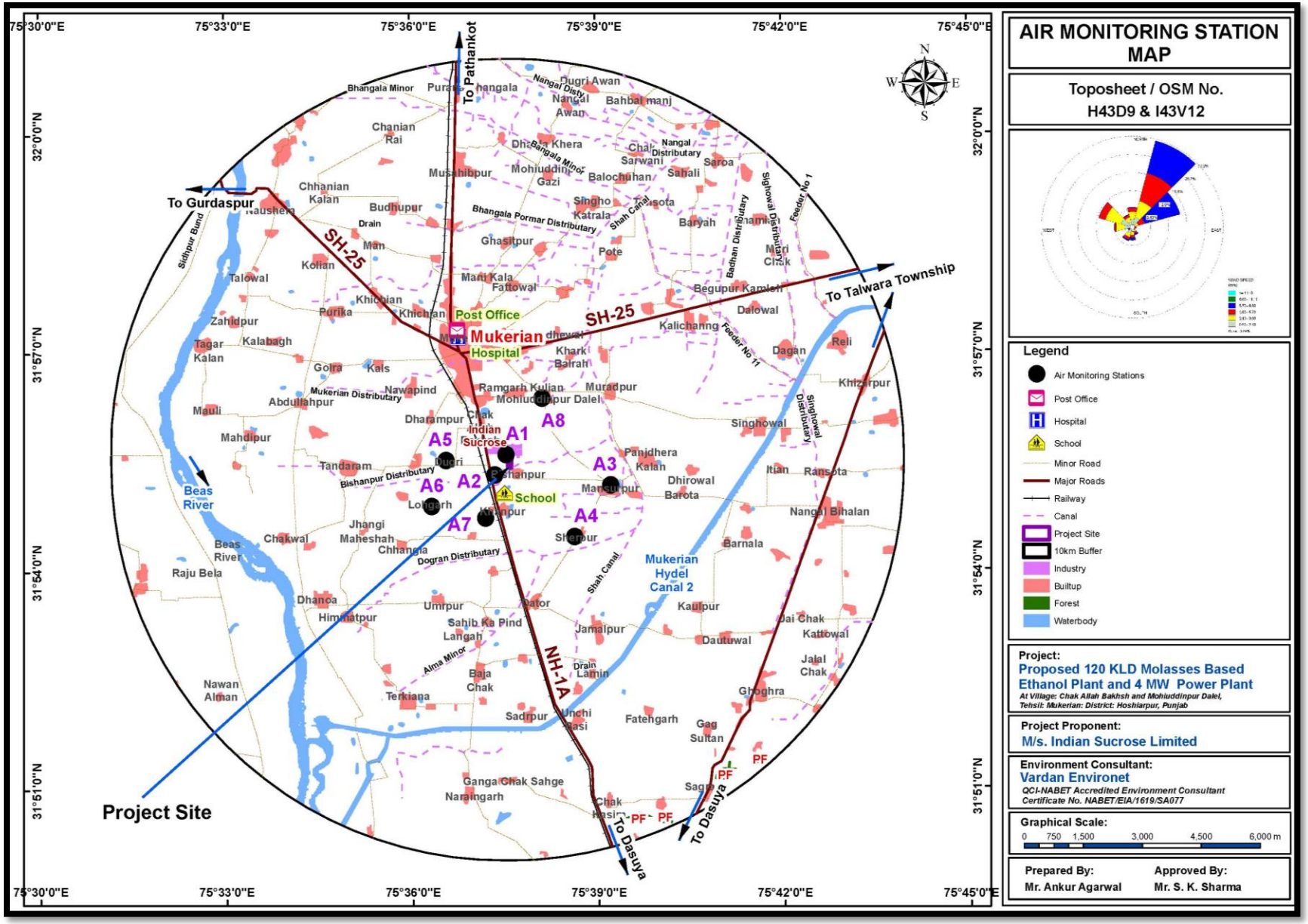


Figure 3-2: Ambient Air Quality Monitoring Location

Methodology

As per the scope of work, 8 ambient air quality monitoring stations were monitored for specific air pollutants during the study period. All the instruments (samplers) were installed between 1 to 4 m above ground level which was free from obstructions. The sampling and analysis of the required parameters were carried out as per IS: 5182 methodology entitled "Methods of Measurement of Air Pollution" and AWMA entitled "Methods of Air sampling and analysis". Following are the parameters monitored during the study period.

1. Particulate Matter (PM_{10} and $PM_{2.5}$)
2. Sulphur dioxide (SO_2)
3. Nitrogen dioxide (NO_2)
4. Carbon Monoxide (CO)

Table 3.4: Techniques Adopted/ Protocols for the Ambient Air Quality Monitoring

S.No	Parameters	Techniques	TechnicalProtocol
1	SulphurDioxide(SO_2)	West&Gaeke	IS:5182(P2)
2	Nitrogen Dioxide(NO_2)	Jacob& Hochheiser	IS:5182(P6)
3	ParticulateMatterPM_{10}	Gravimetric	IS:5182(P15)
4	ParticulateMatter$PM_{2.5}$	Gravimetric	-
5	Carbon-monoxide as CO	NDIR	IS:5182(P-10)

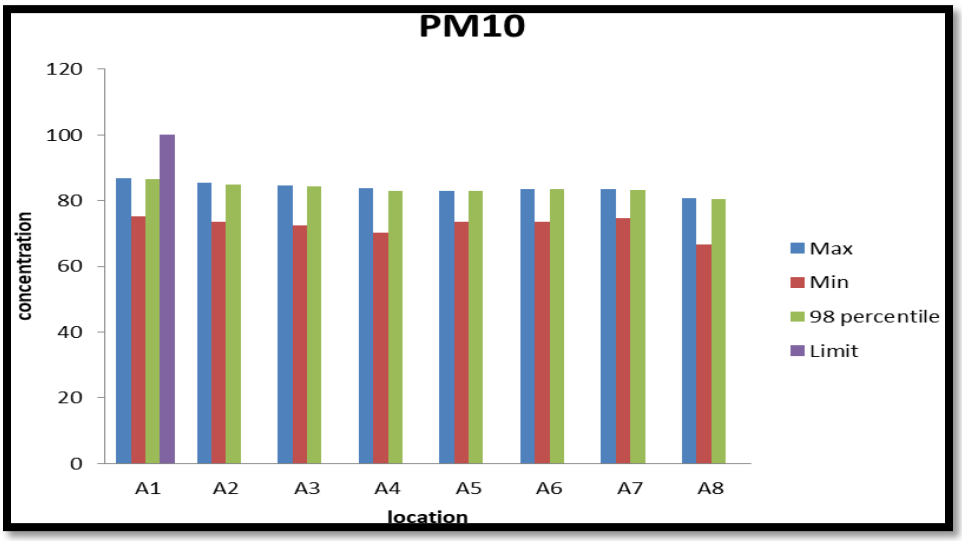
Data Analysis

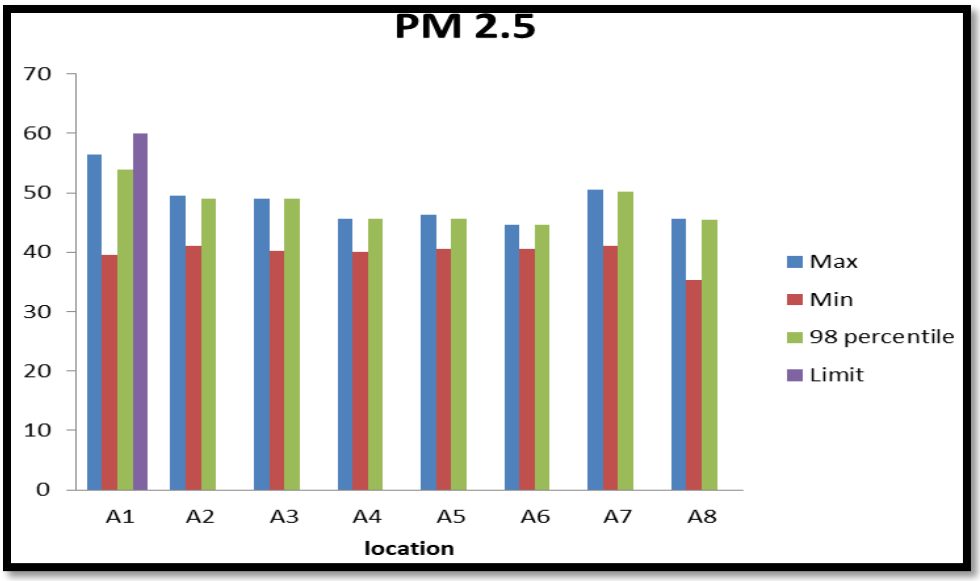
The Ambient Air Quality survey has been carried out at 8 locations within 10 km radius around the proposed project site. Measurement of Particulate matter (PM10 & PM2.5), SO2, NOX and CO levels helps to understand the existing environmental scenario. The results of PM_{10}, $PM_{2.5}$, SO_2, NO_X are expressed in µg/m3 whereas the results of CO are expressed in mg/m3. The detailed air quality reports are given in Annexure. The results of all the locations were further computed for statistical parameters like Minimum, Maximum concentrations and Arithmetic mean (AM). The results are shown in **Table No.3.5.** The graphical representations of the results are depicted in **Fig.No.3.3**.

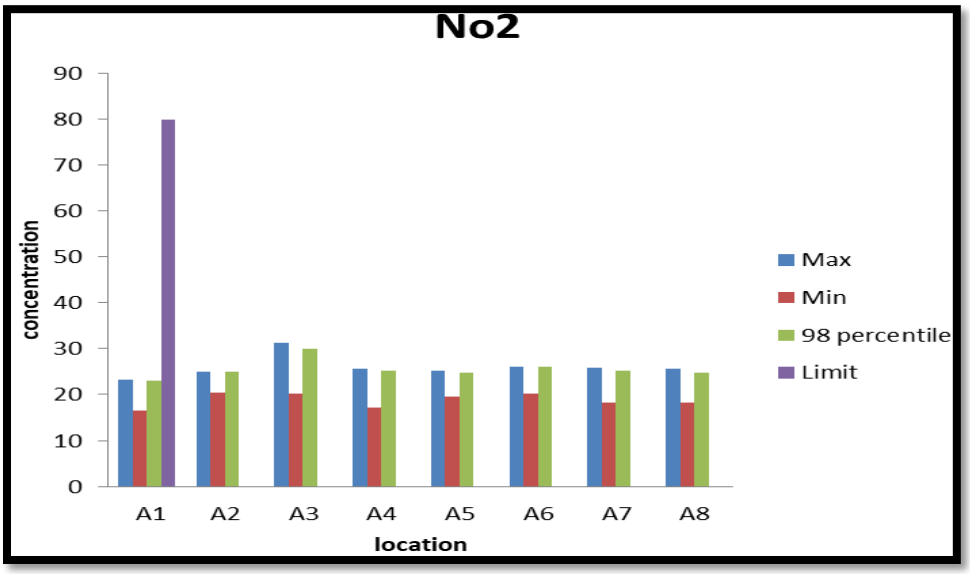
Table 3.5: Ambient Air Quality Data

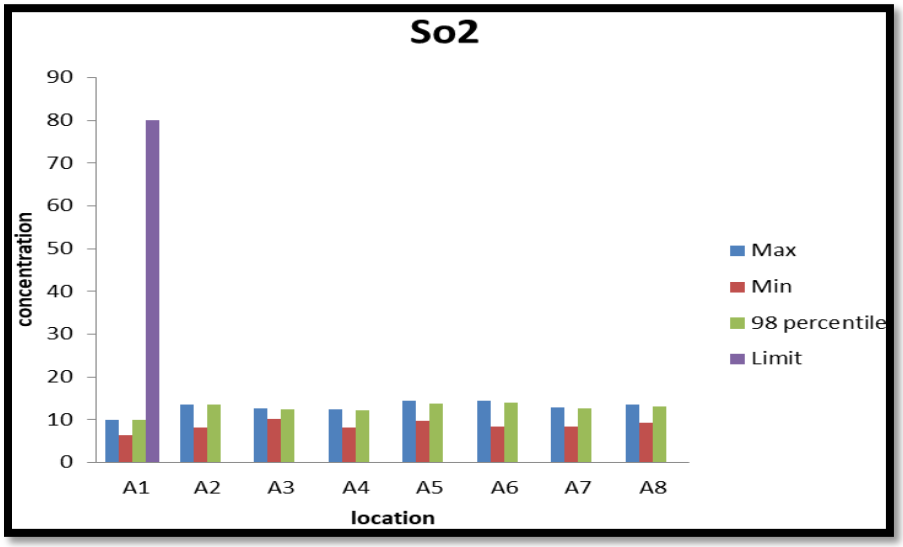
Pollutant	Location Code	Max	Min	98 percentile	NAAQS
PM_{10} (µg/m^3)	A1	86.9	75.3	86.6	100
	A2	85.5	73.5	84.9	
	A3	84.5	72.3	84.2	
	A4	83.7	70.1	83.05	
	A5	83	73.5	82.8	
	A6	83.5	73.4	83.45	
	A7	83.4	74.6	83.1	
	A8	80.7	66.5	80.5	
$PM_{2.5}$ (µg/m^3)	A1	56.4	39.6	53.9	60
	A2	49.5	41	49	
	A3	49	40.2	49	
	A4	45.6	40.1	45.55	
	A5	46.3	40.6	45.7	
	A6	44.6	40.6	44.6	
	A7	50.6	41	50.15	
	A8	45.6	35.3	45.45	

NO_2 ($\mu g/m^3$)	A1	23.2	16.5	22.95	80
	A2	25	20.4	24.9	
	A3	31.2	20.2	29.95	
	A4	25.6	17.2	25.1	
	A5	25.1	19.6	24.7	
	A6	26.1	20.2	26.05	
	A7	25.8	18.3	25.3	
	A8	25.6	18.3	24.8	
SO_2 ($\mu g/m^3$)	A1	10	6.4	9.95	80
	A2	13.5	8.1	13.5	
	A3	12.6	10.2	12.55	
	A4	12.5	8.2	12.25	
	A5	14.35	9.8	13.77	
	A6	14.5	8.4	14	
	A7	12.8	8.4	12.75	
	A8	13.5	9.3	13.15	
CO (mg/m^3)	A1	0.81	0.59	0.8	02
	A2	0.8	0.58	0.8	
	A3	0.81	0.6	0.81	
	A4	0.84	0.65	0.83	
	A5	0.78	0.6	0.77	
	A6	0.87	0.73	0.87	
	A7	0.78	0.69	0.78	
	A8	0.76	0.63	0.75	




PM 2.5
70
60
50
40
30
20
10
0
A1
A2
A3
A4
A5
A6
A7
A8
location
Max
Min
98 percentile
Limit


No2
90
80
70
60
50
40
30
20
10
0
concentration
A1
A2
A3
A4
A5
A6
A7
A8
location
Max
Min
98 percentile
Limit


So2
90
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A5
A6
A7
A8
location
Max
Min
98 percentile
Limit

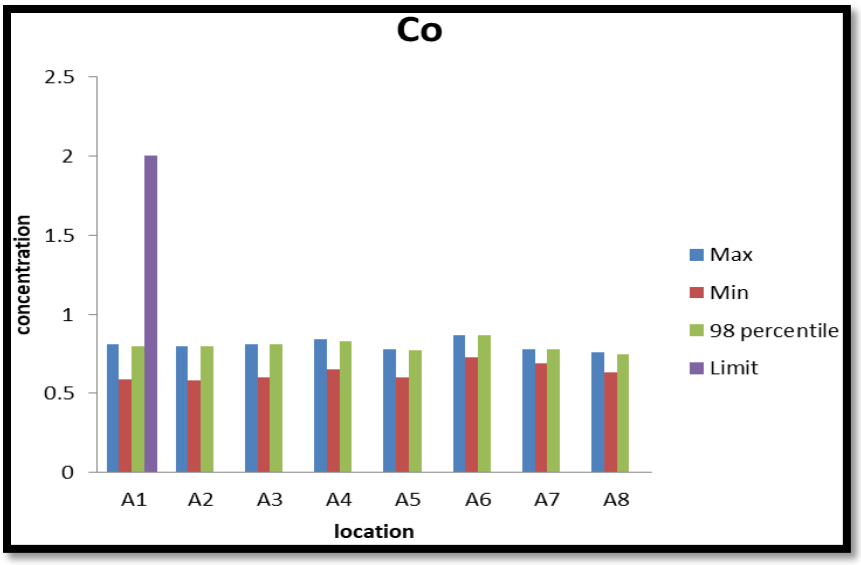


Figure 3-3: Graphical Representation of Pollutant Concentration

Interpretation

- Ambient Air Quality Monitoring reveals that the concentrations of PM10 and PM 2.5 for all the 8 AAQM stations were found between 66.5 to 86.9 µg/m^3 and 56.4 to 39.6 µg/m^3 respectively.
- The high value of Particulate pollutant was observed at plant site, due to existing sugar mill.
- The concentrations of SO_2 and NOx were found to be in range of 6.4 to 14.5µg/m^3 and 16.5to 31.2 µg/m^3 respectively.
- The high value of gaseous pollutant was found to be high in Mansurpur and sherpur villages which can be attributed to dense population and high traffic.
- The concentrations of CO were found between 0.6 to 0.87 mg/m^3 with the highest concentrations at lohgarh village due to the high vehicular movement.
- As per the present proposal, there will be increment in the air emissions which will have an effect on nearby habitations and ecology of surrounding areas.
- As per the analytical reports of the project site and the surrounding areas, the ambient air quality is well below the NAAQS limits, so to maintain the ambient air quality of the area, the latest / modern air pollution control measurements along with suitable EMP will be adopted, which will be elaborated in detailed in chapter-4 of the report.

3.5 NOISE ENVIRONMENT

Noise often defined as unwanted sound, interferes with speech communication, causes annoyance, distracts from work, disturb sleep, thus deteriorating quality of human environment. Noise Pollution survey has therefore been carried out. Noise levels were measured in residential areas and other settlements located within 10 km radius around the site.

3.5.1 NOISE ANALYSIS WITHIN THE STUDY AREA

The noise analysis within the study area was recorded using 4012 Maxtech sound level meter. The analysis reveals that the noise's well within the permissible range. The location of Noise level monitoring is presented in **Table 3.5** and the levels recorded are as stated in **Table 3.6. Figure 3.11** shows the photographs of the sampling location.

Table 3.5: Noise Locations

Stations	Name	Latitude	Longitude	Distance (km)	Direction
N1	Project Site	31°55'36.2"N	75°37'32.3"E	--	--
N2	Bishanpur	31°55'20.9"N	75°37'42.1"E	0.2	SE
N3	Near Chak Allah Baksh	31°56'09.8"N	75°36'59.3"E	1.2	NNW
N4	Dugri	31°55'30.9"N	75°36'34.5"E	1.4	W
N5	Latifpur	31°54'43.4"N	75°37'11.9"E	1.4	SSW
N6	Mansurpur	31°55'09.7"N	75°39'13.5"E	2.5	ESE
N7	Dharampur	31°56'02.7"N	75°36'18.9"E	2.0	NW
N8	Mohiuddinpur Dalel	31°56'22.6"N	75°38'08.0"E	1.6	NNE

Table 3.6: Noise Analysis Result

S. No	Locations	Noise LevelLeq. dB (A)	
		Day Time (6:00 a.m. to 10:00 p.m.)	**Night Time (10:00 p.m. to 6:00 a.m.)**
1.	N1	62.96	51.40
2.	N2	53.61	42.60
3.	N3	51.89	41.15
4.	N4	53.98	42.30
5.	N5	54.95	42.54
6.	N6	52.43	44.89
7.	N7	52.89	42.87
8.	N8	51.89	42.96
CPCB Standards			
a.	**Residential Area**	**55.0**	**45.0**
b.	**Industrial Area**	**75.0**	**70.0**
c.	**Commercial Zone**	**65.0**	**55.0**
d.	**Silence Zone**	**50.0**	**40.0**

Interpretation

- Out of all 8 locations measured for noise levels, the sample collected near to the plant site was found to be on slightly higher side.
- The Leq values at this location for day and night time was observed to be 62.96 and 41.15 dB(A) respectively, which can be attributed to local prevailing environment (Traffic and industrial activities). However the recorded noise levels were found to be within the commercial zone limits (65 dB(A)).
- Apart from this the noise levels recorded near village were found to be of higher level in context to the residential area, which can be attributed to heavy traffic and nearby industrial activities. However these levels are found to be well within the permissible residential limits (55 dB(A)).
- The noise levels recorded at all locations were within the NAAQS limits.
- With the proposed project, the noise levels at the project site will have some impacts on the nearby areas.
- However, with suitable control measures and EMP, the noise levels will be reduced and the impacts will be minimized.

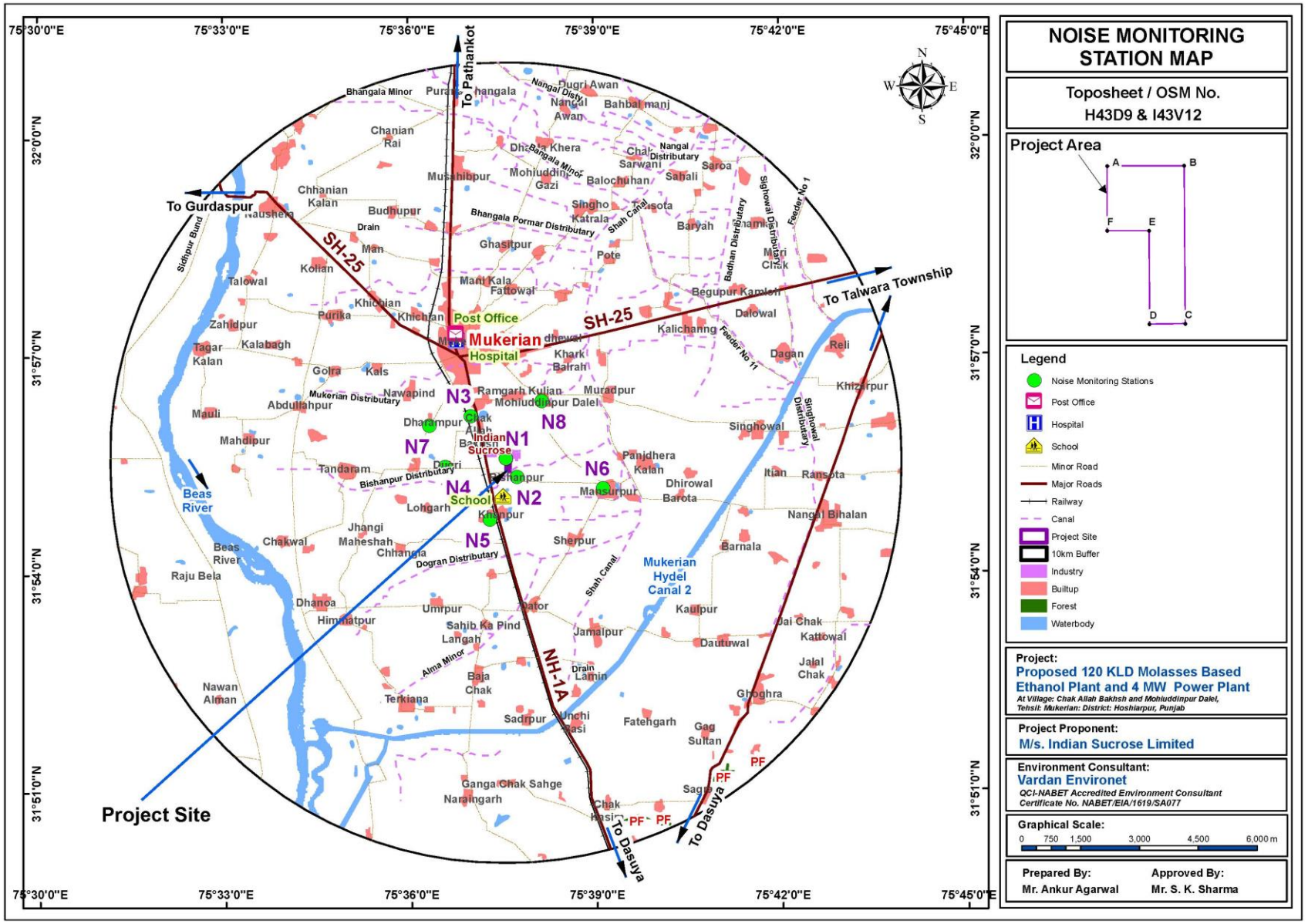


Figure 3-4: Noise monitoring location Map

3.6 TRAFFIC STUDY

Traffic remains the concealed component of the impact analysis of any new development project. Therefore the impact of certain projects on traffic and transportation is too far reaching to be subsumed under a generalized EIA study. Traffic Analysis is a study carried out to predict the magnitude and effects that a proposed development project generated traffic will have on the transportation network. Traffic analysis can also be used to evaluate whether the proposed developmental project is appropriate and what type of transportation facility improvements would be necessary. Traffic impacts could be direct or cumulative. A direct impact would result solely from the implementation of the proposed project while cumulative impact is based on list of past, present and probable future projects in the area.

The contribution of automobile emissions aggravating the air pollution menaces. The three main types of automobile vehicles being used in the country are

- Passenger cars powered by four strokes gasoline engines.
- Motor cars, scooters and auto rickshaws powered mostly by small two stroke diesel engines.
- Large trucks and buses powered by mostly 4 stroked engines.
- The accuracy of traffic data collection and the subsequent predictions are of paramount importance in the fulfillment of an appropriate planning, design, maintenance monitoring and management of the road network.

As regards to the emission problems, diesel engines are more noisy and smoky. The smoke in the diesel exhaust is not just un-burnt hydrocarbons, some of which are proved carcinogens.

In addition to being a traffic hazard by reducing the visibility, smoke contains extremely hazardous constituents. Carbon monoxide is a problem confined to gasoline engines, both two and four strokes. The causes and remedial measure for abatement of CO are similar to those of unburnt hydrocarbons. Oxides of nitrogen have become a major concern from the point of health hazards caused by vehicle emissions.

Data Analysis

The traffic study was carried out at 2 locations (NH-1A, SH25) for 24 hours which is near to the proposed plant and is a medium for transportation of raw and final products to the industry.The trafiic study is based on the The Level of Service (LOS) and the capacity of the Roadway segments computed is based on the Indian Roads Congress (IRC) standards sourced from Guidelines for Capacity of Rular Roads in Plain Areas IRC 64- 1990.

V/C	LOS	Performance
0.0-0.2	A	Excellent
0.2-0.4	B	Very Good
0.4-0.6	C	Good/ Average/ Fair
0.6-0.8	D	Poor
0.8-1.0	E	Very Poor

The traffic distribution on both the road by the proposed project is defined in the table 3.7. The result of the traffic study is shown in Table 3.10.

Table 3.7: Road & higway in the study area & Traffic distribution due the proposed project

Name of National/State highway	Direction		Dispatch ratio in percentage
	Up	Down	
NH-1A	Pathankot	Dasuya	50
SH-25	Gurdaspur	Talwara	50

Table 3.8: Existing Traffic Study

S.No.	Type of Vehicle	Vehicle Distribution/day		PCU	No. of Vehicles in PCU/day		Vehicles in PCU/hr	
		NH-1A	SH 25		NH-1A	SH 25	NH-1A	SH 25
1	Cars	2568	1012	1	2568	1012	107	42
2	Buses	250	130	3	750	390	31	16
3	Trucks	1500	1244	3	4500	3732	188	156
4	Tractors/Trailors	1250	1025	4.50	5625	4613	234	192
5	Two Wheelers	3256	1650	0.50	1628	825	68	34
6	Three Wheelers	2586	500	1.5	3879	750	162	31
Total		**11410**	**5561**		**18950**	**11322**	**790**	**472**

Table 3.9: Exsting Scenario & LOS value

Road	V (Volume in PCU/hr)	C (Capacity in PCU/hr)	Existing V/C Ratio	LOS
NH-1A	792	3600	0.22	**B**
SH-25	472	1250	0.38	**B**

Traffic due to proposed project:

S.No.	Type of Vehicle	Vehicle Distribution/day	PCU	No. of Vehicles in PCU/day	Vehicles in PCU/hr
1	Cars	18	1	18	1
2	Buses	5	3	15	1
3	Trucks	50	3	150	6
4	Tractors/Trailors	60	4.50	270	11
5	Two Wheelers	36	0.50	18	1
6	Three Wheelers	10	1.5	15	1
Total		**10**		**486**	20

Table 3.10: Modified Scenario of the Traffic Study

Road	Increased pcu's-state/national highway	V	C	Modified v/c ratio	Los
NH-1A	20*0.50=10	10 + 790 = 800	3600	0.22	**B**
SH-25	20*0.50=10	10 + 472 = 482	1250	0.38	**B**

Interpretation

- Out of the total traffic vehicles, 2 wheelers are very high followed by light and medium vehicles. The movement of two wheelers and light vehicles are largely found in daytime.
- The difference of heavy vehicle movement both day and night time was very marginal. The density of heavy vehicles was comparatively low.
- The LOS study shows that the existing traffic scenario is “Very Good” and the free flow of vehicles is observed during the study period.
- Due to the expansion of proposed project the traffic density will increase as all the raw material and finished product will be transported through the road under study.
- Suitable traffic management plan will be adopted to minimize the impacts on the traffic scenario of thearea.

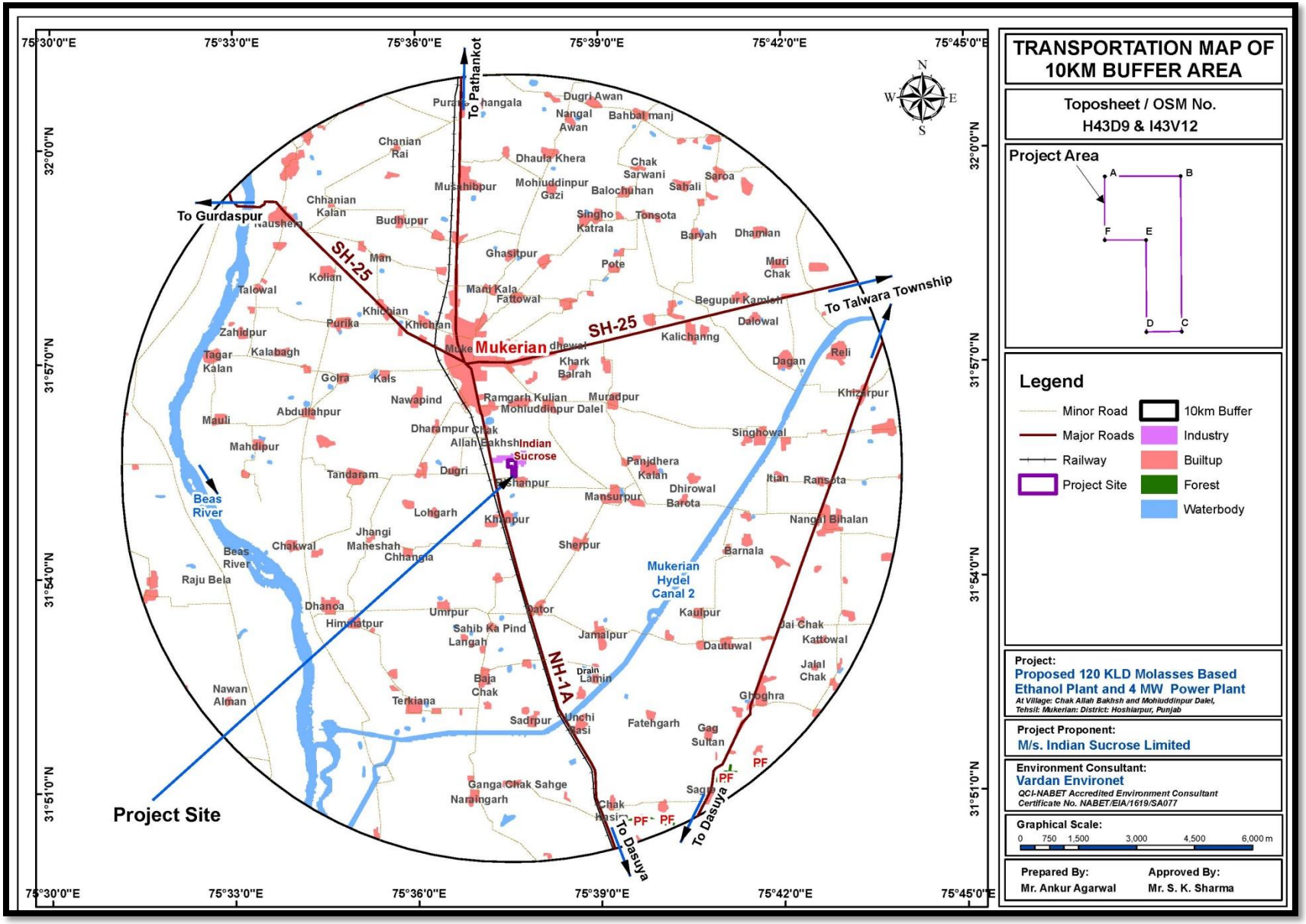


Figure 3-5: Transporation Keyplan of the Study Area

3.7 WATER ENVIRONMENT

Water of high quality is essential to human life, and water of acceptable quality is essential for agricultural, industrial, domestic and commercial uses; in addition, most recreation is water based; therefore, major activities having potential effects on surface water are certain to be of appreciable concern to the consumers.

The hydrological environment is composed of two interrelated phases; ground water and surface water. Impacts initiated in one phase eventually affect the other. For example, a ground water system may charge one surface water system and later be recharged by another surface water system. The complete assessment of an impact dictates consideration of both ground water and surface water. Thus, pollution at one point in the system can be passed throughout, and consideration of only one phase does not characterize the entire problem

Methodology

Water samples were collected from 16 locations (Fig.3.10). Samples were collected as per IS: 3025 (Part 1) methodology. Necessary precautions were taken while collecting, preserving and transporting. The parameters like pH, temperature and DO were measured at the site while collecting the sample. For analyzing other parameters the samples were brought to Head Laboratory situated in Gurugram. All the parameters were analyzed as per "Methods of Sampling and Test (Physical and Chemical) for water and waste water" IS: 3025 and 'Standard Methods for the Examination of Water and Wastewater' APHA. The results are then compared with the standards (IS 10500 & IS 2296) as per the quality of water.

About 8 ground water and 8 surface water samples were collected from the study area to assess the water quality during the study period. The ground water samples were drawn from the hand pumps and open wells being used by the villagers for their domestic needs. Surface water sampling was carried out from Rivers/Ponds present within 10 Km of the project site. The ground water & surface water monitoring location is defined in the Fig: 3.6

Stations	Name	Latitude	Longitude	Distance (km)	Direction
SW1	Mukerian Hydel Canal Near Sadrpur	31°51'48.0"N	75°37'06.3"E	6.7	S
SW2	Beas River Near Zahidpur	31°57'33.3"N	31°57'33.3"N	8.1	WNW
SW3	Shah Canal Near Budhewal	31°57'18.0"N	75°38'51.9"E	3.6	NE
SW4	Beas River Near Himmatpur	31°52'56.8"N	75°34'10.0"E	7.0	SW
SW5	Bisahnpur Distributary Near Bishanpur	31°55'14.2"N	75°37'25.1"E	0.3	SW
SW6	Pond Near Kals	31°56'51.2"N	75°35'17.0"E	4.1	NW
SW7	Singhowal Distributary Near Ransota	31°55'18.7"N	75°42'31.0"E	7.7	E
SW8	Dogran Distributary Near Tagar Khurd	31°54'15.1"N	75°37'28.4"E	2.1	S

GW1	Project Site	31°55'36.2"N	75°37'32.3"E	--	--
GW2	Bishanpur	31°55'20.9"N	75°37'42.1"E	0.2	SE
GW3	Dugri	31°55'30.9"N	75°36'34.5"E	1.4	W
GW4	Mansurpur	31°55'09.7"N	75°39'13.5"E	2.5	ESE
GW5	Ramnagar Kulian	31°56'27.0"N	75°37'44.8"E	1.5	NNE
GW6	Mukerian	31°57'09.0"N	75°36'41.6"E	3.0	NNW
GW7	Khanpur	31°54'48.6"N	75°37'31.6"E	1.0	S
GW8	Dharampur	31°56'02.7"N	75°36'18.9"E	2.0	NW

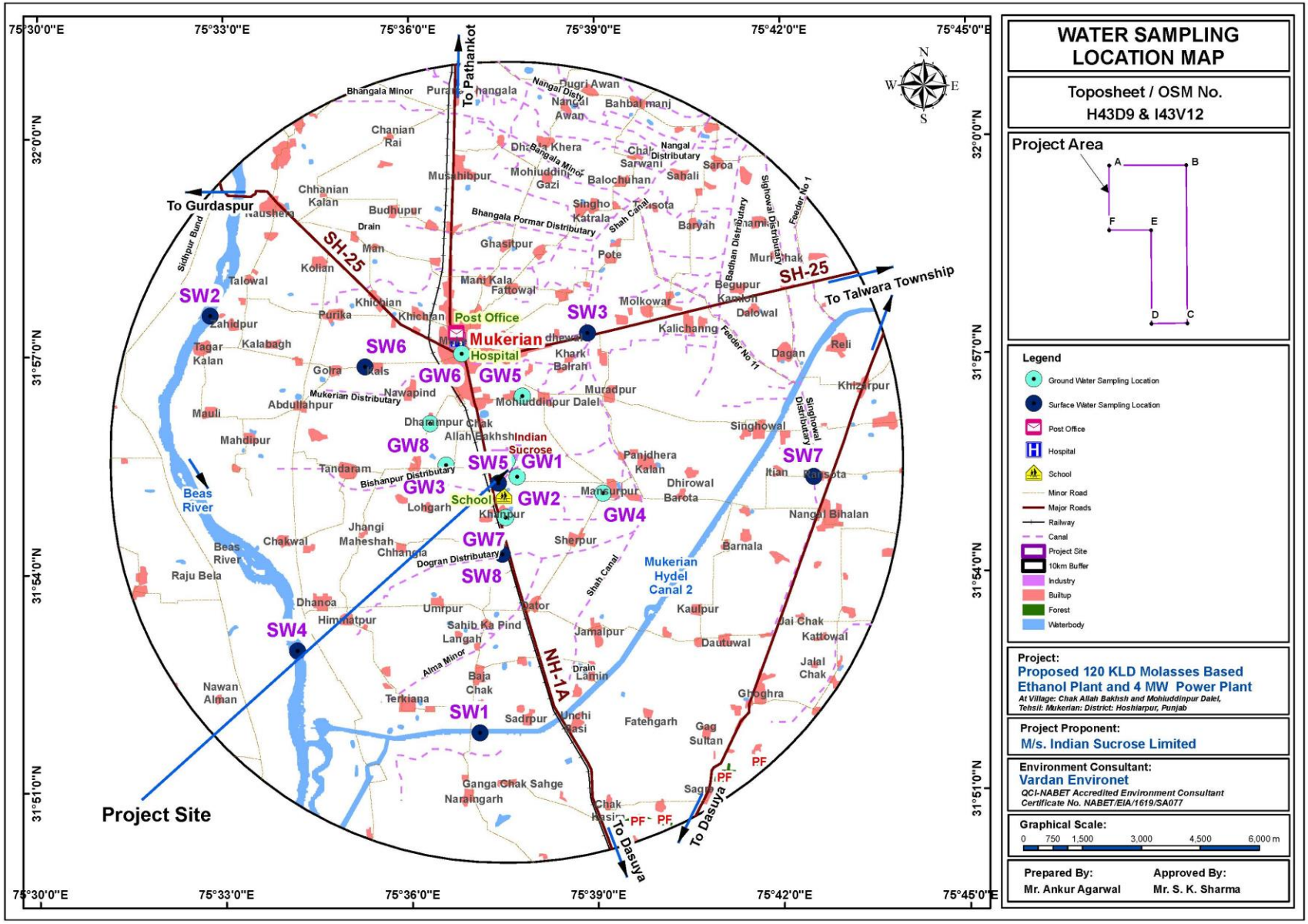


Figure 3-6: Ground & Surface Water Monitoring Location Keyplan

Table 3.11: Ground water Monitoring Result

S.no.	Parameter	GW1	GW2	GW3	GW4	GW5	GW6	GW7	GW8	Acceptable Limit	Permissible Limit
1.	pH (at 25 ^{0}C)	7.85	7.69	7.81	7.89	7.69	7.60	7.39	7.80	6.5 to 8.5	No Relaxation
2.	Colour (Hazen)	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	5	15
3.	Turbidity (NTU)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	1	5
4.	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5.	Taste	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
6.	Total Hardness as $CaCO_3$ (mg/l)	140.0	154.00	170.00	174.00	159.14	141.00	149.00	140.00	200	600
7.	Calcium as Ca (mg/l)	28.40	25.96	36.40	35.40	32.40	34.15	26.10	29.05	75	200
8.	Alkalinity as $CaCO_3$(mg/l)	160.10	151.42	189.14	151.54	148.93	160.72	150.76	131.42	200	600
9.	Chloride as Cl (mg/l)	39.46	31.42	35.63	40.35	45.10	43.61	54.62	46.58	250	1000
10	Cyanide as CN (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.05	No Relaxation
11.	Magnesium as Mg (mg/l)	16.80	21.68	19.24	20.82	19.02	13.56	20.38	16.41	30	100
12.	Total Dissolved Solids (mg/l)	221.00	210.00	256.00	274.00	270.00	275.00	219.00	280.00	500	2000
13.	Sulphate as SO_4 (mg/l)	24.15	24.15	35.20	30.25	25.41	34.10	26.10	34.10	200	400
14.	Fluoride as F (mg/l)	0.45	0.56	0.40	0.51	0.51	0.39	0.40	0.42	1.0	1.5

15.	Nitrate as NO_3 (mg/l)	16.10	9.10	16.30	16.30	12.63	10.14	7.58	18.40	45	No Relaxation
16.	Iron as Fe (mg/l)	0.30	0.28	0.26	0.30	0.40	0.33	0.29	0.26	0.3	No relaxation
17.	Aluminium as Al (mg/l)	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.03	0.2
18.	Boron (mg/l)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.5	1
19	Chromium as Cr (mg/l)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.05	No Relaxation
20.	Conductivity (mS/cm)	0.396	0.360	0.449	0.440	0.445	0.481	0.421	0.490	--	--
21.	Phenolic Compounds (mg/l)	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001	0.002
22.	Mineral Oil (mg/l)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.5	No Relaxation
23.	Anionic Detergents as MBAS (mg/l)	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.2	1.0
24.	Zinc as Zn (mg/l)	0.66	0.32	0.51	0.55	0.30	0.79	0.48	0.61	5	15
25.	Copper as Cu (mg/l)	0.28	0.10	0.11	0.16	0.10	0.19	0.19	0.20	0.05	1.5
26.	Manganese as Mn (mg/l)	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	0.1	0.3
27.	Cadmium as Cd (mg/l)	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	0.003	No Relaxation
28.	Lead as Pb (mg/l)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01	No Relaxation
29.	Selenium as Se (mg/l)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01	No Relaxation
30.	Arsenic as As (mg/l)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01	0.05

31.	Mercury as Hg (mg/l)	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001	No Relaxation
32.	Total Coliform (MPN/100ml)	<2	<2	<2	<2	<2	<2	<2	<2	Shall not be detectable in any 100 ml sample	
33.	E. Coli (MPN/100ml)	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Shall not be detectable in any 100 ml sample	

Table 3.12: Surface water Monitoring Result

S.No.	Parameter	S1	S2	S3	S4	S5	S6	S7	S8	Desirable Limit	Permissible Limit
1.	pH (at 25 ^{0}C)	7.40	7.39	7.40	7.48	7.56	7.30	7.45	7.30	6.5 to 8.5	No Relaxation
2.	Colour (Hazen)	<5	<5	<5	<5	<5	<5	<5	<5	5	15
3.	Turbidity (NTU)	9	18	19	19	14	20	12	12	1	5
4.	Odour	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5.	Total Hardness as $CaCO_3$(mg/l)	131.00	119.00	251.00	145.00	140.00	123.00	196.00	130.00	Agreeable	Agreeable
6.	Calcium as Ca (mg/l)	24.30	29.40	45.10	26.09	25.90	19.40	51.40	22.45	200	600
7.	Alkalinity as $CaCO_3$(mg/l)	115.70	108.00	191.70	180.40	117.30	110.15	126.45	114.51	75	200
8.	Chloride as Cl (mg/l)	35.36	25.40	66.84	36.9	30.14	40.36	41.65	30.40	200	600
9.	Residual free Chlorine (mg/l)	<0.20mg/l	<0.20mg/l	<0.20mg/l	<0.20mg/l	<0.20mg/l	<0.20mg/l	<0.20mg/l	<0.20mg/l	250	1000
10.	Cyanide as CN (mg/l)	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l	0.05	No Relaxation

11.	Magnesium as Mg (mg/l)	17.10	11.09	33.65	18.92	18.31	18.12	16.46	17.97	30	100
12.	Total Dissolved Solids (mg/l)	180.00	185.00	314.00	249.00	175.00	210.00	253.00	210.00	500	2000
13.	Total Suspended solids(mg/l)	30.00	34.00	56.00	32.00	30.00	40.00	45.00	35.00	500	2000
14.	Dissolved Oxygen(mg/l)	6.9	6.5	6.8	6.8	6.7	6.5	7.1	6.3	-	-
15.	Sulphate as SO^4 (mg/l)	20.40	18.55	35.40	17.4	15.45	20.14	19.40	21.20	200	400
16.	Fluoride as F (mg/l)	0.49	0.33	0.40	0.40	0.40	0.33	0.31	0.23	1.0	1.5
17.	BOD (3 Days at 27^0C)(mg/l)	6.9	<5.0	0.9	<5.0	6.10	6.50	<5.0	7.14	45	No Relaxation
18.	COD(mg/l)	20.40	10.92	19.40	16.40	19.40	21.59	12.40	28.50	0.47	0.3
19.	Conductivity(mS/cm)	0.309	0.321	0.612	0.265	0.281	0.341	0.410	0.341	< 0.03	0.03
20.	Nitrate as NO_3 (mg/l)	5.40	15.40	15.40	8.40	9.60	6.01	6.10	11.65	0.69	0.5
21.	Sodium as Na(mg/l)	27	18	31	17	21	16	20.0	26.00	0.69	0.5
22.	Potassium as K(mg/l)	12	6	9	9	7	5.17	6.0	9.00		Less than 30
23.	Iron as Fe (mg/l)	0.19	0.20	0.40	0.21	0.19	0.14	0.12	0.19		Less than 250
24.	Aluminium as Al (mg/l)	<0.03 mg/l	<0.03 mg/l	<0.03 mg/l	<0.03 mg/l	<0.03 mg/l	<0.03 mg/l	<0.03 mg/l	<0.03 mg/l	5	15
25.	Boron (mg/l)	0.33	0.31	0.41	0.40	0.34	0.41	0.35	0.43	0.05	1.5
26.	Chromium as Cr(mg/l)	<0.01 mg/l	<0.01 mg/l	<0.01 mg/l	<0.01 mg/l	<0.01 mg/l	<0.01 mg/l	<0.01 mg/l	<0.01 mg/l	0.1	0.3
27.	Phenolic Compounds (mg/l)	<0.001 mg/l	<0.001 mg/l	<0.001 mg/l	<0.001 mg/l	<0.001 mg/l	<0.001 mg/l	<0.001 mg/l	<0.001 mg/l	0.003	No Relaxation

28.	Mineral Oil(mg/l)	<0.01mg/l	<0.01mg/l	<0.01mg/l	<0.01mg/l	<0.01mg/l	<0.01mg/l	<0.01mg/l	<0.01mg/l	0.01	No Relaxation
29.	Anionic Detergents as MBAS (mg/l)	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l	<0.02 mg/l	< 0.01	No Relaxation
30.	Zinc as Zn (mg/l)	0.40	0.29	0.55	0.40	0.33	0.42	0.40	0.60	< 0.01	No Relaxation
31.	Copper as Cu (mg/l)	0.10	0.12	0.19	0.19	0.19	0.13	0.3	0.19	< 0.01	No Relaxation
32.	Manganese as Mn (mg/l)	<0.10 mg/l	<0.10 mg/l	<0.10 mg/l	<0.10 mg/l	<0.10 mg/l	<0.10 mg/l	<0.10 mg/l	<0.10 mg/l	*BDL(**DL 0.10 mg/l)	*BDL(**DL 0.10 mg/l)
33.	Cadmium as Cd (mg/l)	<0.001 mg/l	<0.001 mg/l	<0.001 mg/l	<0.001 mg/l	<0.001 mg/l	<0.001 mg/l	<0.001 mg/l	<0.001 mg/l	< 0.001	< 0.001
34.	Total Coliform (MPN/100ml)	900	650	750	890	690	618	950	620	MPN/100ml	MPN/100ml
35.	Fecal Coliform (MPN/100ml)	600	310	490	520	370	290	540	347	MPN/100ml	MPN/100ml

Interpretation

Analysis results of ground water reveal the following:

- pH varies from to 7.34 to 7.93
- Total Hardness varies from 184.52 to 320.52 mg/L.
- Total Dissolved Solids varies from 380 to 556 mg/L.

Analysis result of Surface water revel the following:

- pH varies from to 7.30 to 7.56
- Total Hardness varies from 119 to 251 mg/L.
- Total Dissolved Solids varies from 175 to 253 mg/L.

- In study area, water quality has been observed to vary considerably between the sampling locations. Mostly the parameters fall within the permissible limits of drinking water standards. The detailed water quality reports are given inEnclosed in the EIA report.
- The baseline results of ground and surface water were compared with the data of Hoshiarpur district provided by CGWA/WRD and was found to be in course with the same.
- Water requirement for the plant is met from ground water.
- Rain Water Harvesting Scheme shall be adopted to supplement the ground water recharge.

3.8 SOIL ENVIRONMENT

In the study area, there is 1 kind of soils mostly found i.e.Silty loam.

Methodology

Soil Sampling was carried out at eight sites to understand the soil quality. Meticulous attention was paid to collect adequate amount of composite soil samples for analysis. After removing the surface vegetation cover, visible roots, plant litter, gravel, plastic materials and other foreign materials. Samples were collected by using Agar at a depth of 50, 150 and 300 cm and mixed thoroughly and analyzed as a single unit sample. The samples were packed in dependable, waterproof zip lock pouch bag and was marked specifically, accurately and distinctly and brought to the laboratory for testing. This will establish the baseline characteristics and facilitate to identify contamination if any.

Data Analysis

The soil samples were collected from eight locations around the 10 km radius of proposed project. The samples were analyzed and the results were obtained. The detailed soil quality reports are enclosed in the EIA report. The samples were collected during the winter season from the selected locations (Fig. 3.7). The results of all the specified parameters at each location are given in Table 3.11.

Stations	Name	Latitude	Longitude	Distance (km)	Direction
S1	Project Site	31°55'36.2"N	75°37'32.3"E	--	--
S2	Bishanpur	31°55'20.9"N	75°37'42.1"E	0.2	SE
S3	Khanpur	31°54'48.6"N	75°37'31.6"E	1.0	S
S4	Mahdipur	31°55'47.1"N	75°33'15.6"E	6.6	W
S5	RF Near Gag Sultan	31°51'25.6"N	75°41'00.7"E	9.2	SE
S6	Mohiuddinpur Dalel	31°56'22.6"N	75°38'08.0"E	1.6	NNE
S7	Kaluchanng	31°57'10.7"N	75°40'19.5"E	5.1	NE
S8	Mukerian	31°57'09.0"N	75°36'41.6"E	3.0	NNW

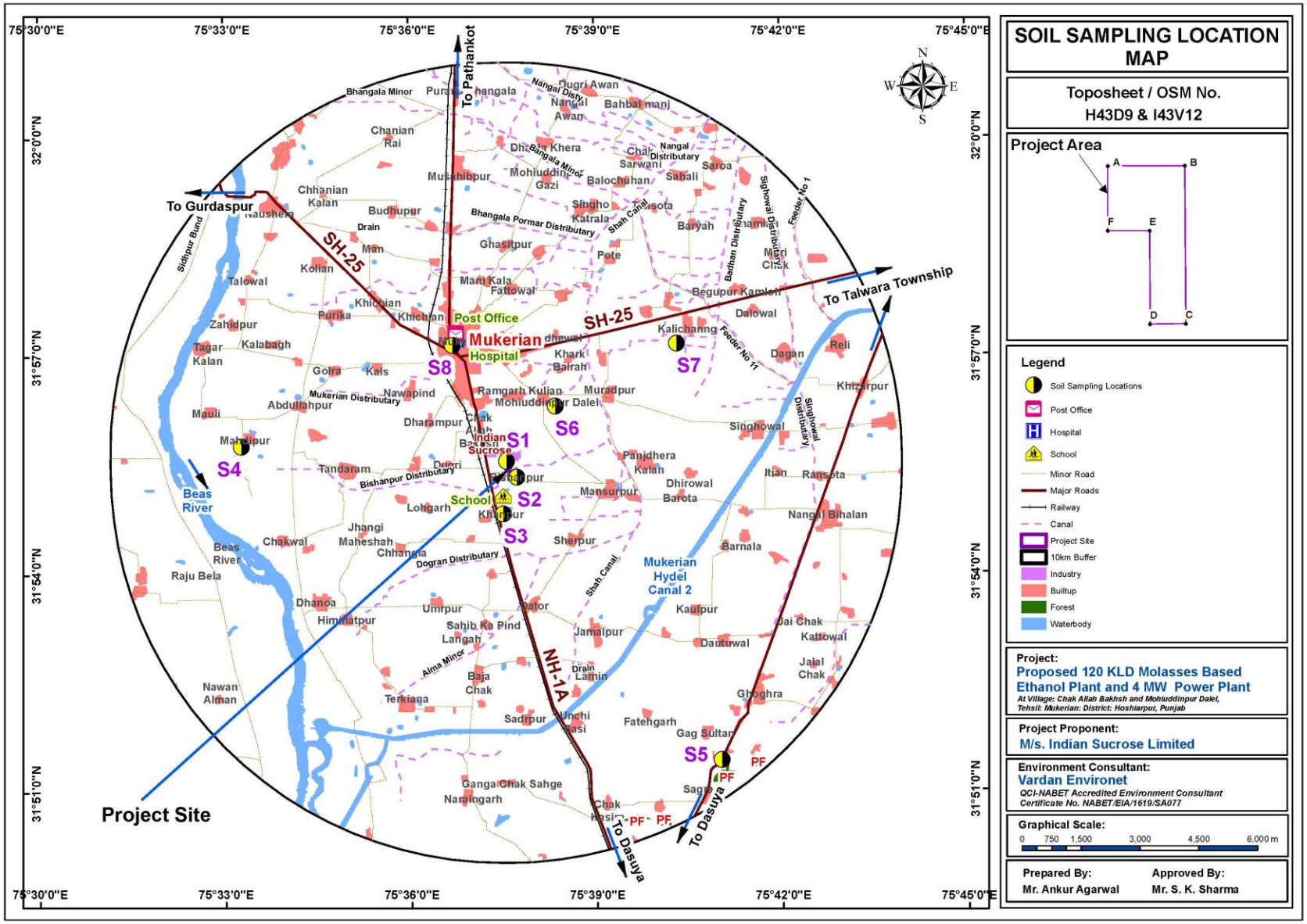


Figure 3-7: Soil Sampling Monitoring Location Key Plan

Table 3.13: Soil Sampling Results

S.no	Parameter	S1	S2	S3	S4	S5	S6	S7	S8	Test Method
1.	pH (at 25 ^{0}C)	7.39	7.37	7.40	7.51	7.81	7.91	7.30	7.55	IS : 2720 (P-26,1987)
2.	Conductivity (mS/cm)	0.317	0.385	0.541	0.540	0.756	0.401	0.619	0.430	IS:14767-2000 Reaffirmed 2006
3.	Soil Texture	Silty Loam	Silty Loam	Silty Loam	Silty Loam	Silty Loam	Silty Loam	Silty Loam	Silty Loam	USDA Method, 1968
4.	Color	Brownish	Brownish	Brownish	Brownish	Brownish	Brownish	Brownish	Brownish	USDA Method, 1968
5.	Water holding capacity (%)	29.70	32.15	26.40	24.40	39.51	30.58	25.40	31.28	USDA Method, 1968
6.	Bulk density (gm/cc)	1.60	1.48	1.40	1.39	1.56	1.40	1.43	1.28	USDA Method, 1968
7.	Chloride as Cl (mg/100gm)	34.89	42.10	51.40	46.51	70.40	70.30	55.30	78.45	USDA Method, 1968
8.	Calcium as Ca (mg/100gm)	31.15	38.40	45.90	40.30	45.96	55.89	46.40	56.10	USDA Method, 1968
9.	Sodium as Na	40.15	46.10	38.33	29.15	46.50	45.40	40.83	52.25	USDA

	(mg/100gm)									Method, 1968
10.	Potassium as K (kg/hec.)	165.30	115.45	130.00	129.00	121.00	122.30	141.00	130.00	USDA Method, 1968
11.	Organic Matter (%)	0.46	0.51	0.65	0.55	0.69	0.53	0.53	0.51	IS:2720 (P-22, 1972)
12.	Magnesium as Mg (mg/100gm)	18.37	25.40	25.40	25.40	23.40	32.79	26.20	36.10	USDA Method, 1968
13.	Available Nitrogen as N (kg./hec.)	248.00	210.00	270.00	245.00	256.40	291.00	272.00	241.00	IS:14684, 1999
14.	Available Phosphorus (kg./hec.)	24.56	29.40	28.40	25.40	34.96	28.40	28.40	27.87	USDA, APHA-4500PC
15.	Zinc as Zn (mg/kg)	0.85	0.81	0.70	0.56	1.19	0.90	0.79	0.92	APHA-3030D, APHA-3111B
16.	Manganese as Mn (mg/kg)	3.40	3.30	4.95	3.96	5.40	6.40	6.96	6.40	APHA-3030D, APHA-3111B
17.	Chromium as Cr (mg/kg)	0.40	0.65	0.33	0.48	0.60	0.76	0.41	0.70	APHA-3030D, APHA-3111B
18.	Lead as Pb	0.10	0.19	0.20	0.29	0.15	0.18	0.24	0.20	APHA-

	(mg/kg)									3030D, APHA-3111B
19.	Cadmium as Cd (mg/kg)	0.51	0.69	0.69	0.56	0.76	0.74	0.63	0.81	APHA-3030D, APHA-3111B
20.	Copper as Cu (mg/kg)	0.60	0.70	0.81	0.60	0.51	0.91	0.93	0.81	APHA-3030D, APHA-3111B

Interpretation

- The analysis results show that soil is acidic in nature as pH value ranges from 7.30 to 7.91 with organic matter 0.46 % - 0.69%.
- The concentration of Nitrogen (210.00 Kg/ha. to 291.00Kg/ha.) Phosphorus (24.56 Kg/ha. to 34.96 Kg/ha.) and Potassium (121.00 Kg/ha. to 165.30 Kg/ha.) has been found to be in good amount in the soil samples.

3.9 LAND USE AND LAND COVER

(A) Data Used

Indian Remote Sensing satellite, multi-spectral digital data has been used for the preparation of land use/ land cover map of present study. Survey of India reference map on 1:50,000 scales have been used for the preparation of base map and geometric correction of satellite data. Ground truthing has been carried out by making field visit by the involved EC and FAE to validate the interpretethose of remotely sensed data, by enabling verification of the interpreted details and by supplementing with the information, which cannot be obtained directly on satellite imagery.

(B) Methodology

The methodology used for the study consists of following components.

Methodology Adopted for Thematic Data Extraction from the Satellite Imageries

ERDAS image processing software and ARC/GIS software were used for the project. ERDAS 9.2 image processing software was used for digital processing of the spatial data. Digital image processing techniques were applied for the mapping of the land use land cover classes of the provided area from the satellite data. Methodology Used for Land use Classification and Mapping is presented in Figure describe below.

