ISO 9001:2008 (QMS 009) ISO 14001:2004 (EMS 003) OHSAH 18001:2007

MANUFACTURERS & EXPORTERS OF
DYES & DYES INTERMEDIATES

Factory : C-1/335 to 337 & A-1/332, Phase-II, GIDC Estate, Vatva, Ahmedabad-382 445. Gujarat INDIA
Phone : +91-79-25832212, 25892212, 65452045 Fax : +91-79-25894564
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Phone / Fax No. : +91-79-26752531, **Web site :** www.jembychemlimited.com
CIN No : U74900GJ1988PLC010792

JEMBY CHEM LIMITED
(A GOVERMENT RECOGNISED EXPORT HOUSE)

Ref. No.

Date : 16.07.2018

To,

Member Secretary,

State level Expert Appraisal Committee,

C/o Gujarat Pollution Control Board,

Gandhinagar

STATE LEVEL EXPERT APPRAISAL COMMITTEE GUJARAT
RECEIVED ON
18 JUL 2018
1413

Sub: Environment Clearance under the EIA Notification, 2006 for proposed expansion of Dyes Intermediates manufacturing at Plot No. C-1/335, 336, 337, Phase-II, GIDC Estate, Vatva, Ahmedabad, Gujarat.

Ref: 1) 401th SEAC MoM, dated 25.05.2018
2) Proposal No. SIA/GJ/IND2/18911/2017

Dear Sir,

With reference to above referred MoM of SEAC, we enclosed herewith compliances for next process of Environmental Clearance.

1. **To submit revised EIA report with proper water balance, sound spent acid management considering as hazardous waste, cleaner production technology, area adequacy with green belt area etc.**

We have modified EIA report with respect to points raised by Honourable SEAC committee and minutize the same in above referred MoM. Revised EIA report is enclosed herewith. There is no change in product profile, water consumption and wastewater generation, stack details and hazardous waste details. Only precise calculation is made.

The major points of modification of EIA report is summarized below.

Proper water balance

We have elaborated all the source of water consumption, wastewater generation, scrubber water and generation SBS and spent acid generation, utilization and balance quantity, which is precisely covered in Chapter-2, Page no. 2-30 to 2-32. Water balance diagram is given in Chapter-2, page no. 2-39 of EIA report.

ISO 9001:2008 (QMS 009) ISO 14001:2004 (EMS 003) OHSAH 18001:2007

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Ref. No. **Date :**

Sound spent acid management considering as hazardous waste

We have elaborated all the sources of spent acid & SBS generation with its concentration. Details of generation and utilization of spent acid & SBS is precisely covered in Chapter-2, page no. 2-32. Spent acid & SBS is also covered in table of Hazardous Water, given in Chapter-2, page no. 2-38 of EIA report.

Cleaner production technology

We have adopted cleaner production technology in our process. We have drastically reduced water consumption and wastewater generation along with increase the quantity and strength of spent acid. Details are given in chapter-10, page no. 10-14 of EIA report.

Area adequacy with greenbelt area

Our plant is existing plant and working since last long. As per the Greenbelt criteria, we have no sufficient land to develop greenbelt in our premises. To fulfil our obligation of the same, we have adopted part of reserve land of GIDC which is around 2000 m^2 where we will develop around 500 saplings. Copy of letter issued by VIA is enclosed as **Annexure-XVI** in EIA report.

Hope that, above details are meeting with your requirement to recommend our project for Environmental Clearance.

Yours truly,
Thanking You,
For, **Jemby Chem Ltd.**

Director

Revised EIA Report

of

Jemby Chem Ltd.

at

C-1/335, 336, 337, G.I.D.C. Estate, Phase-II, Vatva
Dist. Ahmedabad

for

Proposed expansion of dyes intermediates manufacturing

Project Activity: 5(f), Category: B

Prepared by

San Envirotech Pvt. Ltd.

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Chapter-1
Introduction

1.1 PREFACE

An Environmental Impact Assessment (EIA) is an assessment of the possible positive or negative impact that a proposed project may have on the environment, together consisting of the environmental, social and economic aspects. It is an assessment and management tool that evaluates the possible positive or negative impact that a proposed project may have on the environment. EIA systematically examines both beneficial and adverse consequences of the project and ensures that these effects are taken into account during project design. The purpose of the assessment is to ensure that decision makers consider the ensuing environmental impacts when deciding to proceed with a project.

As India is a developing country, lots of industrialization has been came in focus since last few decades that ultimately leads the bigger issues related the environmental quality of the country. Hence, it is needful for Government of India to control the haphazard industrial development by providing sustainable development under the legislation.

In India, Ministry of Environment and Forests has defined elaborated "Environmental Clearance (EC)" framework along with requirements for preparing Environmental Impact Assessment (EIA) under the Environmental (Protection) Act, 1986 (Environmental Impact Assessment Notification, 2006) for establishing/expanding and industry/development projects although it supports development but only if the development does not hamper the environment over a defined threshold limit.

1.2 PURPOSE OF THE REPORT

Industrial development in India has increased economic growth and improved living standards of people. These growths are achieved through industrialization, infrastructure development. Industrialization has played a major role in development of the country. It also has many other benefits. Although the industrial development leads to rapid consumption of natural resources, fuel etc. in day to day operational activity. These

will deteriorating resources and increase emissions of waste in terms of solid, liquid & gaseous. To control the pollutions from industrial activity, government has framed regulations which are governed by Ministry of Environment, Forest & Climate Change in India. Environment Impact analysis is mandatory as per the Environment Impact Assessment (EIA) Notification issued by Ministry of Environment, Forest & Climate change (MoEF&CC), New Delhi dated 14th September, 2006 and its subsequent amendment; for setting up a new projects or activities, or expansion or modernization of existing projects or activities based on their potential environmental impacts as indicated in the Schedule to the notification, being undertaken in any part of India, unless prior environmental clearance has been accorded.

Proposed expansion activity of **M/s. Jemby Chem Limited** falls under the schedule of 5(f) of schedule of EIA Notification, 2006 "Synthetic Organic Chemical Industries (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)" and categorized under "B". Therefore, unit requires Environmental Clearance before expansion of project.

EIA Consultant

In view of the above, legal aspect and monitoring work has been carried out for all the environmental attributes by M/s. San Envirotech Pvt. Ltd., Ahmedabad. Environment Impact Assessment (EIA) and Environmental Management Plan (EMP) have been prepared after obtaining Terms of References (TORs) from SEAC/SEIAA, Gujarat. EIA/EMP report after incorporating compliance of Terms of References (TORs) will be submitted to SEAC, Gujarat for Environment Clearance.

1.3 IDENTIFICATION OF PROJECT &PROJECT PROPONENT

1.3.1 Identification of project site with site specific criteria

The unit exists at Plot No. C-1/335, 336, 337, G.I.D.C. Estate, Phase-II, Vatva, Ahmedabad. Unit proposed to expand production capacity. Expansion will be in the same plant premises. The other supporting features are briefly summarized hereunder-

- Availability of adequate land for proposed expansion activities.
- Availability of all essential facilities like infrastructure, communication, medical facilities, fuel, water, power, unskilled & skilled manpower, raw materials, road network etc.
- As the project is in GIDC, no Rehabilitation &Resettlement is involved.
- The unit is well connected with National Highway (NH-8).
- Availability of good communication and transportation facilities.
- No National park or wildlife Habitats falls within 10 km radial distance from the project site.

So no alternative for site is analyzed.

1.3.2 Project Identification with respect to category

As per the EIA Notification, 2006 and amendment thereof; proposed activity is covered under 5(f) category- 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).

1.3.3 Project proponent

Jemby Chem Ltd. is a company with four Directors. Brief Introduction is given below.

Mr. Bhupendra Patel: He is Chairman & Managing Director of the Company. While he looks after Marketing and Sourcing, also keeps eye on other day to day activities. He is actively involved in the following other organizations also.

- **Chairman:** Basic Chemicals Pharmaceuticals & Cosmetics Export Promotion Council [Set up by Ministry of Commerce, Govt. of India]
- **President:** Gujarat Dyestuff Manufacturing Association
- **Secretary:** The Green Environment Services Co-Op. Society Ltd.
- **Vice Chairman:** Novel Spent Acid Management
- **Energy Comm. Member:** Gujarat Chamber of Commerce & Industry
- **Past President:** Vatva Industrial Association

Mr. Jitendra Patel is a Director. He is highly qualified production In-charge for Looking after the quality control in the Company.

Mr. Bharat Patel is a Director. He is highly qualified and laboratory in charge for development of any dye intermediates in chemical industries and look all Environment Matter.

Mr. Girish Patel is a Director. He is highly qualified in Financial, Marketing and Government legal work in the company.

The above all is backed by highly experienced professional staff to work with good team spirit for produce standard quality.

1.4 BRIEF DESCRIPTION OF PROJECT

1.4.1 Nature of the project

The unit is engaged in manufacturing of dyes intermediates and covered under category of 5(f) - "Synthetic Organic Chemical Industries" as per EIA Notification-2006 and its amendment thereof. List of raw materials to be used are given in **Table 2.6** of chapter-2. Process effluent (Concentrated stream) will be sent to MEE/Spray dryer after primary treatment. Dilute stream of washing and utility effluent will be treated in ETP and discharge to CETP, Vatva for further treatment and final disposal. Hazardous waste generation from the project is given in **Table 2.14.**

1.4.2 Size of the project

Production details are given in table below:

Table 1.1 Product details

Sr. No.	Name of Product	Production Quantity (MT/month)		
		Existing	Proposed addition	Total After expansion
01	Sulpho Tobias Acid	2	23	25
02	J-Acid	2.528	47.472	50
03	**J-Acid derivatives**	12.67	87.33	100
	1. N-Acetyl J-Acid			
	2. N-Methyl J-Acid			
	3 N-Benzoyl J-Acid			
	4. N-Phenyl J-Acid			
04	RW-Acid (Di-J Acid)		10	10
05	Sulpho J- Acid		10	10
06	N-Methyl Gamma Acid	00	5	5
	Total	**17.198**	**182.802**	**200**

1.4.3 Location of the project

The unit is located in GIDC-Vatva, Dist. Ahmedabad. The geographical co-ordinates of the site are 22°57'9.70"N Latitude and 72°38'11.34"E Longitude. Map showing project site is given in **Figure 1.1.**

1.5 APPLICABLE ENVIRONMENTAL REGULATORY FRAMEWORK

The proposed project will abide and function under the purview of the following Rules, Acts & Regulations which are formulated by the Govt. of India to protect the environment and development in a sustainable way.

- The Water (Prevention & Control of Pollution) Act, 1974
- The Air (Prevention & Control of Pollution) Act, 1981
- The Environmental (Protection) Act, 1986
- Environmental Impact Assessment Notification dated 14th September 2006 and subsequent amendments
- The Hazardous & Other Waste (Management and Transboundary Movement) Rules, 2016
- Noise Pollution (Regulation and Control) Rules, 2000 and its amendments
- The Public Liability Insurance Act, 1991

1.6 SCOPE OF THE STUDY

The scope of the EIA study is based on the guideline provided by Ministry of Environment, Forests & Climate Change, Government of India for structure of Environmental Impact Assessment document.

The scope of the study broadly includes:

- Field sampling of environmental attributes at various representative locations in the study area to establish the baseline status;
- Collect & compile secondary data including socio-economic data;
- Identification, assessment and evaluation of the beneficial and adverse impacts on surrounding environment due to proposed project activities considering the existing baseline status along with compilation of other information.
- Analysis of project proposal and data analysis.
- Assessment of pollution potential due to proposed project.
- Predict the incremental levels of pollutants in the study area due to the proposed project;

- Evaluate the predicted impacts on the various environmental attributes by using scientifically developed & widely accepted models.
- Identification and assessment of risks associated with the proposed project and their appropriate management through proper Risk Assessment (RA) and Disaster Management Plan (DMP).
- Prepare an Environmental Management Plan (EMP) to mitigate the predicted impacts; and
- Identify critical environmental attributes required to be monitored during the project execution and to suggest post project monitoring.

The scope also includes all the conditions outlined in the TOR issued by SEIAA, Gujarat and the compliance to the TORs is given below.

1.7 COMPLIANCE TO TERMS OF REFERENCE

Based on the documents submitted and presented before State Level Environment Impact Assessment Authority (SEIAA), Gujarat; Terms of Reference (TOR) was issued by SEIAA vide letter no. SEIAA/GUJ/TOR/5(f)/522/2017, dated 30.04.2017 and directed to prepare detailed EIA/EMP including Terms of References. TOR condition with its compliance is given in table below:

Sr. No.	TOR Condition	Compliance
1.	A tabular chart with index for point-wise compliance of below mentioned TORs.	Details are covered under sec. 1.7, page no. 1-6 to 1-18 of chapter-1.
2.	Executive summary of the project – giving a prima facie idea of the objectives of the proposal, use of resources, justification, etc. In addition, it should provide a compilation of EIA report, including EMP and the post–project monitoring plan in brief.	Executive summary of the project is given in chapter-11.
3.	Justification for selecting the proposed product and unit size.	Unit has been established in 1989 in GIDC, Vatva and engaged in manufacturing of various dyes and dyes intermediates. It is highly demanding nationally & Globally. With the increase in market demand, unit has proposed to expand its production capacity. Details of proposed products are covered in table 1.1; page no. 1-4 of chapter-1.

4.	Land requirement for the project including its break up for various purposes, its availability and optimization.	Total land requirement of the project is 2212 m^2. Land break up for various purposes is given in table 2.1, page no. 2-2 of chapter-2.
5.	Land possession documents. Copy of NA order showing permission to use the project land for industrial purpose. If located in GIDC, copy of plot holding certificate obtained from GIDC Authority.	Copy of GIDC plot allotment letter is enclosed as **Annexure-I.**
6.	Location of the project site and nearest habitats with distances from the project site to be demarcated on a toposheet (1:50000 scale).	Location of the project site demarcated on a toposheet is enclosed as **Annexure-II.**
7.	Topography details of the project area.	Topography of the project site is plain.
8.	Geological features and geo-hydrological status of the study area.	Pls. refer section-3.4 page no. 3.9.
9.	In case of project located outside notified area: Legal Undertaking stating that unit is complying the three conditions [i.e. water consumption less than 25 M^3/day; Fuel consumption less than 25 TPD; and not covered in the category of MAH units as per the Management, Storage, Import of hazardous Chemical Rules (MSIHC Rules), 1989] as per the amendment to EIA Notification, 2006 vide SO 1599 (E) dated 25/08/2014.	Not applicable in our case as the project is located in GIDC, Vatva.
10.	Present land use pattern of the study area shall be given based on satellite imagery.	Land use pattern of the study area is given in figure 3.11, page no. 3-45 & statistics of land cover is given in table 3.23, page no. 3-35 of chapter-3.
11.	Layout plan of the factory premises clearly demarcating various units within the plant unobstructed easy movement of the emergency vehicle/fire tenders without reversing back. Mark the same in the plant layout.	Layout plan of the factory premises demarcating various units and showing entry/exit is given in figure 2.3, page no. 2-41.
12.	Technical details of the plants along with details on Best Available Technologies (BAT), proposed technology and reasons for selecting the same.	Pls. refer sec. 2.10, page no. 2-5 of chapter-2 for BAT and process description.
13.	Product spectrum (Proposed products along with production capacity) and processes.	Product details & production capacity is given in table 2.3, page no. 2-3 of chapter-2.
14.	Chemical name of each proposed product to be manufactured. Details on end use of each product. (Provide CAS	Chemical name & end use of each product is given in table 2.3, page no. 2-3 of chapter-

	number of all the products & raw materials. In case of Dyes, Cl number).	2.
15.	Details on raw materials, source and storage within the premises.	Details of raw materials & source details are given in table 2.6, page no. 2-28 of chapter-2.
16.	Details of complete manufacturing process/operations of each product along with chemical reactions, process flow diagram describing each unit processes and unit operations along with material balance, consumption of raw materials etc.	Pls. refer sec. 2.10, page no. 2-5 to 2-19 of chapter-2 for manufacturing process of each products with chemical reaction & mass balance with consumption of raw material.
17.	Details on strategy for the implementation of cleaner production activities.	Pls. refer sec. 10.8, page no. 10-14 for details of cleaner production.
18.	Assessment of source of the water supply with adequacy of the same to meet with the requirements for the project. Permission obtained from the concern authority for supply of raw water.	Source of water supply is GIDC water supply. The unit is an existing unit. The water is being given by GIDC and is adequate to meet the requirement.
19.	Undertaking stating that no bore well shall be dug within the premises (If project is located within the Industrial estate).	Undertaking is enclosed as **Annexure-III.**
20.	Details on water balance including quantity of effluent generated, recycled & reused. Details of methods to be adopted for the water conservation.	Water balance diagram is given in Fig. 2.1 of chapter-2 on page no. 2-39.
21.	Explore the possibilities for Zero Liquid Discharge (ZLD) or efforts to minimize effluent discharge and to maintain quality of receiving water body.	Unit proposed to evaporate entire quantity of process wastewater. Although unit have maintained their existing discharge and after expansion, organic load drastically reduce due to segregation and evaporate entire quantity of process wastewater.
22.	Segregation of waste streams, characterization and quality with specific treatment and disposal of each stream including action plan for maximum recycle of treated waste water and minimum discharge for effluent.	Pls. refer sec. 2.14.1, page no. 2-21 for segregation of waste stream & treatment and disposal of the same. Characteristics of effluent are given in table 2.10, page no. 2.34.
23.	Capacity of ETP in KL/day. Details of ETP including dimensions of each unit along with schematic flow diagram. Inlet, transitional and treated effluent qualities with specific efficiency of each treatment unit in respect of all	ETP (Dilute stream): 50 KL/day ETP (Concentrated stream): 100 KL/day Pls. refer table 2.9, page no. 2-33 for capacity of ETP unit.

	concerned/regulated environmental parameters. Inlet effluent quality should be based on worst case scenario considering production of most pollution products that can be manufactured in the plant concurrently.	Flow diagram of ETP is given as fig. 2.2, page no. 2-38. We have considered quality & quantity of w/w based on worst case scenario of effluent generation of our product.
24.	<u>In case of discharge into GIDC drainage/ Pipeline</u>: I. Copy of permission letter with quantity (KL/day) from the concern authority of drainage network/pipeline with confirmation for spare capacity available to take additional effluent. II. Characteristics of the combined effluent and treated water to be sent to Common pipeline with reference to the MoEFCC/CPCB/GPCB discharge norms.	Not applicable in our case.
25.	<u>In case of waste water sent to common Facilities</u> (CF) like CETP, MEE, spray Dryer etc. Details of common facilities including (1) Total capacity of the CF (2) Copy of CC&A of the CF. (3) Actual load at present (Qualitative and Quantitative – KL per day) (4) Booked quantity & Spare capacity of CF (5) Copies of XGN generated Inspection reports with analysis reports of the water/Air/ Hazardous samples collected by GPCB (Last 2 year). Copies of instructions issued by GPCB in last 2 year and point wise compliance thereof. (6) Copies of Show cause notices, closure notices etc. served by the GPCB and its compliance. (7) Recommendations and suggestions of the last two Environment Audit report of CETP and its compliance report. (8) Common Facility Up gradation scheme, if any.	All the details of CF are attached as **Annexure-IV.**
26.	<u>In case of Zero liquid Discharge (ZLD)</u>: I. Action plan for 'Zero' discharge of effluent shall be include. Notarized undertaking for assuring that underground drainage connection will not be taken in the unit. II. Economical and technical viability of the effluent treatment system to achieve Zero Liquid Discharge (ZLD). III. Certification of adequacy of proposed ZLD scheme through credible institutes of National	Unit is not going to achieve zero liquid discharge.

	repute. IV. To estimate & monitor ground water quantity & its contamination status, piezometer wells, one on up gradient of the groundwater flow and other three on the down gradient side of the ground water flow of the proposed project at different depth based on available ground water depth shall be established and all the parameter mentioned in IS 10500 for potable water standard shall be monitored.	
27.	In case of in-house MEE/Spray for waste water treatment: Capacity of MEE/Spray dryer in KL/hr. Technical details of MEE including evaporation capacity, steam required for evaporation, adequacy of the proposed boiler to supply steam for evaporation in addition to the steam required for the process etc. Techno economical viability of the evaporation system. Control measures proposed for the evaporation system in order to avoid/reduce gaseous emission/VOCs from evaporation of industrial effluent containing solvents & other chemicals.	Not applicable in our case as no in-house MEE is proposed for expansion. Unit will use common evaporation facility working in the plant vicinity and for that they have obtain membership of same.
28.	Technical details of ATFD/Crystallizer/ spray Dryer, RO/NF system etc. (If any).	Not applicable in our case as no in-house MEE is proposed for expansion.
29.	Undertaking stating that a separate electric meter will be provide for the waste water treatment system viz. ETP, RO, MEE, Spray dryer etc. (Whichever is applicable).	Undertaking is enclosed as **Annexure-III.**
30.	Economical and technical viability of the effluent treatment system.	Details are given on sec. 10.5.3 of chapter 10 on page no 10-9.
31.	Plans for management, collection and disposal of waste streams to be generated from spillage, leakages, vessel washing, used container washing etc. Measures proposed for preventing effluent discharge during unforeseen circumstances.	Details are given on sec. 10.6 of chapter 10 on page no. 10-11.
32.	Action plan for reuse of liquid waste streams like Spent acids, Poly Aluminium Chloride etc. within premises to convert into valuable products instead of sending outside to actual end-users.	Unit proposed to reuse 23.0 KLD spent Sulphuric acid within premises and 24.0 KLD spent Sulphuric Acid will be sent to Novel Spent Acid Management, Vatva for reuse by actual users under Rule-9.
33.	One season Site-specific micro-meteorological data using temperature,	Details are covered under topic no. 3.3.3 of chapter-3

	relative humidity, hourly wind speed and direction and rainfall should be incorporated.	from page no. 3-7.
34.	Anticipated environment impacts due to the proposed project/production may be evaluated for significance and based on corresponding likely impacts VECs (Valued Environmental Components) may be identified. Baseline studies may be conducted within the study area for all the concerned/identified VECs and likely impacts will have to be assessed for their magnitude in order to identify mitigation measures.	Anticipated environment impacts due to the proposed projects are covered under chapter-4 namely sec. 4.3 to 4.10, page no. 4-2 to 4-13. Pls. refer sec. 3.2, page no. 3-5 for VECs. Baseline studies are given under sec. 3.3 to 3.9 of chapter-3 from page no. 3-6 to 3-16.
35.	One complete season base line ambient air quality data (except monsoon season) to be given along with the dates of monitoring. The parameters to be covered shall be in accordance with the revised National Ambient Air Quality Standards (NAAQS) as well as project specific parameter like NH_3, HCl, Cl_2, HBr, VOC etc. Locations of the monitoring stations should be so decided so as to take into consideration the pre-dominant downwind direction, population zone and sensitive receptors. There should be at least one monitoring station in the upwind direction. There should be at least one monitoring station in the pre dominant downwind direction at a location where maximum ground level concentration is likely to occur.	One season complete baseline monitoring of ambient air quality is given under sec. 3.3, from page no. 3-6 to 3-9 & tabulated in table 3.8 to 3.13 from page no. 3-20 to 3-23. We have carried out baseline monitoring from March, 2017 to May, 2017.
36.	Modeling indicating the likely impact on ambient air quality due to proposed activities. The details of model used and input parameter used for modeling should be provided. The air quality contours may be shown on location map clearly indicating the location of sensitive receptors, if any, and the habitation. The wind rose showing pre-dominant wind direction should also be indicated on the map. Impact due to vehicular movement shall also be included into the prediction using suitable model. Results of Air dispersion modeling should be superimposed on satellite Image/geographical area map.	Impact on air due to proposed activity is calculated by ISCST-3 model. Input parameters are covered under sec. 4.4.3, page no. 4-6 of chapter-4. Input parameters are also given in table 4.1, page no. 4-13. Cumulative impact on air quality is given in table 4.2, page no. 4-14. Air quality contour superimposed on location map & Wind rose showing pre-dominant direction is given in figure 4.1 to 4.3 on page no. 4-18 to 4-21.20
37.	Baseline status of the noise environment, impact of noise on present environment due to the project and	Baseline noise level data is given in table 3.18; page no. 3-29 of chapter-3.

	proposed measures for noise reduction including engineering controls.	Impact of noise on present environment is given in sec. 4.6, page no. 4-8. Mitigation measures are covered under topic no. 10.5.5 of chapter-10 on page no. 10-10.
38.	Specific details of a) Process gas emission from each unit process with its quantification. b) Air pollution Control Measures (APCM) proposed for process gas emission. Adequacy of the air pollution control measures (APCM) for process gas emission measures to achieve the GPCB norms. c) Details of the utilities required. d) Type and quantity (MT/hr& MT/day) of fuel to be used for each utility. e) Flue gas emission rate emission from each utility. f) Air Pollution Control Measures (APCM) proposed to each of the utility along with its adequacy. g) List the project specific sources of fugitive emission along with its quantification and proposed measures to control it. h) Details on tail gas treatment.(If any)	i), ii) Process gas emission along with APCM is given in table 2.10, page no. 2-35. iii) We will consider worst case scenario of air flow and pollutant before designing of adequate APCM so that we can easily achieve GPCB norms. iv) Details of utilities are covered under table 2.5 of chapter-2 on page no. 2-21. v) Details of fuel used are covered in sec 2.12(d), page no. 2-21. vi) Flue gas emission rate is given in table 2.10; page no. 2-33 of chapter-2. vii) Pls. refer table 2.11, page no. 2-35 for APCM of the each utility. viii) Source of fugitive emission will be from packing area, raw material storage yard, process area. • Closed vessels will be used for process, liquid material transfer pneumatically, solid/ powder charge carefully to avoid any dust of raw materials. • Close packing method will be used to minimize fugitive emission.
39.	Action plan for odour control to be submitted.	No odor problem observed in existing plant and same pattern production will be expanded after proposed expansion hence no need to give odor control
40.	Management plan for solid/hazardous waste including storage, handling, utilization and safe disposal as per the Hazardous and Other Wastes (Management and Transboundary Movement) Rules 2016. CPCB guideline in respect of specific treatment, such as	Details of generation & disposal of hazardous waste are given in table 2.14, page no. 2-38. Hazardous waste management is given in sec.

	solar evaporation, incineration, etc., need to be followed. How the manual handling of the hazardous wastes will be minimized. Methodology of de-contamination and disposal of discarded containers and its record keeping.	10.5.4, page no. 10-9. Pls. refer sec. 2.15.3(a), page no. 2-26 for methodology of decontamination of discarded container.
41.	Membership of Common Environment Infrastructure like TSDF, Common Incineration Facility (CHWIF), MEE, Spray dryer etc.	Membership certificate of Environment Infrastructure like TSDF/spray dryer is attached as **Annexure-V.**
42.	Name and quantity of each type of solvent to be used for proposed production, Details of in-house solvent recovery system including balance, solvent loss, recovery efficiency (% recovery), feasibility of reusing the recovered solvents etc. for each type of solvent.	No use of any solvent.
43.	Appropriate monitoring network has to be designed and proposed, to assess the possible residual impacts on VECs.	We adopt monitoring network proposed in chapter-6.
44.	A detailed EMP including the protection and mitigation measure for impact on human health and environment as well as details monitoring plan environmental management cell proposed for implementation and monitoring of EMP. The EMP should also include the concept of waste-minimization, recycle/reuse/ recover techniques, energy conservation, and natural resource conservation, Total capital cost and recurring cost/annum earmarked for environment pollution control measures.	Detailed EMP is given in Chapter-10 of EIA report. Details of monitoring plan are given in table 6.1 of chapter-6 on page no. 6-4. Environment Management Cell is covered in sec. 10.3.2, page no. 10-2. Pls. refer sec. 10.8 & 10.9, page no. 10-14 & 10-15 respectively for resource conservation/cleaner production & energy conservation details. Total capital cost and recurring cost/annum is given in table 10.3, page no. 10-22.
45.	Details of in-house monitoring capabilities and the recognized agencies if proposed for conducting monitoring.	In-house monitoring capabilities: Water analysis mainly, pH, TDS, TSS, COD etc.
46.	Permission from PESO, Nagpur for storage of solvent, other toxic chemicals, if any.	Not applicable in our case.
47.	Occupational health impacts on the workers and mitigation measures proposed to avoid the human health hazardous along with the personal protective equipment to be provided. Provision of industrial hygienist and monitoring of the occupational injury to workers as well as impact on the workers. Plan for periodic medical	Pls. refer sec. 10.10 page no. 10-15. Plans for periodic medical checkup of the workers are given in sec. 10.10.1; page no. 10-17 of chapter-10. Work place ambient air quality monitoring plan is

	checkup of the workers exposed. Details of work place ambient air quality monitoring plan as per Gujarat Factories Rules.	given in sec. 10.12.1, page no. 10-22.
48.	Details on volatile organic compounds (VOCs) from the plant operations and occupational safety and health protection measures. Proposal for Leak Detection and Repair (LDAR) program as per the CPCB guidelines.	No chances to generate Volatile Organic Compounds (VOC) hence no adverse impact on health of workers.
49.	Risk assessment including prediction of the worth-case scenario and maximum credible accident scenarios should be carried out. The worth-case scenario should take into account the maximum inventory of storage at site at any point of time. The risk contours should be plotted on the plant layout ma clearly showing which of the facilities would be affected in case of an accident taking place. Based on the same, proposed safeguard measures including On-site/ Off-site Emergency plan should be provided.	Risk assessment including predication of worst case scenario is covered in chapter-7. On-site & off site emergency plan are given in sec. no. 7.13 & 7.14 of chapter-7, page no. 7-22 to 7-31.
50.	MSDS of all the products and raw materials.	MSDS is attached as **Annexure-VI.**
51.	Details of hazardous characteristics and toxicity of raw materials and products to be handled and the control measures proposed to ensure safety and avoid the human health impacts. This shall include the details of Antidotes also.	Hazardous properties of chemicals are given in Table 7.2, page no. 7-5. Pls. refer sec. 7.10.3, page no. 7-19 for details of antidotes.
52.	Details of quantity of each hazardous chemical (including solvents) to be stored, Material of Construction (MoC) of major hazardous chemical storage tanks, dyke details, threshold storage quantity as per schedules of the Manufacture, Storage & Import of Hazardous Chemicals Rules of major hazardous chemicals, size of the biggest storage tank to be provided for each raw material & product etc. How the handling of the hazardous chemicals will be minimized?	Details of quantity of hazardous chemicals are covered in table 7.1 of chapter-7 on page no. 7-4. Material of Construction (MoC) of hazardous chemical storage is covered under table 7.1 on page no. 7-4 of chapter 7. Pls. refer sec. 7.11, page no. 7-19 for details to avoid manual handling of the hazardous chemicals.
53.	Details of the separate isolated storage area for flammable chemicals. Details of flame proof electrical fittings, DCP extinguishers and other safety measures proposed. Detailed fire control plan for flammable substances and processed showing hydrant pipeline network, provision of DG Sets, fire pumps, jockey	Unit is not going to use flammable chemicals hence flameproof electrical fittings may not require in our case. Bulk Hazardous Materials Storage details given in table 7.1 on page no. 7-4.

	pump, toxic gas detectors etc.	Fire Control Plan with details of fire extinguisher is given in sec. 7.10.1, page no. 7-16.
54.	Submit checklist in the form of Do's & Don'ts of preventive maintenance, strengthening of HSE, manufacturing utility staff for safety related measures.	Details are covered in sec. 7.10.2 of chapter-7, page no. 7-17.
55.	Detailed five year greenbelt development program including annual budget, planning schedule, species, width of plantations, number of trees to be planted, area under green belt development [with map], budgetary outlay etc. along with commitment of the management to carry out the tree plantation activities outside the premises at appropriate places in the nearby area and elsewhere.	Five year greenbelt development program including annual budget, types & number of trees to be planted, area under greenbelt development and others are given in sec. 10.7 of chapter-10, page no. 10-11. Commitment of the management to carry out tree plantation activities outside the premises at appropriate places in the nearby area is attached as **Annexure-III.**
56.	Action plan for the greenbelt development – species, width of plantations, planning schedule, etc., in accordance to CPCB published guidelines.	Five year greenbelt development program is given in sec. 10.7 of chapter-10, page no. 10-11.
57.	Detailed socio-economic development measures including community welfare program most useful in the project area for the overall improvement of the environment. Submit a detailed plan for social corporate responsibilities, with appropriate budgetary provisions for the five next years and activities proposed to be carried out; specific to the current demographic status of the area.	CSR activities and budgetary provision of next five years is given in sec. 10.11, page no. 10-18 of chapter-10.
58.	(a) 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. (b) 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, Env. Policy is enclosed as **Annexure-VII.**
59.	What is the hierarchical system or administrative order of the company to deal with the environmental issues and for ensuring compliance with the EC conditions? Details of this system may be given.	Details are covered under topic no. 10.3.3 & figure 10.1 on page no. 10-3 & 10-3.
60.	Does the company have a system of reporting of non-compliances/violations	Pls. refer sec. 10.14, page no. 10-23 of chapter-10.

	of environment norms to the Board of Directors of the company and/or shareholders or stakeholder at large? This reporting mechanism should be detailed in the EIA Report.	
61.	Phase wise project implementation schedule with chart and time frame, in terms of site development, infrastructure provision, EMS implementation etc.	Our is small project and whole project will implement within 6 months after obtaining EC and CTE.
62.	Certificate of accreditation issued by the NABET, QCI to the environmental consultant should be incorporated in the EIA Report.	NABET/QCI certificate is enclosed as **Annexure-VIII.**
63.	An undertaking by the Project Proponent on the ownership of the EIA report as per the MoEF&CC OM dated 05/10/2011 and an undertaking by the Consultant regarding the prescribed TORs have been complied with and data submitted is factually correct as per the MoEF&CC OM dated 04/08/2009.	Undertaking of project proponent is enclosed as **Annexure-III.** Undertaking of consultant is enclosed as **Annexure-IX.**
64	<u>In case of Expansion of the project</u>	
a	Need for the proposed expansion should be justified in detail.	Pls. refer sec. 2.3, page no. 2-1.
b	Adequacy of existing EMS (Environmental Management System).	Pls. refer **Annexure-X.**
c	Records of any legal breach of Environmental laws i.e. details of show-cause notices, closure notices etc. served by the GPCB to the existing unit in last five years and actions taken them after for prevention of pollution.	Pls. refer **Annexure-XI.**
d	Copies of Environmental Clearances obtained for the existing plant, its point wise compliance report.	EC was not obtained because unit was established before publication of EIA Notification-2006.
e	Environment audit reports for last 3 years and compliance of its recommendations/suggestions. (Include latest audit report and its compliance)	Pls. refer **Annexure-XII.**
f	Copy of Consent to Operate (CC&A) obtained along with point wise compliance status of all the conditions stipulated therein.	Copy of CC&A and condition wise compliance is enclosed as **Annexure-XIII.**
g	Compliance of MoEFCC circulars vide No. J-11011/618/2010-IAII (I) dated 30/05/2012 and J-11013/41/2006-IA-II (I) dated 20/10/2009.	Our project was established before publication of EIA Notification 2006 and not obtained EC because it was not applicable in our case at the time of establishment. Hence, compliance report of EC certified by zonal officer

		MoEFCC is not required in our case.
h	Copies of XGN generated Inspection reports with analysis reports of the water/Air/Hazardous samples collected by GPCB (Last 2 year). Copies of instructions issued by GPCB in last 2 year and point wise compliance thereof.	Enclose as **Annexure-XIV.**
65.	In case of project is located in Ankleshwar-Panoli, Vatva-Naroda&Vapi GIDC.	
a	Compliance of MOEFCC's OM no. J-11013/5/2010-IA.II (I), dated 25/11/2016 regarding lifting of moratorium on the consideration of projects for environmental clearance.	We understand in this line that compliance of MOEFCC's OM no. J-11013/5/2010-IA.II (I), dated 25/11/2016 regarding lifting of moratorium is not in our purview. However, we have taking care for maintain or reduce CEPI score by way of; reduce organic load on CETP drastically by way of segregation of effluent Industrial effluent and concentrated will be evaporated and dilute stream will be sent to CETP after treatment.
b	Compliance of direction under section 18 (1) (b) of the Water (Prevention and Control of Pollution) Act, 1974 issued by CPCB dated 31/03/2016 regarding compliance of CETP.	Hydraulic or organic load on CETP will not increase from our proposed expansion as we are reduce organic load on CETP drastically by way of segregation of Industrial effluent. Concentrated from manufacturing activities will be evaporated and only dilute stream will be sent to CETP after treatment. No additional discharge envisages compare with section discharge capacity in our CC&A.
c	Performance of TSDF site with respect to current load & prescribed standards with No Objection Certificate of TSDF site regarding incorporation of the proposed unit for acceptance of hazardous waste to the common infrastructure.	Our TSDF site is out of recently lift off critically area including its buffer zone. We have membership of TSDF site for existing including proposed additional load of disposable waste at TSDF site.
d	Copies of quarterly action report taken for the above points submitted to the CPCB.	We understand in this line that action taken report quarterly submitted to CPCB

		by GPCB and no involvement of project proponent in this regard.
f	Report of GPCB which have conducted monitoring as per the said direction by CPCB dated 31/03/2016.	Monitoring report of GPCB as per the direction by CPCB dated 31/03/2016 is not available with us because not in our purview.

