DRAFT ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN FOR [PROPOSED EXPANSION OF 30 KLPD TO 60 KLPD MOLASSES BASED DISTILLERY]

of

M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd

Ankushnagar, Tal. Ambad, Dist. Jalna

Maharashtra.

PREPARED BY

buildingenvironment

M/S. BUILDING ENVIRONMENT INDIA PVT LTD.

IN ASSOCIATION WITH

technogreen environmental solutions

TECHNOGREEN ENVIRONMENTAL SOLUTIONS

October 2019

Master Index

Note – Each Chapter carries Detailed Self Index

M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd.

Compliance of Terms of Reference

TOR Letter Reference No F.No ide letter No.IA-J-11011/81/2018-IA-II(I) dated 15th June 2018

A. STANDARD TERMS OF REFERENCE

Sr. No.	TOR Points	TOR Compliance
1	**Executive summary**	It is attached as a separate ***Chapter 11*** to the EIA/ EMP report.
2	**Introduction**	
	Details of the EIA Consultant including NABET accreditation	Please refer Chapter 12 of the EIA/ EMP Report for the EIA Consultant including NABET accreditation
	Information about the project proponent	Please refer Chapter 1, point no. 1.3 page no. 3 of the EIA/ EMP report.
	Importance and benefits of the project	Please refer Chapter 8 of the EIA/ EMP Report
3	**Project Description**	
	Cost of project and time of completion	Please refer Chapter 2, point no. 2.8, page no. 28 of the EIA/ EMP report
	Products with capacities for the proposed project	Please refer Chapter 2, point no. 2.3, page no. 15 of the EIA/ EMP report
	If expansion project, details of existing products with capacities and whether adequate land is available for expansion, reference of earlier EC if any.	Please refer Chapter 2, point no. 2.4.2, page no. 19 of the EIA/ EMP report. Industry do not have any EC for existing distiller. Moreover, the land is existing land is adequate for expansion.
	List of raw materials required and their source along with mode of transportation.	Molasses is the main raw material. For details Please refer Chapter 2, point no. 2.5.1, page no. 23 of the EIA/ EMP report
	Other chemicals and materials required with quantities and storage capacities	Please refer Chapter 2, point no. 2.5.1, page no. 23 of the EIA/ EMP report
	Details of Emission, effluents, hazardous waste generation and their management	Please refer Chapter 10, point no. 10.6.1.1 page no. 172 for stack emissions, point no. 10.6.3.1 page no. 175 for Effluent and point no. 10.6.4, page no.178 for Hz. Waste generation and management of the EIA/ EMP report
	Requirement of water, power, with source of supply, status of approval, water balance diagram, man-power requirement (regular and contract)	Please refer Chapter 2, point no. 2.5 page no. 23 - 26 of the EIA/ EMP report
	Process description along with major equipment's and machineries, process flow sheet (quantities) from raw material to products to be provided	Please refer Chapter 2, point no. 2.4 page no. 19 of the EIA/ EMP report
	Hazard identification and details of proposed	Please refer Chapter 7, point no. 7.3 and point

	safety systems.	7.17 page no.124 & 155 resp. of the EIA/ EMP report
	Expansion / Modernization proposals:	
	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 existing operation of the project from SPCB shall be attached with the EIA-EMP report.	No, EC was required for existing project
	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.	No EC was required for existing project.
4	**Site Details**	
	Location of the project site covering village, Taluka/Tehsil, District and State, Justification for selecting the site, whether other sites were considered.	Please refer Chapter 1, point no. 1.4.2 page no. 4 and Chapter 5, point no. 5.2.4 page no. 115 of the EIA/ EMP report.
	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 place)	Please refer Chapter 3, figure no. 3.1 page no. 31 of the EIA/ EMP report.
	Details w.r.t. option analysis for selection of site	Please refer Chapter 5, point no. 5.2.4 page no. 115 of the EIA/ EMP report.
	Co-ordinates (lat-long) of all four corners of the site	Please refer Chapter 1, figure no. 1.2 page no. 6 of the EIA/ EMP report.
	Google map-Earth downloaded of the project site	Please refer Chapter 1, figure no. 1.2 page no. 6 of the EIA/ EMP report.
	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.	Please refer Chapter 2, figure no. 2.2 page no. 18 of the EIA/ EMP report.

	Photographs of the proposed and existing (if applicable) plant site. If existing, show photographs of plantation/greenbelt, in particular	Please refer Chapter 2, figure no. 2.1 page no. 17 of the EIA/ EMP report.
	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	Please refer Chapter 2, Table no. 2.3 page no. 24 of the EIA/ EMP report.
	A list of major industries with name and type within study area (10km radius) shall be incorporated. Land use details of the study area	Please refer Chapter 2, Table no. 2.2 page no. 24 and Chapter 3, Table no. 3.2 page no. 43 of the EIA/ EMP report
	Geological features and Geo-hydrological status of the study area shall be included.	Please refer Chapter 3, point no. 3.9 page no. 35 of the EIA/ EMP report.
	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)	Please refer Chapter 3, point no. 3.11 page no. 39 of the EIA/ EMP report. Not Applicable as no major river present within 1 km radius of the project site.
	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 in possession with the proponent. The proposed expansion will be done on existing premises only.
	R&R details in respect of land in line with state Government policy	The site is situated on a barren land without having human settlements. Therefore no R & R study is required.
5	**Forest and wildlife related issues (if applicable):**	
	Permission and approval for the use of forest land (forestry clearance), if any, and recommendations of the State Forest Department. (if applicable)	Not Applicable as no forest land is involved within 10 km radius of the project site.
	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)	No forest land is involved. Please refer Chapter 3, Figure no. 3.6 page no. 44 of the EIA/ EMP report.
	Status of Application submitted for obtaining the stage I forestry clearance along with latest status shall be submitted.	Not Applicable.
	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-	No National Parks, sanctuaries, Biosphere reserves within the 10 km radius of the project site

	thereon	
	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	Not Applicable. No National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals located within 10 km radius of the project site.
	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**	
	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.	Please refer Chapter 3, Point no. 3.14.2 page no. 45 of the EIA/ EMP report.
	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	Please refer Chapter 3, Point no. 3.18 page no. 55 of the EIA/ EMP report.
	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 foreach of the AAQ parameters from data of all AAQ stations should be provided as an annexure to the EIA Report.	Please refer ***Annexure 16*** of the EIA/EMP report.
	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.	Please refer Chapter 3, Point no. 3.20.3 page no. 67 of the EIA/ EMP report.
	Whether the site falls near to polluted stretch of river identified by the CPCB/MoEF&CC, if yes give details.	No. The site does not falls near to polluted stretch of river identified by the CPCB/MoEF&CC
	Ground water monitoring at minimum at 8 locations shall be included.	Please refer Chapter 3, table no. 3.20.5 page no. 69 of the EIA/ EMP report.
	Noise levels monitoring at 8 locations within the study area.	Please refer Chapter 3, table no. 3.19 page no. 63 of the EIA/ EMP report.
	Soil Characteristic as per CPCB guidelines	Please refer Chapter 3, table no. 3.21 page no. 74 of the EIA/ EMP report.
	Traffic study of the area, type of vehicles, frequency of vehicles for transportation of materials, additional traffic due to proposed project, parking arrangement etc.	Please refer Chapter 3, Point no. 3.15 page no. 48 of the EIA/ EMP report.
	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	Please refer Chapter 3, Point no. 3.22 page no. 81 of the EIA/ EMP report.

	Schedule-I fauna are found within the study area, a Wildlife Conservation Plan shall be prepared and furnished	
	Socio-economic status of the study area	Please refer Chapter 3, Point no. 3.23 page no. 90 of the EIA/ EMP report
7	**Impact and Environment Management Plan**	
	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.	Please refer Chapter 4, Point no. 4.4.1 page no. 86 of the EIA/ EMP report
	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 conveyorcum-rail transport shall be examined	Please refer Chapter 4, Point no. 4.4 page no. 86 of the EIA/ EMP report
	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	Please refer Chapter 4, Point no. 4.6 page no. 88 of the EIA/ EMP report
	Details of stack emission and action plan for control of emissions to meet standards	Please refer Chapter 4, Point no. 4.3.2.1 page no. 85 of the EIA/ EMP report
	Measures for fugitive emission control	Please refer Chapter 4, Point no. 4.3.2.2 page no. 85 of the EIA/ EMP report
	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	Please refer Chapter 10, point no. 10.6.4, page no. 178 for Hz. Waste generation and point 10.13. page no: 192 of the EIA/ EMP report
	Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 2009. A detailed plan of action shall be provided	Industry is using Baggase and HSD as fuel. Hence, there will be no generation of fly.

	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.	Please refer Chapter 10, Point no. 10.9 page no. 180 of the EIA/ EMP report
	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	Please refer Chapter 10, Point no. 10.7 page no. 179 of the EIA/ EMP report.
	Total capital cost and recurring cost/annum for environmental pollution control measures shall be included.	Please refer Chapter 10, table no. 10.10 page no. 191 of the EIA/ EMP report.
	Action plan for post-project environmental monitoring shall be submitted	Please refer Chapter 6, Table no. 6.1 page no. 121 of the EIA/ EMP report.
	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.	Please refer Chapter 7, Point no. 7.11 page no. 148 of the EIA/ EMP report.
8	**Occupational health**	
	Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers	Please refer Chapter 10, Point no. 10.10 page no. 182 of the EIA/ EMP report.
	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	Please refer Chapter 10, Point no. 10.10 page no. 182 of the EIA/ EMP report
	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	Please refer Chapter 10, Point no. 10.10 page no. 186 of the EIA/ EMP report
	Annual report of health status of workers with special reference to Occupational Health and Safety.	Attached as ***Annexure 15*** of EIA/EMP Report.

9	**Corporate Environment Policy**	
	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	Attached as ***Annexure 12*** of EIA/EMP Report.
	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, Attached as ***Annexure 12*** of EIA/EMP Report.
	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	Please refer Chapter 10, figure no. 10.1 page no. 169 of the EIA/ EMP report
	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	Please refer Chapter 10, Figure no. 10.4 page no. 168 of the EIA/ EMP 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.**	As the expansion will be done in existing factory premises hence, all the infrastructure facilities will be available for construction workers.
11	**Enterprise Social Commitment (ESC)**	
	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.	Management of KATSSSKL is committed to upliftment of living standard of villagers through various activities. Please refer Chapter 10, Table no. 10.11 page no. 187 of the EIA/ EMP report
	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.	No
	A tabular chart with index for point wise compliance of above TOR.	Complied

B. SPECIFIC TERMS OF REFERENCE

Sr. No.	TOR Points	TOR Compliance
1.	List of existing distillery units in the study area along with their capacity and sourcing of raw material.	Please refer Chapter 2, Table no. 2.2 page no. 24 of the EIA/ EMP report.
2.	Number of working days of the distillery unit.	Existing working days: 180 days Proposed working days: 300 days
3.	Details of raw materials such as molasses/grains, their source with availability.	Please refer Chapter 6, point no. 2.5.1 page no. 23 of the EIA/ EMP report.
4.	Details of the use of steam from the boiler.	Please refer Chapter 2, point no. 2.5.4 page no. 25 of the EIA/ EMP report.
5.	Surface and Ground water quality around proposed spent wash storage lagoon, and compost yard.	Ground water quality samples were analyzed , refer Chapter 3
6.	Plan to reduce spent wash generation within 6-8 KL/KL of alcohol produced.	Generated Spent wash will be concentrated at MEE and Condensate will be recycled
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).	Please refer Chapter 2 Point 2.6.2 page no. 26 of EIA and EMP report
8.	Proposed action to restrict fresh water consumption within 10 KL/KL of alcohol production	Fresh water requirement will be 612 m3/day
9.	Details about capacity of spent wash holding tank, material used, design consideration. No. of piezometers to be proposed around spent wash holding tank.	5 days storage will be provide for spent wash and 2 piezometers to be proposed around spent wash holding tank.
10.	Action plan to control ground water pollution.	There will be no ground water pollution due to proposed project as the factory will operate on Zero Liquid Discharge technology. Liquid waste will not be discharged to out site factory. Spent will be concentrated at MEE and condensate will be recycled in process.
11.	Details of solid waste management including management of boiler ash, yeast, etc. Details of incinerated spent wash ash generation and its disposal.	Please refer Chapter 2 point no 2.6.3 page no. 28 of EIA and EMP report
12.	Details of bio-composting yard (if applicable).	Not applicable
13.	Action plan to control odour pollution.	Anticipated odor generation sources will be molasses, fermentation unit, spent wash, ETP septic tank, Yeast storage & ETP sludge. Following control measures shall be implemented to avoid the odor in the atmosphere: • Better house-keeping • Whole process is work under closed conditions, close pipeline. • Spent wash from evaporation would be in a closed tank and directly send to the incineration in boiler

		• No bio-methanation will be adopted. • Fermentation unit will be provided with proper cover to avoid the spread of odor and regular steaming of all fermentation equipment's; temperature will be kept under control during fermentation to avoid inactivation/killing of yeast; staling of fermented wash would also be avoided
14.	Arrangements for installation of continuous online monitoring system (24x7 monitoring device)	Continuous online monitoring system (24x7 monitoring device) will be provided

Declaration by Experts Contributing to the EIA of M/s. Building Environment India Pvt. Ltd.

I, hereby, certify that I was a part of the EIA team in the following capacity that developed the above EIA.

EIA Coordinator:

Signature: 

Name: Mr. Ashwin Badge

Date: 16.10.2019

Period of involvement: August 2019 till obtaining clearance.

Contact information:

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Task of the Functional Area Experts:

Sr.No	Functional Areas		Name of the experts	Task
1	**Land Use**		Mr. Hrushikesh Kolatkar	❖ Secondary data collection from Organisation (Govt. & Private). ❖ Preparation of topographical maps ❖ Analysis of Data related to Land use pattern and Preparation of Land use map using GIS tools and its classifications. ❖ Verification of present status by visiting the site and surrounding area.
2	**Air**	**AP**	Mr. Ashwin Badge	❖ Air pollution monitoring. ❖ Meteorological parameter measurement. ❖ Identification & assessment of quantum of emission and its Mitigation measures.
		AQ	Mr. Ashwin Badge	❖ Ambient Air Quality monitoring network designing. ❖ Processing of micrometeorological data for using in model. ❖ Air quality modelling through ISC- Aermod for proposed prediction of impact due to proposed installation of D.G. Sets.
3	**Noise**		Mr. Sanjay Shevkar	❖ Monitoring of noise levels of the project site and surrounding area.

			❖ Assessment of noise level and vibration potential due to proposed project and its mitigation measures.
4	**Water**	Ms. Ketaki Ashok Patil	❖ Water Quality monitoring network designing ❖ Sampling of water samples (surface and ground water). ❖ Monitoring of water quality. ❖ Water Balance, budgeting and water conservation. ❖ Identification & assessment of quantum of water pollution and its Mitigation measures. ❖ STP - ETP Suggestion.
5	**Geology**	Mr. Shrivallabh kothe	❖ Geology & Geomorphologic analysis and preparation of maps
6	**Hydrogeology**	Mr. Shrivallabh kothe	❖ Hydrological studies & analysis preparation of drainage patterns of the study Analysis and description of aquifer characteristics ❖ Preparation of water budget details ❖ Rain water harvesting proposal to recharge bore-wells
7	**Soil Conservation**	Mr. Amol Kulkarni	❖ Sampling analysis & characterization of soil quality ❖ Soil pollution & contaminated soil probability and its mitigation measures
8	**Ecology & Biodiversity**	Mr. Sunil Maruti Belvelkar	❖ Conducting Ecological survey for ground truthing & preparation of status report. ❖ Application of taxonomy in resource inventory (Flora & Fauna) ❖ List of species animals and plants report. ❖ Secondary data collection & validation from Organisation (Govt. & Private). ❖ Identification & assessment of ecological impact due to proposed project and its Mitigation measures. ❖ Green Belt Development
9	**Risk & Hazard Assessment**	Mr. Ashvin Badge	❖ Identification of hazards due to proposed project. ❖ Identification of hazardous substances in the proposed project. ❖ Preparation of risk assessment report and onsite emergency plan.
10	**Solid & Hazardous Waste**	Ms. Yogeshwari Ashwani Kumar	❖ Identification of hazardous and non-hazardous wastes ❖ Reuse and recycling of solid wastes including material balance ❖ Handling and disposal of Non- Hazardous solid waste & Hazardous waste ❖ Identification & assessment of impact due to proposed project and its Mitigation measures.

11	**Socioeconomic**	Mr. Hrushikesh Kolatkar	❖ Baseline socio economic survey (Interviews, Questionnaires, focused group discussion) ❖ Evaluation of Socio economic development status of the area ❖ Secondary data collection & validation from Organization (Govt. & Private). ❖ Corporate Social Responsibility ❖ Identification & assessment of impact due to proposed project and its Mitigation measures.

Declaration by the Head of the Accredited Consultant Organization

I, Mr. Hrushikesh Kolatkar, hereby, confirm that the above mentioned experts prepared the EIA of M/s. Building Environmental India Pvt. Ltd., C.B.D Belapur, Navi Mumbai I also confirm that I shall be fully accountable for any misleading information mentioned in this statement.

Signature: 

Name: Hrushikesh Kolatkar

Designation: Managing Director

Name of the EIA Consultant Organization:

M/s. Building Environmental India Pvt. Ltd. NABET Certificate No: NABET/EIA/1821/RA 0133

List of Abbreviations

EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
BEIPL	Building Environment India Pvt. Ltd.
KATSSSKL	Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd.
NABET	National Accreditation Board of Education & Training
EC	Environmental Clearance
SEIAA	State Environmental Impact Assessment Authority
ToR	Term of Reference
SEAC	State Expert Appraisal Committee
MSL	Meter at Sea Level
CMD	Cubic Meter per Day
CIP	Clean In Process
TDS	Total Dissolved Solids
COD	Chemical Oxygen Demand
BOD	Biochemical Oxygen Demand
MPCB	Maharashtra State Pollution Control Board
EPA	Environmental Protection Act
USEPA	United States Environmental Protection Agency
MoEFCC	Ministry of Environment, Forest and Climate Change
ISCST	Industrial Source Complex Short Term
GLC	Ground Level Concentrations
NAAQS	National Ambient Air Quality Standards
ANQS	Ambient Noise Quality Standards
OSHA	Occupational Safety & Health Administration
EMC	Environmental Management Cell
OHS	Occupational Health Safety
PPE	Personal Protective Equipment
MPCB	Maharashtra Pollution Control Board
CPCB	Central Pollution Control Board
HIRA	Hazards Identification & Risk Analysis
HAZOP	Hazards & Operability Study
CER	Corporate Environmental Responsibility
ENA	Extra Neutral Alcohol
DG	Diesel Generator

FO	Fusel Oil
TPD	Ton Per Day
TPA	Tons Per Annum
TPH	Tons Per Hour
WTP	Water treatment plant

Executive Summary - ENGLISH

EXECUTIVE SUMMARY

DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT

Proposed Expansion 30 KLPD to 60 KLPD Molasses Based Distillery Unit, at Ankushnagar, Tal. Ambad, Dist. Jalna

PROJECT PROPONENT

M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd. (KATSSSKL),

Ankushnagar, Tal. Ambad, Dist. Jalna

PREPARED BY

buildingenvironment

M/S. BUILDING ENVIRONMENT INDIA PVT LTD.

IN ASSOCIATION WITH

technogreen environmental solutions

your future, our care

TECHNOGREEN ENVIRONMENTAL SOLUTIONS

0.1 Introduction

M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd. (KATSSSKL), Ankushnagar, Tal. Ambad, Dist. Jalna is registered under the Maharashtra Co-Operative Societies Act, 1960 vide Registration No. JAL/PRG/A-1 dated 10th February 1982.

The existing crushing capacity of Sugar unit was 2500 TCD, 18 MW Co-generation and 30 KLPD Molasses based Distillery unit.

The factory has obtained No Objection Certificate from Government of Maharashtra for expansion of sugar unit and Rectified spirit and extra neutral alcohol on 15th May 1993 and Environment Clearance for 18 MW Bagasse based power plant on 24th April 2009.

The Karkhana has set up 30 KLPD capacity Distillery Plant based on Biostil fermentation and atmospheric distillation technology in the year 1992. Now, KATSSSKL planning to propose expansion of distillery unit from 30 KLPD to 60 KLPD within the existing premises.

As per EIA Notification on 14th September 2006 issued by Ministry of Environment & Forests, Govt. of India *vide* Gazette Notification No. S.O. 1533(E) dt: 14thSep.'2006, and amended, the proposed expansion of 30 KLPD to 60 KLPD molasses based distillery shall be treated as Category–A; Schedule 5 (g). Accordingly, the project proponent has submitted prescribed application along with pre-feasibility report to the MoEF&CC New Delhi. Terms of Reference has been approved by EAC (vide letter No.IA-J-11011/81/2018-IA-II(I) dated 15th June 2018). Based on the approved TOR and standard TOR, Environmental Impact Assessment studies are carried out. Draft EIA and EMP report was prepared and submitting for public hearing.

0.2 Details of Project

The proposed expansion will be at existing distillery unit. Project located at Ankushnagar, Tal. Ambad, Dist. Jalna Maharashtra. Site comes under Grampanchyat Mahakala Jurisdiction. The site is located at Ankushnagar on national high way No. 211. The nearest railway station is Jalna and is about 55 Km away from the site. It is geographically located in 19°23'40.50"N latitudes and 75°42'21.42"E longitude.

0.3 Project Description

Sr.	Details	Sugar	Cogeneration	Distillery	
1.	**Status**	**Existing**	**Existing**	**Existing**	**Expansion After Expansion**
2.	**Location**	Gat No. 106 Ankushnagar, Tal. Ambad, Dist. Jalna Maharashtra			
3.	**Capacity**	2500 TCD	18 MW	30 KLPD	30 KLPD to 60 KLPD & 2 MW
4.	**Working days**	180	180	190	300
5.	**Raw material**	Sugarcane	Bagasse	Molasses	Molasses
6.	**Quantity of raw Material**	450000 MT	126000 MT	20250 MT	69,231 MT/annum Own : 48,782 MT Remaining : 20449 MT from nearer factories
7.	**Products**	Sugar 51750 MT	Power 18 MW	Industrial Alcohol, Absolute Alcohol and Fusel Oil 30 KLPD	Anhydrous/Fuel Alcohol Impure Spirit, ENA, Fusel Oil : 60 KLPD
8.	**Boiler Capacity**	95 TPH		-	22 TPH
9.	**Boiler Fuel**	Bagasse		-	Conc. Spent wash (6.0 T/hr) and Bagasse (5.0 T/hr)
10.	**Water source**	Godavari River & CGWA Permission		Godavari River & CGWA Permission	Godavari River
11.	**Water requirement**	758 M3/day		240	612 M3/day
12.	**Land ha**	358 Acre			
13.	**Green Belt ha**	50.00 Acre			
14.	Effluent Treatment facility	ETP of Capacity 350 M3/day		Spent wash treated in re boiler and Condensate water is recycled in process & concentrated spent Wash used for bio composting to achieve zero discharge	Spent wash will be treated at MEE and Concentrated spent wash will be used as fuel in Boiler. Condensate from will be Treated in CPU and used for process
15.	APC measures for boiler	76 m stack height & ESP		-	Stack height. 60 m and bag Filter

0.3.1 Basic Requirement of the proposed project

i. Land: The Company owns total 358 Acre out of which for distillery require 5.5 acre of land. The project will be accommodated in the existing factory premises.

ii. Raw Material: Molasses is one of the waste products produced from sugar factory. Molasses can be used as raw material for distillery. The resultant alcohol has various uses in chemical industry, pharmaceutical industry and as Ethanol. Distillery unit needs the raw material as molasses & this can be fulfilled by sugar factory of our own. The molasses requirement for distillery after modernization will be 230.77 MT/day (69,231 MT/annum). The factory will have its own molasses to the extent of 27104 MT from Unit I and 20615 MT from KATSSSKL.

iii. Water: Fresh Water demand is 612 m3/day. Permission of Irrigation Department is obtained. Water source is Godavari River.

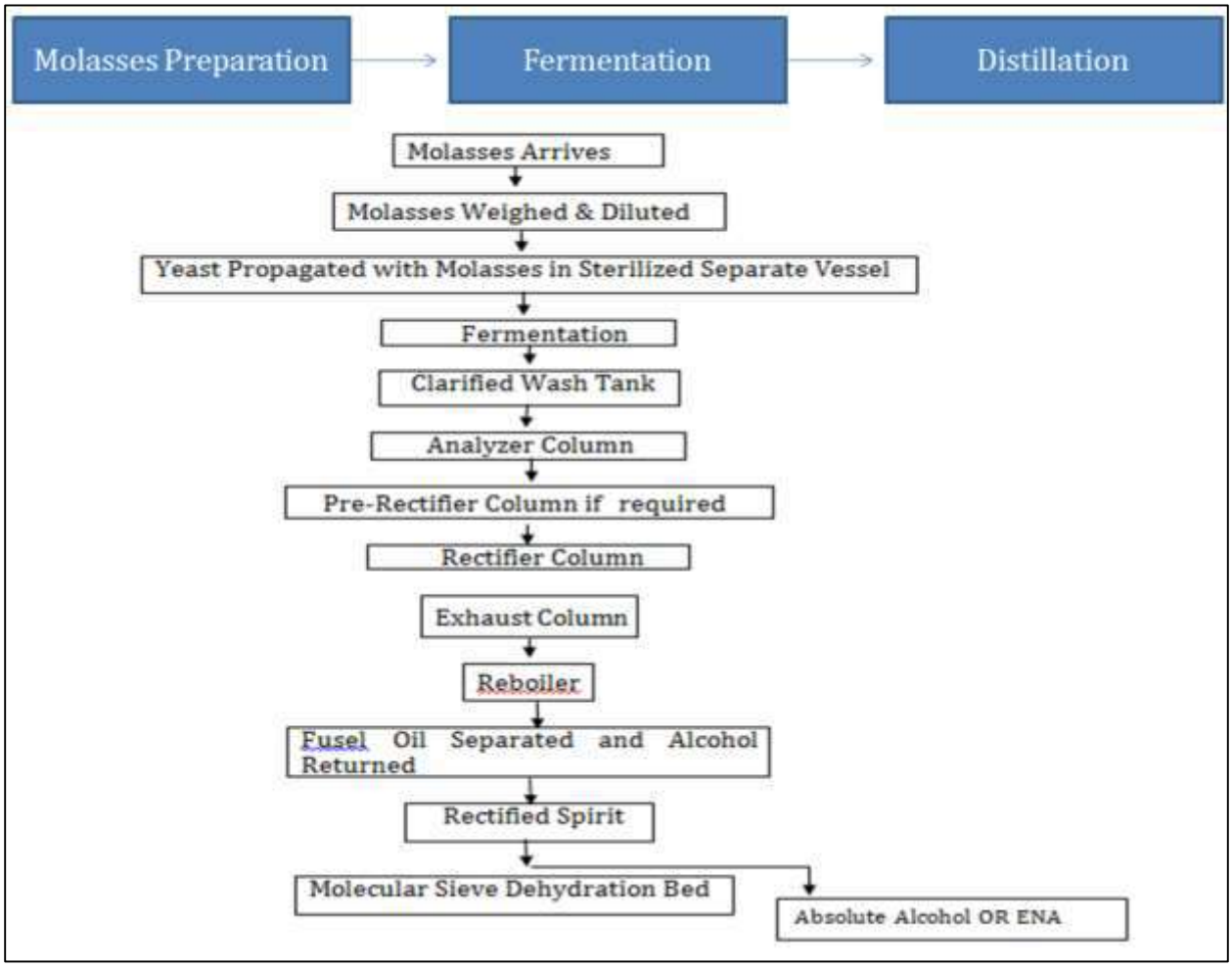
iv. Power: The steam and power requirement for the proposed expansion plant will be made available by installing separate 22 TPH boiler.

v. Fuel: Coal and Slop will be used as fuel for the 22 TPH boiler.

vi. Man Power: Total Manpower working in existing distillery is 98. Total employees out of whom 57 shall be Skilled and 41 shall be unskilled. More than 85 % of the manpower requirement will be fulfilled by employing the local people. Man power requirement for construction work will be about 50. Construction workers will reside in nearby villages.

0.4 Manufacturing Process:

There are four major steps in preparation of alcohol. (a) Substrate (feed) preparation for fermentation, (b) Yeast propagation and continuous fermentation, (c) Multi-pressure distillation and (d) Dehydration of RS to anhydrous alcohol or it will be purified to get ENA.



0.5 Pollution control Technology & Equipment

i. Air Pollution Control: For 22 TPH boiler, stack height will be 60 m and Bag filter will be provided to control the particulate matter

ii. Water and waste Water: 650 M3/day spent wash will treated through evaporation – Incineration and Condensate will be treated in CPU and reused in process

iii. Solid Waste: Ash will be sold to brick manufacturing.

Total project cost: Rs. 7800 lakh. (distillery unit), Funds allocated for pollution control equipment will be Rs. 6.95 lakh and for O & M will be Rs. 45 lakh per year. Funds earmarked for CER activity will be Rs 78 lakh.

0.6 Description of Environment

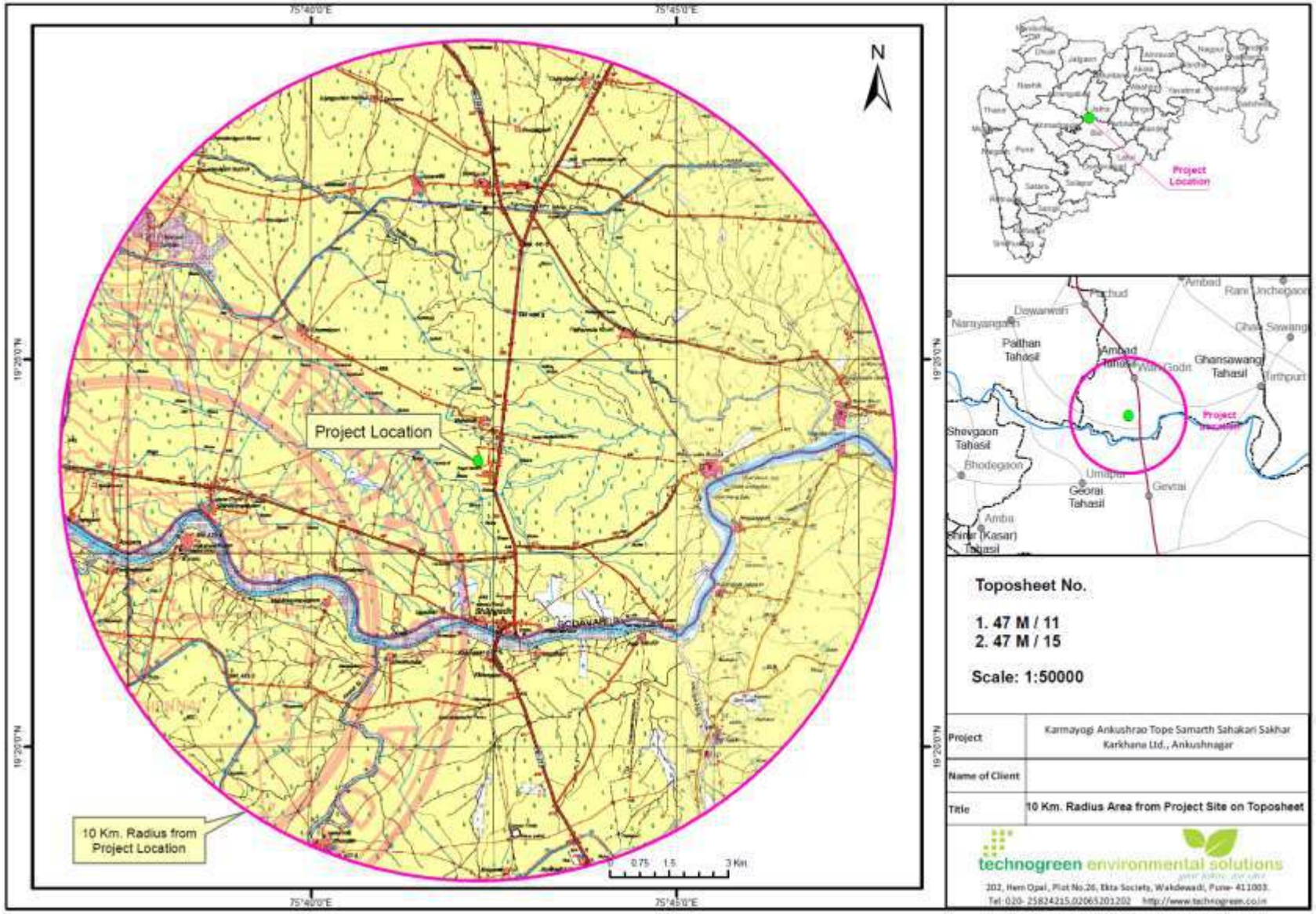
The area around the proposed Distillery Plant is being surveyed for physical features and existing environmental scenario. The field survey and baseline monitoring has been has been done from the period of March 2018 to April 2018

Environmental Setting of the Study Area: The site is located in the rural area. No other industries are found in the region. Location features of the Study area are given in Table below.

Environmental Setting (10 km radius)

Particulars	**Details**
Latitude	19°23'40.50"N
Longitude	75°42'21.42"E
Site Address	Ankushnagar, Tal. Ambad, Dist. Jalna
No. of villages in the study area	12 villages
Nearest Habitation	Mahakala
Nearest River /Water Body	Godavari river
Nearest IMD Observatory	Aurangabad
Nearest Town	Aurangabad
Nearest Railway Line	Kodi 46.77 km
Nearest Air Port	Aurangabad Airport 62.14 km
Approach to site by Road	NH 211
Religious / Historical Place	None
Archaeological monuments	None
Ecological Sensitive Area/ Reserve Forest	None
Seismic Zone	III

Figure Toposheet Map _ 10 km Radius area from Project Site



0.7 Ambient Air Quality

To understand the AAQ within the study area, eight locations were selected and AAQ monitoring was carried for the period March to May 2019.

Air Quality monitoring reports showed that all the parameters are under limit as per NAAQS Standards. It can be seen that PM_{10} and $PM_{2.5}$ ranges from 46.81 to 88.51/m^3 and17.12 to 32.44 µg/m^3. SO_2, NO_x & CO ranges from 12.55 to 27.92/m^3 15.11 to 39.11/m^3 and 0.12 to 0.58 **µ**g/m^3 respectively.

0.8 Ambient Noise Quality

The Leq values of noise levels during daytime Leq (d) varied between 50.97 to 69.1dB (A). Highest Leq value was recorded at Project Site [69.1dB (A)] while the Leq values of noise levels during night time Leq (N) varied between 40.36 to 57.13dB (A). Highest Ln value was recorded at project site [57.13dB (A)].

The hourly Leq noise levels recorded at various locations in the study area shows considerable fluctuations because of changes in traffic movement, commercial and industrial activities in the study area, however the noise level (Leq daytime as well as Leq night time) found at all locations within prescribed limit of both during day time as well as night time.

0.9 Water Quality

Ground water samples were collected from 9 different locations and surface water samples were collected from 3 locations within the 10 km radius.

Ground water Quality

The ground water pH ranges from 6.67 – 7.52. Total Dissolved Solid (TDS) was found to be in the range of 134.19- 634.05 mg/l. Total Hardness is in the range of 103- 536.5 mg/l. Sulphate is in the range of 24.6- 309.77 mg/l. Chlorides ranges from 41.99- 155.95 mg/lit. All the samples are within permissible limit.

Surface Water Quality

The pH of surface water ranges from 6.89 to 7.89. Total dissolved solids were found to be in the range of 106.98– 134.67mg/l. Total hardness is in the range of 89.8– 114.8mg/l. Chlorides and Sulphate are in the range of 37.99– 45.99 mg/l and 27.82– 39.08 mg/l respectively which shows that all of them are within permissible limit..

0.10 Soil Quality

- pH: The pH of the samples varied from 7.09 to 8.16. it is found that pH of all the locations is slightly on alkaline scale.
- Electrical Conductivity: Electrical Conductivity value ranges from 0.15 µS/cm to 0.67 µS/cm.
- Bulk Density: The bulk density of soil in the study area is found to be in the range of 1.28 - 1.38 g/cc. It can be observed from the results that the soil is ideal for plant growth.
- Porosity: The porosity of soil observed in the study area ranged from 35.2 to 48.9 %. It is observed that Calcium and Magnesium concentrations are in the range of 16.3- 24.2mg/kg and 1.94- 5.56 mg/kg respectively whereas; Sodium and Potassium are in the range of 12- 53 mg/kg and 196- 621mg/kg respectively.
- Organic matter is found to be in the range of 0.22- 1.34% and Phosphorus is present in soil more than sufficient limit i.e. in the range of 5.3- 12.28 mg/kg. The soil porosity is found to medium hence, the water holding capacity of the soil will be medium. From above observations it can be concluded that soil moderately fertility in nature.
- Soil Texture: the sand percentage varied between 23.0 to 30.0 % and silt percentage varied from 48.0 to 51.0 % whereas clay percentage is in the range of 21.0 to 28.0 %. When obtained results are compared with standard soil texture classification it can be concluded that soil texture of study area is Loam

0.11 Ecology

From the data collected it can be observed that approx. 85 species of trees & shrubs were observed within the study area. Common trees Albizia saman, Terminalia catappa, Spathodea campanulata, Peltophorum pterocarpum, Cassia siamea few of Mangifera indica, Azadirchta indica and varieties of Ficus were observed in the study area.

From the faunal study it was observed that there were 59 different species of birds, 17 species of butterfly's, 6 species of mammals, 5 species of amphibians and reptiles in the study area.

None of the species were found in Schedule 1 as per Wildlife Protection Act, 1972. In the project area green belt is developed with native species. Pollution load of the proposed expansion will be minimal and will not affect the Flora and Fauna of the study area.

0.12 Socio Economic Survey

The study area is witnessing a rapid growth in its population beginning from last decade due to

Agriculture development, urbanization and industrialization.

- The study area covers one Jalna district of Maharashtra State, one block Ambad and total 23 villages in the study area. Total study area consisting of 20641.31ha with the population density of 212 person / km².
- Total population of the region (Census 2011) is worked out as 43940 out of which 22455(51.10%) are male and 21485(48.89%) female.
- Out of the total population, Scheduled Caste and Scheduled Tribe are 5655(12.86%) and 1147(2.61%) respectively.
- The literacy rate of the total population is worked out to 25825(58.77%). Male literacy 15026 (58.18%), and female literacy is 10799 (41.82%) respectively.
- The total population of main worker, marginal worker and non-worker category are 19587(44.58%), 2580(5.87%) and 21773(49.55%) respectively.

The majority pattern of the cultivator worker 8715(44.49%) and agricultural worker is 7389 (37.72%). There are 341 (1.74%) and 3142 (16.04%) as household worker and other worker

0.13 Impact Mitigation Analysis

The environmental impacts can be categorized as either primary or secondary. Primary impacts are the ones that are caused directly due to the project activity on environmental attributes, whereas secondary impacts are indirectly induced

Impacts on Air Environment: -

- Existing 95 TPH capacity boilers are in operation and 22 TPH incineration boiler is proposed.
- To arresting air emission from existing 95 TPH boiler wet scrubbers and ESP with adequate 76 m stack height is provided to attenuation of air pollution and for distillery unit 22 TPH boiler bag filter and 60 m Stack height will be provided.
- On line Continuous Monitoring system is installed and connect to Pollution control board as per CPCB guidelines

Impacts on Noise Quality: Noise quality is concern in the factory premises as well as around the periphery of factory area. Operation of Boiler house, cooling tower and other machineries engaged in various unit processes. Noise generated from DG sets, transportation vehicles are also envisaged.

Impacts on Soil Environment: Impacts are predicted if waste water is directly discharged in agricultural field. Improper storage of waste residues and other wet waste may hamper soil quality

Impacts on water environment: Impacts are envisaged due to runoff of water from waste storage area. Groundwater leachate is envisaged if waste is dumped on open land.

Ecological Environment: No impacts are envisaged during operational phase.

Socio Economic Environment: During operational phase both positive as well as negative impacts are foreseen. Positive impacts will comply employment generation, improvement of other social and physical infrastructure amenities such as schools, hospitals, banking offices etc. Negative impacts include prolonged exposure to noisy environment may lead to hearing loss

0.13.1 Mitigation measures

Air: Emissions from boiler house shall be passed through pollution Control equipment before emitting directly to atmosphere. Adequate green belt is development to minimize particulate emissions. If required water sprinkling methodology shall be adopted on dust prone roads.

No additional boiler is proposed for the expansion.

Table 1 Air pollution sources and mitigation measures

Sr.	Source	Fuel	Emissions	Control Measures
1.	Existing 95 TPH Boiler	Bagasse	Particulate Matter, SO_2 and NO_X	76 m stack and wet scrubber provided
2.	Existing DG Set 1010 KVA	HSD	Particulate Matter, SO_2 and NO_X	7 m stack height provided
3.	Proposed 22 TPH Incineration Boiler	Bagasse & Conc.Spent wash	Particulate Matter, SO_2 and NO_X	60 m stack and Bag filter will be provided
4.	Proposed 105 KVA D.G Set	HSD	Particulate Matter, SO_2 and NO_X	6 m stack height will be provided

Noise: Workers shall be provided with ear muffs and other personal protective equipment's those working in noise prone environment. Development of greenbelt cover will minimize the noise levels ion industrial premises. Noise generating machineries should be operated in day time.

Soil: Soil quality will be improved by supplying treated water with nutrient addition. Soil samples shall be tested regularly and appropriate mitigation measures shall be adopted based on nutrient result.

Water & Waste water:

- Regular water quality monitoring will be carried out as per CPCB and norms ensured by MoEF&CC.

- In distillery unit, condensate of MEE will be treated in Condensate polishing unit (CPU) and will be reused in process and cooling tower. Concentrated spent wash will be used in boiler as fuel.

0.14 Corporate Environment Responsibility (CER)

As per New Office Memorandum Published by MOEF &CC, New Delhi on 1st May 2018 regarding applicability of CER and Budget to the decided towards CER activities.

The total project cost is Rs. 78 lakhs. 1.0% of the total cost it becomes Rs.78 lakhs approx. Hence we have dedicated Rs 78 lakh for Corporate Environment Responsibility (CER) activities to be carried out in surrounding villages based on need assessment.

0.15 Environment Monitoring and Management Plan

Environment monitoring is prescribed during pre-construction, construction and operation phase. During operation phase of project it is important to understand the baseline environment status which is caused due to proposed project activity. Environmental monitoring will comply Air, Water, Soil, Ecology, and Noise parameters as per monitoring compliance norms and schedule. All parameters will be tested as per standard tools and methods and obtained results should be compared with CPCB norms.

Table 2 Cost of Environmental Protection Measures

S. No.	Environmental Aspect	Capital Expenditure Rs in Cr.	Recurring Expenditure Rs in Cr.(per annum)
1	Emission control Engineering	4.0	0.10
2	Water & Wastewater management	2.0	0.15
3	Solid Waste management	0.20	0.05
4	Greening Drive	0.20	0.10
5	Environment Monitoring	0.05	0.05
7	Other aspects like Rain Water Harvesting, Safety, Security etc.	0.50	0.10
	Total	**6.95**	**0.55**

Executive Summary - MARATHI

कार्यकारी सारांश

मसुदा पर्यावरण प्रभाव आकलन अहवाल

प्रस्तावित (मोलासीस) माळी आधारित ३० केएलपीडी ते ६० केएलपीडी चा विस्तारित प्रकल्प

डिस्टिलरी युनिट, अंकुशनगर, ता. अंबड, जि. जालना

प्रकल्प भविष्यवाणी

मे. कर्मयोगी अंकुशराव टोपे समर्थ सहकारी साखर कारखाना लि.

अंकुशनगर, ता. अंबड, जि. जालना

यांनी तयार केला

buildingenvironment

मी/स. बिल्डिंग एनव्हीवन्मेंट (इंडिया) परिवते लिमिटेड .

संयुक्त विद्यमाने

technogreen environmental solutions

टेकनॉग्रीन एन्विरॉन्मेंटल सोल्युशन्स

०.१ परिचय

मे. कर्मयोगी अंकुशराव टोपे समर्थ सहकारी साखर कारखाना लि. (केएटीएसएसएसकेएल), अंकुशनगर, ता. अंबड, जि. जालनाची महाराष्ट्र सहकारी संस्था अधिनियम, अन्वये नोंदणी क्रमांक जेएएल / पीआरजी / ए दिनांक १० फेब्रुवारी १९८२ च्या अंतर्गत नोंदणीकृत

साखर युनिटची सध्याची गाळप क्षमता २५०० टीसीडी, १८ मेगावॅट को-जनरेटिंग आणि 30 केएलपीडी मोलासेस आधारित डिस्टिलरी युनिट आहे.

या कारखान्याने १५ एप्रिल १९९३ रोजी साखर युनिटच्या विस्तारासाठी महाराष्ट्र शासनाकडून ना हरकत प्रमाणपत्र आणि सुधारित आत्मा आणि अतिरिक्त तटस्थ अल्कोहोल आणि २४ मे एप्रिल २००९ रोजी १८ मेगावॅट बगसे आधारित वीज प्रकल्पांसाठी पर्यावरण मंजुरी प्राप्त केली.

कारखानाने बायोस्टिल किण्वन व वातावरणीय ऊर्धपातन तंत्रज्ञानावर आधारित १९९२ मध्ये ३० केएलपीडी क्षमतेचे डिस्टिलरी प्लांट स्थापित केले आहेत. आता केएटीएसएसएसकेएल सध्याच्या आवारात डिस्टिलरी युनिट ३० केएलपीडी ते ६० केएलपीडी वाढविण्याचा प्रस्ताव ठेवत आहे.

पर्यावरण व वन मंत्रालय, शासनाने १४ सप्टेंबर २००६ रोजी जारी केलेल्या ईआयए अधिसूचनेनुसार एस. भारत *व्हिडि* राजपत्र अधिसूचना क्रमांक एस.ओ. १५३३ E (ई) दि. १४ वा से. २००६, आणि सुधारित, ३० केएलपीडीच्या ६० केएलपीडी मोलासेस आधारित डिस्टिलरीपर्यंत प्रस्तावित विस्तार श्रेणी - अ म्हणून गणला जाईल; वेळापत्रक 5 (जी) त्या अनुषंगाने प्रकल्प प्रस्तावित व्यक्तीने एम-ईएफ आणि सीसी नवी दिल्लीला पूर्व-व्यवहार्यता अहवालासह विहित अर्ज सादर केला आहे. संदर्भ अटींना ईएसीने मान्यता दिली आहे (पत्र क्रमांक आयआयए-जे -१११११११ / १८/२०१८-आयए-II (I) दिनांक १५ जून २०१८). मंजूर केलेल्या टीओआर आणि प्रमाणित टीओआरच्या आधारे पर्यावरणीय परिणाम मूल्यांकन मूल्यांकन केले जाते. मसुदा ईआयए आणि ईएमपी अहवाल तयार केला होता आणि जनसुनावणीसाठी सादर केला जात होता.

०.२ प्रकल्पाचा तपशील

प्रस्तावित विस्तार विद्यमान डिस्टिलरी युनिटवर असेल. अंकुशनगर, ता. येथील प्रकल्प अंबड, जि. जालना महाराष्ट्र. साइट ग्रामपंचायत महाकाल कार्यक्षेत्रात येते. ही जागा अंकुशनगर येथे राष्ट्रीय महामार्ग क्रमांक २११ वर आहे. सर्वात जवळचे रेल्वे स्टेशन जालना आहे आणि जागेपासून सुमारे ५५ कि.मी. अंतरावर आहे. हे भौगोलिकदृष्ट्या **१९°२३'४०.५०" उत्तर** अक्षांश आणि **७५°४२'२१.४२" पूर्व** रेखांश मध्ये स्थित आहे.

०.३ प्रकल्प वर्णन

आं क्र.	तपशील	साखर	सहनिर्मिती	आसवनी	
१	स्थिती	अस्तित्वात	अस्तित्वात	अस्तित्वात	**प्रस्तावित**
२	ठिकाण	गट क्रमांक १०६ अंकुशनगर, ता. अंबड, जि. जालना महाराष्ट्र			
३	क्षमता	२५०० टीसीडी	१८ मेगावॅट	३० केएलपीडी	३० केएलपीडी ते 60 केएलपीडी आणि २ मेगावॅट
४	कामाचे दिवस	१८०	१८०	१९०	३००
५	कच्चा माल	ऊस	बॅगॅस	मळी	मळी
६	कच्चा मालाचे प्रमाण	४५०००० मेट्रिक टन	१२६००० मेट्रिक टन	२०२५० मेट्रिक टन	६९,२३१ मे.टन / वार्षिक मालकीचे: ४८,७८२ मेट्रिक टन शिल्लक: जवळील कारखान्यांमधून २०४४९ मे.टन
७	उत्पादने	साखर ५१७५० MT	वीज १८ मेगावॅट	औद्योगिक अल्कोहोल, परिपूर्ण अल्कोहोल आणि फ्यूसल तेल 30 केएलपीडी	निर्जल / इंधन अल्कोहोल अशुद्ध आत्मा, अतिरिक्त विभक्त अल्कोहोल, फ्यूसल तेल: ६० केएलपीडी
८	बॉयलरची क्षमता	९५ टीपीएच		--	२२ टीपीएच
९	बॉयलर इंधन	बॅगॅस			कॉन्सण्ट्रेट. स्पेंट वॉश (६.० टी / ता) आणि बगासे (५.० टी / ता)
१०	पाणी स्त्रोत	गोदावरी नदी व सीजीडब्ल्यूए परवानगी		गोदावरी नदी व सीजीडब्ल्यूए परवानगी	गोदावरी नदी
११	पाण्याचे प्रमाण	७५८ एम ३ / दिवस			६१२ एम ^{3} / दिवस
१२	जमीन	३५८ एकर			
१३	हरित पट्टा	५०.०एकर			

१४	औद्योगिक सांडपाणी उपचार यंत्रना	क्षमताचे ईटीपी ३५० एम ३ / दिवस	री बॉयलर आणि कंडेन्सेट पाण्यात उपचार केलेल्या स्पेंट वॉशचे प्रक्रियेमध्ये पुनर्वापर केले जाते आणि बायो कंपोस्टिंगसाठी वापरलेला स्पेंट वॉश शून्य स्त्राव साध्य करण्यासाठी	स्पेंट वॉशचा इलाज एमईई येथे केला जाईल आणि कॉन्सेन्ट्रेटेड खर्च वॉशचा वापर बॉयलरमध्ये इंधन म्हणून केला जाईल.कंडेन्सेट चा उपचार सीपीयूमध्ये केला जाईल आणि प्रक्रियेसाठी वापरला जाईल
१५	बॉयलर - निघणाऱ्यावायू प्रदूषण नियंत्रण संयंत्रणा	७६ मीटर स्टॅक उंची आणि ईएसपी	--	उंची स्टॅक. ६० मी आणि बॅग फिल्टर

०.३.१ प्रस्तावित प्रकल्पाची मूलभूत आवश्यकता

१. जमीन: कंपनीकडे एकूण 358 एकर मालकी आहे, त्यापैकी डिस्टिलरीसाठी . ५.५ एकर जागेची आवश्यकता आहे. प्रकल्प सध्याच्या कारखान्याच्या आवारात सामावून घेण्यात येईल.

२. कच्चा माल: साखर कारखान्यातून निर्मीत कचरा उत्पादनांमध्ये मोलासेस एक आहे. डिस्टिलरीसाठी चष्मा कच्चा माल म्हणून वापरला जाऊ शकतो. परिणामी अल्कोहोलचे रासायनिक उद्योग, फार्मास्युटिकल उद्योग आणि इथेनॉल म्हणून विविध उपयोग आहेत. डिस्टिलरी युनिटला कच्च्या मालाची खसखशीची गरज असते आणि ती आपल्याच साखर कारखान्याने पूर्ण करता येते. आधुनिकीकरणा नंतर डिस्टिलरीसाठी डाळांची गरज २३०.७७ मे.टन / दिवस ६९.२३१ मे.टन / वार्षिक) असेल. कारखान्याचे स्वतःचे गुळ युनिट १ पासून २७१०४ मे.टन आणि केएटीएसएसएसकेएल पासून २०६१५ मे.टन पर्यंत असेल.

३. पाणी: दिवसाची ताजी पाण्याची मागणी ६१२ मी ^{3} आहे. पाटबंधारे विभागाची परवानगी घेतली आहे. पाण्याचे स्रोत गोदावरी नदी आहे.

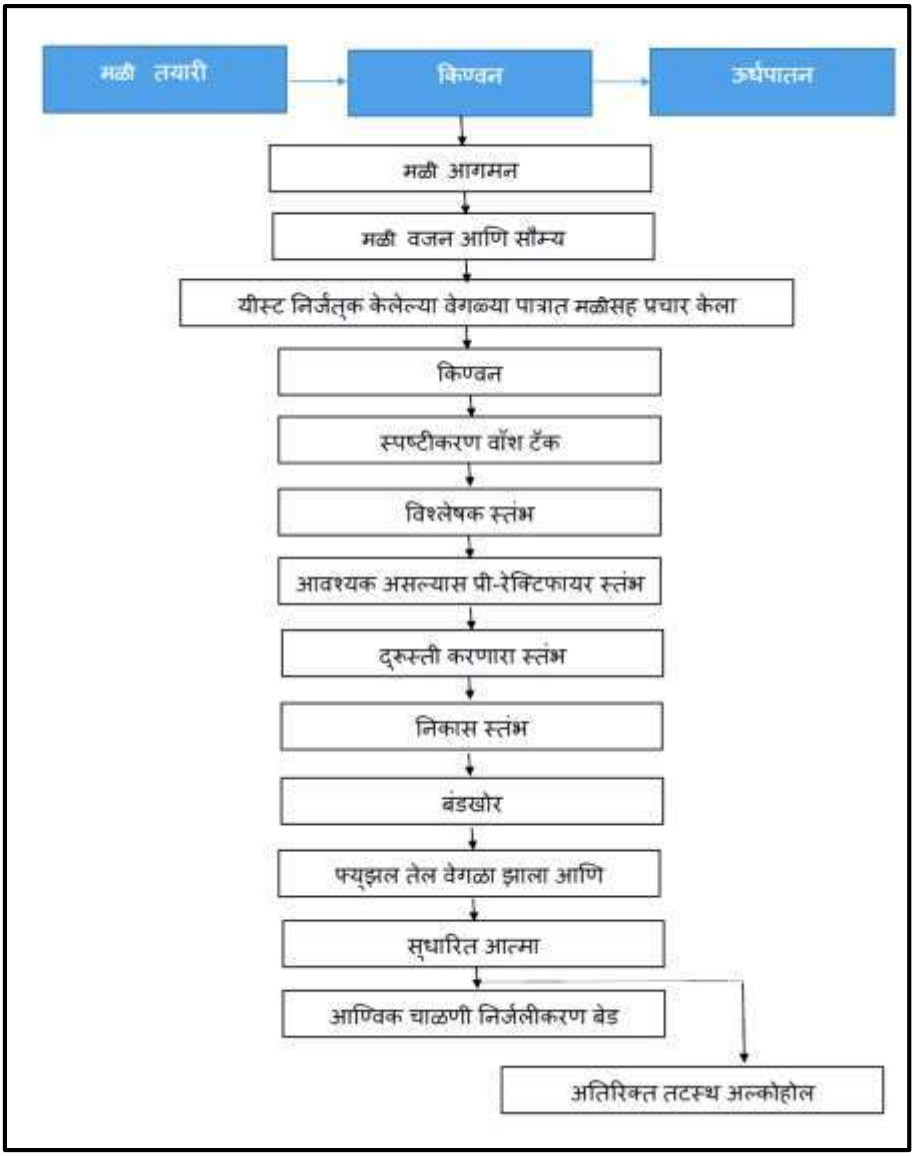
४. उर्जा: प्रस्तावित विस्ताराच्या प्रकल्पासाठी स्टीम व उर्जेची आवश्यकता स्वतंत्र २२ टीपीएच बॉयलर बसवून उपलब्ध करुन देण्यात येईल.

५. इंधन: २२ टीपीएच बॉयलरसाठी इंधन म्हणून कोळसा आणि उतार वापरला जाईल.

६. मनुष्य शक्ती: विद्यमान डिस्टिलरीमध्ये कार्यरत एकूण मनुष्यबळ is is आहे. एकूण कर्मचाऱ्यांपैकी ५७ कुशल व ४१ अकुशल असतील. स्थानिक लोकांना नोकरी देऊन मनुष्यबळाची ८५% हून अधिक आवश्यकता पूर्ण केली जाईल. बांधकाम कामासाठी मनुष्य शक्तीची आवश्यकता सुमारे ५० असेल. बांधकाम कामगार जवळच्या खेड्यात राहतील.

०.४ उत्पादन प्रक्रिया

अल्कोहोल तयार करण्यासाठी चार प्रमुख चरण आहेत. (अ) किण्वन तयार करण्यासाठी सब्सट्रेट (फीड) तयारी, (ब) यीस्टचा प्रसार आणि सतत किण्वन, (क) मल्टी-प्रेशर डिस्टिलेशन आणि (डी) निर्जल अल्कोहोलसाठी आरएसची डिहायड्रेशन किंवा अतिरिक्त विभक्त अल्कोहोल मिळविण्यासाठी ते शुद्ध केले जाईल.



०.५ प्रदूषण नियंत्रण तंत्रज्ञान आणि उपकरणे

१. वायू प्रदूषण नियंत्रणः २२ टीपीएच बॉयलरसाठी, स्टॅकची उंची ६० मीटर असेल आणि कणातील वस्तू नियंत्रित करण्यासाठी बॅग फिल्टर दिले जाईल.

२. पाणी आणि कचरा पाणी: ६५० एम^3 / दिवस खर्च केलेल्या वॉशचा बाष्पीभवनद्वारे उपचार केला जाईल - भस्म आणि कंडेनसेटचा उपचार सीपीयूमध्ये केला जाईल आणि प्रक्रियेत पुन्हा वापरला जाईल

३. घनकचरा: राख वीट उत्पादनात विकली जाईल.

४. एकूण प्रकल्प किंमत: रु. ७८०० लाख. (डिस्टिलरी युनिट), प्रदूषण नियंत्रण उपकरणांसाठी देण्यात आलेला निधी रु. ९५.९५ लाख आणि ओएंडएमसाठी रु. ४५ लाख प्रति वर्ष सीईआर कार्यासाठी राखीव निधी ७८ लाख रुपये असेल.

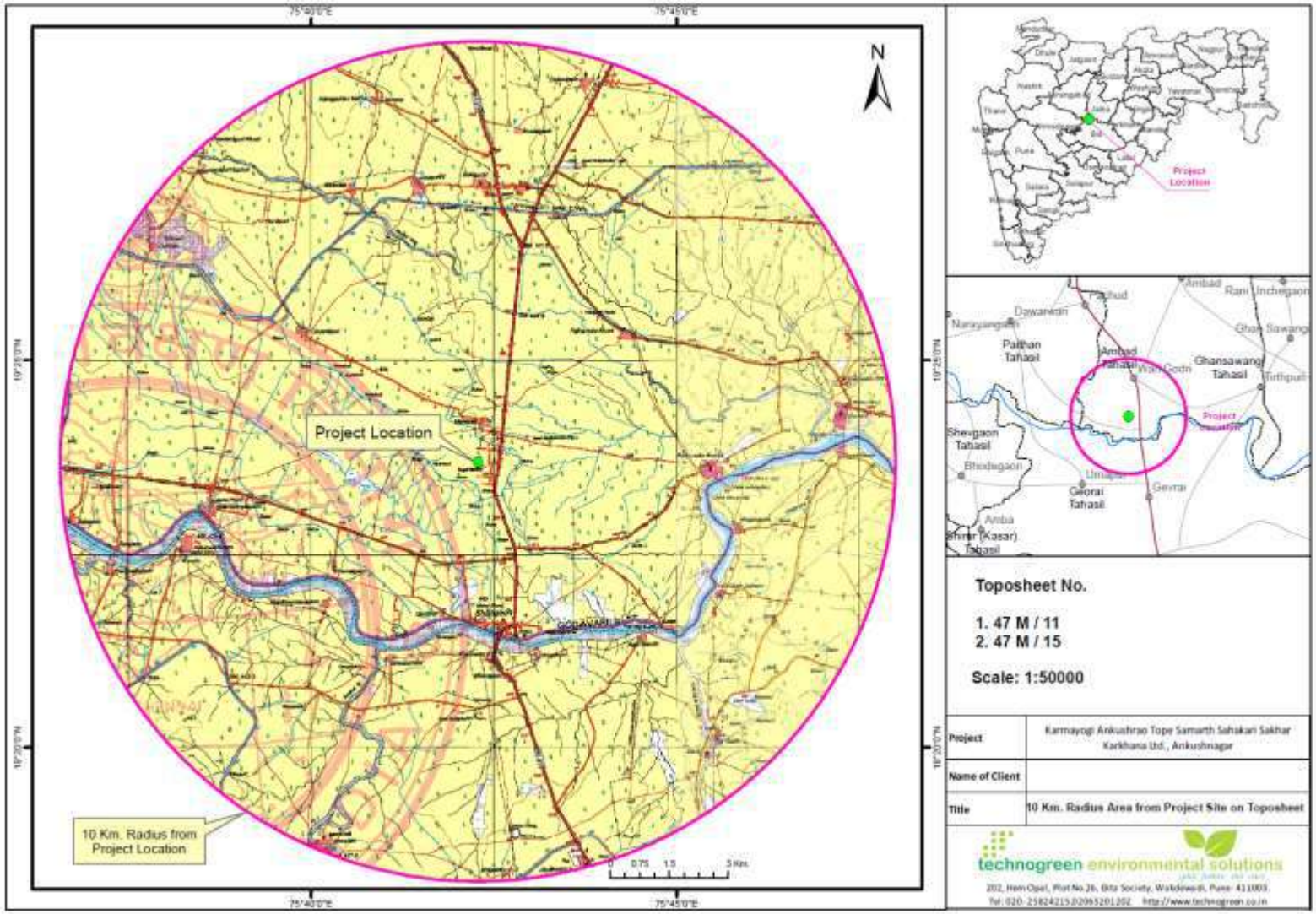
०.६ वातावरणाचे वर्णन

प्रस्तावित डिस्टिलरी प्लांटच्या आसपासच्या भागाचे भौतिक वैशिष्ट्ये आणि विद्यमान पर्यावरणीय परिस्थितीसाठी सर्वेक्षण केले जात आहे. मार्च २०१८ to ते एप्रिल २०१९ of या कालावधीत फील्ड सर्वे व बेसलाईन मॉनिटरिंग केले गेले आहे

अभ्यास क्षेत्राची पर्यावरणविषयक सेटिंगः साइट ग्रामीण भागात आहे. प्रदेशात इतर कोणतेही उद्योग आढळले नाहीत. अभ्यास क्षेत्राची स्थाने वैशिष्ट्ये खाली तक्त्यात दिली आहेत.

पर्यावरण सेटिंग (१० किमी त्रिज्या)

तपशील	तपशील
अक्षांश	**१९°२३'४०.५०" उत्तर**
रेखांश	**७५°४२'२१.४२" पूर्व**
साइट पत्ता	अंकुशनगर, ता. अंबड, जि. जालनाची
अभ्यास क्षेत्रामधील खेड्यांची संख्या	१२ गावे
जवळचे निवासस्थान	**महाकाला**
जवळचे नदी / पाण्याचे शरीर	**गोदावरी**
जवळचे आयएमडी वेधशाळे	**औरंगाबाद**
जवळचे शहर	**औरंगाबाद**
सर्वात जवळचे रेल्वे लाईन कोडी 46.77 किमी	औरंगाबाद विमानतळ ६२. १४कमी
सर्वात जवळचे एअर पोर्ट	कोडी ४६. ७७कमी
रोड मार्गे साइटकडे जा	राष्ट्रीय महामार्ग २११
धार्मिक / ऐतिहासिक ठिकाण	काहीही नाही
पुरातत्व वास्तू	कोणतीही नाही
पर्यावरणीय संवेदनशील क्षेत्र / राखीव वन	कोणतीही नाही
भूकंपाचा विभाग	III



आकृती टोपोशीट नकाशा _ प्रकल्प साइटपासून 10 किमी त्रिज्या क्षेत्र

०.७ वातावरणीय वाताची गुणवत्ता

अभ्यास क्षेत्रामधील एएक्यू समजून घेण्यासाठी, मार्च ते मे २०१९ या कालावधीत आठ स्थाने निवडली गेली आणि एएक्यू देखरेखीखाली घेण्यात आले.

एअर क्वालिटी मॉनिटरिंग अहवालात असे दिसून आले आहे की सर्व पॅरामीटर्स एनएएक्यूएस मानकांनुसार मर्यादित आहेत. हे पाहिले जाऊ शकते की पीएम$_{10}$ आणि पीएम$_{2.5}$ ४६.८१ ते ८८.५१ / मी.^{3} आणि १७.१२ ते ३२.४४ सूक्ष्म ग्राम / मी.^{3} पर्यंत आहेत. एसओ$_2$, एनओएक्स आणि सीओ १२.५५ ते २७.९२/ एम^3 १५. ११ ते ३९. ११/ मी.^{3} आणि ०.१२ ते ०.५८ सूक्ष्म ग्राम / मी.^{3} पर्यंत आहेत.

०.८ सभोवतालच्या शोरची गुणवत्ता

दिवसाच्या लेक (डी) दरम्यान आवाजाच्या पातळीचे लेक मूल्ये . ५०.९७ ते ६९.१ डीबी (ए) दरम्यान बदलतात. प्रोजेक्ट साइटवर [६९.१ डीबी (ए)] मध्ये सर्वाधिक लेक मूल्य नोंदवले गेले तर रात्रीच्या वेळी आवाज पातळीचे लेक मूल्ये लेक (एन) ४०.३६ ते ५७.१३ डीबी (ए) दरम्यान बदलली. प्रोजेक्ट साइटवर सर्वाधिक एलएनएल मूल्य नोंदविले गेले [५७.१३ डीबी (ए)].

अभ्यासाच्या क्षेत्रात विविध ठिकाणी नोंदवलेल्या तासाच्या लेक आवाजाची पातळी, अभ्यासाच्या क्षेत्रात रहदारी, व्यावसायिक आणि औद्योगिक क्रियाकलापांमधील बदलांमुळे लक्षणीय चढ-उतार दर्शविते, तथापि सर्व ठिकाणी ध्वनी पातळी (लेक डेटाइम तसेच लेक रात्री) आढळली. दिवसाची वेळ तसेच रात्रीच्या वेळी दोन्हीच्या निर्धारित मर्यादेत.

०.९ पाण्याची गुणवत्ता

भूगर्भातील पाण्याचे नमुने ९ वेगवेगळ्या ठिकाणाहून गोळा केले गेले आणि १० किमीच्या परिघामध्ये ३3 ठिकाणाहून पृष्ठभाग पाण्याचे नमुने घेण्यात आले.

भूजल गुणवत्ता

भूजल पीएच ६.६७ ते ७.५२ पर्यंत आहे. एकूण विलीन केलेले सॉलिड (टीडीएस) १३४. १९ - ६३४.०५ मिलीग्राम / एलच्या श्रेणीमध्ये असल्याचे आढळले. एकूण कठोरता १०३ - ५३६. ५ मिलीग्राम / एल च्या श्रेणीत आहे. सल्फेट २४. ६ - ३०९. ७७ मिलीग्राम / एल च्या श्रेणीमध्ये आहे. क्लोराईड्स ४१.९९ - १५५. ९५ मिलीग्राम / लिटर पर्यंत आहेत. सर्व नमुने अनुज्ञेय मर्यादेत आहेत.

पृष्ठभाग पाण्याची गुणवत्ता

पृष्ठभाग पाण्याचे पीएच ६.८९ ते ७.८९ पर्यंत असते. एकूण विरघळलेले घन १०६. ९८ - १३४. ६७मग. / लि. च्या श्रेणीत असल्याचे आढळले. एकूण कठोरता८९. ८ - ११४. ८ मग. / लि. च्या श्रेणीमध्ये आहे.

क्लोराईड्स आणि सल्फेट अनुक्रमे. ३७. ९९ - ४५. ९९ मिलीग्राम / ली आणि २७. ८२ - ३९. ०८ मिग्रॅ / एल च्या श्रेणीत आहेत जे दर्शविते की ते सर्व अनुज्ञेय मर्यादेत आहेत.

०.१० मातीची गुणवत्ता

- ✓ पीएच: नमुन्यांचे पीएच ७. ०९ ते ८. १६ पर्यंत बदलते. असे आढळले आहे की सर्व ठिकाणांचे पीएच अल्कधर्मी प्रमाणात असते.
- ✓ विद्युत वाहकता: विद्युत प्रवाहकता मूल्य ०. १५ µS / सेमी ते ०. ६७ µS / सेमी पर्यंत असते.
- ✓ बल्क घनता: अभ्यास क्षेत्रात मातीची बल्क घनता १. २८ ते १. ३८ ग्रॅम / सीसीच्या श्रेणीत असल्याचे आढळले. माती ही वनस्पतींच्या वाढीसाठी योग्य आहे याचा परिणाम यावरून दिसून येतो.
- ✓ पोरसिटी: अभ्यास क्षेत्रात आढळणारी मातीची ताकद ३५. २ ते ४८. ९ % पर्यंत आहे. असे दिसून आले आहे की कॅल्शियम आणि मॅग्नेशियमची संख्या एकाग्रता अनुक्रमे १६. ३ - २४. २ मिलीग्राम / कि.ग्रा. आणि १. ९४ ते ५. ५६ मिलीग्राम / किलो आहे; सोडियम आणि पोटॅशियम अनुक्रमे १२ ते mg ५३ मिलीग्राम / कि.ग्रा. आणि अनुक्रमे १९६- ६२१mg / किलो
- ✓ सेंद्रिय पदार्थ ०. २२ ते १. ३४ % च्या श्रेणीत असल्याचे आढळले आहे आणि फॉस्फरस मातीमध्ये पुरेशी मर्यादेपेक्षा जास्त आहे म्हणजेच ५. ३ - १२. २८ मिग्रॅ / किग्राच्या श्रेणीमध्ये. मातीची छिद्र मध्यम प्रमाणात आढळते, म्हणून जमिनीत पाणी साठवण्याची क्षमता मध्यम असेल. वरील निरीक्षणावरून असा निष्कर्ष काढला जाऊ शकतो की जमिनीत मध्यम प्रजोत्पादनाची क्षमता असते.
- ✓ मातीचा पोत: वाळूची टक्केवारी २३. ० ते ३०. ०% आणि गाळ टक्केवारी ४८. ० ते ५१. ०% पर्यंत बदलली आहे, तर चिकणमातीची टक्केवारी २१.० ते २८.० % पर्यंत आहे. जेव्हा प्राप्त झालेल्या परिणामांची तुलना प्रमाण मातीच्या पोत वर्गीकरणाशी केली जाते तेव्हा असा निष्कर्ष काढला जाऊ शकतो की अभ्यास क्षेत्राची मातीची रचना लोम आहे.

०.११ पर्यावरणशास्त्र

गोळा केलेल्या माहितीवरून हे जवळपास पाहिले जाऊ शकते. अभ्यासाच्या क्षेत्रात ८५ जातीच्या झाडे आणि झुडुपे पाहिल्या. अभ्यासक्षेत्रात अल्बिजिया सामन, टर्मिनलिया कॅटप्पा, स्पॅथोडिया कॅम्पानुलता, पेल्टोफोरम टेरोकार्पम, कॅसिआ सॅमिया अशी काही सामान्य झाडं आढळली.

अभ्यासाच्या अभ्यासानुसार असे दिसून आले आहे की अभ्यासाच्या ठिकाणी पक्ष्यांच्या ५९ वेगवेगळ्या प्रजाती, फुलपाखराच्या १, प्रजाती, सस्तन प्राण्यांच्या, प्रजाती, उभयचरांच्या प्रजाती आणि सरपटणारे प्राणी आढळले आहेत.

वन्यजीव संरक्षण अधिनियम, १९७२ नुसार अनुसूची १ मध्ये कोणतीही प्रजाती आढळली नाहीत. प्रकल्प क्षेत्रात ग्रीन बेल्ट मूळ प्रजातींसह विकसित केला गेला आहे. प्रस्तावित विस्ताराचा प्रदूषण भार कमी असेल आणि अभ्यास क्षेत्राच्या फ्लोरा आणि जीवनावर त्याचा परिणाम होणार नाही.

०.१२ सामाजिक आर्थिक सर्वेक्षण

- ✓ गेल्या दहा दशकापासून कृषी विकास, शहरीकरण आणि औद्योगिकीकरणामुळे या लोकसंख्येच्या अभ्यासानुसार अभ्यासाचे क्षेत्र वेगाने वाढत आहे.
- ✓ अभ्यासाच्या क्षेत्रात महाराष्ट्र राज्यातील एक जालना जिल्हा, एक ब्लॉक अंबड आणि अभ्यास क्षेत्रामधील एकूण २३ गावे समाविष्ट आहेत. २१२ व्यक्ती / किमी^{2} लोकसंख्येच्या घनतेसह २०६४१.३१ एच असलेले एकूण अभ्यास क्षेत्र.
- ✓ प्रदेशाची एकूण जनगणना (जनगणना २०११) ४३९४० झाली असून त्यापैकी २२४५५ (५१.१०%) पुरुष आणि २१४८५ (४८.८९%%) महिला आहेत.
- ✓ एकूण लोकसंख्येपैकी अनुसूचित जाती व अनुसूचित जमाती अनुक्रमे ५६५५ (१२.८६%) आणि ११४७ (२.६१%) आहेत.
- ✓ एकूण लोकसंख्येचा साक्षरता दर २५८२५ (५८.७७%) पर्यंत तयार झाला आहे. पुरुष साक्षरता १५०२६ (५८.१8%) आणि महिला साक्षरता अनुक्रमे १०७९९ (४१.८२%) आहे.
- ✓ मुख्य कामगार, सीमांत कामगार आणि कामगार नसलेली वर्गवारीची एकूण लोकसंख्या अनुक्रमे १९५८७ (४४.८८%), २५८० (५. ८७%) आणि २१७७३ (४९ .५५%) आहे.
- ✓ शेतकरी कामगार ८७१५ (४४.४९%) आणि कृषी कामगार यांची बहुतेक पध्दत आहे ७३८९(३७.७२%). घरगुती कामगार आणि इतर कामगार म्हणून ३४१ (१.७४%) आणि ३१४२ (१६.०४%) आहेत.

०.१३ प्रभाव शमन विश्लेषण

पर्यावरणीय प्रभावांचे प्राथमिक किंवा दुय्यम एक म्हणून वर्गीकरण केले जाऊ शकते. पर्यावरणीय गुणधर्मांवरील प्रकल्पाच्या क्रियेमुळे प्राथमिक परिणाम हे थेट होतात, तर दुय्यम परिणाम अप्रत्यक्षपणे प्रेरित केले जातात.

वायु वातावरणावर होणारे परिणाम:

- विद्यमान ९५ टीपीएच क्षमतेचे बॉयलर कार्यरत आहेत आणि २२ टीपीएच जाळण्याचे बॉयलर प्रस्तावित आहे.
- विद्यमान टीपीएच बॉयलर ओला स्क्रबर्स व वायू प्रदूषणाचे प्रमाण कमी करण्यासाठी ईएसपीच्या वायू उत्सर्जन रोखण्यासाठी आणि डिस्टिलरी युनिट २२ टीपीएच बॉयलर बॅग फिल्टर आणि मीटर स्टॅक उंची प्रदान केली जाईल.
- ऑनलाईन सतत मॉनिटरिंग सिस्टम स्थापित केलेली आहे आणि सीपीसीबीच्या मार्गदर्शक सूचनांनुसार प्रदूषण नियंत्रण मंडळाशी कनेक्ट आहे

ध्वनी गुणवत्तेवर परिणामः

कारखाना परिसर तसेच कारखान्याच्या परिसराभोवती ध्वनीची गुणवत्ता ही चिंताजनक आहे. बॉयलर हाऊस, कूलिंग टॉवर आणि इतर युनिट प्रक्रियेत गुंतलेल्या इतर मशीनचे ऑपरेशन. डीजी संच, वाहतुकीच्या वाहनांमधून निर्माण झालेला आवाजाचीही कल्पना केली जाते.

माती वातावरणावरील परिणामः

सांडपाणी थेट शेती क्षेत्रात सोडल्यास परिणामांचा अंदाज आहे. कचऱ्याचे अवशेष आणि इतर ओल्या कचऱ्याचे अयोग्य साठवण केल्यास मातीची गुणवत्ता बाधित होऊ शकते

पाण्याच्या वातावरणावर होणारे परिणामः

कचरा साठवण परिसरातील पाण्याच्या वाहिन्यामुळे परिणामांची कल्पना केली जाते. खुल्या जमिनीवर कचरा टाकल्यास भूजल लीचेटची परिकल्पना केली जाते.

पर्यावरणीय पर्यावरण:

ऑपरेशनल टप्प्यात कोणत्याही प्रभावांची कल्पना केली जात नाही.

सामाजिक आर्थिक वातावरण:

ऑपरेशनल अवस्थेदरम्यान दोन्ही सकारात्मक आणि नकारात्मक प्रभाव येण्याची शक्यता असते. सकारात्मक परिणामांमुळे रोजगार निर्मिती, शाळा, रुग्णालये, बँकिंग कार्यालये यासारख्या सामाजिक व शारिरीक पायाभूत सुविधांच्या सुधारणेचे अनुपालन होईल. नकारात्मक परिणामांमुळे गोंगाटाच्या वातावरणास दीर्घकाळ संपर्कात आणल्यास सुनावणी कमी होऊ शकते.

शमन उपाय

हवा:

बॉयलर हाऊसमधून निघणारे उत्सर्जन थेट वातावरणास उत्सर्जन होण्यापूर्वी प्रदूषण नियंत्रण उपकरणांद्वारे केले जाईल. कण उत्सर्जन कमी करण्यासाठी पुरेसा ग्रीन बेल्ट विकास आहे. आवश्यक असल्यास पाण्याची शिंपडण्याची पद्धत धूळ होण्याची शक्यता असलेल्या रस्त्यांवर अवलंबली जाईल.

विस्तारासाठी कोणतेही अतिरिक्त बॉयलर प्रस्तावित नाही.

वायू प्रदूषण स्रोत आणि शमन उपाय

आंक्र.	स्त्रोत	इंधन	उत्सर्जन	उपाययोजना
१	विद्यमान ९५ टीपीएच बॉयलर	बॅगॅस	पार्टिक्युलेट मॅटर, एसओ$_2$ आणि एनओ$_x$	७६ मीटर स्टॅक आणि ओले स्क्रबर प्रदान केले
२	विद्यमान डीजी सेट १०१० केव्हीए	एचएसडी	पार्टिक्युलेट मॅटर, एसओ$_2$ आणि एनओ$_x$	७ मीटर स्टॅक उंची प्रदान केली
३	प्रस्तावित २२ टीपीएच ज्वलनशील बॉयलर	बॅगॅस आणि कॉन्क.स्पेन्ट वॉश	पार्टिक्युलेट मॅटर, एसओ$_2$ आणि एनओ$_x$	६० मीटर स्टॅक आणि बॅग फिल्टर प्रदान केले जाईल
४	प्रस्तावित १०५ केव्हीए डीजी सेट	एचएसडी	पार्टिक्युलेट मॅटर, एसओ$_2$ आणि एनओ$_x$	६ मीटर स्टॅक उंची प्रदान केली जाईल

गोंगाट:

कामगारांना कानातले झोके आणि इतर वैयक्तिक संरक्षक उपकरणे प्रदान केली जातील ज्यांची नाद प्रवण वातावरणात काम करतात. ग्रीनबेल्ट कव्हरचा विकास आवाजाची पातळी कमी करेल औद्योगिक परिसर. आवाजाचे उत्पादन करणारी मशीन्स दिवसा वेळेत चालविली पाहिजेत.

माती:

पौष्टिक जोडांसह पाण्याचा उपचार करून मातीची गुणवत्ता सुधारली जाईल. मातीच्या नमुन्यांची नियमित तपासणी केली जाईल आणि पौष्टिक परिणामाच्या आधारे योग्य शमन उपाय अवलंबले जातील.

पाणी आणि सांडपाणी:

सीपीसीबी आणि एमओईएफ आणि सीसी द्वारे निश्चित केलेल्या निकषांनुसार नियमित पाण्याची गुणवत्ता देखरेख केली जाईल.

डिस्टिलरी युनिटमध्ये, एमईईच्या कंडेन्सेटचा उपचार कॉडेन्सेट पॉलिशिंग युनिट (सीपीयू) मध्ये केला जाईल आणि प्रक्रिया आणि कूलिंग टॉवरमध्ये पुन्हा वापरला जाईल. एकाग्र खर्च केलेला वॉश बॉयलरमध्ये इंधन म्हणून वापरला जाईल.

०.१४ कॉर्पोरेट पर्यावरण जबाबदारी (सीईआर)

एमईईएफ आणि सीसी, नवी दिल्ली यांनी दि .१ मे २०१ ८ on रोजी सीईआरच्या लागू केलेल्या निर्णयाला सीईआर आणि बजेटच्या संदर्भात प्रकाशित केलेल्या नवीन कार्यालयाच्या ज्ञापन पत्रानुसार.

एकूण प्रकल्पाची किंमत रु. ७८०० लाख. एकूण खर्चाच्या १.०% ते अंदाजे ७८ लाख रुपये होते. म्हणूनच आम्ही गरजांच्या आधारावर आजूबाजूच्या खेड्यांमध्ये कॉर्पोरेट पर्यावरण जबाबदारी (सीईआर) उपक्रमांसाठी ७८ लाख रुपये समर्पित केले आहेत.

०.१५ पर्यावरण देखरेख आणि व्यवस्थापन योजना

पूर्व-बांधकाम, बांधकाम आणि ऑपरेशन टप्प्यात पर्यावरण देखरेखीची सूचना दिली जाते. प्रकल्पाच्या ऑपरेशन टप्प्या दरम्यान प्रस्तावित प्रकल्प क्रियेमुळे उद्भवणा the्या बेसलाइन वातावरणाची स्थिती समजून घेणे आवश्यक आहे. पर्यावरणीय देखरेखीवर देखरेखीचे पालन करण्याच्या निकष व वेळापत्रकानुसार वायु, पाणी, माती, पर्यावरणशास्त्र आणि ध्वनी मापदंडांचे पालन केले जाईल. सर्व मापदंडांची मानक साधने आणि पद्धतींनुसार चाचणी केली जाईल आणि प्राप्त झालेल्या परिणामांची तुलना सीपीसीबीच्या मानदंडांशी केली पाहिजे.

पर्यावरण संरक्षण उपायांची किंमत

आं क्र	**पर्यावरणीय पैलू**	**भांडवली खर्च रु. (कोटी)**	**आवर्ती खर्च रू. वार्षिक (कोटी)**
१	उत्सर्जन नियंत्रण अभियांत्रिकी	४.०	०.१०
२	पाणी व सांडपाणी व्यवस्थापन	२.०	०.१५
३	घनकचरा व्यवस्थापन	०.२०	०.०५
४	हरित ड्राइव्ह	०.२०	०.१०
५	पर्यावरण देखरेख	०.०५	०.०५
६	रेन वॉटर हार्वेस्टिंग, सेफ्टी, सिक्युरिटी इत्यादी इतर बाबी	०.५०	०.१०
	एकूण	**६.९५**	**०. ५५**

CHAPTER -1

INDEX

TABLES

FIGURES

कर्मयोगी अंकुशराव टोपे समर्थ सहकारी साखर कारखाना लि., अंकुशनगर

पो. अंकुशनगर - ४३१ २१२, ता. अंबड, जि. जालना (महाराष्ट्र)

KARMAYOGI ANKUSHRAO TOPE SAMARTH SAHAKARI SAKHAR KARKHANA LTD., ANKUSHNAGAR

Post. Ankushnagar - 431212, Tq. Ambad, Dist. Jalna (Maharashtra)

• GSTIN -27AADAS8482L1ZS • PAN No. AADAS8482L • TAN No. NSKS06848C

• Regd. No. JAL/PRG/(A)-1, Date : 10/02/1982 • Phone & Fax No. (02483) 279623, 279624, 279629

• Mob : 9623457070 • G-mail : samarthsugar@gmail.com • Website : www.samarthsugar.com

Date: 16.10.2019

To,

The Member Secretary SEAC-I,

Environment Department,

Government of Maharashtra,

New Administration Building,

15th Floor, Mantralaya,Mumbai

Subject: Undertaking letter for ownership of EIA and EMP and other documents of proposed expansion of 30 KLPD to 60 KLPD molasses based distillery

Reference: TOR Letter Reference No F.No ide letter No.IA-J-11011/81/2018-IA-II(I) dated 15th June 2018.

Respected Sir,

We, hereby give an undertaking for owning the contents and information provided in the EIA and EMP report prepared for Environmental Clearance for proposed expansion of manufacturing unit of M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd., Post – Ankushnagar, Taluka – Ambad, Dist: Jalna (Maharashtra) .

Thanking you,

Yours Faithfully

(D.S.Patil)

Managing Director

CHAPTER 1

INTRODUCTION

1 General

1.1 Introduction

M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd. (KATSSSKL), Ankushnagar, Tal. Ambad, Dist. Jalna is registered under the Maharashtra Co-Operative Societies Act, 1960 vide Registration No. JAL/PRG/A-1 dated 10th February 1982.

It is one of the progressive Sugar Factories in the state of Maharashtra and is located at Ankushnagar on national high way No. 211. The nearest railway station is Jalna and is about 55 Km away from the site.

The initial crushing capacity of the factory was 1250 TCD and the first crushing season was conducted in the year 1984-85. Due to increasing sugarcane plantation in area of operation and under visionary leadership of founder chairman late. Shri. Ankushraoji Tope, Ex. Member of Parliament, Karkhana has expanded its crushing capacity from 1250 TCD to 2500 TCD in the year 1992-93.

The Karkhana has also set up 2500 TCD Sugar Mill named as "Sagar Sahakari Sakhar Karkhana Ltd," at Tirthpuri Tal. Ghansavangi Dist: Jalna. The Sugar Mill was merged with KATSSSK Ltd, in the year 2013 and was renamed as Samarth SSK Ltd. Unit II. Samarth SSK Ltd has implemented high efficiency grid connected Cogeneration plant in its premises. The 18 MW Cogeneration plant was commissioned in the year 2009-10.

The Factory has obtained No Objection Certificate from Government of Maharashtra for expansion of Sugar unit and Rectified Spirit and Extra Neutral Alcohol on 15th May 1993 and obtained Environment Clearance for 18 MW Baggase based power plant on 24th April 2009.

The Karkhana has set up 30 KLPD capacity Distillery Plant based on Biostil fermentation and atmospheric distillation technology in the year 1992. Now, KATSSSKL planning to propose expansion of Distillery unit from 30 KLPD to 60 KLPD within the existing premises.

Table 1.1 Capacity of Karkhana

Unit	Existing	Expansion	Total
Sugar	2500 TCD	-	2500 TCD
Cogeneration	18 MW	-	18 MW
Distillery	30 KLPD	30 KLPD	60 KLPD

As per EIA Notification S. on 14th September 2006 issued by Ministry of Environment & Forests, Govt. of India *vide* Gazette Notification No. S.O. 1533(E) dt: 14th Sep.'2006, and amended, the proposed expansion from 30 KLPD to 60 KLPD Molasses based Distillery

shall be treated as Category–A; Schedule 5 (g). Accordingly, the project proponent has submitted prescribed application along with Pre-feasibility Report to the MoEF&CC New Delhi. Terms of Reference [ToR] has been approved by EAC (vide letter No.IA-J-11011/81/2018-IA-II(I) dated 15th June 2018). Based on the approved ToR and Standard ToR, Environmental Impact Assessment studies are carried out. Draft EIA and EMP report is prepared and submitting for Public Hearing. Copy is ToR is enclosed as ***Annexure- 1.***

There are no litigations pending against the project and/ or any direction / order passed by any Court of Law against the project.

1.2 Purpose of the Report

Industrial activities such as Distilleries invariably involve utilization of natural resources and generation of waste substances and they may have adverse consequence to the environment. However, mankind as it is developed today cannot live without taking up these activities for his food, security or other needs. Hence, there is a need to harmonies developmental activities with the environmental concern.

Consequently, there is a need to harmonious developmental activities with the environmental concern. EIA is one of the tools available with the planners to achieve the above goal. It is desirable to ensure that the project activity is sustainable. Hence, the environmental consequence must be characterized early in the project cycle and accounted for in the project design. The objective of EIA is to fore see the potential environmental problems that would arise out of the proposed development and address them in the project planning and design stage. The present EIA report incorporates the environmental consequence of the proposed Distillery project along with the measures adopted in the distillery for control of pollution and enhancement of environmental quality.

Alcohol is produced in the distilleries by fermentation and distillation processes. Molasses, a waste/byproduct of sugar industry is used as raw material by most of the distilleries. Spent wash produced as an effluent is the major pollutant from the distilleries. It is highly contaminated with inorganic and organic matter. Proper handling and disposal of spent wash is necessary to prevent its adverse effects on the environment.

State and Central pollution control authorities have issued guidelines to the distilleries for treatment and safe disposal of spent wash. Accordingly, the distillery spent wash will be treated and disposed through Biomethanation, evaporation and bio composting. The proposed project is zero discharge of spent wash to environment.

The proposed distillery project is listed under EIA Notification dated 14-09-2006 of Ministry of Environment and Forests (MoEF&CC), Government of India. Further, it is categorized under Category -A of Schedule 5 (g) of this notification. As per the above notification, prior

clearance from MoEF&CC is mandatory before establishment of this industry. Under Environmental Protection Act (EPA) 1986, before establishment of any project it is also mandatory for the project proponents to obtain consent on environmental angle from State pollution control board. EIA studies have to be conducted and its report is to be prepared for submission to the authorities along with the prescribed application forms to secure their clearance for the proposed project. Hence, the present report is prepared for submission to MoEF&CC New Delhi.

1.3 Identification of the Project and Project Proponent

M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd. (KATSSSKL), Ankushnagar, Tal. Ambad, Dist. Jalna is registered under the Maharashtra Co-Operative Societies Act, 1960 vide Registration No. JAL/PRG/A-1 dated 10th February 1982.

This industry is ably established under the vision of Shri. Ankushrao Tope and is now handled by following personnel's;

Table.1.2 Management Details

Sr. No.	Name	Designation
1.	Smt. Shardatai Ankushraoji Tope	Chairman
2.	Shri. Uttamrao Kashinath Pawar	Vice Chairman
3.	Shri. Amarsinha Kashinathrao Kharat	Director
4.	Shri. Shrirangrao Damodharrao Paithane	Director
5.	Shri. Sadarshigh Dhondusingh Pawar	Director
6.	Shri. Manojkumar Jagannath Markad	Director
7.	Shri. Fatteyabkha Masumkha Pathan	Director
8.	Shri. Sureshrao Dasharathrao Aaute	Director
9.	Shri. Ambadas Vishwanath Pawar	Director
10.	Shri. Sheshrao Namdeo Jagtap	Director
11.	Shri. Vikas Prakashrao Kavhale	Director
12.	Shri. Kiran Subhash Tarakh	Director
13.	Shri. Narshinghrao Vithoba Mundhe	Director
14.	Shri. Babasaheb Vitthalrao Kolhe	Director
15.	Shri. Kailas Damodhar Jige	Director
16.	Shri. Paraji Shesharao Sule	Director
17.	Shri. Dattu Anna Jadhav	Director
18.	Sou. Sumitra Satishrao Honde	Lady Director
19.	Shri. Trimbakrao Narayan Bulbule	Director
20.	Shri. Ashok Anjiram Aaghav	Director
21.	Shri. Dilip S. Patil	Managing Director

This is a cooperative limited sugar factory and local farmers are the members who grow sugarcane.

1.4 Brief Description of Nature, Size & Location of the Project

1.4.1 Nature of Project

Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd. (KATSSSKL) is located at Ankushnagar, Tal. Ambad, Dist. Jalna. The Karkhana has set up 2500 TCD Sugar, 18 MW Cogeneration Plant and 30 KLPD Molasses based Distillery unit. The proposed expansion will be of 30 KLPD to 60 KLPD Molasses based Distillery unit at existing unit of KATSSSKL.

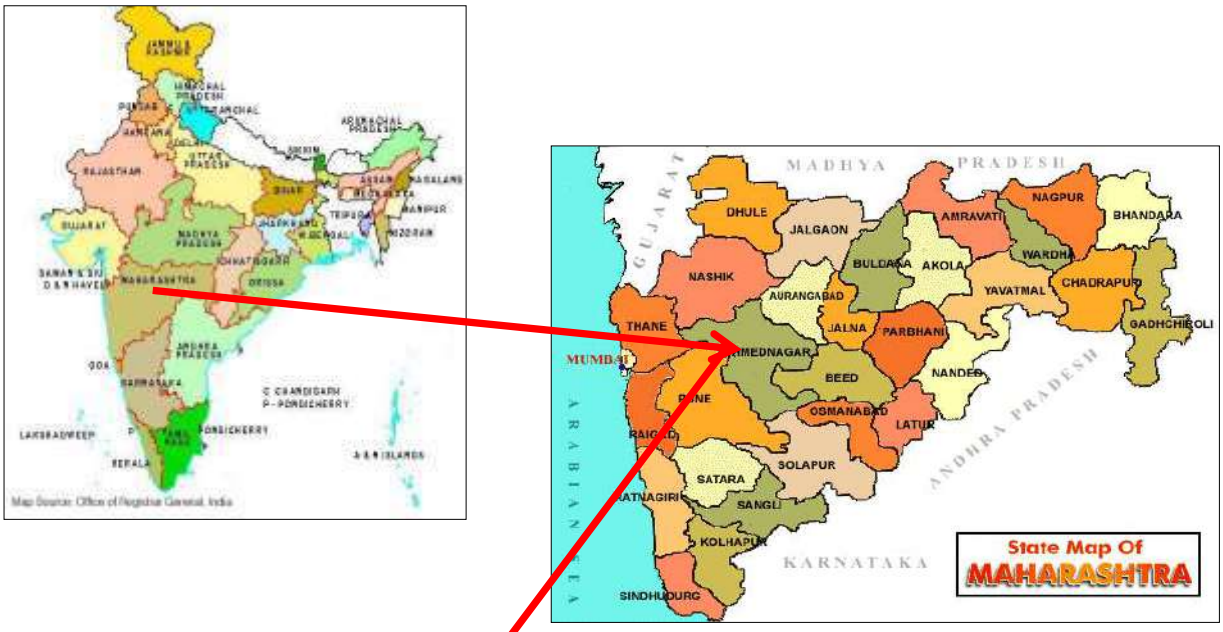
1.4.2 Size of the Project

1.4.3 Project Location

The proposed project is located at Ankushnagar, Tal. Ambad, Dist. Jalna Maharashtra. Site comes under Grampanchyat Mahakala Jurisdiction. No Objection Certificate is obtained from Mahakala Grampanchyat for the said activity.

The site is situated near the National High Way No. 211. The nearest Railway Station is Jalna and is about 55 Km away from the site. It is geographically located in 19°23'40.50"N latitudes and 75°42'21.42"E longitude.

Figure 1.1 Project Location



19°23'40.50"N
75°42'21.42"E
ANKUSHNAGAR, TAL. AMBAD,
DIST. JALNA MAHARASHTRA
STATE – MAHARASHTRA

Figure 1.2 Google Image with Project Location

Table 1.2 Google Co-ordinates for the Industry

Sr. No.	Corners	Particulars	
		LATITUDE	**LONGITUDE**
i.	1	19°24'5.47"N	75°42'13.48"E
ii.	2	19°23'50.80"N	75°42'34.50"E
iii.	3	19°23'21.10"N	75°42'30.86"E
iv.	4	19°23'25.91"N	75°42'10.02"E
v.	5	19°23'29.34"N	75°41'45.55"E
vi.	6	19°23'34.23"N	75°41'48.10"E
vii.	7	19°23'53.54"N	75°41'47.55"E
viii.	8	19°23'57.23"N	75°41'56.28"E
ix.	9	19°24'3.33"N	75°41'56.28"E

1.4.4 Details of Existing Sugar unit and Proposed distillery unit

Details of existing as well as proposed activity is summarized in the following table;

Table 1.3 Details of Existing Sugar Unit, Cogeneration, Distillery and Expansion Distillery Unit

Sr.	**Details**	**Sugar**	**Cogeneration**	**Distillery**	
1.	**Status**	**Existing**	**Existing**	**Existing**	**Expansion After Expansion**
2.	**Location**	Gat No. 106 Ankushnagar, Tal. Ambad, Dist. Jalna Maharashtra			
3.	**Capacity**	2500 TCD	18 MW	30 KLPD	30 KLPD to 60 KLPD & 2 MW
4.	**Working days**	180	180	190	300
5.	**Raw material**	Sugarcane	Bagasse	Molasses	Molasses
6.	**Quantity of raw Material**	450000 MT	126000 MT	20250 MT	69,231 MT/annum Own : 48,782 MT Remaining : 20449 MT from nearer factories
7.	**Products**	Sugar 51750 MT	Power 18 MW	Industrial Alcohol, Absolute Alcohol and Fusel Oil 30 KLPD	Anhydrous/Fuel Alcohol Impure Spirit, ENA, Fusel Oil : 60 KLPD
8.	**Boiler Capacity**	95 TPH		-	22 TPH
9.	**Boiler Fuel**	Bagasse		-	Conc. Spent wash (6.0 T/hr) and Bagasse (5.0 T/hr)
10.	**Water source**	Godavari River & CGWA Permission		Godavari River & CGWA Permission	Godavari River
11.	**Water requirement**	758 M^3/day		240	612 M^3/day
12.	**Land ha**	358 Acre			
13.	**Green Belt ha**	50.00 Acre			

Sr.	Details	Sugar	Cogeneration	Distillery	
14.	Effluent Treatment facility	ETP of Capacity 350 M3/day		Spent wash treated in re boiler and Condensate water is recycled in process & concentrated spent Wash used for bio composting to achieve zero discharge	Spent wash will be treated at MEE and Concentrated spent wash will be used as fuel in Boiler. Condensate from will be Treated in CPU and used for process
15.	APC measures for boiler	76 m stack height & ESP		-	Stack height. 60 m and bag Filter
16.	Project Cost	141 Cr.		11.22 Cr.	78.02 Cr.

Table 1.4 Applicable Environmental Laws and Regulations

Issues	Applicable Legislation	Agency Responsible	Applicable Permits and Requirement	Status
Protection and improvement of Natural Environmental Resource	Article 51-A Clause (g) of the& Directive Principles of State Policy (Article 47)	Every Citizen of India	It states that it shall be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wildlife and to have compassion for all living creatures. • Consent to Establish • Consent to Operate • Compliance under the Act	Being an existing unit the Project Proponent has already obtained Consent to Operate with its subsequent renewal from MPCB and complying all conditions as mentioned in the consent
Prevention and Control of Water Pollution	The Water (Prevention and Control of Pollution) Act, 1974, amended in 1988	MPCB	• Consent to Establish • Consent to Operate • Compliance under the Act	Being an existing unit the Project Proponent has already obtained Consent to Operate with its subsequent renewal from MPCB and complying all conditions mentioned in the consent
Prevention and Control of Air Pollution	The Air (Prevention and Control of Pollution) Act, 1981, amended in 1987 and the Air (Prevention and Control of Pollution) Rules 1982, as amended up to 18th Feb 1992.	MPCB	• Consent to Establish • Consent to Operate • Compliance under the Act	Being an existing unit the Project Proponent already has obtained Consent to Operate with its subsequent renewal from MPCB and complying all conditions mentioned in the consent
Environmental Protection	The Environment (Protection) Act 1986, as amended in April 2003;	MoEF&CC Department of Environment(SEIAA Maharashtra)	Compliance under the rules to maintain stipulated standards and environmental management through various supporting rules promulgated under the Act.	After obtaining EC, PP will submit six monthly monitoring report timely
Environmental Protection – EIA related	EIA Notification, September 2006	EAC, Industry –II MoEF&CC, New Delhi & SEIAA, Mumbai,	Requirement of EC, EIA for environmental appraisal of a project by SEIAA, Maharashtra	Terms of Reference has been approved by EAC (vide letter No.IA-J-11011/81/2018-IA-II(I) dated 15th June 2018).