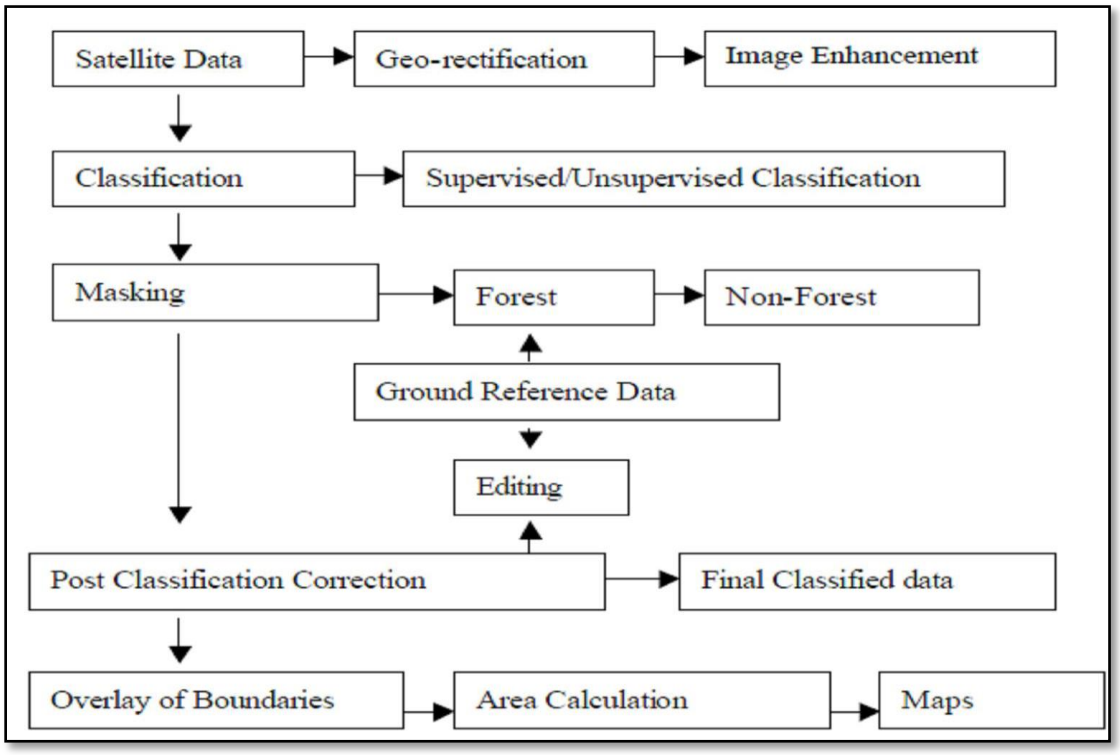


Figure 3-8: Methodology Used for Land use Classification and Mapping Result

In the present study, both digital image processing and using visual interpretation technique were used to generate output of Land use cover map of study area. A standard False Colour Composite (FCC) image and drainage map has also been generated on the same scale **(Figure 3.9 and Figure 3.10)**. The land use pattern of the study area is given in **Table 3.14.**

Table 3.14: land Use Pattern of the Study Area

Land-Use	Area (in Hectares)	% Area
Agriculture land	3995.65	50.9
Water Body	141.3	1.8
Open Shrub	455.3	5.8
Fellow Land	2527.7	32.2
Built up Area	737.9	9.4
Total Area	**7850**	**100**

Conclusion: The proposed study area consisting 50.9% (3995.65Ha.) of Agricultural land, 4% (1148.67 Ha.)Water body, 1.8% (141.3 Ha.)Open shrub, 5.8% (455.3 Ha.) Fellow land,32.2% (2527.7 Ha.) and 9.4% (737.9Ha) Settlement

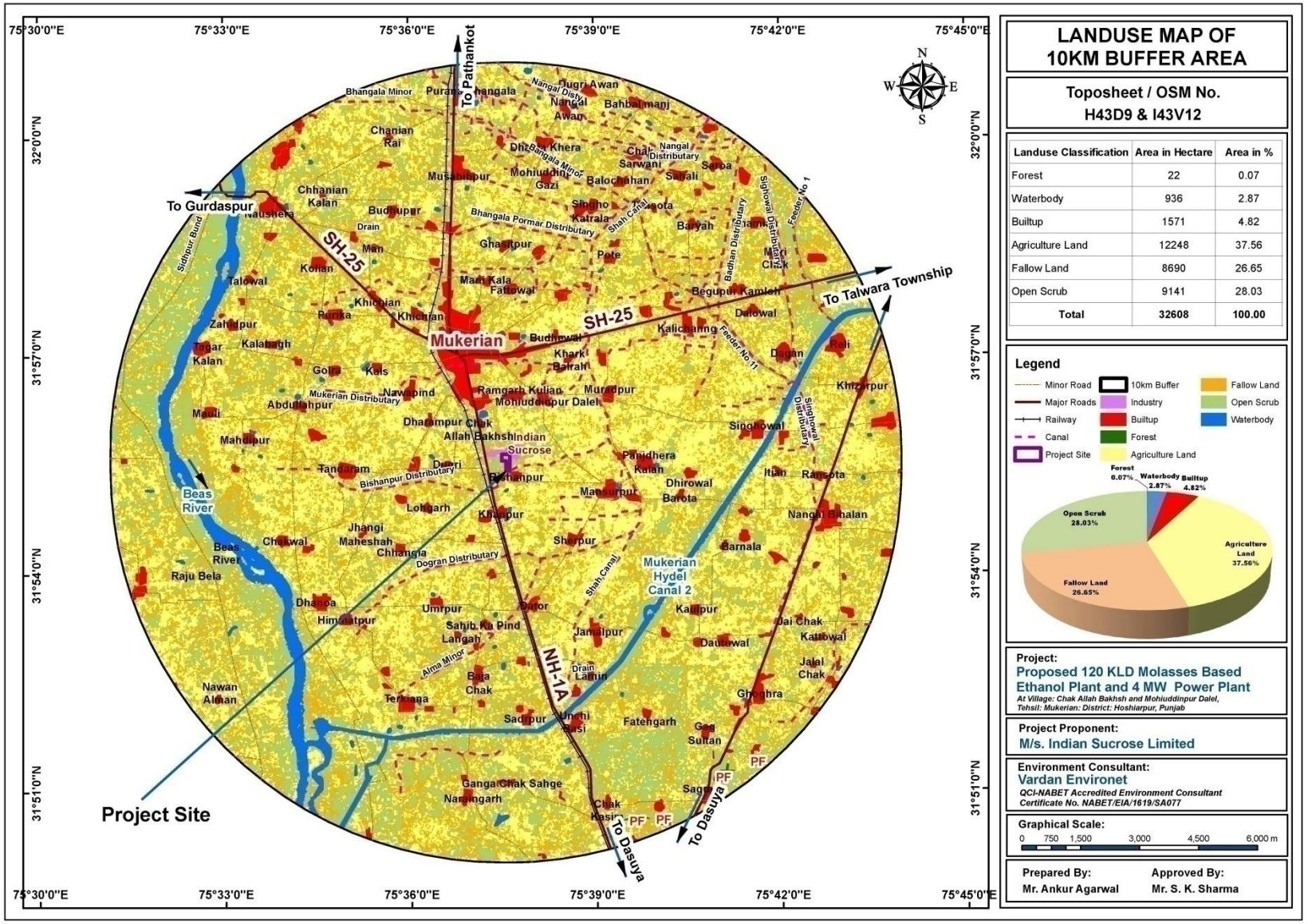


Figure 3-9: LULC Map of the Study Area (10 Km)

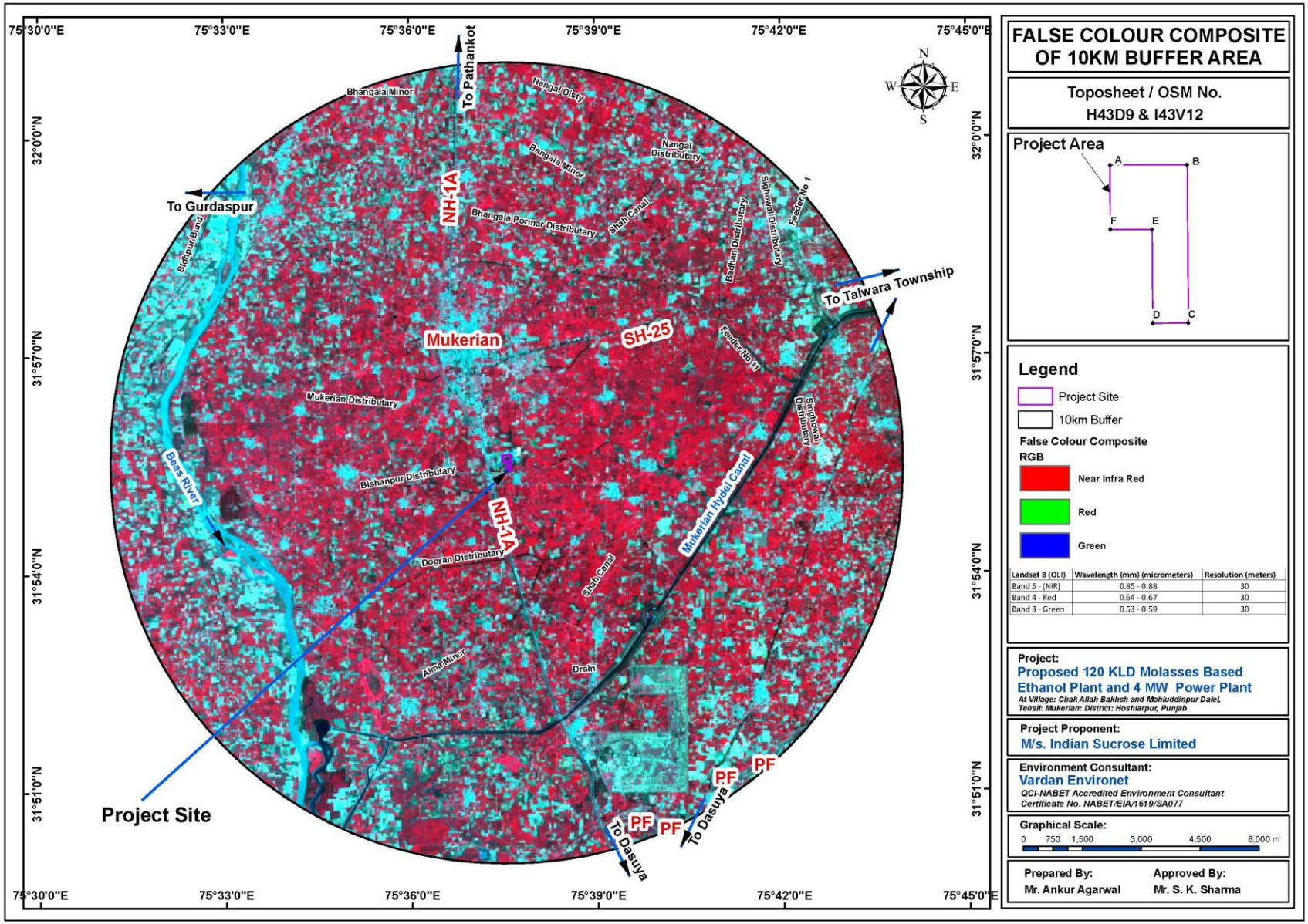


Figure 3-10: FCC Map of the Study Area (10 Km)

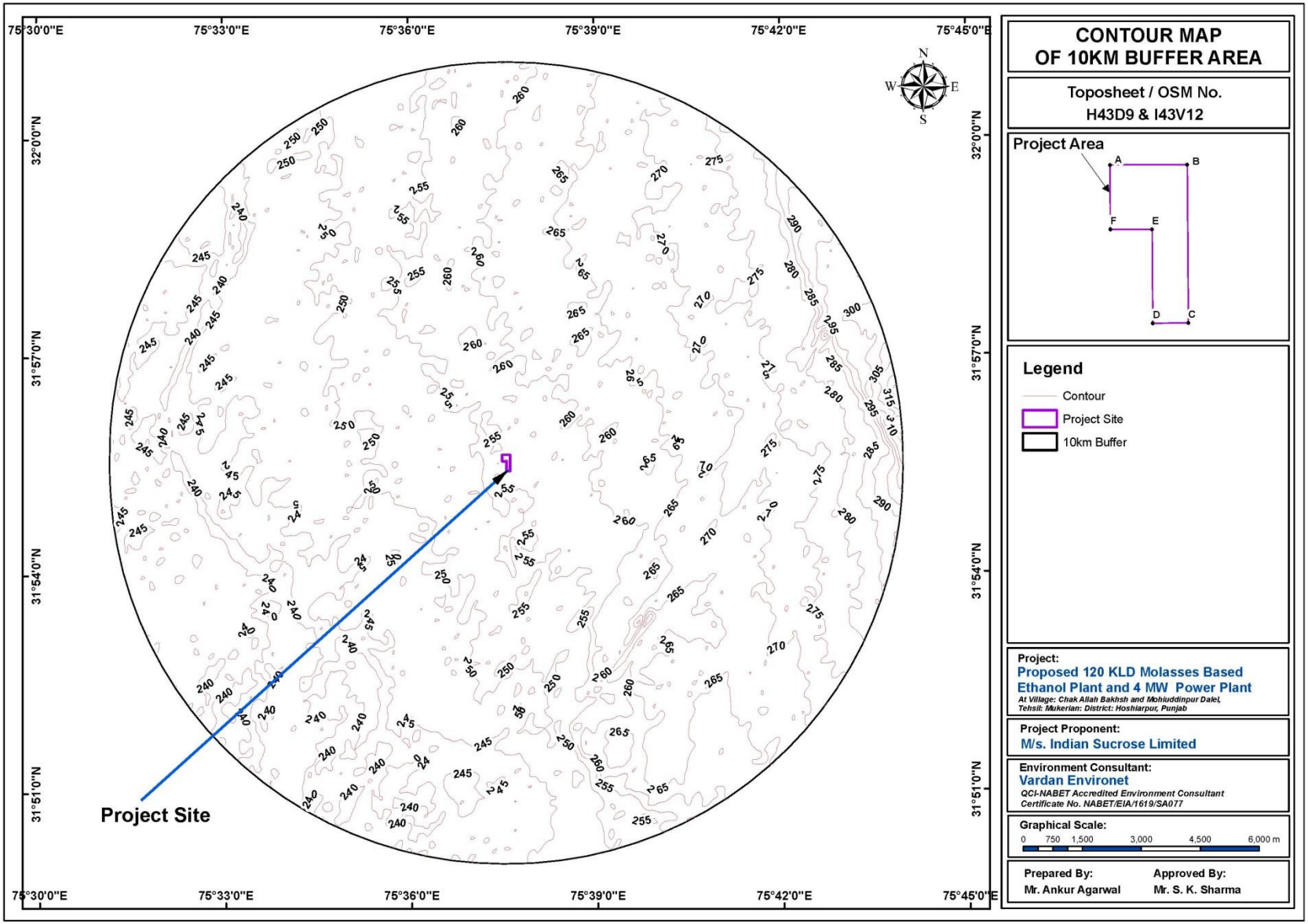


Figure 3-11: Contour Map of the Study Area

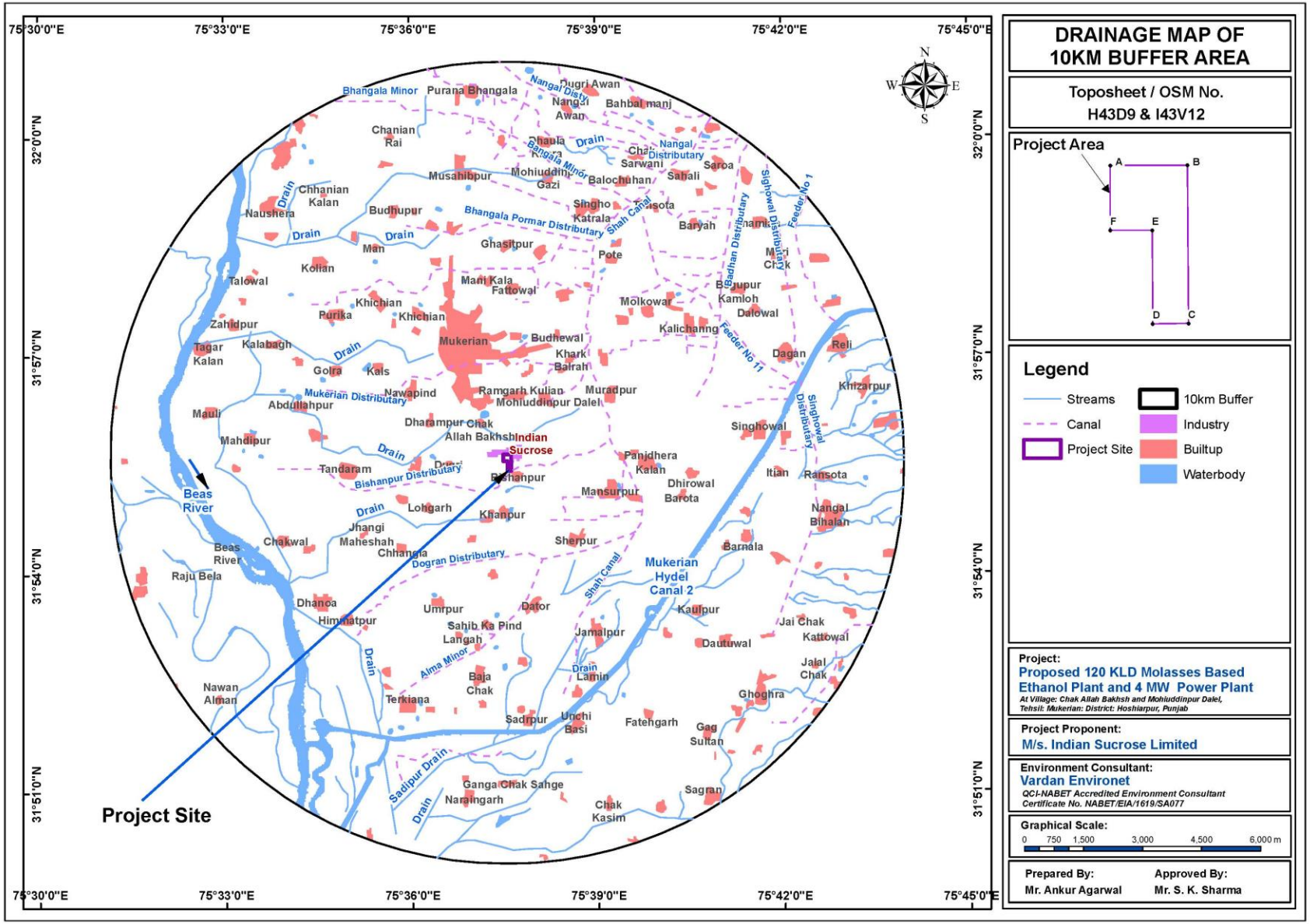


Figure 3-12: Drainage Map of the Study Area

3.10 GEOMORPHOLOGY

The Upper Shiwaliks and the Quaternary deposits constitute the main geological formations of the area. The Upper Shiwaliks comprise conglomerate beds, friable sandstone, siltstone and clay beds. Stray pebbles of granite, limestone and sand stones are also present. Sand stones are soft and friable. Lumps of clay and pellets are also met within the sandstone. At places sand stones show well developed cross-bedding and suggest the possibility of eolian origin. The sand stones contain a large portion of the mica flakes and concretions of clay. They are susceptible to weathering as a result of which there is a considerable collection of sand as talus cones.Quaternary deposits constitute gravel beds, alluvial fans and river terraces. They contain sand and clay in varying proportions. River terraces are seen flanking the present day streams and at some places they occupy the ridges. Gravel beds constitute an important source of white quartzite fragments. Recently ammonite fossils have been encountered in the Shiwalik formations near Garhshankar.

3.11 HYDROGEOLOGY

Unconsolidated alluvial sediments lying south of Siwalik foothills mainly occupy the district. The alluvial sediments are classified as piedmont and fluvial deposits. The piedmont deposits lie along Siwalik Hills, which comprises boulders, pebbles, gravel, sand and clay. It is further divided into Kandi and Sirowal, which are contemporaneous, and merge imperceptibly with each other. The fluvial comprise of silt, sand, gravel and clay in association with Kankar. Ground water is generally fresh at all levels. Ground water exploration was carried out at 48 sites which includes 5 piezometers. The boreholes at Patti Khas, Naloian, Jian, Hariana and Niala were abandoned due to insufficient thickness of aquifers. In the rest of the area, as well the ground water occurs under unconfined conditions in shallow aquifers and under semi-confined to confined condition in deeper aquifers. The drilling depth range from 126 to 460m bgl and constructed in the depth range of 103 to 374m. The yield of these wells ranges from 708 lpm to 2900 lpm with draw down of 5 to 12m. The wells constructed in the northwestern part of the district were high yielding wells than those constructed along the Siwalik foothills zone. Transmissivity of aquifers ranges from 634 to 4120 m^2/day. The hydraulic conductivity value in the district varies from 2 to 29m/day. The value of storage coefficient worked out to be $58x10^{-2}$ to 1.8 x 10^{-3}.Ground water Pre-monsoon Depth is 10-20 m and Post-monsoon Depth <10m.

Climate

The climate of Hoshiarpur district is classified as tropical steppe, hot and semi-arid which is mainly dry with very hot summer and cold winter except during monsoon season when moist air of oceanic origin penetrates into the district. There are four seasons in a year. The hot season starts from mid March to last week of the June followed by the south west monsoon which lasts upto September. The transition period from September to November forms the post monsoon season. The winter season starts late in November and remains upto first week of March.

Air Pollutants upon discharge to atmosphere pass through a number of mechanisms, which include diffusion and transportation leading to dispersion. These mechanisms are governed by the local atmospheric conditions. All these result in the necessity to collect the meteorological parameters like ambient temperature, wind speed, wind direction, and other weather conditions (relative humidity, atmospheric pressure etc.), which will be ultimately used for the prediction of the ground level concentrations of the air pollutants through mathematical modeling.

For this purpose a temporary auto weather station was installed to record micro meteorological data on wind speed, wind direction, Ambient Temperature, Solar Insolation and Relative Humidity on hourly basis.

The primary data from the site was matched with secondary data of IMD station, Amritsarfor data proofing.

A sophisticated on-site meteorological observatory was established near project site and operated continuously for three months' period (1stOctober 2017 to 31stDecember 2017). The observatory was located about 10 m above the ground level and ensured to be free from any obstruction to wind. Besides, this location was found to be most suitable one being close to the project site. The summary of the on-site data generated in respect of the above parameters for the period mentioned above are presented in **Table-3.4**. The Wind rose diagram for the entire period is shown in **Figures 3.7.**

Temperature

The monthly maximum and minimum temperatures recorded on-site during the aforesaidmonitoring period (1st October 2017 to 31st December 2017) varied between 37.4°C - 6 °C and. It could be observed that, the pattern of data recorded on-site generally matches with the past data of IMD.

Relative Humidity

The monthly minimum and maximum relative humidity recorded onsite during the said monitoring period varied between 12 % - 86 %.

Rainfall

The normal annual rainfall of the district is 938 mm which is unevenly distributed over the area in 38 days. The south west monsoon, sets in from first week of July and withdraws in end of September, contributes about 77% of annual rainfall. July and August are the wettest months. Rest 23% rainfall is received during non-monsoon period in the wake of western disturbances and thunder storms. Generally rainfall in the district increases from southwest to northeast.

- Normal Annual Rainfall: 938 mm
- Normal monsoon Rainfall: 720 mm
- Temperature Mean Maximum: 39^{0}C (May- June)
- Mean Minimum: 5^{0}C (January)
- Normal Rainy days: 38

The average annual rainfall at Hoshiarpur is 938 mm/year (As per CGWB report Hoshiarpur-2013).Total 518.1mm rainfall was recorded during the monitoring period.

3.12 SOCIO-ECONOMIC ENVIRONMENT

Any developmental activity exerts a direct impact on the socio-economic environment of the region. Usually, the beneficial impacts such as better job opportunities, improved education, communication, energy, housing, health, transportation facilities etc. outweighs the adverse impacts, if any.

The study of socio-economic component of environment is incorporating various facets, viz. demographic structure, availability of basic amenities such as housing, education, health and medical services, occupation, water supply, sanitation, communication and power supply, prevailing diseases in the region as well as features such as places of tourist attraction and monuments of archaeological importance. The study of these parameters helps in identifying predicting and evaluating the likely impacts due to project activity in the surrounding region.

The land is already under the possession of project proponent. Baseline data such as demographic pattern, occupational status, educational, health and other amenities as existing in the study area have been studied.

I. Baseline Status

The latest available data has been complied to generate the existing socio-economic scenario of the study area. Information on socio-economic profile was collected from the Primary Census Abstract CD 2011 including the population details of the region.

District Profile

Hoshiarpur District-The district takes its name from Hoshiarpur town, which serves as district headquarters. Hoshiarpur derives its name. Firstly, it is said to have been founded by Hargobind and Ram Chand, Diwans of Muhammed Bin Tuglak (AD 1325-1351). The Second ascribes the foundation of the town to one Khan, a resident of Bajwara (a suburb village of Hoshiarpur) who lived about the same period and after whom the town was named.

According to 2011 census, Hoshiarpur district covers an area of 3386 sq. km and ranks eleventh in the state, out of which 142.29 sq. km is urban and 3243.71 sq. km is rural. The area has been derived by subtracting urban area of the district from the total area as supplied by the Surveyor General, India. The tehsil wise area as supplied by the Director, Land records, Punjab,is Dasua (842.37 sq. km), Hoshiarpur (1118.99 sq. km.), Garhshankar (795.67 sq. km.) and Mukerian (628.97 sq. km.) As of 2011 India census, Hoshiarpur had a population of 189,371. Males constitute 50.9% of the population and females 49.1%. Hoshiarpur has an average literacy rate of 85.40%, compared to 81.00% of 2001. Male literacy is 89.90%, and female literacy is 80.80%. In Hoshiarpur, 10% of the population is under 11 years of age.

i. Females per 1,000 males: 962
ii. Density of population (per km².): 396
iii. Percentage increase in population (2001–2011): 7.1%
iv. Child sex ratio (0–6 Age): 859
v. The Scheduled Caste population in this district is 34.3%

Mukerian Tehsil is a city and biggest municipal council of Hoshiarpur district of Punjab. As of 2011 India census, Mukerian city had a population of 129889. Males constitute 52% of the population and females 48%. Mukerian has an average literacy rate of 77%, higher than the national average of 59.5%: male literacy is 80%, and female literacy is 74%. In Mukerian, 11% of the population is under 6 years of age.Mukerian has about 150 villages around it. Majority of the population is employed in agriculture and are serving in Indian Defence forces in several capacities. Mukerian is a permanent base of the Indian Armed forces and its south part hosts Unchi Bassi cantonment and Mansar in north. Region hosts majority of military exercises and war games of Indian army.

The Socio-Economic Status of the study areas is mentioned below and the villages surveyed are enlisted in Table 3.15.

Village: The basic unit for rural areas is the revenue village which has definite surveyed boundaries. The revenue village may comprise of one or more hamlets but the entire village is treated as one unit for presentation of data.

Study Area: The study area was defined as an area within 10 km radius around the proposed project site. Total 124 villages are coming within the 10 km radius of the study area. The villages are from Mukerian, Hazipur and Dasua Tehsil of Hoshiarpur District of Punjab State. Chak Allah Baksh comes in Mukerian Municipal Corporation.

Demographic Structure: Demographic structure of the study area was estimated for the selected parameters as households, population, sex ratio, scheduled caste, scheduled tribes, literacy from primary census abstract, CD 2011 of Punjab State. The summarized demographic structure of the study area is presented in Table 3.16, while the details of the parameters of demographic structure of the villages within 10 kms are shown in Table 3.17. The population details with the distribution of Scheduled Caste and Scheduled Tribes are shown in.

Demographic Profile of the Study Area

- Total number of households are about 23091
- Total population of villages under the study area is 110139 out of which males are 55582 (50.46%) and females are 54557 (49.53%)
- The average family size is about 4.7 persons per family
- Sex ratio (No. of females per 1000 males) is 981 which indicates that females are less in number than their male counterpart in the study area
- Out of the total population, the population of children within the age of 0-6 age-group is about 11773 (10.68%)
- Child Sex ratio is 817 i.e No.of female child per 1000 male child
- Scheduled caste population is about 25107 (22.79%) while the Scheduled tribes population is Nil in the region
- Out of the total population in the region 83886 i.e 76.16% are literates

It can be inferred from the data obtained that area is on an average populated while it is observed that the adult female population is quite higher as compared to female population with the age-group of 0-6 years. Scheduled tribe population is nil in the study area.

Occupational Pattern/ Economic Resource Base

'Work' has been defined as participation in any economically productive activity. Such participation may be physical or mental. Persons on leave and under training are also treated as workers. However, rent receivers and pensioners are not treated as workers.

Total Workers: Occupational pattern of the villages within 10 km is presented in Table 4. Occupational pattern of any region mainly depends upon its economically active group i.e. the working populations involved in different economically productive activities. The total workers further categorized as main worker, marginal and the non-working population.

The workers coming under the main and marginal workers category are cultivators, agricultural labors and those engaged in live stock, forestry, fishing, hunting, and plantations, orchards and allied activities, mining and quarrying, manufacturing, processing, servicing and repairs in household industry, construction trade and commerce, transport, storage & communication, and other services

Different types of workers in total worker population may be classified and described below while presented in Fig 3.16

A. **Main Workers:** Main workers are those who have worked for a major part of the year (i.e. at least six months or 183 days). Main activity of a person who was engaged in more than one activity was reckoned in terms of time disposition. 24681 (22.40%) of the total population comes under the main workers category from the villages coming in the project site. Main workers are further classified into 4 categories viz., cultivators, agricultural laborers and household workers and other main workers

Cultivators For purposes of the Census a person is classified as cultivator if he or she is engaged in cultivation on land owned or held from government or held from private persons or for payment in money, kind or share. The person who is engaged either as employer, single worker or family worker

in cultivation of land is recognized as a cultivator. Cultivation involves ploughing, sowing, harvesting and production of cereals and millet crops such as wheat, paddy, jowar, bajra, ragi, etc., and other crops such as sugarcane, tobacco, ground-nuts, tapioca, etc., and pulses, raw jute and kindred fiber crop, cotton, cinchona and other medicinal plants, fruit growing, vegetable growing or keeping orchards or groves, etc. Cultivation does not include the following plantation crops–tea, coffee, rubber, coconut and betel-nuts (areca).
Maximum populations in the study area are engaged as Cultivators'i.e depended on agriculture. The cultivator population within the study area of rural region is 6530 i.e 26.45%.
Agricultural Labourers: Persons working on land owned by others for wages or share in the yield have been treated as agricultural laborers. Out of the total main worker category very few population are agricultural laborers i.e about 7.13%

Laborers in Household Industry: The laborers engaged in household activity are quite low in all the study area. Among the total main workers very few population are engaged in household activity i.e 886 in rural area.

Other Workers: All main workers i.e. those who have been engaged in some economic activity during the last one year and who are neither cultivators nor agricultural laborers or household industry workers are classified as other main workers. The type of workers that come under this category includes factory workers, plantation workers, those in trade, commerce, business, transport, construction, political or social works, all government servants, municipal employees, teachers, priests, entertainers, artists etc. The other worker category includes maximum population of 15505 (62.82%) from rural region.

It can be concluded that maximum population from the villages are engaged in other activities which means either in service or business activity.

B. Marginal Workers: Marginal workers are those who have worked any time in the year for less than six months or 183 days but have not worked for a major part of the year. The population of marginal workers within the project site comprises of about 5236(4.75%).

C. Non-Workers: Non-Workers are those who have not worked any time at all in the year. Non-workers constitute householders, students, dependents, retired persons etc.

- The economy of the study area is primarily based on agriculture. The agriculture sector has thus absorbed a major portion of the working force.
- The categories of main workers, marginal workers & non workers are complementary to each other. Therefore, in areas where the proportion of main workers & marginal workers are high, the proportion of non workers would be naturally low. At present main workers category outweighs the marginal and non workers in the study area.
- The proportion of female main worker population is high as compared to their male worker counterpart because in general rural areas offer more opportunities for men & women to work in agriculture & animal husbandry etc. In view of the labor intensive nature of agricultural economy a large number of women are required to participate in work especially during the peak seasons ofagricultural operations like sowing & harvesting which are to be carried out in a short span of time covering large areas in each village. Non-worker population in rural area is 80222(72.83%).

Infrastructure Resource Base: The details of infrastructure resources base of the study area with reference to education, medical facility, water supply, post and telegraph, transportation, communication facility, power supply, existence of nearest town etc. are presented in Table 3.19. The significant features of these important parameters for each study area are discussed as below:

Educational Facility: The numbers of educational institution in the study area are primary schools (104) and private primary school are in 60 villages out of the total 124 villages, middle school (42), and Secondary schools (20), and 7 senior secondary school . For further studies people have to avail the facility from the nearest town i.e. Mukerian and Hoshiarpur town.

Drinking Water Facility: The numbers of major sources of drinking water in the study area is through Hand Pump in all 77 villages, Uncovered Well (37), Covered Well (29), untreated Tap water in 45 villages and Treated tap water in 92 villages of the study area.

Medical Facility:Medical institutions in rural parts of the region are inadequate, as per the data recorded in the village amenities CD there is Community Health Centre in 5 villages, Primary health Centre only in 6 villages, Primary health sub-centre in 8 villages, Maternal Child Welfare Centre in 10 villages and Dispensary in 14 villages. People generally prefer for private hospitals because of the inadequate and poor facilities at government hospitals.

Sanitation & Drainage Facility: Sanitation facility is poor in the villages of the study area. 97 Villages have the open drainage system while the covered drainage system is available in 42 villages.

Communication Facility: Communication facility is available in the form of Post office is available in only 5 villages and telephone connections are available in 122 villages.

Transportation Facility: Public Bus Service is the main mode of transportation available in 25 villages and Railway Station is in 6 villages while the nearest railway station is at Mukerian approximately 4.5 kms from the project site.

Approach Road:Pucca roads are available in 122 villages . This shows that the approach roads are available in all the villages which makes easier to travel to long distances.

Power Supply: Electricity is available for domestic in the 122 villages of the study area but is available for only 10-12 hours a day. Electricity is also available for agriculture purpose in 121 villages.

ATMs and COMMERCIAL BANKS: The data collected from the census village directory shows that the ATM facility is available in only 1 village while the commercial banks are in 5 villages.

Economic Resource Base

Agriculture: Out of a total cultivated area of 363,000 hectares, (food crops alone account for 316,000 hectares and area under non-food crops is only 47,000 hectares) 183,000 hectares in Kharif season whereas 180,000 hectares in Rabi season. The important crops as per area during the year 2009-10 are wheat 153,000 hectares, Maize 67,000 hectares, Rice 70,000 hectares, Sugarcane 14,000 hectares and

potato 16.800 hectares. The reason for poor output is because sizeable areas of the district are hilly and sub-mountain, where availability of irrigation facilities are far from satisfactory.

Health Status: Health of the people is not only a desirable goal, but it is also an essential investment in human resources. As per the National Health Policy (1983), Primary Health Care has been accepted as main instrument for achieving this goal of development and strengthening rural health infrastructure through a three-tier system, viz., Primary Health Center (PHCs), Primary Health Subcentres (PHS) and Community Health Centers have been established to provide heath care facility not only to the resident population of the concerned villages but also to the neighboring villages.

Primary Health Centers -PHC is the first contact point between village community and the Medical Officer. The PHCs were envisaged to provide an integrated curative and preventive health care to the rural population with emphasis on preventive and promotive aspects of health care.

Primary Health Sub-Centers -Sub-Centers are assigned tasks relating to interpersonal communication in order to bring about behavioral change and provide services in relation to maternal and child health, family welfare, nutrition, immunization, diarrhea control and control of communicable diseases programmes.

Community Health Centre -Community Health Centre (CHCs) are being established and maintained by the State Government underMNP/BMS programme. As per minimum norms, a CHC is required to be manned by fourmedical specialists i.e. Surgeon, Physician, Gynecologist andPediatrician supported by 21paramedical and other staff.

Lac
k of building, shortage of manpower and inadequate provision of drug supplies are hampering the operationof these units.The standards to be met according to National Rural Health Care System are given below:

Population	Medical Facility & Infrastructure	Personnel
3000-5000	1 Sub centre (Contact Unit of PHC and Community)	1 Health Worker (Female)/ Auxiliary Nurse Midwives & 1 Health Worker (Male)
20,000-30,000	1 PHC (Unit of 6 Sub-Centers)- 6 beds	Medical officers & 14 Paramedical Staff
80,000-1,20,000	Community Health Centre (Referral Unit-4 PHCs)- 30 Bedded Hospital	Medical superintendent

Source: National Rural Health Care System in India (2005-12)

During the study it was revealed that within the study area of 10 km radius there are Community Health Centre(5), Primary Health Centres in 6 villages while the Primary Health Sub-centres are in 8 villages of study area. As per the data of District Human Development Report the prevalence of diseases, it was noted that in Hoshiarpur district 37 persons per 100,000 populations were reported to be suffering from Tuberculosis (RCH-RCS-2002). Tuberculosis (TB) was the most prevalent disease in the villages. In Hoshiarpur district prevalence of Malaria was 121 per 100,000 populations in 2002-04 (RCH-RHS, 2002-04). It is attributed from the data that different health problems are reported

which could be attributed to improper sanitation, lack of health awareness among the people and lack of health related infrastructure facilities.

II. Cultural and Aesthetic Attributes

As such no culturally and aesthetically important places are located within the 10 kms radius of the study area.

Socio-economic Survey

In order to access and evaluate likely impacts arising out of any development projects on socio economic environment, it is necessary to gauge the apprehensions of the people in the study areas.

III. Methodology applied for selection of sample & data collection

The methodology which is applied for primary source of data collection i.e. gathering data through field survey for socio-economic environment is depicted below:

A. Sampling Method

A judgmental and purposive sampling method was used for choosing respondents of various sections of the society i.e. Sarpanch, adult males and females, teachers, medical practitioners, businessmen, agriculture laborers, unemployed group etc. Judgmental and purposive sampling method includes the right cases from the total population that helps to fulfill the purpose of research needs.

B. Data Collection Method

For the process of data collection through primary source certain methods are used among that are:
Field Survey and Observations

Field survey and observations is made at each sampling village and the socioe-conomic status of that region is studied. Visits are made at hospitals, primary health centers and sub-centers to know the health status of the region. Various governmental organizations such as statistical department, department of census operations are visited to collect the population details of that region.

Interview Method

Structured interview method is used to collect data regarding the awareness and opinion from the samples selected of the various socio- economic sections of the community. Structured interviews involve the use of a set of predeterprojectd questions that includes fixed and alternative questions. The questionnaire mainly highlights the parameters such as income, employment and working conditions, housing, food, water supply, sanitation, health, energy, transportation and communication, education, environment and pollution to assess the standard of living of that particular region and general awareness, opinion and expectation of the respondents about the proposed project. Interview method helps to collect more correct and accurate information as the interviewer is present during the field survey.

Socio-economic survey was conducted in the villages within the study areas located in all directions with reference to the clusters. 8 villages were surveyed from study area.

The respondents were asked for their awareness / opinion about the existing plant and also of their opinion about the impacts of the project which are an important aspect of socio-economic environment, viz. job opportunities, education, health care, housing, transportation facility and economic status.

The salient observations recorded during socio economic survey in the study areas are depicted below:

- ✓ Majority of main workforce are engaged in others activity such as service and business

- ✓ Majority of workers are practicing farming activities without any irrigation source, it means that area under irrigation is very low and maximum area is covered by unirrigated land
- ✓ Most of the villages have Primary School (PS) while in some villages it is extended up to Middle School (MS). While for further education villagers go to the town place that is to Mukerian and Hoshiarpur town.
- ✓ The main source of drinking water supply is through treated tap water facility, Hand pump and uncovered well. But majority of respondents expressed unsatisfactory opinion regarding the availability of drinking water facility as the villages mainly have open wells which are not portable for drinking
- ✓ The Government medical facilities in the form of primary health sub- centre and private medical representatives are available in village. ANM (Auxiliary Nurse Midwife) frequently visits all the villages and regular vaccination and health checkup camps are organized by the health centre
- ✓ Two wheelers, Private jeep & bus facility are the main mode of transportation used by natives in the study area
- ✓ Power supply is available in mostly all the sampling villages. Street lights are also available in all villages
- ✓ Wood and LPG gas fuel is used for cooking purpose while is gas agency is available only with few villages
- ✓ Majority of surveyed population opted positive response regarding the proposed project activities as most of the local population will be given preference in employment and the activity will help in development of auxiliary as well as ancillary jobs in the region.

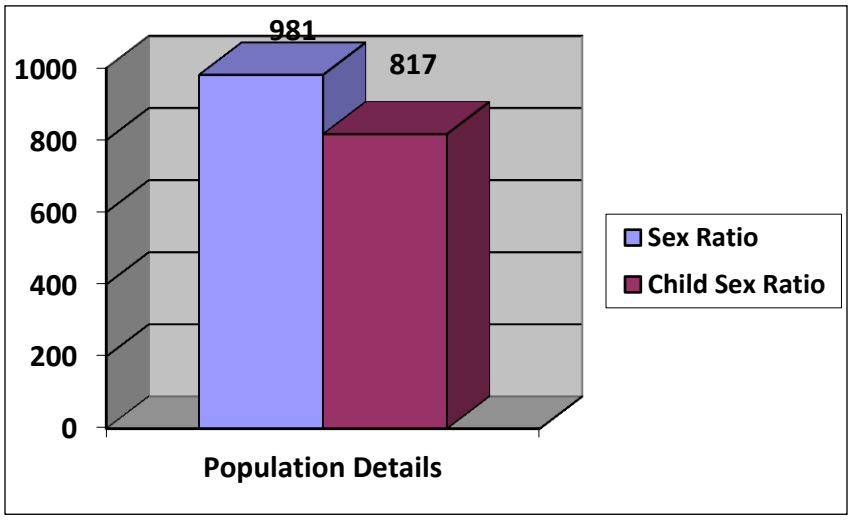


Figure 3-13: Bar Diagram Representation Ratio of Adult Sex Ratio and Child Ratio (Rural & Urban Area)

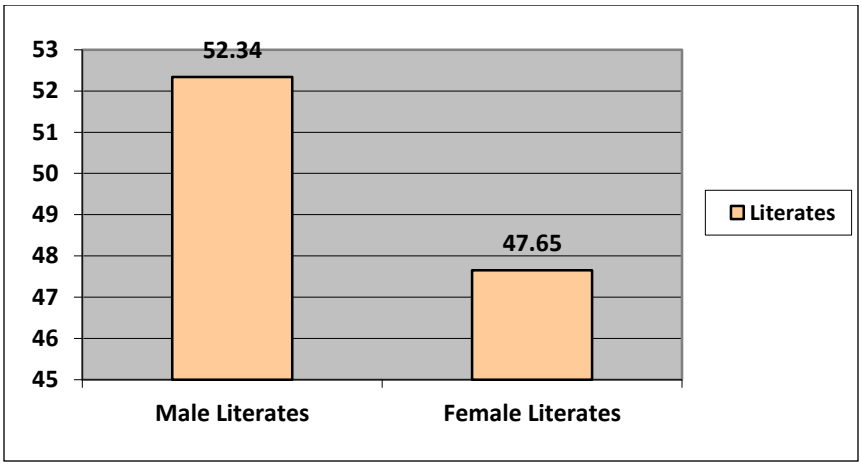


Figure 3-14: Representing the Percentage of the Literates in the Study Area

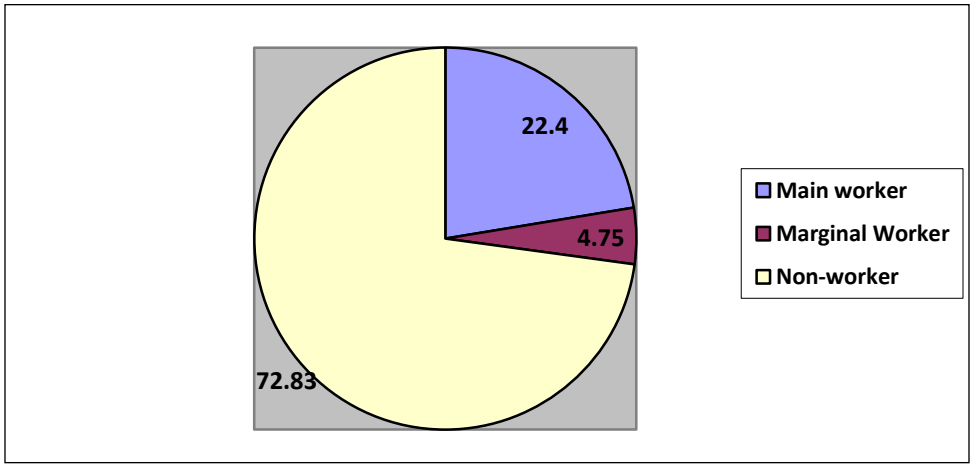


Figure 3-15: Occupational Pattern of the Study Area

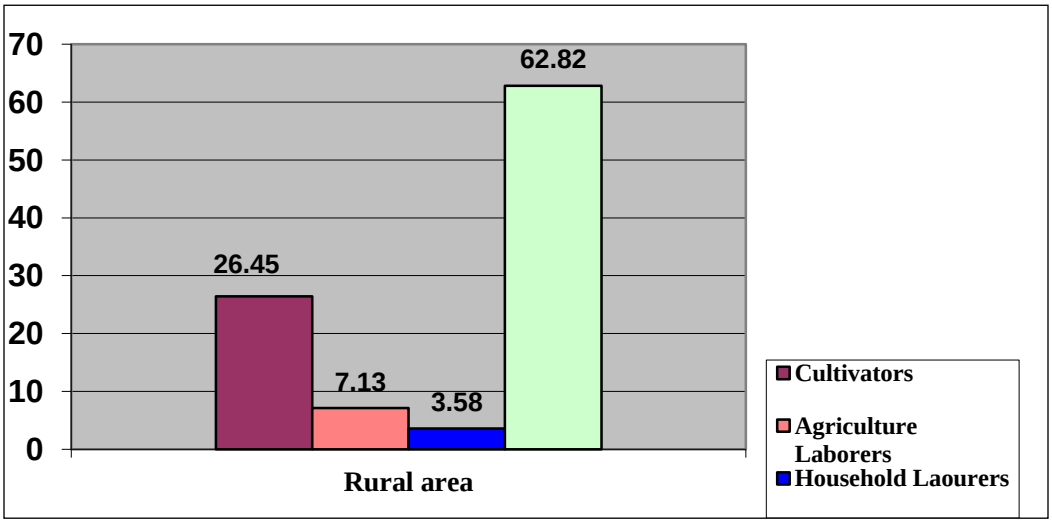


Figure 3-16: Bar Diagram Representing the percentage of Category of workers

Table 3.15: List of the Villages for the Field Survey of the Socio-Economic Environment

Sr. No.	VILLAGES	DIRECTION FROM THE PROJECT SIT
1.	Mahi Ul Dinpur	Project Site
2.	Bishanpur	S
3.	Mukerian	N
4.	Attalgarh	NW
5.	Dugri Raj Putan	W
6.	Latifpur	S
7.	Khanpur	SE
8.	Panjdhera Kalan	E

Table 3.16: Summarized Demographic Structure of the Study Area

S.No	Parameter	Study Area
1.	No. of Villages	124
2.	Household	23091
3.	Household Ratio	4.7
4.	Total Population	110139
5.	Male Population	55582(50.46)
6.	Female Population	54557(49.53)
7.	Population (0-6 Years)%	11773(10.68)
8.	Sex Ratio	981
9.	Child Sex Ratio	817
10.	Scheduled Caste %	25107(22.79)
11.	Scheduled Tribes %	Nil
12.	Literates %	83886(76.16)
13.	Main Workers %	24681(22.40)
i)	Cultivators %	6530(26.45)
ii)	Agricultural Labourers %	1760(7.13)
iii)	Household Labourers %	886(3.58)
iv)	Other workers %	15505(62.82)
14.	Marginal Workers %	5236(4.75)
15.	Non-Workers %	80222(72.83)

Source: PCA Census 2011, Punjab State

Table 3.17: Demographic Structure of the Study Area

Sr.No.	Villages	Households	Total Population	Population (0-6 Years)	Scheduled Caste	Literates
Punjab State						
Hoshiarpur District						
Mukerian Tehsil						
1.	Mahi-Ul-Dinpur Gazi(311)	159	741	74	152	528
2.	Bishanpur (235)	178	817	64	76	634
3.	Latifpur (238)	133	609	62	211	468
4.	Bhatian Jattan (247)	141	695	63	164	529
5.	Salehrian Khurd (248)	207	942	113	114	706
6.	Dugri Raj Putan (237)	425	2052	217	775	1604
7.	Muradpur (242)	175	925	94	112	665
8.	Chhangla (241)	191	891	109	230	703
9.	Umarpur (209)	76	380	39	4	284
10.	Alipur (210)	96	524	49	69	419
11.	Taggar Khurd (211)	94	432	39	38	341
12.	Khanpur (212)	228	1110	118	118	860
13.	Samra (243)	94	484	61	89	369
14.	Chakowal (440)	179	961	86	105	740
15.	Amirpur (438)	115	610	92	13	472
16.	Baopur (437)	88	418	41	39	308

17.	Bagrohi (435)	69	353	38	0	257
18.	Papin (244)	56	260	25	0	188
19.	Mehndipur (434)	251	1120	138	41	799
20.	Mauli (433)	113	526	55	0	392
21.	Abdullapur (432)	260	1313	140	0	1043
22.	Barota Urf Puro Nangal (245)	109	462	59	176	336
23.	Tanda Ram Sahai (246)	578	2478	296	209	1887
24.	Golra (251)	146	657	69	296	530
25.	Kalas (250)	130	623	57	186	461
26.	Attalgarh (249)	389	1856	214	635	1207
27.	Manj Kala (265)	157	740	80	154	576
28.	Pawar (266)	159	767	91	20	576
29.	Khichian (261)	391	1860	204	488	1409
30.	Bhattian Rajputtan (260)	151	700	64	101	557
31.	Porika (259)	368	1671	154	155	1293
32.	Ghalian (252)	59	292	33	40	217
33.	Talwandi Khurd (253)	4	15	2	0	13
34.	Kale Bagh (254)	83	402	43	89	292
35.	Miani Malahan (430)	6	41	8	0	18
36.	Taggar Kalan (431)	214	1065	129	48	768
37.	Zahidpur (428)	240	1197	151	12	847

38.	Tur (255)	84	418	54	29	297
39.	Taluwal (256)	59	271	27	6	206
40.	Kolian (258)	288	1395	152	291	1053
41.	Chhant (257)	153	721	83	118	521
42.	Noshehra (427)	436	2172	229	279	1651
43.	Kalechpur Kalota (426)	137	637	69	110	497
44.	Chhanian Kalan (268)	60	290	40	0	218
45.	Man (267)	147	646	63	117	505
46.	Budhupur (269)	257	1279	130	161	975
47.	Talwandi Kalan (270)	154	763	69	85	597
48.	Musahibpur (312)	415	2040	213	442	1615
49.	Chhanian Rai Ide Khan (314)	86	434	45	0	323
50.	Hoshiarpur Kalota (425)	246	1195	120	278	843
51.	Sadullapur Kalota (424)	205	1006	118	87	731
52.	Salehrian Kalan (313)	253	1226	170	364	914
53.	Ghasitpur (271)	160	865	105	333	633
54.	Manjpur (317)	275	1127	100	170	863
55.	Bhangala (322)	1405	6786	686	2324	5204
56.	Naharpur (335)	93	446	51	117	291
57.	Dhaula Khera(310)	226	1201	134	279	944

58.	Gujjar Katrala (281)	191	849	72	445	637
59.	Singo Katrala (282)	244	1120	133	403	841
60.	Nangal Awana (336)	105	487	47	244	400
61.	Saroa (337)	48	253	31	80	184
62.	Kajla (334)	26	128	12	27	102
63.	Sahota (325)	99	455	40	47	370
64.	Mahiul-Dinpur Dalel (234)	378	1716	162	423	1376
65.	Kharak Balrah (274)	139	625	59	311	482
66.	Fattuwal (272)	221	975	107	339	757
67.	Budhewal (273)	67	313	38	125	243
68.	Trangalian (276)	147	747	73	169	602
69.	Dhido Katrala (280)	33	155	12	61	131
70.	Pandori (192)	432	2108	209	471	1648
71.	Mehatpur (216)	131	644	70	191	519
72.	Mansurpur (215)	406	1786	164	299	1349
73.	Sherpur (214)	140	644	74	210	473
74.	Aima Mangat (213)	224	1005	100	167	834
75.	Pind Sahibka (201)	119	547	63	15	411
76.	Gaunspur (199)	120	504	50	250	403
77.	Devi Dass (198)	165	760	71	279	599

78.	Makha (200)	134	703	71	578	523
79.	Langah (202)	87	419	49	199	319
80.	Aulia (207)	124	597	58	96	478
81.	Jamalpur Khurd (208)	4	17	1	6	16
82.	Sihan (203)	104	497	56	110	396
83.	Dhanoya (206)	389	1895	184	358	1454
Total		**15928**	**75856**	**8035**	**16452**	**57724**
Hazipur Tehsil						
84.	Khizarpur (366)	277	1453	167	0	1082
85.	Daggan (290)	408	2042	235	637	1545
86.	Dalowal (291)	136	608	64	200	457
87.	Begpur Kamloh (292)	140	691	63	196	551
88.	Zahidpur (289)	142	663	72	302	574
89.	Patial (288)	116	560	72	76	415
90.	Kalo Chahang (287)	185	905	106	156	676
91.	Gahlarian (275)	212	953	87	131	773
92.	Piru Chak (279)	0	0	0	0	0
93.	Chahang Hamel (285)	190	872	107	93	642
94.	Malkowal (286)	115	563	57	164	447
95.	Chima (283)	86	422	50	123	320
96.	Pota (284)	144	659	59	277	548
97.	Nansota (296)	72	360	46	7	278
98.	Bariah (295)	122	564	50	265	451

99.	Dhamian (294)	211	931	113	110	682
100.	Mohri Chak (293)	125	630	83	141	482
101.	Ransota (228)	166	865	98	228	688
102.	Ittian (229)	160	836	119	181	497
103.	Dhirowal (232)	71	353	25	77	283
104.	Sunderpur (227)	85	387	30	3	323
105.	Barnala (222)	167	766	84	432	579
106.	Singhpur (223)	175	866	105	205	658
107.	Kaulpur (189)	139	599	63	206	437
108.	Daulowal (188)	165	859	93	352	667
109.	Balhaddah (190)	109	527	58	53	398
110.	Jhigla Pind (191)	60	297	43	0	231
111.	Jamalpur Kalan (193)	57	268	31	0	207
112.	Bhagran (221)	74	340	35	65	258
113.	Barota Urf Puro Nangal (220)	134	687	69	204	530
114.	Muradpur (233)	309	1418	133	298	1109
115.	Panjdhera Gazi (218)	24	101	6	0	86
116.	Panjdhera Rahia (219)	140	589	58	62	439
117.	Panjdhera Kalan (217)	197	966	99	366	725
118.	Singowal (231)	251	1261	126	256	1062
Total		**5164**	**24861**	**2706**	**5866**	**19100**

Dasua Tehsil						
119.	Chak Kasim (150)	93	456	72	100	303
120.	Unchi Bassi (195)	718	3273	323	541	2676
121.	Lamin (194)	343	1573	170	504	1206
122.	Fatehgarh (151)	131	607	52	254	492
123.	Gag Sultan (182)	157	762	101	627	518
124.	Ghogra (183)	557	2751	314	763	1867
Total		**1999**	**9422**	**1032**	**2789**	**7062**
Grand Total		**23091**	**110139**	**11773**	**25107**	**83886**

Source: PCA Census 2011, Punjab State

Table 3.18: Occupational Structure of the Study Area

Sr.No.	Villages	Total Main Workers	Main Workers				Marginal Workers	Non-Workers
			Cultivators	Agricultural Laborers	Household Laborers	Other Workers		
Hoshiarpur District								
Mukerian Tehsil								
1.	Mahiul-Dinpur Dalel (234)	331	90	20	12	209	18	1367
2.	Bishanpur (235)	224	58	23	9	134	47	546
3.	Latifpur (238)	159	49	12	5	93	24	426
4.	Bhatian Jattan (247)	166	34	1	8	123	2	527
5.	Salehrian Khurd (248)	178	5	11	3	159	57	707

6.	Dugri Raj Putan (237)	502	49	11	9	433	50	1500
7.	Muradpur (242)	130	55	3	2	70	121	674
8.	Chhangla (241)	164	70	18	15	61	80	647
9.	Umarpur (209)	60	38	1	3	18	31	289
10.	Alipur (210)	118	4	41	3	70	4	402
11.	Taggar Khurd (211)	106	26	4	1	75	4	322
12.	Khanpur (212)	221	55	25	12	129	52	837
13.	Samra (243)	113	32	43	4	34	15	356
14.	Chakowal (440)	347	29	56	130	132	23	591
15.	Amirpur (438)	5	3	1	1	0	43	562
16.	Baopur (437)	97	11	7	1	78	4	317
17.	Bagrohi (435)	78	33	6	0	39	57	218
18.	Papin (244)	57	32	1	0	24	49	154
19.	Mehndipur (434)	180	74	14	8	84	19	921
20.	Mauli (433)	132	75	12	2	43	3	391
21.	Abdullapur (432)	283	44	6	0	233	30	1000
22.	Barota Urf Puro Nangal	84	39	2	0	43	22	356

	(245)							
23.	Tanda Ram Sahai (246)	430	128	38	11	253	56	1992
24.	Golra (251)	137	41	37	6	53	26	494
25.	Kalas (250)	135	28	12	4	91	3	485
26.	Attalgarh (249)	365	38	7	1	319	114	1377
27.	Manj Kala (265)	183	47	5	2	129	47	510
28.	Pawar (266)	163	16	5	3	139	23	581
29.	Khichian (261)	453	41	10	1	401	13	1394
30.	Bhattian Rajputtan (260)	181	26	1	0	154	1	518
31.	Porika (259)	361	86	7	13	255	7	1303
32.	Ghalian (252)	118	28	2	20	68	2	172
33.	Talwandi Khurd (253)	6	2	0	0	4	0	9
34.	Kale Bagh (254)	94	3	6	5	80	10	298
35.	Miani Malahan (430)	8	0	0	0	8	1	32
36.	Taggar Kalan (431)	227	32	15	0	180	73	765
37.	Zahidpur (428)	276	115	76	7	78	82	839
38.	Tur (255)	102	21	4	2	75	5	311

39.	Taluwal (256)	75	17	10	2	46	7	189
40.	Kolian (258)	406	115	11	3	277	18	971
41.	Chhant (257)	276	27	8	0	241	0	445
42.	Noshehra (427)	529	140	8	6	375	156	1487
43.	Kalechpur Kalota (426)	125	22	2	0	101	12	500
44.	Chhanian Kalan (268)	82	29	0	1	52	15	193
45.	Man (267)	150	73	8	3	66	16	480
46.	Budhupur (269)	341	102	9	2	228	13	925
47.	Talwandi Kalan (270)	123	32	0	1	90	63	577
48.	Musahibpur (312)	472	187	35	10	240	119	1449
49.	Chhanian Rai Ide Khan (314)	138	28	10	2	98	53	243
50.	Hoshiarpur Kalota (425)	131	50	0	0	81	164	900
51.	Sadullapur Kalota (424)	135	39	6	0	90	86	785
52.	Salehrian Kalan (313)	218	64	25	14	115	107	901
53.	Ghasitpur (271)	229	35	47	8	139	7	629
54.	Manjpur (317)	274	87	5	0	182	19	834

55.	Bhangala (322)	1594	229	66	156	1143	211	4981
56.	Naharpur (335)	67	29	0	1	37	43	336
57.	Dhaula Khera(310)	285	47	14	2	222	9	907
58.	Mahi-Ul-Dinpur Gazi(311)	201	91	1	0	109	1	539
59.	Gujjar Katrala (281)	247	26	12	15	194	22	580
60.	Singo Katrala (282)	276	40	27	14	195	26	818
61.	Nangal Awana (336)	75	10	0	0	65	19	393
62.	Saroa (337)	57	27	4	0	26	2	194
63.	Kajla (334)	29	11	2	0	16	0	99
64.	Sahota (325)	93	39	5	1	48	1	361
65.	Kharak Balrah (274)	137	1	36	7	93	4	484
66.	Fattuwal (272)	239	55	20	3	161	11	725
67.	Budhewal (273)	76	27	2	1	46	2	235
68.	Trangalian (276)	176	129	12	14	21	9	562
69.	Dhido Katrala (280)	41	11	4	4	22	3	111

70.	Pandori (192)	419	125	10	15	269	114	1575
71.	Mehatpur (216)	184	89	25	5	65	2	458
72.	Mansurpur (215)	444	142	57	2	243	9	1333
73.	Sherpur (214)	113	50	3	1	59	45	486
74.	Aima Mangat (213)	246	172	5	1	68	21	738
75.	Pind Sahibka (201)	77	52	6	0	19	55	415
76.	Gaunspur (199)	107	28	7	0	72	4	393
77.	Devi Dass (198)	189	67	34	10	78	31	540
78.	Makha (200)	46	15	0	4	27	117	540
79.	Langah (202)	53	29	7	0	17	55	311
80.	Aulia (207)	71	10	3	2	56	72	454
81.	Jamalpur Khurd (208)	0	0	0	0	0	5	12
82.	Sihan (203)	36	10	8	0	18	146	315
83.	Dhanoya (206)	476	122	35	3	316	9	1410
Total		**16732**	**4287**	**1132**	**616**	**10697**	**3121**	**56003**
Hazipur Tehsil								
84.	Khizarpur	204	96	4	6	98	138	1111

	(366)							
85.	Daggan (290)	381	79	7	36	259	187	1474
86.	Dalowal (291)	145	64	1	0	80	4	459
87.	Begpur Kamloh (292)	93	52	1	1	39	58	540
88.	Zahidpur (289)	139	58	6	6	69	246	278
89.	Patial (288)	134	58	17	0	59	1	425
90.	Kalo Chahang (287)	200	110	22	5	63	33	672
91.	Gahlarian (275)	171	62	12	2	95	0	782
92.	Piru Chak (279)	0	0	0	0	0	0	0
93.	Chahang Hamel (285)	189	72	15	2	100	41	642
94.	Malkowal (286)	91	36	2	1	52	51	421
95.	Chima (283)	120	38	27	15	40	18	284
96.	Pota (284)	97	45	7	5	40	97	465
97.	Nansota (296)	112	8	0	2	102	81	167
98.	Bariah (295)	111	30	7	1	73	20	433
99.	Dhamian (294)	342	58	13	126	145	55	534
100.	Mohri Chak	107	59	3	0	45	103	420

	(293)							
101.	Ransota (228)	241	53	1	17	170	16	608
102.	Ittian (229)	291	68	23	0	200	44	501
103.	Dhirowal (232)	95	64	0	0	31	12	246
104.	Sunderpur (227)	90	35	1	4	50	12	285
105.	Barnala (222)	126	40	19	5	62	80	560
106.	Singhpur (223)	187	56	7	1	123	64	615
107.	Kaulpur (189)	102	33	7	0	62	45	452
108.	Daulowal (188)	191	31	28	3	129	48	620
109.	Balhaddah (190)	135	95	3	0	37	20	372
110.	Jhigla Pind (191)	51	23	9	0	19	19	227
111.	Jamalpur Kalan (193)	52	16	0	0	36	1	215
112.	Bhagran (221)	89	40	7	0	42	14	237
113.	Barota Urf Puro Nangal (220)	151	1	55	4	91	17	519
114.	Muradpur (233)	332	56	32	2	242	4	1082
115.	Panjdhera Gazi (218)	27	16	1	0	10	4	70

116.	Panjdhera Rahia (219)	101	31	10	1	59	36	452
117.	Panjdhera Kalan (217)	298	124	27	2	145	32	636
118.	Singowal (231)	261	86	134	2	39	2	998
Total		**5456**	**1793**	**508**	**249**	**2906**	**1603**	**17802**
Dasua Tehsil								
119.	Chak Kasim (150)	82	43	1	0	38	48	326
120.	Unchi Bassi (195)	1045	108	64	4	869	95	2133
121.	Lamin (194)	362	60	8	0	294	83	1128
122.	Fatehgarh (151)	169	35	23	0	111	6	432
123.	Gag Sultan (182)	200	22	15	0	163	39	523
124.	Ghogra (183)	635	182	9	17	427	241	1875
Total		**2493**	**450**	**120**	**21**	**1902**	**512**	**6417**
Grand Total		**24681**	**6530**	**1760**	**886**	**15505**	**5236**	**80222**

Table 3.19: Infrastructure Resource Base of the Study Area

Sr.No.	Amenities	Availability in Number
1.	Education Facility	P(104),Pvt.P(60), M(42), S(20), SSc(7)
2.	Medical Facility	CHC(5), PHC(6), PHS(8), MCW(10),D(14)
3.	Drinking Water Facility	T (92) , UCW(37), HP(77)
4.	Drainage Facility	OD(97),CD(42)

5.	Communication Facility	PO(5), M(122)
6.	Transportation Facility	BS(25),RS(6)
7.	Approach Roads	PR(122)
8.	Power Supply	ED(122), EAG(121)

Source: Village amenities 2011, Punjab State

Abbreviation:

Educational Institutions			**Medical Facilities**			**Drinking Water Supply**			**Communication**		
P	:	Primary School	PHC	:	Primary health Centre	T	:	Tap Water	PO	:	Post Office
M	:	Middle School	PHS	:	Primary health sub centre	W	:	Well Water	PH	:	Phone connections
S	:	Secondary School	MCW	:	Maternal & Child Welfare	HP	:	Hand pump	**Drainage Facility**		
SSc	:	Senior Secondary School							OD	:	Open Drainage
Power Supply			**Approach Road**			**Transportation**					
ED	:	Electricity for domestic purpose	PR	:	Pucca Road	BS	:	Bus			
EAG	:	Electricity for Agriculture Purpose	KR	:	Kuccha road	RS	:	Railway Station			

3.13 ECOLOGY AND BIODIVERSITY

Study of biological environment is one of the important aspects for the Environmental Impact Assessment, in view of the need for conservation of Environmental quality and biodiversity of particular geographical area. Ecological systems show complex interrelationship between biotic and Abiotic components including dependence, competition and mutualism. Biotic components comprises of plant and animal communities which interact not only within and between themselves but also with the Abiotic components viz. Physical and Chemical; components of the environment.

Generally, biological communities are the good indicators of climatic and edaphic factors. Studies on biological aspects of ecosystems are important in Environmental Impact Assessment for safety of natural flora and fauna. Information on the impact of environmental stress on the community structure serves as an inexpensive and efficient early warning system to check the damage to a particular ecosystem. The biological environment includes mainly terrestrial and aquatic ecosystems.

The animal and plant communities exist in their natural habitats in well organized manner. Their natural settings can be disturbed by any externally induced anthropological activities or by naturally induced calamities or disaster. So, once this setting is disturbed, it becomes practically impossible or takes a longer time to come to its original state. Plants and animals are more susceptible to

environmental stress. A change in the composition of biotic communities reflected by a change in the distribution pattern of natural species of flora and fauna existing in the ecosystem. The sensitivity of animal and plant species to the changes occurring in their existing ecosystem can therefore, be used for monitoring Environmental Impact Assessment studies of any project.

3.13.1 OBJECTIVE OF BIOLOGICAL STUDY:

The main objectives of biological study were:

- To collect the baseline data for the study along with a description of the existing terrestrial, wetland and aquatic biodiversity.
- To assess the scheduled species in the proposed site (rare, endangered, critically endangered, endemic and vulnerable).
- To identify the locations and features of ecological significance.
- To identify the Impacts of proposed project before, after and during development phase.

Table 3.20: Mode of data collection and parameters considered during the survey

Sr. No.	Aspect	Mode of Data collection	Parameters monitored	Remarks
1.	Terrestrial Biodiversity	By field survey	Floral and Faunal diversity	**For Floral Diversity:** Random survey, sapling survey/forest inventory, walking transect, collection and identification with the help of relevant literature. **For Faunal Diversity:** direct and indirect sampling, walking transect, point sampling and nest sampling etc.
2.		From authentic sources like Forests department of Punjab and available published literatures from ZSI, BSI etc.	Floral and Faunal diversity and study of vegetation, forest type, importance etc.	Data collected from the working plan of the region, forest types from the authentic literature of Champion & Seth.
3.	Aquatic Biodiversity	By field survey	Floral and Faunal diversity	**For Plankton Study-** Lackey's drops method and light microscope **For other aquatic-** Random survey, opportunistic observations
4.		From authentic	Floral and Faunal	Desktop literature review

		sources like Forests department of Punjab.	diversity and study of vegetation, forest type, importance etc.	to indentify the representative spectrum of threatened species, population and ecological communities.