1.8 OBJECTIVE OF EIA

EIA is a policy and management tool for both planning and decision making. EIA assists in identification, prediction and evaluation of the foreseeable environmental consequences of proposed developmental and industrial projects.

The objectives of the present EIA study is to assess the impacts on various environmental components due to the proposed project activity, identify potential source of pollution, evaluate impact on environment and to recommend appropriate environmental management system and environment management plan for the unit to ensure that the adverse impacts if any will be minimized. Moreover, to prepare an Environmental Statement to indicate conclusively if the overall impacts are positive or negative.

1.9 METHODOLOGY FOR EIA

Environmental Assessment (EA), another term used in the environmental studies, refers to an understanding of the present status of environment and a study of how to manage them. Keeping in view the nature and size of the proposed project and industrial area and various guidelines available, it was decided to cover an area of 5-km radius from the center of proposed plant site for the purpose of environmental impact assessment study. The methodology is briefly reported below and has been described in this section.

Baseline data collection:

The baseline data for the impact zone have been generated for the following environmental parameters.

- Ambient Air Quality
- Micrometeorology
- Noise Level

- Surface & Ground Water Quality
- Soil Quality
- Ecology & Biodiversity
- Land use pattern
- Socio-Economics

The baseline status of the above environmental parameters has been worked out based on the rapid monitoring/analysis carried out during the study period of **March, 2017 to May, 2017** supplemented by data collected from various Govt. Dept., census publications etc. The data is collected and analyzed as per the standard methods for establishing the baseline data and so determine the impact of proposed activity on the same.

Evaluation of Impact from Project Activities

The Environmental Impact resulting from the various project activities, have been identified, predicted and evaluated based on the study of manufacturing process and other project related activities as well as correlating the same with existing baseline status.

Preparation of Environmental Management Plan

Environmental Management Plan has been prepared covering pollution prevention measures at source in terms of air and water pollution control measures, solid waste/hazardous waste management, safety management, greenbelt development, environmental surveillance and environmental surveillance and environmental management team.

Finally, the detailed assessment of the resultant environmental impacts have been made based on the impacts identification and evaluated from the activities over the baseline status of various environmental components to reduce the pollution and to delineate a comprehensive environment management plan along with recommendations and suggestions to improve environment management system.

1.10 STRUCTURE OF REPORT

The objective of the EIA study is preparation of Environment Impact Assessment (EIA) report based on the guidelines of the Ministry of Environment, Forests & Climate Change (MoEF&CC), CPCB. It incorporates the following.

- **Chapter 1: Introduction**

  This chapter provides background information of unit, brief of project, need of EIA study, basic objectives and methodologies for EIA studies. It also covers identification of project & project proponent and work to be covered under each Environmental component.

- **Chapter 2: Project Description**

  This chapter includes project details and Infrastructure facilities including all industrial & environmental aspects of the unit as well as manufacturing process details. It also gives information about utilities, raw material, water & wastewater quantitative details, stack details, hazardous waste generation, storage & disposal facility.

- **Chapter 3: Description of the Environment**

  This chapter covers Baseline Environmental Status of the study area including meteorological details, air, water, soil, biological environment, socio-economic aspects, basic amenities land use pattern etc.

- **Chapter 4: Anticipated Environmental Impacts and Mitigation Measures**

  This chapter describes the overall impacts of the proposed project activities on various environmental components. It predicts the overall impact of the proposed project on different components of the environment viz. Air, Water, Land, Noise, Biological and Socio-Economic and its mitigation measures.

- **Chapter 5: Analysis of Alternatives**

  This chapter gives details of analysis of alternatives in terms of technology & site.

- **Chapter 6: Environmental Monitoring Programme**

  This chapter describes technical aspects of monitoring (including measurement methodologies, frequency, location and data analysis, reporting schedules, emergency procedures, detailed budget and procurement schedules.

- **Chapter 7: Additional Studies**

This chapter describes Risk assessment and on-site, off-site emergency plan and occupational health & safety programme.

- **Chapter 8: Project Benefits**

  This chapter focuses on benefits of project on improvement in physical infrastructure, social infrastructure & other tangible benefits.
- **Chapter 9: Environmental Cost Benefit Analysis**
- **Chapter 10: Environmental Management Plan**

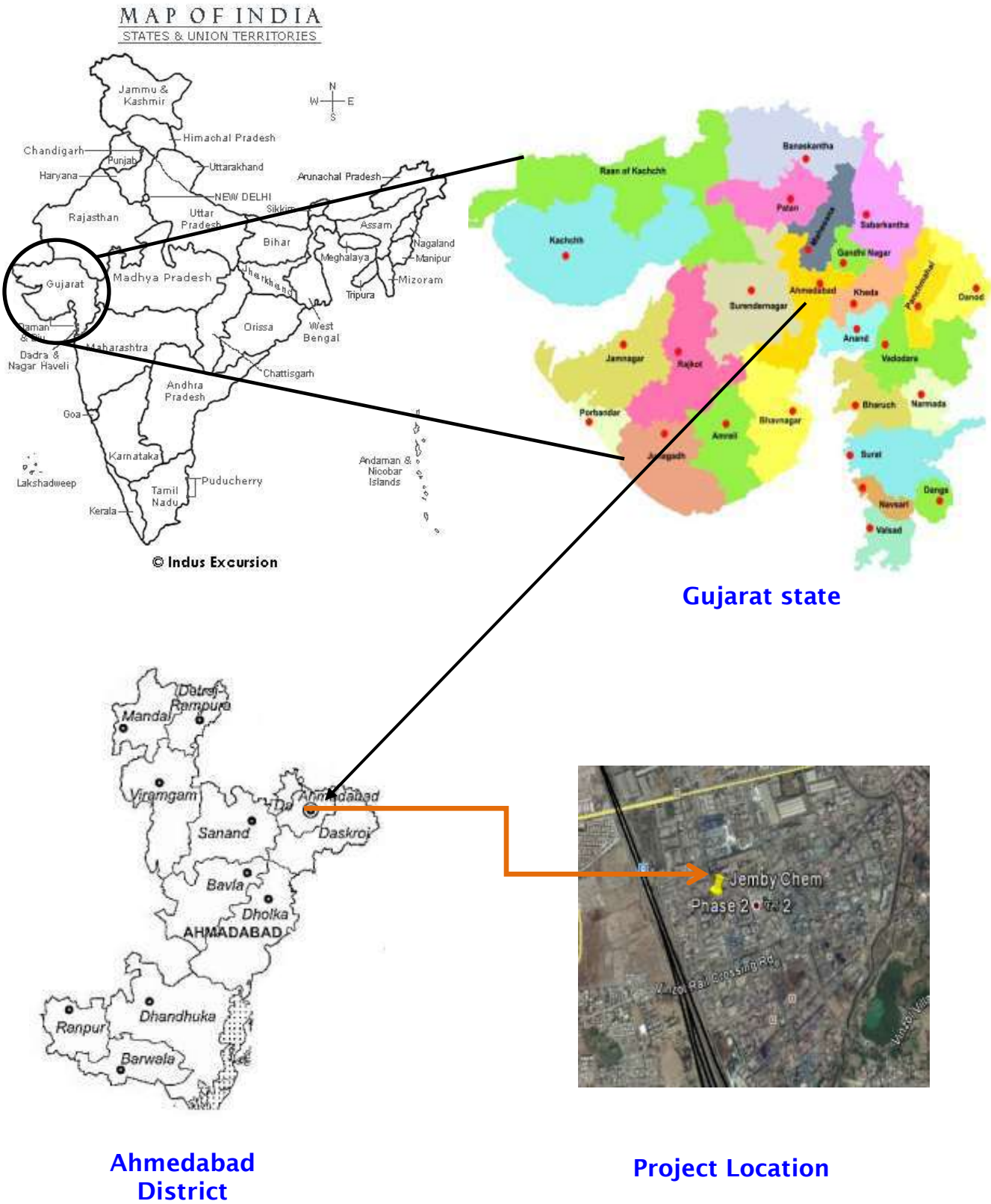
  This chapter describes Environment Management Plan (EMP) to be adopted for mitigation of anticipated adverse impacts if any and to ensure acceptable impacts.
- **Chapter 11: Summary & Conclusion**

  It gives brief of the EIA Report and chapters there in. It also describes about overall justification for implementation of the project and explanation on various mitigation measures.
- **Chapter 12: Disclosure of Consultants engaged**

  This chapter describes the name of the consultant engaged with their brief nature of consultancy activities and members involved in the preparation of EIA report.

Figure 1.1

Location of the project site



Chapter-2
Project Description

2.1 INTRODUCTION

M/s. Jemby Chem Limited is an existing unit located at Plot No. C-1/335, 336, 337, G.I.D.C. Estate, Phase-II, Vatva, Ahmedabad,Gujarat and engaged in manufacturing of Dyes Intermediates like Sulpho Tobias Acid - 2 MT/month, J-Acid - 2.528 MT/month & J-Acid derivatives - 12.67 MT/month. Now, unit proposed to expand production capacity of existing products with addition of new products. After expansion, total capacity of the unit will be 200 MT/month. Expansion will be done in existing plant premises. Unit has obtained CC&A, vide order no. AWH-85798, valid up to 20/03/2022.

2.2 TYPE OF PROJECT

As per the EIA Notification-2006 and amendments thereof; all synthetic organic chemical Industries (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates) located within notified industrial area/estate are listed at S.N. 5(f) and falls under category 'B' hence EC is require prior to expansion of manufacturing facility.

2.3 NEED FOR THE EXPANSION

Jemby Chem Ltd. is well established manufacturer of J-Acid, N- Methyl-J Acid, N-Phenyl-J Acid, N-Acetyl J-Acid, R.W. Acid/DI J-Acid, N - Benzoyl J - Acid, Sulpho J - Acid, Sulpho Tobias Acid, Iso Amino J - Acid, N-Methyl Gamma Acid, etc. The company has established its operations in the Ahmedabad city and has been dealing with many overseas companies including MNCs with the commitment to become a truly global company.

These products are used in diverse industries. In addition to this, consumption of finished products has increased day by day. In view of the increasing market demand, unit proposes to increase its production capacity by adding some new products.

2.4 CAPITAL INVESTMENT

Existing cost of project is Rs. 2.5 crore. The estimated cost of the proposed expansion will be around Rs. 1.5 crore. Out of this, around Rs. 0.4 crore will used for pollution control measures as capital investment and Rs. 506 lakhs will be recurring cost per annum.

2.5 LAND REQUIREMENT

Proposed expansion will be carried out in existing plant premises admeasuring total area of the premises as 2212.0 m^2. It includes plant/machinery, raw material & finished product storage, utilities, ETP, office etc. Detailed break-up of land is given in below table:

Table 2.1 Land break-up of the area

Sr. No.	Particular	Area (m^2)	
		Existing	After expansion
1	Plant facilities	215	450
2	Storage (RM & finished products)	205	250
3	Haz. waste storage area	150	200
4	Storage (fuel & water)	25	35
5	Utilities	100	150
6	ETP	70	100
7	Internal Road	330	330
8	Greenbelt	200	615
9	Office & Lab	50	50
10	Open	867	32
	Total	**2212**	**2212**

2.6 PROJECT SITE SPECIFIC DETAILS

Project site details are given in following table:

Table 2.2: Location Details

Sr. No.	Particulars	Details
1.	**Plant location**	
	Plot No.	C-1/335, 336, 337, Phase-II, G.I.D.C. Vatva
	District	Ahmedabad
	State	Gujarat
2.	**Co-ordinates**	
	Latitude	22°57'9.70"N
	Longitude	72°38'11.34"E
3.	Nearest Railway Station	Vatva - 0.5 km

4.	Nearest Airport	Ahmedabad - 12.8 km
5.	Nearest Highway	NH8 - 4.25 km
Note: Aerial distances are given in above table.		

2.7 PRODUCTION DETAILS

At present the unit is engaged in manufacturing of Dyes Intermediates with total capacity of 17.198 MT/month. Unit has now proposed expansion of existing products with addition of new products. After expansion, total production capacity will be 200 MT/month. The production details are given hereunder.

Table 2.3: List of products

Sr. No.	Name of Product	Production Quantity (MT/month)			End use of product	CAS No.
		Existing	Proposed addition	Total After expansion		
01	Sulpho Tobias Acid	2	23	25	Dyes inter-mediates	171570-11-9
02	J-Acid	2.528	47.472	50		87-02-5
03	**J-Acid derivatives**	12.67	87.33	100		
	1. N-Acetyl J-Acid					6334-97-0
	2. N-Methyl J-Acid					22346-43-6
	3 N-Benzoyl J-Acid					132-87-6
	4. N-Phenyl J-Acid					119-40-4
04	RW-Acid (Di-J Acid)		10	10		87-03-6
05	Sulpho J-Acid		10	10		6535-70-2
06	N-Methyl Gamma Acid	00	5	5		6259-53-9
	Total	**17.198**	**182.802**	**200**		

2.8 PROPOSED SCHEDULE FOR APPROVAL AND IMPLEMENTATION

Specifics	Applied under the Act	Specifics for approval or legal procedure	Related recent Status	Implementation
EC for Expansion of Project	Under Environment Protection Act, 1986	Environment Clearance for the expansion project from SEIAA as per the guideline of EIA Notification-2006& amended time to time.	Submitted Form-I, TOR presentation, TORs awarded on 30.04.2017	Project will expand after obtaining EC from SEAC.
Operation of the Expansion Project	Under Air, Water, Hazardous Waste & Environment (Protection) Act, 1986	CTE & CTO/CCA from GPCB.	Will apply for CTE/CCA to GPCB.	After obtaining CC&A.

2.9 INFRASTRUCTURAL FACILITIES (Plant equipment/Machineries)

The details about additional plant machineries for proposed expansion are shown in below table. The proposed expansion will be carried out within

the existing plant premises. Building construction will be done as per plant design.

Table 2.4 List of plant equipment/machineries

Sr. No.	Name of equipment/machineries	Nos.	Capacity
List of machineries (Existing)			
1.	MS Sulfonator Vessel	2	2.8 KL each
		1	2.0 KL each
2.	MS Separator Vessel	1	2 KL
3.	MS Spare Vessel	1	2.5 KL
4.	MS Holding Tank	1	6 KL
		1	2.5 KL
5.	MS Receiver Tank	4	1 KL each
6.	MS Drowning Vessel	1	4.5 KL
		1	6.0 KL
		1	7.0 KL
7.	MS Lead Vessel	1	5.0 KL
8.	MS Isolation Vessel	1	10.0 KL
		1	8.0 KL
9.	SS Vessel	1	2.8 KL
		1	3.5 KL
		1	6.0 KL
10.	Auto SS Vessel	1	3.5 KL
11.	HDPE Vessel	1	7.0 KL
12.	HDPE Overhead Water Tank	1	5 KL
		1	2 KL
13.	HDPE Tank	1	3 KL
		1	10 KL
14.	Dryer	1	200 Tray
		1	96 Tray
15.	Filter Press (In Plant)	2	36'' x 36''
16.	Chilling Tank	1	4 KL
17.	Collection Tank (underground)	1	2.5 KL
		1	40.0 KL
		1	30.0 KL
List of machineries (Proposed)			
1.	SS 316 Limpet Coil with Condensers & Standard Accessories	1	25 KL
2.	M S R L T L Drowning Vessel with Standard Accessories	1	30 KL
3.	M S R L Centrifuge	1	48''
4.	PP Membrane filter press with Standard Accessories	1	48'' x 48''
5.	P P Filter Nutch with Inside P P Filter Plate	4	--
6.	H D P E Spiral Storage Tank	2	30 KL each
7.	M S Receiver Tank for Oleum	1	3 KL
8.	Blower (P P F R P)	2	10 HP each

9.	HDPE Spiral Storage Tank for Solution	3	20 KL each
10.	Soda Solution making vessel HDPE Spiral	1	5 KL
11.	MS limpet coil Sulfonator with Standard Accessories	2	15 KL each
12.	MS RL TL Drowning Non Jacketed Reactor	2	30 KL each
13.	MS Holding Non Jacketed Reactor	2	15 KL each
14.	B Q Plate Limpet Coil autoclave	2	15 KL each

2.10 DESCRIPTION OF MANUFACTURING PROCESS

This section includes the manufacturing process of the product, chemical reactions and mass balance of each product. The company will use the Best Available Process Technology (BAT) for the production. Unit has adopted cleaner production technology in our process. Unit has drastically reduced water consumption and wastewater generation along with increase the quantity and strength of spent acid. Currently this is the best available technology in the market. Unit has also carried out study of eternal cooling to reduce ice consumption as well as water consumption. As per the input given by the unit, isolation cannot be possible with less volume of process mass. So mentioned input of water and ice is minimum level of process mass for isolation of the product.

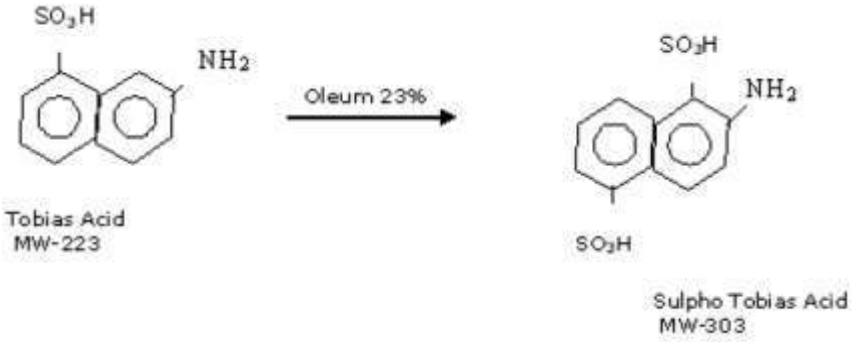
Manufacturing process, chemical reaction & mass balance is given below.

1. Sulpho Tobias Acid

Process Description:

Oleum & Tobias Acid is charged in Sulphonator vessel. After 12 hrs., the reaction completes & the reaction mass is dumped into drowning vessel where ice & salt are added. After drowning, reaction mass is filtered through Neutch filter. The product remains at the top of Neutch filter & the filtrate as wastewater goes to the effluent treatment plant. The product from the Neutch filter is taken into the centrifuge for drying. After drying, the product is packed & dispatched.

Chemical Reaction:



Mass Balance:

Mass balance of Sulpho Tobias Acid

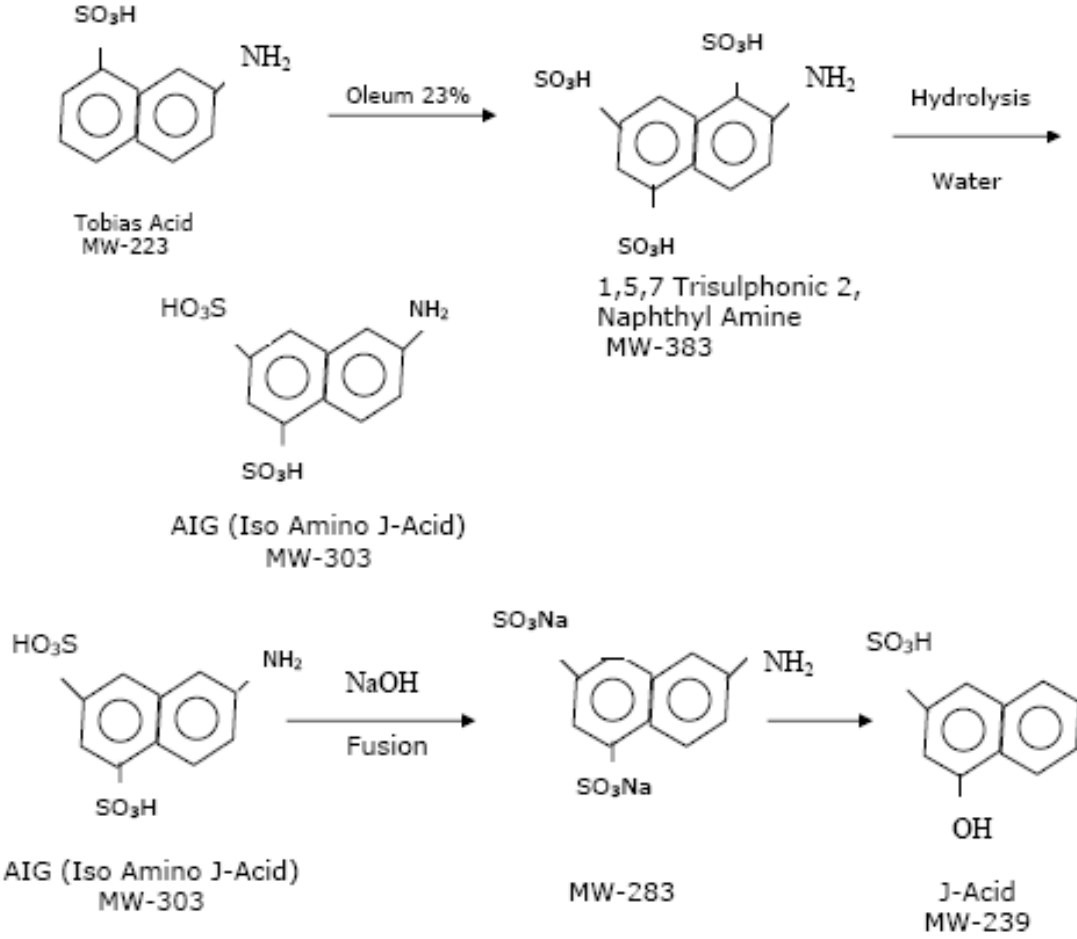
INPUT	Kgs		Kgs	OUTPUT
Oleum (23%)	2400	→ Sulphonation		
Tobias Acid	800	→ Sulphonation		
Ice	7200	→ Drowning		
Salt	2000	→ Drowning		
		Nutch Filter	9660	Spent Acid (24-25%)
		Centrifuge	1200	Spent Acid (24-25%)
		Products Wet cake	1540	Final Product(65%) 1000 Kg Real Basis
Total	**12400**		**12400**	

2. J-Acid

Process Description:

Oleum (23%), Tobias Acid is charged into vessel for Sulphonation. Then water is added for hydrolysis process. The reacted mass is filtered & centrifuged. The wastewater generated is recycled in isolation process. The crude mass is fusioned with NaOH. Then isolation is carried out with charging of dil. Sulfuric acid. The reaction mass is filtered through Neutch filter. Then the wet cake of product is dried in centrifuge, which is then after packed & dispatched.

Chemical Reaction:



Mass Balance:

Mass balance of J- Acid

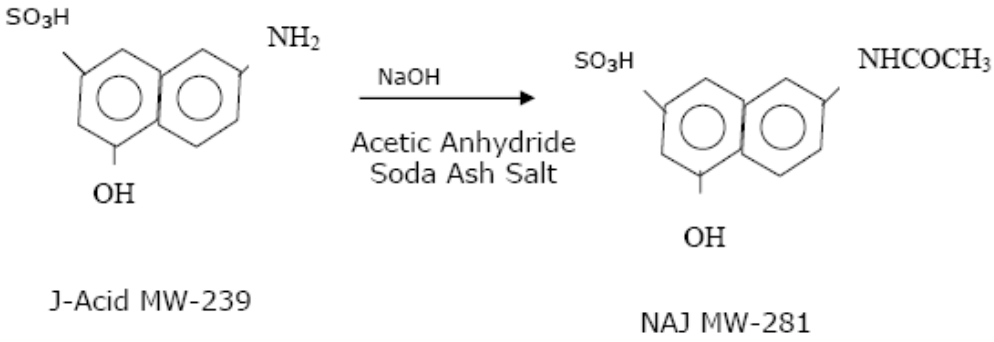
INPUT	Kgs		Kgs	OUTPUT
Oleum (23%)	4715	→ Sulphonation		
Tobias Acid	1430	→ Sulphonation		
Water	5140	→ Hydrolysis		
		Nutch Filter →	3300	Spent Acid (60-65%) Reuse for Isolation
		Nutch Filter →	2140	Spent Acid (60-65%) Reuse for Isolation
		Centrifuge →	1415	Spent Acid (60-65%) Reuse for Isolation
NaOH	1715	→ Fusion		
Spent Acid (60-65%)	3300	→ Isolation		
		Nutch Filter →	6000	Effluent to ETP
		Centrifuge →	1625	Effluent to ETP
		Products Wet cake →	1820	Final Product(55%) 1000 Kg Real Basis
Total	**16300**		**16300**	

3. N-Acetyl J-Acid

Process Description:

J-Acid, Caustic Lye, or flakes Acetic Anhydride & soda Ash and Salt are charged in the reactor for Acetylation process for 22 hrs. The Acetylate reaction mass is filtered through Neutch filter. The wet cake retains on the top of Neutch filter & the filtrate as wastewater goes to the Effluent Treatment Plant. Then the wet cake of product is dried in centrifuge, which is then packed & dispatched.

Chemical reaction:



J-Acid MW-239

NAJ MW-281

Mass Balance:

Mass balance of N-Acetyl -J- Acid

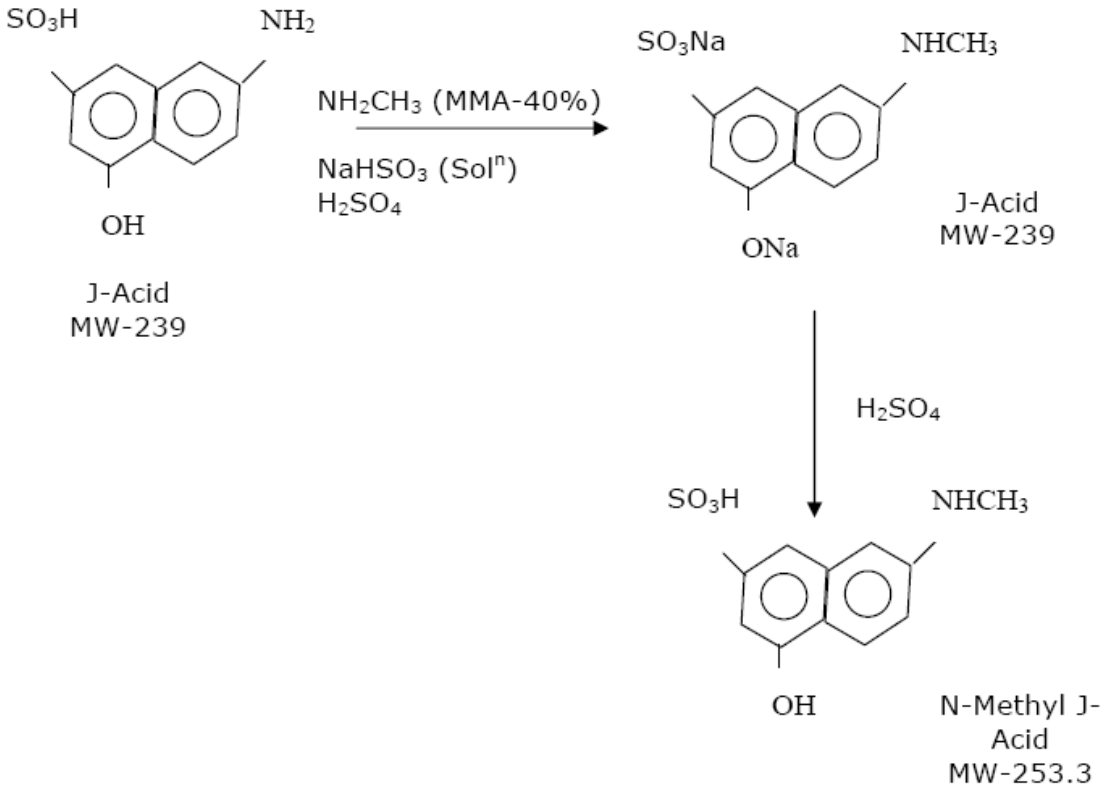
INPUT	Kgs		Kgs	OUTPUT
J-Acid	950	→ Acetylation		
NaOH	275	→ Acetylation		
Acetic Anhydride	535	→ Acetylation		
Salt	1140	→ Acetylation		
Water	5715	→ Acetylation		
		Nutch Filter	6000	Effluent
		Centrifuge	1280	Effluent
		Products Wet cake	1335	Final Product(75%) 1000 Kg Real Basis
Total	**8615**		**8615**	

4. N-Methyl J-Acid

Process Description:

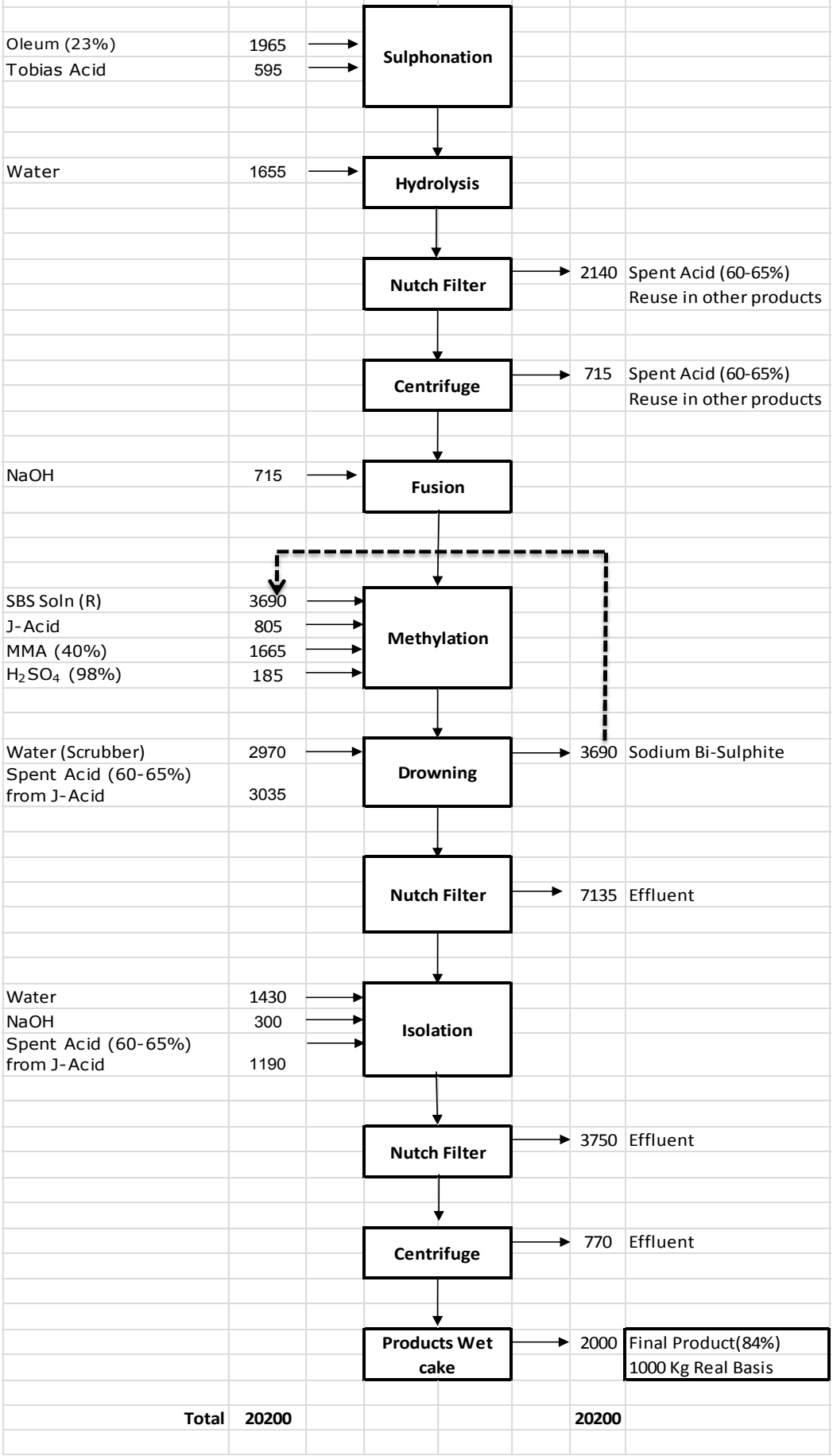
J-Acid, Mono Methyl Amine, Sodium Bi Sulphite solution are added in the reactor for Methylation. The reaction continues for 34 hrs. The MMA vapors are condensed & refluxed back into the reactor. As the reaction completes, the reaction mass is dumped into the drowning vessel, where dilute sulfuric acid are added & SO_2 gas is generated. The isolated mass is filtered through Neutch filter. The wet cake retains on the top of Neutch filter & the filtrate as wastewater goes to the effluent treatment plant. The wet cake is dumped into the vessel, where caustic soda &dilute sulfuric acid are charged. The reaction mass i.e. product is filtered through Neutch filter. The product is retained on the Neutch filter & filtrate is allowed to pass to effluent treatment plant. The wet cake of product is dried in dryer, which is then packed & dispatched.

Chemical Reaction:



Mass Balance:

Mass balance of N-Methyl -J- Acid

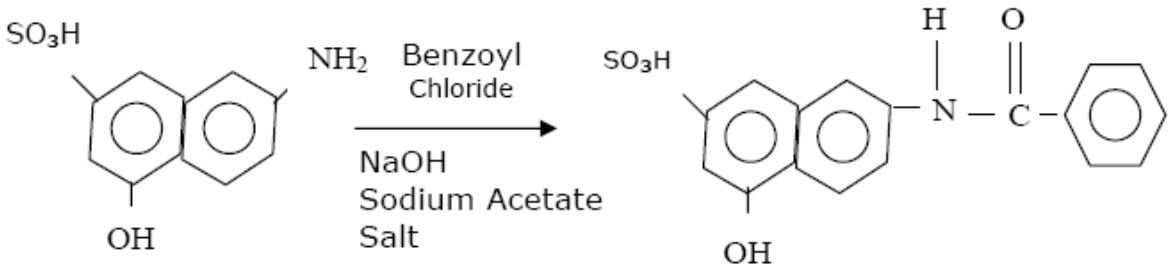


5. N-Benzoyl J-Acid

Process Description:

Take water and add J-Acid, caustic, Benzoyl chloride, soda and salt in reaction vessel. Then mass filter in Neutch. Cake is centrifuge and dried after dried material is packed and dispatch.