Issues	Applicable Legislation	Agency Responsible	Applicable Permits and Requirement	Status
		Maharashtra		
Noise	The Noise (Regulation & Control) Rules, 2000 as amended in January 2010	MPCB	Compliance under the rules to maintain stipulated standards	The PP carries out Noise Monitoring regularly and has provided various control equipment for regulating noise
Hazardous material Storage Handling & Transport	Manufacture Storage and Import of Hazardous Chemicals 1989 and amendment Rules 2000 under the Environment (Protection) Act, 1986, and Rules framed there under	MPCB, CPCB, MoEF&CC, District Collector, Chief Controller of Explosives	• Identification of Major Accident Hazard under Rule 4 • Filing of Safety Report under Rule10 • Preparation of Onsite and Offsite Emergency Control Plan under Rules 13 & 14 • Collection, Development and Dissemination of information including Do's and Don'ts and labelling for hazardous substances handled onsite under Rule 17	Chemical usage like solvents, oil, etc. are recorded and well maintained MSDS. Hazardous waste generated is being handled as per the Hazardous and other Waste [Management and Trans-boundary Movement] Rules 2016. PP shall generates only Used/ Waste Oil as Hazardous Waste and has agreement with Authorized Recycler/Re-Processor for the safe disposal of the same.
Construction and Demolition waste	Construction and Demolition Waste Management Rules, 2016.	Every Individual generating C&D waste, MPCB, CPCB, BIS and IRC	• Compliance under the rules to maintain stipulated standards	For the proposed expansion, construction activity will be very minimal and no demolition activity will be done. Hence, C&D waste generation will also be very minimal and shall be reused internally within the premises for construction itself and for minor landscaping or disposed of as per C&D, 2016 Rules

1.5 Scope of Study

As per EIA Notification S. on 14th September 2006 issued by Ministry of Environment & Forests, Govt. of India *vide* Gazette Notification No. S.O. 1533(E) dt: 14th Sep.'2006, and amended, the proposed expansion from 30 KLPD to 60 KLPD Molasses based Distillery shall be treated as Category–A; Schedule 5 (g). Accordingly, the project proponent has submitted prescribed application along with pre-feasibility report to the MoEF&CC New Delhi. Terms of Reference has been approved by EAC (vide letter No.IA-J-11011/81/2018-IA-II(I) dated 15th June 2018).

1.5.1 Objective of EIA Study

The study envisages characterization of the existing status of physical environment such as air, water, soil, land use, meteorology, socio-economic and heritage etc. as well as biological environment such as flora and fauna of the study area of 10 km radius and quantifying impacts on the environmental parameters. Based on the baseline data, EIA evaluates the proposed control measures by the project and prepares an environment management plan, outlining additional proposed activities and delineates the requirements of environmental monitoring program. EIA-EMP report covers the following aspects.

- Evaluation of present environmental factors through analysis of generated and collected baseline data for one complete non-monsoon season (3 months).
- Assess the probable impact on the environmental factors due to implementation of the project with respect to existing scenario.
- Analyze the predicted impact with respect to the regulatory environmental standards.
- Assess the probable risk at the proposed plant.
- Develop an Environmental Management Plan and on site Disaster Management Plan for the proposed project to mitigate the negative significant impacts that would arise from the proposed project.
- The baseline data has been collected for the following environmental components, during March to May 2018
    - Air Quality
    - Meteorology
    - Noise Environment

- Water Use & Quality
- Soil Quality
- Demographic & socio-economic aspects
- Ecology & Biodiversity

Baseline data on parameters of the above-mentioned aspects over a season provides means for identifying possible impacts; Positive as well as Adverse if any. An Environmental Impact Assessment and Environment Management Plan comprising an overall assessment of the impact due to project activity over baseline condition of the existing environment and a mitigating action plan to counter the adverse impact as defined. An environmental monitoring program is also prepared to provide scientific support to future actions of environmental protection.

1.5.2 Organization of Report

The report has been divided into following eleven chapters:

Chapter 1. Introduction: This chapter provides the purpose of the report, background information of the proposed project, brief description of nature, size and location of project, objectives of the project, estimated project cost, scope and organization of the study. The key environmental legislation and the standards relevant to the project and the methodology adopted in preparation of this report have also been described in this chapter.

Chapter 2. Project Description: The chapter deals with the need of the project, location, environmental setting of the project, details of project, other technical and design details and sources of pollution from the proposed activity and measures proposed to control pollution.

Chapter 3. Description of the Environment: The chapter presents the methodology and findings of field studies undertaken to establish the environmental baseline conditions, which is also supplemented by secondary published literature.

Chapter 4. Anticipated Environmental Impacts & Mitigation Measures: The chapter details the inferences drawn from the environmental impact assessment of the proposed project during various phases of project advancement, such as design, location of project, construction and regular operations. It also describes the overall impacts of the proposed project activities and underscores the areas of concern, which need mitigation measures.

Chapter 5. Analysis of Alternatives (Technology & Site): The technology and project site alternatives are discussed in the chapter.

Chapter 6. Environmental Monitoring Program: Environmental monitoring requirements for effective implementation of mitigatory measures during operational phase have been delineated in this chapter.

Chapter 7. Additional Studies: The chapter describes public consultation issues & various risks associated during operational stage of the project such as fuel storage, chemical storage fire etc.

Chapter 8. Project Benefits: In this chapter describes various benefits of the project to the community in the vicinity and as well as to the region on the whole.

Chapter 9. Environmental cost Benefit analysis

Chapter 10. Environmental Management Plan (EMP): It also provides recommendations/ Environment Management Plan (EMP) including mitigation measures for minimizing the negative environmental impacts of the project. The assessment will cover the baseline data generation, predictions and evaluation of impact on various environmental components and preparation of adequate Environmental Management Plan.

Chapter 11. Summary & Conclusion: This Chapter highlights the expected benefits of the proposed expansion plant to the socio-economic scenario in the study area and to the country as a whole.

Chapter 12. Disclosure of Consultants Engaged.

CHAPTER -2

INDEX

TABLES

FIGURES

CHAPTER 2
PROJECT DESCRIPTION

2.1 Introduction

M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd. (KATSSSKL), Ankushnagar, Tal. Ambad, Dist. Jalna is registered under the Maharashtra Co-Operative Societies Act, 1960 vide Registration No. JAL/PRG/A-1 dated 10th February 1982. The initial Crushing capacity of Sugar Unit was 1250 TCD and 1st Crushing season was conducted in year 1984. Details of existing activity is presented below;

- Existing capacity is 2500 TCD Sugar unit.
- Existing Co-generation – 18 MW
- Existing 30 KLPD based on Biostil fermentation and atmospheric distillation technology in the year 1992 with Re boiler followed by Bio composting

Expansion from 30 KLPD to 60 KLPD to produce Rectified Spirit, ENA and Fuel Ethanol from Molasses with MEE followed by Incineration Boiler.

The management of the KATSSSKL has now decided to expand and modernize existing 30 KLPD distillery based on Biostil Fermentation and Atmospheric Distillation and 30 KLPD Ethanol plant to 60 KLPD based on Fed Batch/Continuous Fermentation Process and Multi-Pressure Distillation with Integrated Evaporation System and Molecular Sieve Dehydration Technology to produce Rectified Sprit, Extra Neutral Alcohol and Fuel Alcohol (Anhydrous Alcohol) from Cane Molasses.

The management of KATSSSKL also decided to adopt Spent Wash Concentration and Incineration System to achieve “Zero Liquid Discharge [ZLD]” of Spent Wash. KATSSSKL has also decided to install Condensate Polishing Unit [CPU] for treatment of low strength effluent i.e. process condensate, spent lees & vacuum pump water etc. to achieve maximum water conservation. The existing daily product receivers and bulk storage for spirit will be suitably modified and used in the modernization and expansion of distillery project.

This chapter covers the processes and affiliated facilities of the project including production and infrastructure, resources utilization, products formed along with wastes/ pollutants generated from the project. The information is needed to assess the impact of these activities on the environment and to delineate the mitigation measures. The proposed expansion project is distillery unit of 30 KLPD to 60 KLPD.

2.2 Justification for the project

Molasses is one of the waste products produced from sugar factory. Environmentally speaking it has very undesirable & risky properties. However, it is possible to put it to useful purpose by producing Alcohol. Molasses can be used as raw material for distillery. The resultant alcohol has various uses in chemical industry, pharmaceutical industry and as Ethanol. The liquid effluent however, is highly polluting though not poisonous or toxic. Spent Wash treated through concentrated at Multi-effect Evaporator (MEE). This concentrated spent wash will be burned in incineration boiler; hence proposed expansion distillery unit will be **Zero Liquid Discharge** unit.

Distillery unit needs the raw material as molasses & this can be fulfilled by sugar factory of our own. This area has very good soil & availability of water. The people are enthusiastic about such crop & hence sugar factory is justifiable.

2.3 Details of proposed Distillery Unit

The proposed expansion will have manufacturing capacity of 30 KLPD to 60 KLPD. The steam and power requirement for the proposed ethanol plant will be made available by installing separate 22 TPH Boiler.

Salient features of the modernization of existing 30 KLPD to 60 KLPD distillery Unit are;

- Modernization of existing Biostil fermentation process to Cascade continuous fermentation /Fed-batch fermentation process for achieving around 10 % (v/v) alcohol concentration in fermented wash.
- Reduction in spent wash generation due to higher alcohol concentration in fermented wash.
- Spent wash will be treated at multi effect evaporation (MEE) followed by incineration boiler as a final treatment.
- Separate 22 TPH incineration boiler and 2 MW TG Set. This will fulfill the steam and power required for distillery plant operation.
- Improvement in alcohol quality due to adoption of multi-pressure distillation technology compared to existing atmospheric distillation.
- Reduction in fresh water requirement due to recycle of treated water from Condensate Polishing Unit for process or non-process application in the distillery.
- Availability of own molasses from Karmayogi Ankushrao Tope Samarth SSK Ltd. Unit No. I and II for operation of the Distillery.
- Improvement in economic viability and profitability after modernization of distillery due to operation of the plant for 300 days per annum.

- Also use B & C Heavy molasses in the same facility without any modification for ethanol production as per the Governments new initiatives to promote ethanol production from B & C Heavy molasses.

60 KLPD of Total Spirit:

- 57.00 KLPD of Rectified Spirit/ENA
- 54.29 KLPD of Fuel ethanol
- 3.0 KLPD of Impure spirit /Technical Alcohol

2.3.1 Project location

The layout is prepared taking into consideration various aspects like Road, Terrain, landscape, ground features and prevailing wind direction, river/dam water intake, space for temporary construction / lay-down area, fabrication yard, storage yard and warehouses is also planned. The proposed plant layout is presented in **Figure 2.2.**

Figure 2.1 Site Photographs

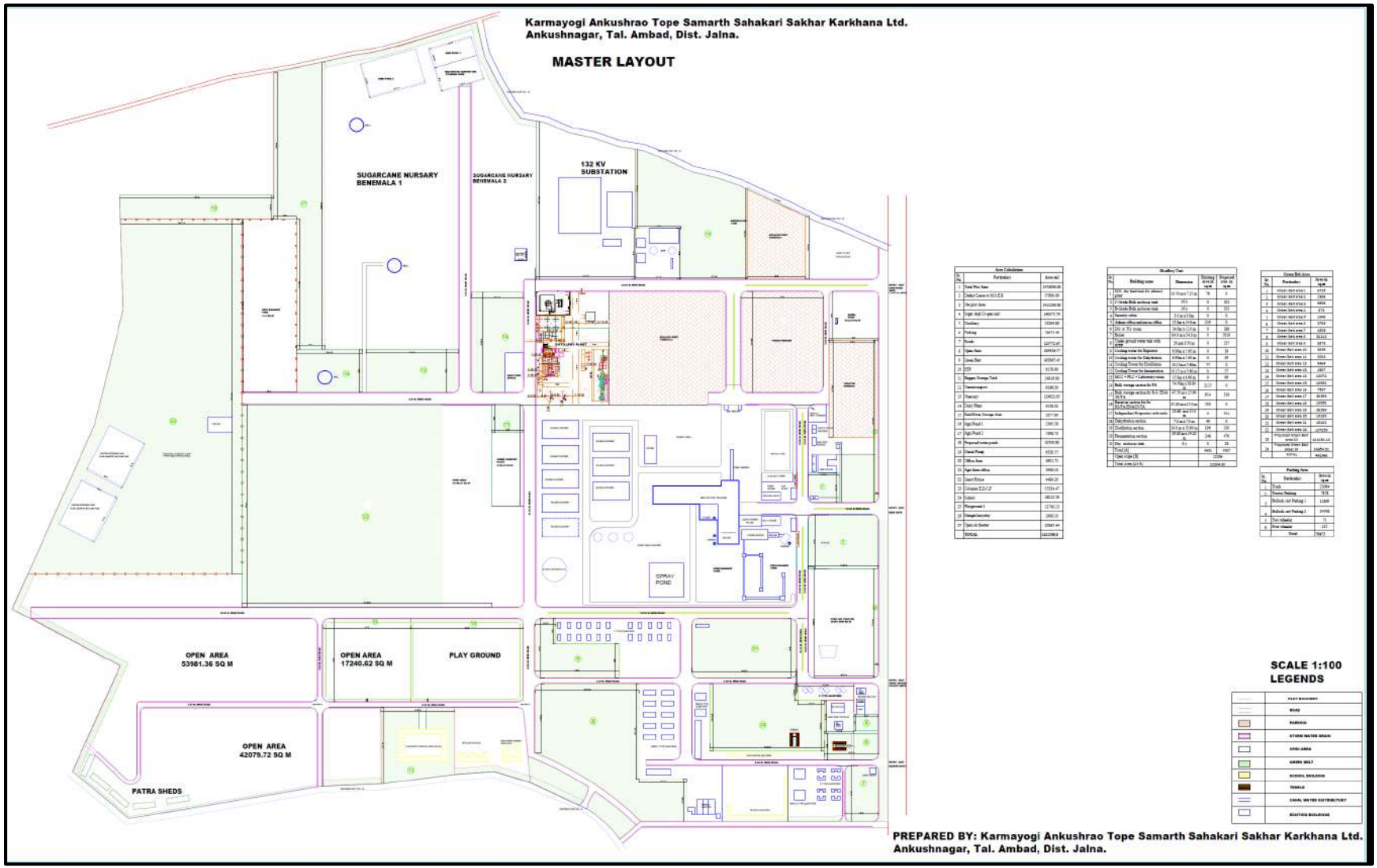


Figure 2.2 Master layout

2.4 Manufacturing Process

There are four major steps in preparation of Alcohol. (a) Substrate (Feed) Preparation for Fermentation, (b) Yeast propagation and continuous Fermentation, (c) Multi-pressure Distillation and (d) Dehydration of RS to Anhydrous Alcohol or it will be purified to get ENA.

2.4.1 Substrate (Feed) Preparation for Fermentation

Molasses is procured carefully with good contents. Molasses stored in a storage tank is first weighed in a tank with load cells so that accurate quantity can be fed to the fermentation section. The weighed molasses then transferred from tank to the diluter in fermentation section where it is diluted with water and fed to the fermenters or culture preparation vessels.

Yeast Propagation and Continuous Fermentation

In this process the culture containing highly efficient yeast strain is propagated in yeast culture vessel under aseptic conditions.

The ready yeast seed is then transferred from culture vessel to fermenter. The sugar/glucose in media gets converted to Alcohol in the fermenters operating on continuous cascade mode. CO_2 gas liberated during reaction is contaminated with traces of alcohol vapours. It is sent to CO_2 scrubber for recovery of Alcohol. After fermentation, the sludge containing spent yeast is separated from the wash in a thickener consisting of settler cum decanter tank and then concentrated in a decanter centrifuge. The yeast sludge in the form of cake with 2.5 % solids will be used as manure.

2.4.2 Multi-Pressure Distillation

The Distillation Plant consists of Multi Pressure Vacuum Distillation and Columns Operate at different pressures to save steam. The plant operated with exhaust steam obtained from co-gen steam turbine. The distillation consists of following stages:

- → Distillation of clarified fermenter product (wart) in distillation columns to separate aqueous alcohol (40%) and spent wash.
- → Rectification of aqueous alcohol to separate rectified spirit (RS) containing 95% alcohol and spent lees.
- → Dilution and rectification of rectified spirit to produce extra neutral alcohol (ENA).

The fermentation wash containing Alcohol, non-fermentable solids and water is supplied to distillation to separate the alcohol and other impurities, as a continuous flow. The distillation system is designed for quality. The system details are as below:

The system consists of 7 columns, namely Analyzer column, De-gassifier, Pre-rectifier column, Rectification Column, Extraction column, Recovery Column, Simmering column. Wash is fed to de-gassifier cum analyzer column. CO_2 and other non-condensable gases are removed at the de-gassifier unit. Distillate containing 40% alcohol from top of analyzer column is sent to RS column for further purification and concentration. Alcohol free aqueous solution containing non fermentable matter is discharged as spent wash from the bottom of analyzer column. Dilute alcohol is concentrated in RS column from where distillate containing 95% of alcohol is removed as Rectified Spirit (RS) from top and aqueous waster containing trace impurities is discharged from bottom as effluent. In case of ENA (Extra Neutral Alcohol) production, the RS along with dilution water is sent to extraction column. Most of the high boiling impurities are removed from top of this column and from bottom aqueous alcohol is obtained. The latter is taken to ENA column, and from where 95 % alcohol is obtained as distillate. 95% alcohol is further distilled in recovery column to remove low boiling impurities (mainly methanol) along with bottoms. ENA from top of purification is sent to storage tanks.

The Alcohol with high boiling impurities (mainly aldehydes) removed from top of RS, extraction, rectifier and refining columns are taken to aldehyde column. Impure spirit is recovered from top of aldehyde column and the balance alcohol with moderate purity is recycled to RS column for further distillation. Low boiling alcohols such as propyl and amyl alcohol are removed from appropriate locations of the RS and ENA columns. These are concentrated in fuel oil columns and recovered as Fuel Oil.

2.4.3 Dehydration of RS to Anhydrous/Fuel Grade Ethanol

There are various dehydration routs such as Azeotropic Distillation, Evaporation, Membrane Technology and Molecular sieve Technology. Environmentally best is selected. Rectified spirit is pumped by a feed pump to the dehydration plant. The rectified spirit containing 95% alcohol and 5% water will first pass through feed economizer, then through a vaporizer cum super heater which will convert the rectified spirit feed to superheated vapors. The superheated vapour will pass through a sieve column, which is already regenerated and pressurized to working pressure. All the water vapors present in vapor mixture are adsorbed in the column. Along with alcohol traces of alcohol are also adsorbed in the column. The Anhydrous alcohol vapors free

from water vapors exhausted from the column are duly condensed in the re-boiler at the recovery column and is further passed through feed economizer to preheat the incoming feed and then to a final product cooler. After saturation of sieve column with water, the flow will be shifted to the next sieve column, which is already regenerated and pressurized. After completion of dehydration cycle, the sieve column saturated with water is regenerated by evacuation of adsorbed water and alcohol. The evacuated vapors are condensed. The condensed mixture of alcohol and water is then fed to a recovery column. This sequence of adsorption and regeneration of sieve column continues.

It is note- worthy that:

- → Rectified spirit feed is pretreated by product vapour
- → Evaporator column gets energy from re-boiler
- → Steam condensate is fed back to boiler
- → Twin adsorbents beds. One in dehydration mode, other is regeneration mode.
- → Switching of beds by Automation.

2.4.4 "Zero Spent wash Discharge" Scheme

The KATSSSKL has proposed to install integrated evaporation plant as primary effluent treatment system followed by standalone multiple effect evaporation as secondary treatment and incineration boiler as final treatment for disposal of spent wash.

The raw spent wash quantity will be reduced through integrated evaporation from 650 M^3/day with 12% solids to 325 M^3/day with 24% solids. The concentrated spent wash coming from integrated evaporation @ 325 M^3/day with 24% solids will be further concentrated to 130 M^3/day containing 60% solids in standalone multiple effect evaporation plant.

In integrated evaporation, to concentrate the spent wash, alcoholic vapors generated in rectification column will be used as heating media for evaporation. The steam required for standalone evaporation body will be around @ 2.75 MT/hr. The spent wash with 60% solids will be fired in incineration boiler along with coal as a supplementary fuel. The steam generated by the incineration boiler and power generated in the turbine will be used for integrated distillation, secondary evaporation and boiler. Thus, the "Zero Liquid Discharge" will be achieved.

The KATSSSKL management has also decided to install Condensate Polishing Unit (CPU) for treatment of evaporation condensate of standalone evaporation plant @ 520 M^3/day and spent lees @ 120 M^3/day. Thus, the total capacity of CPU unit will be 600M^3/day. After treatment in CPU, treated water will be reused for process and non-process applications in distillery. Zero Spent Wash Scheme is presented in Figure 2.2.

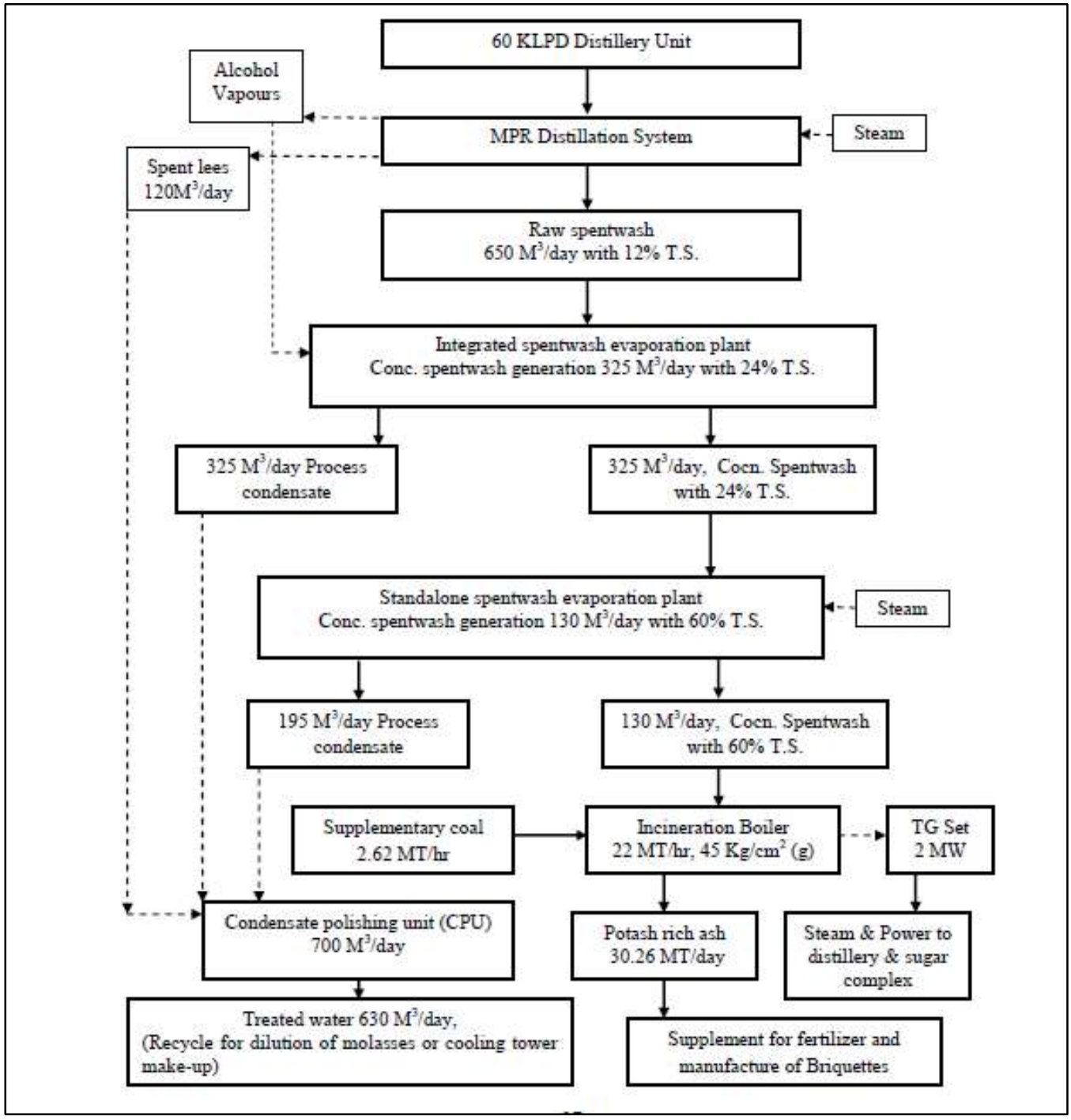


Figure 2.3 "Zero Spent wash Discharge" Scheme

2.5 Basic Requirement

2.5.1 Raw Material

The capacity of the distillery after expansion will be 60 KLPD. For this the main and sole raw material is molasses. Ethanol plant will operate on molasses as feed stock during season and on saved / purchased molasses as feed stock during off-season. Molasses required per day is worked out in the following table below.

Table 2.1. Requirement of Molasses

Sr. No	Item	Ethanol Plant on own / Procured Molasses
1	Cane crushing, TCD	166 MT/hr
2	No. of hrs. per day	24 Hrs
3	No. of season days	170
4	Cane crushing, MT	654770 MT Unit –I & 428185 MT Unit –II
5	No. of days of operation	170
6	Ethanol capacity, KLPD	60
7	Molasses, % cane	4.14
8	Molasses MT	27104.200 + 20615
9	Ethanol recovery, liters / MT of molasses	257
10	No. of days on	
	Own molasses	207
	Procured molasses	93
	Total	**300**
11	Quantities	
	Molasses required MT/ day	230.77
	Molasses required MT /Annum	69231
	Own Molasses, MT	49000
	Procured Molasses, MT	20231

The molasses requirement for distillery after modernization will be 230.77 MT/day (69,231 MT/annum). The factory will have its own molasses to the extent of 27104 MT from Unit I and 20615 MT from KATSSSKL.

During transportation of procured molasses from nearer sugar units all the required precautions will be taken. The list of nearer sugar unit with capacity is given below.

Table 2.2 List of Existing Sugar & Distillery Units in Vicinity

Sr. No	Existing Factories	Sugar TCD	Distillery KLPD	Distance km
1.	Chhatrapati Sambhaji Raje SSK	1250	-	70
2.	Shree Sant Eknath SSK	1250	-	40
3.	Shree Renukadevi Sarad SSK	1250		40
4.	Jaibhavani SSK Gevarai	2500	30 KLPD	30
5.	Shree Rameshwar SSK	2500	-	100
6.	Shree Renuka sugars Ltd	1250	-	100

2.5.2 Land Requirement

Total land 358 Acre is in possession of KATSSKL. Out of 358 Acre land, 32 Acre land is allocated for industrial development. The proposed expansion will be within the existing distillery unit only. The break-up of Land requirement is given in **Table 2.3**

Table 2.3 Break Up of Land

Sr. No.	Particulars	Area m2	Sr. No.	Particulars	Area m2
1	Total Plot Area	1450000.00	15	Rainwater Storage Area	2877.60
2	Deduct Lease to M.S.E.B.	37800.00	16	Agri Pond 1	2365.38
3	Net plot Area	1412200.00	17	Agri Pond 2	5398.73
4	Sugar And Co-gen unit	140375.79	18	Proposed water ponds	10530.00
5	Distillary	22204.80	19	Diesel Pump	6328.55
6	Parking	76475.49	20	Office Area	6301.71
7	Roads	120772.65	21	Agri farm office	1908.10
8	Open Area	236426.57	22	Guest House	4484.20
9	Green Belt	492965.45	23	Colonies E,D,C,F	35334.47
10	ETP	6158.00	24	School	28212.58
11	Baggas Storage Yard	24816.00	25	Playground 1	21743.13
12	Vermicompost	6166.30	26	Mangal karyalay	1908.10
13	Nuersary	129022.65	27	Open air theater	20265.44
14	Dairy Plant	9158.32		**TOTAL**	**1412200.0**

2.5.3 **Water Requirement**

The KATSSSKL is drawing water from Godavari River. Water storage facility available with the factory is 5000 M^3. Thus, sufficient quantity of water can be made available. To achieve better efficiency and to maintain the plant and machinery in good condition, it is necessary to have proper water treatment system. Water will be treated in filtration unit to remove turbidity and algae. Filtered water will be chlorinated and used for process. Soft water

will be used for cooling tower make- up and other applications. Proper water supply system is essential for achieving optimum process efficiencies.

Total requirement of water for 60 KLPD Distillery based on Continuous fermentation, multi pressure vacuum distillation with integrated evaporation, stand- alone evaporation system to concentrate spent wash and an incineration boiler will be around 1600 M^3 per day.

The process condensate (520 M^3/day and spent lees (130 M^3/day) will be treated in condensate polishing unit and approximately 580 M^3 will be recycled back to process and non-process applications. Similarly, 90% steam condensate (408 M^3/day) will be also recycled back to boiler. Thus, actual fresh water requirement after recycle will be around 612 M^3/day.

2.5.4 Steam and Power Requirement

The Steam requirement for 60 KLPD Distillery, Ethanol plant, stand- alone evaporation, desecrator and SCAPH of Incineration Boiler including pipeline losses will be about 18.6 T/hr.

Table 2.4 Energy Balance

Sr. No.	Section	T/hr.
1.	Distillation Wash to Ethanol Wash to ENA	1.5 8.0
2.	Evaporation	5.60
3.	Boiler Deaerator and SCAPH	2.5
4.	Fermentation & Others	1.0
	Total Ethanol/ENA	**18.6**

22 TPH capacity Incineration Boiler having 45 $kg/cm^2(g)$ pressure and & 400 ± 5 °C Temperature is proposed for Distillery Unit.

Therefore, required steam and power will be made available for Distillery Plant from the proposed Incineration Boiler and 2.0 MW/hr. TG. Set.

Table 2.5. Details of Power Consumption

Sr. No.	Section	Operating Power (KW)
1.	Fermentation section including molasses handling	148
2.	Distillation	100
3.	Dehydration Plant	17

4.	Evaporation Plant	385
5.	Boiler Turbine	600
6.	Cooling Tower for fermentation, distillation and dehydration Plant	240
7.	WTP & CTU	40
8.	Other Misc. including lighting	15
	Total	**1545**

2.5.5 Man Power

Total Manpower working in existing Distillery is 98. Total employees out of whom 57 shall be Skilled and 41 shall be unskilled.

More than 85 % of the manpower requirement will be fulfilled by employing the local people. Man power requirement for construction work will be about 50. Construction workers will reside in nearby villages. Residential facility will not be required for the construction personnel.

2.6 Pollution Control Measures

2.6.1 Air Pollution

Table 2.6 Air Pollution sources and control Measures

Sr.	Source	Fuel	Emissions	Control Measures
1.	Existing 95 TPH Boiler	Bagasse	Particulate Matter, SO_2 and NO_X	76 m stack and wet scrubber provided
2.	Existing DG Set 1010 KVA	HSD	Particulate Matter, SO_2 and NO_X	7 m stack height provided
3.	Proposed 22 TPH Incineration Boiler	Bagasse & Conc.Spent wash	Particulate Matter, SO_2 and NO_X	60 m stack and Bag filter will be provided
4.	Proposed 105 KVA D.G Set	HSD	Particulate Matter, SO_2 and NO_X	6 m stack height will be provided

2.6.2 Water and Wastewater Treatment

2.6.2.1 Distillery Unit

In existing distillery unit, spent wash is treated through re boiler followed by Bio composting.

After Expansion:

- The factory has proposed to install integrated evaporation plant as primary effluent treatment system followed by standalone multiple effect evaporation (MEE) as secondary treatment and incineration boiler as final treatment for disposal of spent wash.

- The raw spent wash quantity will be reduced through integrated evaporation from 650 M^3/day with 12% solids to 325 M^3/day with 24% solids. The concentrated spent wash coming from integrated evaporation @ 325 M^3/day with 24% solids will be further concentrated to 130 M^3/day containing 60% solids in standalone multiple effect evaporation plant (MEE).
- In integrated evaporation, to concentrate the spent wash, alcoholic vapors generated in rectification column will be used as heating media for evaporation.
- The steam required for standalone evaporation body will be around @ 2.75 MT/hr. The spent wash with 60% solids will be fired in incineration boiler along with coal as a supplementary fuel. The steam generated by the incineration boiler and power generated in the turbine will be used for integrated distillation, secondary evaporation and boiler. Thus, the "Zero Liquid Discharge" will be achieved
- Condensate Polishing Unit (CPU) for treatment of condensate from MEE @ 520 M^3/day and spent lees @ 120 M^3/day. Thus, the total capacity of CPU unit will be 600M^3/day. After treatment in CPU, treated water will be reused for process and non-process applications in distillery. Flow chart of treatment of spent wash is given in **Figure 2.3**

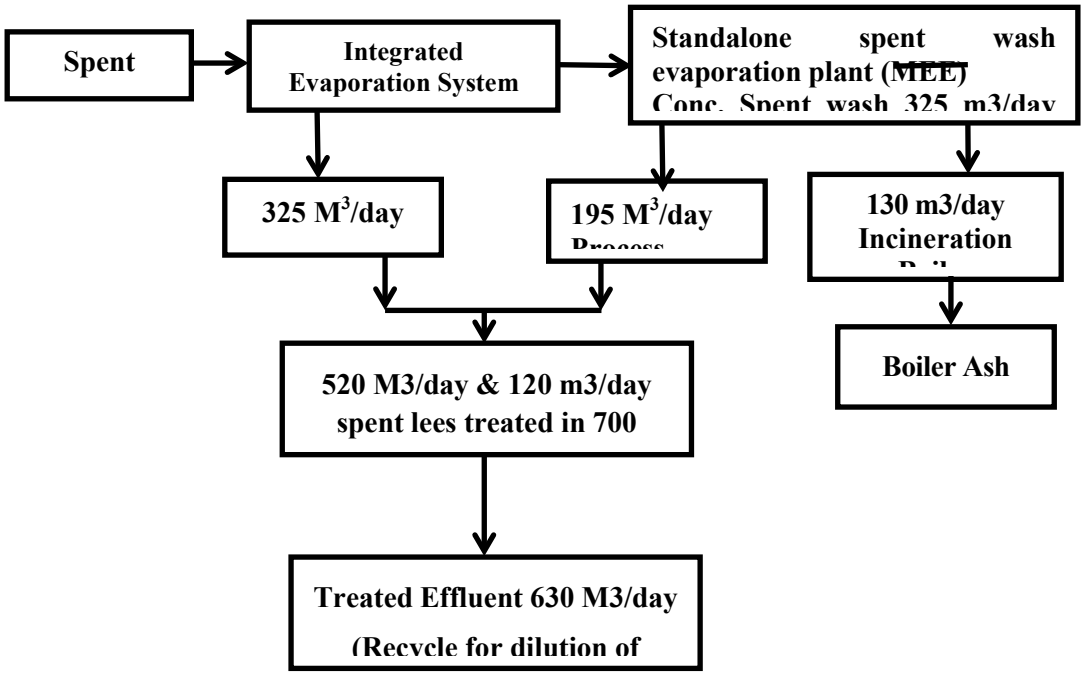


Figure 2.4 Flow chart of treatment of spent wash

2.6.3 Solid Waste Generation and Management

Factory shall generates Bagasse, Molasses, Press Mud, Ash and ETP Sludge from the process. Type of Solid Waste, Quantity and its disposal is presented in the **Table 2.7**

Table 2.7 Solid Waste Management and Disposal

Sr.	Particulars	Generation in MT		Disposal
		Existing	Proposed	
1.	Bagasse	127500	Nil	Used as fuel for cogeneration boiler
2.	Molasses	27104	Nil	Used as raw material for distillery unit
3.	Press Mud	18062	Nil	Composting and sale to farmer as soil conditioner
4.	Ash	1823	5636	Sold to brick manufacturer
5.	ETP Sludge (T/M)	5.0	3.0	Mixed with press mud used as a manure for landscaping

2.7 Cost & Implementation

Cost of the project for proposed expansion shall be Rs. 78 Cr. The time required for the implementation of the project is 1 year after getting all the permissions.

CHAPTER -3

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INDEX

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TABLES

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FIGURES

CHAPTER 3
DESCRIPTION OF THE ENVIRONMENT

3.1 Introduction

This chapter illustrates the description of the existing environmental status of the study area with reference to the prominent environmental attributes. The key purpose of the environmental baseline study is to establish the existing environmental conditions in the project area before the commencement of any project activity. This study covers pre project physical and biological conditions and provides base reference against which the changes due to the implementation of the project are analysed. This will help to predict potential environmental impacts during the construction and operation phases. The baseline environmental quality for the study period of March 2019 to April 2019 has been assessed within 10 km radial distance from the proposed project site. The key components of this baseline study will involve atmospheric conditions, water quality, soil quality, climate, hydro geological aspects, vegetation pattern, ecology and biodiversity, land use, socio-economic profile and places of archaeological and religious importance.

3.2 Study Area

The Existing Unit of M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd. project is located at plot no. 106, At Post- Ankushnagar, Tal. Ambad, Dist. Jalna, Maharashtra. For the present EIA study, the area falling within 10 km radial distance from project site has been selected for preparing the site map infrastructure setup and administrative map, land use/land cover map and socio economic study whereas the area falling within 10km was considered to monitor the baseline environmental quality.

3.3 Methodology Of Baseline Study

The guiding factors for the present baseline study are the requirements prescribed by the guidelines given in the EIA Manual of the MoEFCC and methodologies mentioned in Technical EIA Guidelines Manual for Distilleries by IL&FS Eco-smart Ltd., approved by MoEFCC.

Field monitoring was done for primary data collection of various environment components such as air quality, water quality, soil quality, noise, micrometeorology, flora & fauna, socio-economic, hydro-geological study, traffic study etc. Also, secondary data from authenticated sources was used as a guideline and reference material. The entire data has been collected through actual physical surveys and observations, literature surveys, interaction with locals, government agencies and departments. The baseline study begins with site visits and reconnaissance

survey in the study area. During these visit the locations were fixed for the monitoring and collection of primary data.

3.4 Frequency of Primary Data Collection

Baseline monitoring study was conducted in the period of March 2019 to April 2019. Details of frequency of primary data collection considered for the study are shown in **Table 3.1**

Table 3.1: Frequency Of Primary Data Collection

Environmental Attributes	Parameters	Frequency of monitoring
Meteorology	Wind speed, wind direction, temperature, relative humidity, precipitation	Microprocessor based Weather Monitoring Station Continuous hourly recording
Ambient Air Quality	PM_{10}, $PM_{2.5}$, SO_2 , NO_x & CO	8 Locations 24 hourly samples Twice a week for 3 months
Water Quality (Ground & Surface)	Physical, chemical and biological parameters	Once in season at 12 locations (9 location GW + 3 Location SW)
Soil Quality	Soil type and texture, Physico-chemical properties, NPK	Once in season at 8 locations
Noise Quality	Noise levels in dB(A)	Once in season at 9 Locations
Land use Pattern	Identification & classification of land use	One time visit of the study area for ground truthing
Geology and hydrogeology	Data collected during field survey and from secondary sources	Once in study period
Ecology	Existing terrestrial and aquatic flora and fauna	General in 10 km radial study area and data collected around the project site through field visits
Socioeconomic Data	Socio-economic characteristics of the affected area	General in 10 km radial study area and data collected around the project site through field visits

3.5 Project Location

The project is located at plot no. 106, At Post- Ankushnagar, Tal. Ambad, Dist. Jalna, Maharashtra. The geographical coordinates of the site are 19°23'40.91"N and 75°42'17.62"E; the proposed site is at an elevation of 1481 m above the mean sea level. The study area as per awarded TOR is earmarked 10 km from the project site. The various features around the project site within 10 km radius is shown in Figure 3.1. Toposheet of project site and Satellite image is presented in Figure 3.2 & 3.3respectively

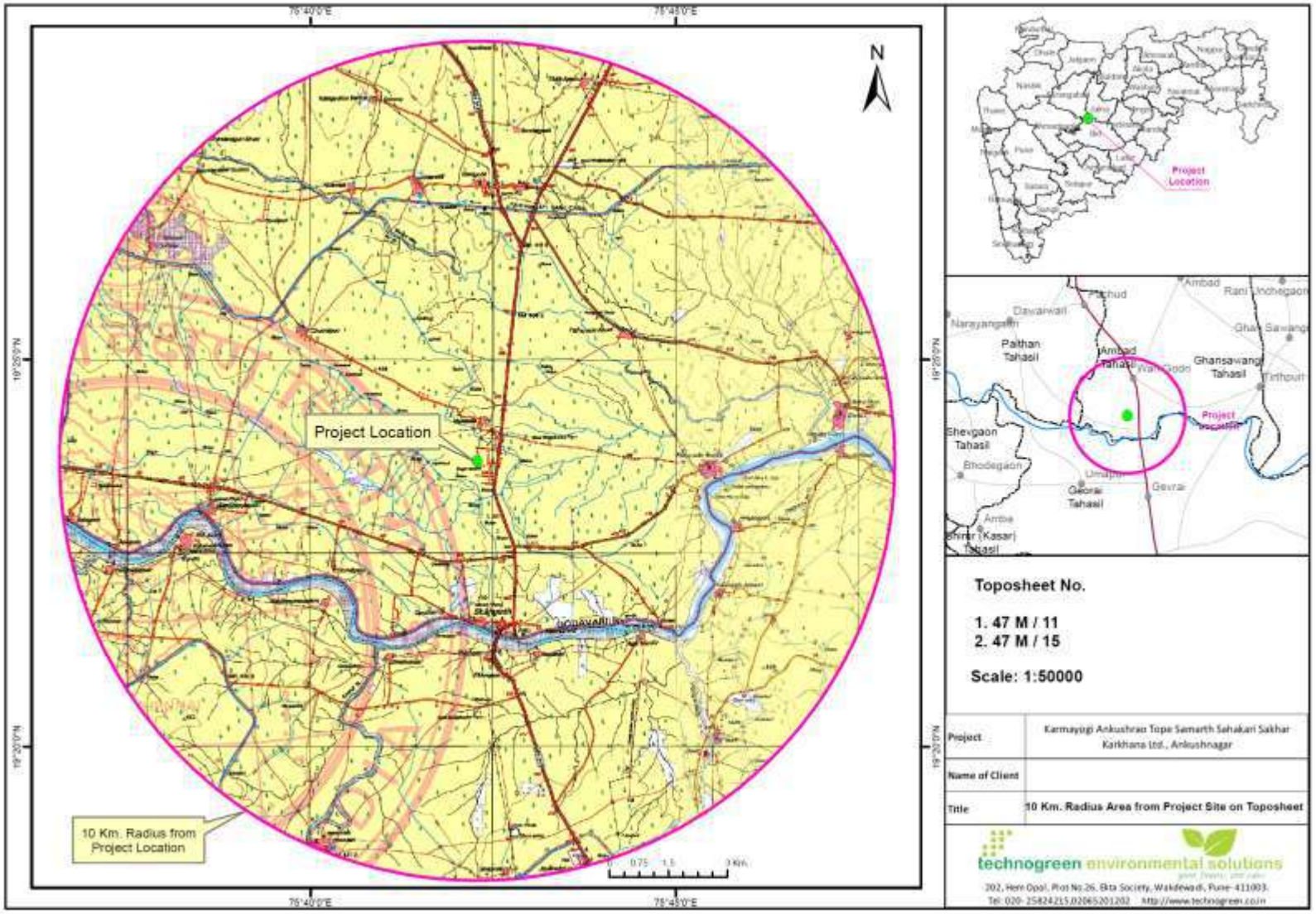


Figure 3.1: Toposheet of the study area

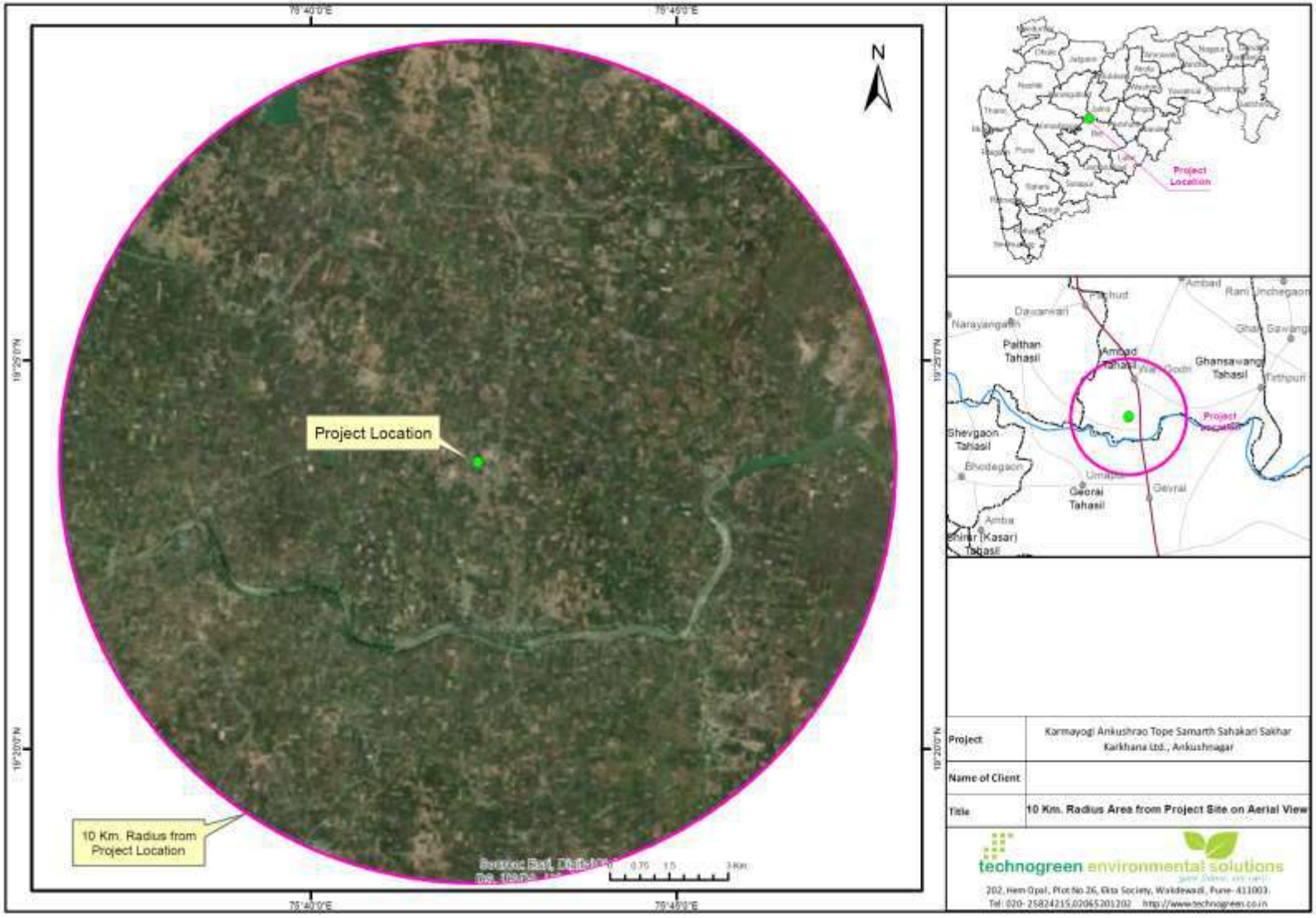


Figure 3.2: Google Earth of the study area

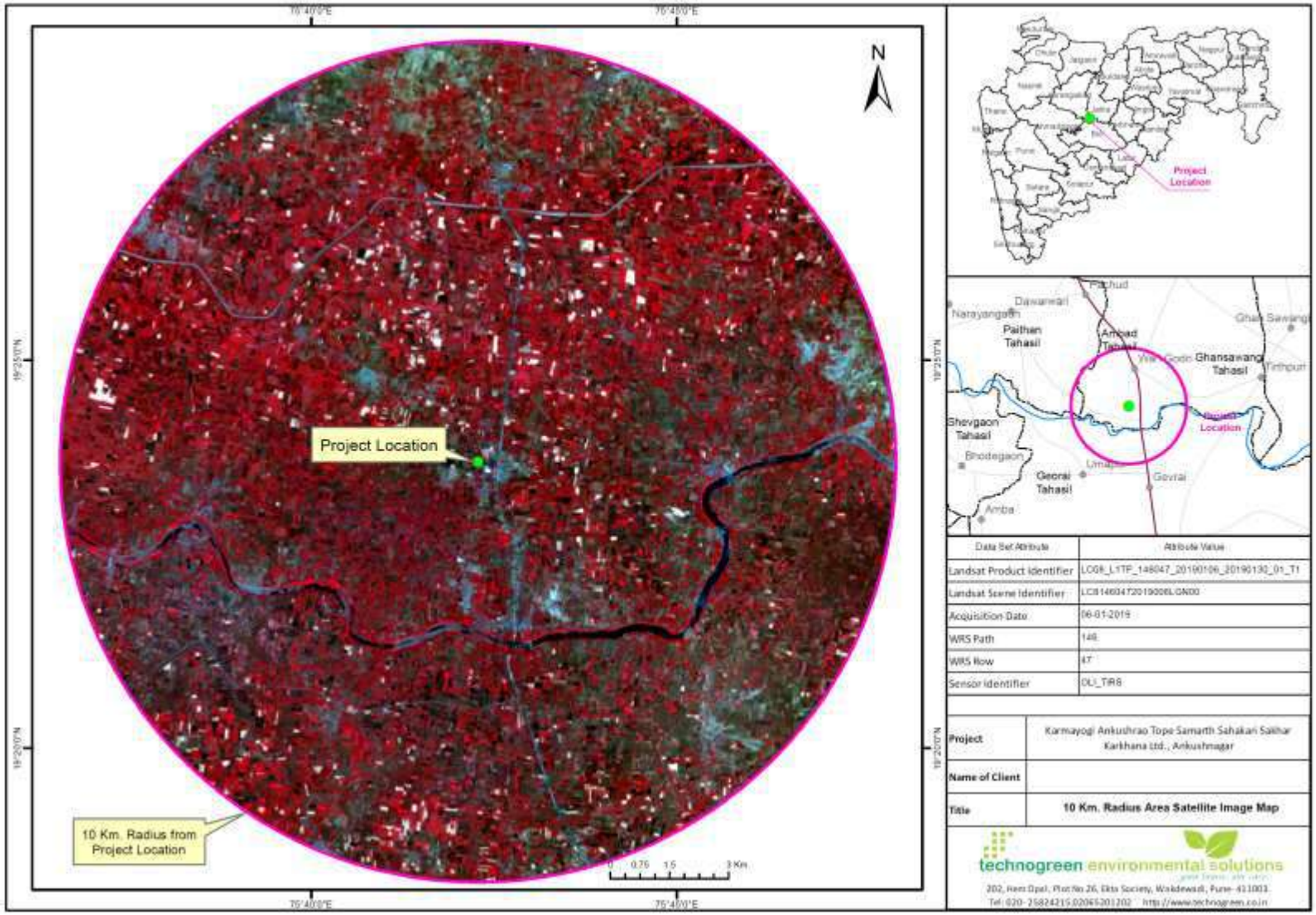


Figure 3.3: Satellite Image of the study area

3.6 Environmental Setting within the Study Area

Major surrounding highlights with respect to transportation, emergency and environmental sensitivity of the site are presented in **Table 3.1**

Table 3.1 Environmental Setting (10 km radius)

Amenities	Name	Directions	Aerial distance from Project site (km)
Connectivity			
Nearest Airport	Aurangabad Airport	NNW	62.14
Nearest Railway station	Kodi	NE	46.77
Nearest Bus Stand	Shahagad Bus stand	SSE	3.91
Nearest Highway	NH 211(Solapur – Aurangabad Highway)	E	0.40
Nearest School	Kasturba Gandhi School	SSW	0.45
Emergency			
Nearest Post office	Mahakala Post Office	S	0.48
Nearest Fire Station	Fire Station Georia	SSE	15.77
Nearest Police Station	Ichawar police station	NW	17.94
Nearest Hospital	Dr. Kulkarni	NW	15.14
Environment Sensitive			
Nearest Religious / Historical Place	Shivgadh Fort	N	3.45
Nearest Water Body / Canal / Dam	Godavari River	S	3.88
Nearest Protected Forest / National Park/ Wildlife Sanctuary	None within 10 km radius of the study area		
Inter-state boundaries and International boundaries	None within 10 km radius of the study area		
Seismic Zone	Moderate (Zone III)		

3.7 Physiography

The District is situated in central Maharashtra, in the North of the Marathwada Region, one of eight Districts as part Aurangabad division, and is bounded on the North by Jalgaon District, on the East by Parbhani District and Buldhana District, on the South by Beed District and on the West by Aurangabad District.

The District occupies an area of 7,718 Square Kilometres (2,980 sq mi). The range of geographical latitudes and longitudes of the District is from 19.01' N to 21.03'N and from 75.04'E

to 76.04'E, with gently to moderately sloping topography. The Northern part of the District is occupied by the Ajanta and Satmala Hill ranges.

The District was formed during the term of Chief Minister Abdul Rehman Antulay. The District is divided into two sub-divisions, Jalna and Partur. These are further divided into eight talukas: Jalna, Ambad, Bhokardan, Badnapur, Ghansavangi, Partur, Mantha and Jafrabad. There is a total of 970 villages in the district.

According to the 2011 census,

- Jalna District has a population of 1,958,483
- This gives it a ranking of 237th in India (out of a total of 640).
- The District has a population density of 255 inhabitants per Square Kilometre (660/sq mi). Its population growth rate over the decade 2001–2011 was 21.84%.
- Jalna has a Sex ratio of 929 females for every 1000 males, and a Literacy rate of 73.61%

(Source: https://en.wikipedia.org/wiki/Jalna_district#Geography)

3.8 Topography

Jalna District is situated in the upper Godavari Basin. The central hill range known as Jalna Hill is an upland, plateau and is drained by Purna River and its tributaries. Southern portion is comparatively low land, flat area terminating at Bank of Godavari River in the South. District slopes towards south and average elevation above sea level is 534 meters. The district has moderately to gently shopping undulated topography. The northern part of the district is occupied by the Ajanta and Satmala hill ranges. The length and breadth of district from north to south and from east to west is about 150 km and 110 km respectively. According to the census of 2011, the geographical area of the district 7718, sq km. It is 2.15 percent of Maharashtra state area. The urban area occupies 1.32 percent of the total area i.e. 102.0 sq km. and the rural area occupies 98.68 percent of the total area i.e. 7625 sq km. According to taluka wise geographical area Jalna district, while Jafrabad taluka has the lowest area (9.54 percent) of the total Jalna district.

(Source: https://shodhganga.inflibnet.ac.in/bitstream/10603/121994/9/10_chapter2.pdf)

3.9 Geology

The region is peculiarly occupied by the Deccan Traps. However, there are exposes of granite and Vindhyans in the district Nanded. The Deccan traps are of the age upper Cretaceous to lower Eocene. The thickness of each lava flow varies from few meters to 40-45 meters. The

basalts are of vesicular, zeolitic, jointed, columnar weathered in nature. At places the alluvial patches are found near the bank of the river.

The entire district is occupied by basaltic lava flows of the Deccan traps of upper cretaceous to Eocene age. The lava flows are piled over one another. The individual flow thickness ranges Between 20 to 30 mtrs. The individual flow has two distinct units. The upper part is vesicular in nature and vesicles are filled with secondary minerals like zeolite and quartz (e.g. Moss Agate, Zebra Agate and Green Agate) which is often called as zeolitic trap. The lower part of the lava flow forms the massive basalt, and often called as massive trap. Alluvial deposits along the major rivers overlie the Deccan traps.

The alluvium consists of clay, silt and sand. The thickness ranges between 10 to 20 mtrs. The alluvium forms a very fertile land

(*Source*: **https://gsda.maharashtra.gov.in/english/index.php/Regions_Information_InDetailed/index/6** **https://jalna.gov.in/about-district/demography/**)

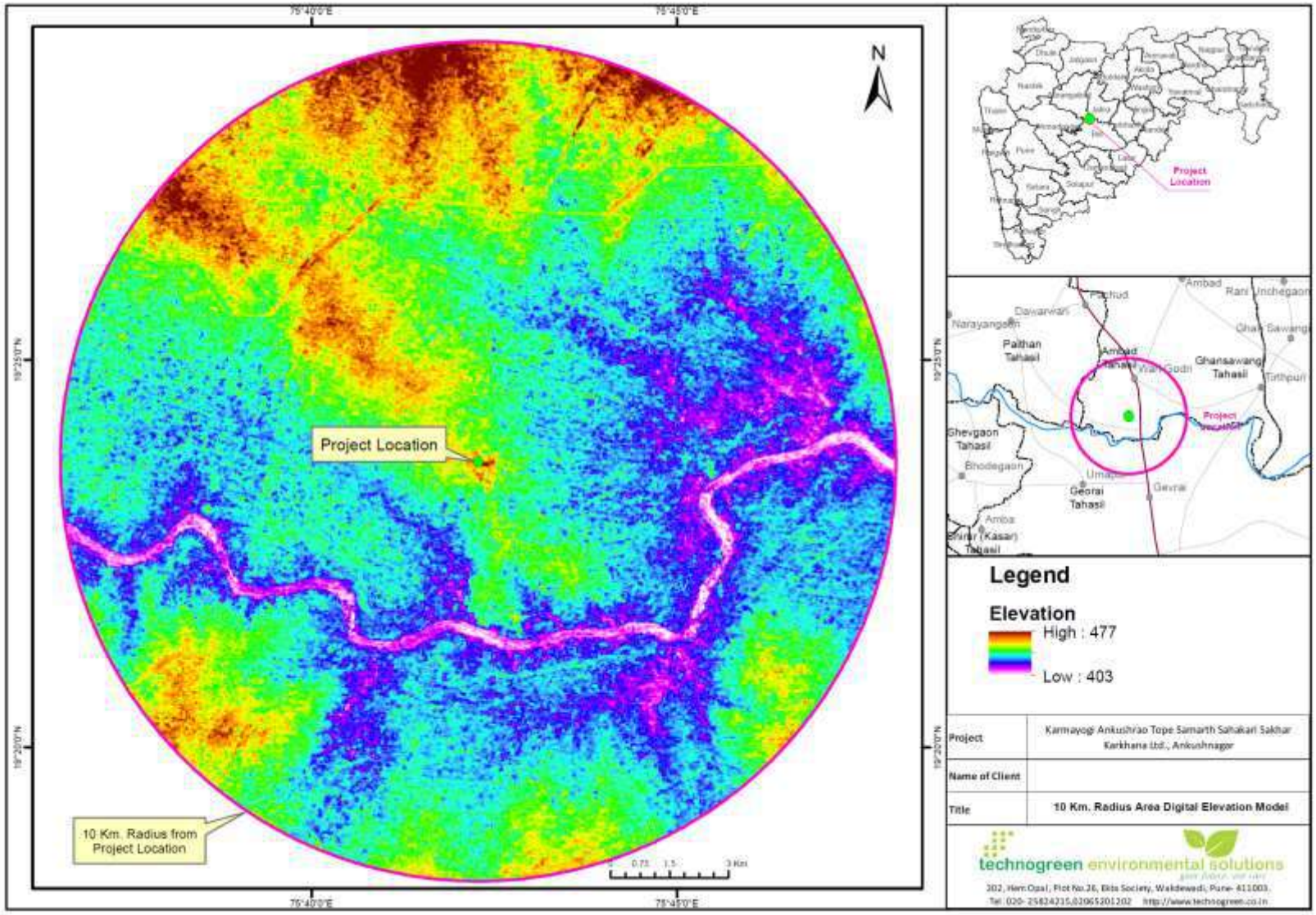


Figure 3.4 Digital Elevation Map (DEM) of the Study Area

3.10 Hydrogeology

Groundwater occurrence and movement in the area is influenced by its rock formations. Groundwater potentially depends upon porosity and permeability (both primary and secondary) of rock formations. Jalna district is underlain by basaltic lava flows and alluvium only. Water bearing properties of these rocks are described below.

The regional Static water level in the area varies from 20 to 25 m BGL. Ground water extraction in the area is done mainly through dug wells and 5 bore wells. The average depth range of dug wells in the area is from 15.00 to 30.00 m. The average depth range of bore wells in the area is from 60.00 to 80.00 m.

(*Source*: ***http://cgwb.gov.in/District_Profile/Maharashtra/Jalna.pdf)***

3.10.1 Deccan Trap Basalt

The basaltic lava flows belonging to the Deccan Traps occupy about 98% of the area of the district. The formation is very thick and comprises scores of lava flows of 5 to 25 meters individual thickness. Each flow comprises a lower zone of 40 to 70% hard, massive basalt which is devoid of primary porosity and permeability. The upper zone of 30 to 60% is vesicular basalt which has limited primary porosity. However, the formation generally has secondary porosity and permeability acquired due to weathering, jointing, shearing, fracturing etc. When the thickness of these zones are appreciable (30 to 60% of a flow), the flow forms an aquifer of moderate potential. The structural and composite characteristics described above are repeated in all the lava flows of an area and they thus form a multiple aquifer system which generally extends to depths of 150 to 250 meters.

Apart from the inherent properties of lava flows cited above, topography also plays an important role in groundwater potential of basaltic area. Hills and higher grounds stood out as their rocks are hard, compact and resistant to weathering. The steep gradient causes rain water to run off rapidly without much infiltration. In contrast, the valleys depressions and areas of lower elevations are formed where rocks were weaker, prone to weathering due to joints, fractures etc. In addition, rain water runoff is less and infiltration is more in such areas.

Groundwater in Deccan traps occur under water table condition in weathered, jointed, fractured and vesicular zones of the flow exposed at the surface. Groundwater occurs under confined conditions in Jointed, brecciated or fractured and vesicular zones of lower flows. The vesicular and zeolitic basalts are highly susceptible to weathering as interconnected vesicles form conduits from weathering agents. It is generally seen that “Pahoehoe” flows contains uniformly distributed vesicles and have good porosity and permeability and constitute potentials aquifers.

(*Source*: ***http://cgwb.gov.in/District_Profile/Maharashtra/Jalna.pdf)***

3.10.2 Alluvium

It occurs as small patches along banks, flood plains and meanders of main rivers. These have individual extent from 1 to 20 Km2 and 5 to 30m thickness. It comprises beds and lenses of sands, gravels and boulders in a matrix of clays. These granular zones form aquifers in which groundwater occurs under Phreatic and semi confined conditions. The porosity of these granular zones ranges from 10 to 15 %.

(*Source*: ***http://cgwb.gov.in/District_Profile/Maharashtra/Jalna.pdf)***

3.11 Drainage

The District is well drained by River system, which are dendritic type and have matured valleys. There are two main drainage systems viz: (1) Godavari river and (2) the Purna and Dudhna Rivers. The river Godavari forms the entire southern boundary of the district in Ambad and Partur Talukas. It is one of the most important river of Deccan plateau and whole district of Jalna falls in its great basin. The direct tributaries of the River are Shivbhadra, Yellohadrs, Galhati and Musa Rivers. All these tributaries rise from the Ajanta and Ellora plateau and flow South and Eastwards to join the Godavari River. While most of the smaller streams dry up in summer, the major Rivers are perennial. The Purna River rises from near Mehun about 8 km NE of Satmala hills and at a height of about 725 m AMSL. It is most major river after Godavari and drains entire area of Jafrabad, Bhokardan and Parts of Jalna district. Its tributaries are the Charna, the Khelna, the Jui, the Dhamna, the Anjan, the Girja, the Jivrakha and the Dudhna.

The Dudhna River is the largest tributary of the Purna River which is nearly as long as main River itself. It has the longest course in Jalna District and drains parts of Ambad, Jalna and Partur talukas with its tributaries such as the Baldi, the Kundilikha, the Kalyan, the Lahuki, the Sukna, etc.

The drainage map of the study area are given in Figure3.5

(*Source*: ***http://cgwb.gov.in/District_Profile/Maharashtra/Jalna.pdf)***

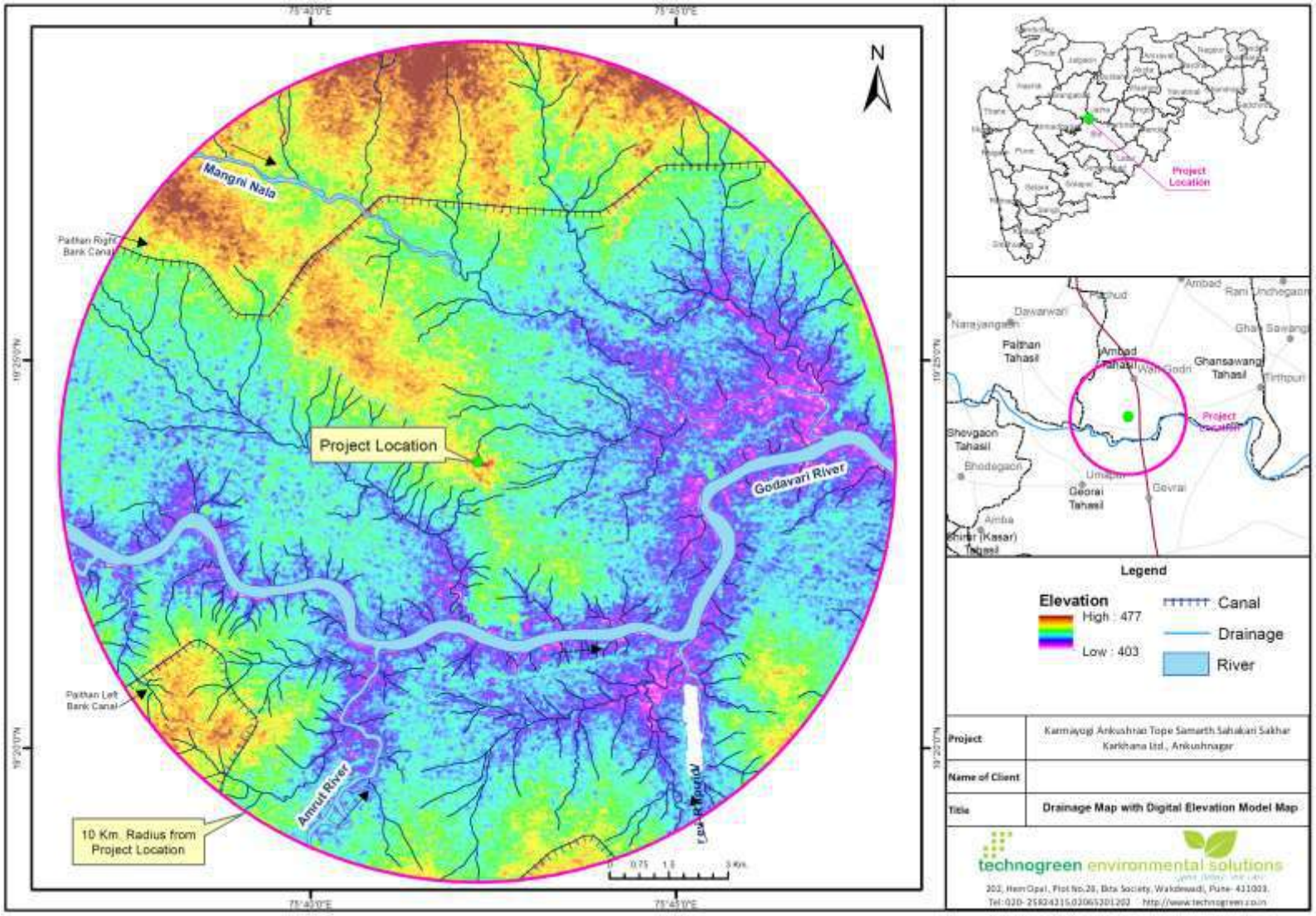


Figure 3.5: Drainage Map of the Study Area

3.12 Land Use Pattern

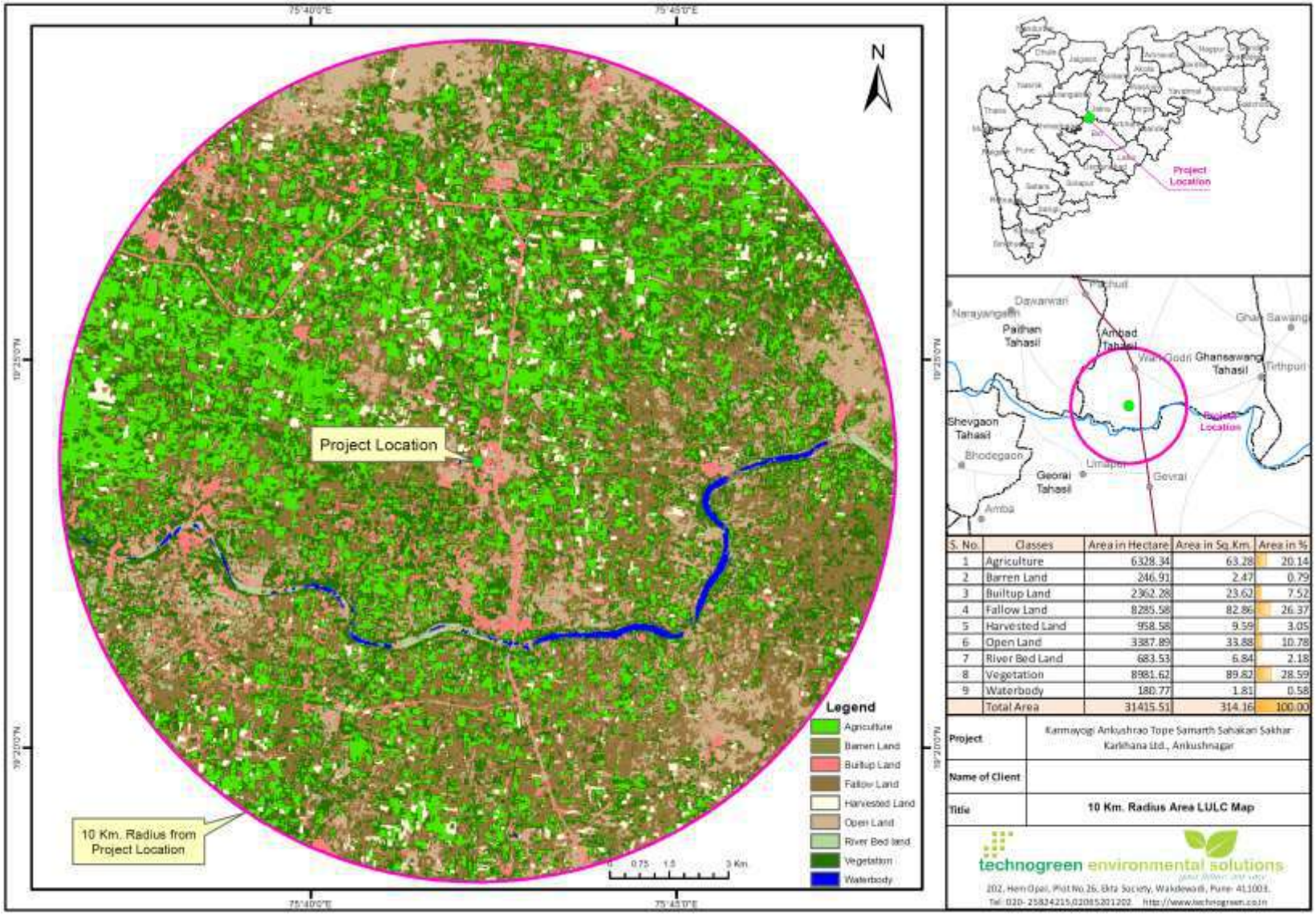
Land use, land cover is a fundamental parameter describing the Earth's surface. This parameter is a considerable variable that impacts on and links many parts of the human and physical environments.

The project area was placed, based on coordinates taken on the site, on satellite imagery and determined the study area for the proposed project. The resulting satellite data of study area was interpreted through onscreen visual interpretation using basic elements of interpretation resulting in the combined land use/cover map for the proposed project. Detailed ground truth verification was carried out to check the discrepancy of the interpreted data. It comprises of data collection of ground features along with the respective geographical position in terms of latitudes and longitudes. The aim of ground truth studies is to confirm whether the interpreted land use/ cover are correct thus, improving the quality of the output. Interaction was done with local people to gather background information.

3.12.1 Methodology

- Acquisition of satellite data.
- Preparation of base map from Survey of India topo-sheet.
- Interpretation of satellite data
- Ground truth study/ Field survey
- Final map preparation
- Area calculation for statics generation

Land use pattern of 10 km study area is depicted in **Figure 3.6** and summary of land use is presented in **Table 3.2.**



S. No.	Classes	Area in Hectare	Area in Sq.Km.	Area in %
1	Agriculture	6328.34	63.28	20.14
2	Barren Land	246.91	2.47	0.79
3	Builtup Land	2362.28	23.62	7.52
4	Fallow Land	8285.58	82.86	26.37
5	Harvested Land	958.58	9.59	3.05
6	Open Land	3387.89	33.88	10.78
7	River Bed Land	683.53	6.84	2.18
8	Vegetation	8981.62	89.82	28.59
9	Waterbody	180.77	1.81	0.58
	Total Area	31415.51	314.16	100.00

Project	Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd., Ankushnagar
Name of Client	
Title	10 Km. Radius Area LULC Map

technogreen environmental solutions

202, Hem Opal, Plot No.26, Ekta Society, Wakdewadi, Pune- 411003.
Tel: 020- 25824215,02065201202. http://www.technogreen.co.in

Figure 3.6Land use Map of the Study Area

Table 3.2 Land Use/ Land cover Statistics

Sr. No.	Type	Colour Code bifurcation	Area in Sq. m.	Area in %
1.	Agriculture		63.28	20.14
2.	Barren Land		2.47	0.79
3.	Built up Land		23.62	7.52
4.	Fallow Land		82.86	26.37
5.	Harvested Land		9.59	3.05
6.	Open Land		33.88	10.78
7.	River Bed Land		6.84	2.18
8.	Vegetation		89.82	28.59
9.	Water body		1.81	0.58
Total Area			**314.16**	**100.00**

3.12.2 Results

A map depicting major land use/ land cover classes under inhabitations is given in **Figure 3.6.** The details of land use/ land cover statistics of 10 km radial periphery from project site boundary are tabulated in **Table 3.2** It can be observed that the maximum percentage of land is "Vegetation" followed by "Fallow Land".

3.13 Seismology

Based on the tectonic featured & records of earthquakes, a seismic zoning map has been developed for the country by Bureau of Indian Standards (BIS). The area under study falls in Zone-II [Least Active], according to Indian Standard Seismic Zoning Map. Suitable seismic coefficients in horizontal & vertical directions respectively have to be adopted while designing the structures. Seismic zoning map of India showing tentative location of proposed site is represented in **Figure 3.7**.

Figure 3.7 Seismic Zones for Project Site

During 1990's such occasional earth quake occurred and few of them have been listed below;

a. August 28 , 1990 (Magnitude 4.9)
b. December 08, 1993 (Magnitude 5.0)
c. February 01, 1994 (Magnitude 5.0)
d. March 12, 1995 (Magnitude 4.7)

3.14 Meteorology

Assessment of micro and macro meteorology is an important from the standpoint of understanding the nature and extent of air pollution in the study area. Climate has an important role in the build-up of pollution levels. The climatic condition of the area may be classified as Hot

and Humid with four seasons in a year. Winter is critical for air pollution build-up because of frequent calm conditions with temperature inversions resulting in poor atmospheric mixing, natural ventilation resulting in an increased emission loads.The impact on air environment would depend and has been identified on the basis of identification of sources of air pollution from various process operations; the nature of pollutants and their quantities likely to be discharged to the atmosphere; and the baseline data on air quality.

3.14.1 Climatic Condition

The district has dry and tropical climate with very hot summer and mild winter with humid SW monsoon season of moderate rainfall. The climate can be divided into three main seasons viz;

a) Hot to warm humid monsoon season from June to September.

b) Cool dry winter season from October to February and

c) Hot dry summer season from March to June.

Temperature during rainy season ranges from 21 to 30^0 C. In winter season temperature fall appreciably and range from 10 to 25^0C. In nights temperature range is 20 to 25^0C with privilege of cool breeze.

(*Source*: ***http://cgwb.gov.in/District_Profile/Maharashtra/Jalna.pdf)***

3.14.2 Study Period of Microclimatic Data

Industry had installed Meteorological station to assess the microclimatic data of project site and collected data for the period of 1st March 2019 to 31st May 2019 to get a baseline profile of the Temperature, Relative Humidity (RH), Rainfall Ddistribution, Wind Speed and Wind Ddirection of the study area and obtained results are discussed as below. Apart from the primary study, secondary data from Government agency like IMD the average of meteorological parameters is presented in below **Table 3.3.**

Table 3.3 Average Of Meteorological Data

Location: At Aurangabad**,** Maharashtra; (Lat: 19° 51' N, Long: 75° 24' E) (Station Code: 43014)
Aerial Dist from Project Site: Approx. 59.73km North-North-West
Height of installation: 579 m above MSL

Month	Temperature (°C)		Relative Humidity (%)		Mean Wind Speed (K.m.p.h.)	Pre-dominant Wind Direction	Precipitation (mm)
	Max.	Min.	Mor.	Eve.			
January	29.2	12.2	64	37	4.2	W	3.3
February	31.8	14.2	53	31	5.4	W	2.2
March	35.7	18.5	42	26	6.8	W	6
April	38.6	22.4	39	25	8.5	W	3.9
May	39.4	24.4	52	28	12.9	W	19.5
June	34.7	23.4	75	54	14.2	W	137.4
July	30.2	22.2	85	70	13	W	164.8
August	29	21.5	87	73	11.9	W	170.7
September	30.4	21.2	82	66	7.6	W	175.8
October	31.6	18.5	67	48	4.2	N	76.8
November	30.2	14.7	62	44	3.9	E	19.2
December	28.7	11.8	62	41	3.6	SE	10.1
Annual Total or Mean	32.5	18.8	64	45	8.0	W	789.7

Source: IMD

3.14.3 Rainfall

The rainfall record shows that the district has two regions on the rainfall pattern. The first comprises Bhokardan, Jafrabad and Jalna talukas with rainfall of about 700 mm favorable for Khariff cropping. The second region comprises Ambad and Partur talukas with rainfall of about 800 mm, more favorable for rabi cropping. Rainfall is not uniform in all parts of the district as assured rainfall areas are Jalna and Ambad talukas and the area of moderate rainfall of 625 to 700 mm is Bhokardan and Jafrabad talukas. The average annual rainfall in the area is 725.80mm. About 83% of the rainfall occurs during June to September and July is the rainiest month. The total annual rainfall observed from the MD data is 789.7mm. There was no rain during the study period as the monitoring has been conducted in pre-monsoon season.

3.14.4 Temperature

A temperature is an objective comparative measure of hot or cold. Moderate temperatures are mainly observed here. The average maximum temperature of 28.62 °C and average minimum temperature of 34.36°C was observed in the month of March and May respectively according to IMD data presented in **Table 3.4**. However, according to primary data recorded at site it was observed that the average maximum temperature during the study period was found to be 38.47 °C and average minimum was found to be 27.77 °C which is presented in **Table 3.4**

Table 3.4 Summary of Temperature

Month & year	Temperature (^{0}C)		
	Min	Max	Average
Mar-19	24.00	34.20	28.62
Apr-19	28.50	40.10	30.33
May-19	30.80	41.10	34.46
March – May 2019	**27.77**	**38.47**	**31.14**

3.14.5 Relative Humidity

Relative humidity is the ratio of the partial pressure of water vapor to the equilibrium vapor pressure of water at the same temperature. According to IMD data presented in **Table 3.3,** it was observed that the average relative humidity values ranges from 42.33 % to 70.00 %. However, according to primary data recorded at site it was observed that the average relative humidity during the study period was found to be approx. 58.65 % which is presented in **Table 3.5**

Table 3.5 Summary of Relative Humidity

Month & year	Relative Humidity (%)		
	Min	Max	Average
Mar-19	42.00	70.00	57.04
Apr-19	45.00	71.00	62.56
May-19	40.00	69.00	56.34
March – May 2019	**42.33**	**70.00**	**58.65**

3.14.6 Wind Direction & Wind Speed

Site specific meteorological data was analysed for the study period from March 2019 to May 2019 and is represented in wind rose diagram which shows that predominant wind direction during baseline monitoring period was from West (W) to North West (NW) followed by North (N) to South (S). The average wind speed during this period was found to be 0.93 m/s which is shown in **Figure 3.8**

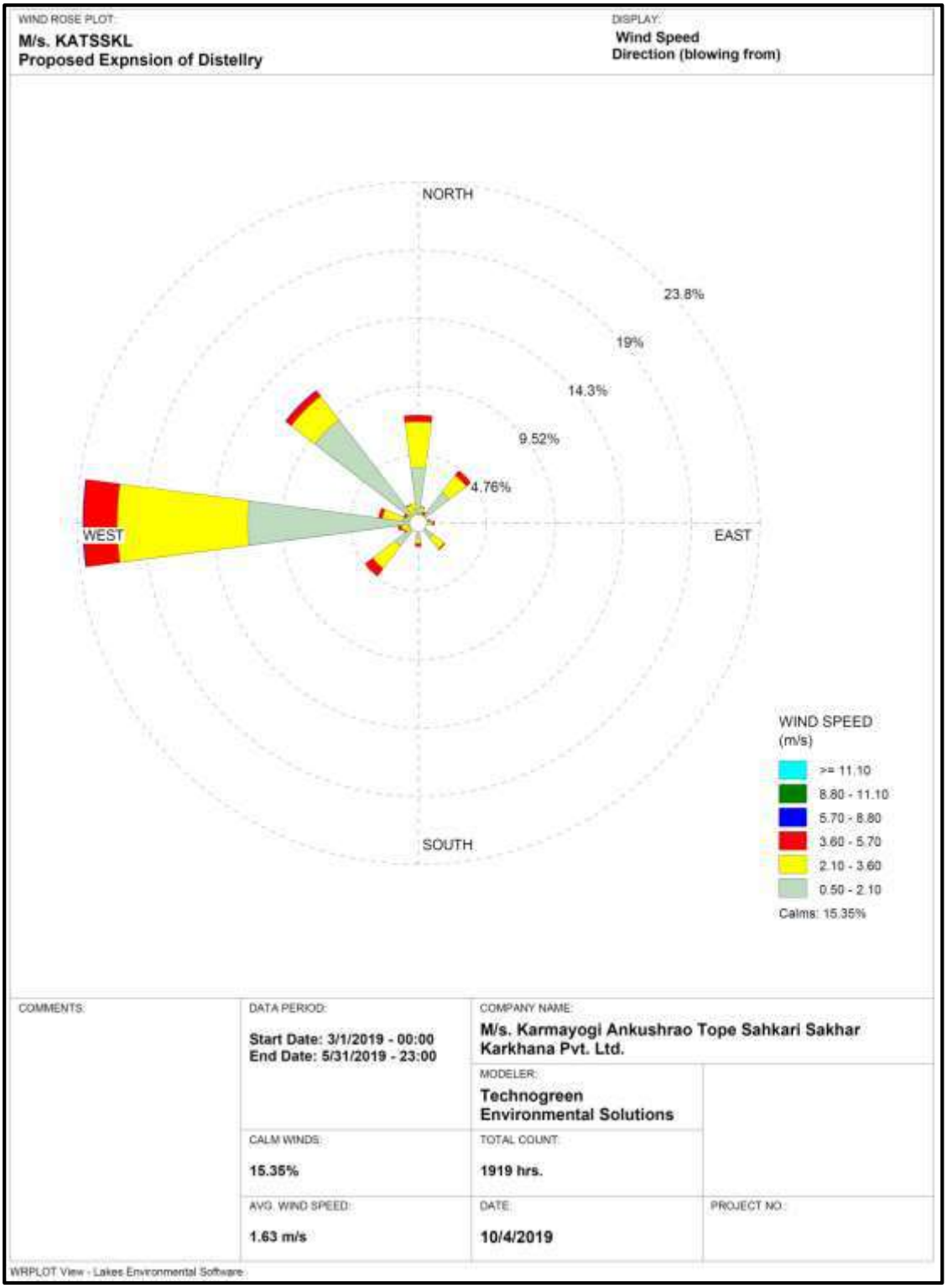


Figure 3.8 Wind Rose Diagram

3.15 Traffic Study

The existing project site is located outside industrial area. The traffic survey was conducted on the approach road National Highway 211 [Solapur-Aurangabad-Dhule Road] and the adjacent Mahakala village road. The major traffic on this road is truck, public vehicles such as taxis, auto

rickshaws and private vehicles such as two wheelers and four wheelers. The present section discusses the results of assessment of the present scenario of local transportation and connectivity to the project site. The study attempts to achieve this by analysing the adequacy of the existing infrastructure related to vehicular movement and based on this the impacts of increased load of transportation related facilities will be proposed. Appropriate mitigation measures are suggested at the end of the section in order to eliminate or minimize the impacts related to vehicular congestion around the proposed project site.

3.15.1 Objective

The objective of the study is to assess & evaluate the present traffic pattern from the main approach roads to the project site in order to estimate the traffic flow pattern on completion of the proposed project.

3.15.2 Methodology

Measurements of Traffic density were made by visual observation and by counting of vehicles under four categories. The road map is shown in **Figure 3.9**. The sampling locations for the study are depicted in **Figure 3.10** and provided in **Table 3.6**.

3.15.3 Data Collection

The transport roads for the proposed project have been identified; transportation of material carrying vehicles will mainly take place through National Highway 211[Solapur-Aurangabad-Dhule Road] village road. Further access up to project site is achieved by internal connecting Mahakala Village Road.

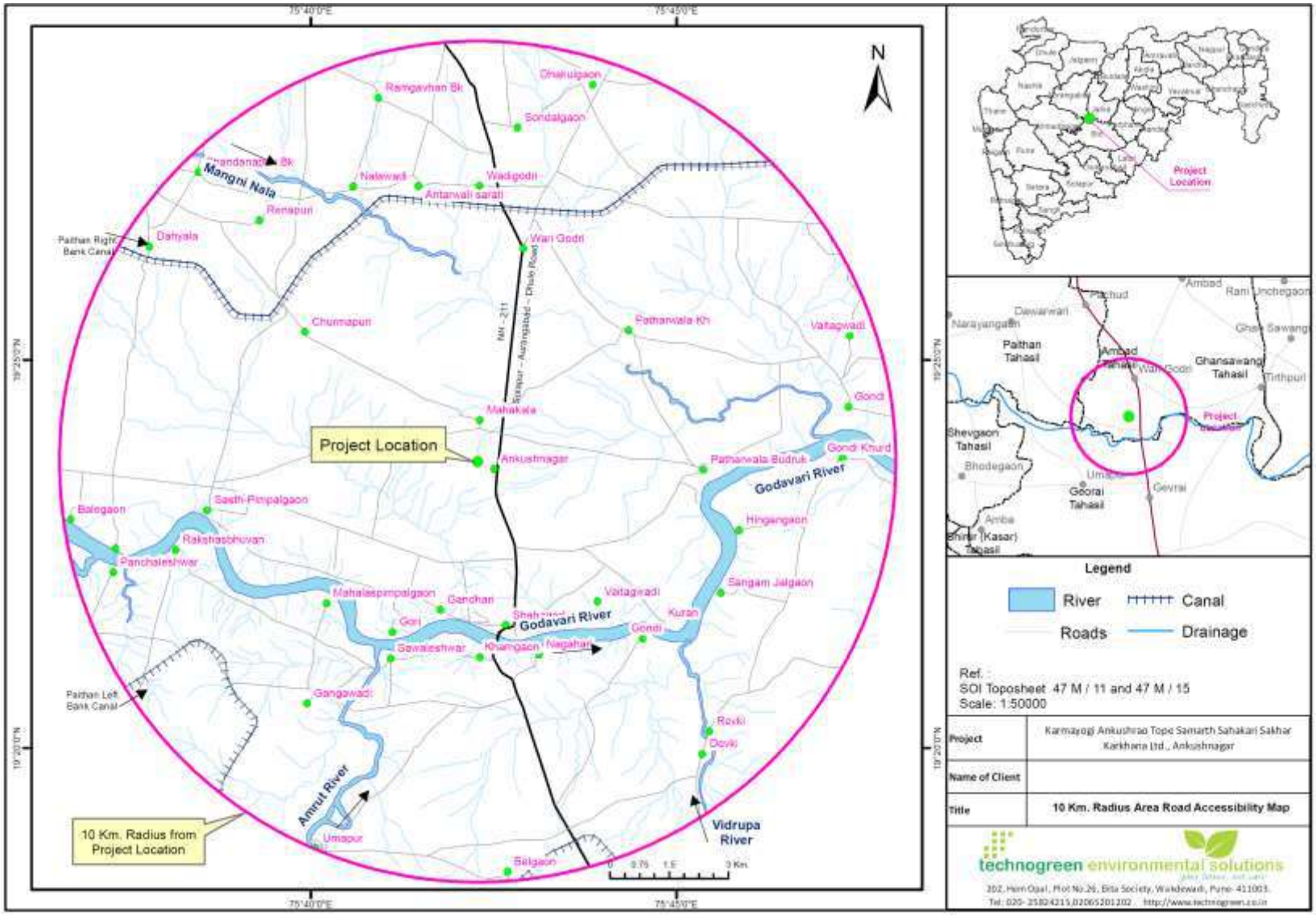


Figure 3.9 Road Map of the Study Area

Table 3.10 Traffic Study Observation Locations

Sr. No.	Observation Point Code	Observation Point Details	Aerial Distance from project site (km)
1.	TS1	National Highway 211	Adjacent to project site
2.	TS2	Mahakala Village Road	Adjacent to project site

3.16 Categorization of Traffic

To establish effective vehicle count during the survey the traffic was categorized into Heavy Vehicles (Multi Axle Vehicles), Truck, Tempo, Bus, Car, Auto (Three Wheelers), Motorcycle (Bike) & Cycle. The results of vehicle count are converted into Passenger Car Units (PCU's) as per the equivalent PCUs prescribed by Indian Road Congress (IRC) guidelines, as given in following **Table 3.7**

Table 3.7 Recommended PCU Factors For Various Types Of Vehicles On Urban Roads

Types of Vehicles	Equivalent PCU's	
	5%	10% & above
Two Wheelers, Motor Cycle or Scooter etc.	0.5	0.75
Passenger Car, Pick – up Van	1.0	1.0
Auto – Rickshaw	1.2	2.0
Light Commercial Vehicle	1.4	2.0
Truck or Bus	2.2	3.7
Agricultural Tractor Trailer	4.0	5.0
Cycle	0.4	0.5

Cycle Rickshaw	1.5	2.0
Tonga (Horse drawn vehicle)	1.5	2.0
Hand Cart	2.0	3.0

Source IRC: 106-1990

Table 3.8 Traffic Scenario- Existing of TS1

Time	Type of Vehicle																		Total Vehicle	Total PCU/ hr
	Truck	@ 3 PCU	Tractor	@ 1.5 PCU	Bullock cart	@ 8 PCU	Tempo	@ 1 PCU	Bus	@ 3 PCU	Auto	@ 1 PCU	Car	@ 1 PCU	Motorcycle	@ 0.5 PCU	Cycle	@ 0.5 PCU		
Peak Hours																				
8.00 -9.00 am	11	33	0	0	0	0	16	16	10	30	20	20	28	28	100	50	40	20	225	197
9.00 – 10.00 am	9	27	0	0	0	0	10	10	17	51	30	30	33	33	80	40	65	33	244	224
4.00 -5.00 pm	9	27	0	0	0	0	7	7	22	66	39	39	25	25	60	30	45	23	207	217
5.00 - 6.00 pm	5	15	0	0	0	0	12	12	27	81	55	55	17	17	110	55	70	35	296	270

Table 3.9 Traffic Scenario- Proposed of TS1

Time	Type of Vehicle																		Total Vehicle	Total PCU/ hr
	Truck	@ 3 PCU	Tractor	@ 1.5 PCU	Bullock cart	@ 8 PCU	Tempo	@ 1 PCU	Bus	@ 3 PCU	Auto	@ 1 PCU	Car	@ 1 PCU	Motorcycle	@ 0.5 PCU	Cycle	@ 0.5 PCU		
Peak Hours																				
8.00 -9.00 am	2	6	0	0	0	0	3	3	1	3	7	7	2	2	29	15	14	7	58	43
9.00 – 10.00 am	2	6	0	0	0	0	4	4	0	0	3	3	7	7	14	7	12	6	42	33
4.00 -5.00 pm	1	3	0	0	0	0	2	2	0	0	7	7	5	5	6	3	7	4	28	24
5.00 - 6.00 pm	1	3	0	0	0	0	7	7	0	0	4	4	5	5	17	9	13	7	47	34

Table 3.10 Traffic Scenario- Existing of TS2

Time	Type of Vehicle																	Total Vehicle	Total PCU/ hr
	Truck	@ 3 PCU	Tractor	@ 1.5PCU	Bullock cart	@ 8 PCU	Tempo	@ 1 PCU	Bus	@ 3 PCU	Auto	@ 1 PCU	Car	@ 1 PCU	Motor cycle	@ 0.5 PCU	Cycle	@ 0.5 PCU		
Peak Hours																				
8.00 -9.00 am	3	9	39	59	30	240	25	25	2	6	22	22	16	16	112	56	46	23	295	456
9.00 – 10.00 am	2	6	33	50	33	264	27	27	2	6	31	31	12	12	84	42	60	30	284	468
4.00 -5.00 pm	1	3	20	30	17	136	33	33	2	6	40	40	18	18	63	32	49	25	243	322
5.00 - 6.00 pm	2	6	28	42	20	160	40	40	2	6	61	61	15	15	128	64	65	33	361	427

Table 3.11 Traffic Scenario- Proposed of TS2

Time	Type of Vehicle																	Total Vehicle	Total PCU/ hr
	Truck	@ **3 PCU**	**Tractor**	@ **1.5 PCU**	**Bullock cart**	@ **8 PCU**	**Tempo**	@ **1 PCU**	**Bus**	@ **3 PCU**	**Auto**	@ **1 PCU**	**Car**	@ **1 PCU**	**Motorcycle**	@ **0.5 PCU**	**Cycle**	@ **0.5 PCU**		
Peak Hours																				
8.00 - 9.00am	1	3	2	3	3	24	4	4	0	0	8	8	2	2	15	8	13	5	48	57
9.00 – 10.00 am	1	3	0	0	2	16	4	4	0	0	8	8	5	5	13	7	3	1	36	44
4.00 -5.00 pm	0	0	1	2	2	16	2	2	0	0	6	6	4	4	11	6	5	2	31	37
5.00 - 6.00 pm	0	0	1	2	0	0	7	7	0	0	6	6	2	2	10	5	0	0	26	22

Table 3.12: Traffic Survey Comparison for TS1

Name of Road	Recommended PCU/Hr as per IRC 64-1990 guidelines for capacity of Roads in Rural Areas (for Single lane Roads)	Maximum PCU/hr Observed during peak hour	Expected from proposed Project PCU/ hr	Future after proposed project
National Highway 211	2000 PCU/Hr	270	43	313 which is less than standards

Table 3.13: Traffic Survey Comparison for TS2

Name of Road	Recommended PCU/Hr as per IRC 64-1990 guidelines for capacity of Roads in Rural Areas (for Single lane Roads)	Maximum PCU/hr Observed during peak hour	Expected from proposed project PCU/ hr	Future after proposed project
Mahakal Village Road	2000 PCU/Hr	468	44	512 which is less than standards

3.16.1 Results

Peak hours for both the locations TS1 and TS2 are considered from 8:00 am – 10:00 am and 4:00 pm – 6:00 pm. Highest peak hourly traffic on this route after proposed project is expected to be approximately 313 and 512 PCU/hr for TS1 and TS2 respectively. TS2 being an internal connected village road has maximum proposed Traffic load because of the Bullock carts and Tractors. Thus contributing more in the traffic of TS2 compared to TS1.

As per the above data, the additional load on the carrying capacity of the concern roads is not likely to have any significant adverse effect.

3.17 Observation & Assessment

The observations and line source dispersion modelling of the traffic is discussed in Chapter 4 (i.e. Impact Assessment and its Mitigation Measures) of this EIA/ EMP Report.

3.18 Air Environment

The ambient air quality was studied for the study period of March 2019 to May 2019. The various sources of air pollution in the study area are existing industrial emissions, other industrial sources, vehicular traffic and domestic firewood burning. The impact of these emissions is reflected in the results of ambient air quality. The major air pollutants released into atmosphere from different sources are Sulphur Dioxide, Nitrogen Dioxide, PM_{10}, $PM_{2.5}$, Ozone, Lead, Carbon Monoxide, and Ammonia

3.18.1 Designing of Ambient Air Quality Modelling Network

The following criteria were taken into account while designing the ambient air quality-monitoring network:

- Pre-dominant wind direction from IMD for the study area
- Nearest habitation around the project site
- Prediction of maximum concentrations and distances of their likely occurrence under prevailing meteorological conditions
- Representation of regional background from MPCB

3.18.2 Reconnaissance Survey

Reconnaissance survey was undertaken to establish the baseline status of air environment in the study region. The prime objective of the NAAQ survey, within 10 km radial study area around the plant was to establish the existing ambient air quality levels. Eight Ambient Air Quality Monitoring (AAQM) stations were selected based on the criteria used for designing the network.

3.18.3 Frequency and Duration of Sampling

Ambient air quality monitoring has been carried out for 24hrs twice a week for a period of three month at eight locations from March 2019 to May 2019.

3.18.4 Parameters for Sampling

The baseline data of air environment, for all the eight monitoring stations, was generated for the following parameters PM_{10}, & $PM_{2.5,}$ $SO_{2,}$ NOx, Carbon Monoxide.

3.18.5 Sampling locations

The prime objective of collecting baseline air quality data is to assess the prevailing / existing ambient air quality in the project influence area. Ambient air monitoring for 24hours at project site and surrounding villages within 10km radius was carried out. The details of air quality locations with global coordinates, distance from project site and wind direction are presented in **Table 3.14** and locations are depicted in **Figure 3.11.** Eight sampling locations were selected with due consideration to the meteorological conditions of the region i.e. wind direction. The samples were collected as per the CPCB norms.