3.13.2 STUDY AREA: THE STUDY AREA IS DIVIDED INTO TWO PARTS

a) **Core Zone:** Project Site i.e. Indian Sucrose Limited Plant.

b) **Buffer Zone:** Area within 10 Km radius from the project site.

3.13.3 RIPARIAN ENVIRONMENT:

The study of riparian vegetation of a river is an important as it strongly affects soil-water characteristics of the area and thus the aquatic life. Moreover, the vegetation provides the human population with vital life support and socio- economic security. Riparian zones often regulate aquatic-terrestrial linkages. Riparian vegetation is important for regulating nutrient cycle of the streams, preventing soil erosion and stabilizing river banks. Further, the riparian vegetation is modified or destroyed by grazing, logging, urbanization, road construction, water development, mining and recreation. Also, the riparian zone is thought to have a disproportionate influence (relative to its land area) on the running water because of its immediate effects on the transport of water, nutrients and sediments. Riparian flora of Beas River, Shah Canal and Mukerian Hydel canal is given in table along with the terrestrial flora.

Table 3.21: Location sites for the study of Riparian Vegetation

Sr. No.	Site Location	Direction
I.	Beas River (Down Stream)	South West
II.	Beas River (Up Stream)	West
III.	Shah Canal at Tansota	North East
IV.	Mukerian Hydel Canal at Singhowal	East
V.	Mukerian Hydel Canal at Jamalpur	South East
VI.	Mukerian Hydel Canal No. 2 at Sadrpur	South

3.13.4 TERRESTIAL FLORA AND FAUNA:

Biological communities are the indicator environmental condition and resource of itsdistribution and survival. Biotic component comprises of both plants (Flora) and animal (Fauna) communities, which interact not only within and between them but also with theAbiotic components, viz. physical and chemical components of the environment. Thechanges in biotic community are studied in the pattern of distribution, abundance anddiversity.

3.13.5 TERRESTRIAL FLORA:

The Vegetation and plant species composition observed and documented during field visitin and around the proposed location of the project. Besides primary surveys in theproject sites, published literature and various floras were consulted to prepare aninventory of plant species growing at project sites. The vegetation of the study area ishighly degraded and some areas consisting water bodies. The plant diversity isclassified into various plant groups such as tree, shrubs, herbs, climbers, sedges andgrasses. The plant diversity survey in the project area was undertaken during thesummer season

with the objectives of preparing a checklist of flora in the study area which is divided into two parts i.e. Core Zone & Buffer Zone.

Core Zone: Core zone is project site. The ISL has proposed the 120 KLPD Molasses based ethanol plant and 4 MW co-generation power plants. Project will produce fuel ethanol and Extra Neutral Alcohol from molasses as raw materials in Village Chak Allabaksh, Tehsil-Mukerian, District-Hoshiarpur, Punjab.

There is no vegetation and no fauna to be disturbed as part of proposed project. During the field survey plantation under green belt development programme was recorded from the plant area.

Buffer Zone: The selection of terrestrial and aquatic ecological sampling location was based on land use pattern, topography and habitat patterns of the study area. The terrestrial ecological survey was carried out in forest and non-forest areas (agricultural fields, roadsides, urban & semi-urban wastelands etc) and the aquatic ecological survey was carried out at rivers & ponds/lakes within the study area.

3.13.6 METHODOLOGY:

The present study on the floral assessment for the project activity is based on field survey of the area. By the following forest inventory methodology; the survey of biological parameters has been conducted within the buffer zone (10 km radial distance) from project site at Village: Chak Allabaksh, Tehsil-Mukerian District-Hoshiarpur, Punjab, in accordance with the guidelines issued by the Ministry of Environment, Forests and Climate Change, CPCB, and SPCB during the study period. A preliminary survey of the study area has been performed to get a general picture of the landscapes in vegetation. Traverses have been taken within different zone of the study area to note major vegetation patterns and plant communities including their growth form and dominant species. A forest inventory is "an attempt to describe the quantity and quality of forest trees and many of the characteristics of the land area upon which the trees are grown." The objective this floral inventory of the study area, is to provide complete checklist of floristic structure within the core zone and buffer zone (10 km radial distance) from project site for formulating effective management and conservation measures.

A. Floristic Composition of Core/Buffer Zone:

The terrestrial flora of the study area i.e. buffer zone (10 km radial distance) from the project site could be categorized as agriculture vegetation, social forestry plantation, Agro-forestry plantation, plantation for green belt development and natural/forest vegetations.

B. Agricultural and Horticulture Crops:

Agriculture is the primary sector of Punjab State economy and majority of the population is directly or indirectly dependent on agriculture and its allied activities. The climatic conditions of a region affect the agricultural cropping pattern of different areas. Thus, it produces different crops. Amongst a host of climatic factors i.e. rainfall, temperature, humidity, wind velocity and duration of sunshine etc. affect the cropping pattern in a significant way. Annual rainfall and its distribution over the entire year and the regimes of diurnal and annual temperatures are by far, the prominent factors affecting agriculture and the life style of the people.

Table 3.22: Cropping pattern of Study Area

Crop Variety	Family	Botanical Name	Trade Name
Agriculture Crops			
Vegetable	Malvaceae	*Abelmoschus esculentus*	Lady Finger

Crop Variety	Family	Botanical Name	Trade Name
	Cucurbitaceae	*Cucurbita pepo*	Kaddu
	Cucurbitaceae	*Momordica charantia*	Karela
	Solanaceae	*Capsicum fruitiscens*	chilli
	Solanaceae	*Solanum melongena*	Brinjal
	Solanaceae	*Solanum tuberosum*	Potato
	Solanaceae	*Lycopersicon lycopersicum*	Tomato
	Liliaceae	*Allium cepa*	Onion
	Brassicaceae	*Brassica oleracea var. capitata*	Cabbage
	Brassicaceae	*Brassica oleracea var. botrytis*	Cauliflower
	Cucurbitaceae	*Cucumis melo*	Cucumber
	Cucurbitaceae	*Cucurbita maxima*	Pumpkin
	Apiaceae	*Daucus carota*	Carrot
	Convonvulaceae	*Ipomoea batatas*	Sweet Potato
	Brassicaceae	*Raphanus sativus*	Radish
	Chenopodiaceae	*Spinacia oleracea*	Spinach
Cereals	Poaceae	*Oryza sativa*	Rice
	Poaceae	*Triticum aestivum*	Wheat
	Poaceae	*Zea mays*	Maize
Pulses	Fabaceae	*Vigna radiate*	Moong
	Fabaceae	*Vigna mungo*	Urd
	Fabaceae	*Cajanus cajan*	Pigeon Pea
	Fabaceae	*Vigna umbellata*	Rice Bean
	Fabaceae	*Cicer arietinum*	Gram
	Fabaceae	*Lens culinaris*	Lentil
	Fabaceae	*Pisum sativum* Subsp. *arvense*	Field Pea
Spices	Amaryllidaceae	*Allium sativum*	Garlic
	Zingiberaceae	*Zingiber officinale*	Adrak
Oilseeds	Fabaceae	*Arachis hypogaea*	Ground Nut
	Asteraceae	*Helianthus annus*	Sunflower
	Pedaliaceae	*Sesamum indicum*	Sesamum

Crop Variety	Family	Botanical Name	Trade Name
Other	Malvaceae	*Gossypium hirsutum*	Cotton
	Poaceae	*Saccharum officinarum*	Sugar Cane
Horticulture Crops			
Fruits	Moraceae	*Artocarpus heterophyllus*	Jack Fruit
	Caricaceae	*Carica papaya*	Papaya
	Rutaceae	*Aegle marmelos*	Bel
	Anacardiaceae	*Mangifera indica*	Mango
	Musaceae	*Musa paradasiaca*	Banana
	Myrtaceae	*Psidium guajava*	Guava
	Myrtaceae	*Syzygium cumini*	Jamun
	Fabaceae	*Tamarindus indica*	Imli

C. Social/Agro-Forestry:

In India, natural forests are being conserved primarily for the environmental benefits. Serious efforts are also being done to plant large number of trees outside forest under social forestry programs to increase the tree cover and fulfill demand of various forest produce required by the people and forest based industries. Agricultural fields are one of the potential areas, where large scale planting of trees can be taken up along with the agricultural crops. Agro-forestry models adopted by the farmers in Punjab state are highly lucrative, therefore, attracting farmers in a big way.

Table 3.23: Agro Forestry Species of the Study Area (Buffer Zone)

Botanical Name	Trade Name	Family
Delonix regia	Gulmohar	Caesalpiniaceae
Dalbergia sisso	Shisham	Fabaceae
Azadirachta indica	Neem	Meliaceae
Mangifera indica	Aam	Anacardiaceae
Pongamia pinnata	Karanj	Euphorbiaceae
Musa paradisiacal	Banana	Musaceae
Ficus religiosa	Pipal	Moraceae
Eucalyptus cameldulensis	Nilgiri	Myrtaceae
Pisidium guava	Guava	Myrtaceae
Tectona grandis	Sagwan	Verbenaceae
Dendrocalamus strictus	Lathi bans	Poaceae
Butea monosperma	Kachnar	Fabaceae
Cassia fistula	Amaltas	Fabaceae
Saraca asoca	Asok	Fabaceae
Populous deltoids	Popular	Salicaceae
Shorea robusta	Sal	Dipterocarpaceae

Tectona grandis	Teak	Lamiaceae
Toona ciliata	Meliaceae	Cedar

D. Grasslands:

No prominent grass land ecosystem has been found in core and buffer zone of the project. However the grass lands were mixed with natural vegetation in low lands and cultivable waste lands are now being utilized as grazing grounds to the livestock species: Goat, Cow, Ox and Buffalo. The grass species and sedges of core and buffer zone are listed below with the natural vegetation of buffer zone.

E. Endemic/Endangered Flora:

No endangered and endemic flora was recorded from core and buffer zone of the project area.

F. Location of National Park/Sanctuaries:

There is no Bio-sphere Reserve, National Parks, Wildlife Sanctuary, Tiger Reserve and Elephant Reserve within 10 km radius of the project site.

G. Natural/Forest Vegetation:

The total study area is covered mostly with agriculture land. The flora of buffer zone comprises of plants growing in scattered vegetation, the edges of agricultural land, village woodlots and trees planted along the roads. Many tree species are planted in the area because of their usefulness, economic and aesthetic values. The tree species observed in the area are, Sal (*Shorea robusta*), Jamun (*Syzygium cumini*), Bel (*Aegle marmelos*), Bargad (*Ficus bengalensis*), Neem (*Azadirachta indica*), Peepal (*Ficus religiosa*), Popular (*Populus dealtoides*), Safeda (*Eucalyptus cameldulensis*), Sisam (*Dalbergia sissoo*) etc.

In agricultural waste land and along the road side, growth of weeds likes *Argemone mexicana, Cannabis sativa, Cenchrus cilitaris, Heteropogon contortus, Lantana camara, Parthenium hysterosporus,* etc. are very common. The species found in the core zone are also found all along the riverbed in the study area. These weeds are affecting the agricultural productivity of the region due to fast growth, short life cycle and enormous production of seeds.

In scrub area commonly seen plant species in such areas are *Cannabis sativa, Lantana camara, Ipomea carnea, Calotropis procera, Cassia tora, Parthenium hysterophorus, Ziziphus mauritiana, Heteropogon contortus, Argemone Mexicana,* etc. These weeds also affect the agricultural productivity of the region.

Table 3.24: Floristic composition of Buffer zone

Sr. No.	Botanical Name	Family	Common Name
TREES			
1.	*Aegle marmelos*	Rutaceae	Bel
2.	*Ailanthus excels*	Simaroubaceae	Adusa
3.	*Albizia procera*	Fabaceae	Safed Siris
4.	*Albizia lebbeck*	Fabaceae	Kala Siris
5.	*Anogeissus latifolia*	Combretaceae	Dhaura
6.	*Azadirachta indica*	Meliaceae	Neem
7.	*Acacia catechu*	Fabaceae	Khair
8.	*Adina cordifolia*	Rubiaceae	Haldu
9.	*Bauhinia acuminate*	Fabaceae	Safed Kachnar
10.	*Bauhinia vahlii*	Fabaceae	Malu Creeper

Sr. No.	Botanical Name	Family	Common Name
11.	*Bauhinia variegate*	Fabaceae	Kachnar
12.	*Bombax ceiba*	Malvaceae	Semal
13.	*Cassia fistula*	Fabaceae	Amaltas
14.	*Cassia siamea*	Fabaceae	Kasood
15.	*Dalbergia sissoo*	Fabaceae	Shisham
16.	*Delonix regia*	Fabaceae	Gulmohar
17.	*Emblica officinalis*	Phyllanthaceae	Amla
18.	*Eucalyptus camaldulensis*	Myrtaceae	Nilgiri
19.	*Ficus racemosa*	Moraceae	Gular
20.	*Ficus religiosa*	Moraceae	Pipal
21.	*Ficus benghalensis*	Moraceae	Bargad
22.	*Holoptelia integrifolia*	Ulmaceae	Kanju
23.	*Mallotus philippensis*	Euphorbiaceae	Kamala
24.	*Melia azedarach*	Meliaceae	Bakain
25.	*Morus alba*	Moraceae	Shehtoot
26.	*Neolamarckia cadamba*	Rubiaceae	Kadam
27.	*Phoenix sylvestris*	Palmaceae	Khajur
28.	*Populous deltoids*	Salicaceae	Poplar
29.	*Shorea robusta*	Dipterocarpaceae	Sal
30.	*Syzygium cumini*	Myrtaceae	Jamun
31.	*Tectona grandis*	Lamiaceae	Teak
32.	*Terminalia belerica*	Combretaceae	Baheda
33.	*Terminalia chebula*	Combretaceae	Harad
34.	*Toona ciliata*	Meliaceae	Toon, Cedar
SHRUBS & HERBS			
35.	*Abrus precatorius*	Fabaceae	Ratti
36.	*Abutilon indicum*	Malvaceae	Kanghi
37.	*Achyranthes aspera*	Amaranthaceae	Chirehitta
38.	*Adhatoda vasica*	Acanthaceae	Vasaka
39.	*Alternanthera sessilis*	Amaranthaceae	Garundi
40.	*Amaranthus spinosa*	Amaranthaceae	Kate Chawli
41.	*Amaranthus viridis*	Amaranthaceae	Jungle Chaulai
42.	*Argemmone maxicana*	Papaveraceae	Satyanashi
43.	*Barleria crisata*	Acanthaceae	Varja Danti
44.	*Bauhinia vahlii*	Leguminoceae	Maljhan
45.	*Boerhavia diffusa*	Nyctaginaceae	Punarnawa
46.	*Bulbostylis barbata*	Cyperaceae	Water Grass
47.	*Caesalpinia sepiaria*	Sapindaceae	Kainju Bel
48.	*Calotropis procera*	Asclepiadaceae	Aak

Sr. No.	Botanical Name	Family	Common Name
49.	*Calotropis gigantea*	Asclepiadaceae	Madar
50.	*Cannabis sativa*	Urticaceae	Bhang
51.	*Carrissa occidentalis*	Apocynaceae	Karaunda
52.	*Cassia tora*	Caesalpiniaceae	Panwar
53.	*Chinopodium album*	Amaranthaceae	Bathuwa
54.	*Clematis gouriana*	Ranuculaceae	Balkangu
55.	*Crotolaria medicaginea*	Papilionaceae	Rattle Weed
56.	*Cryptolepis buchanani*	Apocynaceae	Dudhi
57.	*Cyperus compressus*	Cyperaceae	Annual Sedge
58.	*Cyperus rotundus*	Cyperaceae	Nut grass
59.	*Datura metel*	Solanaceae	Datura
60.	*Denderocalamus strictus*	Poaceae	Lathi Baans
61.	*Eclipta alba*	Asteraceae	Bhangra
62.	*Eriophorum Comosum*	Cyperaceae	Nakli Bhabbar
63.	*Euphobia hirta*	Euphorbiaceae	Dudhi
64.	*Evolvulus alsinoides*	Convonvulaceae	--
65.	*Gloriosa superba*	Colchicaceae	Glory Lilly
66.	*Ipomoea carnea*	Convonvulaceae	Besharam
67.	*Lantana camara*	Verbenaceae	Raimuniya
68.	*Murraya koenigii*	Rutaceae	Gandhela
69.	*Nerium indicum*	Apocynaceae	Kaner
70.	*Ocimum sanctum*	Lamiaceae	Tulsi
71.	*Oxalis corniculata*	Oxalidaceae	Yellow sorrel
72.	*Parthenium hysterophorus*	Asteraceae	Gajar Ghas
73.	*Physalis minima*	Solanaceae	Rasbhari
74.	*Pueraria truberosa*	Leguminoceae	Sural
75.	*Ranunculus sceleratus*	Ranunculaceae	Jaldhaniya
76.	*Rumex dentatus*	Polygonaceae	Jungle Palak
77.	*Rauvolfia serpentine*	Apocynaceae	Sarpgandha
78.	*Scindapsus officianlis*	Araceae	Gajpipper
79.	*Sida acuta*	Malvaceae	--
80.	*Solonum erianthum*	Solanceae	Aradu, Ban
81.	*Solanum indicum*	Solanaceae	Makoi
82.	*Solanum viarum*	Solanaceae	Jungle Begun
83.	*Syzygium cumini*	Myrtaceae	Jamun
84.	*Tephrosia purpurea*	Fabaceae	Nili
85.	*Terminalia chebula*	Combretaceae	Bahera
86.	*Trichodesma indicum*	Boraginaceae	Chota Kalpa
87.	*Tridax procumbens*	Asteraceae	Kamarmodi

Sr. No.	Botanical Name	Family	Common Name
88.	*Typha angustifolia*	Typhaceae	Patera
89.	*Urena lobata*	Malvaceae	Caesar Weed
90.	*Vallaris solancea*	Apocynaceae	Buddhi Bel
91.	*Withania somnifera*	Solanceae	Asgandh
92.	*Xanthium stumarium*	Asteraceae	Chota Gokhru
93.	*Zizyphus nummularia*	Rhacnaceae	Beri
GRASSES			
94.	*Apluda mutica*	Poaceae	Banjura grass
95.	*Aristida hystrix*	Poaceae	
96.	*Cenchrus echinatus*	Poaceae	Sandbur
97.	*Chloris barbata*	Poaceae	
98.	*Cymbopogon 101ernate*	Poaceae	Tikhadi
99.	*Cynodon dactylon*	Poaceae	Doob
100.	*Dactyloctenum aegyptium*	Poaceae	Crow foot grass
101.	*Digitaria 101ernate*	Poaceae	
102.	*Echinochloa colona*	Poaceae	Jungle Rice
103.	*Eragrostiella bifaria*	Poaceae	
104.	*Eragrostis ciliaris*	Poaceae	
105.	*Panicum tripheron*	Poaceae	
106.	*Sacharrum spontanium*	Poaceae	

H. Wetland Diversity & Marsh Lands:

Wetlands are very useful to us. By producing resources,enabling recreational activities and controlling flood andpollution, they contribute to the national and localeconomies and environmental consequences. Wetlandsprovide important and incredible services to society, theseservices can neither be sold nor do they have the marketvalue and tried to give wetlands an economic value.

Table 3.25: Wetland/Marshland Diversity of Study Area

Family	Botanical Name	Local Name
Salviniaceae	*Azolla pinnata*	Mosquito Fern
Asteraceae	*Caesulia axillaris*	Maka
Ceratophyllaceae	*Ceratophyllum demersum*	Hornwort
Poaceae	*Chrysopogon zizanioides*	Vetiver
Poaceae	*Coix lacryma-jobi*	Adlay Millet
Araceae	*Colocasia esculenta*	Taro
Commelinaceae	*Commelina benghalensis*	Kana
Cyperaceae	*Cyperus alternifolius*	Umbrella Sedge
Dryopteridaceae	*Dryopteris filix-mas*	Fern

Family	Botanical Name	Local Name
Dryopteridaceae	*Dryopteris sieboldii*	Fern
Poaceae	*Echinochloa colona*	Shama
Pontederiaceae	*Eichhornia crassipes*	Jal Kumbhi
Asteraceae	*Grangea maderaspatana*	Madras Carpet, Mustaru
Acanthaceae	*Hygrophila salicifolia*	---
Convonvulaceae	*Ipomea aquatic*	Kalmi Shak
Lemnaceae	*Lemna minor*	Duck Weed
Onagraceae	*Ludwigia adscendens*	Water Primrose
Marsileaceae	*Marsilea quadrifolia*	Four Leaf Clover
Sterculiaceae	*Melochia corchorifolia*	Bilpat
Nelumbonaceae	*Nelumbo nucifera*	Lotus, Kamal
Nymphaeaceae	*Nymphaea pubescens*	White Lotus
Oxalidaceae	*Oxalis corniculata*	Amrul
Pandanaceae	*Pandanus odoratissimus*	Keora
Urticaceae	*Pilea microphylla*	Gun Powder Plant
Polygonaceae	*Polygonum hydropiper*	Marsh Pepper Knot Weed
Portulacaceae	*Portulaca oleracea*	Little Hog-Weed
Potamogetonaceae	*Potamogeton natans*	Floating Pond Weed
Lythraceae	*Trapa natans*	Water Chest Nut
Ranunculaceae	*Ranunculus sceleratus*	Aglaon
Polygonaceae	*Rumex dentatus*	Ambavati
Typhaceae	*Typha angustata*	Patera
Lentibulariaceae	*Utricularia gibba*	Floating Bladderwort
Plantaginaceae	*Veronica anagallis-aquatica*	Water Speedwell

I. Faunal Diversity:

To prepare a detailed report on the status of wildlife biodiversity within 10 km radial area along the existing pipeline to assess the impacts due to the project activity and evolve suitable mitigation measures to protect and conserve wildlife biodiversity following components were studied:

- Wildlife Survey (Diversity)
- Habitat Study (Feeding, Breeding and Roosting areas)
- Distribution/Status of Birds
- Rare & Endangered species of Fauna
- Specific local characteristics of biodiversity in the study area.

Methodology for Faunal Diversity:

A linear transect of 1.0 km each was chosen for sampling at each site. Each transect was trekked for 1.5 hr for the sampling of faunal diversity through following methods for different categories. For the sampling of butterflies, the standard 'Pollard Walk' method was employed and all the species recorded daily. Voucher specimens of the species that could not be identified in the field were collected using a butterfly net besides photographing them.

For bird's sampling, 'Point Sampling' along the fixed transect (Foot trails) was carried out. All the species of birds were observed through a binocular and identified with the help of field guide book and photographs.

For the sampling of mammals, direct count on open width (20m) transect was used. In addition, information on recent sightings/records of mammals by the villagers/locals was also collected. For carnivores, indirect sampling was carried out and the mammals were identified by foot marks, faeces and other marks/sign created by them. In case of reptiles mainly lizards were sampled by direct count on open width transects.

The study of fauna takes substantial amount of time to understand the specific faunal characteristic of area. The assessment of fauna has been done by extensive field survey of the area. During survey, the presence of wildlife was also inhabitants depending on animal sightings and the frequency of their visits in the project area which was later confirmed from forest department, Wildlife Department etc.

Table 3.26: Faunal Diversity from the study Area

S. No.	English Name	Scientific Name	Status/Schedule
Mammals			
1.	Little Indian field mouse	*Mus booduga*	Schedule-V
2.	Nilgai	*Boselaphus tragocamelus*	Schedule-III
3.	Monkey	*Maccaca mulata*	Schedule-II
4.	Bat	*Rousettus leschenaultia*	Schedule-V
5.	Common Langur	*Semnopithecus entellus*	Schedule-II
6.	Five Striped Palm Squirrel	*Funambulus pennanii*	Schedule-IV
7.	Chachundar	*Suncus murinus*	Schedule-IV
Amphibians			
1.	Indian pond frog	*Rana hexadactyla*	Schedule-IV
2.	Common Indian Toad	*Duttaphrynus melanostictus*	Not Listed
3.	Indian Bull Frog	*Hoplobatrachus tigerinus*	Schedule-IV
4.	Indian Skipper Frog	*Euphlyctis cyanophlyctis*	Schedule-IV
5.	Marble Toad	*Bufo stomaticus*	Not Listed
Reptiles			
1.	House gecko	*Hemidactylus flavivridis*	Common
2.	Common garden lizard	*Calotes versicolor*	Common
3.	Brahminy skink	*Mabuya carinata*	Common
4.	Indian Cobra	*Naja naja*	Schedule-II
5.	Rat Snake	*Ptyas mucosa*	Schedule-IV
6.	Himalayan Pit Viper	*Ancistrodon himalayanus*	Schedule-IV
7.	Indian Krait	*Bungarus caeruleus*	Schedule-IV

S. No.	English Name	Scientific Name	Status/Schedule
8.	Russel Viper	*Daboia siamensis*	Schedule-II
		Butterflies	
1.	White orange tip	*Ixias marianne*	Common
2.	Lime butterfly	*Papilio demoleus*	Common
3.	Common crow	*Euploea core*	Common
4.	Common map	*Cyrestis thyodamas*	Common
5.	Common mormon	*Papilio polytes*	Common
6.	Common Grass Yellow	*Eurema hecabe*	Fairly Common
7.	Stripped Tiger	*Danaus genutia*	Common
8.	Danaid Egg Fly	*Hypolimanas misippus*	Common
9.	Common Bush Brown	*Mycalesis perseus*	Common
		Aves	
1.	House Crow	*Corvus splendens*	Schedule-V
2.	Rock Pigeon	*Columba livia*	Common
3.	Gery francolin	*Francolinus pondicerianus*	Least Concern
4.	Jungle babbler	*Turoides striatus*	Schedule-IV
5.	Common Myna	*Acridotheres tristis*	Schedule-IV
6.	Green bee-eater	*Merops orientalis*	Least Concern
7.	Indian roller	*Coracias benshalensis*	Schedule-IV
8.	Black Drongo	*Dicrirus macrocercus*	Schedule-IV
9.	Little cormorant	*Microcarbo niger*	Schedule-IV
10.	Common swift	*Apus apus*	Schedule-IV
11.	House swift	*Apus affinis*	Schedule-IV
12.	Shikra	*Accipiter badius*	Schedule-IV
13.	Cattle Egret	*Bubulcus ibis*	Schedule-IV
14.	Little Egret	*Egretta garzetta*	Schedule-IV
15.	Pond heron	*Ardeola grayii*	Schedule-IV
16.	Red wattled lapwing	*Vanellus indicus*	Schedule-IV
17.	Black Ibis	*Pseudibis papillosa*	Schedule-IV
18.	Ring dove	*Streptopelia decaocto*	Schedule-IV
19.	Spotted Dove	*Streptopelia chinensis*	Schedule-IV
20.	White Breasted Kingfisher	*Halcyon smyrnensis*	Schedule-IV
21.	Blue Cheeked Bee Eater	*Merops persicus*	Schedule-IV
22.	Asian Koel	*Eudynamys scolopacea*	Schedule-IV
23.	Drongo Cuckoo	*Srniculus lugubris*	Schedule-IV
24.	Pied Kingfisher	*Ceryle rudis*	Schedule-IV
25.	Red Jungle Fowl	*Gallus sallus*	Schedule-IV
26.	White breasted water hen	*Amaurornis phoenicurus*	Schedule-IV

S. No.	English Name	Scientific Name	Status/Schedule
27.	Common Moorhen	*Gallinule chloropus*	Schedule-IV
28.	Raven	*Corvus corax*	Schedule-IV
29.	Tree Pie	*Dendrocitta vagabunda*	Schedule-IV
30.	Indian Robin	*Saxicoloides fulicata*	Schedule-IV
31.	Pied Bush Chat	*Saxicola caprata*	Schedule-IV
32.	Purple Sun Bird	*Nectarinia asiatica*	Schedule-IV
33.	Small Sun Bird	*Nectarinia minima*	Schedule-IV
34.	House Sparrow	*Passer domesticus*	Schedule-IV
35.	Grey Tit	*Parus major*	Schedule-IV
36.	Red Vented Bulbul	*Pycnonotus cafer*	Schedule-IV
37.	Bank Myna	*Acridotheres ginginianus*	Schedule-IV
38.	Common Babbler	*Turdoides caudatus*	Schedule-IV
39.	Tailor Bird	*Orthotomus sutorius*	Schedule-IV
40.	Rose Ringed Parakeet	*Psittacula krameri*	Schedule-IV
41.	Baya	*Ploceus philippinus*	Schedule-IV
42.	Owl	*Bubo bubo*	Schedule-IV
43.	Indian Peafowl	*Pavo cristatus*	Schedule-I
	Pisces		
1.	Rohu	*Labeo rohita*	Least Concern
2.	Katla	*Catla catla*	Least Concern
3.	Calbasu	*Labeo calbasu*	Least Concern
4.	Cat fish	*Mystus cavasius*	Least Concern
5.	Black Fish	*Barbus chilinadea*	Least Concern
6.	Singi	*Clarias batrachus*	Least Concern
7.	Bronze Feather Back	*Notopterus notopterus*	Least Concern
8.	Ganges River Gizzard Shad	*Gonialosa manmina*	Least Concern
9.	Hilsa	*Tenualosa ilisha*	Not Listed
10.	Chelluah	*Aspidoparia morar*	Least Concern
11.	Barna Baril	*Barilius barna*	Least Concern
12.	Chaguni	*Chagunius chagunio*	Least Concern
13.	Common Carp	*Cyprinus carpio*	Least Concern
14.	Reba Carp	*Cirrhinus reba*	Least Concern
15.	Sind Danio	*Danio devario*	Least Concern
16.	Kharsa, Butter	*Labeo angra*	Least Concern
17.	Bata	*Labeo bata*	Least Concern
18.	Boga Bata	*Labeo boga*	Least Concern
19.	Kali, Boalla	*Labeo dyocheilus*	Least Concern
20.	Kuri, Khursa	*Labeo gonius*	Least Concern

S. No.	English Name	Scientific Name	Status/Schedule
21.	Swamp Barb	*Puntius chola*	Least Concern
22.	Great Snakehead	*Channa maruliuss*	Least Concern

3.13.7 ENDANGERED SPECIES:

Only single species i.e.***Pavo cristatus***is listed in the Schedule I under Wildlife Protection Act, 1972.

3.13.8 AQUATIC DIVERSITY:

Methodology For Aquatic Diversity:

The samples for qualitative and quantitative analysis of planktons were collected from the sub surface layer at knee depth. Water samples were filtered through plankton net of 20µ mesh size (APHA, 1971). The filtered samples were concentrated by using the centrifuge. By using Lackey's drops method and light microscope (Lackey, 1938), the qualitative analysis was carried out for phytoplankton and zooplankton (Table 8). The standard flora and other literature were followed for the qualitative evaluation of Plankton.

Table 3.27: List of Phytoplankton & Zooplankton from Study Area

PHYTOPLANKTON	ZOOPLANKTONS
Anabaena variabilis	*Anura Sp.*
Cladophora Sp.	*Arcella Sp.*
Cylindrospermum Sp.	*Asplancha Sp.*
Cypris Sp.	*Brachionus Sp.*
Desmodium Sp.	*Cyclops Sp.*
Diploneis Sp.	*Difflugia Sp.*
Euglena Sp.	*Horaella Sp.*
Gyrosigma Sp.	*Lecane Sp.*
Microcoleus chthonoplastes	*Nauplii Sp.*
Microcoleus paludosus	*Noctiluca Sp.*
Nostoc communae	*Testudinella Sp.*
Oedogonium Sp.	*Vorticella Sp.*
Oscillatoria Sp.	
Volvox Sp.	

CHAPTER-4 : ANTICIPATED ENVIRONMENT IMPACT AND MITIGATION MEASURES

4.1 INTRODUCTION

This chapter presents identification and appraisal of various impacts from the proposed power plant in the study area. Generally, the environmental impacts can be categorized as either primary or secondary. Primary impacts are those which are attributed directly to the project and secondary impacts are those which are indirectly induced and typically include the associated investment and changed patterns of social and economic activities by the proposed action.

Quantification of assessments in terms of measurable units would be the ideal method for impact assessment. Mathematical models are the best tools to quantitatively describe cause-effect relationships between sources of pollution and different components of environment.However, due to lack of information/data, uncertainties involved and complex interrelationships between various sectors of environment; it is not always possible or at least not easily achievable. In such cases, only qualitative predictions have been made based on experience and judgments.

The Environment Management Plan (EMP) is required to ensure sustainable development in the study area (10 km) of the proposed plant site, hence it needs to be an all en-compassive plan for which the proposed industry, Regulating agencies like pollution control board working in the region and more importantly the affected population of the study area need to extend their co-operation and contribution.

The affected environmental attributes in the region are air quality, water quality, soil, land use, ecology and public health. The management action plan aims at controlling pollution at the source level to the extent possible with the available and affordable technology followed by treatment measures before they are discharged. The proposed project would create impact on the environment in two distinct phases:

During the construction phase which may be regarded as temporary or short term; and

During the operation phase which would have long term effects.

The construction and operational phase of the proposed project comprises various activities each of which will have an impact on some or other environmental parameters. Various impacts during the construction and operation phase on the environmental parameters have been studied and mitigation measures for the same are discussed briefly below and elaborated in the subsequent sections.

Types & Nature of Impacts Considered

The impacts can be classified into various categories depending upon various aspects. Typical types of impacts considered for the present study are described below:

Direct (Primary) and Indirect (Secondary) Impacts: Direct impacts occur through direct interaction of an activity with an environmental, social or economic component. These effects are generally associated with the construction, operation, or maintenance of a facility or activity and are obvious as well as quantifiable. Indirect impacts on the environment are those which are not a direct result of the project involving a number offactors, often produced as a result of a complex impact pathway. The indirect impacts are also known as secondary impacts. These are generally induced changes in the environment, population, economic growth and land use.

Short-term (Temporary) and Long-Term (Permanent) Impacts: Impacts can be short-term or long-term depending upon the persistence or duration of the impacts. The duration of impacts may have a lot to do with the project phase in which they occur.

Positive (Beneficial) and Negative (Adverse) Impacts: Even though the term "environmental impact" has come to be interpreted in the negative mean, many actions have significant positive effects that should be clearly defined and discussed. This is particularly appropriate for

redevelopment or corrective actions whose specific purpose and need is to mitigate any undesirable condition.

Cumulative Impacts: Cumulative impacts are those environmental impacts that result from the incremental impact of the proposed action on a common resource when added to other past, present, and reasonably foreseeable future actions. The assessment of cumulative impacts is difficult in part due to the exploratory nature of the possible future actions and in part due to the complex interactions that need to be evaluated when considering collective effects. Air quality modeling provides a means to study effects of cumulative impacts

Direct – D
Indirect - ID
Short – term – ST
Long – term – LT
Positive – P
Negative – N

4.2 PREDICTION OF THE POTENTIAL OF THE IDENTIFIED IMPACTS

This phase involves the activities like erection of civil structures, movement/ removal of old construction, erection of new equipment and machinery, greenbelt development etc. Air, Noise and Land are likely to be effected by these activities, although Aesthetics and Socio-economic factors are also identified. But the impacts will be marginal land for short term only.The greenbelt development will have positive impacts. The impacts on different environmental parameters due to proposed project construction are discussed in **Table 4.1.**

Table 4.1: Aspect-Impact Identification

	Project activity	Air Quality (AQ)	Noise and Vibration (NV)	Surface Water (SW)	Ground Aspect Water (GW)	Land Use/Land cover (LU/LC)	Soil (SC)	Ecology & bio diversity	Socio – Economic (SE)	Occupational Health & safety (OH)	Impacts
1	**Preparation of sites**										
1.1	Clearance of existing land for expansion	√	√			√	√		×	√	**AQ:** Adverse health effects on workers due to possible increase in the level of SPM in ambient air during land leveling. **NV**: Adverse health effects on workers due to possible increase in the level of ambient noise during operation of leveling machine. **LU:** Fractional change in land use pattern. **SE:** Improvement in local infrastructure due to employment opportunity. **OH:** Risk of life and occupational injury due to movement of earth machinery.
1.2	Work force accommodation at site for construction and erection work			√	√		√		×	√	**SW:** Adverse health effects on people due to possibility of surface water contamination to improper disposal of domestic sewage water. **GW:** Adverse health effects on people due to increase in the possibility of groundwater contamination during improper disposal of sewage water. **SC:** Loss of productivity due to soil contamination to improper disposal of sewage water. **SE**: Increase in the marginal income of local due to on site crew.

											OH: Risk of community health/life due to improper disposal of sewage water to the surrounding area if not stored properly.
1.3	Vehicle movement for transportation of surplus in earth	√	√		√		√		×	√	**AQ:** Adverse health effects on workers due to increase in the level of SPM, NOX, SOX, HC and CO during transportation. **NV:** Adverse health effects on the workers due to increase in the level of ambient noise during transportation. **SE:** Increase in the economic level of local people due to hiring of vehicles and transport equipment / potential damage to village roads due to vehicular movement. **OH:** Risk of life of human being due to transportation
2	**Construction Activities**										
2.1	Vehicular movement for transportation of materials and equipment	√	√				√		×	√	**AQ:** Adverse health effects on workers due to increase in CO, HC, NOx, SO2, SPM levels in ambient air during transportation of materials. **NV:** Adverse health effects on the workers due to increase in the level of ambient noise during vehicular movement. **GW:** Adverse health effects on people due to ground water contamination during accidental leakage of fuel and oil from vehicles. **SC:** Loss of productivity of soil due to accidental leakage of fuel and oil from vehicles. **SE:** Indirect employment generation and potential damage to village roads due to vehicle movement. **OH:** Risk of life and injury during transportation.
2.2	Operations of cranes, pneumatic /electrical vibrators for concreting,	√	√		√		√		×	√	**AQ:** Adverse health effects on the people/workers due to increase in the levels SPM in ambient air during cement/sand handling. **NV:** Adverse health effects on the workers due to ambient noise level during blasting. **SC:** Loss of productivity of soil due to accidental leakage

	blasting, welding machines concrete mixers etc										of fuel and oil from vehicle. **SE:** Indirect employment due to hiring of vehicles for transportation. **OH:** Risk of life and injury to human being during operation of cranes, blasting and welding machine.
2.3	Plain Concreting, RCC Civil foundations and Erection Activities	√	√				√		×	√	**AQ:** Adverse health effects on workers due to increase in the levels SPM in ambient air during cement/sand handling NV: Adverse health effects on workers due to increase in ambient noise level during operating machines. **SC:** Loss of productivity of soil due to removal of topsoil; SE: Employment opportunities for civil works. **OH:** Risk of life and injury to human being due to erection activities.
2.4	Heavy Fabrication work for erecting of major plant equipments	√	√						×	√	**AQ:** Adverse health effects due to increase in CO2, NOx, levels in the air. **NV:** Adverse health effects on the workers due to increase in ambient noise levels during erection of major plant equipment.**SE:** Employment opportunities for fabrication works. **OH:** Risk of life and injury of human being during working at heights & welding works.
3	**During Operation Phase**										
3.1	Storage and handling of raw materials, fuel and finished products	√			√		√			√	**AQ**: Adverse health effects on workers due to increase in the level of SPM in ambient air during unloading of rice Husk. **SC:** Loss of productivity of soil due to probable spillage of chemicals and finished product ENA. **OH:** Risk of life and injury to human life due to improper handling of raw material; Risk fire for Alcohol/etc. **SE:** Employment opportunities due to loading/unloading of materials

3.2	Distillery Plant Operation	√	√	√	√				×	√	**AQ:** Adverse health effects on workers due to increase in the level of CO2 and CH4 in ambient air during treatment process (in case of anaerobic digestion) **NV:** Adverse health effects on workers due to increase in noise level during distillery operation process. **SW:** Adverse health effects on people due to contamination of surface water to accidental spillage/ leakage of spent wash generated during manufacturing process. **GW:** Adverse health effects on people due to contamination of ground water during accidental spillage/ leakage of spent wash from storage tank. **OH:** Risk of life and injury to human being due to possibility of operation and waste disposal. **SE:** Employment opportunity to the local people.
3.3	Operation of DG set	√	√		√		√				**AQ**: Adverse health effects on workers due to emission of NOx, HC, CO, SPM in ambient air during operation of DG set. **NV:** Adverse health effects on workers due to increase in the ambient noise level during operation of DG set. **GW:** Adverse health effects on local people due to contamination of ground water during accidental spillage of diesel or oil. **SC:** Loss of productivity of soil due to accidental spillage of diesel or oil
3.4	Operation of Boiler	√	√							√	**AQ:** Adverse health effects on workers due to increase in the level SPM in ambient air during burning of baggase/Rice husk/spent wash and dumping of fly ash on land. **NV:** Adverse health effects on workers due to increase in the level of ambient noise during boiler operation. **OH:** Risk of life and injury to human being due to high pressure steam.

3.5	Waste water treatment for Distillery	√		√	√		√				**AQ:** Risk of global warming due to emission of methane gas to atmosphere from waste water plant. **GW:** Adverse health effects on people due to increase in the possibility of groundwater contamination during leakages from spent wash lagoons/compost yard. **SC:** Loss of productivity of soil due to leakage from spent wash storage site.
3.6	Solid waste Disposal and Handling	√	√								**AQ:** Adverse health effects on workers due to emission of SPM, NOx & SO2 during vehicular transportation. **NV:** Adverse health effects on workers due to increase in the level of ambient noise during vehicular transportation.
3.7	Transportation of finished products and Raw Material	√	√							√	**AQ:** Adverse health effects on workers duo to increase in the level of CO, HC, NOx, SO2 & SPM during transportation. **NV:** Adverse health effects on workers due to increase in the level of ambient noise during transportation. **OH:** Risk of life and injury to workers during transportation.

4.3 ANTICIATED ENVIRONMENTAL IMPACT & MITIGATION MEASURE DURING CONSTRUCTION PHASE

4.3.1 AIR ENVIRONMENT

Impact during Construction Phase: The main sources for impact on air quality during construction phase will be due to movement of vehicles and construction equipment at site, dust emitted during leveling, foundation works,transportation of construction material etc. Dust would be generated during activities such as loading and unloading of construction materials, top soil removal, movement of vehicles over dusty roads and air born dust from exposed project site. Hence, during the construction phase, suspended particulate matter PM10 & PM2.5 will be the main pollutant. The emissions from vehicles and construction equipment may also contribute to NOx and SOx. The dust generated will be fugitive in nature. The impacts will be localized in nature and the areas outside the project boundary are not likely to have any major adverse impact with respect to ambient air quality.

Proposed Mitigation Measures:

- Spraying of water for dust suppression will be used as per requirement at the construction site.
- Construction materials will be fully covered during transportation to the project site by road.
- The present road conditions are reasonably good for proposed movement of traffic.
- Preventive maintenance will be carried out for vehicles and pollution check on periodic basis will be mandatory.
- Construction material shall be stored in covered shed
- The approach roads will be paved or tarred and vehicles will be kept in good order to minimize the pollution due to vehicular traffic.
- The nose-mask will be provided to workers in dust prone area.

4.3.2 WATER ENVIRONMENT

Impacts during construction phase: Construction works for the proposed project will be carried out for the additional buildings/sheds and infrastructures required only for manufacturing & storage of materials and pollution control. Majority of the work will be of fabrication type, which does not require much water. However water will be required for domestic usage & civil construction work. The water requirement during construction phase will be temporary requirement and the quantity will not be significant as construction works will be moderate in size. Runoff from construction site &domestic wastewater may have impacts on water resources of the area if disposed off in nearby river or on land.

Proposed Mitigation Measures

- Proper sanitation facilities like mobile toilets etc. will be provided for the construction workers.
- Treatment of sewage from temporary labor rest rooms shall be done in temporaryseptic tanks and soak pits.
- Temporary arrangements will also be made for prevention of runoff by providing earthen bund/barrier around construction site.

4.3.3 NOISE ENVIRONMENT

Impact during Construction Phase: The construction period of the project will last for 8-12 months. The major sources of noise pollution during construction phase would be operation of

equipment and vehicles engaged in various construction activities. Most of these activities would be confined to the close vicinity of construction site and would produce noise for limited period (day time only). The expected noise sources during construction phase are listed in **Table 4.2**.During construction period, noise levels shall vary between 75-85 dbA (day time only). No significant long-term impact on human beings is anticipated, except noise exposureon workers at construction site.

Table 4.2: Noise Source during Phase

Activities	Equipment
Site Clearance and excavation	Excavators
Material Haulage / Transportation	Trucks / Tractors / MAVs
Excavation, Earth work, compaction	Excavator, Concrete Mixer, Roller / Compactor etc.
Other	Horn / Siren DG Sets Compressor Motors Pumps

Proposed Mitigation Measures:

- Labor camp should be located away from the construction site
- Construction camps should be located at least 500m distance from nearest habitation, silence zone, etc.
- If near habitation, silence zone, forests, construction activities should be halted in night time.
- All equipment shall be of standard make and equipped with silencer. The construction equipment should be good working conditions, properly lubricated and maintained to keep noise/vibration within permissible limits. Noise limits for construction equipments used in this project (measured at one meter from the edge of the equipment in free field) such as compactors/roller, excavator, concrete mixer, vibrators etc. shall not exceed 75 dB (A), as specified in the Environment (Protection) Rules, 1986.
- High noise zone should be marked and earplugs/earmuffs shall be provided to the workmen near high noise producing equipment. The workmen should be made aware of noise and vibration impacts on their health and mandatory use earplugs.
- Proper shifting arrangement shall be made to prevent over exposure to noise and vibration.
- Silent DG sets shall be used at construction sites.
- Speed limits shall be enforced on vehicle.
- Use of horns / sirens shall be prohibited.
- Use of loud speakers shall comply with the regulations set forth by CPCB.
- Regular noise monitoring shall be carried at construction camps / construction sites to check compliance with prevailing rules.
- All statutory precautionary measures will be implemented.
- Construction work shall be restricted during day time.

4.3.4 SOCIO-ECONOMIC ENVIRONMENT

Impacts during construction phase: No rehabilitation and resettlement is required for proposed Distillery unit project. Employmentopportunities will be generated for the local population, especially the illiterate and theunskilled workers during construction phase. During construction

phase, 190-200 local laborsshall be employed. Thus, the impacts on socio-economic fronts are positive during construction.

4.3.5 ECOLOGICAL ENVIRONMENT

As noticed during study and from topo-sheet map, the project site is far away from the ecologicalpotential area. Hence, issue of impacts on ecology during construction of the proposed project isnot envisaged. Also it has been noticed that impacts on ecology may occur due to land preparation. However identified impacts would be temporary &restricted to the construction phase only. Thus it has been envisaged that no major impacts onecology would occur as the site is far away from ecological potential area.

4.3.6 LAND ENVIRONMENT

There will be no drastic change in the land use pattern of the study with the proposed project. As the land is already in possession and land document are enclosed in the EIA report.

4.3.7 OCCUPATIONAL HEALTH & SAFETY

Impact & Mitigation to the human being related to construction is explained in the Chapter7**.**

4.4 ANTICIATED ENVIRONMENTAL IMPACT & MITIGATION MEASURE DURING OPERATION PHASE

4.4.1 AIR ENVIRONMENT

The operational activities will have significant sources of stationary & fugitive emissions. These emissions will result in considerable impacts on the air quality of the area.Baseline data indicates that Ambient Air Quality at project site and in the surrounding studyarea is well below the limits as prescribed under the National Ambient Air Quality Standards (NAAQS, 2009) and hence the impacts in terms of change in prevailing ambient air qualitystatus, if not high can be acceptable. To determine the significance of impacts of proposedproject with reference to the baseline ambient air quality status of the study area, impacts assessment has been carried out for various emission sources from proposed project as described below under respective heading.

4.4.1.1 Various Impact on Air Environment

Process emissions

The process emissions likely to be generated for manufacturing of fuel grade ethanol will be from various processes like:

- Distillation will contribute to VOC emissions.
- Fermentation will contribute to traces of ethanol and CO2 emissions.

Utility emissions

Utility emissions will be mainly from Boiler and D.G. sets proposed for the Ethanol Plant. The Company proposes to install a

of 45 TPH capacity and one D.G. sets having capacity of 600 KVA each. Fuel burned in the boiler is the mixture of Bagasse and spent wash. The composition of spent wash is 30-35 %, if the sludge content in the spent wash is 50-60% brix (4000-6000 mg/kg) for the maximum gross value. The quantity of bagasse required will be ~ 20 TPH.

Fugitive emissions

Fugitive emission from distilleries includes volatilization of alcohol from process & storage tanks, dust from stock piles, spills, raw material and fuel handling, loading-unloading, transportation and open vessel.

4.4.1.2 Impact Assessment through Mathematical Modelling

ISCST3 Dispersion Model

The Industrial Source Complex (ISC) Short Term model provides options to model emissions from a wide range of sources that might be present at a typical industrial source complex. ISCST3 is US-EPA approved model to predict the air quality. The model uses urban dispersion and regulatory defaults options as per guidelines on air quality models (PROBES/70/1997-1998). Emission sources are categorized into four basic types of sources, i.e., point sources, volume sources, area sources, and open pit sources. The volume source option and the area source option may also be used to simulate line sources. The model assumes receptors on flat terrain. The ISC short term area source model is based on a numerical integration over the area in the upwind and cross wind directions of Gaussian plume formula. This can be applied to the Point, Area, Line or Volume sources simultaneously and their resultant incremental concentration of the pollutant can be predicted.

Model Options Used For Computations: The options used for short-term computations are:

- The plume rise is estimated by Briggs formulae, but the final rise is always limited to that of the mixing layer;
- Stack tip down-wash is not considered;
- Buoyancy Induced Dispersion is used to describe the increase in plume dispersion during the ascension phase;
- Calms processing routine is used by default;
- It is assumed that the pollutants do not undergo any physio-chemical transformation and that there is no pollutant removal by dry deposition;
- Washout by rain is not considered;
- Flat terrain is assumed / used for computations;
- Cartesian co-ordinate system has been used for computations; and
- The model computations have been done for 10 km with 100 m grid interval.

Gaussian Plume Model

Ground Level Concentration (χ) (GLC) from a point source at any receptor is given by –

$$\chi = \frac{Qg_1g_2}{(2\pi\sigma_y\sigma_z u)} \quad \text{- (USEPA ISCST3, 1987)}$$

where,

$\mathbf{g_1}$ = exp(-y2/2σy2)

$\mathbf{g_2}$ = exp[-(z-H)2/2σz2] + exp[-(z+H)2/2σz2]

Q = source strength

Z = receptor height above the ground

H_e = effective stack height (Plume rise + Physical stack height)

u = wind speed at stack level

σ_y &σ_z = dispersion parameters

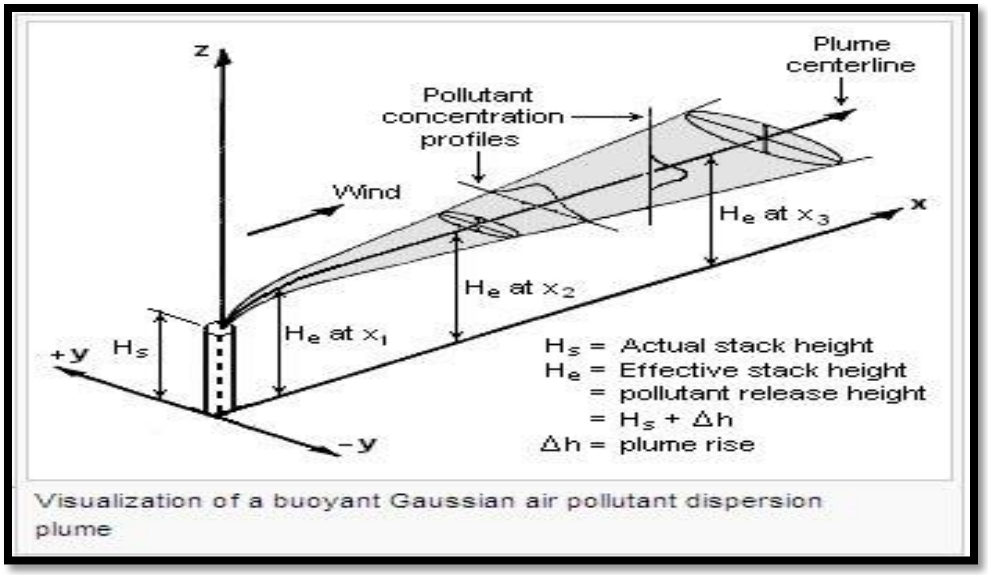


Figure 4-1Gaussian Plume Model

Dispersion Parameters

Dispersion parameters σ_y and σ_z for open country conditions (Briggs, 1974) are used, as the project is located on in a rural area. Atmospheric dispersion coefficients vary with downwind distance (x) from emission sources for different atmospheric stability conditions. (CPCB – PROBES/70/1997-98).

Table 4.2 - Dispersion parameters as per stability class

Stability Class	**σ_y**	**σ_z**
A	$0.22x(1+0.0001x)^{-.5}$	0.20x
B	$0.16x(1+0.0001x)^{-.5}$	0.12x
C	$0.11x(1+0.0001x)^{-.5}$	$0.08x(1+0.0002x)^{.5}$
D	$0.08x(1+0.0001x)^{-.5}$	$0.06(1+0.0015x)^{.5}$
E	$0.06x(1+0.0001x)^{-.5}$	$0.03x(1+0.0003x)^{-1}$
F	$0.04x(1+0.0001x)^{-.5}$	$0.16x(1+0.0003x)^{-1}$

Plume Rise

Plume rise Δh has been determined according to Brigg's formula (CPCB guideline)

$$\Delta h = 21.425 \frac{F^{3\,4}}{U_s} \quad \text{for } F<55$$

$$\Delta h = 38.71 \frac{F^{3\,5}}{U_s} \quad \text{for } F>55$$

F = g VsD2(Ts-Ta)/4Ts

Where

Us = wind speed at stack level (m/s)

Vs = stack gas velocity (m/s)

Ts = stack gas temperature (0K)

Ta = ambient temperature (0K)
F = Buoyancy flux parameter (m4/s3)
Δh = Plume rise (m)
D = Diameter of the stack (m)
g = acceleration due to gravity, 9.807 (m/s2)

Table 4.3: Stack details

Stack Attached to	Capacity	Stack Ht., m	Stack Dia., m	Stack Exhaust, nm^3/s	Fuel Used	PM10 Emitted AFTER APCD, gm/sec	PM2.5 Emitted AFTER APCD, gm/sec	SO2 Emitted gm/sec	NOx Emitted gm/sec
Boiler	45 TPH	75	2	8.34	Baggase, Spent Wash	0.885	0.354	0.250	0.09
DG set	600 KVA	30	0.2	0.14	HSD	0.002	0.001	0.097	0.001

Results

- The maximum cumulative GLC concentration of **PM10 wiz. 87.127 ug/m^3** was predicted inside the study area. As the distance from source increases, the incremental concentration of PM10 drops drastically due to settling of PM10 particles under gravity.
- The maximum cumulative GLC concentration of **SO2 wiz. 14.563 ug/m^3** was predicted inside the study area.
- The maximum cumulative GLC concentration of **NOx wiz. 31.207 ug/m^3** was predicted inside the study area.

Table 4.4: Predicted GLCof PM10 at Ambient Air Quality Monitoring Station

LOCATION CODE	LOCATION	PARAMETER	MAX BASELINE CON. (µG/M3)	PREDICTED GLC, (µG/M3)	CUMULATIVE GLC, (µG/M3)
A1	Project Site	PM10	86.9	0.22714	87.127
		PM2.5	56.4	0.09061	56.491
		SO2	10	0.20409	10.204
		NOx	23.2	0.0243	23.224
A2	Nr Village Bishanpur	PM10	85.5	0.12817	85.628
		PM2.5	49.5	0.05138	49.551
		SO2	13.5	0.20364	13.704
		NOx	25	0.015	25.015
A3	Nr Village Mansurpur	PM10	84.5	0.07032	84.570
		PM2.5	49	0.02802	49.028
		SO2	12.6	0.05336	12.653
		NOx	31.2	0.00737	31.207

A4	Nr village Sherpur	PM10	83.7	0.03669	83.737
		PM2.5	45.6	0.01462	45.615
		SO2	12.5	0.0428	12.543
		NOx	25.6	0.00385	25.604
A5	Nr village Durgi	PM10	83	0.04096	83.041
		PM2.5	46.3	0.0163	46.316
		SO2	14.35	0.05689	14.407
		NOx	25.1	0.00423	25.104
A6	Nr Village Lohgarh	PM10	83.5	0.04936	83.549
		PM2.5	44.6	0.01974	44.620
		SO2	14.5	0.06346	14.563
		NOx	26.1	0.00548	26.105
A7	Nr Village Latifpur	PM10	83.4	0.0468	83.447
		PM2.5	50.6	0.01875	50.619
		SO2	12.8	0.01057	12.811
		NOx	25.8	0.0053	25.805
A8	Nr Village Mohiuddinpur dalel	PM10	80.2	0.076	80.276
		PM2.5	45.6	0.01974	45.620
		SO2	13.5	0.0309	13.531
		NOx	23.7	0.00786	23.708

The contour maps showing the predicted concentration levels of PM_{10}, $PM_{2.5}$, SO_2, NOx are presented in **Figure 2, Figure 3, Figure 4** and **Figure 5**.