Chemical Reaction:



J-Acid MW-239

N-Benzoyl J Acid
MW-343

Mass Balance:

Mass balance of N-Benzoyl J-Acid

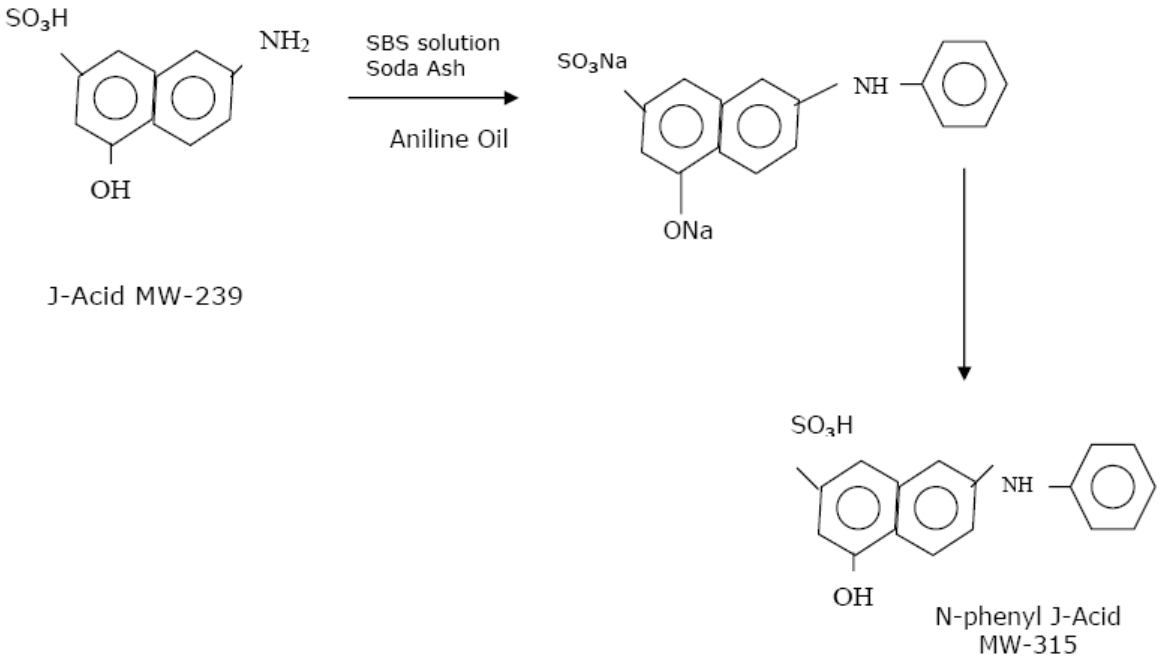
INPUT	Kgs		Kgs	OUTPUT
J-Acid	770	→ Benzoylation		
Benzoyl Chloride	655	→ Benzoylation		
Sodium Acetate	920	→ Benzoylation		
NaOH	230	→ Benzoylation		
Soda Ash	150	→ Benzoylation		
Salt	230	→ Benzoylation		
Water	3845	→ Benzoylation		
		Benzoylation → Nutch Filter		
		Nutch Filter →	3845	Effluent
		Nutch Filter → Centrifuge		
		Centrifuge →	955	Effluent
		Centrifuge → Products Wet cake		
		Products Wet cake →	2000	Final Product(50%) 1000 Kg Real Basis
Total	**6800**		**6800**	

6. N- Phenyl J-Acid:

Process Description:

J-Acid, Aniline oil, SBS, Soda and water are added in the reactor for reflux. The reaction continued for 40 hrs. As the reaction is completed the reaction mass is filtered through Neutch filter/filter press. The wet cake retains on the top of Neutch filter and the filter is used in next batch. The wet cake is centrifuged above, and the cake is taken for second stage of purification, in to vessel where sulphuric acid and water are charged. The batch is filtered through Nutch filter/filter press. The product is retained on the Nutch filter and filtrate is allowed to pass through Effluent Treatment Plant. The wet cake is centrifuged and dried which is then packed and dispatched.

Chemical Reaction:



Mass Balance:

Mass balance of N-Phenyl -J- Acid

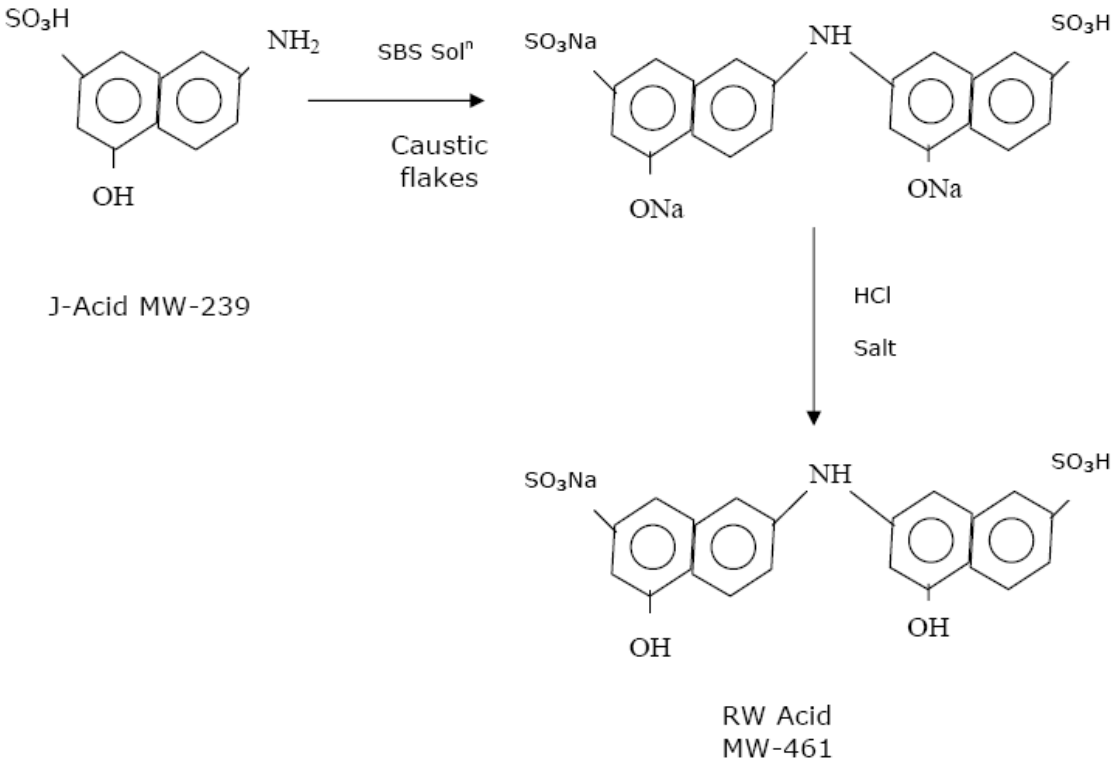
INPUT	Kgs		Kgs	OUTPUT
Mother Liq.	1230	→ Reflux		
Soda Ash	55	→ Reflux		
SBS Sollution(R)	1840	→ Reflux		
J-Acid	910	→ Reflux		
Aniline Oil	365	→ Reflux		
		Nutch Filter	1230	ML
		Centrifuge		
Water	2730	→ Purification		
Spent Acid (60-65%) from J-Acid	910	→ Purification		
		Nutch Filter	4240	Effluent
		Centrifuge	1145	Effluent
		Products Wet cake	1425	Final Product(70%) 1000 Kg Real Basis
Total	**8040**		**8040**	

7. RW Acid/Rhoduline Acid/Di-J-Acid

Process Description:

This is two-stage process, one is refluxing & another is purification. In the refluxing process, J-Acid, caustic lye, or flakes sodium bisulphite, salt are charged into vessel for 40 hrs. The reaction mass is filtered through Neutch filter. The wet cake retains on the top of Neutch filter & the filtrate as wastewater goes to the effluent treatment plant. Then the wet cake is centrifuged. The crude cake is taken for 2nd stage i.e. for purification. The crude cake is taken into vessel where HCl, salt & water are charged. The reaction mass i.e. product is filtered through Neutch filter. The product is retained on the Neutch filter & filtrate is allowed to pass to effluent treatment plant. The wet cake of product is dried in centrifuge, which is then packed & dispatched.

Chemical Reaction:



Mass Balance:

Mass balance of RW -Acid

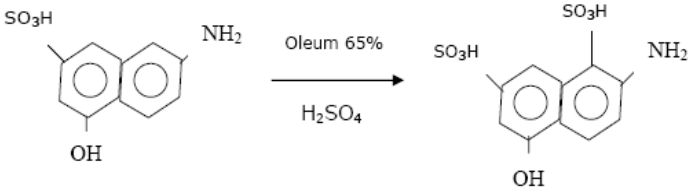
INPUT	Kgs		Kgs	OUTPUT
J-Acid	1425	→ **Reflux**		
NaOH	200	→		
SBS Sollution (R)	1785	→		
Salt	1450	→ **Isolation**		
Water	1570	→		
		Nutch Filter	4285	Effluent
HCl	485	→ **Purification**		
Salt	1360	→		
Water	10310	→		
		Nutch Filter	10335	Effluent
		Centrifuge	1965	Effluent
		Products Wet cake	2000	Final Product(50%) 1000 Kg Real Basis
Total	**18585**		**18585**	

8. Sulpho J- Acid

Process Description:

Oleum and J-Acid is charged in Sulphonator vessel and heated to maintain required temperature. Add sulphuric acid and After 12 hrs the reaction is complete and the reaction mass is dumped in to drowning vessel where ice, water, high flow and carbon are charged. The batch is filtered through Neutch filter/filter press. The filtrate is taken for second stage of isolation. The filtrate is taken in to vessel where salt are charged. The batch is filtered through Nutch filter/filter press. The wet cake of product is centrifuged and dried which is packed and dispatched. The filtrate is passed through ETP.

Chemical reaction:



J-Acid MW-239

Sulpho J-Acid
MW-319

Mass Balance:

Mass balance of Sulpho -J- Acid

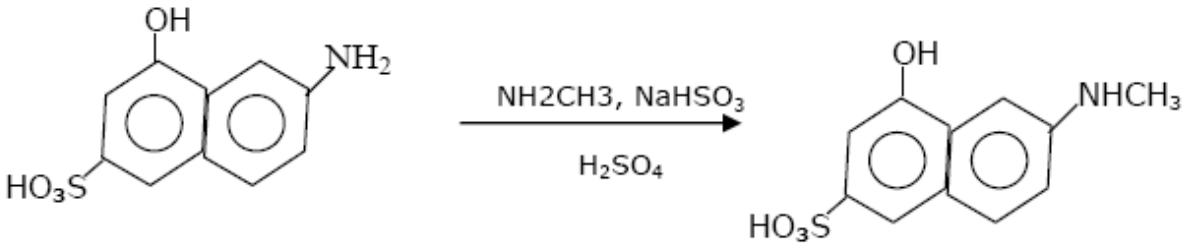
INPUT	Kgs		Kgs	OUTPUT
J-Acid	1500	→ Reflux		
Oleum (65%)	6450	→ Reflux		
Sulphuric Acid	1075	→ Reflux		
		↓		
Water	11500	→ Drowning		
Ice	8250	→ Drowning		
		↓		
		Clarification		
		↓		
Salt	4250	→ Isolation		
		↓		
		Nutch Filter	24450	→ Spent Acid (24%)
		↓		
		Centrifuge	6575	→ Spent Acid (24%)
		↓		
		Products Wet cake	2000	→ Final Product (50%) 1000 Kg Real Basis
Total	**33025**		**33025**	

9. N-Methyl Gamma Acid

Process Description:

Gama-Acid, Mono Methyl Amine, Sodium Bi Sulphite solution are added in the reactor for Methylation. The reaction continues for 34 hrs. The MMA vapors are condensed & refluxed back into the reactor. As the reaction completes, the reaction mass is dumped into the drowning vessel, where dilute sulfuric acid are added & SO_2 gas is generated. The isolated mass is filtered through Neutch filter. The wet cake retains on the top of Neutch filter & the filtrate as wastewater goes to the effluent treatment plant. The wet cake is dumped into the vessel, where caustic soda &dilute sulfuric acid are charged. The reaction mass i.e. product is filtered through Neutch filter. The product is retained on the Neutch filter & filtrate is allowed to pass to effluent treatment plant. The wet cake of product is dried in dryer, which is then packed & dispatched.

Chemical reaction:



Gama Acid
2-Amino, 8-Napthol,
6-Sulphonic Acid,
MW- 239.25

n-Methyl Gama Acid
1-naphthol 3-
sulphonic acid 7-
Methyl Amino
MW- 253.3

Mass Balance:

Mass balance of N-Methyl Gama Acid

INPUT	Kgs		Kgs	OUTPUT
Gama Acid	1190	Sulphonation		
MMA (40%)	1785			
H_2SO_4 (98%)	180			
SBS Solution(R)	3120			
Water	2795	Drowning	3120	Scrubber Soln. (SBS)
Spent Acid (60-65%) from J-Acid	2740			
		Nutch Filter	6845	Effluent
Water	2620	Isolation		
NaOH	300			
Spent Acid (60-65%) from J-Acid	1190			
		Nutch Filter	4045	Effluent
		Centrifuge	720	Effluent
		Products Wet cake	1190	Final Product(84%) 1000 Kg Real Basis
Total	**15920**		**15920**	

2.11 PROJECT COMPONENTS

Components of the project include all facilities required for the operation of the project with legal necessity.

a) Input requirements: Raw materials, water, fuel, power etc.

b) Utility requirements: Boiler, TFH, Cooling tower, D. G. Set etc.

c) Pollution control facilities:

- Water Treatment Facilities: Process concentrated effluent will be sent to common spray dryer and dilute H_2SO_4 will be partly reused in-house and balance will be sent to Novel Spent Acid Management, Vatva reuse by actual users under Rule-9. Dilute stream from washing and utilities will be treated in ETP and sent to CETP, Vatva for further treatment and final disposal.
- Air Pollution Control Facilities: Cyclone separator to flue gas stack and alkali scrubber (Ventury + two stage Packed column) to process gas stack.
- Hazardous/Solid waste facilities: It includes haz. waste storage

d) Other facilities: It includes greenbelt area, rain water harvesting system etc.

2.12 INPUT REQUIREMENTS

(a) Raw material requirement:

The transportation of raw materials will be done by road complying with all safety requirements. The raw materials will be stored/inventory will be maintained as per market requirement of the products and production schedule. Raw materials are indigenously available. The details of the raw material requirement are given in **Table 2.6.**

(b) Water requirement:

At present, total water requirement (Industrial + Domestic + Greenbelt) is 34.0 KLD. After expansion; it will be increased up to 105.0 KLD. Out of which, water consumption for domestic will be 5.0 KLD, process & scrubber 45.0 KLD, cooling tower 15.0 KLD, Boiler 10.0 KLD, washing 20.0 KLD, water treatment 5.0 & Gardening 5.0 KLD. Source of fresh water is GIDC water supply. After expansion, source of fresh water will remain same. Detailed breakup of the water consumption is given in **Table 2.7.** Water balance diagram is given in **Figure 2.1.**

(c) Power:

Total power requirement is sourced from Torrent Power Ltd. At present, power requirement is 152 KW [48 KW (ETP) & 104 KW (Production] and additional power demand for expansion activities will be 260 KW [60 KW (ETP) & 200 KW (Production)]. Hence, total 412 KW will be required after expansion. Unit has installed one stand by D. G. Set (125 kVA) to meet power requirement in case of power failure from state grid.

(d) Fuel:

At present, bio fuel - 2.0 MT/day in steam boiler & TFH is used as a fuel. After expansion, 4.0 MT/day bio fuel will be used in newly installed boiler. Diesel-14 lit/hr. is used as fuel for D.G. Set (125 kVA) which will be used only in case of emergencies/power failure.

(e) Manpower:

After expansion, total manpower will be 55; i.e. existing 40 nos. and proposed 15 nos. which include manpower at all levels (i.e. chemists, supervisors, operators, miscellaneous etc.).

2.13 UTILITIES REQUIREMENTS

Utilities facilities are tabulated below:

Table 2.5: Utility details

Sr. No.	Particulars	Qty.	Capacity
1.	Boiler	1	0.6 TPH (Existing) (to be dismantled)
		1	1.0 TPH (Proposed)
2.	Thermic Fluid Heater	1	4.0 lakhs kcal/hr. (Existing) (to be dismantled)
		1	10.0 lakhs kcal/hr. (Proposed)
3.	D. G. Set	1	125 kVA
4.	Cooling Tower	1	150 TR
		1	200 TR (Proposed)

2.14 GENERATION OF POLLUTANTS

The sources of pollution will be as below;

2.14.1 Wastewater generation

After proposed expansion, total wastewater generation will be increased from 34.0 KLD to 102.0 KLD. Out of which, 99.0 KLD will be industrial effluent and 3.0 KLD will be sewage effluent. Higher quantity of industrial

wastewater generation will be due to use of Ice and water retain with products.

Main sources of industrial wastewater generation will be process, washing and utilities. Entire quantity of the industrial wastewater is segregated into 2 streams as per the concentration-

- High COD effluent stream
- Low COD effluent stream (Dilute stream)

Total spent sulphuric acid generation will be tune around 47.0 KLD; out of which; 23.0 KLD will be captive use and 24.0 KLD spent Sulphuric Acid will be sent to Novel Spent Acid Management, Vatva for reuse by actual users under Rule-9.

Sewage will be disposed off into soak pit through septic tank. The details of wastewater generation (Existing & after proposed expansion) are given in **Table 2.7.** Water balance diagram is given in **Figure 2.1.**

2.14.2 Gaseous Emissions

Main sources of the gaseous emission are from flue gas stacks and process stack. In existing set up, flue gas emission is from stack attached with boiler and thermic fluid heater, where Bio fuel (Briquette) is used as fuel. After expansion, existing boiler and TFH will be dismantled and unit will install new boiler of 1.0 TPH capacity and TFH of 10.0 lakhs kcal/hr. capacity.

Unit has also installed one stand by D.G. set (125 kVA) for emergency purpose, where diesel is used as a fuel. Emitted flue gas pollutants will be SPM, SO_2 and NOx.

At present, process gas emission is from stack of reaction vessel. After expansion one stack of reaction vessel will be added, where SO_2 will be emitted. Adequate stack height & SMF to the flue gas stack and process gas stack has been provided for proper dispersion of gaseous emission. The details of the flue gas stacks & process gas stacks are given in **Table 2.11.**

<u>Sources of fugitive emission</u>:

In proposed activities, there will be chances of generation of acid fumes from material handling area, process area, solvent storage area etc.

There will be also changes of generation of PM (Dust) from packing/ finishing area.

2.14.3 Hazardous/Solid Waste generation

After expansion, main source of hazardous waste generation will be ETP sludge, used oil and discarded containers/barrels/liners, Spent Sulphuric Acid (24%-65%) and Sodium Bi Sulfite (40-45%).

The details of hazardous waste generation are given in **Table 2.14.**

2.14.4 Noise Pollution

At present, the main source of noise generation is boiler, process plant, vehicular transportation & other machineries.

There will be slight increase in noise level due to proposed manufacturing activities, due to installation of some new additional mechanical equipment required for the proposed expansion. The noise level in the unit is well within the prescribed limit.

2.15 POLLUTION CONTROL MEASURES

The details of pollution control strategy for various parameters are given hereunder:

2.15.1 Effluent Management

After expansion, quantity of industrial effluent generation will be increased up to 99.0 KLD. Entire quantity of the industrial wastewater is segregated into 2 streams as per the concentration-

- High COD effluent stream
- Low COD effluent stream (Dilute stream)

From high concentrated stream, total spent Sulphuric acid generation will be tune around 47.0 KLD; out of which; 23.0 KLD will be captive use and 24.0 KLD spent Sulphuric Acid will be sent to Novel Spent Acid Management, Vatva for reuse by actual users under Rule-9.

Process effluent of 68.0 KLD after primary treatment will be sent for common spray dryer to avoid heavy load of organic and inorganic on CETP.

Dilute stream of 31.0 KLD from washing and utilities will be treated in ETP and after achieving CETP inlet norms, it will be sent to Common CETP of GESCSL, Vatva.

There is no increase pollution load in terms of Hydraulic and organic compare with granted pollution load by GPCB in existing CC&A but on the contrary reduce organic load due to high TDS high COD effluent directly send to common evaporation facility. Domestic sewage-3.0 KLD will be disposed into soak pit followed by septic tank.

Unit has full-fledge ETP with capacity of 50 m^3/day for dilute stream and 100 m^3/day for concentrated stream. After expansion, unit will treat its effluent in same ETP. Design details of ETP are given in **Table 2.9** and flow diagram of ETP is given as **Figure 2.2.**

- **Effluent treatment scheme:**

ETP of high COD concentrated stream

Raw effluent from process is collected separately into collection Tank. Then it is passed through Neutch filter/filter press there by following coagulation/flocculation process in the tank. After this, process effluent wastewater will be conveyed to holding tank. Then it will be sent to common Spray dryer.

ETP of dilute stream

Dilute effluent streams coming from plant and utilities are collected in collection tank. Then it is taken to Neutralization tank, where pH of the effluent is adjusted as per the acidity/alkalinity of the effluent. Then treated effluent is passed through filter press to separate out solid sludge. Clear effluent from filter press is taken to primary sump. Effluent emerging out from Primary sump shows marked reduction in COD and TDS as organic dissolved solids also gets precipitated out in filter press. Then the effluent is taken to equalization tank. Then it is passing to bioreactor, here the suitable bacterial culture is nourished & desired level of MLSS and MLVSS is maintained by adding cow dung or other nutrients like urea as and when required. To provide required amount of air for biological degradation, blower is provided. Such bioreactor will ensure into desired COD reduction. The overflow of this tank is directed to flow into secondary settling tank. Biomass is recycled back. The settled sludge is taken by sludge sump from where it is taken into sludge drying bed. Clear treated effluent is transferred to Sand Filter to remove TSS and is passed to Activated Carbon Filter, to remove the color and other

impurities and finally treated effluent is collected in overhead treated water collection tank. From where after achieving CETP inlet norms, treated effluent will be discharge to CETP drainage for further treatment and final disposal. Sludge collected at bottom of primary settling tank is sent to Sludge drying beds.

2.15.2 Air Pollution Control

Flue gas stacks

Flue gas emission is due to the combustion of fuel. At present, bio fuel is used as fuel in stack of boiler& TFH. Multi cyclone is installed as APCM. After expansion, one boiler with capacity of 1 TPH &TFH with 10.0 lakhs kcal/hr. capacity will be installed (Existing boiler & TFH will be dismantled) where the same fuel i.e. bio fuel (Briquette) will be used. To control Air pollution (PM), Multi Cyclone will be installed as APC.

Unit has one D.G. set with capacity of 125 kVA. It is used in case of non-availability of power. Diesel is used as fuel. Proper stack height & SMF will be provided in order to achieve norms prescribed by statutory authority. The details of the stacks with their APC measures & height are given in **Table 2.11.**

Process stacks/vents

At present, process gas emission is from the stack attached to reaction vessel. After expansion, SO_2 scrubber having stack height of 15 m will be added. Two stage alkali scrubber systems will be provided to recover Sodium bisulphite and meeting the emission norms laid down by GPCB. The details of process gas stacks with their APC measures & height are given in **Table 2.11.**

Fugitive Emission Control

To control fugitive emission, following steps will be implemented:

- Entire process will be carried out in closed reactors.
- Pneumatically transfer of liquid raw material in rector.
- Raw material will be stored in the covered structure.
- Regular maintenance of valves, pipes etc. will be done.
- PPEs will be provided to the workers.
- Frequent work area monitoring will be done ensure fugitive emissions level.

- Internal roads will be concreted or paved to reduce fugitive emission during vehicular movement.
- Air borne dust will be controlled with water sprinklers.
- Greenbelt will be developed around the plant to arrest the fugitive emission.

2.15.3 Hazardous/Solid Waste Management

Entire quantity of hazardous waste will be handled & disposed as per Hazardous & Other waste (Management & Transboundary Movement) Rules, 2016. ETP sludge will be disposed by land filling at approved TSDF site. Discarded containers/liners will be sold to registered recycler. Used Oil will be reused as lubricant or sold to registered re-processor. Spent Sulphuric Acid (24%-65%) will be partly reused in-house and balance qty. sent to Novel spent management or actual users under Rule-9 of Haz. Rules, 2016 and Sodium Bi Sulfite (40-45%) will be completely reused in-house. The unit has provided isolated area with impervious flooring & roof cover for the storage of hazardous waste. Details of hazardous waste disposal are given in **Table 2.14.**

Fly Ash management

In existing operation, fly ash is generated around 6.0 MT/month. Total fly ash generation after proposed expansion will be 18.0 MT/month. Fly ash is sold to brick manufacturer working in 25 km radius from project site and also supplied to the companies for land leveling, conditioning & road construction, etc.

(a) Methodology of Decontamination of Discarded Containers

Generated drums/carboys will be stored at identified place within the plant premises. As per the HAZ Rules, contaminated containers will be decontaminated in plant and log book will be maintained for generation and disposals. Separate area for decontamination of containers will kept near to proposed ETP. Contaminated water will be treated with effluent in ETP.

2.15.4 Noise control measures

Following steps will be taken by industry to control noise:

- Proper maintenance of equipment & oiling to avoid increase in noise.
- Provide PPEs like ear puff, ear plugs etc. to workers.

- Rotate the workers from noise generating area to other.
- Greenbelt will be developed within industrial premises to prevent the noise pollution.
- Periodic monitoring of noise levels will be done.

2.16 RAIN WATER HARVESTING SYSTEM

The storm water from the building roofs will be directed through the drainage to the covered storm water drainage line. All drainage system will be concreted lined and located along the roads up to rain water harvesting pit. Roof top rain water will be collected in tanks and reused after filtration as per requirements.

2.17 GREEN BELT DEVELOPMENT

The unit has developed greenbelt in area of 200 m^2 and it will be increased up to 615 m^2 area. Overall greenbelt area is tune around 30% of the total area of the project. However, the unit will plan to develop the greenbelt in areas available outside the plant anywhere in GIDC. Unit has adopted part of reserve land of GIDC which is around 2000 m^2 where we will develop around 500 saplings. Copy of letter issued by VIA is enclosed as **Annexure-XVI**.

Table 2.6

Details of raw materials

Sr. No.	Name of Raw Materials	CAS No.	Quantity (MT/Month)	Source	Transportation
Sulpho Tobias Acid					
1.	Oleum (23%)	8014-95-7	2400	Local	By road
2.	Tobias Acid	171570-11-9	800	Local	By road
3.	Salt	--	2000	Local	By road
J-Acid					
1.	Tobias Acid	171570-11-9	1430	Local	By road
2.	Oleum (23%)	8014-95-7	4715	Local	By road
3.	NaOH	1310-73-2	1715	Local	By road
4.	Dil. H_2SO_4	7664-93-9	3300	Local	By road
N-Acetyl J-Acid					
1.	J-Acid	87-02-5	950	Local	By road
2.	NaOH	1310-73-2	190	Local	By road
3.	Acetic Anhydride	108-24-7	530	Local	By road
4.	Salt	--	1140	Local	By road
N-Methyl J-Acid					
1.	J-Acid	87-02-5	1190	Local	By road
2.	MMA (40%)	80-62-6	1785	Local	By road
3.	Sodium Bisulphite	7631-90-5	2975	Local	By road
4.	H_2SO_4 (98%)	7664-93-9	180	Local	By road
5.	Caustic Soda	1310-73-2	300	Local	By road
6.	Dilute H_2SO_4	7664-93-9	1190	Local	By road
N-Benzoyl J-Acid					
1.	J-Acid	87-02-5	770	Local	By road
2.	Ben. Chloride	98-88-4	655	Local	By road
3.	Sodium Acetate	127-09-3	925	Local	By road
4.	NaOH	1310-73-2	155	Local	By road
5.	Soda Ash	497-19-8	75	Local	By road
6.	Salt	--	385	Local	By road
RW-Acid (Di-J Acid)					
1.	J-Acid	87-02-5	1430	Local	By road
2.	NaOH	1310-73-2	200	Local	By road
3.	Sodium Bisulphite	7631-90-5	4250	Local	By road
4.	HCl (30%)	7647-01-0	480	Local	By road
5.	Salt	--	3140	Local	By road
Sulpho J-Acid					
1.	J-Acid	87-02-5	1500	Local	By road
2.	Oleum 65%	8014-95-7	6450	Local	By road
3.	H_2SO_4 (98%)	7664-93-9	1075	Local	By road
4.	Salt	--	4250	Local	By road
N-Phenyl J-Acid					
1.	J-Acid	87-02-5	910	Local	By road
2.	Aniline Oil	62-53-3	365	Local	By road
3.	Soda Ash	497-19-8	55	Local	By road

Sr. No.	Name of Raw Materials	CAS No.	Quantity (MT/Month)	Source	Transportation
4.	Sodium Bisulphite	7631-90-5	1845	Local	By road
5.	Dilute H_2SO_4	7664-93-9	910	Local	By road
N-Methyl Gamma Acid					
1.	Gamma Acid	90-51-7	1000	Local	By road
2.	MMA (40%)	80-62-6	1500	Local	By road
3.	Sodium Bisulphite	7631-90-5	2500	Local	By road
4.	H_2SO_4 (98%)	7664-93-9	150	Local	By road
5.	Caustic Soda	1310-73-2	250	Local	By road
6.	Dilute H_2SO_4	7664-93-9	1000	Local	By road

Table 2.7

Breakup of water consumption & wastewater generation

Water consumption

Sr. No.	Source	Existing water consumption (KL/Day)	Total water consumption after expansion (KL/Day)
I	**Domestic**	2.5	5.0
II	**Gardening**	1.0	5.0
III	**Industrial**		
a)	Process + Scrubber	19.0	45.0
b)	Cooling	9.0	15.0
c)	Boiler	1.0	10.0
d)	Washing	1.5	20.0
e)	Water treatment	00	5.0
Total Industrial		**30.5**	**95.0**
Total (I+II+III)		**34.0**	**105.0**

Wastewater Generation

Sr. No.	Source	Existing wastewater generation (KL/Day)	Total wastewater generation after expansion (KL/Day)
I	**Domestic**	2.0	3.0
II	**Industrial**		
a)	Process	16.0	68.0
b)	Cooling	0.5	1.0
c)	Boiler	0.50	5.0
d)	Washing	15.0	20.0
e)	Water treatment	00	5.0
Total Industrial		**32.0**	**99.0**
Total (I+II)		**34.0**	**102.0**

Process effluent of 68.0 KLD after primary treatment will be sent for common spray dryer to avoid heavy load of organic and inorganic on CETP and 31.0 KLD dilute effluent from washing and utilities will be sent for final treatment and final disposal to CETP-GESCSL, Vatva.

Note: Total spent Sulphuric acid generation will be tune around 47.0 KLD; out of which; 23.0 KLD will be captive use and 24.0 KLD spent Sulphuric Acid will be sent to Novel Spent Acid Management, Vatva for reuse by actual users under Rule-9.

Reference of calculation of water consumption, wastewater generation

Sr. no.	Product name	Qty MTPM	Batch Size (kg)	batch/ month	Wc/ batch/L	Wc/M	Wc/day	Ice/ batch/L	Ice/M	Ice/day	W/w/ batch	W/w/M	W/w/ day
1	Sulpho Tobias Acid	25	1000	25	0	0	0	7200	180000	6923	0	0	0
2	J-Acid	50	1000	50	5140	257000	9885	0	0	0	7625	381250	14663
3	N-Acetyl J-Acid	100	1000	100	5715	571500	21981	0	0	0	7280	728000	28000
4	N-Methyl J-Acid	100	1000	100	3085	308500	11865	0	0	0	11655	1165500	44827
5	N-Benzoyl J-Acid	100	1000	100	3845	384500	14788	0	0	0	4800	480000	18462
6	N-Phenyl J-Acid	100	1000	100	2730	273000	10500	0	0	0	5385	538500	20712
7	RW-Acid	10	1000	10	11880	118800	4569	0	0	0	16585	165850	6379
8	Sulpho J- Acid	10	1000	10	11500	115000	4423	8250	82500	3173	0	0	0
9	N-Methyl Gamma Acid	5	1000	5	2620	13100	504	0	0	0	11610	58050	2233
						Total (lit/day)	**31246**			**10096**			**68102**
						Total (KL/day)	**31.2**			**10**			**68.10**

Table 2.8

Acid Generation, Utilization and Balance quantity

All units are expressed in lit

Sr. no.	Product name	Qty MTPM	Batch Size (kg)	batch/ month	Acid/ batch/L (Gen)	Acid/M (Gen)	Acid/day (Gen)	Acid/ batch/L (Uti)	Acid/M (Uti)	Acid/day (Uti)
1	Sulpho Tobias Acid	25	1000	25	10860 (24-25%)	271500	10442	0	0	0
2	J-Acid	50	1000	50	6855 (60-65%)	342750	13183	3300	165000	6346
3	N-Acetyl J-Acid	100	1000	100	0	0	0	0	0	0
4	N-Methyl J-Acid	100	1000	100	2855 (60-65%)	285500	10981	4225	422500	16250
5	N-Benzoyl J-Acid	100	1000	100	0	0	0	0	0	0
6	N-Phenyl J-Acid	100	1000	100	0	0	0	910	91000	3500
7	RW-Acid	10	1000	10	0	0	0	0	0	0
8	Sulpho J- Acid	10	1000	10	31025 (24-25%)	310250	11933	0	0	0
9	N-Methyl Gamma Acid	5	1000	5	0	0	0	3930	19650	756
						Total (lit/day)	**46539**			**23352**
						Total (KL/day)	**47**			**23.35**
						Difference	**24 to Novel or actual users**			

Sodium Bi-Sulphate Generation, Utilization and Balance quantity

All units are expressed in lit

Sr. no.	Product name	Qty MTPM	Batch Size (kg)	batch/ month	SBS/ batch (Gen)	SBS/M	SBS/day	SBS/ batch (Uti)	SBS/M	SBS/day
1	Sulpho Tobias Acid	25	1000	25	0.00	0.00	0.00	0.00	0.00	0.00
2	J-Acid	50	1000	50	0.00	0.00	0.00	0.00	0.00	0.00
3	N-Acetyl J-Acid	100	1000	100	0.00	0.00	0.00	0.00	0.00	0.00
4	N-Methyl J-Acid	100	1000	100	3690 (40-45%)	369000	14192	3690	369000	14192
5	N-Benzoyl J-Acid	100	1000	100	0	0	0	0	0	0
6	N-Phenyl J-Acid	100	1000	100	0	0	0	1840	184000	7077
7	RW-Acid	10	1000	10	0	0	0	1785	17850	687
8	Sulpho J- Acid	10	1000	10	0	0	0	0	0	0
9	N-Methyl Gamma Acid	5	1000	5	3120 (40-45%)	15600	600	3120	15600	600
						Total (lit/day)	**14792**			**15479**
						Total (KL/day)	**14.7**			**15.48**
						Difference	**-0.78**			

Table 2.9

Name and size of ETP units

Dilute stream

Sr. No.	Particulars	Qty.	MOC	Capacity (m^3)
1.	Small Collection Tank	1	MSRLTL [Under Ground]	4
2.	Big Collection Tank	1	MSRLTL	40
3.	Neutralization vessel	1	MSRLTL	25
4.	Filter Press	1	Plate Size: 36”	-
5.	Primary Sump	1	RCC MSRL	10
6.	Equalization Tank	1	RCC	80
7.	Bio-Reactor [Mickey]	2	RCC	40
8.	Settling Tank	1	RCC	30
9.	Secondary Collection Tank	1	RCC	10
10.	Sand Filter	1	MSRL	1 MT
11.	Carbon Column	1	MSRL	1 MT
12.	Treated Waste Water Tank	1	RCC [Overhead]	20

High COD Concentration Stream

Sr. No.	Particulars	Qty.	MOC	Capacity (m^3)
1.	Collection Tank	1	MSRLTL	30
2.	Vessels(Chemical Treatment)	2	MSRLTL	7
3.	Round Tub With Filter Net	1	HDPE	500Ltr
4.	Filter Pump	1	PP PUMP	30
5.	Holding Tank	3	HDPE Spiral Tank	30

Table 2.10

Characteristic of untreated and treated effluent of Process W/w

Parameters	Unit	Untreated effluent	Treated effluent	CETP inlet norms
pH	pH Unit	1.7	7.7	To common Spay Dryer
Color	Co-Pt Unit	1092	360	
SS	mg/L	1580	279	
TDS	mg/L	35499	38578	
COD	mg/L	8285	6662	
BOD	mg/L	3928	2675	
Oil & Grease	mg/L	31	7.9	
Ammonical Nitrogen	mg/L	92	47	

Characteristic of untreated and treated effluent of dilute stream

Parameters	Unit	Untreated effluent	Treated effluent	CETP inlet norms
pH	pH Unit	4.9	7.2	6.5-8.5
Color	Co-Pt Unit	115	46	--
SS	mg/L	201	59	600
TDS	mg/L	4971	4642	--
COD	mg/L	892	475	1200
BOD	mg/L	281	198	500
Oil & Grease	mg/L	5.0	4.5	20
Ammonical Nitrogen	mg/L	12	8.2	50

Table 2.11

Details of stacks

Sr. No.	Stack attached to	Fuel Type	Stack Height, in m	APC measures	Probable emission
Existing					
Flue Gas Stacks					
1.	Steam Boiler*	Bio fuel	15	Multi Cyclone separator	SPM<150 mg/Nm^3 SO_2<100 ppm NO_2<50 ppm
2.	Thermic Fluid Heater (4.0 lakhs kcal/hr.)*	Bio fuel	15	Multi Cyclone separator	SPM<150 mg/Nm^3 SO_2<100 ppm NO_2<50 ppm
3.	D G set (125 kVA)	Diesel – 30 lit/hr.	11	--	SPM<150 mg/Nm^3 SO_2<100 ppm NO_2<50 ppm
Process Gas Stacks					
1.	Reaction Vessels	-	15	Alkali Scrubber (Ventury + Packed column)	SO_2<40 mg/Nm^3
Proposed					
Flue Gas Stacks					
1.	Steam Boiler	Bio fuel (Briquette) – 4 MT/day	15	Cyclone separator	SPM<150 mg/Nm^3 SO_2<100 ppm NO_x<50 ppm
2.	Thermic Fluid Heater (10.0 lakhs kcal/hr.)	Bio fuel (Briquette) – 6.5 MT/day	15	Multi Cyclone separator	SPM<150 mg/Nm^3 SO_2<100 ppm NO_2<50 ppm
Process Gas Stacks					
2.	Reaction Vessels	-	15	Alkali Scrubber (Ventury + Packed column)	SO_2<40 mg/Nm^3

***** Existing boiler & TFH with capacity of 0.6 TPH & 4.0 lakhs kcal/hr. will be dismantled after expansion and unit will install boiler of 1 TPH and TFH of 10.0 lakhs kcal/hr.