Table 3.14 Details of Ambient Air Monitoring Station

Sample Code	Particulars	Co-ordinates		Distance	Direction	Justification
		Latitude	Longitude			
AA1	Project Site	19º23'51.23"N	75º42'15.46"E	-	-	Core
AA2	Shahgad	19º21'49.92"N	75º00'59.18"E	3.78 km	SSE	DW
AA3	Patharvad	19º23'41.32"N	75º45'20.62"E	5.39 Km	ENE	CW
AA4	Kuran	19º06'16.65"N	73º01'16.65"E	5.16 Km	SE	CW
AA5	Chrampuri	19º01'48.44"N	73º02'06.39"E	3.95 Km	NW	CW
AA6	Saskt Pimpelgaon	19º02'44.56"N	73º04'27.17"E	6.14 Km	WSW	CW
AA7	Patharwada KH	19º09'43.08"N	72º59'55.33"E	4.43 Km	NE	UW
AA8	Mahakala	19º04'40.92"N	73º01'48.71"E	1 Km	SE	CW

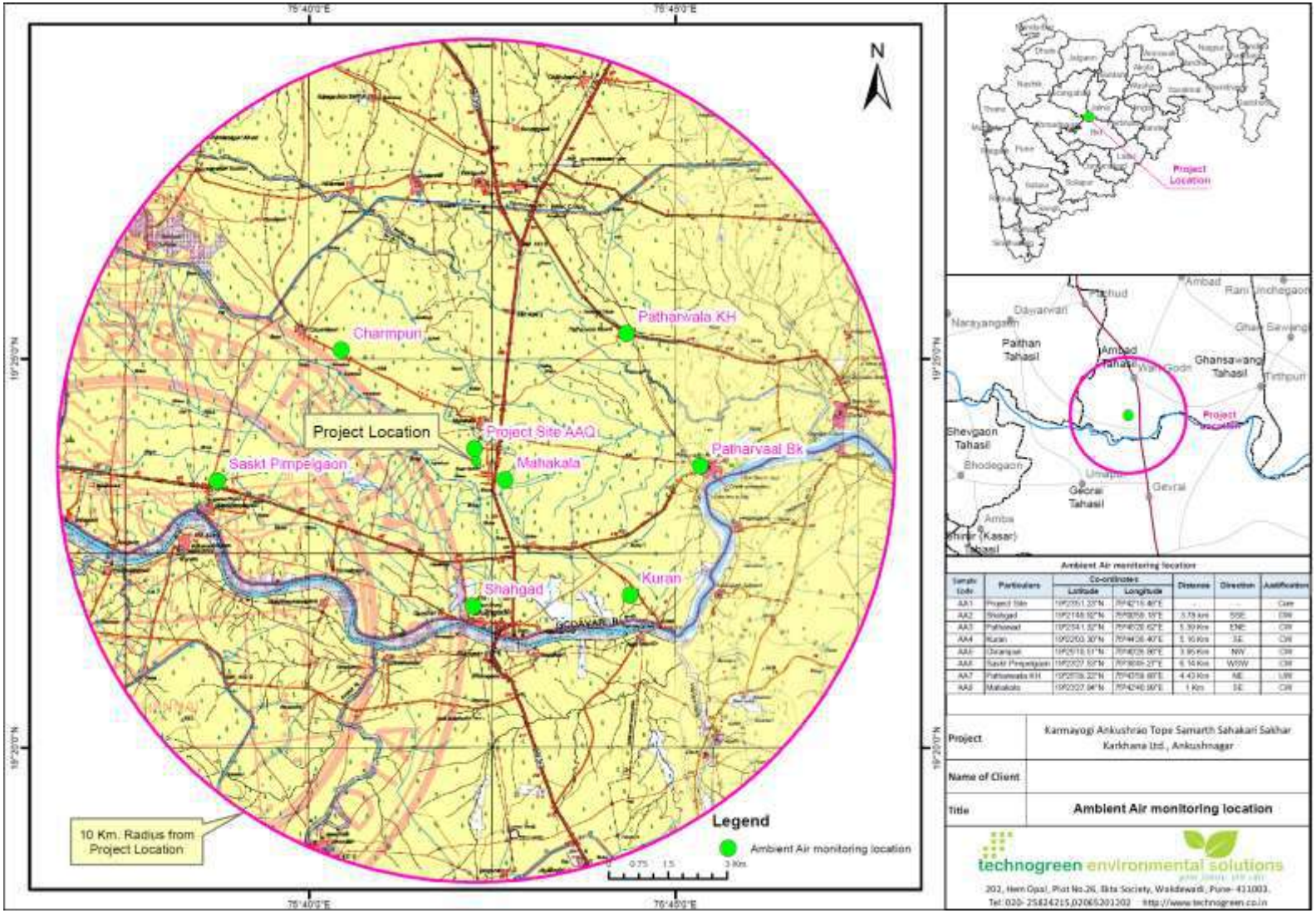


Figure 3.11 Ambient Air Quality Monitoring Locations

The existing baseline levels with respect to PM_{10}, $PM_{2.5}$, SO_2, NOx, and Carbon Monoxide are presented in **Table 3.15** with interpretation of statistical analysis of observed ambient air quality data for eight locations. Baseline Monitoring results are attached as **Annexure 16**

Table 3.15 Ambient Air Quality Monitoring Results

CO mg/m³	Parameters	$PM_{2.5}$	$PM_{10.0}$	NO_x	SO_2	CO
	UoM	µg/m³				mg/m³
Project Site – AAQ1	Min	19.67	61.67	19.25	12.55	0.23
	Max	26.70	79.54	39.11	27.92	0.44
	Average	22.77	72.36	23.14	17.52	0.30
	98th Percentile	25.96	79.37	33.98	24.32	0.43
Shahgad - AAQ2	Min	20.04	46.81	17.31	15.20	0.19
	Max	26.70	88.51	27.67	21.40	0.50
	Average	23.47	57.26	23.36	18.42	0.30
	98th Percentile	26.49	81.73	27.42	21.25	0.48
Patharvad -AAQ3	Min	17.12	50.21	19.40	15.02	0.21
	Max	27.91	77.45	27.30	22.74	0.56
	Average	22.79	62.39	23.97	19.31	0.33
	98th Percentile	27.72	76.09	27.01	22.54	0.54
Kuran - AAQ4	Min	17.51	51.29	18.34	15.89	0.12
	Max	30.25	79.32	30.45	22.33	0.53
	Average	23.32	60.34	24.48	18.77	0.30
	98th Percentile	28.45	77.51	30.11	22.04	0.52
Chrampuri - AAQ5	Min	19.64	48.95	18.54	15.20	0.20
	Max	28.19	60.25	28.44	25.12	0.53
	Average	22.73	54.57	23.54	20.43	0.33
	98th Percentile	27.00	60.23	28.06	24.89	0.52
Saskt Pimpelgaon - AAQ6	Min	18.90	50.16	15.11	14.99	0.21
	Max	26.95	69.77	26.05	22.81	0.52
	Average	22.32	56.07	22.90	18.97	0.35
	98th Percentile	26.86	69.24	25.96	22.21	0.52
Patharwada KH - AAQ7	Min	19.05	46.81	19.69	15.23	0.19
	Max	32.44	63.60	28.05	26.96	0.46
	Average	22.76	53.44	23.35	18.55	0.34
	98th Percentile	29.91	62.53	27.51	25.18	0.45

Mahakala - AAQ8	**Min**	17.55	50.17	20.36	15.58	0.18
	Max	25.70	69.11	28.56	21.20	0.58
	Average	22.03	55.52	24.02	18.72	0.35
	98th Percentile	25.66	66.03	27.66	20.90	0.56
NAAQS Limit (24 Hourly Concentration)		100	60	80	80	4

3.18.6 Interpretation of the Ambient Air Monitoring Results

Air Quality monitoring reports showed that all the parameters are under limit as per NAAQS Standards. It can be seen that PM_{10} and $PM_{2.5}$ ranges from 46.81 to 88.51/m^3 and17.12 to 32.44 µg/m^3. SO_2, NO_x & CO ranges from 12.55 to 27.92/m^3 15.11 to 39.11/m^3 and 0.12 to 0.58 **µ**g/m^3 respectively. Graphical representation of the results of $PM_{2.5}$, PM_{10}, NO_X, SO_2 and CO are presented in **Figure 3.12, 3.13, 3.14, 3.15, 3.16,** respectively.

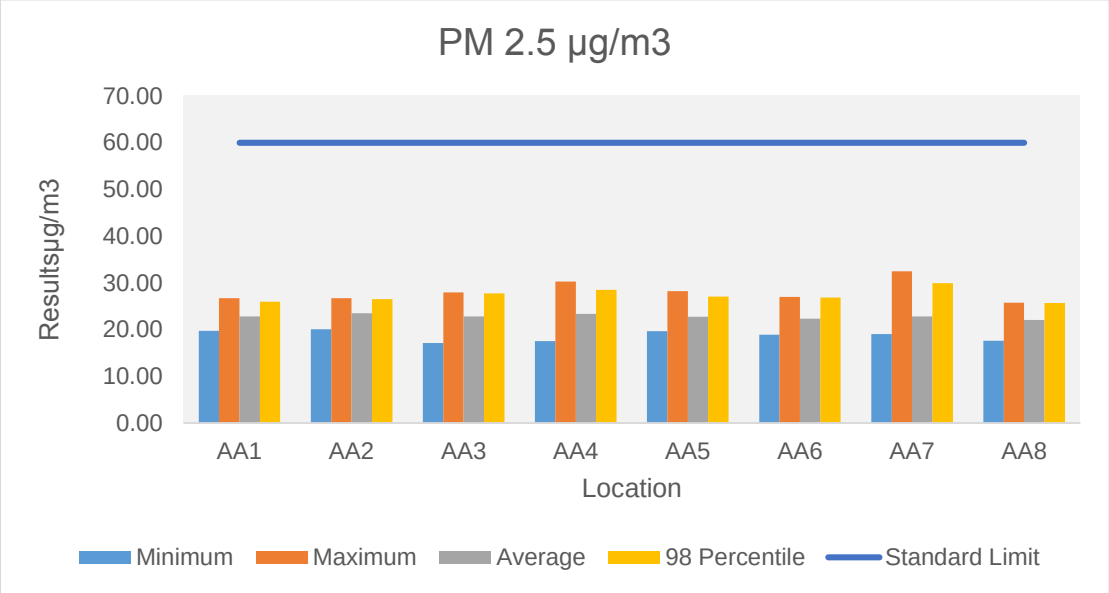


Figure 3.12 Results of $PM_{2.5}$ µg/m^3

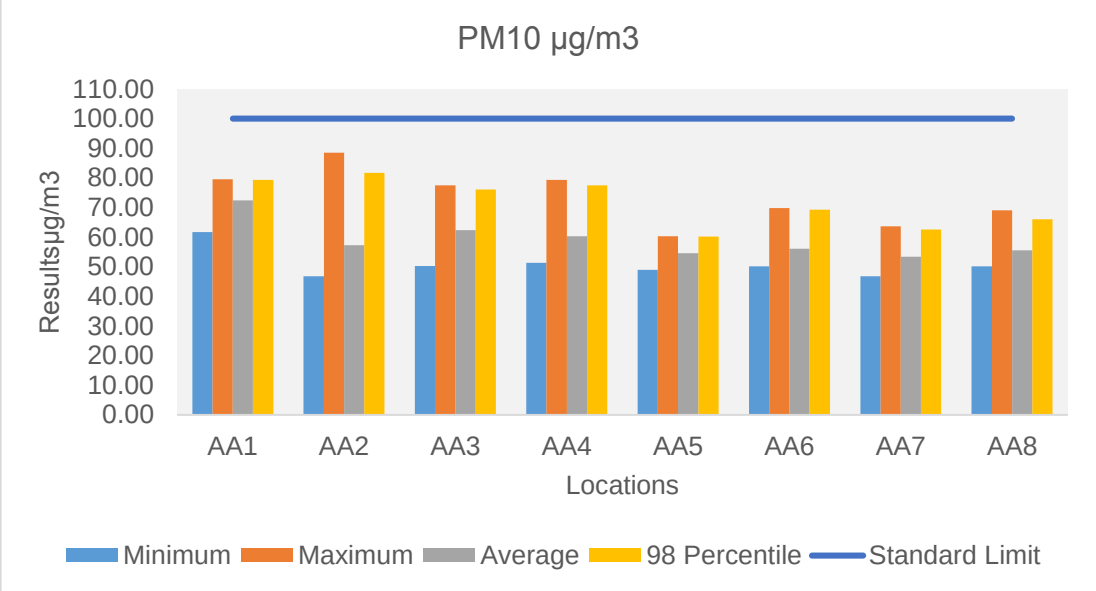


Figure 3.13 Results of PM_{10} µg/m^3

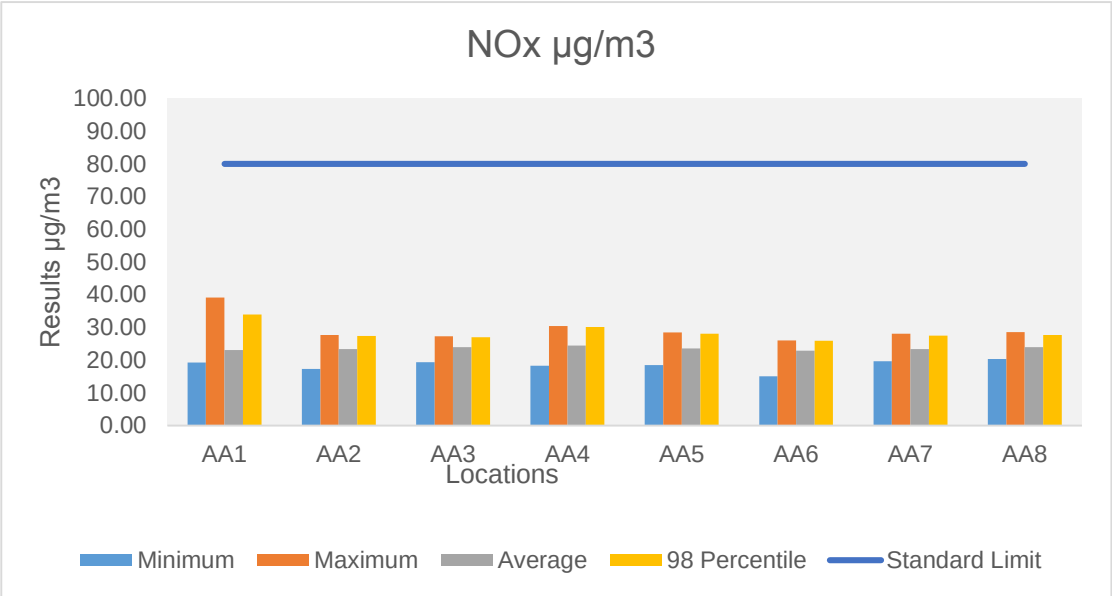


Figure 3.14 Results of NO_x µg/m³

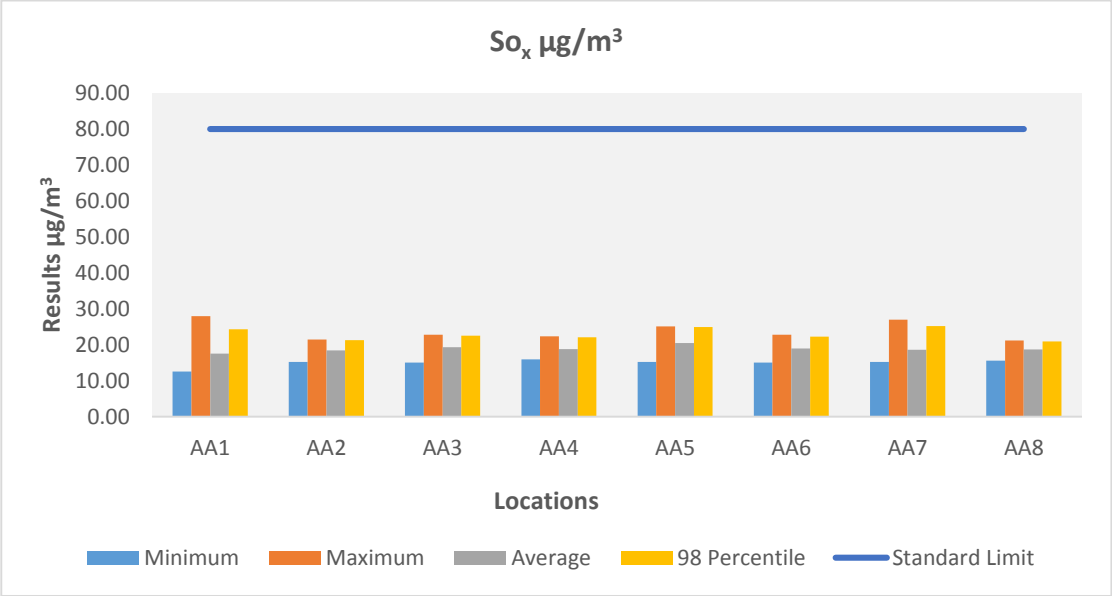


Figure 3.15 Results of SO_2 µg/m³

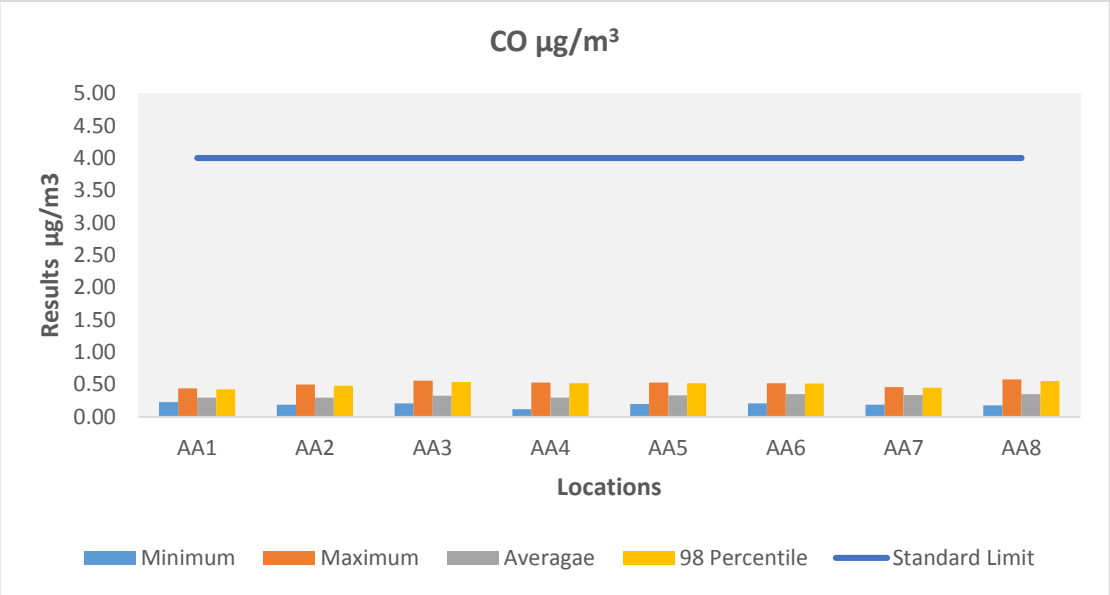


Figure 3.16 Results of CO mg/m³

3.19 Ambient Noise Environment

Noise can be defined as an unwanted sound. It interferes with speech and hearing and is intense enough to damage hearing or is otherwise annoying. Noise can also disturb natural wildlife and ecological system.

3.19.1 Equivalent Continuous Sound Levels

Though there are a huge number of indices in use worldwide, use of equivalent continuous level (L_{eq}) is the best noise index. The L_{eq} is an 'A' weighted average measure of sound pressure levels over a given period of time. It is a logarithmic variable and, therefore, not linearly additive. Moreover, all noise prediction models give L_{eq} value. This is because; L_{eq} is independent of the statistics of the source contribution.

The L_{eq} can be calculated based on equation as given below;

$$L_{eq} = 10 \log \left(\sum_{i=1}^{n} fi \sqrt{10^{LpAi/10}} \right)^2$$

Where L_{pAi} is the dBA level and fi is the i^{th} fraction of time that L_{pAi} is in progress.

Hourly L_{eq} values for study period during daytime and night-time were computed from combination of data from similar land-use in and around the project site**.** L_{eq} values recorded for various stations in study area during daytime (06:00 am to 10:00 pm) and night-time (10:00 pm to 06:00 am) at differing land-use, in and around project site.

3.19.2 Design of Network Stations for Noise Monitoring

An assessment of baseline noise quality was undertaken to establish the status of exposure of the major sensitive receptors. This assessment was accomplished by conducting a site specific background monitoring program.

To understand the noise environment in the study area, a survey was conducted using Sound Level Meter. Fourteen stations were selected based on the criteria used for designing the network.

3.19.3 Reconnaissance Survey

A preliminary reconnaissance was undertaken to identify the major noise generating sources in the area. 14 locations were identified based on the activities in the village area, traffic and sensitive areas like hospitals and schools. Noise generating sources have been identified with respect to the activities, viz. ambient noise pollution due to activities other than industrial sources, which have impact on sensitive areas.

The objective of survey was to assess the impact of noise, being generated by the existing industrial unit and other related activities within the project site and its surrounding areas.

3.19.4 Location for Monitoring

The locations along with relative direction and distance with respect to project site are given in **Table 3.17** and **Figure 3.17**

Table 3.17 Noise Level Monitoring Stations

Sample Code	Location	Coordinates		Distance	Direction	Category of Area / Zone
		Latitude	Longitude			
N1	Project Site	Within factory premises		-	-	Industrial
N2	Project Site			-	-	Industrial
N3	Mahakala	19º23'30.27"N	75º42'40.76"E	0.76 km	SE	Residential
N4	New Samarth Colony	19º23'25.70"N	75º41'54.03"E	0.94 km	SW	Residential
N5	Patharvad	19º23'28.31"N	75º44'26.05"E	3.70 km	ESW	Residential
N6	Shahgadh	19º21'51.15"N	75º42'44.72"E	3.72 km	SSE	Residential
N7	Domalgaon	19º22'32.77"N	75º40'20.75"E	4.28 km	SW	Residential
N8	Srinath Grocey (Mahakala)	19º24'39.18"N	75º41'36.82"E	2.01 km	NW	Commercial
N9	Patharwada Kh.	19º25'17.29"N	75º44'17.41"E	4.42 km	NE	Residential

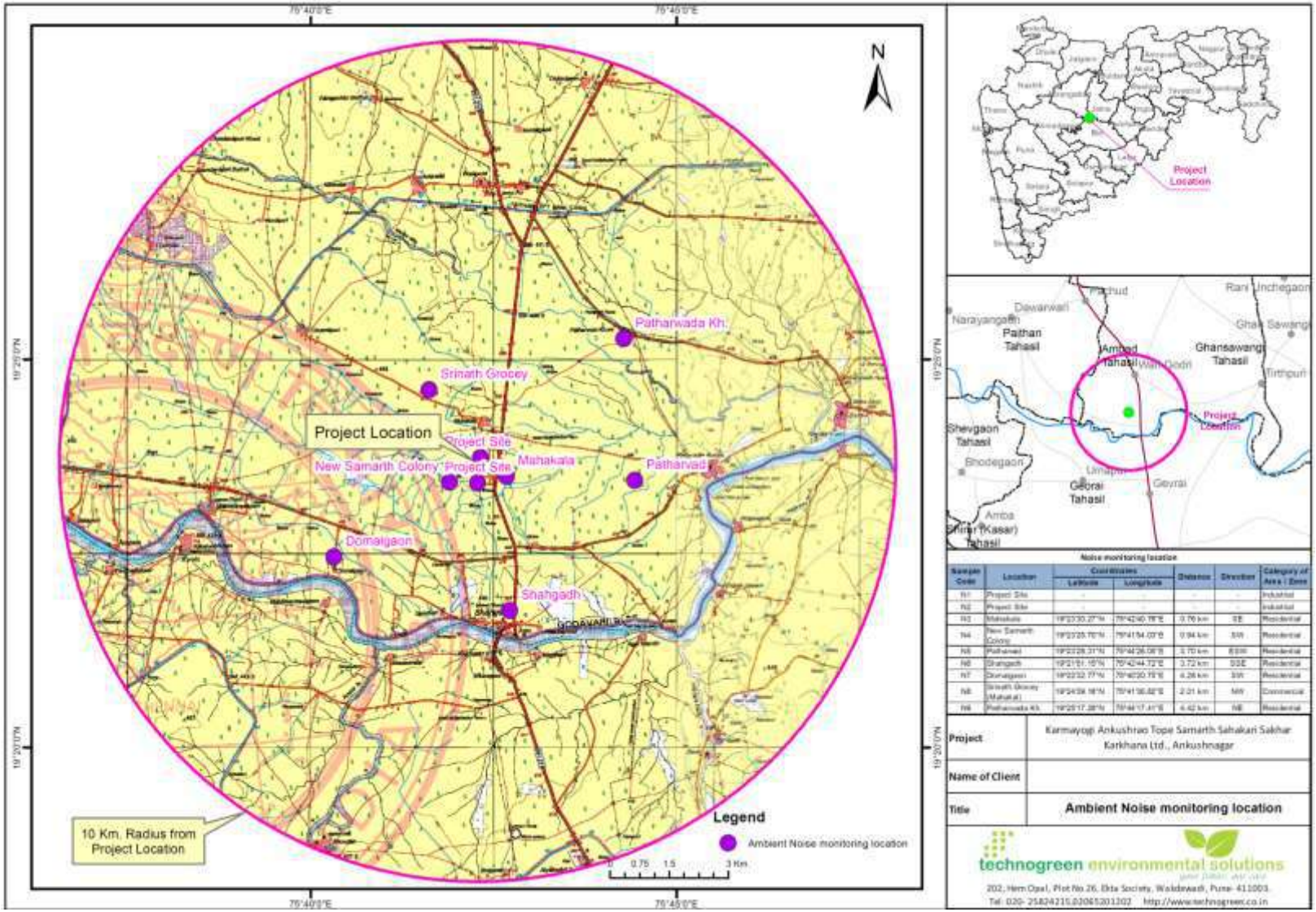


Figure 3.17 Noise Quality Monitoring Locations

3.19.5 Analysis of data

Measured noise levels were compared with noise standards as per the CPCB permissible limits. The measured noise level for Leq (Day) & Leq (Night) within the study area are presented in **Table 3.18** Graphical representation of Noise Monitoring results are shown in **Figure 3.18** Baseline Monitoring results are attached as **Annexure 16**

Table 3.18 Noise Level Monitoring Results

Sample Code	Location	Zone	Day Time	CPCB Permissible Limit (Day Time)	Night Time	CPCB Permissible Limit (Night Time)
			dB(A)			
N1	Project Site	Industrial	69.1	<75	57.13	<70
N2	Project Site	Industrial	66.15	<75	43.54	<70
N3	Mahakala	Residential	51.71	<55	40.74	<45
N4	New Samarth Colony	Residential	53.82	<55	41.72	<45
N5	Patharvad	Residential	52.11	<55	41.4	<45
N6	Shahgadh	Residential	50.97	<55	43.2	<45
N7	Domalgaon	Residential	53.14	<55	41.66	<45
N8	Srinath Grocey (Mahakal)	Commercial	61.02	<65	50.91	<55
N9	Patharwada Kh.	Residential	52.32	<55	40.36	<45

3.19.6 Interpretation of Results

The Leq values of noise levels during daytime Leq (d) varied between 50.97 to 69.1dB (A). Highest Leq value was recorded at Project Site [69.1dB (A)] while the Leq values of noise levels during night time Leq (N) varied between 40.36 to 57.13dB (A). Highest Ln value was recorded at project site [57.13dB (A)].

The hourly Leq noise levels recorded at various locations in the study area shows considerable fluctuations because of changes in traffic movement, commercial and industrial activities in the study area, however the noise level (Leq daytime as well as Leq night time) found at all locations within prescribed limit of both during day time as well as night time.

3.20 Water Environment

Water environment consists of water resources such as ponds, streams, lakes, dams, groundwater etc. Water quality forms the essential component of study that not only helps identify resource availability for potability and other human applications but also to evaluate critical impacts / issues with a view to suggest appropriate mitigation measures for implementation. In general, any major industrial development project is expected to cause impacts on water environment in two ways: one is stress on water resources (continuous withdrawal of large

quantities of water) and other is pollution impacts through discharge of effluents. These impacts may be related to either or both surface and groundwater resources present in the study area. To address these issues, it is necessary to ensure the availability of water resources in project area with respect to their existing quality to represent the baseline status of water environment.

3.20.1 Design of Network Stations for collection of water sample

Water sampling stations were designed and selected to assess the surface and ground water quality in and around the project site. Eleven surface water and eight ground water sample stations were selected around 10km radius of the study area including the project site. Standard procedures were followed for the sampling and analysis of physico-chemical parameters of the water.

3.20.2 Water environment of the Study Area

The water quality (Ground Water and Surface Water) of the study area has been assessed to understand the baseline water quality conditions of the area. The quality of groundwater and surface water was compared with IS: 10500: 2012.

3.20.3 Surface water environment

Surface water samples were collected from eleven different locations comprising of River upstream, downstream and lakes, ponds, dams. Details of the sampling locations along with distance and directions were identified in the study area for water quality monitoring which is represented in **Table 3.19** and sampling locations are depicted in **Figure 3.18**

Table 3.19 Surface Water Sampling Locations

Sample Code	Sample Location	Distance (km)	Direction	Co-ordinates	
				Latitude	Longitude
SW1	Godavari River_Upstream	4.01	SSE	19º21'29.42"N	75º42'20.83"E
SW2	Godavari River_Downstream	4.36	SE	19º21'21.65"N	75º42'56.46"E
SW3	Paithan Canal	6.63	NNE	19°26'52.76"N	75°43'57.04"E

Table 3.20 Surface Water Quality of the Study Area

Sr. No	Parameters	Unit			
Location Name			**Godawari River (D/S)**	**Godawari River (U/S)**	**Canal Paithan**
1	**Temprature**	°C	28.5	28.7	28.6
2	**Colour**	Hazen	10	10	10
3	**Turbidity**	NTU	7.8	4.9	0.8
4	**Total Suspended Solids**	mg/l	53.8	57.8	6.8
5	**Total Dissolved Solids**	mg/l	134.67	133.21	106.98
6	**Total Solids**	mg/l	195.47	198.01	120.78
7	**pH**	pH Unit	6.89	7.03	7.89
8	**Total Hardness (as CaCO3)**	mg/l	114.8	114.8	89.8
9	**Total Alkalinity (as CaCO3)**	mg/l	140	140	112
10	**Chloride (as Cl-)**	mg/l	45.98	45.99	37.99
11	**Chemical Oxygen Demand**	mg/l	<10	<10	<10
12	**Biochemical Oxygen Demand (at 27degC for 3 days)**	mg/l	2.8	2.4	2.7
13	**Sulphate (as SO4-2)**	mg/l	39.08	38.05	27.82
14	**Fluoride (as F)**	mg/l	0.012	0.011	0.01
15	**Silica(SiO2)**	mg/l	8.5	8.5	9.26
16	**Phosphate (as PO4)**	mg/l	0.178	0.023	0.022
17	**Dissolved Oxygen**	mg/l	6.8	2.8	1.2
18	**Total Kjeldhal Nitrogen**	mg/l	12.2	36.5	11.3
19	**Aluminium (as Al)**	mg/l	0.03	0.064	0.037
20	**Arsenic (as As)**	mg/l	Nil	Nil	Nil
21	**Calcium (as Ca)**	mg/l	30.1	30.1	23.5
22	**Cadmium (as Cd)**	mg/l	Nil	Nil	Nil
23	**Chromium (as Cr)**	mg/l	Nil	Nil	Nil
24	**Copper (as Cu)**	mg/l	Nil	Nil	Nil
25	**Iron (as Fe)**	mg/l	0.03	0.02	0.11

26	**Mercury (as Hg)**	mg/l	Nil	Nil	Nil
27	**Magnesium (as Mg)**	mg/l	7.3	7.3	5.7
28	**Manganese (as Mn)**	mg/l	Nil	Nil	Nil
29	**Nickel (as Ni)**	mg/l	0.0012	0.008	0.004
30	**Boron (as B)**	mg/l	0.007	0.001	0.002
31	**Sodium (as Na)**	mg/l	0.2	0.03	0.12
32	**Selenium (as se)**	mg/l	Nil	Nil	Nil
33	**Potassium (as K)**	mg/l	0.05	0.5	0.09
34	**Zinc (as Zn)**	mg/l	Nil	Nil	Nil
35	**Total Coliform**	/100ml	25	17	25

3.20.4 Interpretation of Surface Water Analysis

The pH of surface water ranges from 6.89 to 7.89. Total dissolved solids were found to be in the range of 106.98– 134.67mg/l. Total hardness is in the range of 89.8– 114.8mg/l. Chlorides and Sulphate are in the range of 37.99– 45.99 mg/l and 27.82– 39.08 mg/l respectively which shows that all of them are within permissible limit. Maximum water samples were found to be within permissible limits for all the parameters except few which were higher on minor level.. Baseline Monitoring results are attached as **Annexure 16**

3.20.5 Ground water environment

Ground water samples were collected from eleven different locations comprising of bore well or dug well. Details of the sampling locations along with distance and directions were identified in the study area for water quality monitoring which is represented in **Table 3.21** and sampling locations marked on Toposheet are depicted in **Figure 3.18**

Table 3.21 Ground Water Sampling Locations

Sample Code	Sampling Location	Distance from project site (km)	Direction w.r.t. Project Site	Co-ordinates	
				Latitude	Longitude
GW1	Ghansavangi	6.20	ENE	19°24'33.76"N	75°45'42.24"E
GW2	Patharwala Kh	4.71	ENE	19°24'1.71"N	75°44'57.29"E
GW3	Churmapuri	4.60	NW	19°25'10.90"N	75°40'14.86"E
GW4	Gahininath Nagar	3.07	WSW	19°23'24.43"N	75°40'33.96"E
GW5	Gayatri Nagar	0.78	SSW	19°23'12.67"N	75°42'13.21"E
GW6	Mahakala	1.74	N	19°24'32.98"N	75°42'28.39"E
GW7	Antarwali Sarathi	4.27	NNE	19°25'57.17"N	75°42'32.68"E
GW8	Gandhari	3.17	SSW	19°21'55.49"N	75°41'58.79"E
GW9	Agar Nandu	6.76	SSE	19°20'7.41"N	75°43'38.05"E

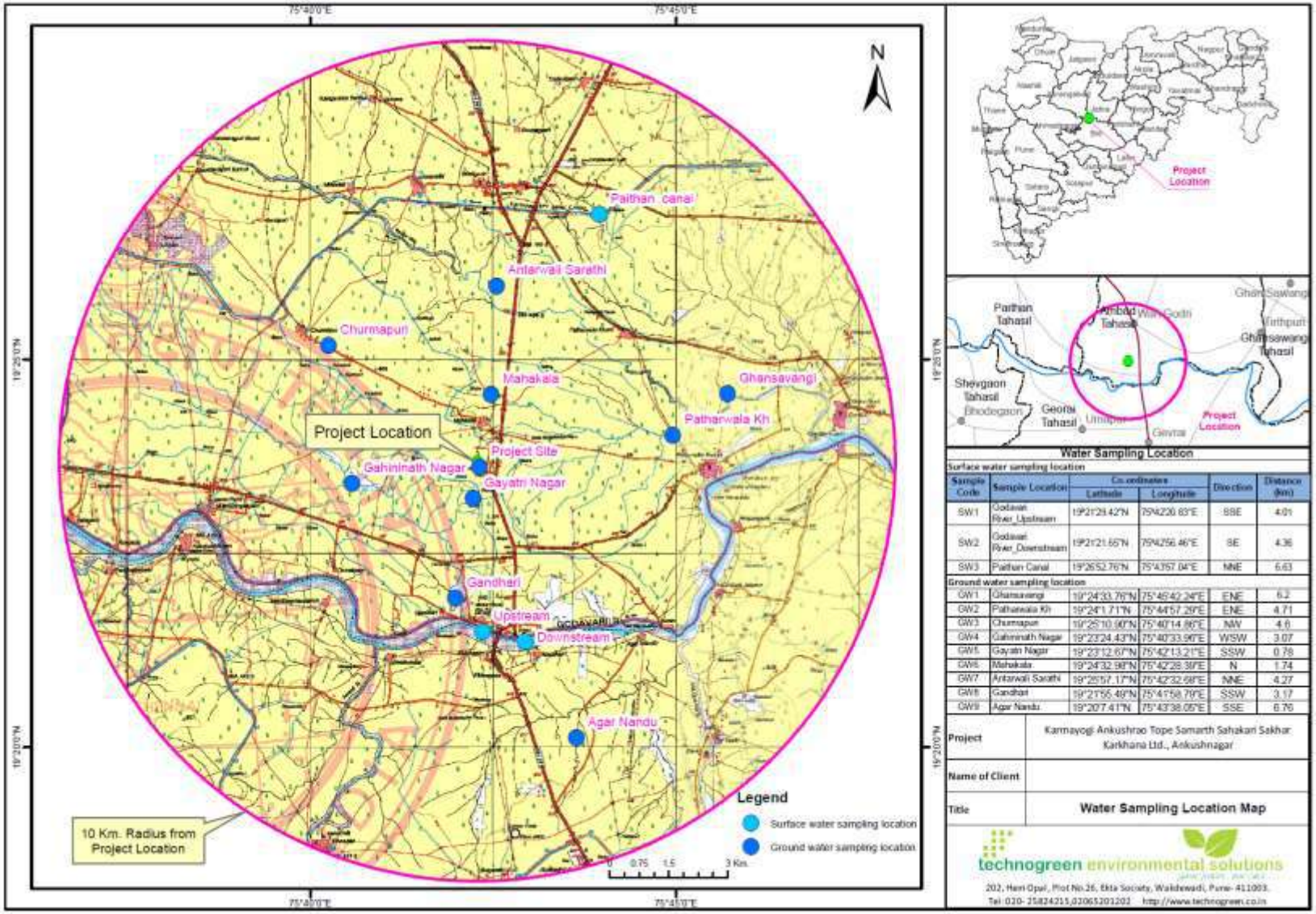
Table 3.22 Ground Water Quality of the Study Area

Sr. No	Parameters	Unit									
Location Name			Ghansavangi	Patharwala Kh	Churmapuri	Gahininath Nagar	Gayatri Nagar	Mahakala	Antarwali Sarathi	Gandhari	Agar Nandu
1	**Temprature**	°C	28.6	28.1	28.1	28.6	28.1	28.6	28.6	28.7	28.2
2	**Colour**	Hazen	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
3	**Turbidity**	NTU	0.2	0	0.8	1.9	0.2	4.7	6.5	0.2	0.2
4	**Total Suspended Solids**	mg/l	19.6	0.4	4.2	4.4	5.4	9	34.6	0.6	1.8
5	**Total Dissolved Solids**	mg/l	634.05	192.45	378.26	392	247	367.9	168.33	134.19	214.85
6	**Total Solids**	mg/l	676.65	215.85	405.46	419.4	275.4	399.9	225.93	157.79	239.65
7	**pH**	pH Unit	6.76	7.52	6.95	6.75	7.16	6.67	7.46	6.9	7.28
8	**Total Hardness (as CaCO3)**	mg/l	536.5	159.8	332.9	340.4	212	314	103	112.6	174.9
9	**Total Alkalinity (as CaCO3)**	mg/l	416	348	280	280	174	330	160	200	208
10	**Chloride (as Cl-)**	mg/l	125.96	61.96	155.95	99.97	83.97	120.96	75.98	41.99	81.97
11	**Chemical Oxygen Demand**	mg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
12	**Biochemical Oxygen Demand (at 27degC for 3 days)**	mg/l	2.9	3	3.1	3.2	3.2	3.1	3	2.9	3
13	**Sulphate (as SO4-2)**	mg/l	309.77	53.68	86.09	156.78	67.74	103.79	24.6	38.05	42.53
14	**Fluoride (as F)**	mg/l	0.018	0.025	0.025	0.014	0.012	0.023	0.017	0.017	0.029
15	**Silica(SiO2)**	mg/l	10.2	16.76	19.56	16.06	21.8	30.94	19.94	12.32	27.16
16	**Phosphate (as PO4)**	mg/l	1.213	0.036	0.053	0.105	0.069	0.27	0.033	0.046	0.063
17	**Dissolved Oxygen**	mg/l	NA								
18	**Total Kjeldhal Nitrogen**	mg/l	15.7	16.1	15.4	13.2	12.4	13.5	14.1	15.2	13.2
19	**Aluminium (as Al)**	mg/l	0.017	0.017	0.031	0.023	0.01	0.004	0.043	0.013	0.017

20	**Arsenic (as As)**	mg/l	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
21	**Calcium (as Ca)**	mg/l	142	42.3	88.1	90.1	56.1	83.1	27.25	29.8	46.3
22	**Cadmium (as Cd)**	mg/l	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
23	**Chromium (as Cr)**	mg/l	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
24	**Copper (as Cu)**	mg/l	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
25	**Iron (as Fe)**	mg/l	0.05	0.05	0.05	0.1	0.14	0.33	0.12	0.01	0.23
26	**Mercury (as Hg)**	mg/l	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
27	**Magnesium (as Mg)**	mg/l	34.5	10.3	21.4	21.9	13.6	20.2	16.524	7.2	11.3
28	**Manganese (as Mn)**	mg/l	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
29	**Nickel (as Ni)**	mg/l	0.001	0.004	0.003	0.004	0.005	0.002	0.003	0.004	0.001
30	**Boron (as B)**	mg/l	0.015	0.002	0.005	0.004	0.007	0.005	0.007	0.006	0.007
31	**Sodium (as Na)**	mg/l	0.15	0.13	0.16	0.12	0.15	0.16	0.12	0.32	0.14
32	**Selenium (as se)**	mg/l	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
33	**Potassium (as K)**	mg/l	0.04	0.09	0.02	0.08	0.06	0.08	0.09	0.01	0.05
34	**Zinc (as Zn)**	mg/l	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
35	**Total Coliform**	/100ml	NA	NA	NA	NA	NA	NA	NA	NA	NA

3.20.6 Interpretation of Ground Water Analysis

The ground water pH ranges from 6.67 – 7.52. Total Dissolved Solid (TDS) was found to be in the range of 134.19- 634.05 mg/l. Total Hardness is in the range of 103- 536.5 mg/l. Sulphate is in the range of 24.6- 309.77 mg/l. Chlorides ranges from 41.99- 155.95 mg/lit. All the samples are within permissible limit. Baseline Monitoring results are attached as **Annexure 16**



Sample Code	Sample Location	Co-ordinates Latitude	Co-ordinates Longitude	Direction	Distance (km)
SW1	Godavari River_Upstream	19°21'29.42"N	75°42'26.63"E	SSE	4.01
SW2	Godavari River_Downstream	19°21'21.65"N	75°42'56.46"E	SE	4.36
SW3	Paithan Canal	19°26'52.76"N	75°43'57.04"E	NNE	6.63
Ground water sampling location					
GW1	Ghansavangi	19°24'33.76"N	75°45'42.24"E	ENE	6.2
GW2	Patharwala Kh	19°24'1.71"N	75°44'57.29"E	ENE	4.71
GW3	Churmapuri	19°25'10.80"N	75°40'14.86"E	NW	4.6
GW4	Gahininath Nagar	19°23'24.43"N	75°40'33.96"E	WSW	3.07
GW5	Gayatri Nagar	19°23'12.67"N	75°42'13.21"E	SSW	0.78
GW6	Mahakala	19°24'32.98"N	75°42'28.38"E	N	1.74
GW7	Antarwali Sarathi	19°25'57.17"N	75°42'32.68"E	NNE	4.27
GW8	Gandhari	19°21'55.49"N	75°41'58.78"E	SSW	3.17
GW9	Agar Nandu	19°20'7.41"N	75°43'38.05"E	SSE	6.76

Figure 3.18 Surface & Ground Water Sampling Locations

3.21 Soil Environment

Soil is one of the vital resources on living planet Earth. The comprehensive understanding of temporal variability, physicochemical parameters and effect on the environment is becoming an essential task in soil environment. The project site is located in an industrialized area and there are limited places where any agricultural activities are prevalent. Coarse Shallow, Medium black to deep black soil is identified in study region.

3.21.1 Design of Network Stations for collection of Soil sample

The sampling locations have been identified with the following objectives;

- To determine the baseline soil characteristic of the study area
- To determine the impact identification of proposed project on soil characteristic
- To determine impact on soil more importantly from agricultural productivity point of view

3.21.2 Reconnaissance Survey

Reconnaissance survey of surrounding area covering 10km radius from project site is carried out to identify most appropriate soil sampling locations.

3.21.3 Soil sampling locations

As part of baseline study conducted, soil samples were collected from eight different locations from the project site and surrounding and analysed for the physical and chemical parameters in order to determine the properties of soil. The details of soil sampling locations along with distance & directions from the project site are given in Table 3.22 and sampling locations marked on Toposheet is presented in Figure 3.19

Table 3.23 Soil Sampling Locations

Sample Code	Sample Location	Distance from Project Site (Km)	Direction from Project Site	Co-ordinates	
				Latitude	Longitude
SS1	Project Site	--	--	19º23'44.07"N	75º42'22.00"E
SS 2	Shahgad	4.28	S	19º21'38.74"N	75º42'29.23"E
SS 3	Patharwala	2.80	ENE	19°23'27.76"N	75°45'18.09"E
SS 4	Kuran	4.90	SE	19º21'53.65"N	75º44'25.55"E
SS 5	Nalewadi	4.09	WNW	19º25'51.19"N	75º40'28.72"E
SS 6	Sasht Pimplagaon	6.29	WSW	19°23'26.69"N	75°38'48.89"E
SS 7	Parthawala Kh.	4.72	NE	19°25'17.87"N	75°44'25.95"E
SS 8	Mahakala	0.8	SE	19°23'26.98"N	75°42'41.84"E

Table 3.24 Soil Quality in the Study Area

Sr. No	Sampling Location									
	Parameters	**Unit**	**Project Site**	**Shahgad**	**Patharwala**	**Kuran**	**Nalewadi**	**Sasht Pimplagaon**	**Parthawala Kh.**	**Mahakala**
	Physical Characteristics									
1	Particle size distribution (%)	Total sand	23	27	26	29	30	25	26	29
2		Silt	49	51	50	48	49	48	50	48
3		Clay	28	22	24	23	21	27	24	23
4	Textural class		Loam	Loam	Loam	Loam	Loam	Loam	Loam	Loam
5	Bulk density	(gm/cm3)	1.36	1.32	1.31	1.28	1.35	1.34	1.38	1.32
6	Porosity	(%)	48.9	43.2	37.8	35.2	38.1	36.3	37.1	39.1
7	Water Holding Capacity	(%)	38.9	42.1	43.2	40.1	36.3	37.8	38.9	38.2
8	Moisture Content	(%)	9.17	2.5	1.24	3.77	1.93	3.01	1.39	6.92
9	Total Organic Matter	(%)	0.22	1.29	0.22	0.44	0.55	1.28	1.18	1.34
	Chemical Characteristics									
10	pH		7.85	7.09	7.33	7.22	7.36	8.16	7.34	7.74
11	EC	µS/cm	0.15	0.54	0.19	0.23	0.67	0.21	0.22	0.44
12	Ca++	mg/Kg	16.4	18.1	20.2	24.1	16.3	20.2	24.2	18.6
13	Mg++		1.94	5.56	2.92	2.92	3.86	2.9	3.82	2.88
14	Na+		50	53	12	30	24	21	42	32
15	Cl-		5. 98	12.96	11.9	9.82	4.92	5.36	3.86	4.16
	Macro nutrient									
16	Organic Carbon	(%)	0.13	0.54	0.22	0.26	0.32	0.74	0.69	0.78
17	N	(mg/Kg)	196	159.1	156.3	125.6	153.4	168.9	174.3	179.6
18	P		12.28	7.6	6.9	5.3	7.4	12	11.8	11.9
19	K		621	371	245	196	334	543	504	581
	Heavy Metals									

20	Fe	(%)	6.21	4.26	4.12	2.96	4.53	5.23	5.3	6.42
21	Cu	Mg/ kg	0.46	0.38	0.29	0.26	0.35	0.39	0.38	0.41
22	Ni	Mg/ kg	ND	ND	ND	ND	ND	ND	ND	ND
23	Zn	Mg/ kg	0.29	0.23	0.23	0.15	0.22	0.26	0.25	0.25
24	Pb	Mg/ kg	ND	ND	ND	ND	ND	ND	ND	ND
25	As	Mg/ kg	ND	ND	ND	ND	ND	ND	ND	ND
26	Al	Mg/ kg	ND	ND	ND	ND	ND	ND	ND	ND
27	Cr	Mg/ kg	ND	ND	ND	ND	ND	ND	ND	ND
28	Cd	Mg/ kg	ND	ND	ND	ND	ND	ND	ND	ND
29	Se	Mg/ kg	ND	ND	ND	ND	ND	ND	ND	ND
30	Hg	Mg/ kg	ND	ND	ND	ND	ND	ND	ND	ND
31	Ag	Mg/ kg	ND	ND	ND	ND	ND	ND	ND	ND
32	Mn	Mg/ kg	4.15	2.41	2.31	1.98	2.53	2.49	3.21	3.24

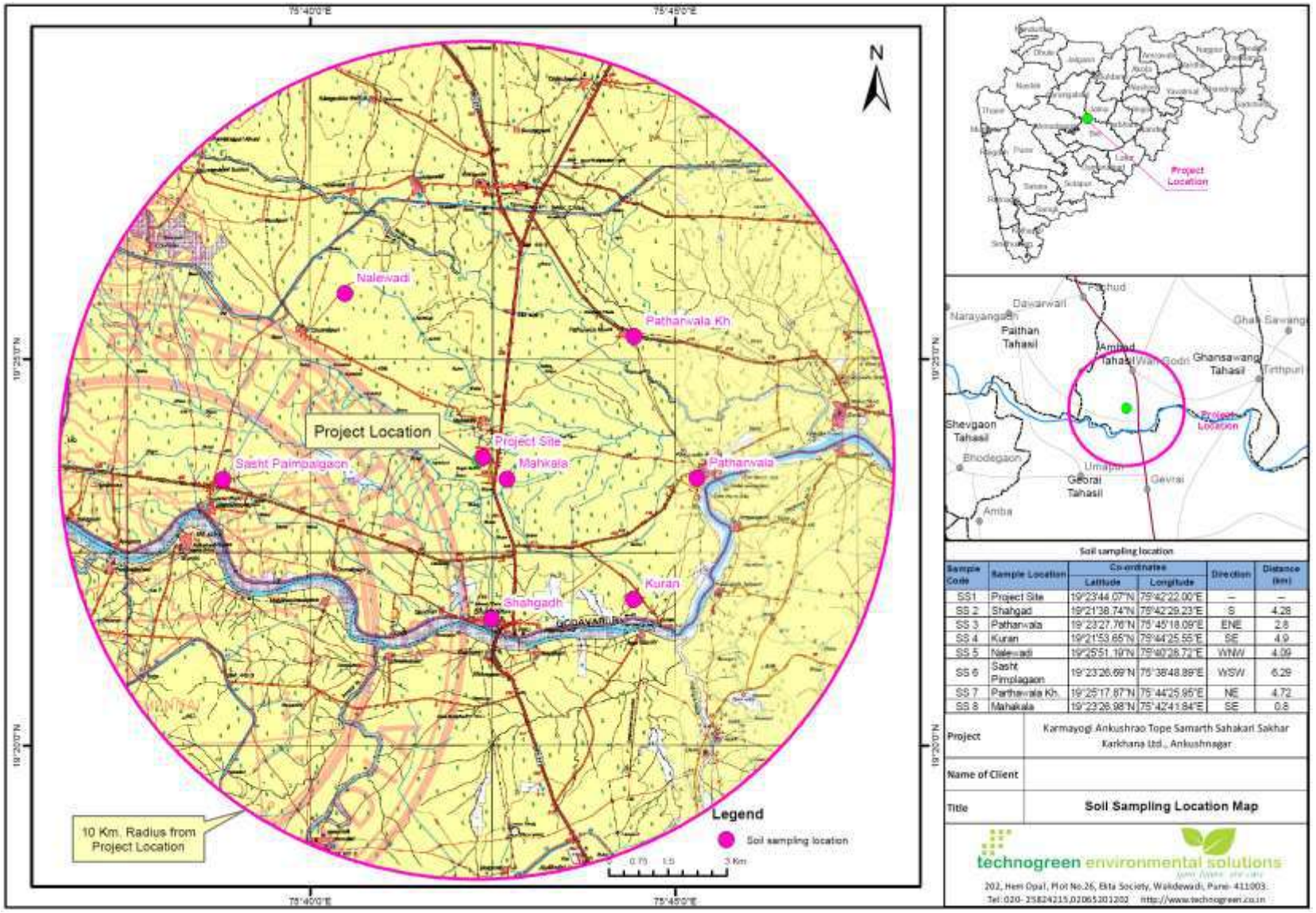


Figure 3.19 Soil Sampling Locations

3.21.4 Interpretation of Soil Quality of the study area

pH: The pH of the samples varied from 7.09 to 8.16. As per **Table 3.24**, it is found that pH of all the locations is slightly on alkaline scale.

Electrical Conductivity: Electrical Conductivity value ranges from 0.15 µS/cm to 0.67 µS/cm. Hence, as per **Table 3.25**, it can be stated that the soil is not harmful for germination or cropping.

Bulk Density: The bulk density of soil in the study area is found to be in the range of 1.28 - 1.38 g/cc. It can be observed from the results that the soil is ideal for plant growth.

Porosity: The porosity of soil observed in the study area ranged from 35.2 to 48.9 %. It is observed that Calcium and Magnesium concentrations are in the range of 16.3- 24.2mg/kg and 1.94- 5.56 mg/kg respectively whereas; Sodium and Potassium are in the range of 12- 53 mg/kg and 196- 621mg/kg respectively.

Organic matter is found to be in the range of 0.22- 1.34% and Phosphorus is present in soil more than sufficient limit i.e. in the range of 5.3- 12.28 mg/kg. When compared to standard **Table 3.25** Micro and Macro nutrients are found in ample amount. The soil porosity is found to medium hence, the water holding capacity of the soil will be medium. From above observations it can be concluded that soil moderately fertility in nature.

Soil Texture: As per **Table 3.24,** the sand percentage varied between 23.0 to 30.0 % and silt percentage varied from 48.0 to 51.0 % whereas clay percentage is in the range of 21.0 to 28.0 %. When obtained results are compared with standard soil texture classification given in **Figure 3.20** it can be concluded that soil texture of study area is Loam

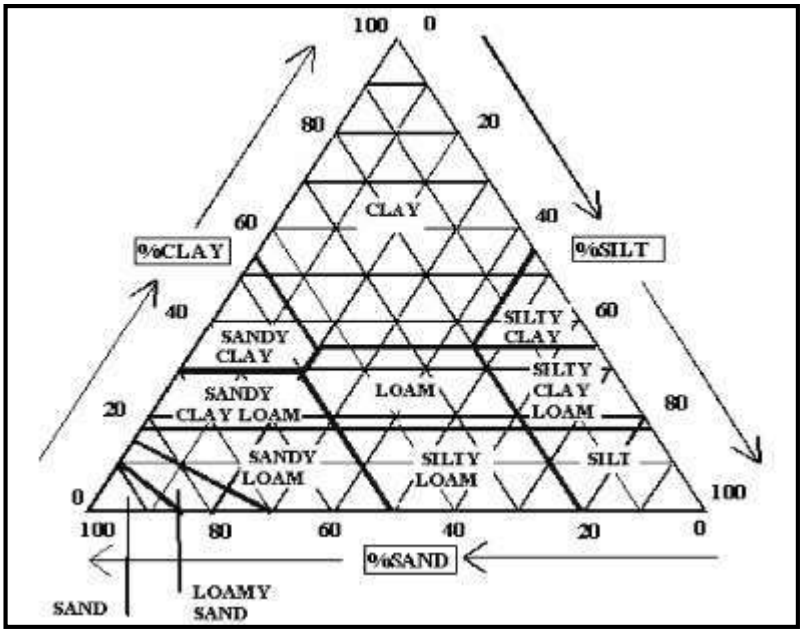


Figure 3.20 Soil Texture Classifications

Table 3.25 Standard Soil Classification

Sr. No.	Soil Test Parameter	Classification
1	pH	< 4.50 Extremely acidic
		4.51- 5.00 Very strongly acidic
		5.51-6.00 Moderately acidic
		6.01-6.50 Slightly acidic
		6.51-7.30 Neutral
		7.31-7.80 Slightly alkaline
		7.81-8.50 Moderately alkaline
		8.51-9.00 Strongly alkaline
		9.01 Very strongly alkaline
2	Salinity Electrical Conductivity (ppm) (1 ppm = 640 mho/cm) Upto 1.00	1.01-2.00 harmful to germination
		2.01-3.00 harmful to crops (sensitive to salts)
3	Organic Carbon (%)	Up to 0.2: very less
		0.21-0.4: less
		0.41-0.5 medium
		0.51-0.8: on an average sufficient
		0.81-1.00: sufficient
		>1.0 more than sufficient
4	Nitrogen (Kg/ha)	Up to 50 very less
		51-100 less
		101-150 good
		151-300 Better
		>300 sufficient
5	Phosphorus (Kg/ha)	Up to 15 very less
		16-30 less

		31-50 medium,
		51-65 on an average sufficient
		66-80 sufficient
		>80 more than sufficient
6	Potash (Kg/ha)	0 -120 very less
		120-180 less
		181-240 medium
		241-300 average
		301-360 better
		>360 more than sufficient

(Source: Hand Book of Agriculture, ICAR, New Delhi)

Table 3.26 Standard Soil Classification

Soil Fertility Level	Organic Carbon (%)	Available N kg/ha	Available P_2O_5 kg/ha	Available K_2O kg/ha
Very high	> 1.00	> 700	> 80.0	> 360
High	0.81- 1.00	561 – 700	64 – 80	301 – 360
Medium	0.61-0.80	421 – 560	48 – 64	241 – 300
Medium Low	0.41-0.60	281 – 420	32 – 48	181 – 240
Low	0.21-0.40	141 – 280	16 – 32	121 – 180
Very Low	< 0.20	< 140	< 16.0	< 120

(***Source**: Tondon H. L. S., 2005)*

3.22 Ecology & Biodiversity

The basic purpose of exploring the biological environment under Environmental Impact Assessment (EIA) is to assist in the decision making process and to ensure that the project options under consideration are bio-environmental friendly. EIA identifies ways of improving project environmentally by preventing, minimizing, mitigating or compensating for adverse impacts before construction and development phase. The present study on the biological assessment of the proposed project is based on field survey of the area supported by secondary data from various governmental and non-governmental sources.

3.22.1 Objective of the study

The objectives of this study were as follows:

1. To conduct detail study for Terrestrial and Aquatic environment for the proposed study area
2. To conduct detail study for floral/ faunal/ avifaunal elements in the study area.
3. To assess scheduled species in the study area (Rare, endangered, critically endangered, endemic and vulnerable).
4. To identify locations and features of ecological significance
5. To collect baseline data for the study area along with a description of the existing terrestrial and aquatic vegetation.

6. To identify impact of project during expansion of the present capacity on the biological environment

3.22.2 Activities undertaken during the study

Flora survey

i. Identification and documentation of Tree, shrub, herb, climber and grass species

ii. Analysis of scheduled taxa of the study area.

Fauna survey

i. Identification and Documentation of Avian, Reptilian, Amphibian, Mammal and other faunal diversity

ii. Observations by direct and indirect evidences

iii. Analysis of Scheduled species

iv. Study of Habitat/microhabitat for the faunal elements in the project site and surrounding areas within 10 km from the project boundary.

v. Photo documentation for flora and fauna (E – herbarium for flora)

3.22.3 Survey methodology

Flora

The present study on the floral assessment for the proposed project activity is based on extensive field survey of the area**.** The study has been conducted in early summer season. The unidentified plant species were identified with the help of secondary sources like educational Universities and forest department. Besides the collection of plant species, information was also collected with vernacular names of plant species made by local inhabitants. In this process the whole study area was divided into different sections to get the maximum diversity of plant species. The sampling sites were selected based on land use pattern, topography and floristic composition of the study area. Data on forest type, legal status and their extent in the study area has been collected from forest department. The other relevant data on biodiversity, economically important plant species and medicinal plant, rare and endangered species in the study area have been collected during site visit and from different secondary sources.

Fauna

The study of fauna takes substantial amount of time to understand the specific faunal characteristics of the area. The assessment of fauna has been done by extensive field survey of the area. During survey, Line Transect method was used for the study of mammals and Transact & Patch sampling

was used for Amphibians. In addition the following sources were also used during survey.

- Sighting during ecological studies
- Animal call
- Foot mark and excreta

During survey, the presence of wildlife was also confirmed from the local inhabitants depending on the animal sightings and the frequency of their visits in the project area which was later confirmed from different government offices like forest department, wildlife department etc.

Avifauna

During Birds survey actual counts of birds were made following the standard survey technique. Observations were made during a walk through in the chosen transect for sighting birds. The number of birds observed in each sampling location was directly counted and listing was made. Birds were noted, counted and identified with the help of 8X40 “Optima Zenith” binocular and standard field identification guides.

3.22.4 Flora of the study area

From the data collected, it has been observed the following variety of Trees & Shrubs in the study area. The detailed list of species is presented in **Table 3.27.** The name of observed plants is given along with their botanical names for easy identification.

Table 3.27 List of Flora of Study Area

Sr. No.	Scientific Name	Local Name	Family
1.	*Abrus precatorius*	Chanoti	Fabaceae
2.	Acacia auriculiformis	Australian acacia	Fabaceae
3.	Acacia leucophlea	Subabul	Fabaceae
4.	*Acacia nilotica*	Babul	*Fabaceae*
5.	*Adhatoda vasica*	Adulsa	Acanthaceae
6.	*Aegle marmelos*	Bel	*Rutaceae*
7.	*Agave Americana*	Agave	Asparagaceae
8.	Ailanthus excelsa	Maharukh	Simaroubaceae
9.	*Albizia lebbeck*	Siris	*Fabaceae*
10.	*Albizia procera*	Safed Siris	Fabaceae
11.	*Aloe vera*	Gorphad	Xanthorrhoeaceae
12.	Alstonia scholaris	Saptaparni	Apocynaceae
13.	*Annona reticulate*	Ramphal	Annonaceae
14.	*Annona squamosa*	Sitaphal	Annonaceae
15.	Anthocephalus cadamba	Kadamba	Rubiaceae
16.	*Argemone Mexicana*	Pila Dhatura	Papaveraceae

17.	Asparagus racemosus	Shatavari	Asparagaceae
18.	*Azadirachta indica*	Neem	Meliaceae
19.	*Barleria cristata*	Koranta	Acanthaceae
20.	*Bauhinia purpurea*	Bahunia	Fabaceae
21.	*Bauhinia racemosa*	Ari	Fabaceae
22.	*Bombax ceiba*	Semal	Malvaceae
23.	Bougainvillea glabra	Bougainvel	Nyctaginaceae
24.	Buchanania lenzen	Char	Anacardiaceae
25.	*Butea monosperma*	Palash	Fabaceae
26.	*Calotropis gigantean*	Rui	Apocynaceae
27.	*Calotropis procera*	Rui	Asclepiadaceae
28.	Carica papaya	Papaya	Caricaceae
29.	Carissa caronulas	Caranda	Apocyanaceae
31.	*Cassia fistula*	Amaltas	Fabaceae
32.	*Cassia tora*	Puwad	Fabaceae
33.	Citrus lemon	Nimbo	Rutaceae
34.	Cocos nucifera	Coconut	Arecaceae
35.	*Crotalaria juncea*	Bansan	Fabaceae
36.	*Cuscuta reflexa*	Amarvel	Convolvulaceae
37.	*Cymbopogon martini*	Rosha	Poaceae
38.	*Dalbergia latifolia*	Shisham	Fabaceae
39.	*Dalbergia sissoo*	Shisham	Fabaceae
40.	*Delonix regia*	Gulmohar	Fabaceae
41.	*Dendrocalamus strictus*	Baus-Bongu	Poaceae
42.	*Emblica officinalis*	aawla	Phyllanthaceae
43.	*Eucalyptus sp.*	*Eucalyptus*	Myrtaceae
44.	*Euphorbia hirta*	Asthma Weed	Euphorbiaceae
45.	*Euphorbia pulcherrima*	Euphorbia	Euphorbiaceae
46.	*Euphorbia tirucali*	Euphorbia	Euphorbiaceae
47.	*Ficus benghalensis*	Vad	Moraceae
48.	*Ficus racemosa*	Gular, Umar	Moraceae
49.	*Ficus religiosa*	Pipal	Moraceae
50.	Hemidesmus indicus	karala	Apocynaceae
51.	*Hibiscus rosa-sinensis*	Jaswand	Malvaceae
53.	*Ipomoea carnea*	Beshram	Convolvulaceae
54.	*Jatropha curcas*	Ratanjyot	Euphorbiaceae
55.	*Lantana camara*	Ghaneri	Verbenaceae
56	*Lawsonia inermis*	Mehendi	Lythraceae
57	*Mangifera indica*	Aam	Anacardiaceae
58.	*Morinda tinctoria*	Mungna	Rubiaceae

59.	*Musa paradisiaca*	Banana	Musaceae
60.	*Nerium indicum*	Kaner	Apocynaceae
61.	Nyctanthes arbor-tristis	Parijatak	Oleaceae
62.	*Ocimum gratissimum*	Vantulsi	Lamiaceae
63.	*Parthenium hysterophorus*	Gajar Ghaas	Asteraceae
64.	Peltophorum pterocarpum	Peltophorum	Fabaceae
65.	*Pithecellobium dulce*	Jungle Jalebi	Fabaceae
66.	*Plumeria rubra*	chafa	Apocynaceae
67.	*Pongamia pinnata*	Karang	Fabaceae
68.	Prosopis Juliflora	Prosopis	Fabaceae
69.	*Psidium guava*	Amrud	Myrtaceae
70.	*Ricinus communis*	Arandee	Euphorbiaceae
71.	Samania saman	Raintree	Fabaceae
72.	Sarca asoka	Ashoka	Caesalpiniaceae
73.	*Sida acuta*	Bala	Malvaceae
74.	*Sida rhombifolia*	Atibala	Malvaceae
75.	*Solanum nigrum*	Kangni	Solanaceae
76.	*Syzygium cumini*	Nerale	Myrtaceae
77.	*Tamarindus indica*	Chinch	Caesalpiniaceae
78.	Tectona grandis	Sagwani, Tegu, Sagar	Verbenaceae
79.	Terminalia arjuna	Hole-matti	Combretaceae
80.	*Thespesia lampas*	Rankapas	Malvaceae
81.	*Tribulus terrestris*	Gokharu	Zygophyllaceae
82.	*Tridax procumbens*	Kumru	Asteraceae
84.	*Vitex negundo*	Vaaili	Lamiaceae
85.	*Ziziphus mauritiana*	Bor	Rhamnaceae

Source: 1. Species identified by the Survey team during site visit
2. Consultation with local people

3.22.5 Fauna of the study area

Faunal studies include inventory of birds, mammals, reptiles, butterflies found within study area. Species were recorded on the basis of observations, direct sighting, evidences found during visits & discussions with the local peoples. List of Fauna of study area is given below in **Table 3.28**

Table 3.28 List of Fauna Observed in Study Area

Sr. No.	Scientific Name	Common Name	Family	Status in Wildlife (Protection) Act-1972	Status in IUCN Category
Mammals					
1.	*Canis aureus*	Jackal	Canidae	Schedule II	Least Concern
2.	*Funambulus pennanti*	Palm Squirrel	Sciuridae	Not Enlisted	Least Concern
3	*Herpestes edwardsii*	Common Mongoose	Herpestidae	Schedule II	Least Concern
4	*Lepus nigricollis*	Indian Hare	Leporidae	Schedule IV	Least Concern
5	*Presbytis entellus*	Common Langur	Cercopithecidae	Schedule II	Not Evaluated
6	*Rattus rattus*	Common House Rat	Muridae	Not Enlisted	Least Concern
Reptiles and Amphibians					
7	*Bungarus caeruleus*	Krait	Elapidae	Schedule IV	Not Evaluated
8	*Ramphotyphlops braminus*	Common Blind snake	Typhlopidae	Schedule IV	Not Evaluated
9	*Vipera russelli*	Russel viper	Viperidae	Schedule IV	Not Evaluated
10	*Dryophis mycterizans*	*Common green whip snake*	Colubridae	Schedule IV	Not Evaluated
11	*Ptyas mucosus*	Common Rat Snake	Colubridae	Schedule II	Not Evaluated

Source: 1. Species identified by the Survey team during site visit
2. Consultation with concern state forest officials and local people

3.22.6 Butterflies of the study area

In many regions of the world, Butterflies are widely accepted as ecological indicators of ecosystem health. Many of their physiological tolerances, such as light, temperature and habitat requirements, have been quantified and correlations with changes in ecosystem conditions have been demonstrated. In addition, butterflies are small, have high reproductive rates and are at a low trophic level that allows them to quickly respond to environmental stress.

Because of their specific habitat and landscape requirement, are very sensitive to changes in landscape and are reliable indicators of ecosystem. During survey 17 species of butterfly were observed from four different families in the study area. Nymphalidae was the most dominant family with 12 species followed by Pieridae and Danaidae, Papilionidae The lists of Butterflies observed in the study area are presented in Table No 3.29

Table 3.29 List of butterfly species observed in the study area

Sr. No.	Common Name	Scientific Name	Family
1	Blue pansy	Précis orithyia	Nymphalidae
2	Chocolate pancy	Junonia iphita	Nymphalidae
3	Common crow	Euploea core	Nymphalidae
4	Common Emigrant	Catopsilia crocale	Pieridae
5	Common four ring	Ypthima huebneri	Nymphalidae
6	Common grass yellow	Eurema hecade	Pieridae
7	Common leopard	Phalanta phalantha	Nymphalidae
8	Common rose	Pachliopta aristolochiae	Papilionidae
9	Common sailor	Neptis hylas	Nymphalidae
10	Common sergeant	Athyma perius	Nymphalidae
11	Danaid eggfly	Hypolimnas misippus	Nymphalidae
12	Glassy Tiger	Parantica aglea	Nymphalidae
13	Grey pancy	Junonia atlites	Nymphalidae
14	Indian jezebel	Delias eucharis	Pieridae
15	Peacock pansy	Précis almanac	Nymphalidae
16	Plain tiger	Danaus chrysippus	Danaidae
17	Striped Tiger	Danaus genutia	Nymphalidae

3.22.7 Avifauna of the study area

Diversity of avifauna is one of the most important ecological indicators to evaluate the quality of habitats. Now-a-days, avifaunal diversity has been decreasing due to the destruction of natural habitats and human disturbances. Random destruction of natural habitats by cutting nesting trees and foraging plants for commercial use of woods and lands are the main factor responsible for narrow down in avian foraging habitat and their nesting sites. Thus, many species of birds may be forced to inhabit in the urban areas and constrain them to breed there. Birds are essential animal group of an ecosystem and maintain a trophic level. Therefore, detail study on avifauna and their ecology is important to protect them.

During overall survey in the study area, a total of 59 bird species was recorded. List of birds observed in the study area are presented in **Table no 3.30**

Table No 3.30 List of bird species observed in the study area

Sr no.	Common name	Scientific Name	Family	Status as per WPA 1972	IUCN Status
1	Barn swallow	Hirundo rustica	Hirundinidae	Schedule IV	Least Concern
2	Baya weaver	Ploceus philippinus	Ploceidae	Schedule IV	Least Concern
3	Black – Winged Kite	Elanus caeruleus	Accipitridae	Schedule IV	Least Concern
4	Black drongo	Dicrurus macrocercus	Dicruridae.	Schedule IV	Least Concern
5	Black Ibis	Pseudibis papillosa	Threskiornithidae	Schedule IV	Least Concern
6	Black stork	Ciconia nigra	Ciconiidae	Schedule IV	Least Concern
7	Black tailed Godwit	Limosa limosa	Scolopacidae	Schedule IV	Near threatened
8	Blossom – head Parakeet	Pesitacula Cyanocephala	Pesittacidae	Schedule IV	Least Concern
9	Blue Rock Pigeon	Columba livia	Columbidae	Schedule IV	Least Concern
10	Brahminy Starling	Sturnus Pagodarum	Sturnidae	Schedule IV	Least Concern
11	Caspian tern	Hydroprogne caspia	Laridae	Not enlisted	Least Concern
12	Cattle egret	Bubulcus ibis	Ardeidae	Schedule IV	Least Concern
13	Citrine wagtail	Motacilla citreola	Motacillidae	Schedule IV	Least Concern
14	Common grey Hornbill	Ocyceros birostris	Bucerotide	Schedule IV	Least Concern
15	Common Indian Nightjar	Caprimulgus asiaticus	Caprimulgidae	Schedule IV	Least Concern
16	Common Myna	Acridotheres tristis	Sturnidae	Schedule IV	Least Concern
17	Common Pariah Kite	Milvus migrans	Accipitridae	Schedule IV	Least Concern
18	Common tern	Sterna hirundo	Laridae	Schedule IV	Least Concern
19	Crow Pheasant	Centropus sinensis	Cuculidae	Schedule IV	Least Concern
20	Gery Partridge	Francolinus pondicerianus	Phasianidae	Schedule IV	Least Concern
21	Grey heron	Ardea cinerea	Ardeidae	Schedule IV	Least Concern
22	Hoopoe	Upupa epops	Upupidae	Schedule IV	Least Concern
23	House Crow	Corvus splendens	Corvidae	Schedule IV	Least Concern
24	House Sparrow	Passer domesticus	Passerinae	Schedule IV	Least Concern
25	Indian Cuckoo	Cuclus micropterus	Cuculidae	Schedule IV	Least Concern
26	Indian peafowl	Pavo cristatus	Phasianidae	Schedule I	Least Concern
27	Indian pond heron	Ardeola grayii	Ardeidae	Schedule IV	Least Concern
28	Jungle Babbler	Turdoides striatus	Timaliinae	Schedule IV	Least Concern
29	Jungle Crow	Corvus macrorhynchos Wagler	Corvidae	Schedule IV	Least Concern
30	Koel	Eudynamys scolopacae	Cuculidae	Schedule IV	Least Concern
31	Large Egret	Casmoerodius albus	Ardeidae	Schedule IV	Least Concern

32	Little Brown Dove	Streptopelia sengalensis	Columbidae	Schedule IV	Least Concern
33	Little cormorant	Microcarbo niger	Phalacrocoracidae	Schedule IV	Least Concern
34	Little Egret	Egretta garzetta	Ardeidae	Schedule IV	Least Concern
35	Little ringed Plover	Charadrius dubius	Charadiriidae	Not enlisted	Least Concern
36	Long tailed shrike	Lanius schach	Laniidae	Schedule IV	Least Concern
37	Median Egret	Mesophoyx intermedia	Ardeidae	Schedule IV	Least Concern
38	Northern shoveler	Spatula clypeata	Anatidae	Not enlisted	Least Concern
39	Pied bushchat	Saxicola caprata	Muscicapida e	Schedule IV	Least Concern
40	Purple – rumped sunbird	Nectarinia Zeylonica	Nectariniidae	Schedule IV	Least Concern
41	Purple Sunbrid	Nectarinia asiatica	Nectariniidae	Schedule IV	Least Concern
42	Purple swamphen	Porphyrio porphyrio	Rallidae	Schedule IV	Least Concern
43	Red – vented Bulbul	Pycononotus cafer	Pycononotidae	Schedule IV	Least Concern
44	Red Munia	Amandava amandava	Estrildidae	Schedule IV	Least Concern
45	Red wattled lapwing	Vanellus indicus	Charadriidae	Schedule IV	Least Concern
46	Rose – ringed Parakeet	Pesitacula Kramri (Scopoli)	Pesittacidae	Schedule IV	Least Concern
47	Sand plover	Charadrius mongolus	Charadriidae	Schedule IV	Least Concern
48	Small Bee – eater	Merops Orientalis	Meropidae	Schedule IV	Least Concern
49	Small Blue Kingfisher	Alcedo athhis	Alcedinidae	Schedule IV	Least Concern
50	Spotted Dove	Streptopelia chinensis	Columbidae	Schedule IV	Least Concern
51	Spotted Munia	Lonchura Punctulata	Estrildidae	Schedule IV	Least Concern
52	Spotted owlet	Athene brama	Strigidae	Schedule IV	Least Concern
53	White – breasted Kingfisher	Halcyon smyrnensis	Alcedinidae	Schedule IV	Least Concern
54	White – throated Munia	Lonchura Malabarica	Estrildidae	Schedule IV	Least Concern
55	White browed wagtail	Motacilla maderaspatensis	Motacillidae	Schedule IV	Least Concern
56	White throated kingfisher	Halcyon smyrnensis	Alcedinidae	Schedule IV	Least Concern
57	Wire tailed swallow	Hirundo smithii	Hirundinidae	Schedule IV	Least Concern
58	Yellow – wattled Lapwing	Vanellus malabricus	Charadiriidae	Schedule IV	Least Concern
59	Yellow wagtail	Motacilla flava	Motacillidae	Schedule IV	Least Concern

3.22.8 Observations

From the data collected in above mentioned Table 3.27, and 3.28 it can be observed that approx. 85 species of trees & shrubs were observed within the study area. Common trees *Albizia saman*, *Terminalia catappa*, *Spathodea campanulata*, *Peltophorum pterocarpum*, *Cassia siamea* few of *Mangifera indica*, *Azadirchta indica* and varieties of Ficus were observed in the study area.

From the faunal study it was observed that there were 59 different species of birds, 17 species of butterfly's, 6 species of mammals, 5 species of amphibians and reptiles in the study area.

None of the species were found in Schedule 1 as per Wildlife Protection Act, 1972. In the project area green belt is developed with native species. Pollution load of the proposed expansion will be minimal and will not affect the Flora and Fauna of the study area.

3.23 Socio-Economic Environment

Major developmental activities in industrial sector are required for economical development as well as creation of employment opportunities (direct / indirect) and to meet the basic / modern needs of the society, which ultimately results in overall improvement of quality of life through economical, health, education nutrition status in project region, state as well as the country. The project is also expected to generate/discharge different types of pollutants in the surrounding environment. They may cause natural resource degradation, ecological and human health risks, unless the development is planned properly and implemented in an environmentally sustainable manner through implementation of pollution prevention, mitigation and control measures. In this manner all developmental projects have direct as well as indirect relationship with socioeconomic aspect, which also include public acceptability for new developmental projects. Thus, the study of socio-economic component incorporating various facets related to prevailing social and cultural conditions and economic status of the project region is an important part of EIA study. The study of socio-economic component incorporating various facts related to socio-economic condition in the area is an integral part of EIA process. This includes demographic structure, population dynamics, infrastructure resources, health status of the community and economic attributes refers to employment, industrial development and sustainability of the project in view of financial terms.

3.23.1 Socio-Economic survey

Secondary data from Census 2011 was taken for the project site and 10km radius study area of the project site

3.23.2 Reconnaissance

The revised Socio Economic study for the project M/s. KarmayogiAnkushrao Tope Samarth Sahakari Sakhar Karkhana Ltd. Ankush village, AmbadTaluka, District Jalana, State

3.23.3 Baseline status

Demographic Structure

The demographic structure of the study area was derived primarily from data of Census record of Jalna district,Ambad block and twenty three villagesof Maharashtra state. The Demographic structures of each village in the study area as per Census 2011 are presented in **Table 3.31** Summary of demographic structure is presented in **Table 3.32**

Table 3.31 Demographic Structure of Each Village in the Study Area

Sr. No	Villages	Area in Hectares	House Hold	Population			SC	ST	Literates			Main Worker	Marginal Worker	Non Worker
				TP	M	F			TL	M	F			
Ambad Block														
1.	Nagzari	1087.55	238	1184	626	558	30	0	680	409	271	508	137	539
2.	Dodadgaon	1927.52	248	1243	623	620	240	1	692	417	275	423	238	582
3.	PithoriSirasgaon	1711.46	593	3036	1567	1469	407	46	1691	1012	679	1554	144	1338
4.	Dhakalgaon	665.16	714	3830	1916	1914	70	49	2048	1179	869	1856	155	1819
5.	SoundalgaonKh.	571.88	98	520	269	251	48	12	303	175	128	280	3	237
6.	Ramgavhan Bk.	1425.82	199	1036	516	520	249	24	597	344	253	575	37	424
7.	Taka	425.25	323	1606	829	777	180	179	985	574	411	799	7	800
8.	ChandanpuriKh.	249.18	217	1046	544	502	125	115	549	330	219	640	7	399
9.	Chandanpuri Bk.	628.74	68	248	140	108	246	0	137	84	53	130	8	110
10.	Dahyala	297.93	334	1807	935	872	246	63	1072	647	425	738	175	894
11.	Renapuri	486	112	489	250	239	104	0	290	179	111	280	4	205
12.	Nalewadi	1165	359	1761	906	855	314	29	1169	676	493	975	25	761
13.	AntarwaliSarathi	816.67	605	2866	1471	1395	347	85	1771	1057	714	1566	14	1286
14.	Wadigodri	1127	776	3737	1879	1858	498	193	2426	1395	1031	1446	491	1800
15.	PatharwalaKh.	1199.83	337	1773	905	868	408	42	1026	636	390	1069	21	683
16.	Churmapuri	332	531	2753	1420	1333	144	0	1470	879	591	1273	277	1203
17.	Apegaon	323	175	642	343	299	129	13	433	254	179	247	1	394
18.	Domalgaon	465.5	276	1332	677	655	261	92	758	444	314	560	261	511
19.	Gori	368	85	392	211	181	116	0	255	157	98	166	67	159
20.	Gandhari	468	241	1125	559	566	257	131	574	339	235	424	44	657
21.	Shahagad	526.38	1374	7866	3979	3887	788	36	4943	2684	2259	2703	351	4812
22.	Belgaon	1580.16	123	629	341	288	64	0	429	256	173	246	71	312
23.	Rui	2793.28	611	3019	1549	1470	384	37	1527	899	628	1129	42	1848
Total		**20641.31**	**8637**	**43940**	**22455**	**21485**	**5655**	**1147**	**25825**	**15026**	**10799**	**19587**	**2580**	**21773**

Source: Primary Census Abstract and Village Directory 2011,Jalna,-District, State- Maharashtra

Table 3.32 Summary of Demographic Structure in Study Area

Sr. No	Demographic Parameters	10 km Radius Area Details
1.	Name of State	Maharashtra
2.	Name of District	Jalna
3.	Name of Block	Ambad
4.	No. of Total Villages	23
5.	Total Area village(ha)	20641.31
6.	Total No. of Households	8637
7.	Total Population	43940
8.	Density of Population (km2)	213
9.	Sex ratio (N0. of female/1000 males)	956
10.	Total Male	22455(51.10%)
11.	Total Female	21485(48.89%)
12.	Scheduled castes	5655(12.86%)
13.	Scheduled Tribes	1147(2.61%)
14.	Literate	25825(58.77%)
15.	Main Worker	19587(44.58%)
16.	Marginal Worker	2580(5.87%)
17.	Non Worker	21773(49.55%)

Source: Primary Census Abstract and Village Directory 2011,Jalna,-District, State- Maharashtra

The salient features of Demographic Structure are as follows:

- The study area covers one Jalna district of Maharashtra State, one block Ambadand total 23 villages in the study area. Total study area consisting of 20641.31ha with the population density of 212 person / km².
- Total population of the region (Census 2011) is worked out as 43940 out of which 22455(51.10%) are male and 21485(48.89%) female.
- Out of the total population, Scheduled Caste and Scheduled Tribe are 5655(12.86%) and 1147(2.61%) respectively.
- The literacy rate of the total population is worked out to 25825(58.77%). Male literacy 15026 (58.18%), and female literacy is 10799 (41.82%) respectively.
- The total population of main worker, marginal worker and non-worker category are 19587(44.58%), 2580(5.87%) and 21773(49.55%) respectively.
- The majority pattern of the cultivator worker 8715(44.49%) and agricultural worker is 7389 (37.72%). There are 341 (1.74%) and 3142 (16.04%) as household worker and other worker.

- Sex ratio (number of females per thousand of males) in the region is recorded 956 indicating male population is marginally higher in the region as compared with the female.

The graphical representation of male and female composition of the study area is presented in below **Figure 3.21**

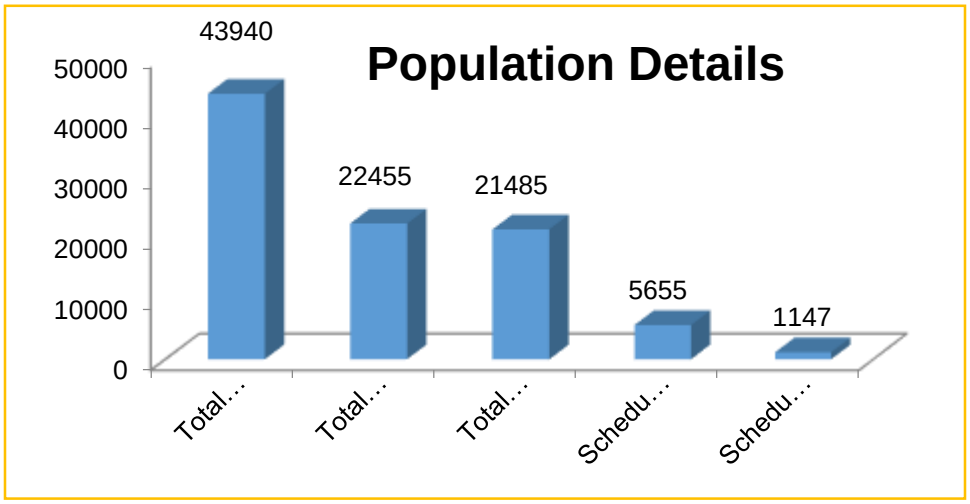


Figure 3.21 Demographic Structure

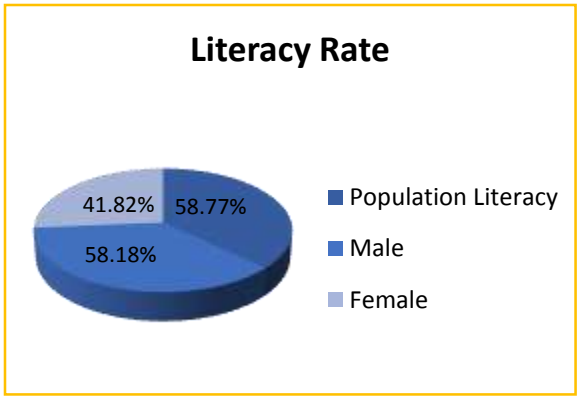


Figure 3.22 Literacy rate of Male Female

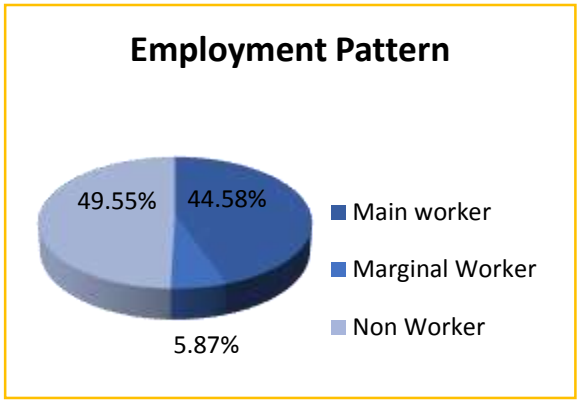


Figure 3.23 Employment Rate

3.24 Infrastructure Resources

The infrastructure resources in the study area with reference to education, medical facility, water supply, post, transportation, communication and power supply are satisfactory.

Education: According to village directory, all villages having education facilities such as primary school and Secondary School. Due to better transport from villages to taluka place Ambad block and district place of the study area, Students have opportunity to travel for better education.

Public Health Services: Very few villages in the study area are having medical facilities. Some villages having Health facility like; Sub center, primary health center and some villages having private clinic, for better medical treatment, the people move to nearby town and district place, where medical facilities are available.

Drinking Water: According to the censes recoerd, people are using Tap water, tank ,well tube, for purposes of drinking water; however, pond water also used of other purpose.

Power Supply: According to the censes record, Electricity is available in the study area. All purpose is using Electricity facility in the study region.

Communication and Transportation: Almost villages having good road facility in the study area.Some villages having kachha road. It was observed that bus services are limited and primarily buses run in the whole day, on state and national highway. Regular local transport facility is available in the villages, like auto rickshaw. All villages having satisfactory road facility in the study area. Some villages are having sub post office facilities, and all villages having phone facility.

Road Approach: All villages are having road, approach routes either paved road, mud road or foot path.

Banks: All centralized bank in Taluka place and district places, People are using bank facility for saving purpose.

3.24.1 Economic Attributes

Work

Work is defined as participation in any economically productive activity with or without compensation, wages or profit. Such participation may be physical and/or mental in nature. Work involves not only actual work but also includes effective supervision and direction of work. It even includes part time help or unpaid work on farm, family enterprise or in any other economic activity. All persons engaged in “work” as defined above are workers. The main point to note is that the activity should be economically productive. Reference period for determining a person as worker and non-worker is one year preceding the date of enumeration.

Main worker

A person who has worked for major part of the reference period (i.e. six months or more during the last one year preceding the date of enumeration) in any economically productive activity is termed as “Main worker”.

Marginal worker

A person who worked for less than six months of the reference period (i.e. in the last one year preceding the date of enumeration in any economic activity is termed as “Marginal worker”

Non worker

A person who has not worked at all in any economically productive activity during the reference period (i.e. last one year preceding the date of enumeration is termed as “Non worker”

Main Worker Four types

a) Cultivator labour

For purposes of the Census a person is classified as cultivator if he or she is engaged in cultivation on land owned or from government or from private persons or institutions for payment in money, kind or share. Cultivation also includes effective supervision or direction in cultivation. 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 fibre crop, cotton, cinchona and other medicinal plants, fruit growing, vegetable growing or keeping orchards or groves, etc. Cultivation does not include the plantation crops like tea, coffee, rubber, coconut and betel-nuts (areca).

b) Agricultural labour

A person who works on another person‟s land for wages in cash or kind or share is regarded as an agricultural labour. She/he has no risk in the cultivation, but merely works on another person‟s land for wages. An agricultural labour has no right of lease or contract on land on which she/he works.

c) Household industry worker

Household industry is defined as an industry conducted by one or more members of the household at home or within the village in rural areas and only within the precincts of the house where the household lives in urban areas. The larger proportion of workers in household industry should consist of members of the household. The industry should not be run on the scale of a registered factory which would qualify or has to be registered under the Indian Factories Act and should be engaged in manufacturing, processing, servicing and repairs of goods. The activity relate to production, processing, servicing, repairing or making and selling of goods. It does not include professions such as a pleader, Doctor, Musician, Dancer, Waterman, Astrologer, Dhobi, Barber, etc. or merely trade or business, even if such professions, trade or services are run at home by members of the household.

d) Other worker

A person who has been engaged in some economic activity during the last year of reference period but not as a cultivator or agricultural labour or worker in Household Industry. The type of workers that come under this category include all government servants, municipal employees, teachers, factory workers, plantation workers, those engaged in trade, commerce, business, transport, banking, mining, construction, political or social work, priests, entertainment artists, etc. In fact, all those workers other than cultivators or agricultural labours or household industry workers are „Other Workers".

The classification of workers is related with their occupation. Economic resource based of any region mainly depends upon its economically active group i.e. the working population involved in productive work. Work may be defined as participation in any economically productive activity. Such participation may be physical or mental in nature.Work involves not actual work but also effective supervision and direction of work. It also includes unpaid work on farm or in family enterprise. There are different types of workers that may be classified as under with main workers employment pattern given in **Table 3.33**

Table 3.33 Main Worker Employment Pattern

Sr. No.	Villages	Main Cultivator	Main Agriculture	Main Household	Main Other Worker
Ambad Block					
1.	Nagzari	253	186	1	68
2.	Dodadgaon	272	114	1	36
3.	PithoriSirasgaon	842	590	22	100
4.	Dhakalgaon	1114	291	14	437

5.	SoundalgaonKh.	130	121	6	23
6.	Ramgavhan Bk.	223	319	8	25
7.	Taka	655	103	7	34
8.	ChandanpuriKh.	422	160	4	54
9.	Chandanpuri Bk.	21	90	2	17
10.	Dahyala	229	456	6	47
11.	Renapuri	191	83	0	6
12.	Nalewadi	473	290	83	129
13.	AntarwaliSarathi	494	989	6	77
14.	Wadigodri	458	402	61	525
15.	PatharwalaKh.	500	523	7	39
16.	Churmapuri	742	338	10	183
17.	Apegaon	170	55	7	15
18.	Domalgaon	199	317	12	32
19.	Gori	90	44	0	32
20.	Gandhari	90	267	3	64
21.	Shahagad	450	1121	47	1085
22.	Belgaon	83	136	0	27
23.	Rui	614	394	34	87
Total		**8715**	**7389**	**341**	**3142**

Source: Primary Census Abstract 2011,Jalna,-District, State- Maharashtra

3.24.2 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), Sub Centers and Community Health Center.

Diarrhea / Cholera, Malaria, eye disease, tuberculosis, respiratory infection, skin disease,joint pain and Unhygienic are the general health problem which are attributed due to improper sanitation, mosquito nuisance and water logging. Malaria is one of the most frequently occurring diseases and also respiratory infection in the region. Lack of building, shortage of manpower and inadequate provision of drug supplies are hampering the Operationalization of these units.

3.24.3 Cultural and Aesthetic Attributes

Tourism is an important aspect of human life. It is a part of the service sector of an economy and is a big source of employment generation and foreign exchange earnings. Tourism has become a knowledge based industry. Tourism can be for sightseeing, holidaying, education, business, medical treatment, rejuvenation of mind and body etc. In many countries tourism is treated as an industry.

a) Matsodari Devi Temple

This is located at Ambad which is 21km away from the Jalna city. This temple is built on a hill. It is known by this name because of the shape of a fish called matsya. This temple is one of the oldest temples in the Jalna district.

b) Mazaar-E-MaulaiNoorudinSaheb

The Mausoleum of MoulaiNuruddin named Mazaar-E-Maulai is at AtDongaonTq.Ambad. MoulaiNuruddin was the a "Walī al-Hind" (representative/caretaker for India) of DawoodiBohradawat, was designated by the Dā'ī, the center of Yemen to run the dawat in India. MoulaiNuruddin went to Cairo, Egypt, to learn, and went to India in 467 AH. and went to the Deccan. He died on Jumadi al-Ula 11 at DongaonTq.Ambad, Dist.Jalna.

3.24.4 Sampling Methodology

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 labours, unemployed group etc. Judgmental and purposive sampling method includes the right cases from the total population that helps to fulfill the purpose of study needs.

3.24.5 Data Collection Method

In order to assess and evaluate the likely impacts arising out of any developmental projects on socio-economic environment, it is necessary to gauge the apprehensions of the people in the project area. For the process of data collection through primary and secondary sources certain methods are used are given below

3.24.5.1 Field Survey and Observations

Field survey and observations is made at each sampling villages and the quality of life of that region is studied. Visits are made at hospitals, primary health centres and sub-centres 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

3.24.5.2 Interview Method

Structured interview method is used to collect data regarding the awareness and opinion from the sample selected of the various socio-economic sections of the community. Structured interviews involve the use of a set of predetermined questions that includes fixed and alternative questions. The questionnaire mainly highlights the parameters such as income, employment

and working conditions, housing, food, clothing, water supply, sanitation, health, energy, transportation and communication, education, environment and pollution to assess the quality of life of that particular region and general awareness and opinion of the respondents about the project. Interview method helps to collect more correct and accurate information as the interviewer is presented during the field survey. Socio-economic survey was conducted in 18 villages within the study area located in all directions with reference to the project site. The respondents were asked for their awareness / opinion about the project and also the impacts of the project which is an important aspect of socio-economic environment, viz. job opportunities, education, health care, transportation facility and economic status.

Observations during Socio-economic Survey

The salient observations recorded during survey in the study area are:

- Almost villages having Gram panchyat and some villages having group grampanchayat.
- All villages are having Anganwadi facilities. Some villages having primary school.
- In most of the villages having Asha workers.
- The survey reported that most of the villages have primary and middle school facility, for further education student have to go about 3 to 25 km away. Maximum educational level of the study area is up to 10th standard. In the study area observed that most of student choose English medium for education .For higher & technical education people have to go to Taluka place and District place.
- Communication facilities are very good; people are using mobile cell phone. Dish TV and internet facilityis also available in the study area.
- The survey area cover national highway NH-211 Solapur-Aurangabad-dhule road.
- A road approach is mainly pakka road. Road construction is very good. Each and every village connects to the pakka(main) road. For travelling purpose government bus service and auto are sources available for villagers in this region.
- Tap water, Bore well, tank water, well are the main source of drinking water supply in the region. There is no drinking water problem.
- Godaveri the biggest river in Maharashtra its cover some villages in the project site and other is Vidrupa and Amrut river also cover the project site.
- Sanitation facilities are good condition. 70% villagers are using toilets.

- Health condition of villagers is good in this area; villagers are satisfied with the health centers because they are getting proper treatment from Government Hospitals. Private clinics are also available in study area.
- Electricity is available in almost all the villages. Most of the villages having irrigation facility through electricity. Electricity use for all purpose in the study area.
- LPG gas and Wood is major fuel for cooking purpose; kerosene is also used in some villagers.
- Self Help Group (SHG) is actively strong in maximum villages. It's very useful for women empowerment and development of small types of business activities
- Marathi is the principal and official language of the District and is the mother tongue. Hindi, Urdualso known.Few people know English, because day by day increasing English medium educational facility

3.24.5.3 Awareness and Opinion of People about the Project

- An attempt has been made to know the awareness and opinion of the people about proposed project
- Most of villagers are not aware about the revised project site

3.24.5.4 Quality of Life

Standard indicators of the quality of life include not only wealth and employment but also the built environment, physical and mental health, education, recreation and leisure time, and social belonging. Quality of life is an important concept in the field of international development, since it allows development to be analyzed on a measure broader than standard of living.

In this area living standard of life is good, all are the facilities is good and satisfactory level due to good economic status like income, employment, educational facilities and also availability of basic needs, viz. food, clothing, and housing. Main indicator of quality of life is given below in **Table 3.34**

Table 3.34 Socio-economic Indictors

	Socio-economic Indictors
1.	Income
2.	Employment
3.	Working Condition
4.	Housing
5.	Food
6.	Health
7.	Water Supply and Sanitation
8.	Clothing
9.	Energy
10.	Transportation
11.	Communication
12.	Education
13.	Environment and Pollution
14.	Recreation
15.	Social Security
16.	Human Rights

CHAPTER -4

INDEX

TABLES

FIGURES

CHAPTER 4
ANTICIPATED ENVIRONMENTAL IMPACT AND MITIGATION MEASURES

4.1 Introduction

Identification of impacts and mitigation measures of the same in Environmental Impact Assessment study helps in quantification and evaluation of impacts. During baseline study several impacts can be identified but it is necessary to identify the critical impacts both positive and negative on various components of the environment that are likely due to installation of Distillery Unit.

The environmental impacts can be categorized as either primary or secondary. Primary impacts are the ones that are caused directly due to the project activity on environmental attributes, whereas secondary impacts are indirectly induced.

The construction and operational phase of the project activity comprises various activities, each of which may have either positive or negative impact on some or other environmental attributes. The proposed project activities would impart impact on the environment in two distinct phases:

The proposed project may influence the environment of the area in two phases:

Phase I: During the Construction period, the impact may be temporary or short term

Phase II: During the Operation Phase which may have long term effects.

4.2 Construction Phase

This phase involves the activities like

- Site preparation and development
- Civil construction work
- Vehicular movement
- Loading and unloading civil items and plant machineries
- On site storage of civil items & plant machineries.
- Erection of plant and civil structures
- Maintenance of construction machinery
- Disposal of solid wastes
- Accommodation for construction workers
- Green Belt Development

Land, Air and Noise are likely to be effected by these activities, although Aesthetics and Socio-economic factors are also identified. But the impacts will be marginal and for short term only.

The green belt development will have positive impacts.

The detailed impacts & mitigation measures have been discussed in the following sections.

4.2.1 Land Environment

This is an existing operating sugar, cogeneration and distillery project. Total 358 acre Land is in possession of KATSSSKL. Adequate land is available within the premises for expansion of distillery unit. The area identified for the distillery unit is almost flat and not much of leveling work is expected.

Mitigation Measures

- All earth work will be completed in such a way so that the soil erosion and carryover of the materials in other areas are protected.
- The packaging materials which may consist of wooden boxes and jute wrappers will be stored at suitable place and disposed of suitably.
- Excavated soil will be used for green-belt development.

4.2.2 Water Environment

Due to construction activities, the surface run-off during rainy season may contain more of eroded soil and other loose matter. With segregation of construction area and proper drainages, the water contamination is prevented. As far as possible, construction activities will be avoided during rainy days. Increased water demand during construction phase for site preparation, dust spraying, construction activities, curing, domestic and other water requirements for labour and staff onsite.

Mitigation Measures

- The earth work (cutting and filling) will be avoided during rainy season and will be completed during the winter and summer seasons only
- Stone pitching on the slopes and construction of concrete drains for storm water to minimize soil erosion in the area will be undertaken
- To strengthen the green belt in and around plant will be undertaken during the monsoon season
- Soil binding and fast growing vegetation will be grown within the plant premises to arrest the soil erosion
- The overall impact on water environment during construction phase of the modernization unit will be temporary and insignificant
- Construction worker will not allow for staying at project site

- Use of tanker water for construction activity
- Provision of temporary toilets for labour
- Wastewater generated will be recycled/reused

4.2.3 Air Environment

The main sources for impact of air quality during construction period is 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 PM_{10} & $PM_{2.5}$ will be the main pollutant. The emissions from vehicles and construction equipment may also contribute to NO_x and SO_x.

The dust generated will be fugitive in nature, which can be controlled by sprinkling of water. 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.