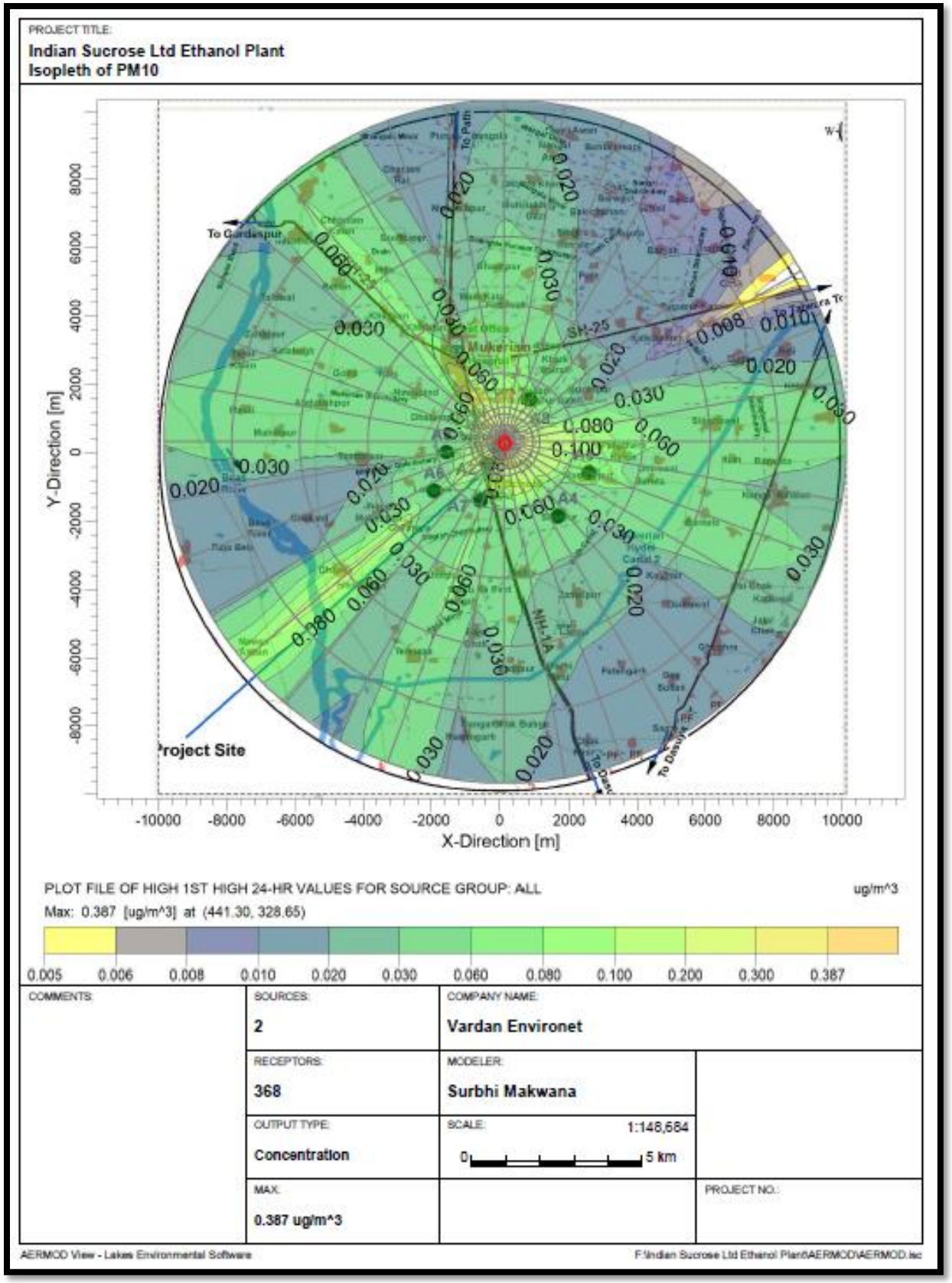


Figure 4-2: Spatial distribution of predicted GLCs of PM_{10}

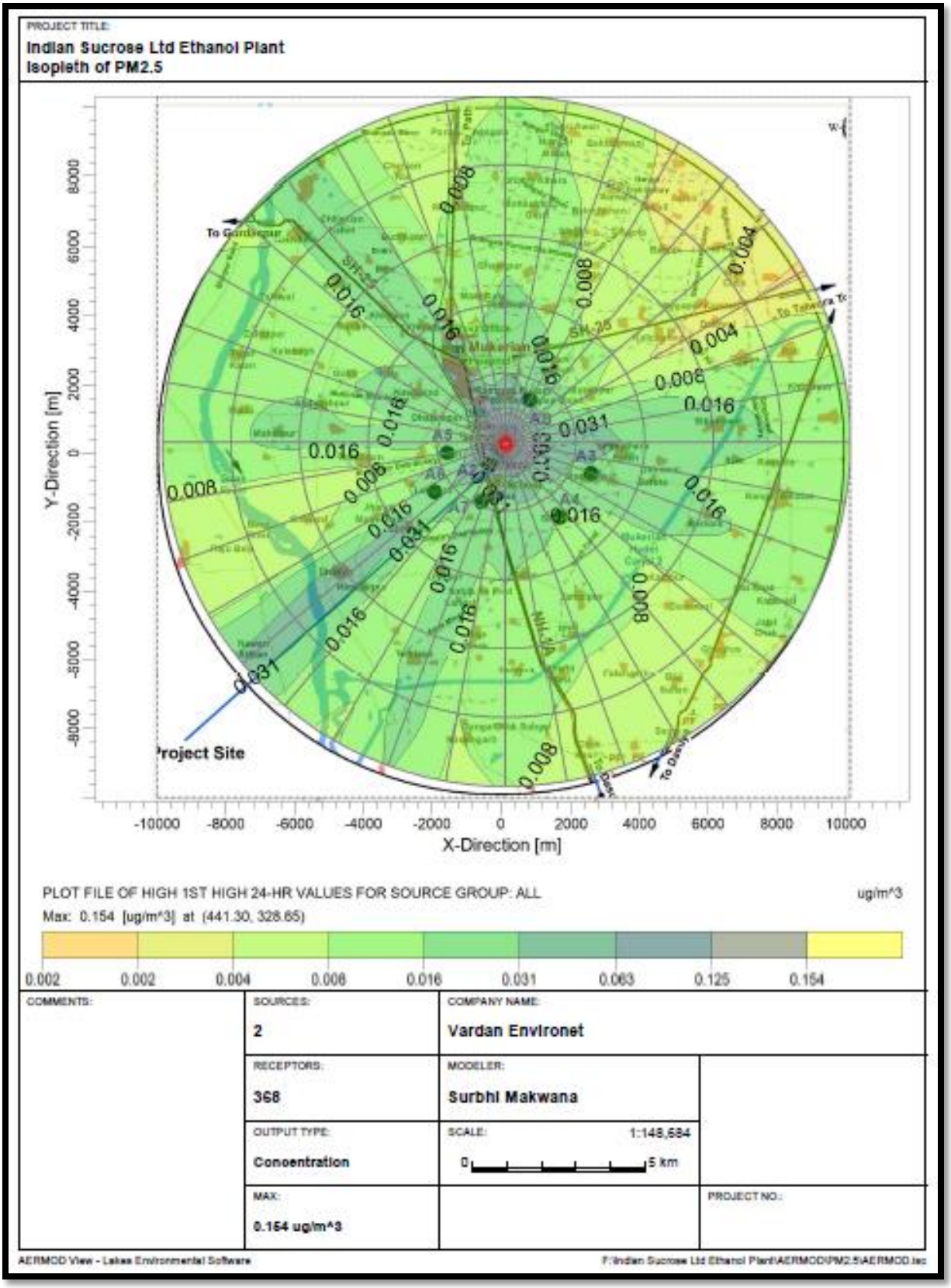


Figure 4-3: Spatial distribution of predicted GLCs of $PM_{2.5}$

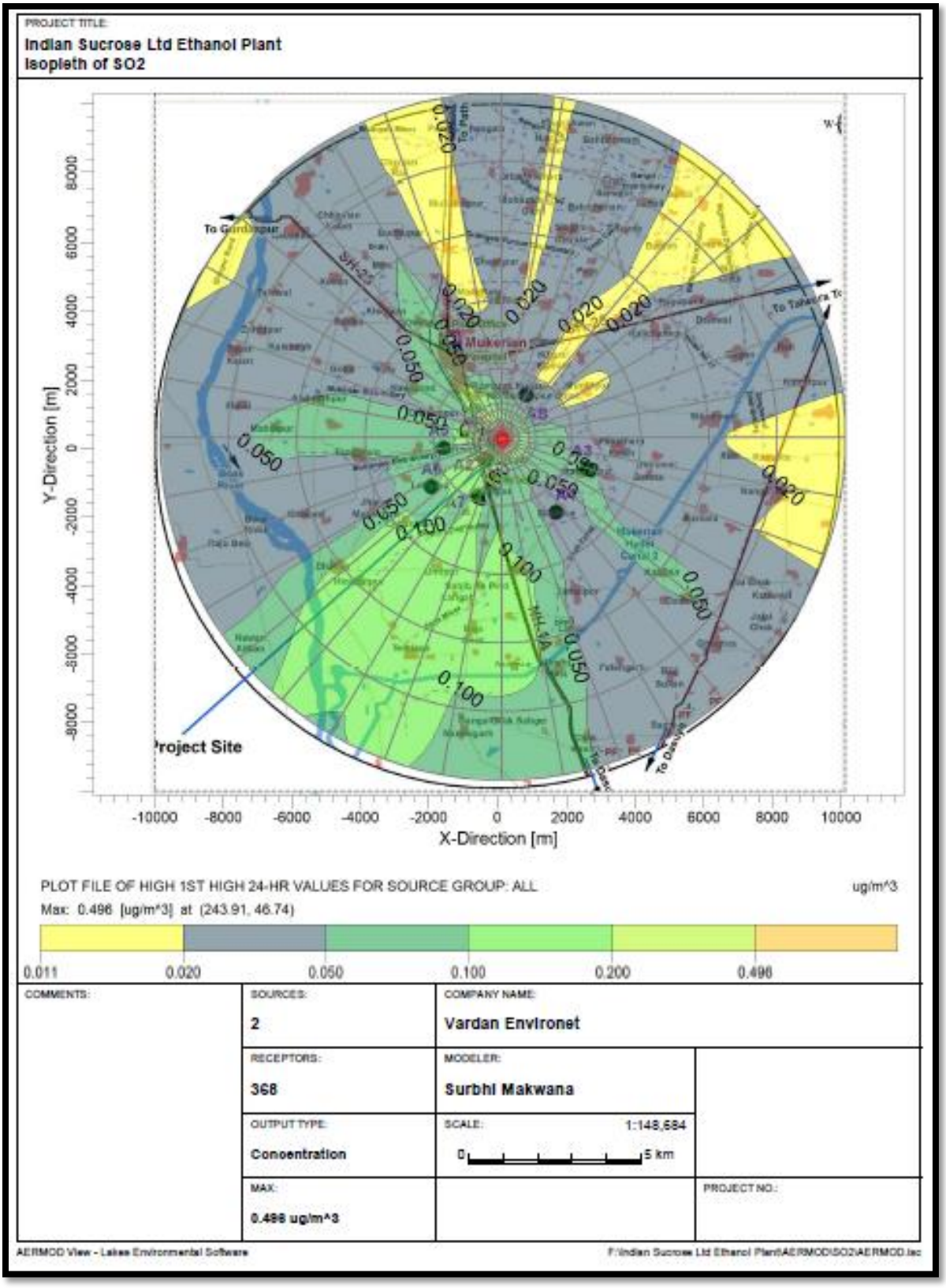


Figure 4-4: Spatial distribution of predicted GLCs of Sox

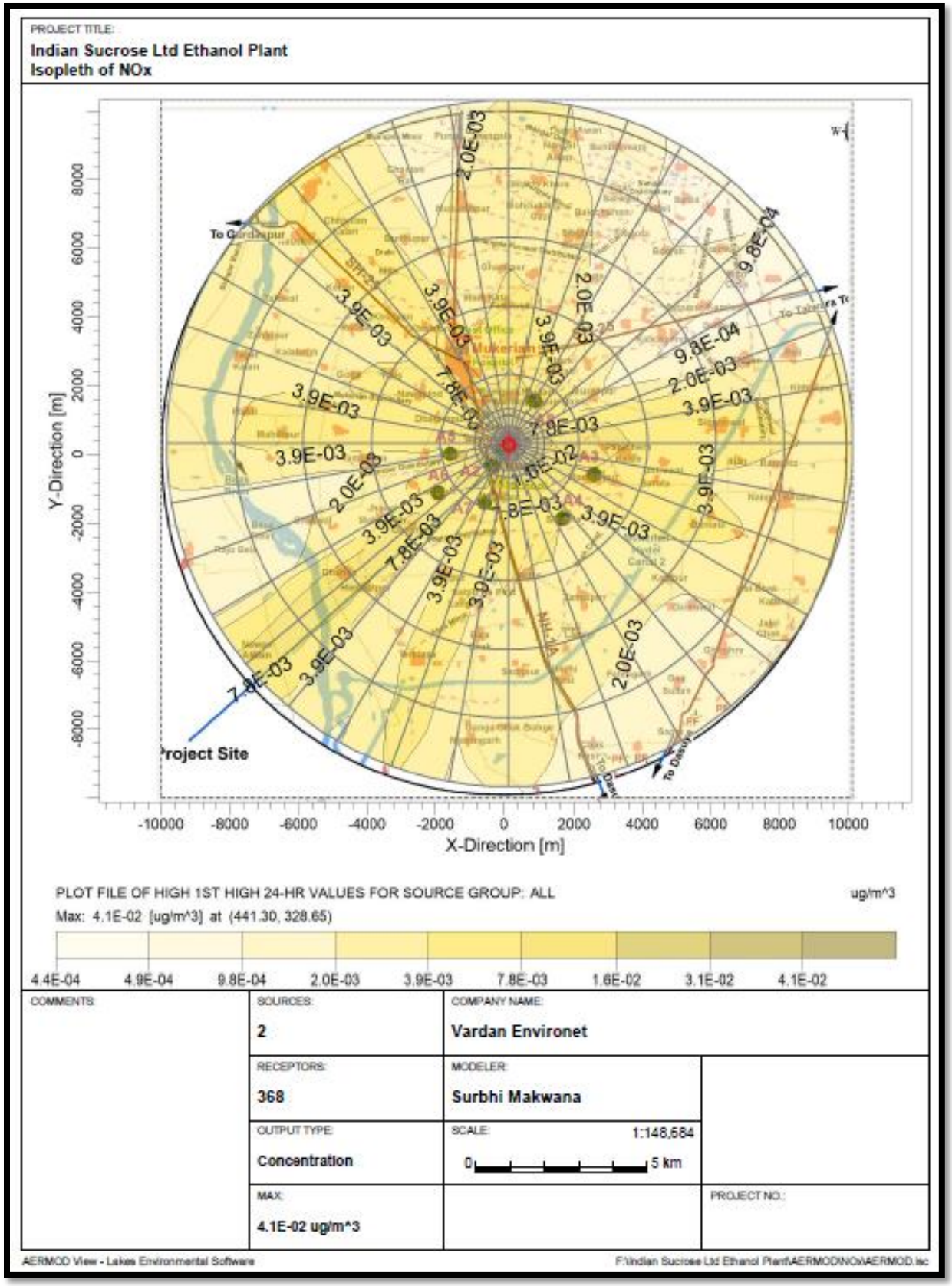


Figure 4-5: Spatial distribution of predicted GLCs of Nox

4.4.1.3 Proposed Mitigation Measures

- The control the particulate emissions ESP will be installed and particulate matter value will be maintain less than 50mg/m^3 as per standards of CPCB.
- CO2 scrubber will be provided to scrub CO2 emissions in water.
- The whole process will be carried out in closed condition so as to avoid any chances of VOC emissions
- Online stack monitoring system for regular monitoring of (for Particulate Matter) will be installed and transmission of online data to Punjab Pollution Control Board and CPCB will be done.
- Adequate stack height will be provided to Boiler and D.G. sets.
- The main raw material and product shall be brought in and dispatched by road in covered enclosures.
- Dust collectors will be installed at loading-unloading section to minimize the PM emission at the site.
- Emphasis will be given for proper handling and storage of chemicals, product, fuel and raw material to minimize the chances of any dust or fugitive emissions.
- It will be ensured that the vehicle owners must have valid PUC Certificate.
- Dust suppression on haul roads will be done at regular intervals.
- Boiler ash will be transferred in closed conveyors to the end users to avoid any spillage.

4.4.2 WATER ENVIRONMENT

4.4.2.1 Impact on Water Quality

- Water requirement of the proposed plant is proposed to be met by ground water.
- The proposed molasses based distillery would have ‘Zero Liquid Discharge’.
- The main pollutant of this unit will be Spent Wash generation, which has the very high BOD & COD value, if this water will be discharge without any treatment can containment the ground & Surface water.
- Other water stream such as process condensate, cooling tower blow down, boiler blow down, spent lees etc. will have impact on soil and groundwater if discharged without treatment.
- Another impact may be contamination of groundwater, surface water due to domestic waste water.
- Storm water runoff contaminating the surface water during rainy season.

4.4.2.2 Proposed Mitigation Measures

- Spent wash will be treated through Centrifuge Decanters for separation of Suspended Solids as yeast sludge, which will be dried in lagoon & later used as cattle feed as it contains higher protein and fiber content.
- Thin slop from the Decanter Centrifuge are partly recycled back to process (30-35%) and partly taken to Multi Effect Evaporator.
- Spent less water from the distillation column, dehydration, boiler blow down, cooling tank will be treated in the Condensate Polishing Unit (CPU).
- Treated water from the CPU will be used as make up water for the boiler, cooling tower and in the back in process again.
- Domestic wastewater will be disposed of through septic tank followed by soak pit system.
- Proper storm water drainage will be provided during rainy season to avoid mixing of storm water with effluent.

- Online monitoring station will be installed and results will be transmitted to the PPCB websites to maintain the ZLD.

4.4.3 LAND ENVIRONMENT

Impacts during operational phase

The main impacts on soil/ land during operation phase will be due to disposal of solid such as yeast sludge, boiler ash, CPU sludge and hazardous waste on land. Yeast sludge if discharged directly on land, damages the soil characteristics like porosity, soil fertility etc. These factors cause germination disorders in seeds that are plated. Infiltration of silt and sand with storm water collection.

Proposed Mitigation Measures

- The hazardous waste i.e. spent oil generated will be very minor , will be given to authorized vendor for the disposal
- Solid waste such as MEE sludge will be burnt in the boiler with the supporting fuel i.e baggase.
- Boiler Ash will be sold to brick manufacturer.
- Proposed distillery unit will be zero liquid discharge distillery unit. No spent wash shall be disposed of on land. All solid waste from the proposed Distillery Unit will be properly collected, stored and disposed.
- Paved areas at the boundary will be developed with permeable paving & impermeable surfaces to direct all runoff towards storm water collection pits. Storm water will be collected in proposed rain water harvesting pits & will recharge the ground water.
- Greenbelt has been planned for the proposed project which will result in the overall considerable beneficial impacts on land/ soil.
- Greenbelt development will also prevent erosion of soil by holding the soil by its roots.

4.4.4 NOISE ENVIRONMENT

Impacts during operational phase

After commencement of the plant there will be an increase in the noise levels. Source ofnoise will be operation of DG Sets during power failure. The noise is likely to be generated due to movement of vehicles and running equipment.

Proposed Mitigation Measures

- All equipment shall be of standard make and equipped with silencer.
- Closed rooms shall be provided for all the utilities so as to attenuate the noise pollution.
- High noise zone should be marked, and earplugs/earmuffs shall be provided to the workmen near high noise producing equipment. The workmen should be made aware of noise and vibration impacts on their health and mandatory use earplugs.
- All pipes and valves (including pressure controlvalve) shall be one schedule higher than needed by pressure considerations to attenuate noise.
- Padding shall be provided on plant floors to avoid noise due to vibration / falling objects.
- Proper shifting arrangement shall be made to prevent over exposure to noise and vibration.
- Silent DG sets shall be used.
- Speed limits shall be enforced on vehicle.
- Use of horns / sirens shall be prohibited.
- Use of loud speakers shall comply with the regulations set forth by CPCB.

- Regular noise monitoring shall be carried at project site and baseline monitoring stations to check compliance with prevailing rules.
- All statutory precautionary measures will be implemented.
- Vehicles/machinery shall be regularly maintained (by oiling/greasing) to produce less noise.
- Greenbelt with dense trees shall be developed around the periphery of the plant to reduce noise levels.

Impact due to Ground Vibration

No ground vibration impacts are expected on property and human beings due to proposed project due to absence of any major vibration source during construction and operation phases.

Full body vibration and hand-arm vibration impacts shall be felt by operators of sitting in heavy vehicles and operating vibrating devices, respectively. Necessary precautions in workplace environment shall be exercised to reduce work place vibration impacts.

4.4.5 ODOUR MANAGEMENT

- Some Odor problem may be there due to the production of hydrogen sulphide in the fermentation tank, but the same shall be controlled and restricted by controlling the production of hydrogen sulphide by:
- Maintaining the pH in the range 5_9 and temperature will be maintained for the reaction. Even in some cases
- Doping will be done by the Chlorine dioxide that destroy the Odour at the source.
  $5H_2S + 8\ ClO_2 \longrightarrow 5H_2SO_4 + 8\ Cl + 4H_2O.$
- Odour Management Plan outlines the methods by which odorous emissions will systematically assess, reduce and prevent potentially from the distillery unit.
- Odour shall be primarily controlled at source by good operational practices, including physical and management control measures.
- Better housekeeping will maintain good hygiene condition by regular steaming of all fermentation equipment.
- Use of efficient bio-cides to control bacterial contamination.

4.4.6 SOILD & HAZARDOUS WASTE MANAGEMENT

- Boiler ash will be collected and will be given to authorized vendor for the Brick manufacturing.
- MEE salt will be burnt in the boiler.
- Yeast Sludge from the fermenter tank and decanter will be dried in the lagoon and would be used as the cattle feed.
- Used oil which will be in minimum quantity would be given to authorized vendor for disposal.
- Other solid waste like plastic container, tank would be sold to authorized vendor.

4.4.7 ECOLOGY ENVIRONMENT

- ESP will be provided to the boiler stack to reduce the emission of particulate matter and sox
- Dust collectors will be provided in the areas of loading and unloading.
- The industry will adopt the ZLD policy
- Yeast sludge, will be sold to the farmer.
- Greenbelt will be developed within the factory premises to promote habitat for various birds and small fauna and insects.

- Boiler is based on the renewable Biomass which decrees the dependency on the Non-renewable sources.

4.4.8 IMPACT ON BIOLOGICAL ENVIRONMENT

There are no National Parks and Protected Sanctuaries within the study area, no impact is anticipated on the same. For estimation the adverse impact of the proposed project on sensitive area, air quality modeling has done and Air quality modeling results shows that no adverse impact on sensitive area.

In spite of there being no impact, efforts will be made not only to maintain the ecological balance of the surroundings but also to improve upon the same.

The attributes that are identified to describe ecology are animals, birds, fish, field crops, threatened species, natural vegetation etc. The study area does not have any identified endangered species, Forest, National Park, Sanctuaries and hence there is no question of any adverse impact on the same.

Emphasis will be placed on social forestry programme wherein tree plantation would be undertaken within the plant premises. The tree plantation under this programme would help in absorbing atmospheric heat, noise as well as pollutants.

Hence, all efforts will be put-up by the project proponent to maintain the ecological balance and improve the environment in terms of ecology and Green Belt development.

Industry will follow the zero discharge norms.Hence, no adverse impacts on surrounding ecology.

4.4.9 IMPACT ON SOCIO-ECONOMIC ENVIRONMENT

Critically analyzing the existing environmental status of the socio-economic profile and visualizing the scenario with the project, the impacts of the project would be varied and may generate both positive and negative impacts of the proposed project in the region that are stated below.

4.4.9.1 Positive Impacts

No Rehabilitation

The villages and their inhabitants at the project site will not be disturbed from their settlements due to the proposed project. Therefore neither villages nor any part of village or any hamlet will be disturbed during the project. As the project operations will not disturb or relocate any village or settlement, no adverse impact is anticipated on any human settlement.

Employment potential –skilled; semi-skilled and unskilled:

As per the survey it has been observed that the population in general do not have opportunities of earning from employment and the non worker population is higher in the region so the project in general will require total manpower of about 99 persons for the proposed project which will include all Categories of unskilled, semiskilled, skilled personnel and contract labour.

The proposed project will help to increase in demand of ancillary services including hotels, lodges, retail shops, banks, automobile workshops, school, health care centres, public transport and other logistics services.

This will help in upliftment of local people in terms of economy and social welfare and will lead economic upliftment of the area.

Indirect Employment PotentialThe project might be creating more demand for cane cultivating people and labor and business people.The project shall have positive impact on demand for the land value, which will generate more income for the local people.

No burden in the existing Infrastructure Facilities

Local work force will be given first preference in the activity due to which influx of the outsiders is not envisaged or it will be very minimal. Thus, there will not be the necessity of provision of housing facility for the local workers and not stressing on the existing civic amenities of the area. If sufficient number of local workers will not be available, then workers from outside will be engaged. For the outside workers if any, housing arrangement and the facilities will be provided at the project site. The projects will benefit the local people due to the civil construction and transportation companies.

Improvement in Infrastructure

The activity will benefit the local people due to provision of more infrastructural facilities such as developments of approach routes within the village area, street light, health facilities etc.

4.4.9.2 Adverse Impacts:

Impacts on Human Health

- As discussed adequate air, water and noise pollution control measures in compliance to the regulatory standards will be provided in the proposed project.
- Boiler ash will collect & give to brick manufectures and MEE sludge will be collected and given to the farmers. Spent wash and press mud will be given to the farmers.
- Waste water from domestic use and industrial use will be treated in STP and MEE respectively and after treatment the water will used in green belt development, floor washing and sprinkling
- The overall impact on human health will be insignificant during operation phase.

Impacts on Agriculture

Productivity of crops may be deteriorated affecting the agriculture based livelihood due to the pollution arising out of the project activity, if proper mitigation measures are not implemented.

Table 4.5 Qualitative Effects on Socio-economic Environment

Parameter	Local	Regional	Direct	Indirect	Reversible	Irreversible
Employment	+	•	+	+	•	+
Income	+	•	+	+	•	+
Transport	+	+	+	+	•	+
Education	+	•	+	•	•	+
Medical facilities	+	•	+	•	•	+
Communication	+	+	+	•	•	+
Sanitation	-	•	-	•	•	-
Housing	+	•	+	•	•	+
Health	-	•	-	-	•	-
Recreation	+	+	•	+	•	+
Agriculture	-	•	-	-	•	-
Cost of living	+	•	•	-	•	+
Business	+	+	+	•	•	+
Per Capita Income	+	+	+	•	•	+
Pollution	-	•	-	•	•	•

+: Positive
- : Negative
• : Insignificant

4.4.9.3 Mitigation Measures of Socio Economic Environment:

- Adequate measures have been envisaged in the project design to control air pollution. Proposed adequate & effective control measures will be provided to mitigate the impacts
- Awareness programs shall be arranged on health, hygiene and sanitation
- Periodic health checkup camps, shall be organized by project authority for villagers, contract laborers, employees and their family
- Apart from the normal health check up, emphasis shall also be given to prevent specific diseases originating due to emission of different pollutants such as respiratory aliments, skin problems, water borne diseases, hearing abilities etc.
- Job oriented training courses must be organized through industrial / technical training institutions for educated youth like electrical, tailoring, plumbing, type writing, shorthand and machine repairing, welding fabrication, and other skill developing trades
- Whenever necessary, collaboration between project authority and local bodies will be done on regular basis with an objective to build and maintain a good relationship which is necessary for smooth functioning of the project as well as progress and welfare of the people in the study area
- Awareness programs will be taken to make people aware about the environmental protection, need of water conservation etc.
- At the work place, first aid facilities shall be maintained at a readily accessible place with necessary appliances including sterilized cotton wool etc. Ambulance facility shall also be provided during emergency
- Sufficient supply of water fit for drinking shall be provided at suitable places.
- Sanitary facilities shall be provided at accessible place within the work zone and kept in a good condition.

4.4.10 IMPACT ON HYDROGEOLOGY

During the construction phase of proposed project, water will be required for construction activities at site. This requirement of water will be drawn from the ground water. The exploitation of ground water resources during the construction phase will not have a significant impact on the ground water availability in the area. Drinking water facility will be provided to the construction workers and waste water will be discharged into septic tanks via soak pits. Also there will be no constructional discharge from the site which can have any impact on the water quality. There is no surface water body within the core zone as well as there will be no waste water discharge outside the premises. Thus, it is clear that due to the construction activities there will be no impact on the surface water environment.

Water requirement of the plant is proposed to be met by ground water & recycled water. The proposed molasses based distillery would have “Zero Effluent discharge”. Thus, it is clear that during operational activities there will be no impact on the ground/surface water environment.

4.4.11 RISK ASSESSMENT

Detailed risk assessment study is given in Chapter 7.

4.4.12 CULTURAL ENVIRONMENT

The workers working in the industry are of different culture and religion. The interaction and in termingling of all these people will improve the understanding of various cultures.This will definitely improve and strengthen friendliness, brotherhood and unity among them.

Indirect Impacts

Impacts on Public Health and Safety

The discharge of waste materials (stack emission, wastewater and solid wastes), from process operations can have potential impact on public safety and health. The impact due to the emission from the proposed plant will be insignificant as the mitigation measures delineated in EMP are strictly followed. The public health and safety is dependent on the effective implementation of control measures suggested for pollution control.

Management of Public Interests

Based on the analysis of the socio-economic profile of the study area along with the prediction and evaluation of likely impacts arising out of the proposed activity, it has been possible to prepare a feasible environmental management plan. It is felt that this would help in minimizing the adverse impacts on the socio-economic environment to a considerable extent, while at the same time addressing to large extent the aspirations of the community. For the recruitment of semi-skilled and un-skilled workers particularly during construction, preference shall be given to the local people.

The project proponent is equally conscious for socio-economic development and is committed to raise quality of life and social wellbeing of communities where it operates. Its CER initiatives have been prioritized on local needs, which focus on Health, Education, Sustainable Livelihood, Social Mobilization, Infrastructure Development, Water Harvesting, Agriculture, and Environment Conservation.

4.5 RAIN WATER HARVESTING

Rainwater harvesting is the accumulation and deposition of rainwater for reuse on-site, rather than allowing it to runoff. Rainwater can be collected from surface runoffs or roofs, and in many places the water collected is redirected to a deep pit (well, shaft, or borehole), a reservoir with percolation, or collected from dew or fog with nets or other tools. Its uses include water for domestic use, irrigation purpose, industrial uses etc. The harvested water can also be used as drinking water, longer-term storage and for other purposes such as groundwater recharge.

Computation of Rainfall & approach for Artificial Recharge to Groundwater:

As per Dynamic Ground Water Resources ofIndia (2013) ofCGWB District Hoshiarpur falls under ‘Semi-Critical’ category and non-notified area, having stage of ground water development more than100%. Implementations of recharge mechanisms shall ensure the balance between the discharge vis-à-vis recharge relationships of the aquifer system and improve in the ground water quality. The normal annual rainfall in the said area is 0.938 m.The implementation of rainwater harvesting structures are generally done by diverting the runoff generated from the catchment area, roof top areas, paved areas, roads and greenbelt areas for recharging into the ground water system. Rainwater harvesting mechanism is done herethrough rooftop, road, pavement, open area and greenbelt area with in project premise.

Rain Water Harvesting & Artificial Recharge within Project premises:

Based on the site plan of the project area, the computation of rainfall runoff of entire project premises has been worked out and the details are tabulated below:

Table 4.6: Rain Water Harvesting/Recharge Details (Annually)

Sr.No	Area Type	Area in Sq. m	Runoff Coefficient	Annual Rainfall in Meter	Total Available Runoff in m^3 /year
1	Roof Top	23714.58	0.90	0.938	20019.8

2	Road/Paved Area	5139.5	0.60	0.938	2892.5
3.	Green Area/open area	23755.06	0.15	0.938	3342.3
	Total	52609.14			26254.6

From the above computation, it is evident that a total quantum nearly of 26254.6 m^3 of rain water can be generated annually. In order to design the recharge structure, hourly intensity of rainfall is considered to be 27 mm/hr has been taken into account and the details are tabulated below:

Table 4.7Rain Water Harvesting/Recharge Details (hourly)

Sr. No	Area Type	Area in Sq. m	Runoff Coefficient	Hourly Rainfall Intensity (m/hr)	Total Available Runoff per hour
1	Roof Top	23714.58	0.90	0.027	576.26
2	Road/Paved Area	5139.5	0.60	0.027	83.25
3.	Green / open Area	23755.06	0.15	0.027	96.20
	Total	10000			755.71

It has been worked out that total runoff generated within project premises per hour with 27 mm/hr intensity of rainfall shall be **755.71 m^3/hr**.

Quantum of Rainwater recharge through individual recharge Structure:

1. Volume of water within free Board (Settlement Chamber)

= 2 m x 2 m x 3m
= 12 m^3

2. Volume of water in Gravel filled Part

I.e. Volume of water within the pore spaces of sand, gravel filled part @40%.
= 2 m x 2 m x 3m x 0.40
= 4.8 m^3

3. Volume of water in Recharge Well through which recharge will be done

Intake capacity of recharge well= 36000 lph = 36 m^3/hr.
Therefore, Total volume to be recharge through an individual structure will be
= (12 +4.8 +36)
= 52.8 m^3/hr
Thus, the rain water recharging pit can accommodate **52.8 m^3/hr** of the rain water. Therefore, **14** rainwater harvesting structure require to accommodate the total quantum of runoff.

4.6 SUMMARY & CONCLUSION

Though every development activity has some negative impact on the environment of the project area, with the use of proper mitigative measures and environment management systems negative impacts shall be checked to acceptable levels. In this project activity use of latest technology, appropriate pollution control equipment, proper operation and maintenance of green belt

development (33% of the total project area) will help in reducing the generation at source not to cause any significant impact on the environment and human health of the study area.

CHAPTER-5 : ANALYSIS OF ALTERNATIVE SITE AND TECHNOLOGY

5.1 INTRODUCTION

The technologies for the treatment and safe disposal of spent wash, most polluting element from distillery is very difficult. Molasses based distilleries are among the most polluting industries. However, grain-based distilleries are considered as eco-friendly alternative for the production of alcohol. This is because the effluents generated in the process are less polluting in nature and easy to treat as well as dispose. The whole process based on the proven technology.

5.2 ALTERNATIVE FOR SITE TECHNOLOGY AND OTHER PARAMETERS

Project proponent hasn't considered any alternative option for the installation of its new ethanol plant, as this project is situated adjoining to its sugar plant and land is already under the possession. Moreover, the basic raw material (Molasses) will not require any transportation

And reduces the transportation cost for the project. The proposed alternative for the technology and other parameter is defined in the **table 5.1**:

Table 5.1: Alternative for Technology and Other Parameter

S.No	Particular	Proposed	Alternative	Remark
1	**Technology**	Molasses based Ethanol plant.	• Grain based distillery • 2 Generation Ethanol plan (Raw material can be rice husk)	Molasses based ethanol plant is more polluting than the grain based distillery.
2	**Waste water treatment**	Spent wash will be treated in the MEE. Spent less will be treated in the Condensate polishing unit.	No alternative	As MEE & CPU is the latest technology for the waste water treatment.
3	**Air environment**	ESP	No alternative	Efficiency for ESP can up to 95-99%, depend upon the electric current.
	Boiler	Based on the Bagasse + MEE salt	No alternative	Among the waste agro product Bagasse have the highest calorific value of range (1700-2200 Kcal/kg)
4	**Solid waste management**			
	Sludge	Burned in the boiler		Pollution load decrees
	Yeast sludge	Dried in the lagoon		sludge will be used as cattle feed
	Boiler Ash	Used in the brick manufacturing		Proper handle of the Boiler Ash with the dust collector and transfer in the closed conveyor belt.

5.3 CONCLUSION

The technology used in the project are the best for the production of ethanol from the molasses and as the molasses & baggase is the by-product of its own os Sugar Plant . Therefore No thoughts are required to switching on other alternative.

CHAPTER-6 : ENVIRONMENTAL MONITORING PROGRAMME

6.1 INTRODUCTION

Environmental Monitoring is an essesntial tool for sustainable development andensuring effective most implementation and monitoring of environmental management plan and mitigation measures. It is also very essential to keep updating the environmental management system for effective conservation of environment along with ongoing project activities/operation. The environment monitoring plan enables environmental management system with early sign of need for additional action and modification of ongoing actions for environment management, improvement and conservation. It provides exact idea for mitigation measures to be implemented as it is linked with actual distraction of environmental quality due to the project activities. Hence, Monitoring of critical parameters of environmental quality is very essential in the routine activity schedule of project operation. An Environmental Monitoring Program shall be scheduled for the following objectives:

- Assessment of the changes in environmental conditions, if any, during the project operation/activities.
- Monitoring and trackling the effectiveness of Environment Management Plan and Implementation of mitigation measures.
- Identification of any significant adverse transformation in environmental condition to plan additional mitigation measures.

6.2 MONITORING POINTS/LOCATION AND COMPONENTS

The environemental monitoring points shall be decided considering the environmental impacts likely to occur due to the operation of proposed project as the main scope of monitoring program is to track, timely and regularly, the change in environmental condition and to take timely action for protection of environment. The monitoring points/location and components of significance shall be as per **Table 6.1**

Table 6.1: Post Project Environmental Monitoring Locations

S. No.	Environmental Components	Monitoring Points/ Location
1.	Ambient Air	Two station in project site including stack and two in nearest settlement
2.	Water Ground Water	Water quality of the area was studied at minimum 2 location near project site
	Waste water	• Wastewater from all sources. • Wastewater at different stages of Effluent treatment Process.
3.	Emission	• At Source of emission (Stacks) from Sampling Port/ D.G. Sets. • Process emission in workplace area/ plants (for each area/plant minimum 2 locations and 1 location outside plant area near vent)
4.	Noise	• At all source and outside the Plant area. • At least 5 points near/around the plant Boundary.
5.	Greenbelt/Vegetation Cover	• Greenbelt Area at Boundary and Garden

6.	Solid Waste	• Process dust generated and collected as Solid wastes. • Domestic Biological Solid waste before manuring and prepared manure/compost.
7.	Soil	• At least 2locations from area near Solid/ hazardous waste storage/ Dumping Area. • At least four locations from Greenbelt and area where manure of biological waste is applied.

6.3 MONITORING PARAMETER, METHODOLOGIES AND FREQUENCY

Monitoring of environmental samples shall be done as per the guidelines provided by MoEF & CC/ CPCB/ PPCB mention in the above **Fig 6.2**. The monitoring parameters and frequency of monitoring shall be as per **Table 6.2.**

Table 6.2: Post project Environmental Monitoring Parameter and Frequency

Sr.No	Item	Parameters	Frequency	methodology
1.	Ambient Air quality	PM_{10}, $PM_{2.5}$, SO_2, NO_x, CO, etc.	Twice in a week or 24 hourly at each station.	IS-5182, CPCB (guidelines for measurement of Ambient Air Pollutants).
2.	Stationary Emission from Stack	PM, SO_2, NO_x	Quarterly	Is-11255 (guidelines for stack emission)
3.	Process emission	Fugitive gaseous pollutant expected.	Quarterly	
4.	Surface water and ground water	pH, Temperature, EC, Turbidity, Total Dissolved Solids, Calcium, magnesium, Total hardness, Total Alkalinity, Chlorides, Sulphates, Nitrates, DO, COD, BOD, oil and Grease, Metals expected in effluent.	Once in three months	Standard limits: Surface-IS:2296 Ground-IS 10500 Sampling Methodology-IS: 3025
5	Liquid Effluent	Physical and chemical parameters with organic content	Once in every week	Sampling Methodology-IS: 3025
6.	Noise	Equivalent noise level- dB (A)	Once in a week	IS:9989(Assessment of noise with respect to community response)
7.	Soil and Solid wastes	pH, Humidity, Texture, Organic matter, N, P, K, Sulphate, Calcium, Magnesium, C:N	Quarterly	Sampling Methodology and Analysis- IS: 2720

		ratio.		
8.	Greenbelt	Number of plantation (Units), Number of Survived plants/ trees, Number of poor plants/ Trees	Ongoing- round the year	
9.	Environmental Audit	As per Direction of ISO 14001	Once in a Year	

6.4 REPORTING AND DOCUMENTATION

The records of the monitoring program shall be kept on regular basis for all aspects of the monitoring. Separate records for water, wastewater, solid wastes, air emission, soil and manure/compost shall be prepared and preserved regularly. Immediately upon the completion of monitoring as per the planned schedule, report shall be prepared and necessary documents shall be forwarded to the concerned person. Methodology of monitoring (sampling and analysis) shall be prepared as separate documents as SOP (Standard Operating Procedure) wherever required. The records showing results/outcome of the monitoring programs shall be prepared as per the requirement of the schedule mentioned above. Regularly, these documents and records shall be reviewed for necessary improvement of the monitoring plan/mitigation measures/environmental technologies as well for necessary actions of Environmental Management Cell.

6.5 BUDGETS FOR THE ENVIRONMENTAL MANAGEMENT PLAN

S. No.	Item	Cost (lakhs/yr)
1.	Cost of monitoring of environmental parameters for Air, Water and Noise	02
2.	Occupational Health & Safety	53
TOTAL		**55**

6.6 SUMMARY

The environment monitoring plan enables environmental management system with early sign of need for additional action and modification of ongoing actions for environment management, improvement and conservation. The environmental monitoring points will be decided considering the environmental impacts likely to occur due to the operation of proposed project as the main scope of monitoring program is to track, timely and regularly, the change in environmental conditions and to take timely action for protection of environment Monitoring of environmental samples will be done as per the guidelines provided by MoEF&CC/CPCB/APPCB. Separate records for water, wastewater, solid wastes, air emission, soil and manure/ compost will be prepared and preserved regularly. Along with other budgets, Budget for environmental management will be prepared and revised regularly as per requirement.

CHAPTER-7 ADDITIONAL STUDY

7.1 PREAMBLE

In this chapter following issues are described and have been carried out by **M/s Indian Sucrose Limited**

- Public consultation/Public Hearing.
- Hazard Identification and Risk Assessment.

7.2 PUBLIC CONSULTATION

Public hearing is a very significant part of the process of public participation envisaged under guidelines issued by MoEF&CC, Government of India. It facilitates involvement of all the stake holders of the project which is essential for ensuring smooth running of project and benefitting all section of society in the process of economic development of the region. This process will be considered after the submission of Draft EIA.

Public Hearing for project was conducted on 11.06.2019. Public Hearing process was presided over by Additional Deputy Commissioner, Hosiyarpur & Supervised in the presence of Environmental Engineer (Mega), Punjab Pollution Control Board, Patiala & Asstt. Environmental Engineer, PPCB, Regional Officer, Hosiarpur and the public hearing was attended by 83 persons and entire process of the said hearing was video graphed. The proceeding of P.H, Photograph is attached as Annexure. The MoM action plan is given in table below:

Public Hearing MoM Action Plan

Sr. No.	Name & Address of the person	Detail of query statement/information/clarification sought; by the person present	Reply of the query/statement/information/clarification given by the project proponent.	Action Plan
1.	Sh. Adarsh Kumar Officer, M.C Mukerian, District Hoshiarpur	He welcomed the officers present in the Public Hearing. He stated that the M.C Mukerian should be adopted by the industry for development of the towns as the industry falls in the municipal limit. He also stated that the industry should manage the municipal solid waste of the town under the CER activities and he also requested Addl. Deputy Commissioner Hoshiarpur for the same.	On the advice of the project proponent, Environmental Consultant of the company informed that the project proponent will consider the matter	The project Proponent consider the matter and decided the meeting will be held with Adll. Deputy Commisioner Hoshiarpur, M.C and other District Officers. Total Amount of CER Activity is **Rs. 3.2 Crores** and

				the same will be utilized for the development of villages. As per decision taken by the committees after grant of EC.
2.	Sh. Santokh Singh, r/o Khanpur, District: Hoshiarpur	He stated that the employment should be given to the local 5 villages and assurance should be given by the project proponent. He further stated that the pollution from the industry to be generated should be controlled.	Environment Consultant of the company informed that the management of the industry has decided to give preference to the local persons in the employment. The industry will provide employment to the local people through district administration. He further informed that the industry will spend Rs. 9 Crores for the control of the pollution. No water will be discharged outside the premises of the industry. Online monitoring system will be provided by the industry, which will be monitored by the Officers of CPCB & PPCB. Environmental Engineer (Mega), Punjab Pollution Control Board, informed that as per the project report of the industry, no waste water will be discharged outside the industry. Boiler of 45 TPH capacity will be installed and online monitoring system will be provided system will be provided by the industry which will be monitored continuously by the officers of PPCB & CPCB which its compulsory for the industry.	The demand for employment will be send to deputy commissioner, Hoshiarpur and employment will be decided to the local person as per discussion with D.C on the merit. The PP has already stated that they will not discharge any effluent outside the industry and the air emission will be also within the limit. The pp will spend Rs. 9.0 Crores for

				pollution control measures.
3.	Sh. Jai Pal Sharma, Village Chak Allabaksh, District: Hoshiarpur	He stated that the industry is to be set up in the land of his village, as such, the employment should be provide to the people of his village. He further stated that the pollution should be controlled. He demanded that the Sugar Mill should pay the balance amount of the farmers, who have sold the sugarcane to it.	Environmental Consultant of the company informed that he had already informed that the management of the industry has already decided to give preference to the local people. Applications in this regards be given to the office of Deputy Commissioner, Hoshiarpur. He further informed that the CER activities will be implemented with the help of District Administration.	The demand for employment will be send to Deputy Commissioner, Hoshiarpur and employment will be decided to the local person as per discussion with D.C on the merit. Total Amount of CER Activity is **Rs. 3.2 Crores** and the same will be utilized for the development of villages. As per decision taken by the committees after grant of EC.
4.	Sh. Aagar Kumar, r/o Rajputa, Distict Hosiyarpur	He stated that the area will be developed with the establishment of industry. He further stated the pollution should be controlled properly.	Environmental Consultant of the company informed that the pollution from the industry will be controlled properly.	The PP has already stated that they will not discharge any effluent outside the

				industry and the air emission will be also within the limit. The pp will spend Rs. 9.0 Crores for pollution control measures.
5.	Sh. Jagan Nath Sial, r/o Village Madinpur, District Hoshiarpur	He stated that the area will developed with the establishment of the industry and he gives his consent for the same. Project proponent should give assurance for implementation of pollution control laws.	Representative of the project proponent informed that all the pollution control laws will be implemented	The PP has already stated that they will not discharge any effluent outside the industry and the air emission will be also within the limit. The pp will spend Rs. 9.0 Crores for pollution control measures.
6.	It is pertinent to mention here that the Environmental Engineer, Punjab pollution Control Board, Regional Office, Hoshiarpur vide letter no. 2615 dated 10.06.2019 informed that Sh. Neelam Kumar Oswal S/o Sh. Vidhya Sagar Oswal, resident of Dhandari Kalan, Ludhiana has sent a complaint vide letter dated 03.05.2019 submitting that the area of 13 acrea on which this project is proposed to be set up, is in ownership of the complainant and M/s Mukerian Papers Ltd. Environmental Engineer, Regional Office, Hoshiarpur further informed that	It is important to note that certificate of sale was executed in favour of Indian Sucrose Ltd. on 17.02.2010 by Mr. S. Sengupta, Authorised representative of IFCI Limited, Chandigarh under SARFAESI Act 2002, whereon IFCI Limited auctioned the movable and immovable properties and transferred all movable and immovable assets of Mukerian Papers Ltd in favour of Indian Sucrose Ltd. The said Mr. Neelam Oswal filed a Writ petition no. CWP 9131 of 2012 before Hon'ble Punjab & Haryana High Court against the said auction which was dismissed by the Hon'ble High Court. Mr. Neelam Oswal then filed an SLP in Supreme	

	the complainant has requested to reject the proposal of the said unit and to take strict action against the official of M/s India Sucrose Ltd., for furnishing false information. A copy of letter No. 2615 dated 10.06.2019 written by Environmental Engineer, Punjab Pollution Control Board Regional Office, Hoshiarpur and a copy of complaint dated 03.05.2019 of sh. Neelam Kumar Oswal S/o Vidhya Sagar Oswal. Resident of Dhandari Kalan, Ludinana is Annexed as **Annexure 1& 2.**	Court titled Mukerian Papers Vs. ARCIL (Civil no. 30231 of 2012) which was disposed of by the Apex Court on 29.05.2016. He then filed a review petition as well as Curative petition but both were dismissed by the Supreme Court. Hence it is clear from the above mentioned orders that there is no dispute of the sale certificate issued by IFCI Ltd & ARCIL in favour of Indian Sucrose Limited and thus Indian Sucrose Limited is the absolute owner of land of Mukerian papers Limited. Copy of reply submitted to Environmental Engineer, Punjab Pollution Control Board Regional Office, Hoshiarpur is attached as **annexures.**

7.3 OBJECTIVE OF THE RISK ASSESSMENT

The main objective of the risk assessment study is to propose a comprehensive but simple approach to risk analysis and suggesting suitable mitigation measures for industries and planning & management of industrial hazards.

The Distillery has been identified as a major hazard installation for manufacturing, storage and handling of Ethyl Alcohol in excess of the threshold quantity (1000 MT) assigned for a highly flammable liquid in accordance with the manufacture, storage and import of Hazardous Chemical Rules (MSIHC), 1989 by the Ministry of Environment and Forest, Government of India. Manufacture and storage of such a large quantity of hazardous chemicals has potential to cause a "Major Accident". The term major accident has been defined under MSIHC rules as under:

"An occurrence such as a major emission, fire or explosion involving one or more hazardous chemicals and resulting in uncontrolled developments in the course of industrial activity leading to serious effects both inside or outside the installation, likely to cause substantial loss of life or property including adverse effect on health and on the environment"

The present study was undertaken with the objective:

To identify the potential hazardous chemicals in the installation which have potential to cause major accidents?

a) To conduct preliminary study to identify the potential hazardous chemicals in the installation which have potential to cause major accidents.
b) To conduct preliminary hazards analysis of the hazardous installations.
c) To identify Maximum Credible Loss Scenario (MCLS) involving major accidents.
d) To assess the damages due to the consequential effects of the identified MCLS.
e) To carry out the fire hazard potential of the ethyl alcohol storage installation by DOW FIRE AND EXPLOSION
f) To suggest hazard control measures where ever necessary.

7.4 HAZARD IDENTIFICATION & RISK ASSESSMENT (HIRA)

Risk analysis involves the identification and assessment of risks to the population is exposed to as a result of hazards present. This requires an assessment of failure probability credible accident scenario, vulnerability of population etc. Much of this information is difficult to get or generate consequently, the risk analysis in present case is confined to maximum credible accident studies and safety and risk aspect related to proposed expansion of Molasses-based Distillery, Captive power plant.

Activities requiring assessment of risk due to occurrence of most probable instances of hazard and accident are both onsite and off-site.

7.4.1 MATERIAL IDENTIFICATION

Ethanol

The properties (chemical and physical) of Ethanol and Fire and Explosion Data is indicated in Table 2.1 (MSDS Table) given below-

Table 7.1: Material Safety Data Sheet of Ethanol

PRODUCT NAME	Ethanol
FORMULA	C_2H_5OH

Table 7.2: Physical & Chemical Properties of Ethanol

PHYSICAL STATE	LIQUID	**BOILING POINT/RANGE (^oC)**	78
APPEARANCE and ODOUR	CLEAR, COLOURLESS, VOLATILE LIQUID	**IGNITION POINT** • **FUEL IN AIR ERCENTAGE** • **TEMPERATURE (^oC)**	• 3-19 • 455
SOLUBILTY in WATER @ 21^oC% VOLUME	100		
OCTANE (R+M)	98-100	**SPECIFIC GRAVITY, 15.6^oC**	0.7936
REID VAPOR PRESSURE (psi)	2.3	**REASERCH OCTANE NUMBER/MOTOR OCTANE NUMBER (RON/MON)**	108.6/89.7
MELTING/FREEZING POINT (^oC)	43 to -49	**CUBICAL EXPANSION Lt/kl/^0C**	1.12

Table 7.3: Fire and Explosive Data of Etanol

FLAME VISIBILITY	POOR	**EXPLOSIVE LIMIT**	4.3-19	**FLASH POINT, ^oC**	13

7.4.2 IDENTIFICATION OF THE HAZARDS IN MOLASSES BASED DISTILLERY & CO-GENERATION PLANT (HAZID)

The potentially hazardous areas and the likely accidents with the concerned area have been enlisted below

Table 7.4: Possible Hazardous Location onsite

Sr. No.	Hazardous Area	Likely Accident
1.	Storage yard (Biomass)	Fire
2.	Boiler fuel storage area	Fire and spillage
3.	Ethanol Storage Area (ENA, Rectified Spirit)	1. Fire & Explosion 2. Leak Scenario (10mm, 25 mm), Worst (Catastrophic Rupture) 3. Internal Floating Roof Failure 4. Earthing Failure 5. Spark Arrestor Failure 6. Ruptureofhosepipe/pipeoftank/truck. 7. Weldbreakage/ruptureofpipelineconnectedtostoragetank. 8. Breakopenofflangeconnectedtostoragetank. 9. Heavyleakagesinstoragetanks. 10. Overfilling of storagetanks.
4.	Distillation (Multi pressure)	Fire, Vapor Cloud Explosion (VCE), 1. Release of excessive flammable evapors ofethyl alcoholthroughtheventofthedistillationcolumn due to: a) Failureorlessflowofcoolantintotheheatexchangerofthecondenserofthedistillationunit. b) Highertemperatureofsteamusedforboilingofethylalcohol c) Highertemperatureofthecoolingwater. d) Scalingoftheheatexchangerofthecondenser. 2. Vacuum in the wash boiling column This situation may arise due to condensation of ethanol vapor as a result of failure of steam supply. This will lead to increase of air percent into the system rendering explosive atmosphere inside the column and it may be to the extent of explosion of the column. To prevent the implosion vacuum relief valve has been provided. 3. Fireattheventofthecondenser This event may take place due to content with the electro static spark or any other source of ignition
7.	Transfer and Handling	Pump seal, Gasket Failure Piping failure

	of Ethyl Alcohol	
8	Boiler Area	Fire & Explosion
9.	Turbine room	Explosion
10.	Electrocution	Lose fitting
11.	Electrical rooms	Fire and electrocution
12.	Transformer area	Fire and electrocution
13.	Cable tunnel	Fire and electrocution
14.	Chimney	Air pollution

7.5 DAMAGE CRITERIA

In order to appreciate the damage effect produced by various scenarios, physiological/physical effects of the blast wave, thermal radiation or toxic vapor exposition are discussed.

A. LFL or Flash Fire

Hydrocarbon vapor released accidentally will spread out in the direction of wind. If a source of ignition finds an ignition source before being dispersed below lower flammability limit (LFL), a flash fire is likely to occur and the flame will travel back to the source of leak. Any person caught in the flash fire is likely to suffer fatal burn injury. Therefore, in consequence analysis, the distance of LFL value is usually taken to indicate the area, which may be affected by the flash fire.

Flash fire (LFL) events are considered to cause direct harm to the population present within the flammability range of the cloud. Fire escalation from flash fire such that process or storage equipment or building may be affected is considered unlikely.

B. Thermal Hazard Due to Pool Fire, Jet Fire

Thermal radiation due to pool fire, jet fire or fire ball may cause various degree of burn on human body and process equipment. The following table details the damage caused by various thermal radiation intensity.

C. Vapour Cloud Explosion

In the event of explosion taking place within the plant, the resultant blast wave will have damaging effects on equipment, structures, building and piping falling within the overpressure distances of the blast. Tanks, buildings, structures etc. can only tolerate low level of overpressure. Human body, by comparison, can withstand higher overpressure. But injury or fatality can be inflicted by collapse of building of structures. The following Table4.23 illustrates the damage effect of blast overpressure.

Table 7.5: Damage due to Overpressures

Peak Overpressure	Damage Type
12.04 psi	Total Destruction
4.35 psi	Heavy Damage
1.45 psi	Moderate Damage
0.44 psi	Significant Damage
0.15 psi	Minor Damage

D. Blast Effects

Petroleum Vapors evaporated from a large pool of spillage would normally spread out in the direction of wind and if a source of ignition is found before the lower inflammable level is reached, a flash fire preceded by a vapour cloud explosion will result. The resultant blast over pressure of the explosion may have serious damaging effects on building, structural and equipment, which are summarized below.

Table 7.6: blast overpressure Effects

Over pressure bar/ psi	Mechanical damage to equipment	Damage to people
0.3/4.41	Heavy damage of plant and structure	Fatality probability = 1 for humans indoor as well as outdoor 50 eardrum damage > 50 serious wounds from flying objects.
0.1/ 1.47	Repairable damage	1 % death > 1% eardrum damage > 1 serious wounds from flying objects.
0.03/ 0.441	Major glass damage	Slight injury from flying objects
0.01/0.147	10 % glass damage	--

Boiler Explosion

Explosion may lead to release of heat energy & Pressure waves. Table 2.7 shows tentative list of Damages envisaged due to different heat loads.

Table 7.7: list of Damages Envisaged at Various Heat Loads

Sr. No.	Heat loads (kW/m^2)	Type of Damage Intensity	
		Damage to Equipment	Damage to People
1	37.5	Damage to process equipment	100% lethality in 1 min. 1% lethality

			in 10 sec
2	25.0	Minimum energy required to ignite wood	50% Lethality in 1 min. Significant injury in 10 sec
3	19.0	Maximum thermal radiation intensity allowed on thermally unprotected equipment	--
4	12.5	Minimum energy required to melt plastic tubing	1% lethality in 1 min
5	4.0	--	First degree burns, causes pain for exposure longer than 10 sec
6	1.6	--	Causes no discomfort on long exposures
***Source**: World Bank (1988). Technical Report No. 55: Techniques for Assessing Industrial Hazards. , Washington, D.C: The World Bank.*			

7.6 DOW INDEX OF ETHYL ALCOHOL TANK FARM

Material Factor (MF) = 16

1) General Process Hazards (GPH) Handling and transfer of materials=
   a) Loading of Road Tanker 0.5
   b) Warehouse storage in tank farm 0.3
   Total penalty for GPH 0.8
2) Special Process Hazards(SPH)
3) Penalty Storage & Handling at Temperature above Flash Point 0.25
   Operation near Flammable Range 0.50
4) Storage of flammable material
   Quantity of flammable material=14,85,000 Ltrs.i.e.1192MT Say 1200MT

Heat of combustion of Ethanol=26.0x106J/kg Energy
Present= 1200x26.0x106x103
Hence, penalty for quantity of flammable material=1.0

Loss of material through corrosion & Erosion 0.10
Leakage of joints and packing 0.20
Total penalty for SPH total = (0.25 + 0.50 + 1.0 + 0.10 + 0.20)= 2.05
Penalty

Dow Fire and Explosion Index

= MF x (1 + GPH tot) x (1 + SPH tot)
= 16 x 1.8 x 3.05
= 87.84

Thus, the ethanol storage installation falls in category II.

Table 7.8: Degree of Hazards based On FEI

FEI Range	Degree of Hazard
0 – 60	Light
61-96	Moderate
97 – 127	Intermediate
128 - 158	Heavy
159 and Above	Severe
Source: *Dow's Fire and Explosion Index Hazard Classification Guide, Seventh Edition, AIChE Technical Manual (1994)*	

7.7 CONSEQUENCE ANALYSIS OF MAXIMUM CREDIBLE ACCIDENT SCENARIO

A Maximum Credible Loss Scenario (MCLS) represents a major accident with and acceptable probability of occurrence having potential to cause consequential effect on the largest scale in the surrounding area that determines the probable largest possible damage potential of the hazardous installation for which there should be an adequate emergency plan to mitigate and control the emergency of such a scale.

Table 7.9: Probable Consequences of Failure at Proposed Distillery

Sl no	FAILURE CASE: LIKELY CONSEQUENCES	Level
1.	Pipeline/ rupture-Pool Fire (Small Leak)	Level 1
2.	Pipeline/ rupture – Flash Fire/ VCE(Large Leak)	Level 2
3.	Storage Tank leakage/ rupture – Pool Fire (Small Leak)	Level 1
4.	Storage Tank leakage/ rupture – Flash Fire/ VCE(Large Leak)	Level 3
5.	Failure of HOV/MOV of storage tanks- Flash Fire/ VCE(Large Leak)	Level 3
6.	Booster Pump suction/discharge leakage/ rupture – Flash Fire/ VCE(Large Leak)	Level 2
7.	Main Line Pump discharge/suction leakage/ rupture– Pool Fire (Small Leak)	Level 1
8.	Main Line Pump discharge/suction leakage/ rupture– Flash Fire/ VCE (Large Leak)	Level 2
10.	Overheating/electrical spark/arc in control/administration/MCC room-Fire	Level 2
12.	Integrity failure of structures/tanks due to flood/storm/earthquake/third party activity- Flash Fire/	Level 3

	VCE (Large Leak)	
13.	Accumulation of combustible material-Fire	Level 1

7.7.1 MCA STUDY OF PROPOSED 120KLD MOLASSES BASED DISTILLERY

Study Assumptions One of the largest storage tanks in the tank farm of Ethanol, Rectified Spirit and ENA storage is involved in a major accident scenario. The contents of the storage tank have discharged due to pipeline failure of the bottom discharge line of 10% failure of the valve in the discharge line.

The entire content of the storage vessel has discharge on the ground and formed a liquid pool of ethanol.

The damage to life and property is caused by the thermal radiation emitted in the surrounding area. The ambient temperature is 35 Deg. C.

All the Parameters and Selected Failure cases are based on Past Accident Scenario.