Hence effective stacks of flue gas and process is given below:

Sr. No.	Stack attached to	Fuel Type	Stack Height, in m	APC measures	Probable emission
Flue Gas Stacks					
1.	Steam Boiler (1.0 TPH)	Bio fuel (Briquette) – 4 MT/day	15	Cyclone separator	SPM<150 mg/Nm^3 SO_2<100 ppm NO_x<50 ppm
2.	Thermic Fluid Heater (10.0 lakhs kcal/hr.)	Bio fuel (Briquette) – 6.5 MT/day	15	Multi Cyclone separator	
3.	D G set (125 kVA)	Diesel – 30 lit/hr.	11	--	
Process Gas Stacks					
1.	Reaction Vessels	-	15	Alkali Scrubber (Ventury + Packed column)	SO_2<40 mg/Nm^3
2.	Reaction Vessels	-	15	Alkali Scrubber (Ventury + Packed column)	SO_2<40 mg/Nm^3

Table 2.12

Air Emission Quality

Sr. No.	Stack attached to	Stack Temp.(^{0}C)	Velocity (m/s)	Stack Height in m	Dia. (m)	SPM mg/ Nm^3	SO_2 mg/ Nm^3	NO_X mg/ Nm^3
1.	Boiler	163	8.1	15	0.450	115.5	8.4	27.2
2.	TFH	182	8.3	15	0.300	109.7	6.8	31.0
3.	Boiler	175	8.5	15	0.450	120.0	10.0	30.0
4.	D G set (125 kVA)	210	10	11	0.225	90.0	25.0	30.0
5.	Reaction Vessels (Existing)	73.5	6.5	15	0.225	SO_2-17.5		
6.	Reaction Vessels (Proposed)	80.0	6.5	15	0.225	SO_2-20.0		

Table 2.13

Technical specification of Thermic Fluid Heater

Cap. 10 lakhs kcal/hr.

Sr. No.	Description	Specification
1	Heat Output	1000000 kcal/hr.
2	Heat Transfer area	105 m^2/hr.
3	Thermic fluid heater coil volume	665 ltr
4	Coil structure 3 start tube OD BS 3059	63 mm
5	Thermic fluid dimension	3700 mm x 1750 mm x 2500 mm
6	Thermal efficiency without APH With APH	88% 92%
7	Outlet Temperature	280 ^{0}C
8	Fuel (agro waste) consumption without APH With APH	375 kgs/hr. 337 kgs/hr.
9	Circulating pump	15 HP
10	ID fan	10 HP
11	FD fan	5 HP
12	Total electrical load	30 HP

Technical specification of Thermic Fluid Heater

Cap. 4 lakhs kcal/hr.

Sr. No.	Description	Specification
1	Heat Output	400000 kcal/hr.
2	Max. Fluid temp. outlet	290 ^{0}C
3	Flow rate	29 m^3/hr.
4	Efficiency at full load on GCV basis	75+2%
5	Heat Transfer area	42 m^2/hr.
6	Coil volume	265 ltr
7	Tube OD	50.8 mm
8	Tube thickener	3.66 mm
9	**Thermic fluid circulation pump**	
a	Flow	30 m^3/hr.
b	Head	55 MLC
c	Motor	10 HP
10	ID Fan	
a	Flow	4000 m^3/hr.
b	Head	200 mm Wc
c	Motor	3 HP
11	Stack temperature	205 ^{0}C
12	Total connected load	15 HP
13	Fuel consumption	150 kgs/hr.

Table 2.14

Details of Hazardous waste

Sr. No.	Type of waste	Waste Category	Existing Generation	Total after expansion	Disposal Facility
1.	ETP sludge	35.3	40 MT/month	290 MT/month	Sold to cement manufacturer or Disposal to TSDF site.
2.	Discarded containers/ barrels/ liners	33.1	12 nos./month Liner-8 kg/month	42 nos./month Liner-58 kg/month	Being used for packing of ETP sludge in case of excess it will be sold to approved recyclers.
3.	Used Lubricating Oil	5.1	200 Lit/yr.	400 Lit/yr.	It will be sold to approve recycler with CPCB.
4.	Spent Sulphuric Acid (24%-65%)	26.3	--	1222 Kl/month	Collection, storage and partial reuse in-house and balance qty. sent to Novel spent management or actual users under Rule-9 of Haz. rules, 2016
5.	Sodium Bi Sulfite (40-45%)	B(15)	45 Kl/month	390 Kl/month	Collection, storage and reuse in-house

Figure 2.1

Water Balance Diagram (Total after expansion)

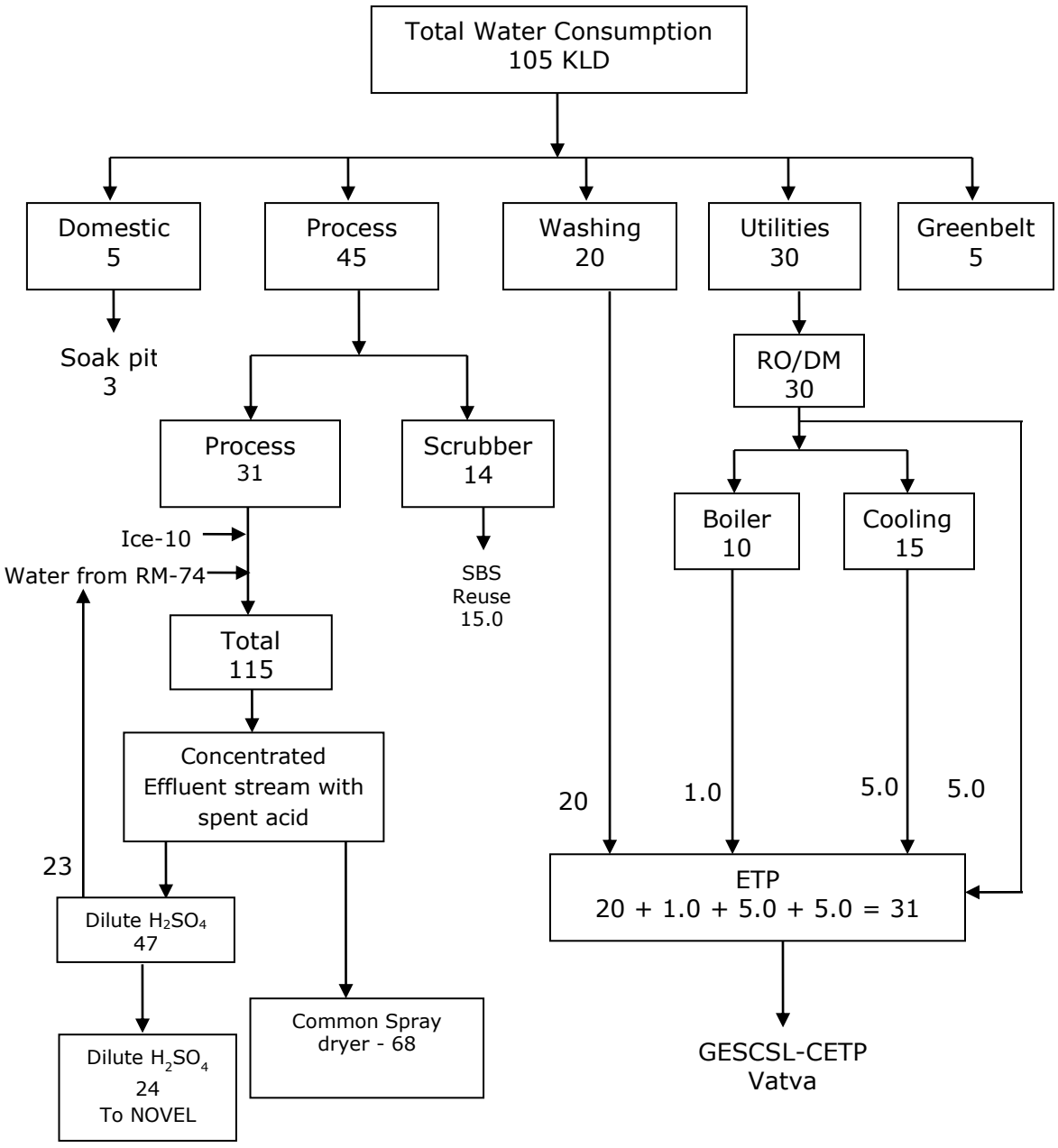
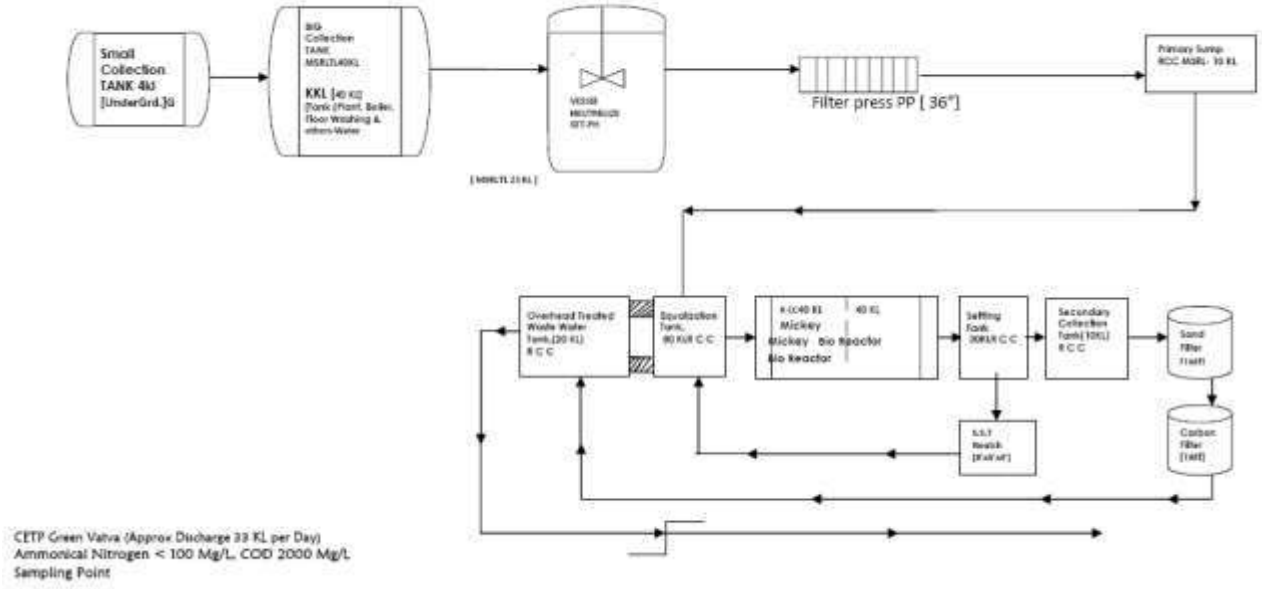


Figure 2.2

Flow diagram of ETP

Dilute stream ETP



High COD concentration ETP

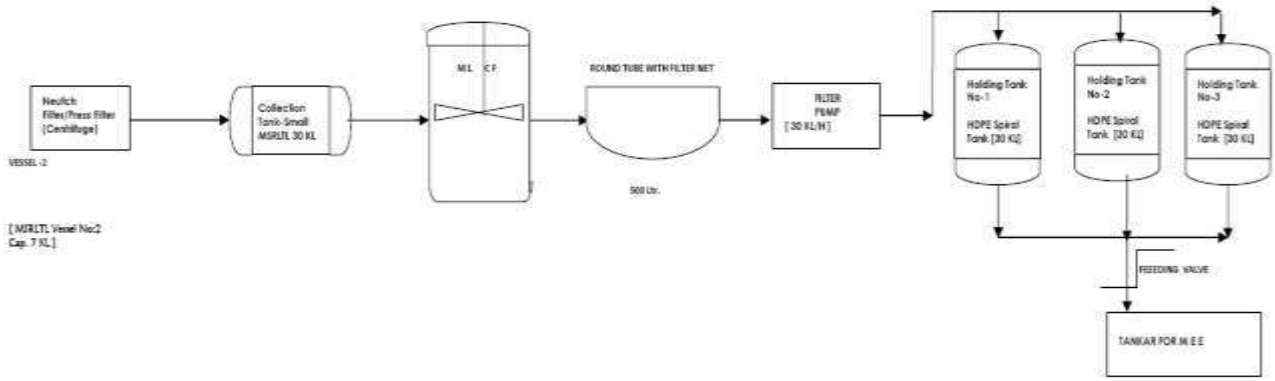
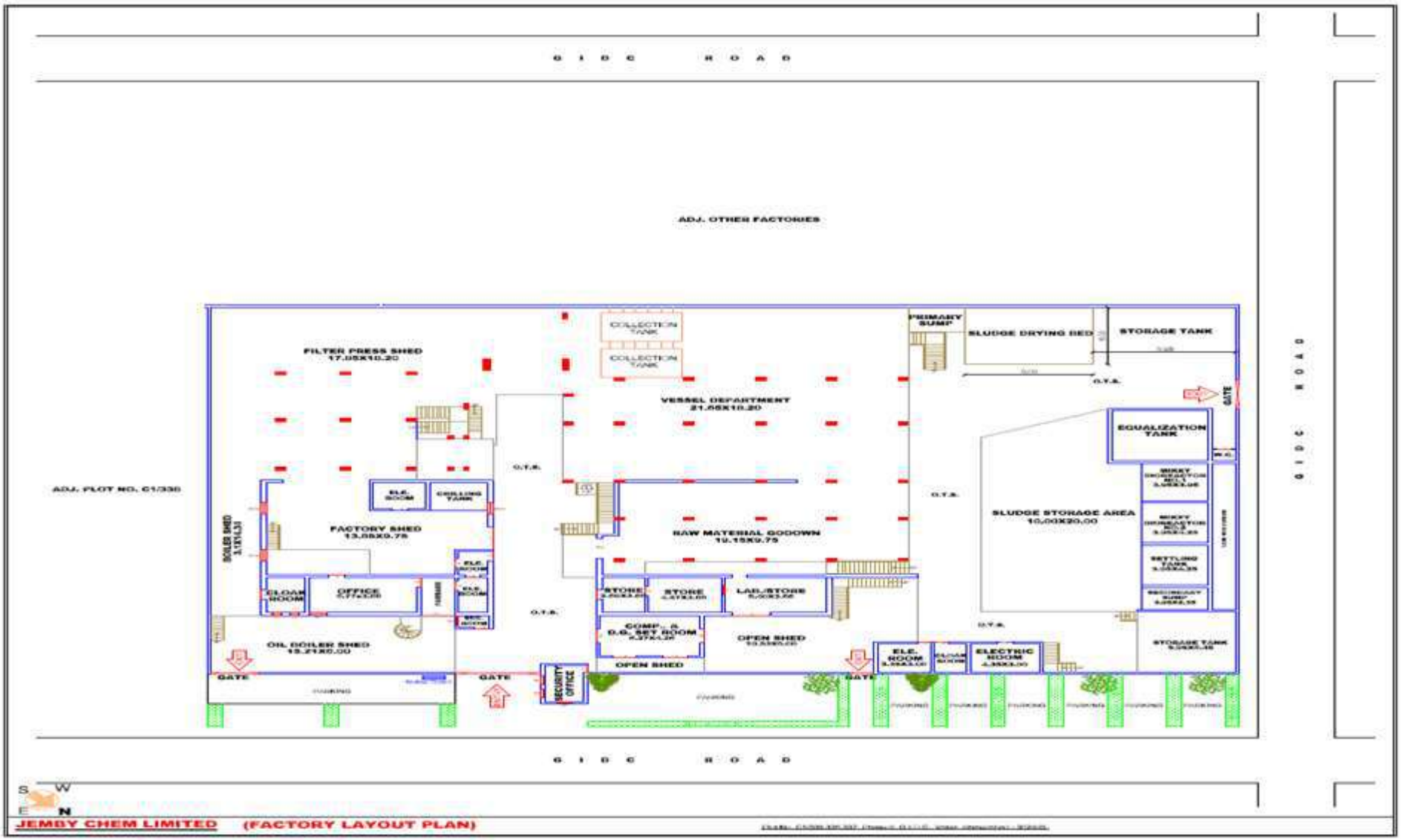


Figure 2.3
Plant Layout



Chapter-3
Description of the Environment

3.1 PRELUDE

To assess environmental impacts from proposed project at a specific location, it is essential to monitor the environmental quality prevailing in the surrounding area prior to implementation of the proposed project. The environmental status within the impact zone could be used for identification of significant environmental issues to be addressed in the impact assessment study.

In order to identify and establish the extent of likely impacts, it is essential to gather information on existing environmental quality with regard to various components of the environment.

3.1.1 Study area

Jemby Chem Limited is an existing project located at Plot No. C-1/335, 336, 337, G.I.D.C. Estate, Phase- II, Vatva, Ahmedabad, Gujarat. The baseline study was carried out within 5 km radius from the center as per the TOR issued by SEAC, Gujarat.

3.1.2 Period of Study

The baseline study of the project was carried out during **March, 2017 to May, 2017** within 5 km radius from the center of the project site.

3.1.3 Basic Component of the Environment

The study of the basic component of the present environment is obligatory to predict the environmental impact on the study area; therefore it is necessary to discriminate the various components of the Environment. Environment consists of Lithosphere, Hydrosphere, Atmosphere and Biosphere. The following Environmental components have been considered for the study of the Existing environment:

(I) Lithosphere: It includes the terrain and landscape study. Such as

a) Topography and Geology of the study area

(II) Hydrosphere or Water Environment: It includes water quality study by means of –

a) Surface water quality

b) Ground water quality

(III) Atmosphere or Air Environment: Atmospheric condition mainly depend upon the -

a) Climatic condition, and

b) Micrometeorological data such as wind, temperature, humidity, Rainfall etc. of the project area.

(IV) Biosphere: The biosphere is the ecological system integrating all living beings and their relationships i.e. the interaction between both abiotic and biotic components including dependence, competition and mutualism. Biotic components comprises of both plant and animal communities, which interact not only within and between themselves but also with the abiotic physical and chemical components of the environment. Biotic component includes study of -

a) Fauna: Study of the Animal

b) Flora: Study of the Plant

(V) Other Component: Other component includes Socio-Economic data and noise level data of the surrounding area.

Survey for above all components of the study area and data collected by means of Primary and Secondary data are described from **Sec: 3.3 to 3.8.**

3.1.4 Methodology

(a) <u>AIR ENVIRONMENT MONITORING</u>:

Process:

- Reconnaissance
- Design of Network for AAQM Stations (Fig: 3.6 shows all Six Air monitoring stations counting project site)
- Air quality monitoring or data collection
- Sample analysis

Methodology for Ambient Air Monitoring:

To understand the Air environment in the study area, monitoring of the air quality was done by setting up reconnaissance, using Respirable Dust Sampler (RDS) & Fine Particulate Sampler for monitoring of PM_{10}, $PM_{2.5}$, SO_2, NO_x. Details of methodology are given in below table.

Table 3.1: Methodology of Ambient Air Monitoring

Sampling Parameters	Sampling equipment	Analytical Equipment	Sensitivity /Detection Limit	Methodology
PM_{10}	Respirable Dust Sampler with Cyclone & Flow measurement	Electronic balance	1 µg/m^3	Gravimetric IS: 5182 (Part 23) 2006
$PM_{2.5}$	Fine Particulate Sampler	Electronic balance	1 µg/m^3	Guideline for the measurement of ambient air pollutant Volume-1 by CPCB, 2011, Gravimetric
SO_2	Gaseous flow attachment with RDS Sampler	Spectro photometer	0.002 ppm	Colorimetric IS: 5182: (Part II) 2001
NO_x	Gaseous flow attachment with RDS Sampler	Spectro photometer	0.002 ppm	Colorimetric IS: 5182: (Part VI) 2006
VOC	Grab samples	Gas Chromatograph	0.01 ppm	As per equipment manual

(b) <u>WATER ENVIRONMENT MONITORING</u>:

Process:

- Reconnaissance
- Design of network stations for collection of water sample (Fig: 3.8 shows all water sampling stations)
- Sample collection & preservation
- Analysis of water quality by using following methodology

Methodology for water sample collection:

Water sampler was used for collection of surface water sample. Sampling locations & date of sampling is given in table below:

Table 3.2: Surface Water Sampling Locations

Sample Code	Sampling Location	Date of Sampling
SW1	Vinzol Lake	21/04/2017

Table 3.3: Ground Water Sampling Locations

Sample Code	Locations	Date of Sampling	Taluka	District
GW1	Project site	20/04/2017	Daskroi	Ahmedabad
GW2	Vatva	20/04/2017	Daskroi	Ahmedabad
GW3	Ghodasar	20/04/2017	Daskroi	Ahmedabad
GW4	Vinzol	21/04/2017	Daskroi	Ahmedabad
GW5	Ramol	21/04/2017	Daskroi	Ahmedabad
GW6	Hathijan	21/04/2017	Daskroi	Ahmedabad

Methodology for water sample analysis:

To understand the water quality of the study area, analysis of water sample collected from Surface and Ground was done as per IS: 10500: 2012 of drinking water or APHA (American Public Health Association).

(c) LAND ENVIRONMENT MONITORING:

- Reconnaissance
- Design of network stations for collection of soil sample (Fig: 3.10 shows all six soil sample collection stations counting project site)
- Sample collection
- Physico-Chemical analysis of soil based on following methodology

Methodology for soil sample collection:

Undisturbed top soil samples were collected using Auger from 0.3-0.5 m depth. Sampling locations with date of sampling is given in table below:

Table 3.4: Soil sampling locations

Sample Code	Locations	Date of sampling	Taluka	District
S1	Project site	20/04/2017	Daskroi	Ahmedabad
S2	Vatva	20/04/2017	Daskroi	Ahmedabad
S3	Ghodasar	20/04/2017	Daskroi	Ahmedabad
S4	Vinzol	21/04/2017	Daskroi	Ahmedabad
S5	Ramol	21/04/2017	Daskroi	Ahmedabad
S6	Hathijan	21/04/2017	Daskroi	Ahmedabad

Methodology for analysis:

To understand the soil quality of the study area, analysis of soil sample from all six locations was conducted by making suspension of soil sample. Analysis was done using following methodology.

Table 3.5: Soil Sample analysis methodology

Sampling Parameters	Sample collection	Analytical Equipment	Methodology	Remarks
Porosity	Manual sample collection using	-	IS: 2720 Part 7	Trial pit method for topsoil sample collection; disturbed samples
Water holding capacity		-	-	
Permeability		-	IS: 2720 Part 17	
Moisture content		Electronic Balance	IS: 2720 Part 2	
Particle size Distribution		Glass wares	IS: 2720 Part 4	5% Leachate to be made and analyzed as per APHA, "Standard Methods"
SAR		F. Photometer (Na, K) Titration (Ca & Mg)	Calculation	

pH	Auger	pH Meter	4500 H+B	All method numbers are as per APHA "Standard Methods" (22nd edition)
Calcium		Glass wares	3500 Ca B	
Magnesium		Glass wares	3500 Mg B	
Sodium (Na)		Flame Photometer	3500 Na B	
Potassium		Flame Photometer	3500 K B	

(d) NOISE ENVIRONMENT MONITORING:

- Reconnaissance
- Design of network stations for noise monitoring (Fig: 3.9 shows all eight noise monitoring stations counting project site)

Methodology:

To understand the noise environment in the study area, a survey was conducted using Sound Level Meter at each of the 8 locations including the plant site. Monitoring methodology of noise is given in below table.

Table 3.6: Monitoring Methodology of Noise

Environment Component	Sampling Location	Sampling Parameter	Sampling Frequency	Sampling Equipment	Detection Limit
Ambient Noise levels	8 locations	Decibels – dB (A)	Once during the study Hourly reading for 24 hours at each location	Sound Level Meter	0.1 dB (A)

3.2 VALUED ENVIRONMENTAL COMPONENTS (VECs) IN EIA STUDY

Valued environmental components (VECs) are defined as fundamental elements of the physical, biological and socio-economic environment, including the air, water, soil, terrain, vegetation, wildlife, fish, birds and land use that may be affected by a proposed project.

Physical Environment includes;

Physical components include features such as climate, physiography and topography, soils/geology, groundwater and hydrology. This Environmental Impact Assessment (EIA) Report describes and assesses key physical features including:

Atmosphere: Climate conditions and trends, and extreme weather events and air-quality conditions.

Geology & Hydrogeology structure

Soils: Soil types and characteristics,

Surface Water: Water bodies, characteristics and sources of potable water

Ground Water: Primarily water source & groundwater characteristics.

Project effects on the physical environment are described with respect to their potential pathway to the components of the terrestrial, aquatic and socioeconomic environments.

Biological Environments: Biological Environments including flora, fauna.

Socio-economic Environment: Socio-economic valued components are aspects of the socio-economic environment that are valued by people- Land & Resource use, Population, Infrastructure and Services, Economy, Personal, Family and Community Life. **Above all components are taken into consideration while carrying out EIA study.**

3.3 AIR ENVIRONMENT

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.

The baseline data on air quality and micrometeorological conditions of the area surrounding the project site have been generated through an appropriately designed network for monitoring of Ambient Air Quality (AAQ) within the zone of likely impacts.

3.3.1 Design of Network for Ambient Air Quality Monitoring Stations

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

- Topography/Terrain of the study area
- Populated areas within the region
- Prediction of maximum concentrations and distances of their likely occurrence under prevailing meteorological conditions
- Representation of regional background
- Representation of valid cross sectional distribution in downwind direction

3.3.2 Reconnaissance

Reconnaissance was undertaken to establish the baseline status of air environment in the study region. The prime objective of the NAAQ

survey, within 5 km radial study area around the plant was to establish the existing ambient air quality levels. Six Ambient Air Quality Monitoring (AAQM) stations were selected based on the criteria used for designing the network. The locations (relative directions and distances) of these stations with respect to project site are given in **Table 3.7** and details of these stations are shown in **Figure 3.6.**

The Particulate Matter (PM_{10}), Particulate Matter ($PM_{2.5}$), Sulphur Dioxide (SO_2), Oxides of Nitrogen (NOx) and VOC were identified as significant parameters for ambient air quality monitoring, particularly because these are likely to be emitted from the industries and for which ambient air quality standards are prescribed. The micrometeorological data on wind speed, wind direction, temperature and relative humidity were collected through a weather monitoring station for the study period. The baseline status of air quality was monitored within the study area i.e. 5 km radial distance from project site as per the latest regulatory guidelines.

3.3.3 Micrometeorology of the area

The micrometeorological conditions at the project site will regulate the transport and diffusion of air pollutants released into the atmosphere. The principle meteorological variables are horizontal convective transport (average wind speed and direction), vertical convective transport (atmospheric stability, mixing height) and topography of the area. The data on surface meteorological parameters (hourly average wind speed and direction) in the study area were collected during the **March, 2017 to May, 2017** using portable weather monitoring station placed at industry site. The sensors of this equipment were kept at about 10 m above ground level with free exposure to the atmosphere all through the study period. In addition, data on temperature as well relative humidity were also recorded simultaneously using a data logger.

Wind Rose (Secondary data)

The 24 hourly wind rose was prepared using the data on wind direction and speed, collected during **March, 2017 to May, 2017** in the study area. The same, depicted in **Figure 3.7**, shows the predominant wind directions - NW, WNW, W, ESW,SW; implying that winds come from

these directions for most of the time during the period. The wind speed class 1-5 kmph occurred for 1.76 %, 6-10 kmph about 14.17 %, 11-15 kmph 36.96 % and above 15 kmph and below 40 kmph occurred for 37.59 % of the study duration and of the time. The calm condition (below 1 kmph) prevails 9.52 % of time. The wind data generated at site were also compared with the climatologically data obtained from the nearest Indian Meteorological Department station at Ahmedabad. The local prevailing wind pattern during the study period is in conformity with the climatologically normal of the region.

Temperature (Primary data)

During the study period, the maximum temperature was recorded as 47.0°C and minimum was 18.0 °C.

Relative Humidity (Primary data)

During study period, the maximum relative humidity was recorded as 76.0 % and min. was 2.0 %.

Rainfall (Primary data)

No rainfall during the study period at project site.

3.3.4 Ambient Air Quality Survey

The ambient air quality monitoring was carried out at six AAQM locations, with a frequency of twice a week to assess the existing sub-regional air quality status during the period of **March, 2017 to May, 2017.** The Respirable Dust Sampler and Fine Particulate Sampler along with the analytical methods prescribed by CPCB were used for carrying out air quality monitoring. At all these sampling locations; PM_{10}, $PM_{2.5}$, SO_2, NO_x and VOC were monitored on 24-hourly basis to enable the comparison with ambient air quality standards prescribed by the Central Pollution Control Board. The data on concentrations of various pollutants were processed for different statistical parameters like arithmetic mean, standard deviation, minimum and maximum concentration and various percentile values.

3.3.5 Baseline Status

The existing baseline levels with respect to PM_{10}, $PM_{2.5}$, SO_2, NO_x & VOC are presented in **Tables 3.9 to 3.13** with interpretation of statistical

analysis of observed ambient air quality data for eight locations. Presented results, represent the cross sectional distribution of baseline air quality status of the study region.

Particulate Matter (PM_{10})

An average and 98th percentile value of 24-hourly PM_{10} values at all the locations varied between 68.7-81.4 $\mu g/m^3$ and 72.7-88.8 $\mu g/m^3$, which are well within the stipulated standard of CPCB, 100 $\mu g/m^3$.

Particulate Matter ($PM_{2.5}$)

An average and 98th percentile value of 24-hourly $PM_{2.5}$ values at all the locations varied between 33.2-36.7 $\mu g/m^3$ and 35.1-42.2 $\mu g/m^3$, which are well within the stipulated standard of CPCB, 60 $\mu g/m^3$.

Sulphur Dioxide (SO_2)

An average and 98th percentile value of 24-hourly SO_2 value of arithmetic mean at all the locations ranged between 15.4-20.6 $\mu g/m^3$ and 18.0-23.8 $\mu g/m^3$ respectively, which are well within the stipulated standards of 80 $\mu g/m^3$.

Oxides of Nitrogen (NO_x)

An average and 98th percentile value of 24 hourly NO_x value of arithmetic mean at all the locations ranged between 20.0-23.7 $\mu g/m^3$ and 22.5-26.2 $\mu g/m^3$ respectively, which are much lower than the standards stipulated by CPCB, i.e. 80 $\mu g/m^3$.

3.4 Geological and Hydro-Geological status of the study area

Average rainfall of ten years is 637 mm. Main River is Sabarmati, which originates from Aravalli Ranges of Rajasthan and meeting to sea in the bay of Cambay. Geologically the area consists of Quaternary alluvium. The south west area viz. Part of Barvada, Ranpur and Dhandhuka is made up of Basalt Rock. While rest area of the district is consist of alluvial formation. This is made up of alternate beds of Clay and Sand.

Geohydrologically, major parts of the district consist of alluvial formation. Alluvial formation is made up of Sand, clay, kankers, silt and gravels. In this formation water is available under confined and unconfined conditions. Remaining area is made up of Basalt. This is very poor in

ground water availability and yield. Sufficient discharge is available from alluvial formation.

Thickness of Alluvium in north- west part of the area is more. Average depth of tube-well in eastern part ranges from 90-120 mts and in north-west part it is 350 to 400 Mts.

Generally water supply schemes of Ahmedabad district are based on deep tube wells. Due to heavy drilling activity and over extraction of ground water since last two decades, there is a sharp decline in water levels and in the quality of water.

Aquifer System:

An aquifer is an underground layer of water-bearing permeable rock or unconsolidated materials (gravel, sand, or silt) from which groundwater can be extracted using water well. The sedimentary deposits of recent age are considered as alluvial deposits. The alluvium contains soil and clay majorly. Sand mixed with kankar is porous in nature, suitable for storage of ample quantities of groundwater. Water table in the study area is varying with 35 m to 40 m. During the monsoon, it is naturally recharged.

3.5 WATER ENVIRONMENT

Water is one of the essential requirements of living elements. Also it is an essential requirement for many of the industrial activities. The change in quality of water may bring about an adverse impact on the entire environment. Due to their physical, chemical and biological interrelations, change in water quality parameter may trigger changes in other variables. Physico-chemical parameters have been analyzed to ascertain the baseline status of fresh water. There are mainly two types of water available in the region: surface water and ground water.

Surface Water: There are surface water bodies like canal, pond/reservoir, and lake in the study area. Surface water samples were collected from Vinzol Lake. **Table 3.16** shows the analysis of the same.

Ground water: Ground water is the major/important source of water supply in the study area. Water samples have been collected from Project

Site, Vatva, Ghodasar, Vinzol, Ramol and Hathijan. **Table 3.15** shows the analysis of the same.

3.5.1 Ground Water Quality (Primary data)

Collected water samples were analyzed for various desirable characteristics of ground water. Sampling location is shown in **Figure 3.8.** The results are shown in **Table 3.15.**

Color: All the samples were colorless meeting desirable norms.

pH: All the samples meet the desirable standards (pH ranges from 7.3 to 7.4).