Mitigation Measures:

Following measures would greatly reduce the impacts during the construction phase

- The approach roads will be paved or tarred and vehicles will be kept in good order to minimize the pollution due to vehicular traffic.
- It is necessary to control the dust emissions particularly during dry weather. This will be achieved by regular water sprinkling all over the exposed area, at least twice a day using truck-mounted sprinklers.
- The nose-mask will be provided to workers in dust prone area.
- Existing green belt will help in attenuation of fugitive emission.
- Checking of vehicles and construction machinery to ensure compliance to Indian Emission Standards
- Transportation vehicles and machineries to be properly and timely maintained and serviced regularly to control the emission of air pollutants in order to maintain the emissions of NO_X and SO_X within the limits established by CPCB.

4.2.4 Noise Environment

The major sources of noise during the construction phase are vehicles and construction equipment like dozers, scrapers, concrete mixers, cranes, pumps, compressors, pneumatic tools, saws, vibrators etc. The operation of these equipment's can generate noise levels in the range 85-90 dB (A) near the source. These noises levels will be temporary during the day time only hence will not have any significant impact on surrounding during construction phase.

Mitigation Measures:

- The noise control measures during the construction phase include provision of caps on the construction equipment and regular maintenance of the equipment.
- Equipment's will be maintained appropriately to keep the noise level within 85 dB (A).
- Wherever possible, equipment will be provided with silencers and mufflers.
- High noise producing construction activities will be restricted to day time only. Greenbelt development will be undertaken from the construction stage itself. Further, workers deployed
- in high noise areas will be provided with necessary protective devices such as ear plug, ear-muffs etc.
- Overall, the impact of increase in noise on the environment would be insignificant, as it will be localized and mainly confined to the day hours.

4.2.5 Biological Environment

The site acquired for the proposed distillery unit of the project is devoid of any vegetation. Hence there will not be any adverse impact on flora during construction phase of the proposed project. Also, the increased vehicular traffic coupled with higher noise level due to various constructional activities will drive away the local fauna from the project site to the neighboring area temporarily.

Mitigation Measures

- Construction activities needs to be restricted to day hours only and the movements of workers and vehicles should be completely banned during early morning and late evening when wildlife activities are at peak.
- Workers should be briefed about do's and don'ts like No hunting, vegetation burning, off-road driving, speeding, improper behavior towards local residents
- The project area is close to open scrub reserve forest and there are occurrences of schedule wild life. Hence, sign boards/ Notice Boards at the site like, NO HORN PLEASE, SILENCE ZONE etc. will be fixed
- Animals, which are found within the project area and categorized under schedule I to Schedule IV of Wild Life Protection Act 1972, are strictly protected and there is a complete ban on their exploitation for any purpose. Care should be taken not to disturb their habitats.
- In addition, do the awareness program among the, drivers school children & local community about the ecology & biodiversity.
- Proper management of waste material.

4.2.6 Storage of Hazardous Material

The hazardous materials used during construction may include petrol, diesel, welding gas and paints. These materials will be stored and handled carefully under applicable safety guidelines. Some of the precautions of storage include the following:

- Temporary storage will be made for diesel and other fuels. These fuels required for running construction equipment's, DG sets etc.
- Storage shall be separated by fire insulating walls from other storage tanks;
- The distance between the storage tanks shall be at least half of their height.

4.2.7 Socio-Economic Environment

- The proposed project does not involve any displacement of inhabitants for the construction of terminal.
- Construction phase could lead to creation of employment and procurement opportunities.
- A multiplier effect will be felt on the creation of indirect employment through the local community establishing small shops like tea stalls, supply of intermediate raw materials, repair outlets, hardware stores etc.
- Self- employment options for individuals possessing vocational or technical training skills like electricians, welders, fitters etc, which are likely to be sourced locally;
- There would be influx of workers during construction phase which could lead to pressure on key local infrastructure such as water, healthcare, electricity.
- The construction activity could lead to increased nuisance level from air emissions and noise due to transportation of material and equipment as well as labourers.
- The construction activity could also lead to water logging in mud pockets leading to breeding of mosquito and related health impacts.

Mitigation Measures

- Employing local people for construction work to the maximum extent possible.
- Providing proper facilities for domestic supply, sanitation, domestic fuel, education, transportation etc. for the construction workers.
- Barricades, fences and necessary personnel protective equipment such as safety helmet, hoes, goggles, harness etc. will be provided to the workers and employees.
- Constructional and occupational safety measures to be adopted during construction phase of the industry.
- The health of workers will be checked for general illness; first time upon employment and thereafter at periodic intervals, as per the local laws and regulations.

- The workers will be diagnosed for respiratory functions at periodic intervals and during specific complaints etc. Health center and ambulance facility will be provided to the worker.
- Job rotation schemes will be practiced for over-exposed persons. Insignificant impact is expected on the workers' health and safety during the operation phase stage.

4.3 During Operation Phase

Operational phase activities may have impacts minor or major, positive or negative on environmental discipline such as soils, surface and ground water hydrology, micro meteorology, water use, water and air quality, ecology, socio economics & noise environment.

This phase includes following activities:

- Raw material storage
- Product manufacturing
- Product storage
- Transportation
- Gaseous emission
- Effluent discharge
- Solid waste generation
- Occasional equipment failure/ process upset and related problems
- Industrial development
- Chemical hazards

4.3.1 Impact on Air Environment

The operational phase of the project comprises of various activities each of which will have an impact on air quality. The impact on air quality can be due to:

- The source of dust emissions is loading/unloading, transportation and storage of raw material& finished product.
- Adequate pollution control measures will be taken to keep the emissions from all sources within the statutory norms. Spraying of water on roads will be done to control such emissions.
- In a plant, the major emission from stack is Particulate Matter (PM) emissions. In addition,
- Gaseous pollutants (SO2, NOx and CO) are also anticipated from stack emissions and vehicular emissions.

Bag Filter is proposed as air pollution control measure to proposed boiler. Also, stack of adequate height, 60 m is proposed to disperse the flue gas

Stack emissions will be maintained below 50 µg/Nm3 Vehicles and machineries will be regularly maintained. Proper upkeep and maintenance of vehicles will be done.

Hence, the overall quality of the ambient air will be maintained within the limit prescribed by CPCB/SPCB after the commencement of the operation of proposed project.

4.3.2 Impacts Due To Fugitive Emissions

Particulate emission due to burning of fuel from proposed Incineration boiler; similarly transportation facilities will affect the surrounding will be controlled through adequate dust suppression and/or extraction system so that the impact will be negligible.

4.3.2.1 Stack Emissions:

The following measures will be adopted for the control of emissions for the proposed plant

- Suitably designed bag Filter and 60 m stack height will be placed to proposed 22 TPH boilers which will separate out the incoming dust in flue gas and limit the dust concentration at its designed outlet concentration of 50 mg/Nm3.
- For the effective dilution and dispersion of the pollutants stack height has been proposed as per CPCB guidelines. The height of the stack will be 60 m single chimney.

4.3.2.2 Fugitive Emissions:

The following measures will be adopted to control fugitive emissions:

- Dust suppression system by water sprinkler during operational activities
- Regular dust suppression with water sprinkler at transfer points;
- Control of fugitive emissions from the ash handling area will be mitigate through frequently water sprinkling
- Green belt development and afforestation in the plant and surroundings of ash handling area.
- Dust suppression/extraction system at fuel handling plant to control fugitive emissions.

4.4 Air Quality Predictions through Mathematical Modelling

AERMOD model version 09292 is used from the open source at USEPA web source (DOS-based format) for evaluating the emission scenarios for proposed project. The inputs to the model are defined in 5 functional pathways as represented in the following sections. Each of these functional parameters include several options that may be user defined or set as default, the details of some of these essential elements of AERMOD runs have been explained in the discussions.

Line Sources

Being a sugar industry with existing infrastructure, Line sources are for raw material, transport, product and personal use. Emissions from line source are considered for the modeling.

Point Sources

For the model ready inputs, each stack is provide with unique discrete Cartesian ID, stack height, temperature, velocity, diameter & emission rate in gm/s. The details of Model input file is presented in **Table 4.1** for source parameters

Details of stacks and stack height calculations are given in **Table 4.1**

Table 4.1 Details of Model input file for source parameters

Sr. No.	Attached to	Capacity	Fuel	Fuel Qty.	Height[m]	Dia. (m)	Gas Qty, Nm^3/hr	Gas Temp ^0C	APCD
Existing Stack									
1	Boiler	95TPH	Bagasse	1000 MT/day	76 Mtrs	3.0 Mtrs	92692 m3/Sec	150	ESP
2	D.G set	1010 KVA	HSD	200 Ltr/Hrs	6.1 Mtrs	102 Mtrs	10512 m3/Sec	160	Aquatic cover
Proposed Stack									
1	Incineration Boiler	22 TPH	Bagasse & Conc. Spent wash	B-4.5 MT/Hrs C-2.5 MT/Hrs S.W.-6.2 MT/Hrs	60 Mtrs	2.5 Mtrs	96573 m3/Sec	190	Bag Filter
2	D.G set	1050 KVA	HSD	10 Lts/Hrs	6.1 Mtrs	102 Mtrs	1000 m3/Sec	150	Aquatic cover

4.4.1 Model Inputs

The model setup requires pollutant source, receptors, emissions from the source and the meteorological data/weather of the region.

4.4.2 Source and Receptors

Air dispersion modeling is carried out considering a study area of radius 10 km from the project site as per the guidelines of EIA & predicts Ground Level Concentration at receptors spaced at 500 m x 500 m in form of Cartesian grid to assess the impacts. Further details of the input pathways for each of the above mentioned parameters are discussed in the following sections of this report.

4.4.3 Source Emission Inventory

The sources for modeling study are classified into three major categories most of them already existing as follows;

1. Existing Point sources in form of Boiler of 95TPH
2. Existing Point sources in form of D.G Set of 1010 KVA capacity
3. Proposed Point sources in form of Boiler of 22 TPH
4. Proposed D.G Set of 1050KVA capacity
5. Line source existing and proposed traffic on road

4.4.4 Receptor Pathway Inputs

Cartesian grid starting at the SE corner area around Halide Chemicals equidistant on all sides with 500m increment over X & Y coordinates, thus forming a receptor output grid of 10km^2. Being MIDC, no discrete locations were identified within the study area.

Meteorology

1. Three hourly data for one complete year that is from 1st January 2018 to 31st March 2018 was used as an input in the meteorology processor to generate model ready one hourly input surface & profile meteorology files.

Meteorology Pathway Inputs

- The inputs contain a surface file & profile file that are computed through modified AERMET – INDIA-IMD processor using the baseline meteorology parameters such as year, month, day, hour of meteorology data with wind speed, direction, temperature & cloud cover from Indian Meteorology Department for the year 2018
- Roughness length of 1m of measurement height, displacement height of 0.2m, Albedo of 0.2 & href of 10m i.e. the height at which measurements of meteorology have been done
- The minimum wind speed (0.5m/s lower than 1m/s considered as calm by IMD), minimum mixed layer height (50m), and minimum heat flux 20W/M^2/s)
- The Bowen ratio = Sensible Heat flux/Latent Heat Flux as a function of month to allow smaller Bowen Ratios during the Indian monsoon season when the ground is wet and latent heat fluxes become significant (from 2 in non-monsoon to 0.5 in monsoon)
- The potential temperature gradient above the mixed layer (0.008 degrees/m)

4.5 Results & Discussions

Model outputs have been generated in form of 1st highest of all averages, along with 24 hourly 1st highest as well as 1st fifty, 24 hourly highest values of concentration for all pollutants. Model outputs were obtained for emissions of each of the pollutants in each of the 500m x 500m receptor grid spread across 10km^2 gridded impact zone. The results of these emissions for each grid were plotted in SURFER by considering the location of the X and Y coordinates of each grid versus the emission values for respective grid.

Contour maps are plotted for each of the study pollutants for a variety of source groups as discussed in later section of the report representing impact by each of these sources and combination of them for present & future scenario including Business as Usual scenario & considering the ONE D.G. Set to be added in proposed project scenario. This map is superimposed on the satellite imagery as well as source grid of the proposed location. Since air quality was expected to be influenced mainly due to the existing emissions & to avoid redundancy, separate analysis of individual sources & types is NOT included in the results but only the differentiating present & future emissions are represented.

4.6 Air Quality at Present and in Future

4.6.1 Scenario Analysis for CO

Each of these sources for 1 hour average concentration are discussed for their impacts on ambient air in the following sections.

In case of CO emissions, all point sources and line sources are assumed to be contributing to emissions, the statistical analysis of which is represented in **Table 4.2**. Though they are supposed to be used only during power failure, it is considered that they shall be operated once a week for entire 24hours as worst case scenario.

Table 4.2 Statistical analysis of CO for all scenarios

Simulation Scenario	Details	Min	Max	Avg	SD	3SD
R-2019	Existing traffic	0.00645	0.37863	0.031803	0.043936	0.131807
R-2024	Proposed traffic after five year 2024	0.00958	0.56245	0.047245	0.065265	0.195796
DG	DG Set	0.09305	1.95789	0.300491	0.27191	0.815729
ESTG	Existing Stack	0.42373	1254.992	226.8078	233.5997	700.7991
PST	Proposed Stack	0.68059	315.327	62.02666	60.00382	180.0115
ALESTG	AlES: All Existing including Roads	0.47968	1255.041	226.8412	233.6207	700.8622
ALP	AlPr: All Proposed including future roads	0.72538	315.3993	62.07627	60.0376	180.1128
ALT	ALLT: All sources existing & proposed Together	0.75451	1570.392	275.3038	275.4439	826.3318

NOTE: All represented values are in µg/m³ & adjusted for Outliers

Though the concentration of CO from these sources during operational phase is adding 275 µg/m^3 average concentration. Model simulations from proposed activity shows barely 275 µg/m^3 contribution and thereby only final operational phase contour is presented in **Figure 4.1**.

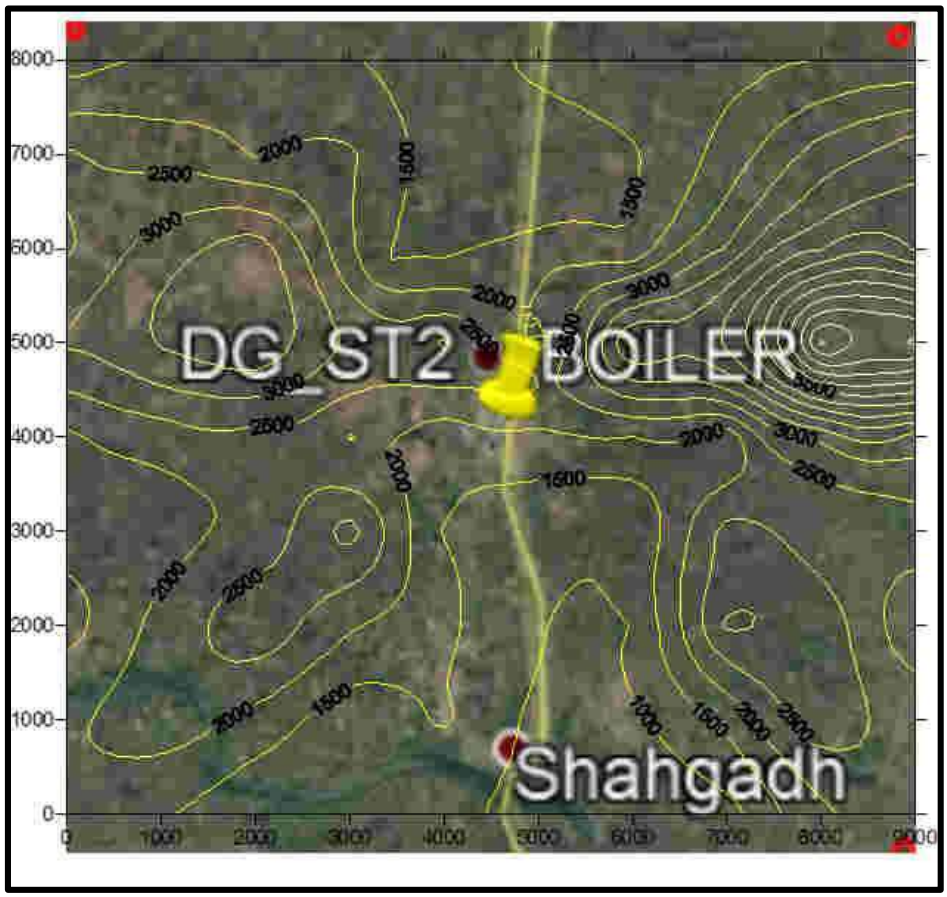


Figure 4.1 Concentration Contour for CO (µg/m^3) During Operational Phase.

4.6.2 Scenario Analysis for NO_x

Similar to CO, the outputs for the modeled NO_x concentrations are done with regards to point sources as classified in earlier sections of the report for existing as well as future operational phase scenario. Each of these sources is discussed for their impacts on ambient air in the following sections.

In case of NO_x emissions too, the statistical analysis as represented in **Table 4.3** shows average concentration is only 0.78 µg/m^3 which is miniscule compared to the ambient air quality standards and may not pose any threat to life or property.

Table 4.3 Statistical analysis of NOx for all scenarios

Simulation Scenario	Details	Min	Max	Avg	SD	3SD
R-2019	Existing traffic	0.00464	0.28075	0.023373	0.032712	0.098136
R-2024	Proposed traffic after five year 2024	0.00687	0.41569	0.034415	0.052952	0.158857
DG	DG Set	0.09305	1.95789	0.292957	0.288081	0.864243
ESTG	Existing Stack	0.20736	2.68587	0.628231	0.516574	1.549723
PST	Proposed Stack	0.04138	0.48592	0.125684	0.099415	0.298244
ALESTG	All Existing including Roads	0.21213	2.78104	0.651475	0.543191	1.629574
ALP	All Proposed including future roads	0.04838	0.81755	0.160098	0.138922	0.416767
ALT	All sources existing & proposed Together	0.25628	3.30859	0.788329	0.653592	1.960776

***NOTE*: All represented values are in µg/m^3 & adjusted for Outliers**

The concentration of NOx from these sources during operational phase is 0.78009µg/m^3. Contour map for operation phases is presented in **Figure 4.2**

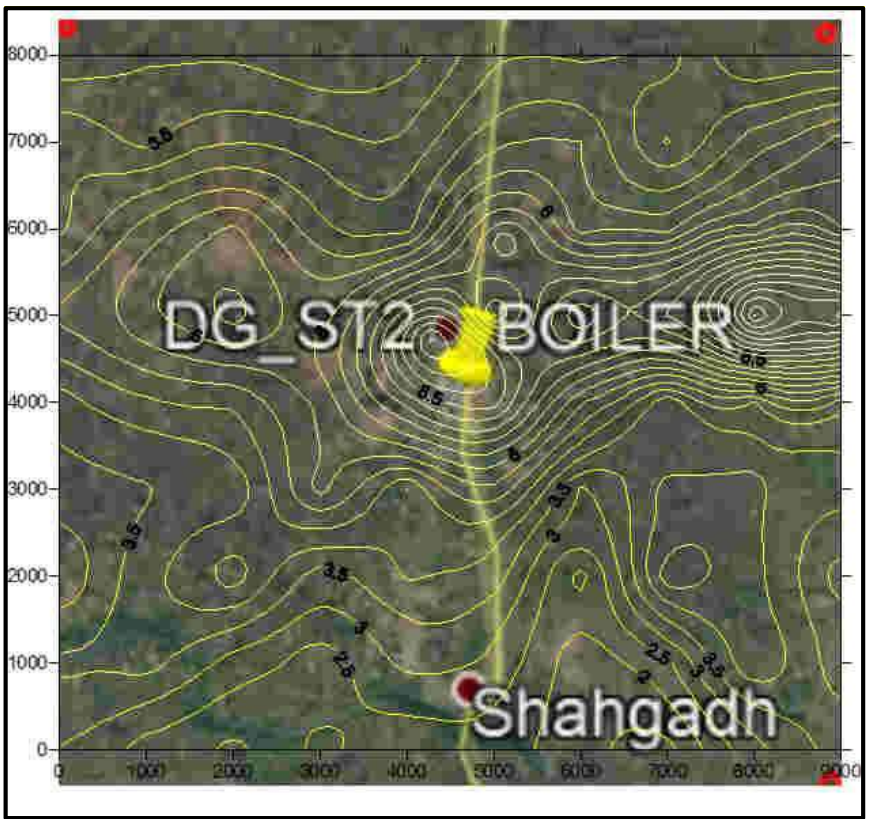


Figure 4.2 Concentration Contour for NOx (µg/m^3) During Operational Phase

4.6.3 Scenario Analysis for PM_{10}

PM_{10} mainly finds its emissions from all existing point sources and line source. The contribution of proposed activity in operation phase is 3.07 µg/m^3

Table 4.4 Statistical analysis of PM_{10} for all scenarios

Simulation Scenario	Details	Min	Max	Avg	SD	3SD
R-2019	Existing traffic	0.01097	0.66584	0.055388	0.077612	0.232836
R-2024	Proposed traffic after five year 2024	0.0163	0.98987	0.082337	0.115386	0.346159
DG	DG Set	0.00445	0.09364	0.014312	0.012944	0.038832
ESTG	Existing Stack	0.86493	10.74983	2.335227	1.72974	5.189221
PST	Proposed Stack	0.22393	2.94401	0.66105	0.505235	1.515705
ALESTG	All Existing including Roads	0.87622	10.83659	2.390615	1.768045	5.304134
ALPRO	All Proposed including future roads	0.2406	3.09286	0.743387	0.570146	1.710439
ALT	All sources existing & proposed Together	1.11367	13.57174	3.078614	2.227705	6.683114

NOTE: All represented values are in µg/m^3 & adjusted for Outliers

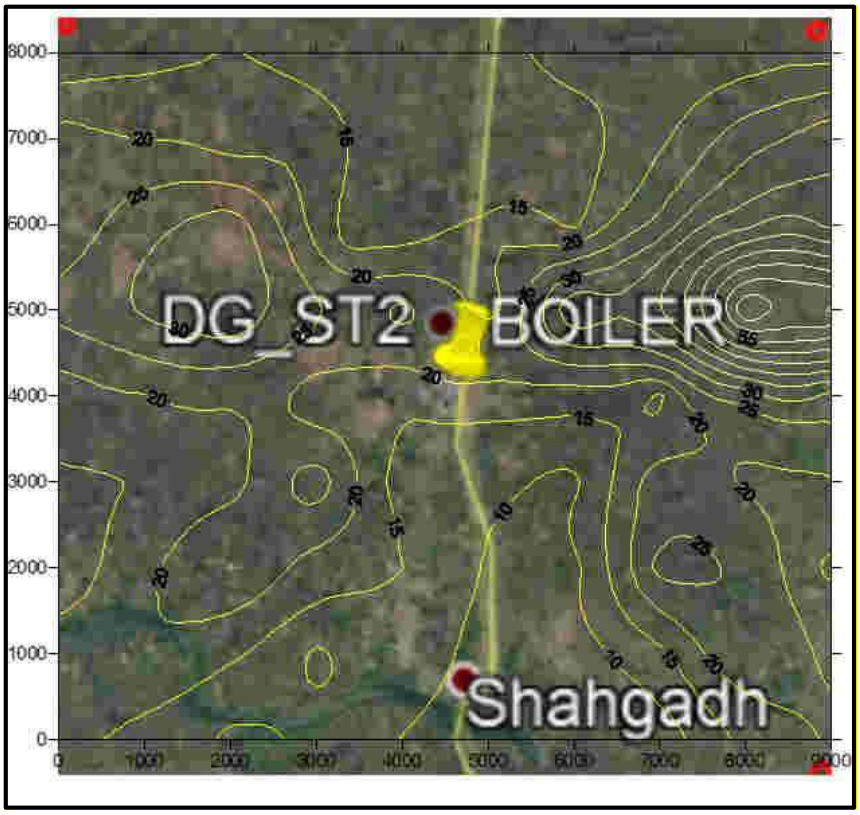


Figure 4.3 Concentration contour for PM_{10} (µg/m^3) During Operational Phase

Table 4.5 Comparison of Baseline Results with Incremental Value

Ambient Air Monitoring Location	Baseline results (98 percentile)			Maximum Incremental value (All Source together)			Final Value [Post Expansion]		
	PM_{10}	NO_x	CO	PM_{10}	NO_x	CO	PM_{10}	NO_x	CO
	$\mu g/m^3$		mg/m^3	$\mu g/m^3$		mg/m^3	$\mu g/m^3$		mg/m^3
Project Site	79.37	33.98	0.43	0.743387	0.160098	62.07627	80.11	34.14	62.51
Shahgad	81.73	27.42	0.48				82.47	27.58	62.56
Patharvad	76.09	27.01	0.54				76.83	27.17	62.62
Kuran	77.51	30.11	0.52				78.25	30.27	62.60
Chrampuri	60.23	28.06	0.52				60.97	28.22	62.60
Saskt Pimpelgaon	69.24	25.96	0.52				69.98	26.12	62.60
Patharwada	62.53	27.51	0.45				63.27	27.67	62.53
Mahakala	66.03	27.66	0.56				66.77	27.82	62.64
NAAQS Limit	100	80	4	100	80	4	100	80	4

4.7 Conclusion

As mentioned in above table, the baseline results around 10km radius of project site for modeled parameters PM_{10}, NO_x, and CO were within range of 60.23 to 81.73 $\mu g/m^3$, 25.96 to 33.98 $\mu g/m^3$ and 0.43 mg/m^3 to 0.56 mg/m^3 respectively. Predicted maximum incremental value for modeled parameter PM_{10}, NO_x, SO_2 and CO was 0.75 $\mu g/m^3$, 0.16 $\mu g/m^3$, and 62.07 mg/m^3 respectively.

4.8 Impact on Land Environment

The project site of 5.5 acres area is identified for distillery unit out of 358 Acre. Along with implementation of project, more than 33 % of the land area is covered with greenery. The study area comprises of agricultural and non-agricultural lands.

During summer, the latter are dry and devoid of vegetation. However, during rainy season they cover green with grass and shrubs. Part of the agricultural land is irrigated under bore well and lifts irrigation. The main sources which will affect the land environment are by products from proposed activity i.e. ash, Spent wash, ETP effluent & sludge etc.

Pollutants from the proposed activity damage the porosity, oxygen transfer is hampered and the degradation of the effluent organics in soil depletes of nitrogen. These factors cause germination disorders in seeds that are planted. Prolonged land irrigation using effluent, may cause soil sickness.

Other damages caused by effluent discharge on land are:

- Charring of vegetables and crops.
- Accumulation of salts.
- Increase in cropping period.
- Increase in the electrical conductivity

Soil quality may be affected by accidental leakage and spillage of hazardous chemicals/oils during handling. Improper segregation and disposal of solid waste generated during operation of the proposed project.

Mitigation measures:

The generated ash along with press mud directly sold farmers as a manure. Balanced ash will be sold to brick manufacturers unit. The spent wash will be concentrated in MEE followed by Incineration and condensate will be treated in CPU and used for industrial use Measures will be taken to minimize waste soil generation. Construction waste material will be recycled.

- Designation and demarcation of construction site with due provision for infrastructure.
- Appropriate measures are adopted for slope stabilization to reduce land erosions.
- Used oil from D.G. Set shall be sold to recyclers. There are no other hazardous wastes
- All hazardous wastes shall be securely stored, under a shed for eventual transportation and disposal to the authorized dealer by MPCB.

4.9 Impact on Ambient Noise

During the operation phase noise will be generated from noise generating sources. The principle source of noise from industry are from fans, centrifuge, turbine, steam traps, steam vents etc.

Exposure to excessive noise produces varying degree of damage to human hearing system which is initially reversible. Speech interference, sleep interference annoyance, mental fatigue and headache are few of the other effects which are caused by the high level exposure of long duration noise. In certain circumstances noise can cause decreased electrical resistance in the skin and a reduction in gastric activity

With increasing distance from the source the noise level decreases due to wave divergence. Additional decrease also occurs due to atmospheric effects and interaction with objects in the transmission paths.

Mitigation Measures

The ambient noise levels in the study area within permissible limits and will remain stipulated/prescribed limit even after commissioning of the proposed project.

The general mitigation for the attenuation of the noise are given below:

- Noise level can be reduced by stopping leakages from various steam lines, compressed air lines and other high pressure equipment
- By providing padding at various locations to avoid rattling due to vibration
- By adopting new technologies for control of noise in various units
- Encasement of noise generating equipment where otherwise noise cannot be controlled
- Providing noise proof cabins to operators where remote control for operating noise generating equipment is feasible.
- The air compressor, process air blower, pneumatic valves will be provided with acoustic enclosure;
- In all the design/installation precautions are taken as specified by the manufacturers with respect to noise control will be strictly adhered to;
- High noise generating sources will be insulated adequately by providing suitable enclosures;
- Design and layout of building to minimize transmission of noise, segregation of particular items of plant and to avoid reverberant areas;
- Use of lagging with attenuation properties on plant components / installation of sound attenuation panels around the equipment

- Other than the regular maintenance of the various equipment, ear plugs/muffs are recommended for the personnel working close to the noise generating units;
- All the openings like covers, partitions will be designed properly
- Inlet and outlet mufflers will be provided which are easy to design and construct.
- All rotating items will be well lubricated and provided with enclosures as far as possible to reduce noise transmission. Extensive vibration monitoring system will be provided to check and reduce vibrations. Vibration isolators will be provided to reduce vibration and noise wherever possible;
- The insulation provided for prevention of loss of heat and personnel safety will also act as noise reducers

4.10 Noise source and control measures

Sources of noise: The source and quality of noise in the distillery are given bellow;

- Steam turbines : 85-90 dB (A)
- Diesel Generators : 75-80 dB (A)
- Fans, blowers and compressors : 80-85 dB (A)

The sound intensity appears to be at moderate level in distillery plants. In general at the locations of turbines, compressors, fans etc. The sound intensity generally exceeds the limit. Necessary measures as indicated below are taken to reduce the sound intensity below the allowable limits at the source itself. The workers engaged in such locations are provided with earmuffs to have additional safety against noise nuisance. These units will be manufactured to meet the noise levels as per MOEF&CC/ CPCB guide lines.

Noise control measures: Workers near equipment will be provided ear muff and ear plug as personnel protective appliances against noise. They are installed on vibration proof foundation and base. Steam turbine and diesel generators are located in isolated and acoustic building.

Diesel Generator – 500 KVA

Diesel generators will meet the Specification of MoEF&CC. They are with low noise engine supplied with vibration free base frame and acoustic enclosure. Efforts shall be done to bring down the noise level of the D. G. set with in the allowable limits of about 70 dB(A) by sitting and control measures.

Steam Turbine – 2 MW

Fan Blower and Compressor– Water sealed vacuum pump and air blowers are used in fermentation, distillation and evaporator plants. Air fans are used at boiler house

In addition to green belt will be developed,

Notes:

- At 100 meters from project boundary, 0. 6 dB of time averaged increase over baseline noise levels is predicted, and at 200 meters, 0.2 dB of increase is predicted, both of which are negligible.
- Surrounding Villages are located beyond a distance of 250 meters from the Plant boundary and will not see any increase in Noise Levels because of the Sources of noise inside the Project site.
- Mitigations Measures as listed below should be implemented for avoiding any potential impact on the Noise Environment.

Table 4.6 Equipment Noise and Mitigation Measures

Sr. No.	Machinery / Equipment Description	Predicted SPL at 1m distance	Mitigations Required
1.	Air Handling Units	95~100 dB	1. Air handling units usually comprise of Motors and Blowers (either axial fans or centrifugal blowers). Centrifugal blowers usually have larger Noise levels because of turbulence generated inside the blower. 2. The Motor and the Blower usually have combined Noise Level of 100 dB, hence Acoustical Enclosure with 20 dB Transmission Loss should be installed for All AHUs. 3. The ducting from each of the AHUs must have Acoustical Lining from inside or In-line Silencer installed after the blower in order to avoid the transmission of Noise through the ducts.
2	Pumps (Multiple Numbers)	85~95 dB	1. Pumps can have Sound Pressure Levels ranging from 85 dB to 95 dB Depending upon size. 2. Acoustical Enclosures should be installed in order to bring the SPL below 80 dB at 1 meter distance. 3. Acoustical Panels with Transmission Loss Rating of 15 dB or more should be used for pumps.
3.	Boiler	100~105 dB	There are multiple sources of sound in a Boiler. 1. All Boiler feed pumps to be provided with Acoustical Enclosures with 30 dB

			Transmission Loss 2. All Safety valves to be installed with 15 dB Insertion Loss Rating Silencers. 3. Detailed study should be conducted of the boiler for noise levels upon completion of installation.
4.	Air Compressors (Or Compressor House)	> 100 dB	1. All compressors should be installed at a common location i.e. compressor house. 2. The Compressors should be provided with Acoustical Enclosure of at least 30 dB Transmission Loss Rating.
5.	Steam Turbine	90~100 dB	1. Usually Steam turbine will not create noise levels above 90 dB, however 100 dB has been considered for a worst-case scenario. 2. Steam turbine to be provided with Acoustical Enclosure of 20 dB Transmission Loss Rating. 3. Appropriate Thermal insulation blanket with noise reduction rating of 6-7 dB should be installed onto the steam turbine.
6.	Cooling Tower	85 dB	Noise Levels of up to 85 dB will be generated due to the cooling tower, which is safe for a noise dosage of up to 8 hours even if there are people working around the cooling tower, hence no mitigations are necessary for this source of noise.
7	Additional Mitigations / Cares to take	N/A	1. All people working in the vicinity of the Equipment/Machinery with Sound Pressure Levels higher than 95 dB should wear protective ear plugs to avoid permanent hearing damage.

4.10.1 Impacts on Water Environment

Water requirement for the proposed plant will be 612 M3/day. The water requirement will be fulfilled from Godavari River. Permission from Irrigation department, GoM is obtained. Water storage facility available with the factory is 5000 M^3. Thus, sufficient quantity of water can be made available. To achieve better efficiency and to maintain the plant and machinery in good condition, it is necessary to have proper water treatment system. Water will be treated in filtration unit to remove turbidity and algae. Filtered water will be chlorinated and used for process. Soft water will be used for cooling tower make- up and other applications. Proper water supply system is essential for achieving optimum process efficiencies

Total requirement of water for 60 KLPD distillery based on Continuous fermentation, multi pressure vacuum distillation with integrated evaporation, stand- alone evaporation system to concentrate spent wash and an incineration boiler will be around 1600 M^3 per day.
The process condensate (520 M^3/day and spent lees (130 M^3/day) will be treated in condensate polishing unit and approximately 580 M^3 will be recycled back to process and non-process applications. Similarly, 90% steam condensate (408 M^3/day) will be also recycled back to boiler. **Thus, actual fresh water requirement after recycle will be around 612 M^3/day.**

- The raw spent wash quantity will be reduced through integrated evaporation from 650 M^3/day with 12% solids to 325 M^3/day with 24% solids. The concentrated spent wash coming from integrated evaporation @ 325 M^3/day with 24% solids will be further concentrated to 130 M^3/day containing 60% solids in standalone multiple effect evaporation plant (MEE).
- In integrated evaporation, to concentrate the spent wash, alcoholic vapors generated in rectification column will be used as heating media for evaporation.
- The steam required for standalone evaporation body will be around @ 2.75 MT/hr. The spent wash with 60% solids will be fired in incineration boiler along with coal as a supplementary fuel. The steam generated by the incineration boiler and power generated in the turbine will be used for integrated distillation, secondary evaporation and boiler. Thus, the “Zero Liquid Discharge” will be achieved
- Condensate Polishing Unit (CPU) for treatment of condensate from MEE @ 520 M3/day and spent lees @ 120 M3/day. Thus, the total capacity of CPU unit

will be 600M^3/day. After treatment in CPU, treated water will be reused for process and non-process applications in distillery.

Zero Pollution by Distillery Effluent - Technical Approach:

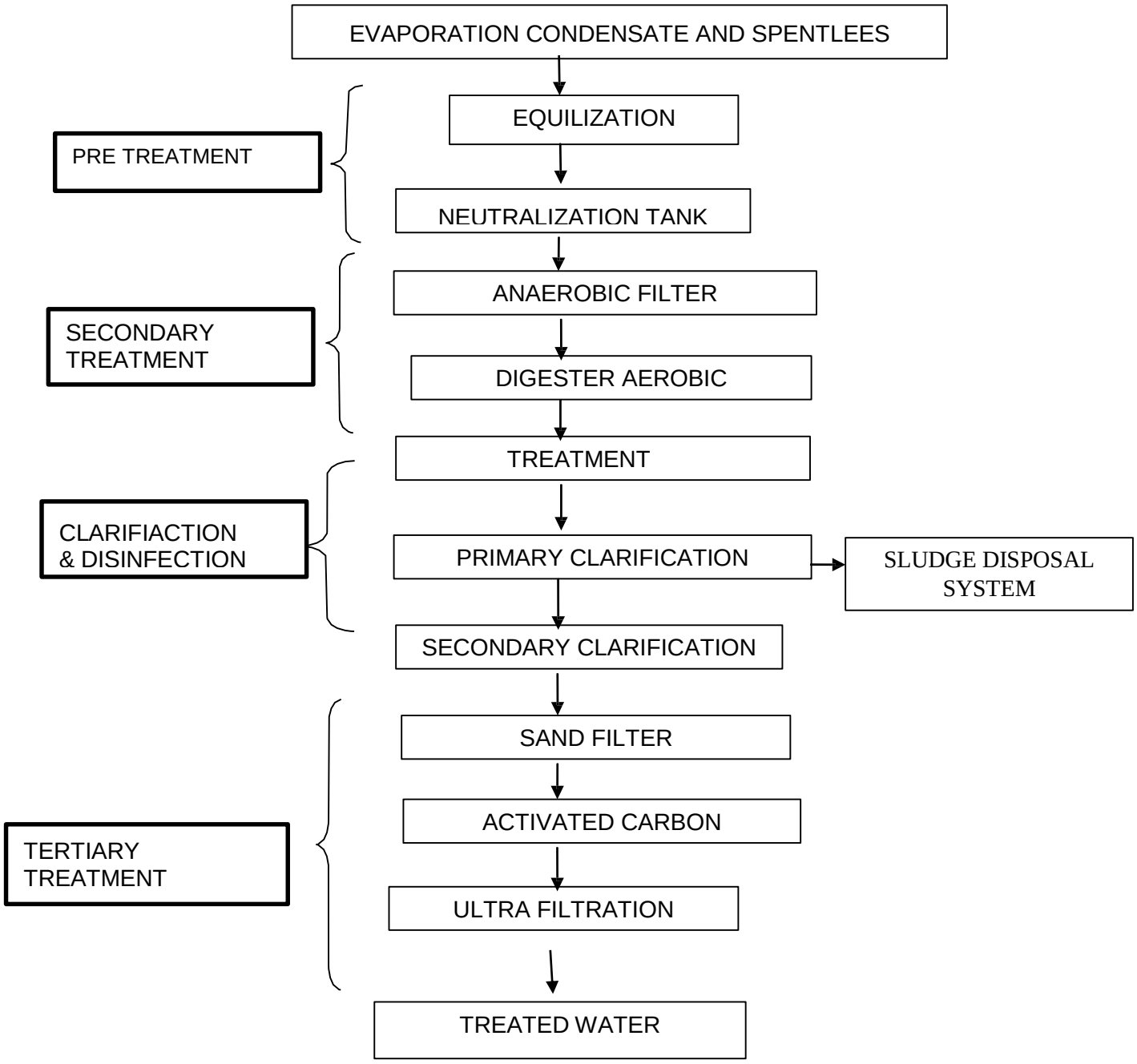
As per MoEF&CC guidelines, "Zero Discharge" is mandatory for distillery project. Spent wash is main liquid waste generated from distillery. The total 650 KL/day spent wash will be generated. Spent wash is concentrated in multi-effect evaporator (MEE) to reduce the volume & concentrate. Concentrated spent ash will be used in slop fired boiler as fuel.

4.11 Condensate Polishing Unit (CPU)

Table 4.7 Condensate polishing unit designed for the following parameters

PARAMETER	Inlet	Treated Effluent
Flow (m^3/Day)	520	520
Temperature	55^0c	30 ^{0}c
pH (S U)	4.0 – 4.5	7 – 8
BOD (mg/l)	2,000	Less than 100 mg/L
COD (mg/l)	4,000	Less than 200 mg/L
TDS	<3,000	Less than 300 mg/L
TSS	-	NIL

Figure 4.4 Typical process flow diagram for CPU



4.12 Details of Condensate Polishing Unit (CPU)

Pre-treatment:

- Collection: Collection tank of one day capacity.
- Neutralization: Neutralization system is provided to neutralize the effluent using lime slurry (10%) or soda ash.

Secondary treatment:

Up-flow anaerobic sludge blanket reactor (UASBR): Wastewater from intermediate tank would be pumped into UASB reactor through a specially designed distribution pipes. The multiple distributions ensures uniform distribution of flow throughout the sludge blanket making maximum rises to the top of Anaerobic reactor along with bio-gas generated and also some sludge particles. A unique three-phase gas – solid – liquid separator would be provided at the top to separate out the gas, liquid and the sludge particles. The wastewater flows upward through a sludge blanket composed of biologically formed granules or particles. Treatment occurs as the wastewater comes in contact with the granules. The gases produced under anaerobic conditions (principally methane and carbon dioxide) cause internal circulation, which helps in the formation and maintenance of the biological granules. Some of the gas produced within the sludge blanket becomes attached to the biological granules. The free gas and the particles with the attached gas rise to the top of the reactor. The particles that rise to the surface, strike the bottom of the degassing baffles, which causes the attached gas bubbles to release. The degassed granules typically drop back to the surface of the sludge blanket. The free gas and the gas released from the granules are captured in the gas collection domes located in the top of the reactor. Liquid containing some residual solids and biological granules passes into settling chamber, where the residual solids are separated from the liquid. The separated solids fall back through the baffle system to the top of the sludge blanket. Gas will be collected in the domes provided at the top. The liquid overflows through the gutters and suspended solids then separated are allowed to settle down in the sludge blanket thereby retaining valuable bacterial population. The gas will be carried through a gas line equipped with safety devices to the flare stack and would be burnt subsequently.

Anaerobic treatment

The anaerobic waste treatment process is an effective method for the treatment of many organic wastes. The treatment has a number of advantages over aerobic treatment process, namely,

- The energy input of the system is low as no energy is required for oxygenation,
- Lower production of excess sludge (biological synthesis) per unit mass of substrate utilized,

- Lower nutrient requirement due to lower biological synthesis
- Degradation leads to production of biogas which is a valuable source of energy.

ASP – Activated sludge process (Aeration):

This is the main section of the plant where degradation of organic pollutants with the help of aerobic micro-organism takes place. In aeration tank activated biomass is developed in such a way that certain MLSS is maintained for continuous effluent flow which comes to aeration basin.

Effluent is degraded in given retention time and activated sludge is further passed to clarifier and recycled as per requirement. The sludge, which is not required after recirculation, is passed to sludge drying bed. To maintain the aerobic condition in the bioreactor, air supply arrangement is provided by means of aeration equipment which has high oxygen transfer efficiency.

Primary Clarifier: In Primary clarifier, effluent passed from first aeration tank along with biomass (MLSS) gets settled here. The settled biomass recycled back to aeration tank as per requirement and excess biomass transfer to sludge drying bed.

Secondary Clarifier: In secondary clarifier, effluent passed from second aeration tank along with biomass (MLSS) gets settled here. The settled biomass recycled back to aeration tank as per requirement and excess biomass transfer to sludge drying bed.

Tertiary treatment

Coarse filtration:

The raw water is first passed through a Multi-grade sand filter to reduce the suspended solids present in the raw water. The filter will have to be washed with the help of raw water for 10 to 15 mins daily. This filter is provided to keep a check on the suspended solids.

Activated carbon filter:

Activated Carbon Filter shall be used for De-chlorination of filtered water, where the excess chlorine will be removed along with undesired color & odor.

Advantages of treatment scheme

- This plant will produce the treated water which can be recycled back.
- This plant is based on biological principle hence no need use of any excessive hazardous chemicals for the main degradation process.
- Due to efficient aeration system, electrical power requirement is very low.
- Due to user friendly equipment, plant maintenance is very less.
- Due to inbuilt automation, plant machinery life is high & ensures trouble free operation
- All process rotating electromechanical equipment is provided with standby equipment to ensure the uninterrupted operation.
- Due to effective after sales service from our qualified staff, maintenance issues

to the owner are less.

4.13 Rain Water Harvesting Plan

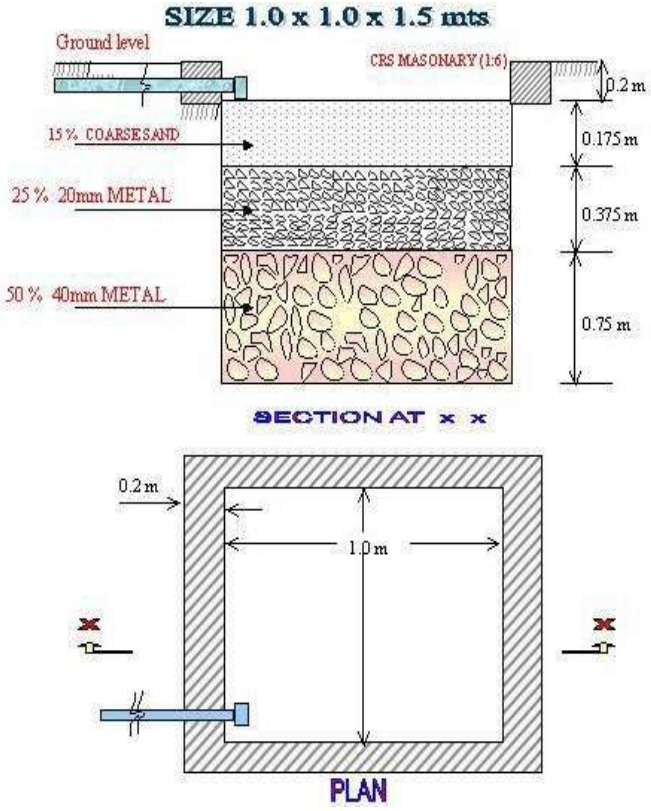
RWH structures will be provided to harvest the rain water from roof TOP and plant area. The collected rain water will be utilized for plant uses to optimize the raw water requirement. The surface water run-off from the main plant area would be led to a sump for settling and the over flow would be collected in the common water basin for further uses in the plant to optimize the raw water requirement of the plant. The excess rain water may be discharged to the nearest surface water body through dedicated storm water drain for recharging the ground water.

- Rain Water Harvesting Structure (RWHS) for Ground water Recharge:
- Size: 1.5m x 1.5m x 2.0m

Table4.8 Construction Details of Rain Water Harvesting for Ground Water Discharge

S. No	Volume, Cu.m	Description
1	4.5	Excavation in Hard Gravelly and all available soils
2	2.25	65 mm metal
3	1.25	20 mm metal
4	0.675	Coarse sand
5	0.24	CRS masonry in 1:6 prop.
6	4.5	Carting of excavated earth outside RWHS

Figure 4.5 Tentative Rain Water Harvesting Structure



4.14 Impacts 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.

Green belt is developed on 492965.45 sq.m area in the factory premises.

4.15 Impacts Solid Waste

Minimization at all levels need be attempted for discarded products, empty containers, packing surpluses, incoming raw material unloading spillages and fugitives. The factory has very little scrap materials. All these, however, be carefully stored on raised platform with dwarf toe walls all around, and a roof over-head. The contents should not be held in the premises for more than a fortnight.

The solid in process generate only as CPU sludge, spent catalyst and boiler ash. Ash is non-hazardous and in fact a good building material. It can be used in Cement mills and for soil enrichment.

Other will be empty drums which can be used for refill or may be disposed to original vendors. The colony is very small and its organic portion will be composted and inert sent for low land filling.

These measures can easily be taken because (1) they have no discards or off-specification products, (2) the waste is fully recycled and (3) they have experience in the line for the same type of product.

Non Hazardous Solid Waste: Based on above working, the summary is per day. Ash pit is provided. Ash will be transported by tractor to compost site/ brick makers.

Table4.9 Solid Waste Management

Sr.	Particulars	Generation in MT		Disposal
		Existing	Proposed	
1	Bagasse	127500	Nil	Used as fuel for cogeneration boiler
2	Molasses	27104	Nil	Used as raw material for distillery unit
3	Press Mud	18062	Nil	Composting and sale to farmer as soil conditioner
4	Ash	1823	5636	Sold to brick manufacturer
4	ETP Sludge (T/M)	5.0	3.0	Mixed with press mud used as a manure for landscaping

4.16 Impact on Traffic

The existing project site is located outside industrial area. The traffic survey was conducted on the approach road National Highway 211[Solapur-Aurangabad-Dhule Road] and the adjacent Mahakala village road. The major traffic on this road is truck, public vehicles such as taxis, auto rickshaws and private vehicles such as two wheelers and four wheelers. The present section discusses the results of assessment of the present scenario of local transportation and connectivity to the project site. The study attempts to achieve this by analysing the adequacy of the existing infrastructure related to vehicular movement and based on this the impacts of increased load of transportation related facilities will be proposed. Appropriate mitigation measures are suggested at the end of the section in order to eliminate or minimize the impacts related to vehicular congestion around the proposed project site.

The objective of the study is to assess & evaluate the present traffic pattern from the main approach roads to the project site in order to estimate the traffic flow pattern on completion of the proposed project.

Measurements of Traffic density were made by visual observation and by counting of vehicles under four categories.

The transport roads for the proposed project have been identified; transportation of material carrying vehicles will mainly take place through National Highway 211[Solapur-Aurangabad-Dhule Road] village road. Further access up to project site is achieved by internal connecting Mahakala Village Road.

Table 4.10 Traffic Study Observation Locations

Sr. No.	Observation Point Code	Observation Point Details	Aerial Distance from project site (km)
1.	**TS1**	National Highway 211	Adjacent to project site
2.	**TS2**	Mahakala Village Road	Adjacent to project site

To establish effective vehicle count during the survey the traffic was categorized into Heavy Vehicles (Multi Axle Vehicles), Truck, Tempo, Bus, Car, Auto (Three Wheelers), Motorcycle (Bike) & Cycle. The results of vehicle count are converted into Passenger Car Units (PCU's) as per the equivalent PCUs prescribed by Indian Road Congress (IRC) guidelines.

Table 4.11 Traffic Survey Comparison for TS1

Name of Road	Recommended PCU/Hr as per IRC 64-1990 guidelines for capacity of Roads in Rural Areas (for Single lane Roads)	Maximum PCU/hr Observed during peak hour	Expected from proposed Project PCU/ hr	Future after proposed project
National Highway 211	2000 PCU/Hr	270	43	313 which is less than standards

Table 4.12 Traffic Survey Comparison for TS2

Name of Road	Recommended PCU/Hr as per IRC 64-1990 guidelines for capacity of Roads in Rural Areas (for Single lane Roads)	Maximum PCU/hr Observed during peak hour	Expected from proposed project PCU/ hr	Future after proposed project
Mahakal Village Road	2000 PCU/Hr	468	44	512 which is less than standards

Peak hours for both the locations TS1 and TS2 are considered from 8:00 am – 10:00 am and 4:00 pm – 6:00 pm. Highest peak hourly traffic on this route after proposed project is expected to be approximately 313 and 512 PCU/hr for TS1 and TS2 respectively. TS2 being an internal connected village road has maximum proposed Traffic load because of the Bullock carts and Tractors. Thus contributing more in the traffic of TS2 compared to TS1.

As per the above data, the additional load on the carrying capacity of the concern roads is not likely to have any significant adverse effect.

4.17 Impacts on Socio-Economic Environment

The proposed expansion project is expected to have several positive impacts on demography and socio-economic condition which are listed below:

- Increase in employment opportunities so as people will not migrate outside for employment.
- Growth in service sectors
- Improvement in prices of indigenous produce and services benefiting local people such as increase in land value, house rent rates and labour wages.
- Improvement in socio-cultural environment of the area.

- Improvement in transport, communication, health and educational services.
- Increase in employment due to increased business, trade, and commerce and service sector.
- Thus the overall impact on the socio economic environment of the region is expected to be beneficial for the local population.

Table 1: Assessment of Impacts due to proposed activity on Environment

Sr. No	Environmental Component	Project Activity	Impacts Identified	Impact Assessment
1.	Topography	Site Clearance	Minor changes in landscape.	Insignificant
		Construction Activities	Changes in landscape.	Insignificant
		Operation activities	Changes in land use. The available land allocated for industrial activity is utilized.	Insignificant
2.	Air Quality	Site clearance	Excavation and leveling activities are limited hence, fugitive emissions would be restricted.	significant
		Construction activities	Local increase in Particulate Matter	significant
		Transportation	Vehicular and fugitive emissions	Significant
3.	Noise	Construction activities	Temporary local increase in noise	significant
		Operation activities	Continuous noise but confined to within the Plant Area	significant
		Transportation	Increase in noise levels due to vehicular traffic	significant
4.	Water Resources	Construction activities	The water will be used during the construction activities.	Insignificant
		Operation activities	Surface water	Significant,
5.	Water Pollution	Construction activities	Small volume of wastewater from the construction and sanitation	Insignificant
		Operation activities	Effluent generated in the plant	Insignificant as there will be zero discharge of effluent.
6.	Ecology	Site Clearance	There will not be major disturbance to flora fauna	Insignificant
		Construction activities	There will not be major disturbance	Insignificant
		Operation activities	There will not be major disturbance to flora fauna	Insignificant
7.	Soil Characteristics	Construction activities	Since there is minimal levelling and excavation, the proposed project area is within the existing facilities.	Insignificant
		Operation activities	No changes are envisaged in this phase	Insignificant
8.	Land Use	Construction activities	There will be change in landuse for industrial purpose.	Significant

		Operation activities	The existing landuse is change to industrial use	Insignificant
9.	Socio-economics	Construction activities	Creation of additional jobs/ businesses	Significant
		Operation activities	Rise in per capita income due to increased opportunities	Significant
10.	Civic Amenities	Construction activities	Built up of temporary structures for workers and non-workers	Moderately insignificant
		Operation activities	Availability of permanent structures for workers, non-workers	Moderately insignificant
11.	Occupational Health	Construction activities	Dusty conditions during summer with vehicular movement	Insignificant
		Operation activities	Process specific activities, heat and emission protective control measures followed	Insignificant
12.	Vibrations	Construction activities	Heavy equipment usage will be temporary	Insignificant
		Operation activities	Continuous usage of machinery	Insignificant
13.	Solid/ Hazardous waste	Construction activities	General construction waste will be disposed off in designated sites	Insignificant
		Operation activities	Ash from burning of spent wash in boilers will be sold to brick manufacturer	Insignificant

CHAPTER -5

INDEX

FIGURES

CHAPTER 5
ANALYSIS OF ALTERNATIVES

5.1 Introduction

It is necessary that one should try to find various alternatives and what is environmentally best preferred. There can be many points for which alternatives must be found. This is attempted here, irrespective of whether scoping has asked so or not. This is done voluntarily and submitted herein below.

5.2 Alternatives

Any proposed human activity is never a simple straightforward matter. A number of decisions are required to be taken and for each step a number of alternatives are available. Selection is thus all the more critical in an industrial development where time, money, environment and natural resources are at stake.

Industry decides to undertake an "Alternative Analysis (AA)" for this project. The various alternatives are (1) Product (2) Raw materials, (3) Technology, Engineering & Hardware, (4) Site, and (5) 'No-Project'.

Highlights of the final selection can be summarized as:

- The unit will be with latest technology including continuous fermentation and multi pressure vacuum distillation system.
- Large quantity of condensate water will be recovered from integrated-evaporators which will be utilized in the plant itself for dilution molasses and make up of cooling water.
- Provision of re-boiler, which has resulted in reduction of effluent generation and fresh water requirement.
- Spent wash is treated evaporation and Incineration.
- Boiler ash contains plant nutrients such as potash and phosphate. This will be given to farmers as plant nutrients.
- The distillery will be with zero discharge of spent wash.
- Sugar and co-gen units will support distillery.

5.2.1 Product

Proponents have opted to produce totally three products, of which one new product variety is Ethyl Alcohol. This option is selected with some consideration. This comes from molasses which is otherwise a waste from our sugar unit and is an environment risk with high BOD (900000 mg/lit.) and auto-combustion nature. On the other hand, the product alcohol is useful in pharmaceutical, food and as petrol-substitute. It is in demand. This is evident from Indian manufacture statistics. There are more than 300 such distilleries in the country with a

total installed capacity of 3500 million liters per annum. However, though such abundant licensed capacity the production is only about 1900-2000 million liters per annum. Department of Chemicals & Petrochemicals Government of India have kept an aim of at least 2710 million liters per annum. This shows how much the chemicals are in great demand both in India and abroad. Though the global recession has thrown that industry out of balance, in India the demand continues. This industry with wide support of research then decided to Ethyl Alcohol. This has given a versatile look to this industry. Now we can cater to many fields which are as say acetic acid, acetaldehyde, acetic anhydride, VAM, Ethyl acetate, and many similar.

While producing alcohol in its fermentation step CO_2 is liberated by microbiological activity. We have adopted a practice to scrub it in water. While producing alcohol in its distillation step liquid effluent spent wash is generated. This is a nuisance creating foul odour and large scale fish mortality. To avoid this we are using this to get valuable gas and burnable concentration with calorific value.

5.2.2 Raw Material

The raw materials required are available with us and additional if needed are from assured vendors in this and adjoining district where much sugarcane based agro-industries are working. There is also good road connectivity. Some other helping substances also will be needed in minor quantities on occasions such as acid etc., as also lubricating oil. The choice of source, as mentioned above was adopted because there the materials are in purer forms. If raw material is purer and is in the desirable form, it avoids a probability of discards or non-specification outcome. It also obeys the mass balance more faithfully than when impurities are involved. No problem of any empty containers or bags is encountered.

There is a possibility of selecting excellent molasses.

5.2.3 Technology Alternatives

The technology is very simple and straight forward with only few steps involved and Simplified Flow Sheet is as per Figure given below

Ethyl Alcohol

Figure 5.1 Simplified Flow Diagram

The technology of making these products has been developed over the years, and refined indigenously in well-equipped Research and Development Laboratories of Government and private Institutes and Private Vendors etc., in which devoted scientists, engineers, skilled and experienced staff is working, to find the best alternatives, addressing the above enquiries.

Engineering & Hardware Options: Especially regarding process of product alcohol, there was still scope of improvement and minimizes the requirement of inputs and energy. The process development and engineering designing of this project has been done in such a way that the whole operation of manufacturing can be carried out in a controlled system with no or low gaseous emissions, effluents, and minimum waste generation. The material handling and transfer of raw materials are also carried out in controlled and supervised system. Thus, the technology is not only cost-effective but also environment friendly.

The process involves three main steps each, as depicted above. Improvements are done by modernization such as Dehydration. There are many ways and environmentally the best one is selected. It is note- worthy that;

- Rectified spirit feed is pre-treated by product vapour
- Evaporator column gets energy from free boiler
- Steam condensate is feedback to boiler
- Twin adsorbents beds. One in dehydration mode, other is regeneration mode
- Switching of beds by Automation

Raw material is basically a product derived as waste from sugar mill i.e. molasses. we already have made a dialogue. If extra is needed, it is always desirable to have listed suppliers. This ensures continuous and clean supply of choice. This also makes it easier to maintain a schedule of dispatch. Here, the stocks to be maintained are very low. High stock in waiting not only involves blocked money but also is a hanging sword from point of view of (1) hydro-carbons becoming air-borne, (2) High SPM Fugitives, and (3) fear of combustion. The excess entails wastage too.

The process development and engineering designing of this project has been done and the industry proposes to employ following specialty in their manufacturing. The peculiarities of this processing unit are as follows;

- The first peculiarity is this, that the Project Proponent has made a provision of about 11.5% of their capital outlay for pollution control and greening drive in the outset itself.

- The raw material is used immediately after procuring. This is transported and also transferred without any chance of fugitives. This has become possible due to nearness of site to the raw materials fields and tar roads in the vicinity. The size is controllable.
- It is possible to select good and uncontaminated, materials answering particular specifications, as free from any foreign material including any undesired admixtures.
- Selection of correct quality raw material is possible because three inspections are done in time.
- When the procurement is done, the quality also will be recorded, which keeps an eye on recovery, resource conservation and waste minimization. This is prevention of pollution.

It may be summed up as –

- Incoming Raw Materials: This is selected from self or known vendors, nearest area with quick transport and quickly used on arrival inspection. The Prompt use prevents wastage, rain-washed pollutants escaping out, and ease of keeping record of losses and check.
- Weighing & Lab Analysis: This is regularly done. This ensures better check on mass balance. Purer material means less discards.
- In Process design, following Technology absorption, is planned as built in measures for resource conservation and pollution control in the industry. The main objective is to follow environments friendly process, with efficient utilisation of resources, minimum waste generation and built in waste treatment and operation safety. The measures adopted are,
- Continuous fermentation to improve alcohol yield and recovery and thereby molasses consumption reduced.
- Separation, recovery and recycle of yeast present in fermenter wash for reuse in fermenter. This reduces the use of fresh culture and nutrients in the fermenter and also improves ethanol yield.
- Use of live steam is avoided by employing re-boiler in distillation columns. This reduces the generation of wastewater.
- Multi pressure distillation system is used to reduce the consumption of steam and quantity of effluent.
- Use of pumps with mechanical seals to avoid liquid leakages.
- Scrubbing of fermenter vent gases containing CO2 to recover traces of alcohol present in it.

- Water utilization reduced by 1. Evaporation of spent wash with recovery condensate water for use in cooling tower. 2. Re boiler reduces water utilization 3. Recycle of lees water for dilution of molasses 4. Decanter centrifuge and recycle of thin yeast slurry saves water and improves alcohol recovery.
- Concentrated spent wash is used as fuel in boiler.

I. **Process operation**, following hardware, is planned as –

- Water feed to boiler is especially kept of good quality.
- Combustion efficiency is raised by feeding ample air and this air is pre-heated by using the waste heat which is present while cooling

II. **Energy Conservation** option is also kept in mind and it is planned to see –

- Electrical load management to restrict maximum demand
- Optimum utilization of steam
- Power factor improvement
- Energy management.
- Improving thermal efficiency of boiler.
- Change to more energy efficient motors
- Variable frequency drive application for motors
- Energy conservation awareness training

III. **Supervisory Control** is important. Training is imparted, Documentation is designed, and Indicator chart, hourly reading charts are provided. Best operational control and retrieval of information results in better checks

These are the points of Environmental Significance. In brief it may be summarized.

a. Fermentation:

- Molasses handling: To be fed carefully with dilution
- Yeast Propagation: Special Yeast is supplied by principal vendor and is developed further in–situ. Precautions of adding measured quantity of sterilized molasses substrate, aeration, taken and needed time for multiplication given. For this provision of Yeast Activation Vessels.
- Fermentation: Yeast works on sugars contained in molasses, breaks down the sugar into alcohol and carbon dioxide and significant heat. Temperature controlled to 33-35°C (by circulating cooling water). A series of tank to secure more percentage of alcohol. From last tank CO2 collected and directed to scrubber. What remains is now known as wash.

b. Distillation (Multi-Pressure)

- The wash comes here. The hardware contains columns basically for two functions, namely Stripping and Rectification. Thus
    - Analyzer column – Operated under vacuum
    - Rectifier cum Exhaust column- Operated under pressure(Additional columns only for refinement)
- The wash is first preheated in beer heater and fed to Analyzer column
- Vapour draw-containing alcohol from wash from Analyzer column top is fed to Pre-rectifier column (if required), which too is working under vacuum. Liquid is refluxed. The impure spirit is drawn from top of column and that collected at bottom is fed to top of the Exhaust portion of the Rectifier cum Exhaust column. Under pressure heat is given through Re-boiler. Alcohol is enriched towards the top and drawn out as Rectified Spirit about 95% v/v concentrations.
- To avoid build-up of fuel oil, it is drawn out to a tank, diluted with water, decanted, layers separated and alcohol layer returned as recovery

c. Dehydration

- This is to produce anhydrous Alcohol from Rectified Spirit
- Rectified Spirit is preheated and fed to evaporation/ regeneration column. Vapours drawn, sent to Sieve Bed, dehydrated, condensed and cooled. Thus forms Absolute Alcohol of desired 99.8% v/v purity.

There is alternate Sieve Bed 2 ready for next operation.

5.2.4 Site Alternatives:

The criteria kept for sites (apart from possible infrastructure optimization of this candidate site) included:

- Nearness of raw materials
- Purity of raw materials
- Ease of conveyance of raw materials
- Desire of Government for industrialization in that area
- Nearness of market
- Dispatch facilities
- Less Undulation of site
- Power and water supply, without encroaching on need of others
- Remoteness of target
- Not Destroying prime agricultural lands
- Maximizing infrastructure capacity utilization

- No forest land is involved
- No Revenue land is involved
- No tribal land is involved
- No R & R dis-satisfaction.
- Infrastructure Optimization

Existing site is passed by local body office for establishing this unit. It was our endeavor to strike such a balance that the environmentally best should also have acceptability commercially. Study of many existing units brought out an interesting point that they are required to haul raw materials from long distances to keep it running. This ends up in delay and vehicular pollution. In this unit the material flow is so kept to get an advantage that the requirement is fulfilled by quick haulage.

The site should be well connected by Road, so that both the raw materials and finished goods can be conveniently handled. The Road is neither too busy, so as to have a fear of accidents, nor is too away from network. Area requirement and built-up area requirement in this industry is only moderate. We have made a survey of a few existing units to find the "Use Factor" of their built-up area. Accordingly the Architects have designed a least- plinth outlay. Less buildings and less roads means saving of rubble, sand, bricks, etc, which otherwise has to be procured by robbing nature. We have some infrastructure already.

Some part of this District is socio-economically backward and the government has a desire to improve its status. The land of the District as a whole cannot be said to be of a prime agricultural importance. The pollution generation from this industry is finally made insignificant having taken all the precautions from raw material selection up to low or no waste generation and conversion. This site has a connecting road and has approachability. This site is connected with State Electricity Board power. When various sites were seen, this site appeared to be environmentally best as also from the business angle and therefore this option was finally adopted.

On the four sides of this particular site we have only open fields. There is no habitation within one km. There is no sensitive establishment in the vicinity such as health resort, hospital, archaeological monuments, sanctuaries, etc. The normal wind direction is found to be favorable at this site. Villages in the study zone are examined. It is found that:

- Majority of the villages are engaged in agriculture.
- All these villages have road network connected.

- None of these villages have fully satisfactory amenities like medical facilities, education, employment, transportation, communication. They would like to have this through media of industry.
- All are provided with drinking water from wells or Government Water Supply Schemes RWS. Hence industry does not encroach upon their supply.
- The population is limited.

With all this consideration, this site was ranked first and adopted.

a) Waste Water (Spent Wash) Treatment Options:

a. **Spent Wash Treatment Methods:** In earlier days the spent wash was treated by primary and secondary biological treatment processes to reduce its BOD content and then let out on land for agriculture usages. However the treated spent wash contained high inorganic salts and therefore caused the serious problem of pollution to ground water, surface water and soil. In recent days, technology has developed for utilization of spent wash in composting of bio-waste such as press mud, municipal waste, or other organic solid waste to produce bio-manure. Composting process results into zero effluent and it does not produce harmful wastes. Bio-manure is an environmental friendly fertilizer suitable for crops and plantation. However, the adoption of composting process depends on the availability of press mud in adequate quantities. Further, compost process cannot be operated during rainy period and it requires large storage capacity for spent wash. It involves the risk of surface and ground water contamination. Alternatively, the spent wash can also be managed by the following methods,

b. **Concentration and incineration:** Spent wash is concentrated in multi-effect evaporators. The concentrated spent wash rich in organic matter has a high heat value. Hence, this may be used as fuel in the boiler. The ash produced in the boiler contains mainly potassium and phosphate salts and therefore, it can be used as plant nutrient in agriculture. This route will allow us to run the factory for 270 days per year.

c. **Ferti-irrigation:** It is a post sown application of spent wash along with irrigation water on agricultural land. The spent wash contains plant nutrients such as potassium, phosphate and nitrogen. It may be dosed admixture with irrigation water. However, the ferti-irrigation depends on the availability of assured irrigation water throughout the year.

d. **One time land application:** It is a pre sown one time application of spent wash on agricultural lands. It enhances the nutrient value of the soil. One time land application of spent wash has to be practiced scientifically to avoid possible adverse effects to soil, crop and nearby water bodies.

e. Bio-composting: It is possible to use this liquid spent wash as the fertilizer organic compost in solid form. For this, filler material and proper efforts of sprinkling and turning is essential on the windrows. This becomes very popular if demand is in the vicinity.

b) Choice of spent wash treatment Method: A maximum of 360 KLD spent wash is generated from the proposed 45 KLD ethanol plant. Spent wash will be concentrated at MEE and concentrated spent wash will be used fuel for incineration boiler. Condensate of MEE will be treated in CPU and reused in process.. Thus, the ethanol plant will be with zero discharge of effluent and can work satisfactorily for 300 days per year.

5.2.5 'NO-PROJECT' Option

In this option, it is required to be considered as to whether it is more advantageous to the Nation; not to commence at all the production proposed. The district statistical Census report and Gazetteer of the District clearly states that the socio-economic conditions in this district are very low. They will, therefore, need a reasonable industrialization.

On this background in order to support the national requirement, PP has proposed this activity to produce national wealth from waste. In other words if a "No Project" option is selected the repercussions will be widely felt around. Therefore, No Project option cannot be entertained.

It is noteworthy that the activity now proposed will support this cause of National productivity, of saving the foreign exchange, of providing employment and in an environmentally friendly manner.

This project, as it will be soon shown, keeps an aim of sustainable development. 'No-Project' option is adopted only in an extreme last step of negative listing and is not warranted at all in the present case.

CHAPTER -6

INDEX

TABLES

FIGURES

No table of figures entries found.

CHAPTER 6
ENVIRONMENTAL MONITORING PROGRAMME

6.1 Introduction

This chapter contains technical aspects of monitoring the effectiveness of mitigation measures and the environmental management plan. It ensures the smooth execution of EMP and also monitors the changes in the ambient environmental quality due to the proposed project. It includes laboratory and other facilities monitoring facilities, environmental parameters to be monitored, and data to be analyzed and sampling location and schedule. It also includes budgetary provision and procurement schedule for the monitoring facilities.

Monitoring of various environmental parameters will be carried out on regular basis to ascertain the following,

i. Pollution status within the plant and in its vicinity.
ii. Generate data for predictive or corrective purpose in respect of pollution.
iii. Effectiveness of pollution control measures and control facilities.
iv. To assess environmental impacts.
v. To follow the trend of parameters which have been identified as critical.

6.2 Monitoring plan

Regular monitoring of important and crucial environmental parameters is of immense importance to assess the status of environment during plant operation. The knowledge of baseline status and monitored data is an indicator to ascertain for any deterioration in environmental conditions due to operation of the plant. Based on these data, suitable mitigation steps could be taken in time to safeguard the environment. Monitoring is as important as that of pollution control since the efficiency of control measures can only be determined by monitoring. The routine monitoring program as indicated below will be implemented in the industry. A comprehensive monitoring program is suggested.

Monitoring shall take the form of direct measurement and recording of quantitative information, such as amounts and concentrations of discharges, emissions and wastes, for measurement against corporate or statutory standards, consent limits or targets. It may also require measurement of ambient environmental quality in the vicinity of a site using ecological/biological, physical and chemical indicators. Monitoring may include socio-economic interaction, through local liaison activities or even assessment of complaints.

The environmental monitoring during the operational phase of the proposed project is important to assess the performance of pollution control equipment's installed in proposed project. Hence, regular monitoring of crucial environmental parameters is of immense importance to assess the status of environment during plant operation. With the knowledge of baseline conditions, the monitoring programme can serve as an indicator for any deterioration in environmental conditions due to operation of the plant so as suitable steps could be taken in time to safeguard the environment.

The sampling and analysis of environmental attributes including monitoring locations will be as per the guidelines of the Central Pollution Control Board/ State Pollution Control Board. Accordingly, environmental monitoring will be conducted on regular basis by SIAL to assess the pollution level in the plant as well in the surrounding area with the following objectives:

- To verify the impacts predicated due to the proposed project.
- To identify the trends with time in the levels of parameters.
- To check or assess the efficacy of the various pollution controlling measures.
- To ensure that new parameters, other than those identified in the impact assessment study, do not become critical through the commissioning of proposed project.
- Establish database for future Impact Assessment Studies for expansion projects.

6.1.1 **The following Environmental Component will be monitored as under:**

- Air quality;
- Water and wastewater quality;
- Noise levels;
- Soil quality;
- Ecological preservation and afforestation;
- Socio-economic status and community development

6.1.2 Meteorology

Meteorological parameters such as wind, atmospheric pressure, temperature, humidity and rain fall shall be monitored.

6.1.3 Gaseous Emissions and Ambient Air Quality

Both ambient air quality and stack emissions shall be monitored for pollutants such as Particulate Matter, NO_x and SO_2. Monitoring will be done as per CPCB guidelines.

6.1.4 Water and Waste Water Quality

All the effluents emanating from the plant should be monitored for their physicochemical characteristics and heavy metals. In addition, ground water samples at downstream and up stream of the Project shall be monitored on regular basis.

6.3 Sampling Schedule and Locations

Monitoring Plan for monitoring waste water and flue gases discharged from the industry and the environmental parameters including meteorology, quality of ambient air, ground water and soil is given below;

Table 6.1 Post Project Monitoring Schedule for Distillery

Sr. No.	Particulars	Location	Frequency
1.	Ambient Air quality for PM_{10}, $PM_{2.5}$, SO_2 and NO_X	a. Two samples downwind direction at 500m and 1000 m b. 1 sample upwind direction at 500m.	24 hour sample half yearly
2.	Flue gas from chimney for flow rate $PM_{10,}$ $PM_{2.5}$, SO_2 and NO_x	Sampling port of chimney	Online Continues
3.	Wind velocity and direction	At site	Hourly
4.	Temperature (max & min) Humidity (max & min) Rainfall	At site	Daily
5.	Ground water	Within 1 km radius from spent wash tank and compost yard. Two locations downward, one location upward additional three locations within 10km radius from site	Half yearly
6.	River water	One each at upstream and downstream	Quarterly
7.	Soil	At lands utilizing compost manure and treated effluent, three locations	Pre –monsoon and Post monsoon.
8.	Effluent	ETP(treated and untreated)	Daily

6.4 Laboratory Facilities

Laboratory facility is proposed for routine monitoring of air, water, soil and noise. The following parameters of environmental components will be monitored during the implementation of the post project environmental monitoring programme.

i. For water component: pH, temp, BOD, C.O.D, T.D.S.

ii. For Air: Velocity, Temp, PM_{10}, $PM_{2.5}$, SO_2, NO_X, CO and CO_2 from the stack. PM_{10}, $PM_{2.5}$, SO_2, NO_X from ambient air.

iii. Meteorology: Wind speed and direction, atmospheric pressure, temperature, relative humidity and rainfall.

iv. Air Quality: RDS, Meteorological station (continuous), Spectrophotometer (Visible range), Sound level meter

6.5 Budget for Environment Monitoring

Table 6.2 Budget for environmental monitoring for distillery

Sr. No.	Item	Amount in Rs. lakhs.	Procurement schedule
Capital investment			
1.	Laboratory facilities	5.0	During construction phase
2.	Weather monitoring facilities	2.0	During construction phase
Recurring cost			
1.	Monitoring of water, waste water, soil, solid waste	5.0	During operation phase
2.	Ambient air and stack , emission monitoring	5.0	During operation phase.

6.6 Effective Implementation on Environmental Monitoring Programme

The mitigation measures suggested in Chapter-4 i.e. Anticipated Environment & Mitigation measures will be implemented so as to reduce the impact on environment due to the operations of the proposed project. In order to facilitate easy implementation of mitigation measures, the phased priority of implementation is given in table 6.3.

Table 6.3 Implementation Plan to Mitigate Environmental Impact

Sr. No.	Recommendations	Time Requirement	Action
1.	Air pollution control measures	Before commissioning of respective units	Immediate
2.	Water pollution control measures	Before commissioning of the plant	Immediate
3.	Noise control measures	Along with the commissioning of the Plant	Immediate
4.	Ecological preservation and up gradation	Stage wise implementation	Immediate & Progressive
5.	Green Belt development	Stage wise implementation	Immediate & Progressive

CHAPTER -7

INDEX

TABLES

FIGURES

CHAPTER 7
ADDITIONAL STUDIES

7.1 Public consultation

Draft EIA report is prepared and submitting for Public hearing. After receipt of public hearing minutes of meeting will be incorporated.

7.2 Risk assessment

The Environmental risks are inherent in operation of any industry, or any human activity for that matter. Any system failure can lead to disaster. The Risk assessment is done for the project.

7.3 Hazard Identification

In practical terms, hazard identification is a thorough look at the workplace and processes to identify those things, situations, processes that may cause harm, particularly to the working force and nearby population. After identification of the potential hazards, one has to evaluate it potential to cause harm and then decide what type of control measures shall be taken to control it from the happening. Hazard identification is very important tool as it is integral part of a good occupational health and safety management plan. The aim of the hazard identification process is to reduce level of risk by taking precautions or initiating control during project execution. The various hazard analysis techniques that may be applied are Hazard and Operability (HAZOP) studies, Fault – Tree Analysis (FTA), event –tree analysis and failure and effects mode analysis.

7.3.1 Hazard Identification & Risk Assessment (HIRA)

The purpose of a Hazard Identification and Risk Assessment (HIRA) is to understand what risks or threats to public safety, property or the environment exist.

7.3.2 Hazard Identification and Risk Assessment (HIRA) Process,

- Identification of hazards
- Analyze or evaluate the risk associated with the hazards
- Determine appropriate ways to eliminate or control the hazards
- Evaluate the likelihood of an injury or illness occurring, and its severity
- Review of all available health and safety information about the hazard including
- MSDS, manufacturer’s literature, information from organizations and results of testing
- Identify actions necessary to eliminate or control the risk
- Monitoring to confirm the risk is controlled

- Keep any documentation or records that may be necessary. Documentation may include detailing the process used to assess the risk, outlining any evaluations, or detailing how conclusions were made.

7.3.3 Identification Hazard

Details of major anticipated risks from the Hazards is given in Table 7.1

Table 7.1 Hazards of the proposed plant

Sr. No	Name	Description	Severity	Hazard
1.	Transportation of Raw Materials	Molasses	Major	Exposure
		Coal	Minor	
		Yeast/Urea	Minor	Exposure and Inhalation
		Sulphuric acid, Diammonium Phosphate, Anti Foam reagent, Caustic Soda	Major	Exposure and Inhalation
2.	Storage of Molasses Products and byproducts	Molasses, RS/ ENA/ Technical Alcohol, Bagasse, fuel oil	Major	Explosion/Fire
3.	Manufacturing process	Fermentation	Major	Fire
		Distillation Unit	Major	Heat & Fire
4.	Utilities	D.G set, Boiler,	Major	Heat Fire and Electrocution
5.	Other Accidents	Leakages from the vessels, Catastrophic rupture of pressure vessels and Storage Tanks	Major	Exposure and Fire

7.4 Risk Assessment

Risk analysis deals with the identification and quantification of risks, the plant equivalent and personnel are exposed to, due to accidents resulting from the hazards present in the factory. Risk classification table is given in table 7.2.

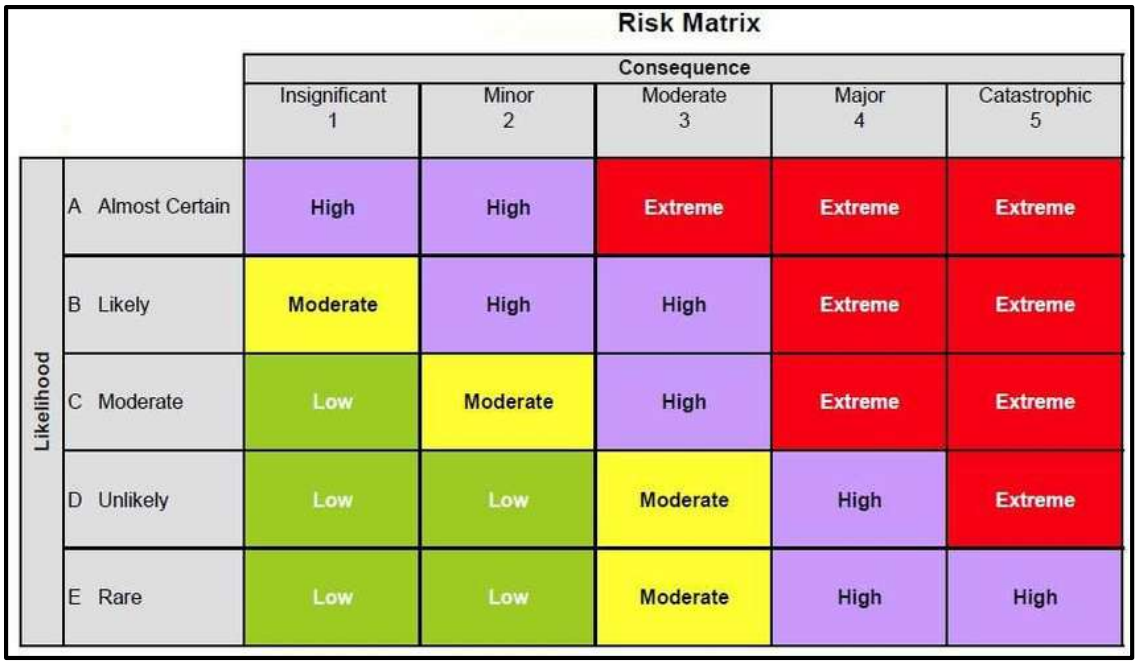


Figure 7.1 Risk classification and score table

Table 7.2 Risk classification and score table

Risk Score	Risk Level Category	Description
1 to 4	**Low Risk**	Manage by routine procedures and operations, should not require much attention but should be reviewed at least every 18months
5 to 10	**Moderate Risk**	Manage by specific monitoring or response procedures; should be monitored and reviewed every 12 months
11 to 18	**High Risk**	Requires escalation to VP, should be constantly monitored and reviewed every 3 months
19 to 25	**Critical Risk**	Requires escalation to Board Committee, responsible for risk management oversight, should be constantly monitored and reviewed monthly

7.4.1 Potential risk and mitigation measures for during construction phase

The proposed plant has maintained the risk associated with the operational component. Following are the general risk assessment and mitigation measures associate with proposed project operation. Risk impact and mitigation measures during construction phase are describes in Table 7.3.

Table 7.3: Risk Impact and rating matrix during construction phase

Activity	Associated hazards	Health Impact	Risk Rating	Proposed mitigation and Control measures
Site Leveling	Vehicular movement, Insect/snake bite	Physical injury, and organ damage	M	• Providing PPEs to workers • Appointing the qualified • persons for the particular job. • Speed limit control • Providing Training
Loading and Unloading of material	Accidents	Physical Injury	M	• Providing PPEs to workers • Training to workers
Excavation	Falling objects or objects near an excavation Slips, trips, and falls	Property Loss Physical injury	M	• Work Permit System will be followed. • Excavated material will be stacked safely. • Area will be barricaded • Training to workers • PPEs will be provided
Construction	Structure may fall down Workers may fall down from the height	Physical Injury Physically handicapped Property Loss	H	• Work Permit System will be followed. • Height work permit will be issued to the person. Safety belt will be provided to workers • Training to workers
Cutting and Welding	Fire or explosion Electric shock from electrical welding	Physical Injury Burn Injury Property loss	H	• Standards Work Procedure • Training will be provided • Proper PPEs will be • Provided. • Regular monitoring of • electrical equipment's to • avoid loose connection Area will be barricaded
Installation of Machineries	Structure may collapse	Property loss Physical Injury	M	• Only authorized person will operate the machine. • Appropriate platform will be designed as per the load bearing calculation.

7.4.2 Potential risk and mitigation measures during operation phase

Table 7.4 Risk Impact and rating matrix for Boiler operation

Sr.No	Activity	Associated hazards	Health Impact	Risk Rating	Proposed mitigation and Control measures
1	Working near boiler	High Noise	Noise induced hearing loss	M	• Required PPEs need to be used
2	Boiler maintenance	Mechanical hazard	Physical injury	M	• PPEs • Regular monitoring for checking leakages • Individual vigilance and proper training to worker for proper handling • Provision of First aid box
3	High Pressure Steam	Explosion	Risk of severe injury, damage to equipment		• Required PPEs • Good housekeeping • Regular monitoring of the storage facility • Flammable chemicals stored away from the source of ignition • Firefighting facility • Provision of First aid Box
4	Incomplete Combustion	Asphyxiation from carbon monoxide	Possible fatality	H	• Online CO monitors • Regular checking of workplace • Individual alertness and precaution
5	Maintenance work	Slips, Trips and Falls	Physical injury	M	• PPEs • Individual alertness and precaution
6	Electrical maintenance work	Electricity	Electric shock, Possible burns	H	• Regular checking and maintenance of electricalunits • PPEs • Provision of First aid box
7	Maintenance of burner	Burn injury	Severe Physical injury or burn	M	• PPE's will be provided. • Work will be carried out under proper supervision. • Follow of SOPs. • Individual alertness and precaution is important • Provision of First aid box

Table 7.5 Risk Impact and rating matrix for D.G. set operation

Sr. No	Activity	Associated hazards	Health Impact	Risk Rating	Proposed mitigation and Control measures
1	Working near DG	High Noise	Noise induced hearing loss	M	• Required PPEs need to be used
2	Maintenance	Fire	Burns, Serious injury	H	• Restricted Entry • Use of flame proof fittings • Use of PPEs
3	HSD Storage	Leakage / Fire	Risk of severe physical injury and Burn	H	• Storage will be away from ignition source. • Regular monitoring to check the leakages and spillages • Firefighting facility will be provided • PPEs will be provided • First aid box
4	DG set maintenance	Mechanical Hazard	Physical injury	M	• Leakage and heat in the joint will be checked before maintenance • First aid box at approachable place

7.4.3 Risk during Electrical Transformer

Table 7.6: Impact and rating matrix for Electrical Transformer operation

Sr. No	Activity	Associated hazards	Health Impact	Risk Rating	Proposed mitigation and Control measures
1	Electrical Transformer-Electrical shock and fire	Fire, Shock , burn	Severe Physical injury or burn, Death	H	• Cut off power supply. • Treat the injured for electrical shock • If fire is caused, immediately fight fire with available resources, summoning outside help if necessary

7.4.4 Hazard & associated Risk of storage and handling of Raw Material

Impact matric for risk associated with storage and handling of material is given in Table 7.7.

Table 7.7 Impact matric for risk associated with storage and handling of material

Sr. No	Activity	Associated hazards	Health Impact	Risk Rating	Proposed mitigation and Control measures
1	Storage, handling, loading &Unloading of material	Exposure, leakage, Fire, Explosion	Physical Injury, burn, Eye irritation and respiratory problem	H	• Provision of Eye wash. • Inspection and regular monitoring of storage area • Training to Workers for proper handling • PPEs will be provided as Nose mask, Hand gloves. • Proper system for loading operation to prevent spillage • Provision of level indicators for storage Tanks • Spill kit for Acid and other chemicals • Proper ventilation • First Aid boxes
2	Storage of Bagasse of existing sugar Unit	Fire	Burns, serious injury	H	• Firefighting facility in the factory premises is provided
3	Transportation	Fire, Accident, leakage	Burns, serious injury	H	• Firefighting facility • Training to Driver • MSDS • TREM Card • First Aid Box

7.4.5 Hazard & associated Risk of Molasses storage tank

Molasses can ferment if excessive moisture contamination is allowed. Fermentation can yield carbon dioxide with possible traces of ethanol or volatile fatty acids (e.g. acetic, propionic, lactic, or butyric) and if exposed to a spark or flame may result in an explosion. Fermentation may also occur in dilute surface layers formed by condensation from the headspace above the liquid.

Table 7.8 Storage Tanks details

Sr. No	Particulars	Storage Capacity Ltrs.	Diameter cm	Height cm
	Alcohol Storage Tanks			
1.	R.S . St orage Vat No. l{Existing)	609243.00	881.30	1003.00
2.	R.S. Storage Vat No. 2(Existing)	608148.00	881.20	999.00
3.	R.S. Storage Vat No. 3{Existing)	606466.00	880.10	998.00
4.	New Ethanol Storage Vat No.4(Existing)	750000.00	875.00	1250.00
5.	I.S. Storage Vat No. l{Existing)	52421.00	362.90	498.00
6.	I.S. Storage Vat No. 2(Existing)	52314.00	363.00	497.00
7.	I.S. Storage Vat No. 3{Existing)	51876.00	363.00	497.00
8.	Extra Neutral Alcohol Vat No.l(Existing)	71015.00	297.80	1000.00
9.	Extra Neutral Alcohol Vat No.2(Existing)	70420.00	298.0	1000.00
10.	Extra Neutral Alcohol Vat No.3(Existing)	71285.00	298.4	996.00
11.	ODS Storage Vat No.l (Existing)	36796.00	303.30	497.00
12.	ODS Storage Vat No.2(Existing)	36332.00	303.30	497.00
13.	Alcohol Storage Vat No.l(Proposed)	600000.00	880.00	995.00
14.	Alcohol Storage Vat No.2(Proposed)	600000.00	880.00	995.00
	Receiver Tank Details			
1.	DailyRectified Spirit Receiver No.l(Existing)	36647.00	353.40	373.00
2.	Daily Rectified Spirit Receiver No.2(Existing)	37075.00	352.70	378.00
3.	Daily Rectified Spirit Receiver No.3(Existing)	36771.00	353.00	376.00
4.	Daily Impure Spirit Receiver No.l(Existing)	10501.00	190.00	374.00
5.	Daily Impure Spirit Receiver No.2(Existing)	10558.00	190.00	375.00
6.	Feint Spirit Receiver No.l(Existing)	11004.00	189.90	374.00
7.	Feint Spirit Receiver No.2(Existing)	10990.00	189.90	375.00
8.	Daily Ethanol Receiver No.l(Existing)	30885.00	324.90	372.00
9.	Daily Ethanol Receiver No.2(Existing)	30896.00	324.90	372.20
10.	Daily Ethanol Receiver No.3(Existing)	30946.00	324.80	371.00
11.	Fusel Oil Tank No.l(Existing)	10648.00	189.70	373.00
12.	Fusel Oil Tank No.2(Existing)	10610.00	189.70	372.00
	Molasses Storage Tank			
1.	Molasses Storage Tank No.l(Existing)	4000	2000.00	971.00
2.	Molasses Storage Tank No.2(Existing)	4000	2000.00	971.00
3.	Molasses Storage Tank No.3(Existing)	4000	1996.00	971.00
4.	Molasses Storage Tank No.4(Proposed)	2500	1600.00	940.00
5.	Molasses Storage Tank No.5(Proposed)	2500	1600.00	940.00

Table 7.9 Impact matrix of storage of molasses

Sr. No	Activity	Associated hazards	Health Impact	Risk Rating	Proposed mitigation and Control measures
1	Storage and Handling	Explosion	May cause slight irritation May cause irritation	H	• Proper ventilation • shall be provided • Inspection and regular monitoring • of storage area • Training to Workers for

					proper handling • PPEs will be provided as Nose mask, Hand gloves. Provision of level • indicators for storage Tanks • If causes eye irritation wash area with soap, flood eye with water and water

7.4.6 Risk associated with alcohol storage and its mitigation measures

Impact matric of risk associated with storage and transportation of alcohol along with control and mitigation measures are given in Table 7.9.

Table 7.10 Impact matric of risk associated Alcohol storage

Sr. No	Activity	Associated hazards	Health Impact	Risk Rating	Proposed mitigation and Control measures
1	Storage of Alcohol	Exposure, inhalation, ingestion & Fire	• Exposure to over 1000 ppm may cause headache, drowsiness and lassitude, loss of appetite, and inability to concentrate. Throat Irritation • Ingestion causes depression of central nervous system, nausea, vomiting, and diarrhea • Liquid or vapor may cause eye and skin irritation Burn injury	H	**Storage** • Storage will be away from process area with well ventilation. • Avoid all possible sources of ignition like spark or flame. • Use spark/flame proof hand tools • Electrical wiring will be flame proof type • Based on the leakage quantity, wiped out with or dilute by spraying the water to suppress the vapors **Control measures in case of over exposure** • If victim is conscious and able to swallow, then give water or milk to drink to dilute the contents in the stomach • Look out for medical help **Skin or Eye exposure** • Immediately flush affected area with plenty of water. Eyes should be flushed for at least 15 minutes with water • PPEs will be provided to avoid exposure

7.4.7 Risk associated with work area of Distillation

Table 7.11 Impact matric of risk associated Distillation area

Sr. No	Activity	Associated hazards	Health Impact	Risk Rating	Proposed mitigation and Control measures
1	Working near Distillation column	Heat & Fire	Physical Injury and Burning	H	• PPEs • Firefighting facility • First aid box • Periodic checking of all parts

7.4.8 Risk associated with storage of Alcohol

Warning Information for Ethyl Alcohol - MSDS attached as **Annexure A.**

7.5 Safety Measure Recommendation

Storage and material handling area

- Proper ventilation shall be provided
- Area will be marked as “No smoking Zone”
- Use of proper PPEs
- Pressure relief valves shall be provided
- Provision of Safety valves and rupture disk
- Provision of fire hydrant system along with other portable fire extinguishers
- Adequate distance between the storage Tanks
- Provision of dyke wall to the Tanks
- Proper earthing to the Tanks

Reactor Safety

- Provision will be made for temperature & pressure indicators
- Heating & cooling Jacket will be provided to maintain the temperature
- Pressure switch with hooter shall be provided
- Pressure safety valve will be provided
- Double earthing shall be provided

DG Sets

- Acoustic enclosures to be provided
- Entry near the unit shall be restricted

- Qualified and highly trained engineers shall be appointed

Boiler

- Work permit system will be evolved and will be followed during maintenance work
- Proper ventilation shall be maintained
- Entry shall be allowed only after proper checking of gases, if any
- Worker should be trained properly
- Working should be under supervision of qualified and trained personnel

Storage and Handling of Alcohol

- Keeping away from oxidizers, heat and flames.
- Avoidance of plastics, rubber and coatings in the storage area.
- Cool, dry, and ventilated storage and closed containers.
- Leakage should be washed out and diluted.
- Regular monitoring and maintenance to avoid leakages.
- If major leakage in tanks can be mitigated by transferring the material to other tank.
- Transfer the material to other tank.

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

- Use of extinguishing media surrounding the fire as water, dry chemicals (BC or ABC powder), 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 and 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.

Molasses storage

- Store in good quality ventilated and leak-proof tanks (mild steel, stainless steel, polyethylene, PVC) at ambient temperatures, out of moisture.
- Continuous mixing of molasses should be done.
- If there is increase in temperature beyond 30^0C external cooling of tanks should be provided. A temperature recorder should be provided to the tanks.
- Avoid microbiological contamination or dilution with water.
- Regular monitoring and maintenance to avoid leakages

Building & workspace

- Adequate space will be provided for equipment repair or removal
- Equipment maintenance shops will be set up with appropriate safety provisions for hazards associated with maintenance activities
- Lightning protection will be provided

Electric items

- Medium and high voltage cables will be completely enclosed
- Electrical equipment will be grounded adequately
- Wiring will be properly insulated, grounded, and non-exposed
- Emergency shutoff switch, clearly labeled, at all machinery units will be provided
- DG set will be provided as stand by source of power
- Maintenance tools with insulated handles will be provided

Fire

The fire protection system is to provide for early detection, alarm, containment and suppression of fires. The complete fire protection system will comprise of the following. Fire hydrant network will be provided for firefighting in the entire project area along with following firefighting equipment will be provided.

- Different type of Fire Extinguishers, Detectors and fire Alarm shall be provided
- Fire hydrant system
- Fire Tender with chemicals foam and required arrangement for firefighting to control the fire from the alcohol storage
- Foam system shall be contain aqueous film forming compound of 3 to 6% alcohol resistance foam concentrated with ISI mark 4889
- Water storage Tank exclusively for firefighting operation
- Rubber mat will be used near panel area

- Periodical training to the identified supervisors and Employees in the field of Firefighting and safety
- Emergency exits at specific locations and will be marked on the layout
- Cautionary note, safety posters, stickers will be displayed at appropriate locations
- First Aid boxes will be made available at appropriate locations
- Emergency Control Center Provision shall be made to establish an Emergency Control Centre (ECC) from which emergency operations are directed and coordinated. This center is activated as soon as on–site emergency is declared. ECC is equipped with adequate communication systems in the form of telephones (Emergency telephone numbers.) and other equipment's to allow unhampered organizations and other nearby facility personnel.

7.6 Occupational health hazard and safety measures

During operation handling of chemicals and other material used, a practice of preventive maintenance shall be adopted to take care of employee's health. The various safety equipment such as breathing apparatus, gum boots, goggles and helmets will be provided to the workers/operators. Besides, all the first aid, firefighting devices will also be inspected, tested and maintained periodically so that it is available in ready to use condition. Provision of premedical and periodical health check-up for all the employees shall be implemented and record maintained. If any abnormality is noticed due to occupational exposure, necessary Treatment will be assured from qualified physician. Following measures shall be implemented to avoid the occupational hazards to the employees.

- Regular housekeeping of the entire plant area
- Regular or preventive maintenance of floor, platforms, staircases and passages to avoid the slip incident
- Provision of obstruction free walkways and workplace
- Periodical training to the employees for the proper operation of the Plant and various processes
- Restricted entry into the plant premises
- Checking and calibration of all Instruments and Fire Devices to keep them in proper operating conditions
- Installation of Electrical devises as per the prescribed standards
- Provision of D.G. Sets to avoid the complication during power failure
- Provision of required fire Extinguishers at different locations for easy access
- Provision of lighting Arrester

- Various types of PPEs like breathing apparatus, ear muffs, earplug, masks, leather hand gloves; asbestos hand gloves; acid/alkali proof rubber hand gloves; electrical resistance hand gloves and gum boots, goggles and helmets will be made available
- Provision of First aid Boxes and periodical checking for required medicine and other material to take care of superficial bodily injuries during work

7.6.1 Proposed Mitigation Measures

A. Preventive Measures for Electricity Hazard

- All electrical equipment 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 firefighting facilities such as fire water pumps and fire alarm stations is considered
- All electrical equipment 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

B. Bagasse Storage

- Bagasse handling unit/Agency is at minimum 500 meters away from the residential area, school/colleges, Historical Monuments, Religious Places, Ecological sensitive area as well as forests area.
- The storage handling unit is located at a minimum 500 meters away from the Railway line, Express ways, National Highways, State Highways and District Roads and from water bodies like River, Nala, Canal, Pond etc.

- The Storage unit is provided with paved approach with adequate traffic carrying capacity.
- Compound wall with adequate height is constructed around the coal storage area
- The unit has adequate water supply through pipe/ surface water before selection of the site. The storage unit is to be ensured for stacking of coal in heaps and care is taken that it does not get higher than the compound wall of premises of unit.
- Adequate dust suppression measures are provided to prevent fugitive emission and also risk of fire. Similar measures are also adopted for loading/unloading operations.
- Raw material/ash transported in tankers is to be covered and closed and so that there is no chance of spillage during transportation.
- Fire fighting measures are provided to avoid any fire case
- Measures are taken to control the air pollution during loading/handling coal

C. Precautionary Measures for Falling material

- Safety helmets to be used to protect workers below against falling Material.
- Barriers like a toe boards or mesh guards is to be provided to prevent items from slipping or being knocked off the edge of a structure.
- An exclusion zone is to be created beneath areas where work is taking place.
- Danger areas are to be clearly marked with suitable safety signs indicating that access is restricted to essential personnel wearing hard hats while the work is in progress.

D. 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

(i) 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.

(ii) First Aid Measure

For Skin contact, Eye contact, & Inhalation

(iii) 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 (CO_2).