Consequence Modelling is carried out in PHAST Software Tool

Table Showing Consequence Analysis (Damage Distance with respect to Damage Criteria is shown in Table below:

Scenario considered	Wind stability class	Flash fire LFL concentration (m)	Jet Fire (m)			Pool Fire (m)			Late Explosion (VCE)			Overpressure Damage Distance (m)		
			4 kW/m^2	12.5 kW/m^2	37.5 kW/m^2	4 kW/m^2	12.5 kW/m^2	37.5 kW/m^2	(0.02068 bar) [m]	(0.13 79 bar) [m]	(0.20 68 bar) [m]	(0.02068 bar) [m]	(0.13 79 bar) [m]	(0.20 68 bar) [m]
Piping Leak for Rectified Spirit Storage Tank 5 MM LEAK	2F	2.70627	9.00783	7.98374	n/a	22.6126	15.2727	8.56707	n/a	n/a	n/a	n/a	n/a	n/a
	3D	2.9089	8.38011	7.27516	n/a	22.7284	15.8619	8.65411	n/a	n/a	n/a	n/a	n/a	n/a
	5D	2.75997	7.62864	6.47051	n/a	22.9317	16.5385	8.82519	n/a	n/a	n/a	n/a	n/a	n/a
Rectified Spirit Storage tank 10 MM LEAK	2F	4.3068	16.8231	13.6616	n/a	41.1216	27.4872	14.1924	22.9644	12.5197	11.8892	25.9288	5.03945	3.77838
	3D	3.83039	15.7502	12.8367	n/a	41.0014	28.1073	14.0882	n/a	n/a	n/a	n/a	n/a	n/a
	5D	3.70331	14.4748	11.762	n/a	40.9846	28.7998	14.1058	n/a	n/a	n/a	n/a	n/a	n/a
Rectified Spirit Storage tank 25 MM	2F	11.7989	36.7744	30.0333	n/a	92.0419	61.0016	33.4279	62.0621	36.2315	34.6721	64.1242	12.463	9.34427
	3D	9.35479	34.62	28.26	n/a	91.29	61.64	34.14	42.235	24.32	23.24	44.471	8.643	6.480

Scenario considered	Wind stability class	Flash fire LFL concentration (m)	Jet Fire (m)			Pool Fire (m)			Late Explosion (VCE)			Overpressure Damage Distance (m)		
			4 kW/ m^2	12.5 kW/ m^2	37.5 kW/ m^2	4 kW/ m^2	12.5 kW/ m^2	37.5 kW/ m^2	(0.02068 bar) [m]	(0.13 79 bar) [m]	(0.20 68 bar) [m]	(0.02068 bar) [m]	(0.13 79 bar) [m]	(0.20 68 bar) [m]
LEAK			88	28		2	68	74	8	17	02	6	36	46
	5D	6.64584	32.07 03	26.06 53	21.20 32	90.80 66	62.42 1	35.71 53	30.709 8	14.02 51	13.01 79	41.419 6	8.050 17	6.035 71
Rectified Spirit storage tank Catastrophic Rupture	2F	786.666	n/a	n/a	n/a	n/a	n/a	n/a	4240.8 6	1540. 79	1380. 44	6721.7 3	1281. 58	960.8 78
	3D	692.864	n/a	n/a	n/a	n/a	n/a	n/a	4106.5	1419. 79	1262. 2	6713	1259. 59	944.3 9
	5D	857.51	n/a	n/a	n/a	n/a	n/a	n/a	4060.0 8	1380. 4	1225. 16	6700.1 7	1240. 81	930.3 1
Piping Leak for ENA Storage Tank 5 MM LEAK	2F	2.71002	9.101 62	7.989 23	n/a	22.93 96	15.48 09	8.541 6	n/a	n/a	n/a	n/a	n/a	n/a
	3D	2.91208	8.476 33	7.282 17	n/a	23.03 67	16.05 96	8.630 33	n/a	n/a	n/a	n/a	n/a	n/a
	5D	2.77365	7.722 59	6.477 72	n/a	23.22 99	16.73	8.805 95	n/a	n/a	n/a	n/a	n/a	n/a

Scenario considered	Wind stability class	Flash fire LFL concentration (m)	Jet Fire (m)			Pool Fire (m)			Late Explosion (VCE)			Overpressure Damage Distance (m)		
			4 kW/m^2	12.5 kW/m^2	37.5 kW/m^2	4 kW/m^2	12.5 kW/m^2	37.5 kW/m^2	(0.02068 bar) [m]	(0.1379 bar) [m]	(0.2068 bar) [m]	(0.02068 bar) [m]	(0.1379 bar) [m]	(0.2068 bar) [m]
ENA Storage tank 10 MM LEAK	2F	4.39706	16.9784	13.7967	n/a	41.7562	27.8707	14.1419	23.1842	12.5624	11.9212	26.3684	5.12488	3.84244
	3D	3.88009	15.9103	12.9575	n/a	41.5972	28.4693	14.1573	n/a	n/a	n/a	n/a	n/a	n/a
	5D	3.71868	14.6302	11.8733	n/a	41.5533	29.1432	14.389	n/a	n/a	n/a	n/a	n/a	n/a
ENA Storage tank 25 MM LEAK	2F	14.1787	37.0701	30.2672	n/a	93.5258	61.8821	34.0373	62.4285	36.3027	34.7255	64.8571	12.6054	9.45106
	3D	10.1397	34.9355	28.4813	n/a	92.7196	62.4765	34.9996	55.3742	34.9317	33.6976	50.7484	9.8633	7.39513
	5D	7.01876	32.3851	26.2735	21.6188	92.1719	63.1932	36.7648	42.5687	24.3864	23.2887	45.1374	8.77275	6.57748
ENA storage tank Catastrophic	2F	942.216	n/a	n/a	n/a	n/a	n/a	n/a	4317.7	1629.1	1473.59	6755.39	1258.2	927.186
	3D	761.914	n/a	n/a	n/a	n/a	n/a	n/a	4163.3	1473.	1318.	6706.7	1266.	897.7

Scenario considered	Wind stability class	Flash fire LFL concentration (m)	Jet Fire (m)			Pool Fire (m)			Late Explosion (VCE)			Overpressure Damage Distance (m)		
			4 kW/m^2	12.5 kW/m^2	37.5 kW/m^2	4 kW/m^2	12.5 kW/m^2	37.5 kW/m^2	(0.02068 bar) [m]	(0.1379 bar) [m]	(0.2068 bar) [m]	(0.02068 bar) [m]	(0.1379 bar) [m]	(0.2068 bar) [m]
Rupture									8	31	89	5	61	72
	5D	878.624	n/a	n/a	n/a	n/a	n/a	n/a	4099.62	1426.72	1290.82	6719.24	1153.44	561.631
Piping Leak for Ethanol Storage Tank 5 MM LEAK	2F	2.72267	9.33063	8.01419	n/a	23.6423	15.927	8.48837	n/a	n/a	n/a	n/a	n/a	n/a
	3D	2.92193	8.70378	7.31034	n/a	23.7007	16.4899	8.58433	n/a	n/a	n/a	n/a	n/a	n/a
	5D	2.80072	7.95437	6.5065	n/a	23.8758	17.15	8.77694	n/a	n/a	n/a	n/a	n/a	n/a
Ethanol Storage tank 10 MM LEAK	2F	2.72267	9.33063	8.01419	n/a	23.6423	15.927	8.48837	n/a	n/a	n/a	n/a	n/a	n/a
	3D	2.92193	8.70378	7.31034	n/a	23.7007	16.4899	8.58433	n/a	n/a	n/a	n/a	n/a	n/a
	5D	2.80072	7.95437	6.5065	n/a	23.8758	17.15	8.77694	n/a	n/a	n/a	n/a	n/a	n/a

Scenario considered	Wind stability class	Flash fire LFL concentration (m)	Jet Fire (m)			Pool Fire (m)			Late Explosion (VCE)			Overpressure Damage Distance (m)		
			4 kW/ m^2	12.5 kW/ m^2	37.5 kW/ m^2	4 kW/ m^2	12.5 kW/ m^2	37.5 kW/ m^2	(0.02068 bar) [m]	(0.13 79 bar) [m]	(0.20 68 bar) [m]	(0.02068 bar) [m]	(0.13 79 bar) [m]	(0.20 68 bar) [m]
Ethanol Storage tank 25 MM LEAK	2F	2.72267	9.33063	8.01419	n/a	23.6423	15.927	8.48837	n/a	n/a	n/a	n/a	n/a	n/a
	3D	2.92193	8.70378	7.31034	n/a	23.7007	16.4899	8.58433	n/a	n/a	n/a	n/a	n/a	n/a
	5D	2.80072	7.95437	6.5065	n/a	23.8758	17.15	8.77694	n/a	n/a	n/a	n/a	n/a	n/a
Ethanol storage tank Catastrophic Rupture	2F	1012.83	n/a	n/a	n/a	n/a	n/a	n/a	4440.5	1788.97	1652.48	6801	1137.95	764.957
	3D	881.093	n/a	n/a	n/a	n/a	n/a	n/a	4268.32	1599.22	1455.47	n/a	n/a	n/a
	5D	877.265	n/a	n/a	6736.64	1178.45	830.945	n/a	4171.77	1512.87	1377.83	n/a	n/a	n/a
Transfer Pump of Rectified Spirit Gasket	2F	5.27923	n/a	n/a	6783.55	1145.73	775.65	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	3D	4.7942	12.71	10.28	n/a	37.96	27.16	15.47	n/a	n/a	n/a	n/a	n/a	n/a

Scenario considered	Wind stability class	Flash fire LFL concentration (m)	Jet Fire (m)			Pool Fire (m)			Late Explosion (VCE)			Overpressure Damage Distance (m)		
			4 kW/m^2	12.5 kW/m^2	37.5 kW/m^2	4 kW/m^2	12.5 kW/m^2	37.5 kW/m^2	(0.02068 bar) [m]	(0.13 79 bar) [m]	(0.20 68 bar) [m]	(0.02068 bar) [m]	(0.13 79 bar) [m]	(0.20 68 bar) [m]
Leak 5 mm				74		93	36	04						
	5D	4.23816	12.32 59	9.860 22	n/a	38.49 71	28.43 04	16.23 54	n/a	n/a	n/a	n/a	n/a	n/a
Transfer Pump of Rectified Spirit Gasket Leak 10 mm	2F	7.88037	22.14 64	18.19 19	n/a	68.69 54	46.94 75	26.41 43	29.156 1	13.72 31	12.79 15	38.312 3	7.446 25	5.582 92
	3D	8.08444	21.64 3	17.58 91	n/a	68.54 63	47.91 97	27.32 34	n/a	n/a	n/a	n/a	n/a	n/a
	5D	7.79176	20.98 03	16.86 43	n/a	68.49 36	48.97 85	28.38 62	n/a	n/a	n/a	n/a	n/a	n/a
Transfer Pump of Ethanol Gasket Leak 5 mm	2F	5.3137	13.41 86	10.97 59	n/a	38.15 98	26.46 51	15.02 44	n/a	n/a	n/a	n/a	n/a	n/a
	3D	4.82323	13.27 4	10.73 72	n/a	38.42 35	27.49 65	15.53 17	n/a	n/a	n/a	n/a	n/a	n/a
	5D	4.26328	12.97 4	10.37 25	n/a	38.95 44	28.80 1	16.39 44	n/a	n/a	n/a	n/a	n/a	n/a

Scenario considered	Wind stability class	Flash fire LFL concentration (m)	Jet Fire (m)			Pool Fire (m)			Late Explosion (VCE)			Overpressure Damage Distance (m)		
			4 kW/ m^2	12.5 kW/ m^2	37.5 kW/ m^2	4 kW/ m^2	12.5 kW/ m^2	37.5 kW/ m^2	(0.02068 bar) [m]	(0.13 79 bar) [m]	(0.20 68 bar) [m]	(0.02068 bar) [m]	(0.13 79 bar) [m]	(0.20 68 bar) [m]
Transfer Pump of Ethanol Gasket Leak 10 mm	2F	7.96671	22.7697	18.6887	n/a	69.7492	47.6152	26.95	29.77	13.8424	12.8809	39.5399	7.68486	5.76181
	3D	8.17382	22.3722	18.1608	n/a	69.5164	48.5542	27.9247	n/a	n/a	n/a	n/a	n/a	n/a
	5D	7.89133	21.8208	17.5103	14.4773	69.4012	49.5875	29.1448	n/a	n/a	n/a	n/a	n/a	n/a

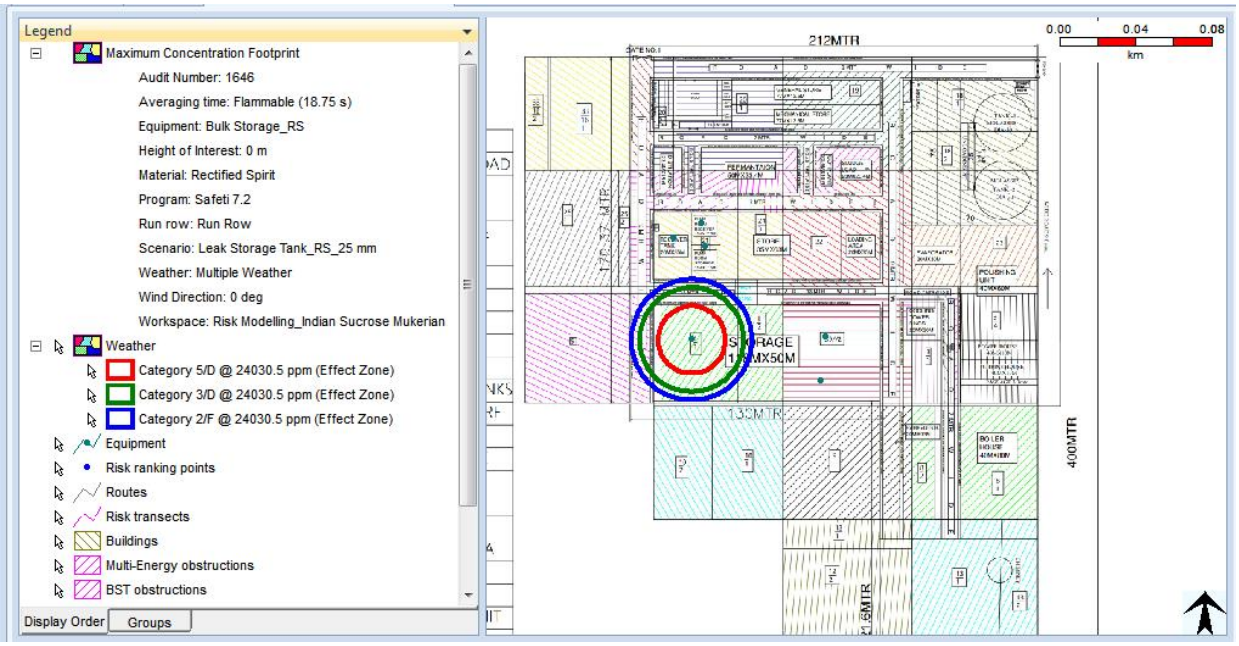


Figure 7-1: Maximum Concentration Footprint of Rectified Spirit Storage Tank for 25 mm Leak (Credible) scenario

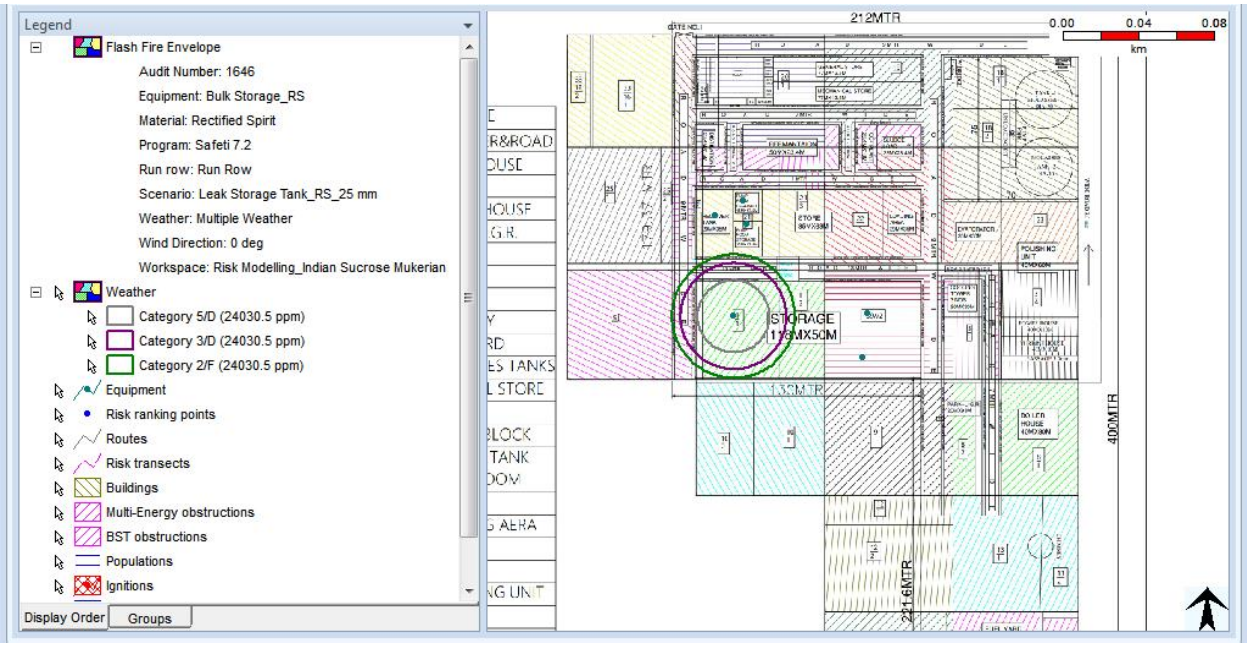


Figure 7-2: Flash Fire Envelope of Rectified Spirit Storage Tank for 25mm Leak (credible) Scenario

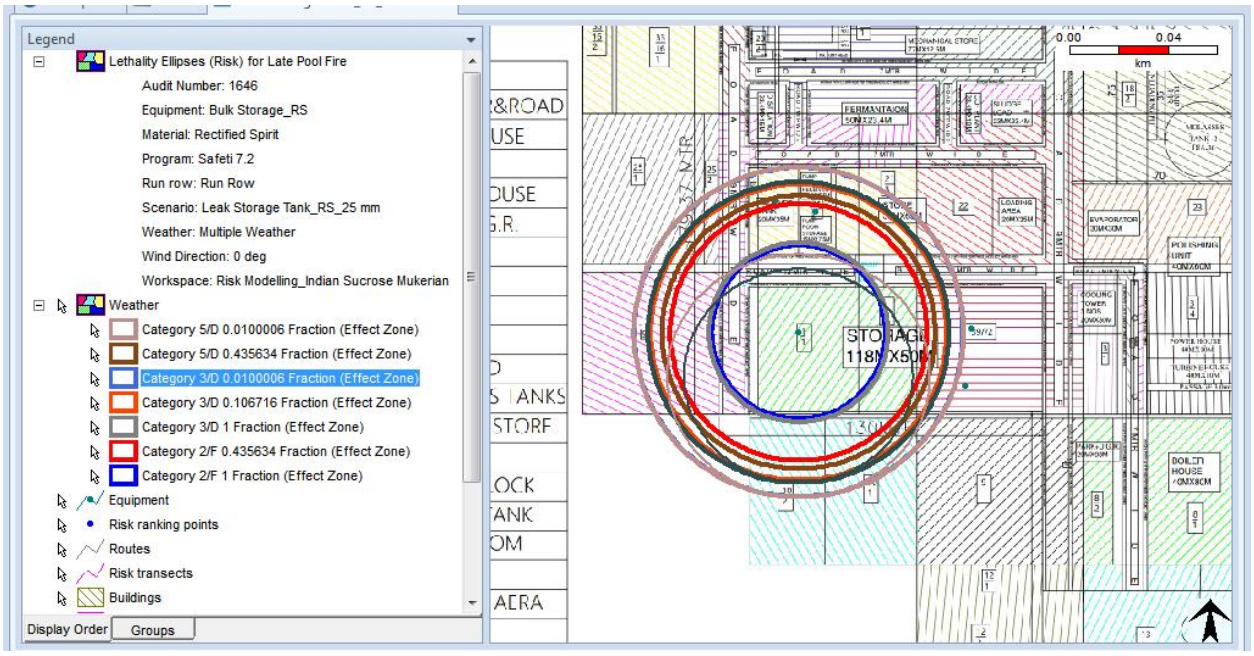


Figure 7-3: Lethality Ellipse (Risk) Late Pool Fire of Rectified Spirit Storage Tank for 25 mm Leak(Credible) scenario

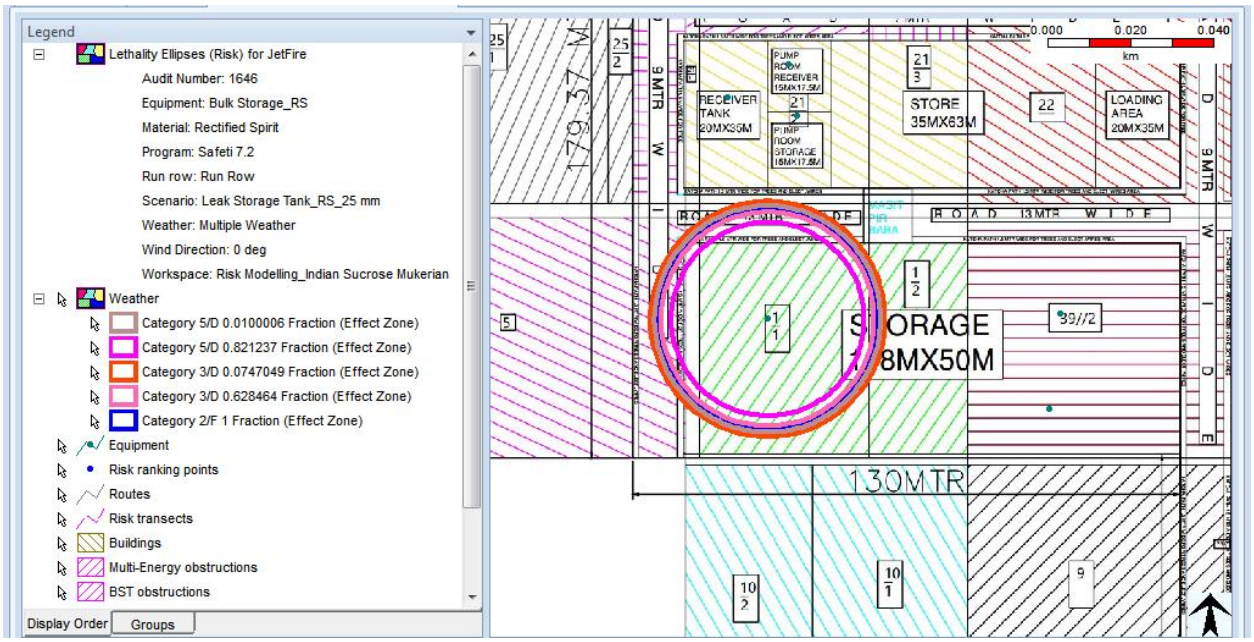


Figure 7-4: Lethality ellipses (Risk) Jet Fire of Rectified Spirit tank for 25 mm Leak (Credible) scenario

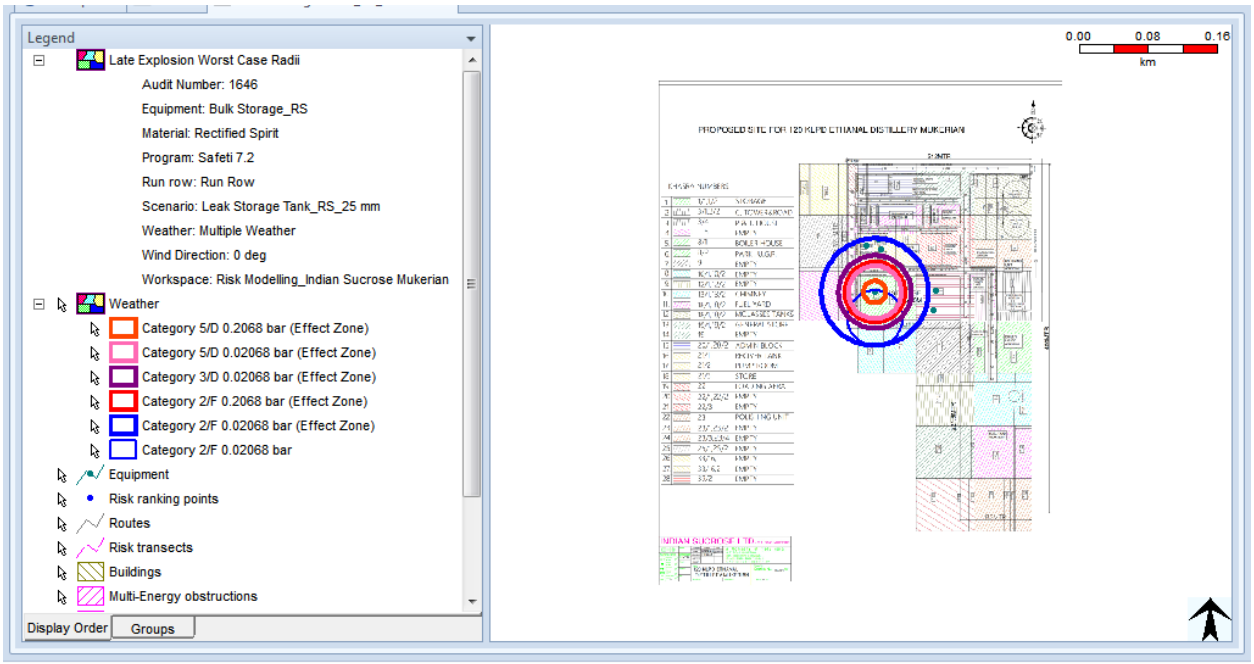


Figure 7-5: Late Explosion worst Case Radii of Rectified Spirit Storage Tank for 25 mm (Credbile) Scenario

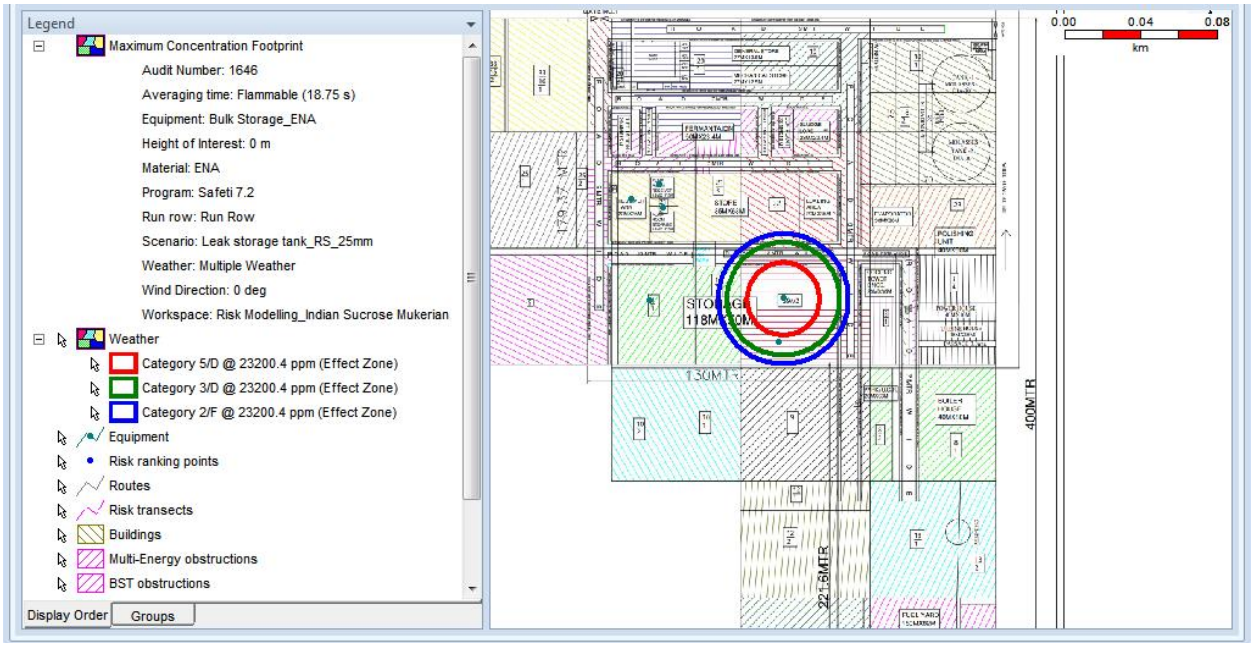


Figure 7-6: Maximum Concentration Footprint of ENA Storage Tank for 25 mm(credible) scenario

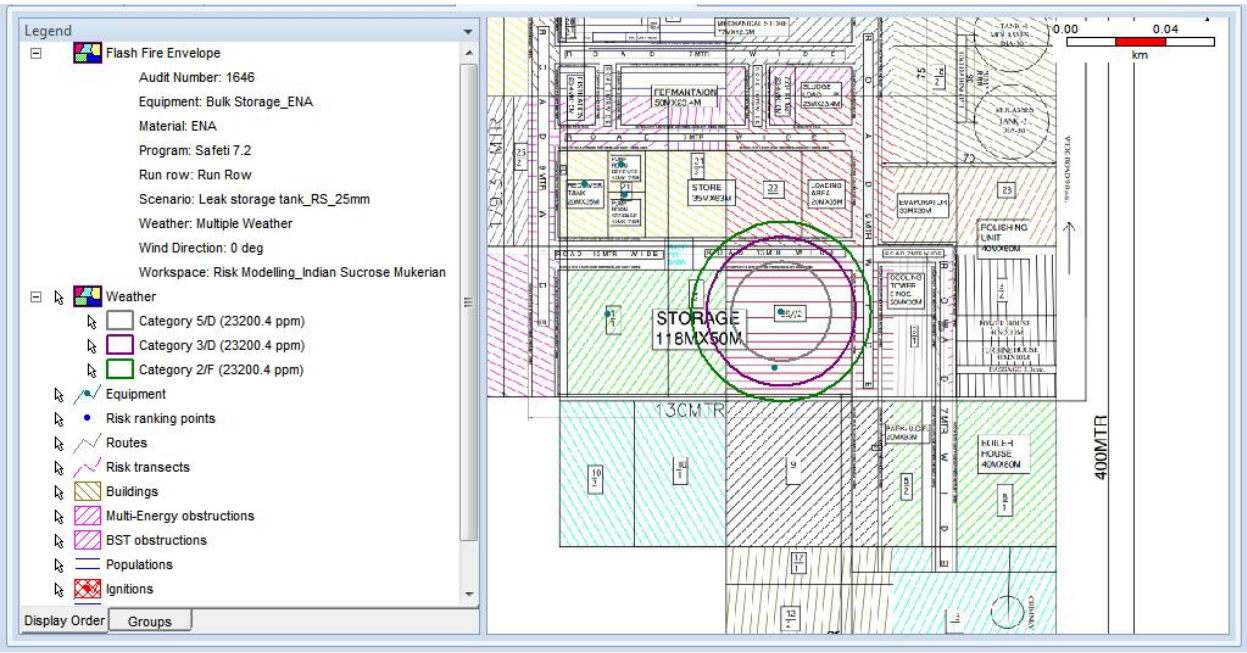


Figure 7-7: Flash Fire Envelope of ENA Storage Tank for 25 mm (credible) Scenario

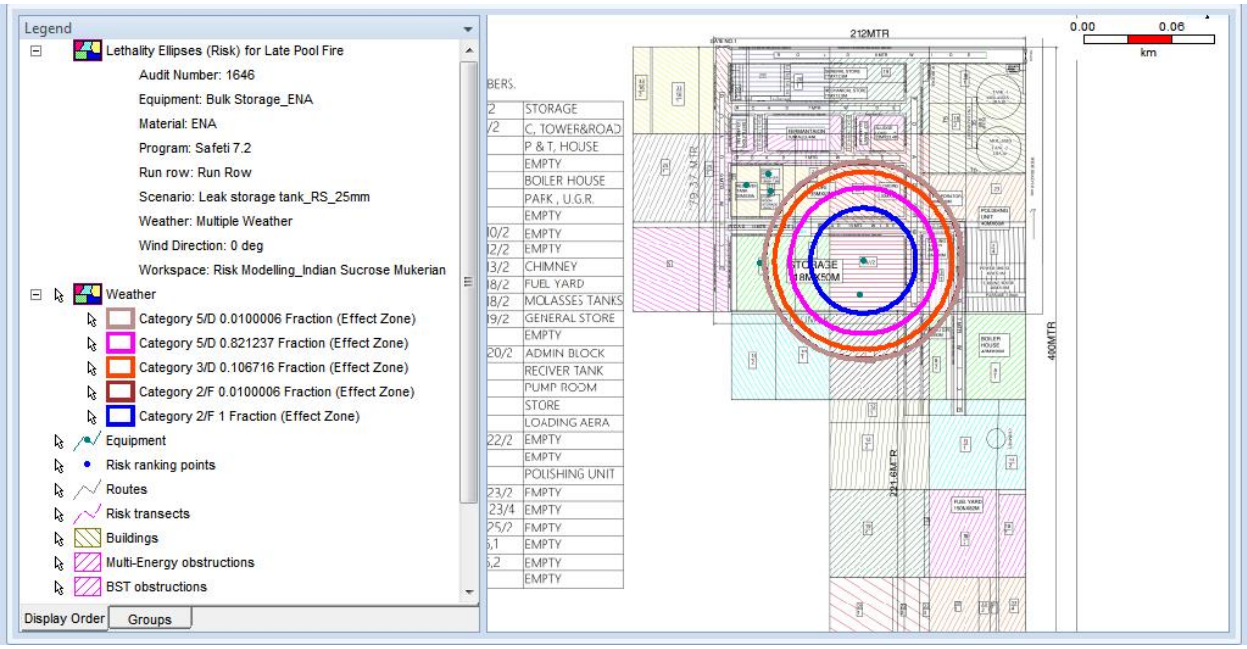


Figure 7-8: Lethality Ellipse (Risk) Late Pool Fire of ENA Storage Tank for 25 mm (Credible) scenario

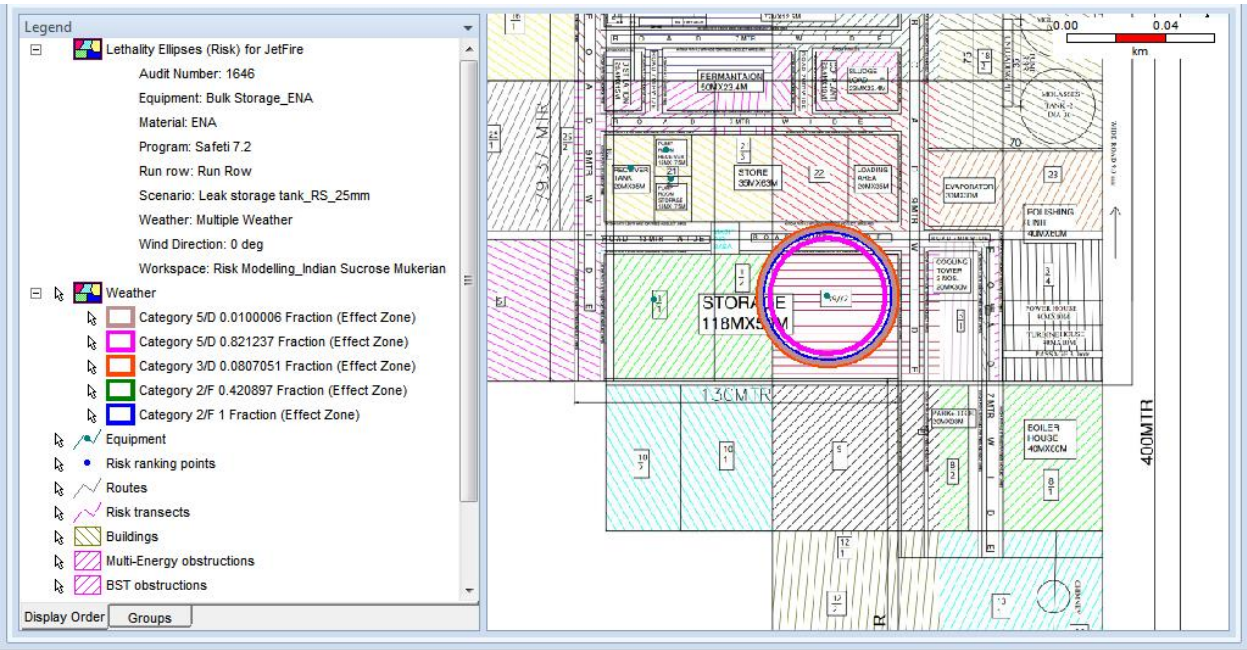


Figure 7-9: Lethality ellipses (Risk) Jet Fire of ENA Storage Tank for 25 mm (Credible) scenario

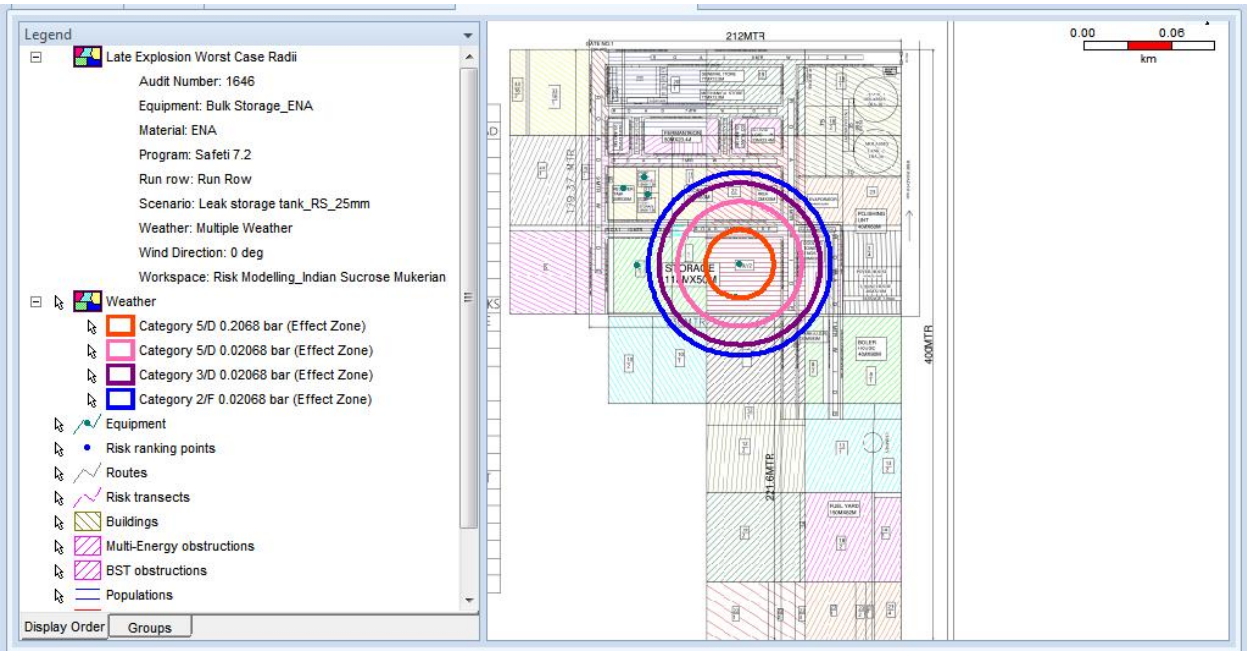


Figure 7-10: Late Explosion worst Case Radii of ENA Storage Tank for 25 mm (Credbile) Scenario

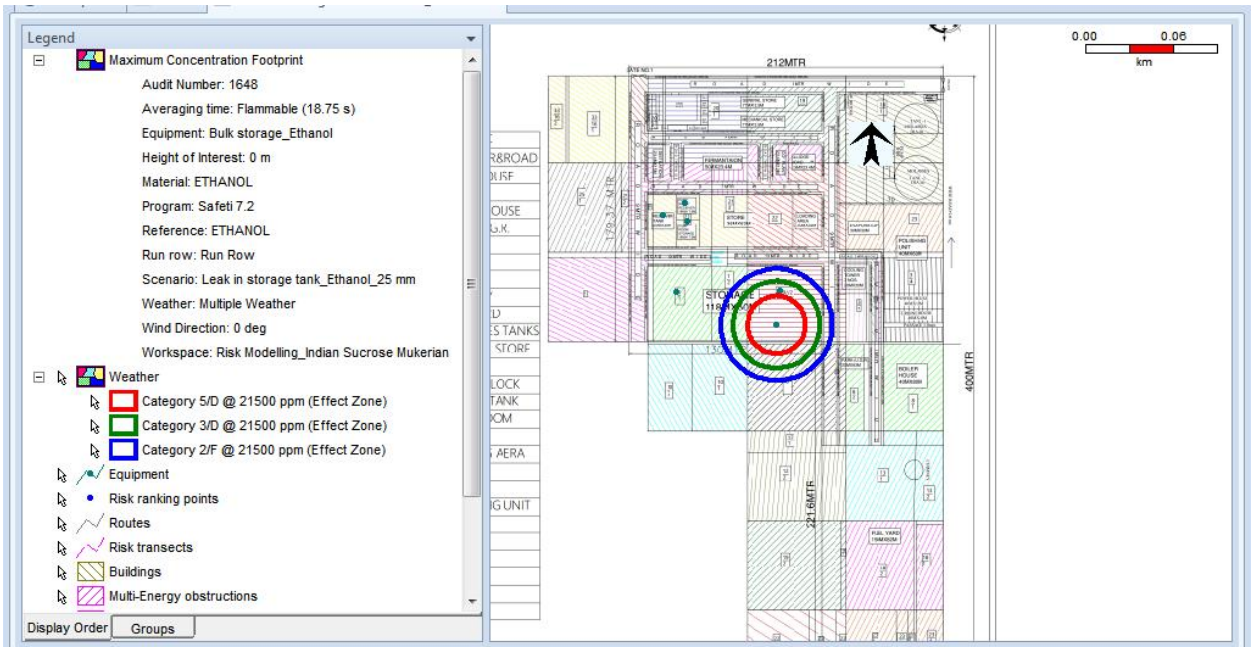


Figure 7-11: Maximum Concentration Footprint of Ethanol Storage Tank for 25 mm(credible) scenario

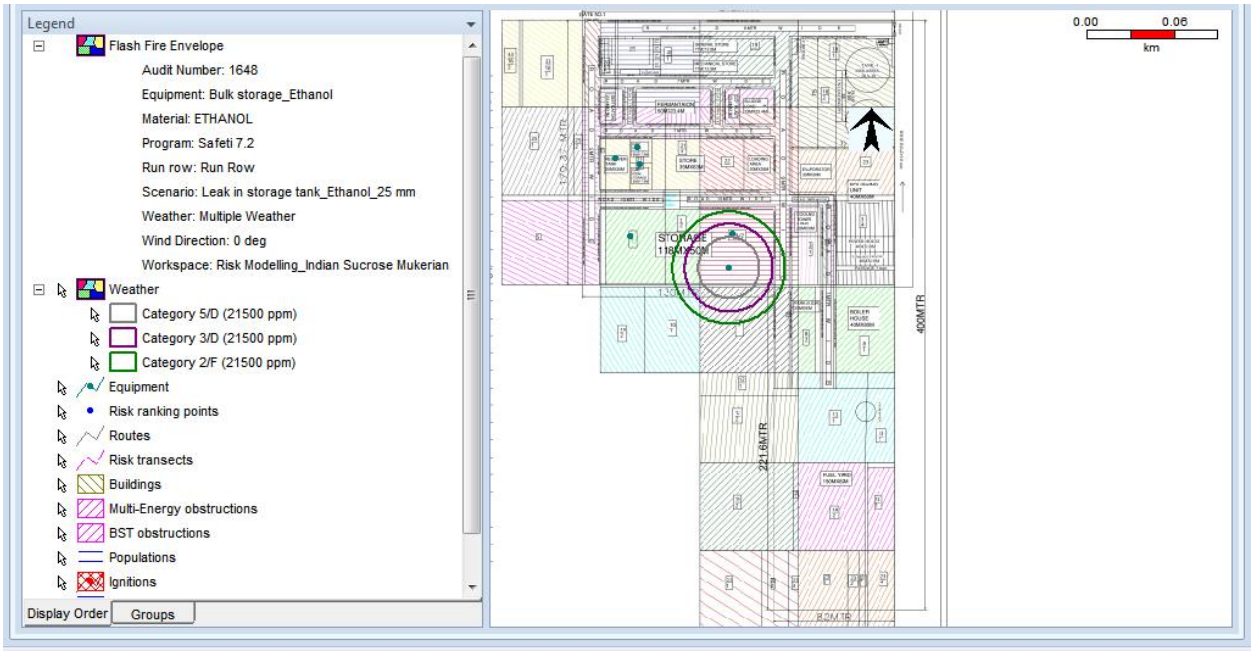


Figure 7-12: Flash Fire Envelope of Ethanol Storage Tank for 25 mm (credible) Scenario

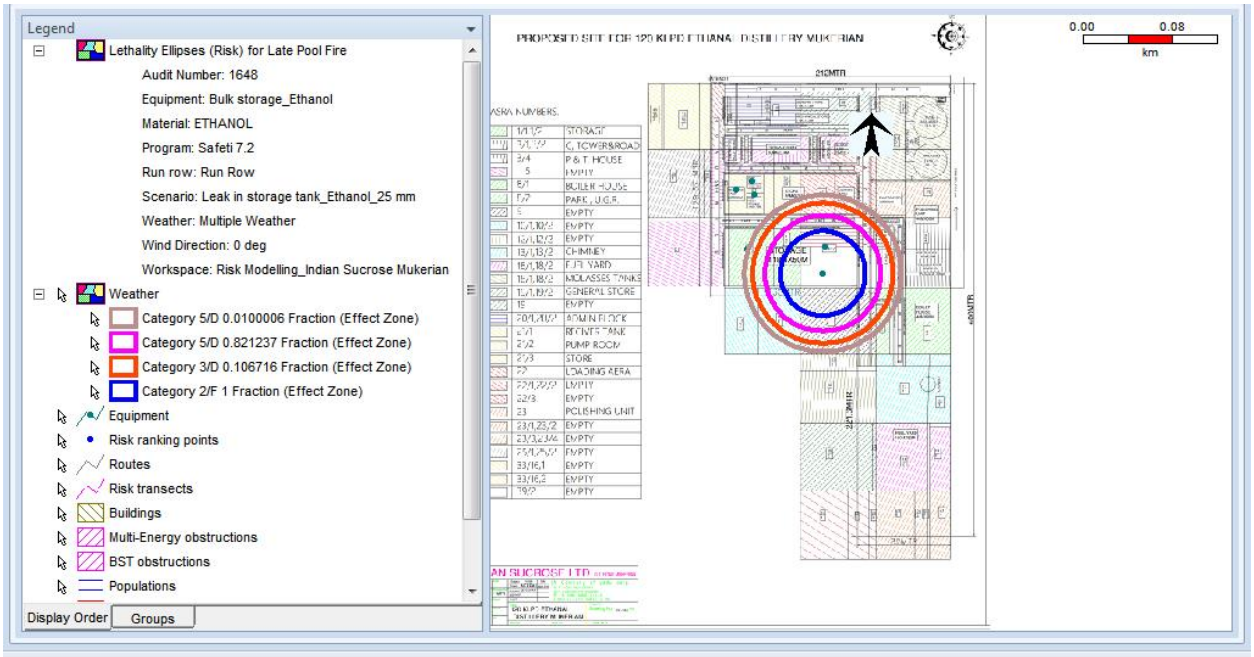


Figure 7-13: Lethality Ellipse (Risk) Late Pool Fire of Ehanol Storage Tank for 25 mm (Credible) scenario

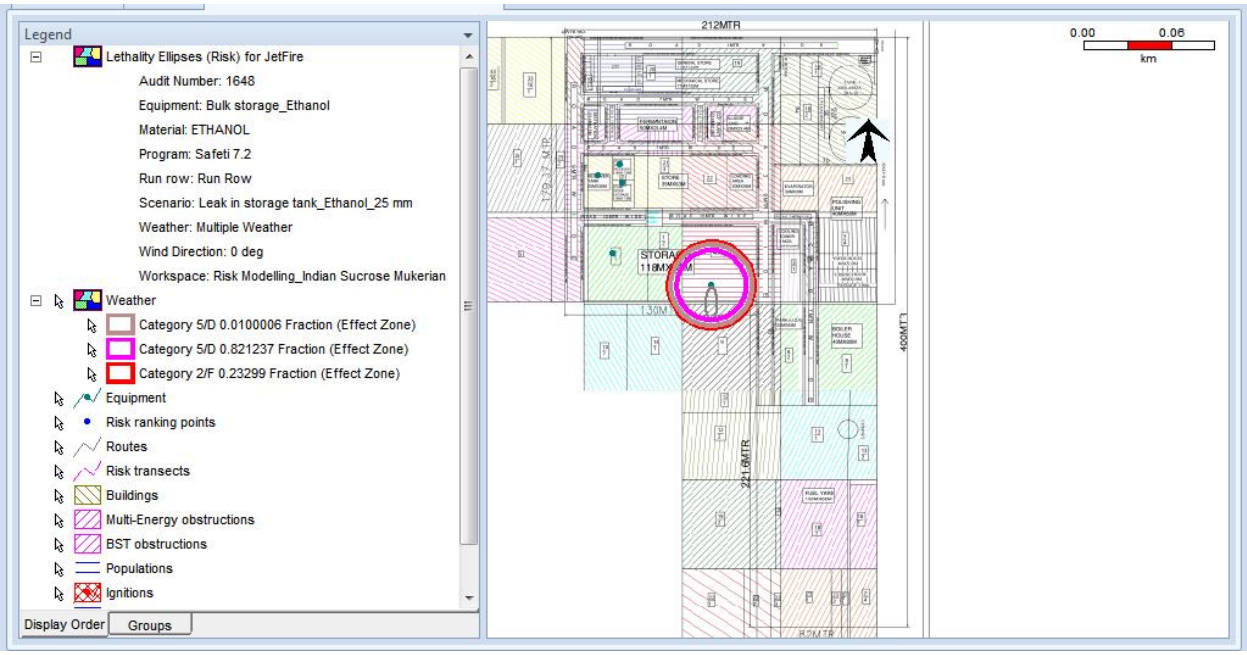


Figure 7-14: Lethality ellipses (Risk) Jet Fire of Ethanol Storage Tank for 25 mm (Credible) scenario

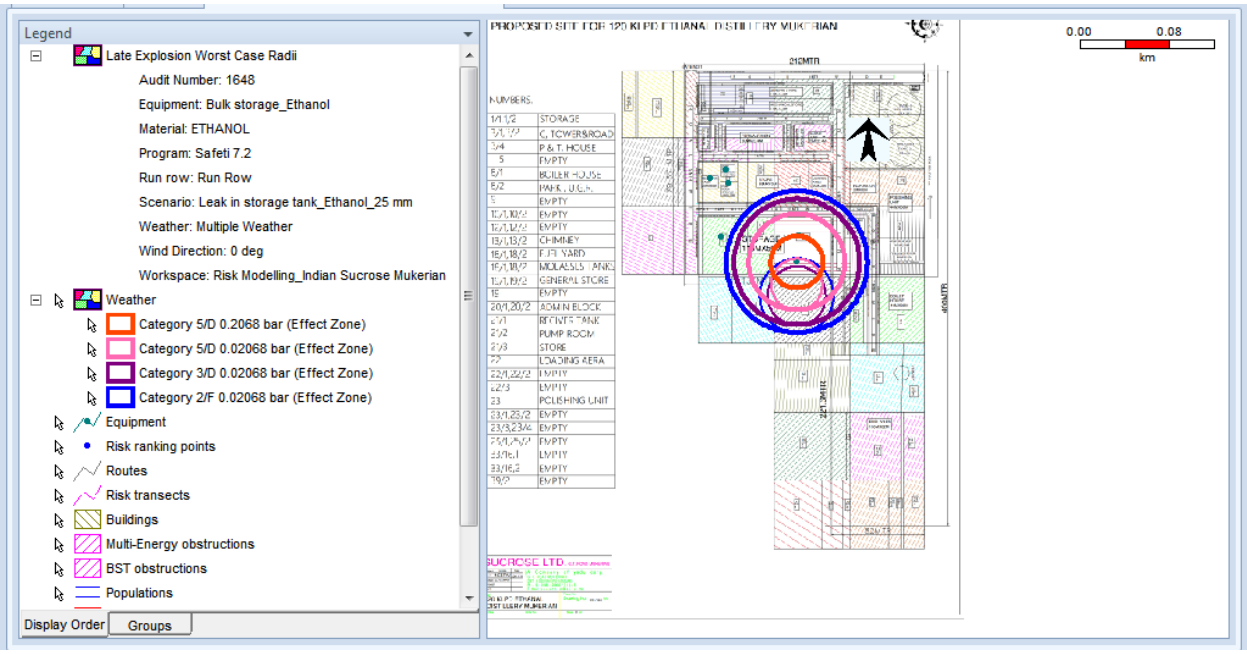


Figure 7-15: Late Explosion worst Case Radii of Ethanol Storage Tank for 25 mm (Credbile) Scenario

7.8 CONCLUSION AND RECOMMENDATION

Proposed Project has underlying Hazards due to Ethanol (Rectified Spirit & ENA) Handling and Boiler Operation. Appropriate Mitigation Measures shall be taken to Reduces the chances of Emergency Scenarios generating onsite due to Fire and Explosion.

Plant will have Fire Fighting system installed along with fire Monitors. Emergency Response structure and Fire Organogram shall be followed once plant is operational.

7.8.1 GENERAL RECOMMADATION

- It is assumed that the storage vessel and process plant has been designed in accordance to an appropriate standards or code of practices. Adherence to the approved design standard ensures the mechanical integrity of the plant. It may be noted that the vents of the ethanol storage vessels have not been provided with flame arrestors which prevent entering of spark of flame into the vapor space of storage vessel. Provision of vacuum cum pressure relief valve would minimize the loss by evaporation and it will also prevent the explosion of the storage tank while discharging ethyl alcohol.
- It is important to have proper written safe operating procedures for each of the operating being carried out in ethyl alcohol storage and distillery. It should also be ensured that these written safe operating procedures are strictly followed.
- Schedule inspection and testing of vessels, pipelines, valves, pumps, pressure regulators, pressure relief valves, level indicators etc. should be carried out and proper record to be maintained.
- The increase in temperature to external surface of the tanks by way of heating by torch or pool fire etc. should be avoided to prevent BLEVE.

- The potentially hazardous excursions from normal operating condition leading to major accident should be prevented by provision of alarm & trip system for pressure, temperature and level. The manual level gauging of the ethyl alcohol storage tank and the loading of the road tankers need to be strictly supervised to avoid spillage due to overflowing.
- The MCA study of the ethyl alcohol tank farm has highlighted the necessity of provision of bund for containment of accidental spillage from a storage vessel.
- Inadvertent drive away protection for the road tanker during ethyl alcohol loading operation should be achieved by means of provisio of wheel chokes and taking away of the ignition key from the driver.
- High standards of operation, maintenance and testing can be achieved by conducting hazard and operability study of the identified hazardous operation such as road tanker loading, distillation & liquor bottling. This takes care of consequences of deviation from the normal operating parameters and thereby suggesting the necessary safety measures.
- Periodic inspection and testing of pipelines should be carried out to determine the thining due to corrosion and erosion and recors should be maintained.
- The ethyl alcohol is condidered as class A petroleum hence its bulk storage should comply with the requirements of petroleum Act and Rules. The silent aspects of this rule to be complies are:
  i. Provision of a bund with storm water drainage with a valve normally kept closed.
  ii. Provision of 1.8 M high fencing to prevent the entering of unauthorized persons.
  iii. Approvd type electrical fitting to be installed within the premises which should be maintained properly.
  iv. Provision of water hydrant line
  v. Strict adherence to hot work permists systems.

7.8.2 SPECIFIC RECOMMENDATION

1. Preventive Measures for Electricity Hazard

- All electrical equipment's is to be provided with proper earthing. Earthed electrode are periodically tested and maintained
- Emergency lighting is to be available at all critical locations including the operator's room to carry out safe shut down of the plant
- Easy accessibility of fire fighting facilities such as fire water pumps and fire alarm stations is considered
- All electrical equipment's are to be free from carbon dust, oil deposits, and grease
- Use of approved insulated tools, rubber mats, shockproof gloves and boots, tester, fuse tongs, discharge rod, safety belt, hand lamp, wooden or insulated ladder and not wearing metal ring and chain.
- Flame and shock detectors and central fire announcement system for fire safety are to be provided.
- Temperature sensitive alarm and protective relays to make alert and disconnect equipment before overheating is to be considered.
- Danger from excess current due to overload or short circuit is to be prevented by providing fuses, circuit breakers, thermal protection.

2. Safety Measures for Storage & Handling of Alcohol

Handling and storage of alcohol is done as per prescribed norms. The alcohol is directly fed to the bottling unit mechanically and no manual handling will be involved which will reduce the risk of spillage in the storage area. Following precautionary measures would be taken for safety:

a) Handling and storage

Keeping away from heat, sparks and open flame, care will be taken for avoidance of spillage, skin and eye contact, well ventilation, Use of approved respirator if air contamination is above acceptable level will be promoted. For Storage and handling following precautions will be taken:

- Keeping away from oxidizers, heat and flames.
- Avoidance of plastics, rubber and coatings in the storage area.
- Cool, dry, & ventilated storage and closed containers.
- Grounding of the container and transferring of equipment to eliminate static electric sparks.

a) At Distillation Section

With the vapours of the ethanol escaping through the vent. Therefore, it is necessary to provide a flame arrestor to the vent in order to prevent flash back of the flame.
The safety measures to control the above-mentioned hazards are:

- Provision of monitoring of flowrate, inlet and outlet temperature of the cooling water.
- Scheduled cleaning and descaling of the heat exchanger of the condenser which has been reported to befilled.
- Monitoring of steam temperature or pressure. Steam pressure in the unit is maintained between 8– 10 lbs, with the provision of a steam pressure regulating valves. The temperature of steam is maintained between 115 – 120 ^{o} C. Corresponding to the aforesaid pressure setting. These control measures would minimize the loss of ethyl alcohol vapour in the atmosphere leading to enhanced production of the distilled ethyl alcohol.

3. First Aid Measures

- For Skin contact, Eye contact, & Inhalation first aid measures to be taken onsite.
- Medical help to be sought as soon as possible.

4. Fire Fighting Measures

- ✓ Use of extinguishing media surrounding the fire as water, dry chemicals (BC or ABC powder), CO_2.
- ✓ Foam System for firefighting will be provided to control fire from the alcohol storage tank. The foam thus produced will suppress fire by separating the fuel from the air (oxygen), and hence avoiding the fire & explosion to occur in the tank. Foam would blanket the fuel surface smothering the fire. The fuel will also be cooled by the water content of the foam.
- ✓ The foam blanket suppresses the release of flammable vapors that can mix with the air.
- ✓ Special Fire Fighting Procedures; Keeping the fire upwind. Shutting down of all possible sources of ignition, keeping of run-off water out of sewers and water sources. Avoidance of water in straight hose stream which will scatter and spread fire. Use of spray or fog nozzles will be promoted, cool containers will be exposed to flames with water from the side until well after the fire is out.

5. Accident Release Measures

For Spill Cleanup well Ventilation, Shutting off or removal of all possible sources of ignition, absorbance of small quantities with paper towels and evaporate in safe place like fume hood and burning of these towels in a safe manner), Use of respiratory and/or liquid-contact protection by the Clean-up personnel will be promoted.

6. Role of Fire Fighting Group

A small spark of fire may result into loss of lives, machines and the damage by fire may result in high economic losses. This type of losses can be avoided by preventing and controlling the fire instantly for which fire–fighting group will be established.

The firefighting group would house and keep in readiness, the following types of equipment and arrangements.

- ✓ CO_2 extinguishers
- ✓ Dry powder chemical extinguishers
- ✓ Foam extinguishers
- ✓ 80 mm. spray hoses
- ✓ Fire hydrant

In order to avoid fire in cable galleries, all the power and control cables of FRLS type (Fire Resistant Low Smoke) will be used.

7.9 EVIRONMENT HEALTH AND SAFETY CELL

A fully fledge EHS cell (Environment Health & Safety Cell) has been there at plant site. Main function of EHS cell is to assess the potential risks/hazards to environment, health of employees & society and safety within the plant. Installation of firefighting system, fire alarm, provision of safety/protective equipment's to workers and regular medical check-ups have been taken up. Plant is maintained at zero discharge so no likely impact is likely to occur on environment and society. Also, regular monitoring of different parameters is being carried out to ensure safety of environment and society. Trainings and Mock drills are also carried out in regular intervals for workers to ensure the safety in case of any accident or natural hazard.

7.10 EMERGENCY PLANNING & PROCEDURE

Emergency Control Center

Emergency Control Centre (ECC) is cell from which emergency operations are directed and coordinated. This centre activates as soon as on–site emergency is declared.

General Description of ECC

The ECC is located in an area that offers minimal risk being directly exposed to possible accidents.

During an emergency, the Emergency Management Staff, including the site controller shall gather in the ECC. Therefore, the ECC shall be equipped with adequate communication systems in the form of telephones and other equipment's to allow unhampered organisations and other nearby facility personnel.

The ECC provides shelter to its occupants against the most common accidents; in addition, the ECC's communication systems are protected from possible shutdown. The ECC has its own emergency lighting arrangement and electric communication systems operation. **Figure 7.1** shows Team involved in Emergency planning.

Only a limited and prearranged number of people are admitted to the ECC, when in use. This eliminates unnecessary interference and reduces confusion.

The ECC is always ready for operation and provided with the equipment and supplies necessary during the emergency such as:

- Updated copies of the on–site Disaster Management Plan.
- Emergency telephone numbers.
- The names, phone number, and address of external agencies, response organizations and neighboring facilities.
- The adequate number of telephone (more than two).
- Emergency lights, Clocks, Personal protective equipment.
- List of fire extinguishers with their type no. and location, capacity, etc.
- Safety helmets – List of quantity & location.
- Status boards/message board.
- Material safety data sheets for chemicals handled at the facility.
- Several maps of the facility including drainage system for surrounding area showing:

✓ Areas where hazardous materials are stored.
✓ Plot plans of storage tanks, routes of pipelines, all water permanent lines etc.
✓ The locations where personal protective equipment are stored.
✓ The position of pumping stations and other water sources.
✓ Roads and plant entrances.
✓ Assembly areas & layout of Hydrant lines.

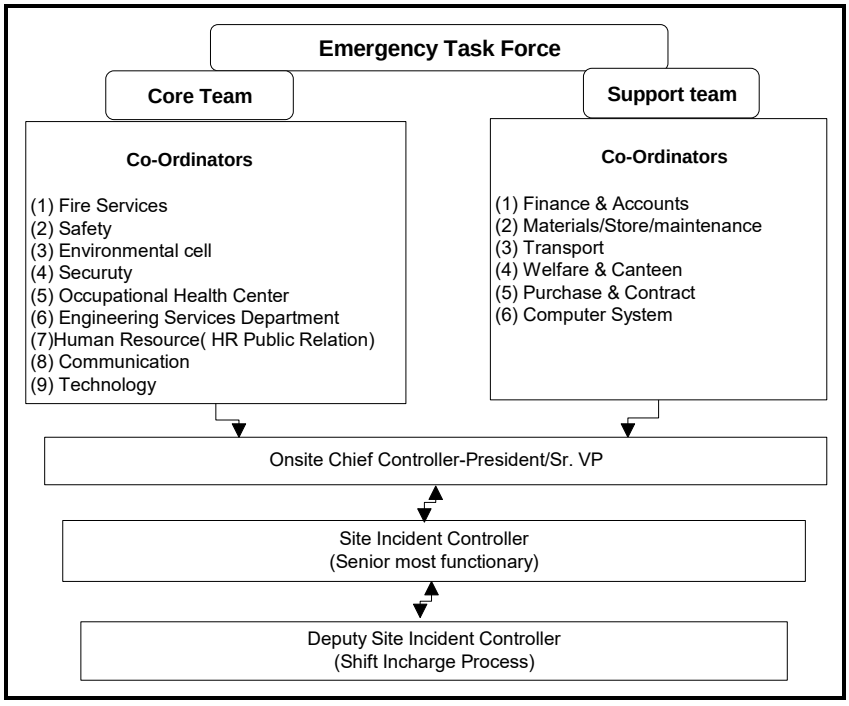


Figure 7-16: Emergency team

7.11 EMERGENCY PLANNING FOR DISASTER DUE TO FIRE

Cable rooms, transformer, unit, auxiliary transformers, oil tanks, etc. within the plant are the likely areas for which disaster management plan is to be made to deal with any eventuality of fire. Stores, workshop, canteen and administrative building will be included.

7.12 DISASTER MANAGEMENT PLAN

Definition

A major emergency in an activity/project is one which has the potential to cause serious injury or loss of life. It may cause extensive damage to property and serious disruption both inside and outside the activity/project. It would normally require the assistance of emergency services to handle it effectively.

Scope

An important element of mitigation is emergency planning, i.e. identifying accident possibility, assessing the consequences of such accidents and deciding on the emergency procedures, both on site and off site that would need to be implemented in the event of an emergency.

Emergency planning is just one aspect of safety and cannot be considered in isolation from the proposed 120 KLD capacity Molasses based ethanol unit and hence before starting to prepare the plan, works management will ensure that the necessary standards, appropriate to safety legislation, are in place.

Objective

The overall objectives of the emergency plan will be:

- ✓ To localize the emergency and, eliminate it; and
- ✓ To minimize the effects of the accident on people and property.

Elimination will require prompt action by operations and works emergency staff using, for example, fire–fighting equipment, water sprays etc.

Minimizing the effects may include rescue, first aid, evacuation, rehabilitation and giving information promptly to people living nearby.

Identification of Hazards

The following types of hazards may be identified at Shahabad Ethanol plant.

- Fire in Electric Panels, Oil room and alcohol storage.
- Waste treatment processes.
- Cleaning of barrels, which have held chemical substances.
- To deal the above emergencies, the Emergency Plan is prepared.

Safety Measures for Storage & Handling of Alcohol

The alcohol will be directly fed to the bottling unit mechanically and no manual handling will be involved which will reduce the risk of spillage in the storage area. Following precautionary measures would be taken for safety

Handling and Storage; Keeping away from heat, sparks and open flame, care will be taken for avoidance of spillage, skin and eye contact, well ventilation, Use of approved respirator if air contamination is above acceptable level will be promoted. For Storage and handling following precautions will be taken:

- Keeping away from oxidizers, heat and flames.
- Avoidance of plastics, rubber and coatings in the storage area.
- Cool, dry, & ventilated storage and closed containers.
- Grounding of the container and transferring of equipment to eliminate static electric sparks.

In case of any emergency following measures would be taken:

First Aid Measures: For Skin contact, Eye contact, & Inhalation.

Fire Fighting Measures:

- Use of extinguishing media surrounding the fire as water, dry chemicals (BC or ABC powder), CO, Sand, dolomite, etc
- Foam System for firefighting will be provided to control fire from the alcohol storage tank. The foam thus produced will suppress fire by separating the fuel from the air (oxygen), and hence avoiding the fire & explosion to occur in the tank. Foam would blanket the fuel surface smothering the fire. The fuel will also be cooled by the water content of the foam.

- The foam blanket suppresses the release of flammable vapors that can mix with the air.
- Special Fire Fighting Procedures; Keeping the fire upwind. Shutting down of all possible sources of ignition, keeping of run-off water out of sewers and water sources. Avoidance of water in straight hose stream which will scatter and spread fire. Use of spray or fog nozzles will be promoted, cool containers will be exposed to flames with water from the side until well after the fire is out.
- Hazardous Decomposition Products: gases of Carbon Monoxide (CO) & Carbon Dioxide (CO2).

Accidental Release Measures; For Spill Cleanup Well Ventilation, Shutting off or removal of all possible sources of ignition, absorbance of small quantities with paper towels and evaporate in safe place like fume hood and burning of these towels in a safe manner), Use of respiratory and/or liquid-contact protection by the Clean-up personnel will be promoted.

7.13 EMERGENCY PLANNING

General

Disaster Management Plan for an industrial unit is necessarily a combination of various actions which are to be taken in a very short time but in a present sequence to deal effectively and efficiently with any disaster, emergency or major accident with an aim to keep the loss of men, material, plant/machinery etc. to the minimum.

The main functions of the Disaster Management Cell are to prepare a detailed Disaster Management Plan, which includes:

- Identification of various types of expected disaster depending upon the type of the industrial unit.
- Identification of various groups, agencies, departments etc. necessary for dealing with a specific disaster effectively.
- Preparation – by intensive training of relevant teams/groups within the organization to deal with a specific disaster and keep them in readiness.
- Establishment of an early detection system for the disaster.
- Development of a reliable instant information/communication system.
- Organization and mobilization of all the concerned departments/ organizations / groups and agencies instantly when needed.
- A major disaster that can be expected due to fire in this proposed distillery.

Emergency Planning for Disaster due to Fire

Cable rooms, transformer, unit, auxiliary transformers, oil tanks, etc. within the plant are the likely areas for which disaster management plan is to be made to deal with any eventuality of fire. Stores, workshop, canteen and administrative building will be included.

Classification of Fire

Class (A): Fire involving combustible materials like wood, paper, cloth etc.

Class (B): Fire due to liquid materials like oil, diesel, petroleum products and all inflammables.

Class (C): Fires involving domestic and industrial gases like butane and propane etc.

Class (D): Metal fires etc.

Need of Establishing a Fire Fighting Group

A small spark of fire may result into loss of machines and the damage by fire may high economic losses. This type of losses can be avoided by preventing and controlling the fire instantly for which fire–fighting group will be established.

Establish which would house and keep in readiness, the following types of equipment and arrangements.

- CO2 extinguishers
- Dry powder chemical extinguishers
- Foam extinguishers
- 80 mm. spray hoses
- Fire brigade
- Fire hydrant
- Protocol (chemical to combat oil fires).

In order to avoid fire in cable galleries, all the power and control cables of FRLS type (Fire Resistant Low Smoke) will be used.

Inspection

- Fire alarm panel (electrical) will cover the entire plant. The inspection group will periodically inspect fire extinguishers in fire stations and machines and other places.
- The groups will display emergency telephone number boards at vital points.
- The group will regularly carry out general inspection for fire.

Procedure for Extinguishing Fire

The following steps will be taken during a fire accident in the system:

As soon as the message is received about fire, one of the systems will be diverted to the place of the fire accident along with a staff member.

Simultaneously plant fire station will be informed by phone walkie for fire brigades and fire stations of nearby area.

In the meanwhile, the pipe system will be operated to obtain maximum pressure on output. In case cables are within the reach of fire, power supply will be tripped and the cables shifted.

Fire Fighting with Water

Adequate and reliable arrangement is required for fighting the fire with water such as:

1. Provision for Fire brigade and Fire hydrant.
2. Arrangement of pipelines along and around all vulnerable areas.
3. Provision of valves at appropriate points to enable supply of water at the required place/area or divert the same to another direction/pipe line.
4. Provision of overhead tanks which will be providing with the water during power failure and it would work by the gravitational force.

Sources of Water for Fire Fighting

The following two sources of water have been considered for firefighting:

- Overhead Tank
- Raw Water Reservoir

Fire Fighting with Fire Extinguishers

To deal with fire – other than carbonaceous fires, which can be deal with by water – suitable fire extinguishers are required to do the job effectively. It is therefore, necessary to keep adequate number of extinguishers in readiness at easily approachable places. Adequate number of fire stations would be:

- Further, other spray groups from the system will be diverted to the spot.
- In case of fire in the belt, belt will be cut near the burning portion to save the remaining parts.
- After extinguishing the fire, the area will be well prepared for reuse.
- Foam System for firefighting will be provided to control fire from the alcohol storage tank. The foam thus produced will suppress fire by separating the fuel from the air (oxygen), and

hence avoiding the fire & explosion to occur in the tank. Foam would blanket the fuel surface smothering the fire. The fuel will also be cooled by the water content of the foam.

- The foam blanket suppresses the release of flammable vapors that can mix with the air.

7.14 ON–SITE EMERGENCY PLAN

Introduction

The views of the possible hazards that can arise out of the daily operations in the distillery plant, various measures are adopted to prevent the occurrence of a major accident. This comprises of:

- Built in safety measures, alarms, trips and interlocks etc.
- Standard safe operating and maintenance procedures permit system etc.
- Training of all the involved staff in normal and emergency operating procedures.
- Training of all employees in safety, fire fighting and first aid.

However, in spite of these precautions, it is required to foresee situation of major accident and plan for taking timely action to minimize the effects of such incident on the safety and health of persons working in the plant as well as those living around the premises.

Preparation of Plan

Alarm System

A siren shall be provided under the control of Security office in the plant premises to give warning. In case of emergencies this will be used on the instructions to shift in charge that is positioned round the clock. The warning signal for emergency shall be as follows:

–Emergency Siren: Waxing and waning sound for 3 minutes.

–All clear signal: Continuous siren for one minute.

Communication

Walkies & Talkies are located at strategic locations; internal telephone system EPBX with external P&T telephones would be provided.

Fire Protection System: Fire Fighting System

The fire protection system for the unit is to provide for early detection, alarm, containment and suppression of fires. The fire detection and protection system has been planned to meet the above objective an all–statutory and insurance requirement of Tariff Advisory Committee (TAC) of India.