Total Dissolved Solids (TDS): TDS in samples ranges from 1048 mg/L (Project Site) to 1413 mg/L (Ramol). All the samples meet the permissible limit of 2000 mg/L (If alternate sources of potable water are not available).

Calcium: Calcium contents in the water ranges from 54 mg/L (Project site) to 68 mg/L (Vatva), all the samples meet the permissible limit of 200 mg/L. (If alternate sources of potable water are not available).

Magnesium: Magnesium content in the water ranges from 32 mg/L (Hathijan) to 64 mg/L (Ramol). All the samples meet the permissible limit of 100 mg/L (if alternate source of potable water in not available).

Sulphate: Sulphate content in the water ranges from 57 mg/L (Ramol) to 89 mg/L (Ghodasar). All the samples meet the permissible limit of 400 mg/L for drinking water. (if alternate source of potable water in not available).

Fluoride: Fluoride content in the water ranges from 0.48 mg/L (Vinzol) to 0.69 mg/L (Project site). All the samples meet the permissible limit (1.5 mg/L).

Total Alkalinity: Total alkalinity in the water samples ranges from 290 mg/L (Ghodasar) to 388 mg/L (Project site). All the samples are within the permissible limit of drinking water (600 mg/L) (if alternate source of portable water is not available).

Other Parameters: Potassium (ranges from 14 mg/L to 23 mg/L), Sodium (ranges from 303 mg/L to 428 mg/L) and Chloride (ranges from 401 mg/L to 554 mg/L).

Heavy metals like copper, lead, chromium and zinc are found below detectable limit in all samples.

Conclusions: Ground water samples from villages meet the permissible limit set by the authority (BIS). Indian Standard specification for drinking water is given in **Table 3.17.**

3.6 NOISE ENVIRONMENT (Primary data)

3.6.1 Introduction

Noise can be defined as an unwanted sound. It interferes with speech & hearing and is intense enough to damage hearing or is otherwise annoying. The definition of noise as unwanted sound implies that it has an adverse effect on human beings and their environment. Noise can also disturb natural wildlife and ecological system. Sound is mechanical energy from a vibrating surface, transmitted by cyclic series of compression and rarefaction of molecules of the materials through which it passes. Sound can be transmitted through gases, liquids and solids. The number of compressions and refractions of the air molecules in the unit of time is described as its frequency. Frequency is expressed in hertz (Hz), which is the same as the number of cycles per second.

3.6.2 Methodology

To understand the noise environment in the study area, a survey was conducted using Sound Level Meter at each of the eight locations including the plant site as shown in **Figure 3.9.**

3.6.3 Day-Time and Night-Time Noise Levels

Noise survey was carried out once at each of the eight locations in the day and night time during the study period. **Table 3.18** depicts average L_{eq}(day) and L_{eq}(night) noise levels for all locations.

3.6.4 Ambient Air Quality Standards in Respect of Noise

Ministry of Environment and Forest has notified the ambient standards in respect of noise in Gazette of India dated 14th February, 2000. **Table 3.19** depicts these standards in respect of noise.

3.6.5 Ambient Noise Levels in the Study Area

The L_{eq} values of noise levels during day-time varied from 52.4 dB(A) to 64.2 dB(A). Highest L_{eq} daytime value was recorded at Project site. The

L_{eq} values of noise levels during night time varied from 40.4 dB(A) to 56.7 dB(A). Highest L_{eq} value during night time was also recorded at plant site.

3.6.6 Conclusions

The hourly L_{eq} noise levels recorded at various locations in the study area show considerable fluctuations because of changes in traffic movement, commercial and domestic activities in the study area. In the study area higher Noise value during day time was noted at Project site, but it is less than the Ambient standards of Industrial area for day time {75 dB (A)} and highest results in night time was also recorded at Project site, which is also less than the prescribed limit of Industrial area for night time {70 dB (A)}.

3.7 SOIL ENVIRONMENT (Primary data)

3.7.1 Introduction

Soils may be defined as a thin layer of earth's crust that serves as a natural medium for the growth of plants. It is the unconsolidated mineral matter that has been subjected to and influenced by genetic and environmental factors. Soils serve as a reservoir of nutrients for plants and crops and provide mechanical anchorage and favorable tilth.

3.7.2 Methodology

The soil samples were collected from 6 locations (Project site, Vatva, Ghodasar, Vinzol, Ramol and Hathijan) during the study period and these locations are shown in **Figure 3.10.** At each of these locations soil was collected using an Auger from 0.3-0.5 m depth. The samples were filled in polythene bags, labeled in the field with number and site name and sent to laboratory for analysis. Values of important physical & chemical parameters of these soil samples are depicted in **Table 3.20.**

3.7.3 Corollaries of soil analysis

Physical Parameters

- **Particle Size:** A Particle size of the different constituents (clay, silt, sand and gravel) controls the porosity and water holding characteristic of the soil. Clay (size < 0.002 mm) amount in the soil samples ranges from 18 % to 23 %; Silt (size 0.002 to 0.075 mm) in the soil samples is 21 % to

26 % and Sand (size 0.075 to 0.475 mm) in the soil samples is 22 % to 27 %; while Gravel (size > 4.75 mm) in the soil samples is 29 % to 33 %. Analysis shows that the soil has moderate water holding capacity.

- **Porosity:** Porosity is a measure of space in between soil particles caused by structural conditions and determined under identical conditions. Porosity of soil samples of the study area ranges from 40.0 to 42.9 %.
- **Water Holding Capacity (WHC):** Water holding capacity (WHC) of soil samples of the study area ranges between 39.2 % to 41.5 %.
- **Bulk Density:** Bulk Density of soils in the study area is found to be in the range from 1.41 to 1.48 g/cm^3.

Chemical Parameters

- **pH:** pH of soils in the study area is found to be in the range of 7.57 to 7.94.
- **Chloride:** Chloride content in soils of the study area is found to be in the range of 339 to 465 mg/kg.
- **Soluble Calcium:** The soluble calcium as $CaCO_3$ in soil samples is found to be in the range of 78 to 98 mg/kg.
- **Magnesium:** Magnesium content in soil samples of the study area ranges from 37 to 56 mg/kg.
- **Available Phosphorus:** Available Phosphorus content in soil samples of the study area ranges from 28 to 68 mg/kg.
- **Available Nitrogen:** Available nitrogen content in soil samples of the study area is found to be in the range from 96 to 124 mg/kg.
- **Potassium:** Potassium content in soil samples of the study area is found to be in the range from 108 to 135 mg/kg.
- **Sodium:** Sodium content in soil samples of the study area is found to be in the range from 239 to 332 mg/kg.
- **Total Organic Matter (TOM):** Total organic matter content in soil samples of the study area is found to be in the range of 1.25 to 1.49 mg/kg.

3.7.4 Conclusion

Above analysis shows that, soil is sandy loam, clay loam and the pH value ranging from of 7.57 to 7.94 which shows that the soil is slight neutral to

basic in nature. The water holding capacity is found in between 39.2 % to 41.5 %. The soils with low bulk density have favorable physical condition where as those with high bulk density exhibit poor physical conditions (porosity and permeability) for agriculture crops.

3.8 ECOLOGY (Primary data)

A detailed flora fauna study was carried out in 5 km radius area of the site. The structure and type of vegetation depends on climatic conditions and physiography of an area. Climate of the study area is suited for the variety of vegetation. The contents of this subsection are based primarily on reconnaissance survey carried out by the team of San Envirotech Pvt. Ltd. & through secondary sources.

3.8.1 Period of the study

The baseline study, for the assessment of the floral and faunal biodiversity of the terrestrial environment of the study area, within 5 km radius of the site was conducted during **March, 2017 to May, 2017.**

3.8.2 Study methodology

The study region was earmarked for 5 km radius area for baseline data. The survey methodology was based on the flora and fauna species identification in personal and recently recorded and found in the region by the localities. Sampling of grass species was carried out by quadrat sampling method to examine the species distribution and its frequency in the region.

- **Quadrat Sampling Method:**

A quadrat (or plot-based) survey is a quantitative examination of species distribution and abundance. Quadrats are more likely to detect inconspicuous or threatened species because a smaller area is sampled in a concentrated search. This survey technique also provides a basis for subsequent monitoring. The survey was carried out for the vegetation ground cover found in the road edges by 1 m^2 quadrat and study on the edge effect due to rapid industrialization and urbanization. The results and findings of the same are discussed in the following sections.

3.8.3 Floral diversity in the study area

The vegetation of this area was represented by tall trees, middle layer trees and shrubs, ground layer of herbaceous and twiners and climbers. This biodiversity is the natural biological capital of the earth and presents important opportunities for all nations. It provides goods and services essential to support human livelihoods and aspirations and enables societies to adapt to changing needs and circumstances. In addition, biodiversity maintains the ecological balance necessary for planetary and human survival. The species of floral diversity observed in the study area were identified and presented in the **Table 3.21** of this report.

3.8.4 Faunal Diversity in the study area

For the documentation of the faunal biodiversity of the study area with respect to birds, reptiles, amphibians species; a baseline survey had been conducted for the study area of 5 km radius. A faunal biodiversity with their scientific names and common names is presented in **Table 3.22.**

3.9 SOCIO ECONOMIC & LAND USE (Secondary Data)

3.9.1 Land use pattern and infrastructure

The land use pattern indicates the manner in which different parts of land in an area is being utilized or non-utilized. It is an important indicator of environmental health; human activity and a degree of inter play between these two. Even though the soil quality, water availability and climate have strong influence on agriculture and vegetation, the human activity may alter the natural environment to a large extent to suit human needs. Unnatural land use often triggers rapid environmental deterioration and disturbs ecological balance. In census records, major land use classifications are; Forests, Culturable land, culturable wasteland and area not available for cultivation. Culturable land is further classified as: irrigated and unirrigated. Area not available for cultivation includes lands put to non-agriculture uses as well as barren and uncultivable lands.

The main land use in area is for dwellings, infrastructure and related activities. However, the land use pattern for rural areas is discussed below. The information is preliminary based on 2011 Census as depicting in Table 3.25. Total land area is 1695.89 ha, out of that Irrigated area is

913.8 ha. It constitutes 53.88% of the total land area. Land has got irrigation facilities from tube well with electricity. 327.9 ha are un-irrigated by source and it constitutes 19.33% of total land area. The study area consist of Cultivable wasteland is 307.3 ha (18.12%). Area not available for cultivation is 147 ha & it constitute 8.66%.

3.9.2 Demographic and Socio-Economic Environment

The demographic and Socio-economic details of the study area are discussed below. These are primarily based on census data of 2011. Data on number of households, population as well as literacy and employment pattern in the study area have been presented in Table-3.26. The employment pattern in the area is indicator of number of persons employed in various sectors. It also indicates the various categories of employment flourishing in the area. The Study area in 5 km radius has 7 villages including project site.

The total no. of household in the villages are 1932 and the total population is 9284 (51.97% men & 48.03% women). 69.10% of are literate while literacy rate among women & men is 39.74% & 29.36% respectively. 30.22% of male population is part of main worker, while only 7.28% of female population is a part of main workers. 1.77% of male workers are marginal workers, while 1.74% of female workers are engaged in such type of activities. 21.06% of male population and 39.00% of female population are non-workers.

3.9.3 Living Standard and Infrastructure

In India it is not possible to setup a primary standard of living because of wide variations in terms of income, economic conditions, social custom, employment opportunity, pattern of spending, etc. However, availability of amenities like education, medical, water supply, communication, road network, electricity, etc. significantly reflects the level of development of the area. Information on available amenities in the study area has been extracted from census record of 2011. Total numbers of village in study area are 7. On the basis of data presented in the Table-3.27, the status of available amenities is discussed in following sub-sections:

Educational Facilities

As per 2011 census, there are 7 primary schools, 2 Higher Secondary schools, 2 colleges in all 7 villages.

Medical Facilities

7 villages in the study area have 3 Registered Private Medical Practitioner, 4 Community Health Worker/Health Worker, 2 Maternity and Child Welfare Centre, 2 Primary Health Centre, 2 Hospitals and 1 Child Welfare Centre in study area of 5 km.

Drinking Water Supply

All the villages in the study area have two or more sources of drinking water. Most of the villages in study area have Well water supply in addition to Tap water (almost all). Moreover most of villages have facility of Tube Well water facility, 3 have Tank water facility, 1 have river facility and 1 have hand pump facilities.

Communication and Transport

The main mode of public transport available in the study area is by bus service. All villages have approach to railway station as western railway meter gauge line is passing through nearby. Majority of villages in the study area is connected with pucca road.

Post and Telegraph

As per 2011 census record out of 7 villages in study area, almost all the villages have post office facility at doorstep & phone facility.

Power Supply

As per 2011 census record almost all the villages are getting power supply for all purposes.

Table 3.7: Ambient Air Quality Monitoring Locations

(Period of Monitoring: March, 2017 to May, 2017)

Sr. No.	Sampling Location	Direction w.r.t center of Industry	Distance (km)	Type of Area
1	Project site (A1) (22°57’27.90"N, 72°38’0.30"E)	00	00	Industrial
2	Vatva (A2) (22°56’35.84"N, 72°36’48.81"E)	SSW (UW)	2.34	Residential
3	Ghodasar (A3) (22°57’6.59"N, 72°36’58.63"E)	W (UW)	1.5	Residential
4	Vinzol (A4) (22°57’01.54"N, 72°38’31.80"E)	E (DW)	0.87	Residential
5	Ramol (A5) (22°57’59.00"N, 72°39’14.98"E)	ENE (DW)	3.8	Residential
6	Hathijan (A6) (22°56’22.30"N, 72°39’55.19"E)	SE (DW)	4.2	Residential

Table 3.8: Ambient Air Quality Status

(Period of Monitoring: March, 2017 to May, 2017)

Sr. No.	Sampling Station	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	NOx ($\mu g/m^3$)
		Average (Min-Max)			
1	Project site (A1)	77.6 (71.1-81.7)	33.5 (29.2-37.4)	20.6 (15.8-24.0)	23.5 (18.0-26.2)
2	Vatva (A2)	73.4 (67.2-81.3)	33.2 (30.6-35.2)	17.2 (14.3-19.7)	20.1 (16.5-22.7)
3	Ghodasar (A3)	81.4 (71.1-89.0)	36.7 (29.8-42.6)	17.5 (14.3-22.9)	21.3 (17.5-26.5)
4	Vinzol (A4)	76.7 (67.7-82.1)	35.2 (30.5-39.6)	15.5 (10.4-18.3)	21.1 (16.1-24.2)
5	Ramol (A5)	71.3 (63.5-75.2)	33.8 (31.4-35.7)	19.9 (17.9-22.7)	23.7 (21.1-26.3)
6	Hathijan (A6)	68.7 (64.7-72.8)	35.7 (32.3-39.6)	15.4 (11.5-18.1)	20.0 (15.8-23.4)
Standards		**100**	**60**	**80**	**80**

Table 3.9: Ambient Air Quality Status (PM_{10})

(Period of Monitoring: March, 2017 to May, 2017)

Average - 24 Hours Unit - $\mu g/m^3$

Station Name	Max	Min	98th Percentile	75th Percentile	50th Percentile	25th percentile	Avg.	SD
Project site(A1)	81.7	71.1	81.5	79.6	77.8	76.1	77.6	2.7
Vatva (A2)	81.3	67.2	80.1	75.4	73.2	71.3	73.4	3.4
Ghodasar (A3)	89.0	71.1	88.8	85.8	81.6	77.4	81.4	5.5
Vinzol (A4)	82.1	67.7	81.9	79.7	76.9	74.8	76.7	3.7
Ramol (A5)	75.2	63.5	75.2	74.0	71.6	69.6	71.3	3.3
Hathijan (A6)	72.8	64.7	72.7	70.8	68.2	66.7	68.7	2.5

Table 3.10: Ambient Air Quality Status ($PM_{2.5}$)

(Period of Monitoring: March, 2017 to May, 2017)

Average - 24 Hours Unit - $\mu g/m^3$

Station Name	Max	Min	98th Percentile	75th Percentile	50th Percentile	25th percentile	Avg.	SD
Project site(A1)	37.4	29.2	37.2	35.2	33.7	31.8	33.5	2.3
Vatva (A2)	35.2	30.6	35.1	34.1	33.3	32.4	33.2	1.3
Ghodasar (A3)	42.6	29.8	42.2	38.0	37.0	35.3	36.7	3.4
Vinzol (A4)	39.6	30.5	39.0	36.6	35.2	33.8	35.2	2.2
Ramol (A5)	35.7	31.4	35.7	34.9	33.8	32.8	33.8	1.4
Hathijan (A6)	39.6	32.3	39.5	37.2	35.1	34.2	35.7	2.2

Table 3.11: Ambient Air Quality Status (SO_2)

(Period of Monitoring: March, 2017 to May, 2017)

Average-24 Hours Unit-μg/m^3

Station Name	Max	Min	98th Percentile	75th Percentile	50th Percentile	25th percentile	Avg.	SD
Project site(A1)	24.0	15.8	23.8	22.3	20.5	19.2	20.6	2.1
Vatva (A2)	19.7	14.3	19.6	18.7	17.4	16.1	17.2	1.7
Ghodasar (A3)	22.9	14.3	22.2	19.6	17.0	15.6	17.5	2.4
Vinzol (A4)	18.3	10.4	18.2	17.6	15.9	14.5	15.5	2.3
Ramol (A5)	22.7	17.9	22.7	20.6	19.6	18.9	19.9	1.5
Hathijan (A6)	18.1	11.5	18.0	16.6	15.2	14.4	15.4	1.7

Table 3.12: Ambient Air Quality Status (NO_x)

(Period of Monitoring: March, 2017 to May, 2017)

Average-24 Hours Unit-μg/m^3

Station Name	Max	Min	98th Percentile	75th Percentile	50th Percentile	25th percentile	Avg.	SD
Project site(A1)	26.2	18.0	26.1	25.1	23.8	22.2	23.5	2.1
Vatva (A2)	22.7	16.5	22.5	21.6	20.2	19.0	20.1	1.7
Ghodasar (A3)	26.5	17.5	25.6	23.3	21.0	19.6	21.3	2.4
Vinzol (A4)	24.2	16.1	24.1	23.3	22.0	18.8	21.1	2.7
Ramol (A5)	26.3	21.1	26.2	24.8	23.8	22.3	23.7	1.6
Hathijan (A6)	23.4	15.8	23.2	21.5	20.0	18.6	20.0	1.9

Table 3.13: Ambient Air Quality Status (VOCs)

(Period of Monitoring: March, 2017 to May, 2017)

Sr. No.	Station Name	VOCs as BTX (μg/m^3)			
		Benzene	Xylene	Toluene	Total Concentration BTX
1	Project site(A1)	2.16	0.91	1.72	4.79
2	Vatva (A2)	1.71	0.42	BDL	1.71
3	Ghodasar (A3)	0.91	BDL	BDL	0.91
4	Vinzol (A4)	1.29	BDL	BDL	1.29
5	Ramol (A5)	2.05	BDL	BDL	2.05
6	Hathijan (A6)	0.49	BDL	BDL	0.49

Table 3.14: National Ambient Air Quality Standards

(EP, 7th amendment rules-2009)

Pollutants	Time-weighted average	Concentration in ambient air		
		Industrial, Residential, Rural and others area	Ecologically Sensitive area (Notified by Central Government)	Method of Measurement
Sulphur Dioxide (SO_2) µg/m^3	Annual Average*	50	20	▪ Improved west and Gaeke ▪ Ultraviolet fluorescence
	24 hours**	80	80	
Oxides of Nitrogen as (NO_2) µg/m^3	Annual Average*	40	30	▪ Modified Jacob &Hochheiser (Na-Arsenate) ▪ Chemiluminescence
	24 hours**	80	80	
Particulate Matter (Size less than 10 µm or PM_{10}) µg/m^3	Annual Average*	60	60	▪ Gravimetric ▪ TOEM ▪ Beta attenuation
	24 hours**	100	100	
Particulate Matter (Size less than 2.5 µm or $PM_{2.5}$) µg/m^3	Annual Average*	40	40	▪ Gravimetric ▪ TOEM ▪ Beta attenuation
	24 hours**	60	60	
Ozone (O_3) µg/m^3	8 hours **	100	100	▪ UV photometric ▪ Chemiluminescence ▪ Chemical Method
	1hours**	180	180	
Lead (Pb) µg/m^3	Annual Average*	0.50	0.50	▪ AAS/ICP method after sampling on EPM 2000 or equivalent filter paper ▪ ED-XRF using Teflon filter
	24 hours**	1.0	1.0	
Carbon Monoxide (CO) mg/m^3	8 hours**	02	02	▪ Non Dispersive Infra Red (NDIR) spectroscopy
	1 hour**	04	04	
Ammonia(NH_3) µg/m^3	Annual Average*	100	100	▪ Chemiluminescence ▪ Indophenol Blue Method
	24 hours**	400	400	
Benzene (C_6H_6) µg/m^3	Annual*	05	05	▪ Gas chromatography based continuous analyzer ▪ Adsorption and desorption followed by GC analysis
Benzo(a)Pyrine (BaP)-particulate phase only, µg/m^3	Annual*	01	01	▪ Solvent extraction followed by HPLC/GC analysis
Arsenic (As), µg/m^3	Annual*	06	06	▪ AAS/ICP method after sampling on EPM 2000 or equivalent filter paper

Nickel (Ni) $\mu g/m^3$	Annual*	20	20	▪ AAS/ICP method after sampling on EPM 2000 or equivalent filter paper
*	Annual Arithmetic mean of minimum 104 measurements in a year taken twice a week 24 hourly at uniform interval.			
**	24 hourly/8 hourly or 01 hourly values, as applicable, shall be complied with 98% of the time in a year. 2% of the time they may exceed the limits but not two consecutive days of monitoring.			

Table 3.15: Results of Groundwater Quality in the Study Area (Date of Sampling: 20/04/17 to 21/04/17)

Parameters	Unit	Project site (GW1)	Vatva (GW2)	Ghodasar (GW3)	Vinzol (GW4)	Ramol (GW5)	Hathijan (GW6)
pH	pH Unit	7.4	7.3	7.3	7.3	7.4	7.4
Color	Co-Pt Unit	Colorless	Colorless	Colorless	Colorless	Colorless	Colorless
Taste	---	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
Conductivity	µmhos/cm	1510	1653	1615	1690	2018	1672
Turbidity	NTU	4.6	5.2	6.4	4.9	7.0	5.8
TDS	mg/L	1048	1348	1121	1182	1413	1170
Total Hardness as $CaCO_3$	mg/L	378	372	353	319	406	279
Total Alkalinity	mg/L	388	354	290	303	307	313
Sodium as Na^+	mg/L	303	386	358	428	341	380
Potassium as K^+	mg/L	17	22	14	18	23	19
Calcium as Ca^{+2}	mg/L	54	68	64	60	57	59
Magnesium as Mg^{+2}	mg/L	59	49	47	41	64	32
Chlorides as Cl^-	mg/L	401	517	486	554	532	528
Sulfates as SO_4^{-2}	mg/L	79	64	89	68	57	62
Fluoride as F^-	mg/L	0.69	0.57	0.61	0.48	0.65	0.59
Nitrates as NO_3^{-3}	mg/L	15	13	19	16	17	20
Phenol	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium as Cd	mg/L	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Nickel as Ni	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Copper as Cu	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead as Pb	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Manganese as Mn	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Iron as Fe	mg/L	0.46	0.21	0.20	0.14	0.19	0.28
Chromium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc as Zn	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004

Parameters analyzed on site: pH & Temperature

Table 3.16: Results of Surface water Quality in the Study Area

Date of Sampling: 20/04/16 to 21/04/16

Parameters	Unit	Concentration	Test Method (Ref to IS)
		Vinzol Lake (SW1)	
pH	pH Unit	7.8	3025 (Part 11)
Temperature	^{0}C	29	--
Conductivity	Micro mhos/cm	653	3025 (Part 14)
Turbidity	NTU	12.4	3025 (Part 10)
TDS	mg/L	454	3025 (Part 16)
Dissolved Oxygen	mg/L	4.2	--
Total Hardness	mg/L	195	3025 (Part 21)
Total Alkalinity	mg/L	292	3025 (Part 23)
Sodium	mg/L	130	3025(Part 45)
Potassium	mg/L	27	3025(Part 45)
Calcium	mg/L	43	3025 (Part 40)
Magnesium	mg/L	21	3025 (Part 46)
Chlorides	mg/L	172	3025 (Part 32)
Sulfates	mg/L	41	3025 (Part 24)
Nitrates	mg/L	17	3025 (Part 34)
Phenolic Compounds	mg/L	<0.01	3025 (Part 43)
Arsenic	mg/L	<0.01	3025 (Part 37)
Cadmium	mg/L	<0.003	3025 (Part 41)
Copper	mg/L	<0.01	3025 (Part 42)
Lead	mg/L	<0.01	3025 (Part 47)
Manganese	mg/L	<0.01	3025 (Part 59)
Iron	mg/L	0.14	3025 (Part 53)
Total Chromium	mg/L	<0.001	3025 (Part 52)
Zinc	mg/L	<0.004	3025 (Part 49)
Nickel	mg/L	<0.01	3025 (Part 54)

Parameters analyzed on site: pH, Temperature & DO

Table 3.17: Indian Standard Specification for Drinking Water

Sr. No.	Parameters	Desirable Limit	Permissible Limit in the Absence of Alternate Source
I	**Essential Characteristics**		
1.	Colour, Hazen Units, Max.	5	25
2.	Odour	Unobjectionable	-
3.	Taste	Agreeable	-
4.	Turbidity, NTU, Max.	5	10
5.	pH value	6.5-8.5	No Relaxation
6.	Total Hardness (as $CaCO_3$) mg/l, Max.	300	600
7.	Iron (as Fe) mg/l, Max.	0.3	1.0
8.	Chlorides (as Cl) mg/l, Max.	250	1000
9.	Residual Free Chlorine, mg/l, Min.	0.2*	-
II	**Desirable Characteristics**		
10.	Dissolved Solids, mg/l, Max.	500	2000
11.	Alkalinity (as $CaCO_3$), mg/l, Max.	200	600
12.	Sulphate (as SO_4) mg/l, Max.	200	400
13.	Nitrate (as NO_3)	50	No Relaxation
14.	Fluoride (as F) mg/l, Max.	1.0	1.5
15.	Calcium (as Ca) mg/l, Max.	75	200
16.	Magnesium (as Mg) mg/l, Max.	30	100
17.	Copper (as Cu) mg/l, Max.	0.05	1.5
18.	Manganese (as Mn) mg/l, Max.	0.1	0.3
19.	Mercury (as Hg) mg/l, Max.	0.001	No Relaxation
20.	Cadmium (as Cd) mg/l, Max.	0.01	No Relaxation
21.	Selenium (as Se) mg/l, Max.	0.01	No Relaxation
22.	Arsenic (As As) mg/l, Max.	0.05	No Relaxation
23.	Lead (as Pb) mg/l, Max.	0.05	No Relaxation
24.	Zinc (as Zn) mg/l, Max.	5	15
25.	Aluminium (as Al) mg/l, Max.	0.03	0.2
26.	Boron (as B) mg/l, Max.	1	5
27.	Chromium (as Cr) mg/l, Max.	0.05	No Relaxation
28.	Cyanide (as CN) mg/l, Max.	0.05	No Relaxation
29.	Phenolic Compounds (as C_6H_5OH) mg/l, Max.	0.001	0.002
30.	Anionic Detergents (as MBAS) mg/l, Max. mg/l, Max.	0.2	1.0
31.	Mineral Oil mg/l, Max.	0.01	0.03
32.	Pesticides	Absent	0.001
33.	Radioactive Materials a. Alpha Emitters, Bq/I, Max. b. Beta Emitters, Pci/I, Max	 - -	 0.1 0.037

*Applicable only when water is chlorinated

Source: IS: 10500-2012

Table 3.18: Ambient Noise Levels in the Study Area

Date of Monitoring: 20/04/17 to 21/04/17

Sr. No.	Noise Monitoring Locations	Date of Monitoring	Average Noise levels in dB(A)	
			L_{eq} (Day) dB(A)	L_{eq} (Night) dB(A)
1.	Project site	20/04/17	64.2	56.7
2.	Nr. VIA	20/04/17	58.6	45.3
3.	Vatva Village	20/04/17	52.4	42.5
4.	Trikampura Patiya	20/04/17	54.8	49.2
5.	Ghodasar	21/04/17	53.1	42.3
6.	Vinzol	21/04/17	55.6	43.5
7.	Ramol	21/04/17	52.7	40.4
8.	Hathijan	21/04/17	54.1	42.2

Table 3.19: Ambient Air Quality Standards with respect to noise

Category of Area	Limits L_{eq}, dB(A)	
	Day Time	Night Time
Industrial	75	70
Commercial	65	55
Residential	55	45
Silence	50	40

Table 3.20: Soil Analysis of Study area

Date of Sampling: 20/04/17 to 21/04/17

S. No.	Parameters	Unit	Project site (S1)	Vatva (S2)	Ghodasar (S3)	Vinzol (S4)	Ramol (S5)	Hathijan (S6)
1.	pH (5%) Solution	--	7.75	7.65	7.71	7.57	7.94	7.91
2.	Moisture	%	3.0	5.3	5.8	3.8	6.5	4.3
3.	Loss of Ignition	%	7.0	6.1	6.5	6.8	6.3	5.9
4.	Particle Size							
	Clay (<0.002 mm)	%	21	18	23	20	18	22
	Silt (0.002 to 0.075 mm)	%	26	25	21	24	23	23
	Sand (0.075 - 0.475 mm)	%	22	25	27	25	27	22
	gravel (size > 4.75 mm)	%	31	32	29	31	32	33
5.	Texture	--	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam
6.	Water Holding Capacity	%	41.4	41.0	40.6	39.2	40.0	41.5
7.	Permeability	cm/hr.	3.07	3.13	3.05	2.80	3.05	2.85
8.	Bulk Density	g/cm^3	1.41	1.46	1.48	1.43	1.45	1.47
9.	Porosity	%	42.9	40.8	40.0	42.1	41.3	40.5
10.	Sodium Absorption Ratio	Meq/ 100 gm	6.49	4.92	7.63	6.02	7.29	7.07
11.	Sodium	mg/kg	303	239	328	285	332	327
12.	Potassium	mg/kg	135	122	129	108	110	119
13.	Calcium	mg/kg	98	85	78	91	82	85
14.	Magnesium	mg/kg	40	56	37	47	45	46
15.	Chlorides	mg/kg	435	438	465	442	339	396
16.	Sulphates	mg/kg	94	63	103	179	107	78
17.	Organic Matter	mg/kg	1.28	1.31	1.25	1.38	1.49	1.41
18.	Total Nitrogen	mg/kg	96	114	124	118	105	102
19.	Total Phosphorus	mg/kg	65	42	46	36	28	68
20.	Iron	mg/kg	1.15	1.23	1.38	1.53	1.62	1.31
21.	Cation Exchange Capacity	mg/ 100 gm	2.49	2.24	2.46	2.36	2.51	2.54

Table 3.21: Floral Diversity

(i) Trees

Sr. No.	Family	Scientific name	Local name
1.	Fabaceae	*Pongamia pinnata*	Karanj
2.	Myrtaceae	*Eucalyptus globules*	Nilgiri
3.	Mimosaceae	*Acacia nilotica Subsp. Indica*	Baval
		Acacia auriculiformis	Australian Baval
		Prosopis juliflora	Gandobaval
		Leucaena leucoephala	Pardesi Baval
		Acacia caiechu	Khair
		Albizzia indica	Siris
		Prosopis spicigera	Khijado
4.	Salvadoraceae	*Salvadora aleoides*	Pilvo
5.	Meliaceae	*Azadirachta indica*	Limbado
		Melia azedarah	Bakan Limdo
6.	Arecaceae	*Roystonea regia*	Royal Palm
7.	Moraceae	*Ficus benghalensis*	Vad
		Ficus religiosa	Piplo
8.	Caesalpiniaceae	*Parkinsonia aculeate*	Rambaval
		Peltophorum pterocarpum	Tamarafali

(ii) Shrubs

Sr. No.	Family	Scientific name	Local name
1.	Euphorbiaceae	*Euphorbia nivulia* Buch – Ham	Thor
2.	Capparidaceae	*Cadaba indica*	Telio hemkand
		Capparis sepiaria	Kerdo
		Capparis sepiaria	Kanthar
3.	Apocgnaceae	*Thevetia peruviane* Merr	Pili karen
		Nerium indicum Mill	Lal Karen
4.	Convolvulaceae	*Ipomoea fistulosa*	Nafatio
5.	Rhamnaceae	*Zizgphus mummularia*	Chanibor
		Zizgphus glabrata Hegne	Bor
6.	Asclepiadaceae	*Calotropis gigantea*	Akado
		Calotropis procera	Akado

(iii) Herbs

Sr. No.	Family	Scientific name	Local name
1.	Acanthaceae	*Hygrophila auriculata* (Schum.)	Kanatashelio, Akaro
2.	Solanaceae	*Solanum indicum*	Rigni
3.	Amaranthaceae	*Amarantus paniculatus*	Rajagro
4.	Papilionaceae	*Phaseolus aureus* Roxb.	Mag
		Phaseolus aconitifolius,Jacquin	Math
		Cyamopsis psoralioides	Guvar
5.	Lamiaceae	*Ocimum sanctum*	Tulsi
		O. Canam Sims	Ramtulsi
		O. Basilicum	Damro
6.	Liliaceae	*Aloe barbadensis* mill	Kunvarpato
7.	Rutaceae	*Citrus aurantifolia, Swingle*	Limbodi
8.	Poaceae	*Triticum aestivum*	Ghau
		Sorghum bicolor	Jowar
		Zea mays	Makai
		Pennisetum typhoides	Bajra
		Cynodon doctylon	Darbh
		Chloris barbata	Mindadin
		Heteropogon contortus	Dabhsuliu

(iv) Climbers and Twiners

Sr. No.	Family	Scientific name	Local name
1.	Cuscutaceae	*Cuscuta reflexa* Roxb	Amarvel
2.	Menispermaceae	*Cocculus hirsutus*	Vevdi
3.	Convolvulaceae	*Ipomea aquatic* Forsk	Nadanivel

Table 3.22: Faunal Diversity

(i) Birds

Sr. No.	Family	Scientific name	Local name
1.	Threskiornithidae	*Pseudibis papillosa*	Black Ibis
2.	Accipitridae	*Elanus caerwleus*	Black – winged kite
		Accipitel nisus	Sparrow – hawk
3.	Anhingidae	*Anhinga melanogaster*	Darter or Snake Birds
4.	Charadriidae	*Himantopus himantopus*	Black-winged Stilt
		Vanellus indicus	Red-wattled Lapwing
5.	Apodidae (Swifts)	*Apus apus*	Common Swift
6.	Ardeidae	*Bubulcus ibis*	Cattle egret
		Ardeola grajii	Pond Heron
7.	Alcedinidae	*Alcedo atthis*	Common kingfisher
8.	Dacelonidae	*Halcyon smyrnensis*	White brested Kingfisher
9.	Columbidae	*Columba livia*	Blue Rock Pigeon
		Streptopelia orientalis	Oriental Turtle Dove
		Streptopelia chinensis	Spotted Dove
10.	Meropidae	*Merops persicus Merops superciliosus*	Blue-cheeked Bee-eater
11.	Corvidae	*Corvus splendens*	House crow
12.	Muscicapidae	*Saxicoloides fulicata*	Indian Robin
13.	Passeridae	*Passer domesticus*	House Sparrow
14.	Pycnonotidae	*Pycnonotus cafer*	Red-vented Bulbul
15.	Sturnidae	*Acridotheres tristis*	Common Myna
16.	Sylviidae	*Turdoides striatus*	Jungle Babbler
17.	Ciconiidae	*Mycteria leucocephala*	Painyed Strok
18.	Rallidae	*Amaurornis phoenicurus*	White – breasted water hen

(ii) Butterflies

Sr. No.	Family	Scientific name	Local name
1.	Papilionidae	*Papilio polgtes Linnaeus*	Common Mormon
		Pachliopta aristolochiae	Common Rose
2.	Pieridae	*Eurema hecabe Linnaeus*	Common Grass yellow
		Catopsilia Pomona Fabricius	Common Emigrant

3.	Nymphalidae	*Melanitis leda Linnaeus*	Common evening Brown
		Junonia hierta Fabricius	Yellow Orange tip
		Mycalesis perseus	Common bush Brown

(iii) Reptiles

Sr. No.	Scientific name	Local name
1.	Ptyas mucosus (Linn.)	Common rat snake
2.	Calotes versicolor (Daudin)	Common garden lizard
3.	Nanja Naja (Linn.)*	Indian cobra
4.	Hemidactylus flaviviridis	House Gecko

* Not sighted but included as per the information provided by villagers.