(iv) 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 Cleanup personnel will be promote

7.7 Need of Establishing a 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.

Table 7.12 Existing Fire Extinguisher Details

Sr. No.	Houses	Type of extinguisher	Capacity	Qty (Nos.)
1.	Mill House	Type-I-A Water Co_2	9 Lit	01
		Type-III-ACBE DCP	5 kg	01
		Type-V- ABCE-ABC	9 kg	01
2.	Panel room	Type-VI BCE- Co_2	4.5 Kg	02
3.	Turbine	Type VI BCE- Co_2	4.5 Kg	02
4.	Store House	Type-I-A Water Co_2	9 Lit	02
		Type-II AB- Mechanical foam	9 Lit	03
		Type-III-ACBE- DCE	5 Kg	01
		Type-IV-BCBE DCP	10 Kg	01
		Type-V-ABCE-ABC	9 Kg	01
5.	Power House	Type-II-AB Mechanical foam	9 Lit	01
		Type-III-ACBE-DCP	5 Kg	02
		Type IV- BCBE-DCP	10 Kg	01
		Type-V-ABCE-ABC	9 Kg	01
6.	Boiler house	Type-X-BCDE-DCP	5 Kg	03
7.	RBC boiler sugar	Type-II-AB Mechanical foam	9 Lit	02
		Type-V-ABCE-ABC	9 kg	01
8.	Boiling House	Type-III ACBE-DCP	5Kg	01
9.	Lab Section	Type-II AB Mechanical foam	9 Lit	01
10.	Sugar House	Type- I Water- Co2	9 Lit	01
		Type- I Water- Co2	9 kg	01
11.	Sugar Godown	Type-I-A-Water Co2	9 Lit	07
		Type-II-AB- Mechanical foam	9 kg	01
		Type-III-ACBE-DCP	5Kg	05
12.	Office	Type III-ACBE-DCP	5Kg	02
		Type-V-ABCE-ABC	6 Kg	02
13.	Switch Yard	Type-VI-BCE- Co2	4.5 kg.	01
		Type-VII-BCE- Co2	22.5 Kg	02
		Type-IX AB Mechanical foam	0 kg.	02

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 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 water during power failure and it would work by the gravitational force.

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 provided.

- 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 vapours that can mix with the air.

7.8 Environment cell

Industry has proposed full fledge Environment Cell. Main function of ENVIRONMENT 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 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.

Environment Policy of M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd. (KATSSSKL),**:**

At KATSSSK, we have values which assist us in:

- Protecting the health and safety of our employees, our contractors, our customers and our neighbors
- Maintaining the security of our people and assets,
- Protecting the environment.

In addition to compliance with laws and regulatory requirements, our Company will pursue the following objectives:

- Ensure that all activities are conducted in a manner which is consistent with Health, Safety, and Environment Standards.
- Ensure that business activities are conducted to prevent harm to employees, contractors, the public, other stakeholders and the environment.
- Develop, manufacture and market our products with full regard for HSE aspects.

7.8.1 To achieve this we will:

- Set targets and measure progress to ensure continuous improvement in HSE performance Provide safe and healthy workplaces for our employees and contractors.
- Provide information, instruction and training to enable employees to meet their responsibility to contribute to compliance with the Policy.
- Provide appropriate HSE information for all contractors and others who work for us.
- Protect the environment by preventing or minimizing the environmental impact due to our activities and products through appropriate design, manufacturing, distribution and by promoting responsible use and disposal practices.
- Develop products and processes that help preserve resources and the environment

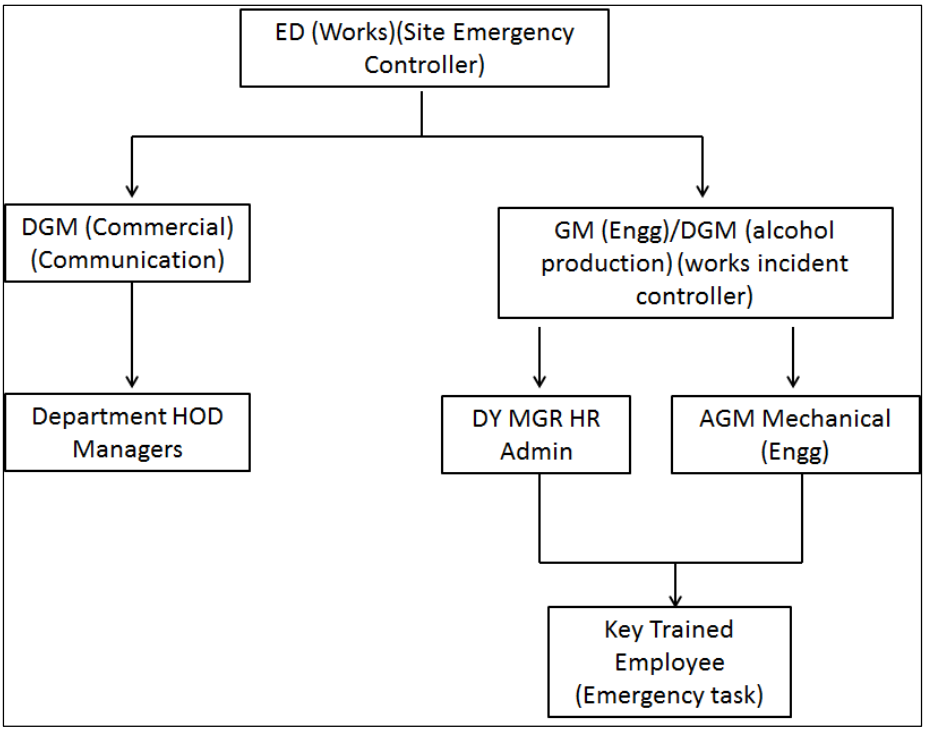


Figure 7.2: HSE Organization Chart

7.9 Emergency Planning & Procedure

7.9.1 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.

7.9.2 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 to allow unhampered organizations 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 DGM (Commercial) (Communication Department HOD Managers DY MGR HR Admn. AGM Mechanical (Engg ED (Works)(Site Emergency Controller) GM (Engg)/DGM (alcohol Production) (works Incident Controller) Key Trained Employee (Emergency Task 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 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.

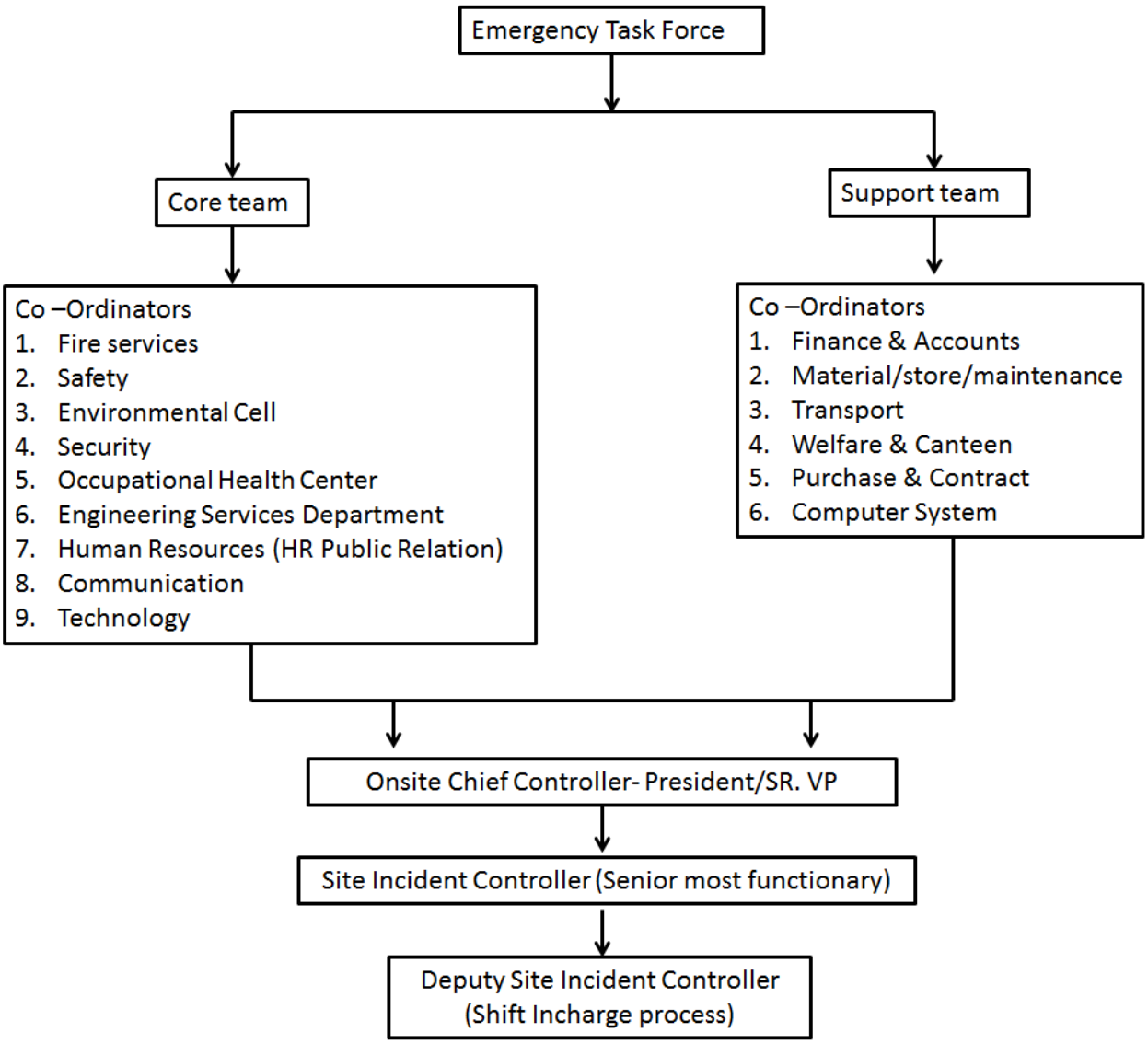


Figure 7.3 Emergency Task Force flowchart

Table 713 Emergency Task Force

Sr no.	Designation/ department	Name of the heading person	Contact numbers
Core team coordinators			
1	Fire service	F.m. dunge	8999595014
2	Safety service	F.m. dunge	8999595014
3	Environmental cell	R.g. bankar	9623457030
4	Security services	F.m. dunge	8999595014
5	Occupational health centre	Dr. V.m. mote	9822986934
6	Engineering service department	S.n. survase	9623457006
7	Human resource	N.d. bhavar	8275326199
8	Communication services	D.d. chandge	9850089499
9	Technology technical division	S.b. raut	9607363808
Support team members			
10	Finance and accounts	R.d.pagar	9623457072
11	Material and stores	A.g. pathan	7774047877
12	Transport	K.n. loya	9623457024
13	Welfare canteen	R.n. kharat	9623457022
14	Purchase and contract	A.v. korde	9623457023
15	Computer system / control room	D.d. chandge	9850089499

7.9.3 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.

Disaster Management Plan

7.9.4 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.

A disaster is catastrophic situation in which suddenly, people are plunged into helplessness and suffering and as a result, need protection, clothing, shelter, medical and social care and other necessities of life. Disasters can be divided into two main groups.

In the first, are Disasters resulting from natural phenomena like earthquakes, volcanic eruptions, cyclones, tropical storms, floods, avalanches, landslides etc.

The second group includes disastrous events occasioned by man, or by man's impact upon the environment. Examples are industrial accidents, radiation accidents, factory fires, explosions and escape of toxic gases or chemical substances, river pollution, mining or other structural collapses, air, sea, rail and road transport accidents and can reach catastrophic dimensions in terms of human loss. There can be no set criteria for assessing the gravity of a disaster in the abstract since depends to a large extent on the physical, economic and social environment in which it occurs. What would be considered a major disaster in developing country, will be equipped to cope with the problems involved, may not mean more than temporary emergency elsewhere. However all disasters bring in their wake similar consequences that call for immediate action, whether at the local, national or international level, for the rescue and relief of the victims. This includes the search for the dead and injured, medical and social care, removal of the debris, the provision of temporary shelter for the homeless food, clothing and medical supplies, and the rapid reestablishment of essential services.

7.9.5 Objectives:

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.

7.10 Phases of Disaster

There are various phases of Disaster including pre and Post Management of Hazardous Event that may or has occurred.

Warning Phase

Emergencies /disasters are generally preceded by warnings during which preventive measures may be initiated. For example uncontrollable build-up of pressure in process equipment, weather forecast give warning about formation of vapour cloud, equipment failure etc.

Period of Impact Phase

This is the phase when emergency /disaster actually strike and preventive measures may hardly be taken. However, control measures to minimise the effects may be taken through a well-planned and ready-to-act disaster management plan already prepared by organization. The duration may be from seconds to days.

Rescue Phase

This is the phase when impact is almost over and efforts are concentrated on rescue and relief measures.

Relief Phase

In this phase, apart from organization and relief measures internally, depending on severity of the disaster, external help are also to be summoned to provide relief measures (like evacuations to a safe place and providing medical help, food clothing etc.). This phase will continue till normalcy is restored.

Rehabilitation Phase

This is the final and longest phase. During which measures required to put the situation back to normal as far as possible are taken. Checking the systems, estimating the damages, repair of equipment and putting them again into service are taken up. Help from revenue/insurance authorities need to be obtained to assess the damage, quantum of compensation to be paid etc.

7.11 Proposed On–Site Emergency Plan

7.11.1 Onsite Emergency Plan

The onsite emergency is an unpleasant situation that causes extensive damage to plant personnel and surrounding area and its environment due to in operation, maintenance, design and human error. Onsite plan will be applied in case of proposed expansion.

Following points are to be taken into consideration:

- To identify, assess, foresee and work out various kinds of possible hazards, their places, potential and damaging capacity and area in case of above happenings.
- Review, revise, redesign, replace or reconstruct the process, plant, vessels and control measures if so assessed.
- Measures to protect persons and property of processing equipment in case of all kinds of accidents, emergencies and disasters
- To inform people and surroundings about emergency if it is likely to adversely affect them

7.11.2 Disaster control Management system

Disaster Management group plays an important role in combating emergency in a systematic manner. Schematic representation Emergency Control Management system for M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd. (KATSSSKL), is shown in **Figure 7.3** & List of team onsite is given in **Table 7.14**

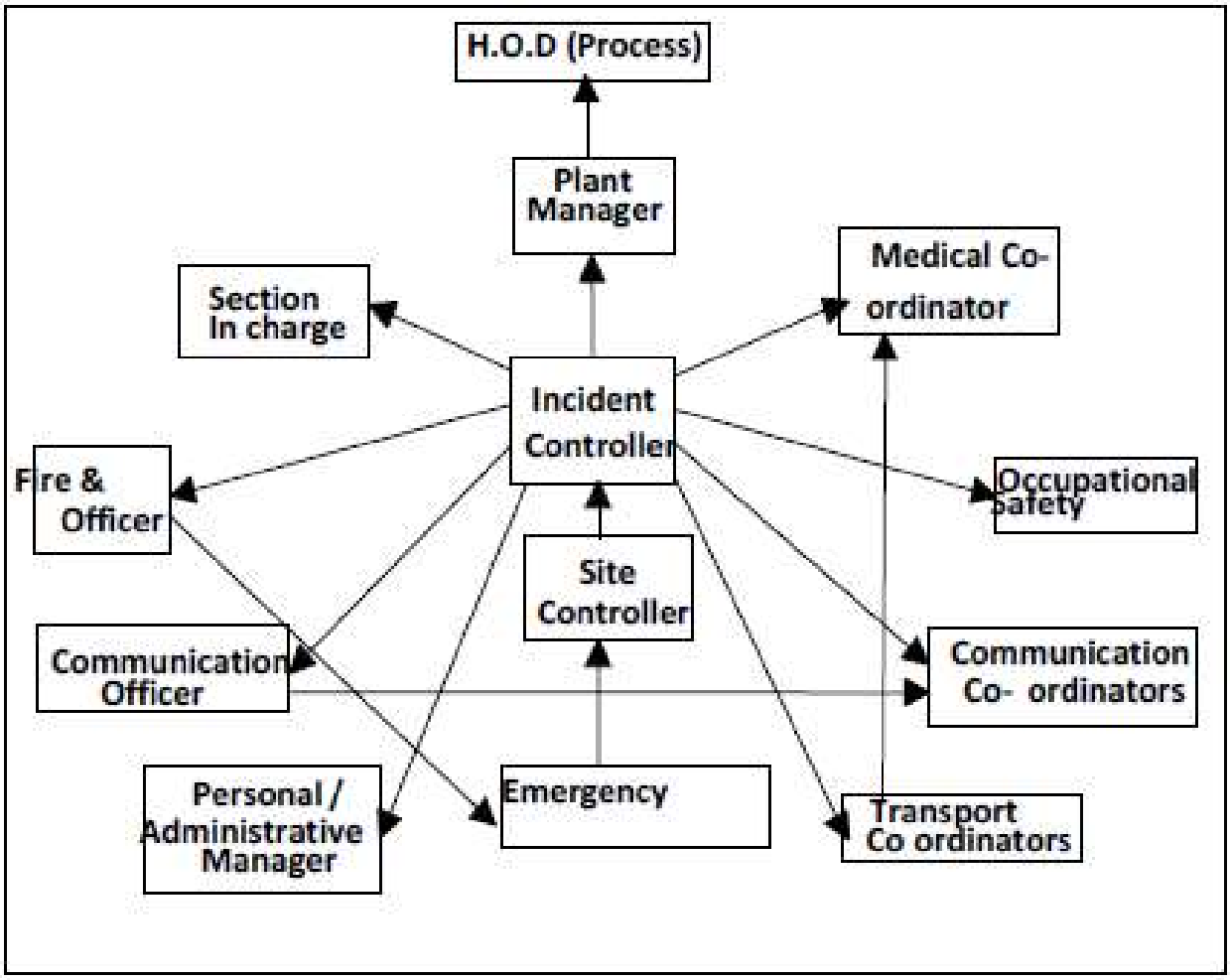


Figure 7.4: Onsite DMP - Disaster Control / Management System

Table 7.14 Emergency control management team

Sr No.	Name of the person	Designation	Contact Number
1.	D.S. Patil	Managing Director	9637764111
2.	S.N. Survase	Works Manager	9623457006
3.	N.D. Pawar	Chief Chemist	9834093195
4.	R.D. Pagar	Chief Accountant	9623457072
5.	V.H. Padwal	Chief Agri Officer	9623457038
6.	S.M. Nibe	Distillery Manager	9623457118
7.	D.S. Thonge	Civil Engineer	9623457012

7.11.3 General Industrial Emergencies

The emergencies that could be envisaged in the plant are as follows:

- Fire scenario due to storage of Bagasse/Ethanol.
- Contamination of food / water.
- Sabotage / social disorder.
- Structural failures.
- Slow isolated fires
- Earthquakes.

7.12 Emergency Organization's

It is recommended to setup an Emergency Organization. A senior executive who has control over the affairs of the plant would be heading the Emergency Organization. He would be designated as Site Controller.

In case of stores, utilities, open areas which are not under the control of production heads, executive responsible for maintenance of utilities would be designated as Incident Controller. All records and actions would be reported to the site controller.

Shift Incharge would be the reporting Officer, who would bring the incidence to the notice of the Incidence Controller and Site Controller.

Emergency Coordinators would be appointed who would be undertake the responsibilities like firefighting, rescue, rehabilitation, transport and support services.

In each shift, electrical supervisor, electricians, pump house incharge and other maintenance staff would be drafted for emergency operations. In the event of power communication system failure, some of staff members in the office/ plant offices would be drafted and their services would be utilized as messengers for quick passing of communications. All these personnel would be declared as essential personnel.

7.13 Emergency Communication

Whoever notices an emergency situation such as fire, growth of fire, leakage etc. should communicate with (ECC) Emergency Control Center. The person on duty in the Emergency Control Centre would appraise the site controller. Site controller verifies the situation from the Incident Controller of that area or the shift Incharge and takes a decision about an implementing on Site Emergency. This would be communicated to all the Incident Controllers, Emergency

Coordinators. Simultaneously, the emergency warning system would be activated on the instructions of the Site Controller

7.13.1 Site Controller

On receiving information about emergency he would rush to ECC and take charge of ECC and the situation and assesses the magnitude of the situation on the advice of incident controller and decides.

- Whether affected area needs to be evacuated.
- Whether personnel who are at assembly points need to be evacuated.
- Declares Emergency and orders for operation of emergency siren.
- Organizes announcement by public address system about location of emergency.
- Assesses which areas are likely to be affected, or need to be evacuated or are to be altered
- Maintains a continuous review of possible development and assesses the situation in consultation with Incident Controller and other key personnel whether shutting down the plant or any section of the plant required and if evacuation of persons is required.
- Directs personnel of rescue, rehabilitation, transport, fire brigade, medical and other designated mutual support systems locally available, for meeting emergencies.
- Controls evacuation of affected areas, if the situation is likely to go out of control or effects are likely to go beyond the premises of the factory, informs to District Emergency Authority, Police, Hospital and seeks their intervention and help.
- Informs Inspector of factories, Deputy Chief Inspector of factories, APPCB and other statutory authorities.
- Gives public statement if necessary.
- Keeps record of chronological events and prepares an investigation report and preserves evidence.

7.13.2 Incident Controller

- Assembles the incident control team.
- Directs operations within the affected areas with the priorities for safety to personnel minimize damage to the plant, property and environment and minimize the loss of materials.
- Directs the shutting down and evacuation of plant and areas likely to be adversely affected by the emergency.
- Ensures that all-key personnel help is sought.
- Provides advice and information to the Fire and Security officer and the local Fire Services as and when they arrive.
- Ensures that all non-essential workers / staff of the affected areas evacuated to the appropriate assembly points (near the Admin office) and the areas are searched for causalities.
- Has regard to the need for preservation of evidence so as to facilitate any enquiry into the cause and circumstances, which caused or escalated the emergency.
- Coordination on with emergency services at the site.
- Provides tools and safety equipment's to the team members.
- Keeps in touch with the team and advise them regarding the method of control to be used.
- Keep the site Controller of Emergency informed of the progress being made

7.13.3 Emergency Coordinator - Rescue, Fire Fighting

- On knowing about emergency, rushes to Emergency Control Centre.
- Helps the incident controller in containment of the emergency.
- Ensure fire pumps in operating conditions and instructions pump house operator to be ready for any emergency, which stand arrangement.
- Guides the fire-fighting crew i.e. Firemen trained plant personnel and security staff.
- Organizes shifting the fire-fighting facilities to the emergency site, if required.

- Takes guidance of the Incident Controller for fire-fighting as well as assesses the requirements of outside help.
- Arranges to control the traffic at the gate and the incident area / Directs the security staff to the incident site to take part in the emergency operations under his guidance and supervision.
- Evacuates the people in the plant or in the nearby areas as advised by site controller
- Searches for casualties and arranges proper aid for them.
- Assembles search and evacuation team.
- Arranges for safety equipment's for the members of this team.
- Decides which paths the evacuated workers should follow.
- Maintains law and order in the area, and if necessary seeks the help of police.

7.13.4 Emergency Coordinator

In the event of failure of electric supply and there by internal telephone, sets up communication point and establishes contact with the Emergency Control Center (ECC).

Organizes medical treatment to the injured and if necessary will shift the injured to near by hospitals.

Mobilizes extra medical help from outside, if necessary

7.14 Emergency Control Centre

For the time being office block is identified as Emergency control center. It would have external Telephone and Fax facility. All the Incident controller officers, senior personnel would be located here. The following information and equipment are to be provided at the Emergency control center (ECC).

- Intercom, telephone
- P&T telephone
- Fire suit / gas tight goggles / gloves / helmets
- Factory layout, site plan
- Emergency lamp / torchlight

- Plan indicating locations of hazard inventories, plant control room, locations of safety equipment, road plan, assembly points, rescue location vulnerable zones, escape routes Hazard chart
- Breathing apparatus
- Wind direction, wind velocity indications
- Public Address Megaphone, Hand bell, Telephone directories (Internal, P&T).
- Address with telephone numbers and key personnel, Emergency coordinator.
- Important addresses, telephone numbers such as experts from outside,
- Government agencies neighboring industries etc.
- Emergency shutdown procedures.
- Nominal roll of employees

7.15 Emergency Medical Facilities

Gas masks and general first aid materials for dealing with chemical burns, fire burns etc. would be maintained in the medical center as well as in the emergency control room. Private medical practitioners help would be sought. Government/Private hospital would be approached for emergency help. Apart from plant first aid facilities, external facilities would be augmented. Names of Medical Personnel, Medical facilities in village would be prepared and updated. Necessary specific medicines for emergency treatment of Burns patients, and for those affected by toxicity would be maintained. Breathing apparatus and other emergency medical equipment would be provided and maintained. The help of nearby industrial managements in this regard would be taken on mutual support basis.

7.15.1 Emergency Shutdown

There are number of facilities which can be provided to the help deal with hazard conditions. The suggested arrangements are

- Stop feed
- Deluge contents
- Remove heat

7.15.2 Evacuation of Personnel

The area would have adequate number of exits pathways/staircase. In the event of an emergency unconnected personnel have to escape to assembly point. Operators have to take emergency shutdown procedure and escape. Time office maintains a copy of deployment of employees in each shift at ECC. If necessary, persons can be evacuated by rescue teams.

7.15.3 All Clear Signal

At the end of emergency, after discussing with Incident Controllers and Emergency Coordinators, the site controller orders an all clear signal.

7.16 Occupational Health

In large scale industries where multifarious activities are involved during construction, erection, testing, commissioning, operation and maintenance, the men, materials and machines are the basic inputs. Along with the booms, the industrialization generally brings several problems like occupational health and safety. Occupational health needs attention both during construction and operation phases. However the problem varies both in magnitude and variety in the above phases.

7.17 Safety Training

Safety training is being provided by the safety officers to all the employees with the assistance of faculty members called from professional safety institutions and universities. In addition to regular employees, limited contractor labours are also provided with safety training. To create safety awareness safety films will be shown to workers and leaflets etc. will be distributed.

- Compartmentalization of the cable galleries, use of proper sealing techniques of cable passages and crevices in all directions would help in localizing and identifying the area of occurrence of fire as well as ensure effective automatic and manual firefighting operations.
- Spread of fire in horizontal direction would be checked by providing fire stops for cable shafts.
- Reliable and dependable type of fire detection system with proper zoning and interlocks for alarms
- Housekeeping of high standard helps in eliminating the causes of fire and strengthens fire prevention and firefighting.

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. Shows details with Communication Nos during Offsite Emergency

Table 7.15 Local Statutory Government bodies

S.no	Name of Govt agency	Phone nos.
1.	District collector	02482-225121,225326, 224000
2.	Sub divisional officer	02482-225121,225326, 224000
3.	Factory inspector of the area	0240-2331326
4.	Pcb head quarters	0240-2473462
5.	Dcp traffic (hq/control room)	02482-2220929
6.	Addnl. Commissioner of police	02482-2229352,2225601

7.19 City Fire Services

To combat fire and carry out other emergency operations as per the need In case of fire, the fire brigade is the best help from outside. Even in a disaster not involving fire, the fire brigade could be of good help, inside the plant and outside, in view of their specialized equipments and expertise in rescue and relief.

7.19.1 Responsibilities

- To reach the accident spot as soon as possible with all necessary equipments to extinguish the fire.
- To provide all other necessary help depending on nature of emergency.

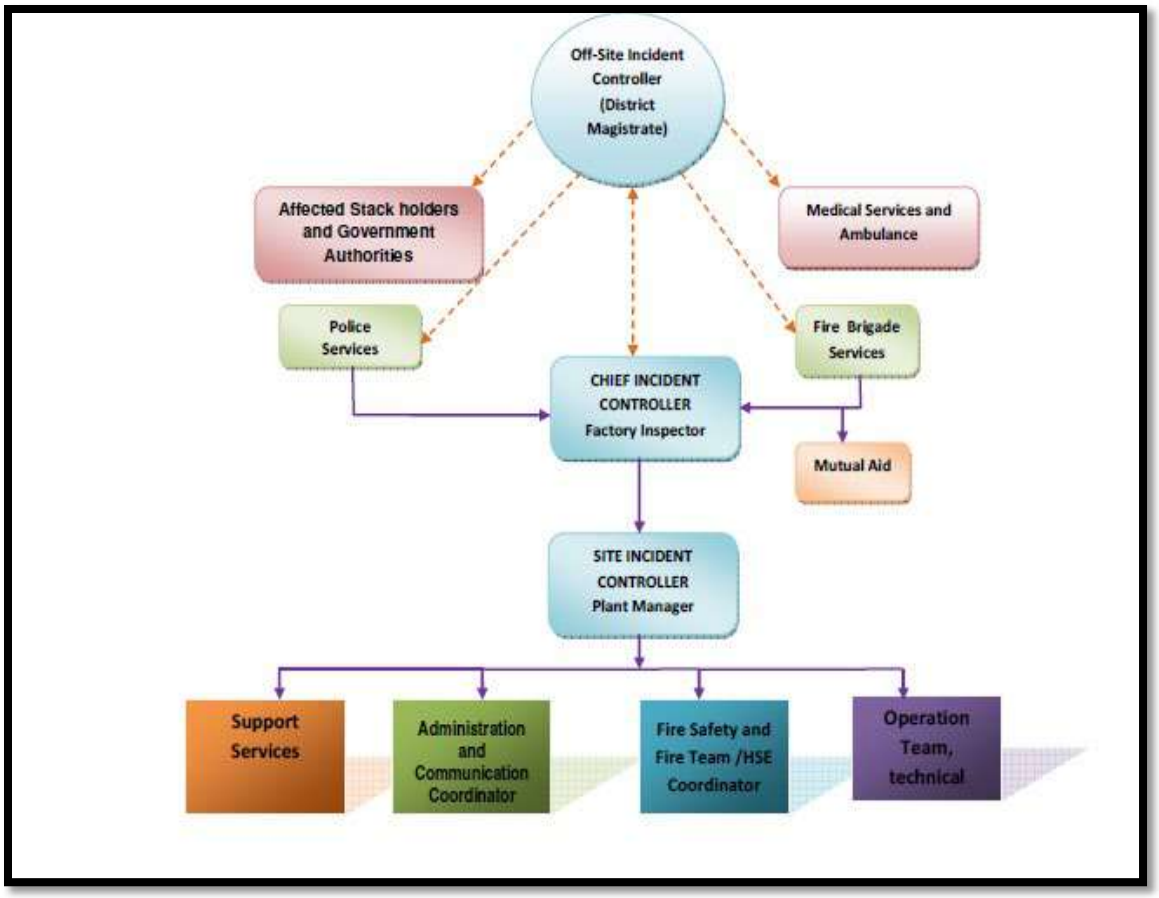


Figure 7.5: Organizations involved and role of responsibilities

7.20 Police

- To manage and control the mob, violence, sabotage or outbreak if any; Cordoning of the area and help in fire fighting and other emergency operations.
- In case of emergency the police department has a number of functions to perform; these are:

7.20.1 Responsibilities

- Maintain law and order situation near the facility premises.
- To control the traffic to facilitate the victims to reach hospitals as early as possible.
- To restrict entry of any unauthorized persons.
- To set up communication to assist in disaster management operation.
- To take control of surrounding transport facilities and assist in disaster management operation by shifting injured persons and casualties to nearby hospitals.
- To assist in fire fighting and other emergency operations.

7.21 District Collectorate/ Administration

- To supervise of all off-site emergency operations; order to evacuate off-site population.
- Local administration means those who are responsible for administration of the geographical area where the Facility is located.

7.21.1 Responsibilities

- To protect the citizens.
- To assess the situation for overall control.
- To monitor the functioning and need of various agencies in rescue operation at site.
- To requisite and make available the services and facilities available in the area like hospitals, doctors, transport, police, fire brigade and so on.
- To coordinate the activities outside the facility in view of their authority and experience in coordinating rescue and relief operations.

7.22 RTO

- To clear all approach roads to and from corporation area for free flow of vehicular traffic, which is engaged in combating the emergency and demarcate parking area for vehicles to evacuate population.

7.23 Controller of Explosives & Factory Inspectorate

- To provide expert advice and help in coordinating emergency operations with government agencies.
- The inspector of factories is expected to be a friend and a guide to industrial establishments. His involvement is a matter of course, since he would be officially connected with inquires after the disaster.

7.23.1 Responsibilities

- To coordinate with local govt. body e.g. collectorate, civil hospital, police department etc. as well as surrounding voluntary organizations.
- To act as Off-site emergency controlling authority.
- To inform public for precautionary measures.

7.24 Voluntary Organizations

- Voluntary organizations could help in relief and humanitarian services to victims in case of any emergency.

7.24.1 Responsibilities

- To assist in rescue operations and first aid to the victims.
- To arrange transport, refreshment and shelter.
- To take necessary assistance from social organizations like Red Cross Society, Scouts, NCC, Rotary, Lions clubs etc.

Table 7.16 Emergency DO'S AND DON'TS

	DO'S	DON'TS
Any One Noticing An Emergency Situation	Actuate nearest fire alarm **manual call point** and /or inform CR/Fire Station on telephone or inform the supervisor. Wait till arrival of fire crew and direct then to the site of emergency. Then report to the assembly point.	**DO NOT** panic and avoid running all over the place, prevent other from doing so. **DO NOT** enter the site unless instructed or all clear siren/message is heard.
Contractor Personnel	Stop work on hearing alarm. Assemble at the **ASSEMBLY POINT** and be ready to evacuate.	**DO NOT** enters the site, till it is cleared for the normal work by site incident controller.
Security	Keep the gate manned; Keep the road clear for movement of fire tenders. Control traffic at gates.	**DO NOT** allow unauthorized visitors free to enter.
Visitors	Leave the place and assemble at assembly point.	**DO NOT** enter the site if emergency alarm is heard.
All Other Employees On Site	On hearing **FIRE** alarm, go to assembly point and wait for further instruction.	**DO NOT** panic. **DO NOT** go to the site of emergency unless specifically instructed by site main/incident controller.

CHAPTER -8

INDEX

CHAPTER 8
PROJECT BENEFITS

It is seen that the Project is aimed to fulfill the objective of Sustainable Development. It will certainly improve social status. In what way and to what extent this will reach is submitted herein below.

8.1 Improvements in the physical infrastructure

This Project will improve the physical infrastructure of this area.

- → It will not disturb the existing pattern of drainage, because the building construction is not massive. It is more a steel structure not preventing the natural flow of rain water. There will neither be any inundation nor any erosion. As roof rain harvesting is proposed, there will not be any incremental run-off causing floods downstream.
- → Rain harvesting will improve the groundwater table. On the other hand no groundwater is consumed by us as we are either dependent on authorized surface water source or on recycled wastewater after full treatment. The enhanced groundwater will be indeed useful to the surrounding farmers who are down gradient. The green crops in their fields on such groundwater will improve the physical infrastructure.
- → The industry is dependent on raw materials and helping chemicals, which arrives by road. The finished goods too is dispatched by goods. All the labour force will come by road. Thus we shall have to maintain the roads in good conditions. Road connectivity thus will improve. This improved physical infrastructure will be an added facility to the community for surface transport.
- → Greening drive in the premises will give a pleasant look to the land. It will absorb some portion of the CO_2 produced by fuel burning (utilities). For greening fresh water is not proposed to be used. The treated wastewater will be recycled and its CNPK contents will be useful as nutrients. Canopy of trees will arrest dust fugitive SPM as well as the noise.
- → When we are developing our own tree plantation, concept of bio-diversity will be kept in mind. This will need many species. These will be made available to us only through nursery. Nursery once so established will be useful in turn for others too who need. The nursery available with us may inspire others to plant more trees in this area in their compounds. This physical infrastructure will available to them.
- → Whether by a particular activity the physical infrastructure is improving or deteriorating is best judged by the change in prevailing land prices. Generally the land prices get

appreciated based on two factors namely (1) the comfort that it offers and (2) the occupation that it serves. On both these counts, this distillery activity downstream of nearby sugar units is desirable. This consideration is also reflected when the people are contacted to know about their opinion on the new venture here.

8.2 Improvements in the social infrastructure

This Project will improve the social infrastructure of this area.

→ It will not disturb the existing pattern of social relations and democratic set up. In the District similar industries are already running their units over the years. These are not only running with efficiency but are running with no disturbance from the local people. Local people have even encouraged the expansion of such projects for production. This mainly because they are accepted by local culture, without any disturbance to the existing pattern of social relations or hierarchy. Likewise the same Grampanchayat continues with same members and it gets support from this unit and the unit gets encouragement from the Grampanchayat. The peoples' democratic set up is undisturbed.

→ It is evident from a short history, that the Zilla Parishad has become somewhat stronger since the inception of similar units in the district here. The proponent's management consists of good-meaning people. They will employ proper sons of the soil without discrimination, wherever feasible. The buildings of the unit have significant ratable value and substantial raw material comes into the premises of local body. The Proponent's management keeps the transparent account. This will further enhance with diversification and the Grampanchayat will have a continued benefit of taxes and cess.

→ Time management is of importance especially in industrialized community though may not be so in agriculture oriented society. In rural background much of the time and energy is wasted in reaching from one place to another. This is due to lack of swift mode of transport. By the presence of this industry, number of vehicles in this area will generally improve (both private and public-owned). This will help shorten the time reaching destination and utilize it for some fruitful productive work. As people will more know about the importance of time, more vehicles will come on the roads.

→ Society and this Industry are interdependent. Industry gets strength from the villagers and get livelihood and amenity support. Both of them can get better future. To maintain this continuity, this is based on "Symbiosis", as also timely funds.

→ The rural economy is found generally dwindling because farmers depend only on one single source of livelihood namely conventional agriculture. With support of funds and amenities by our help, perhaps they will have more purchasing power and more use of domestic animals. The increased greenery and farming with support of the grass production can increase and animal husbandry will enhance. Buffalos, sheep and poultry can be a good business and work for ladies and elderly persons.

→ Upliftment of rural sector is slow because of lack of amenities and facilities. If there is a nucleus of industry or steady support of money-flow, such utilities can come to that area and sustain. By presence of similar units, already we are seeing the availability of Banking services and Government Post Office. With the advent of unit like ours, these services will be used more and more advance facilities will come to the horizon. Firefighting tenders will be now more easily available as also the Police Protection.

→ In the study zone of 10km radius, there was previously hardly any purchasing power and people had hardly any materials for sale. As a result even weekly bazaar markets were very scanty. It is now foreseen that there will be a well disciplines bazaar in the vicinity either to sell or purchase the needed commodities, without waiting for weekly bazaar or walking over there. The agricultural implements, agro-chemicals and vehicles will be in more demand and village grown milk products, vegetables and agricultural proceeds can be for sale.

→ Education level goes along with flow of funds and avenue of livelihood. Dependence on Government subsidy also goes along with political stability of the area. The level of education and literacy (especially rural and women) is very poor, needing improvement. This activity by this Proponent will certainly play a catalytic role in this.

→ Likewise the health level goes along with flow of funds and avenue of livelihood. Dependence on Government institutes like PHC (Primary Health Centre) also goes along with political stability of the area. The level of health and medication (especially children and women) is very poor, needing improvement. This activity by this Proponent will certainly play a catalytic role in this.

→ Health awareness and economic independence may also help in Family Planning decision-making.

→ What is stated above about the human health is equally true about animal husbandry and veterinary assistance. This may improve now.

→ Living in harmony is an important aspect of the society. This can happen only if all the components are comfortably placed. Persons engaged in their respective vocation and accruing job satisfaction leads to this. This will become possible by this venture.

→ It may not be out of place if we point out that the sister concerns of some of our directors have already demonstrated their interest in community development. The group is associated with local social bodies, educational institutes, credit societies and developmental societies. The corporate social responsibility initiatives are focused on employees, the community around its facilities and the environment. Running of the activities include

- Running of community centers which employ the wives of the employees, where they are provided vocational training to make them self-sufficient and uniforms and hand gloves stitched by them can be used here.
- Activities conducted by the employees focus on three groups: women, senior citizens and underprivileged children wherein each department in the company adopt an institution around here. These are schools, old age homes and remand homes.
- Unit will actively support the efforts of primary education to children of economically weaker section of society.
- On the environment front active drives of tree plantations across villages and training lectures in-house undertaken
- Construction of Hospital, Shopping Centre and Community Hall, in steps.

8.3 Employment potential – skilled, semi-skilled and unskilled

The industry and its supporting activity need many types of people right from manual to managerial strength, in a pyramid. The raw material carting may need unskilled workers with people on tractors tankers, trucks and tractor repairers as skilled ones. So in manufacturing activity all three types i.e. skilled, semi-skilled and unskilled people are required. The overall potential including the garages, loading-unloading actions, eateries, small shop owners is substantial. The local people can get a good share out of this. In the factory, science and technology prevails and there some outsiders will have to be engaged at least for the time being. If the second generation local people acquire that skill, they too will be able to fill the gap and accrue benefit of higher jobs. If the activity becomes stable by that time, perhaps expansion may become possible further and then employment availability may further enhance.

It can be stated that by this activity employment potential is certainly increasing in all walks of life – skilled, semi-skilled and unskilled

8.4 Other tangible benefits

Both tangible and non-tangible benefits will result from this activity and many of those are described above. Apart from direct employment, many other benefits will accrue like

- → Flood control by rain-water arresting, and harvesting
- → Groundwater level enhancing by recharging
- → Time saving by quicker transport
- → Aesthetics improvement by general greening with emphasis on biodiversity
- → Availability of nursery facilitates plantation
- → Developed economy strengthens democratic set-up.
- → Strengthened democratic set-up will bring weightage to secure better school-subsidy and health-institutes
- → Developed economy brings with it literacy and healthful living.
- → Improved safety-security in surrounding with better Law and Order.
- → Symbiosis and sustainable development will be the ultimate objective.

CHAPTER -9

INDEX

TABLES

No table of figures entries found.

FIGURES

No table of figures entries found.

CHAPTER 9
ENVIRONMENTAL COST-BENEFIT ANALYSIS

9.1 Introduction

Industry while making production also generates pollution. Production is beneficial to the Industry. Pollution is a diseconomy to the general public, by way of mal-effect on health and well-being. Industry is asked to internalize this external diseconomy by designing pollution mitigation measures. Then this is an extra cost to the Industry. However, if this cost is supported by the Industry then benefit will go to the public around. This is a cost-benefit relation. Cost and benefit are in inverse proportion. More mitigation cost to Industry is more benefit to society. Less mitigation cost to Industry is benefit saving to Industry but adverse to society. Best solution is Industry gets the production (albeit with lesser margin due to spending on environmental protection) and society gets the benefit (from employment and reasonably safe environment). This also comes under overall justification for the project.

9.2 If recommended at the Scoping stage

MoEF&CC in its Scoping stage has not asked the Proponents to dwell on the cost-benefit aspect. However, briefly this can be mentioned that this study has taken full responsible care to see that the Industry does not wish to gain profit at the cost of comfort of the society. In fact it is the endeavor of the Proponents;

- To reduce the pollution created by this new factory by utilizing it in the boilers, and to recycle as usable matter.
- In the final analysis (1) society to get pollution-free environment, (2) neighboring people getting useful amenities and (3) Indian community getting useful material as Alcohol and Power.
- This could be a win-win situation with benefit to Proponents, benefit to the Public and no (or low) harm to the environment. More of this finds place in Chapter Ten.
- All this is possible for which Environment Management Plan as worked out is scrupulously obeyed.

9.3 Voluntary Submission:

However, briefly this can be mentioned that this study has taken full responsible care to see that the proponent group does not wish to gain profit at the cost of comfort of the society.
In fact it is the endeavor of the Proponents;

- To keep transparent relations with the neighbors in the area
- To strengthen the Grampanchayat democratic set up, by paying taxes.

- Not to disturb any prime agricultural land
- Not to encroach on others' existing water source
- Not to overload the existing power supply, causing load-shedding to the villagers
- To remove the barrenness of the land and prevent wasting of rainwater.
- To Recharge the groundwater
- To strengthen the physical infrastructure
- To create greenery within our premises and even outside to some extent
- To reduce the wastewater pollution created by this new activity by utilizing it (1) as boiler feed after concentration, (2) as recycled water for other purposes, and (3) organic solid waste as manure in our own fields as water to grow plantation and landscaping.
- To reduce the solid waste pollution created by this new activity by utilizing it in the fields of our own community land development.

CHAPTER -10

INDEX

TABLES

FIGURES

CHAPTER 10

ENVIRONMENT MANAGEMENT PLAN (EMP)

10.1 Introduction

Environment Management is a crucial segment of Industrial Management, in view of the global concept of sustainable development. Apart from the social obligation, the industries are required to meet a series of statutory norms laid by Government bodies. Better environment management means less waste generation, better resources management leading to cost savings. Further, it gives a better public image. Therefore, preparation of Environmental Management Plan is a must to fulfill bifocal aspect of the statutory compliance as well as that of social concern.

Water needs of proposed expansion plant may be reasonably low, but generally this resource is declining. Thus, on one hand one should use it less and on the other the source should not be left polluted for others. Air environment needs to be continuously managed, because man needs inhalation every moment, so also is Flora and Fauna dependent on it. The biological aspects, soil and ground water are all interdependent. Thus, there is a need of proper environmental management and a conscious plan for it.

In this respect efforts are oriented towards

- Molasses will be used as raw material for distillery unit
- Spent wash will be used evaporated in MEE and conc. Spent wash will be used as fuel in incineration boiler.
- Condensate of MEE will be treated in CPU and will be used in process
- Treated effluent will be used for green belt development & agricultural purposes.
- Effluent (cooling tower blowdown, backwash) remaining is further used for green belt development.

10.2 Objectives of Environmental Management Plan

i. To define the components of environmental management.
ii. To prepare an environmental hierarchy.
iii. To prepare a checklist for statutory compliance.
iv. To prepare environmental organization.
v. To prepare a schedule for monitoring and compliance.
vi. To establish a watchdog committee voluntarily.

10.3 Checklist of Statutory Obligations

There are a number of environmental statutes required to be attained by the industries. KATSSSKL shall obey the provisions of all relevant Acts, Rules, Notifications and Orders.

The checklist of these obligations, which facilitates the obedience of the laws of land are given below:

- Water (Prevention and Control of Pollution) Act, 1974;
- Water (Prevention and Control of Pollution) Cess Act, 1977;
- Air (Prevention and Control of Pollution) Act, 1981;
- Environment (Protection) Act, 1986;
- Environment (Protection) Rules, 1986;
- Hazardous Waste (Management and Handling) Rules 2003;
- EIA Notification 2006 and its amendments

10.4 Environmental Management Cell (EMC)

KATSSSKL has a well laid Corporate Environmental Policy. Along with**,** an Environment Management Cell shall be developed by an effective mixing of a group of technical experts from various departments of the project to look after the all obligatory requirements and shall be responsible for the effective implementation of all environmental pollution control measures.

It will be the responsibility of this Cell to supervise the monitoring of environmental attributes viz. ambient air quality, water and effluent quality, noise level etc. either departmentally or by appointing external agencies wherever necessary.

In case the monitored results of environmental contaminants are found to exceed the standard limits, the Environmental Management Cell will suggest remedial measures and get them implemented.

The functions of Environmental Management Cell will be as follows:

- ❖ Obtaining Consent Order from the Maharashtra Pollution Control Board.
- ❖ Environmental monitoring.
- ❖ Analysis of environmental data, preparation and submission of reports to statutory authorities, Corporate Centre etc.
- ❖ Co-ordination with statutory bodies, functional groups of the station, head office etc.
- ❖ Interactions for evolving and implementation of modification programs to improve the availability/ efficiency of pollution control devices / systems.
- ❖ Conducting Environmental Appraisal (Internal) and Environmental Audit

The cell shall be headed by the Plant In charge as shown in **Figure 10.1** There should be one Environment Officer, who will report to plant in charge and will be assisted by chemist environment and environment & safety officer.

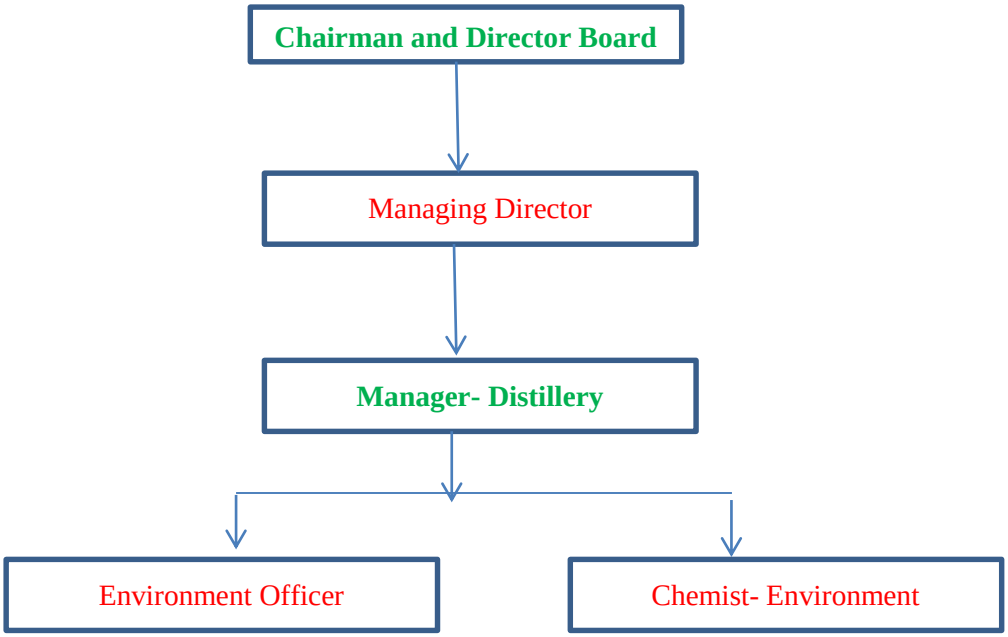


Figure 0.1 Environment Management Cell for distillery

10.5 Environmental management plan: Construction Phase

Environment impacts during construction phase will be mainly due to civil works such as site clearing, foundation, construction, material and machinery transportation etc. The construction phase impact will be temporary in nature and localized phenomena except the permanent change in land-use pattern at the project site.

10.5.1 Air environment

The construction of proposed expansion plant would result in the increase of particulate matter concentrations due to fugitive dust. Frequent water sprinkling in the vicinity of the construction sites would be undertaken and will be continued after the completion of plant construction as there is scope for heavy truck mobility. It will be ensured that both gasoline and diesel powered vehicles are properly maintained to comply with exhaust emission requirements. To minimize such impact following measures shall be taken:

- Preparation of paved internal movement roads will be taken up at the initial stage of civil construction work.

- All the loose material either stacked or transported shall be provided with suitable covering such as tarpaulin.
- Vehicles and equipment's will be periodically checked for pollutant emissions against stipulated norms.
- Water sprinkling shall be done at the location where dust generation is anticipated.
- To minimize the occupational health hazard, proper personnel protective equipment's like dust mask, ear plug, helmet, safety belt etc. shall be provided to the workers who are engaged in dust generation activity.
- DG sets shall be provided acoustic enclosure with adequate stack height.
- Possibility of raising green belt along with construction activity will also be explored

10.5.2 Noise environment

The noise generation during the construction phase will be around 80-100 dB (A) which will be restricted to the construction site only and will decrease with increasing distance.

- Construction machinery and vehicles will undergo periodic maintenance to keep them in good working condition.
- All machineries to be used for construction purpose will be of highest standard of reputed make and shall comply of noise pollution control norms.
- Acoustic enclosure/ temporary barrier around areas with high noise levels shall be provided.
- Personnel protective equipment's like ear plug shall be provided to the workers
- Possibility of raising green belt along with construction activity will also be explored so as to serve as a noise barrier.

10.5.3 Water Environment

During construction phase water will be utilized from existing source. The generated waste water will be treated in existing ETP and STP. The requirements shall be fulfilled as follows:

- Proper drinking water facility already exists in the premises which can be used by the construction workers
- Sanitation facilities are available at existing premises and will be used by workers
- Temporary barriers will be created during construction phase to avoid moving of the run off to the pathways or the other existing units.

10.5.4 Solid Waste Management Plan

- During the construction phase, whatever quantity of construction waste is generated shall be stored at a designated site within the premises to prevent scattered discharge on land and disposed of at the designated disposal site.
- Care shall be taken to ensure that temporary stacking and transportation shall not cause any disturbance to the surrounding environment.
- All proper safety measures shall be adopted by the workers handling the waste.

10.5.5 Safety & Health

Adequate space will be provided for construction of temporary sheds for construction workers mobilized by the contractors. Potable water supply will be provided for the construction workers. The safety department will supervise the safe working of the contractor and their employees. Work spots will be maintained clean, provided with optimum lighting and enough ventilation to eliminate dust/fumes.

10.6 Environmental Management Plan: Operation Phase

Environmental Management Plan is detailed under the following heads:

1. Air Quality Management
2. Noise Management
3. Waste Water Management
4. Solid & Hazardous Waste Management
5. Energy Conservation
6. Greenbelt Development & Plantation Programme
7. Occupational Health & Safety Measures.

10.6.1 Air Quality Management

The major pollutants of air in a distillery are the particulate matters from the stack and fugitive emissions due to material handling.

The monitored ambient air quality has been found to be very much within the norms established by the regulating agency such as Central Pollution Control Board. However, to maintain the existing status and minimize the impact due to the proposed project operations the following steps would be initiated for a better air environment:

- The emission characteristics should also be monitored regularly.
- At plant periphery as well as in-between spaces, recommended plant species should be grown in a manner that such small green patches act as a part of green belt to trap dust being emitted from fuel combustion and /or fugitive sources and also attenuate the other gaseous pollutants.
- The control of fugitive emission such as hydrocarbons from DG sets, process units/storage, the following measures are recommended:
  - Proper maintenance and clearing of the roads inside the plant to avoid excess fugitive dust generation
  - Raw materials and ash disposal trucks should be covered to stop dust emission
  - Monitor the consented parameters at ambient station.
  - Monitor the work zone at various stations to satisfy the corporate requirements for health and environment.

10.6.1.1 Stack Emissions

The following measures will be adopted for the control of emissions from the stacks of the proposed unit.

- The height of the stack will be 60 m for proposed 22 TPH boiler as per CPCB Norms

- Suitably designed ESP with efficiency of 99.9 % will be placed downstream of the stack which will separate out the incoming dust in flue gas so as to maintain the emissions PM (50 mg/Nm^3) at the outlet of the stack.

- Stack emissions will be regularly monitored by external agencies on periodic basis to check the efficiency of air polluting control devices and necessary action

Table 10.1: Utility emission and its control measures

Sr. No.	Attached to	Capacity	Fuel	Fuel Qty.	Height[m]	Dia. (m)	Gas Qty, Nm^3/hr	Gas Temp ^0C	APCD
Existing Stack									
1	Boiler	95TPH	Bagasse	1000 MT/day	76 Mtrs	3.0 Mtrs	92692 m3/Sec	150	ESP
2	D.G set	1010 KVA	HSD	200 Ltr/Hrs	6.1 Mtrs	102 Mtrs	10512 m3/Sec	160	Aquatic cover
Proposed Stack									
1	Incineration Boiler	22 TPH	Bagasse & Conc.Spent wash	B-4.5 MT/Hrs C-2.5 MT/Hrs S.W.-6.2 MT/Hrs	60 Mtrs	2.5 Mtrs	96573 m3/Sec	190	Bag Filter
2	D.G set	105KVA	HSD	10 Lts/Hrs	6.1 Mtrs	102 Mtrs	1000 m3/Sec	150	Aquatic cover

10.6.1.2 Fugitive Emission Management

- The main raw material and product shall be brought in and dispatched by road in covered enclosures.
- Bag filters/ Dust collectors shall be installed at loading-unloading section to minimize the PM emission at the site.
- Emphasis shall 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 shall be ensured that the vehicle owners must have valid PUC Certificate.
- Dust suppression on haul roads shall be done at regular intervals.
- Boiler ash shall be transferred in closed conveyors to the end users to avoid any spillage.
- Besides this odour is also a problem in the distillery plant due to typical odour compounds like alcohol, fusel oils & fermentation process. Use of efficient bio-cides to control bacterial contamination. Control of temperature during fermentation to avoid in-activation/ killing of yeast. Avoiding stalling of fermented wash.
- Development of greenbelt in and around the plant premises helps to obscure the odour and fugitive emissions.
- Good housekeeping shall be maintained within the project premises.

10.6.1.2.1 Sources of fugitive emission

Material Storage: Dust may be generated here due to carryover by wind. However, to avoid this, material will be kept in covered location, preferably in silos or covered shed.

Transportation: Transportation of material like coal and ash shall be done carefully, preferably in covered belt conveyor to avoid dust emission. Movement of heavy trucks/vehicles on the non-metallic road generates substantial quantity of dust emission. This is due to the presence of dust over the road, which is carried away by wind. To control the generation of dust, all the roads inside the plant premises will be tar roads. Regular sweeping of all the roads and floors is being done by vacuum sweeper. Sprinkling of water through tankers is being done on bare lands and roads.

The following measures will be adopted to control the fugitive emissions:

- The dust generated from vehicular traffic during operation phase will be suppressed by providing adequate water spray systems.
- All vehicles and their exhausts will be well maintained and will be regularly monitored for emission generated from the vehicle exhaust;
- Provide wheel washers for vehicles to remove particulate matter that would otherwise be carried offsite by vehicles that would decrease deposition of particulate matter on area roads and subsequent entrainment from those roads.
- To control of the airborne fugitive emissions from the ash handling area will be achieved through regular water sprinkling in this area.
- The green belt development at ash handling areas will be undertaken.
- Avenue plantation and green belt development will be undertaken in the operation phase.

Table 10.2 Air Pollution sources and control Measures

Sr.	Source	Fuel	Emissions	Control Measures
1.	Existing 95 TPH Boiler	Bagasse	Particulate Matter, SO_2 and NO_X	76 m stack and wet scrubber provided
2.	Existing DG Set 1010 KVA	HSD	Particulate Matter, SO_2 and NO_X	7 m stack height provided
3.	Proposed 22 TPH Incineration Boiler	Bagasse & Conc.Spent wash	Particulate Matter, SO_2 and NO_X	60 m stack and Bag filter will be provided
4.	Proposed 105 KVA D.G Set	HSD	Particulate Matter, SO_2 and NO_X	6 m stack height will be provided

10.6.2 Noise & odour Management

Exposure of high noise level to workers for long duration may lead to certain occupational diseases. To mitigate the high noise level, following measures are being adopted. The same will be practiced for proposed expansion also. Odour management shall also be undertaken

- Walls and ceilings of the concerned buildings are lined with sound absorbing materials.
- Properly insulated enclosures are provided to equipment making excessive noise.
- Improved silencers are provided in the equipment generating high noise.
- Proper maintenance, oiling and greasing of machines at regular intervals is being done to reduce generation of noise.
- Personal Protective Equipment (PPEs) like earplugs and earmuffs is being provided to the workers exposed to high noise level.
- Area having high noise level being displayed at site with Noise level and signage for usages of Personal Protective Equipments (PPE's).
- Green Belt of appropriate width inside the plant premises and at the plant boundary has been developed and same will be maintained in future.
- Regular monitoring of noise level is being carried out and corrective measures in concerned machinery are being adapted accordingly to the possible extent.
- The ambient Odour level and work zone Odour level shall be monitored by sensing.
- Awareness will be created for Odour attenuation and mitigation.

10.6.3 Water Management

10.6.3.1 Waste Water Management

The major contribution of pollution in a proposed distillery unit is aqueous effluent i.e, spent wash. The spent wash of a distillery process is a serious problem by way of threat to the environment. Its volume from continuous fermentation plant is as large as 650 KL/day for a distillery of 60 KL/day capacity.

In existing 30 KLPD distillery unit, spent wash is treated through re boiler followed by Bio composting. After expansion treatment technology will be MEE followed by Incineration.

The spent wash evaporation technology is a multiple effect evaporator system in which heat recovered from one effect is used to concentrate spent wash in second effect evaporator with continuous recirculation of concentrated spent wash within the system until desired concentration is obtained.

This entire concentration process is carried out under vacuum leading to less consumption of steam and maximum concentration of spent wash with in less period of time.

The concentrated spent wash generated after entire process of evaporation is then sprayed in a furnace with auxiliary fuel such as coal and is then burnt in a boiler.

In order to fulfill the Pollution Norms and to achieve zero Discharge and at the same time to operate distillery for the period more than 300 days per annum, Factory proposes to go for spent wash Concentration and Incineration Technology simultaneously generating Steam and Power for the process and Distillery.

With effective utilization of such a technology big hurdle of spent wash disposal will be solved and distilleries will become zero effluent discharging units to be called as **"Evergreen BIO-FUEL Refineries".**

Table 0.3 Spent Wash Generation and Treatment

Sr. No.	Particular	Details
1.	Spent wash Generation	650 kl/day
2.	Sent to Multi effect evaporator	325 kl/day
3.	Quantity of spent wash remaining	130 kl /day
4.	Sent to slop fired boiler	
	Boiler capacity	22 TPH
	Stack height	60 mts.
	Pollution control equipment	Bag filter
5.	Hence zero discharge is achieved	

KATSSSKL proposes to go for spent wash Concentration and Incineration Technology simultaneously generating Steam and Power for the process and Distillery. Condensate from MEE will be treated at CPU. Treated condensate will be used in process and cooling tower.

The KATSSSKL has proposed to install integrated evaporation plant as primary effluent treatment system followed by standalone multiple effect evaporation as secondary treatment and incineration boiler as final treatment for disposal of spent wash.

The raw spent wash quantity will be reduced through integrated evaporation from 650 M3/day with 12% solids to 325 M3/day with 24% solids. The concentrated spent wash coming from integrated evaporation @ 325 M3/day with 24% solids will be further concentrated to 130 M3/day containing 60% solids in standalone multiple effect evaporation plant.

In integrated evaporation, to concentrate the spent wash, alcoholic vapors generated in rectification column will be used as heating media for evaporation. The steam required for standalone evaporation body will be around @ 2.75 MT/hr. The spent wash with 60% solids will be fired in incineration boiler along with coal as a supplementary fuel. The steam generated by the incineration boiler and power generated in the turbine will be used for integrated distillation, secondary evaporation and boiler. Thus, the "Zero Liquid Discharge" will be achieved.

The KATSSSKL management has also decided to install Condensate Polishing Unit (CPU) for treatment of evaporation condensate of standalone evaporation plant @ 520 M3/day and spent lees @ 120 M3/day. Thus, the total capacity of CPU unit will be 600M3/day. After treatment in CPU, treated water will be reused for process and non-process applications in distillery.

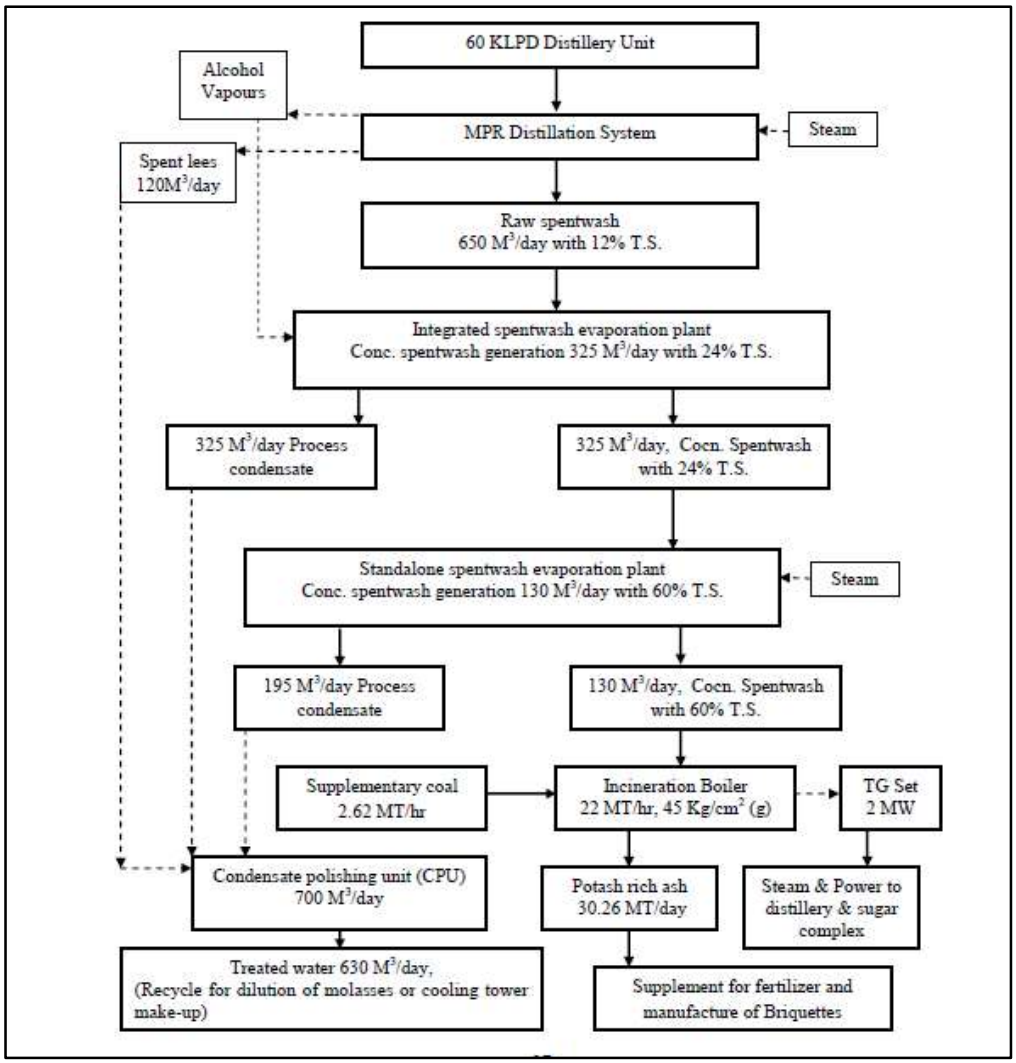


Figure 10.2 Zero Spent wash Discharge" Scheme

10.6.3.2 Water Conservation

The proponent has decided to reuse/ recycle all effluent to meet the total water requirement of the company after proposed project. Wastewater will be managed as per the planned recycling & Zero Discharge scheme for wastewater management.

The following measures will be adopted to minimize use of fresh water:

- Re-use of effluent and domestic wastewater
- Periodic preventive maintenance of water distribution systems
- Rain water harvesting from the roof top catchment area will be done for the proposed distillery project.
- Training and awareness on water conservation measures
- Proper storm water drainage will be provided during rainy season to avoid mixing of storm water with effluent

10.6.4 Solid and hazardous Waste Management

Solid waste generated shall be recycled, reused or disposed off as per norms.

Table 10.4 Solid waste management and disposal

Sr.	Particulars	Generation in MT		Disposal
		Existing	Proposed	
•	Bagasse	127500	Nil	Used as fuel for cogeneration boiler
•	Molasses	27104	Nil	Used as raw material for distillery unit
•	Press Mud	18062	Nil	Composting and sale to farmer as soil conditioner
•	Ash	1823	5636	Sold to brick manufacturer
•	ETP Sludge (T/M)	5.0	3.0	Mixed with press mud used as a manure for landscaping

10.6.5 Noise Management Plan

Various components of industrial operations cause some amount of noise, which shall be controlled by proper maintenance and compact technology.

- Closed room shall be provided for all the utilities so as to attenuate the noise pollution.
- Acoustic enclosure shall be provided to D.G sets.
- Free flow of traffic movement shall be maintained. Earmuffs shall be used while running equipment's of the plant.
- Proper maintenance, oiling and greasing of machines at regular intervals shall be done to reduce generation of noise.
- Regular monitoring of noise level shall be carried out.
- Greenbelt shall be developed around the periphery of the plant to reduce noise levels.

10.6.6 Odour Management Plan

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.
- Control of temperature during fermentation to avoid in-activation/ killing of yeast.
- Avoid staling of fermented wash.
- Regular use of bleaching powder in the drains to avoid generation of putrefying microorganisms.

10.6.7 Traffic Management Plan

- Culverts shall be maintained.
- Alcohol shall be transported in tankers hence there shall not be any fugitive dust/ VOC generation during transportation of raw materials, fuel and products.
- Good traffic management system shall be developed and implemented for the incoming and outgoing vehicles so as to avoid congestion on the public road.
- The area earmarked for parking in the proposed project will be 76475.49sq. m.

10.7 Rain Water Harvesting

The Rain Water Harvesting (RHW) program can helps in many ways starting from conservation of natural resources to prevention of soil erosion. Rainwater is very helpful to industry in terms of saving of economy of water consumption. The rainwater collection by roof top harvesting has been preferred at present for the proposed project. Proponent has decided to conduct rainwater harvesting. The probable available catchment areas worked out to be approximately 10,492 m^2. The calculated harvesting potential details are provided in **Table 10.5**. Accordingly, the unit will have a harvesting potential of 13331.35 m^3/Annum.

Storm Water Drainage Line: Channels will be installed wherever required to collect and transport rain water to the storage tank. Drainage will be semi-circular and will be made using Galvanized Iron sheet folded to required shapes. Drainages will be fixed using Iron Brackets.

The quantum of water that could be harvested in the study area is calculated using the formula,

Harvesting potential = Catchment Area (m^2) * Runoff Coefficient * Annual Rainfall (m)

Table 10.5 Rainwater Harvesting Calculations

Particulars	Details	
Roof top area (m2)	a	10492
Run off coefficient	b	0.9
Annual Rainfall Intensity m	c	1.41
Annual Rain water Harvesting Potential m3/Y	d= a*b*c	13331.35
Daily Rain water Harvesting Potential m3/ day	e= d/46	289.81
Rain Water Harvesting Tank Capacity m3	f	20000

Total 2642 m3 water will be stored at Agri pond will be used for landscaping in off season

10.8 Storm Water Management

The total runoff shall be managed through the provided drainage system and thus no water logging shall be happened.

The drainage line are open channels. Detailed storm water calculation along is presented below in **Table 10.6**

Table 10.6 Strom water Calculations

Particulars	Details	
Paved area (m2)	A	492965.45
Run off coefficient	b	0.80
Unpaved area (m^2)	c	433674.71
Run off coefficient	d	0.25
Effective catchment (m^2)	e = (a*b)+(c*d)	502791.04
Total annual rainfall (in m)	f	1.41
Max. rainfall intensity (in m)	g	0.19
Max. hourly rainfall recorded (m)	h	0.01
Annual Strom water potential (in m^3/Y)	e*f	709840.39
Maximum daily StromWater potential (in m^3/D)	e*g	93569.41
Maximum hourly StromWater potential (in m^3/hr.)	e*h	3898.73
Max storm water load on the site with per hour retention (in m3/hr.)		**3898.73**

As per above calculation, Total storm water Runoff potential of the factory shall be 3898.73m3/hr. This storm water shall be managed through the storm water pipeline which shall be adequate to manage the storm water.

10.9 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. Green belt planning has been done as per guidelines laid by CPCB. Taking into consideration ecological perspectives and availability of space and other aspects greenbelt development has been planned for the proposed distillery project. This will

help in increasing the aesthetic effect of the environment. Greenbelt will be developed along most of the periphery of the project area as well as along roads for avenue plantation

Factory has provided green area of 492965.45 m^2. i.e about 34% of Total Plot Area.

Figure 10.3 Existing green Area

Table 10.7 List of Trees Recommended For Greenbelt Development

Sr. No.	Common Name	Scientific Name	Nos. of Trees		Total
			Existing	Proposed	
1.	Coconut	*Cocos Nucifera*	8000	1500	9500
2.	Mango	*Mangifera indica*	9800	1300	11100
3.	Sesame	*Sesamum indicum*	1000	1000	2000
4.	Neem tree	*Azadirachta indica*	16250	13406	29656
5.	Nilgiri	*Eucalyptus*	8000	1000	9000
6.	Karanj	*Millettia pinnata*	1000	1000	2000
7.	Jamun	*Syzygium cumini*	800	1000	1800
8.	Purple	*Ficus religiosa*	1250	1211	2461
9.	Babool	*Vachellia nilotica*	600	1000	1600
10.	Banyan	*Ficus benghalensis*	1300	1000	2300
11.	Shevari	*Sesbania bispinosa*	1027	1500	2527
Total			**49027**	**24917**	**73944**

10.10 Occupational Health & Safety

a. Occupational Health

Occupational health needs attention both during construction & erection and operation & maintenance phases. However, the problem varies both in magnitude and variety in the above phases.

Construction & Erection: The occupational health problems envisaged at this stage can mainly be due to constructional accident and noise. To overcome these hazards, in addition to arrangements to reduce it within TLV's personal protective devices should also be supplied to workers.

Operation and Maintenance: The problem of occupational health, in the operation and maintenance phase is due to respirable dust and noise. With suitable engineering controls the exposures can be reduced to less than TLV limits and proper personnel protective devices should be given to employees. The working personnel should be given the following appropriate personnel protective devices.

- → Industrial safety helmet;
- → Crash helmets;
- → Face shield with replacement acrylic vision;
- → Zero power plain goggles with cut type filters on both ends;
- → Zero power goggles with cut type filters on both sides and blue colour glasses;
- → Chemical goggles;

- → Welders equipment for eye & face protection;
- → Cylindrical type earplug;
- → Ear muffs;
- → Dust masks;
- → Canister gas mask;
- → Self contained breathing apparatus;
- → Leather apron;
- → Aluminized fiber glass fix proximity suit with hood and gloves;
- → Boiler suit;
- → Safety belt/lime man's safety belt;
- → Leather hand gloves;
- → Asbestos hand gloves;
- → Acid/alkali proof rubberized hand gloves;
- → Canvas cum leather hand gloves with leather palm;
- → Lead hand glove;
- → Electrically tested electrical resistance hand gloves;
- → Industrial safety shoes with steel toe;
- → Rubber boots (alkali resistant); and
- → Electrical safety shoes without steel toe and gum boots.

Full-fledged hospital facilities should be made available round the clock for attending emergency arising out of accidents, if any. All working personnel should be medically examined at least once in every year and at the end of his term of employment. This is in addition to the pre-employment medical examination.

b. Safety Plan

Safety of both men and materials during construction and operation phases is of concern. The preparedness of an industry for the occurrence of possible disasters is known as emergency plan. The disaster in the plant is possible due to leakage of hazardous chemicals, collapse of structures and fire/explosion etc. Keeping in view the safety requirement during construction, operation and maintenance phases, steel plant has formulated safety policy with the following regulations:

- → To allocate sufficient resources to maintain safe and healthy conditions of work;

- → To take steps to ensure that all known safety factors are taken into account in the design, construction, operation and maintenance of plants, machinery and equipment;
- → To ensure that adequate safety instruction are given to all employees;
- → To provide wherever necessary protective equipment, safety appliances and clothing, and to ensure their proper use;
- → To inform employees about materials equipment or processes used in their work which are known to be potentially hazardous to health or safety;
- → To keep all operations and methods of work under regular review for making necessary changes from the point of view of safety in the light of experience and up to date knowledge;
- → To provide appropriate facilities for fist aid and prompt treatment of injuries and illness at work;
- → To provide appropriate instruction, training, retraining and supervision to employees in health and safety, first aid and to ensure that adequate publicity is given to these matters;
- → To ensure proper implementation of fire prevention methods and an appropriate firefighting service together with training facilities for personnel involved in this service;
- → To organize collection, analysis and presentation of data on accident, sickness and incident involving personnel injury or injury to health with a view to taking corrective, remedial and preventive action;
- → To promote through the established machinery, joint consultation in health and safety matters to ensure effective participation by all employees;
- → To publish/notify regulations, instruction and notices in the common language of employees;
- → To prepare separate safety rules for each types of occupation/processes involved in a project; and
- → To ensure regular safety inspection by a competent person at suitable intervals of all buildings, equipment, work places and operations.

c. Safety Organization

Construction & Erection Phase: A qualified and experienced safety officer will be appointed. The responsibilities of the safety officers include identification of the hazardous conditions and unsafe acts of workers and advice on corrective actions, conduct safety audit, organize training programs and provide professional expert advice on various issues related to occupational safety and health. He is also responsible to ensure compliance of works safety rules/statutory provisions.

Operation & Maintenance Phase: When the construction is completed the posting of safety officers should be in accordance with the requirement of factories act and their duties and responsibilities should be as defined thereof.

Occupational Health Surveillance

In Distillery unit, the occupational health surveillance of the employee shall be done on a regular basis and records of the same shall be maintained as per the Factory Act. The occupational health surveillance program will include lung function; sputum analysis and audiometric analysis on regular basis to observe any contraction due to exposure to dust and noise and corrective measures will be taken accordingly.

Vocational training programs will be conducted. Under vocational training, the workers will be given training related to all safety and health aspects pertaining to their vocation and thereafter, every quarter special training courses/ awareness program for Malaria eradication, HIV and health effects on exposure to dust, heat, noise, chemicals will be organized for employed person. Periodical medical camps with specialized doctors of various disciplines will also be held to provide the specialized medical assistance to employees as well as neighboring communities.

All workers will be insisted to have appropriate Personal Protective Equipment at all times within the premises like

- → Industrial Safety helmets, Crash helmets
- → Face shield
- → Zero power Safety goggles & Gas Cutting Goggles
- → Welders equipment for eye and face protection i.e. welding shield
- → Ear muffs and Ear Plugs
- → Full body Safety harness
- → Leather hand gloves, Electrical hand gloves, Heat Resistive hand gloves, Chemical hand gloves & Cut resistance hand gloves
- → Safety net, Barricading net
- → Industrial safety shoes with steel toe, Gum boots
- → Retractable and fall arrestors
- → Leather apron, Reflective Jackets, Protective clothing, etc.

During operation stage, dust, gas cutting, welding may cause hazards, micro-ambient conditions near border, platforms etc. Periodical examination of workers' occupational health is necessary

Table 10.8 Health Evaluation Matrix

S. No.	Occupation	Type of Evaluation	Frequency Pre-placement & Thereafter		
			Age <30 every(year)	Age 30-40 every (Year)	Age 41-50 every (year)
1.	Cane crushing area	Chest X-ray, Spirometry & vision testing	5	4	2
2.	Sugar Process area & Co-generation Area	Chest X-ray, Spirometry & vision testing	5	4	2
3.	Main Control Room	Far & Near Vision, colour vision and hearing test	5	4	2
4.	Ash & Coal handling area	Chest X-ray, Spirometry, vision & Hearing testing	5	4	2
5.	Noise prone area	Audiometry	Annually		

Note: All workers engaged in material handling system will be regularly examined for lung diseases such as PFT (Pulmonary Function Test) and regarding Liver.

For the present, it is found that the situation is within Permissible Exposure level (PEL). In order to maintain the same, what measures the company has adopted to keep them within PEL so that health of the workers can be preserved is mentioned. For future work, namely exposure specific health status evaluation of worker, we propose to conduct health evaluation on a pre-designed format for chest X rays, Audiometry, Spirometry, Vision testing (Far & Near vision, colour vision and any other ocular defect), ECG during pre-placement and periodical examinations as per Factory Act & Rules, as detailed above. This will be for future working when alcohol manufacturing is involved, with an aim of maintaining OHS standards as per OSHAS/USEPA. Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers is separately earmarked.

d. Provision for Occupational Health and Safety

Every worker will undergo medical tests before being employed. Periodic testing shall also be conducted by this hospital/ lab. Qualified Doctor will be employed by company on full-time basis,

who will monitor workers health and conduct routine check-up. Every worker shall be insured with Health insurance and Life Insurance by reputed insurance company.

e. Work-zone Comfort Environment:

→ The work zone temperature and humidity levels shall be monitored.

→ Sensors will be installed in sensitive areas to record ambient air quality

→ Facilities like toilets, rest rooms, sanitation, canteen, recreational area shall be provided for workers as well as truck drivers, cleaners and contract labors

→ The work zone will be spacious with appropriate air circulation

10.11 Corporate Environment Responsibility (CER)

As per New Office Memorandum Published by MOEF &CC, New Delhi on 1st May 2018 regarding applicability of CER and Budget to the decided towards CER activities.

The total project cost is Rs. 7800 lakhs. 1.0% of the total cost it becomes Rs.78 lakhs approx. Hence we have dedicated Rs 78 lakh for Corporate Environment Responsibility (CER) activities to be carried out in surrounding villages based on need assessment.

Table 0.9 The details CER activities proposed along with budget is given

CER Activities Details - SSK								
Sr. No.	**CER Activity**	**Location**	**Details**	**Quantities**	**Total Amount in Rs (Lacs)**	**TOTAL DURATION OF THE PROJECT: 3 Years**		
						1st Year 2019	**2nd Year 2020**	**3rd Year 2021**
						(Lacs)		
1	Water Supply	Malunge Zilla Parishad School	Providing Drinking Water Supply (RO)	3	**120000**	40000	40000	40000
		Sant Tukaram school , Pashan		3	**120000**	40000	40000	40000
		Zilla Parishad Primary School, Sus Road		3	**120000**	40000	40000	40000
		Zilla prathamik School, Sherlin Regency road		3	**120000**	40000	40000	40000
		Gondi School		3	**120000**	40000	40000	40000
		Ambad Hospital		2	**80000**	40000	40000	0
		Shahgad Hospital		2	**80000**	40000	40000	0
2	Sanitation (Providing Toilets, Donating Dustbins)	Malunge Zilla Parishad School	To Municipal School.	3	**150000**	50000	50000	50000
		Sant Tukaram school , Pashan		3	**150000**	50000	50000	50000
		Zilla Parishad Primary School, Sus Road		3	**150000**	50000	50000	50000
		Zilla prathamik School, Sherlin Regency road		3	**150000**	50000	50000	50000
		Gondi School		3	**150000**	50000	50000	50000
3	Electrification Including Solar	For Malunge Gram Pancyat	Electrification and Solar Work for Municipal	10	**800000**	266667	266667	266667
		Ambad Hospital		5	**400000**	133333	133333	133333

	Power		Office					
4	Rain Water Harvesting	Malunge Zilla Parishad School,	Construction of Recharge pits	3	**135000**	45000	45000	45000
		Sant Tukaram school , Pashan		3	**135000**	45000	45000	45000
		Zilla Parishad Primary School, Sus Road		3	**135000**	45000	45000	45000
		Zilla prathamik School, Sherlin Regency road		3	**135000**	45000	45000	45000
		Patharwala School		3	**135000**	45000	45000	45000
		Gondi Hospital		2	**90000**	30000	30000	30000
		Ghansangvi Hospital		2	**90000**	30000	30000	30000
5	Avenue Plantation	Ambad Municipal Park	Tree Planation along Ambad Municipal Park	1500	**450000**	150000	150000	150000
6	Plantation in Community Areas	Ghansangvi Municipal Park	Planation in Ghansangvi Municipal Park	1500	**450000**	150000	150000	150000
7	Ambulance	Gondi Hospital	Provide ambulance	1	**1400000**	0	1400000	0
		Ambad Hospital		1	**1400000**	0	1400000	0
8	Local Farmer	Domalgaon Village	Awareness /Fertilizers/ Support	1	**270000**	270000	0	0
		Gundewadi Village		1	**270000**	270000	0	0
	TOTAL AMOUNT Rs.				**7805000**	**2055000**	**4315000**	**1435000**

Figure 10.4 KATSSSKL officials carrying Social Activities

10.12 Environmental Monitoring Schedule

Monitoring of the post project environment is of utmost importance and has legal requirements. Regular monitoring of the environment helps in assessing the benefits of implementation of environment management plan. KASSSKL shall adopt an effective monitoring plan with proper schedule as a step forward to ensure better environment management practices. Details about Environmental Monitoring Schedule given in the **Chapter-6**

10.12.1 Budget for the Environmental Management plan

The Capital Cost of Distillery project is Rs. 78.02 Cr. Before the commission of the plant the Environment Management Cell will be formed to take care of environmental issues including plantation. The total capital cost for EMP will be Rs 6.95 Cr and O & M cost will be 0.55 Cr - details are given in **Table. 10.10**

Table No. 10.10 Cost of Environmental Protection Measures

S. No.	Environmental Aspect	Capital Expenditure Rs in Cr.	Recurring Expenditure Rs in Cr.(per annum)
1	Emission control Engineering	4.0	0.10
2	Water & Wastewater management	2.0	0.15
3	Solid Waste management	0.20	0.05
4	Greening Drive	0.20	0.10
5	Environment Monitoring	0.05	0.05
7	Other aspects like Rain Water Harvesting, Safety, Security etc.	0.50	0.10
	Total	**6.95**	**0.55**

10.13 Concept of Waste-Minimization, Energy and Natural Resource Conservation

Other than all the pollution control measures, KATSSSK is also following waste minimization and natural resource conservation strategy. Details of which are shared below.

Waste-Minimization

Process optimization by using latest technology equipment and waste treatment technology. Usage of Baggase and HSD as fuel which ultimately eliminates fly ash generation as waste

Energy Conservation

The following measures shall also be adopted by KATSSSK, for reduction in specific energy consumption:

- Installation of energy efficient lightings with the use of LED/CFL lighting.
- Use of energy efficient electric motors.
- Training, awareness and motivational Programmes.

Natural Resource Conservation

- Water will be treated and recycled to reduce the fresh water consumption and to reduce water drawl. Thus, a major step towards conservation of water resource.
- Rain water harvesting shall be carried out to conserve water recycle it in gardening and washing activities.

CHAPTER -11

INDEX

CHAPTER 11
SUMMARY & CONCLUSION

11.1 Introduction

M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd. (KATSSSKL), Ankushnagar, Tal. Ambad, Dist. Jalna is registered under the Maharashtra Co-Operative Societies Act, 1960 vide Registration No. JAL/PRG/A-1 dated 10th February 1982.

The existing crushing capacity of Sugar unit was 2500 TCD, 18 MW Co-generation and 30 KLPD Molasses based Distillery unit.

The factory has obtained No Objection Certificate from Government of Maharashtra for expansion of sugar unit and Rectified spirit and extra neutral alcohol on 15th May 1993 and Environment Clearance for 18 MW Bagasse based power plant on 24th April 2009.

The Karkhana has set up 30 KLPD capacity Distillery Plant based on Biostil fermentation and atmospheric distillation technology in the year 1992. Now, KATSSSKL planning to propose expansion of distillery unit from 30 KLPD to 60 KLPD within the existing premises.

As per EIA Notification on 14th September 2006 issued by Ministry of Environment & Forests, Govt. of India *vide* Gazette Notification No. S.O. 1533(E) dt: 14thSep.'2006, and amended, the proposed expansion of 30 KLPD to 60 KLPD molasses based distillery shall be treated as Category–A; Schedule 5 (g). Accordingly, the project proponent has submitted prescribed application along with pre-feasibility report to the MoEF&CC New Delhi. Terms of Reference has been approved by EAC (vide letter No.IA-J-11011/81/2018-IA-II(I) dated 15th June 2018). Based on the approved TOR and standard TOR, Environmental Impact Assessment studies are carried out. Draft EIA and EMP report was prepared and submitting for public hearing.

11.2 Details of Project

The proposed expansion will be at existing distillery unit. Project located at Ankushnagar, Tal. Ambad, Dist. Jalna Maharashtra. Site comes under Grampanchyat Mahakala Jurisdiction. The site is located at Ankushnagar on national high way No. 211. The nearest railway station is Jalna and is about 55 Km away from the site. It is geographically located in 19°23'40.50"N latitudes and 75°42'21.42"E longitude.

11.3 Project Description

Sr.	Details	Sugar	Cogeneration	Distillery	
1.	**Status**	**Existing**	**Existing**	**Existing**	**Expansion After Expansion**
2.	**Location**	Gat No. 106 Ankushnagar, Tal. Ambad, Dist. Jalna Maharashtra			
3.	**Capacity**	2500 TCD	18 MW	30 KLPD	30 KLPD to 60 KLPD & 2 MW
4.	**Working days**	180	180	190	300
5.	**Raw material**	Sugarcane	Bagasse	Molasses	Molasses
6.	**Quantity of raw Material**	450000 MT	126000 MT	20250 MT	69,231 MT/annum Own : 48,782 MT Remaining : 20449 MT from nearer factories
7.	**Products**	Sugar 51750 MT	Power 18 MW	Industrial Alcohol, Absolute Alcohol and Fusel Oil 30 KLPD	Anhydrous/Fuel Alcohol Impure Spirit, ENA, Fusel Oil : 60 KLPD
8.	**Boiler Capacity**	95 TPH		-	22 TPH
9.	**Boiler Fuel**	Bagasse		-	Conc. Spent wash (6.0 T/hr) and Bagasse (5.0 T/hr)
10.	**Water source**	Godavari River & CGWA Permission		Godavari River & CGWA Permission	Godavari River
11.	**Water requirement**	758 M3/day		240	612 M3/day
12.	**Land ha**	358 Acre			
13.	**Green Belt ha**	50.00 Acre			
14.	Effluent Treatment facility	ETP of Capacity 350 M3/day		Spent wash treated in re boiler and Condensate water is recycled in process & concentrated spent Wash used for bio composting to achieve zero discharge	Spent wash will be treated at MEE and Concentrated spent wash will be used as fuel in Boiler. Condensate from will be Treated in CPU and used for process
15.	APC measures for boiler	76 m stack height & ESP		-	Stack height. 60 m and bag Filter

11.3.1 Basic Requirement of the proposed project

i. Land: The Company owns total 358 Acre out of which for distillery require 5.5 acre of land. The project will be accommodated in the existing factory premises.

ii. Raw Material: Molasses is one of the waste products produced from sugar factory. Molasses can be used as raw material for distillery. The resultant alcohol has various uses in chemical industry, pharmaceutical industry and as Ethanol. Distillery unit needs the raw material as molasses & this can be fulfilled by sugar factory of our own. The molasses requirement for distillery after modernization will be 230.77 MT/day (69,231 MT/annum). The factory will have its own molasses to the extent of 27104 MT from Unit I and 20615 MT from KATSSSKL.

iii. Water: Fresh Water demand is 612 m3/day. Permission of Irrigation Department is obtained. Water source is Godavari River.

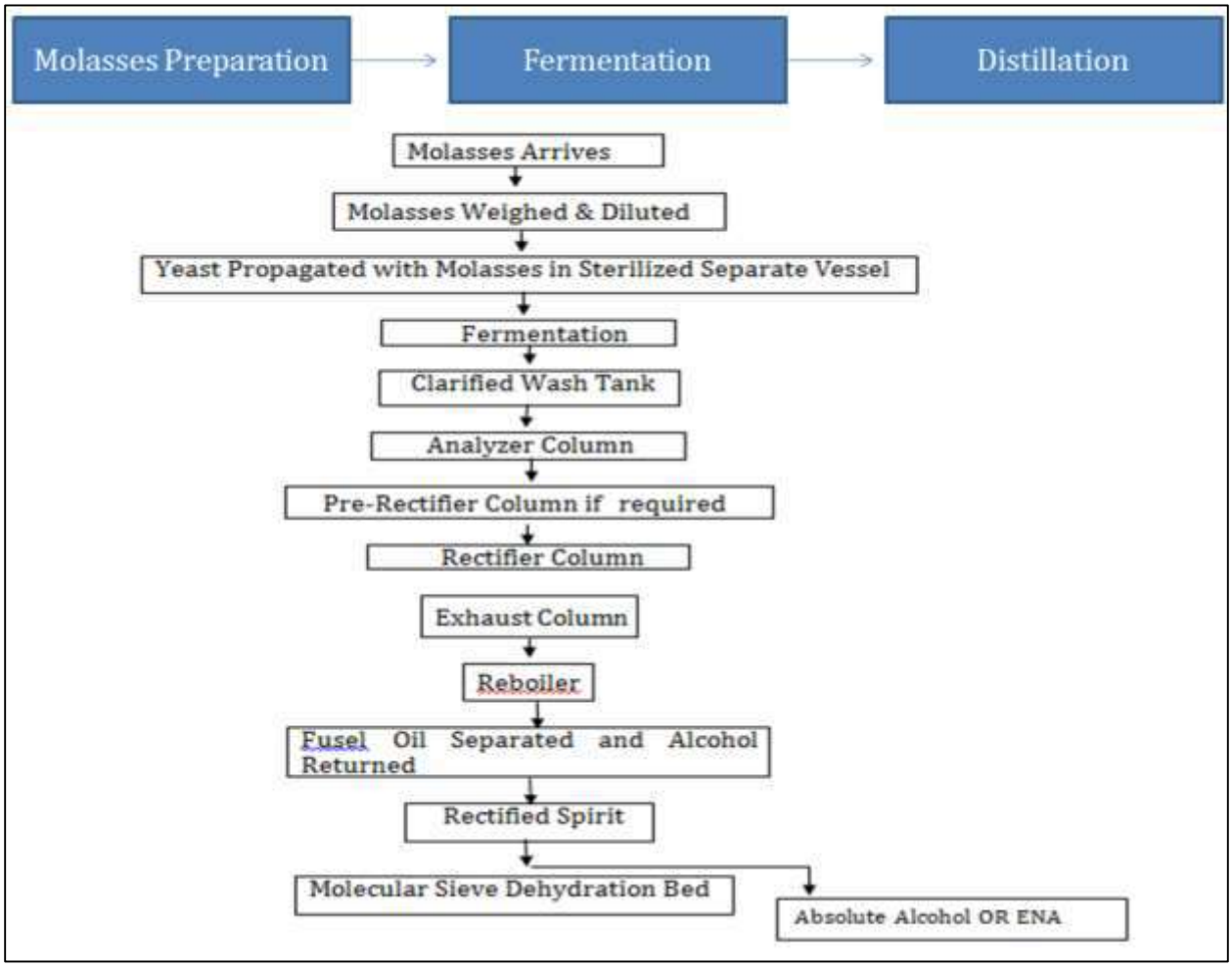
iv. Power: The steam and power requirement for the proposed expansion plant will be made available by installing separate 22 TPH boiler.

v. Fuel: Coal and Slop will be used as fuel for the 22 TPH boiler.

vi. Man Power: Total Manpower working in existing distillery is 98. Total employees out of whom 57 shall be Skilled and 41 shall be unskilled. More than 85 % of the manpower requirement will be fulfilled by employing the local people. Man power requirement for construction work will be about 50. Construction workers will reside in nearby villages.

11.4 Manufacturing Process:

There are four major steps in preparation of alcohol. (a) Substrate (feed) preparation for fermentation, (b) Yeast propagation and continuous fermentation, (c) Multi-pressure distillation and (d) Dehydration of RS to anhydrous alcohol or it will be purified to get ENA.



11.5 Pollution control Technology & Equipment

i. Air Pollution Control: For 22 TPH boiler, stack height will be 60 m and Bag filter will be provided to control the particulate matter

ii. Water and waste Water: 650 M3/day spent wash will treated through evaporation – Incineration and Condensate will be treated in CPU and reused in process

iii. Solid Waste: Ash will be sold to brick manufacturing.

Total project cost: Rs. 7800 lakh. (distillery unit), Funds allocated for pollution control equipment will be Rs. 6.95 lakh and for O & M will be Rs. 45 lakh per year. Funds earmarked for CER activity will be Rs 78 lakh.

11.6 Description of Environment

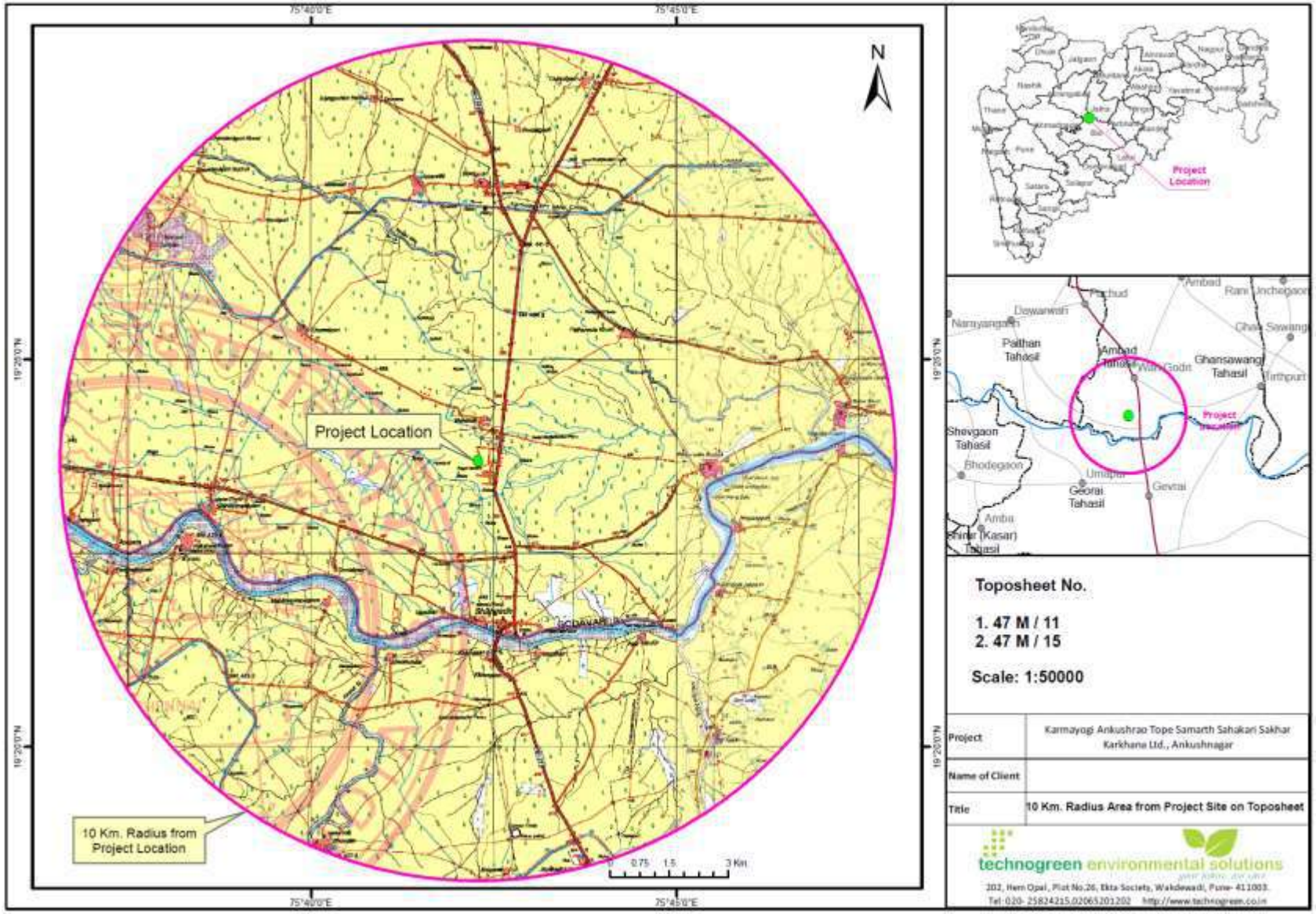
The area around the proposed Distillery Plant is being surveyed for physical features and existing environmental scenario. The field survey and baseline monitoring has been has been done from the period of March 2018 to April 2018

Environmental Setting of the Study Area: The site is located in the rural area. No other industries are found in the region. Location features of the Study area are given in Table below.

Environmental Setting (10 km radius)

Particulars	**Details**
Latitude	19°23'40.50"N
Longitude	75°42'21.42"E
Site Address	Ankushnagar, Tal. Ambad, Dist. Jalna
No. of villages in the study area	12 villages
Nearest Habitation	Mahakala
Nearest River /Water Body	Godavari river
Nearest IMD Observatory	Aurangabad
Nearest Town	Aurangabad
Nearest Railway Line	Kodi 46.77 km
Nearest Air Port	Aurangabad Airport 62.14 km
Approach to site by Road	NH 211
Religious / Historical Place	None
Archaeological monuments	None
Ecological Sensitive Area/ Reserve Forest	None
Seismic Zone	III

Figure Toposheet Map _ 10 km Radius area from Project Site



11.7 Ambient Air Quality

To understand the AAQ within the study area, eight locations were selected and AAQ monitoring was carried for the period March to May 2019.

Air Quality monitoring reports showed that all the parameters are under limit as per NAAQS Standards. It can be seen that PM_{10} and $PM_{2.5}$ ranges from 46.81 to 88.51/m^3 and17.12 to 32.44 µg/m^3. SO_2, NO_x & CO ranges from 12.55 to 27.92/m^3 15.11 to 39.11/m^3 and 0.12 to 0.58 **µ**g/m^3 respectively.

11.8 Ambient Noise Quality

The Leq values of noise levels during daytime Leq (d) varied between 50.97 to 69.1dB (A). Highest Leq value was recorded at Project Site [69.1dB (A)] while the Leq values of noise levels during night time Leq (N) varied between 40.36 to 57.13dB (A). Highest Ln value was recorded at project site [57.13dB (A)].