The following systems of fire protection are proposed to be provided for the plant:

a) Fire alarm system
b) Fire containment
c) Hydrant system for the entire plant
d) High velocity water spray (HVWS) system
e) Carbon dioxide flooding system
f) Portable fire extinguishers.

a) Fire alarm system

A fire alarm system would be installed to provide visual and audible alarm in the plant for fire detection at the incipient stage. This system would comprise manual call points located at strategic locations in areas which are normally manned, and automatic smoke and heat detectors located at important points such as the cable vault, the control room, switchgear room etc., to detect fire at an early stage, and provide visual and audible alarm.

b) Fire containment

Strategic areas in the plant would be separated by adequately rated firewalls. All openings for switchgears and cable entry would be sealed by fireproof seals to prevent spread of fire from one area to another.

c) Reserve water storage for fire demand

Reserve storage of 500 m3 would be provided in the treated effluent storage tank with a suitable partition to cater to the water requirements of the fire protection system.

d) Hydrant system

The hydrant systems comprise the following:

i. Four pumps, two motor driven and two diesel engines driven, each of 10m3/hour, capacity would be provided to keep both the hydrant and HVWS system mains pressurized. These pumps will take the suction from the water storage tank.
ii. External as well as internal fire hydrants in all areas of the industry.
iii. (High velocity water spray system
iv. The HVWS system would be provided for the fuel storage area. Since the parameters for the HVWS system will be identical to that of the hydrant system, the diesel engine driven pump described in the hydrant system serve as a common standby for both HVWS system and hydrant system. The HVWS system consists of a number of high velocity water projectors. Smoke and heat detectors have been used strategically.
v. Portable fire extinguishers
vi. Wall/column mounted type portable fire extinguishers in various areas of the plant including the control room, administration building, canteen, stores, workshop, etc. would be provided. These portable fire extinguishers are basically of carbon dioxide and dry power type.

First Aid: A first aid centre with adequate facilities shall be provided. It shall be maintained round the clock by a compounder cum dresser and a doctor. An Ambulance shall also be provided at site to carry affected people to hospital.

Security: The security requirements of the company premises shall be taken care of by CSO assisted by a Fire In charge. The team, apart from the normal security functions will manage the role required during a disaster management operation as a part of the crisis control team.

Safety: The safety wing led by a Safety Manager will meet the requirement of emergencies round the clock. The required safety appliances shall be distributed at different locations of the plant to meet any eventualities. Poster/ placards reflecting safety awareness will be placed at different locations in the plant area.

Evacuation Procedure: As the major hazard is only due to fire, which has more or less localized impact no mass evacuation, procedures are required. Evacuation would involve only the people working very close to the fire area.

Emergency Control Center: Provision is made to establish an Emergency Control Centre (ECC) from which emergency operations are directed and coordinated. This centre is activated as soon as on–site emergency is declared.

The ECC consists of one room, located in an area that offers minimal risk being directly exposed to possible accidents.

During an emergency, the Emergency Management Staff, including the site controller will gather in the ECC. Therefore, the ECC is equipped with adequate communication systems in the form of telephones and other equipments to allow unhampered organisations and other nearby facility personnel.

The ECC provides shelter to its occupants against the most common accidents; in addition, the ECC's communication systems are protected from possible shutdown. The ECC has its own emergency lighting arrangement and electric communication systems operation.

Only a limited and prearranged number of people are admitted to the ECC, when in use. This eliminates unnecessary interference and reduces confusion.

The ECC is always ready for operation and provided with the equipment and supplies necessary during the emergency such as:

- Updated copies of the On–site Disaster Management Plan.
- Emergency telephone numbers.
- The names, phone number, and address of external agencies, response organizations and neighbouring facilities.
- The adequate number of telephone (more than two).
- Emergency lights, Clocks, Personal protective equipment.
- List of fire extinguishers with their type no. and location, capacity, etc.
- Safety helmets – List of quantity & location.
- Status boards/message board.
- Material safety data sheets for chemicals handled at the facility.

Several maps of the facility including drainage system for surrounding area showing:

- Areas where hazardous materials are stored.
- Plot plans of storage tanks, routes of pipelines, all water permanent lines etc.
- The locations where personal protective equipment are stored.
- The position of pumping stations and other water sources.
- Roads and plant entrances.
- Assembly areas & layout of Hydrant lines.

Communication Equipment's and Alarm Systems: This kind of equipment is absolutely vital for notifying accident; make the emergency known both inside and outside of the facility, and coordinating, the response actions among the various groups involved in response operations.

In particular, this equipment is used to communicate within the facility; communicate between the facility and outside organizations; and inform the public.

Different communications systems can vary in effectiveness, depending on the task. The most common types installed in the plant are given below.

Sirens: These are audible alarm systems commonly used in facilities. In case of any emergency siren will be operated short intermittently for 1.5 minutes.

An alarm does more than just emergency warning. It also instructs people to carry out specific assignments, such as reach to assembly point for further instructions and actions, or carry out protective measures; this can be achieved only if the people are familiar with the alarm systems and are trained to respond to it.

7.15 PERSONAL PROTECTIVE EQUIPMENTS

This equipment is used mainly for three reasons; to protect personnel from a hazard while performing rescue/accident control operations, to do maintenance and repair work under hazardous conditions, and for escape purposes. The list of Personal Protective Equipment provided at the facility and their locations are available in ECC.

Effective command and control accomplish these functions necessitates personal trained in this On–site Disaster Management Plan with adequate facilities and equipments and equipment to carry out their duties and functions. These organizations and the facilities required to support their response are summarized in the following subsections.

7.16 PROCEDURE FOR TESTING & UPDATING THE PLAN

Simulated emergency preparedness exercises and mock fire fighting exercises including mutual aid scheme resources and in conservation with district emergency authority to be carried out time to time.

7.17 DISCLOSURE OF INFORMATION TO WORKER & PUBLIC AWARENESS SYSTEM IN EXISTENCE & ANTICIPATED

- Safety awareness among workers by conserving various training programmes and Seminars, competition, slogans etc.
- Practical exercise.
- Distribution and practices of safety Instructions.
- Safety Quiz contests.
- Display of Safety Posters & Safety Slogans.
- Developing Safety Instructions for every Job and ensuring these instructions/booklets or manuals by the workers.

7.18 OFF-SITE EMERGENCY PLANNING

The off-site emergency plan is an integral part of any hazard control system. It is based on those accidents identified by the works management, which could affect people and the environment outside the works. Thus, the off-site plan follows logically from the analysis that took place to provide the basis for the on-site plan and the two plans therefore complement each other. The roles of the various parties that may be involved in the implementation of an off-site plan are described below. The responsibility for the off-site plan will be likely to rest either with the works management or with the local authority. Schematic representation of various organisation involved during emergency is shown below in Figure 7.2& Table given below shows details with Communication Nos during Offsite Emergency.

Local Statutory Government bodies

List of DCs – Punjab

Sl No	District	Office/Fax No	Residence No.	Mobile No.
1	Ferozerpur	01612-24404/245467	244005	98552-12021
2	Faridkot	01639-250009/256009	254913	98552-12021
3	Jalandhar	0181-2224549/2458058	245966	9880-71075
4	Patiala	0175-2311324/2311329	2311325	98722-30897
5	Ropar	01831-221252/2714184	-	98150-00069 98729-10003
Deputy Commissioner				
1	Amritsar	0183-2226161 0183-2223551/2223991	2226162	94782-18866 98778-61786
2	Batinda	0164-2210042/2212789	2212789	7589033333
3	Barnala	01679-244360/241111	244386	84271-01650
4	Faridkot	01639-251651/251024	2510000	94630-75767
5	Fatehgarh Sahib	01763-232215/231339	221341	98722-21702
6	Ferozpur	01632-244008/241101	244006	98153-04213
7	Fazilka	01638-260555/260555	261555	98015-00008
8	Gurudaspur	01874-247500/224501	224270	94631-25029
9	Hoshirpur	01882-220301/220303	270302	98780-07221
10	Jalandhar	0181-2224783/2224727	2459664	94175-90001
11	Kapurthala	01822-233777/233393	233776	94170-79777
12	Ludhiana	0161-2403100/2400394	2404055	95013-99999
13	Mansa	01652-227700/229247	232900	90544-98988

14	Moga	01636-234400/234411	225401	89680-13313
13	Sri Muktsar Sahib	01633-263643/263808	263644	98140-57363
14	Patiala	0175-2311300/2311301/2201366	2311302-03	94179-44155
15	Pathankot	0186-2220342/2220342	2257233	99150-10135
16	Roopnagar	01881-221150/221165	221250	94638-37773
17	Sangrur	01672-234004/230008	232900	97800-08595
18	S.A.S Nagar **(ADC)**	0172-2270731/630966	2270220	98889-87867
19	S.A.S Nagar	01823-221301/226426	221401	94634-24848
20	Tarn-Taran	01852-224101/224102	246161	98552-330110

Details of SPs of Districts - Punjab

S.No	Name District	Mobile	Office No	Residential No	Fax No
1	Amritsar (R)	98727-72385 95929-00163	2584369, 2583819 97800-04040	0172-2625182	2702355
2	Tarn Taran	98761-00008	01852-226500	95929-14302 226200	224100
3	Gurdaspur	98765-16004	241173 502903 502860	220207 45081-84172	245396
4	Batala	95019-18300	242145 242134 97800-06109	220901	285320
5	Pathankot	98151-98144	0186-2220070/2220388	2250133	2220388
6	Jalandhar Rural	75080-85888 78373-40999	2220136 2220126	2233309	2220226
7	Shahid Bhagat Singh Nagar	94172-90000	01823-226039 / 221023 (PBX)		226763

8	Hoshiarpur	98786-18009	01882-22051 / 247501		247502 220513
9	Kapurthala	98780-00580	0182-2233736/2220513		233761
10	Patiala	97800-05544 95929-12501	0175- 5055417/5055418(SSP) 0175-5055402(SP (H))	2311135	2311115
11	Sangrur	95929-00051	0805-4545001(SSP) 0805-4545002(SP (H)) 0805-4545003(SP(D))	241300-01	241700
12	Fatahgarh sahib	97803-12000 95929-12301	01763-509666 / 609602	232990	220090
13	Barnala	98721-00016	0169-231107		243683
14	S.A.S. Nagar	98147-77863	0172-2270948(SP City-I) 0172-2270575(SP, City-II)		2270359
15	Ludhiana rural	98158-00301	224048 223359		223239
16	khanna	98158-00451 95929-14021	226325		226024
17	Rupnagar	97798-00888	01881-220946(SSP) 01881-22019(SP(D))		228874
18	Firozpur	98158-00405	01632-244049 / 246697 / 245063		244402
19	Fazilka	95929-86400	01638-262333		263312
20	Sri Muktsar sahib	90412-80817	01633-264809		241722
21	Moga	98158-00756	01636-236600		237817
22	Faridkot	98153-06868 84271-00068	01639-252000		250920
23	Bathinda	98765-16001	0164-2219100	2219101 2217900	2219300

8	Hoshiarpur	98786-18009	01882-22051 / 247501		247502 220513
9	Kapurthala	98780-00580	0182-2233736/2220513		233761
10	Patiala	97800-05544 95929-12501	0175- 5055417/5055418(SSP) 0175-5055402(SP (H))	2311135	2311115
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20	Sri Muktsar sahib	90412-80817	01633-264809		241722
21	Moga	98158-00756	01636-236600		237817
22	Faridkot	98153-06868 84271-00068	01639-252000		250920
23	Bathinda	98765-16001	0164-2219100	2219101 2217900	2219300

Either way, the plan must identify an emergency coordinating officer who would take overall command of the off-site activities. Consideration of evacuation may include the following factors:
In the case of a major fire but without explosion risk (e.g. an oil storage tank), only houses close to the fire are likely to need evacuation

- If fire is escalating very fast it is necessary to evacuate people nearby as soon as possible
- In acute emergency people are advised to stay indoors and shield themselves from the fire.

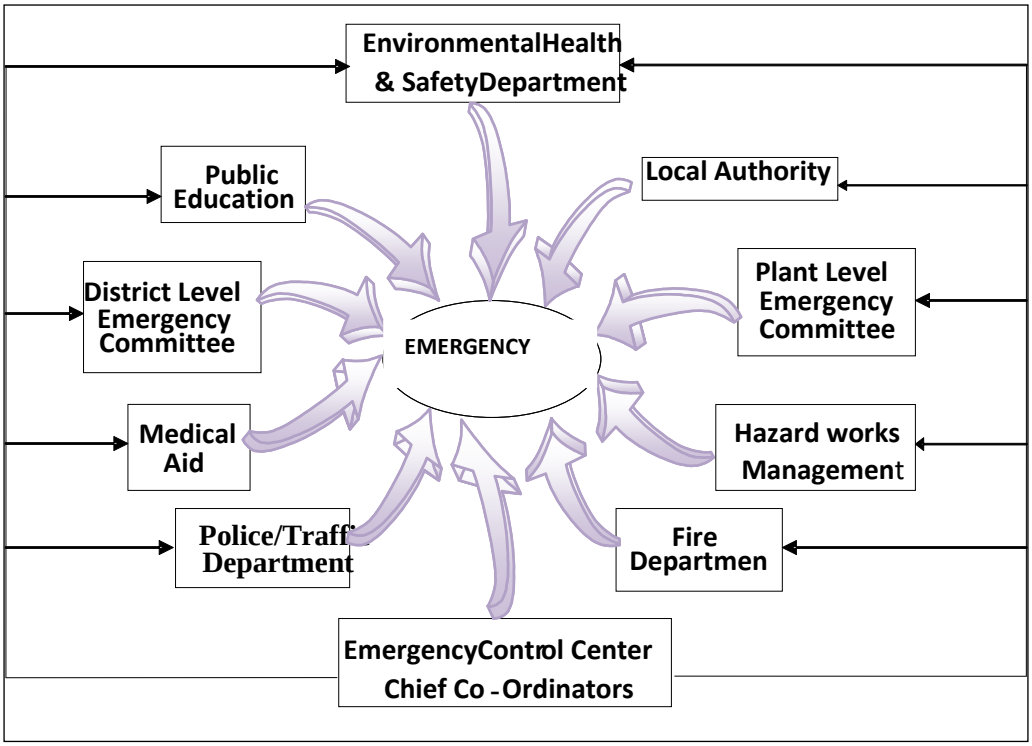


Figure 7-17: Various Organization Involved During Emergency

Organization: Organizational details of command structure, warning systems, implementation procedures, emergency control centres include name and appointments of incident controller, site main controller, their deputies and other key personnel involved during emergency.

Communications: Identification of personnel involved, communication centre, call signs, network, list of telephone numbers.

Special Emergency Equipment: Details of availability and location of heavy lifting gear, specified fire-fighting equipment, fireboats etc.

Voluntary Organizations: Details of Voluntary organizations, telephone numbers nearby of hospitals, Emergency helpline, resources etc are to be available with chief authorities.

Non-governmental Organizations (NGO): NGO's could provide a valuable source of expertise and information to support emergency response efforts. Members of NGOs could assist response personnel by performing specified tasks, as planned during the emergency planning process.

- Evacuation of personnel from the affected area.
- Arrangements at rallying posts and parking yards.
- Rehabilitation of evacuated persons.

Chemical information: Details of the hazardous substances (MSDS information) and a summary of the risks associated with them are to be made available at respective site.

Meteorological information: There is to be arrangements for obtaining details of weather conditions prevailing at or before the time of accident and weather forecasts updates.

Humanitarian Arrangements: Transport, evacuation centres, emergency feeding, treatment of injured, first aid, ambulances, temporary mortuaries.

Public Information

- Dealing with the media-press office
- Informing relatives, etc.
- Assessment
- Collecting information on the causes of the emergency
- Reviewing the efficiency and effectiveness of all aspects of the emergency plan.

Role of local authority:Local Authorities like Panchayat, Sabha, Samity, municipalities can help in combating emergency situation after assessing the impact scenario in rescue phase.

Role of police:

- The police is to assist in controlling of the accident site, organizing evacuation and removing of any seriously injured people to hospitals.
- Co-ordination with the transport authorities, civil defence and home guards
- Co-ordination with army, navy, air force and state fire services
- Arrange for post mortem of dead bodies
- Establish communication centre with easy contact with ECC

Role of Fire Brigade: The fire brigade is to be organized to put out fires and provide assistance as required during emergency.

Media: The media is to have ready and continuous access to designated officials with relevant information, as well as to other sources in order to provide essential and accurate information to public throughout the emergency and to avoid commotion and confusion

- Efforts are made to check the clarity and reliability of information as it becomes available, and before it is communicated to public
- Public health authorities are consulted when issuing statements to the media concerning health aspects of chemical accidents
- Members of the media are to facilitate response efforts by providing means for informing the public with credible information about accidents involving hazardous substances

Role of health care authorities:

- Hospitals and doctors must be ready to treat all type of injuries to causalities during emergency.
- Co-ordinate the activities of Primary Health Centres and Municipal Dispensaries to ensure required quantities of drugs and equipments
- Securing assistance of medical and paramedical personnel from nearby hospitals/institutions
- Temporary mortuary and identification of dead bodies

7.19 CONCLUSION

As discussed above this Project activity is likely to pose risk of Fire & Explosion. Fire Specific Measures shall be Taken due care with. Fire Hydrant line and Portable Extinguishers shall me made readily available at all points. Emergency Preparedness plan shall be practiced every month by carrying out Mock Drill. Proper safety Training shall be given to all employees working the Area.
Detailed OHS Budget for Proposed project is given below:

Table 7.10: Proposed OHS budget

Sl No.	OHS Requirement	OHS Budget
1.	Route Maintenance of Fire Hydrant Line	15 Lakh Rupees
2.	Installation of Heat Detectors, smoke detectors and Maintenance	4.00 Lakh Rupees
3.	Yearly Hydro test of Fire Extinguishers	5.00 Lakh Rupees
4.	Work Zone Monitoring (Production and Control Room)	3.00 Lakh Rupees
5.	CO2 Flooding System for MCC & Panel Rooms	5.00 Lakh Rupees
6.	Environment Audit(Once in Year)	2.00 Lakh Rupees)
7.	Third Party EHS Audit (Once in 2 years)	2.00 Lakh Rupees
8.	PPE Purchase	3.00 Lakh Rupees
9.	Exhaust Ventilation Test	5.00 Lakh Rupees
10.	Yearly Occupational Health Monitoring of Employees and Record Maintenance	5.00 Lakh Rupees
11.	Training and Safety Awareness Program	2.00 Lakh Rupees
12.	Safety week celebration Conduction and Safety Slogans	1.00 Lakh rupees
13.	Misc	1.00 Lakh Rupees
Total		**53 Lakhs**

CHAPTER-8 PROJECT BENEFIT

8.1 INTRODUCTION

The development of industrial projects plays a key role in the economic growth of any country. There is drastic increase in the production of ethanol, after the National Bio-fuel Policy, 2009. Before 2009 ethanol is only used for the consumption and industrial purposes. But now ethanol is used as the fuel for the blending purposed. The growth of the distillery industry significantly contributes to economic growth as it generates employment both directly and also helps in the reduction in green house gases. Peripheral development takes place and due to more influx of money through the area, overall importance of the area increases and overall the infrastructure improves.

8.2 EMPLOYMENT POTENTIAL

8.2.1 DIRECT EMPLOYMENT

Employment scenario of the study area is largely dependent on the agriculture and Industrialization of the area. The proposed project has employment generationpotential by way of recruiting local people directly for different activities of the project.

Estimated manpower requirement for the operation phasefor the proposed project be **98**. Both skilled & un-skilled workers will be employed by the company. These persons will be on Company payroll. Others will be arranged through contractors. From unloading of raw materials to loading of finished goods one or more labor contracts will be awarded to local contractors.

Local people will be given the opportunity in employment as per their capability and expertise. Priority will be given to scheduled tribe families and women. This will enhance the present socio economic status of the local people.

8.2.2 INDIRECT EMPLOYMENT

Indirect employment and income effects of any sugar plant are non-marginal and usually remain widespread across a long region. Over the years Yadu Corporation has caused generation of income and employment opportunities the ancillaries and service unit switch came in the vicinity of the existing sugar plant, ancillary, transport and manufacturing sectors. Employment generation potential by way of recruiting local people directly for different activities of the project, specifically at the construction phase. It is expected that substantial portion of the investment in this project will trickle down to the local people in the form of employment and income.

Further, indirect employment in various forms i.e. transportation, refreshment stalls, daily commodityshops, etc. will also add in the employment potential of the proposed project. Also the purchaseof the sugarcane as the raw material from the local farmers will encourage the farming in the regionand will be beneficial to the affected families.

8.3 IMPORTANCE IN INFRASTRUCTURE

M/s Indian Sucrose Limited intended to provide the following infrastructure in the study area of 10 km radius:

- **Road Transport:** There will be improved road communication due to the proposed project and maintenance will also be done time to time.
- **Market**: Need for the proposed products are based on the demand and supply gap in the current market. With increasing utilization of the current products, in future, to cater the requirement of all the products, it is essential to have the proposed manufacturing unit.

- **Infrastructure**: Creation of community assets (infrastructure) like Installation/ Repair of Hand Pumps/ Bore wells Gram Panchayat dug well de-siltation and deepening, as a part of corporate social responsibility.
- **Increasing other business opportunities for local people**- There will be scope of hiring vehicle like tractors & trolleys, bulldozers, JCB, excavators during construction and operation phase of the project.

8.4 EDUCATION

The local peoples' interest towards education will increase due to the expectation of getting jobs, especially from non-agricultural sources such as the industries in the vicinity of sugar mill. The project is expected to increase such aspirations by bringing opportunities of some direct and indirect employment for the local people. The general awareness towards the importance of education is expected to increase as a result of the proposed expansion. The project will have positive impact on the level of education of the people.

8.5 CORPORATE ENVIRONMENT RESPONSIBILITY

Corporate Environment Responsibility is for the sustainable development of various components like Social, Economic, Environmental etc. These entire components are closely interrelated and mutually re-enforcing. This budget will be used to meet the issue raised during Public hearing and for Social need assessment. The CER budget proposed by the project proponent is **3.2 Crore.**This CER budget is proposed as per the Office Memorandum dated 1st May, 2018 by the MoEF & CC.

S. No.	Area of Concern	Name of the village represented in public hearing	Action Plan	Budget (Crore)
1	Community Water Conservation	1. Bishanpur 2. Chak Allabaksh 3. Durgi Rajpuran 4. Mahiuldinpur 5. Khanpur	A reverse osmosis system in village cost of the scheme @10lakhs in each village*5=50	0.50
			Rainwater harvesting system in village cost of Scheme @10 lakhs in each village*5=50	0.50
2	Health facility		New dispensary in the village cost of dispensary @10Lakhs in each village*5=50	0.50

3	Employment opportunity	1. Bishanpur 2. Chak Allabaksh 3. Durgi Rajpuran 4. Mahiuldinpur 5. Khanpur	Vocational training center for the educated youth of the village Short term courses for skill upgradation for villagers	0.30
4	Educational Facility	1. Bishanpur 2. Chak Allabaksh 3. Durgi Rajpuran 4. Mahiuldinpur 5. Khanpur	Development of sports infrastructure in village (development of courts for different games, sports equipment's in village clubs or schools) to promote the sports. Distibution of computer to the Govt. School	0.60
5	Infrastructure development	1. Bishanpur 2. Chak Allabaksh 3. Durgi Rajpuran 4. Mahiuldinpur 5. Khanpur	Toilets construction under Swatch Bharat Creation of Cow shed in village	0.50
6	Miscellaneous	1. Bishanpur 2. Chak Allabaksh 3. Durgi Rajpuran 4. Mahiuldinpur 5. Khanpur	Campaigning program to stop the residual burning to stop the Air Pollution.Plantation programme in nearby areas.	0.10
Total				**3.2**

8.6 ENVIRONMENTAL BENEFIT

- The project proponent adopts the Zero Liquid Discharge (ZLD) technology. Hence, there will be NO discharge of liquid effluent outside factory premises. Industrial waste water will be treated in the MEE and Condensate Polishing Unit.
- Waste product of the sugar industry will be used as the raw material for this industry, which promote the Sustainable development.
- Agricultural waste will be used as fuel in the boiler, which decrees the dependency on the Natural resources.
- To minimize the air pollutant concentration, ESP will be installed.
- The produced product from the Ethanol plant will be used for the blending of fuel (20% by 2020) as per National Biofuel policy which results in the reduction of Green house gases.

8.7 OTHER TANGEBILE BENEFIT

- Helps in the generation of revenue to the state which will help in national economy.
- The rural economy will get a big boost due to purchase of large quantity of sugarcane.
- The unit will be pollution free since there will be no effluent discharge. So it's an ecofriendly project.
- Groundwater table will be enhanced by rain water harvesting method. Rain water harvesting system had been explained in detail in the chapter 4.

CHAPTER-9 ENVIRONMENTAL COST ANALYSIS BUDGET

As per EIA Notification dated 14th September, 2006; as amended from time to time; the Chapter on 'Environmental Cost Benefit Analysis' is applicable only, if the same is recommended at the Scoping stage.

As per the ToR points issued by MoEFCC, New Delhi vide letter no. IA-J-11011/404/2018-IA-II (I) dated 07/01/2019 for the proposed 120 KLPD Molasses based ethanol plant and 4 MW co-generation power plants. Project will produce fuel ethanol and Extra Neutral Alcohol from molasses as raw materials in Village Chak Allabaksh, Tehsil-Mukerian, District-Hoshiarpur, Punjab, No recommendation of environmental cost benefit analysis was given during scoping stage, hence it is not carried out.

CHAPTER-10 : ENVIRONMENT MANAGEMENT PLAN

10.1 INTRODUCTION

The environmental management plan consists of the set of mitigation, management, monitoring and institutional measures to be taken during implementation and operation to eliminate adverse environmental impacts or reduce them to acceptable levels. The present environmental management plan addresses the components of environmental affected during construction of the plant and by the different activities forming part of the manufacturing processes.

10.2 PURPOSE OF ENVIRONMENTAL MANAGEMENT PLAN

The main purpose of the environmental management plan is given below.

- Overall conservation of environment.
- Minimization of waste generation and pollution.
- To treat and dispose of all the pollutants viz. liquid, gaseous and solid waste so as to meet statutory requirements with appropriate technology.
- To promote green-belt development.
- To encourage good working conditions for employees.
- Safety, welfare and good health of the work force and public.
- To reduce fire and accident hazards.
- Budgeting and allocation of funds for environment management system.
- To adopt cleaner production technology and waste minimization program.

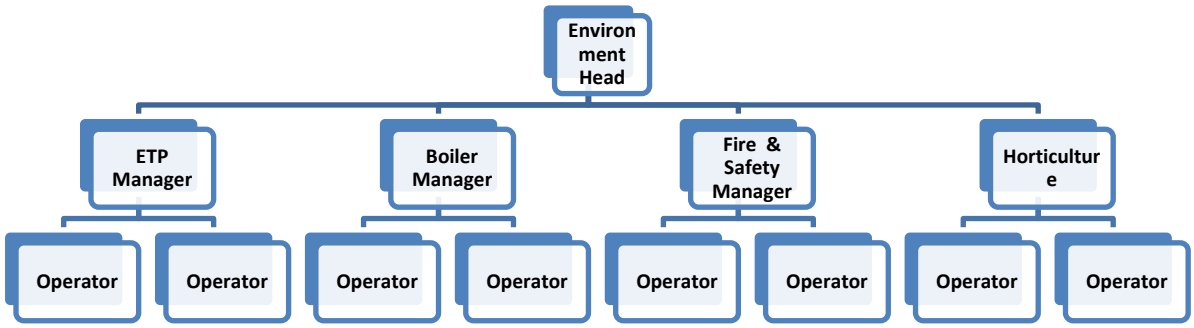


Figure 10-1: Environment Management Cell

Roles and Responsibilities:

1. **Managing Director of M/s Indian Sucrose Ltd**. is the overall in-charge for the Environmental Management Cell. His role is to verify the implementation of the Environmental Management Systems in the industry time to time.
2. **Assistant General Manager**–Technical is responsible for the efficient operation of ESP, blow downs from the utilities such as cooling towers, DM plant reject, APCD, Ash Management etc.
3. **General Manager** Production is responsible for the operation of the CPU, water management in the process, green area development and maintenance etc.
4. **The other subordinate staff**s are working under the Assistant General Manager–Technical and General Manager Production as per their instructions.

10.3 ENVIRONMENTAL POLICY

- The Environment cell follow the well defined Environment policy Which are defined below:

- Effectively manage, monitor, Improve and communicate the environmental performance.
- Take all reasonable steps to prevent pollution.
- Set realistic anti measurable objectives and targets for continual improvement of theEnvironmental performance.
- Ensure that all employees and contractors are trained to understand their environmental responsibilities and create an environment that adheres to the company's Policies, Procedures and Application Regulations.
- Hold leadership accountable for good environment performance of our operations and projects, inherent in that accountability will be the commitment of senior management to provide resources and successfully create an appropriate environment. .
- Comply fully with all relevant legal requirements, codes of practice and regulations.
- Reduce, recycle and reuse natural resources.
- Minimize waste anti increase recycling withinn the frame work of waste management procedures, identify and manage environmental risks anti hazards.
- The protect proponent shall regularly review this policy and ensure that corrective and
- Preventive actions are taken in order to ensure continual improvement.
- To treat all the pollutants viz liquid and gaseous, which contribute to the degradation of the environment, with appropriate technologies.
- To comply with all regulations stipulated by the Central] State Pollution Control Boards related to air emission and liquid effluent discharge as per air and water pollution control laws.
- To handle hazardous wastes as per the hazardous Waste (Management and Handling Rules), 2009 of the Environment (Protection) Act, 1986.
- To encourage support and conduct development work for the purpose of achieving
- Environmental standards and to improve the methods of environmental management.
- To create good working conditions (avoid of all order and noise pollution) for employees.
- To minimize fire and accident hazards.
- Perspective bed getting and allocation of funds for environment management expenditure.
- Preventive maintenance and regular checking of machineries and equipments.
- To make continuous efforts in waste minimization.
- For the equipments and pipe lines, leakage detection and repair shall be scheduled to minimize fugitive emissions. '
- Continuous efforts with energy nudist for the reduction of fuel and energy consumption.
- The system of reporting of none—conformance/ violation of any Environmental Law/ Policy will be as per quality management system. The internal audit will be conducted on periodic basis and any none—conformance] violation to Environmental Law/ Policy will be closed and discussed during Management Review Meetings of Board of Directors/ Partners.
- Environmental Management Cell will be responsible to implement the Environmental Policy.

10.4 GREEN BELT DEVELOPMENT

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

It will be exercised as follows:

i. Out of the total plant area **1.7ha** (33% of total are) will be utilized for green belt development and plantation will be done as per Central Pollution Control Board (CPCB) Norms, with consideration of the nature of pollutants, availability of space and dominant wind directions.

ii. The green belt would be consisting of shrubs, trees, avenue trees, revenue trees, crops and potted plants
iii. Native species will be given priority for Avenue plantation like Species like Sal (*Shorearobusta*), Jamun (*Syzygiumcumini*), Bel (*Aeglemarmelos*), Bargad(*Ficusbengalensis*), Neem (*Azadirachtaindica*), Peepal (*Ficusreligiosa*), Popular (*Populusdealtoides*), Safeda (*Eucalyptus cameldulensis*), Sisam (*Dalbergiasissoo*) etc.will be planted
iv. All the species suggested are pollution tolerant, besides having an aesthetic appeal.
v. Plantation will be developed at the periphery, near the MEE, near the fermentation tank, near pump& boiler etc to minimize te effect of Noise & odour problem.
vi. Green belt will be proposed as per the new guideline by the MOEF & CC i.e **2500 plant per ha**.
vii. Total no of plant to be planted in the premises will be **4250.**The five year plan with the budget is given in the **table no 10.1.**
viii. A total of **Rs 10 lakhs** will be allocated for green belt. Greenbelt development plan for the next 5 year is given in the table below:

Table 10.1: Greenbelt Development Plan

Sr. No.	Year	Total Plants	Budget (in Lakhs)	Recurring Cost(in Lakhs)
1	1st Year	850	2	0.70
2	2nd Year	850	2	0.70
3	3rd Year	850	2	0.70
4	4th Year	850	2	0.70
5	5th Year	850	2	0.70
Total		**4250**	**10**	**3.5**

Capital Cost:

- Calculation of Cost for Green belt Development for five year
- Plant Rs. 150*4250 = 63,7500/-
- Planting cost (Including soil workings, Pits @ 50 x 4250 = Rs2,12500/-
- Fencing Rs.1,50000/-
- For 5 years Total Expenditure = Rs.30 Lakhs

Recurring Cost:

- Fertilization = 20,000/-
- Security and vigilance= (Rs.50,000/-)

10.5 BUDGETORY PROVISION FOR ENVIRONMENTAL PROJECTION MEASURES

Table 10.2: Environment Management cost of Project

S.No	Environmental Protection Measure	Capital Cost (In Crore)	Recurring Cost (In lakhs)
1	Air pollution control measure		
	ESP	3	1
	Water sprinkler	1	0.3
2	Water pollution control measure		
	MEE	2	0.8
	Condensate polishing Unit	2	1.0
	Soak Pit & Septic Tank	0.01	0.06
3	Green belt development	0.10	0.70
4	Rain water harvesting	0.50	0.35
5	Fire fighting and safety measure	1	0.15
	Total EMP budget	**9.61**	**4.36**

10.6 CONSERVATION PLAN

The conservation plan has been submitted to the Chief Wildlife Warden, Mohali for approval. Reciving for conservation plan submission is attached as annexure.

CHAPTER-11 SUMMARY & CONCLUSION

11.1 OVERALL JUSTIFICATION FOR IMPLEMENTATION OF THE PROJECT

The ISL has proposed the 120 KLPD Molasses based ethanol plant and 4 MW co-generation power plants. Project will produce fuel ethanol and Extra Neutral Alcohol from molasses as raw materials in Village Chak Allabaksh, Tehsil-Mukerian, District-Hoshiarpur, Punjab.

11.2 THE PROPOSAL IS ESSENTIAL FOR THE SUSTAINABLE DEVELOPMWNT DUE TO FOLLOWING REASONS

- Bio-fuels are derived from molasses which is the by-product from the sugar industry and therefore provide a strategic advantage to promote sustainable development and to supplement conventional energy sources.
- Fuel grade ethanol is cleaner fuel as compare to diesel.
- Generation of revenue to the State.
- By product(Molasses, baggase) from our own the existing Sugar Mill will be sed as the raw material for the production of Fuel grade Ethanol, hence leading to sustainable development.
- Priority will be given for greenery development and rain water harvesting at the factory premises.
- The fuel used in boiler is the baggase, which is again the by-product of the Sugar industry, which reduces the dependence on the Non-renewable source of energy.

11.3 SALIENT FEATURE OF THE PROJECT ARE AS FOLLOW

- The proposed project will help to increase the fuel grade ethanol production in Indian, which directly help in achieving the goal of 2020 (20% blending of petrol & diesel) as per the National Bio-fuel policy 2009.
- The industry has taken all the necessary preventive measures to mitigate the negative impact caused by the industrial activities. This industry does not produce any toxic products and does not have significant adverse effect on the quality of water, air and land.
- Gaseous emission will be generated from the boiler, which will be treated in the suitable APCD i.e Electrostatic Precipitator and vented through the stack of propoper height.
- Except the used oil which will be in minimum quantity, there will be no hazardous waste generation.
- All the solid waste generated from the proposed project will be in the agro in naturei.e easily degradable.
- The project will adopt the ZLD policy.
- The industry has taken all the necessary preventive measures to mitigate the negative impact caused by the industrial activities. This industry does not produce any toxic products and does not have significant adverse effect on the quality of water, air and land.
- As per the OM 1 may 2018, the proponent has proposed the budget of 3.2 Crore, which will be used for the upliftment of the surrounding area & society.
-

11.4 CONCLUSION

M/s Indian Sucrose ltd will generate a fair amount of direct, indirect and induced employment in the region. The local economy will receive a boost due to employee spending and services generated by the company. Due to the implementation of the project activity there shall be improvement in the standard of living viz. better education, improved health, sanitation facilities etc. This is envisaged as a major positive benefit. The company's management shall recruit semi skilled and unskilled workers

from the nearby villages due to availability of local labors. The employment provided due to the proposed project would rapidly increase the social status of the villagers. There are various issues raised by the public during the public hearing related to the Pollution, proponent will consider these issues and work on it to make sustainable development.

CHAPTER-12 DISCLOUSER OF CONSULTANT

Vardan EnviroNet, established on 16th August 2012, is an accredited organization by Quality Council of India/NABET (National Accreditation Board for Education and Training) certificate no. **NABET/EIA/1619/SA077**. The updated list of accredited consultant is also available online at http://nabet.qci.org.in/environment/pop.asp?file=documents/Annexure7.pdf&heading=Accredited%20EIA%20Consultant%20Organizations%20with%20accredited%20sectors. We have our in-house Environmental Laboratory named "Vardan EnviroLab" at Plot No.82A, Sector-5, IMT Manesar, Gurgaon (Haryana) approved by National Accreditation Board for Testing and Calibration Laboratories, Govt. of India (NABL).

Quality Council of India

National Accreditation Board for Education & Training

Certificate of Accreditation

Vardan Environet

D-142, Ground Floor Sushant Lok-III, Golf Course Ext. Road Sec-57, Gurgaon -122001, Haryana

***Accredited as Category - A** organization under the QCI-NABET Scheme for Accreditation of EIA Consultant Organizations: Version 3 for preparing EIA-EMP reports in the following Sectors:*

Sl.No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals including Open cast/ Underground mining	1	1 (a) (i)	A
2	Coal Washeries	6	2 (a)	A
3	Mineral beneficiation including palletisation	7	2 (b)	A
4	Metallurgical industries (ferrous & non-ferrous)	8	3 (b)	A
5	Cement plants	9	3 (b)	A
6	Coke oven plants	11	4 (b)	A
7	Petrochemical based processing (processes other than cracking & reformation and not covered under the complexes)	20	5 (e)	B
8	Synthetic organic chemicals industry (dyes and dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	21	5 (f)	A
9	Distilleries	22	5 (g)	A
10	Sugar Industry	25	5 (j)	B
11	Oil & gas transportation pipeline (crude and refinery/ petrochemical products), passing through national parks/sanctuaries/ coral reefs/ecologically sensitive areas including LNG terminal	27	6 (a)	A
12	Isolated storage & handling of hazardous chemicals (As per threshold planning quantity indicated in column 3 of Schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	28	6 (b)	B
13	Highways	34	7 (f)	A
14	Common effluent treatment plants (CETPs)	36	7 (h)	B
15	Common Municipal Solid Waste Management Facility (CMSWMF)	37	7 (i)	B
16	Building and construction projects	38	8 (a)	B
17	Townships and Area development projects	39	8 (b)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in SA AC minute dated Oct 12, 2018, posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/18/0844 dated Dec 19, 2018.The accreditation needs to be renewed before the expiry date by Vardan Environet following due process of assessment.

Sr. Director, NABET
Dated: Dec 19, 2018

Certificate No.
NABET/EIA/1619/ SA 077

Valid up to
Nov 9 ,2019

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.

National Accreditation Board for Education and Training
(Member - International Accreditation Forum & Pacific Accreditation Cooperation)

November 06, 2019

QCI/NABET/EIA/ACO/19/1111
Vardan Environet
Plot No. 82-A, Sector 5, IMT Manesar
Gurugram – 122051, Haryana
(Kind Attention: **Mr Anshul Yadav**)

Sub: Validity of Accreditation

Dear Sir,

This has reference to the accreditation of your organization under QCI-NABET EIA Scheme, the validity of **Vardan Environet, Gurugram** is hereby extended till February 08, 2020 or completion of assessment process, whichever is earlier.

The above extension is subject to the submission of required information/documents related to assessment on time to NABET.

You are requested not to use this letter after expiry of the above stated date.

With best regards,

06/11/2019

A.K Jha
Senior Director| NABET

Institute of Town Planners India, 6th Floor, 4-A, Ring Road, I.P Estate, New Delhi-110 002, India
Telefax : +91-11-233 23 416, 417, 418, 419, 420 E-mail : ceo.nabet@qcin.org Fax : +91-11-233 23 415 Website : www.qcin.org

National Accreditation Board for Education and Training
(Member - International Accreditation Forum & Pacific Accreditation Cooperation)

NABET

Jan 20, 2020

QCI/NABET/EIA/ACO/20/1212

Vardan Environet
D-142, Sushant-Lok III,
Golf Course Extension Road, Sector- 57,
Gurugram, Haryana

Sub: Validity of Accreditation

Dear Sir/Madam,

This has reference to the accreditation of your organization under QCI-NABET EIA Scheme, the validity of Vardan Environet, Gurugram is hereby extended till April 19, 2020 or completion of assessment process, whichever is earlier.

The above extension is subject to the submission of required information/documents related to assessment on time to NABET.

You are requested not to use this letter after expiry of the above stated date.

With best regards,

for 20/1/2020
A.K Jha
Senior Director| NABET

Institute of Town Planners India, 6th Floor, 4-A, Ring Road, I.P Estate, New Delhi-110 002, India
Tel. : +91-11-233 23 416, 417, 418, 419, 420, 421, 423 E-mail : ceo.nabet@qcin.org Website : www.qcin.org

Annexure-I

Executive Summary

1. The Indian Sucrose Ltd has proposed the 120 KLD Molasses based ethanol plant and 4 MW co-generation power plants. Project will produce fuel ethanol and Extra Neutral Alcohol from molasses in Village ChakAllabaksh and Mahiuldinpur Dalel, Tehsil-Mukerian, District-Hoshiarpur, Punjab.

2. The online application on the MOEF&CC portal was applied on dated 5th December 2018 under Category 'A' (Molasses based distillery greater than 60 KLD) and Activity 5 (g) and Standard ToR was granted on dated 7th January, 2019.

3. The proposed project will help to increase the fuel grade ethanol production in Indian, which directly help in achieving the goal of 2020 (20% blending of petrol & diesel) as per the National Bio-fuel policy 2009.

4. Fuel grade ethanol is cleaner fuel as compare to diesel.

5. Industry will help in the Generation of revenue to the State.

6. By product(Molasses, baggase) from our own the existing Sugar Mill will be used as the raw material for the production of Fuel grade Ethanol, hence leading to sustainable development.

7. The proposed CER budget for the project is 3.2 crore, which will be to meet the issue raised during Public hearing and for the up liftmen of the society as Social need assessment.

8. The proposed Industry will provide the employment to the **98 (approx)**persons during the operation work and **50 (Approx)** during construction work will be

9. The total land required for the project is 13 ha. No forestland is involved. The entire land has been acquired for the project. It has been reported that no water body/ water body exist around the project and modification/diversion in the existing natural drainage pattern at any stage has not been proposed.

10. Industry will develop greenbelt in an area of 17 Ha (33% of the total area). Approx. 4250 no of trees will be planted in the project premises.

11. The estimated project cost is Rs. 160 crores. Total capital cost earmarked towards environmental pollution control measures is Rs. 9.61 Crore and the Recurring cost (operation and maintenance) will be about Rs. 4.36 Lakhs per annum.

12. There are no National parks, wildlife sanctuaries, Biosphere Reserves, Tiger/Elephant Reserves, and Wildlife Corridors etc. within 10 km distance from the project site. Beas River is following at a distant 6m in SW from the project site.

13. The basic raw material requirement for the project is molasses (480 TPD)& baggase (20 TPH) which will be brought from the its own sugar mill & nearby sugar mill (Bhawanpur&Bhogpur Sugar Mill).

14. The total fresh water requirement for the project is853 KLD (Industrial 848 KLD + Domestic 5 KLD) which will be source from the Ground water. CGWA application for the withdrawal of Ground water has been applied vide application no 21-4/4688/PB/IND/2019 on dated 14-01-2019.

15. The total Power requirement for the project is 3100 Kwh which will be sourced from its own co-generation power plant. Total steam requirement for the project is 30TPH which will be source the boiler of capacity 45 TPH.

16. The project will be based on the ZLD scheme. Waste water (Spent wash) generated from the process will be treated in the Multiple Effect Evaporator and the Spent less water will be treated in the Condensate polishing Unit.

17. Gaseous emission will be generated from the boiler, which will be treated in the suitable APCD i.e Electrostatic Precipitator and vented through the stack of popper height.

18. Except the used oil which will be in minimum quantity, there will be no hazardous waste generation.All the solid waste generated from the proposed project will be in the agro in naturei.eeasily degradable.

19. Based on the ToR letter No.IA-J-11011/404/2018-IA-II(I) the 3 month baseline data was collectedfrom October-December 2018 and the result are found to be within limit.

Annexure-II

Application for Permission to Abstract Ground Water for Industrial Use (Application For New NOC)

Application Number : 21-4/4688/PB/IND/2019

1.	**General Information:**		
	Water Quality:		Fresh Water
	Application Type Category/ Type of Application:		Distilleries
	(i)	**Name of Industry:**	M/S INDIAN SUCROSE LIMITED
	(ii)	**Location Details of the Industrial Unit- (Attach Approved Site Plan with Location Map) ($)**	
		Address Line 1 :	G.T. ROAD, MUKERIAN, HOSHIARPUR, PUNJAB
		Address Line 2 :	
		Address Line 3 :	
		State:	PUNJAB
		District:	HOSHIARPUR
		Sub-District:	MUKERIAN
		Village/Town:	Bishanpur (235)
		Latitude:	31.925694
		Logitude:	75.626400
		Area Type :	Non-Notified
		Area Type Category :	Semi Critical
	(iii)	**Communication Address**	
		Address Line 1:	202/47, THAPAR ARCADE KALU SARAI, HAUZ KHAS
		Address Line 2:	
		Address Line 3:	
		State:	DELHI
		District:	SOUTH WEST
		Sub-District:	
		Pincode:	110016
		Phone Number with Area Code:	
		Mobile Number:	91 8308849105
		Fax Number:	
		E-Mail:	deepak.yadav@yaducorporation.com
	(iv)	**Salient Features of the Industrial Activity:**	
		Indian Sucrose Limited (ISL) is an integrated conglomerate, primarily engaged in manufacture of sugar and allied products.	

(v) Land Use Details of the Existing / Proposed Industrial Unit Premises Ownership of the Land :

Land Use Details	Existing (sq meter)	Proposed (sq meter)	Grand Total (sq meter)
Green Belt Area		17401.50	17401.50
Open Land		6353.56	6353.56

Application for Permission to Abstract Ground Water for Industrial Use (Application For New NOC)

Application Number : 21-4/4688/PB/IND/2019

		Road/ Paved Area		5139.50	5139.50
		Rooftop area of building/ sheds		23714.58	23714.58
		Total		52609.14	52609.14

	(vi)	**Drainage in the Area (River/ Nala etc) :**	Bishanpur distributary flowing below the southern boundary of the project area
	(vii)	**Source of Availability of Surface Water for Infrastructure Use (Submit Water Availability / Non Availability Certificate):($)**	na
	(viii)	**Average Annual Rainfall in the Area (in mm):**	938.00
	(ix)	**Townships / Villages (Within 2km Radius of the Industrial Unit):**	Chak Allah Baksh, Mahiuldinpur Dalel
	(x)	**Whether Ground Water Utilization for:**	New Industry
		Date of Commencement Industry:	
		Date of Expansion :	

2. Details of Water Requirement (Fresh and Recycled Water Usage):
(Please Enclose Water Balance Flow Chart of Activities and Requirement of Water at each Stage) ($)

(i) Total Water Requirement (a+b+c+d) (m3/day)

			Existing	Proposed	Total
		Water Requirement Details (Fresh Water) (m3/day)			
(a)	**Ground Water Requirement (m3/day):**		0.00	1150.00	1150.00
(b)	**Surface Water Available (Canal, River, Ponds etc.) (m3/day):**		0.00	0.00	0.00
(c)	**Water Supply from Any Agency (m3/day):**		0.00	0.00	0.00
	Total Fresh Water Requirement (a+b+c)(m3/day):		**0.00**	**1150.00**	**1150.00**
(d)	**Recycled Water Usage (m3/day):**		0.00	948.00	948.00
	Total Water Requirement : (a+b+c+d)(m3/day)		**0.00**	**2098.00**	**2098.00**

(ii) Breakup of Water Requirement and Usage:

Activity	Existing Requirement (m3/day)	Proposed Requirement (m3/day)	Total Requirement (m3/day)	No. of Operational Days in a Year	Annual Requirement (m3/year)
Industrial Activity	0.00	2080.00	2080.00	330	686400.00
Residential / Domestic	0.00	11.00	11.00	330	3630.00
Greenbelt Development /Environment Maintenance	0.00	7.00	7.00	330	2310.00
Other Use	0.00	0.00	0.00	330	0.00
Grand Total	0.00	2098.00	2098.00		692340.00

Application for Permission to Abstract Ground Water for Industrial Use (Application For New NOC)

Application Number : 21-4/4688/PB/IND/2019

					(m3/day)	(Days)	(m3/year)
(iii)	**Breakup of Recycled Water Usage:**						
	(a)	**Total Waste Water Generated :**			1116.00	330	368280.00
	(b)	**Quantity of Treated Water Available**			948.00		
		i).	**Reuse in Industrial Activity:**		944.00	330	311520.00
		ii).	**Reuse in Green Belt Development:**		0.00	330	0.00
		iii).	**Other Uses:**		4.00	330	1320.00
	(c)	**Total Treated Water Utilized:**			948.00		312840.00
Net Ground Water Requirement:					1150.00 (m3/day)		

3. (a). Groundwater Abstraction Structure- Existing:

Number of Existing Structures: 0

SNo.	Type of Structure Name / Year of Construction	Depth (Meter) / Diameter (mm)	Depth to Water Level (Meters below Ground Level)	Discharge (m3/Hour)	Operational Hours (Day) / Days (Year)	Mode of Lift Name	Horse Power of Pump	Whether Fitted with Water Meter	Whether Permission Registered with CGWA / If so Details Thereof

(b). Groundwater Abstraction Structure- Proposed:

Number of Proposed Structures: 2

SNo.	Type of Structure Name / Year of Construction	Depth (Meter) / Diameter (mm)	Depth to Water Level (Meters below Ground Level)	Discharge (m3/Hour)	Operational Hours (Day) / Days (Year)	Mode of Lift Name	Horse Power of Pump	Whether fitted with Water Meter	Whether Permission Registered with CGWA / If so Details Thereof
1	Borewell / -	200.00 / -		250.00	- / -	Submersible Pump	120.00	Yes	Yes / -
2	Borewell / -	200.00 / 305		250.00	- / -	Submersible Pump		Yes	Yes / -

4. Groundwater Availability (Please Enclose a Comprehensive Report / Note on Groundwater Condition in and Around the Area) Applicable to Industries Consuming Greater Than 500 m3/day : ($)

Detailed Hydrogeological report attached

5. Details of Rrainwater Harvesting and Artificial Recharge Measures Proposed / Implemented. If Ground Water Recharge outside the Industrial Unit Premises, then provide NOC from the Concern Authority / Agency if Already implemented, details may be furnished. (Attach Rainwater Harvesting /Artificial Recharge Proposal).($)

Attached as Rain water harvesting report

Application for Permission to Abstract Ground Water for Industrial Use (Application For New NOC)

Application Number : 21-4/4688/PB/IND/2019

6.	**Consent to Operate / Estibilish / Approval Letter from Statutory Bodies viz Ministry of Environment & Forests (MoEF) or State Pollution Control Board(SPCB) or State Level Expert Appraisal Committee(SEAC) or State Level Environment Impact Assessment Authority(SLEIAA):($)**			
	Attached Consent/ Approval of Government Agency(Previous: Referral Letter)			
	Letter Number		**new project**	
	S.No	**Consent /Approval of Govornment Agency**	**Attachment Name**	**File Name**
	1	Other Central Agency	Factory intimation letter	factory Intimation letter.pdf

7.	**Have You Applied Earlier for Groundwater Clearance from CGWA / State Government Agency:**
	If Yes, so Details thereof with Status:

INDUSTRIAL USE- Self Declaration

☑ It is to Certify that the Data and Information Furnished Above are True to the Best of My Knowledge and Belief and I am Aware that if Any Part of the Data / Information Submitted is Found to be False or Misleading at Any Stage the Application will be Rejected Out Rightly.

1. Application Proforma is Subject to Modification from Time to Time.

2. Application should be submitted to Regional Office.

Regional Director,Central Ground Water Board North Western Region, Bhujal Bhawan, Plot No. 3B, Sector 27-A, CHANDIGARH, CHANDIGARH, 160019

3. Incomplete Application will be Summarily Rejected.

Submitted Application will not be Processed till the Print Out of the Signed Complete Application is Submitted to Regional Office.

4. Applicant has to Submit Processing Fee of Rs. 1000.00/- (Rupees One Thousand Only) through NON TAX RECEIPT PORTAL (https://bharatkosh.gov.in). A receipt will be generated. Please fill in the Transaction Ref No. and Date from the receipt, in print out of application and attach receipt along with hard copy of application.

Bharatkosh Details:-

Transaction Ref Number:-	
Dated:-	

Note:- The Processing Fee is Non-Refundable. Applicant should ensure and Check Eligibility of Submission of Application and Required Documents before Submitting Online Application.

Attached Files:

1). Site Plan with Location Map (Previous: Site Plan) : (Refer: 1 (ii))

S.No	Attachment Name	File Name
1	Location map	Location Map.pdf

2). Certified Revenue Sketch : (Refer: 1 (ii))

No Attachment Found!

3). Documents of Ownership / Lease : (Refer: 1 (v))

No Attachment Found!

Application for Permission to Abstract Ground Water for Industrial Use (Application For New NOC)

Application Number : 21-4/4688/PB/IND/2019

4). Source Water Availability/Non-availability Certificate(Previous: Source of Availability of Surface Water) : (Refer: 1 (vii))

S.No	Attachment Name	File Name
1	Denial letter	Denial letter.pdf

5). Water Balance Flow Chart (Previous: Enclose Flow Chart of Activity and Requirement of Water): (Refer: 2)

S.No	Attachment Name	File Name
1	water flow chart	water flow chart.pdf

6). Hydrogeological Report(Previous: Groundwater Availability Report) : (Refer: 4)

S.No	Attachment Name	File Name
1	Hydrogeology report	Hydrogeology report.pdf

7). Rain Water Harvesting/Artificial Recharge proposal(Previous: Details of Rainwater Harvesting / Artificial Recharge Measures) : (Refer: 5)

S.No	Attachment Name	File Name
1	Rain water harvesting report	Rainwater Harvesting Report.pdf

8). Authorization Letter (Previous: Authorization) :

S.No	Attachment Name	File Name
1	authorization letter	authorization letter.pdf

10). Ground Water Quality Report(Previous: Non-Polluting Effluent) :

S.No	Attachment Name	File Name
1	ground water quality report	Ground Water quality report comp.pdf

11). Extra Attachment :

No Attachment Found!

12). Scanned Industrial Application :

No Attachment Found!

Application for Permission to Abstract Ground Water for Industrial Use (Application For New NOC)

Application Number : 21-4/4688/PB/IND/2019

Date : Name & Signature of the applicant

Place : (With official seal)

Associated User : anshul523

Submitted By User : anshul523

Submission Date : 14/01/2019

* In case signed by any authorized signatory, the details of the signatory with the authorization shall be enclosed.

Annexure-III

भारत सरकार
Government of India

वाणिज्य और उद्योग मंत्रालय
Ministry of Commerce & Industry

औद्योगिक सहायता सचिवालय
Secretariat for Industrial Assistance

जन सम्पर्क एवम् शिकायत अनुभाग
Public Relation & Complaints Section

Contact Address in St
V.N.MATHUR
CHIEF CO-ORDINATOR
DIRECTOR OF INDUSTRIES
17-DAYS BUILDING,
SECTOR 17
CHANDIGARH
Telephone : 701285
Fax : 701279

प्राप्ति सूचना

संख्या..... 555/SIA/IMO/2016 नई दिल्ली, दिनांक
No. ..... ACKNOWLEDGEMENT New Delhi, Date 05/04/2016

एतद्द्वारा निम्नलिखित का विनिर्माण करने संबंधी आपका ज्ञापन प्राप्त होने की सूचना दी जाती है।
The receipt of your memorandum for the manufacture of following is hereby acknowledged:-

Item Code		
	Proposed Item of Manufacture	DISTILLING, RECTIFYING AND BLENDING OF SPIRITS (UN DENATURED ETHYL ALCOHOL OF AN ALCOHOLIC STRENGTH BY VOLUME OF 80% VOL OR HIGHER)
	falling under NIC - broad description	
11019	DISTILLING, RECTIFYING AND BLENDING OF SPIRITS	
	Proposed Capacity :	125.00 KLPD

********** No More Items **********

This acknowledgement is subject to the provisions of Press Note No 6 dated 29th July 1993, Press Note No 17 dated 28th November 1997 and Press Release dt 17-01-2012 (F.No.7(7)/2011-IP) regarding the significance implications and legal status of filing of Industrial Entrepreneur Memorandum
** No Potable Alcohol shall be produced

M/S INDIAN SUCROSE LTD,
GT ROAD, MUKERIAN,
ADJOINING SUGAR MILL,
MUKERIAN,HOSHIARPUR,
PUNJAB - 144211

R. Mythili
(R. Mythili)
Under Secretary
Ministry of Commerce & Industry
Deptt. of Industrial Policy & Promotion
Udyog Bhawan, New Delhi

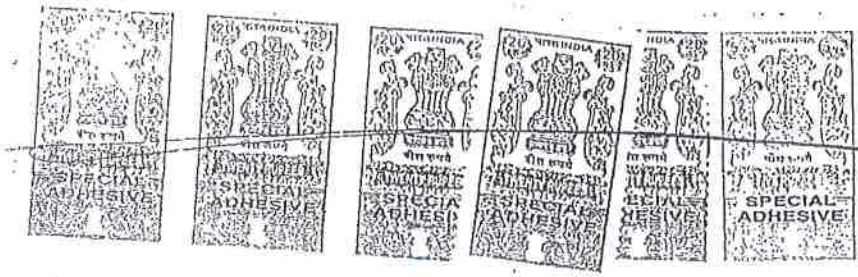
स्थापना–स्थल Located at	
स्थान/कस्बा Place/Town	GT ROAD MUKRIAN
तहसील/ताल्लुक Tehsil/Taluk	
जिला District	HOSHIARPUR
राज्य State	PUNJAB

E1404173...

Annexure-IV

Annexure-A-4

(13)



CERTIFICATE OF SALE

(for movable property)

This Stamp Paper forms part of Certificate of Sale executed in favour of Indian Sucrose Limited

On 17.02.2010

IFCI LIMITED CHANDIGARH

17/2/2010

153

A. CERTIFICATE OF SALE
(for movable property)

Whereas

The undersigned being the Authorised Officer of IFCI Ltd and having its registered office at IFCI Limited, IFCI Tower, 61, Nehru Place, New Delhi 110 019 (hereinafter referred to as "IFCI") under the Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002 and in exercise of the powers conferred under sub-section (12) of Section 13 read with rules 7 and 9 of the Security Interest (Enforcement) Rules, 2002 has in consideration of the payment of Rs. 7.2 crore (Rupees Seven Crore Twenty Lacs only) sold on behalf of the Secured Creditors who has financed Secured Debt as defined in the Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002 (hereinafter referred to as "Secured Creditors") in favour of Indian Sucrose Ltd, a company registered under the Companies Act, 1956 and having its registered office at G. T. Road, Mukerian 144211, Hoshiapur, Punjab the assets described and shown in the Schedule I hereto, secured in favour of the Secured Creditors by M/s Mukerian Paper Ltd. towards the financial facilities offered by Secured Creditors as under:

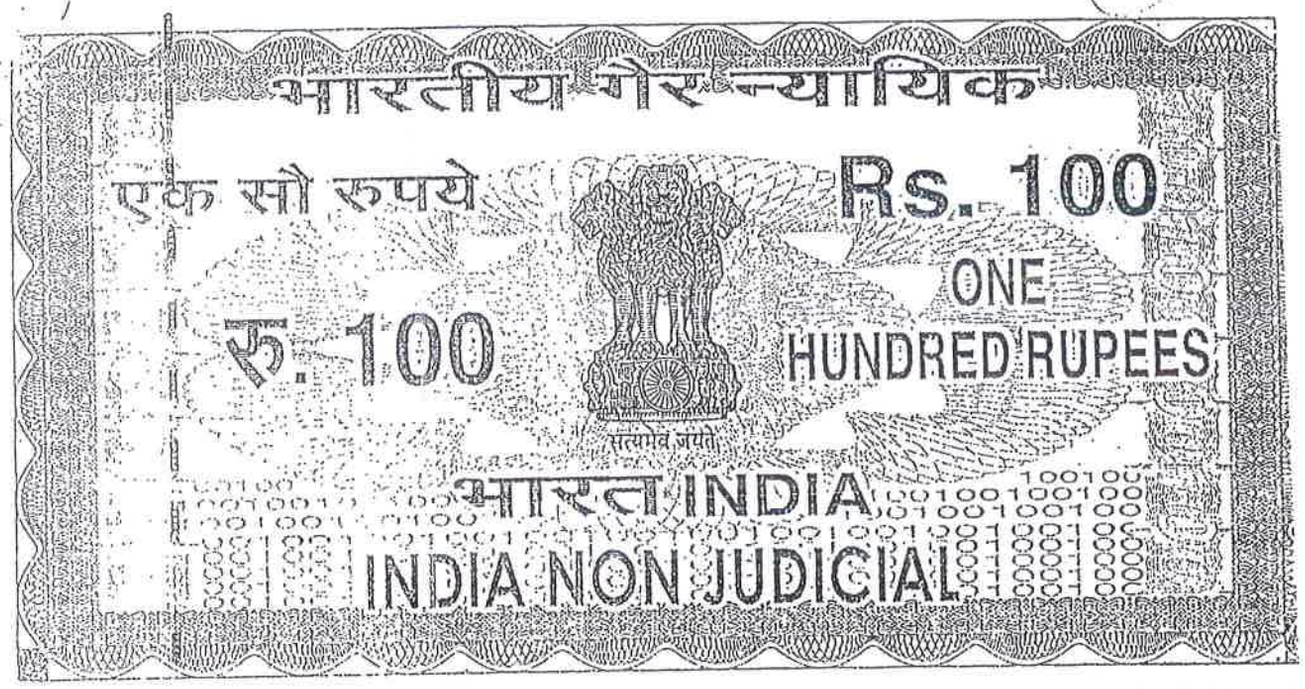
Secured Creditors	Total Outstanding as on February 16, 2010 - Rs. 10,00,50,99,284/- together with further interest and expenses w.e.f February 17, 2010.

The undersigned acknowledges the receipt of the sale price in full and has handed over the delivery and possession of the property as mentioned in the schedule I.

The details of the payments received by Arcil are as given below.

Sr. No.	Demand Draft/ Pay Order/ Cheque No	Date	Amount (Rs. lakhs)	Bank
1	626836	29.12.09	310.00	PNB, Mukerian, (pb)
2	006203	29.12.09	50.00	ICICI Bank, Mukerian (pb)
3	563374	13.02.10	225.00	PNB, Mukerian, (pb)
4	563375	15.02.10	135.00	PNB, Mukerian, (pb)
Total			720.00	

17/2/2010



पंजाब PUNJAB

K 544141

SALE CERTIFICATE

(for Immovable property)

This Stamp Paper forms part of Sale Certificate executed in favour of Indian Sucrose Limited on 17.02.2010.

IFCI LIMITED CHANDIGARH

17/2/2010

E CERTIFICATE

ovable property)

ed Officer of IFCI Ltd and having its registered 1, Nehru Place, New Delhi 110 019 (hereinafter Securitisation and Reconstruction of Financial ty Interest Act, 2002 and in exercise of the n (12) of Section 13 read with rules 7 and 9 of nt) Rules, 2002 has in consideration of the es Thirty One Crore Eighty Lacs only) sold on no has financed Secured Debt as defined in the of Financial Assets and Enforcement of Security ferred to as "Secured Creditors") in favour of egistered under the Companies Act, 1956 and Road, Mukerian 144211, Hoshiapur, Punjab, the e Schedule I hereto, secured in favour of the an Paper Ltd. towards the financial facilities der:

	Total Outstanding as on February 16, 2010 - Rs. 10,00,50,99,284/- together with further interest and expenses w.e.f February 17, 2010.

eceipt of the sale price in full and has handed e property as mentioned in the schedule I.

by Arcil are as given below.