(iv) Mammals

Sr. No.	Scientific name	Local name
1.	*Herpestes edwardsi (Geoffory)*	Common Mongoose
2.	*Funambulus palmarum (Linnaeus)*	Three striped palm Squirrel
3.	*Rattus rattus (Linnaeus)*	Common House rat

Table 3.23: Land use statistics base on satellite imaginary

Sr. No.	Land use/cover	Area (km^2)	Area (%)
1	Habitation	32.99	42.3
2	Industrial area	9.76	12.5
3	Water body/river/canal	3.68	4.65
4	Barren land	8.00	10.25
5	Agriculture	13.88	17.8
6	Marshy Land & Scrubs	9.75	12.5
	Total	**78.06**	**100**

Table 3.24: Land Use Pattern

Name of Village	Total Area of the Village (ha)	Irrigated by source (ha)	Un-irrigated (ha)	cultivable waste (ha)	Area not available for cultivation (ha)
Geratnagar	312.2	167.0	100.4	31.5	13.2
Geratpur	136.73	60.2	9.0	60.3	7.3
Ropda	117.4	81.5	24.2	8.1	3.6
Gamdi	512.49	437.9	37.9	10.9	25.8
Navapura	407.97	92.8	85.3	136.7	93.2
Bibipur	209.1	74.4	71.1	59.8	3.9

Table 3.25: Summary of Socio-Economic Status (Demography)

Name of the Village/ Town/Ward	No. of Occupied Residential House	Total Population (Including institutional and houseless population)			Literates		Total main Workers		Marginal Workers		Cultivators		Agricultural Laborer		Non-Worker	
		P	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Geratnagar	178	867	431	436	336	306	360	5	1	1	-	-	-	-	170	430
Geratpur	460	2021	1061	960	893	707	566	87	40	30	3	4	3	-	455	843
Ropda	243	1228	652	576	481	303	381	107	1	19	-	1	-	18	270	450
Gamdi	332	1533	798	735	621	449	448	99	37	16	1	-	22	11	313	620
Navapura	490	2475	1291	1184	865	552	715	358	75	40	2	-	52	31	501	786
Bibipur	229	1160	592	568	493	409	336	20	10	56	-	1	6	53	246	492

Table 3.26: Basic amenities in the study area

Name of Village	Educational Facility	Medical Facility	Drinking Water Facility	Communication (Post or Telegraph)	Transportation Facility (Bus etc.)	Approach to Village	Nearest town and Distance (Kms.)	Power Supply
Geratnagar	P,S,C(5-10)	CWC,RMP,CHW,H(5-10),MCW(5-10), PHC(<5)	T,TW	PH,PO(<5)	BS,RS(<5)	PR	Ahmedabad(10)	EA
Geratpur	P,S,C(10+)	RMP,H(10+), MCW(10+), PHC(<5)	T,HP,TW,W, TK	PO,PH(13)	BS,RS	PR,MR,FP	Ahmedabad(12)	EA
Ropda	P,C(10+)	CHW, H(10+), MCW(10+), PHC(10+)	T,W	PH(5),PO(<5)	BS(<5), RS(<5)	PR,MR,FP	Ahmedabad(19)	EA
Gamdi	P,C(10+)	PHS,RMP,CHW, H(10+),MCW(<5), PHC(<5)	T,TW,W,TK, R,O	PO,PH	BS,RS(<5)	PR	Ahmedabad(15)	EA
Navapura	P(2), C(10+)	RMP, CHW, H(10+), MCW(10+), PHC(10+)	T, TW, W, R	PH(4), PO(<5)	BS, RS(10+)	PR	Ahmedabad(23)	EA
Bibipur	P,C(10+)	CHW, H(10+), MCW(<5), PHC(<5)	T,TW,TK,O	PO,PH(5)	BS,RS(10+)	PR,FP	Ahmedabad(14)	EA

Abbreviations:

Educational

P - Primary School
C - College
S - Higher Secondary School

Medical Facility

MCW - Maternity & Child Welfare Centre
PHC - Primary Health Centre
RMP - Registered Private Medical Practitioner
CHW - Common Health Worker
H - Allopathic Hospital
CWC - Child Welfare Centre
MCW - Maternity & Child Welfare

Drinking Water

T - Tap Water
HP - Hand Pump
TW - Tube well Water
W - Well Water
TK - Tank water
R - River water
O - Others

Post and Telegraph

PO - Post Office
PH - Telephone Connection

Transportation

BS - Bus
RS - Railway Station

Approach to Village

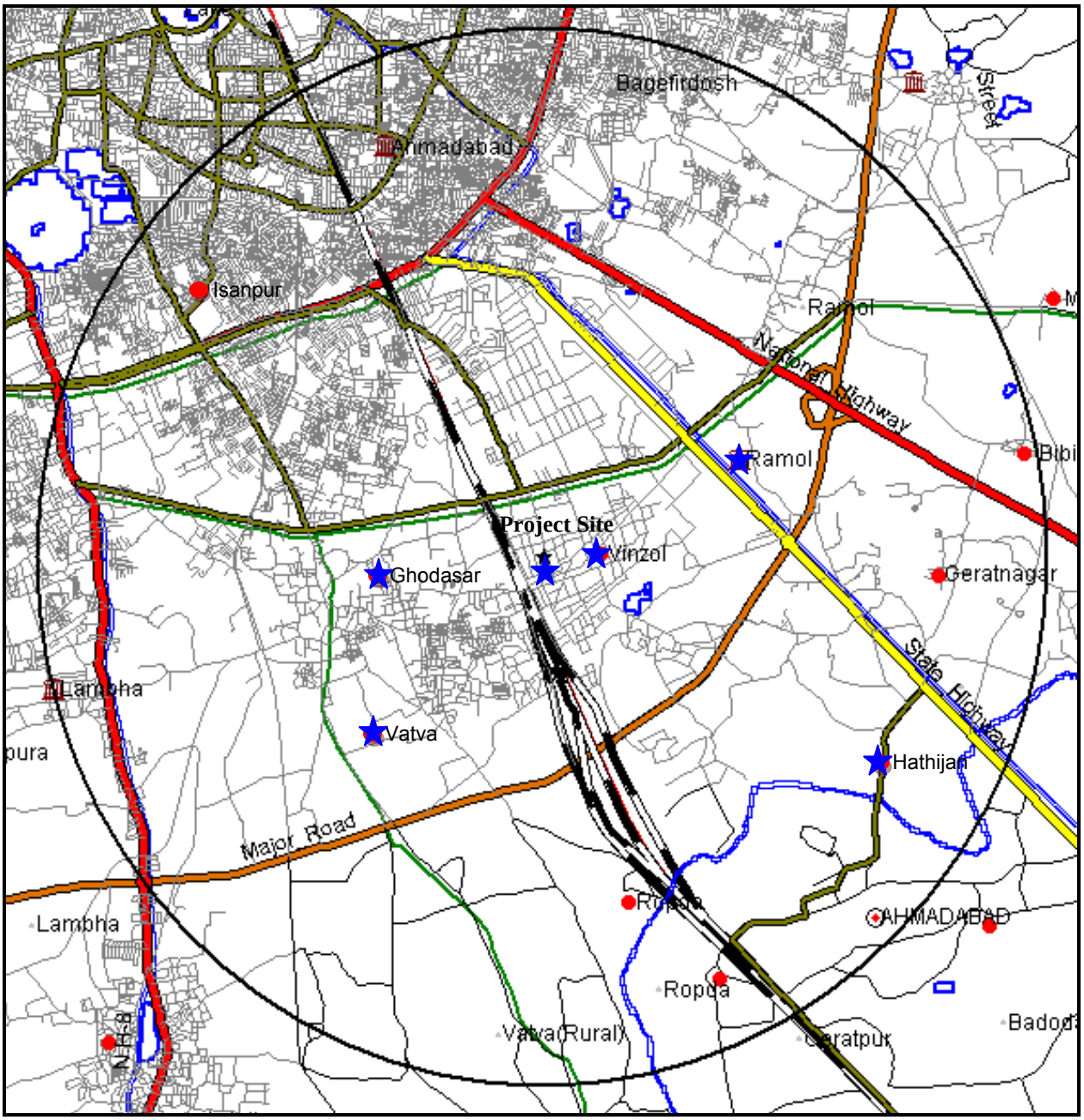
PR - Pucca Road
MR - Mud Road
FP - Foot path

Power Supply

EA - Electricity for all Purposes

Figure 3.1

Location of AAQM



★ **Indicating AAQM stations**

Figure 3.2

Wind Rose Diagram

(Period: March-2017 to May-2017)

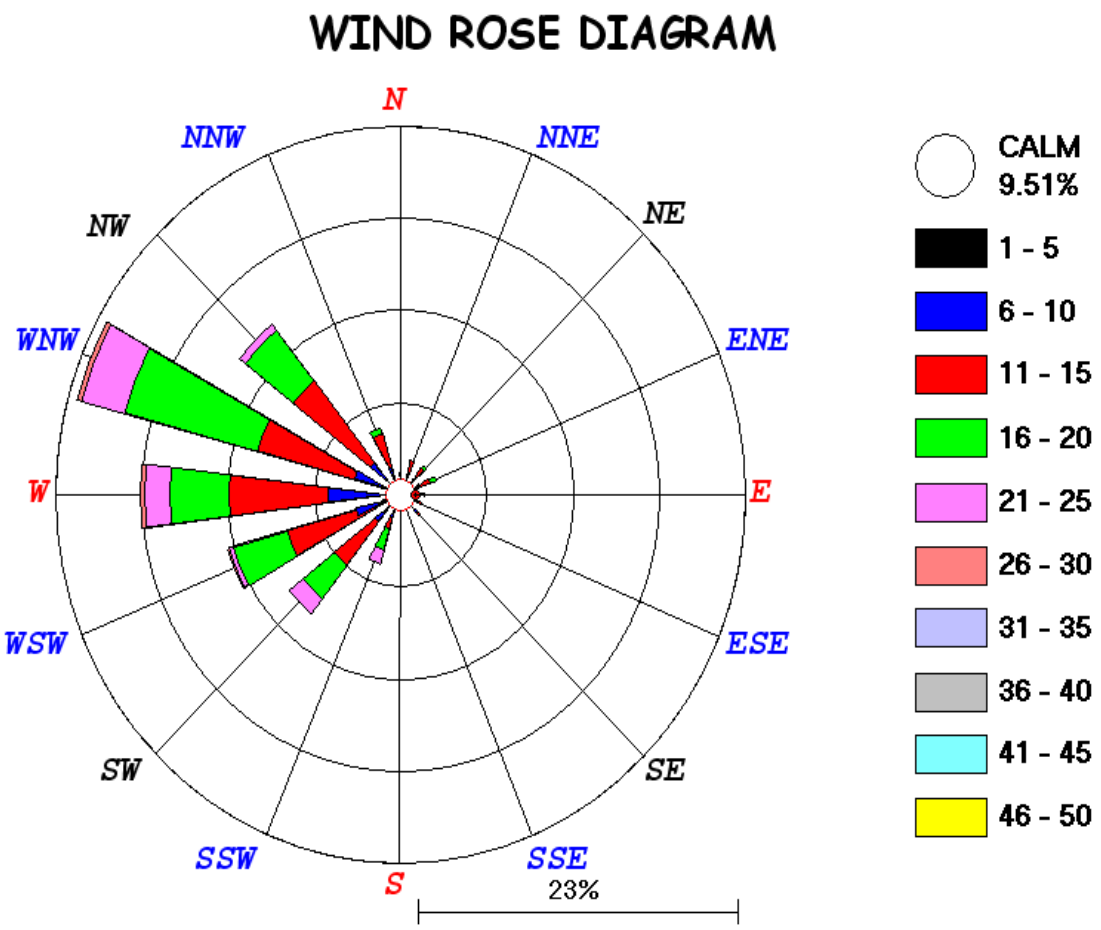
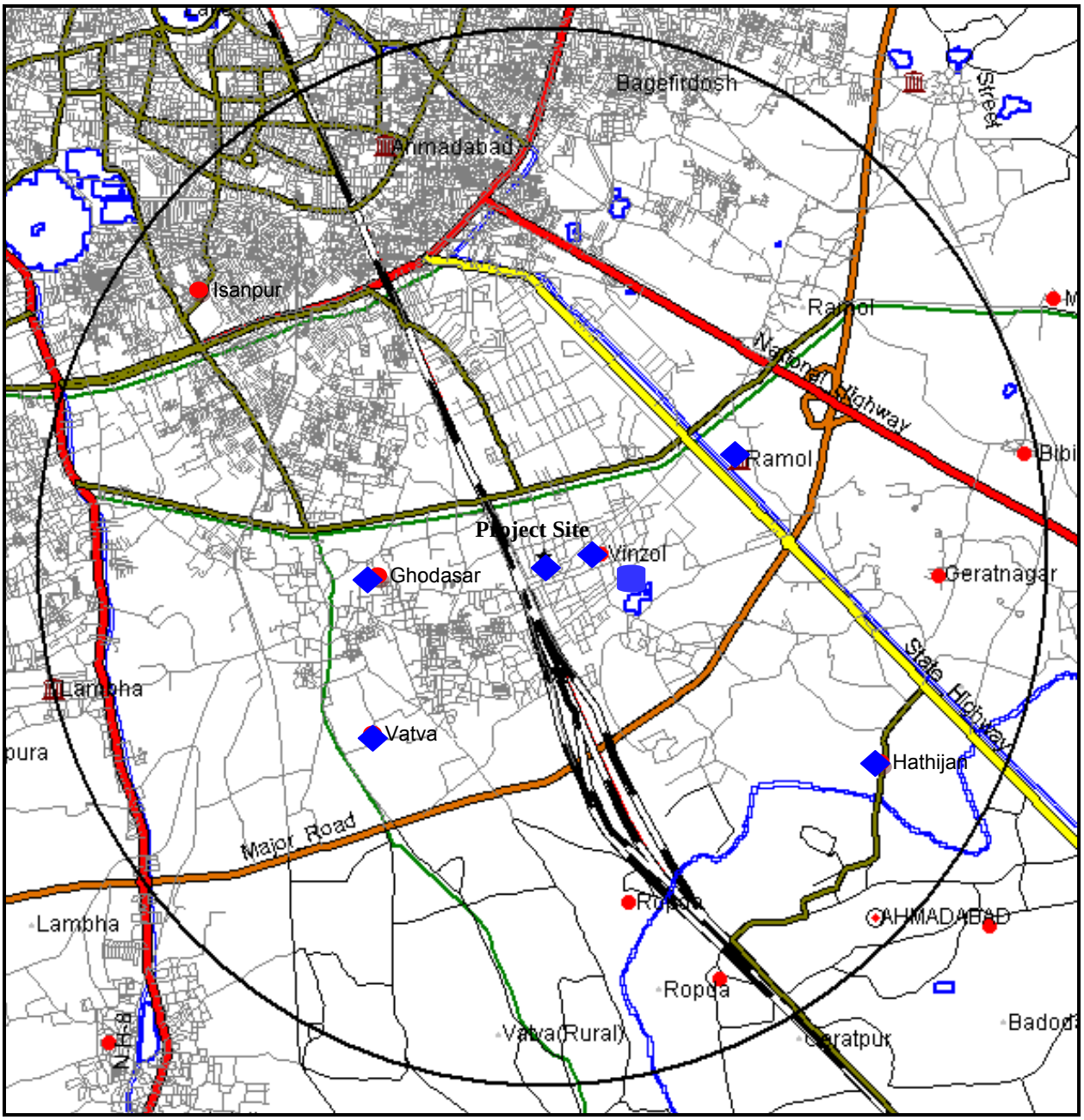


Figure 3.3

Water sampling Locations

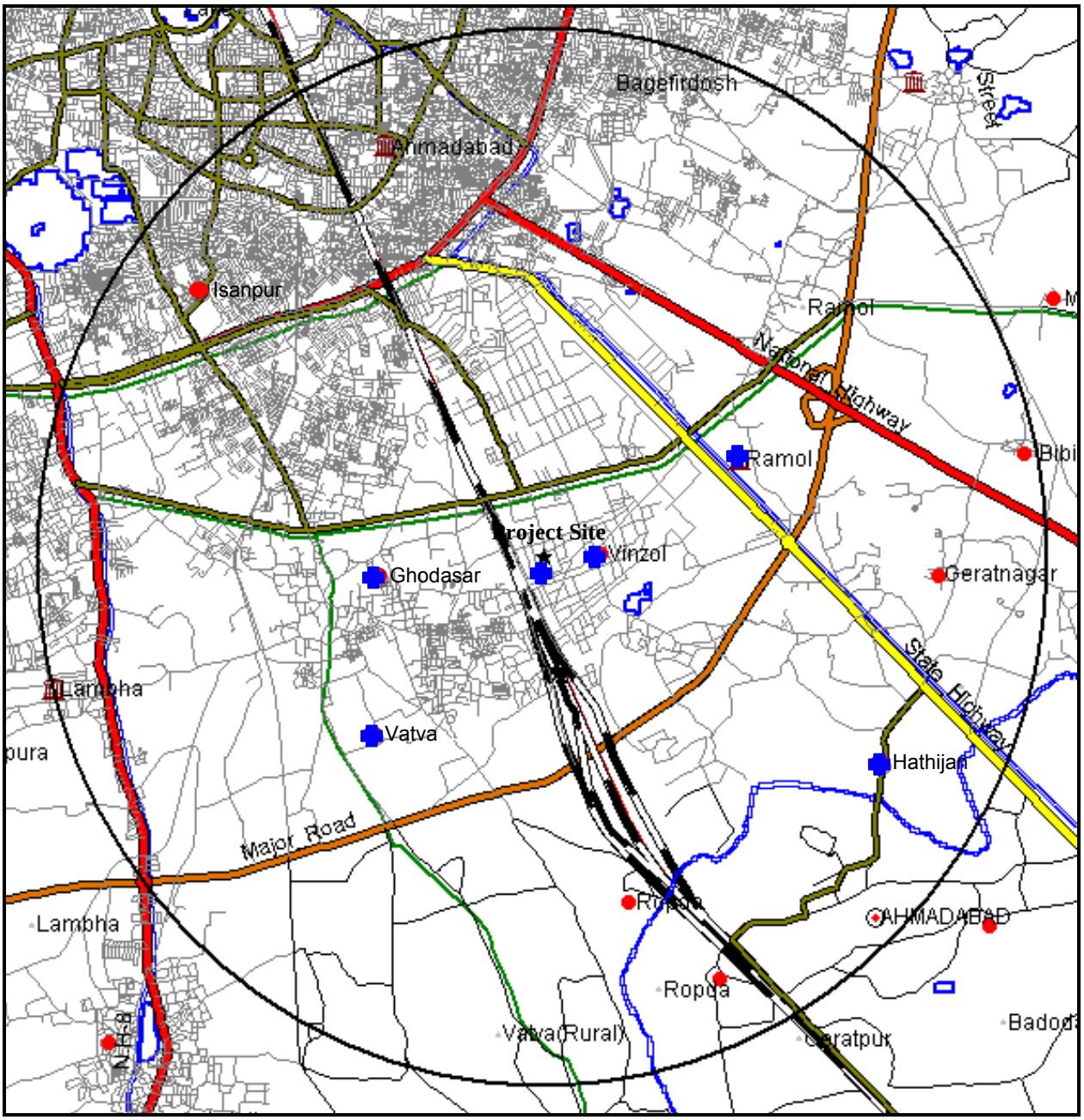


Indicating Ground Water sampling location

Indicating Surface Water sampling location

Figure 3.4

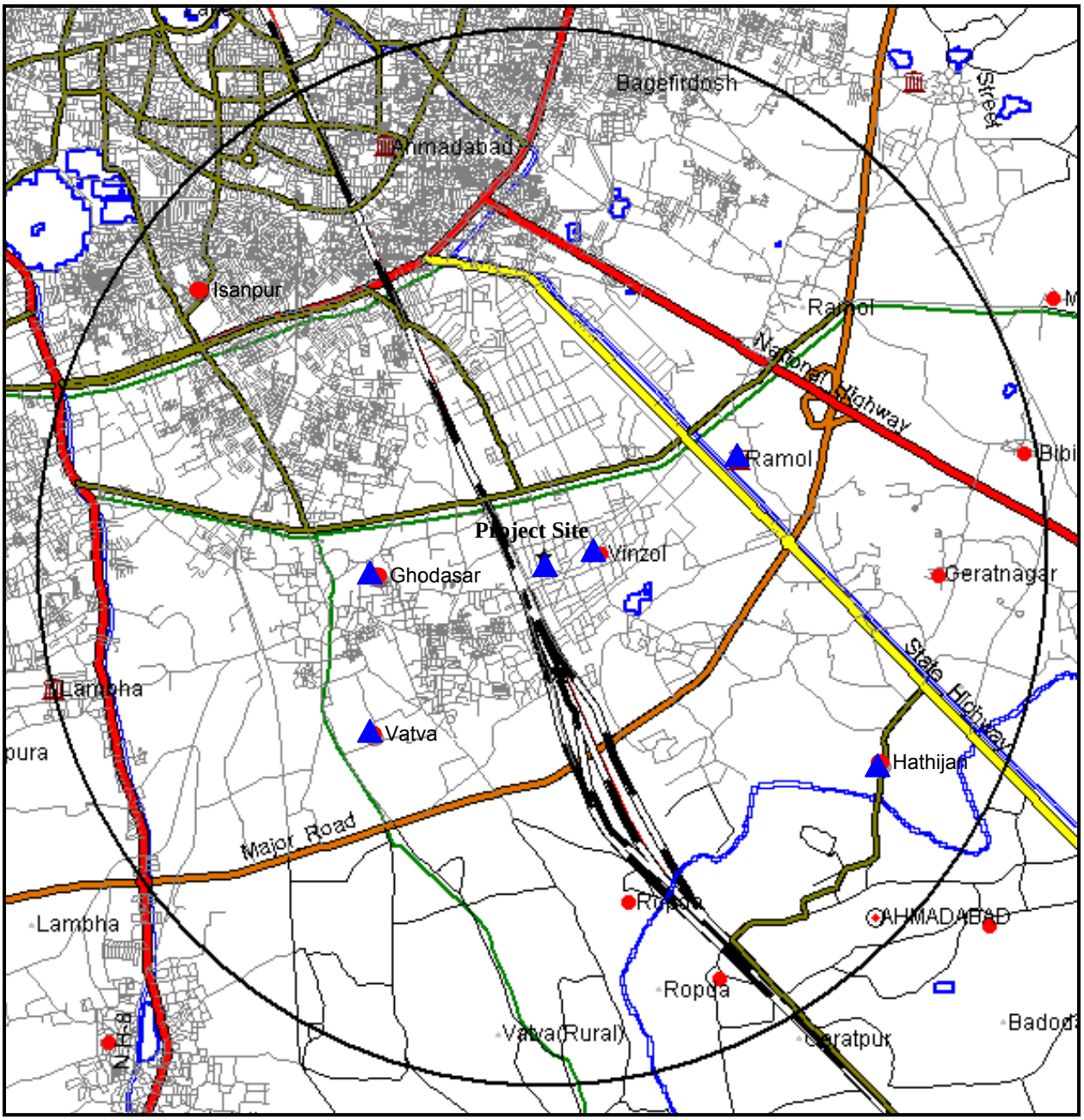
Locations of Noise monitoring station



Indicating Noise Monitoring location

Figure 3.5

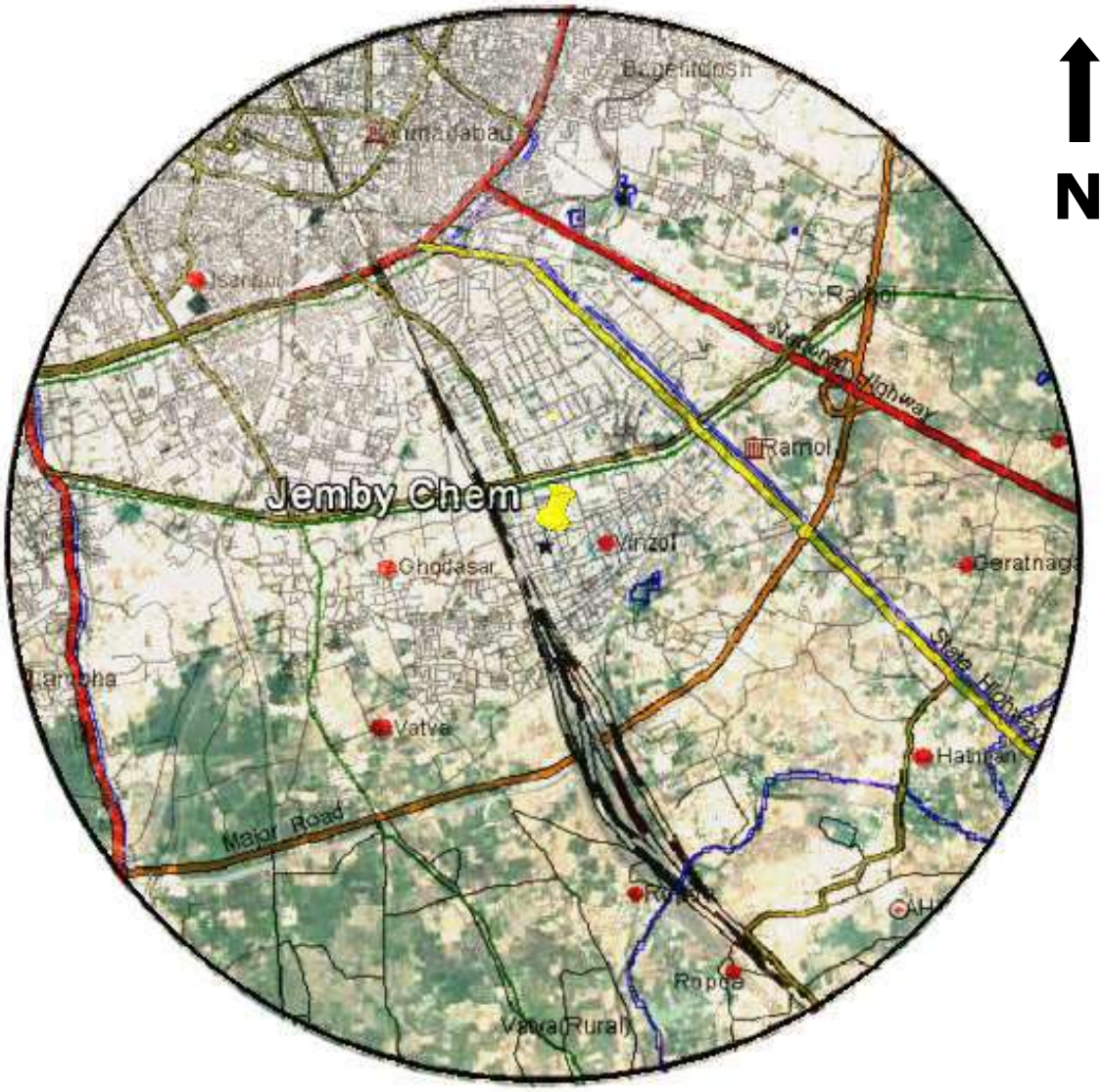
Locations of Soil sampling



▲**Indicating Location of Soil sampling**

Figure 3.6

Land use pattern of the study area (Satellite Imagery)



Chapter-4
Anticipated Environmental Impacts & Mitigation Measures

4.1 GENERAL

Environmental Impact can be defined as any change in environmental conditions which may be adverse or beneficial; occurred due to action or set of actions under consideration.

Environmental impact can be assessed by identifying the sources of the impact and predicting the same. The identification of environmental impacts has been made by co-relating the relationship between project activity and environmental parameters. The project activities of the proposed project are usually divided into two phases: Construction Phase and Operation Phase. The activities like building construction, transportation of construction material, etc. are usually considered in the construction phase. While in the operation phase, the activities like manufacturing process, transportation and storage of raw materials and finished products, resource consumption, emergency, disaster and greenbelt development has been considered.

The next step is prediction of impacts, which is an important component in environmental impact assessment process. Several techniques and methodologies are in vogue for predicting the impacts due to industrial development on physical, chemical, biological and socio-economic components of environment. Such predictions delineate contribution in existing baseline condition for the proposed activity. The impacts due to proposed activities are analyzed by keeping in mind the baseline status. This helps to assess the assimilative capacity of the environment and in turn the gravity of the impacts.

The third important component is evaluation of the environmental assessment. Based on the identification and prediction of the nature of impact on the environment, the impact can be evaluated qualitatively and quantitatively.

4.2 IDENTIFICATION OF ENVIRONMENT ATTRIBUTES

There are various types of impacts arise due to the project activities which will be evaluated considering the following environment parameters in construction and operational phase,

- Impact on Topography
- Impact on Air Environment
- Impact on Water Environment
- Impact on Noise Environment
- Impact on Land Environment (Hazardous/solid waste generation)
- Impact on Biological Environment
- Impact on Socio-Economic Environment

4.3 IMPACT ON TOPOGRAPHY

Proposed expansion will be carried out in the existing premises. The area of the plant is almost flat terrain. During the construction, excavated soil will be restored to its original shape. Thus, the impact during the construction is reversible, for short terms and insignificant.

4.4 IMPACT ON AIR ENVIRONMENT

Sources of Impact

There are chances of impact on the air environment due to installation of machinery during construction phase and due to gaseous emission from the stacks during operational phase.

a. Construction Phase impact & mitigation measures

The proposed expansion will be carried out in the existing premises wherein the construction activities will be carried out as per the plant design. So, there will be chances of dust emission from site cleaning and construction activity and excavation activities. This will be limited only up to working area. Dust and other emissions are not likely to spread in wider area, which would affect home and other properties. Water sprinkling will be done to suppress the airborne dust. Vehicular movement for transportation of construction material also has minor impacts on ambient air quality. PPEs will be given to workers working in dust generating areas. Impacts on the ambient air quality will be temporarily for short duration & reversible in nature and restricted to small area only. Hence it can be concluded that, the impacts on air due to

the construction & erection activities will be minimum or negligible & by implementing the proper mitigation measures.

b. Operational phase impact & mitigation measures

Mathematical model used for predictions of impact includes steady state Gaussian Plume Dispersion model designed for multiple point sources. The impacts on air quality from project depend on various factors like design capacity, process technology, raw material, fuel to be used, air pollution control measures, operation and maintenance. Apart from the above, other activities associated with any project, viz., transportation of fuel, raw materials and finished products, storage facilities and material handling within the plant premises may also contribute to air pollution. The sources & expected emission level are described below:

Emission from the plant

In existing set up, flue gas emission is from stack attached with boiler and thermic fluid heater, where Bio fuel (Briquette) is used as fuel. After expansion, existing boiler and TFH will be dismantled and unit will install new boiler of 1 TPH capacity and TFH of 10.0 lakhs kcal/hr. capacity.

At present, process gas emission is from the stack attached to reaction vessel. After expansion, one more reaction vessel having stack height of 15 m will be added. Alkali Scrubber (Ventury + Packed column) will be provided to recover Sodium bisulphite and meeting the emission norms laid down by GPCB. One stand by D.G. set of 125 kVA is installed in the premises, which will be used in case of power failure/emergency only. HSD will be used as a fuel.

Mitigation Measures

Multi cyclone will be installed as APCM to the stack of new boiler. Ventury + Packed column alkali scrubber will be installed as APCM to control process gas emission. Adequate stack height and facility for sampling such as ladder & sampling point is provided as per the SPCB guidelines for proper dispersion of pollutants.

Fugitive Emission control

The fugitive pollutants such as RPM & Acid Mists are likely to emit from process area. However, it will be within acceptable level.

- ✓ To minimize fugitive emission; unit has adopted the practice of carrying out entire manufacturing process into closed vessel.
- ✓ Special care is also taken while material handling and storage.
- ✓ To reduce the pollutant emitted during transportation, the unit has adopted the practice of regular check-up and maintenance of vehicular engines for complete combustion of the fuel.
- ✓ Paved road are made to reduce the fugitive emission. Water sprinkler will be provided to reduce the dusting from road transportation.

To mitigate the impact due to Suspended Particulate Matter (SPM), following control measures will be implemented:

- Regular housekeeping will be carried out.
- Construction material will be stored separately and covered to control dust emission due to wind.
- Regular maintenance of vehicles and machinery will be carried out.
- PUC certified vehicles will be used.
- Ambient air quality monitoring will be done at strategic location.

4.4.1 Air Pollution Dispersion modeling of stack

Following sub-section give air dispersion modeling details for prediction of changes in GLC of pollutants emitted from the above stacks.

Objective: The objective of dispersion modeling is to predict the ground level concentration during the operation phase and its impact on ambient air quality of the area and compare with applicable NAAQS.

Model used: The impact on air quality due to emissions from single source or group of sources is evaluated by use of mathematical models. The impacts of air pollutants were predicted using Gaussian air dispersion model, which is selected on the basis of existence of multiple point sources within the industrial complex and the plain terrain at the project site. In order to predict the impact of air pollutants on ambient air quality, ISCST3 model (Industrial Source Complex – Short Term (ISCST3) dispersion model) of United State Environmental Protection Agency (USEPA) was used by considering guidelines stipulated by CPCB for air pollution dispersion modeling. The Gaussian model provides estimates of pollutant concentrations at various receptor locations.

It is an hour-by-hour steady state Gaussian model which takes into account the following:

- Terrain adjustments
- Stack-tip downwash
- Gradual plume rise
- Buoyancy-induced dispersion, and
- Complex terrain treatment and consideration of partial reflection
- Plume reflection off elevated terrain
- Building down wash
- Partial penetration of elevated inversions is accounted for Hourly source emission rates, exit velocity and stack gas temperature

Only two stability conditions based on the meteorology aspects were used to calculate the theoretical maximum ground level concentration is comparing the actual data and data generated from mathematical modeling, it highlights that the stability condition E & A-B were predominant in the region.

Following are the assumptions made while using the model:

- No dry and wet depletion of pollutants
- Receptors are on flat terrain

The key emitted pollutants will be SPM, SO_2, NO_x.

4.4.2 Micrometeorology

Hourly micrometeorological data collected during the study period **(March, 2017 to May, 2017)** have been used for modeling. The hourly wind speed, solar insolation & total cloudiness during day time and wind speed & total cloudiness during night time were used to determine the hourly atmospheric stability classes (defined by Pasquill and Gifford as A to F, A being most unstable and F being most stable). The hourly stability classes were determined based on the technique suggested by Turner. Turner's system used for determining the stability classes is as follows:

- For day or night: If total cloud cover (TC) = 10/10 and ceiling <7000 ft (2134 m), NR=0
- For night-time (defined as period from one hour before sunset to one hour after sunrise):

a) If TC<4/10, use NR = -2

b) If TC>4/10, use NR = -1

- For daytime: determine isolation class number (IN)

a) If TC<5/10, use NR=IN

b) If TC>5/10, modify IN by the sum of the following applicable criteria

If ceiling<7000 ft (2134 m), modification = -2

If ceiling>7000 ft but <16000 ft (4877 m), modification = -1

- If TC=10/10 and ceiling>7000 ft, modification = -1 and let modified value of IN=NR, except for day-time NR cannot be <+1.