The hourly Leq noise levels recorded at various locations in the study area shows considerable fluctuations because of changes in traffic movement, commercial and industrial activities in the study area, however the noise level (Leq daytime as well as Leq night time) found at all locations within prescribed limit of both during day time as well as night time.

11.9 Water Quality

Ground water samples were collected from 9 different locations and surface water samples were collected from 3 locations within the 10 km radius.

Ground water Quality

The ground water pH ranges from 6.67 – 7.52. Total Dissolved Solid (TDS) was found to be in the range of 134.19- 634.05 mg/l. Total Hardness is in the range of 103- 536.5 mg/l. Sulphate is in the range of 24.6- 309.77 mg/l. Chlorides ranges from 41.99- 155.95 mg/lit. All the samples are within permissible limit.

Surface Water Quality

The pH of surface water ranges from 6.89 to 7.89. Total dissolved solids were found to be in the range of 106.98– 134.67mg/l. Total hardness is in the range of 89.8– 114.8mg/l. Chlorides and Sulphate are in the range of 37.99– 45.99 mg/l and 27.82– 39.08 mg/l respectively which shows that all of them are within permissible limit..

11.10 Soil Quality

- pH: The pH of the samples varied from 7.09 to 8.16. it is found that pH of all the locations is slightly on alkaline scale.
- Electrical Conductivity: Electrical Conductivity value ranges from 0.15 µS/cm to 0.67 µS/cm.
- Bulk Density: The bulk density of soil in the study area is found to be in the range of 1.28 - 1.38 g/cc. It can be observed from the results that the soil is ideal for plant growth.
- Porosity: The porosity of soil observed in the study area ranged from 35.2 to 48.9 %. It is observed that Calcium and Magnesium concentrations are in the range of 16.3- 24.2mg/kg and 1.94- 5.56 mg/kg respectively whereas; Sodium and Potassium are in the range of 12- 53 mg/kg and 196- 621mg/kg respectively.
- Organic matter is found to be in the range of 0.22- 1.34% and Phosphorus is present in soil more than sufficient limit i.e. in the range of 5.3- 12.28 mg/kg. The soil porosity is found to medium hence, the water holding capacity of the soil will be medium. From above observations it can be concluded that soil moderately fertility in nature.
- Soil Texture: the sand percentage varied between 23.0 to 30.0 % and silt percentage varied from 48.0 to 51.0 % whereas clay percentage is in the range of 21.0 to 28.0 %. When obtained results are compared with standard soil texture classification it can be concluded that soil texture of study area is Loam

11.11 Ecology

From the data collected it can be observed that approx. 85 species of trees & shrubs were observed within the study area. Common trees Albizia saman, Terminalia catappa, Spathodea campanulata, Peltophorum pterocarpum, Cassia siamea few of Mangifera indica, Azadirchta indica and varieties of Ficus were observed in the study area.

From the faunal study it was observed that there were 59 different species of birds, 17 species of butterfly's, 6 species of mammals, 5 species of amphibians and reptiles in the study area.

None of the species were found in Schedule 1 as per Wildlife Protection Act, 1972. In the project area green belt is developed with native species. Pollution load of the proposed expansion will be minimal and will not affect the Flora and Fauna of the study area.

11.12 Socio Economic Survey

The study area is witnessing a rapid growth in its population beginning from last decade due to

Agriculture development, urbanization and industrialization.

- The study area covers one Jalna district of Maharashtra State, one block Ambad and total 23 villages in the study area. Total study area consisting of 20641.31ha with the population density of 212 person / km².
- Total population of the region (Census 2011) is worked out as 43940 out of which 22455(51.10%) are male and 21485(48.89%) female.
- Out of the total population, Scheduled Caste and Scheduled Tribe are 5655(12.86%) and 1147(2.61%) respectively.
- The literacy rate of the total population is worked out to 25825(58.77%). Male literacy 15026 (58.18%), and female literacy is 10799 (41.82%) respectively.
- The total population of main worker, marginal worker and non-worker category are 19587(44.58%), 2580(5.87%) and 21773(49.55%) respectively.

The majority pattern of the cultivator worker 8715(44.49%) and agricultural worker is 7389 (37.72%). There are 341 (1.74%) and 3142 (16.04%) as household worker and other worker

11.13 Impact Mitigation Analysis

The environmental impacts can be categorized as either primary or secondary. Primary impacts are the ones that are caused directly due to the project activity on environmental attributes, whereas secondary impacts are indirectly induced

Impacts on Air Environment: -

- Existing 95 TPH capacity boilers are in operation and 22 TPH incineration boiler is proposed.
- To arresting air emission from existing 95 TPH boiler wet scrubbers and ESP with adequate 76 m stack height is provided to attenuation of air pollution and for distillery unit 22 TPH boiler bag filter and 60 m Stack height will be provided.
- On line Continuous Monitoring system is installed and connect to Pollution control board as per CPCB guidelines

Impacts on Noise Quality: Noise quality is concern in the factory premises as well as around the periphery of factory area. Operation of Boiler house, cooling tower and other machineries engaged in various unit processes. Noise generated from DG sets, transportation vehicles are also envisaged.

Impacts on Soil Environment: Impacts are predicted if waste water is directly discharged in agricultural field. Improper storage of waste residues and other wet waste may hamper soil quality

Impacts on water environment: Impacts are envisaged due to runoff of water from waste storage area. Groundwater leachate is envisaged if waste is dumped on open land.

Ecological Environment: No impacts are envisaged during operational phase.

Socio Economic Environment: During operational phase both positive as well as negative impacts are foreseen. Positive impacts will comply employment generation, improvement of other social and physical infrastructure amenities such as schools, hospitals, banking offices etc. Negative impacts include prolonged exposure to noisy environment may lead to hearing loss

11.13.1 Mitigation measures

Air: Emissions from boiler house shall be passed through pollution Control equipment before emitting directly to atmosphere. Adequate green belt is development to minimize particulate emissions. If required water sprinkling methodology shall be adopted on dust prone roads.

No additional boiler is proposed for the expansion.

Table 1 Air pollution sources and mitigation measures

Sr.	Source	Fuel	Emissions	Control Measures
1.	Existing 95 TPH Boiler	Bagasse	Particulate Matter, SO_2 and NO_X	76 m stack and wet scrubber provided
2.	Existing DG Set 1010 KVA	HSD	Particulate Matter, SO_2 and NO_X	7 m stack height provided
3.	Proposed 22 TPH Incineration Boiler	Bagasse & Conc.Spent wash	Particulate Matter, SO_2 and NO_X	60 m stack and Bag filter will be provided
4.	Proposed 105 KVA D.G Set	HSD	Particulate Matter, SO_2 and NO_X	6 m stack height will be provided

Noise: Workers shall be provided with ear muffs and other personal protective equipment's those working in noise prone environment. Development of greenbelt cover will minimize the noise levels ion industrial premises. Noise generating machineries should be operated in day time.

Soil: Soil quality will be improved by supplying treated water with nutrient addition. Soil samples shall be tested regularly and appropriate mitigation measures shall be adopted based on nutrient result.

Water & Waste water:

- Regular water quality monitoring will be carried out as per CPCB and norms ensured by MoEF&CC.

- In distillery unit, condensate of MEE will be treated in Condensate polishing unit (CPU) and will be reused in process and cooling tower. Concentrated spent wash will be used in boiler as fuel.

11.14 Corporate Environment Responsibility (CER)

As per New Office Memorandum Published by MOEF &CC, New Delhi on 1st May 2018 regarding applicability of CER and Budget to the decided towards CER activities.

The total project cost is Rs. 78 lakhs. 1.0% of the total cost it becomes Rs.78 lakhs approx. Hence we have dedicated Rs 78 lakh for Corporate Environment Responsibility (CER) activities to be carried out in surrounding villages based on need assessment.

11.15 Environment Monitoring and Management Plan

Environment monitoring is prescribed during pre-construction, construction and operation phase. During operation phase of project it is important to understand the baseline environment status which is caused due to proposed project activity. Environmental monitoring will comply Air, Water, Soil, Ecology, and Noise parameters as per monitoring compliance norms and schedule. All parameters will be tested as per standard tools and methods and obtained results should be compared with CPCB norms.

Table 2 Cost of Environmental Protection Measures

S. No.	Environmental Aspect	Capital Expenditure Rs in Cr.	Recurring Expenditure Rs in Cr.(per annum)
1	Emission control Engineering	4.0	0.10
2	Water & Wastewater management	2.0	0.15
3	Solid Waste management	0.20	0.05
4	Greening Drive	0.20	0.10
5	Environment Monitoring	0.05	0.05
7	Other aspects like Rain Water Harvesting, Safety, Security etc.	0.50	0.10
	Total	**6.95**	**0.55**

CHAPTER -12

CHAPTER 12

DISCLOSURE OF CONSULTANTS

INTRODUCTION

Building Environment (India) Pvt. Ltd. is a **'QCI Accredited -** Environmental Consulting Organization'**.** The company works at the interface where infrastructure and environment interact with the aim of bridging the gap between the two and thrives to address environmental concerns holistically which is the need of the hour. We therefore help for better building's environment and in doing so build the environment through our varied services.

This report is released for the purpose of obtaining Environment clearance for project, under the provision of EIA notification dated 14th September 2006, of M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd. (KATSSSKL), Information provided (unless attributed to referenced third parties) is otherwise copyrighted and shall not be used for any other purpose without the written consent of **Building Environment India Pvt Ltd.**

EIA REPORT DETAILS

Report	**Environmental Impact Assessment and Environmental Management Plan Report**						
Project Details							
Name of the Report	M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd., EIA / EMP Report PROPOSED EXPANSION OF 30 KLPD TO 60 KLPD MOLASSES BASED DISTILLERY. Ankushnagar, Tal. Ambad, Dist. Jalna						
Client	**M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd.**						
Prepared by	**Building Environment India Pvt Ltd.**						
Project Number		**Report No**		**Version**		**Released Date**	
Contact Details							
Head Office: Building Environment India Pvt Ltd, Say Sangam, Office No. 603, Plot No. 85, Sector 15, CBD Belapur, Maharashtra - 400614, India Tel. No. : 91-22-41237073 hkolatkar@beipl.co.in **Branch Office:** Building Environment India Pvt Ltd, Shalini Apartment, Flat No.10, 2nd Floor, Plot No.16, Surevy No. 148/150/151,							

Sanghavi Nagar, Aundh, Pune- 411007
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Web: www.beipl.co.in, www.beipl.com
Email: beiplpune@gmail.com

NABET Accreditation No. – NABET/EIA/1821/RA 0133

EC Application Reference Document	**TOR Issued:** TOR Letter Reference No F.No ide letter No.IA-J-11011/81/2018-IA-II(I) dated 15th June 2018

Issue Order

Date	**Building Environment India Pvt Ltd.**				**KATSSSKL**	
	Originated by		**Checked and Approved by**		**Checked by**	**Approved by**
	Name	**Signature**	**Name**	**Signature**	**Name**	**Signature**
	Mr. Ashvin Badge				Dilip Patil	

Disclaimer

Building Environment India Pvt Ltd. has taken all reasonable precaution in the preparation of this report as per its auditable quality plan. **Building Environment India Pvt Ltd.** 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. **Building Environment India Pvt Ltd.** 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.

LIST OF EC & FAE ENGAGED

Declaration by Experts contributing to the EIA/ EMP Report preparation for M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd., EIA / EMP Report, Proposed expansion of 30 klpd to 60 klpd molasses based Distillery

<table>
<tr><th>Nature of Work</th><th colspan="5">Person Responsible (s)</th><th>Name of the person(s) responsible</th></tr>
<tr><td>Issue of List of requirements, draft of covering letter & undertaking to Client</td><td colspan="5">Project Manager</td><td>Mr. Ashvin Badge</td></tr>
<tr><td rowspan="3">Site Visit</td><td colspan="5">EIA Coordinator</td><td>Mr. Ashvin Badge</td></tr>
<tr><td colspan="5">Associate EC</td><td>--</td></tr>
<tr><td colspan="5">Project Manager, FAEs & Team Member</td><td>Mr. Hrushikesh Kolatkar
Mr. Sanjay Shevkar
Ms. Ketaki Ashok Patil
Mr. Shrivallabh kothe
Mr. Amol Kulkarni
Mr. Ashvin Badge
Ms. Yogeshwari Ashwani Kumar
Mr. Sunil Maruti Belvelkar</td></tr>
<tr><td rowspan="5">As per terms of reference given in MoEF EIA manual, the baseline data generation for different environmental parameters</td><td colspan="6">All FAEs (In-house& Empanelled) each for the below given respective functional area</td></tr>
<tr><td colspan="2">AREA</td><td>FAE</td><td>FAA</td><td colspan="2">Team Member</td></tr>
<tr><td colspan="2">Land Use</td><td>Mr. Hrushikesh Kolatkar</td><td>Mr. Sanket Dilip Awasare.</td><td colspan="2"></td></tr>
<tr><td>Air</td><td>AP</td><td>Mr. Ashvin Badge</td><td>Mr. Sarthak rajesh Dange
Mr.Ashok Shamrao Bandagar</td><td colspan="2">Mr. Ajay Ojha
Ms. Rutuja Bhasme
Md. Nadeem Shaikh
Ms. Savita Upadhyay</td></tr>
<tr><td colspan="2">Noise</td><td>Mr. Sanjay Shevkar</td><td></td><td colspan="2"></td></tr>
<tr><td colspan="2">Water</td><td>Ms. Ketaki Ashok Patil</td><td></td><td colspan="2">Mrs. Priyanka M.
Ms. Sanika S.
Ms. Shradhha B.</td></tr>
</table>

	Geology & Hydrogeology	Mr. Shrivallabh kothe		--
	Soil Conservation	Mr. Amol Kulkarni		Ms. Shraddha Gathe Mr. Pravin Gathe
	Risk & Hazard Assessment	Mr. Ashvin Badge		
	Solid Waste Management	Ms. Yogeshwari Ashwani Kumar		Dr. Sandhya Clemente Ms. Suvidha Patil
	Ecology & Biodiversity	Mr. Sunil Maruti Belvelkar		Ms. Savita Upadhya
	Socioeconomic	Mr. Hrushikesh Kolatkar		Ms. Vaishali Patil
Preparation of EIA report				
Originator	Mr. Hrushikesh Kolatkar	Checker		
Approval of Report	Client	**M /s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana.** **Mr. Dilip Patil**		

I, hereby, certify that I was a part of the EIA team in the following capacity that developed the above EIA.

EIA Coordinator:

Name	Mr. Ashvin Badge 	
Period of Involvement	**2019**	
Contact Information	**Address** **Building Environment India Pvt Ltd,** Say Sangam, Office No. 603, Plot No. 85, Sector 15, CBD Belapur, Maharashtra - 400614, India	**Contact Number** Tel. No.: 91-22-41237073 hkolatkar@beipl.co.in

List of Annexure

Annexure No.	Particulars
Annexure 1	Samartha_SSKL_TOR
Annexure 2	IEM
Annexure 3	Ground water permission
Annexure 4	Water Permission Letter Jaykwadi
Annexure 5	C t O Valid for sugar unit
Annexure 6	C t O valid for Co-gen unit
Annexure 7	Valid consent to operate
Annexure 8	Master Layout
Annexure 9	Contour Layout
Annexure 10	Distillery Fire Hydrant Layout
Annexure 11	NoC from Village for Expansion
Annexure 12	Env. Policy - KATSSSKL
Annexure 13	Plant & Machinery List
Annexure 14	Safety Audit Report
Annexure 15	Annual Health Checkup
Annexure 16	Baseline Monitoring reports
Annexure 17	NABET Accreditation Letter

No.IA-J-11011/81/2018-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
15 Jun 2018

To,

M/s M/S SAMARTHA SAHAKARI SAKHAR KARKHANA LTD.
Ankushnagar Tah. Ambad, Dist. Jalna, Maharashtra.,
Jalna-431203
Maharashtra

Tel.No.0712-2293225; Email:samartha12568@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/MH/IND2/73300/2018
2. Name of the Proposal:	Expansion of 30 KLPD Distillery plant to 60 KLPD by Samrtha Sahkari Sakhar Karkhana Ltd.
3. Category of the Proposal:	Industrial Projects - 2
4. Project/Activity applied for:	5(g) Distilleries
5. Date of submission for TOR:	12 May 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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MFG — IEM

No.: 1018/SIA/IMO/2009

By Registered Post
Amendment No.: 1

Government of India
Ministry of Commerce & Industry
Department of Industrial Policy & Promotion
Secretariat of Industrial Assistance
(Industrial Entrepreneurs Memorandum Section)

New Delhi 01/10/2018

To,
KARMAYOGI ANKUSHRAO TOPE
SAMARATH SAHAKARI SAKHAR
KARKHANA LTD.
PO - ANKUSHNAGAR,
TALUKA: AMBAD,
DISTT:JALNA
MAHARASHTRA - 431 212

Subject : IEM application of KARMAYOGI ANKUSHRAO TOPE SAMARATH SAHAKARI SAKHAR KARKHANA LTD. for the manufacture of WHITE CRYSTAL SUGAR.

Reference : This Ministry's IEM Acknowledgement no. 1018/SIA/IMO/2009 dated 22/04/2009

Dear Sir,

I am directed to refer to your letter(s) No. F-25(2346)/17-ST/525 dated 26/07/2018 on the above mentioned subject and to say that the following corrections / Modification / amendements are made in the Ministry's IEM Acknowledgement No. 1018/SIA/IMO/2009 dated 22/04/2009

	EXISTING	AMENDED
a. Name of the Company	SAMARTH SAHAKARI SAKHAR KARKHANA LTD.ANKUSHNAGAR	KARMAYOGI ANKUSHRAO TOPE SAMARATH SAHAKARI SAKHAR KARKHANA LTD.
Registered Address	ANKUSHNAGAR, MAHAKALA, AMBAD, JALNA	PO - ANKUSHNAGAR, TALUKA: AMBAD, DISTT:JALNA MAHARASHTRA - 431 212
b. NIC Codes / Items of Manufacture	1. 2060 WHITE CRYSTAL SUGAR *Falling under NIC broad description* MANUFATURE AND REFINING OF SUGAR (VACUUM PAN SUGAR FACTORIES)	
c. Proposed Capacity Existing Capacity Total capacity after expansion	1,500 TCD 2,500 TCD 4,000.00 TCD	
b. NIC Codes / Items of Manufacture	2. 2079 BAGASSE *Falling under NIC broad description* MANUFACTURE OF OTHER INDIGENOUS SUGAR-CANE/SUGARBEET/PALM JUICE PRODUCTS N.E.C.	
c. Proposed Capacity Existing Capacity	180,000 MT --	

5096

Inward No. 5096 Date 13 OCT 2018
Dept. PA/CA/EA M.D.
Manufacturing -

File
13/10/18

	EXISTING	AMENDED
b. NIC Codes / Items of Manufacture	3. 2079 MOLASSES *Falling under NIC broad description* MANUFACTURE OF OTHER INDIGENOUS SUGAR-CANE/SUGARBEET/PALM JUICE PRODUCTS N.E.C.	
c. Proposed Capacity Existing Capacity	40,000 MT --	
d. Proposed Investment Rs. Existing Investment Rs.	-- --	
e. Location	ANKUSHANAGAR AMBAD JALNA MAHARASHTRA	

f. Miscellaneous (any other)

2. This may be kept attached with the original Acknowledgement no. 1018/SIA/IMO/2009 dated 22/04/2009

3. The receipt of this letter may please be acknowledged.

1-10-18

(SHAHID RASOOL)
RESEARCH OFFICER

CGWA

MEMBER SECRETARY

सत्यमेव जयते

भारत सरकार
केन्द्रीय भूमि जल प्राधिकरण
जल संसाधन, नदी विकास
और गंगा संरक्षण मंत्रालय

Government of India
Central Ground Water Authority
Ministry of Water Resources,
River Development & Ganga Rejuvenation

File No: - 21-4/594/MH/IND/2016 - 996

NOC No: - CGWA/NOC/IND/ORIG/2017/2546

Date:- 18 MAY 2017

Inward No 1764 Date 24 MAY 2017
Dept. WR/Civil/Engg M.D

To,
M/s Samarth Sahkari Sakhar Karkhana Ltd.
Village Mahakala PO Ankushnagar,
Taluka Ambad, District Jalna,
Maharashtra– 431212

Sub: - NOC for ground water withdrawal to M/s Samarth Sahkari Sakhar Karkhana Ltd. in respect of their existing Sugar manufacturing unit located at Village Mahakala, PO. Ankushnagar, Taluka Ambad, District Jalna, Maharashtra – reg.

Refer to your application on the above cited subject. Based on recommendations of Regional Director, Central Ground Water Board, Central Region, Nagpur vide their recommendations dated 02/03/2017 and further deliberations on the subject, the NOC of Central Ground Water Authority is hereby accorded to **M/s Samarth Sahkari Sakhar Karkhana Ltd. in respect of their existing Sugar manufacturing unit located at Village Mahakala, PO. Ankushnagar, Taluka Ambad, District Jalna, Maharashtra.** The NOC is, however subject to the following conditions:-

1. The firm may abstract **200 cu.m/day** (and not exceeding **73,000 cu.m/year**) of ground water, through existing three (3) dugwells fitted with pumps only. No additional ground water abstraction structures to be constructed for this purpose without prior approval of the CGWA.
2. All the wells to be fitted with water meter by the firm at its own cost and monitoring of ground water abstraction to be undertaken accordingly on regular basis, atleast once in a month. The ground water quality to be monitored twice in a year during pre- monsoon and post- monsoon periods.
3. **M/s Samarth Sahkari Sakhar Karkhana Ltd.**shall, in consultation with the Regional Director, Central Ground Water Board, Central Region, Nagpur implement ground water recharge measures atleast to the tune of **3,00,000 cu.m/year** as proposed, for augmenting the ground water resources of the area within six months from the date of issue of this letter. Firm shall only implement Roof Top Rain Water Harvesting within the plant complex. In addition, the firm shall adopt one (1) no. village for Water Security Plan in District Jalna, Maharashtra. The necessary guideline for the Water Security Plan is available on website of Ministry of Water Resources, RD & GR (www.mowr.gov.in). Both, the Demand Side Management /Supply Side Management with maintenance of structures in the said villages to be ensured and a comprehensive plan to be submitted

to Regional Director, CGWB. Firm shall also undertake periodic maintenance of recharge structures at its own cost.

4. The photographs of the recharge structures after completion of the same are to be furnished immediately to the Regional Director, Central Ground Water Board, Central Region,Nagpur for verification and under intimation to this office

5. The firm at its own cost shall install two (2) piezometers fitted with automatic water level recorder with telemetry system at suitable location and execute ground water regime monitoring programme in and around the project area on regular basis in consultation with the Central Ground Water Board, Central Region, Nagpur.

6. The ground water monitoring data in respect of S.No.2 & 5 to be submitted to Central Ground Water Board Central Region, Nagpur on regular basis at least once in a year.

7. The firm shall ensure proper recycling and reuse of waste water after adequate treatment.

8. Action taken report in respect of S. No. 1 to 7 may be submitted to CGWA within one year period.

9. The permission is liable to be cancelled in case of non-compliance of any of the conditions as mentioned in S. No. 1 to 8.

10. This NOC is subject to prevailing Central/State Government rules/laws or Courts orders related to construction of tubewell/ground water withdrawal/construction of recharge or conservation structure/discharge of effluents or any such matter as applicable.

11. This NOC does not absolve the applicant / proponent of this obligation / requirement to obtain other statutory and administrative clearances from other statutory and administrative authorities.

12. The NOC does not imply that other statutory / administrative clearances shall be granted to the project by the concerned authorities. Such authorities would consider the project on merits and be taking decisions independently of the NOC.

13. This NOC is valid from 18/04/2017 till 17/04/2019.

Member Secretary

Copy to:

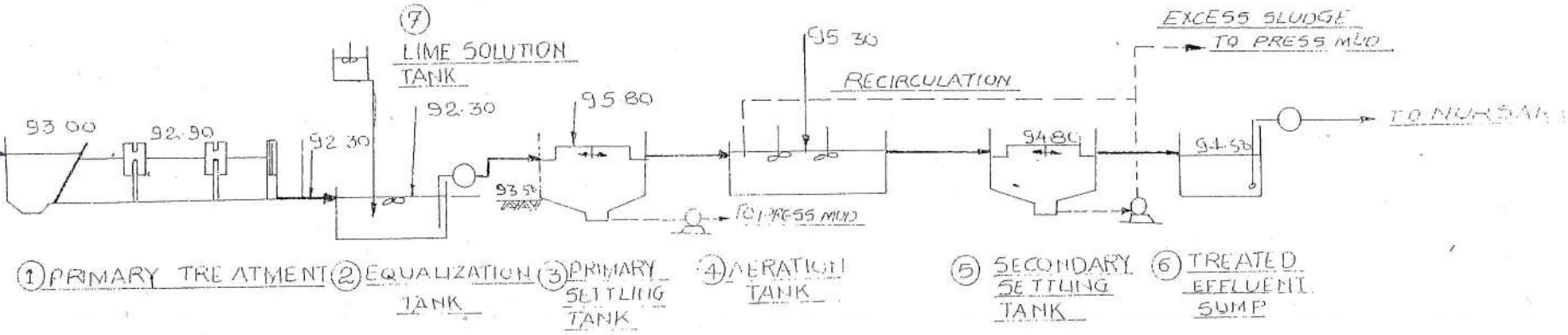
1. The Member Secretary, Maharashtra Pollution Control Board, Maharashtra Jeevan Pradhikaran, Express Towers, 4th Floor, Nariman Point, Mumbai 400021, **with a request to ensure that the conditions mentioned in the NOC are complied by the firm in consultation with the District Collector & Magistrate, District Jalna, Maharashtra.**
2. The District Collector & Magistrate District Jalna, Maharashtra *for necessary action*
3. The Regional Director, Central Ground Water Board Central Region, Nagpur. This has reference to your recommendation dated 02/03/2017
4. TS to the Chairman, Central Ground Water Board, Bhujal Bhawan, Faridabad, Haryana.
5. Guard File 2017-18.

Member Secretary

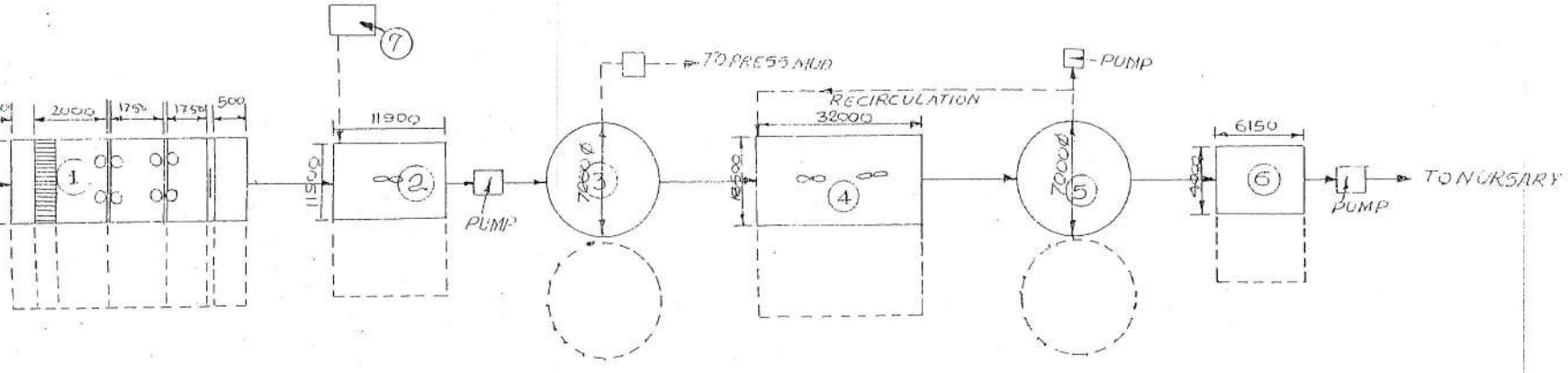
regarding installation and commissioning of online continuous effluent monitoring system (OCEMS). The, unit has provided URL & password to assess the data submitted from OCEMS, and requested to revoke the closure notice; and

NOW THEREFORE, on considering the compliance of industry, CPCB hereby revoke the closure directions issued under Section 5 of Environment (Protection) Act, 1986. The unit shall ensure compliance of the norms. In case of failure of the unit to comply with the norms action as deemed appropriate will be taken with the provisions under Environment (Protection) Act, 1986.

(S.P. SINGH PARIHAR)
CHAIRMAN



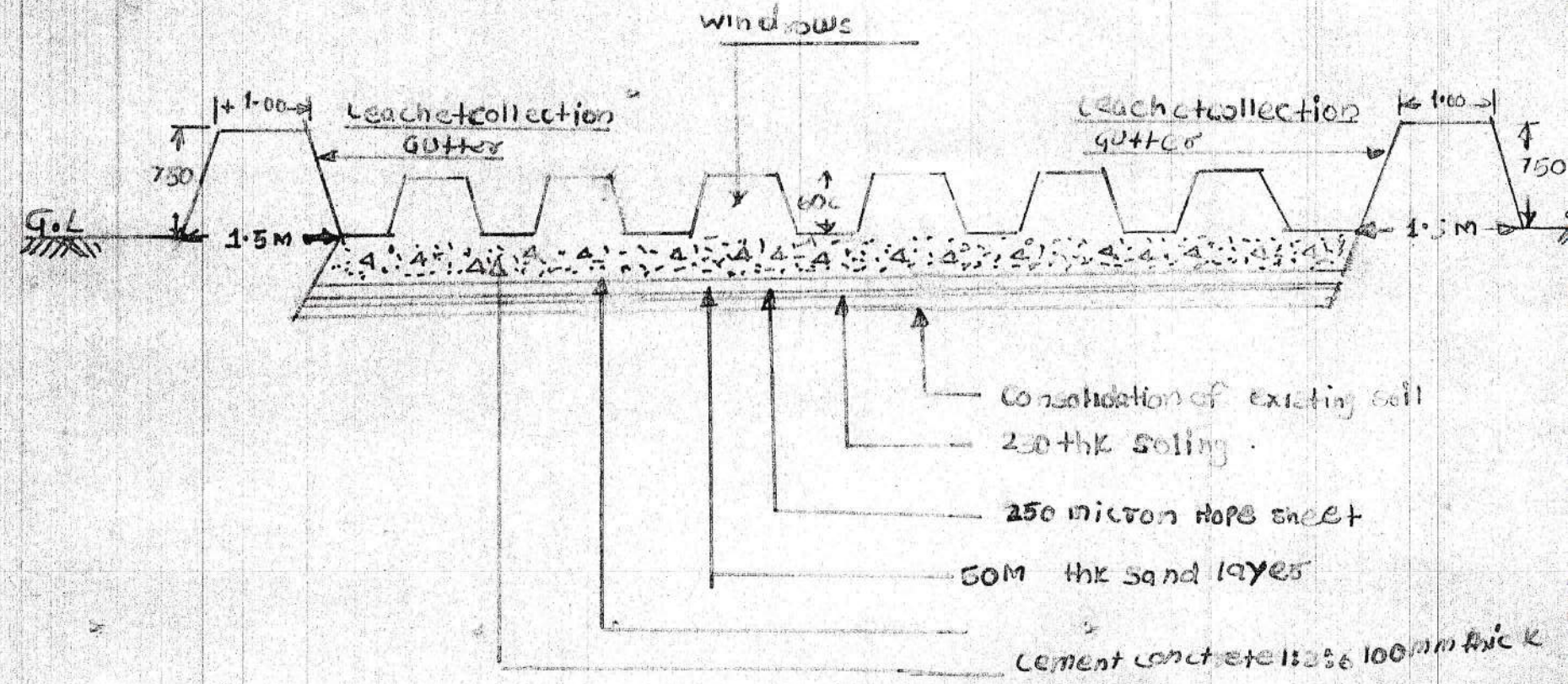
SECTION



PLAN

TREATMENT OF FACTORY EFFLUENT

Sugar ETP



SAMARTH S.S.K LTD ANKUSH

COMPOSTING YARD DETAIL

Managing Director
Yogi Ankushrao Tope Samarth S.S.K. Ltd,
Ankushnagar, Tq. Ambad, Dist. Jalna (M.S.)

Distillery ETP

Tel.

DIRECTORATE OF SUGAR,
MAHARASHTRA STATE,
Mithapelli Estates, Shankarshet Road,
PUNE 411 009.

DIRECTOR

Date.. 10th February, 1982.

No. JAL/PRG/(A)-1.

CERTIFICATE OF REGISTRATION

The Director of Sugar and Additional Registrar, Co-operative Societies, Maharashtra State, Pune - 411 037 hereby certifies that " Samarth Sahakari Sakhar Karkhana Ltd., Ambad, District Jalna (Maharashtra State) has been registered Under Section-9(1) of the Maharashtra Co-operative Societies Act, 1960 (Maharashtra Act XXIV of 1961). The registration number of the Society is "JAL/PRG/(A)-1 and the same has been classified as Processing Society, Sub-Class Agricultural Processing Society Under Section-12(1) of the ~~said~~ Act read with Maharashtra Co-operative Societies Rules No-107(1) 196

Pune - 411 037

(R.M. PREMKUMAR)
Director of Sugar and Additional Registrar, Co-operative Societies, Maharashtra State, Pune-37.

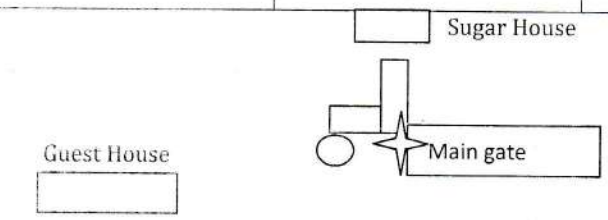
.....

Managing Director
Samarth S.S.K.Ltd., Ankushnagar
Tq. Ambad, Dist. Jalna

Phone : (020) 26902100 - 30 lines
Fax : (020) 26902244
E-mail : vsilib@vsnl.com
Web site : www.vsisugar.com

VSI
तंत्रज्ञानेन संवृद्धिः
VASANTDADA SUGAR INSTITUTE
Manjari (Bk.) Tal. : Haveli, Dist. : Pune - 412 307, Maharashtra, India.

TEST REPORT

UIN	1503-3006		
Name of Industry Address	**Samarth Sahakari Sakhar Karkhana Ltd. Post Ankushnagar,Tal: Ambad, Dist Jalana**		
Sample Collected by	**Vasantdada Sugar Institute, Pune**		
Date of Sampling	24-03-2015	**Location of the Sampler**	**Main gate**
Time	3:30 pm to 11.30 pm	**Duration**	8 Hrs
Sampling Location: **Main Gate**			

Monitoring Results

Parameter	Result	National AAQM Std. For Industrial Area.	Unit	Method
PM_{10}	112.47	100	$\mu g/m^3$	USEPA 40CFR Part 50Appendex 'J'
NO_x	5.86	80	$\mu g/m^3$	IS- 5182(Part VI) 2006
SO_2	BDL	80	$\mu g/m^3$	IS- 5182(Part II)- 2001

Ref: Analysis method Bureau of Indian Standards (IS).
BDL for NOx and Sox = 5 $\mu g/m^3$
Date of analysis: 01-04-2015

Analyzed by
(----VP Patil----)

Authorized signatory
(----------)

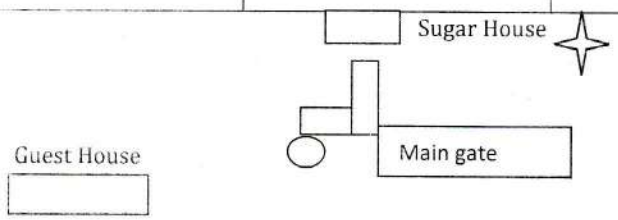
Phone : (020) 26902100 - 30 lines
Fax : (020) 26902244
E-mail : vsilib@vsnl.com
Web site : www.vsisugar.com

VSi
संशोधनेन संवृद्धिः

VASANTDADA SUGAR INSTITUTE

Manjari (Bk.) Tal. : Haveli, Dist. : Pune - 412 307, Maharashtra, India.

TEST REPORT

UIN	1503-3007		
Name of Industry Address	**Samarth Sahakari Sakhar Karkhana Ltd. Post Ankushnagar,Tal: Ambad, Dist Jalana**		
Sample Collected by	**Vasantdada SugarInstitute, Pune**		
Date of Sampling	26-03-2015	**Location of the Sampler**	Sugar House
Time	7:30 pm to 3.30 am	**Duration**	8 Hrs
Sampling Location: **Sugar House**			

Monitoring Results

Parameter	Result	National AAQM Std. For Industrial Area.	Unit	Method
PM_{10}	81.23	100	$\mu g/m^3$	USEPA 40CFR Part 50Appendex 'J'
NO_x	24.92	80	$\mu g/m^3$	IS- 5182(Part VI) 2006
SO_2	BDL	80	$\mu g/m^3$	IS- 5182(Part II)- 2001

Ref: Analysis method Bureau of Indian Standards (IS).
BDL for NOx and Sox = 5 $\mu g/m^3$
Date of analysis: 01.04.2015

Analyzed by

(--------V.P. Patil--)

Authorized signatory

(----------)

Phone : (020) 26902100 - 30 lines
Fax : (020) 26902244
E-mail : vsilib@vsnl.com
Web site : www.vsisugar.com

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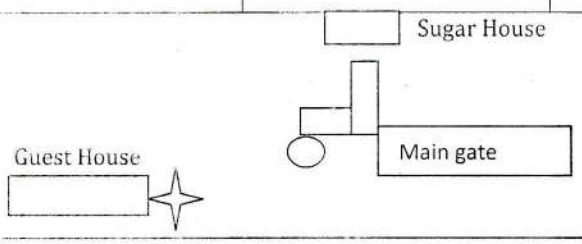
VASANTDADA SUGAR INSTITUTE
Manjari (Bk.) Tal. : Haveli, Dist. : Pune - 412 307, Maharashtra, India.

TEST REPORT

UIN	1503-3008		
Name of Industry Address	**Samarth Sahakari Sakhar Karkhana Ltd. Post Ankushnagar,Tal: Ambad, Dist Jalana**		
Sample Collected by	**Vasantdada Sugar Institute, Pune**		
Date of Sampling	27/03/2015	**Location of the Sampler**	Guest Hous
Time	5:00 Pm to 1.00 am	**Duration**	8 Hrs
Sampling Location: **Guest House**			

Monitoring Results

Parameter	Result	National AAQM Std. For Industrial Area.	Unit	Method
PM_{10}	83.73	100	$\mu g/m^3$	USEPA 40CFR Part 50Appendex 'J'
NO_x	21.49	80	$\mu g/m^3$	IS- 5182(Part VI) 2006
SO_2	BDL	80	$\mu g/m^3$	IS- 5182(Part II)- 2001

Ref: Analysis method Bureau of Indian Standards (IS).
BDL for NOx and Sox = 5 $\mu g/m^3$
Date of analysis: 01.04.2015

Analyzed by
(---V.P. Patil---)

Authorized signatory
(----------)

water Permission Jaykwadi

एक सौ रुपये

Rs. 100

रु. 100

ONE
HUNDRED RUPEES

सत्यमेव जयते

भारत INDIA

INDIA NON JUDICIAL

महाराष्ट्र MAHARASHTRA

GE 879238

AGREEMENT

(For non-Irrigation water supply)

An agreement made on the 21st day of Jan. 2014 between the Managing Director, Samarth Sahakari Sakhar karkhana Ltd., Ankushnagar registered under the co-operative Act of Maharashtra State of co-operative Societies Act 1960 and having its registered office at Ankushnagar hereinafter referred to as "KARKHANA" (which expression shall unless excluded by or it be repugnant to the context or meaning thereof be deemed to include its successor and assigns) of the one part. And the Executive Engineer, Jayakwadi Irrigation Division, Nathnagar (North), Paithan, Dist. Aurangabad hereinafter referred to as 'Government' (which expression shall unless excluded by or it be repugnant to the context or meaning thereof be deemed to include his successor and assigns) of the other part.

Whereas the karkhana had already constructed pumping station on the karkhana land at Shahagad for drawing water from the river Godaveri. hereinafter referred to as "the said river" for the use by the karkhana's sugar plant (hereinafter referred to as "the said plant") and laying underground and surface pipes and drains for discharge of the factory effluent.

AND whereas the Government has sanctioned to draw 0.054Million meter cube of water per year from the said source.

AND whereas the karkhana has paid Rs. Nil (Rupee Nil) to Govt. towards the proportional cost of capital outlay of the project.

AND whereas the Govt. has agreed to grant the aforesaid permission to the karkhana on the terms and conditions hereinafter appearing.

AND WHEREAS UNDER the said terms and conditions the karkhana has to deposit with the Executive Engineer, Jayakwadi Irrigation Division Paithan, Division to the Government a sum of Rs. 85000/- as 'Security equivalent to 2 months karkhana's probable water charges based on yearly sanctioned demand as communicated in cash or in the from of fixed deposit receipt or a Bank Guarantee issued by a scheduled/nationalised bank having it's main/branch office situated locally for the due observance and performance by the karkhana of the terms and conditions of this Agreement AND WHEREAS in karkhana has accordingly prior to the execution of these presents deposited with the Government Rs.85000/- as security for the due observance and performance by the karkhana of the terms and conditions herein contained., AND WHEREAS it has been agreed that the said amount will not carry any interest if deposited in cash.

Definitions:-

Quota :- Quota means demand sectioned and communicated to karkhana by the Executive Engineer of Jayakwadi Irrigation Division, Paithan.

Corporation :- Corporation means the River Basinl Corporations like Maharashtra Krishna valley Development Corporation (MKVDC) Godawari Marathawada Irrigation Development Corporation (GMIDC) Tapi Irrigation Development Corporation (TIDC) Konkan Irrigation Development Corporation (KIDC) & Vidarbha Irrigation Development Corporation (VIDC) Municipal Corporation, Municipalities etc.

Yearly Applicable demand :- Yearly Applicable demand means the water demand communicated by the USER for the period form 1st November to 31st October to the Executive Engineer & sanctioned by Irrigation Department every year in the month of September along with its bifurcation for industrial, domestic and agricultural use.

Samarth S.S.K. Ltd., Ankushnagar Regd. No. JAL/PRG/(A)-1 Dt.10-02-1982 Ambad Dist. Jalna

USER : User means water using agency Karkhana .

NOW THIS AGREEMENT WITNESSTH AS FOLLOWS :

(a) In consideration of the karkhana making payment to the Government as hereinafter specified and observing and performing the convenience and conditions herein contained Government do hereby grants to the karkhana permission to draw 0.054 Million Cubic Meter (MCM) of water per year form the said source (Tentative Yearly requirement will be communicated in the month of Oct. of every year.) 0.054 Million Cubic Meter (MCM) of water per year for the purpose of the karkhana's said plant and for supply of residential colonies for a **term of six years commencing from the 21st day of January 2014** on the following terms and conditions.

(b) The quota assigned for domestic use and for agricultural use shall not exceed 10% each of the total water demand. In the case wherein the water used for Domestic/Agricultural use exceeds 10% in each case the excess use shall be charged at industrial applicable rate specified in clause II of this agreement.

(c) The Industrial water requirement, the Domestic water requirement and agricultural(nursery/gardening) water requirement of the karkhana as demanded deemed to be separate and independent for the sole purpose and water charges assessment shall be accordingly separate and independent for other clauses of this agreement.

2) The permission hereby granted shall be subject to the provision of the Maharashtra Irrigation Act 1976 and the Bombay Canal Rules and subsequent revisions, if any, in force and any executive orders issued in this behalf by Government and any statutory amendment thereof from time to time and for the time being in force.

3) Nothing herein contained shall be deemed to imply any guarantee on the part of the Government as to the availability or otherwise of any specific quantity of water and Government shall not be responsible for the non-supply or inadequate supply of water on any account whatsoever.

Regd. No. JAL/PRG/(A)-1 Dt.10-02-1982

However in case of inadequate or non-supply due to shortage of water or reason beyond the control of the Government of Corporation, bill shall be charged as per actual quantity of water lifted during such period.

4) The karkhana shall use the water drawn from the said river for the purpose of the karkhana's said plant and for supply to the residential colonies constructed by the karkhana within the area of the said plant for providing housing to its employees and workers (hereinafter referred to as "the said residential colonies") The karkhana shall not sell the water from the said river to any other person, firm or company, corporation or other body. In the event of the karkhana selling water drawn from the said river, then the Government without prejudice to its right will forthwith revoke the license. Government shall be entitled to recover from the karkhana the proceeds of any such sale made by the karkhana.

As regards, water supply to the karkhana this clause of resale of water will not be applicable to the extent of the water supplied by them to the industrial units and residential colonies in their jurisdiction. But, for any purposes other then the above, if karkhana desires to supply the water then the prior permission of the Government in Irrigation Department is obligatory. Water supply made by karkhana without prior permission will be charged at the maximum rates applicable for industrial water supply.

5) Government shall be entitled to utilise water of the said river available after meeting the reasonable requirements of the karkhana, as to which matter the decision of the Government shall be final and binding on the karkhana, for such purposes as Government deems fit.

6) The permission hereby granted shall not in any manner prejudicially affect the existing water rights vested in the upstream riparian owners, nor shall it in any way, prejudice Government's right to here after launch or implement in public interest any new scheme or schemes on its own, on or in connection with the present source of channel of water supply available to the karkhana, subject however to the safe-guarding of its reasonable demand referred to in clause (5) above.

Regd. No. JAL/IRG(A)-1/ Dt.10-02-1982

7) The karkhana shall not construct the pick-up weir in the Godavari river bed of the said river unless he proposals, plans, drawings, specifications, estimates and all other details thereof are previously submitted to and approved in writing by an officer authorised in that behalf by the Government and while granting its approval to the construction of the pick-up weir Government may impose such conditions as it may in its discretion think fit.

8) (a) For ascertaining the quantity of water drawn by the karkhana, the karkhana shall forthwith at its own cost and after obtaining prior approval in writing thereto of the Executive Engineer, install independent pipelines fitted with separate electronic water measuring devices for use of water for the said independent intention (hereinafter referred to as "the said electronic measuring devices")at such places as is indicated by the Executive Engineer. All the pipeline showing locations of the metering equipment's from the said source for different purposes shall be got jointly verified and got approved from Executive Engineer, Irrigation Department. Layout from the said source shall be got approved from the Executive Engineer. No changes in the approved layout shall be made without the prior written approval from the Executive Engineer. In the event of the karkhana failing to install and keep in proper working order the said electronic measuring devices for use of water for the said Plant and supply to the said residential colonies as aforesaid the karkhana shall be liable to pay for the full sanctioned water quota as mentioned in clause 8 (d) I and II.

During such period 125% of the proportionate sanctioned quantity will be charged at the prevailing rates for the said plant. The said electronic measuring devices shall always be kept under the lock and seal of the Executive Engineer and the key of such lock shall at all times remain with the Executive Engineer. The karkhana shall at all times, during the substance of this agreement at its own cost maintain the said electronic measuring devices in proper working order and condition.

(b) Readings for the water so drawn by the karkhana will be taken on the said electronic measuring devices, on the 1st day of each month/at agreed times, jointly by the authorised representatives of the Executive Engineer and of the karkhana

(c) If at any time in the opinion of the Executive Engineer the said electronic measuring devices are found defective, the same shall be tested for its accuracy and the cost of such testing shall be borne and paid by the karkhana. If on such testing the said electronic measuring devices are found to be defective the karkhana shall forthwith get the same repaired and set right at its own cost and in the event of karkhana failing to do so within 30 (Thirty) days thereafter the Executive Engineer may proceed to do so on account and at the cost of the karkhana.

(d) In the event of the said electronic measuring devices going out of the order and becoming defective the quantity of water drawn by the karkhana during the period when the meter was defective and not working shall be ascertained in the following manner.

(i) If the said electronic measuring devices remain out of order for a period of less than 30 days then the quantity of water deemed to be drawn by the USER during the said period shall be taken to be 90% of the yearly sanctioned demand as communicated in clause No.11 or average for the last six month's whichever is higher.

(ii) If the said electronic measuring devices remain out of order for a period exceeding 30 days then the quantity of water deemed to be drawn by the USER during the said period shall be taken to be 125% of the yearly sanctioned demand as communicated in clause II or average for the last Six month whichever is higher. This will be made applicable for the period during which the measuring devices remained out of order.

The aforesaid provisions will also apply when the quantity of water drawn by the karkhana cannot be measured on account of removal of the said electronic measuring devices for repairs of the same in the opinion of the Executive Engineer not working properly.

(iii) If electronic meter meant for domestic or for agricultural use is not fitted or remains out of order or is removed, the water charges will be levied as per the rates specified for he industrial use for the total quota as referred to in clause I (a) of this agreement.

9) Billing should be done on bi-monthly basis. The Bill for the water drawn by the karkhana during the previous calendar months shall be sent in duplicate/triplicate by the Executive Engineer to the office of

the karkhana within 15 day after the end of the water consumption months. The karkhana shall thereafter duly pay the same by a cheque drawn in the name of the Executive Engineer Jayakwadi Irrigation Division, Paithan for and on behalf of the Government within a fortnight form the date of receipt of the bill and shall not allow the same to fall in arrears. If the karkhana fails to pay the amount within this stipulated time (15 days from the date of receipt of the bill i.e. before the end of the current month) extra charge not exceeding 10% per annum of the amount due will be charged. If the delay in payment of water charges exceeds six months, the irrigation department reserves the right to terminate the water supply with a notice of 15 days in advance.

10) The cost of all works in connection with the arrangement for water supply including the cost of measuring devices and its installation and maintenance, shall be borne by the karkhana.

11) Subject to the provisions of clause (8) hereof, the karkhana shall pay to the Government at the time and in the manner specified in clause (12) hereof water charges for the quantity of water drawn by the karkhana from the said river as measured by the said electronic measuring devices at the following rates, namely:-

(Here rates which are going to be applied to the karkhana with mention of purpose of use of water, sanctioned quota and present rate (subject to its revision may be specified) The water lifted by the USER during rainy season from the river where irrigation Department has not released the water, concessional rate as decided by Irrigation Department shall be charged.

I. Provided however that after the expiry of two years from the date the karkhana starts drawing water from the said river if in any month the quantity of water drawn by the karkhana is less than 90 per cent of the quantity of water specified in clause (1) hereof then the karkhana shall pay to the Government water charges calculated for 90 per cent of the quantity of water specified in clause (1) hereof or for average of the quantity of water drawn by the karkhana during the period of previous three months including the month in question whichever is greater.

Regd. No. JAI/PRG(A)-1 Dt.10-02-1982 Tq. Ambad Dist. Jalna

II. For any unforeseen reasons, if the karkhana would like to reduce/increase the demand of water made earlier/entered in the agreement, they will be required to make the revised annual demand before the commencement of the year i.e. 1st day of November. On acceptance of such revised demand the karkhana will be charged as per changed demand for period specified, other conditions remaining same.

A supplementary agreement on hundred rupees stamp paper for this changed quantity which will from part of main agreement.

III. No penal rate will be levied for the quantity to 10% in excess of the sanctioned one. For quantity used in excess of this 10% without prior sanction a penal rate of 25% will be charged over the basic rate. The delay in payment on account of this also, will be governed by clause 9 above.

IV. For any unforeseen reasons (such as sudden closure of the units or sudden rise in production etc.) there could be abrupt fluctuations in the demand on both sides. Such cases will be decided at Govt. level only, by giving due considerations to the availability of water in the particular sub-basin and so on.

V. In addition to the payment of water charges referred to above the karkhana shall also pay to the Government local fund cess at the rate of 20 paise per every rupee of basic water charges.

VI. Water bills- The bi-monthly bills for the period from November to August (for 10 months) shall be prepared on the basis of actual quantity of water lifted at the prevailing rate. The bill for the month of September & October (11th & 12th Month) shall be prepared by taking review of annual sanctioned demand and the terms and conditions of the agreement and then shall be adjusted and paid accordingly. While adjusting so it shall be considered that the 90% of the annual sanctioned demand has been lifted/used.

The water lifted in excess, upto 10% of sanctioned demand shall be charged at single and excess above 10% without prior permission will be charged at penal rate of 1.25 times of the normal rate, as mentioned in the relevant clause. However the local cess shall be charged on single rate only.

12) (a) The karkhana shall pay to the Executive Engineer, water rates and local fund cess either in advance every bi-month's, on he basis of anticipated quantum of water to be drawn by it from the said source during the month's or on monthly basis within fifteen (15) days from the date of receipt of the bi-monthly demands by the USER from the Executive Engineer. Or default of the USER to pay the water rate or local fund cess as aforesaid vide clause 9 and 11, Government shall without prejudice to its any other rights and remedies he entitled this agreement forthwith as per clause No.9

(b) In the case of disputes regarding quantity of water billed or rate of which the bill is prepared the karkhana shall first pay the complete amount of the bill and then claim for refund of any excess bill charged giving the reasons/justification of wrong billing. However the decision of Superintending Engineer, Aurangabad in this regards shall be final and binding on the karkhana.

13) Government hereby reserves to itself the right to revise from time to time the water rates and local fund cess and karkhana shall pay the revised water rates and local fund cess as may be fixed by Government from time to time.

13) The USER shall not discharge the effluent in any Nalla or river and shall not pollute directly or indirectly any portion of the said Nalla/river even by septic tank effluents. If any water sources are polluted by any industry as identified by irrigation/pollution control Board/MIDC/MJP the industry shall be charged with a penalty of rupees 5,000/- per such incident per day till it is rectified. The opinion of Maharashtra Pollution Control Board in respect of degree of pollution will be binding on the industry.

The industry shall recycle the effluent water their use such as gardening, recreation, cooling, cleaning, washing and manufacturing process etc. so that atleast 50% reduction in consumption of fresh water is achieved.

15) The effluent disposal arrangement made by the karkhana shall be got approved by the karkhana from the Maharashtra Pollution Control Board / Environmental Department of the Government prior of commencing the operation of pumping/drawing water from the source.

16) The karkhana shall at all the times allow an officer of irrigation Department of the Government authorised in that behalf to inspect the said works as well as the accounts and copies taken of entries from the records maintained by the karkhana.

17) Any notice or other document to be given to or served upon the karkhana may be given or served on behalf of the Government by the Executive Engineer, Paithan and any such notice or document shall be deemed to have been duly given to or served upon the karkhana or sent by registered post to the registered karkhana if it is delivered at the registered office of the karkhana or sent by registered post to the registered address for the time being of the karkhana .

18) The said sum of Rs. 85,000/- deposited in the form of FDR/Bank guarantee/cash by the karkhana with the Executive Engineer, Jayakwadi Division, Paithan to the Government as aforesaid shall be held by the Government as security for the due observance and performance by the karkhana of the covenants, terms and conditions herein contained. In case of default on the part of the covenants to perform and observe any of the said covenants, terms and conditions it shall be lawful for the Government in its absolute discretion to forfeit the whole of the security deposit or any part thereof without prejudice nevertheless to any rights and remedies which the Government may have against the covenants under these presents for such breach and the covenants shall forthwith pay up the amount so forfeited and shall always maintain the original amount of deposit throughout the period of this agreement. On the expiry of the terms of the agreement, the said security deposit of Rs.85,000/- or such part thereof as shall not have been appropriated as aforesaid shall be refunded to the karkhana.

Regd. No. JAL/PR-3/(A)-1 Dt.10-02-1982

19) All amounts due to the Government by the karkhana under this agreement shall be deemed to be arrears of land revenue and may without prejudice to any other rights and remedies of the Government be recovered from the karkhana as arrears of land revenue.

20) On the expiry of the term of this agreement Government may renew this agreement within 90 days for such further period and on such terms and conditions, as Government may at its absolute discretion deem fit.

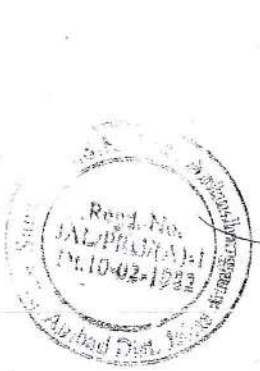
21) The costs incurred in the execution of the incidental charges for this agreement including stamp duty shall be borne by and paid by karkhana.

22) Permission for extra water over and above the sanctioned quota will be granted only when the written permission for expansion etc. is produced by the karkhana from the industrial Department.

23) The agreement supercedes all the previous agreements entered into by the USER with the Government in connection with the supply of water from Godavari River.

24) The karkhana will have to make an arrangement at it's own cost for adequate storage (Balancing Tank) of not less than two months requirement of water in case of perennial canal, five months requirement in case of 8 monthly canal system, four months requirement in case of perennial water source of river/nalla and one month water requirement in case of perennial water source of river/nalla so as to take care of the closure period. But if unexpectedly the closure period is increased by more than the specified period stipulated herein the karkhana will have to make an alternative arrangement for its water requirement at its own cost.

25) IF THE KARKHANA COMMITS A BREACH OF ANY OF THE TERMS AND CONSITIONS THEREOF GOVERNMENT SHALL BE ENTITLED TO CANCEL THIS PERMISSION AND DISCONTINUE THE SUPPLY OF WATER WITHOUT PAYMENT OF ANY COMPENSATION WHATSOEVER TO THE KARKHANA.



26) The Govt, hereby reserves to itself its rights to ange/amend/modify/ cancel/revise any of the terms and conditions, rules and regulations of water management and Maharashtra irrigation Act and rules laid under them which shall be applicable to this agreement.

IN WITHNESS WHEREOF THE Common seal of the Samarth Sahakari Sakhar Karkhana Ltd., Ankushnagar has been hereunto affixed AND the Executive Engineer, Jayakwadi Irrigation Division, Paithan has for and on behalf of the Governor of Maharashtra hereto set his hand and affixed the seal of his office the day and year first herein above written.

THE COMMON SEAL OF SAMARTH SAHAKARI SAKHAR KARKHANA LTD., ANKUSHNAGAR was pursuant to a resolution off the Board of Directors of the karkhana dated 07 January 2014.

Managing Director
M/s. Samarth S.S.K.Ltd. Ankushnaga.
Tq.Ambad, Dist.Jalna. Pin 431 21.

Regd. No. JAL/PRG/(A)-1 Dt.10-02-1982 Ankushnagar Ambad Dist. Jalna

Hereto affixed in the presence of

1. Hon.Shri.Manojkumar Jagannath Markad
2. Hon.Shri.Vikas Prakashrao Kavhale

Two Directors of the karkhana who in taken thereof have hereto set their respective hands in the presence of

SIGNED, SEALED AND DELIVERED by the Executive Engineer Jayakwadi Irrigation Division, Paithan.

Executive Engineer
Jayakwadi Irrigation
Division N. N. (N) Paithan

for and on behalf of the Government of Maharashtra in the presence of

1. ----------
2. ----------

शाखाधिकारी
जायकवाडी सिंचन शाखा क्र.४
दैठणघाट ता.अंबड, जि जालना

Sub Divisional Engineer
J.I.Sub Division No.14
WADIGODRI

Sugar Convent

MAHARASHTRA POLLUTION CONTROL BOARD

Tel: 24010437/24020781/24014701
Fax: 24024068 /24023515
Website: http://mpcb.gov.in
E-mail: mpcb@vsnl.net

Kalpataru Point, 2nd - 4th Floor,
Opp. Cine Planet Cinema,
Near Sion Circle, Sion (E)
Mumbai - 400 022

Red/LSI

Consent No: Format 1.0/BO/CAC-CELL/UAN No. 0000030504/R/CAC- 1712000177

Date: 07/12/2017.

To,

M/s. Karmayogi Ankushrao Tope Samarth SSK Ltd.,
Ankushnagar, Tal. Ambad,
Dist. Jalna

Subject : Renewal of Consent to Operate of 2500 TCD Sugar unit with increase in CI under RED category.

Ref :
1. Consent to operate for sugar granted by the Board vide No. BO/CAC-CELL/UAN No. 0000012440/R/CAC-1612000193 dtd. 05.12.2016.
2. Consent to Operate for Co-gen unit granted by the Board vide No. BO/CAC-CELL/EIC No. AD-1172-15/R/CAC-9346 dtd.22.07.2016.
3. Minutes of CAC meeting held on 31.10.2017.

Your application: UAN No. 0000030504.
Dated: 19.07.2017

For: Renewal of Consent to Operate of 2500 TCD Sugar unit with increase in CI under RED category, under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization under Rule 6 of the Hazardous & Other Wastes (M, H & T M) Rules 2016 is considered and the consent is hereby granted subject to the following terms and conditions and as detailed in the schedule I, II, III & IV annexed to this order:

1. The consent is granted for a period from **01.08.2017 to 31.07.2020.**
2. The actual total investment of the sugar industry is Rs. **141.016Cr.** (As per C. A. Certificate submitted by industry)
3. The Consent is valid for the manufacture of –

Sr. No.	Product / By-Product Name	Maximum Quantity in MT/M
1	Sugar	8000
2	Molasses	320
3	Pressmud	2400
4	Bagasse	24000

(The cane crushing Capacity of Sugar Industry shall not exceed 2500 TCD)

4. Conditions under Water (P&CP), 1974 Act for discharge of effluent:

Sr. no.	Description	Permitted quantity of discharge (CMD)	Standards to be achieved	Disposal
1.	Trade effluent	195	As per Schedule - I	On land for irrigation
2.	Domestic effluent	70.0	As per Schedule - I	On land for irrigation

5. Conditions under Air (P& CP) Act, 1981 for air emissions:

Sr. no.	Description of stack / source	Number of Stack	Standards to be achieved
1.	Boiler (95 TPH)	1	As per Schedule – II
2.	DG set of 1010 KVA	1	As per Schedule – II

6. **Conditions under Hazardous & Other Wastes (M, H & T M) Rules, 2016 for treatment and disposal of hazardous waste:**

Sr. No.	Type of Waste	Category	Quantity	UOM	Disposal
1	Used /Spent Oil	5.1	2.5	MT/A	Reuse in own boiler as fuel

7. **Non-Hazardous Solid Wastes:**

Sr. No.	Type of Waste	Quantity	UOM	Treatment	Disposal
1.	Fly/Boiler Ash	400	MT/M	-	Sale to Bricks manufacturers / Soil conditioning.
2.	Sludge from waste water treatment	---	MT/A	-	Use as manure

8. This Board reserves the right to review, amend, suspend, revoke etc. this consent and the same shall be binding on the industry.

9. This consent should not be construed as exemption from obtaining necessary NOC/permission from any other Government agencies.

10. **Industry shall operate online monitoring system which is installed as per the Directions of CPCB and shall connect/ upload the online monitoring data at MPCB and CPCB server.**

For and on behalf of the
Maharashtra Pollution Control Board

6/12/17

(P. K. Mirashe)
Member Secretary

Received Consent fee of –

Sr. No.	Amount (Rs.)	DR. No.	Date	Drawn On
1	2,82,032/-	JSBI5659500999	14.07.2017	SBI (Online Payment)
2	1,00,000/-	JSBI5705088982	03.10.2017	SBI (Online Payment)
3	5,64,028/-	TXN1711002233	25.11.2017	Online Payment

Copy to:

1. Regional Officer – MPCB Aurangabad & Sub -Regional Officer – Jalna, MPCB, He is directed to ensure the compliance of the consent conditions.
2. Chief Accounts Officer, MPCB, Mumbai.
3. CC/CAC desk- for record & website up-dation purposes.

Schedule-I

I) **Terms & Conditions for compliance of Water Pollution Control**

1) A] **As per your application, you have provided Effluent Treatment Plant with capacity 1000 CMD, comprising of Grit Chamber, Oil & Grease Trap, Neutralization Tank, Equalization Tank, Primary Clarifier, Aeration Tank, Secondary Clarifier & SDB's**

2) B] The Applicant shall operate the effluent treatment plant (ETP) to treat the trade effluent so as to achieve the following standards prescribed by the Board or under EP Act, 1986 and Rules made there under from time to time, whichever is stringent.

Sr. No.	Parameters	Standards prescribed by Board
		Limiting Concentration in mg/l, except for pH
01	pH	5.5-9.0
02	Oil & Grease	10
03	BOD (3 days 27oC)	100
04	Sulphate	1000
05	Suspended Solids	100
06	COD	250
07	Chloride	600
08	Total Dissolved Solids	2100

C] The treated effluent 195 CMD of Sugar unit shall be disposed on land for irrigation on 49 acres of own land /as per the bilateral agreement with farmers. **In no any case treated/untreated effluent shall find its way outside the factory premises directly or indirectly.**

D] **CREP conditions for Sugar Factory**

i. Operation of ETP shall be started at least one month before starting of cane crushing to achieve desired MLSS. So as to meet prescribed standards from day one the operation of mill.
ii. Waste water generation shall be maintained as 100 liters per ton of cane crushed.
iii. Industry shall achieve zero discharge into in land surface water bodies.
iv. 15 days storage capacity tank shall be provided for treated effluent to take care of no demand for irrigation.

E] Industry shall maintain properly the arrangement provided for covering the effluent collection system and to avoid the ingress of Bagasse other material.

F] **The unit shall operate ETP even after completion of the crushing season so that any effluent generated during washing & maintenance is discharged after proper treatment.**

G] **The unit shall optimize water use in industrial process & maintain records of water consumption & waste water generation.**

3) A] As per your consent application, for the 70 CMD sewage generation you have provided septic tank & soak pit for the treatment of sewage.

B] The Applicant shall operate the sewage treatment system to treat the sewage so as to achieve the following standards.

(1) **Suspended Solids Not to exceed 100 mg/l.**
(2) **BOD 3 days 27°C Not to exceed 100 mg/l.**

C] The treated sewage shall be disposed on land for gardening/irrigation.

4) The industry shall have bilateral agreement with the farmers on whose land the treated effluent is used for irrigation purposes and a copy of the agreements with validity shall be submitted to the Regional/Sub- Regional Office of the Board.

5) The industry shall create Environmental Cell by appointing an Environmental Engineer, Chemist and Agriculture expert for looking after day to day activities related to Environment and irrigation field where treated effluent is used for irrigation.

6) **CONDITIONS FOR MOLASSES STORAGE:**

(i) The molasses shall be properly collected and stored in steel tanks which shall be leak proof. At no stage of handling of molasses, there shall be leakage or spillage.

(ii) The capacity of tanks for storage of molasses shall be such that it will take care of bumper production of sugar, non-lifting of molasses etc.

(iii) All the area on which molasses are stored and handled should be provided with drain for diverting the spills to the treatment plant/ molasses tank. Suitable arrangements for accidental discharges of molasses from the tanks shall be provided to contain the same within factory premises.

(iv) Destruction of molasses and its disposal shall not be done without specific permission in writing from the authorized officer of the Board. Intimation of intention to destroy or dispose of the molasses shall be given to the Board atleast 15 (fifteen) days in advance by registered post under intimation to the Sub-Regional officer and Regional officer of the Board under whose jurisdiction the factory is situated.

(v) The storage tanks shall be kept in good conditions all the year round with adequate maintenance. The tanks size and capacity per cm, height, total capacity in tonnes shall be displayed prominently near /on the tank.

(vi) The above conditions shall be in addition to and not in derogation of the provisions contained in the "Bombay Molasses Rules, 1955" and "Maharashtra Molasses Storage and Supply Regulation, 1965".

7) The Applicant shall provide Specific Water Pollution control system as per the conditions of EP Act, 1986 and rule made there under from time to time/ Environmental Clearance / CREP guidelines if applicable.

II) **Conditions under Water (Prevention & Control of Pollution) CESS Act, 1977 as amended**

The Applicant shall comply with the provisions of the Water (Prevention & Control of Pollution) Cess Act, 1977 and as amended, by installing water meters, filing water cess returns in Form-I and other provisions as contained in the said act.

Sr. No.	Purpose for water consumed	Water consumption quantity (CMD)
1.	Industrial Cooling, boiler feed etc.,	120
2.	Domestic purpose	88.0
3.	Processing whereby water gets polluted & pollutants are easily biodegradable	550
4.	Processing whereby water gets polluted & pollutants are not easily biodegradable and are toxic	___

Schedule-II
Terms & conditions for compliance of Air Pollution Control

1. As per your application, you have provided the Air pollution control (APC) system and also erected following stack (s) to observe the following fuel pattern-

Sr. No.	Stack Attached to	APC System	Height in meter	Type of Fuel	Quantity	S %	SO_2 Kg/ Day
1.	Boiler (95 TPH)	ESP	76	Bagasse	920 MT/D	0.2 %	3680
2.	DG set of 1010 KVA	---	---	---	---	---	---

2. The Applicant shall provide ESP/ Bag filter/ Wet scrubber to the Bagasse fired boiler and Dust Collector to Sugar bagging section as an Air Pollution control equipments OR as per the conditions of EP Act, 1986 and rule made there under from time to time / Environmental Clearance / CREP guidelines.

3. The applicant shall operate and maintain above mentioned air pollution control system, so as to achieve the level of pollutants to the following standards:

Particulate matter	Not to exceed	150 **mg/Nm^3**

4. The Applicant shall obtain necessary prior permission for providing additional control equipment with necessary specifications and operation thereof or alteration or replacement/alteration well before its life come to an end or erection of new pollution control equipment.

5. The Board reserves its rights to vary all or any of the condition in the consent, if due to any technological improvement or otherwise such variation (including the change of any control equipment, other in whole or in part is necessary).

Schedule-III
Details of Bank Guarantees

NEW BG

Sr. No.	Consent (C to E/O/R)	Amt of BG Imposed	Submission Period	Purpose of BG	Compliance Period	Validity Date
1	C to R	Rs. 5.0 Lacs	To be extended	O & M for achieving consented standards of Effluent & Stack emission.	31.07.2020	30.11.2020

Schedule-IV
General Conditions

1) The applicant shall provide facility for collection of environmental samples and samples of trade and sewage effluents, air emissions and hazardous waste to the Board staff at the terminal or designated points and shall pay to the Board for the services rendered in this behalf.
2) Industry should monitor effluent quality, stack emissions and ambient air quality monthly.
3) The applicant shall provide ports in the chimney/(s) and facilities such as ladder, platform etc. for monitoring the air emissions and the same shall be open for inspection to/and for use of the Board's Staff. The chimney(s) vents attached to various sources of emission shall be designated by numbers such as S-1, S-2, etc. and these shall be painted/ displayed to facilitate identification.
4) Whenever due to any accident or other unforeseen act or even, such emissions occur or is apprehended to occur in excess of standards laid down, such information shall be forthwith Reported to Board, concerned Police Station, office of Directorate of Health Services, Department of Explosives, Inspectorate of Factories and Local Body. In case of failure of pollution control equipments, the production process connected to it shall be stopped.
5) The applicant shall provide an alternate electric power source sufficient to operate all pollution control facilities installed to maintain compliance with the terms and conditions of the consent. In the absence, the applicant shall stop, reduce or otherwise, control production to abide by terms and conditions of this consent.
6) The firm shall submit to this office, the 30th day of September every year, the Environmental Statement Report for the financial year ending 31st March in the prescribed Form-V as per the provisions of rule 14 of the Environment (Protection) (Second Amendment) Rules, 1992.
7) The industry shall recycle/reprocess/reuse/recover Hazardous Waste as per the provision contain in the H&OW (MH&TM) Rules 2016, which can be recycled /processed /reused /recovered and only waste which has to be incinerated shall go to incineration and waste which can be used for land filling and cannot be recycled/reprocessed etc should go for that purpose, in order to reduce load on incineration and landfill site/environment.
8) The industry should comply with the Hazardous & Other Wastes (M, H & TM) Rules, 2016 and submit the Annual Returns as per Rule 6(5) & 20(2) of Hazardous & Other Wastes (M, H & TM) Rules, 2016 for the preceding year April to March in Form-IV by 30th June of every year.
9) An inspection book shall be opened and made available to the Board's officers during their visit to the applicant.
10) **The applicant shall make an application for renewal of the consent before the date of the expiry of the consent.**
11) Industry shall strictly comply with the Water (P&CP) Act, 1974, Air (P&CP) Act, 1981 and Environmental Protection Act, 1986 and industry specific standard under EP Rules 1986 which are available on MPCB website (www.mpcb.gov.in).
12) The industry shall constitute an Environmental cell with qualified staff/personnel/agency to see the day to day compliance of consent condition towards Environment Protection.
13) Separate drainage system shall be provided for collection of trade and sewage effluents. Terminal manholes shall be provided at the end of the collection system with arrangement for measuring the flow. No effluent shall be admitted in the pipes/sewers downstream of the terminal manholes. No effluent shall find its way other than in designed and provided collection system.
14) Neither storm water nor discharge from other premises shall be allowed to mix with the effluents from the factory.
15) The applicant shall install a separate meter showing the consumption of energy for operation of domestic and industrial effluent treatment plants and air pollution control system. A register showing consumption of chemicals used for treatment shall be maintained.
16) Conditions for D.G. Set

a) Noise from the D.G. Set should be controlled by providing an acoustic enclosure or by treating the room acoustically.
b) Industry should provide acoustic enclosure for control of noise. The acoustic enclosure/ acoustic treatment of the room should be designed for minimum 25 dB (A) insertion loss or for meeting

the ambient noise standards, whichever is on higher side. A suitable exhaust muffler with insertion loss of 25 dB (A) shall also be provided. The measurement of insertion loss will be done at different points at 0.5 meters from acoustic enclosure/room and then average.

c) Industry should make efforts to bring down noise level due to DG set, outside industrial premises, within ambient noise requirements by proper sitting and control measures.
d) Installation of DG Set must be strictly in compliance with recommendations of DG Set manufacturer.
e) A proper routine and preventive maintenance procedure for DG set should be set and followed in consultation with the DG manufacturer which would help to prevent noise levels of DG set from deteriorating with use.
f) D.G. Set shall be operated only in case of power failure.
g) The applicant should not cause any nuisance in the surrounding area due to operation of D.G. Set.
h) The applicant shall comply with the notification of MoEF dated 17.05.2002 regarding noise limit for generator sets run with diesel.

17) The industry should not cause any nuisance in surrounding area.
18) The industry shall take adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standard in respect of noise to less than 75 dB (A) during day time and 70 dB (A) during night time. Day time is reckoned in between 6 a.m. and 10 p.m. and night time is reckoned between 10 p.m. and 6 a.m.
19) The applicant shall maintain good housekeeping.
20) The applicant shall bring minimum 33% of the available open land under green coverage/ plantation. The applicant shall submit a yearly statement by 30th September every year on available open plot area, number of trees surviving as on 31st March of the year and number of trees planted by September end.
21) The non-hazardous solid waste arising in the factory premises, sweepings, etc. be disposed of scientifically so as not to cause any nuisance / pollution. The applicant shall take necessary permissions from civic authorities for disposal of solid waste.
22) The applicant shall not change or alter the quantity, quality, the rate of discharge, temperature or the mode of the effluent/emissions or hazardous wastes or control equipments provided for without previous written permission of the Board. The industry will not carry out any activity, for which this consent has not been granted/without prior consent of the Board.
23) The industry shall ensure that fugitive emissions from the activity are controlled so as to maintain clean and safe environment in and around the factory premises.
24) The industry shall submit quarterly statement in respect of industries obligation towards consent and pollution control compliance's duly supported with documentary evidences (format can downloaded from MPCB official site).
25) The industry shall submit official e-mail address and any change will be duly informed to the MPCB.
26) The industry shall achieve the National Ambient Air Quality standards prescribed vide Government of India, Notification dt. 16.11.2009 as amended.
27) The Board reserves its rights to review plans, specifications or other data relating to plant setup for the treatment of waterworks for the purification thereof & the system for the disposal of sewage or trade effluent or in connection with the grant of any consent conditions. The Applicant shall obtain prior consent of the Board to take steps to establish the unit or establish any treatment and disposal system or an extension or addition thereto.
28) The industry shall ensure replacement of pollution control system or its parts after expiry of its expected life as defined by manufacturer so as to ensure the compliance of standards and safety of the operation thereof.

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Co-gen Consent

MAHARASHTRA POLLUTION CONTROL BOARD

Tel: 24010437/24020781/24014701
Fax: 24024068 /24023515
Website: http://mpcb.gov.in
E-mail: mpcb@vsnl.net

Kalpataru Point, 2nd - 4th Floor,
Opp. Cine Planet Cinema,
Near Sion Circle, Sion (E)
Mumbai - 400 022

Red/LSI

Consent No: Format 1.0/BO/CAC-CELL/EIC No. - AD-1172-15/R/CAC-9346 *Date: 22/07/2016.*

To,
M/s. Samarth SSK Ltd., (Co-gen),
Ankushnagar, Tal. Ambad,
Dist. Jalna.

Subject : Renewal of Consent to Operate for 18 MW Co-gen unit under RED category.
Ref : 1. Consent to Operate granted by the Board vide no. BO/RO-Aurangabad/RO (P&P)/ EIC-AD-5502-10/O/CC-412 dtd. 15.12.2010.
2. Minutes of CAC meeting held on 02/02/2016.

Your application: CR1512000252.
Dated: 05/12/2015.

For: Renewal of Consent to Operate for 18 MW Co-gen unit under RED category, under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization under Rule 5 of the Hazardous Wastes (M, H & T M) Rules 2008 is considered and the consent is hereby granted subject to the following terms and conditions and as detailed in the schedule I, II, III & IV annexed to this order:

1. The consent is granted from a period 01.10.2015 to 31.07.2020.
2. The actual capital investment of the industry is Rs. 77.61 Cr. (As per C. A. Certificate submitted by industry)
3. The Consent is valid for the manufacture of –

Sr. No.	Product / By-Product Name	Maximum Quantity
1	Electric Power (Co-gen)	18 MW

4. Conditions under Water (P&CP), 1974 Act for discharge of effluent:

Sr. no.	Description	Permitted quantity of discharge (CMD)	Standards to be achieved	Disposal
1.	Trade effluent	34	As per Schedule - I	100% recycle
2.	Domestic effluent	Nil	NA	

5. Conditions under Air (P& CP) Act, 1981 for air emissions:

Sr. no.	Description of stack / source	Number of Stack	Standards to be achieved
1.	Boiler (95 TPH)	1	As per Schedule – II
2.	DG set of 1000 KVA	1	As per Schedule – II

Co-gen Consent

6. Conditions under Hazardous Waste (M, H & T M) Rules, 2008 for treatment and disposal of hazardous waste:

Sr. No.	Type of Waste	Category	Quantity	UOM	Disposal
1	Used/Spent Oil	5.1	----	Kg/D	Reuse in own Boiler as Fuel.

7. Non-Hazardous Solid Wastes:

Sr. No.	Type of Waste	Quantity	UOM	Treatment	Disposal
1.	Boiler Ash / Fly Ash	45	MT/D	-	Sold to brick mfgr. & Used for compost production.

8. This Board reserves the right to review, amend, suspend, revoke etc. this consent and the same shall be binding on the industry.

9. This consent should not be construed as exemption from obtaining necessary NOC/permission from any other Government agencies.

10. **Industry shall operate online monitoring system which is installed as per the Directions of CPCB and shall connect/ upload the online monitoring data at MPCB and CPCB server.**

For and on behalf of the
Maharashtra Pollution Control Board

(P. K. Mirashe)
Member Secretary

Received Consent fee of –

Sr. No.	Amount (Rs.)	DD. No.	Date	Drawn On
1	Rs. 1,25,100/-	016709	04.09.2015	State Bank of India.
2	Rs. 5,00,000/-	B1196	14.06.2016	State Bank of India.

Industry has paid above mentioned fees for the period up to 30.09.2020, however Board has granted Consent for the period up to 31.07.2020, hence fees of Rs. 52,084/- is balance with the Board and same will be considered during next Renewal of Consent to Operate.

Copy to:

1. Regional Officer – MPCB Aurangabad and Sub -Regional Officer – Jalna, MPCB, He is directed to ensure the compliance of the consent conditions.
2. Chief Accounts Officer, MPCB, Mumbai.
3. CAC desk- for record & website updation purposes.

Schedule-I

I) Terms & Conditions for compliance of Water Pollution Control

1) A] As per your application, you have provided existing Effluent Treatment Plant (ETP).

B] The Applicant shall operate the effluent treatment plant (ETP) to treat the trade effluent so as to achieve the following standards prescribed by the Board or under EP Act, 1986 and Rules made there under from time to time, whichever is stringent.

Sr No.	Parameters	Standards prescribed by Board (If any)
	I. Compulsory Parameters	Limiting Concentration in mg/l, except for pH
01	pH	5.5 -9.0
02	Oil & Grease	10
03	BOD (3 days 27oC)	100
04	Total Dissolved Solids	2100
05	Chemical Oxygen Demand	250
06	Suspended Solids	100
07	Chloride	600
08	Sulphate	1000
09	% Sodium	60%
(2) Treatment for Cog-en Plant Condenser Cooling Water		
01	pH	6.5 to 8.5
02	Temperature	Not to exceed 5°C . Higher than the intake water temp.
03	Free available chlorine	0.5
Boiler Blow Down		
01	Suspended Solids	100
02	Oil & Grease	10
03	Copper (Total)	1
04	Iron (Total)	1
Cooling Tower Blow Down		
1	Free available chlorine	0.5
2	Zinc	1
3	Chromium (Total)	0.2
4	Phosphate	5

C] Industry shall 100% recycle the trade effluent 34 CMD. In no any case treated/untreated effluent shall find its way outside the factory premises directly or indirectly.

D] Industry shall regularly Operate & Maintain the ETP provided for the treatment of effluent generation from Co-generation plant.

2) As per your consent application, sewage generation is NIL.

3) The industry shall have bilateral agreement with the farmers on whose land the treated effluent is used for irrigation purposes and a copy of the agreements with validity shall be submitted to the Regional/Sub- Regional Office of the Board.

4) The industry shall create Environmental Cell by appointing an Environmental Engineer, Chemist and Agriculture expert for looking after day to day activities related to Environment and irrigation field where treated effluent is used for irrigation.

5) The Applicant shall provide Specific Water Pollution control system as per the conditions of EP Act, 1986 and rule made there under from time to time/ Environmental Clearance / CREP guidelines if applicable.

II) Conditions under Water (Prevention & Control of Pollution) CESS Act, 1977 as amended

The Applicant shall comply with the provisions of the Water (Prevention & Control of Pollution) Cess Act, 1977 and as amended, by installing water meters, filing water cess returns in Form-I and other provisions as contained in the said act.

Sr. No.	Purpose for water consumed	Water consumption quantity (CMD)
1.	Industrial Cooling, boiler feed etc.,	750.00
2.	Domestic purpose	00.00
3.	Processing whereby water gets polluted & pollutants are easily biodegradable	00.00
4.	Processing whereby water gets polluted & pollutants are not easily biodegradable and are toxic	---

Schedule-II

Terms & conditions for compliance of Air Pollution Control

1. As per your application, you have provided the Air pollution control (APC) system and also erected following stack (s) to observe the following fuel pattern-

Sr. No.	Stack Attached to	APC System	Height in meter	Type of Fuel	Quantity	S %	SO_2 Kg/ Day
1.	Boiler (95 TPH)	ESP	76	Bagasse	920 MT/D	0.2%	3680
2.	DG Set of 1000 KVA	Acoustic Enclosure	7.0	HSD	4920 Litrs./D	1%	98.4

2. The Applicant shall provide ESP/ Bag filter/ Wet scrubber to the Bagasse fired boiler and Dust Collector to Sugar bagging section as an Air Pollution control equipments OR as per the conditions of EP Act, 1986 and rule made there under from time to time / Environmental Clearance / CREP guidelines.

3. The applicant shall operate and maintain above mentioned air pollution control system, so as to achieve the level of pollutants to the following standards:

Particulate matter	Not to exceed	150 mg/Nm^3

4. The Applicant shall obtain necessary prior permission for providing additional control equipment with necessary specifications and operation thereof or alteration or replacement/alteration well before its life come to an end or erection of new pollution control equipment.

5. The Board reserves its rights to vary all or any of the condition in the consent, if due to any technological improvement or otherwise such variation (including the change of any control equipment, other in whole or in part is necessary).

Schedule-III
Details of Bank Guarantees

Sr. No.	Consent (C to E/O/R)	Amt of BG Imposed	Submission Period	Purpose of BG	Compliance Period	Validity Date
1	C to R	Rs. 5.0 Lacs	15 Days	O & M for achieving consented standards of Effluent.	31.07.2020	30.11.2020
				O & M for achieving consented standards of Stack emission,		

Schedule-IV

General Conditions

1) The applicant shall provide facility for collection of environmental samples and samples of trade and sewage effluents, air emissions and hazardous waste to the Board staff at the terminal or designated points and shall pay to the Board for the services rendered in this behalf.
2) Industry should monitor effluent quality, stack emissions and ambient air quality monthly.
3) The applicant shall provide ports in the chimney/(s) and facilities such as ladder, platform etc. for monitoring the air emissions and the same shall be open for inspection to/and for use of the Board's Staff. The chimney(s) vents attached to various sources of emission shall be designated by numbers such as S-1, S-2, etc. and these shall be painted/ displayed to facilitate identification.
4) Whenever due to any accident or other unforeseen act or even, such emissions occur or is apprehended to occur in excess of standards laid down, such information shall be forthwith Reported to Board, concerned Police Station, office of Directorate of Health Services, Department of Explosives, Inspectorate of Factories and Local Body. In case of failure of pollution control equipments, the production process connected to it shall be stopped.
5) The applicant shall provide an alternate electric power source sufficient to operate all pollution control facilities installed to maintain compliance with the terms and conditions of the consent. In the absence, the applicant shall stop, reduce or otherwise, control production to abide by terms and conditions of this consent.
6) The firm shall submit to this office, the 30th day of September every year, the Environmental Statement Report for the financial year ending 31st March in the prescribed Form-V as per the provisions of rule 14 of the Environment (Protection) (Second Amendment) Rules, 1992.
7) The industry shall recycle/reprocess/reuse/recover Hazardous Waste as per the provision contain in the HW (MH&TM) Rules 2008, which can be recycled /processed /reused /recovered and only waste which has to be incinerated shall go to incineration and waste which can be used for land filling and cannot be recycled/reprocessed etc should go for that purpose, in order to reduce load on incineration and landfill site/environment.
8) The industry should comply with the Hazardous Waste (M, H & TM) Rules, 2008 and submit the Annual Returns as per Rule 5(6) & 22(2) of Hazardous Waste (M, H & TM) Rules, 2008 for the preceding year April to March in Form-IV by 30th June of every year.
9) An inspection book shall be opened and made available to the Board's officers during their visit to the applicant.
10) **The applicant shall make an application for renewal of the consent at least 60 days before the date of the expiry of the consent (in case of Renewal of consent).**
11) Industry shall strictly comply with the Water (P&CP) Act, 1974, Air (P&CP) Act, 1981 and Environmental Protection Act, 1986 and industry specific standard under EP Rules 1986 which are available on MPCB website (www.mpcb.gov.in).
12) Separate drainage system shall be provided for collection of trade and sewage effluents. Terminal manholes shall be provided at the end of the collection system with arrangement for measuring the flow. No effluent shall be admitted in the pipes/sewers downstream of the terminal manholes. No effluent shall find its way other than in designed and provided collection system.
13) Neither storm water nor discharge from other premises shall be allowed to mix with the effluents from the factory.
14) The applicant shall install a separate meter showing the consumption of energy for operation of domestic and industrial effluent treatment plants and air pollution control system. A register showing consumption of chemicals used for treatment shall be maintained.
15) Conditions for D.G. Set
    a) Noise from the D.G. Set should be controlled by providing an acoustic enclosure or by treating the room acoustically
    b) Industry should provide acoustic enclosure for control of noise. The acoustic enclosure/ acoustic treatment of the room should be designed for minimum 25 dB (A) insertion loss

or for meeting the ambient noise standards, whichever is on higher side. A suitable exhaust muffler with insertion loss of 25 dB (A) shall also be provided. The measurement of insertion loss will be done at different points at 0.5 meters from acoustic enclosure/room and then average

c) Industry should make efforts to bring down noise level due to DG set, outside industrial premises, within ambient noise requirements by proper sitting and control measures.
d) Installation of DG Set must be strictly in compliance with recommendations of DG Set manufacturer.
e) A proper routine and preventive maintenance procedure for DG set should be set and followed in consultation with the DG manufacturer which would help to prevent noise levels of DG set from deteriorating with use.
f) D.G. Set shall be operated only in case of power failure.
g) The applicant should not cause any nuisance in the surrounding area due to operation of D.G. Set.
h) The applicant shall comply with the notification of MoEF dated 17.05.2002 regarding noise limit for generator sets run with diesel.

16) The industry should not cause any nuisance in surrounding area.
17) The industry shall take adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standard in respect of noise to less than 75 dB (A) during day time and 70 dB (A) during night time. Day time is reckoned in between 6 a.m. and 10 p.m. and night time is reckoned between 10 p.m. and 6 a.m.
18) The applicant shall maintain good housekeeping.
19) The applicant shall bring minimum 33% of the available open land under green coverage/plantation. The applicant shall submit a yearly statement by 30th September every year on available open plot area, number of trees surviving as on 31st March of the year and number of trees planted by September end.
20) The non-hazardous solid waste arising in the factory premises, sweepings, etc. be disposed of scientifically so as not to cause any nuisance / pollution. The applicant shall take necessary permissions from civic authorities for disposal of solid waste.
21) The applicant shall not change or alter the quantity, quality, the rate of discharge, temperature or the mode of the effluent/emissions or hazardous wastes or control equipments provided for without previous written permission of the Board. The industry will not carry out any activity, for which this consent has not been granted/without prior consent of the Board.
22) The industry shall ensure that fugitive emissions from the activity are controlled so as to maintain clean and safe environment in and around the factory premises.
23) The industry shall submit quarterly statement in respect of industries obligation towards consent and pollution control compliance's duly supported with documentary evidences (format can downloaded from MPCB official site).
24) The industry shall submit official e-mail address and any change will be duly informed to the MPCB.
25) The industry shall achieve the National Ambient Air Quality standards prescribed vide Government of India, Notification dt. 16.11.2009 as amended.
26) The Board reserves its rights to review plans, specifications or other data relating to plant setup for the treatment of waterworks for the purification thereof & the system for the disposal of sewage or trade effluent or in connection with the grant of any consent conditions. The Applicant shall obtain prior consent of the Board to take steps to establish the unit or establish any treatment and disposal system or an extension or addition thereto.
27) The industry shall ensure replacement of pollution control system or its parts after expiry of its expected life as defined by manufacturer so as to ensure the compliance of standards and safety of the operation thereof.

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Vaild Consent Copy

MAHARASHTRA POLLUTION CONTROL BOARD

Tel: 24010437/24020781/24014701
Fax: 24024068 /24023515
Website: http://mpcb.gov.in
E-mail: mpcb@vsnl.net

Kalpataru Point, 2nd - 4th Floor,
Opp. Cine Planet Cinema,
Near Sion Circle, Sion (E)
Mumbai - 400 022

Red/LSI *Date:* 22/01/2019

Consent No: Format -1.0/BO/CAC-CELL/UAN No. 0000054383/R/CAC- 1901001719

To,
M/s. Karmayogi Ankushrao Tope Samarth SSK Ltd.,
Ankushnagar, Tal. Ambad,
Dist. Jalna.

Subject : **Renewal of Consent to Operate of 30 KLPD Distillery Unit (Molasses Base) under RED category.**

Ref : 1. Consent to Operate granted by Board vide No. BO/CAC-CELL/UAN No. 0000012292/R/CAC-1701000932 dtd. 18.01.2017.
2. Minutes of CAC meeting held on 10.12.2018.

Your application: **0000054383.**
Dated: **11.08.2018.**

For: Renewal of Consent to Operate of 30 KLPD Distillery Unit (Molasses Base) under RED category, under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization under Rule 5 of the Hazardous Wastes (M, H & T M) Rules 2008 is considered and the consent is hereby granted subject to the following terms and conditions and as detailed in the schedule I, II, & III annexed to this order:

1. The consent is granted for a period from 01.01.2018 **to 31.08.2021.**
2. The total capital investment of the Distillery Unit is Rs. 11.2018 Cr. (As per C.A. Certificate submitted by industry)
3. The Consent is valid for the manufacture of –

Sr. No.	Product / By-Product Name	Maximum Quantity	UoM
1	Industrial Alcohol	900	KL/M
2	Absolute Alcohol	900	KL/M
3	Fusel Oil	750	Kg/M

(Distillery Capacity shall not exceed 30 KLPD)

4. Conditions under Water (P&CP), 1974 Act for discharge of effluent:

Sr. no.	Description	Permitted quantity of discharge (CMD)	Standards to be achieved	Disposal
1.	Trade effluent	300 (After volume reduction 228)	As per Schedule - I	Re-boiler followed by Bio-composting.
2.	Domestic effluent	0	As per Schedule - I	On land for irrigation

5. Conditions under Air (P& CP) Act, 1981 for air emissions:

Sr. no.	Description of stack / source	Number of Stack	Standards to be achieved
Steam taken from existing Sugar & Co-gen unit.			

6. Conditions under Hazardous Waste (M, H & T M) Rules, 2008 for treatment and disposal of hazardous waste:

Sr. No.	Type of Waste	Category	Quantity	UOM	Disposal
1	Distillation Residue	20.3	2.0	MT/M	Used in composting.

7. Non-Hazardous Solid Wastes:

Sr. No.	Type of Waste	Quantity	UOM	Treatment	Disposal
----------Nil----------					

8. This Board reserves the right to review, amend, suspend, revoke etc. this consent and the same shall be binding on the industry.

9. This consent should not be construed as exemption from obtaining necessary NOC/permission from any other Government agencies.

10. **Industry shall operate online monitoring system which is installed as per the Directions of CPCB and shall connect/ upload the online monitoring data at MPCB and CPCB server.**

11. **Industry shall extend existing Bank Guarantee of Rs. 5 lakhs towards O & M of pollution control systems and compliance of Consent condition.**

For and on behalf of the
Maharashtra Pollution Control Board

(E. Ravendiran IAS)
Member Secretary

Received Consent fee of –

Sr. No.	Amount (`)	DD. No.	Date	Drawn On
01	Rs. 50000 /-	TXN1808001578	16.08.2018	State Bank of India
02	Rs. 15000 /-	TXN1809002009	20.09.2018	State Bank of India
03	Rs. 1,00,000 /-	TXN1901000191	02.01.2019	State Bank of India

Copy to:

1. Regional Officer – MPCB Aurangabad.
2. Sub -Regional Officer - Jalna, MPCB, He is directed to ensure the compliance of the consent conditions.
3. Chief Accounts Officer, MPCB, Mumbai.
4. CAC desk- for record & website updation purposes.

Schedule-I

I) Terms & Conditions for compliance of Water Pollution Control

A] You have provided comprehensive treatment for volume reduction consisting of Re-boiler followed by Bio-composting on 10.0 acres land for achieving zero discharge.

B) The Condensate water is recycled in process & concentrated spent Wash used for Bio-composting to achieve zero discharge. In no case effluent/spent wash shall discharge outside factory premises /on land /into stream directly or indirectly.

C] Conditions for Aerobic Composting:

i. The spent wash should be stored in impervious tanks. The spent wash tanks should have proper lining with HDPE and should be kept in proper condition to prevent ground water pollution. As per the CPCB recommendation and undertaking given by the company, storage should not exceed 30 days capacity.

ii. Applicant shall ensure availability of adequate filler material such as press mud, bagasses, agricultural, biological waste as required for effective composting system.

iii. Composted material shall meet the following specifications—

Moisture	... 30 to 35%
C/N	... Below 17
Nitrogen	... 1.5 to 2%
Phosphorous	... 1.5 to 2%
Potassium	... 3 to 4%

iv. The composting site shall be prepared as per the guideline enclosed. Composting shall be such that it includes mechanical mixing and spraying of spent wash along with mechanical aeration to ensure thorough composting. Hand/ manual spraying of spent wash shall not be permitted.

v. The compost leachete (1 gr. of compost mixed with 100 ml. of distilled water and filtered) Filterate shall conform to the following limit.

pH	Between	7.5 to 8.0
BOD 3 days 27 Deg. C.	Not to exceed	30 mg/l.

vi. A pucca leak proof guard pond of 30 days holding capacity as per (i) above shall cope up with the effluent discharge during short term process disturbances In case of prolonged disturbance in effluent treatment and disposal system, distillery shall be shut down and shall not be restarted without rectifying the system.

vii. The composting site/pits shall be made leak proof by proper lining. A catch drain shall be provided around the composting site to collect the storage pound for application on compost depots. Arrangements for overturning of compost material in windrows and spraying of spent wash shall be made to ensure appropriate aeration and uniform distribution of spent wash.

viii. In case of composting in open fields, the application of spent wash shall stop by end of April, so that compost is ready and the site is cleared of the composted manure before monsoon (i.e. 31st May). The manure shall be collected and stored on a raised platform with suitable rain cover so that the compost manure is not washed away by rain/runoff.

ix. Characteristic of soil, ground water and effect on crop yield should be monitored in the area where compost is used as manure and results thereof shall be compiled and reported in the Environment statement to be submitted every year.

x. The test wells shall be provided around the compost site for ground water monitoring. The well water quality has to be maintained at 2006 level.

xi. Top pullover impervious sheets shall be provided for entire compost yard, press mud and compost storage so as to cover the same during untimely rains and idles period.

xii. The operation of distillery should be restricted to 270 days in a year and that it will not operate during rainy season.

1) The industry shall create Environmental Cell by appointing an Environmental Engineer, Chemist and Agriculture expert for looking after day to day activities related to Environment and irrigation field where treated effluent is used for irrigation.

2) The Applicant shall provide Specific Water Pollution control system as per the conditions of EP Act, 1986 and rule made there under from time to time/ Environmental Clearance / CREP guidelines if applicable.

II) **Water Consumption of Industry:**

Sr. No.	Purpose for water consumed	Water consumption quantity (CMD)
1.	Industrial Cooling, boiler feed etc.,	20
2.	Domestic purpose	0
3.	Processing whereby water gets polluted & pollutants are easily biodegradable	210
4.	Processing whereby water gets polluted & pollutants are not easily biodegradable and are toxic	—

Schedule-II
Terms & conditions for compliance of Air Pollution Control

NA as steam taken from the boiler of existing Sugar & Co-gen unit.