	Amount (Rs. lakhs)	Bank
2.09	250.00	PNB, Mukerian (pb)
2.09	50.00	PNB, Mukerian (pb)
2.09	50.00	PNB, Mukerian (pb)
2.09	200.00	PNB, Mukerian (pb)
2.09	65.00	PNB, Mukerian (pb)
2.09	975.00	PNB, Mukerian (pb)
2.10	750.00	PNB, Mukerian (pb)
2.10	420.00	PNB, Mukerian (pb)
2.10	420.00	PNB, Mukerian (pb)
	3180.00	

IFCI LIMITED CHANDIGARH

17/2/2010

Annexure-A-5

(151)

POSSESSION OF SECURED ASSETS OF MUKERIAN PAPER LTD

Pursuant to and simultaneous with the Sale Certificate for immovable property and Certificate of Sale for movable property executed today by Authorised Officer of IFCI Ltd. (IFCI) in respect of secured assets of M/s Mukerian Paper Ltd, we, Indian Sucrose Limited confirm that we have received vacant and peaceful possession in good condition and without any grievance whatsoever of the following property-

All those piece and parcel of freehold property admeasuring 48.30 acres situated at Chak Allabaksh, Tehsil Mukerian, District Hoshiarpur, in the state of Punjab:

On the North by	Sugar Mills
On the South by	Colony / Bishanpura Road
On the East by	Agricultural land
On the West by	G.T.Road (Jallandhar - Pathankot Highways)

together with all buildings, structures thereon and all plant and machinery attached to the earth or permanently fastened to anything attached to the earth (more particularly described in Annexure enclosed hereto).

Vacant and peaceful possession of the above Secured Assets (as per Annexure enclosed to this Receipt) handed over pursuant to the receipt of amount of entire sale proceeds.

Possession of the above Secured Assets received as per Annexure enclosed to this Receipt. We have verified all the items and have satisfied ourselves.

(S. Sengupta) 17/2/2010

Authorised Officer
For IFCI Ltd.

Witness.....

Name: Aalok Dave
Assistant Vice President
Asset Reconstruction Company (India) Ltd

Date: 17/2/2010

Place: Mukerian, Punjab

(KUNAL SINGH)

Authorised Signatory
For Indian Sucrose Ltd.

Witness.....

Name GAURAV AGARWAL
Chief Manager
Indian Sucrose Ltd.

Date:

Place: Mukerian, Punjab

Possession Handed over by:
(S. Sengupta)
Authorised Officer
For IFCI Ltd.

17/2/2010

Possession taken over by:
(M. K. KATOCH)
Authorised Signatory
For Indian Sucrose Ltd.

(RAJENDER KUMAR)

ANNX - C-3



पंजाब PUNJAB

K 544142

SALE CERTIFICATE

(for Immovable property)

This Stamp Paper forms part of Sale Certificate executed in favour of Indian Sucrose limited On 17.02.2010.

17/2/2010

ANNX - C - 4

A. SALE CERTIFICATE

(for Immovable property)

Whereas

1. The undersigned being the Authorised Officer of IFCI Ltd and having its registered office at IFCI Limited, IFCI Tower, 61, Nehru Place, New Delhi 110 019 (hereinafter referred to as "IFCI") under the Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002 and in exercise of the powers conferred under sub-section (12) of Section 13 read with rules 7 and 9 of the Security Interest (Enforcement) Rules, 2002 has in consideration of the payment of Rs. 31.8 crore (Rupees Thirty One Crore Eighty Lacs only) sold on behalf of the Secured Creditors who has financed Secured Debt as defined in the Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002 (hereinafter referred to as "Secured Creditors") in favour of Indian Sucrose Ltd, a company registered under the Companies Act, 1956 and having its registered office at G. T. Road, Mukerian 144211, Hoshiapur, Punjab, the assets described and shown in the **Schedule I** hereto, secured in favour of the Secured Creditors by M/s Mukerian Paper Ltd. towards the financial facilities offered by Secured Creditors as under:

Secured Creditors	Total Outstanding as on February 16, 2010 - Rs. 10,00,50,99,284/- together with further interest and expenses w.e.f February 17, 2010.

The undersigned acknowledges the receipt of the sale price in full and has handed over the delivery and possession of the property as mentioned in the schedule I.

The details of the payments received by Arcil are as given below.

Sr. No.	Demand Draft/ Pay Order/ Cheque No	Date	Amount (Rs. lakhs)	Bank
1	626807	15.12.09	250.00	PNB, Mukerian (pb)
2	626808	15.12.09	50.00	PNB, Mukerian (pb)
3	626809	15.12.09	50.00	PNB, Mukerian (pb)
4	626833	28.12.09	200.00	PNB, Mukerian (pb)
5	626837	29.12.09	65.00	PNB, Mukerian (pb)
6	626991	29.12.09	975.00	PNB, Mukerian (pb)
7	627060	15.02.10	750.00	PNB, Mukerian (pb)
8	563372	15.02.10	420.00	PNB, Mukerian (pb)
9	563373	15.02.10	420.00	PNB, Mukerian (pb)
Total			3180.00	

17/2/2010

ANNEXURE

DESCRIPTION OF THE MOVABLE AND IMMOVABLE ASSETS

A. Details of Land and Building

All those piece and parcel of freehold property admeasuring 48.30 acres situated at Chak Allabaksh, Tehsil Mukerian, District Hoshiarpur, in the state of Punjab:

On the North	Sugar Mills
On the South by	Colony / Bishanpura Road
On the East by	Agricultural land
On the West by	G.T.Road (Jallandhar - Pathankot Highways)

together with all buildings, structures thereon attached to the earth or permanently fastened to anything attached to the earth.

More particularly described as under:

All those pieces and parcels of land admeasuring 48.30 acres situate at village Chak Allabaksh, Tehsil Mukerian Distt. Hoshiarpur in the State of Punjab comprised in rectangle nos. 30,32,33,34,37,38,39 as described in the Deed of Conveyance dated June 2, 1977 executed by the President of Indian in favour of Company described as under:

Possession Handed over by:
(S. Sengupta)
Authorised Officer
For IFCI Ltd.

17/2/2016

Rajender Kumar
(RAJENDER KUMAR)

Possession taken over by:
(M K KATARIA)
Authorised Signatory
For Indian Sucrose Ltd.

District	Tehsil	Locality	Rect.	Killa	Area
Hoshiarpur	Mukerian	Chak-Alla Baksh H.B. No. 236-	30	13 Min	1.00
				18 Min	1.04
				23 Min	1.04
			32	3/1 Min	0.04
				3/2	1.00
				8 Min	1.04
				13 Min	1.03
				18/1	4.17
				18/2	2.12
				19	7.16
				20/1	6.08
				20/2	1.03
				21/1	0.08
				21/2	4.16
				21/3	2.16
				22	8.00
				23	7.16
			33	16/1	6.04
				16/2	1.07
				17/1	3.18
				17/2	3.18
				21/1	3.02
				21/2	4.18
				22/1	3.02
				22/2	2.09
				22/3	2.09
				23/1	2.00
				23/2	4.12
				23/3	1.08
				24/1	3.08
				24/2	0.08
				24/3	3.16
				25/1	5.16
				25/2	2.04
			34	25/1	2.18
				25/2	4.02
			37	5	5.06
				6	4.10
				15	3.06
				16/1	1.18
			38	1	7.11

Possession Handed over by:
(S. Sengupta)
Authorised Officer
For IFCI Ltd.

17/2/2010

Rajinder Kumar
(RAJINDER KUMAR)

Possession taken over by:
(M.K. KATARIA)
Authorised Signatory
For Indian Sucrose Ltd.

INDIAN SUCROSE LIMITED
G.T. Road, Mukerian

				2	7.11
				3/1	3.12
				3/2	0.08
				3/3	3.12
				4	7.11
				5	7.11
				6	8.00
				7/1	3.08
				7/2	4.12
				8	8.00
				9	8.00
				10	8.00
				11	8.00
				12	8.00
				13/1	3.02
				13/2	4.18
				14	8.00
				15/1	5.13
				15/2	1.07
				15/3	1.00
				16	8.00
				17	8.00
				18/1	4.17
				18/2	3.03
				19	8.00
				20	8.00
			39	1/1	4.11
				1/2	2.13
				2	7.11
				3/1	1.10
				3/2	0.15
				3/3	0.11
				3/4	4.11
				8/1	6.04
				8/2	1.07
				9	7.16
				10/1	4.06
				10/2	3.10
				11	8.00
				12/1	2.00
				12/2	6.00
				13/1	5.12
				13/2	2.08
				18/1	2.02

Possession Handed over by:
(S. Sengupta)
Authorised Officer
For IFCI Ltd.

17/2/2010

Rajesh Kumar
(RAJESH KUMAR

Possession taken over by:
(M.K. KATARA
Authorised Signatory
For Indian Sucrose Ltd.

				18/2	5.08
				19/1	0.08
				19/2	7.12
				20/1	2.16
				20/2	5.04
				116 Min	4.06
		Total			385.80

OR

48.30 acres

together with all buildings, structures thereon attached to the earth or permanently fastened to anything attached to the earth.

Possession Handed over by:
(S. Sengupta)
Authorised Officer
For IFCI Ltd.

17/2/2010

Rajender Kumar
(RAJENDER KUMAR)

Possession taken over by:
(M.K. KATARIA)
Authorised Signatory
For Indian Sucrose Ltd.

INDIAN SUCROSE LIMITED
G.T. Road, Mukerian

5

Annexure-2

1.1.1.1 Impact Assessment through Mathematical Modelling

ISCST3 Dispersion Model

The Industrial Source Complex (ISC) Short Term model provides options to model emissions from a wide range of sources that might be present at a typical industrial source complex. ISCST3 is US-EPA approved model to predict the air quality. The model uses urban dispersion and regulatory defaults options as per guidelines on air quality models (PROBES/70/1997-1998). Emission sources are categorized into four basic types of sources, i.e., point sources, volume sources, area sources, and open pit sources. The volume source option and the area source option may also be used to simulate line sources. The model assumes receptors on flat terrain. The ISC short term area source model is based on a numerical integration over the area in the upwind and cross wind directions of Gaussian plume formula. This can be applied to the Point, Area, Line or Volume sources simultaneously and their resultant incremental concentration of the pollutant can be predicted.

Model Options Used For Computations: The options used for short-term computations are:

- The plume rise is estimated by Briggs formulae, but the final rise is always limited to that of the mixing layer;
- Stack tip down-wash is not considered;
- Buoyancy Induced Dispersion is used to describe the increase in plume dispersion during the ascension phase;
- Calms processing routine is used by default;
- It is assumed that the pollutants do not undergo any physio-chemical transformation and that there is no pollutant removal by dry deposition;
- Washout by rain is not considered;
- Flat terrain is assumed / used for computations;
- Cartesian co-ordinate system has been used for computations; and
- The model computations have been done for 10 km with 100 m grid interval.

Gaussian Plume Model

Ground Level Concentration (χ) (GLC) from a point source at any receptor is given by –

$$\chi = \frac{Qg_1g_2}{(2\pi\sigma_y\sigma_z u)} \quad \text{- (USEPA ISCST3, 1987)}$$

where,

$\mathbf{g_1}$ = exp(-y2/2σy2)

$\mathbf{g_2}$ = exp[-(z-H)2/2σz2] + exp[-(z+H)2/2σz2]

Q = source strength

Z = receptor height above the ground

H_e = effective stack height (Plume rise + Physical stack height)

u = wind speed at stack level

σ_y &σ_z = dispersion parameters

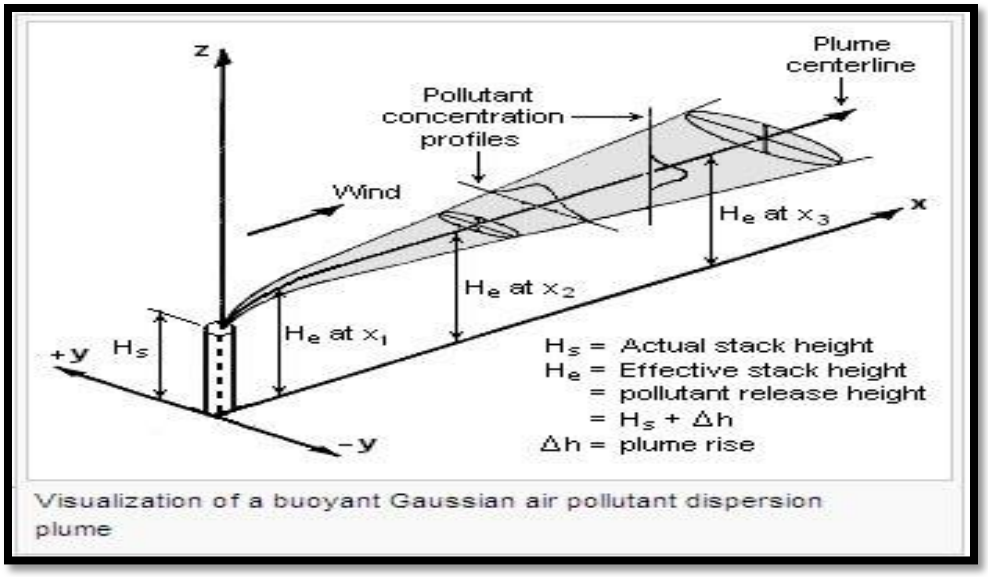


Figure Error! No text of specified style in document.**-1: Gaussian Plume Model**

Dispersion Parameters

Dispersion parameters σ_y and σ_z for open country conditions (Briggs, 1974) are used, as the project is located on in a rural area. Atmospheric dispersion coefficients vary with downwind distance (x) from emission sources for different atmospheric stability conditions. (CPCB – PROBES/70/1997-98).

Table 1.0 - Dispersion parameters as per stability class

Stability Class	σ_y	σ_z
A	$0.22x(1+0.0001x)^{-.5}$	$0.20x$
B	$0.16x(1+0.0001x)^{-.5}$	$0.12x$
C	$0.11x(1+0.0001x)^{-.5}$	$0.08x(1+0.0002x)^{.5}$
D	$0.08x(1+0.0001x)^{-.5}$	$0.06(1+0.0015x)^{.5}$
E	$0.06x(1+0.0001x)^{-.5}$	$0.03x(1+0.0003x)^{-1}$
F	$0.04x(1+0.0001x)^{-.5}$	$0.16x(1+0.0003x)^{-1}$

Plume Rise

Plume rise Δh has been determined according to Brigg's formula (CPCB guideline)

$$\Delta h = 21.425 \frac{F^{3/4}}{U_s} \quad \text{for } F<55$$

$$\Delta h = 38.71 \frac{F^{3/5}}{U_s} \quad \text{for } F>55$$

$F = g\ VsD2(Ts-Ta)/4Ts$

Where

Us = wind speed at stack level (m/s)

Vs = stack gas velocity (m/s)

Ts = stack gas temperature (0K)
Ta = ambient temperature (0K)
F = Buoyancy flux parameter (m4/s3)
Δh = Plume rise (m)
D = Diameter of the stack (m)
g = acceleration due to gravity, 9.807 (m/s2)

Table 1.1: Stack details

Stack Attached to	Capacity	Stack Ht., m	Stack Dia., m	Stack Exhaust, nm^3/s	Fuel Used	PM10 Emitted AFTER APCD, gm/sec	PM2.5 Emitted AFTER APCD, gm/sec	SO2 Emitted gm/sec	NOx Emitted gm/sec
Boiler	45 TPH	75	2	8.34	Baggase, Spent Wash	0.885	0.354	0.250	0.09
DG set	600 KVA	30	0.2	0.14	HSD	0.002	0.001	0.097	0.001

Results

- The maximum cumulative GLC concentration of **PM10 wiz. 87.127 ug/m^3** was predicted inside the study area. As the distance from source increases, the incremental concentration of PM10 drops drastically due to settling of PM10 particles under gravity.
- The maximum cumulative GLC concentration of **SO2 wiz. 14.563 ug/m^3** was predicted inside the study area.
- The maximum cumulative GLC concentration of **NOx wiz. 31.207 ug/m^3** was predicted inside the study area.

Table 1.2: Predicted GLC of Ambient Air Quality Monitoring Station

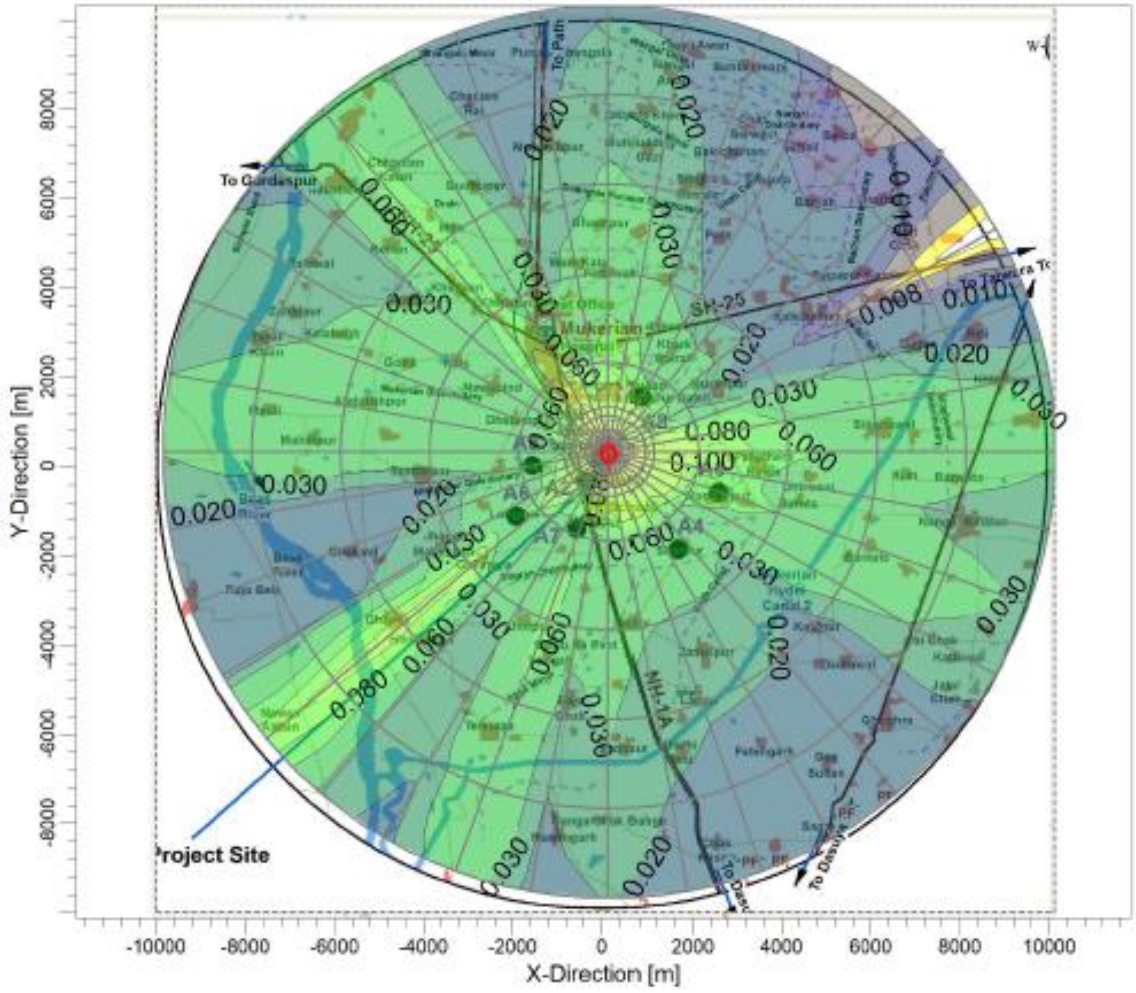
LOCATION CODE	LOCATION	PARAMETER	MAX BASELINE CON. (µG/M3)	PREDICTED GLC, (µG/M3)	CUMULATIVE GLC, (µG/M3)	CPCB NORMS
A1	Project Site	PM10	86.9	0.22714	87.127	100
		PM2.5	56.4	0.09061	56.491	60
		SO2	10	0.20409	10.204	80
		NOx	23.2	0.0243	23.224	80
A2	Nr Village Bishanpur	PM10	85.5	0.12817	85.628	100
		PM2.5	49.5	0.05138	49.551	60
		SO2	13.5	0.20364	13.704	80
		NOx	25	0.015	25.015	80
A3	Nr Village Mansurpur	PM10	84.5	0.07032	84.570	100
		PM2.5	49	0.02802	49.028	60

		SO2	12.6	0.05336	12.653	80
		NOx	31.2	0.00737	31.207	80
A4	Nr village Sherpur	PM10	83.7	0.03669	83.737	100
		PM2.5	45.6	0.01462	45.615	60
		SO2	12.5	0.0428	12.543	80
		NOx	25.6	0.00385	25.604	80
A5	Nr village Durgi	PM10	83	0.04096	83.041	100
		PM2.5	46.3	0.0163	46.316	60
		SO2	14.35	0.05689	14.407	80
		NOx	25.1	0.00423	25.104	80
A6	Nr Village Lohgarh	PM10	83.5	0.04936	83.549	100
		PM2.5	44.6	0.01974	44.620	60
		SO2	14.5	0.06346	14.563	80
		NOx	26.1	0.00548	26.105	80
A7	Nr Village Latifpur	PM10	83.4	0.0468	83.447	100
		PM2.5	50.6	0.01875	50.619	60
		SO2	12.8	0.01057	12.811	80
		NOx	25.8	0.0053	25.805	80
A8	Nr Village Mohiuddin pur dalel	PM10	80.2	0.076	80.276	100
		PM2.5	45.6	0.01974	45.620	60
		SO2	13.5	0.0309	13.531	80
		NOx	23.7	0.00786	23.708	80

The contour maps showing the predicted concentration levels of PM_{10}, $PM_{2.5}$, SO_2, NOx are presented in **Figure 1.2, Figure 1.3, Figure 1.4** and **Figure 1.5**.

PROJECT TITLE:

Indian Sucrose Ltd Ethanol Plant
Isopleth of PM10



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

Max: 0.387 [ug/m^3] at (441.30, 328.65)

0.005 0.006 0.008 0.010 0.020 0.030 0.060 0.080 0.100 0.200 0.300 0.387

COMMENTS:	SOURCES: 2	COMPANY NAME: Vardan Environet	
	RECEPTORS: 368	MODELER: Surbhi Makwana	
	OUTPUT TYPE: Concentration	SCALE: 1:148,684 0 5 km	
	MAX: 0.387 ug/m^3		PROJECT NO.:

AERMOD View - Lakes Environmental Software

F:\Indian Sucrose Ltd Ethanol Plant\AERMOD\AERMOD.isc

Figure Error! No text of specified style in document.**-2: Spatial distribution of predicted GLCs of PM_{10}**

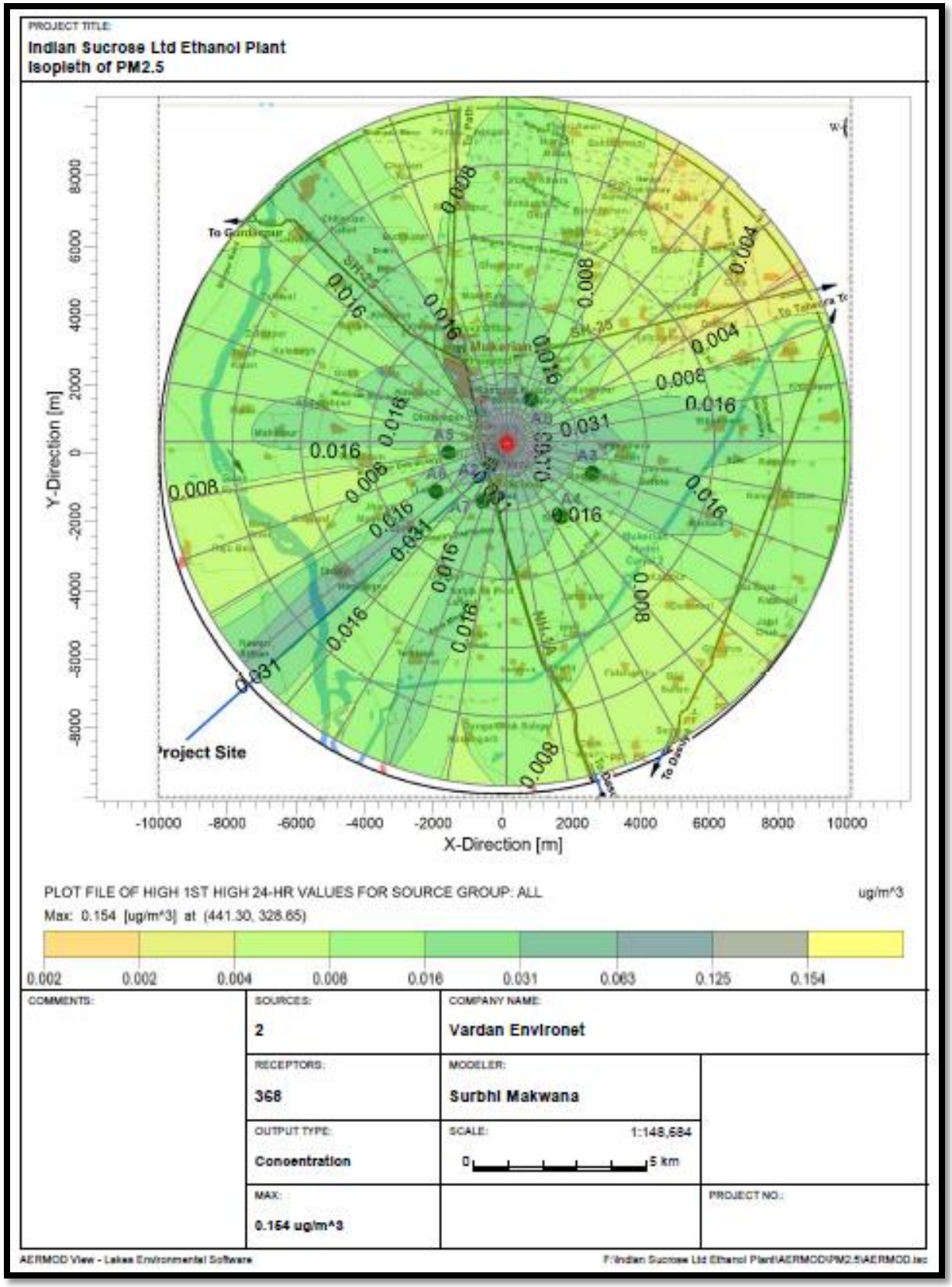


Figure 1-3: Spatial distribution of predicted GLCs of $PM_{2.5}$

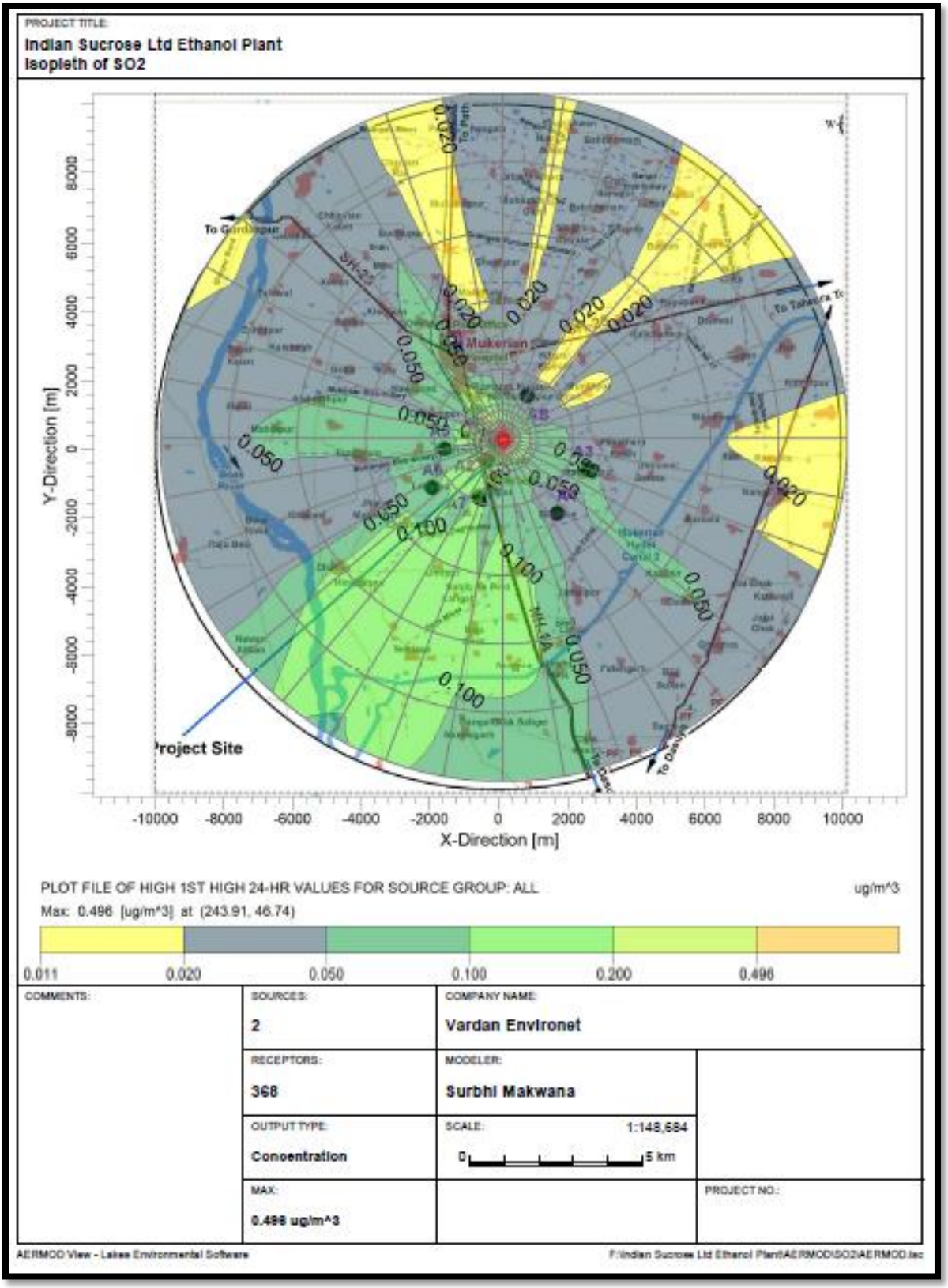
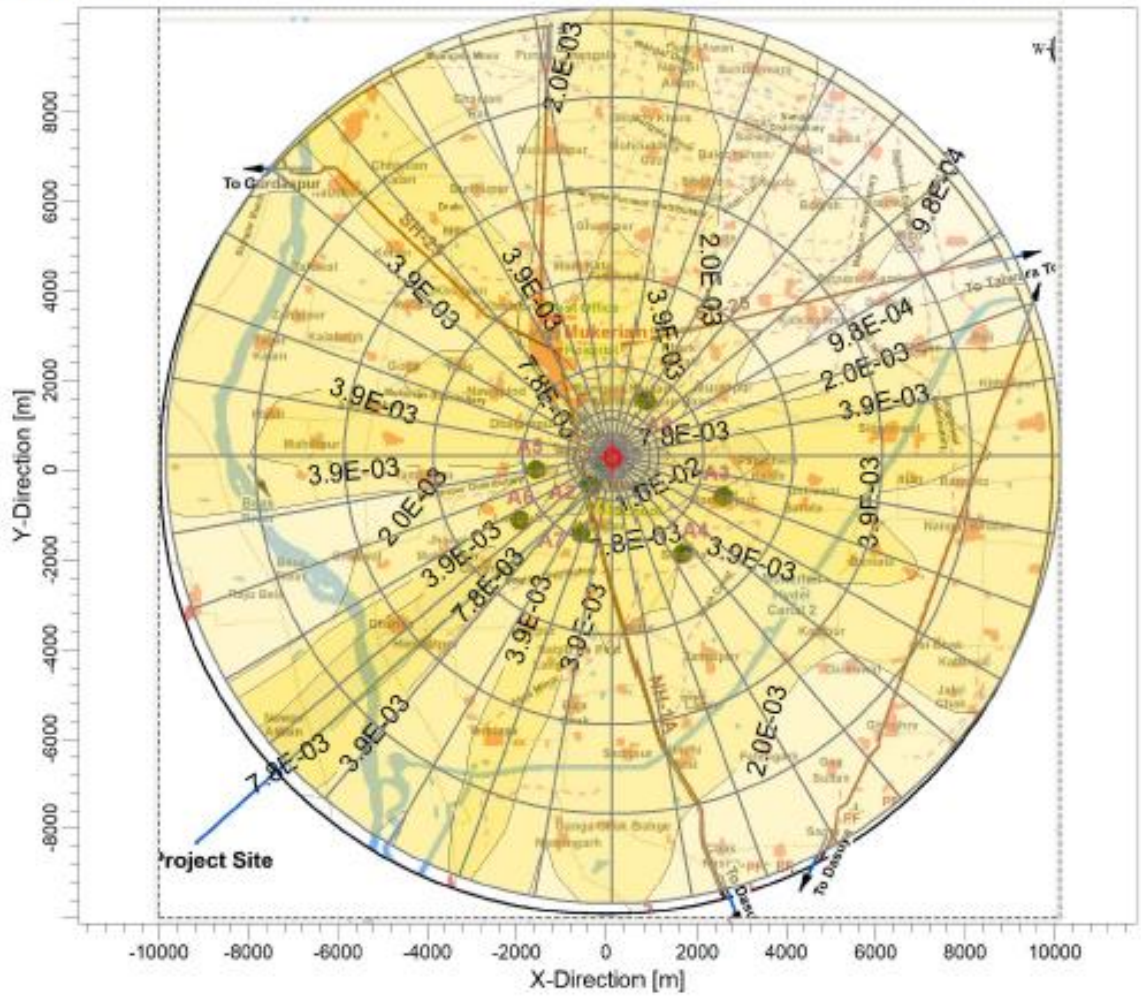


Figure Error! No text of specified style in document.**-4: Spatial distribution of predicted GLCs of Sox**

PROJECT TITLE:

Indian Sucrose Ltd Ethanol Plant
Isopleth of NOx



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

Max: 4.1E-02 [ug/m^3] at (441.30, 328.65)

4.4E-04 4.9E-04 9.8E-04 2.0E-03 3.9E-03 7.8E-03 1.6E-02 3.1E-02 4.1E-02

COMMENTS:	SOURCES: 2	COMPANY NAME: Vardan Environet	
	RECEPTORS: 368	MODELER: Surbhi Makwana	
	OUTPUT TYPE: Concentration	SCALE: 1:148,684 (0 — 5 km)	
	MAX: 4.1E-02 ug/m^3		PROJECT NO.:

AERMOD View - Lakes Environmental Software

F:\Indian Sucrose Ltd Ethanol Plant\AERMOD\NOx\AERMOD.isc

Figure Error! No text of specified style in document.**-5: Spatial distribution of predicted GLCs of Nox**

1.1.1.2 Proposed Mitigation Measures

- The control the particulate emissions ESP will be installed and particulate matter value will be maintain less than 50mg/m^3 as per standards of CPCB.
- CO2 scrubber will be provided to scrub CO2 emissions in water.
- The whole process will be carried out in closed condition so as to avoid any chances of VOC emissions
- Online stack monitoring system for regular monitoring of (for Particulate Matter) will be installed and transmission of online data to Punjab Pollution Control Board and CPCB will be done.
- Adequate stack height will be provided to Boiler and D.G. sets.
- The main raw material and product shall be brought in and dispatched by road in covered enclosures.
- Dust collectors will be installed at loading-unloading section to minimize the PM emission at the site.
- Emphasis will be given for proper handling and storage of chemicals, product, fuel and raw material to minimize the chances of any dust or fugitive emissions.
- It will be ensured that the vehicle owners must have valid PUC Certificate.
- Dust suppression on haul roads will be done at regular intervals.
- Boiler ash will be transferred in closed conveyors to the end users to avoid any spillage.

INDIAN SUCROSE LIMITED
G.T.Road, Mukerian - 144 211 Distt. Hoshiarpur, (Punjab) India Fax: +91-1883-244532
EPABX No. +91+9115110651/52 e-mail : info.isl@yaducorporation.com
CIN - L15424PB1990PLC010903 ram.chand@yaducorporation.com

TO WHOMSOEVER IT MAY CONCERN

I, Abhay Upadhyay, Director of **M/s. Indian Sucrose Ltd.** located at **Village- Chak Allah Baksh, Tehsil: Mukeria, District: Hoshiarpur, (Punjab)** is proposing a 120 KLD Molasses based ethanol plant & 4 MW Co-generation power plant. For this proposed site we are undertaking as follows:

(1) There is no court case/NGT order pending against the proposed project.

(2) The court case initially filed by petitioners under Petition no. CWP No. 9131 of 2012 (In High Court of Punjab & Haryana at Chandigarh) against DEBT Recovery Appellate Tribunal, was dismissed by the Division Bench of Punjab & Haryana High Court on 24th May 2012. Recently, Hon'ble Supreme Court of India dismissed their Curative Petition on 19th February 2019. So as of today's date there is no court case pending against the proposed site of the Project of M/s Indian Sucrose Ltd.

M/s. Indian Sucrose Ltd.

Abhay Upadhayay
Director, Indian Sucrose Limited.
Date:28.01.2020

Change of land use document

(illegible) 2016-2017 (illegible) 236 (illegible)

30 — 13/1 - 18/1 - 23/1

32 — 3/1/1 - 3/2/2 - 8/1 - 13/2 -

32 — 18/1 - 18/2 - 19 - 20/1 - 20/2 - 21/3 - 22 - 23 21/1

33 — 16/1 - 17/2 - 21/1 - 21/2 - 22/1 -

33 — 22/3 - 23/1 - 23/2 - 23/3 - 24/1 - 24/2 - 24/3 - 25/1 -

34 — 25/2 - 25/2

37 — 5/2 - 6/1 - 15/2 -

37 — 16/1/1

38 — 1 - 2 - 3/1 - 3/2 3/3 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13/1 - 15/1 -

38 — 15/2 - 15/3 - 16 - 18/2 - 19 - 20 - 21/1/2 - 21/2/2 - 21/2/3 - 21/2/3/1 - 21/2/3/2 - 22 - 23 - 25 -

39 — 1/1 - 1/2 - 2 - 3/1 - 3/2 - 3/3 - 3/4 - 8/1 - 9 - 10/1 - 10/2 - 11 - 12/1 - 12/2 - 13/1 -

39 — 13/2 - 18/1 - 8/2 18/2 - 19/2 - 20/1 - 20/2 - 21/1 - 21/2 - 22/1 - 22/2 - 22/3 - 23/1 - 23/4 - 116/1 -

133 - 39 — 19/1 - 23/2 - 23/3 - 38/24 - 7/2 - 13/2 - 14 - 17 - 18/1 - 33 — 16/2 - 17/1 - 32 — 21/1 - 21/2 -

33 — 25/2

(illegible) 30/1/2020

ACC

K.L.G.

C.J. Telangana Mu...

30.1.202

(illegible) 256. 12.2.1 (illegible) 31/01/2020. 30/01/2020

ANNEXURE-5

1.1 PUBLIC CONSULTATION

Public hearing is a very significant part of the process of public participation envisaged under guidelines issued by MoEF&CC, Government of India. It facilitates involvement of all the stake holders of the project which is essential for ensuring smooth running of project and benefitting all section of society in the process of economic development of the region. This process will be considered after the submission of Draft EIA.

Public Hearing for project was conducted on 11.06.2019. Public Hearing process was presided over by Additional Deputy Commissioner, Hosiyarpur & Supervised in the presence of Environmental Engineer (Mega), Punjab Pollution Control Board, Patiala & Asstt. Environmental Engineer, PPCB, Regional Officer, Hosiarpur and the public hearing was attended by 83 persons and entire process of the said hearing was video graphed. The proceeding of P.H, Photograph is attached as Annexure. The MOM action plan is given in table below:

Public Hearing MOM Action Plan

Sr. No.	Name & Address of the person	Detail of query statement/information/clarification sought; by the person present	Reply of the query/statement/information/clarification given by the project proponent.	Action Plan
1.	Sh. Adarsh Kumar Officer, M.C Mukerian, District Hoshiarpur	He welcomed the officers present in the Public Hearing. He stated that the M.C Mukerian should be adopted by the industry for development of the towns as the industry falls in the municipal limit. He also stated that the industry should manage the municipal solid waste of the town under the CER activities and he also requested Addl. Deputy Commissioner Hoshiarpur for the same.	On the advice of the project proponent, Environmental Consultant of the company informed that the project proponent will consider the matter	The project Proponent consider the matter and decided the meeting will be held with Adll. Deputy Commisioner Hoshiarpur, M.C and other District Officers. Total Amount of CER Activity is **Rs. 3.2 Crores** and the same

				will be utilized for the development of villages. As per decision taken by the committees after grant of EC.
2.	Sh. Santokh Singh, r/o Khanpur, District: Hoshiarpur	He stated that the employment should be given to the local 5 villages and assurance should be given by the project proponent. He further stated that the pollution from the industry to be generated should be controlled.	Environment Consultant of the company informed that the management of the industry has decided to give preference to the local persons in the employment. The industry will provide employment to the local people through district administration. He further informed that the industry will spend Rs. 9 Crores for the control of the pollution. No water will be discharged outside the premises of the industry. Online monitoring system will be provided by the industry, which will be monitored by the Officers of CPCB & PPCB. Environmental Engineer (Mega), Punjab Pollution Control Board, informed that as per the project report of the industry, no waste water will be discharged outside the industry. Boiler of 45 TPH capacity will be installed and online monitoring system will be provided system will be provided by the industry which will be monitored continuously by the officers of PPCB & CPCB which its compulsory for the industry.	The demand for employment will be send to deputy commissioner, Hoshiarpur and employment will be decided to the local person as per discussion with D.C on the merit. The PP has already stated that they will not discharge any effluent outside the industry and the air emission will be also

				within the limit. The pp will spend Rs. 9.0 Crores for pollution control measures.
3.	Sh. Jai Pal Sharma, Village Chak Allabaksh, District: Hoshiarpur	He stated that the industry is to be set up in the land of his village, as such, the employment should be provide to the people of his village. He further stated that the pollution should be controlled. He demanded that the Sugar Mill should pay the balance amount of the farmers, who have sold the sugarcane to it.	Environmental Consultant of the company informed that he had already informed that the management of the industry has already decided to give preference to the local people. Applications in this regards be given to the office of Deputy Commissioner, Hoshiarpur. He further informed that the CER activities will be implemented with the help of District Administration.	The demand for employment will be send to Deputy Commissioner, Hoshiarpur and employment will be decided to the local person as per discussion with D.C on the merit. Total Amount of CER Activity is **Rs. 3.2 Crores** and the same will be utilized for the development of villages. As per decision taken by the

				committees after grant of EC.
4.	Sh. Aagar Kumar, r/o Rajputa, Distict Hosiyaropur	He stated that the area will be developed with the establishment of industry. He further stated the pollution should be controlled.	Environmental Consultant of the company informed that the pollution from the industry will be controlled properly.	The PP has already stated that they will not discharge any effluent outside the industry and the air emission will be also within the limit. The pp will spend Rs. 9.0 Crores for pollution control measures.
5.	Sh. Jagan Nath Sial, r/o Village Madinpur, District Hoshiarpur	He stated that the area will developed with the establishment of the industry and he gives his consent for the same. Project proponent should give assurance for implementation of pollution control laws.	Representative of the project proponent informed that all the pollution control laws will be implemented	The PP has already stated that they will not discharge any effluent outside the industry and the air emission will be also within the limit. The pp will spend Rs. 9.0 Crores for pollution

				control measures.
6.	It is pertinent to mention here that the Environmental Engineer, Punjab pollution Control Board, Regional Office, Hoshiarpur vide letter no. 2615 dated 10.06.2019 informed that Sh. Neelam Kumar Oswal S/o Sh. Vidhya Sagar Oswal, resident of Dhandari Kalan, Ludhiana has sent a complaint vide letter dated 03.05.2019 submitting that the area of 13 acrea on which this project is proposed to be set up, is in ownership of the complainant and M/s Mukerian Papers Ltd. Environmental Engineer, Regional Office, Hoshiarpur further informed that the complainant has requested to reject the proposal of the said unit and to take strict action against the official of M/s India Sucrose Ltd., for furnishing false information. A copy of letter No. 2615 dated 10.06.2019 written by Environmental Engineer, Punjab Pollution Control Board Regional Office, Hoshiarpur and a copy of complaint dated 03.05.2019 of sh. Neelam Kumar Oswal S/o Vidhya Sagar Oswal. Resident of Dhandari Kalan, Ludinana is Annexed as **Annexure 1& 2.**	It is important to note that certificate of sale was executed in favour of Indian Sucrose Ltd. on 17.02.2010 by Mr. S. Sengupta, Authorised representative of IFCI Limited, Chandigarh under SARFAESI Act 2002, whereon IFCI Limited auctioned the movable and immovable properties and transferred all movable and immovable assets of Mukerian Papers Ltd in favour of Indian Sucrose Ltd. The said Mr. Neelam Oswal filed a Writ petition no. CWP 9131 of 2012 before Hon'ble Punjab & Haryana High Court against the said auction which was dismissed by the Hon'ble High Court. Mr. Neelam Oswal then filed an SLP in Supreme Court titled Mukerian Papers Vs. ARCIL (Civil no. 30231 of 2012) which was disposed of by the Apex Court on 29.05.2016. He then filed a review petition as well as Curative petition but both were dismissed by the Supreme Court. Hence it is clear from the above mentioned orders that there is no dispute of the sale certificate issued by IFCI Ltd & ARCIL in favour of Indian Sucrose Limited and thus Indian Sucrose Limited is the absolute owner of land of Mukerian papers Limited. Copy of reply submitted to Environmental Engineer, Punjab Pollution Control Board Regional Office, Hoshiarpur is attached as **annexures-1&2.**	

Annexure-1

NEELAM KUMAR OSWAL S/O LALA VIDYA SAGAR OSWAL
396, Maharani Jhansi Road Civil Lines, Ludhiana-141001.
Email: nkoswal@yahoo.com. Phone: 0161-2421143, 2421728 Fax :0161-2424422

Date : 03.05.2019

The Member Secretary,
Punjab Pollution Control Board,
Vatavaran Bhawan,
Nabha Road, Patiala

Subject: **Objection Regarding Set up of Molasses Based Ethanol Plant of 120 KLD capacity and a co-generation Power Plant of 4MW in the area of 13 Acres in the revenue estate of Village Chak Allahbaksh and Mahiuldinpur Dalel, Tehsil Mukerian, District Hoshiarpur.**

That there is a public notice in the newspaper "The Tribune" dated 01-05-2019 regarding the set up of Molasses Based Ethanol Plant of 120 KLD capacity and a co-generation Power Plant of 4MW in the area of 13 Acres in the revenue estate of Village Chak Allahbaksh and Mahiuldinpur Dalel, Tehsil Mukerian, District Hoshiarpur by M/s Indian Sucrose Limited. But the above said area of 13 Acres is the ownership of Neelam Kumar Oswal son of Sh. Vidya Sagar Oswal resident of Dhandari Kalan, Ludhiana and M/s Mukerian Papers Limited and the above said M/s Indian Sucrose Limited has no right, title or interest over the above said 13 acres of land. So the proposal by M/s Indian Sucrose Ltd. regarding the setup of Molasses Based Ethanol Plant of 120 KLD capacity and a co-generation Power Plant of 4MW in the area of 13 Acres of Land is illegal and the same is liable to be rejected. So, the above said proposal of M/s Indian sucrose Ltd. may kindly be rejected and the strict action may kindly be taken against the officials of M/s Indian Sucrose Ltd. for furnishing false information.

Thanking You,

Yours faithfully,

Neelam Kumar Oswal
son of Sh. Vidya Sagar Oswal
resident of Dhandari Kalan, Ludhiana

CC. The Deputy Commissioner-cum- Collector,
District – Hoshiarpur, Punjab.

CC. The Sub Divisional Magistrate,
Mukerian, District Hoshiarpur (Punjab)

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Annexure-2

ਦਫਤਰ: ਮੁੱਖ ਵਾਤਾਵਰਣ ਇੰਜੀਨੀਅਰ, ਜਲੰਧਰ

ਪਿੰਡ ਅੰਕਣ ਨੰਬਰ: 1794 ਮਿਤੀ : 12-05-19

ਉਪਰੋਕਤ ਦਾ ਉਤਾਰਾ ਸੀਨੀਅਰ ਵਾਤਾਵਰਣ ਇੰਜੀਨੀਅਰ, ਪੰਜਾਬ ਪ੍ਰਦੂਸ਼ਣ ਰੋਕਥਾਮ ਬੋਰਡ, ਜੋਨਲ ਦਫਤਰ, ਜਲੰਧਰ, ਨੂੰ ਸੂਚਨਾ ਅਤੇ ਅਗਲੇਰੀ ਕਾਰਵਾਈ ਲਈ ਭੇਜਿਆ ਜਾਂਦਾ ਹੈ ਜੀ।

ਮੁੱਖ ਵਾਤਾਵਰਣ ਇੰਜੀਨੀਅਰ,
ਜਲੰਧਰ

Office: Senior Environmental Engineer, Zonal office, Jalandhar

Endtt. No: 2675 Dated 24/5/19

A Copy of the above is forwarded to Environmental Engineer, Pb. Pollution Control Board, Regional office, Hoshiarpur for your information and further necessary action please.

24/5/19
For Senior Environmental Engineer
24/5/19

Scanned by CamScanner

INDIAN SUCROSE LIMITED
G.T.Road, Mukerian - 144 211 Distt. Hoshiarpur, (Punjab) India Fax: +91-1883-244532
EPABX No. +91+9115110651/52 e-mail : info.isl@yaducorporation.com
CIN - L15424PB1990PLC010903 ram.chand@yaducorporation.com

REF: NO:ISL:AS:2019-20/ 329

Dated : 05.08.2019

The Secretary to Govt. of India,
Ministry of Environment, Forest & Climate Change,
Impact Assessment Division,
Indira Paryavaran Bhavan, Vayu Wing, 3rd Floor,
Aliganj, Jor Bagh Road,
NEW DELHI – 110003.

Subject: **Reply of the complaint submitted by Neelam Kumar Oswal.**

Reference:-
1. **ToR No. No.IA-J-11011/404/2018-IA-II(I) dt. 07.01.2019 against Proposal No. IA/PB/IND2/87561/2018**
2. **Proceeding of the Public Hearing conducted on 11.06.2019 in conection with application filed by M/s Indian Sucrose Ltd., Mukerian for obtaining Environmental Clearance under EIA Notification dated 14/09/2006 for setting up a molasses based ethanol plant of 120 KLD capacity and co-generation power plant of 4 MW in the revenue estate of Village Chak Alla Baksh and Mahiuldinpur Dalel, Tehsil Mukerian, Distt. Hoshiarpur.**

Sir,

As good-self is well aware that we (Indian Sucrose Limited) are going to set up a molasses bases Ethanol Plant of 120 KL/D capacity and 4 MW Co-generation Plant at Village Chak Alla Bakash and Mahiuldinpur Dalel, Tehsil Mukerian, District Hoshiarpur, Punjab.

In response of the complaint submitted by Neelam Kumar Oswal at the Offices of Environmental Engineer, RO, PPCB, Hoshiarpur and the Member Secretary, Punjab Pollution Control Board, Nabha Road, Patiala, which has mentioned in the proceedings of Public Hearing of our Ethanol Plant. The applicant (Indian Sucrose Limited) submits their reply as under:-

Land of Chak Alla Baksh

1. As regard the land situated at village Chak Alla Baksh. It is submitted that this land was earlier belongs to M/s Mukerian Papers Limited.

2. That M/s Mukerian Papers Limited has taken a heavy amount of loan from the Government Institutions and they were fail to repay the same, subsequently IFCI Ltd. has taken over the possession of Mukerian Papers Limited in the year 2009 and ultimately IFCI Ltd. auctioned the moveable and immoveable properties of Mukerian Papers Limited under under SARFAESI Act, 2002.

Contd..on..P/2..

3. At the time of auction M/s Indian Sucrose Limited was the highest bidder so all the movable and immovable Properties of Mukerian Papers Limited was purchased by M/s Indian Sucrose Limited. Accordingly the sale certificate have been issued in favour of Indian Sucrose Limited by IFCI Ltd. and ARCIL on dated 17.02.2010. The copy of sale certificates are attached here with as **Annexure – 1 & 2.**

4. The IFCI Ltd. and ARCIL handed over the possession of movable and immovable assets of Mukrerian Papers Limited in favour of Indian Sucrose Limited on 17.02.2010. The copy of possession letter of Movable and Immovable Assets is attached here with as **Annexure -3.**

5. Neelam Kumar Oswal filed a Writ Petition No.CWP No. 9131 of 2012 before Hon'ble Punjab and Haryana High Court, Chandigarh against the auction made by IFCI Ltd. and ARCIL. The Punjab & Haryana High Court vide their order dated CWP 24.05.2012 dismissed the writ petition filed by Mukerian Papers Limited through Neelam Kumar Oswal. **Annexure – 4.**

6. Neelam Kumar Oswal again filed a Special Leave Petition titled Mukerian Papers Limited v/s ARCIL (Civil No. 30231 of 2012 before the Hon'ble Supreme Court against the order dated 24.05.2012 Passed by Hon'ble Punjab & Haryana High Court, Chandigarh. The Supreme Court disposed this SLP on dated 29.05.2016 as **Annexure - 5.**

7. Neelam Kumar Oswal again filed Review Petition (Civil) 1757 of 2017 title Mukerian Papers Limited v/s ARCIL. The Hon'ble Supreme Court again dismissed this Review Petition vide their order dated 22.08.2017 as **Annexure - 6.**

8. Neelam Kumar Oswal again filed Curative Petition (Civil) No.156 of 2018 title Mukerian Papers Limited v/s ARCIL before Hon'ble Supreme Court against the order dated 22.08.2017 passed by Hon'ble Supreme Court on the same matter. The Supreme Court dismissed this Curative Petition of Neelam Kumar Oswal vide their order dated 19.02.2019 as **Annexure – 7.**

So it is very clear from the above mentioned orders of Hon'ble Punjab & Haryana High Court, Chandigarh and Hon'ble Supreme Court that there is no dispute of sale certificate and possession certificate issued by IFCI Ltd. & ARCIL in favour of M/s Indian Sucrose Limited for the moveable and immovable properties of Mukerian Papers Limited in favour of Indian Sucrose Limited.

Contd..on..P/3..

It is also submitted that in the light of above orders the entire land of Mukerian Papers Limited which is situated in the village Chak Alla Baksh, Tehsil Mukerian has no dispute and Indian Sucrose Limited is the absolute owner of land of Mukerian Papers Limited.

The proposed set up of molasses based ethanol plant of 120 KL/D capacity and 4 MW co-generation plant is going to be setup on the land of Mukerian Paper Limited which is situated at Village Chak Alla Baksh and has no dispute at all.

From above clarification, it is very clear that there is no dispute of land situated in villages Chak Alla Baksh where Indian Sucrose is going to setup ethanol plant and 4 MW co-generation plant. It is also clear that Indian Sucrose Limited is the absolute owner of said land.

Neelam Kumar Oswal filed a false complaint before your office just to harass the management of Indian Sucrose Limited and creating hurdles for setting up a ethanol plant of 120 KL/D and 4 MW Power Plant.

You are requested to please upload the reply with proceedings of Public Hearing of our plant of Ethanol Plant.

Hope your goodself will be satisfied with our above clarification.

Thanking you,

Yours sincerely,

For INDIAN SUCROSE LIMTED

AUTHORISED SIGNATORY

Encl: As above

Copy to : Environmental Engineer (MEGA),
Punjab Pollution Control Board,
Nabha Road, Patiala.

with a request to upload this reply with our proceedings.

Annexure 1

भारतीय गैर-न्यायिक

एक सौ रुपये

Rs. 100

₹. 100

ONE HUNDRED RUPEES

सत्यमेव जयते

भारत INDIA

INDIA NON JUDICIAL

पंजाब PUNJAB

K 544140

CERTIFICATE OF SALE

(for movable property)

This Stamp Paper forms part of Certificate of Sale executed in favour of Indian Sucrose Limited on 17.02.2010

ISGL LIMITED CHANDIGARH

17/2/2010

A. CERTIFICATE OF SALE
(for movable property)

Whereas

The undersigned being the Authorised Officer of IFCI Ltd and having its registered office at IFCI Limited, IFCI Tower, 61, Nehru Place, New Delhi 110 019 (hereinafter referred to as "IFCI") under the Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002 and in exercise of the powers conferred under sub-section (12) of Section 13 read with rules 7 and 9 of the Security Interest (Enforcement) Rules, 2002 has in consideration of the payment of Rs. 7.2 crore (Rupees Seven Crore Twenty Lacs only) sold on behalf of the Secured Creditors who has financed Secured Debt as defined in the Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002 (hereinafter referred to as "Secured Creditors") in favour of Indian Sucrose Ltd, a company registered under the Companies Act, 1956 and having its registered office at G. T. Road, Mukerian 144211, Hoshiapur, Punjab the assets described and shown in the Schedule I hereto, secured in favour of the Secured Creditors by M/s Mukerian Paper Ltd. towards the financial facilities offered by Secured Creditors as under:

Secured Creditors	Total Outstanding as on February 16, 2010 - Rs. 10,00,50,99,284/- together with further interest and expenses w.e.f February 17, 2010.

The undersigned acknowledges the receipt of the sale price in full and has handed over the delivery and possession of the property as mentioned in the schedule I.

The details of the payments received by Arcil are as given below.

Sr. No.	Demand Draft/ Pay Order/ Cheque No	Date	Amount (Rs. lakhs)	Bank
1	626836	29.12.09	310.00	PNB, Mukerian, (pb)
2	006203	29.12.09	50.00	ICICI Bank, Mukerian (pb)
3	563374	13.02.10	225.00	PNB, Mukerian, (pb)
4	563375	15.02.10	135.00	PNB, Mukerian, (pb)
Total			720.00	

17/2/2010

The sale of the Schedule Property has been made as per the Terms and Conditions attached herewith as Schedule II (hereinafter referred to as "Terms and Conditions"). These Terms and Conditions form part and parcel of the Certificate of Sale and are to read in conjugation with the Certificate of Sale.

List of encumbrances:

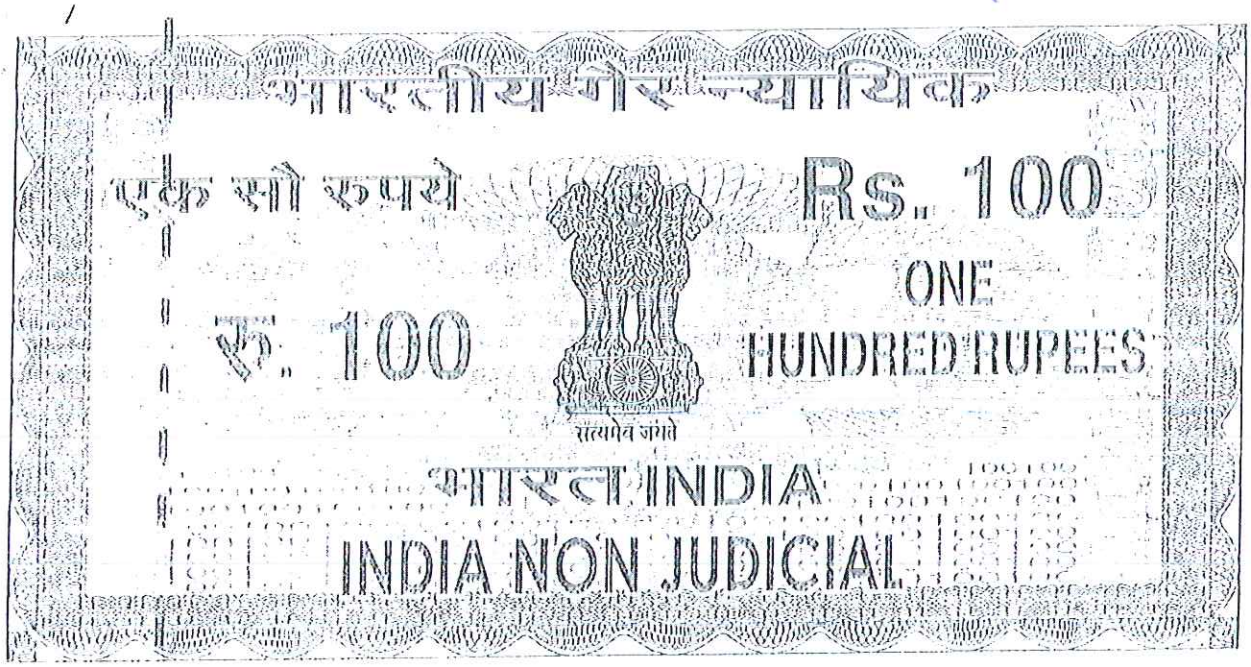
The Secured Assets are being sold strictly on "as is where is & as is what is" basis with all known and unknown encumbrances (except the encumbrances and liabilities to the Secured Creditors in respect of the above financial facilities including interest thereon as against the Schedule Property). Further, all liabilities, dues of authorities and departments, statutory or otherwise, any other dues, if any, in respect of the Secured Assets and if payable in law/ attachable to the Secured Assets/sale proceeds by reason of the sale of the Secured Assets, shall be the sole responsibility of and to the account of the Purchaser.

Authorised Officer
IFCI Limited

Date: 17.02.2010
Place: Mukerian
Punjab

Witness:
JEEVAN KUMAR S/o Late Maj. Som Dutta (Retd.)
(Asst. Vice President)
Asset Reconstruction Co. (India) Ltd
Mumbai

Annexure-2



पंजाब PUNJAB K 544141

SALE CERTIFICATE

(for Immovable property)

This Stamp Paper forms part of Sale Certificate executed in favour of Indian Sucrose Limited On 17.02.2010.

17/2/2010

A. SALE CERTIFICATE

(for Immovable property)

Whereas

1. The undersigned being the Authorised Officer of IFCI Ltd and having its registered office at IFCI Limited, IFCI Tower, 61, Nehru Place, New Delhi 110 019 (hereinafter referred to as "IFCI") under the Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002 and in exercise of the powers conferred under sub-section (12) of Section 13 read with rules 7 and 9 of the Security Interest (Enforcement) Rules, 2002 has in consideration of the payment of Rs. 31.8 crore (Rupees Thirty One Crore Eighty Lacs only) sold on behalf of the Secured Creditors who has financed Secured Debt as defined in the Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002 (hereinafter referred to as "Secured Creditors") in favour of Indian Sucrose Ltd, a company registered under the Companies Act, 1956 and having its registered office at G. T. Road, Mukerian 144211, Hoshiapur, Punjab, the assets described and shown in the Schedule I hereto, secured in favour of the Secured Creditors by M/s Mukerian Paper Ltd. towards the financial facilities offered by Secured Creditors as under:

Secured Creditors	Total Outstanding as on February 16, 2010 - Rs. 10,00,50,99,284/- together with further interest and expenses w.e.f February 17, 2010.

The undersigned acknowledges the receipt of the sale price in full and has handed over the delivery and possession of the property as mentioned in the schedule I.

The details of the payments received by Arcil are as given below.

Sr. No.	Demand Draft/ Pay Order/ Cheque No	Date	Amount (Rs. lakhs)	Bank
1	626807	15.12.09	250.00	PNB, Mukerian (pb)
2	626808	15.12.09	50.00	PNB, Mukerian (pb)
3	626809	15.12.09	50.00	PNB, Mukerian (pb)
4	626833	28.12.09	200.00	PNB, Mukerian (pb)
5	626837	29.12.09	65.00	PNB, Mukerian (pb)
6	626991	29.12.09	975.00	PNB, Mukerian (pb)
7	627060	15.02.10	750.00	PNB, Mukerian (pb)
8	563372	15.02.10	420.00	PNB, Mukerian (pb)
9	563373	15.02.10	420.00	PNB, Mukerian (pb)
Total			3180.00	

17/2/2010

The sale of the Schedule Property has been made as per the Terms and Conditions attached herewith as Schedule II (hereinafter referred to as "Terms and Conditions"). These Terms and Conditions form part and parcel of the Sale Certificate and are to read in conjugation with the Sale Certificate

List of encumbrances:

The Secured Assets are being sold strictly on "as is where is & as is what is" basis with all known and unknown encumbrances (except the encumbrances and liabilities to the Secured Creditors in respect of the above financial facilities including interest thereon as against the Schedule Property). Further, all liabilities, dues of authorities and departments, statutory or otherwise, any other dues, if any, in respect of the Secured Assets and if payable in law/ attachable to the Secured Assets/sale proceeds by reason of the sale of the Secured Assets, shall be the sole responsibility of and to the account of the Purchaser.