During the study period, stability calculated based on above-mentioned Turner method gives average stability as A-B class during Day time and E class during Night time.

4.4.3 Input data

Stack emissions data have been used for prediction of incremental GLC values of PM, SO_2 and NOx using one season meteorological data during March, 2017 to May, 2017. Input data includes quantitative expected emission levels, temperature, mixing height from the stack. Input data is given in **Table 4.1.**

4.4.4 Output of model (24-hourly GLCs)

The 24-hourly average Ground Level Concentration (GLC) values from project have been computed for PM, SO_2 & NO_x considering topographical features around the plant & applicable stability classes. The maximum 50 (24-hr) average concentration values for PM, SO_2 & NOx are given in **Table 4.3 to 4.5.** Corresponding Isopleths for 24-hourly predicted value is generated which is shown in **Figure 4.1 to 4.3.**

It may be noted from the computed result for the proposed scenario that, the highest 24-hourly average GLCs value of PM, SO_2 & NO_x from the proposed activity are 1.314 $\mu g/m^3$, 0.174 $\mu g/m^3$ & 0.352 $\mu g/m^3$ respectively. These GLCs are expected to occur at a distance of 1.0 km from the source in E direction. With this marginal contribution due to the proposal of the project, the levels of PM, SO_2, NO_x will remain well below the 24-hourly ambient air quality standards for SO_2 & NOx (80 $\mu g/m^3$), PM_{10} (100 $\mu g/m^3$), $PM_{2.5}$ (60 $\mu g/m^3$) prescribed by CPCB.

4.4.5 Incremental & cumulative concentration of pollutants

The maximum incremental GLCs due to project for SPM, SO_2, NO_x is superimposed on the baseline concentrations recorded during the study period to arrive at the likely resultant concentrations after implementation of the proposed plant. The cumulative concentrations (baseline + incremental) of the project is tabulated below at **Table 4.2.**

4.4.6 Conclusion

The modeling study proved that, the air emissions from the proposed activities would not likely to cause any significant impact on the ambient air quality of the study area. The ambient air quality around project site will remain within the National Ambient Air Quality Standards (NAAQS) prescribed for residential area.

4.5 IMPACT ON WATER ENVIRONMENT

a. Construction Phase Impact & mitigation measures

The proposed expansion activities will be in the existing premises so construction activities will be carried out as per requirement. There will not be any adverse impact on the quality of water because very small quantities of water will be used and met from GIDC, Vatva water supply system. No disposal of construction waste outside the plant and no leaching is anticipated. Thus, the quality and quantity of ground water will not have any adverse impact during construction phase.

b. Operational Phase Impact & mitigation measures

The unit use GIDC water supply to satisfy the existing and proposed water requirement. The total water requirement after expansion will be 105 KL/day for domestic, industrial & gardening purpose. Further, proponent has decided to implement a Rain Water Harvesting Programme. Thus, operation of the proposed project will not affect water availability in the study area.

(A) Impact Assessment

Since additional fresh water will be required for the proposed expansion activities, there will be insignificant impact on the ground water table because water requirement will be met through GIDC water supply.

The industrial wastewater generation will be from the process, washing and utilities. The unit has provided 2 separate ETP for treatment of High

concentrated effluent and dilute stream. Low COD effluent stream will be treated in to in-house ETP and after meeting with GPCB norms flows to CETP drainage where it is ultimately disposed.

From high concentrated stream, total spent Sulphuric acid generation will be tune around 47.0 KLD; out of which; 23.0 KLD will be captive use and 24.0 KLD spent Sulphuric Acid will be sent to Novel Spent Acid Management, Vatva for reuse by actual users under Rule-9. Process effluent of 68.0 KLD after primary treatment will be sent for common spray dryer to avoid heavy load of organic and inorganic on CETP.

Domestic w/w will be disposed in soak pit followed by septic tank. Thus, there will not be any major impact on the water environment due to proposed expansion activities.

Hence, it can be concluded that, all identified impacts on water during operation phase will be negligible as no ground water shall be abstracted.

So no major impact is envisaged and proper, effective Environment Management Planning will be implemented to minimize the temporary effect so as to ensure minimal impacts on water resources.

4.6 IMAPACT ON NOISE ENVIRONMENT

During construction phase, the impact on noise environment will be due to installation of some new mechanical equipments and machineries while during the operational phase, the impact on noise environment will be due to manufacturing activities, boiler, TFH & transportation activities.

a. Construction Phase Impact & mitigation measures

The noise produced during construction may have significant impact on the existing ambient noise levels. The proposed expansion is in the existing premises wherein the construction activities will be carried out. Minor noise will be generated due to installation of new machineries and equipments. The impact will be very minor and temporary in nature.

b. Operational Phase Impact & mitigation measures

The main sources of noise (at present & after expansion) within the plants are: boiler, Thermic fluid heater, D.G. set, transferring pumps and material handling systems. Suitable noise control system will be provided to ensure that noise does not exceed the limits. The noise level shall however exceed the above limits for a short period during start-up of

equipment. The other sources of noise are the movement of vehicles along the road. However, proper noise preventive measures have been taken to minimize the noise pollution like ear plugs, dampers to the boilers, efficient silencers to the vehicles, etc.

The results of monitoring carried out in the region are presented in Chapter-3. The results are below the standards prescribed for Industrial environment. It can be concluded that, the impact on noise environment will be long term but insignificant. The mitigation measures proposed for minimising impacts on noise quality are provided in Chapter-10.

4.7 IMPACT ON LAND/SOIL ENVIRONMENT

The main source of impact on land and soil environment will be due to construction activities and hazardous waste disposal.

a. Construction Phase Impact & mitigation measures

Since the proposed expansion project activities will be carried out in the existing plant premises, leveling would not be required. The area of the plant is flat. Excavated soil will be used for land filling in plant premises. Thus, topography will also be remaining unchanged for proposed expansion activities. Thus, the impact on the land/soil during the construction is for short terms and insignificant.

b. Operational Phase Impact (Solid/Hazardous Waste)

During the operation phase, it is identified that the impacts on land would occur due to the contamination by Solid/Hazardous wastes. The hazardous wastes are the major source of impacts on land. Hazardous waste generation from project must be considered to identify the potential impacts. There will be increase in the quantity of generation of hazardous waste. Total qty. after proposed expansion is given below.

Details of Hazardous Wastes

a) ETP Sludge – 290 MT/month
b) Used Oil – 400 Lit/yr.
c) Discarded containers/liners – 42 nos./month and 58 kg/month
d) Spent Sulphuric Acid (24%-65%) – 1222 Kl/month
e) Sodium Bi Sulfite (40-45%) – 390 Kl/month

Entire quantity of the hazardous waste will be stored in the isolated hazardous waste storage area within premises having impervious

platform having RCC floor, leachate collection system & roof cover and disposed as per the scientific method. Entire quantity of ETP sludge will be sent to TSDF site for final disposal. Whereas, discarded containers/ liners will be reuse/sold to registered recyclers and used oil will be reused as lubricant within premises or sold to registered re-refiners. Spent Sulphuric Acid (24%-65%) will be partly reused in-house and balance qty. sent to Novel spent management or actual users under Rule-9 of Haz. Rules, 2016 and Sodium Bi Sulfite (40-45%) will be completely reused in-house. So no adverse impact on the land environment is likely to occur. Hence, no significant negative impact is envisaged on the surrounding soil quality.

4.8 IMPACT ON BIOLOGICAL ENVIRONMENT

a. Construction phase impact & mitigation measures

The site is located in GIDC industrial area and proposed expansion will be done in existing premises. So, the site preparation will not involve the clearance of the any vegetation. Thus, it is envisaged that there will not be any adverse impacts on the ecology/biological environment due to the construction of project.

b. Operational phase impact & mitigation measures

Unit is already in existence in Industrial estate, so there will not be any cutting of natural vegetation. No endangered species are reported in the proposed project site hence there will not be any adverse impact during operation phase. Further, unit already has developed greenbelt to enhance the biological feature of the project site. Following is the list of trees from the identified species which are helpful as pollution absorber and at the same time pollution sensitive.

Family Name	Botanical Name	Common Name	Sensitive	Tolerant
Anacardiaceae	*Mangifera indica*	Mango	Cement dust, Coal dust, SO_2	Dust collector
Anonaceae	*Polyalthia longifolia*	Asopalav	SO_2	Dust collector
Caesalpiniaceae	*Cassia fistula*	Garmalo	Cement dust, Poor Dust collector, SO_2	N.A
	Delonix regia	Gulmohar	SO_2, Fly ash, Cement dust	N.A

Family Name	Botanical Name	Common Name	Sensitive	Tolerant
Meliaceae	*Azadirachta indica*	Neem	Cement dust	SO_2

The high stomatal Index of Azadirachta Indica, makes them susceptible to SO_2. However, the SO_2 emissions from the industry will be within limits. Hence, no major adverse impact is expected on these plants with the increased emissions. Thus, there will not be any significant impact on ecological environment due to proposed expansion activities.

4.9 IMPACT ON SOCIO-ECONOMIC ENVIRONMENT

a. Construction Phase Impacts & mitigation measures

During the peak construction phase, construction manpower including construction workers will be employed. However, to the maximum extent possible, construction workers will be employed within the study area. Since the construction phase of this project will be for short time period, the socio-economic impact due to construction of this project is going to be temporary. Around 10-15 workers will be employed in the construction work. This will increase construction employment in the study area. As the construction phase for the proposed expansion project will be few months, the impact would be temporary.

b. Operation Phase Impacts & mitigation measures

The proposed expansion activities will be carried out in the existing plant premises. Therefore, no displacement of person is envisaged. Unit will provide employment opportunity to locally available skilled and un-skilled labours at different level as per the requirement, which in turn result into a positive impact on prevailing socio-economic environment. For the proposed expansion, additional 15 nos. of workers will be employed. In addition, employment will be generated by the secondary supporting activities e.g. transportation, communication, daily utility services. Surrounding area has got good educational facilities and most of employees will come from the surrounding area. Thus, overall impacts on socio-economic environment are long term and positive in nature.

4.10 IMPACT ON OCCUPATIONAL HEALTH & SAFETY

a. Construction Phase Impacts & mitigation measures

In the Construction phase of the project, some effects on occupational health and safety of the employees working in the site are envisaged. Major health issues encountered will be physical hazards & accidental Hazard. All plans and construction schedule will be followed as per relevant laws approved by competent authority, so as to minimize the occupational health hazards.

Sr. No.	Environmental Attribute	Mitigation Measures
1	Safety & Health	• Necessary PPEs like helmets, ear plug/ear muff, safety shoes, goggles etc. will be provided to workers.
		• Incident/accident reporting system will be developed and all the employees will be made aware for the same.
		• Periodic inspection & testing of equipments & machineries will be done.

b. Operational Phase Impacts & mitigation measures

In operational phase of the project, various effects on occupational health and safety of the employees working in the plant are envisaged. Major health and safety issues encountered will be physical hazards, respiratory hazards, electrical hazards, noise, fire hazards associated while working within the plant. Preventive safety measures shall be taken to minimize the risk of accident with respect to chemical handling.

Sr. No.	Environmental Attribute	Mitigation Measures
1	Safety & Health	Emergency preparedness plan should be implemented.
		First aid/other emergency treatment should be provided.
		Workers shall be well equipped with personal protective equipments. Only authorized persons will be allowed inside the plant.
		A health monitoring program shall be in place to monitor the health of the persons working on the site to ensure the health status of all concerned.
		Fire hydrant system, fire extinguishers will be installed at different locations within premises.
		Sign boards will be displayed at designated locations indicating appropriate hazard warnings.
		Good house-keeping will be ensured within the factory premises.

Table 4.1

Input data for air quality modeling

Sr. No.	Stack attached to	Stack Temp. (^{0}C)	Velocity (m/s)	Stack Height in m	Dia. (m)	SPM mg/ Nm^3	SO_2 mg/ Nm^3	NO_x mg/ Nm^3
1.	Boiler	163	8.1	15	0.450	115.5	8.4	27.2
2.	TFH	182	8.3	15	0.300	109.7	6.8	31.0
3.	Boiler	175	8.5	15	0.450	120.0	10.0	30.0
4.	D G set (125 kVA)	210	10	11	0.225	90.0	25.0	30.0
5.	Reaction Vessels (Existing)	73.5	6.5	15	0.225	SO_2-17.5		
6.	Reaction Vessels (Proposed)	80.0	6.5	15	0.225	SO_2-20.0		

Table 4.2

Cumulative Concentrations at various locations

Station	Direction	Distance (Km)	Baseline Concentration ($\mu g/m^3$)			Predicted GLC ($\mu g/m^3$)			Cumulative Concentration ($\mu g/m^3$)		
			PM	SO_2	NO_x	PM	SO_2	NO_x	PM	SO_2	NO_x
Project site (A1)	00	00	77.6	20.6	23.5	0.15	0.02	0.04	77.75	20.8	23.9
Vatva (A2)	SSW (UW)	2.34	73.4	17.2	20.1	0.2	0.02	0.04	73.6	17.22	20.14
Ghodasar (A3)	W (UW)	1.5	81.4	17.5	21.3	0.2	0.02	0.04	81.6	17.52	21.34
Vinzol (A4)	E (DW)	0.87	76.7	15.5	21.1	0.25	0.12	0.02	76.95	15.62	21.3
Ramol (A5)	ENE (DW)	3.8	71.3	19.9	23.7	0.15	0.05	0.1	71.45	19.95	24.7
Hathijan (A6)	SE (DW)	4.2	68.7	15.4	20.0	0.05	0.01	0.02	68.75	15.41	20.01

Table 4.3: The 24-hourly average GLC Concentration Values for SPM

RANK	CONC	RECEPTOR (XR,YR)	TYPE	RANK	CONC	RECEPTOR (XR,YR)	TYPE
1	1.314	(1000.00, .00)	GC	26	0.678	(1000.00, .00)	GC
2	1.112	(1000.00, .00)	GC	27	0.668	(1000.00, .00)	GC
3	1.099	(1000.00, -1000.00)	GC	28	0.662	(2000.00, .00)	GC
4	1.098	(1000.00, .00)	GC	29	0.661	(1000.00, .00)	GC
5	1.047	(1000.00, .00)	GC	30	0.651	(1000.00, -1000.00)	GC
6	0.961	(1000.00, .00)	GC	31	0.613	(1000.00, 1000.00)	GC
7	0.929	(1000.00, -1000.00)	GC	32	0.603	(1000.00, -1000.00)	GC
8	0.906	(1000.00, 1000.00)	GC	33	0.600	(1000.00, .00)	GC
9	0.883	(1000.00, -1000.00)	GC	34	0.600	(1000.00, .00)	GC
10	0.874	(1000.00, .00)	GC	35	0.599	(2000.00, -2000.00)	GC
11	0.873	(1000.00, -1000.00)	GC	36	0.582	(3000.00, .00)	GC
12	0.867	(1000.00, .00)	GC	37	0.581	(1000.00, -1000.00)	GC
13	0.853	(2000.00, .00)	GC	38	0.568	(2000.00, .00)	GC
14	0.809	(1000.00, .00)	GC	39	0.567	(1000.00, 1000.00)	GC
15	0.798	(1000.00, .00)	GC	40	0.565	(1000.00, 1000.00)	GC
16	0.783	(1000.00, -1000.00)	GC	41	0.564	(1000.00, .00)	GC
17	0.757	(1000.00, .00)	GC	42	0.563	(1000.00, .00)	GC
18	0.756	(1000.00, .00)	GC	43	0.561	(1000.00, -1000.00)	GC
19	0.738	(1000.00, .00)	GC	44	0.561	(2000.00, .00)	GC
20	0.714	(1000.00, .00)	GC	45	0.552	(1000.00, -1000.00)	GC
21	0.708	(2000.00, .00)	GC	46	0.547	(2000.00, .00)	GC
22	0.696	(1000.00, -1000.00)	GC	47	0.546	(1000.00, 1000.00)	GC
23	0.695	(1000.00, 1000.00)	GC	48	0.545	(1000.00, 1000.00)	GC
24	0.690	(1000.00, -1000.00)	GC	49	0.537	(1000.00, -1000.00)	GC
25	0.683	(2000.00, .00)	GC	50	0.534	(1000.00, -1000.00)	GC

Note: Receptor Types: GC = Grid cart, Concentration in $\mu g/m^3$

Table 4.4: The 24-hourly average GLC Concentration Values for SO_2

RANK	CONC	RECEPTOR (XR,YR)	TYPE	RANK	CONC	RECEPTOR(XR,YR)	TYPE
1	0.1744	(1000.00, .00)	GC	26	0.0860	(2000.00, .00)	GC
2	0.1474	(1000.00, .00)	GC	27	0.0859	(1000.00, -1000.00)	GC
3	0.1451	(1000.00, .00)	GC	28	0.0819	(2000.00, .00)	GC
4	0.1384	(1000.00, .00)	GC	29	0.0809	(1000.00, -1000.00)	GC
5	0.1381	(1000.00, -1000.00)	GC	30	0.0796	(2000.00, .00)	GC
6	0.1246	(1000.00, .00)	GC	31	0.0778	(1000.00, 1000.00)	GC
7	0.1185	(1000.00, -1000.00)	GC	32	0.0776	(1000.00, .00)	GC
8	0.1183	(1000.00, 1000.00)	GC	33	0.0773	(1000.00, .00)	GC
9	0.1168	(1000.00, .00)	GC	34	0.0767	(1000.00, .00)	GC
10	0.1144	(1000.00, .00)	GC	35	0.0757	(1000.00, .00)	GC
11	0.1108	(1000.00, -1000.00)	GC	36	0.0746	(1000.00, -1000.00)	GC
12	0.1088	(1000.00, -1000.00)	GC	37	0.0736	(1000.00, 1000.00)	GC
13	0.1054	(1000.00, .00)	GC	38	0.0722	(1000.00, -1000.00)	GC
14	0.1054	(1000.00, .00)	GC	39	0.0712	(1000.00, 1000.00)	GC
15	0.1049	(1000.00, .00)	GC	40	0.0712	(1000.00, .00)	GC
16	0.1033	(2000.00, .00)	GC	41	0.0710	(1000.00, 1000.00)	GC
17	0.1027	(1000.00, .00)	GC	42	0.0708	(1000.00, -1000.00)	GC
18	0.0991	(1000.00, -1000.00)	GC	43	0.0705	(2000.00, -2000.00)	GC
19	0.0977	(1000.00, .00)	GC	44	0.0702	(1000.00, 1000.00)	GC
20	0.0967	(1000.00, .00)	GC	45	0.0689	(2000.00, .00)	GC
21	0.0938	(1000.00, .00)	GC	46	0.0684	(1000.00, -1000.00)	GC
22	0.0881	(1000.00, .00)	GC	47	0.0683	(3000.00, .00)	GC
23	0.0881	(1000.00, 1000.00)	GC	48	0.0678	(1000.00, .00)	GC
24	0.0881	(1000.00, .00)	GC	49	0.0677	(1000.00, .00)	GC
25	0.0879	(1000.00, -1000.00)	GC	50	0.0674	(2000.00, .00)	GC

Note: Receptor Types: GC= Grid cart, Concentration in $\mu g/m^3$

Table 4.5: The 24-hourly average GLC Concentration Values for NOx

RANK	CONC	RECEPTOR (XR, YR)	TYPE	RANK	CONC	RECEPTOR (XR,YR)	TYPE
1	0.3526	(1000.00, .00)	GC	26	0.1810	(2000.00, .00)	GC
2	0.2980	(1000.00, .00)	GC	27	0.1793	(1000.00, .00)	GC
3	0.2953	(1000.00, .00)	GC	28	0.1776	(1000.00, .00)	GC
4	0.2936	(1000.00, -1000.00)	GC	29	0.1756	(2000.00, .00)	GC
5	0.2813	(1000.00, .00)	GC	30	0.1735	(1000.00, -1000.00)	GC
6	0.2573	(1000.00, .00)	GC	31	0.1636	(1000.00, 1000.00)	GC
7	0.2485	(1000.00, -1000.00)	GC	32	0.1606	(1000.00, -1000.00)	GC
8	0.2428	(1000.00, 1000.00)	GC	33	0.1606	(1000.00, .00)	GC
9	0.2358	(1000.00, -1000.00)	GC	34	0.1606	(1000.00, .00)	GC
10	0.2342	(1000.00, .00)	GC	35	0.1585	(2000.00, -2000.00)	GC
11	0.2335	(1000.00, .00)	GC	36	0.1550	(1000.00, -1000.00)	GC
12	0.2328	(1000.00, -1000.00)	GC	37	0.1538	(3000.00, .00)	GC
13	0.2265	(2000.00, .00)	GC	38	0.1520	(1000.00, .00)	GC
14	0.2166	(1000.00, .00)	GC	39	0.1517	(1000.00, .00)	GC
15	0.2145	(1000.00, .00)	GC	40	0.1513	(1000.00, 1000.00)	GC
16	0.2091	(1000.00, -1000.00)	GC	41	0.1512	(1000.00, 1000.00)	GC
17	0.2042	(1000.00, .00)	GC	42	0.1510	(2000.00, .00)	GC
18	0.2026	(1000.00, .00)	GC	43	0.1498	(1000.00, -1000.00)	GC
19	0.1996	(1000.00, .00)	GC	44	0.1488	(2000.00, .00)	GC
20	0.1924	(1000.00, .00)	GC	45	0.1471	(1000.00, -1000.00)	GC
21	0.1880	(2000.00, .00)	GC	46	0.1463	(1000.00, 1000.00)	GC
22	0.1856	(1000.00, 1000.00)	GC	47	0.1458	(1000.00, 1000.00)	GC
23	0.1853	(1000.00, -1000.00)	GC	48	0.1452	(2000.00, .00)	GC
24	0.1846	(1000.00, -1000.00)	GC	49	0.1432	(1000.00, -1000.00)	GC
25	0.1833	(1000.00, .00)	GC	50	0.1423	(1000.00, -1000.00)	GC

Note: Receptor Types: GC = Grid cart, Concentration in $\mu g/m^3$

Figure 4.1: Isopleths for Ground Level Concentrations for SPM

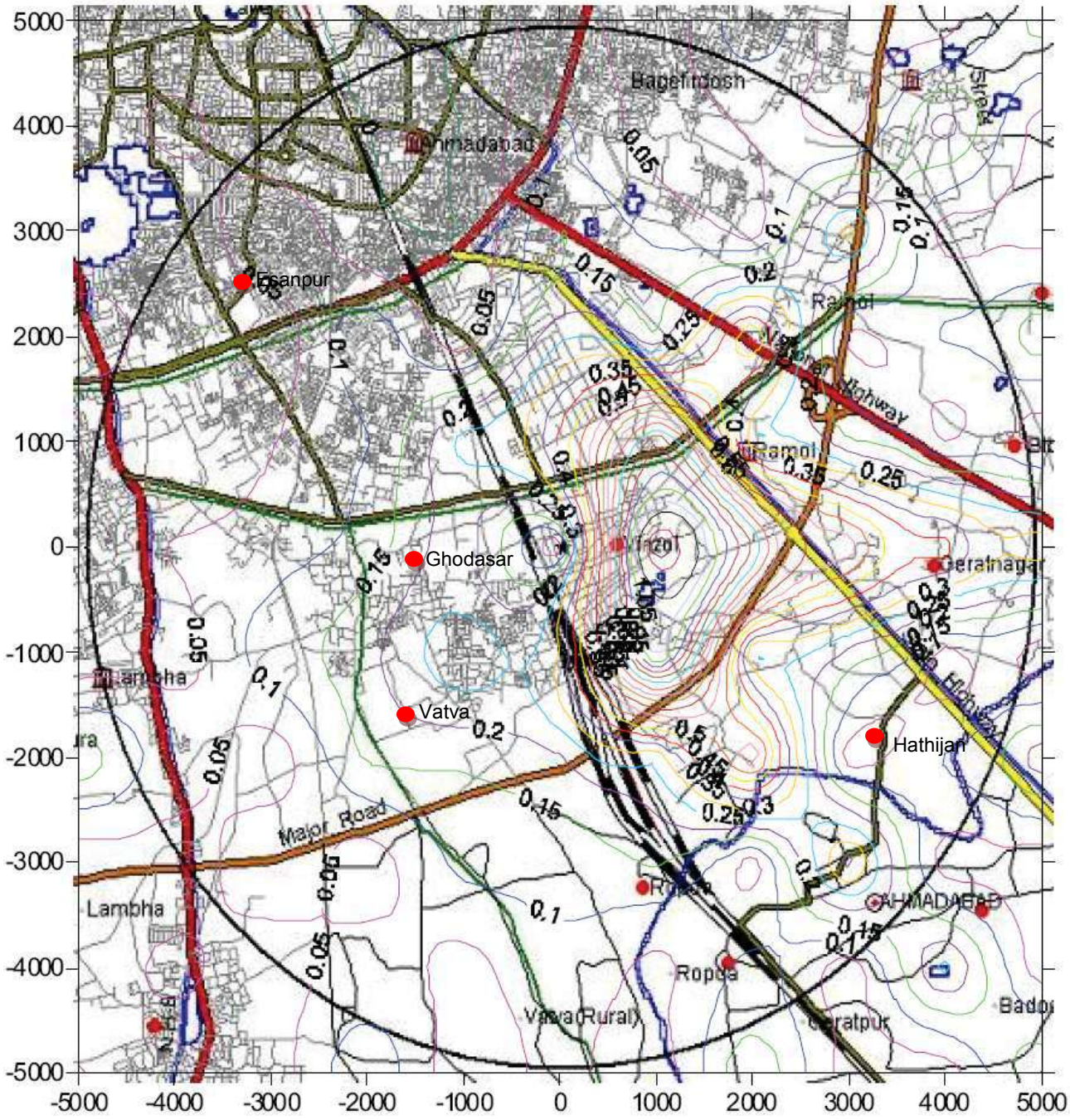


Figure 4.2: Isopleths for Ground Level Concentrations for SO_2

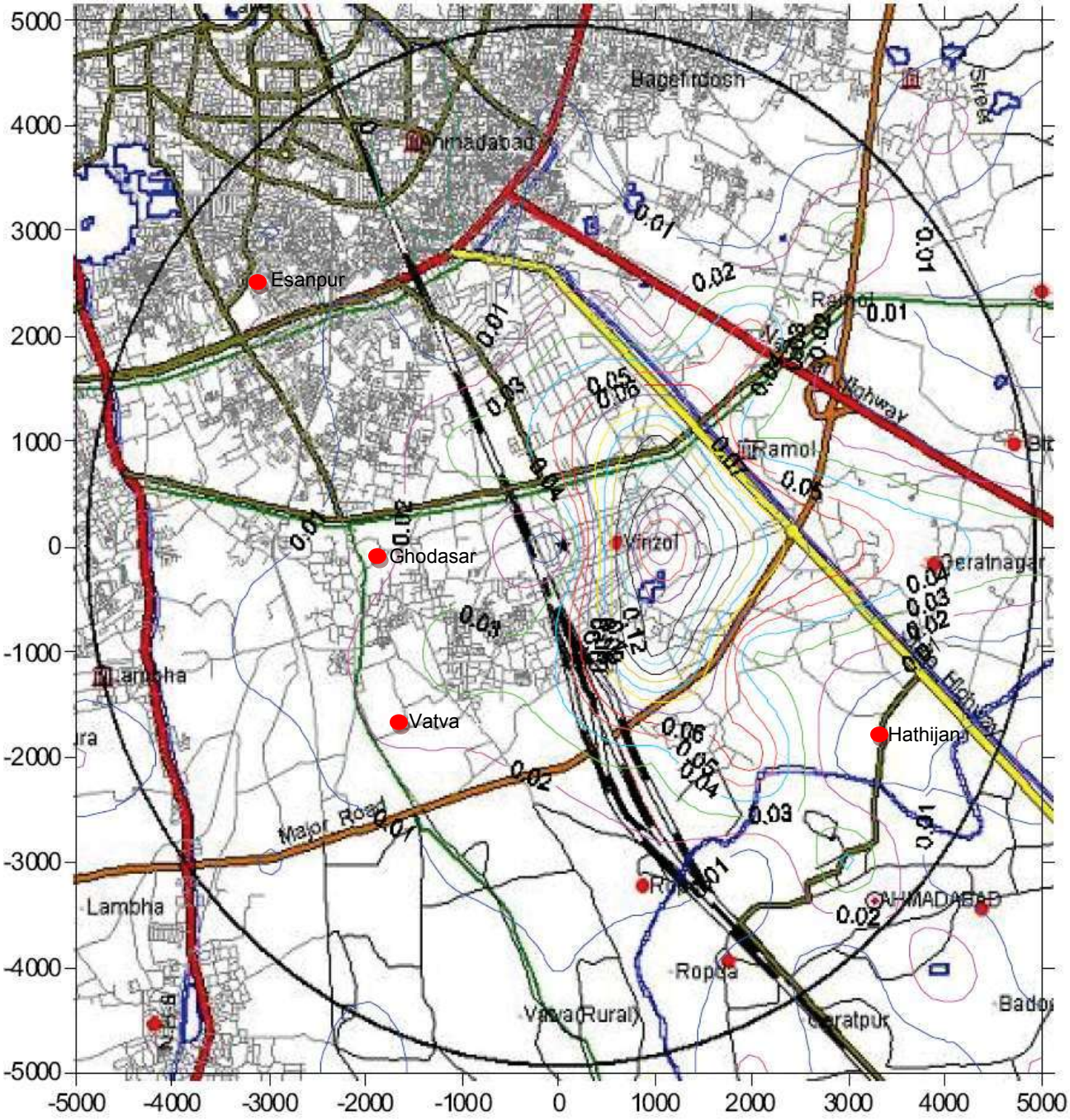
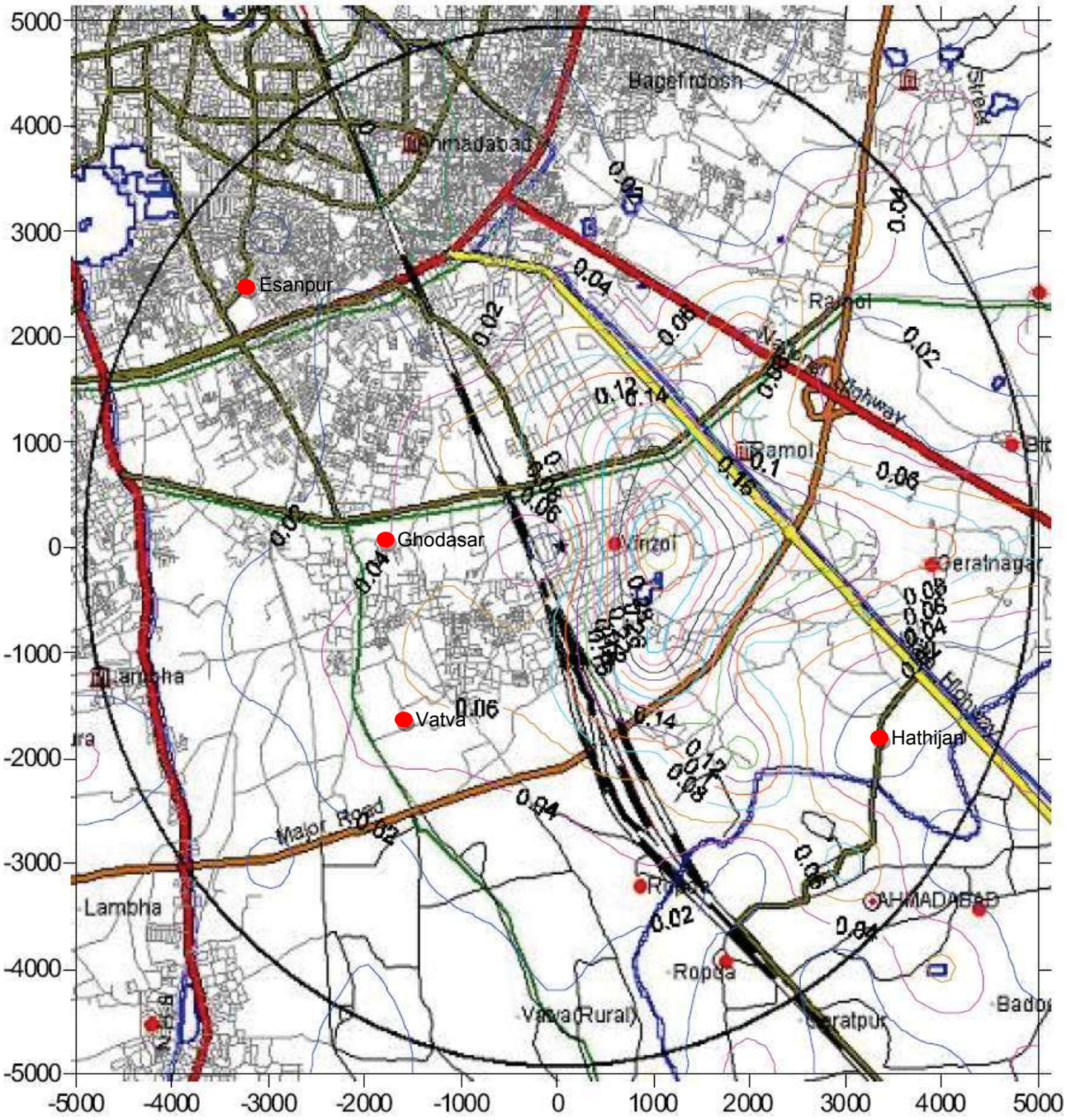


Figure 4.3: Isopleths for Ground Level Concentrations for NOx



Chapter-5
Analysis of Alternatives

5.1 PROLOGUE

Alternative analysis is the process of analyzing the proposed locating for suitability for basic necessities to operate the plant safely, this analysis also covers the environmental aspect of pollution prevention and improvement in quality of life nearby the project vicinity. The project alternative is the course of action in pace of another, that would meet the same purpose and need, but which would avoid or minimize negative impacts and enhance project benefits.

Such projects may result in specific impacts which can be avoided or mitigated by adherence to certain predetermined performance standards, guidelines or design criteria. Alternative approaches may therefore be more effective in integrating environmental and social concerns into the project planning process.

5.2 SITE ALTERNATIVE

The project site is in proximity of Ahmedabad district of Gujarat state and already in existence; therefore, it becomes easy for the unit to expand the project in the same premises. Vatva GIDC has lots of other chemical industries and hence the required infrastructure and resources are readily available. Other supporting features are briefly summarized hereunder,

- Availability of adequate land for proposed expansion activities.
- Availability of all essential facilities like infrastructure, communication, medical facilities, fuel, water, power, unskilled & skilled manpower, raw materials, road network etc.
- As the project is in GIDC, no Rehabilitation & Resettlement is involved.
- The unit is well connected with National Highway (NH-8).
- Availability of good communication and transportation facilities.
- No National park or wildlife Habitats falls within 10 km radial distance from the project site.

So no alternative for site is analyzed

5.3 PROCESS ALTERNATIVE

The company will use the Best Available Process Technology (BAT) for the production. Unit has adopted cleaner production technology in our process. Unit has drastically reduced water consumption and wastewater generation along with increase the quantity and strength of spent acid. Currently this is the best available technology in the market. Unit has also carried out study of eternal cooling to reduce ice consumption as well as water consumption. As per the input given by the unit, isolation cannot be possible with less volume of process mass. So mentioned input of water and ice is minimum level of process mass for isolation of the product.

The products manufactured by unit are established since last long. Existing process is technically feasible, commercially viable and environmentally acceptable. Hence, no proposal of alternate process or technology and currently it is best technology available with the proponent.

For better environmentally acceptable, we proposed to segregate process effluent with low biodegradable with high COD and high TDS from process is to be spray dried in common environmental infrastructure working in vicinity of plant. Wastewater generated from utility and washing will be treated in existing treatment plant and after achieving CETP inlet norms fixed by GPCB it will send to CETP, Vatva for final disposal.