Schedule-III
Details of Bank Guarantees

Sr. No.	Consent (C to E/O/R)	Amount of BG Imposed	Submission Period	Purpose of BG	Compliance Period	Validity Date
1.	C to R	5.0/- Lakhs	Within 15 days.	O & M of pollution control systems & compliance of Consent Conditions.	31.08.2021	31.12.2021

Schedule-IV

General Conditions

1) The applicant shall provide facility for collection of environmental samples and samples of trade and sewage effluents, air emissions and hazardous waste to the Board staff at the terminal or designated points and shall pay to the Board for the services rendered in this behalf.
2) Industry should monitor effluent quality, stack emissions and ambient air quality monthly/quarterly.
3) The applicant shall provide ports in the chimney/(s) and facilities such as ladder, platform etc. for monitoring the air emissions and the same shall be open for inspection to/and for use of the Board's Staff. The chimney(s) vents attached to various sources of emission shall be designated by numbers such as S-1, S-2, etc. and these shall be painted/ displayed to facilitate identification.
4) Whenever due to any accident or other unforeseen act or even, such emissions occur or is apprehended to occur in excess of standards laid down, such information shall be forthwith Reported to Board, concerned Police Station, office of Directorate of Health Services, Department of Explosives, Inspectorate of Factories and Local Body. In case of failure of pollution control equipments, the production process connected to it shall be stopped.
5) The applicant shall provide an alternate electric power source sufficient to operate all pollution control facilities installed to maintain compliance with the terms and conditions of the consent. In the absence, the applicant shall stop, reduce or otherwise, control production to abide by terms and conditions of this consent.
6) The firm shall submit to this office, the 30th day of September every year, the Environmental Statement Report for the financial year ending 31st March in the prescribed Form-V as per the provisions of rule 14 of the Environment (Protection) (Second Amendment) Rules, 1992.
7) The industry shall recycle/reprocess/reuse/recover Hazardous Waste as per the provision contain in the HW (MH&TM) Rules 2008, which can be recycled /processed /reused /recovered and only waste which has to be incinerated shall go to incineration and waste which can be used for land filling and cannot be recycled/reprocessed etc should go for that purpose, in order to reduce load on incineration and landfill site/environment.
8) The industry should comply with the Hazardous Waste (M, H & TM) Rules, 2008 and submit the Annual Returns as per Rule 5(6) & 22(2) of Hazardous Waste (M, H & TM) Rules, 2008 for the preceding year April to March in Form-IV by 30th June of every year.
9) An inspection book shall be opened and made available to the Board's officers during their visit to the applicant.
10) **The applicant shall make an application for renewal of the consent before 60 days from the date of the expiry of the consent.**
11) Industry shall strictly comply with the Water (P&CP) Act, 1974, Air (P&CP) Act, 1981 and Environmental Protection Act, 1986 and industry specific standard under EP Rules 1986 which are available on MPCB website (www.mpcb.gov.in).
12) Separate drainage system shall be provided for collection of trade and sewage effluents. Terminal manholes shall be provided at the end of the collection system with arrangement for measuring the flow. No effluent shall be admitted in the pipes/sewers downstream of the terminal manholes. No effluent shall find its way other than in designed and provided collection system.
13) Neither storm water nor discharge from other premises shall be allowed to mix with the effluents from the factory.
14) The applicant shall install a separate meter showing the consumption of energy for operation of domestic and industrial effluent treatment plants and air pollution control system. A register showing consumption of chemicals used for treatment shall be maintained.
15) Conditions for D.G. Set
    a) Noise from the D.G. Set should be controlled by providing an acoustic enclosure or by treating the room acoustically.
    b) Industry should provide acoustic enclosure for control of noise. The acoustic enclosure/ acoustic treatment of the room should be designed for minimum 25 dB (A) insertion loss or for meeting the ambient noise standards, whichever is on higher side. A suitable exhaust muffler with

insertion loss of 25 dB (A) shall also be provided. The measurement of insertion loss will be done at different points at 0.5 meters from acoustic enclosure/room and then average.

c) Industry should make efforts to bring down noise level due to DG set, outside industrial premises, within ambient noise requirements by proper sitting and control measures.
d) Installation of DG Set must be strictly in compliance with recommendations of DG Set manufacturer.
e) A proper routine and preventive maintenance procedure for DG set should be set and followed in consultation with the DG manufacturer which would help to prevent noise levels of DG set from deteriorating with use.
f) D.G. Set shall be operated only in case of power failure.
g) The applicant should not cause any nuisance in the surrounding area due to operation of D.G. Set.
h) The applicant shall comply with the notification of MoEF dated 17.05.2002 regarding noise limit for generator sets run with diesel.

16) The industry should not cause any nuisance in surrounding area.
17) The industry shall take adequate measures for control of noise levels from its own sources within the premises so as to maintain ambient air quality standard in respect of noise to less than 75 dB (A) during day time and 70 dB (A) during night time. Day time is reckoned in between 6 a.m. and 10 p.m. and night time is reckoned between 10 p.m. and 6 a.m.
18) The applicant shall maintain good housekeeping.
19) The applicant shall bring minimum 33% of the available open land under green coverage/ plantation. The applicant shall submit a yearly statement by 30th September every year on available open plot area, number of trees surviving as on 31st March of the year and number of trees planted by September end.
20) The non-hazardous solid waste arising in the factory premises, sweepings, etc. be disposed of scientifically so as not to cause any nuisance / pollution. The applicant shall take necessary permissions from civic authorities for disposal of solid waste.
21) The applicant shall not change or alter the quantity, quality, the rate of discharge, temperature or the mode of the effluent/emissions or hazardous wastes or control equipments provided for without previous written permission of the Board. The industry will not carry out any activity, for which this consent has not been granted/without prior consent of the Board.
22) The industry shall ensure that fugitive emissions from the activity are controlled so as to maintain clean and safe environment in and around the factory premises.
23) The industry shall submit quarterly statement in respect of industries obligation towards consent and pollution control compliance's duly supported with documentary evidences (format can downloaded from MPCB official site).
24) The industry shall submit official e-mail address and any change will be duly informed to the MPCB.
25) The industry shall achieve the National Ambient Air Quality standards prescribed vide Government of India, Notification dt. 16.11.2009 as amended.
26) The Board reserves its rights to review plans, specifications or other data relating to plant setup for the treatment of waterworks for the purification thereof & the system for the disposal of sewage or trade effluent or in connection with the grant of any consent conditions. The Applicant shall obtain prior consent of the Board to take steps to establish the unit or establish any treatment and disposal system or an extension or addition thereto.
27) The industry shall ensure replacement of pollution control system or its parts after expiry of its expected life as defined by manufacturer so as to ensure the compliance of standards and safety of the operation thereof.

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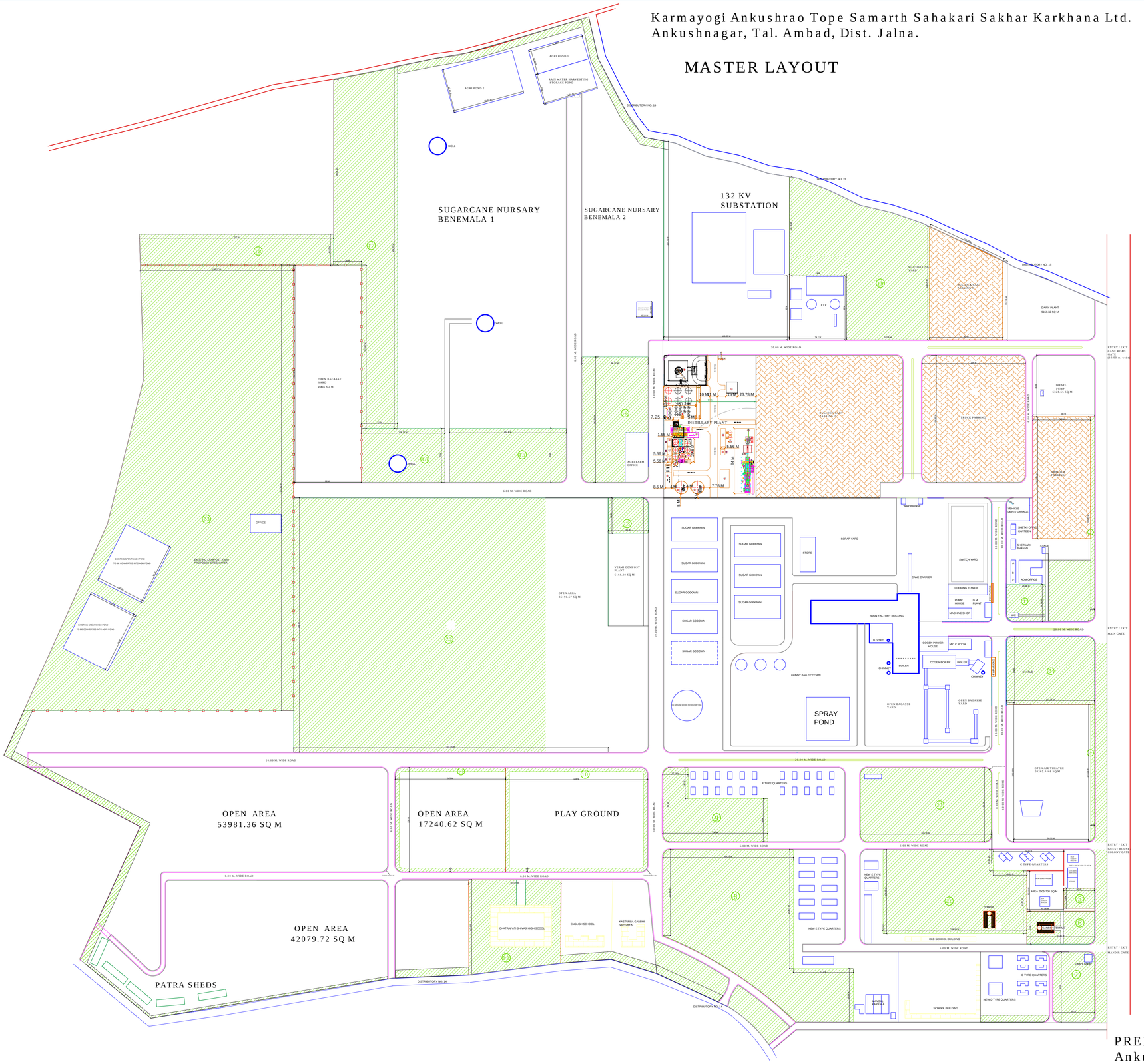
Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd.
Ankushnagar, Tal. Ambad, Dist. Jalna.

MASTER LAYOUT



Area Calculation		
Sr. No.	Particulars	Area m2
1	Total Plot Area	1450000.00
2	Deduct Lease to M.S.E.B.	37800.00
3	Net plot Area	1412200.00
4	Sugar And Co-gen unit	140375.79
5	Distillary	22204.80
6	Parking	76475.49
7	Roads	120772.65
8	Open Area	236426.57
9	Green Belt	492965.45
10	ETP	6158.00
11	Baggas Storage Yard	24816.00
12	Vermicompost	6166.30
13	Nuersary	129022.65
14	Dairy Plant	9158.32
15	RainWater Storage Area	2877.60
16	Agri Pond 1	2365.38
17	Agri Pond 2	5398.73
18	Proposed water ponds	10530.00
19	Diesel Pump	6328.55
20	Office Area	6301.71
21	Agri farm office	1908.10
22	Guest House	4484.20
23	Colonies E,D,C,,F	35334.47
24	School	28212.58
25	Playground 1	21743.13
26	Mangal karyalay	1908.10
27	Open air theater	20265.44
	TOTAL	1412200.0

Distillery Unit				
Sr. No.	Building name	Dimension	Existing area in sq.m	Proposed area in sq.m
1	SDS day feed tank for ethanol plant	10.50 m x 7.25 m	76	0
2	C-Grade Bulk molasses tank	16 ϕ	0	201
3	B-Grade Bulk molasses tank	16 ϕ	0	201
4	Security cabin	3.0 m x 3.0m	0	9
5	Admin office and excise office	15.0m x 14.6 m	219	0
6	DG & TG room	24.0m x 12.0 m	0	288
7	Boiler	84.0 m x 24.0 m	0	2016
8	Under ground water tank with WTP	30.mx 8.50 m	0	255
9	Cooling tower for Eaporator	6.90m x 5.60 m	0	39
10	Cooling tower for Dehydration	6.90m x 5.60 m	0	39
11	Cooling Tower for Distillation	10.15m x 5.60m	57	0
12	Cooling Tower for fermentation	10.15 m x 5.60 m	0	57
13	MCC + PLC + Laboratory room	15.0m x 6.60 m	0	99
14	Bulk storage section for FA	54.50m x 38.80 m	2115	0
15	Bulk storage section for R-S/ ENA /S/TA	47.50 m x 25.90 m	914	316
16	Receiver section for for RS/FA/ENA/IS/TA	35.30 m x 15.0 m	530	0
17	Independent Evaporator with tanks	23.60 m x 15.0 m	0	354
18	Dehydration section	7.0 m x 7.0 m	49	0
19	Distillation section	24.0 m x 13.60 m	196	130
20	Fermentation section	29.80 m x 24.20 m	246	476
21	Day molasses tank	ϕ ϕ	0	28
	Total [A]		4401	4507
	Open scape [B]			13296
	Total Area [A+ B]			22204.80

Green Belt Area		
Sr. No.	Particulars	Area in sq.m
1	Green Belt area 1	6735
2	Green Belt area 2	1306
3	Green Belt area 3	9998
4	Green Belt area 4	872
5	Green Belt area 5	1040
6	Green Belt area 6	3756
7	Green Belt area 7	4833
8	Green Belt area 8	32213
9	Green Belt area 9	8878
10	Green Belt area 10	3059
11	Green Belt area 11	2024
12	Green Belt area 12	9464
13	Green Belt area 13	2357
14	Green Belt area 14	12074
15	Green Belt area 15	10554
16	Green Belt area 16	7587
17	Green Belt area 17	30593
18	Green Belt area 18	10058
19	Green Belt area 19	26299
20	Green Belt area 20	19189
21	Green Belt area 21	16102
22	Green Belt area 22	107859
23	Proposed Green Belt area 23	141461.10
24	Proposed Green Belt areas 24	24654.81
	TOTAL	492965

Parking Area		
Sr. No.	Particulars	Area in sq.m
1	Truck	22064
2	Tractor Parking	7878
3	Bullock cart Parking 1	11809
4	Bullock cart Parking 2	34548
5	Two wheeler	51
6	Four wheeler	125
	Total	76475

SCALE 1:100

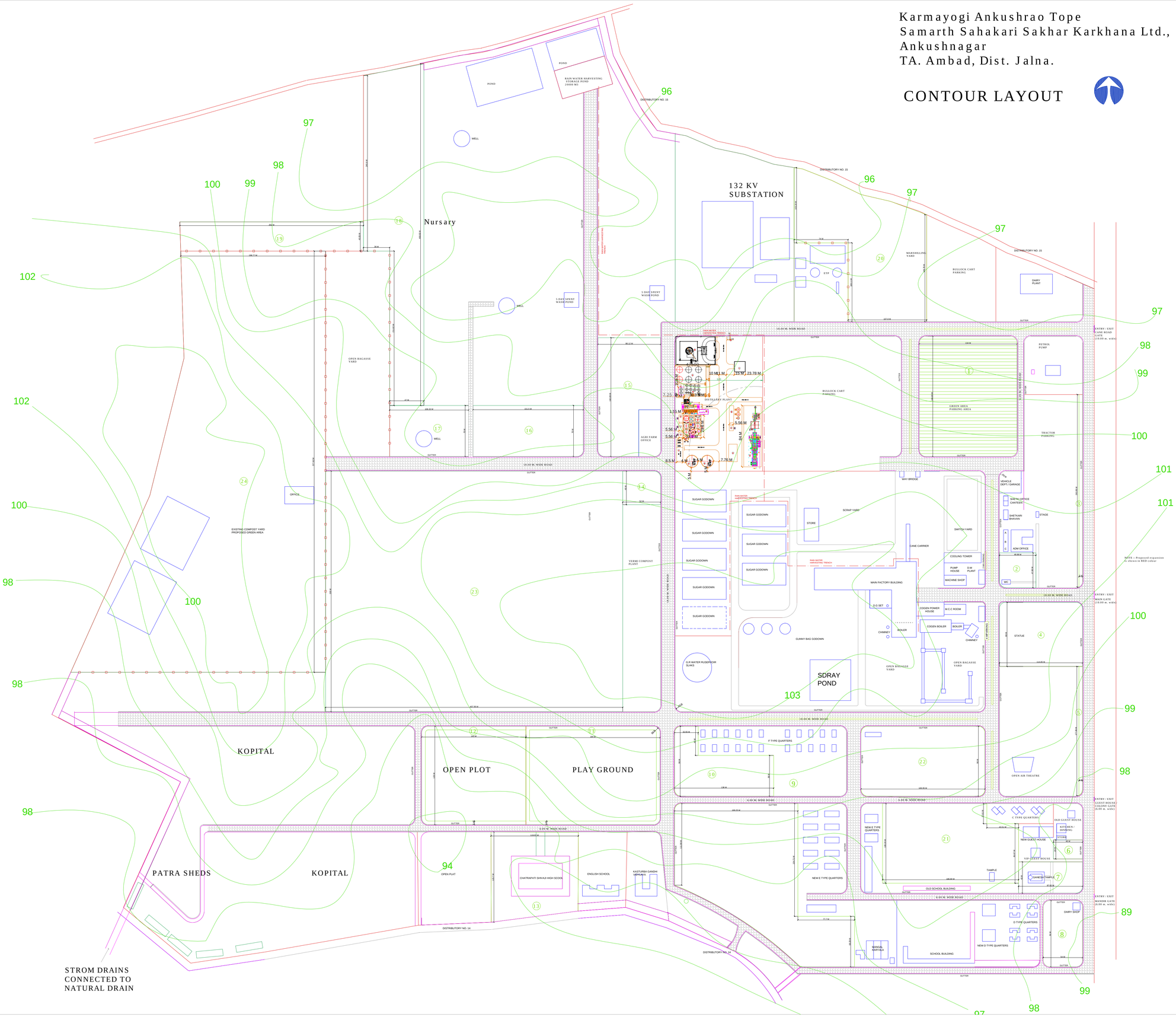
LEGENDS

	PLOT BOUNDRY
	ROAD
	PARKING
	STORM WATER DRAIN
	OPEN AREA
	GREEN BELT
	SCHOOL BUILDING
	TEMPLE
	CANAL WATER DISTRIBUTORY
	EXISTING BUILDINGS

PREPARED BY: Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd.
Ankushnagar, Tal. Ambad, Dist. Jalna.

Karmayogi Ankushrao Tope
Samarth Sahakari Sakhar Karkhana Ltd.,
Ankushnagar
TA. Ambad, Dist. Jalna.

CONTOUR LAYOUT



Stormwater Calculations		
Particulars	**Details**	
Paved area (m2)	A	492965.45
Run off coefficient	b	0.80
Unpaved area (m2)	c	433674.71
Run off coefficient	d	0.25
Effective catchment (m2)	e = (a*b)+(c*d)	502791.04
Total annual rainfall (in m)	f	0.00
Max. rainfall intensity (in m)	g	0.00
Max. hourly rainfall recorded (m)	h	0.00
Annual Strom water potential (in m3/Y)	e*f	0.00
Maximum daily StromWater potential (in m3/D)	e*g	0.00
Maximum hourly StromWater potential (in m3/hr.)	e*h	0.00
Max storm water load on the site with per hour retention [Qg2] (in m3/hr.)		**0.00**
Rainwater Harvesting Calculations		
Roof top area (m2)	a	10492.00
Run off coefficient	b	0.90
Annual Rainfall Intensity m	c	1.41
Annual Rain water Harvesting Potential m3/Y	d= a*b*c	13331.35
Daily Rain water Harvesting Potential m3/ day	e= d/46	289.81
Rain Water Harvesting Tank Capacity m3	f	20000.00

LEGENDS

	PLOT BOUNDRY
	ROAD
	PARKING
	STORM WATER DRAIN
	RAIN WATER HARVESTING TRENCH
	RAIN WATER HARVESTING POND
	EXISTING BUILDINGS

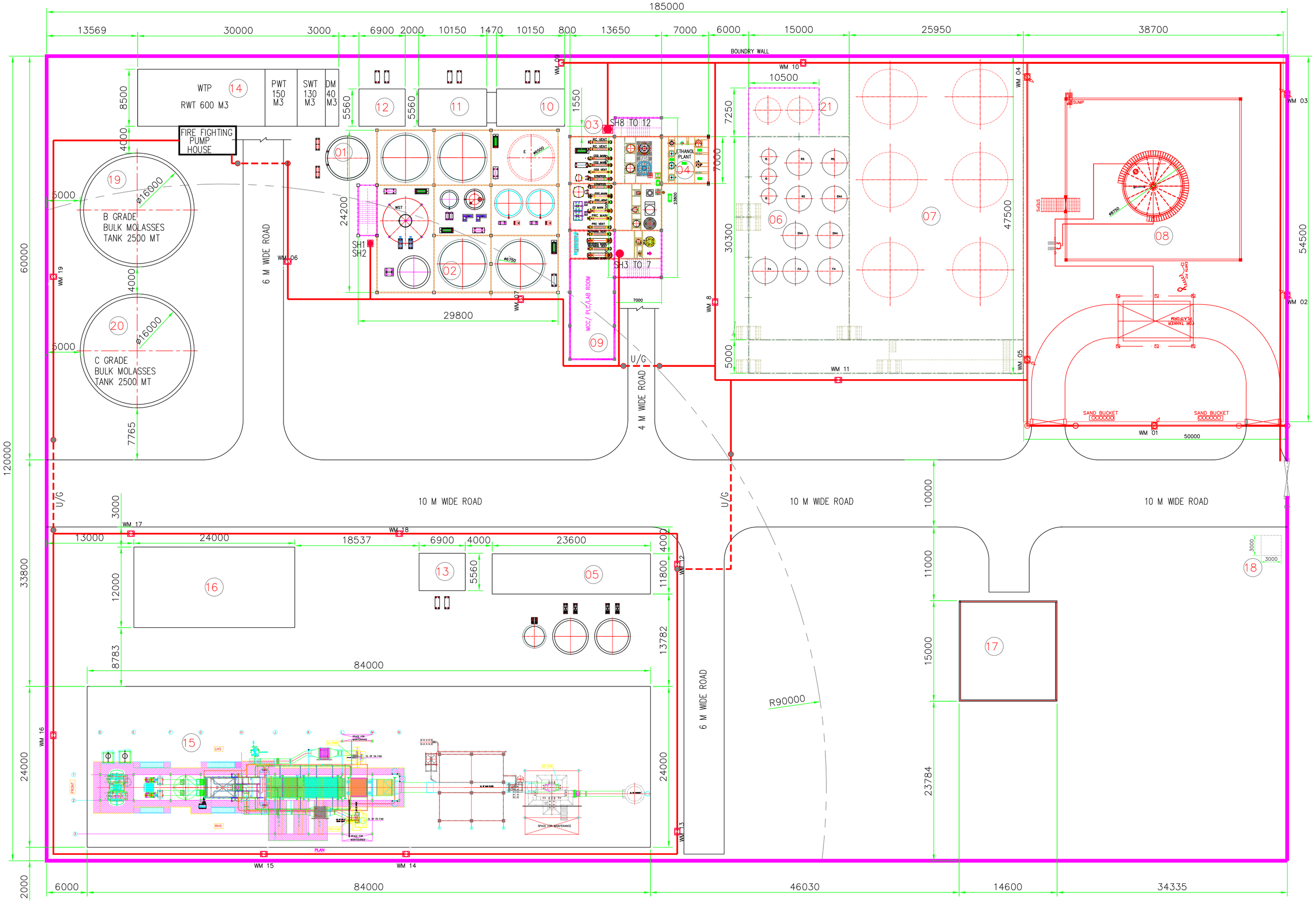
REV.	MODIFICATION	MADE	APPD.	DATE

NOTES :–

1) ALL DIMENSIONS ARE IN METER.
2) LEGENDS :–
   - : TREES
   - : SITE BOUNDARY
   - : GARDEN
   - U/G : UNDERGROUND
3) ALL BUILDING DIMENSSIONS & CENTER DISTANCES ARE TENTATIVE & MAY BE REVISED DURING DETAIL ENGINEERING.

W S N E
NORTH ORIENTATION

SH	P 01 TO 12	SINGLE HYDRANT (LANDING) VALVE	12
WM	WM 01 TO 19	WATER MONITOR	19



I.NO.	QTY.	DESCRIPTION	SIZE (mtr.)
21	01	SDS DAY FEED TANKS FOR ETHANOL PLANT	10.5x 7.25
20	01	C GRADE BULK MOLASSESE TANK	ø16.0
19	01	B GRADE BULK MOLASSESE TANK	ø16.0
18	01	SECURITY CABIN	3.0 x 3.0
17	01	ADMIN OFFICE & EXCISE OFFICE	15.0 x 14.6
16	01	DG & TG ROOM	24.0 x 12.0
15	01	BOILER	84.0 x 24.0
14	01	UNDER GROUNG WATER TANK WITH WTP	30.0 x 8.5
13	01	COOLING TOWER FOR EVAPORATOR	6.9 x 5.6
12	01	COOLING TOWER FOR DEHYDRATION	6.9 x 5.6
11	01	COOLING TOWER FOR DISTILLATION	10.15 x 5.6
10	01	COOLING TOWER FOR FERMENTATION	10.15 x 5.6
09	01	MCC+PLC+LABORATORY ROOM	15.0 x 6.6
08	01	BULK STORAGE SECTION FOR FA	54.5 x 38.8
07	01	BULK STORAGE SECTION FOR RS/ENA/IS/TA	47.5 x 25.9
06	01	RECEIVER SECTION FOR RS/ENA/FA/IS/TA	35.3 x 15.0
05	01	INDEPEDENT EVAPORATOR WITH TANKS	23.6 x 15.0
04	01	DEHYDRATION SECTION	7.0 x 7.0
03	01	DISTILLATION SECTION	24.0 x 13.6
02	01	FERMENTATION SECTION	29.8 x 24.2
01	01	DAY MOLASSES TANK	ø6.0

KARMAYOGI ANKUSHRAO TOPE SAMARTH S.S.K. LTD.

PLANT :– MODERNIZATION & EXPANSION 60 KLPD MOLASSES BASED DISTILLERY PLANT
LOCATION :– POST–ANKUSHNAGAR, TAH–AMBAD, DIST–JALANA, PIN 431212

TITLE
MODERNIZATION & EXPANSION OF 60 KLPD MOLASSESE BASED DISTILLERY PLANT

DRAWN		TAG NO.	SCALE		REV	SIZE
CHECKED		SYS	NTS		R0	A1
APPROVED		DATE 23.04.2019				

Grampanchayat Mahakala
Tq.Ambad, Dist: Jalna
Date: 19/04/2019

-: NO OBJECTION CERTIFICATE :-

This is to certify that M/s. **KARMAYOGI ANUSHRAO TOPE SAMARTH SAHAKARI SAKHAR KARKHANA LTD., ANKUSHNAGAR,** Tq.Ambad, Dist Jalna (M.S.) is setting up new 60 KLPD Distillery plant at Gat No 106 in their existing Sugar factory premises at Mahakala Village Gram Panchyat.

We have no objection for new 60 KLPD Distillery plant .

Gram Vikas Adhikari
ग्रामपंचायत कार्यालय महाकाळा
ता.अंबड जि.जालना

Sarpanch
ग्रामपंचायत कार्यालय महाकाळा
ता.अंबड जि.जालना

महाराष्ट्र शासन

गाव नमुना सात

अधिकार अभिलेख पत्रक

(महाराष्ट्र जमीन महसुल अधिकार अभिलेख आणि नोंदवह्या (तयार करणे व सुस्थितीत ठेवणे) नियम १९७१ यातील नियम ३,५,६ आणि ७)

गाव :- महाकाळा तालुका :- अंबड जिल्हा :- जालना

गट क्रमांक व उपविभाग १०६ भुधारणा पद्धती भोगवटादार वर्ग -१

शेतीचे स्थानीक नाव		भोगवटदाराचे नाव	क्षेत्र	आकार	पो.ख.	फेरफार क्र.	खाते क्रमांक
क्षेत्र एकक	हे.आर.चौ.मी	उत्तम रामा पटेकर	०.३७.००	०.५७		(२४२)	२३८४, २५५०
जिरायत	१५.९६.००						कुळाचे नाव
बागायत	-	कर्मयोगी अंकुशराव टोपे				(३२२५)	इतर अधिकार
तरी	-	समर्थ सहकारी साखर कारखाना लि.अंकुशनगर	१५.५९.००	२३.८३		(३२२५)	बोजा - राष्ट्रीयकृत बँक गहाण
वरकस	-						५५६१,७६ लाख स. स. साखर कारखाना कडे (
इ	-						२५८१)
---	---						द महाराष्ट्र स्टेट को. बँ. शा. मुंबई (२५८१)
एकुण क्षेत्र	१५.९६.००						बोजा - राष्ट्रीयकृत बँक गहाण
---	---						२६१६,६० लाख कर्ज स. स. साखर कारखाना कडे
पोटखराब (लागवडीस अयोग्य)							(२५८३)
वर्ग (अ)	-						भारत सरकार एच. डी. एफ. बँक (२५८३)
वर्ग (ब)	-						सह विज निर्मीती प्रकल्पासाठी (२५८३)
एकुण पो ख	०.००.००						बोजा - राष्ट्रीयकृत बँक गहाण
---	---						दि. एम.एस.सी.बँक लि. मुंबई (२७८२)
आकारणी	२४.४०						यांचे म. मु. कर्ज रु. १३५.२५ लाख कर्ज (२७८२)
---	---						समर्थ स. सा. कारखाना लि. अंकुशनगर कडे (
जुडी किवा विशेष आकारणी	-						२७८२)
							बोजा
							१४५१ लाख रुपये समर्थ सह सा कारखाना (२९९७
							)
							महाराष्ट्र को ऑप बँक लि मुंबई (२९९७)
							बोजा
							१२६४,५६ लाख समर्थ सह कारखाना (३१९५)
							दि महाराष्ट्र स्टेट कोऑप बँक लि.मुंबई ३१९५)
		(२४२),(४०३),(४०८),(१४२१),(३१३६),(३२२५)					सीमा आणि भुमापन चिन्हे

या ७/१२ वर शेवटचा फेरफार क्रमांक ३२२५ व दिनांक ०१/०७/२०१७ रोजी चा असे व दिनांक ०१/०५/२०१८ ७:०२:२५ PM रोजी वैध असे.

या ७/१२ वरील माहिती व डिजिटल स्वाक्षरीची वैधता पडताळणी क्र. **1805100000020772** वापरून aapleabhilekh.mahabhumi.gov.in वरून तपासता येईल.

Signature Not Verified
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Date: 2018.05.01 19:25:32 +05:30

गाव नमुना बारा

पिकांची नोंदवही

(महाराष्ट्र जमीन महसूल अधिकार अभिलेख आणि नोंदवह्या (तयार करणे व सुस्थितीत ठेवणे) नियम १९७१ यातील नियम २९)

गाव :- महाकाळा तालुका :- अंबड जिल्हा :- जालना

गट क्रमांक व उपविभाग १०६

		पिकाखालील क्षेत्राचा तपशील									लागवडीसाठी उपलब्ध नसलेली जमीन		जल सिंचनाचे साधन	शेरा
		मिश्र पिकाखालील क्षेत्र			घटक पिके व प्रत्येकाखालील क्षेत्र			निर्भेळ पिकाखालील क्षेत्र						
वर्ष	हंगाम	मिश्रणाचा संकेत क्र.	जल सिंचित	अजल सिंचित	पिकांचे नाव	जल सिंचित	अजल सिंचित	पिकांचे नाव	जल सिंचित	अजल सिंचित	स्वरूप	क्षेत्र		
(१)	(२)	(३)	(४)	(५)	(६)	(७)	(८)	(९)	(१०)	(११)	(१२)	(१३)	(१४)	(१५)
			हे.आर.चौ.मी	हे.आर.चौ.मी		हे.आर.चौ.मी	हे.आर.चौ.मी		हे.आर.चौ.मी	हे.आर.चौ.मी		हे.आर.चौ.मी		
२०१५-१६	खरीप							बाजरी		०.३७००				
	संपूर्ण वर्ष										पडीत	१५.००००		
२०१६-१७	रब्बी							ज्वारी		०.३७००				
	खरीप							बाजरी		०.३७००				
	संपूर्ण वर्ष										पडीत	१५.००००		
२०१७-१८	रब्बी							ज्वारी		०.३७००				
	खरीप							बाजरी		०.३७००				

या ७/१२ वर शेवटचा फेरफार क्रमांक ३२२५ व दिनांक ०१/०७/२०१७ रोजी चा असे व दिनांक ०१/०५/२०१८ ७:०२:२५ PM रोजी वैध असे.

या ७/१२ वरील माहिती व डिजिटल स्वाक्षरीची वैधता पडताळणी क्र. **1805100000020772** वापरून aapleabhilekh.mahabhumi.gov.in वरून तपासता येईल.

Signature Not Verified
Digitally signed by NATKAR SUVARNA VISHWAMBHAR
Date: 2018.05.01 19:25:32 +05:30

कर्मयोगी अंकुशराव टोपे समर्थ सहकारी साखर कारखाना लि., अंकुशनगर

पो. अंकुशनगर – ४३१ २१२, ता. अंबड, जि. जालना (महाराष्ट्र)

KARMAYOGI ANKUSHRAO TOPE SAMARTH SAHAKARI SAKHAR KARKHANA LTD., ANKUSHNAGAR

Post. Ankushnagar - 431212, Tq. Ambad, Dist. Jalna (Maharashtra)

● GSTIN -27AADAS8482L1ZS ● PAN No. AADAS8482L ● TAN No. NSKS06848C

● Regd. No. JAL/PRG/(A)-1, Date : 10/02/1982 ● Phone & Fax No. (02483) 279623, 279624, 279629

● Mob : 9623457070 ● G-mail : samarthsugar@gmail.com ● Website : www.samarthsugar.com

Ref. No.

Date:

ENVIRONMENT, HEALTH &SAFETY (EHS)POLICY

The Company considers Environment, Health and Safety as oneits prime objectives. It is committed to continually improve Environment and OH&S Management to prevent pollution, injuries and ill health. The Management is of the firm opinion that all incidences like near miss, minor and major injuries, fire occurrences and release/spillages of chemicals are preventable.

All the manufacturing plants and supporting services shall adopt techniques for manufacturing, handling, storing and disposing of all substances safely and without creating unacceptable risk to equipment, human life or the environment. All activities relating to construction and maintenance including contract services shall also ensure safe practices.

The Company shall continue to follow all applicable legal and other requirements related to occupational Environment, Health and Safety to which the organization subscribes. It shall adopt its own Environment, Health and Safety standards where such laws or regulations may not be available to prevent accidents.

The Company shall continue to impart training in Environment, Occupational Health and Safety to all its employees both in-house and in outside specialized institutes.

The Company shall continue to give due consideration to integrate Environment, Health and Safety in all decisions including those dealing with purchase of Plant, Equipment, Machinery and Material as well as selection and placement of personnel.

Yours Faithfully

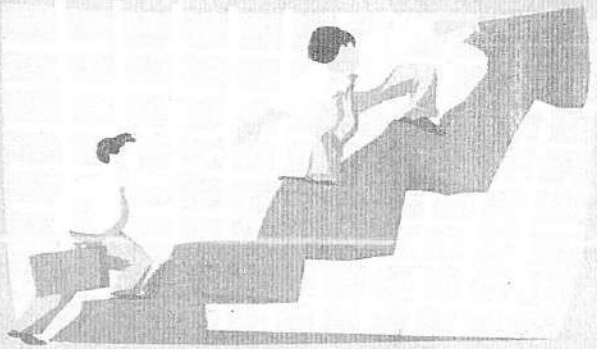
(D.S.Patil)

Managing Director

II	Add GST @18%
	Total cost of Civil & Buildings (I+II)

10.2.2 Details of Plant and Machinery:

Sr. No.	Particulars
1	Modernization of 30 KLPD to 60 KLPD Distillery Plant & Machinery for RS with new one day molasses storage tank, new 3 fermenters, Multipressure distillation along with receiver and storage & modernization of 30 to 60 KLPD dehydration system
3	Integrated plus standalone raw spent wash evaporation (600 M3/day feed)
4	Condensate Polishing unit (600M3/day)
5	Boiler, 22MT/hr, 45 kg/ cm2 (g) with accessories, ESP,dump condenser
6	TG set (2 MW) with accessories, 11KVA
7	EOT crane
8	Coal handling system
9	Ash handling system
10	Auotmation software
12	Distributed Control System (DCS)
13	Cooling tower for TG set
14	Dump condenser
15	Air Compressor
16	IBR Piping
17	Electrical package- Transformers - 2 PCC Cables DG set (500 KVA), 415 Volt
I	**Basic cost Plant and Machinery**
	Add: GST @28%



SAFETY AUDIT REPORT

OF

KARMAYOGI ANKUSHRAO TOPE SAMARTH SAHAKARI SAKHAR KARKHANA LTD. UNIT No-1.

JALNA.

By

GIRISH PAWAR & ASSOCIATE

AURANGABAD

OFF: 61 Bansilal Nagar, Aurangabad- 431005.
Mobile:98926 89989 E-mail: girish_pawar2002@yahoo.co.in

PREFACE

An audit is a technique designed to ensure that, the standards achieved at the place of work and other places affected by work, confirm closely to the objectives specified by the factory management. The objectives are to control the risk of injury, health, damage to property, plant, equipment and their environment. It also provides the information to the management to justify for continuation of the same strategy or need of change of course.

Today's workplace environment is radically different to that of just ten years ago. Changing circumstances across the globe have thrown up unique sets of challenges and new areas of risk, as well as innovative solutions. The primary responsibility of every organization remains the same: to provide an environment that minimizes risks and protects its workers.

Safety Auditing falls under two categories:

1) Internal Audit

2) External Audit

The enclosed safety Audit Report of Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd., Unit No.1 Ankushnagar is based on the safety audit carried out by us, i.e. Girish Pawar and Associate in the month of April 2019. This report has been prepared after inspection of the plant., study of related records, reports, references and technical information presented by the management and subsequent discussions with the technical staff engaged in operation & maintenance of the plant. The officials of the plant gave wholehearted co-operation during field study completion of the report.

We thank the management of Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd., Unit No.1 Ankushnagar. for giving the opportunity to carry out this assignment of safety Audit.

We also sincerely thank Safety Dept. for their cooperation during the audit process.

Aurangabad .

Girish Pawar & Associate

Index

The Assignment

LEGAL REQUIREMENTS:

The General duties of the ''Occupier'' specified in section 7-A of the Factories Act.-1948 & Rule 73-L of Maharashtra Factories Rules -1963, MSIHC Rules.1989 & MF(CIMAH) Rules, 2003. give different obligations to the occupier. These will be fulfilled to great extent if the observations / comments made in the present audit report are heeded to and the recommendations are implemented.

Safety Audit is one of the powerful techniques of identify the hazards and evaluate the effectiveness of the various Safety systems.

DESIRE FOR IMPROVEMENT –

During the course of the study ,discussions were held with various officials of the company at different levels from these dialogues it was quite apparent that apart from the legal obligations, the management of Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd., Unit No.1 Ankush Nagar was really seem to be keen to improving the safety culture of the factory. It was, therefore, thought of very prudent that if an independent assessment of the status of safety is carried out, it could help the management to identify the areas responsible for the accidents that may take place in the factory. The future safety programmers could then be designed so as to take corrective actions for ''Vulnerable conditions.''

OUTCOME-

The present Safety Audit Report is an off-shoot of the above considerations.

AIMS OF THE SAFETY AUDIT-

The following aims were set for the audit Team-

1) To examine and evaluate the accident prevention measures.

2) To analyze the safety procedures. systems and practices.

3) To observe the working conditions and operating methods. including storage handling of raw materials and finished products.

4) To pinpoint occupational health hazards.

5) To check the adequacy of fire fighting arrangements.

6) To comment upon various statutory compliances.

METHODOLOGY-

In order to fulfill the above aims ,the following methodology was adopted

1) Critical scrutiny of all the documents, records pertaining to safety, Health and Environment made available by the company.

2) Detailed observation rounds of the plant ,including manufacturing areas, storage areas and utility blocks. During these rounds, unsafe conditions in the acts requiring immediate corrective measures were indicated to the officials and supervisors.

3) In- depth discussion with the managers ,supervisors ,safety stewards and team Members of the factory on the matters pertaining to the audit.

SCOPE OF THE SAFETY AUDIT:-

The following would be the. board areas of inspections, examinations and verification of documents decided by the auditors for conducting the audit for aforesaid company.

1) Process Safety Systems.

2) Fire prevention and protection system.

3) Safety in storage and transportation of Hazardous Materials .

4) Chemical Hazards and their control –covering ventilation and exhaust system, work environment monitoring ,personal protective equipment, etc.

5) Pollution and Environment Management systems.

6) Waste Disposal System.

7) Review of procedure –Operating, Maintenance, start up and shut down, permit to work etc

8) General Hazards and their control system. Viz. Covering of machine guarding Material handling system and equipments, working surfaces and drainage System ,means of access, electrical hazards ,housekeeping etc.

9) Roll of safety Management.

10) Emergency Preparedness.

ELEMENTS OF SAFETY AUDIT

MANAGEMENT ASPECTS	TECHNICAL ASPECTS
1. Safety, Health and Environmental (S.H.E.) Policy of company	1.Building & Structure
2.Safety And Health Organizational setup	2.Operating safety and procedure
3.Education and Training	3.Process in built Safety
4.Communication.Motivation and promotion in safety	4.Handling and storage of Hazardous Chemicals
5.Safety Inspection	5.Material Handling Equipment and procedures
6.Accident Reporting ,Investigation and Implementation of recommendations	6. Fire and explosion Hazards
7. Maintenance of accident statistics and Utilization	7.Inspection and testing of pressure vessels
8. Safety Audits	8. Piping and valves
9.Compliance with statutory requirements	9.Pumps & and compressors
10.Personal protective equipment	10.Preventive Maintenance
11.Pressure /Plant Modification procedure	11.Electrical Hazards
12.Safe operating procedures	12.Instrumentation
13.Work Permit System	13 House Keeping
14.Fire Fighting System	14.Hand Tools
15Health & Safety Improvements Plans Targets	15.Diesel Storage Yard
16.Prevention occupational diseases	16.Use and Issue of PPE
17.Work Environment System	17.Emergency preparedness
18.First Aid Facilities	18 .E.T.P.
19.Medical Examination	19. Environment Monitoring
20.Material Safety Data Sheet	20.Hazardous Waste Disposal
21.Emergency Preparedness Plans	21. Ventilation
22. Hazardous waste treatment and disposal	22.Noise
23.Transportation of Hazardous Materials	23.Illumination

24.Hazard Identification	
25.Contractor Safety System	
26.New Equipment: Review Inspection	
Note:- This table is only Indicative and not exhaustive.	

PERSONS INVOLVED IN THE AUDIT:

1. Nitin Bhawar, HR.

PLANT SECTION UNDER SAFETY AUDIT:

1.**Production** Milling Plant, Weigh Bridge, Split Cane carrier, Cane unloader, Feeder table, Preparation of Cane, Mills, Bagasse Elevator, Drive for Crushers & Mills, Imbibition, Measurement of equipments of raw juice, Juice Heaters, Juice Sulphuring Tank, Furnace, Evaporation & Boiling Plant, Syrup Treatment Plant. & Co.gen. 18 MW. Turbine 3.0 MW & 1.5.MW

2.Quality: Lab

3.Transformer Yard :3.2 KVA 2 Nos.
3.0 KVA 1 No.
2.5 KVA 2 Nos.
27.0 KVA 1 No.

4. Stores

5.Utility Block : Boiler Cap. 20 TPH 2 Nos.
Cap. 32 TPH 1 No.
Cap. 95 TPH 1 No.

6.Security : System ,Fire , Alarm, Fire fighting ,Water Reservoir

7.Chemical Storage Yard.: Sulphur Godown

8.Maintance : Workshop

CHECKLIST:

During audit, a checklist questionnaire as per IS 14489-1998 was given to the Management. This checklist forms a vital tool of successful inspection & in this sense it is as valuable as audit itself.

REPORT:

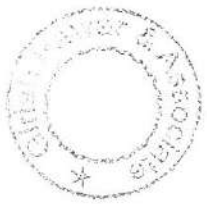
The report is as follows-

We have recommended many useful and practical suggestions, which if implemented, will help in improving the safety scenario of the factory and in achieving the ultimate goals set above.

The Audit Report has generally been prepared on the Guidelines given in Indian Standard 14489-1998 (Code of practice on occupational Safety and Health Audit). The main elements audited have been taken from Annexure 'A'' of the code and the Provisions/requirements of various sections of the FA.

The safety audit report generally reports its findings separately for each Department, but in relation to the safety systems and subject areas are listed in the scope of work.

The report is presented in the form of brief description of process, possible potential hazards and consequences, observations and findings, suggestions and recommendations, rating etc.



CHAPTER-1

*Location:-

The factory is located at 54 KM. From Jalna City in the Jalna District

PRODUCTS: Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd..

Unit No.1 Ankushnagar engaged in Manufacturing of Sugar and by-products.

*RAW MATERIALS

The raw materials used for manufacturing the products are:

Sulphur, Sugar Cane, Bagasse

*MANUFACTURING PROCESS :

The various process and process flow charts of various operations are given at Annexure-A

*OCCUPIER & FACTORY MANAGER:

Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd. Unit No.1 Ankushnagar. is a co-operative Sugar mill. Shri. Dilip S. Patil is the Managing Director who is the occupier of the company.

CHAPTER-2

EXECUTIVE SUMMARY:

01.Safety and health policy of company is in place and is well communicated to all employees. The implementation to the strategy emphasized in the policy needs to be explained clearly to all employees and to be monitored at all levels.

02.The Safety & Health policy of the company covers all aspects of safety required during Operation & Maintenance of the plant except commitment towards statutory compliances & awareness to the employees and surrounding inhabitants.

03. Workers exposed to hazards during handling and processing of various products are provided with protective clothing and safety appliances and their knowledge about hazards and consequences is improved by imparting training and re-training.

04.Probabilities of failure & Unsafe conditions of the plant are all taken care of by maintaining the machines and equipments in efficient running condition and moderately good housekeeping. Hence, there is a scope to improve.

05.Examination & testing of pressure vessels and Lifting Machines, tools & Tackles are conducted regularly by the competent person as per statutory provision. However, it is to be ensured that the tests are done by external agencies regular basis

06.Electrical Installations are as per standard specification & Codes.

07.Plant start-up & Shut down procedure are followed as per plant/ Manufactures' instructions. Concerned employees are made aware of the startup & Shut down procedures.

08.Routine & running maintenance of the plant are carried out as per schedule & Safety Regulations provided in general safety rules of the company.

09.Portable fire extinguishers have been provided in different locations of the plant.

10.On-Site Emergency plan shall be prepared. Actions of various persons need to be explained and mock drill to be conducted.

11.Waste discharge from plant is managed well. Waste discharge includes process Waste, which are fed into ETP treatment plant for proper treatment as per pollution Control Board standards.

12. All machines and equipment are guarded and maintained in efficient running condition. The preventive maintenance is regularly carried out for critical machines.

13.Safety committee shall be constituted consisting of members from management and employee's representatives. The meeting is held regularly, and members take interest in implementation the statutory rules and regulations regarding safety of personnel and safe working condition of plant.

Recently focus has been given to:-

a. Display of safety posters & slogans
b. Display of Hazard Communication sheets of hazardous chemicals
c. Training of employees in safety awareness, fire Emergency mock drill and First Aid Treatment.
d. The proceedings of the meeting of the safety committee being maintained and kept available for inspection
e. The Annual Test and Examination of Lifting Machines and pressure pipelines used in the plant by the contractor workers should also be examined, tested and certified by the Competent person.
f. Earth pit resistance of all earthing system is tested annually; however, the condition of pits is to be improved and external earthing to all electrical equipment is to be provided. The Minimum spacing between two electrodes should not be less than twice the length of the electrodes. Inter-connection of GI – Strips in the earth grid should be done by welding instead of bolting and welding portion should be Painted with Zinc rich paint or block bitumen paint to avoid rusting. Down conductors of lightening arrestor should have separate Earthing pit.

   All Earth pits should be serially numbered and record of earth resistance of each Electrode /earth pit should be maintained

14. Safety performance of plant in general is in good condition. Accident rates are low.

The Accidents can be controlled by adopting following methods:

a. Creating safety awareness by means of training and re-training
b. Adopting accident prevention Methods such as job safety Analysis, Machine safety analysis, process safety analysis, etc.
c. Risk assessment is required to be carried out by an external agency periodically .
d. Hazard identification is to be carried out for all departments periodically.
e. Safety inspection is also required to be done periodically by external experts.
f. The safety department should play more proactive role in improving safety scenario of the factory by involving themselves more in the departmental safety activities and giving solution to the safety related issues on daily basis .
g. First Aid Boxes are there in the factory.

CHAPTER-3

3.00 HAZARDOUS AREA IDENTIFICATION

IDENTIFICATION OF HAZARDS:

Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana Ltd.. Unit No.I

Ankushnagar is engaged in production of Sugar & its byproducts. Sulphitation is one of the process which is the one of the potential sources of hazards. Plants have been designed and constructed with outmost care as per international codes applicable in specific cases incorporating all possible safety measures. In spite of all inbuilt safety system, precautionary measures are taken and practiced. There are chances of unusual occurrence likely to take place due to instrument failure or failure of operators.

Despite the efforts to keep the plant operating condition within safe limits, there are chances of leakages /release of flammable gases and liquid which may affect the normal working condition of the plant and the plant personnel.

CHAPTER-4

4.00 REVIEW OF SAFETY SYSTEMS & PROCEDURES

4.1 REVIEW OF GENERAL SAFETY SYSTEMS:

Adequately qualified and experienced persons have been appointed to co-ordinate health and safety measures and implement the emergency procedures. The safety department is manned with full time executives and staff who are coming in general shift as well as in 3 shifts.

1. Safety inspection & sampling is carried out by plant heads, Senior Engineer & member of safety Committee. Specific safety monitoring is to be developed for each department.

2. Damage to structural items, plant machine & equipment is controlled by Systematic Inspection by managerial personal and Maintenance Engineer during daily round of the factory.

3. The occupational safety aspects of the employees are taken care of by the plant managers and the senior engineers. Employees are informed about the preventive measures and safety codes to be followed for different type of jobs. Safety hazards are displayed in different areas.

4.Systems for the formal investigation of accident, ill health, near misses and dangerous occurrences have been established.

5. First Aid Arrangements has been adopted in the Plant. It has been emphasized to implement adequate numbers on the shop floors to fulfill the statutory requirements of section 40B of FA,1948 & MFR 76 & 77.

6. Separate safety services have been included in the department organizational set-up of the company. Plant manager and senior Engineers of respective sections have been assigned the responsibility of plant operation & maintenance & also for implementation of safety and health policy of the company. It is necessary to assign the work of

implementation of safety and health related issues to a middle management level officer in addition to his normal duty for better co-ordination.

7. Hazard reporting system is in operation however. hazard awareness level amongst workers are not up to the mark.

8. Precautionary measures required to be taken by the employees while material Handling has to be drawn up. The implementation is also to be strengthened by giving Regular emphasis on safety.

9. System of joint Consultation with worker's representative and the staff for safety and health issues is in place.

10. Safety committee shall be constituted. Members of safety committee take the responsibility in right perspective and record made available showing periodic inspection of the plant & equipment .it would be in the interest of safety & health of the plant to implement such a system for doing assessment and making recommendations for the improvement of conditions of safety ,health and hygiene. The record notes of meeting of the safety committee are maintained .committee's recommendations are to be seen by the above take force for their implementation.

11.Training courses are organized to educate the workers about the importance and Procedure of safety measures. The level of awareness is increased by imparting training And re-training at a regular interval .This area needs special attention for bringing Improvement and reducing accidents. Help of external experts can be taken for Improving the present condition.

12. A system for controlling damage to structural items, machinery and equipment etc. is in place. It includes periodical surveys and records of rectification in replacements. A Certificate of stability is obtained from the competent authority.

13. The causes of accident, ill health, near misses and dangerous occurrence are Analyzed in terms of failure of established safe system of work.

14. Annual health and safety budget is yet to be brought in practice for the whole plant, however ,for the requirement of safety related activities ,budget allocation is done on case to case basis.

15. Safety system at work has been established and the same is making a significant Contribution in controlling accidents ,fire incidence or dangerous occurrence of serious nature. Head of plant is paying special attention to these issues by setting up a task force on safety and reviewing its recommendations on daily and weekly basis.

16. The system of safety permit to work is in place. All such work where risk is involved are executed under safety permit system particularly for the job at height ,hot work, electrical installation ,storage of hazardous chemical areas .Specimen copy of safety permit is enclosed (Annexure).Same to extended to confined space entry. Lock. out & Tag out system is also recommended for electrical work which is the place now.

17. Capability of employees as regards health and safety are taken into account when entrusting them with tasks

4.2 CONTROL PROCEDURE:

I) Formal inspection of machinery, plant, electrical equipment ,warning system, welfare amenity etc. are under taken. Machine guards and safety devices are examined on regular basis as per schedule.

II)Safe procedure is adopted where the job involves high degree of risk. Safety to work System has been introduced & is operative on all such jobs.

III)Fire and emergency procedures are practiced on a regular basis. The Emergency team

Comprises of members from maintenance, operation and security.

IV) Planned maintenance system is in practice. Special safety Measures are taken during repair & maintenance of plant, machines I equipment & control systems.

V) Housekeeping i.e. material storage ,waste disposal ,removal of spillage is well care of: Stair ways ,exits access & egress points to the work places are maintained and kept clean. The housekeeping of some of the areas are yet to be improved.

VI) Start-up & shut down of plant is carried out safety according to manufacturer's Instructions.

VII) Monitoring of personnel exposed to health risk is done on regular basis.

VIII) Personal protective appliances & clothing are provided to the employees according to their job.

IX) Welfare & Health amenity provisions are adequate & maintained well.

X) Statutory Inspection & Examination of equipment and pressure vessels are carried out by the competent person on regular intervals.

XI) Internal safety audit of plant is conducted by the safety Department periodically. Implementation of the recommendations of the safety observations are done on need based.

Apart from the standard maintenance techniques & practices followed by the unit the various equipment, tools & tackles which have to undergo statutory test & examination by the statutory authority & the competent person as prescribed under the Act & Rules are done as per the provisions of statute.

The equipment classified as follows:

Sr. No.	Type of equipment
1.	Pressure Vessels
a.	Air Receiver
b.	Pressure pipeline's

2.Lifting Machine ,Cranes, Chain Pulley Blocks, Slings and chains

PRESSURE VESSELS:

All pressure vessels working above atmospheric pressure are covered under the purview of factory Act. and Maharashtra Factories Rules. All such equipment are required to be thoroughly examined by the competent person externally once in every six months and internally once every year .In case Internal examination is not possible hydraulic test should be carried out once in every Two/four years. No. equipment can be used unless the above regulations are complied with and the equipment are certified for the use. the air receivers tested and certified every six monthly by the competent person

LIFTING EQUIPMENT & TOOLS

Lifting tools and tackle such as cranes, lifting machines, chain pulley blocks, slings, Chains, winch, etc. are covered under MFR and are required to be examined and tested every year. the equipment which are used by the contractors during repair and maintenance of the plant and machinery; though these are not owned by the management but they should also be examined, tested and certified by the competent person.

4.3 REVIEW OF SAFETY SYSTEM OF OPERATION & MAINTENANCE:

1.Process operation is carried out with great care and precaution. start up and shut down of the plant equipment and machines are carried out strictly in accordance with plant operating instructions. operating staffs are fully aware o the sate operation and shut down procedure .The entire process is smooth and safe.

All sections of the plant undergo regular shut down during which preventive Maintenance of machines and equipments including pollution control system is under taken. statutory inspection of pressure vessels, safety valves, etc. is carried out. Safety codes are strictly followed during preventive and normal maintenance of plant. For the smooth operation of plant, scheduled maintenance adopted are broadly divided in three following heads.

*Plant preventives maintenance.

*Scheduled maintenance at certain interval during operation period.

*Running repair and break down maintenance.

Following steps are to be taken for the smooth and trouble-free operation of the plant.

A regular inspection about behaviors of critical equipment such as air compressor,

Pressure plant, etc.

B Regular inspection of critical equipments.

C Inspection of flanges which are likely to leak.

D Lubrication of moving machines as per directives of suppliers as well as when found necessary. Health of the plant is periodically checked by plant manager and maintenance engineer.

E Internal safety audit is conducted periodically to monitor the health of plant and immediate action is taken to implement recommendations of safety audit report. During start-up and shut-down of plant, recommended procedures are strictly followed to prevent premature ageing of equipment and machinery.

F Interlock system ,safety trips ,and safety valves provided on equipment and pipeline operating under pressure are checked regularly.

2.The plant machines & equipment/s are maintained in good working order & safe condition. The plant maintenance schedule includes preventive & routine maintenance. the defective ,damaged and worn out parts are repaired or replaced during preventive maintenance program. thorough check up of the electrical items is also carried out and defects removed as per schedule.

3.Material handling such as crane ,etc. is maintained in good working condition.

4.Following are the requirement for a good maintenance and overhauling work.—

*Engineering records.

*Effective programming and scheduling.

*Proper constant supervision & inspection.

*Constant watch on proper lubrication.

*Training and development of manpower.

*Standardization.

*Inventory control of stores and spares.

*Cleanliness.

4.3 SAFETY COMMITTEE

The factory shall formed safety committee. safety committee shall arrange meetings weekly or monthly. The action recommended by the committee effectively carried out on time bound basis.

4.4 EDUCATION AND TRAINING.

The company is conducting various training programme, technical as well as on safety Subject periodically .The training on safety awareness needs to be improved from the present level.

4.5 MOTIVATION AND PROMOTIONAL MEASURES FOR OCCUATIONAL SAFETY & HEALTH (OS & H):

Motivational and OS & H Promotional measures have been taken time to time. The management, seems to be keen for taking some initiative in this direction. They are celebrating safety week every year and organizing some poster, slogan, competition among employees.

4.6 NEW EQUIPMENT REVIEW & INSPECTION:

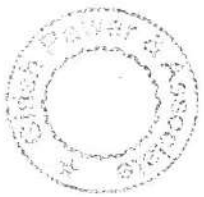
Every new equipment (replacement or modifications) are received & inspected thoroughly from safety angle before taking into use & necessary test certificates are taken from concerned manufacturer/person.''

4.7 MEDICAL FACILITIES

In house medical facility is in place. In case of emergency nearby dispensaries First Aid Box is available. Regular health check up shall be carried out to of all the employees.

4.8 FIRE FIGHTING ARRANGEMENT :

There are 110 Nos. of fire extinguishers available in the factory .There is no dedicated Fire department in the factory Security has been entrusted with this responsibility. Workmen are trained to operate fire extinguishers.



4.9 PERSONAL PROTECTIVE EQUIPMENTS:

There are sufficiency's in PPEs provided to the employees. A number of employees were found without proper PPEs during our visits. The supervisors are told to make sure that no person working on the shop floor shall be allowed to work without using appropriate PPEs. Here is the list of the personal protective equipments:

Safety Goggles.

Hand Gloves (Cotton. Rubber. Leather. Knitted)

Safety shoes

Safety Helmet

Glass Shield

Ear Plug Muff, etc.

Weld protective ,etc.

4.10 PERIODIC TESTS:

Pressure vessel & Lifting tools are examined by the competent person periodically.

4.11 WELFARE FACILITIES.

1. Medical Facility ,
2. Uniforms , Shoes
3. Safety Appliances,
4. Urinals are provided for male and female.
5. Personal Accident Policy.
6. Workmen compensation policy.
7. Housing Loans. Emergency Advance.
8. Bonus is paid regularly as per the profitability of the company.
9. Get together once in every year.

4.12.COMPLIANCE REPORTS :

*Factory license for company is valid

*Testing of pressure vessels & Lifting devices carried out for compliance under Rule 65 & 64 MFR respectively.

*Safety Policy reports shall be prepared in for compliance of rule 73L of MFR.

*MPCB consent has been obtained valid .

*Ventilation Survey Report was prepared in for compliance of rule

*Stability Certificate is obtained in form 1A which is valid till 2018

*Risk analysis has not been done

4.12 GENERAL DISCUSSION:

Factory has maintained a good health & Safety standard.

Documentation

Following documents were verified during audit

Particulars

*Company profile & Introduction of company.

*Organization structure (Organizational chart)

*Safety Organization chart.

*List of raw materials.

*List of chemicals & Material Safety Data Sheet & Quantity.

*List of equipment & Machinery

*Manufacturing process/process flow diagram.

*List of by products.

*List of finished products.

*Copy of license issued by Directorate Industrial Safety & Health

* Copy of license issued by Maharashtra Pollution Control Board.

* Copy of license issued by controller of Explosives.

*Stability Certificate.

*Details of fire fighting arrangements.

*Details of Medical facility.

*Inspection book of various regulatory bodies.

*Details of welfare activities.

*Details of non-reportable & reportable accidents occurred in the premises during last Three years.

*Housekeeping arrangements.
*Maintenance schedule & Procedure
*Work Permit system.
*Details of the west treatment.
* Medical Examination reports of employees.
*Details of training to employees for
*Fire fighting
*First Aid Training
* Lock out/Tag out procedure (Not existing).
*Record of testing done as per rule 64 & 65 of Maharashtra Factories Rules 1963.
*Record of Previous audit.
*Record of ventilation survey /Noise Level Survey.
*Record of plant safety instruction .
* Calibration & Testing Reports.

CHAPTER-5

5.00 HAZARDS & THEIR PREVENTION FOR SOME OF THE ACTIVITIES

EQUIPMENT BASIC SAFETY:

HAZARDS:

*Removal, relocation and modification of any part of safety devices may lead to personal injury of machine damage.

PREVENTION:

*All doors and protection covers, interlocks and safety devices should be closed and checked before switching ON the power supply.

*Easy access of the EMERGENCY STOP button should be ensured.

*Switch off the main power breaker in case power failure.

*Before starting machine operation, operator should be aware of the position of

the switches, to avoid incorrect operation.

*Stop all machine operations before cleaning the machine or any other peripheral equipment.

*MSDS for all the chemicals should be available for reference.

PERSONNEL SAFETY:

Hazards:

*Potential damage of entanglement in rotation for moving parts

*Excessive stress while handling the object.

*Falling of object component may cause severe injure.

*Cut injury to the fingers or hand by sharp edges of the components if the operator does not take precaution.

*Splashing of chemicals in eyes.

*High voltage area where opening the cover and touching the device inside may Result in electrical shock and serious injury.

Prevention:

*Operator should not wear jewelry ,body adamants ,loose clothing etc. that could

caught while operating rotating/-sliding machinery.

*Always wear personnel protective equipments as and when required.

*Always use hand gloves when loading or unloading component to protect the hands or fingers from sharp edge or dirt during operation.

*Lifting devices and components should be handled by the operator as per working instruction .displayed at the working section.

*Never touch electrical cabinet ,operational panel pumps and motors when in operation.

OPERATIONAL SAFETY:

Hazards:

*Accidents may occur due to cracks ,current leakages or electrical short circuit.

*Improper loading of the component will get struck and can stop operation.

*Fall of equipment from roller conveyer may cause accident /injury.

Prevention

*Check all electrical cables for damage and cracks.

*Load the component properly

*Avoid using hand gloves ,while working in machine panels.

WORKPLACE SAFETY:

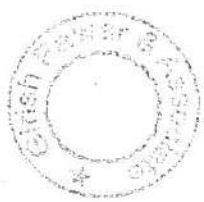
Hazards

Slipping tripping failing hitting by failing objects.

Prevention

*Clean up spillage immediately if any

*Keep work area clean and free from other materials that create tripping or Housekeeping. Problems.



*Workbenches .cabinets shall be kept in a clean and orderly manner.

*Platform must be kept in good condition

*Remove all spillage from the floor and dry floor periodically to prevent accidents.

*Adequate illumination level is maintained in the work area.

HAND TOOLS AND POWER TOOLS-

USE OF WRONG TOOLS:

Hazards

*Because of sufficient /suitable tools are not available results into personal injury

*Tendency of temporary gains result into personnel injury.-prevention.

*Easy availability of proper hand tools to the operator should be ensured.

*Tools must be used correctly and for the purpose to which they are suitable.

IMPROPER METHOD OF USINGTOOLS :

Hazards

*Even though the hand tools area in excellent conditions accidents may cause if the tools are not used properly.

*Cut injury to the sharp edge of the job ,injury due to slipping of tools.

*Accidents caused due to improper while using tools.

Prevention

*Now the proper method of using the tools.

*Presence of mind and careful attention minimizes the unsafe action while working with the tools.

DEFECTIVE TOOLS:
Hazard:

*Injury caused due to defective tools.

*Electric Shock due to use of non-insulated tools.

Prevention

*Operator should check the tool condition before using.

HAND OPERATED PALLET TRUCKS/TROLLYS /FORKLIFTS:

Hazards

*Accidents caused due to misuse of pallet result in serious personnel injury.

*Risk of personal injury caused by failing of loads.

*A located truck can overturn when attempting to turn on an incline

Prevention

*Read and understand the operating manual before use.

*Always wear safety shoes when working with the pallet truck.

*It is forbidden for a person to be present in and around pallet truck.

*Never turn a loaded truck on an incline.

*Daily service /safety checks should be carried out before taking into use.

DIESEL,CHEMICALS,PAINT & THINNERSTORAGE AND DISTRIBUTION:

Hazard:
*Fire explosion hazards –danger to the life of the people and surrounding properly.

*Static spark creates the fire hazard.

Prevention
*Always check for leakages of storage area

*Do not carry communication equipments inside the area.
*Always maintain yard clean and free from waste material ,vegetation.
*Always maintain fire extinguisher at its place.

*Always clean wire mesh of breather for any blockage.

*Hot work like welding and gas cutting should not be carried inside the area.

*Only authorized persons are allowed in the area.

*Loading /charging should be done as per requirements.

*Daily check should be made.

AIR COMPRESSOR

Hazards.

*It acts as live bomb if safe working pressure of such vessel or its fittings is exceeded.
*Any defect may cause bursting of vessels or fittings.

*The condensate ,if not drained regularly can lead to violent explosion.

*Noise hazards.

Prevention

*Air receiver is constructed with sound material of construction.

*Hydraulic and ultrasonic test should be carried out periodically.

*Air receiver is provided with pressure gauge to indicate safe working pressure

*Air receiver is provided with safety valve, which operate at a pressure 1.5 bar higher then safe operating pressure.

*Air receiver is provided with auto drain valve.

*proper PPE should be used.

DIESEL GENERATOR ROOM:

Hazards.

*Sound (Noise)Pollution.
*Diesel storage
*Lube oil storage
*Heating of engine and exhaust line.
*Flywheel movement.

Prevention

*Use earmuff and earplugs while DG set is in operation to minimize the exposure to high noise level.

*Diesel tank should identify with capacity, leakages and spillage of diesel of diesel should be checked, immediate action to be taken to avoid any accident.

*Lube oil barrel should be identified .leakages and spillage should be avoided. one should not touch engine while DG set is in operation.

*Fire extinguishers of suitable type kept in DG room and easily accessible.

OFFICE AREA:

SAFETY RELATED OBSERVATIONS IN OFFICE:

1.Office area is generally prone to fire hazard. stacked papers, drawings, etc. are fuel to the fire and thus need to be kept properly and wastes to be removed regularly.

2.Sufficient exit doors are provided without proper exit marking. Exit marking should be done properly to enable people guide the right direction at the time of emergency.

3.Sufficient numbers of toilets are available for male and female separately. The Cleanliness and hygiene level of these toilets are good.

4.Ventilation of office area is very good.

5.Cleanliness –Good

6.Fire extinguishers are kept properly at different locations. its and its Checked by the expert.

Chapter -6 SAFETY AUDIT QUISTIONNAIRE

According to IS -14489:1998

A1:Health & Safety Policy [Section 7A(3) of FA]

Sr. No.	Particulars	Yes/No.	Remark
1.	Has the H & S Policy prepared? Section 7A(3) of FA	Yes	
2.	Obtain a copy of the policy	Yes	
3.	Copy of the Corporate office	No	
4.	Whether policy has been sent to the DISH	Yes	
5.	Who has signed: occupier	Yes	Shri. Dilip S. Patil
6.	When was it declared & adopted	Yes	
7.	How many times revised	2	
8.	Statement as per MFR	Yes	
	i)Commitment and intention of top Management to SHE	Yes	
	ii)Compliance with all statutory requirement	Yes	
	iii)Organizational set-up and clear assignment of respective	Yes	
	iv)Arrangements for making the policy effective	Yes	
	v)involvement of workers	Yes	
	vi)H & S performance for consideration in career advancement	Yes	
	vii)Fixing responsibility of contractors and other agencies	Yes	
	viii)Resume of H & S performance in co's annual report	Yes	
	ix)Use of techniques (SA, RA)	Yes	
	x)Intention to integrate H & S in all decision including purchase of plant & Machinery and personnel	Yes	
	xi)Arrangement for informing, educating, training and retraining of employees & public	Yes	
9.	Publicity i)Distribution to all ii)Display at conspicuous places iii)Other means of communication	Yes	

A2 : SAFETY ORGANISATION

Sr. No.	Particulars	Yes/No.	Remark
1.	Does the factory have a safety Department?	Yes	
2.	Head of the safety Department		
	a)Mr. S.N. Surwase Works Manager	-	
	b)Designation: Mr. Nitin Bhawar HR Manager	-	
	c)Qualification as per MFR.	Yes	
	d)Experience in the safety field:	-	
	e)Who are the safety officer(SO) FA section 40B(1) (MFR)	-	
	f) Strength of the safety Department (including SOs & Staff) as per MFR	1	
3.	Occupier : FA Section 2 (n) Mr. Dilip S. Patil	Yes	
4.	Factory Manager: FA Section 7(f)	Yes	
5.	Head of the safety Department reports to (MFR) (Organistion Chart)	No	
6.	Training received by SOs in Total Safety Management	Yes	
7.	Any additional duties SO are required to do (MFR)	No.	
8.	What is the power of the SO –vis unsafe act.	all	
9.	Normal work done by the so as per (MFR):	Yes	Accident reporting investigate Training. Liasoning Work permit, Inspection
10.	Facilities provided		

SO : Safety officer ,MFR: Maharashtra Factories Rule, FA: Factories Act.

A3 : SAFETY COMMITTEE

1.	Does it have a safety Committee:41G(1) of FA.(MFR) Title Safety Committee	Yes	
2.	Does it have departmental (or sub) Safety Committees	No	
3.	Composition :41G(2) of FA.(MFR) (obtain a copy of the order)	No	
4.	Head: As per (MFR):	No	
5.	Secretary : as per (MFR)	No	
6.	How are the workmen nominations obtained?:	No	
7.	Tenure of the present safety Committee		
8.	Meetings	Yes	
	i)Dates of Meetings held in last 3 years: As per (MFR)	10	
	ii)Notice issued	No	
	iii)Agenda for meetings given:	No	
9.	Minutes of the meetings (Obtain copies of last 3 meetings)		
	i)Are minutes prepared :	No	
	ii)Approval by the management:	No	
	iii)Circulation to members:	yes	
	iv)when are they circulated:	No	
10.	How are the recommendations of the Committee implemented ?		
11.	Any suggestion for further effectiveness		

A4 : Any other forum for discussion on safety or any other scheme such as safety Co-ordinators.

Description: No.

A5 : Involvement of Line Management and Senior Management personnel: Yes

A6: SAFETY BUDGET

1.	Is there a provision of making an annual Safety Budget: Yes/No	Yes	
2.	Outcome of the last 3 budgets	Yes	
3.	Safety Budget as a percentage of the total budget	Yes	2%
4.	Budget utilization	Yes	100%
5.	Basis for the safety budget	Yes	Training, Modification, PPE, Motivation, Communication
6.	What is the pattern of expenditure for last 3 years	Yes	Training Modification, PPE, Motivation, Communication etc.
7.	What are the sanctions and how are they conveyed	Only for capital items	

A7 : ACCIDENT REPORTING,INVESTIGATION AND ANALYSIS

1.	Availability of accident Data for Reportable, Non-Reportable Accidents and near-miss incidents	---	
	a)Reportable Accidents (RA)	No	
	b)Non-Reportable Accidents (NRA)	No	
	c)Near-Miss Incidents (NMI)	No	
2.	How are the RA,NRA & NMI reported		
	a)Reporting of RA	No	Form-24shall be maintained
	b) Reporting of RA	No	Intimation slip shall be maintained
3.	Are all RA & Dangerous occurrences reported in time to inspector of Factories in prescribed form?	No	Form 24 shall be Maintained
4.	Has the Accident Register Maintained in the prescribed Form (MFR)	No	
5.	Who maintains the accident /Incidents Data and how.	-	Safety ,HR and admin dept.
6.	How is the top management apprised of the data/accidents/Inc.	Yes	Review Meeting
7.	How is the accident /incident data utilized	Yes	Analysis used for target point action
8.	Are all RA, NRA, NMI, investigated		
	RA:	Yes	
	NRA:	Yes	

	NMI:	Yes	
9.	Is the accident investigation procedure laid down		
10.	Who Investigate the accidents		Team
	RA-Fatal:	Yes	Team
	RA-Non Fatal:	Yes	
	NRA-	Yes	
	NMI-	Yes	
11.	Are the investigation reports maintained: Attach the copy as a sample for each of the type under point (8) above	No	
12.	Is there a system of analyzing accidents/incidents	No	
13.	Accident Analysis done for last 3 years	No	
14.	What is the trend?	Downward	
15.	What nature of injuries occurred during last 3 years	-----	
16.	What are the major causes of accidents for last 3 Years	-----	
17.	How implementation of recommendations emerged out of accident investigation is ensured?		98% Implemented

A-8: SAFETY MANUAL (SM)

1) Has SM Been prepared=No.

2) If yes obtain a copy of its contents

A-9:SAFETY INSPECTION (SI)

1.	Who carries out SI?	Safety officer	
2.	What type of SI are carried out:	Theme Based	Electrical Mechanical Chemical PPE etc.
3.	What is the frequency :	As per the schedule	
4.	Has the system of SI maintained : Yes/No.	Yes	
5.	Are the check –lists for SI prepared-Yes /No. (Obtain a sample copy)	Yes	
6.	Who has prepared the check-list?	Safety Dept.	
7.	How are the observations and recommendation conveyed to respective departments?	Through E-Mail	
8.	How implementation or recommendations ensured or how are they followed up and by whom?	Follow-up and meeting	By HRS Safety Department
9.	Are safety Committee Members Involved in carrying out SI: Yes /No. if yes frequency:	Yes	Monthly

A-10:SAFETY COMMUNICATION /MOTIVATION/PROMOTION

1.	Safety Suggestion Scheme: Yes /No	Yes	
2.	Participation in National Awards Scheme: Yes/No. if yes. which?	Yes	
3.	Any Award received during last 3 years .if yes which are they?	Yes	
4.	Any safety related celebrations by the company obtain details	Yes	Safety week Fire Week
5.	Any safety contests other than during celebrations obtain details	No	
6.	Display of posters /slogans	Yes	Needs to Improvement
7.	Display of procedures /precautions	Yes	
8.	Publications of the company : Yes /No	No	
9.	Do they include information on H & S topics :Yes/ No	Yes	
10.	How is the literature on safety made available to- a)Management b)others	Yes	
11.	How is the H & S Publicized a)Bulletin Boards b)After the Accidents c)Notice Boards d)News letters e) Other (specify)	Yes	

A11: FIRST-AID

1.	Are first- aid Boxes Maintained : Yes /No (MFR)	Yes	
2.	Locations of FA boxes (MFR)	1)Distillers 2)Engineering 3)Manufacturing 4)General Office	20 Department wise
3.	Are locations of FA boxes made known : Yes /No	Yes	20
4.	Is the number of FA boxes adequate : Yes /No	Yes	3
5.	How are the FA boxes ?: (Give size, material, indications etc.)	---	
6.	Contents of the first aid boxes	----	
7.	Condition of the First aid boxes	Good	
8.	Is here an Ambulance Room: Yes /No	Yes	
9.	How many trained First –Aiders available (obtain list)	10	
10.	How are the names of the trained first aiders publicized	Yes	
11.	How many Ambulance Vans are available (obtain details)	One and one of govt.	
12.	How are the Ambulance Van manned?	2	

A12: MEDICAL

1.	Is a hospital available : Yes /No Is it an occupational Health Centre (OHC)	Yes	
2.	Manning of the hospital /OHC i)In charge : ii)Other medical officers: iii)Qualified & trained dresser-cum compounder : iv)Nurse : v)Sweeper: vi)Any other person employed :	 Yes Yes Yes NA Yes NA	
3.	Intra –structural Facilities available in the hospital i)Total area of rooms : ii)Other facilities : Medical	 Actual Check Yes	
4.	Ambulance Vans i)Numbers and other details(MFR) ii)Contents (MFR) iii)No of drivers & their duty timings (MFR) 2	 Check check Check	
5.	Medical Examination i)Pre-employment ii)Annual iii)Canteen employees iv)Vision Test of Crane Operators	 Yes Yes Yes No	 For all For all
6.	Maintenance of Health Register/Records : Yes /No	Yes	
7.	Training of Hospital staff in fire Fighting& Resource Operations	Yes	
8.	Hospital waste Disposal Systems (Rules)	Yes	

A13: PERSONAL PROTECTIVE EQUIPMENT (PPE)

1.	Has a list of requirement PPE for each/operation been developed : Yes /No (if yes ,obtain the list)	Yes	
2.	Procedure issue of PPEs	Yes	
3.	Is SO consulted in selection ? Yes /No	Yes	
4.	Conformity of PPEs to standards	Yes	
5.	Workers training in the use of PPEs :	Yes	
6.	System of procurement & Inspection :	Yes	
7.	System of replacement :	Yes	
8.	System of storage of PPE :	Yes	
9.	System of maintenance of PPE :	Yes	
10	Observation regarding use of PPEs	Yes	Satisfactory

A14: GENERAL WORKING CONDITION

A	Housekeeping		
	i)Condition of Floors and Stairways	OK	
	ii)Marking and clear gangways	Yes	
	iii) System to deal with spillages	No	
	iv)Provision of bins for collecting scrap, garbage etc	Yes	
	v)Housekeeping contest	Yes	
	vi)Any good practices and standards available (obtain a copy)	No.	
	vii) Any working conditions which make the flooring slippery and measures to make them safe	No.	
	viii)Any observations regarding Sub –standards of housekeeping	Yes	
B	Noise		
	i)Which are the machines/areas/process generating high noise	Yes	Milling
	ii)Any noise study conducted : Yes /No (if yes obtain a copy of the study report)	No	
	iii)Action taken on report	No	
	iv)Engineering measures/controls to reduce noise level	Yes	
	v)Periodic audiometric tests of the persons working in high noise	No	

	vi)Use of Ear plugs/ muffs in high noise areas	No	Shall be Implemented
	vii)Awareness among persons working in high noise areas	Yes	
C	Ventilation		
	i)Areas where ventilation seems to be inadequate	No	
	ii)Are where dust /fumes are existing	No	
	iii)Any ventilation study carried out : Yes/No (if yes ,get a copy of the report)	No	
	v)Action taken on the report	NA	
	vi)Maintenance of ventilation system	Yes	
	vii)Assessment & Monitoring of work areas	No	
	viii)PPEs provided in areas having fumes/dusts	Yes	
D	Illumination		
	i)Any illumination study carried out : Yes /No (if yes, obtain a copy)	No	
	ii) it yes action taken on the study report	No	
	iii)Periodical cleaning replacement &maintenance of lamps/fittings	Yes	
	iv)Any optometry test of workers working in low illumination area. Obtain records	Yes	

A15:STABILITY CERTIFICATE

i)	Is stability certificate available –Yes/No if yes, its reference numbers and other details	Yes	
ii)	The certificate cover	-	
iii)	The certificate does not covered	-	
iv)	Certified by	Chartered Engineer	

A16:WORK PERMIT SYSTEM

i)	Availability of written system: Yes /No If yes ,obtain a copy	Yes	Shall be implemented immediately
ii)	Types of permits	Working at height/Electrical Work/fragile roof /Highly flammable area	
iii)	Salient features of the system	Ensuring all safety Requirements	
iv)	Register of work permits issued	Yes	

A17:SOPs

i)	Availability of SOPs	No	SOP for all Activities shall be prepared
ii)	Display of SOPs	No	
v)	How are SOPs prepared?	No	
vi)	System of updating SOPs	No	
vii)	Observation regarding implementation of SOPs	No	
viii)	Training of workers in SOPs	No	

A18:WASTE DISPOSAL SYSTEMS

i)	Identification of different types of wastes	Yes	
ii)	Quantities of different types of wastes estimated and checked (Records)	Yes	
iii)	Disposal Modes of different wastes	-	-
iv)	System /Measures of controlling air /water pollution	Yes	
v)	Effluent Treatment	Yes	
vi)	Use of treated effluent	Yes	Gardening

A19:PREVENTIVE MAINTENANCE

i)	Existence of system of preventive Maintenance : Yes/No	Yes	
ii)	Preventive Maintenance System (Obtain a copy)	Yes	Once in a six Month for critical machines
iii)	Observation regarding preventive Maintenance schedule vis-à-vis progress chart	Yes	Found OK

A20:CONTRACTOR SAFETY

i)	List of contractors vis-à-vis work done by them	Yes	Checked
ii)	Standard Contract Documents available : Yes /No If yes obtain copy	Yes	
iii)	Special Contract Documents available: Yes/ No If yes obtain copy	Yes	
iv)	Safety Co-ordinator by each contractor : Yes/ No If yes obtain copy	No	
v)	Safety inspection of contractor site	Yes	By respective agency
vi)	System for certifying contractors tools /equipment for safety	No	System to be made for checking During gate Entry.
vii)	Meeting with contractor	Yes	
viii)	Follow-up on safety matters	Yes	
ix)	Accident statistics regarding contract workmen	Yes	
x)	Pre-award meeting with contractors	Yes	Recently Initiated
xi)	Observation regarding use of PPEs by contractor's employees:	Yes	Satisfactory
xii	Are contract workers educated in SOPs: Yes /No If yes, details	Yes	

A21:LIFTING MACHINE

i)	Marking of identification Nos.(MFR)	No	
ii)	Marking of SWL: Safe Working Load (MFR)	No	
iii)	Availability of list : Yes /No If yes obtain copy	No	
iv)	Examination & testing certificates in prescribed from (MFR) available : Yes /No.	Yes	
v)	Certified by competent person: Yes /No If yes ,get his reference	Yes	
vi)	As the operators trained in the use ? Yes /No.	No	
vii)	Condition of lifting Machines	OK	
viii)	Any unsafe ropes lying on floor : Yes /No If yes give details	No	
ix)	How are wire ropes stored?	Hooks shall be arrange to store the rope	
x)	Any unsafe use of equipments	No	

A22:PRESSURE VESSELS

i)	Marking of identification marks:.(MFR _____)	No	
ii)	Available of list : Yes /No If yes .obtain a copy	Yes	
iii)	Availability of examination and testing certificates in prescribed form :.(MFR _____) : Yes /No	No.	
iv)	Certified by competent person	Yes	
v)	Any observations	No	

A23:MATERIAL STORAGES

i)	Storage facilities available : (Get details)	Yes	Stores
ii)	Are areas defined : Yes /No	Yes	
iii)	Condition of rack/Steel cupboards	NA	
iv)	Equipment for handling in stores	Goods Lift ,Pallet lifter	
v)	Comments on manual handling	NA	NA
vi)	Storage of material in gunny bags	NA	NA

A24:HAZARD IDENTIFICATION & CONTROL

i)	Hazardous areas	Yes	Chemicals Storage Tank. Boiler. Molasses, Spent wash
ii)	HAZOP study done ?: Yes /No. if yes obtain details	No	
iii)	Risk Assessment Done : Yes /No. if yes obtain details	No	
Iv	Safety Audits done ? a)Internal : Yes/No if yes ,obtain details b)External : Yes /No if yes ,obtain details	. Yes	
v)	Implementation of Recommendations of a)HAZOP Studies b)Risk Assessment Studies c)Safety Audi ties	No No No	

A-25Guarding of Rotating parts

Found adequate at all places.

26: Working at Height

Permit system is there.

A-27 : Access and Egress

Found inadequate at:

Found adequate at all places

A-28 Opening's Falls etc.

Found adequate at all places

A-29: Layout

Yes obtained

B: SAFETY TRAINING

B-1	Safety Training by : Safety officer	Internal	Safety Dept
B-2	Availability of Intra-structural facilities	Yes	Training hall LCD Chairs etc
B-3	Training Identification system:	Yes	
B-4	Induction Training :	Yes	
B-5	Training Programmes conducted with details	Yes	
B-6	Statutory Training , if any	Yes	
B-7	Sponsorship for External Training programme Obtain details	Yes	
B-8	Training Records	Yes	

C:SAFETY IN STORAGE AND HANDLING OF CHEMICALS AND GAS CYLINDERS

C-1	Chemicals used (Obtain a list of chemicals along with their normal quantities)	Yes	
C-2	Licenses for storages:	Available	
C-3	Availability of MSDS:	Yes	
C-4	Labeling of chemical containers	Yes	

C-5: STORAGE OF CHEMICALS

i)	Toxic Chemical Storages a)(Types of storages) quantities stored in each vessel and locations, above, below ground etc b) Stand by :NA c)Solution Valves :NA d) detector system: Yes	Yes	
ii)	Storage of flammable chemicals a)Type of storages, quantities stored in each vessel, locations, above/below ground	Sulphur lime Gunny Bags	
	b)Flameproof electrical installations	No	
	c)Earthling /bonding	No	
	d) Isolation Valves	NA	

	e)Alarms	Yes	
	f)Stand-bye	No	
	g)Fire fighting provisions	Yes	
iii)	Provision of dykes a)containment capability	NA	
	b)strength	NA	
	c) Placement	NA	
	d)Provision of valve for rain water	NA	

C-6: STORAGE OF GAS CYLINDER

i)	Different types of gas cylinders stored	NA	
ii)	Storing compatible	NA	
iii)	Availability of shed	NA	
iv)	Stability of storages	NA	
v)	Precaution taken for storage of flammable gas cylinders	NA	
vi)	Non –availability of safety caps	NA	
vii)	Condition of gas cylinders	NA	

viii)	Transportation of gas cylinders	NA	
ix)	Licenses	NA	
x)	Any other non-compliance	NA	

C-7:MSDS

MSDS are available

C-8:Colour Coding of pipelines

Colour coding has not been done on pipeline –Cheeks

D 1:General

1	Is there a fire department : No	No	
2	Who is the head of fire Department: (Get his details)	No	Security
3	Personal Intra Structure	Yes	-
4	Any contractors (Get details of the work done)	Yes	AMC for fire Extinguishers
5	Fire Department Layout	Yes	
6	Record of fire incidents	NA	
7	Measure taken on recommendation ensuing from record of incidents/investigation	NA	

D2: FIRE FIGHTING

Trained fire fighters are distributed throughout the shops and offices in each shift

D 2.1: Fire Extinguishers

1	Availability of location wise, Type wise ,Quantity wise list :Yes/No..-110 Nos.	Yes
2	Making on plant layout : Yes /No.	No
3	Testing of extinguishers	Yes
	i)Who is doing testing /examination?	Contractor
	ii)Check List	Yes
	iii)Frequency:	Half Yearly
	iv)Records:	Yes
4	Display of information	Yes
5	Placement in the plant	Yes

D 2.2: Fire Hydrant

Fire hydrant is available

D 2.3: other Fire fighting Systems

Sand Buckets : Yes

D 2.4: Detector and Alarm System

A:Detection System: Yes (Leak and Smoke)

B:Alaram System : Yes (Hooters)

D 3.: Fire Training

i)	List of trained fire Fighters (Get it)	Yes	
ii)	Display of list	Yes	
iii)	Persons conversant with fire fighting systems	Yes	20 Nos.
iv)	Persons conversant with fire presentation and protection System	Yes	

D 4.: Rehearsals

i)	System	
ii)	Frequency	
iii)	How many persons Involved	System of rehearsal found
iv)	Record	
v)	Implementation of recommendations	

E:EMERGENCY PLANNING

1.	Preparedness	
	i)Is on site Emergency plan (OEP) available: Yes /No	No
	ii)OEP Awareness	No
	iii)Preparedness at possible scenario sites	No
	iv)Mutual Aid Scheme	No
	v)Detectors for toxic gas releases	No

Emergency Action Plan is in progress

1.	Rehearsals	
	i)Dates	Six Monthly
	ii)Records	
	iii) Implementation	
3	Emergency Control Room	
	i)Locations: Main Gate	Yes
	ii)Facilities: Telephone, Mobile, First Aid Box	Yes
4	Assembly Points	
	i)Identification	Yes
	ii)Display	Yes
	iii)Awareness by Employees	Yes
5	Training	Yes
6	Availability protective and Rescue Equipment	Yes
7	Emergency Communication Systems	Yes
	i)Alarm System	Yes
	ii)Other Communication Systems	Yes
8	Medical Emergency Response Systems	Yes

CHAPTER-7

OBSERVATION & RECOMMENDATIONS:

Following are the few the observations and recommendations made during the audit Process:

*Tested and due date of pressure vessel shall be displayed.

*First Aiders name shall be displayed on First Aid box.

*Fire extinguisher lay out shall be displayed on shop floors as well as in Security cabin.

*First Hydrant lay out shall be displayed on shop floors as well as in Security cabin.

*Ear plug ,mask shall be made compulsory for the employees working in Boiler house ,in mill area.

*Internal Roads within the factory premises are found to be worst and shall be changed .

*Safety awareness program shall be arranged in the factory.

*Anti static device shall be arranged outside the storage tank yard

*Earth pits shall be identify and same shall be tested half yearly.

General Recommendations:

*Safety Audit shall be updated every year from external as well as internal experts.

*Regular Maintenance with all safety measures shall be carried out by using work Permit.

*Information, Instructions, Training and supervision shall be provided to all Employees as well as contractors for hazardous process with the help of experts.

*Untrained workers engaged through contractors shall not be allowed to work on equipments and accessories.

*Workers and Supervisor staffs shall regularly participate in seminars related to Electrical, Mechanical ,Chemical hazards.

*Schedule XXIII under rule 114 of Maharashtra Factories Rule 1963 shall be complied with.

*Workers and staffs shall be trained for Electrical Fire fighting with CO2,ABC,DCP fire extinguishers

Prepared by ,

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Mobile 9892689989

Format No.: EELRC/F/AMR/84

AMBIENT AIR MONITORING REPORT

Client's Name & Address	Report No.	EEL/ABD/A-214/03/2019-20
M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	20/03/2019

SAMPLING DETAILS

01) Location of Sampling	Patharvad- AAQ3
02) Sampling Procedure	As Per IS : 5182 Part 5
03) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Centre
04) Date of Sampling	13/03/2019
05) Time of Sampling	10:30 AM
06) Date of Sample Received in Lab	14/03/2019
07) Analysis Start Date	14/03/2019
08) Ambient Temperature	32^0C
09) Dry Bulb Temperature	32^0C
10) Wet Bulb Temperature	21^0C
11) Relative Humidity	58% RH

RESULTS

Sr. No.	Parameter	UOM	Results	NAAQ Standards	Standard Method
1	Particulate Matter PM_{10}	$\mu g/m^3$	56.43	<100	USEPA (40 CFR) Part 50
2	Particulate Matter $PM_{2.5}$	$\mu g/m^3$	22.61	<60	USEPA (40 CFR) Part 50
3	Sulphur Dioxide (SO_2)	$\mu g/m^3$	15.48	<80	IS: 5182 (Part 2) 2001
4	Nitrogen Dioxide (NO_2)	$\mu g/m^3$	25.48	<80	IS: 5182(Part 6):2006
5	CO	$\mu g/m^3$	0.25	<4	

UOM – Unit of Measurement.

"The results pertain to tested portion of sample"

Remark: - All above results are within National Ambient Air Quality Standards, Notification dtd November 18, 2009.

Prepared By

Checked By

Authorized Signatory

Excellent Enviro Laboratory & Research Centre ★ D-52/18, MIDC, Waluj, Aurangabad.

Format No.: EELRC/F/AMR/84

AMBIENT AIR MONITORING REPORT

Client's Name & Address	Report No.	EEL/ABD/A-215/04/2019-20
M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	30/04/2019

SAMPLING DETAILS

01) Location of Sampling	Patharvad – AAQ3
02) Sampling Procedure	As Per IS : 5182 Part 5
03) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Centre
04) Date of Sampling	20/04/2019
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07) Analysis Start Date	23/04/2019
08) Ambient Temperature	32^0C
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10) Wet Bulb Temperature	23^0C
11) Relative Humidity	58% RH

RESULTS

Sr. No.	Parameter	UOM	Results	NAAQ Standards	Standard Method
1	Particulate Matter PM_{10}	$\mu g/m^3$	59.38	<100	USEPA (40 CFR) Part 50
2	Particulate Matter $PM_{2.5}$	$\mu g/m^3$	23.51	<60	USEPA (40 CFR) Part 50
3	Sulphur Dioxide (SO_2)	$\mu g/m^3$	17.78	<80	IS: 5182 (Part 2) 2001
4	Nitrogen Dioxide (NO_2)	$\mu g/m^3$	21.89	<80	IS: 5182(Part 6):2006
5	CO	$\mu g/m^3$	0.35	<4	

UOM – Unit of Measurement.

"The results pertain to tested portion of sample"

Remark: - All above results are within National Ambient Air Quality Standards, Notification dtd November 18, 2009.

Prepared By

Checked By

Authorized Signatory

Excellent Enviro Laboratory & Research Centre D-52/18, MIDC, Waluj, Aurangabad.

Format No.: EELRC/F/AMR/84

AMBIENT AIR MONITORING REPORT

Client's Name & Address	Report No.	EEL/ABD/A-216/05/2019-20
M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	16/05/2019

SAMPLING DETAILS

01) Location of Sampling	Patharvad- AAQ3
02) Sampling Procedure	As Per IS : 5182 Part 5
03) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Centre
04) Date of Sampling	07/05/2019
05) Time of Sampling	10:30 AM
06) Date of Sample Received in Lab	08/05/2019
07) Analysis Start Date	08/05/2019
08) Ambient Temperature	32^0C
09) Dry Bulb Temperature	32^0C
10) Wet Bulb Temperature	21^0C
11) Relative Humidity	58% RH

RESULTS

Sr. No.	Parameter	UOM	Results	NAAQ Standards	Standard Method
1	Particulate Matter PM_{10}	$\mu g/m^3$	59.39	<100	USEPA (40 CFR) Part 50
2	Particulate Matter $PM_{2.5}$	$\mu g/m^3$	17.12	<60	USEPA (40 CFR) Part 50
3	Sulphur Dioxide (SO_2)	$\mu g/m^3$	20.38	<80	IS: 5182 (Part 2) 2001
4	Nitrogen Dioxide (NO_2)	$\mu g/m^3$	24.51	<80	IS: 5182(Part 6):2006
5	CO	$\mu g/m^3$	0.27	<4	

UOM – Unit of Measurement.

"The results pertain to tested portion of sample"

Remark: - All above results are within National Ambient Air Quality Standards, Notification dtd November 18, 2009.

Prepared By

Checked By

Authorized Signatory

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Format No.: EELRC/F/AMR/84

AMBIENT AIR MONITORING REPORT

Client's Name & Address	Report No.	EEL/ABD/A-217/03/2019-20
M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	14/03/2019

SAMPLING DETAILS

01) Location of Sampling	Kuran – AAQ4
02) Sampling Procedure	As Per IS : 5182 Part 5
03) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Centre
04) Date of Sampling	06/03/2019
05) Time of Sampling	10:30 AM
06) Date of Sample Received in Lab	07/03/2019
07) Analysis Start Date	07/03/2019
08) Ambient Temperature	33^0C
09) Dry Bulb Temperature	33^0C
10) Wet Bulb Temperature	22^0C
11) Relative Humidity	54% RH

RESULTS

Sr. No.	Parameter	UOM	Results	NAAQ Standards	Standard Method
1	Particulate Matter PM_{10}	$\mu g/m^3$	70.09	<100	USEPA (40 CFR) Part 50
2	Particulate Matter $PM_{2.5}$	$\mu g/m^3$	17.51	<60	USEPA (40 CFR) Part 50
3	Sulphur Dioxide (SO_2)	$\mu g/m^3$	21.47	<80	IS: 5182 (Part 2) 2001
4	Nitrogen Dioxide (NO_2)	$\mu g/m^3$	29.7	<80	IS: 5182(Part 6):2006
5	CO	$\mu g/m^3$	0.25	<4	

UOM – Unit of Measurement.

"The results pertain to tested portion of sample"

Remark: - All above results are within National Ambient Air Quality Standards, Notification dtd November 18, 2009.

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AMBIENT AIR MONITORING REPORT

Client's Name & Address	Report No.	EEL/ABD/A-218/04/2019-20
M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	18/04/2019

SAMPLING DETAILS

01) Location of Sampling	Kuran – AAQ4
02) Sampling Procedure	As Per IS : 5182 Part 5
03) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Centre
04) Date of Sampling	08/04/2019
05) Time of Sampling	10:30 AM
06) Date of Sample Received in Lab	09/04/2019
07) Analysis Start Date	09/04/2019
08) Ambient Temperature	32^0C
09) Dry Bulb Temperature	32^0C
10) Wet Bulb Temperature	24^0C
11) Relative Humidity	58% RH

RESULTS

Sr. No.	Parameter	UOM	Results	NAAQ Standards	Standard Method
1	Particulate Matter PM_{10}	$\mu g/m^3$	51.29	<100	USEPA (40 CFR) Part 50
2	Particulate Matter $PM_{2.5}$	$\mu g/m^3$	25.61	<60	USEPA (40 CFR) Part 50
3	Sulphur Dioxide (SO_2)	$\mu g/m^3$	20.77	<80	IS: 5182 (Part 2) 2001
4	Nitrogen Dioxide (NO_2)	$\mu g/m^3$	20.18	<80	IS: 5182(Part 6):2006
5	CO	$\mu g/m^3$	0.51	<4	

UOM – Unit of Measurement.

"The results pertain to tested portion of sample"

Remark: - All above results are within National Ambient Air Quality Standards, Notification dtd November 18, 2009.

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Format No.: EELRC/F/AMR/84

AMBIENT AIR MONITORING REPORT

Client's Name & Address	Report No.	EEL/ABD/A-219/05/2019-20
M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	28/05/2019

SAMPLING DETAILS

01) Location of Sampling	Kuran- AAQ4
02) Sampling Procedure	As Per IS : 5182 Part 5
03) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Centre
04) Date of Sampling	18/05/2019
05) Time of Sampling	10:30 AM
06) Date of Sample Received in Lab	20/05/2019
07) Analysis Start Date	20/05/2019
08) Ambient Temperature	34^0C
09) Dry Bulb Temperature	34^0C
10) Wet Bulb Temperature	226^0C
11) Relative Humidity	45% RH

RESULTS

Sr. No.	Parameter	UOM	Results	NAAQ Standards	Standard Method
1	Particulate Matter PM_{10}	$\mu g/m^3$	58.1	<100	USEPA (40 CFR) Part 50
2	Particulate Matter $PM_{2.5}$	$\mu g/m^3$	26.31	<60	USEPA (40 CFR) Part 50
3	Sulphur Dioxide (SO_2)	$\mu g/m^3$	17.55	<80	IS: 5182 (Part 2) 2001
4	Nitrogen Dioxide (NO_2)	$\mu g/m^3$	25.64	<80	IS: 5182(Part 6):2006
5	CO	$\mu g/m^3$	0.12	<4	

UOM – Unit of Measurement.

"The results pertain to tested portion of sample"

Remark: - All above results are within National Ambient Air Quality Standards, Notification dtd November 18, 2009.

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AMBIENT AIR MONITORING REPORT

Client's Name & Address	Report No.	EEL/ABD/A-220/03/2019-20
M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	22/03/2019

SAMPLING DETAILS

01) Location of Sampling	Chrampuri – AAQ5
02) Sampling Procedure	As Per IS : 5182 Part 5
03) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Centre
04) Date of Sampling	15/03/2019
05) Time of Sampling	10:30 AM
06) Date of Sample Received in Lab	16/03/2019
07) Analysis Start Date	16/03/2019
08) Ambient Temperature	33^0C
09) Dry Bulb Temperature	33^0C
10) Wet Bulb Temperature	24^0C
11) Relative Humidity	38% RH

RESULTS

Sr. No.	Parameter	UOM	Results	NAAQ Standards	Standard Method
1	Particulate Matter PM_{10}	$\mu g/m^3$	51.02	<100	USEPA (40 CFR) Part 50
2	Particulate Matter $PM_{2.5}$	$\mu g/m^3$	20.62	<60	USEPA (40 CFR) Part 50
3	Sulphur Dioxide (SO_2)	$\mu g/m^3$	18.56	<80	IS: 5182 (Part 2) 2001
4	Nitrogen Dioxide (NO_2)	$\mu g/m^3$	22.36	<80	IS: 5182(Part 6):2006
5	CO	$\mu g/m^3$	0.3	<4	

UOM – Unit of Measurement.

"The results pertain to tested portion of sample"

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AMBIENT AIR MONITORING REPORT

Client's Name & Address	Report No.	EEL/ABD/A-221/04/2019-20
M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	29/04/2019

SAMPLING DETAILS

01) Location of Sampling	Chrmpuri – AAQ5
02) Sampling Procedure	As Per IS : 5182 Part 5
03) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Centre
04) Date of Sampling	20/04/2019
05) Time of Sampling	10:30 AM
06) Date of Sample Received in Lab	22/04/2019
07) Analysis Start Date	22/04/2019
08) Ambient Temperature	34^0C
09) Dry Bulb Temperature	34^0C
10) Wet Bulb Temperature	22^0C
11) Relative Humidity	36% RH

RESULTS

Sr. No.	Parameter	UOM	Results	NAAQ Standards	Standard Method
1	Particulate Matter PM_{10}	$\mu g/m^3$	52.69	<100	USEPA (40 CFR) Part 50
2	Particulate Matter $PM_{2.5}$	$\mu g/m^3$	25.61	<60	USEPA (40 CFR) Part 50
3	Sulphur Dioxide (SO_2)	$\mu g/m^3$	24.29	<80	IS: 5182 (Part 2) 2001
4	Nitrogen Dioxide (NO_2)	$\mu g/m^3$	26.02	<80	IS: 5182(Part 6):2006
5	CO	$\mu g/m^3$	0.26	<4	

UOM – Unit of Measurement.