Date: 17.02.2010

Place: Mukerian
Punjab

Authorised Officer 17/2/2010

IFCI Limited,

Witness:

(Jeewan Kumar)
S/o Late Maj (Retd) Som Dutta
Asst Vice President
Asset Reconstruction Company (India) Ltd
Mumbai

Schedule I

DESCRIPTION OF THE IMMOVABLE ASSETS CONSTITUTING SCHEDULE PROPERTY

All those piece and parcel of freehold property admeasuring 48.30 acres situated at Chak Allabaksh, Tehsil Mukerian, District Hoshiarpur, in the state of Punjab together with all buildings, structures thereon and all plant and machinery attached to the earth or permanently fastened to anything attached to the earth

On the North	Suger Mills
On the South by	Coloney / Bishanpura Road
On the East by	Agricultural land
On the West by	G.T.Road (Jallandhar - Pathankot Highways)

together with all buildings and structures thereon and all the plants and machinery attached to the earth.

<u>More particularly deseribed as under:</u>

All those pieces and parcels of land admeasuring 48.30 acres situate at village Chak Allabaksh, Tehsil Mukerian Distt. Hoshiarpur in the State of Punjab comprised in rectangle nos. 30,32,33,34,37,38,39 as described in the Deed of Conveyance dated June 2, 1977 executed by the President of Indian in favour of Company described as under:

12/2/2010

District	Tehsil	Locality	Rect.	Killa	Area
Hoshiarpur	Mukerian	Chak-Alla Baksh ILB, No. 236	30	13 Min	1.00
				18 Min	1.04
				23 Min	1.04
			32	3/1 Min	0.04
				3/2	1.00
				8 Min	1.04
				13 Min	1.03
				18/1	4.17
				18/2	2.12
				19	7.16
				20/1	6.08
				20/2	1.03
				21/1	0.08
				21/2	4.16
				21/3	2.16
				22	8.00
				23	7.16
			33	16/1	6.04
				16/2	1.07
				17/1	3.18
				17/2	3.18
				21/1	3.02
				21/2	4.18
				22/1	3.02
				22/2	2.09
				22/3	2.09
				23/1	2.00
				23/2	4.12
				23/3	1.08
				24/1	3.08
				24/2	0.08
				24/3	3.16
				25/1	5.16
				25/2	2.04
			34	25/1	2.18
				25/2	4.02
			37	5	5.06
				6	4.10
				15	3.06
				16/1	1.18
			38	1	7.11
				2	7.11

12/2/2010

				3/1	3.12
				3/2	0.08
				3/3	3.12
				4	7.11
				5	7.11
				6	8.00
				7/1	3.08
				7/2	4.12
				8	8.00
				9	8.00
				10	8.00
				11	8.00
				12	8.00
				13/1	3.02
				13/2	4.18
				14	8.00
				15/1	5.13
				15/2	1.07
				15/3	1.00
				16	8.00
				17	8.00
				18/1	4.17
				18/2	3.03
				19	8.00
				20	8.00
			39	1/1	4.11
				1/2	2.13
				2	7.11
				3/1	1.10
				3/2	0.15
				3/3	0.11
				3/4	4.11
				8/1	6.04
				8/2	1.07
				9	7.16
				10/1	4.06
				10/2	3.10
				11	8.00
				12/1	2.00
				12/2	6.00
				13/1	5.12
				13/2	2.08
				18/1	2.02
				18/2	5.08
				19/1	0.08

17/2/26

IFCI LIMITED

				19/2	7.12
				20/1	2.16
				20/2	5.04
				116 Min	4.06
		Total			385.80

OR

48.30 acres

together with all buildings, structures thereon attached to the earth or permanently fastened to anything attached to the earth.

Date: 17.09.2010

Place: Mukerian
Punjab

Authorised Officer 17/9/2010

IFCI Limited

Annexure-3

POSSESSION OF SECURED ASSETS OF MUKERIAN PAPER LTD

Pursuant to and simultaneous with the Sale Certificate for immovable property and Certificate of Sale for movable property executed today by Authorised Officer of IFCI Ltd. (IFCI) in respect of secured assets of M/s Mukerian Paper Ltd, we, Indian Sucrose Limited confirm that we have received vacant and peaceful possession in good condition and without any grievance whatsoever of the following property-

All those piece and parcel of freehold property admeasuring 48.30 acres situated at Chak Allabaksh, Tehsil Mukerian, District Hoshiarpur, in the state of Punjab:

On the North by	Sugar Mills
On the South by	Colony / Bishanpura Road
On the East by	Agricultural land
On the West by	G.T.Road (Jallandhar - Pathankot Highways)

together with all buildings, structures thereon and all plant and machinery attached to the earth or permanently fastened to anything attached to the earth (more particularly described in Annexure enclosed hereto).

Vacant and peaceful possession of the above Secured Assets (as per Annexure enclosed to this Receipt) handed over pursuant to the receipt of amount of entire sale proceeds.

(S. Sengupta) 17/2/2010

Authorised Officer
For IFCI Ltd.

Witness.....

Name: Aalok Dave
Assistant Vice President
Asset Reconstruction Company (India) Ltd

Date: 17/2/2010

Place: Mukerian, Punjab

Possession Handed over by:
(S. Sengupta)
Authorised Officer
For IFCI Ltd.
17/2/2010

Rajender Kumar
(RAJENDER KUMAR)

Possession of the above Secured Assets received as per Annexure enclosed to this Receipt. We have verified all the items and have satisfied ourselves.

(KUNAL SINGH)

Authorised Signatory
For Indian Sucrose Ltd.

Witness.....

Name GAURAV AGARWAL
Chief Manager
Indian Sucrose Ltd.

Date:

Place: Mukerian, Punjab

Possession taken over by:
(M. K. KATARIA)
Authorised Signatory
For Indian Sucrose Ltd.

Annexure-4

IN THE HIGH COURT OF PUNJAB AND HARYANA AT CHANDIGARH

CWP No.9131 of 2012
Date of decision: 24.05.2012

Mukerian Papers Limited and another

-----Petitioners.

Vs.

DEBT Recovery Appellate Tribunal and others

----Respondents

CORAM:- HON'BLE MR. JUSTICE AJAY KUMAR MITTAL.
HON'BLE MR. JUSTICE GURMEET SINGH SANDHAWALIA

Present:- Mr.Jainainder Saini, Advocate for the petitioners.
Mr. Chetan Mittal, Sr. Advocate with
Mr. Rohit Sapra, Advocate for respondent Nos. 2 and 3.

Ajay Kumar Mittal,J.

1. Challenge in this writ petition filed under Article 226 of the Constitution of India is to the order dated 19.3.2012, Annexure P.1 passed by the Debt Recovery Appellate Tribunal (DRAT) whereby the petitioners have been required to deposit 25% of the amount claimed in the notice under section 13(2) of the Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002 (in short, "the SARFAESI Act") as a pre-condition for hearing the appeal.

2. Briefly, the facts as narrated in the petition may be noticed. Petitioner No.1 is a limited company incorporated under the Companies Act, 1956 and having its registered office at Ludhiana. The company is engaged in manufacturing of writing and printing papers. Petitioner No.2 is the Managing Director and Chairman of the Company. Respondent No.2 is Asset Reconstruction Company

India Limited (ARCIL) incorporated under the Companies Act. On 12.9.2008, it became secured creditor of the petitioner-company by virtue of acquiring its debt from respondent No.3 - IFCI. Respondent No.3 - IFCI Limited was a financial institution but the Reserve Bank of India (RBI) vide circular dated 29.8.2007 declared it as Non Banking Finance Company (NBFC). Respondent No.3 was the originator of the loan to the petitioner-company but later on ceased to be its secured creditor by virtue of sale of its debt to respondent No.2 who became the secured creditor in its place w.e.f 12.9.2008. Respondent No.5 is a Public Limited company under the name and style of Indian Sucrose Limited claiming to acquire the assets of the petitioner- company through auction.

3. The petitioner-company was purchased by a joint venture of Shri Vidya Sagar Oswal (father of petitioner No.2) and Associates in the year 1981 from its original owners when the company was in a state of financial sickness. After family division, it was taken over by Shri Neelam Oswal, petitioner No.2. During the course of business, petitioner No.1 applied for financial assistance to respondent No.3 - IFCI who in turn sanctioned loan from time of time but all of sudden it stopped. The IFCI diverted the capital funds towards the adjustment of its old running account and stoppage of loan destroyed the whole expansion project of the petitioners. The company was making profits till the year 1995-96. From the year ending 1997, it started incurring cash losses and became Sick Company and a reference was made to Board for Industrial and

Financial Reconstruction (BIFR) under Sick Industrial Companies (Special Provisions) Act, 1985 (SICA).

4. Respondent No.3 thereafter filed an application, Annexure P.3 under section 19 of the Recovery of Debts due to the Banks and Financial Institutions Act, 1993 before the DRT at Chandigarh for recovery of ₹ 139 crores. The IFCI also issued demand notice dated 31.7.2002, Annexure P.3A under section 13(2) of the SARFAESI Act for a sum of ₹ 213 crores charging interest on amount of ₹ 139 crores. The Company was declared sick vide order dated 9.8.2005, Annexure P.4. Respondent No.3 was appointed as Operating Agency by the BIFR. The petitioner company approached respondent No.3 for settlement of its dues. On 9.8.2007, Annexure P.5, the Board of Directors of respondent No.3 approved a One Time Settlement Scheme (OTS) at ₹ 30 crores which was payable in four equal quarterly installments in one year but this decision was never communicated to the petitioners. On 8.11.2007, Annexure P.6, the petitioners received a letter from respondent No.3 revoking the OTS scheme. The petitioners filed a complaint before the BIFR and a direction was issued by the BIFR to the petitioners to pay ₹ 7.5 crores within one month to respondent No.3 and to pay the remaining amount of ₹ 22.5 crores in three installments in one year. On 5.2.2008, Annexure P.8, respondent No.3 wrote a letter to the petitioners asking them to pay ₹ 15.75 crores within a week so that the OTS scheme could be revived. On 12.9.2008, Annexure P.9, respondent No.3 sold the entire debt of the petitioners with all rights

and interests to respondent No.2 for a consideration of ₹ 19.86 crores as per section 5(I) (b) of the SARFAESI Act but this fact was kept concealed from the petitioners. On 3.2.2009, Annexure P.10 under the guise of revival of the company, authorised representative of respondent No.3 took partial possession of 15.86 acres of vacant land of the company for sale. Respondent No.3 informed the petitioners that 50% of the sale proceeds will be adjusted towards the OTS amount and 50% will be given to the petitioners for revival of the company. The representative of respondent No.3 took possession of the vacant land of the petitioner company on 3.2.2009. On 2.6.2009, it was decided by respondent No.2 that the petitioners will settle the due of IFCI and State Bank of Patiala at ₹ 35-36 crores and all other statutory liabilities will be paid by the petitioners on its own. The representative of respondent No.3 took possession of the remaining assets of the company on 9.7.2009. On 22.9.2009, the petitioners received an e-mail from respondent No.2 to send a sum of ₹ 50 lacs to show their bonafide. The petitioners in reply stated that a sum of ₹ 40 lacs was ready for payment towards the initial payment of OTS and for revival of the company. Respondent No.2 accepted the said amount without any objection. On 13.11.2009, Annexure P.15, the petitioners were shocked to come across a sale notice issued by respondent No.2 in the Economic Times for sale of the assets of the company. The petitioners raised objection but in no vain. Ultimately they filed an application under section 17 before the DRT-I Chandigarh on 7.2.2010 challenging the sale notice. An interim

application was also moved for grant of relief by way of stay which was dismissed by DRT vide order dated 19.3.2010 stating the assets had already been sold for ₹ 39 crores to the highest bidder. The petitioners filed an appeal against the said interim order before the DRAT at Delhi which was admitted and status quo was granted vide order dated 7.1.2011. Ultimately the interim application was dismissed by the DRT-I Chandigarh vide order dated 12.9.2011, Annexure P.22. The petitioners filed an appeal before the DRAT at Delhi against the order dated 12.9.2011. The registry raised objection and asked the petitioners to deposit 50% of the amount of debt due from them as per Section 18 of the SARFAESI Act. The petitioners moved an application for exemption of any pre-deposit on the ground of non applicability of Section 18 of the SARFAESI Act in case of the petitioners. The DRAT vide order dated 19.3.2012, Annexure P.1 instead of exempting the petitioners from any pre-deposit directed them to deposit 25% of the amount claimed through notice under section 13(2) of the SARFAESI Act by respondent No.3. Direction was also given to the petitioners to deposit the amount within eight weeks from the date of passing of the order and in case of failure to deposit the amount within the given time, the appeal shall not be entertained and be dismissed. Hence this petition.

5. Learned counsel for the petitioners submitted that the DRAT had not determined any debt and in such a situation when only sale of the property was under challenge, the DRAT could not have required the petitioners to deposit any amount as a precondition for

hearing the appeal. It was also contended that no amount has been claimed by the secured creditor, as the loan had been taken by the petitioners from IFCI who was declared to be NBFC and had assigned the same in favour of respondent No.2 - ARCIL who had not issued any notice raising any demand as a secured creditor.

6. Learned counsel for the respondents controverting the aforesaid submissions submitted that the notice under section 13(2) of the SARFAESI Act was issued in respect of recovery of ₹ 213 crores and the Tribunal has only required the petitioners to deposit 25% of the said amount and has also allowed the sale proceeds of the auction of the property amounting to ₹ 39 crores to be reduced. No illegality could be said to have been there in the order passed by the DRAT.

7. After hearing learned counsel for the parties and perusing the record, we do not find any merit in the writ petition.

8. The DRAT had directed the petitioners to deposit 25% of the amount claimed in the notice under section 13(2) of the SARFAESI Act. Further, the DRAT had allowed adjustment of any payment made by the borrower after the issue of notice of demand or received by the secured creditor in respect of loan in question. The DRAT while deciding the application for pre-deposit, in the order impugned herein, had recorded as under:-

> "The Tribunal below has not determined the amount of debt due on the appellants. As per para 30 of the impugned judgment, the demand notice dated 30.6.2002 was issued for more than Rs.213 crores. The contention of Mr. Mehra that since the appellants are challenging the auction sale of the secured asset for Rs.39 crores,

therefore, they cannot take benefit of the amount of sale consideration received by the secured creditor for calculating the amount of pre-deposit is however, not acceptable. In my opinion any amount either deposited by the borrower or received by the secured creditors by the sale of any secured asset after the issuance of the demand notice is entitled to be adjusted for the purposes of calculating the amount for pre-deposit. Although no specific ground has been shown in the application for reducing the amount of pre-deposit and the grounds taken for assailing the impugned order have also been stressed for the same, yet considering the quantity of the amount claimed and without commenting upon the merit of the grounds raised for assailing the impugned order at this stage, the amount of pre-deposit is reduced to 25% of the amount claimed through notice under section 13(2) of the SARFAESI Act."

9. Further, observations made by the DRAT while disposing of the application for exemption from pre-deposit are as under:-

"The application is disposed of accordingly and the appellants are directed to deposit 25% of the amount claimed in the notice under section 13(2) of the SARFAESI Act within eight weeks from the date of this order. Any deposit made by the appellants/borrowers after the issuance of notice of demand referred to above or any amount received by the secured creditors in respect of the loan in question shall be adjusted towards the payment of the amount of pre-deposit. The amount shall be deposited with the Registrar of this Tribunal, who shall forthwith invest the same in any interest bearing fixed deposit in the name of 'Registrar, DRAT, Delhi' with any nationalized bank for an initial period of 13 months, renewable from time to time as and when required."

10. Adverting to the second contention, suffice it to notice at this stage that once the debt had been assigned by the IFCI who was secured creditor in favour of ARCIL, the contention does not carry any weight.

11. In view of the above, it cannot be said that the discretion exercised by the DRAT was erroneous in any manner.

12. Before parting, it may be essential to notice that on 16.5.2012, on the basis of statement of learned counsel for the petitioner, the following order was passed:-

> "Learned counsel for the petitioners inter alia submits that though the claim of the bank is for Rs.213 crores but the petitioners have only filed appeal before the Debt Recovery Appellate Tribunal (for short, "DRAT") in respect of the auction sale which has taken place for Rs.39 crores. According to the learned counsel, the DRAT could not have ordered for 25% of Rs.213 crores but of Rs.39 crores. It is further contended that provisions of section 18 of the Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002 are not applicable to the present case.
>
> Notice of motion to respondents No.2 and 3 only at this stage.
>
> Notice re: stay also.
>
> Mr. Rohit Sapra, Advocate accepts notice on behalf of respondents No.2 and 3 and prays for time.
>
> Adjourned to 24.5.2012."

13. Now in the rejoinder to the written statement filed by respondent Nos. 2 and 3, the petitioners have sought to retract from the aforesaid statement by stating in para 9 of the preliminary

submissions as under:-

> "In this regard it is submitted that it is no where the case of the petitioners that the DRAT could have ordered 25% of Rs.39 crore instead of Rs.213 crores. This fact might have occurred due to lack of proper conveying of the contentions by the counsel for the petitioners while arguing for non applicability of Section 18 of the Act which found mention in the order dated 16.5.2012 itself."

14. This contention of the petitioners after seeking notice of motion is not appreciated as the order was dictated in the presence of the counsel for the petitioners. According the order of the DRAT, the petitioner is required to deposit ₹ 14.25 crores whereas even if it is taken to be 25% of ₹ 39 crores, the same would come to ₹ 9.75 crores. Since the petitioners have not shown willingness to deposit any amount as a pre-condition for hearing the appeal by DRAT, we find no merit in the petition and the same is dismissed.

(Ajay Kumar Mittal)
Judge

May 24, 2012
'gs'

(Gurmeet Singh Sandhawalia)
Judge

Annexure-5

No. 3265 SUPREME COURT ORDER S. Court Cell. D. 12 Dated 19/5/16

From,

The Registrar General,
Punjab and Haryana High Court,
Chandigarh.

To,

1. DEBT Recovery Appellate Tribunal, (DRAT) Apartment No. 318, 3rd Floor, Hotel Samrat, Kautilya Marg, Chanakyapuri, New Delhi.
2. Asset Reconstruction Company (India) Ltd. (ARCIL), Siripati Arcade, August Kranti Marg, Nan Chowk, Mumbai through its Authorised Officer.
3. Authorised officer, IFCI Limited, IFCI Bhawan, 1-C, Sector-27-A, Madhaya Marg, Chandigarh.
4. Indian Sucrose Ltd. Registered Office, GT Road, Mukerian, District Hoshiarpur, Punjab through its Authorised Office (Alleged Auction Purchaser).
5. Employees Provident Fund Organisation, Sub-Regional Office 171, Green Park, Sahota Complex, Jalandhar through Regional Provident Fund Commissioner, Jallandhar.

Subject:- SLP (Civil) No. 30231 of 2012
Arising Out in CWP No. 9131 of 2012
Mukerian Papers Ltd. & Anr.
Versus
Assets Reconstruction Co. (I) Ltd. & Ors.

INDIAN SUCROSE LIMITED 136 30/5/16

Sir,

I am directed to forward herewith a copy of Record of Proceedings dated 29.03.2016, received from the Hon'ble Supreme Court of India, New Delhi in the above said case for information and necessary action in the matter.

Yours faithfully,

Supdt. Supreme Court Cell
for Registrar General

337004

ITEM NO.8 COURT NO.7 SECTION XVI

S U P R E M E C O U R T O F I N D I A
RECORD OF PROCEEDINGS

Petition(s) for Special Leave to Appeal (C) No(s). 30231/2012

(Arising out of impugned final judgment and order dated 24/05/2012 in CWP No. 9131/2012 passed by the High Court Of Punjab & Haryana At Chandigarh)

MUKERIAN PAPERS LTD. & ANR. Petitioner(s)

VERSUS

ASSETS RECONSTRUCTION CO.(I) LTD.& ORS. Respondent(s)

(with appln. (s) for directions and permission to file additional documents and raising additional grounds, interim relief and office report)

Date : 29/03/2016 This petition was called on for hearing today.

CORAM :
HON'BLE MR. JUSTICE RANJAN GOGOI
HON'BLE MR. JUSTICE PRAFULLA C. PANT

For Petitioner(s) Mr. Jainainder Saini, Adv.
Mr. Hardeep singh, Adv.
Mr. Bikram Chaudhary, Adv.
Mr. Devvrat,Adv.

For Respondent(s) Mr. Shyam Divan, Sr. adv.
Mr. Galav Sharma, Adv.
Ms. Nandita Bajpai, Adv.
M/s. Parekh & Co

Mr. P. N. Puri,Adv.

Mr. Balraj Dewan,Adv.

Mr. Parag P. Tripathi, Adv.
Mr. Apoorve Karol, Adv.
Mr. Aseem Swaroop, Adv.
Mr. Gagan Gupta,Adv.

Mr. Kush Chaturvedi,Adv.

UPON hearing the counsel the Court made the following

O R D E R

Heard learned counsel for the parties and perused the relevant material.

We do not find any legal and valid ground for interference. The Special Leave Petition is dismissed.

We direct that the amount of Rs.2,00,00,000/- (Rupees two crores only) deposited by the petitioners alongwith interest thereon be transferred to the Debts Recovery Tribunal, Chandigarh which shall be kept by the learned Tribunal in an interest bearing account and will be governed by the order(s) as may be passed by the learned Tribunal.

As a sequel to the above, all pending interlocutory applications are disposed of.

29/3/16

(Neetu Khajuria)
Sr.P.A.

29.3.16

(Asha Soni)
Court Master

29/3/16

Annexure-6

IN THE SUPREME COURT OF INDIA

INHERENT JURISDICTION

CURATIVE PETITION (CIVIL) NO.156 OF 2018

IN

REVIEW PETITION (CIVIL) NO.1757 OF 2017

IN

SPECIAL LEAVE PETITION (CIVIL) NO.30231 OF 2012

Mukerian Papers Limited and Another — Petitioner(s)

Versus

Asset Reconstruction Company (India) Ltd. (ARCIL) and Others — Respondent(s)

O R D E R

We have gone through the Curative Petition and the connected papers. In our opinion, no case is made out within the parameters indicated in the decision of this Court in the case of *Rupa Ashok Hurra* vs. *Ashok Hurra & Another*, reported in 2002 (4) SCC 388. Hence, the Curative Petition is dismissed.

.....CJI.
[Ranjan Gogoi]

.....J.
[A.K. Sikri]

.....J.
[S.A. Bobde]

Signature Not Verified
Digitally signed by
CHETAN KUMAR
Date: 2019.02.27
15:59:22 IST
Reason:

New Delhi
February 19, 2019.

ITEM NO.1004 SECTION

S U P R E M E C O U R T O F I N D I A
RECORD OF PROCEEDINGS

CURATIVE PETITION (CIVIL) NO.156 OF 2018
IN
REVIEW PETITION (CIVIL) NO.1757 OF 2017
IN
SPECIAL LEAVE PETITION (CIVIL) NO.30231 OF 2012

MUKERIAN PAPERS LIMITED AND ANR. Petitioner(s)

VERSUS

ASSET RECONSTRUCTION COMPANY(INDIA) LTD. (ARCIL) & ORS. Respondent(s)

Date : 19-02-2019 This petition was circulated today.

CORAM :
HON'BLE THE CHIEF JUSTICE
HON'BLE MR. JUSTICE A.K. SIKRI
HON'BLE MR. JUSTICE S.A. BOBDE

By Circulation

UPON perusing papers the Court made the following
O R D E R

The curative petition is dismissed in terms of the signed order.

(Chetan Kumar)
A.R.-cum-P.S.

(Anand Prakash)
Court Master

(Signed order is placed on the file)

Annexure-7

ITEM NO.1003 SECTION IV-B

S U P R E M E C O U R T O F I N D I A
RECORD OF PROCEEDINGS

REVIEW PETITION (CIVIL) NO.1757 OF 2017
IN
SPECIAL LEAVE PETITION(CIVIL) NO.30231 OF 2012

MUKERIAN PAPERS LTD. AND ANR. ...PETITIONER(S)

VERSUS

ASSET RECONSTRUCTION
COMPANY (INDIA) LTD. AND ORS. ...RESPONDENT(S)

VERSUS

ASSET RECONSTRUCTION COMPANY (INDIA) LTD. AND ORS. Respondent(s)

(FOR ADMISSION and IA No.73330/2017-APPLICATION FOR DIRECTION FOR ORAL HEARING)

Date : 22-08-2017 This petition was circulated today.

CORAM :
HON'BLE MR. JUSTICE RANJAN GOGOI
HON'BLE MR. JUSTICE PRAFULLA C. PANT

By Circulation

UPON perusing papers the Court made the following
O R D E R

Prayer for oral hearing is rejected.

The review petition is dismissed terms of the signed order.

(NEETU KHAJURIA)
COURT MASTER

(ASHA SONI)
BRANCH OFFICER

(Signed order is placed on the file.)

IN THE SUPREME COURT OF INDIA
CIVIL APPELLATE JURISDICTION

REVIEW PETITION (CIVIL) NO.1757 OF 2017
IN
SPECIAL LEAVE PETITION(CIVIL) NO.30231 OF 2012

MUKERIAN PAPERS LTD. AND ANR. ...PETITIONER(S)

VERSUS

ASSET RECONSTRUCTION
COMPANY (INDIA) LTD. AND ORS. ...RESPONDENT(S)

O R D E R

This Review Petition has been filed against the order dated 29.03.2016 whereby the Special Leave Petition was dismissed.

Prayer for oral hearing is rejected.

We have perused the Review Petition as well as the grounds in support thereof. In our opinion, no case for review of order dated 29.03.2016 is made out. Consequently, the review petition is dismissed.

.....,J.
(RANJAN GOGOI)

.....,J.
(PRAFULLA C. PANT)

NEW DELHI
AUGUST 22, 2017

Validity unknown

Annexure-6

GREENBELT & LANDSCAPE PLAN FOR 120 KLD MOLASSES BASED ETHANOL PLANT AND 4 MW CO-GENERATION POWER PLANT AT VILLAGE- CHAK ALLABAKSH & MAHIULDINPUR DALEL, TEHSIL- MUKERIAN, DISTRICT- HOSHIARPUR (PUNJAB). BY- M/S INDIAN SUCROSE LTD.

Objective of Plan:

The main purpose of this plan is to develop greenbelt and landscape at project site so that following specific purpose are met with after completion of the project:

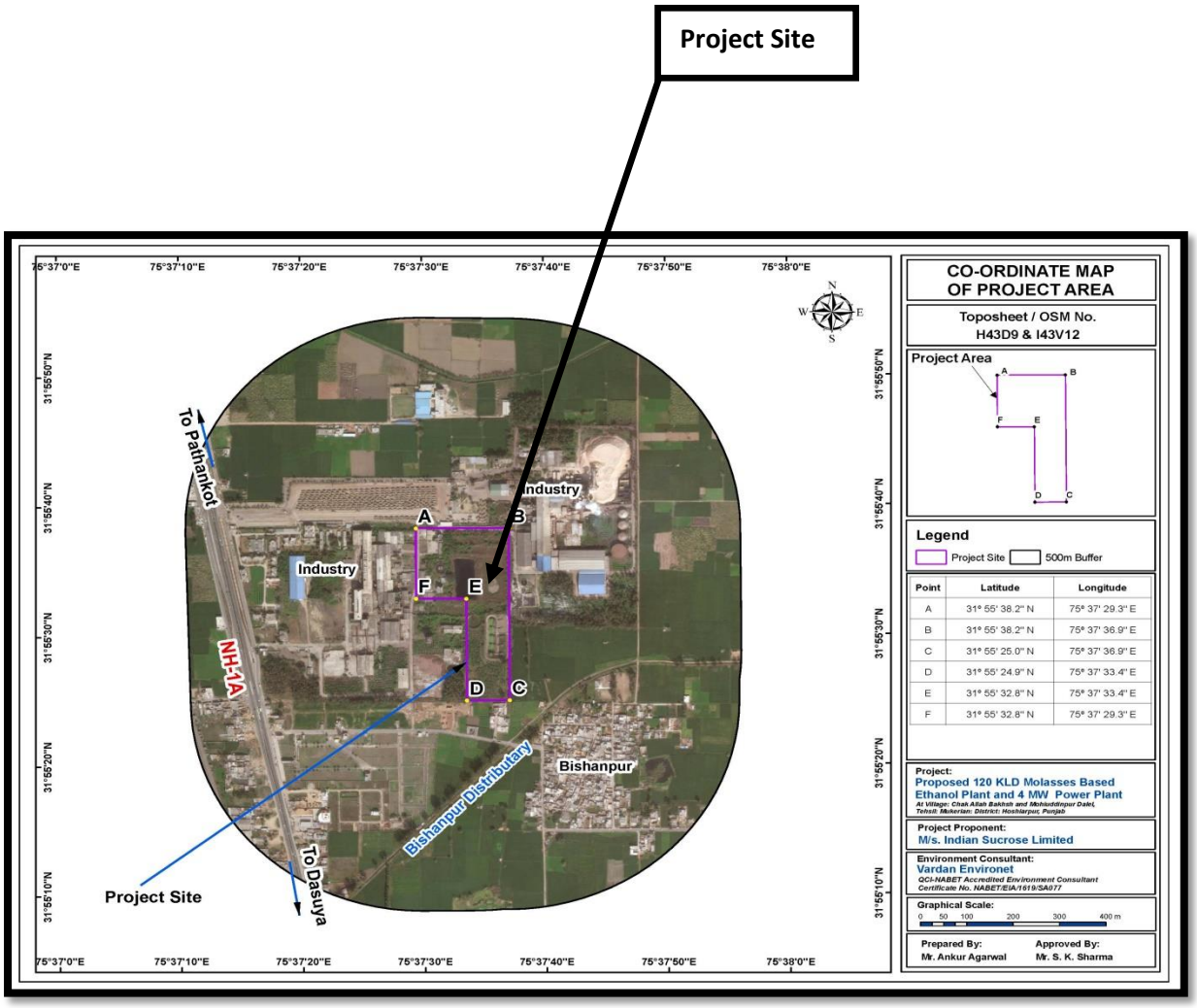
a. General pollution abatement
b. Air pollution attenuation
c. Dust absorption

As envisaged in the National Forest Policy 1988 that one third of the total area should be under green cover to maintain ecological balance in the country. In State Forest Policy 2006 it is envisaged that State will try to attain at least 20% green cover in the phased manner. It is very difficult target to attain agricultural state like Punjab but their enormous scope for attaining this target under the developmental projects where the project is designed as fresh and there is change of land use from agriculture primarily to other uses.

Therefore, to attain the target as envisaged under State Forest Policy and National Forest Policy, the provision of green belts/avenue plantations is made under developmental projects. The species proposed should be long rotation, ornamental, evergreen, hardy, wind firm. The species suitable for urban areas should have capacity to combat pollution.

Project Location:

The proposed project site is located at Village- Chak Allabaksh & Mahiuldinpur Dalel, Tehsil- Mukerian, District- Hoshiarpur (Punjab). Kindly find below the project map and Google image of the site.



Google map showing the project site

The project will be implemented on an area of **5.26 Ha**/12.99 acres/52600.0 m^2. As per recent guidelines; the green space for the projects should be 33 % of the total plot area. Therefore, the total green area provided is 33.39% of total plot area which is 17563.0 m^2 after completion of project. The plan has been prepared considering the above view in mind and the plan has been divided into following components:

1. Greenbelt Plantation
2. Periphery Plantation
3. Lawn & Grass Pavers

The detail of the areas proposed under various components is given below:

1. Greenbelt Plantation: 2298.0 m^2
2. Avenue Plantation: 4144.0 m^2
3. Periphery Plantation : 1528.0 m^2
4. Lawn Area: 9593.0 m^2

Total Green area: 17563.0 m^2 which is 33.39 % of the total plot area

The details of the above components have been shown as under and also have been shown in map/drawing enclosed as under:

1. Greenbelt:

The greenbelt will be planted at-least two rows at a spacing of 2m x 2m. The details as per drawing are given below:

Green Belt Details				Green Belt area	No. of trees
	L	x	W		
GB-1	26.000	x	4.000	104	26
GB-2	26.000	x	4.000	104	26
GB-3	18.000	x	4.000	72	18
GB-4	18.000	x	4.000	72	18
GB-5	150.000	x	4.000	600	150
GB-6	74.000	x	4.000	296	74
GB-7	150.000	x	4.000	600	150
GB-8	50.000	x	9.000	450	113
Total				2298	575

Total no. of plants to be planted :

The species prescribed for the greenbelt should be planted to provide a continuous green curtain to the site. Dense leaved Cassia Fistula (Amaltash), Neem, Peepal **(Ficusreligiosa), Ashoka** & Plumeria alba (Champa) have been proposed for the green belt to combat all kinds of pollution i.e. noise, dust and air pollution.

2. Avenue:

Avenue plantation details as per drawing are given below-

Avenue Plant Details				Avenue Area	No. of trees
AV-1	139.000	x	2.000	278	70
AV-2	130.000	x	2.000	260	65
AV-3	130.000	x	2.000	260	65
AV-4	30.000	x	2.000	60	15
AV-5	30.000	x	2.000	60	15
AV-6	251.000	x	2.000	502	126
AV-7	50.000	x	2.000	100	25
AV-8	63.000	x	2.000	126	32

AV-9	20.000	x	2.000	40	10
AV-10	25.000	x	2.000	50	13
AV-11	108.000	x	2.000	216	54
AV-12	108.000	x	2.000	216	54
AV-13	108.000	x	2.000	216	54
AV-14	33.000	x	2.000	66	17
AV-15	50.000	x	2.000	100	25
AV-16	15.000	x	2.000	30	8
AV-17	9.000	x	2.000	18	5
AV-18	50.000	x	2.000	100	25
AV-19	40.000	x	2.000	80	20
AV-20	102.000	x	2.000	204	51
AV-21	18.000	x	2.000	36	9
AV-22	18.000	x	2.000	36	9
AV-23	197.000	x	2.000	394	99
AV-24	30.000	x	2.000	60	15
AV-25	77.000	x	2.000	154	39
AV-26	77.000	x	2.000	154	39
AV-27	82.000	x	2.000	164	41
AV-28	82.000	x	2.000	164	41
Total				4144	967

3. Periphery Plantation

The trees planted along the boundary wall may be planted under Periphery Plantation. The periphery plantation maybe in a single row. Here, the periphery row has been prescribed all along the boundary. The details of such areas as shown in the map are given below:

Periphery Area details				Periphery Area	No. of Trees
PP-1	247.000	x	2.000	494	124
PP-2	108.000	x	2.000	216	54
PP-3	206.000	x	2.000	412	103
PP-4	203.000	x	2.000	406	102
Total				1528	383

The periphery plantation will be done in single row at the specified places in the plan. The plantation will be done at a spacing of 3m length wise depending upon tree species selected. The species prescribed in the avenue plantation are as under:

1. Peltophorum pterocarpum
2. Millingtonia hortensis
3. Thevetia peruviana

4. Lawns :

The lawn consume lots of water therefore, grass variety should be carefully selected. The most suitable grass variety is selection No. 1 which consumes less than other varieties. The details of area where lawn & Grass Pavers has been prescribed in the drawings in given below:

Lawn Area					
RECT.	NOS	L.	x	B	AREA IN SQM.
LW-1	1	AS PER PLAN			3894
LW-2	1	AS PER PLAN			3136
LW-3	1	AS PER PLAN			2563
TOTAL					9593

(NOTE: LANDSCAPE TERRACE AREAS REMOVED)

The grass area is planted after soil preparation and mixing of compost. The grass is planted by way of dibbling at a spacing of 5 cm x 5 cm for early spread and for formation of carpet.

Suitable species of shrubs as mentioned under may also be planted based on availability in open spaces and surrounding lawns:

1. Tabernaemontana coronaria (Chandani)
2. Cestrum nocturnum (Rat-rani)
3. Hamelia patens
4. Nerium oleander (Kaner)
5. Cassia glauca
6. Calliandra calothyrsus (Powder-puff)

The hedges are generally planted at a spacing of 30 cm x 30 cm in two rows along with paths. The hedges may also be planted along the boundary of the lawns for beautification of the site. The species proposed as per availability are given below:

1. Duranta repens (Golden duranta)
2. Clerodendron inermi (Clerodendron)
3. Ficus panda (Ficus Hedge)

Accent and feature plantation

Maintenance of Plantation Components

Maintenance is an important component under greenbelt and landscape development and for beautification of the area/site. All the plants-trees, shrubs, hedges and lawns should be provided manuring and watering for the good growth. Pesticides may be applied as per requirement especially for the protection of the plants from termites. The grass should be mowed regularly for proper maintenance of the lawn. Trimming of shrubs and hedges be mowed regularly for proper maintenance. Protection from biotic factors is also required.

Other ornamental plants may also be planted at the site if they are suitable to the site as per site condition i.e. soil & water. The soil is loamy sand and pH as informed by project proponent is 7. The tree species specified above should be given importance. Bamboos, Palms etc planted for beautification of the site should be in addition to the number of trees to be actually planted for greenbelt/avenue development.

Cost Statement:

1. Trees : Greenbelt, Avenue and Periphery Plantation
   Total trees nos. proposed: **1924**
   A. Cost of plantation and five years maintenance @ Rs 500 per plant Rs.9,62,000/- for total nos. 1923 trees

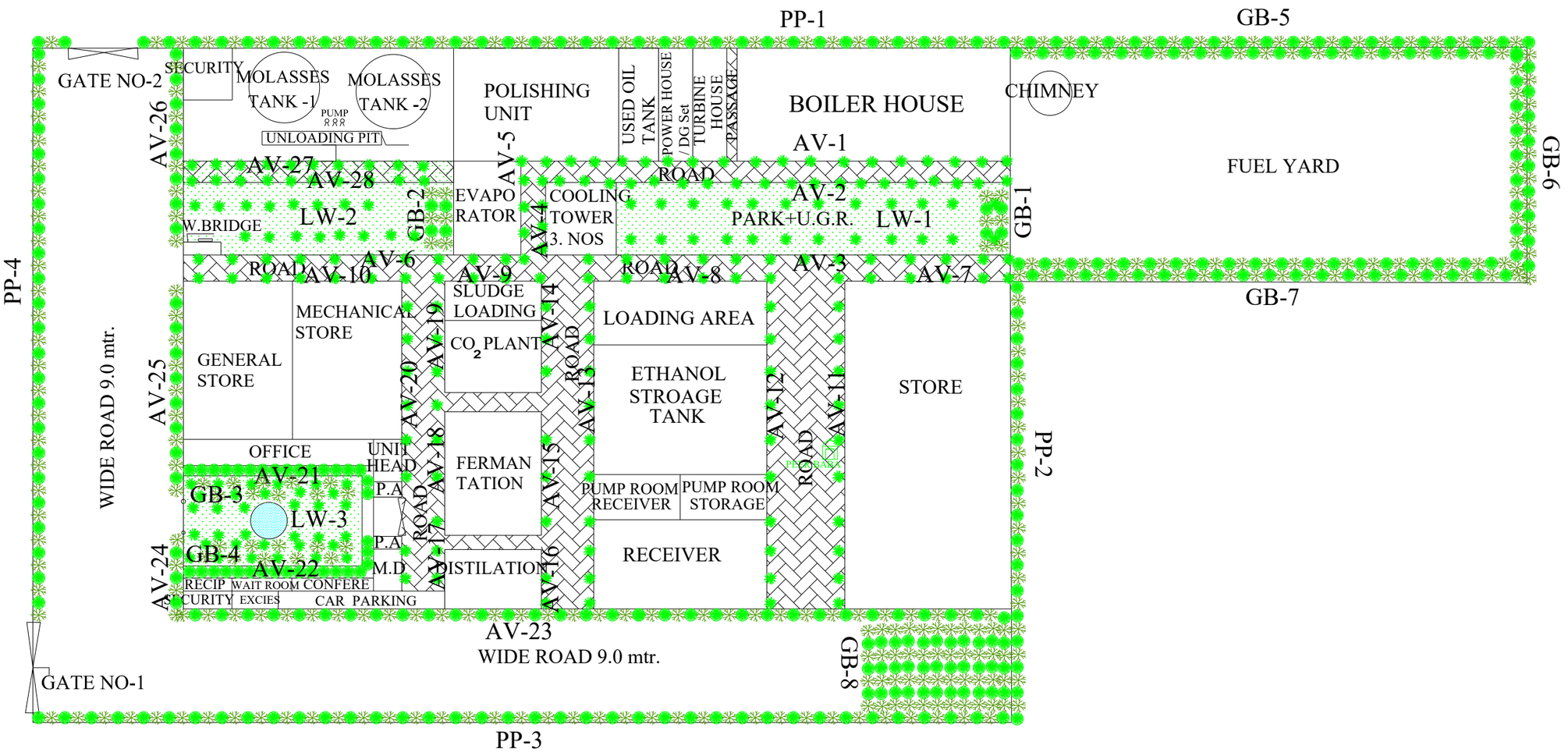
2. Lawn & Grass Pavers
   Area: 9593 m^2
   B. Cost of plantation and five years maintenance @ Rs 40 per sqm ; Rs.3,83,720 /- For total Lawn.

Total Cost (A+B): Rs. 13,45,720 /-

Total tree required for the project= 52600 /80=657.5 = **Say 658**

Total tree planted with in the site= **1924**

LAYOUT OF INDIAN SUCROSE LTD.



THE DRAWING AND DESIGN IS THE PROPERTY OF
INDIAN SUCROSE LIMITED G.T.ROAD MUKERIAN
AND MUST NOT BE COPIED OR LENT WITHOUT THEIR
PERMISSION IN WRITING.

REV No	ZONE	REVISIONS

Drawing No.: MH-3-258 00
Replaced from :

INDIAN SUCROSE LTD. G.T. ROAD MUKERIAN

(A Company of yadu corp.)
G. T. ROAD MUKERIAN
DIST. HOSHIARPUR(PUNJAB)
Ph. + 91- 01883 - 249002 / 3 / 4 / 5
E-mail:yaducorp@sify.com

Surface finish: as cast 5-50m; rough 6-25m; smooth 1.6-6m; grind 0.25-1.6m; mirror --

Scale: NTS
Dimension in
Weight
Material
Nos.

Subject	Initials	Date
Drawn		
Checked		
Approved		
ELECT.		

Title: DISTILLERY PLAN (120KLPD ETHANOL PLANT)

Floppy No.
Drawing No.
Rev

Machine :
Order No. : ----------
Sheet 01 of 01

INDIA NON JUDICIAL

Government of National Capital Territory of Delhi

e-Stamp

सत्यमेव जयते

Certificate No.	:	IN-DL13961653369206S
Certificate Issued Date	:	23-Jan-2020 11:55 AM
Account Reference	:	IMPACC (IV)/ dl862203/ DELHI/ DL-DLH
Unique Doc. Reference	:	SUBIN-DLDL96220336180903309893S
Purchased by	:	ABHAY UPADHYAY
Description of Document	:	Article Undertaking
Property Description	:	Not Applicable
Consideration Price (Rs.)	:	0 (Zero)
First Party	:	ABHAY UPADHYAY
Second Party	:	Not Applicable
Stamp Duty Paid By	:	ABHAY UPADHYAY
Stamp Duty Amount(Rs.)	:	100 (One Hundred only)

Please write or type below this line

NOTARY
Ram Sharan Lohmorh
Kapashera, N. Delhi
Regd. No. 1955
Expiry Date:
27-7-2021
GOVT. OF INDIA

Continue Page-2

Date:- 23-01-2020

TO WHOM IT MAY CONCERN

I, Abhay Upadhyay, Director of **M/s. Indian Sucrose Ltd.** located at **Village- Chak Allah Baksh, Tehsil: Mukeria, District: Hoshiarpur, (Punjab)** is proposing a 120 KLD Molasses based ethanol plant & 4 MW Co-generation power plant. For this proposed unit we are undertaking as follows:

1. **Our company will not operate the proposed ethanol plant until we don't get any alternative source of water/ permission for water withdrawal from CGWA.**

NOTARY
Kapashera, N. Delhi
Regd. No. 1955
Expiry Date:
27-7-2021
GOVT. OF INDIA

M/s. Indian Sucrose Ltd.

Abhay Upadhayay

Director

ATTESTED
NOTARY
Kapashera, New Delhi (India)

Date: 23/01/2020

23 JAN 2020

Annexure-8

FUEL FOR BOILER

Fuel quantity for the boiler will depend on the quantity of Stem required. Fuel burned in the boiler is the mixture of Bagasse and spent wash. The composition of spent wash is 30-35 %, if the sludge content in the spent wash is 50-60% brix (4000-6000 mg/kg) for the maximum gross value. The quantity of bagasse required will be ~ 20 TPH.

Government of Punjab
Department of Forests and Wildlife Preservation
O/o Principal Chief Conservator of Forests (Wildlife)
and Chief Wildlife Warden, Punjab
Forest Complex, Sector 68, S.A.S. Nagar.
Phone: 0172-2298010

No.:_____

To

Divisional Forest Officer (Wildlife),
Hoshiarpur.

Dated:_____

Subject **Submission of Wildlife Conservation Plan for the proposed 120 KLPD Molasses based ethanol plant and 4 MW co-generation power plants at Village Chak Allabaksh, Tehsil Mukerian, District Hoshiarpur, Punjab.**

Reference **i) Your Letter No. 2567 dated 18.12.2019**
ii) M/s Indian Sucrose Limited, Hoshiarpur's Letter No. 534 dated 4.11.2019

****

With respect to above cited subject and letters quoted above, the Wildlife Conservation Plan in view of Schedule I fauna falling in the Buffer Zone of the proposed project "120 KLPD Molasses based ethanol plant and 4 MW co-generation power plants" at Village Chak Allabaksh, Tehsil Mukerian, District Hoshiarpur, Punjab of Rs. 25.00 Lakh as submitted by M/s Indian Sucrose Limited and recommended by you has been considered in this office. This office hereby conveys "In-principle" approval to the Plan subject to the following conditions: -

1. This "In-principle" approval is valid for one month from the date of issue of this letter.
2. The Project Proponent is required to deposit funds of 25.00 lakh to Divisional Forest Officer (Wildlife), Hoshairpur within a period of one month.

3. The Project Proponent will implement the plan in letter and spirit falling which the approval of the plan will be revoked by the competent authority of this office.

4. A copy of the approved Mitigation Plan is enclosed herewith for information and further necessary action.

5. The final approval will be given only after the receipt of funds as proposed in the Plan.

Principal Chief Conservator of Forests (Wildlife)
and Chief Wildlife Warden,
Punjab, S.A.S. Nagar.

Endst. No. 7075-76 Dated: 27.11.2019

A copy is sent to the followings for information and further necessary action.

1. Member Secretary, State Environment Impact Assessment Authority (SEIAA) O/o Punjab Pollution Control Board, Vatavaran Bhawan, Nabha Road, Patiala, Punjab– 147001.

2. M/s Indian Sucrose Limited. Village Chak Allabaksh, Tehsil Mukerian, District Hoshiarpur, Punjab. This is w.r.t. their letter No. 531 dated 04.11.2019

27/11/19

Principal Chief Conservator of Forests (Wildlife),
and Chief Wildlife Warden,
Punjab, S.A.S. Nagar.

4.3 FINANCIAL PROJECTION – ETHANOL PLANT

Rs. 25.00 Lakhs has been allocated towards conservation of scheduled fauna in the area for the implementation of conservation proposal.

Table 11: Budget for Conservation/Management Plan:

S. No.	Component	Budget (Rs in Lakh)
1.	Planting of trees groves inside the surrounding forest area	6.00
2.	Patrolling vehicle	9.00
3.	Equipments (GPS, Nets, Snake Catchers, Cages etc.)	3.00
4.	Workshops, Training and awareness programmes	2.00
5.	Rescue & Rehabilitation of Animals	2.00
6.	Maintenance/ POL for Vehicle for next Three Years.	2.00
7.	Contingency/General	1.00
Total		25.00

Divisional Forest Officer
Wild Life Division
Hoshiarpur.

Approved.
23/12/19
CWLW, Punjab.
Chief Wildlife Warden
Punjab, S.A.S. Nagar

VARDAN ENVIRONET GURGAON

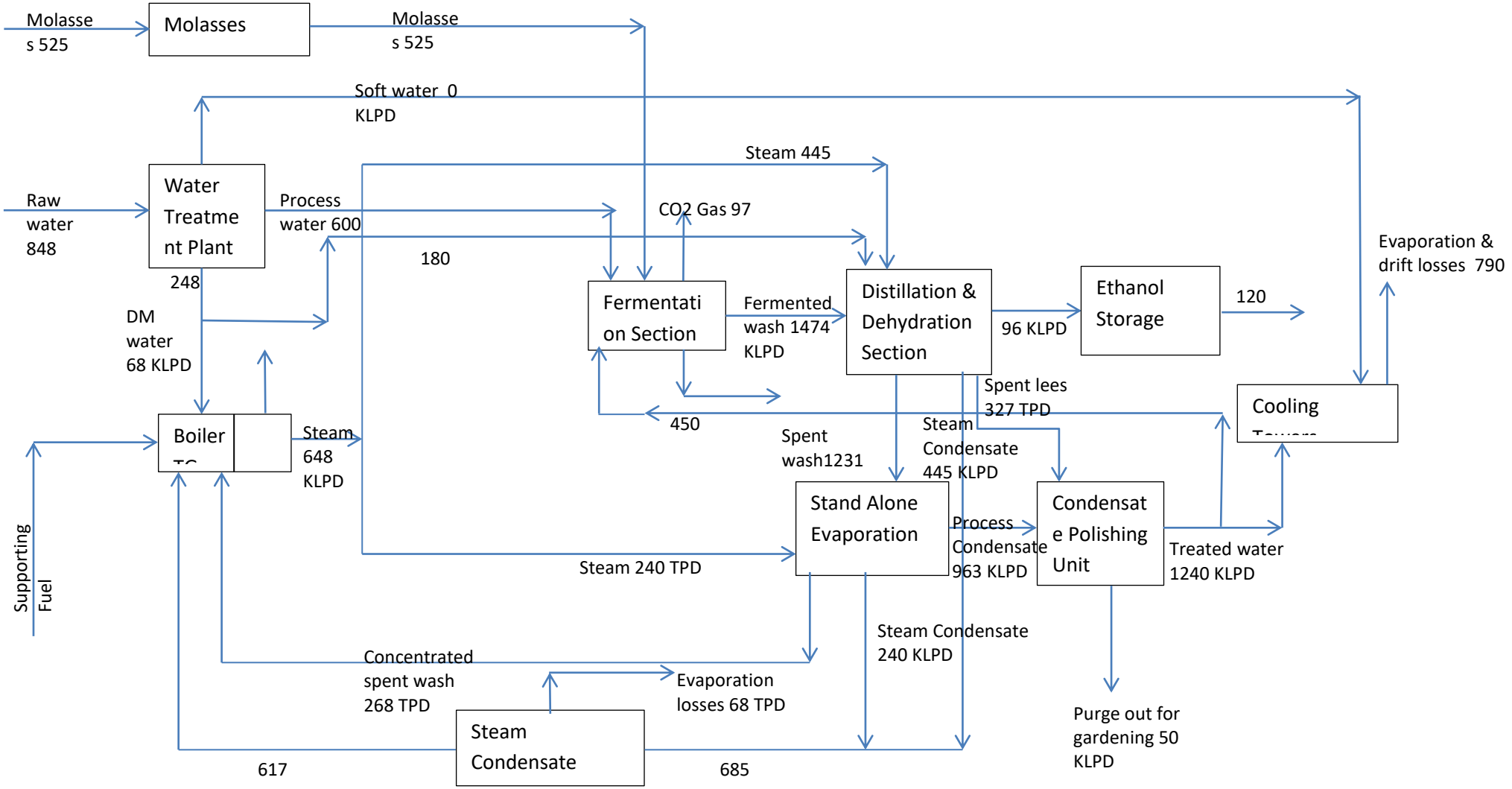
Annexure-10

Fire Hydrant line and Portable Extinguishers shall me made readily available at all points. Emergency Preparedness plan shall be practiced every month by carrying out Mock Drill. Proper safety Training shall be given to all employees working the Area.
Detailed OHS Budget for Proposed project is given below:

Table 1: Proposed OHS budget

Sl No.	OHS Requirement	OHS Budget
1.	Route Maintenance of Fire Hydrant Line	15 Lakh Rupees
2.	Installation of Heat Detectors, smoke detectors and Maintenance	4.00 Lakh Rupees
3.	Yearly Hydro test of Fire Extinguishers	5.00 Lakh Rupees
4.	Work Zone Monitoring (Production and Control Room)	3.00 Lakh Rupees
5.	CO2 Flooding System for MCC & Panel Rooms	5.00 Lakh Rupees
6.	Environment Audit(Once in Year)	2.00 Lakh Rupees)
7.	Third Party EHS Audit (Once in 2 years)	2.00 Lakh Rupees
8.	PPE Purchase	3.00 Lakh Rupees
9.	Exhaust Ventilation Test	5.00 Lakh Rupees
10.	Yearly Occupational Health Monitoring of Employees and Record Maintenance	5.00 Lakh Rupees
11.	Training and Safety Awareness Program	2.00 Lakh Rupees
12.	Safety week celebration Conduction and Safety Slogans	1.00 Lakh rupees
13.	Misc	1.00 Lakh Rupees
Total		**53 Lakhs**

Annexure-11


Molasse s 525
Molasses
Molasse s 525
Soft water 0 KLPD
Steam 445
Raw water 848
Water Treatment Plant
Process water 600
CO2 Gas 97
180
248
DM water 68 KLPD
Fermentation Section
Fermented wash 1474 KLPD
Distillation & Dehydration Section
96 KLPD
Ethanol Storage
120
Evaporation & drift losses 790
Spent lees 327 TPD
Cooling Towers
450
Boiler
Steam 648 KLPD
Spent wash1231
Steam Condensate 445 KLPD
Supporting Fuel
Stand Alone Evaporation
Process Condensate 963 KLPD
Condensate Polishing Unit
Treated water 1240 KLPD
Steam 240 TPD
Steam Condensate 240 KLPD
Concentrated spent wash 268 TPD
Evaporation losses 68 TPD
Steam Condensate
617
685
Purge out for gardening 50 KLPD

1. **Multi-Effect Evaporation:** Spent wash from the process is fed into multi effect evaporator. Whole process is under vacuum and vapor generated are compressed and used as steam. Condensate water generated from evaporation will be recycled back into the process; While concentrate spent wash will be incinerated in the proposed spent wash fired boiler.

2. **Condensate Polishing Unit**: The condensate polishing unit is also envisaged to take care of spent less, cooling tower blow down, washing and process condensate from evaporation plant. After treatment all the stream at CPU, water can be recycled to process and as cooling tower make up.

ANNEXURE-12

1.1 CORPORATE ENVIRONMENT RESPONSIBILITY

Corporate Environment Responsibility is for the sustainable development of various components like Social, Economic, Environmental etc. These entire components are closely interrelated and mutually re-enforcing. This budget will be used to meet the issue raised during Public hearing and for Social need assessment. The CER budget proposed by the project proponent is **3.2 Crore.** This CER budget is proposed as per the Office Memorandum dated 1st May, 2018 by the MoEF & CC.

S. No.	Area of Concern	Name of the village represented in public hearing	Action Plan	Budget (Crore)
1	Community Water Conservation	1. Bishanpur 2. Chak Allabaksh 3. Durgi Rajpuran 4. Mahiuldinpur 5. Khanpur	A reverse osmosis system in village cost of the scheme @10lakhs in each village*5=50	0.50
			Rainwater harvesting system in village cost of Scheme @10 lakhs in each village*5=50	0.50
2	Health facility		New dispensary in the village cost of dispensary @10Lakhs in each village*5=50	0.50
3	Employment opportunity	1. Bishanpur 2. Chak Allabaksh 3. Durgi Rajpuran 4. Mahiuldinpur 5. Khanpur	Vocational training center for the educated youth of the village Short term courses for skill upgradation for villagers	0.30

4	Educational Facility	1. Bishanpur 2. Chak Allabaksh 3. Durgi Rajpuran 4. Mahiuldinpur 5. Khanpur	Development of sports infrastructure in village (development of courts for different games, sports equipment's in village clubs or schools) to promote the sports. Distribution of computer to the Govt. School	0.60
5	Infrastructure development	1. Bishanpur 2. Chak Allabaksh 3. Durgi Rajpuran 4. Mahiuldinpur 5. Khanpur	Toilets construction under Swatch Bharat Creation of Cow shed in village	0.50
6	Miscellaneous	1. Bishanpur 2. Chak Allabaksh 3. Durgi Rajpuran 4. Mahiuldinpur 5. Khanpur	Campaigning program to stop the residual burning to stop the Air Pollution. Plantation programme in nearby areas.	0.10
Total				**3.2**

ANNEXURE-13

1.1 ON–SITE EMERGENCY PLAN

Introduction

The views of the possible hazards that can arise out of the daily operations in the distillery plant, various measures are adopted to prevent the occurrence of a major accident. This comprises of:

- Built in safety measures, alarms, trips and interlocks etc.
- Standard safe operating and maintenance procedures permit system etc.
- Training of all the involved staff in normal and emergency operating procedures.
- Training of all employees in safety, fire fighting and first aid.

However, in spite of these precautions, it is required to foresee situation of major accident and plan for taking timely action to minimize the effects of such incident on the safety and health of persons working in the plant as well as those living around the premises.

Preparation of Plan

Alarm System

A siren shall be provided under the control of Security office in the plant premises to give warning. In case of emergencies this will be used on the instructions to shift in charge that is positioned round the clock. The warning signal for emergency shall be as follows:

–Emergency Siren: Waxing and waning sound for 3 minutes.

–All clear signal: Continuous siren for one minute.

Communication

Walkies & Talkies are located at strategic locations; internal telephone system EPBX with external P&T telephones would be provided.

Fire Protection System: Fire Fighting System

The fire protection system for the unit is to provide for early detection, alarm, containment and suppression of fires. The fire detection and protection system has been planned to meet the above objective an all–statutory and insurance requirement of Tariff Advisory Committee (TAC) of India.

The following systems of fire protection are proposed to be provided for the plant:

a) Fire alarm system
b) Fire containment
c) Hydrant system for the entire plant
d) High velocity water spray (HVWS) system
e) Carbon dioxide flooding system
f) Portable fire extinguishers.

a) Fire alarm system

A fire alarm system would be installed to provide visual and audible alarm in the plant for fire detection at the incipient stage. This system would comprise manual call points located at strategic locations in areas which are normally manned, and automatic smoke and heat detectors located at important points such as the cable vault, the control room, switchgear room etc., to detect fire at an early stage, and provide visual and audible alarm.

b) Fire containment

Strategic areas in the plant would be separated by adequately rated firewalls. All openings for switchgears and cable entry would be sealed by fireproof seals to prevent spread of fire from one area to another.

c) Reserve water storage for fire demand

Reserve storage of 500 m3 would be provided in the treated effluent storage tank with a suitable partition to cater to the water requirements of the fire protection system.

d) Hydrant system

The hydrant systems comprise the following:

i. Four pumps, two motor driven and two diesel engines driven, each of 10m3/hour, capacity would be provided to keep both the hydrant and HVWS system mains pressurized. These pumps will take the suction from the water storage tank.
ii. External as well as internal fire hydrants in all areas of the industry.
iii. (High velocity water spray system
iv. The HVWS system would be provided for the fuel storage area. Since the parameters for the HVWS system will be identical to that of the hydrant system, the diesel engine driven pump described in the hydrant system serve as a common standby for both HVWS system and hydrant system. The HVWS system consists of a number of high velocity water projectors. Smoke and heat detectors have been used strategically.
v. Portable fire extinguishers
vi. Wall/column mounted type portable fire extinguishers in various areas of the plant including the control room, administration building, canteen, stores, workshop, etc. would be provided. These portable fire extinguishers are basically of carbon dioxide and dry power type.

First Aid: A first aid centre with adequate facilities shall be provided. It shall be maintained round the clock by a compounder cum dresser and a doctor. An Ambulance shall also be provided at site to carry affected people to hospital.

Security: The security requirements of the company premises shall be taken care of by CSO assisted by a Fire In charge. The team, apart from the normal security functions will manage the role required during a disaster management operation as a part of the crisis control team.

Safety: The safety wing led by a Safety Manager will meet the requirement of emergencies round the clock. The required safety appliances shall be distributed at different locations of the plant to meet any eventualities. Poster/ placards reflecting safety awareness will be placed at different locations in the plant area.

Evacuation Procedure: As the major hazard is only due to fire, which has more or less localized impact no mass evacuation, procedures are required. Evacuation would involve only the people working very close to the fire area.

Emergency Control Center: Provision is made to establish an Emergency Control Centre (ECC) from which emergency operations are directed and coordinated. This centre is activated as soon as on–site emergency is declared.

The ECC consists of one room, located in an area that offers minimal risk being directly exposed to possible accidents.

During an emergency, the Emergency Management Staff, including the site controller will gather in the ECC. Therefore, the ECC is equipped with adequate communication systems in the form

of telephones and other equipments to allow unhampered organisations and other nearby facility personnel.
The ECC provides shelter to its occupants against the most common accidents; in addition, the ECC's communication systems are protected from possible shutdown. The ECC has its own emergency lighting arrangement and electric communication systems operation.
Only a limited and prearranged number of people are admitted to the ECC, when in use. This eliminates unnecessary interference and reduces confusion.
The ECC is always ready for operation and provided with the equipment and supplies necessary during the emergency such as:

- Updated copies of the On–site Disaster Management Plan.
- Emergency telephone numbers.
- The names, phone number, and address of external agencies, response organizations and neighbouring facilities.
- The adequate number of telephone (more than two).
- Emergency lights, Clocks, Personal protective equipment.
- List of fire extinguishers with their type no. and location, capacity, etc.
- Safety helmets – List of quantity & location.
- Status boards/message board.
- Material safety data sheets for chemicals handled at the facility.

Several maps of the facility including drainage system for surrounding area showing:

- Areas where hazardous materials are stored.
- Plot plans of storage tanks, routes of pipelines, all water permanent lines etc.
- The locations where personal protective equipment are stored.
- The position of pumping stations and other water sources.
- Roads and plant entrances.
- Assembly areas & layout of Hydrant lines.

Communication Equipment's and Alarm Systems: This kind of equipment is absolutely vital for notifying accident; make the emergency known both inside and outside of the facility, and coordinating, the response actions among the various groups involved in response operations.
In particular, this equipment is used to communicate within the facility; communicate between the facility and outside organizations; and inform the public.
Different communications systems can vary in effectiveness, depending on the task. The most common types installed in the plant are given below.
Sirens: These are audible alarm systems commonly used in facilities. In case of any emergency siren will be operated short intermittently for 1.5 minutes.
An alarm does more than just emergency warning. It also instructs people to carry out specific assignments, such as reach to assembly point for further instructions and actions, or carry out protective measures; this can be achieved only if the people are familiar with the alarm systems and are trained to respond to it.

1.2 PERSONAL PROTECTIVE EQUIPMENTS

This equipment is used mainly for three reasons; to protect personnel from a hazard while performing rescue/accident control operations, to do maintenance and repair work under hazardous conditions, and for escape purposes. The list of Personal Protective Equipment provided at the facility and their locations are available in ECC.

Effective command and control accomplish these functions necessitates personal trained in this On–site Disaster Management Plan with adequate facilities and equipments and equipment to carry out their duties and functions. These organizations and the facilities required to support their response are summarized in the following subsections.

1.3 PROCEDURE FOR TESTING & UPDATING THE PLAN

Simulated emergency preparedness exercises and mock fire fighting exercises including mutual aid scheme resources and in conservation with district emergency authority to be carried out time to time.

1.4 DISCLOSURE OF INFORMATION TO WORKER & PUBLIC AWARENESS SYSTEM IN EXISTENCE & ANTICIPATED

- Safety awareness among workers by conserving various training programmes and Seminars, competition, slogans etc.
- Practical exercise.
- Distribution and practices of safety Instructions.
- Safety Quiz contests.
- Display of Safety Posters & Safety Slogans.
- Developing Safety Instructions for every Job and ensuring these instructions/booklets or manuals by the workers.