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AMBIENT AIR MONITORING REPORT

Client's Name & Address	Report No.	EEL/ABD/A-222/05/2019-20
M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	16/05/2019

SAMPLING DETAILS

01) Location of Sampling	Chrampuri – AAQ5
02) Sampling Procedure	As Per IS : 5182 Part 5
03) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Centre
04) Date of Sampling	04/05/2019
05) Time of Sampling	10:30 AM
06) Date of Sample Received in Lab	06/05/2019
07) Analysis Start Date	06/05/2019
08) Ambient Temperature	35^0C
09) Dry Bulb Temperature	35^0C
10) Wet Bulb Temperature	26^0C
11) Relative Humidity	46% RH

RESULTS

Sr. No.	Parameter	UOM	Results	NAAQ Standards	Standard Method
1	Particulate Matter PM_{10}	$\mu g/m^3$	50.79	<100	USEPA (40 CFR) Part 50
2	Particulate Matter $PM_{2.5}$	$\mu g/m^3$	25.06	<60	USEPA (40 CFR) Part 50
3	Sulphur Dioxide (SO_2)	$\mu g/m^3$	15.2	<80	IS: 5182 (Part 2) 2001
4	Nitrogen Dioxide (NO_2)	$\mu g/m^3$	23.05	<80	IS: 5182(Part 6):2006
5	CO	$\mu g/m^3$	0.39	<4	

UOM – Unit of Measurement.

"The results pertain to tested portion of sample"

Remark: - All above results are within National Ambient Air Quality Standards, Notification dtd November 18, 2009.

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Checked By

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Accredition & Approvals
ISO 9001: 2015
EMS 14001 : 2015
OHSAS 45001: 2018
NABL & MOEF & CC approved laboratory By Govt. of India

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AMBIENT AIR MONITORING REPORT

Client's Name & Address	Report No.	EEL/ABD/A-223/03/2019-20
M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	18/03/2019

SAMPLING DETAILS

01) Location of Sampling	Saskt Pimpelgaon – AAQ6
02) Sampling Procedure	As Per IS : 5182 Part 5
03) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Centre
04) Date of Sampling	09/03/2019
05) Time of Sampling	10:30 AM
06) Date of Sample Received in Lab	11/03/2019
07) Analysis Start Date	11/03/2019
08) Ambient Temperature	35^0C
09) Dry Bulb Temperature	35^0C
10) Wet Bulb Temperature	26^0C
11) Relative Humidity	29% RH

RESULTS

Sr. No.	Parameter	UOM	Results	NAAQ Standards	Standard Method
1	Particulate Matter PM_{10}	$\mu g/m^3$	53.24	<100	USEPA (40 CFR) Part 50
2	Particulate Matter $PM_{2.5}$	$\mu g/m^3$	19.58	<60	USEPA (40 CFR) Part 50
3	Sulphur Dioxide (SO_2)	$\mu g/m^3$	19.6	<80	IS: 5182 (Part 2) 2001
4	Nitrogen Dioxide (NO_2)	$\mu g/m^3$	25.85	<80	IS: 5182(Part 6):2006
5	CO	$\mu g/m^3$	0.52	<4	

UOM – Unit of Measurement.

"The results pertain to tested portion of sample"

Remark: - All above results are within National Ambient Air Quality Standards, Notification dtd November 18, 2009.

Prepared By

Checked By

Authorized Signatory

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Format No.: EELRC/F/AMR/84

AMBIENT AIR MONITORING REPORT

Client's Name & Address	Report No.	EEL/ABD/A-224/04/2019-20
M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	29/04/2019

SAMPLING DETAILS

01) Location of Sampling	Saskt Pimpelgaon – AAQ6
02) Sampling Procedure	As Per IS : 5182 Part 5
03) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Centre
04) Date of Sampling	20/04/2019
05) Time of Sampling	10:30 AM
06) Date of Sample Received in Lab	22/04/2019
07) Analysis Start Date	22/04/2019
08) Ambient Temperature	36^0C
09) Dry Bulb Temperature	36^0C
10) Wet Bulb Temperature	24^0C
11) Relative Humidity	48% RH

RESULTS

Sr. No.	Parameter	UOM	Results	NAAQ Standards	Standard Method
1	Particulate Matter PM_{10}	$\mu g/m^3$	52.09	<100	USEPA (40 CFR) Part 50
2	Particulate Matter $PM_{2.5}$	$\mu g/m^3$	22.75	<60	USEPA (40 CFR) Part 50
3	Sulphur Dioxide (SO_2)	$\mu g/m^3$	16.18	<80	IS: 5182 (Part 2) 2001
4	Nitrogen Dioxide (NO_2)	$\mu g/m^3$	20.98	<80	IS: 5182(Part 6):2006
5	CO	$\mu g/m^3$	0.23	<4	

UOM – Unit of Measurement.

"The results pertain to tested portion of sample"

Remark: - All above results are within National Ambient Air Quality Standards, Notification dtd November 18, 2009.

Prepared By

Checked By

Authorized Signatory

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AMBIENT AIR MONITORING REPORT

Client's Name & Address	Report No.	EEL/ABD/A-225/05/2019-20
M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	29/05/2019

SAMPLING DETAILS

01) Location of Sampling	Saskt Pimpelgaon –AAQ6
02) Sampling Procedure	As Per IS : 5182 Part 5
03) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Centre
04) Date of Sampling	21/05/2019
05) Time of Sampling	10:30 AM
06) Date of Sample Received in Lab	22/05/2019
07) Analysis Start Date	22/05/2019
08) Ambient Temperature	33^0C
09) Dry Bulb Temperature	33^0C
10) Wet Bulb Temperature	24^0C
11) Relative Humidity	40% RH

RESULTS

Sr. No.	Parameter	UOM	Results	NAAQ Standards	Standard Method
1	Particulate Matter PM_{10}	$\mu g/m^3$	69.77	<100	USEPA (40 CFR) Part 50
2	Particulate Matter $PM_{2.5}$	$\mu g/m^3$	19.18	<60	USEPA (40 CFR) Part 50
3	Sulphur Dioxide (SO_2)	$\mu g/m^3$	17.45	<80	IS: 5182 (Part 2) 2001
4	Nitrogen Dioxide (NO_2)	$\mu g/m^3$	15.11	<80	IS: 5182(Part 6):2006
5	CO	$\mu g/m^3$	0.25	<4	

UOM – Unit of Measurement.

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AMBIENT AIR MONITORING REPORT

Client's Name & Address	Report No.	EEL/ABD/A-226/03/2019-20
M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	22/03/2019

SAMPLING DETAILS

01) Location of Sampling	Patharwada KH – AAQ7
02) Sampling Procedure	As Per IS : 5182 Part 5
03) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Centre
04) Date of Sampling	13/03/2019
05) Time of Sampling	10:30 AM
06) Date of Sample Received in Lab	14/03/2019
07) Analysis Start Date	14/03/2019
08) Ambient Temperature	34^0C
09) Dry Bulb Temperature	34^0C
10) Wet Bulb Temperature	24^0C
11) Relative Humidity	38% RH

RESULTS

Sr. No.	Parameter	UOM	Results	NAAQ Standards	Standard Method
1	Particulate Matter PM_{10}	$\mu g/m^3$	56.4	<100	USEPA (40 CFR) Part 50
2	Particulate Matter $PM_{2.5}$	$\mu g/m^3$	22.84	<60	USEPA (40 CFR) Part 50
3	Sulphur Dioxide (SO_2)	$\mu g/m^3$	16.27	<80	IS: 5182 (Part 2) 2001
4	Nitrogen Dioxide (NO_2)	$\mu g/m^3$	22.59	<80	IS: 5182(Part 6):2006
5	CO	$\mu g/m^3$	0.36	<4	

UOM – Unit of Measurement.

"The results pertain to tested portion of sample"

Remark: - All above results are within National Ambient Air Quality Standards, Notification dtd November 18, 2009.

Prepared By | Checked By | Authorized Signatory

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AMBIENT AIR MONITORING REPORT

Client's Name & Address	Report No.	EEL/ABD/A-227/04/2019-20
M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	15/04/2019

SAMPLING DETAILS

01) Location of Sampling	Patharvad- AAQ3
02) Sampling Procedure	As Per IS : 5182 Part 5
03) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Centre
04) Date of Sampling	07/04/2019
05) Time of Sampling	10:30 AM
06) Date of Sample Received in Lab	08/04/2019
07) Analysis Start Date	08/04/2019
08) Ambient Temperature	35^0C
09) Dry Bulb Temperature	35^0C
10) Wet Bulb Temperature	26^0C
11) Relative Humidity	48% RH

RESULTS

Sr. No.	Parameter	UOM	Results	NAAQ Standards	Standard Method
1	Particulate Matter PM_{10}	$\mu g/m^3$	52.06	<100	USEPA (40 CFR) Part 50
2	Particulate Matter $PM_{2.5}$	$\mu g/m^3$	22.51	<60	USEPA (40 CFR) Part 50
3	Sulphur Dioxide (SO_2)	$\mu g/m^3$	15.68	<80	IS: 5182 (Part 2) 2001
4	Nitrogen Dioxide (NO_2)	$\mu g/m^3$	21.95	<80	IS: 5182(Part 6):2006
5	CO	$\mu g/m^3$	0.19	<4	

UOM – Unit of Measurement.

"The results pertain to tested portion of sample"

Remark: - All above results are within National Ambient Air Quality Standards, Notification dtd November 18, 2009.

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AMBIENT AIR MONITORING REPORT

Client's Name & Address	Report No.	EEL/ABD/A-228/05/2019-20
M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	27/05/2019

SAMPLING DETAILS

01) Location of Sampling	Patharvad- AAQ3
02) Sampling Procedure	As Per IS : 5182 Part 5
03) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Centre
04) Date of Sampling	18/05/2019
05) Time of Sampling	10:30 AM
06) Date of Sample Received in Lab	20/05/2019
07) Analysis Start Date	20/05/2019
08) Ambient Temperature	34^0C
09) Dry Bulb Temperature	34^0C
10) Wet Bulb Temperature	27^0C
11) Relative Humidity	45% RH

RESULTS

Sr. No.	Parameter	UOM	Results	NAAQ Standards	Standard Method
1	Particulate Matter PM_{10}	$\mu g/m^3$	51.28	<100	USEPA (40 CFR) Part 50
2	Particulate Matter $PM_{2.5}$	$\mu g/m^3$	21.25	<60	USEPA (40 CFR) Part 50
3	Sulphur Dioxide (SO_2)	$\mu g/m^3$	17.54	<80	IS: 5182 (Part 2) 2001
4	Nitrogen Dioxide (NO_2)	$\mu g/m^3$	25.61	<80	IS: 5182(Part 6):2006
5	CO	$\mu g/m^3$	0.28	<4	

UOM – Unit of Measurement.

"The results pertain to tested portion of sample"

Remark: - All above results are within National Ambient Air Quality Standards, Notification dtd November 18, 2009.

Prepared By

Checked By

Authorized Signatory

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Format No.: EELRC/F/AMR/84

AMBIENT AIR MONITORING REPORT

Client's Name & Address	Report No.	EEL/ABD/A-229/03/2019-20
M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	25/03/2019

SAMPLING DETAILS

01) Location of Sampling	Mahakala – AAQ8
02) Sampling Procedure	As Per IS : 5182 Part 5
03) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Centre
04) Date of Sampling	16/03/2019
05) Time of Sampling	10:30 AM
06) Date of Sample Received in Lab	18/03/2019
07) Analysis Start Date	18/03/2019
08) Ambient Temperature	34^0C
09) Dry Bulb Temperature	34^0C
10) Wet Bulb Temperature	26^0C
11) Relative Humidity	30% RH

RESULTS

Sr. No.	Parameter	UOM	Results	NAAQ Standards	Standard Method
1	Particulate Matter PM_{10}	$\mu g/m^3$	52.42	<100	USEPA (40 CFR) Part 50
2	Particulate Matter $PM_{2.5}$	$\mu g/m^3$	23.55	<60	USEPA (40 CFR) Part 50
3	Sulphur Dioxide (SO_2)	$\mu g/m^3$	20.55	<80	IS: 5182 (Part 2) 2001
4	Nitrogen Dioxide (NO_2)	$\mu g/m^3$	21.22	<80	IS: 5182(Part 6):2006
5	CO	$\mu g/m^3$	0.46	<4	

UOM – Unit of Measurement.

"The results pertain to tested portion of sample"

Remark: - All above results are within National Ambient Air Quality Standards, Notification dtd November 18, 2009.

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AMBIENT AIR MONITORING REPORT

Client's Name & Address	Report No.	EEL/ABD/A-230/04/2019-20
M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	30/04/2019

SAMPLING DETAILS

01) Location of Sampling	Mahakala – AAQ8
02) Sampling Procedure	As Per IS : 5182 Part 5
03) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Centre
04) Date of Sampling	23/04/2019
05) Time of Sampling	10:30 AM
06) Date of Sample Received in Lab	24/04/2019
07) Analysis Start Date	24/04/2019
08) Ambient Temperature	33^0C
09) Dry Bulb Temperature	33^0C
10) Wet Bulb Temperature	24^0C
11) Relative Humidity	38% RH

RESULTS

Sr. No.	Parameter	UOM	Results	NAAQ Standards	Standard Method
1	Particulate Matter PM_{10}	$\mu g/m^3$	52.42	<100	USEPA (40 CFR) Part 50
2	Particulate Matter $PM_{2.5}$	$\mu g/m^3$	21.05	<60	USEPA (40 CFR) Part 50
3	Sulphur Dioxide (SO_2)	$\mu g/m^3$	15.58	<80	IS: 5182 (Part 2) 2001
4	Nitrogen Dioxide (NO_2)	$\mu g/m^3$	22.05	<80	IS: 5182(Part 6):2006
5	CO	$\mu g/m^3$	0.25	<4	

UOM – Unit of Measurement.

"The results pertain to tested portion of sample"

Remark: - All above results are within National Ambient Air Quality Standards, Notification dtd November 18, 2009.

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Accredition & Approvals
ISO 9001: 2015
EMS 14001 : 2015
OHSAS 45001: 2018
NABL & MOEF & CC approved laboratory By Govt. of India

Format No.: EELRC/F/AMR/84

AMBIENT AIR MONITORING REPORT

Client's Name & Address	Report No.	EEL/ABD/A-231/05/2019-20
M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Karkhana ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	15/05/2019

SAMPLING DETAILS

01) Location of Sampling	Mahakala – AAQ8
02) Sampling Procedure	As Per IS : 5182 Part 5
03) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Centre
04) Date of Sampling	04/05/2019
05) Time of Sampling	10:30 AM
06) Date of Sample Received in Lab	06/05/2019
07) Analysis Start Date	06/05/2019
08) Ambient Temperature	34^0C
09) Dry Bulb Temperature	34^0C
10) Wet Bulb Temperature	26^0C
11) Relative Humidity	29% RH

RESULTS

Sr. No.	Parameter	UOM	Results	NAAQ Standards	Standard Method
1	Particulate Matter PM_{10}	$\mu g/m^3$	54.91	<100	USEPA (40 CFR) Part 50
2	Particulate Matter $PM_{2.5}$	$\mu g/m^3$	19.85	<60	USEPA (40 CFR) Part 50
3	Sulphur Dioxide (SO_2)	$\mu g/m^3$	19.85	<80	IS: 5182 (Part 2) 2001
4	Nitrogen Dioxide (NO_2)	$\mu g/m^3$	23.05	<80	IS: 5182(Part 6):2006
5	CO	$\mu g/m^3$	0.18	<4	

UOM – Unit of Measurement.

"The results pertain to tested portion of sample"

Remark: - All above results are within National Ambient Air Quality Standards, Notification dtd November 18, 2009.

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Format No.:EELRC/F/NMR/84

NOISE MONITORING REPORT

Client's Name & Address	Report No.	EEL/ABD/N-232/04/2019-20
M/s.KarmayogiAnkushrao Tope Samarth SahakariSakharKharkhana Ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	12/04/2019

SAMPLING DETAILS

01) Location of Sampling	As Listed Below in the Table
02) Sampling Procedure	As Per IS: 4758
03) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Center.
04) Date of Sampling	04/04/2019

RESULTS

Sr. No.	Test Location	UOM	Day Time	Night Time
1	Project Site	dB (A)	69.1	57.13
2	Project Site	dB (A)	66.15	43.54
3	Mahakala	dB (A)	51.71	40.74
4	New Samarth Colony	dB (A)	53.82	41.72
5	Patharvad	dB (A)	52.11	41.4
6	Shahgadh	dB (A)	50.97	43.2
7	Domalgaon	dB (A)	53.14	41.66
8	SrinathGrocey (Mahakal)	dB (A)	61.02	50.91
9	PatharwadaKh.	dB (A)	52.32	40.36

NOISE LEVEL STANDARDS

Sr. No.	Category of Area	Limits in dB(A) Leq	
		Day Time	Night Time
1	Industrial Area	75	70
2	Commercial Area	65	55
3	Residential Area	55	45
4	Silence Zone	50	40

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Format No.:EELRC/F/WAR/84

GROUND WATER ANALYSIS REPORT

Client's Name & Address	Report No.	EEL/ABD/WW-233/04/2019-20
M/s.KarmayogiAnkushrao Tope Samarth SahakariSakharKarkhana ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	12/04/2019

SAMPLING DETAILS

01) Location of Sampling	Ghansavangi
02) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Center.
03) Date of Sampling	04/04/2019
04) Date of Received in lab	05/04/2019
05) Analysis Start Date	05/04/2019

RESULTS

Sr. No.	Characteristic	UOM	Results	Testing Method
1	Temprature	°C	28.6	APHA 2550 B
2	Colour	Hazen	< 5	IS 3025 (Part 4)
3	Turbidity	NTU	0.2	IS 3025 (Part 10)
4	Total Suspended Solids	mg/l	19.6	IS3025 (Part 10)
5	Total Dissolved Solids	mg/l	634.05	IS 3025 (Part 16) (R.A.2006)-
6	Total Solids	mg/l	676.65	IS3025 (Part 16)(R.A.2006)
7	pH	pH Unit	6.76	IS 3025 (Part 11)(R.A.2002)
8	Total Hardness (as CaCO3)	mg/l	536.5	IS3025 (Part 21)(2009)
9	Total Alkalinity (as CaCO3)	mg/l	416	IS3025 (Part 23)(R.A.2003)
10	Chloride (as Cl-)	mg/l	125.96	IS 3025 (Par 32)(R.A.2003)
11	Sulphate (as SO4-2)	mg/l	309.77	APHA:22 Edition (4500-So2)
12	Fluoride (as F)	mg/l	0.018	APHA:22 Edition(4110 B)
13	Silica(SiO2)	mg/l	10.2	APHA4500 C-SiO2
14	Phosphate (as PO4)	mg/l	1.213	APHA 4500 –P D
15	Dissolved Oxygen	mg/l	NA	IS 3025 (PART 38)
16	Total Kjeldhal Nitrogen	mg/l	15.7	APHA 4500 N-NH3-C
17	Aluminium (as Al)	mg/l	0.017	IS:3025 Part-2(R.A.2004)
18	Arsenic (as As)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
19	Calcium (as Ca)	mg/l	142	IS:3025 Part-2(R.A.2004)
20	Cadmium (as Cd)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
21	Chromium (as Cr)	mg/l	Nil	APHA3120-B (ICP)
22	Copper (as Cu)	mg/l	Nil	IS 3025 (Part 42)
23	Iron (as Fe)	mg/l	0.05	IS:3025 Part-2(R.A.2004)
24	Mercury (as Hg)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
25	Magnesium (as Mg)	mg/l	34.5	IS:3025 Part-2(R.A.2004)
26	Manganese (as Mn)	mg/l	Nil	IS:3025 Part-2(R.A.2004)

27	Nickel (as Ni)	mg/l	0.001	IS:3025 Part-2(R.A.2004)
28	Boron (as B)	mg/l	0.015	IS:3025 Part-2(R.A.2004)
29	Sodium (as Na)	mg/l	0.15	-
30	Selenium (as se)	mg/l	Nil	IS 3025 (Part-56)
31	Potassium (as K)	mg/l	0.04	IS 3025 (Part 43)
32	Zinc (as Zn)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
33	Total Coliform	MPN/100ml	NA	IS:1622 (R.A.1996)

UOM – Unit of Measurement, BDL-Below Detectable Limit
"The results pertain to tested portion of sample"
Remark – All above parameter result are complying with required limit as per IS 10500: 2012 Standards.

Prepared By

Checked By

Authorized Signatory

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Excellent Enviro Laboratory & Research Center

Format No.: EELRC/F/WAR/84

GROUND WATER ANALYSIS REPORT

Client's Name & Address	Report No.	EEL/ABD/WW-234/04/2019-20
M/s.KarmayogiAnkushrao Tope Samarth SahakariSakharKarkhana ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	12/04/2019

SAMPLING DETAILS

01) Location of Sampling	PatharwalaKh
02) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Center.
03) Date of Sampling	04/04/2019
04) Date of Received in lab	05/04/2019
05) Analysis Start Date	05/04/2019

RESULTS

Sr. No.	Characteristic	UOM	Results	Testing Method
1	Temprature	°C	28.1	APHA 2550 B
2	Colour	Hazen	< 5	IS 3025 (Part 4)
3	Turbidity	NTU	0	IS 3025 (Part 10)
4	Total Suspended Solids	mg/l	0.4	IS3025 (Part 10)
5	Total Dissolved Solids	mg/l	192.45	IS 3025 (Part 16) (R.A.2006)-
6	Total Solids	mg/l	215.85	IS3025 (Part 16)(R.A.2006)
7	pH	pH Unit	7.52	IS 3025 (Part 11)(R.A.2002)
8	Total Hardness (as CaCO3)	mg/l	159.8	IS3025 (Part 21)(2009)
9	Total Alkalinity (as CaCO3)	mg/l	348	IS3025 (Part 23)(R.A.2003)
10	Chloride (as Cl-)	mg/l	61.96	IS 3025 (Par 32)(R.A.2003)
11	Sulphate (as SO4-2)	mg/l	53.68	APHA:22 Edition (4500-So2)
12	Fluoride (as F)	mg/l	0.025	APHA:22 Edition(4110 B)
13	Silica(SiO2)	mg/l	16.76	APHA4500 C-SiO2
14	Phosphate (as PO4)	mg/l	0.036	APHA 4500 –P D
15	Dissolved Oxygen	mg/l		IS 3025 (PART 38)
16	Total Kjeldhal Nitrogen	mg/l	16.1	APHA 4500 N-NH3-C
17	Aluminium (as Al)	mg/l	0.017	IS:3025 Part-2(R.A.2004)
18	Arsenic (as As)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
19	Calcium (as Ca)	mg/l	42.3	IS:3025 Part-2(R.A.2004)
20	Cadmium (as Cd)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
21	Chromium (as Cr)	mg/l	Nil	APHA3120-B (ICP)
22	Copper (as Cu)	mg/l	Nil	IS 3025 (Part 42)
23	Iron (as Fe)	mg/l	0.05	IS:3025 Part-2(R.A.2004)
24	Mercury (as Hg)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
25	Magnesium (as Mg)	mg/l	10.3	IS:3025 Part-2(R.A.2004)
26	Manganese (as Mn)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
27	Nickel (as Ni)	mg/l	0.004	IS:3025 Part-2(R.A.2004)
28	Boron (as B)	mg/l	0.002	IS:3025 Part-2(R.A.2004)
29	Sodium (as Na)	mg/l	0.13	-
30	Selenium (as se)	mg/l	Nil	IS 3025 (Part-56)

31	Potassium (as K)	mg/l	0.09	IS 3025 (Part 43)
32	Zinc (as Zn)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
33	Total Coliform	MPN/100ml	NA	IS:1622 (R.A.1996)

UOM – Unit of Measurement, BDL-Below Detectable Limit
"The results pertain to tested portion of sample"
Remark – All above parameter result are complying with required limit as per IS 10500: 2012 Standards.

Prepared By

Checked By

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GROUND WATER ANALYSIS REPORT

Client's Name & Address	Report No.	EEL/ABD/WW-235/04/2019-20
M/s. KarmayogiAnkushrao Tope Samarth SahakariSakharKarkhana ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	12/04/2019

SAMPLING DETAILS

01) Location of Sampling	Gahininath Nagar
02) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Center.
03) Date of Sampling	04/04/2019
04) Date of Received in lab	05/04/2019
05) Analysis Start Date	05/04/2019

RESULTS

Sr. No.	Characteristic	UOM	Results	Testing Method
1	Temprature	°C	28.6	APHA 2550 B
2	Colour	Hazen	< 5	IS 3025 (Part 4)
3	Turbidity	NTU	1.9	IS 3025 (Part 10)
4	Total Suspended Solids	mg/l	4.4	IS3025 (Part 10)
5	Total Dissolved Solids	mg/l	392	IS 3025 (Part 16) (R.A.2006)-
6	Total Solids	mg/l	419.4	IS3025 (Part 16)(R.A.2006)
7	pH	pH Unit	6.75	IS 3025 (Part 11)(R.A.2002)
8	Total Hardness (as CaCO3)	mg/l	340.4	IS3025 (Part 21)(2009)
9	Total Alkalinity (as CaCO3)	mg/l	280	IS3025 (Part 23)(R.A.2003)
10	Chloride (as Cl-)	mg/l	99.97-	IS 3025 (Par 32)(R.A.2003)
11	Sulphate (as SO4-2)	mg/l	156.78	APHA:22 Edition (4500-So2)
12	Fluoride (as F)	mg/l	0.014	APHA:22 Edition (4110 B)
13	Silica(SiO2)	mg/l	16.06	APHA4500 C-SiO2
14	Phosphate (as PO4)	mg/l	0.105	APHA 4500 –P D
15	Dissolved Oxygen	mg/l		IS 3025 (PART 38)
16	Total Kjeldhal Nitrogen	mg/l	13.2	APHA 4500 N-NH3-C
17	Aluminium (as Al)	mg/l	0.023	IS:3025 Part-2(R.A.2004)
18	Arsenic (as As)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
19	Calcium (as Ca)	mg/l	90.1	IS:3025 Part-2(R.A.2004)

20	Cadmium (as Cd)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
21	Chromium (as Cr)	mg/l	Nil	APHA3120-B (ICP)
22	Copper (as Cu)	mg/l	Nil	IS 3025 (Part 42)
23	Iron (as Fe)	mg/l	0.1	IS:3025 Part-2(R.A.2004)
24	Mercury (as Hg)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
25	Magnesium (as Mg)	mg/l	21.9	IS:3025 Part-2(R.A.2004)
26	Manganese (as Mn)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
27	Nickel (as Ni)	mg/l	0.004	IS:3025 Part-2(R.A.2004)
28	Boron (as B)	mg/l	0.004	IS:3025 Part-2(R.A.2004)
29	Sodium (as Na)	mg/l	0.12	-
30	Selenium (as se)	mg/l	Nil	IS 3025 (Part-56)
31	Potassium (as K)	mg/l	0.08	IS 3025 (Part 43)
32	Zinc (as Zn)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
33	Total Coliform	MPN/100ml	NA	IS:1622 (R.A.1996)

UOM – Unit of Measurement, BDL-Below Detectable Limit
"The results pertain to tested portion of sample"
Remark – All above parameter result are complying with required limit as per IS 10500: 2012 Standards.

Prepared By

Checked By

Authorized Signatory

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D-52/18, MIDC, Waluj, Aurangabad.

Excellent Enviro Laboratory & Research Center

Format No.:EELRC/F/WAR/84

GROUND WATER ANALYSIS REPORT

Client's Name & Address	Report No.	EEL/ABD/WW-236/04/2019-20
M/s. KarmayogiAnkushrao Tope Samarth SahakariSakharKarkhana ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	12/04/2019

SAMPLING DETAILS

01) Location of Sampling	Gayatri Nagar
02) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Center.
03) Date of Sampling	04/04/2019
04) Date of Received in lab	05/04/2019
05) Analysis Start Date	05/04/2019

RESULTS

Sr. No.	Characteristic	UOM	Results	Testing Method
1	Temprature	°C	28.1	APHA 2550 B
2	Colour	Hazen	< 5	IS 3025 (Part 4)
3	Turbidity	NTU	0.2	IS 3025 (Part 10)
4	Total Suspended Solids	mg/l	5.4	IS3025 (Part 10)
5	Total Dissolved Solids	mg/l	247	IS 3025 (Part 16) (R.A.2006)-
6	Total Solids	mg/l	275.4	IS3025 (Part 16)(R.A.2006)
7	pH	pH Unit	7.16	IS 3025 (Part 11)(R.A.2002)
8	Total Hardness (as CaCO3)	mg/l	212	IS3025 (Part 21)(2009)
9	Total Alkalinity (as CaCO3)	mg/l	174	IS3025 (Part 23)(R.A.2003)
10	Chloride (as Cl-)	mg/l	83.97	IS 3025 (Par 32)(R.A.2003)
11	Sulphate (as SO4-2)	mg/l	67.74	APHA:22 Edition (4500-So2)
12	Fluoride (as F)	mg/l	0.012	APHA:22 Edition (4110 B)
13	Silica(SiO2)	mg/l	21.8	APHA4500 C-SiO2
14	Phosphate (as PO4)	mg/l	0.069	APHA 4500 –P D
15	Dissolved Oxygen	mg/l		IS 3025 (PART 38)
16	Total Kjeldhal Nitrogen	mg/l	12.4	APHA 4500 N-NH3-C
17	Aluminium (as Al)	mg/l	0.01	IS:3025 Part-2(R.A.2004)
18	Arsenic (as As)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
19	Calcium (as Ca)	mg/l	56.1	IS:3025 Part-2(R.A.2004)
20	Cadmium (as Cd)	mg/l	Nil	IS:3025 Part-2(R.A.2004)

21	Chromium (as Cr)	mg/l	Nil	APHA3120-B (ICP)
22	Copper (as Cu)	mg/l	Nil	IS 3025 (Part 42)
23	Iron (as Fe)	mg/l	0.14	IS:3025 Part-2(R.A.2004)
24	Mercury (as Hg)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
25	Magnesium (as Mg)	mg/l	13.6	IS:3025 Part-2(R.A.2004)
26	Manganese (as Mn)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
27	Nickel (as Ni)	mg/l	0.005	IS:3025 Part-2(R.A.2004)
28	Boron (as B)	mg/l	0.007	IS:3025 Part-2(R.A.2004)
29	Sodium (as Na)	mg/l	0.15	-
30	Selenium (as se)	mg/l	Nil	IS 3025 (Part-56)
31	Potassium (as K)	mg/l	0.06	IS 3025 (Part 43)
32	Zinc (as Zn)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
33	Total Coliform	MPN/100ml	NA	IS:1622 (R.A.1996)

UOM – Unit of Measurement, BDL-Below Detectable Limit
"The results pertain to tested portion of sample"
Remark – All above parameter result are complying with required limit as per IS 10500: 2012 Standards.

Prepared By **Checked By** **Authorized Signatory**

Excellent Enviro Laboratory & Research Centre ★ D-52/18, MIDC, Waluj, Aurangabad.

Excellent Enviro Laboratory & Research Center

Format No.:EELRC/F/WAR/84

GROUND WATER ANALYSIS REPORT

Client's Name & Address	Report No.	EEL/ABD/WW-237/04/2019-20
M/s. KarmayogiAnkushrao Tope Samarth SahakariSakharKarkhana ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	12/04/2019

SAMPLING DETAILS

01) Location of Sampling	Mahakala
02) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Center.
03) Date of Sampling	04/04/2019
04) Date of Received in lab	05/04/2019
05) Analysis Start Date	05/04/2019

RESULTS

Sr. No.	Characteristic	UOM	Results	Testing Method
1	Temprature	°C	28.6	APHA 2550 B
2	Colour	Hazen	< 5	IS 3025 (Part 4)
3	Turbidity	NTU	4.7	IS 3025 (Part 10)
4	Total Suspended Solids	mg/l	9	IS3025 (Part 10)
5	Total Dissolved Solids	mg/l	367.9	IS 3025 (Part 16) (R.A.2006)-
6	Total Solids	mg/l	399.9	IS3025 (Part 16)(R.A.2006)
7	pH	pH Unit	6.67	IS 3025 (Part 11)(R.A.2002)
8	Total Hardness (as CaCO3)	mg/l	314	IS3025 (Part 21)(2009)
9	Total Alkalinity (as CaCO3)	mg/l	330	IS3025 (Part 23)(R.A.2003)
10	Chloride (as Cl-)	mg/l	120.96	IS 3025 (Par 32)(R.A.2003)
11	Sulphate (as SO4-2)	mg/l	103.79	APHA:22 Edition (4500-So2)
12	Fluoride (as F)	mg/l	0.023	APHA:22 Edition (4110 B)
13	Silica(SiO2)	mg/l	30.94	APHA4500 C-SiO2
14	Phosphate (as PO4)	mg/l	0.27	APHA 4500 –P D
15	Dissolved Oxygen	mg/l		IS 3025 (PART 38)
16	Total Kjeldhal Nitrogen	mg/l	13.5	APHA 4500 N-NH3-C
17	Aluminium (as Al)	mg/l	0.004	IS:3025 Part-2(R.A.2004)
18	Arsenic (as As)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
19	Calcium (as Ca)	mg/l	83.1	IS:3025 Part-2(R.A.2004)
20	Cadmium (as Cd)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
21	Chromium (as Cr)	mg/l	Nil	APHA3120-B (ICP)

22	Copper (as Cu)	mg/l	Nil	IS 3025 (Part 42)
23	Iron (as Fe)	mg/l	0.33	IS:3025 Part-2(R.A.2004)
24	Mercury (as Hg)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
25	Magnesium (as Mg)	mg/l	20.2	IS:3025 Part-2(R.A.2004)
26	Manganese (as Mn)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
27	Nickel (as Ni)	mg/l	0.002	IS:3025 Part-2(R.A.2004)
28	Boron (as B)	mg/l	0.005	IS:3025 Part-2(R.A.2004)
29	Sodium (as Na)	mg/l	0.16	-
30	Selenium (as se)	mg/l	Nil	IS 3025 (Part-56)
31	Potassium (as K)	mg/l	0.08	IS 3025 (Part 43)
32	Zinc (as Zn)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
33	Total Coliform	MPN/100ml	NA	IS:1622 (R.A.1996)

UOM – Unit of Measurement, BDL-Below Detectable Limit
"The results pertain to tested portion of sample"
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Prepared By **Checked By** **Authorized Signatory**

Excellent Enviro Laboratory & Research Centre D-52/18, MIDC, Waluj, Aurangabad

Excellent Enviro Laboratory & Research Center

Format No.:EELRC/F/WAR/84

GROUND WATER ANALYSIS REPORT

Client's Name & Address	Report No.	EEL/ABD/WW-238/04/2019-20
M/s. KarmayogiAnkushrao Tope Samarth SahakariSakharKarkhana ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	12/04/2019

SAMPLING DETAILS

01) Location of Sampling	AntarwaliSarathi
02) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Center.
03) Date of Sampling	04/04/2019
04) Date of Received in lab	05/04/2019
05) Analysis Start Date	05/04/2019

RESULTS

Sr. No.	Characteristic	UOM	Results	Testing Method
1	Temprature	°C	28.6	APHA 2550 B
2	Colour	Hazen	< 5	IS 3025 (Part 4)
3	Turbidity	NTU	6.5	IS 3025 (Part 10)
4	Total Suspended Solids	mg/l	34.6	IS3025 (Part 10)
5	Total Dissolved Solids	mg/l	168.33	IS 3025 (Part 16) (R.A.2006)-
6	Total Solids	mg/l	225.93	IS3025 (Part 16)(R.A.2006)
7	pH	pH Unit	7.46	IS 3025 (Part 11)(R.A.2002)
8	Total Hardness (as CaCO3)	mg/l	103	IS3025 (Part 21)(2009)
9	Total Alkalinity (as CaCO3)	mg/l	160	IS3025 (Part 23)(R.A.2003)
10	Chloride (as Cl-)	mg/l	75.98	IS 3025 (Par 32)(R.A.2003)
11	Sulphate (as SO4-2)	mg/l	24.6	APHA:22 Edition (4500-So2)
12	Fluoride (as F)	mg/l	0.017	APHA:22 Edition (4110 B)
13	Silica(SiO2)	mg/l	19.94	APHA4500 C-SiO2
14	Phosphate (as PO4)	mg/l	0.033	APHA 4500 –P D
15	Dissolved Oxygen	mg/l		IS 3025 (PART 38)
16	Total Kjeldhal Nitrogen	mg/l	14.1	APHA 4500 N-NH3-C
17	Aluminium (as Al)	mg/l	0.043	IS:3025 Part-2(R.A.2004)
18	Arsenic (as As)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
19	Calcium (as Ca)	mg/l	27.25	IS:3025 Part-2(R.A.2004)
20	Cadmium (as Cd)	mg/l	Nil	IS:3025 Part-2(R.A.2004)

21	Chromium (as Cr)	mg/l	Nil	APHA3120-B (ICP)
22	Copper (as Cu)	mg/l	Nil	IS 3025 (Part 42)
23	Iron (as Fe)	mg/l	0.12	IS:3025 Part-2(R.A.2004)
24	Mercury (as Hg)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
25	Magnesium (as Mg)	mg/l	16.524	IS:3025 Part-2(R.A.2004)
26	Manganese (as Mn)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
27	Nickel (as Ni)	mg/l	0.003	IS:3025 Part-2(R.A.2004)
28	Boron (as B)	mg/l	0.007	IS:3025 Part-2(R.A.2004)
29	Sodium (as Na)	mg/l	0.12	-
30	Selenium (as se)	mg/l	Nil	IS 3025 (Part-56)
31	Potassium (as K)	mg/l	0.09	IS 3025 (Part 43)
32	Zinc (as Zn)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
33	Total Coliform	MPN/100ml	NA	IS:1622 (R.A.1996)

UOM – Unit of Measurement, BDL-Below Detectable Limit
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Excellent Enviro Laboratory & Research Center

Format No.:EELRC/F/WAR/84

GROUND WATER ANALYSIS REPORT

Client's Name & Address	Report No.	EEL/ABD/WW-239/04/2019-20
M/s. KarmayogiAnkushrao Tope Samarth SahakariSakharKarkhana ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	12/04/2019

SAMPLING DETAILS

01) Location of Sampling	Gandhari
02) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Center.
03) Date of Sampling	04/04/2019
04) Date of Received in lab	05/04/2019
05) Analysis Start Date	05/04/2019

RESULTS

Sr. No.	Characteristic	UOM	Results	Testing Method
1	Temprature	°C	28.7	APHA 2550 B
2	Colour	Hazen	< 5	IS 3025 (Part 4)
3	Turbidity	NTU	0.2	IS 3025 (Part 10)
4	Total Suspended Solids	mg/l	0.6	IS3025 (Part 10)
5	Total Dissolved Solids	mg/l	134.19	IS 3025 (Part 16) (R.A.2006)-
6	Total Solids	mg/l	157.79	IS3025 (Part 16)(R.A.2006)
7	pH	pH Unit	6.9	IS 3025 (Part 11)(R.A.2002)
8	Total Hardness (as CaCO3)	mg/l	112.6	IS3025 (Part 21)(2009)
9	Total Alkalinity (as CaCO3)	mg/l	200	IS3025 (Part 23)(R.A.2003)
10	Chloride (as Cl-)	mg/l	41.99	IS 3025 (Par 32)(R.A.2003)
11	Sulphate (as SO4-2)	mg/l	38.05	APHA:22 Edition (4500-So2)
12	Fluoride (as F)	mg/l	0.017	APHA:22 Edition (4110 B)
13	Silica(SiO2)	mg/l	12.32	APHA4500 C-SiO2
14	Phosphate (as PO4)	mg/l	0.046	APHA 4500 –P D
15	Dissolved Oxygen	mg/l		IS 3025 (PART 38)
16	Total Kjeldhal Nitrogen	mg/l	15.2	APHA 4500 N-NH3-C
17	Aluminium (as Al)	mg/l	0.013	IS:3025 Part-2(R.A.2004)
18	Arsenic (as As)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
19	Calcium (as Ca)	mg/l	29.8	IS:3025 Part-2(R.A.2004)
20	Cadmium (as Cd)	mg/l	Nil	IS:3025 Part-2(R.A.2004)

21	Chromium (as Cr)	mg/l	Nil	APHA3120-B (ICP)
22	Copper (as Cu)	mg/l	Nil	IS 3025 (Part 42)
23	Iron (as Fe)	mg/l	0.01	IS:3025 Part-2(R.A.2004)
24	Mercury (as Hg)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
25	Magnesium (as Mg)	mg/l	7.2	IS:3025 Part-2(R.A.2004)
26	Manganese (as Mn)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
27	Nickel (as Ni)	mg/l	0.004	IS:3025 Part-2(R.A.2004)
28	Boron (as B)	mg/l	0.006	IS:3025 Part-2(R.A.2004)
29	Sodium (as Na)	mg/l	0.32	-
30	Selenium (as se)	mg/l	Nil	IS 3025 (Part-56)
31	Potassium (as K)	mg/l	0.01	IS 3025 (Part 43)
32	Zinc (as Zn)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
33	Total Coliform	MPN/100ml	NA	IS:1622 (R.A.1996)

UOM – Unit of Measurement, BDL-Below Detectable Limit
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Remark – All above parameter result are complying with required limit as per IS 10500: 2012 Standards.

Prepared By **Checked By** **Authorized Signatory**

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Excellent Enviro Laboratory & Research Center

Format No.:EELRC/F/WAR/84

GROUND WATER ANALYSIS REPORT

Client's Name & Address	Report No.	EEL/ABD/WW-240/04/2019-20
M/s. KarmayogiAnkushrao Tope Samarth SahakariSakharKarkhana ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	12/04/2019

SAMPLING DETAILS

01) Location of Sampling	Agar Nandu
02) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Center.
03) Date of Sampling	04/04/2019
04) Date of Received in lab	05/04/2019
05) Analysis Start Date	05/04/2019

RESULTS

Sr. No.	Characteristic	UOM	Results	Testing Method
1	Temprature	°C	28.2	APHA 2550 B
2	Colour	Hazen	< 5	IS 3025 (Part 4)
3	Turbidity	NTU	0.2	IS 3025 (Part 10)
4	Total Suspended Solids	mg/l	1.8	IS3025 (Part 10)
5	Total Dissolved Solids	mg/l	214.85	IS 3025 (Part 16) (R.A.2006)-
6	Total Solids	mg/l	239.65	IS3025 (Part 16)(R.A.2006)
7	pH	pH Unit	7.28	IS 3025 (Part 11)(R.A.2002)
8	Total Hardness (as CaCO3)	mg/l	174.9	IS3025 (Part 21)(2009)
9	Total Alkalinity (as CaCO3)	mg/l	208	IS3025 (Part 23)(R.A.2003)
10	Chloride (as Cl-)	mg/l	81.97	IS 3025 (Par 32)(R.A.2003)
11	Sulphate (as SO4-2)	mg/l	42.53	APHA:22 Edition (4500-So2)
12	Fluoride (as F)	mg/l	0.029	APHA:22 Edition (4110 B)
13	Silica(SiO2)	mg/l	27.16	APHA4500 C-SiO2
14	Phosphate (as PO4)	mg/l	0.063	APHA 4500 –P D
15	Dissolved Oxygen	mg/l		IS 3025 (PART 38)
16	Total Kjeldhal Nitrogen	mg/l	13.2	APHA 4500 N-NH3-C
17	Aluminium (as Al)	mg/l	0.017	IS:3025 Part-2(R.A.2004)
18	Arsenic (as As)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
19	Calcium (as Ca)	mg/l	46.3	IS:3025 Part-2(R.A.2004)

20	Cadmium (as Cd)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
21	Chromium (as Cr)	mg/l	Nil	APHA3120-B (ICP)
22	Copper (as Cu)	mg/l	Nil	IS 3025 (Part 42)
23	Iron (as Fe)	mg/l	0.23	IS:3025 Part-2(R.A.2004)
24	Mercury (as Hg)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
25	Magnesium (as Mg)	mg/l	11.3	IS:3025 Part-2(R.A.2004)
26	Manganese (as Mn)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
27	Nickel (as Ni)	mg/l	0.001	IS:3025 Part-2(R.A.2004)
28	Boron (as B)	mg/l	0.007	IS:3025 Part-2(R.A.2004)
29	Sodium (as Na)	mg/l	0.14	-
30	Selenium (as se)	mg/l	Nil	IS 3025 (Part-56)
31	Potassium (as K)	mg/l	0.05	IS 3025 (Part 43)
32	Zinc (as Zn)	mg/l	Nil	IS:3025 Part-2(R.A.2004)
33	Total Coliform	MPN/100ml	NA	IS:1622 (R.A.1996)

UOM – Unit of Measurement, BDL-Below Detectable Limit
"The results pertain to tested portion of sample"
Remark – All above parameter result are complying with required limit as per IS 10500: 2012 Standards.

Prepared By **Checked By** **Authorized Signatory**

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Excellent Enviro Laboratory & Research Center

Format No.:EELRC/F/WAR/84

SURFACE WATER ANALYSIS REPORT

Client's Name & Address	Report No.	EEL/ABD/WW-241/04/2019-20
M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Kharkhana Ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	12/04/2019

SAMPLING DETAILS

01) Location of Sampling	Godavari River (D/S)
02) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Center.
03) Date of Sampling	04/04/2019
04) Date of Received in lab	05/04/2019
05) Analysis Start Date	05/04/2019

RESULTS

Sr. No.	Characteristic	UOM	Results	Testing Method
1	Temperature	°C	28.5	APHA 2550 B
2	Colour	Hazen	10.0	IS 3025 (Part 4)(R.A.2002)
3	Turbidity	NTU	7.8	IS 3025 (Part 5) (R.A.2002)
4	Total Suspended Solids	mg/l	53.8	IS 3025 (Part-10)
5	Total Dissolved Solids	mg/l	134.67	IS 3025 (Part 16) (R.A.2006)
6	Total Solids	mg/l	195.47	IS3025 (Part 16)(R.A.2006)
7	pH	pH Unit	6.89	IS 3025 (Part 11)(R.A.2002)
8	Total Hardness (as CaCO3)	mg/l	114.8	IS 3025 (Part 21)(R.A.2009)
9	Total Alkalinity (as CaCO3)	mg/l	140	IS 3025 (Part 23)(R.A.2003)
10	Chloride (as Cl-)	mg/l	45.98	IS 3025(Part 32)(R.A.2003)
11	Chemical Oxygen Demand	mg/l	<10	IS 3025 (Part-58):2006
12	Biochemical Oxygen Demand (at 27degC for 3 days)	mg/l	2.8	IS 3025 (Part 44):1993
13	Sulphate (as SO4-2)	mg/l	39.08	APHA 22nd Edition(4500-So2 E)
14	Fluoride (as F)	mg/l	0.012	APHA 22nd Edition (4110 B)
15	Silica(SiO2)	mg/l	8.5	APHA4500 C-SiO2
16	Phosphate (as PO4)	mg/l	0.178	APHA 4500 –P D
17	Dissolved Oxygen	mg/l	6.8	IS 3025 (PART 38
18	Total Kjeldhal Nitrogen	mg/l	12.2	APHA 4500 N-NH3-C
19	Aluminum (as Al)	mg/l	0.03	IS 3025(Part 2)(2004)
20	Arsenic (as As)	mg/l	Nil	IS 3025(Part 2)(2004)
21	Calcium (as Ca)	mg/l	30.1	IS 3025(Part 2)(2004)
22	Cadmium (as Cd)	mg/l	Nil	IS 3025(Part 2)(2004)
23	Chromium (as Cr)	mg/l	Nil	IS 3025(Part 2)(2004)
24	Copper (as Cu)	mg/l	Nil	IS3025(Part 42)
25	Iron (as Fe)	mg/l	0.03	IS 3025(Part 2)(2004)
26	Mercury (as Hg)	mg/l	Nil	IS 3025(Part 2)(2004)
27	Magnesium (as Mg)	mg/l	7.3	IS 3025(Part 2)(2004)
28	Manganese (as Mn)	mg/l	Nil	IS 3025(Part 2)(2004)
29	Nickel (as Ni)	mg/l	0.0012	IS 3025 (Part 54)
30	Boron (as B)	mg/l	0.007	IS 3025 (Part-57)

31	Sodium (as Na)	mg/l	0.2	-
32	Selenium (as se)	mg/l	Nil	IS 3025 (Part-56)
33	Potassium (as K)	mg/l	0.05	IS 3025(Part 43)
34	Zinc (as Zn)	mg/l	Nil	IS 3025 (Part-49)
35	Total Coliform	MPN/100ml	25	IS 1622(R.A.1996)

UOM – Unit of Measurement, BDL-Below Detectable Limit

"The results pertain to tested portion of sample"

Remark – All above parameter result are complying with required limit as per IS 10500: 2012 Standards.

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Excellent Enviro Laboratory & Research Center

Format No.:EELRC/F/WAR/84

SURFACE WATER ANALYSIS REPORT

Client's Name & Address	Report No.	EEL/ABD/WW-242/04/2019-20
M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Kharkhana Ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	12/04/2019

SAMPLING DETAILS

01) Location of Sampling	Godavari River (U/S)
02) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Center.
03) Date of Sampling	04/04/2019
04) Date of Received in lab	05/04/2019
05) Analysis Start Date	05/04/2019

RESULTS

Sr. No.	Characteristic	UOM	Results	Testing Method
1	Temperature	°C	28.7	APHA 2550 B
2	Colour	Hazen	10.0	IS 3025 (Part 4)(R.A.2002)
3	Turbidity	NTU	4.9	IS 3025 (Part 5) (R.A.2002)
4	Total Suspended Solids	mg/l	57.8	IS 3025 (Part-10)
5	Total Dissolved Solids	mg/l	133.21	IS 3025 (Part 16) (R.A.2006)
6	Total Solids	mg/l	198.01	IS3025 (Part 16)(R.A.2006)
7	pH	pH Unit	7.03	IS 3025 (Part 11)(R.A.2002)
8	Total Hardness (as CaCO3)	mg/l	114.8	IS 3025 (Part 21)(R.A.2009)
9	Total Alkalinity (as CaCO3)	mg/l	140	IS 3025 (Part 23)(R.A.2003)
10	Chloride (as Cl-)	mg/l	45.99	IS 3025(Part 32)(R.A.2003)
11	Chemical Oxygen Demand	mg/l	<10	IS 3025 (Part-58):2006
12	Biochemical Oxygen Demand (at 27degC for 3 days)	mg/l	2.4	IS 3025 (Part 44):1993
13	Sulphate (as SO4-2)	mg/l	38.05	APHA 22nd Edition(4500-So2 E)
14	Fluoride (as F)	mg/l	0.011	APHA 22nd Edition (4110 B)
15	Silica(SiO2)	mg/l	8.5	APHA4500 C-SiO2
16	Phosphate (as PO4)	mg/l	0.023	APHA 4500 –P D
17	Dissolved Oxygen	mg/l	2.8	IS 3025 (PART 38
18	Total Kjeldhal Nitrogen	mg/l	36.5	APHA 4500 N-NH3-C
19	Aluminum (as Al)	mg/l	0.064	IS 3025(Part 2)(2004)
20	Arsenic (as As)	mg/l	Nil	IS 3025(Part 2)(2004)
21	Calcium (as Ca)	mg/l	30.1	IS 3025(Part 2)(2004)
22	Cadmium (as Cd)	mg/l	Nil	IS 3025(Part 2)(2004)
23	Chromium (as Cr)	mg/l	Nil	IS 3025(Part 2)(2004)
24	Copper (as Cu)	mg/l	Nil	IS3025(Part 42)
25	Iron (as Fe)	mg/l	0.02	IS 3025(Part 2)(2004)
26	Mercury (as Hg)	mg/l	Nil	IS 3025(Part 2)(2004)
27	Magnesium (as Mg)	mg/l	7.3	IS 3025(Part 2)(2004)
28	Manganese (as Mn)	mg/l	Nil	IS 3025(Part 2)(2004)
29	Nickel (as Ni)	mg/l	0.008	IS 3025 (Part 54)

30	Boron (as B)	mg/l	0.001	IS 3025 (Part-57)
31	Sodium (as Na)	mg/l	0.03	-
32	Selenium (as se)	mg/l	Nil	IS 3025 (Part-56)
33	Potassium (as K)	mg/l	0.5	IS 3025(Part 43)
34	Zinc (as Zn)	mg/l	Nil	IS 3025 (Part-49)
35	Total Coliform	MPN/100ml	17.0	IS 1622(R.A.1996)

UOM – Unit of Measurement, BDL-Below Detectable Limit

"The results pertain to tested portion of sample"

Remark – All above parameter result are complying with required limit as per IS 10500: 2012 Standards.

Prepared By **Checked By** **Authorized Signatory**

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EMS 14001 : 2015
OHSAS 45001: 2018
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By Govt. of India

Excellent Enviro Laboratory & Research Center

Format No.:EELRC/F/WAR/84

SURFACE WATER ANALYSIS REPORT

Client's Name & Address	Report No.	EEL/ABD/WW-243/04/2019-20
M/s. Karmayogi Ankushrao Tope Samarth Sahakari Sakhar Kharkhana Ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	12/04/2019

SAMPLING DETAILS

01) Location of Sampling	Canal Paithan
02) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Center.
03) Date of Sampling	04/04/2019
04) Date of Received in lab	05/04/2019
05) Analysis Start Date	05/04/2019

RESULTS

Sr. No.	Characteristic	UOM	Results	Testing Method
1	Temperature	°C	28.6	APHA 2550 B
2	Colour	Hazen	10	IS 3025 (Part 4)(R.A.2002)
3	Turbidity	NTU	0.8	IS 3025 (Part 5) (R.A.2002)
4	Total Suspended Solids	mg/l	6.8	IS 3025 (Part-10)
5	Total Dissolved Solids	mg/l	106.98	IS 3025 (Part 16) (R.A.2006)
6	Total Solids	mg/l	120.78	IS3025 (Part 16)(R.A.2006)
7	pH	pH Unit	7.89	IS 3025 (Part 11)(R.A.2002)
8	Total Hardness (as CaCO3)	mg/l	89.8	IS 3025 (Part 21)(R.A.2009)
9	Total Alkalinity (as CaCO3)	mg/l	112	IS 3025 (Part 23)(R.A.2003)
10	Chloride (as Cl-)	mg/l	37.99	IS 3025(Part 32)(R.A.2003)
11	Chemical Oxygen Demand	mg/l	<10	IS 3025 (Part-58):2006
12	Biochemical Oxygen Demand (at 27degC for 3 days)	mg/l	2.7	IS 3025 (Part 44):1993
13	Sulphate (as SO4-2)	mg/l	27.82	APHA 22nd Edition(4500-So2 E)
14	Fluoride (as F)	mg/l	0.01	APHA 22nd Edition (4110 B)
15	Silica(SiO2)	mg/l	9.26	APHA4500 C-SiO2
16	Phosphate (as PO4)	mg/l	0.022	APHA 4500 –P D
17	Dissolved Oxygen	mg/l	1.2	IS 3025 (PART 38
18	Total Kjeldhal Nitrogen	mg/l	11.3	APHA 4500 N-NH3-C
19	Aluminum (as Al)	mg/l	0.037	IS 3025(Part 2)(2004)
20	Arsenic (as As)	mg/l	Nil	IS 3025(Part 2)(2004)
21	Calcium (as Ca)	mg/l	23.5	IS 3025(Part 2)(2004)
22	Cadmium (as Cd)	mg/l	Nil	IS 3025(Part 2)(2004)
23	Chromium (as Cr)	mg/l	Nil	IS 3025(Part 2)(2004)
24	Copper (as Cu)	mg/l	Nil	IS3025(Part 42)
25	Iron (as Fe)	mg/l	0.11	IS 3025(Part 2)(2004)
26	Mercury (as Hg)	mg/l	Nil	IS 3025(Part 2)(2004)
27	Magnesium (as Mg)	mg/l	5.7	IS 3025(Part 2)(2004)
28	Manganese (as Mn)	mg/l	Nil	IS 3025(Part 2)(2004)
29	Nickel (as Ni)	mg/l	0.004	IS 3025 (Part 54)

30	Boron (as B)	mg/l	0.002	IS 3025 (Part-57)
31	Sodium (as Na)	mg/l	0.12	-
32	Selenium (as se)	mg/l	Nil	IS 3025 (Part-56)
33	Potassium (as K)	mg/l	0.09	IS 3025(Part 43)
34	Zinc (as Zn)	mg/l	Nil	IS 3025 (Part-49)
35	Total Coliform	MPN/100ml	25.0	IS 1622(R.A.1996)

UOM – Unit of Measurement, BDL-Below Detectable Limit

"The results pertain to tested portion of sample"

Remark – All above parameter result are complying with required limit as per IS 10500: 2012 Standards.

Prepared By **Checked By** **Authorized Signatory**

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Format No.: EELRC/F/SAR/84

SOIL ANALYSIS REPORT

Client's Name & Address	Report No.	EEL/ABD/SO-244/04/2019 -20
M/s. KarmayogiAnkushrao Tope Samarth SahakariSakharKharkhana Ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	12/04/2019

SAMPLING DETAILS

01) Location of Sampling	Project Site
02) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Center
03) Date of Sampling	04/04/2019
04) Time of Sampling	12:00 PM
05) Date of Received in Lab	05/04/2019
05) Analysis Start Date	05/04/2019

RESULTS

Sr. No.	Parameter	Units(s)	Results	Standard Method
Physical Characteristics				
1	Particle size distribution (%)	Total Sand	23	-
		Silt	29	-
		Clay	28	-
2	Textural class		Loam	-
3	Bulk density	(gm/cm3)	1.36	-
		Porosity (%)	48.9	-
4	Water Holding Capacity	(%)	38.9	-
5	Moisture Content	(%)	9.17	IS:2720(Part-2)-2010
6	Total Organic Matter	(%)	0.22	IS:2720 (Part-22)-1972
Chemical Characteristics				
7	pH		7.85	IS:2720 (Part-26)-1987
8	EC	µs/cm	0.15	-
9	Ca++	Mg/Kg	16.4	-
10	Mg++		1.94	-
11	Na++		50	-
12	Cl-		5.98	-

	Micro Nutrient			
13	Organic Carbon	(%)	0.13	-
14	N	Mg/Kg	196	-
15	P		12.28	-
16	K		621	-
17	Fe	(%)	6.21	As per Quality Test procedure(ICP)
18	Cu	mg/kg	0.46	As per Quality Test procedure(ICP)
19	Ni	Mg/kg	ND	As per Quality Test procedure(ICP)
20	Zn	Mg/kg	0.29	As per Quality Test procedure(ICP)
21	Pb	Mg/kg	ND	As per Quality Test procedure(ICP)
22	As	Mg/kg	ND	-
23	Al	Mg/kg	ND	-
24	Cr	Mg/kg	ND	As per Quality Test procedure(ICP)
25	Cd	Mg/kg	ND	As per Quality Test procedure(ICP)
26	Se	Mg/kg	ND	-
27	Hg	Mg/kg	ND	As per Quality Test procedure(ICP)
28	Ag	Mg/kg	ND	-
29	Mn	Mg/kg	4.15	As per Quality Test procedure(ICP)

UOM – Unit of Measurement
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SOIL ANALYSIS REPORT

Client's Name & Address	Report No.	EEL/ABD/SO-245/04/2019 -20
M/s. KarmayogiAnkushrao Tope Samarth SahakariSakharKharkhana Ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	12/04/2019

SAMPLING DETAILS

01) Location of Sampling	Shahgad
02) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Center
03) Date of Sampling	04/04/2019
04) Time of Sampling	12:15 PM
05) Date of Received in Lab	05/04/2019
05) Analysis Start Date	05/04/2019

RESULTS

Sr. No.	Parameter	Unit(s)	Results	Standard Method
Physical Characteristics				
1	Particle size distribution (%)	Total Sand	27	-
		Silt	51	
		Clay	22	-
2	Textural class		Loam	-
3	Bulk density	(gm/cm3)	1.32	-
		Porosity (%)	43.2	-
4	Water Holding Capacity	(%)	42.1	-
5	Moisture Content	(%)	2.5	IS:2720(Part-2)-2010
6	Total Organic Matter	(%)	1.29	IS:2720 (Part-22)-1972
Chemical Characteristics				
7	pH		7.09	IS:2720 (Part-26)-1987
8	EC	µs/cm	0.54	-
9	Ca++	Mg/Kg	18.1	-
10	Mg++	Mg/Kg	5.56	-
11	Na++	Mg/Kg	53	-
12	Cl-	Mg/Kg	12.96	-
Micro Nutrient				
13	Organic Carbon	(%)	0.54	--
14	N	Mg/Kg	159.1	-
15	P	Mg/Kg	7.6	-
16	K	Mg/Kg	371	-

Heavy Metals				
17	Fe	(%)	4.26	As per Quality Test procedure(ICP)
18	Cu	mg/kg	0.38	As per Quality Test procedure(ICP)
19	Ni	Mg/kg	ND	As per Quality Test procedure(ICP)
20	Zn	Mg/kg	0.23	As per Quality Test procedure(ICP)
21	Pb	Mg/kg	ND	As per Quality Test procedure(ICP)
22	As	Mg/kg	ND	-
23	Al	Mg/kg	ND	-
24	Cr	Mg/kg	ND	As per Quality Test procedure(ICP)
25	Cd	Mg/kg	ND	As per Quality Test procedure(ICP)
26	Se	Mg/kg	ND	-
27	Hg	Mg/kg	ND	As per Quality Test procedure(ICP)
28	Ag	Mg/kg	ND	-
29	Mn	Mg/kg	2.41	As per Quality Test procedure(ICP)

UOM – Unit of Measurement
"The results pertain to tested portion of sample"

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SOIL ANALYSIS REPORT

Client's Name & Address	Report No.	EEL/ABD/SO-246/04/2019 -20
M/s. KarmayogiAnkushrao Tope Samarth SahakariSakharKharkhana Ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	12/04/2019

SAMPLING DETAILS

01) Location of Sampling	Patharwala
02) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Center
03) Date of Sampling	04/04/2019
04) Time of Sampling	12:25 PM
05) Date of Received in Lab	05/04/2019
05) Analysis Start Date	05/04/2019

RESULTS

Sr. No.	Parameter	Units(s)	Results	Standard Method
	Physical Characteristics			
1	Particle size distribution (%)	Total Sand	26	-
		Silt	50	-
		Clay	24	-
2	Textural class		Loam	-
3	Bulk density	(gm/cm3)	1.31	-
		Porosity (%)	37.8	-
4	Water Holding Capacity	(%)	43.2	-
5	Moisture Content	(%)	1.24	IS:2720(Part-2)-2010
6	Total Organic Matter	(%)	0.22	IS:2720 (Part-22)-1972
	Chemical Characteristics			
7	pH		7.33	IS:2720 (Part-26)-1987
8	EC	µs/cm	0.19	-
9	Ca++	Mg/Kg	20.2	-
10	Mg++		2.92	-
11	Na++		12	-
12	Cl-		11.9	-

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Micro Nutrient				
13	Organic Carbon	(%)	0.22	-
14	N	Mg/Kg	156.3	-
15	P		6.9	-
16	K		245	-
17	Fe	(%)	4.12	As per Quality Test procedure(ICP)
18	Cu	mg/kg	0.29	As per Quality Test procedure(ICP)
19	Ni	Mg/kg	ND	As per Quality Test procedure(ICP)
20	Zn	Mg/kg	0.23	As per Quality Test procedure(ICP)
21	Pb	Mg/kg	ND	As per Quality Test procedure(ICP)
22	As	Mg/kg	ND	-
23	Al	Mg/kg	ND	-
24	Cr	Mg/kg	ND	As per Quality Test procedure(ICP)
25	Cd	Mg/kg	ND	As per Quality Test procedure(ICP)
26	Se	Mg/kg	ND	-
27	Hg	Mg/kg	ND	As per Quality Test procedure(ICP)
28	Ag	Mg/kg	ND	-
29	Mn	Mg/kg	2.31	As per Quality Test procedure(ICP)

UOM – Unit of Measurement
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Format No.: EELRC/F/SAR/84

SOIL ANALYSIS REPORT

Client's Name & Address	Report No.	EEL/ABD/SO-247/04/2019 -20
M/s. KarmayogiAnkushrao Tope Samarth SahakariSakharKharkhana Ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	12/04/2019

SAMPLING DETAILS

01) Location of Sampling	Kuran
02) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Center
03) Date of Sampling	04/04/2019
04) Time of Sampling	12:35 PM
05) Date of Received in Lab	05/04/2019
05) Analysis Start Date	05/04/2019

RESULTS

Sr. No.	Parameter	Unit(s)	Results	Standard Method
Physical Characteristics				
1	Particle size distribution (%)	Total Sand	29	-
		Silt	48	-
		Clay	23	-
2	Textural class		Loam	-
3	Bulk density	(gm/cm3)	1.28	-
		Porosity (%)	35.2	-
4	Water Holding Capacity	(%)	40.1	-
5	Moisture Content	(%)	3.77	IS:2720(Part-2)-2010
6	Total Organic Matter	(%)	0.44	IS:2720 (Part-22)-1972

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Chemical Characteristics				
7	pH		7.22	IS:2720 (Part-26)-1987
8	EC	µs/cm	0.23	-
9	Ca++	Mg/Kg	24.1	-
10	Mg++	Mg/Kg	2.92	-
11	Na++	Mg/Kg	30	-
12	Cl-	Mg/Kg	9.82	-
Micro Nutrient				
13	Organic Carbon	(%)	0.26	-
14	N	Mg/Kg	125.6	-
15	P		5.3	-
16	K		196	-
17	Fe	(%)	2.96	As per Quality Test procedure(ICP)
18	Cu	mg/kg	0.26	As per Quality Test procedure(ICP)
19	Ni	Mg/kg	ND	As per Quality Test procedure(ICP)
20	Zn	Mg/kg	0.15	As per Quality Test procedure(ICP)
21	Pb	Mg/kg	ND	As per Quality Test procedure(ICP)
22	As	Mg/kg	ND	-
23	Al	Mg/kg	ND	-
24	Cr	Mg/kg	ND	As per Quality Test procedure(ICP)
25	Cd	Mg/kg	ND	As per Quality Test procedure(ICP)
26	Se	Mg/kg	ND	-
27	Hg	Mg/kg	ND	As per Quality Test procedure(ICP)
28	Ag	Mg/kg	ND	-
29	Mn	Mg/kg	1.98	As per Quality Test procedure(ICP)

UOM – Unit of Measurement
"The results pertain to tested portion of sample"

Prepared By **Checked By** **Authorized Signatory**

Format No.: EELRC/F/SAR/84

SOIL ANALYSIS REPORT

Client's Name & Address	Report No.	EEL/ABD/SO-248/04/2019 -20
M/s. KarmayogiAnkushrao Tope Samarth SahakariSakharKharkhana Ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	12/04/2019

SAMPLING DETAILS

01) Location of Sampling	Nalewadi
02) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Center
03) Date of Sampling	04/04/2019
04) Time of Sampling	12:45 PM
05) Date of Received in Lab	05/04/2019
05) Analysis Start Date	05/04/2019

RESULTS

Sr. No.	Parameter	Unit(s)	Results	Standard Method
	Physical Characteristics			
1	Particle size distribution (%)	Total Sand	30	-
		Silt	49	-
		Clay	21	-
2	Textural class		Loam	-
3	Bulk density	(gm/cm3)	1.35	-
		Porosity (%)	38.1	-
4	Water Holding Capacity	(%)	36.3	-
5	Moisture Content	(%)	1.93	IS:2720(Part-2)-2010
6	Total Organic Matter	(%)	0.55	IS:2720 (Part-22)-1972
	Chemical Characteristics			
7	pH		7.36	IS:2720 (Part-26)-1987
8	EC	µs/cm	0.67	-
9	Ca++	Mg/Kg	16.3	-
10	Mg++		3.86	-
11	Na++		24	-
12	Cl-		4.92	-

Micro Nutrients				
13	Organic Carbon	(%)	0.32	-
14	N	Mg/Kg	153.4	-
15	P		7.4	-
16	K		334	-
17	Fe	(%)	4.53	As per Quality Test procedure(ICP)
18	Cu	mg/kg	0.35	As per Quality Test procedure(ICP)
19	Ni	Mg/kg	ND	As per Quality Test procedure(ICP)
20	Zn	Mg/kg	0.22	As per Quality Test procedure(ICP)
21	Pb	Mg/kg	ND	As per Quality Test procedure(ICP)
22	As	Mg/kg	ND	-
23	Al	Mg/kg	ND	-
24	Cr	Mg/kg	ND	As per Quality Test procedure(ICP)
25	Cd	Mg/kg	ND	As per Quality Test procedure(ICP)
26	Se	Mg/kg	ND	-
27	Hg	Mg/kg	ND	As per Quality Test procedure(ICP)
28	Ag	Mg/kg	ND	-
29	Mn	Mg/kg	2.53	As per Quality Test procedure(ICP)

UOM – Unit of Measurement

"The results pertain to tested portion of sample"

Prepared By

Checked By

Authorized Signatory

Excellent Enviro Laboratory & Research Centre
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Format No.: EELRC/F/SAR/84

SOIL ANALYSIS REPORT

Client's Name & Address	Report No.	EEL/ABD/SO-249/04/2019 -20
M/s. KarmayogiAnkushrao Tope Samarth SahakariSakharKharkhana Ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	12/04/2019

SAMPLING DETAILS

01) Location of Sampling	SashtPimplegaon
02) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Center
03) Date of Sampling	04/04/2019
04) Time of Sampling	12:55 PM
05) Date of Received in Lab	05/04/2019
05) Analysis Start Date	05/04/2019

RESULTS

Sr. No.	Parameter	Unit(s)	Results	Standard Method
	Physical Characteristics			
	Particle size distribution (%)	Total Sand	25	-
		Silt	48	-
		Clay	27	-
1	Textural class		Loam	-
2	Bulk density	(gm/cm3)	1.34	-
		Porosity (%)	36.3	-
3	Water Holding Capacity	(%)	37.8	-
4	Moisture Content	(%)	3.01	IS:2720(Part-2)-2010
5	Total Organic Matter	(%)	1.28	IS:2720 (Part-22)-1972
	Chemical Characteristics			
6	pH		8.16	IS:2720 (Part-26)-1987
7	EC	µs/cm	0.21	-
8	Ca++	Mg/Kg	20.2	-
9	Mg++		2.9	-
10	Na++		21	-
11	Cl-		5.36	-

Micro Nutrient				
12	Organic Carbon	(%)	0.74	-
13	N	Mg/Kg	168.9	-
14	P		12	-
15	K		543	-
16	Fe	(%)	5.23	As per Quality Test procedure(ICP)
17	Cu	mg/kg	0.39	As per Quality Test procedure(ICP)
18	Ni	Mg/kg	ND	As per Quality Test procedure(ICP)
19	Zn	Mg/kg	0.26	As per Quality Test procedure(ICP)
20	Pb	Mg/kg	ND	As per Quality Test procedure(ICP)
21	As	Mg/kg	ND	-
22	Al	Mg/kg	ND	-
23	Cr	Mg/kg	ND	As per Quality Test procedure(ICP)
24	Cd	Mg/kg	ND	As per Quality Test procedure(ICP)
25	Se	Mg/kg	ND	-
26	Hg	Mg/kg	ND	As per Quality Test procedure(ICP)
27	Ag	Mg/kg	ND	-
28	Mn	Mg/kg	2.49	As per Quality Test procedure(ICP)

UOM – Unit of Measurement
"The results pertain to tested portion of sample"

Prepared By

Checked By

Authorized Signatory

Excellent Enviro Laboratory & Research Centre
D-52/18, MIDC, Waluj, Aurangabad.

REGISTERED OFFICE :
D-52/18, MIDC Waluj, Aurangabad - 431 136.
Ph. 0240-6641879
9970429991

MUMBAI OFFICE
Dhawalgiri Co-op, Hsg. Society, Building No.1, Flat No. B-3, Near Peace Park Hotel, Thana Naka, Panvel - 410 206
9970429991

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Block No.16/17, A WING. 1st Floor, Sagar Complex, Nasik Phata, Kasarwadi, Pune - 411034.
9970429991

Website : www.eelab.in/ eelab@excellentenviro.com

Accredition & Approvals
ISO 9001: 2015
EMS 14001 : 2015
OHSAS 45001: 2018
NABL & MOEF & CC approved laboratory By Govt. of India

Format No.: EELRC/F/SAR/84

SOIL ANALYSIS REPORT

Client's Name & Address	Report No.	EEL/ABD/SO-250/04/2019 -20
M/s. KarmayogiAnkushrao Tope Samarth SahakariSakharKharkhana Ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	12/04/2019

SAMPLING DETAILS

01) Location of Sampling	ParthawalaKh.
02) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Center
03) Date of Sampling	04/04/2019
04) Time of Sampling	13:05 PM
05) Date of Received in Lab	05/04/2019
05) Analysis Start Date	05/04/2019

RESULTS

Sr. No.	Parameter	Unit(s)	Results	Standard Method
	Physical Characteristics			
1	Particle size distribution (%)	Total Sand	26	-
		Silt	50	-
		Clay	24	-
2	Textural class		Loam	-
3	Bulk density	(gm/cm3)	1.38	-
		Porosity (%)	37.1	-
4	Water Holding Capacity	(%)	38.9	-
5	Moisture Content	(%)	1.39	IS:2720(Part-2)-2010
6	Total Organic Matter	(%)	1.18	IS:2720 (Part-22)-1972
	Chemical Characteristics			
7	pH		7.34	IS:2720 (Part-26)-1987
8	EC	µs/cm	0.22	-
9	Ca++	Mg/Kg	24.2	-
10	Mg++		3.82	-
11	Na++		42	-
12	Cl-		3.86	-

Micro Nutrient				
13	Organic Carbon	(%)	0.69	-
14	N	Mg/Kg	174.3	-
15	P		11.8	-
16	K		504	-
17	Fe	(%)	5.3	As per Quality Test procedure(ICP)
18	Cu	mg/kg	0.38	As per Quality Test procedure(ICP)
19	Ni	Mg/kg	ND	As per Quality Test procedure(ICP)
20	Zn	Mg/kg	0.25	As per Quality Test procedure(ICP)
21	Pb	Mg/kg	ND	As per Quality Test procedure(ICP)
22	As	Mg/kg	ND	-
23	Al	Mg/kg	ND	-
24	Cr	Mg/kg	ND	As per Quality Test procedure(ICP)
25	Cd	Mg/kg	ND	As per Quality Test procedure(ICP)
26	Se	Mg/kg	ND	-
27	Hg	Mg/kg	ND	As per Quality Test procedure(ICP)
28	Ag	Mg/kg	ND	-
29	Mn	Mg/kg	3.21	As per Quality Test procedure(ICP)

UOM – Unit of Measurement
"The results pertain to tested portion of sample"

Prepared By

Checked By

Authorized Signatory

Excellent Enviro Laboratory & Research Centre
D-52/18, MIDC, Waluj, Aurangabad.

Format No.: EELRC/F/SAR/84

SOIL ANALYSIS REPORT

Client's Name & Address	Report No.	EEL/ABD/SO-251/04/2019 -20
M/s. KarmayogiAnkushrao Tope Samarth SahakariSakharKharkhana Ltd. Post-Ankushnagar, Tal-Ambad, Dist-Jalna.	Date of Reporting	12/04/2019

SAMPLING DETAILS

01) Location of Sampling	Mahakala
02) Sample Collected By	M/s. Excellent Enviro Laboratory & Research Center
03) Date of Sampling	04/04/2019
04) Time of Sampling	13:15 PM
05) Date of Received in Lab	05/04/2019
05) Analysis Start Date	05/04/2019

RESULTS

Sr. No.	Parameter	Unit(s)	Results	Standard Method
	Physical Characteristics			
1	Particle size distribution (%)	Total Sand	29	-
		Silt	48	-
		Clay	23	-
2	Textural class		Loam	-
3	Bulk density	(gm/cm3)	1.38	-
		Porosity (%)	37.1	-
4	Water Holding Capacity	(%)	38.9	-
5	Moisture Content	(%)	1.39	IS:2720(Part-2)-2010
6	Total Organic Matter	(%)	1.18	IS:2720 (Part-22)-1972

Chemical Characteristics				
7	pH		7.34	IS:2720 (Part-26)-1987
8	EC	µs/cm	0.22	-
9	Ca++	Mg/Kg	24.2	-
10	Mg++		3.82	-
11	Na++		42	-
12	Cl-		3.86	-
Micro Nutrient				
13	Organic Carbon	(%)	0.69	-
14	N	Mg/Kg	174.3	-
15	P		11.8	-
16	K		504	-
17	Fe	(%)	5.3	As per Quality Test procedure(ICP)
18	Cu	mg/kg	0.38	As per Quality Test procedure(ICP)
19	Ni	Mg/kg	ND	As per Quality Test procedure(ICP)
20	Zn	Mg/kg	0.25	As per Quality Test procedure(ICP)
21	Pb	Mg/kg	ND	As per Quality Test procedure(ICP)
22	As	Mg/kg	ND	-
23	Al	Mg/kg	ND	-
24	Cr	Mg/kg	ND	As per Quality Test procedure(ICP)
25	Cd	Mg/kg	ND	As per Quality Test procedure(ICP)
26	Se	Mg/kg	ND	-
27	Hg	Mg/kg	ND	As per Quality Test procedure(ICP)
28	Ag	Mg/kg	ND	-
29	Mn	Mg/kg	3.21	As per Quality Test procedure(ICP)

UOM – Unit of Measurement
"The results pertain to tested portion of sample"

Prepared By

Checked By

Authorized Signatory

Excellent Enviro Laboratory & Research Centre
D-52/18, MIDC, Waluj, Aurangabad.

National Accreditation Board for Education and Training

(Member - International Accreditation Forum & Pacific Accreditation Cooperation)

Ref. No. - QCI/NABET/ENV/ACO/19/1019 July 30, 2019

To,

Building Environment India Pvt. Ltd.
4th Floor, Plot No.2, Dakshina Building,
Sector 11, C.B.D Belapur, Navi Mumbai – 400614, Maharashtra

Sub: Accreditation of EIA Consultant Organizations under NABET Scheme

Ref.: Your application dated May 24, 2018, subsequent correspondence on subject and office assessment at your premises on November 20-23, 2018.

Dear Sir,

QCI-NABET is hereby pleased to accredit **Building Environment India Pvt. Ltd., Navi Mumbai** as Category – A organization. Details of Sectors are mentioned in the Certificate of Accreditation.

The validity of accreditation is subject to continued compliance to the Scheme and the terms & conditions mentioned in **Annexure I to IV.**

NABET look forward for your association and continued support.

With best regards,

30/07/2019

A K Jha
Senior Director
QCI- NABET

Quality Council of India

National Accreditation Board for Education & Training

CERTIFICATE OF ACCREDITATION

Building Environment India Pvt. Ltd.

4th Floor, Plot No.2, Dakshina Building,
Sector 11, C.B.D Belapur, Navi Mumbai – 400614, Maharashtra

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	Onshore oil and gas exploration, development & production	2	1 (b)	A
2	Thermal power plants	4	1 (d)	A
3	Petroleum refining industry	10	4 (a)	A
4	Synthetic organic chemicals industry (dyes & 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
5	Distilleries	22	5 (g)	A
6	Pulp & paper industry excluding manufacturing	24	5(i)	A
7	Sugar Industry	25	5(j)	B
8	Industrial estates/ parks/ complexes/ Areas, export processing Zones (EPZs), Special economic zones (SEZs), Biotech Parks, leather Complexes	31	7 (c)	A
9	Ports, harbours, break waters and dredging	33	7(e)	A
10	Highways	34	7 (f)	A
11	Common municipal solid waste management facility (CMSWMF)	37	7 (i)	B
12	Building and construction projects	38	8 (a)	B
13	Townships and Area development projects	39	8 (b)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RA AC minutes dated December 07, 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/19/1019 dated July 30, 2019. The accreditation needs to be renewed before the expiry date by Building Environment India Pvt. Ltd., Navi Mumbai, following due process of assessment.

Sr. Director, NABET
Dated: July 30, 2019

Certificate No.
NABET/ EIA/1821/ RA 0133

Valid till
28.11.2021

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.

Annexure-I

Ref. No. - QCI/NABET/ENV/ACO/19/1019
Date - July 30, 2019
Name of organization: **Building Environment India Pvt. Ltd., Navi Mumbai**

Accreditation under NABET Scheme for EIA Consultant Organization

Marks obtained in various aspect of Re-Accreditation Assessment

Sl. No.	Aspect	Marks Scored	Out of
1.	Quality and performance of personnel		
	EIA Coordinator/s	6.08	10
	Functional Area Expert/s	6.0	10
2.	Quality Management System	11.72	15
3.	Field investigation and Laboratory system to ensure data integrity	10.1	20
4.	Quality of EIA	16.38	30
5.	Organizational commitment	4.7	5
6.	Improvements achieved	6.5	10
	Total	**61.48**	**100**
	Overall Score	**61.48 %**	

The organization has scored more than 60% overall marks therefore, accredited with Category A.

Annexure-II

Ref. No. - QCI/NABET/ENV/ACO/19/1019
Date – July 30, 2019
Name of organization: **Building Environment India Pvt. Ltd., Navi Mumbai**

Accreditation under NABET Scheme for EIA Consultant Organization

List of Experts

EIA Coordinators (ECs)

Assessed as per RA norms – for ECs approved earlier:

S. No.	Name	Earlier approval status (SA/subsequently)		Current approval status (after RA)		Remarks
		Sector	Cat.	Status	Cat.	
In-house						
1	Pravin Bapuraoji Gathe	38	B	Renewed	B	None
		39	B	Renewed	B	
2	Hrushikesh Shrikant Kolatkar	31	A	Renewed	A	None
		34	A	Renewed	A	
		38	B	Renewed	B	
		39	B	Renewed	B	
3	Ashvin Duryodhan Badge	38	B	Renewed	B	None
4	Vivek Sadanand Kulkarni	38	B	Renewed	B	Obs. Confused between aspects & impacts. Not clear about evaluation of impacts. Does not have a clear concept of EMP
		39	B	Renewed	B	
5	Kapil Dwarka Awtani	4	-	-		Absent during interaction

Assessed as per IA norms – for new sectors of approved ECs and fresh ECs proposed:

Sl. No.	Name	Sectors			Cat.	Remarks
		Applied	Recommended	Approved		
In-house						
1	Nilesh Vitthal Potdar	2	Yes	Yes	A	Onshore only
		4	Yes	Yes	A	None
		10	Yes	Yes	A	None
		37	Yes	Yes	B	None
2	Vivek Sadanand Kulkarni	34	Yes	Yes	A	None
3	Ashvin Duryodhan Badge	25	Yes	Yes	B	None
		22	Yes	Yes	A	
4	Pravin Bapuraoji Gathe	31	-	-	-	Candidature withdrawn
5	Amrita Kulabhi	38	-	-	-	Absent during interaction
		39				
6	Anju Sandip Patil	38	No	No	-	Not recommended for approval as EC for sector 38 due to inadequate overall EIA related experience
7	Sunil Maruti Belvekar	33	No	No	-	Not recommended for approval as EC for sector 33 due to inadequate overall EIA related experience
8	Shraddha Pravin Gathe	38	No	No	-	Not recommended for approval as EC for sector 38 due to inadequate overall EIA related experience
9	Suvidha Vikas Patil	38	No	No	-	Not recommended for approval as EC for sectors 38 and 39 due to inadequate overall EIA related experience
		39				
10	Amol Vijakumar Kulkarni	38	No	No	-	Not recommended for approval as EC for sector 38 due to inadequate overall EIA related experience
Empanelled						
11	Sanjay Rambhau Shevkar	4	Yes	Yes	A	None
		21	Yes	Yes	A	None
		24	Yes	Yes	A	None
		33	Yes	Yes	A	None
		34	Yes	Yes	A	None
12	Yogeshwari Ashwanikumar Bhat	33	Yes	Yes	B	None
13	Anjali Ajay Singam	8	-	-	-	Absent during interaction

Functional Areas (FA) approved for Functional Area Experts (FAEs):

Assessed as per RA norms – for FAEs approved earlier:

Sl. No.	Name	Earlier approval status		Approval status after RA		Remarks
		FAs approved in SA/subsequently	Cat.	Status	Cat.	
In-house						
1	Amrita Kulabhi	EB	-	-	-	Absent during interaction
		MSW	-	-	-	
2	Pravin Bapuraoji Gathe	EB	B	Renewed	B	None
3	Shraddha Pravin Gathe	SC	A	Renewed	A	None
4	Hrushikesh Shrikant Kolatkar	LU	A	Renewed	A	None
		SE	A	Renewed	A	
5	Vivek Sadanand Kulkarni	EB	A	Renewed	A	None
6	Rashmi Hrushikesh Kolatkar	LU	B	Renewed	B	None
7	Kapil Dwarka Awtani	AP	-	-	-	Candidature withdrawn
		AQ	-	-	-	
		MSW	-	-	-	
8	Nilesh Vitthal Potdar	AQ	A	Renewed	A	None
		RH	A	Renewed	A	None
		SHW	A	Renewed	A	SW only Not recommended for approval for FA – HW and BMW due to inadequate experience
9	Sandhya Clemente	EB	A	Renewed	A	None
Empanelled						
10	Sanjay Rambhau Shevkar	SHW	A	Renewed	A	None
		WP	A	Renewed	A	
11	Chintan Kamalakar Athalye	NV	A	Renewed	A	None

Assessed as per IA norms – approved experts for new functional areas and fresh FAEs proposed:

Sl. No.	Name	Functional Areas			Cat	Remarks
		Applied	Recommended	Approved		
In-house						
1	Ashvin Duryodhan Badge	AP	Yes	Yes	A	None
		AQ	Yes	Yes	B	None
		RH	No	No	-	Not recommended for approval as FAE – RH

Sl. No.	Name	Functional Areas			Cat	Remarks
		Applied	Recommended	Approved		
						due to inadequate EIA related experience in the FA
2	Rashmi Hrushikesh Kolatkar	SE	No	No	-	Not recommended for approval as FAE – SE due to inadequate comprehension of the FA and its related Environmental aspects
3	Amol Vijaykumar Kulkarni	EB	Yes	Yes	B	None
		SC	Yes	Yes	B	
4	Pravin Bapuraoji Gathe	SC	No	No	-	Not recommended for approval as FAE – SC due to inadequate EIA related experience
5	Pratik Nagesh Deshpande	AQ	Yes	Yes	B	None
		HG	Yes	Yes	B	
6	Nimisha Kedarnath Rao Ghorpade	EB	Yes	Yes	B	None
		WP	No	No	-	Not recommended for approval as FAE – WP due to inadequate comprehension of the FA and its related Environmental aspects
7	Mahalaxmi Siddheshwar Nilange	WP	Yes	Yes	B	None
		RH	No	No	-	Not recommended for approval as FAE – RH due to inadequate comprehension of the FA and its related Environmental aspects
8	Ketaki Ashok Patil	WP	Yes	Yes	B	None
9	Amrita Kulabhi	SHW	-	-	-	Absent during interaction
10	Suvidha Vikas Patil	MSW	Yes	Yes	B	SW only
11	Dilip Dinesh Shenai	WP	-	-	-	Left the Organization
		EB				
12	Aditya Vijay Athavale	HG	No	No	-	Not recommended for approval as FAE- HG and GEO due to inadequate overall EIA related experience in the FAs
		GEO	No	No	-	

Sl. No.	Name	Functional Areas			Cat	Remarks
		Applied	Recommended	Approved		
13	Anju Sandip Patil	SHW	No	No	-	Not recommended for approval as FAE – SHW due to inadequate comprehension of the FA and its related Environmental aspects
		WP	No	No	-	Not recommended for approval as FAE- WP due to inadequate overall EIA related experience in the FAs
14	Sunil Maruti Belvekar	EB	Yes	Yes	B	None
Empanelled						
15	Sanjay Rambhau Shevkar	Noise	Yes	Yes	A	None
		AP	Yes	Yes	A	
16	Yogeshwari Ashwani Kumar	SHW	No	No	-	Not recommended for approval as FAE – SHW, AP and EB due to inadequate experience in the FAs
		AP	No	No	-	
		EB	No	No	-	
17	Bhushan Onkarsingh Kachawe	HG	Yes	Yes	A	None
		GEO	Yes	Yes	A	
		LU	Yes	Yes	A	
		SC	Yes	Yes	B	

Functional Area Associates (FAAs)

a. FAAs approved earlier:

Sl. No.	Name	Approval status (after SA)		FAE/Mentor	Remarks
		Applied	Approved		
In-house					
1	Ashok Shamrao Bandagar	AQ	Yes	Nilesh Vitthal Potdar	None
2	Akanksha Mohan Kanade	SW	Yes	Saurabh Kumar Garg	None
		WP	Yes	Sanjay Rambhau Shevkar	
3	Priyanka Dattatray Naikodi	SW	Yes	Saurabh Kumar Garg	None
		AP	Yes	Ashvin Duryodhan Badge	
4	Meera Mahesh Anjarlekar	EB	Yes	Vivek Sadanand Kulkarni	None
		SW	Yes	Saurabh Kumar Garg	

Sl. No.	Name	Approval status (after SA)		FAE/Mentor	Remarks
		Applied	Approved		
5	Sneha Surendra kumar Boudh	SW	Yes	Sanjay Rambhau Shevkar	None
		WP	Yes	Sanjay Rambhau Shevkar	
6	Suvidha Vikas Patil	WP	Yes	Ketaki Ashok Patil	

b. **FAAs Proposed:**

Sl. No.	Name	Approval status (after SA)		FAE/Mentor	Remarks
		Applied	Approved		
In-house					
1	Sanket Dilip Awasare	NV	Yes	Chintan Kamalakar Athalye	None
		LU	-	-	Recommended as Team Member
2	Sarthak Rajesh Dange	AP	Yes	Ashvin Duryodhan Badge	None
		LU	Yes	Rashmi Hrushikesh Kolatkar	
3	Anand Shrikant Kirpekar	GEO	-	-	Candidature withdrawn
		HG	-	-	
4	Ashok Shamrao Bandagar	AP	Yes	Ashvin Duryodhan Badge	None

30/07/2019

A K Jha
Senior Director
QCI- NABET

Annexure-III

Ref. No. - QCI/NABET/ENV/ACO/19/1019
Date – July 30, 2019
Name of organization: **Building Environment India Pvt. Ltd, Navi Mumbai**

Accreditation under NABET Scheme for EIA Consultant Organization

Non-Conformances/ Observations: Response to be submit by the ACO with root cause analysis/ corrective and preventive action plans by **October 29, 2019.**

Sl. No.	NC/ Observation	Response of ACO
Observation/s (Obs)		
1.	**Quality Management System:** a. **Performance measurement and review:** KPIs should be defined clearly. Identify quality elements of an EIA Report and establish a procedure for evaluating the quality of EIA report. b. **Action taken to address non-conformities:** Implementation of the procedure should emphasise rootcause analysis. Eg. response to F2 NCs shows that no such analysis was done. c. **Collection and measurement of primary data:** Procedures should explain the "how" to carry out the task. d. **Laboratory work for base line data:** Establish a procedure for quality assurance of the Lab data; this procedure should address both data verification & validation	
2.	**Field investigation and laboratory arrangement:** a. **Primary data:** **Physical Environment – Compliance to methodology for:** 1. Collecting primary data - involvement of ECs & FAEs in selection of sampling locations, type of samples, parameters to be tested etc.: Involvement of ECs & FAEs not evidenced. 2. Quality assurance - including in collection, preservation and transportation of samples: No quality assurance method exists for sample preservation & transportation. 3. Interpretation of data (including statistical analysis to	

	arrive at meaningful information): Interpretation is confined to compliance with legal & other requirements. **b. Secondary Data for Ecological & Social Environment:** 1. **Interpretation of data in EIA context** – The ACO should strive to identify the impacts of the project on EB & SE and evaluate them.	
3.	**EIA assessed during Re-Accreditation-** **EIA 1: EIA Report for for Dhotre to Nagpur -Mumbai Package IV, Nashik, Maharashtra** • No site history given. Labels for the maps are smudgy and not readable. • Sampling methods, Sample preservation & transportation requirements have not been described. CPCB guidelines are mentioned without proper reference. For much of secondary data proper reference has not been given. • Concepts of impacts, their identification quantification, evaluation need to be understood clearly and implemented • Emergency plan for accidents on the highway is provided. This does not cover accidents involving transported chemicals. • EMPs need to be structured to show the objective, responsibility, time frame, resources, performance indicators, monitoring mechanism, review & maintenance. **EIA 2: EIA/EMP for Expansion/Amendment of Mixed Use Development Project, proposed expansion / amendment of Mixed Use Development Project "Ashok Meadows & Godrej 24"** • Project history provided; site described however, surroundings not presented; provided project layout, not specified environmentally sensitive areas. • alternate eco-friendly construction materials not discussed • EIA methodology described however, customized methodologies for various FAs not described. No QA for samples collection and analysis. Water samples	

	analysis incomplete and not as per IS 10,500. Sec. data referred in text however, tables not referred • Baseline data interpretation limited to standards and not with samples site surroundings. There is no proper data interpretation. No clarity on impacts and its quantification • EB data interpreted partially. No biodiversity of species calculated. Impacts not identified except positive impacts due to plantation of trees. No impacts quantified on SE aspects. • RH chapter covered in 15 pages all theoretical. No RH analysis done during construction and operational phase. DMP has been discussed in great detail which is bookish text and not related with project. • EMP described without time frame for implementation, resources required, etc. Needs to be framed properly with clear cut responsibility, indicators for monitoring, review mechanism, etc. Budgetary provision provided without justification. • Generally complied except TOR No. 9 - No details provided.	
4.	**Improvements Achieved-** • **Description of Project site & Environmental Settings:** Legends on maps are smudgy • **Interpretation and utilization of BD in prediction of impacts** (qualitative & quantitative) and recommendation of mitigation measures (Physical Environment -Air, Water, Noise, Soil, EB & SE) - The ACO has to improve his understanding of impacts, their evaluation, mitigation measures & EMP. • **EMP & Environmental Monitoring Plan (EMoP) with budgetary provisions** - Concept of EMP has not been followed by the ACO.	

Annexure-IV

Ref. No. - QCI/NABET/ENV/ACO/19/1019
Date – July 30, 2019
Name of organization: **Building Environment India Pvt. Ltd., Navi Mumbai**

Accreditation under NABET Scheme for EIA Consultant Organization

Terms and conditions

The accreditation of **Building Environment India Pvt. Ltd., Navi Mumbai** as EIA Consultant Organization is subject to compliance to requirements of QCI – NABET Scheme as per Version - 3 and following conditions but not limited to:

1. The Accredited consultant organization (ACO) must have minimum 3 (three) approved In-house experts (one EC and two other FAEs). In case of any shortfall to above requirement at any point of time, NABET must be informed and the shortfall made up within one month.
2. All core functional areas (FAs) must be covered by in-house (IH) experts. However, significant FAs may be covered by IH/empaneled experts as per Annexure IIA of Version 3 of the Scheme.
3. As per provisions of the Scheme, surveillance assessment will be carried out 18 months after IA and assessment for reaccreditation after 36 months of IA. The same cycle of assessment will continue after RA. Completed application is required to be submitted 3 months prior to the due date of assessment. Onus of getting accreditation continued after SA and re-accreditation on time rests with the ACOs.
4. An ACO is required to take up EIA assignments in the accredited category and sectors only. Any deviation viz., taking up EIAs in unapproved sector/s or category, using un-approved EC/FAE shall be considered as a Non-Conformance (NC). Repetition of such NCs will invite stringent action including revoking the accreditation awarded to the organization and approval to the expert/s concerned.
5. Field investigation and Laboratory arrangements:
    a. The EC and relevant FAEs of the ACO must visit the project site for appropriate duration, both prior to and during the process of collection of primary data and ground verification of secondary data. The role of ECs and FAEs in this aspect is detailed in the Scheme and must be adhered to. All ECs, FAEs, FAAs and Team members must maintain a field note book and record relevant information during the visits to the site. These will be seen by NABET assessors during the next assessment.
    b. An ACO must use NABL accredited/ MoEFCC recognized laboratories only for monitoring physical environment baseline data.

c. If an external laboratory is to be used, a MoU must be signed with the laboratory specifying, scope of work mentioning parameters covered, whether sample collection, preservation, transportation is included, period of association and financial terms. The MoU should be signed by the CEOs/ authorized signatories of the two organizations.

d. ACO using internal NABL accredited/ MoEFCC recognized laboratories should have protocols for selection of sampling locations, collection, preservation, transportation. These protocols must be applicable for external laboratories where collection, preservation and transportation of samples is not covered in the scope of the laboratory.

e. The work carried out by the laboratory for each project must be documented and signed by the authorized signatory on behalf of the laboratory. Such documents must be available with the ACO for inspection by NABET assessors.

f. The name of laboratory and analysis result signed by head of the laboratory must be included in all EIA reports prepared by the ACO.

g. Biotic Environment and Socio- Economic data: As a part of Quality Management System (QMS), the ACO must have written down methodologies for collection of primary data on Biotic and Socio Economic environment including field equipment, accessories, questionnaire, interview formats etc. to be used for studies/ surveys and ground validation of secondary data.

6. Systems/ procedures documented in the QMS of the ACO must be implemented meticulously.

7. For In-house experts, detailed records of Appointment Letter with definite terms and conditions, joining letter from the expert and attendance record are to be maintained by the organization. "An In-house expert is defined as a full time employee working on the pay rolls of the organization on regular basis (not on time to time/ as an when required/ assignment basis) and is paid appropriately as per his/her qualification and experience".

8. The ACO must ensure empaneled experts approved for/proposed by them are not associated with more than 4 other EIA Consultant Organizations. MoUs are to be signed between the ACO and concerned empaneled experts giving the name of expert, scope of work, terms and period of engagement.

9. All payments to experts, both in-house and empaneled shall be made by cheque/ bank transfer and relevant records to be maintained by the ACO.

10. The name of EIA Coordinators (EC) and FAEs involved shall be recorded in all EIA reports as per format attached (Annexure VII) at the beginning of the report. These reports should contain original signatures (not scan) of the EIA Coordinator and the FAEs involved. This should also be authenticated by the head of the consultant organization as per the attached format.

11. The ACO is required to maintain an attendance register of employees involved in EIA assignments.

12. Timely replacement of experts –In case an approved EC/FAE leaves the ACO, the same must be intimated to NABET immediately and a suitable replacement proposed within one month. No unapproved persons should be utilized as an EC or FAE for EIA preparation. For training suitable persons may be associated with approved experts as 'Team Member' as provided in the Scheme.

13. Intimation of changes – In case of any change in the organization related to address, systems, procedures, laboratory and other important aspects shall be intimated to NABET within one month.

14. Six Monthly report in word format - List of EIAs being carried out along with list of laboratory being utilized for conducting EIAs shall be intimated to NABET every six month from the date of office assessment.

15. The ACO shall strictly follow the requirements pertaining to conditions for suspension or cancellation of Accreditation and Code of Conduct (Section 12 of the Scheme). Violation of requirements of the Scheme in respect of (but not to be limited to) using fraudulent practices deliberate concealment and/ or submission of false or mis-leading information, suppression of information, falsification of records or data, unauthorized use of logo or accreditation etc. and non-payment of requisite fees on time may result in suspension/cancellation of accreditation.

16. NCs/Obs/Alerts issued after Initial Assessment must be closed within the time frame and as per the guidelines mentioned in Scheme. Recurrence of similar NC/Obs/Alerts in the next assessment may attract even cancellation of accreditation.

17. Annual fee, as applicable, must be paid on time, failure to which will be considered as a non-conformance. Payments to be made to NABET by the ACO within one month after receiving invoice, failing which accreditation may be liable to be cancelled.

18. May we request you for your confirmation of acceptance to all the above terms and conditions. Compliance to above will enable us to issue you the requisite accreditation certificate.

30/07/2019

A K Jha
Senior Director
QCI- NABET