Chapter-6
Environmental Monitoring Program

6.1 PRELUDE

Environment monitoring is the sampling and analysis tool to know the environment conditions at particular time. The record of environmental monitoring is most important as the environmental changes are slow in nature and impact appears after many years. Environmental Monitoring is the technical heart of assessment of environmental and social impacts arising due to implementation of the proposed project. An equally essential element of this process is to develop measures to eliminate, offset or reduce impacts to acceptable levels during implementation and operation of projects. The integration of such measures into project implementation and operation is supported by clearly defining the environmental requirements within an Environmental Management Plan.

Jemby Chem Ltd. is an existing unit and now proposed to expand its production capacity within existing premises. It has proposed adequate environmental monitoring programme.

6.2 POST PROJECT ENVIRONMENT MONITORING PROGRAM

The continuous monitoring of Environmental parameters like air, water, noise, soil and performance of pollution control facilities and safety measures in the plant are vital for proper Environmental management of any industrial project. Therefore, the company shall create environmental monitoring facilities by the environmental and safety department to monitor air and water pollutants as per the guideline of GPCB & CPCB. Moreover, air and water shall be monitored by outside agencies authorized by GPCB at regular frequencies. This department shall also carry out periodical checkup of fire and safety equipments.

6.3 OBJECTIVE OF MONITORING PLAN

The basic objective of monitoring is -

- To know the pollution status within the plant and its vicinity.
- To verify the result of the impact assessment study in particular with regards to new developments;
- Generate data for corrective action in respect of pollution.

- Correlate the production operations with emission and control mechanism.
- To check or assess the efficiency of the controlling measures;
- Examine the performance of pollution control system.
- Assess the Environmental impacts.
- Remedial measures and environment management plant to reverse the impacts.
- To establish a database for future Impact Assessment Studies for new projects.

6.4 SCHEDULES FOR ENVIRONMENT MONITORING:

The environmental monitoring will be scheduled on regular interval to assess the conditions. The record of these monitoring will be compared with the baseline study to know the changes in environmental conditions. The post-project environmental monitoring suggested herewith should be as per the following guideline.

The highlights of the integrated environmental monitoring plan are:

- The stack monitoring facilities like ladder, platform and porthole at all the stacks will be maintained in good condition.
- Regular monitoring of all gaseous emissions from stacks.
- The performance of air pollution control equipment evaluated based on these monitoring results.
- Water consumption will be recorded daily.
- As far as possible, noise curbed at its source, with the help of acoustic hoods and other such noise reducing equipment. Regular noise level monitoring will be carried out.
- Greenbelt will be properly maintained and new plantation programmes will be undertaken frequently.
- Continuous environmental awareness programmes will be carried out for the employees and also in the surrounding villages.

6.5 AMBIENT AIR QUALITY MONITORING

Scheme for monitoring ambient air quality, stack emissions and fugitive emissions are proposed. The ambient air quality monitoring systems are recommended for monitoring the ground level concentrations and fugitive emissions around the plant. Unit should install three monitoring stations

around its battery limit (at 120^0 as per guideline) for monitoring PM, SO_2 and NOx. The combined data will provide overall characteristic and emission from the industry. For this, the following equipment is recommended to be procured or can higher the services from Environmental consultant by the project proponent for implementing the above mentioned monitoring schemes:

Respirable Dust Sampler

Blower - 1.0-1.5 m^3/min capacity with adapter for uniform suction through filter and a properly calibrated manometer assembly for the determination of flow rate through filter paper.

Rota meter - For gaseous sampling, calibrated Rota meter (0-5 LPM) for maintaining flow rate should be provided.

Main housing - The main housing should be rectangular with a stand of about 1.25 m height.

Besides this, stack emissions monitoring as per GPCB guidelines shall be carried out.

Water Environment

Process effluent (concentrated stream) will be sent to common spray dryer after treatment. Dilute stream of washing and utility effluent will be treated in ETP and after achieving CETP inlet norms, it will be discharge to CETP, Vatva for further treatment and final disposal.

Noise Environment

Monitoring of noise levels is essential to assess the efficacy of maintenance schedules undertaken to reduce noise levels and noise protection measures. A good quality digital sound pressure level meter is essential for this purpose.

Table: 6.1 Monitoring schedule for Environmental parameters

Nature of Analysis	Frequency of analysis with its analyzer	Parameters
Wastewater analysis	Monthly by external agency	pH, TDS, SS, Oil & Grease, etc.
Stack Monitoring of each stack	Monthly by external agency	PM, SO_2, NO_X
Ambient Air Quality Monitoring	Monthly for 24 hours or as per the statutory conditions by external agency	PM_{10}, $PM_{2.5}$, SO_2, NO_X
Noise level	Monthly as per the statutory conditions by external agency	Nr. Main gate, Nr. Boiler, Nr. D. G. Set, Process area etc.
Work zone fugitive monitoring	Monthly by external agency	RPM, Acid Mist
Health check-up of workers	As per the statutory guideline	All workers

Table: 6.2 Budget for implementation of Environmental Monitoring Plan

Particulars	No. of location	Parameters	Methodologies	
			Method of Monitoring	Method of Analysis
Stack Monitoring	All stacks	PM, SO_2, NOx	Stack monitoring kit	**PM:** IS 11255: part-1: 1985 **SO_2:** IS 11255: part-2: 1985 **NOx:** IS 11255: part-7: 2005
Ambient Air Quality Monitoring	3 locations	PM_{10}, $PM_{2.5}$, SO_2, NOx	RDS, Fine particulate sampler	**$PM_{2.5}$:** IS 5182: part-23: 2006 **PM_{10}:** IS 5182: part-23: 2006 **SO_2:** IS 5182: part-2: 2001 **NOx:** IS 5182: part-6: 2006
Waste water Analysis	1 sample	pH, TDS, SS, Oil & Grease, etc.	--	APHA-AWWA 22nd edition
Work zone fugitive monitoring	2 to 3 locations	RPM, Acid mist	Personal sampler	Gravimetric, Titrimetric
Noise Pollution	6 to 8 locations	Sound Level Meter	Sound Level Meter	Sound Level Meter
Health status of workers	All workers	As suggested by panel doctor	--	--

Budgetary provision for environment & safety management system has been made in the project planning with Rs. 0.4 crore as capital cost and Rs. 506 Lakhs/annum as recurring cost.

Chapter-7
Additional Studies

Following additional studies have been included in this chapter.

- Risk assessment
- Occupational Health Programme
- On-site/Off-site Emergency Plan

(A) RISK ASSESSMENT

7.1 Introduction

The risk assessment studies have been conducted for identification of hazards, to calculate the damage distances and to spell out risk mitigation measures. Risk Assessment provides basis for determining the safety measures required to eliminate, minimize and control the risks as detailed in Disaster Management Plan (DMP) to handle onsite and offsite emergencies.

M/s. Jemby Chem Limited is an existing unit for manufacturing of Dyes Intermediates namely, Sulpho Tobias Acid of 2 MT/month, J-Acid of 2.528 MT/month, J-Acid derivatives of 12.67 MT/month. Now, unit proposed to expand production capacity of existing products with addition of new products. After expansion, total capacity of the unit will be 200 MT/month. Proposed expansion shall be carried out within the existing premises. The risk assessment studies have been conducted for identification of hazards, to calculate damage distances and to spell out risk mitigation measures.

7.1.1 Scope of Study

The scope of work is to carry out risk analysis for the proposed expansion project covering all the risk to be handled and stored of hazardous chemicals at the plant after expansion.

7.1.2 Study Objective

The objective of the risk analysis includes the following:

- Identification of hazards
- Selection of credible scenarios
- Consequences Analysis of selected accidents scenarios
- Risk Mitigation Measures

7.1.3 The Study Approach

The risk assessment study broadly comprised of the following steps:

- System Description
- Identification of hazards
- Selection of Credible Accident Scenarios
- Consequence Analysis
- Risk Mitigation Measures

7.2 HAZARDOUS IDENTIFICATION

A three levels' risk assessment approach has been adopted for the M/s Jemby Chem Limited. The risk assessment levels are generally consistent with the practices encountered through various assignments for medium and large chemical complexes. The brief outline of the three tier approach is given below:

- **Level 1 – Risk Screening**

  This is top-down review of worst- case potential hazards/risks, aimed primarily at identifying plant sites or areas within plant, which pose the highest risk. Various screening factors considered include: Inventory of hazardous materials; Hazardous Materials properties; Storage conditions (e.g. temperature and pressure); Location sensitivity (distance to residential areas/populace).

- **Level 2 – Major Risk Survey [Semi – Quantitative]**

  The survey approach combines the site inspection with established risk assessment techniques applied both qualitative as well quantitative mode. The primary objective is to identify and select major risks at a specific location in the plant considering possible soft spots/weak links during operation/maintenance. Aspects covered in the risk usually include: Process Hazards; Security Vulnerability; Impact of hazards consequences (equipment damage, business interruption, injury, fatalities); Qualitative risk identification of scenarios involving hazardous materials; Risk reduction measures. Selection of critical scenarios and their potential of damage provide means of prioritizing. Mitigation measures and allocates the resources to the areas with highest risks.

- **Level 3 –Quantitative Risk Assessment [Deterministic]**

  This is the stage of assessment of risks associated with all credible hazards scenarios with potential to cause an undesirable outcome such as human injury, fatality or destruction of property. The four basic elements include:

  - Hazards identification utilizing formal approach (Level 2, HAZOP etc.);
  - Frequency Analysis. Based on past safety data (incidents/ accidents); Identifying likely pathway of failures and quantifying the toxic/ inflammable material release;
  - Hazards analysis to quantify the consequences of various hazards scenarios (fire, explosion, BLEVE, toxic vapour release etc.). Establish minimum value for damage (e.g. IDLH, over pressure, radiation flux) to assess the impact on environment.
  - Risk Quantification: Quantitative techniques are used considering effect/impact due to weather data, population data, and frequency of occurrences and likely hood of toxic release. Data are analyzed considering likely damage (in terms of injury/fatality, property damage) each scenarios is likely to cause.

7.3 HAZARDOUS IDENTIFICATION

Hazard is defined as a chemical or physical conditions those have the potential for causing damage to people, property or the environment. Hazard identification is the first step in the risk analysis and entails the process of collecting information on:

- The types and quantities of hazardous substances stored and handled,
- The location of storage tanks & other facilities,
- Potential hazards associated with the spillage and release of hazardous chemicals and fuel.

A preliminary hazard analysis is carried out initially to identify the major hazards associated with storages and the processes of the plant. This is followed by consequence analysis to quantify these hazards. Finally the vulnerable zones are plotted for which risk reducing measures are deduced and implemented.

7.3.1 Hazardous Material Storage

Unit is engaged in manufacture of various dye Intermediates, which is used as a raw material for dyes manufacturing. During operation phase, various hazardous chemicals will be handled. Important characteristics of these hazardous materials are described in below table. As per Manufacture, storage and Import of Hazardous Chemicals Rules, 1989 and amendment subsequently, there will be few hazardous chemicals, which have potential for creating risk to life and property in an unlikely event of leakage or spillage followed by fire. The hazardous chemicals are stored in the plant in tank with adequate dyke. Other chemicals store in barrels and carboys. Details of storage of hazardous materials are given below:

Table 7.1 Storage of Hazardous Chemicals

Sr. No.	Name of Chemicals	No. of container & size (MT)		MOC
1.	Oleum	1 tank	15.0	MS
2.	H_2SO_4	1 tank	15.0	MS
3.	HCl	1 tank	5.0	MS
4.	Aniline	200 kg x 15 Drums	3.0	HDPE
5.	Acetic anhydride	35 kgs carboys x 30	1.0	HDPE
6.	Benzoyl Chloride	200 kg x 15 Drums	3.0	HDPE

Control Measures for Sulphuric Acid & Oleum:

- Level gauge provided
- Required PPEs provided to all employees
- Double drain valve will be provided to sulfuric Acid storage tank,
- Full body protection will be provided to operator.
- Caution note and emergency first aid will be displayed and train for the same to all employees. Safety shower and eye wash will be provided in storage tank area and plant area.
- Total close process will be adopted for Sulfuric acid and Oleum handling.
- Dyke wall will be provided to storage tank.

Benzoyl Chloride/Acetic Anhydride

- Flame proof plant, pumping transfer, close process, etc.
- Double Static earthing

- Dyke wall
- Tanker unloading procedure
- Fencing if storage is higher than the threshold limit
- No Smoking and prohibited area,
- Flame arrestor provided on vent line of the tank

7.4 RISK SCREENING APPROACH

Risk screening of Jemby plant was undertaken through process study and study of data/information provided by the unit. Data of major/bulk storages of raw materials, intermediates and other chemicals were collected. MSDS of hazardous chemicals were studied vis a vis their inventories and mode of storage. Unit will be using number of hazardous chemicals and also producing organic chemicals. The chemicals stored in bulk and defined under MSHIC Rule will be considered for detailed analysis. Many of the RM/Finished products of Jemby Chemical are hazardous in nature. However, hazards potential (for damage) of products and other materials to plant personnel, environment and off-site area is different for different materials. Jemby will be using a number of raw materials but only 6 are stored in bulk and all these are listed under "List of hazardous and Toxic Chemicals" category under MSIHC Rules, 1989. The raw materials coming under hazardous category as specified by MSIHC Rules, 1989 (including subsequent amendments) is given in table below:

Table 7.2: Hazardous properties of the chemicals

Hazardous Properties of Chemicals to be Consumed												
Sr. No.	**Chemicals**	**Physical form**	**TLV ppm**	**LD_{50} Oral mg/Kgs**	**LD_{50} Dermal mg/ Kgs**	**LC_{50} mg/l**	**Flammable Gas @20 Deg. C (Y/N)**	**LEL %**	**UEL %**	**FP ^0C**	**BP ^0C**	**CAS Number**
1	Acetic anhydride	Liquid	20	1780	4000	1000 PPM	Moderately flammable	2.7	10.3	49	139.9	108-24-7
2	Aniline	Liquid	5	250 mg/kg [Rat.]	820	175 ppm	Moderately flammable	1.3	23	70	184.1	62-53-3
3	Benzoyl Chloride	Liquid	0.5	NA	NA	1870 ppm	flammable	1.2	4.9	72	197.2	98-88-4
4	Sulphuric Acid	Liquid	3	2140 mg/ kg [Rat.]	510	320 mg/m^3 2 hrs. [Mouse]	N	NA	NA	NA	270-340	7664-93-9
5	Oleum	Liquid	1 mg/ m3	2140 mg/ kg [Rat.]	--	510 mg/m^3 for 2 hrs RAT	N	NA	NA	10	650	Sulfuric Acid CAS # 7664-93-9

												Sulfur Trioxide 7446-11-9
6	HCl	Liquid		900 mg/kg [RabbiT]	1108	3124 ppm, 1 hours [Rat]	N	NA	NA	--	100	7647-01-0

7.5 HAZARDS DUE TO LEAKAGE OR CONTAINMENT

Since the unit proposed to expand its existing production capacity, quantity of various hazardous chemicals will be increased.

In the event of leakage or accidental release of Haz. Chemicals; it will create only localized effects within the short distances from fixed or spread pool in case of fire. There will be a possibility of release of some hazardous chemicals may form vapour cloud which can move towards wind direction and may explode in the event of fire if mass and concentration of air and vapour mixture is within the LEL and UEL limits. Storage and handling of hazardous chemical will not pose any hazardous situation if these are handled or stored correctly with adequate safety provisions and fire fighting facilities. Therefore, suitable safety measures including fire fighting facilities will be provided at the plant to attend any emergency due to accidental release of these hazardous chemicals. Among the hazardous inventories, there are few potential toxic materials that can form toxic vapour cloud in unlikely event of release.

7.6 MAXIMUM CREDIBLE ACCIDENT SCENARIOS

The plant will be dealing with some hazardous substances described in details. This is in the form of liquid and considered as odorous. Subsequently, their consequence due to thermal radiation will be confined within short distances. If released quantities are not ignited, therefore, vapour formation can result in vapour and air mixture and may generate explosive mass which can explode if it gets the source of ignition. Toxic cloud of hazardous chemicals may also be formed and moved towards wind direction.

7.6.1 Methodology for Selection of Accident Scenarios

In this study, following steps are followed for scenario selection for risk analysis study:

- The hazardous materials to be handled at the plant and the associated hazards have been identified and assessed.
- Operating and storage conditions of handling and storage of hazardous materials are studied.
- An assessment is made of what inventories can get released accidentally.
- Release rates are calculated considering different cases. For further analysis of selected release sources, representative failure modes and failure sizes are identified.

Maximum Credible Accident Scenarios

Following maximum credible scenarios have been selected for consequence analysis as a result of accidental releases:

Sr. No.	Type of Release	Failure Mode	Consequence
1.	Sulfuric Acid storage tank catastrophic failure	Catastrophic failure	Spill pool Evaporation up to LC 50, IDLH and TLV level.
2.	Oleum storage Tank catastrophic failure	Catastrophic failure	Spill pool Evaporation up to LC 50, IDLH and TLV level.
3.	Acetic anhydride	Un loading arm 100 % failure, Random failure	Unconfined Pool fire Ball Fire, Flash Fire, UVCE

7.6.2 Consequence Analysis

In consequence calculation, use is made of a number of calculation models to estimate the physical effects of an accident (spill of hazardous material) and to predict the damage (lethality, injury, material destruction, other property damage). The risk assessment modelling can be roughly divided into three groups:

- Determination of source strength parameters;
- Determination of consequential effects;
- Determination of damage or damage distances (with specific severity rates)

Consequence analysis has been carried for the selected accident scenarios to estimate the vulnerable zones. When the vulnerable zones are identified for failure cases, mitigation measures can be taken for risk

mitigation and to eliminate/avoid damage to the plant and injury to personal.

In the risk analysis study, probable damages due to worst case scenarios were quantified and consequences were analyzed with object of emergency planning. Various measures taken by the company and findings of the study were considered for deciding acceptability of risks.

Weather Data:

Average wind speed: 5 m/sec. Average Ambient Temperature: 35 deg. C. Average Humidity: 70% Atmospheric Stability: A

Assumption for Oleum/Sulphuric storage tanks as follows.

- Oleum/Sulphuric Acid Storage tank catastrophic failure i.e. SO_2 gas puff dispersion
- For Oleum/Sulphuric Acid outlet line valve failure release scenario, we have considered release rate 1000 grms/sec. 900 kgs Oleum/Sulphuric Acid release within 15 minutes.
- We have calculated following hazardous distance for the above mentioned scenarios.
- Fatality (LC-50)
- Immediate danger to life and health (IDLH) concentration area
- TWA/TLV concentration distance (Meters)

7.6.3 Consequence Analysis for Toxic Release Scenario

Scenario Considered	IDLH (ppm)	TLV (ppm)	Source Strength (kg/sec)	IDLH Distance(m)	TLV (m)
Sulphuric Acid/Oleum 23%	15 mg/m^3	1 mg/m^3	0.5	102	396

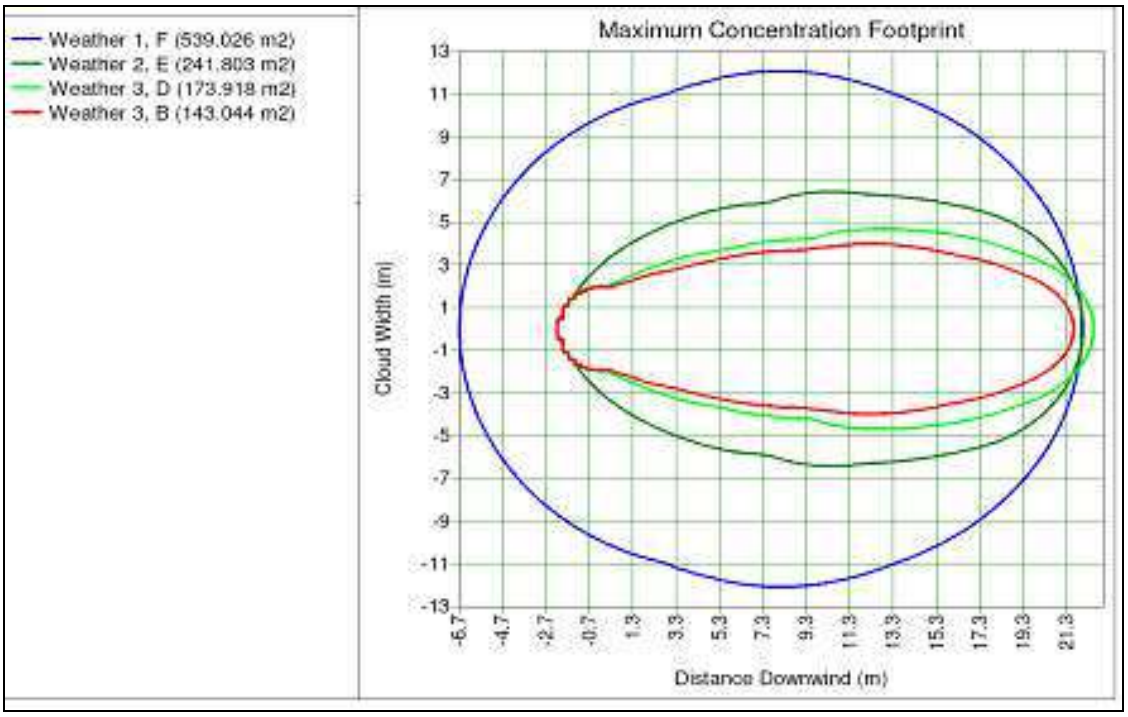
7.6.4 Catastrophic Rupture of 7 kl Acetic Anhydride Tank

In the event of catastrophic rupture of 7 kl Acetic Anhydride following outcomes may be occurred.

UFL & LFL Concentrations Distance (m)

Concentration	F, 1 m/s	E, 2 m/s	D, 3m/s	B, 3m/s
UFL	6.73656	3.6069	3.1816	2.88537
LFL	16.2314	15.4865	17.0166	16.1739
LFL Fraction (6000)	22.3832	22.4829	23.3762	22.4515

- Maximum concentration footprint for **Acetic Anhydride** is shown in **Figure 7.1.**



- Maximum Distance (m) of Overpressure Level

Concentration	F, 1 m/s	E, 2 m/s	D, 3m/s	B, 3m/s
Overpressure (0.1 bar)	No Hazard	No Hazard	No Hazard	No Hazard

- **PROBABLE HAZARDS & RISK**

From the preliminary risk assessment study carried out for **Jemby Chem Limited.** Some of the possible hazards have been identified.

The likely accident scenarios considered are given below:

Sr. No.	Scenario	Vulnerability Zone	Remarks
1.	Toxic Liquid Leakage/ Spillage in Confined Space	Confined Area	Spillage to be mopped up, decontaminated (if required) and disposed of as per norms. Fresh Air inlet/ventilation System to be fully opened. Ventilation Exhaust will carry harmful vapors. Personnel to avoid contact with exhaust vapors. Exhaust to be released at safe elevation.
2.	Flammable liquid tank in tank farm on fire	Area adjoining to tank periphery/ other tanks in tank farm	Deluge all adjoining tanks till fire stops and heat is dissipated. Transfer/ neutralize the spillage (if any).

The above-mentioned hazards scenarios can further aggravate into much more serious incidents if not intercepted in time. The fire in one

tank of tank farm can spread to adjoining tanks and may result in explosions. The vulnerability zone will be considerably enlarged. The vapours of toxic fluids/dust if carried away by wind above TLV concentrations may further enlarge the vulnerability zone. Similarly, toxic fluid spillage and all wastes leaving the live processing zone if not decontaminated properly can cause serious health hazard to plant personnel and persons in nearby area.

7.7 METHODOLOGY, APPROACH AND DAMAGE CRITERIA FOR RISK ASSESSMENT

Consequence analysis is that part of risk analysis, which considers individual failure cases and the damage, caused by each failure case. It is done to predict the outcome of potentially serious hazardous accidents to man and material in and around the plant boundary limits. The advantages of carrying out consequence analysis are given below:

- To improve plant layout
- To meet statutory requirements
- Protection of public in the nearby areas (no residential/inhabited nearby)
- Disaster management planning
- Training tool
- The findings of a consequence analysis provide information about hazardous effects resulting from an accident scenario
- In addition, methods for dealing with possible catastrophic events are also provided

7.7.1 Hazards Evaluation: Exposure due to Vapors

Leakage in process plant from failure of nozzles, joints (flange joint), welding failures or dripping from non-holding valves/glands at times goes unnoticed. If the leaky dust or fluids being toxic and odorless it is a potential source of risk, which may cause fatal/serious hazards.

Liquids with high saturation vapor pressures evaporate faster because the evaporation rate (mass/time) is essentially proportional to the saturation vapor pressure. In the case of vaporization into stagnant air, the vaporization rate is proportional to the difference between the saturation vapor pressure and the partial pressure in the stagnant air.

7.7.2 Liquid Pool Evaporation or Boiling

The pool boiling cases may be encountered during heavy leakage in enclosed area and with heat source nearby (ambient or fire) the vapor can explode or catch fire (in case the material is flammable and sparks/flame contact is made).

7.7.3 Plant Leakage in Confined Space

A fuel spill is a common type of process incident and can lead to potentially serious accident. If the spilled material gives rise to aerosol these may interact with plant environment resulting in explosion or harm to plant's personnel/ damage to plant equipment/machinery (if vapors are inflammable). The plant will be in open with natural ventilation.

7.7.4 Damage Criteria

In order to appreciate the extent of damage produced by various accident scenarios, it is appropriate to discuss the physiological/physical effects of thermal radiation intensities due to spillage causing subsequent fire. The thermal radiation usually results in burn on the human body and damage to plantation. Furthermore, inanimate objects like equipment, piping, cables, etc. may be affected and may aggravate the situation further.

Consequence analysis has been carried out for selected failure cases. It quantifies vulnerable zones for a likely incident and once the vulnerable zone is identified for an incident, measures are proposed to eliminate damage to plant and potential injury to personnel.

7.8 RISK REDUCTION MEASURES

For risk mitigation/reduction, attempts should be made either to reduce inventories that could get released in the event of loss of containment or failure likelihoods or both as feasible. Risk analysis identifies the major risk contributors, which enables prioritization of the plant that deserve special attention in terms of inspection and maintenance in particular and over all safety management as a whole.

For the risk reduction at the plant, the following salient suggestions and recommendations are made:

- On site and off site emergency response plan should be prepared and circulated to concern persons.

- Personnel at the plant and public in surrounding area should be made aware about the hazardous substance stored at the plant and risk associated with them.
- A written process safety information document should be compiled for general use.
- The document compilation should include an assessment of the hazards presented including (i) toxicity information (ii) permissible exposure limits. (iii) Physical data (iv) thermal and chemical stability data (v) reactivity data (vi) corrosivity data (vii) information on process and mechanical design.
- The process design information in the process safety information compilation must include P&IDs/PFDs; process chemistry; maximum intended inventory; acceptable upper and lower limits, pressures, flows and compositions and process design and energy balances.
- The adequate numbers of heat and smoke detectors should be provided at strategic locations in the plant and indication of detectors/sensors should be provided in main control room.
- Predictive and preventive maintenance schedule should be prepared for equipment, piping, etc. and thickness survey should be done periodically as per standard practices.
- A written procedure (Management of Change) must be developed to manage changes to process chemicals, technology, equipment and procedures that affect a covered process.
- Safe work practices should be developed to provide for the control of hazards during operation and maintenance such as: (i) lockout/tag out (ii) Confined space entry (iii) Opening process equipment or piping (iv) Control over entrance into a facility by maintenance, contractor, laboratory, or other support personnel.
- Personnel engaged in handling of hazardous chemicals should be trained to respond in an unlikely event of emergencies.
- The plant should check and ensure that all instruments provided in the plant are in good condition and documented.

- Safety measures in the form of "Do" and "Don't do" should be displayed at strategic locations especially in local language and English.
- Regular mock drills should be carried out once in every 3 months and shortcomings should be recorded and rectified. Records should be maintained for the response of Mock drills and corrective actions should listed and taken accordingly.

7.8.1 PERSONNEL PROTECTIVE EQUIPMENT (PPEs)

- The required PPEs for each area/operation should be identified and the necessary PPEs, like, helmets, goggles, hand gloves, mask, safety belts, ear muff and plug, etc. should be made available to the personnel.
- The workers should be trained in proper use of PPEs.
- The system should exist for replacement/issue of PPEs by testing and as per requirement.
- Lockers should be provided to the workers for safe custody and storage of PPEs.

7.8.2 HANDLING OF HAZARDS

- Personal protective equipment used by the person during handling of hazardous chemicals, should be replaced after certain time.
- Any spillage of hazardous chemicals should be cleaned and disposed off as per standard practice.
- Empty drums of hazardous chemicals should be neutralized immediately.
- Personnel engaged in handling of hazardous chemicals should be made aware of properties of hazardous chemicals.

7.8.3 GENERAL WORKING CONDITIONS

(a) House Keeping

- All the passages, floors and stairways should be maintained in good condition. The system should be available to deal with any spillage of dry or liquid chemical at the plant.
- Sufficient disposable bins should be clearly marked and these should be suitably located in the plant.
- Walkways should be clearly marked and free from obstructions.

- In the plant, precaution and instructions should be displayed at strategic locations.
- Roads/walkway within the plant should be maintained neat and clean.

(b) Ventilation

- Adequate ventilation should be provided in the work floor environment.
- The work environment should be assessed and monitored regularly.
- Local ventilation is most effective method for controlling dust and gaseous emissions at work floor.

7.8.4 SAFE OPERATING PROCEDURES

- Safe operating procedures should be available for mostly all operations and equipment.
- The workers should be informed of the consequences of failure to observe the safe operating procedures.

7.8.5 Work Permit System

- Work permit system should be followed at the plant. Hazardous work permit should be used for hot work, electrical works, etc.

7.8.6 Emergency Preparedness

- On-site emergency plan should be prepared and readily available for an unlikely event of emergency.
- Emergency telephone numbers should be available and display properly strategic locations.

7.8.7 Static Electricity

- All equipment and storage tanks/containers of flammable chemicals should be bounded and earthed.
- Electrical resistance for earthing circuits should be maintained. Periodic inspections should be done for earth pit and record should be maintained.

7.8.8 Access

- Adequate safe access should be provided to all places where workers need to work and all such access should be in good condition.

7.8.9 Material Handling

- Material handling areas should be clearly defined.

- The workers should be made aware about the hazards associated with manual material handling.

7.8.10 Communication System

- Adequate communication facilities should be available at the plant and supported with uninterrupted power supply.
- Communication facilities should be checked periodically for its proper functioning.

7.8.11 First aid Facilities

- First aid box should be provided at strategic locations within the plant.
- At least one stature should be available in first aid room.
- List of important telephone numbers should be displayed in first aid room.

7.8.12 Accident Reporting, Investigation and Analysis

A system should be initiated for accident and near miss reporting, investigation and analysis. To motivate and awareness among the personnel at the plant about safety, total accident (lost time injury) free days can be displayed on the board prominently at strategic location.

7.8.13 Safety Inspections

The system should be initiated for checklist based routine safety inspection and internal audit of the plant periodically. Safety inspection team should be formed from various disciplines and departments.

7.8.14 Safe Operating Procedures

Safe operating procedures should be formulated and updated, specific to process & equipment and distributed to concerned plant personnel.

7.9 TRANSPORTATION OF HAZARDOUS MATERIALS

Spills of hazardous materials, including oil, are the result of a combination of actions and circumstances, all of which contribute in varying degrees to the outcome. Most spills from tankers result from routine operations such as loading, discharging and bunkering, which normally occur in ports, road etc; however, the majority of these spills are small. Accidental causes such as groundings and collisions generally give rise to much larger spills.

Guidelines Principle

- Ensure that their operations, where applicable, are in compliance with:
- Recommendations on the Transport of Dangerous Goods;
- Implement guidance for the prevention and consequence minimization of catastrophic releases of hazardous materials, which may result in toxic, fire, explosion, or other hazards during transportation.
- Prepare a Hazardous Material Transportation Plan for transport hazardous materials;
- Information on the hazards and control measures at the time of emergency is vital for minimizing the effect of such accidents hence it shall be available with transporter. This module is intended to provide the first hand knowledge about the hazard information system.

Following information keeps ready with driver;

- Hazardous information systems
- U.N. Classification for hazard and substance identification
- HAZCHEM
- Responsibilities of consignor
- Responsibilities of the transporter or owner of goods carriage;
- Details with driver for report to police station about accident;
- Correct extinguishing techniques for different type of fires
- Knowledge about initial isolation and proactive action distance.

7.10 OTHER SAFETY PRECAUTIONS & RECOMMENDATIONS

7.10.1 Fire Control Plan

Unit has considered fire prevention measures at the project planning stage for its upcoming new facility to avoid any outbreak of fire. By looking to the hazardous nature of process and the chemicals that are handled and processed, the chances of outbreak of fire is very less which cannot be totally ignored. Hence to tackle such a situation, company will develop a well-resourced and adequate fire protection system/fire fighting network. The company has planned to keep the following types of fire extinguishers at various conspicuous locations.

Sr. No.	Type	Capacity
1	Carbon Dioxide	4.5 kg x 4 nos.

2	Dry chemical powder	5 kg x 10 nos.
		10 kg x 9 nos.
3	Mechanical foam type	50 kg x 2 nos.
4	DCP Pressure	1 kg x 2 nos.
		6 kg x 1 no.
5	D C P Type CO_2 Cylinder	50 kg x 1 no.

Other Fire fighting measures to be adopted, if required, shall be:

- Fire alarms, fire buckets will be provided as per the GFR.
- Working staff will be trained to operate fire extinguishers.
- Factory layout has been designed in such a way that there is a provision for separate entry and exit with adequate margin all around the periphery for unobstructed easy movement of the emergency vehicle/fire tenders without reversing back. D.G set shall be made available as a separate power backup for fire network, in case of emergency or power failure.

7.10.2 Do's & Don'ts

Unit has proposed some of the Do's & Don'ts activities to strengthen the Safety at Work, which will be followed strictly:

For Preventive Maintenance

Do's:

- Inspection of all Fire Fighting Facilities/Check Alarms operation.
- Ensuring that operators/workers etc. follows the SOPs, Safety procedures & standards, work permit system etc.
- Make sure fire extinguishers are fully charged and ready for action.
- Inspections of plant, machinery, tools, equipment, premises, work practices, processes, procedures and general environment must be carried out for the health and safety of plant, people and surrounding.
- On-site and Offsite Emergency Plans shall be reviewed and updated, as per there requirement.

Don'ts:

- Don't allow anyone who hasn't received specific safety and operational training to get indulge in any site activity.
- Don't perform your own maintenance.
- Don't compromise on Design and Engineering part.
- Don't perform any activity without proper permit.

- Don't panic if you are in a risky situation.
- Don't allow spilled chemicals to drain to sewers/gutters etc.

Strengthening of HSE (Applicable for Manufacturing Utility Staff)

Do's:

- Follow the instruction of sign boards/warnings.
- Wash affected part immediately with plenty of water.
- In case of vapour inhalation, immediately render first aid to the patient and then move the patient to First Aid Centre.
- In case of emergency everyone should try to reach at Assembly point.
- Use PPEs like ear plug/muff in high noise area.
- Work permit system to be followed before starting any work, vessel entry or working at height.
- Barricade and mark hazardous/unsafe area.
- Ensure use of safety belt while working at height.
- Electrical cables should be protected from water and from attack by corrosive substances.
- Maintain good housing keeping, it will eliminate many unnecessary hazards.
- All passage ways and stairways should be maintained, clean and unobstructed.
- Employees must know the locations of fire extinguisher and fire exists.
- During emergency be calm and do not get panicky.

Don'ts:

- Do not smoke cigarette/beedi in restricted areas.
- Unauthorized entry into battery limits of every plant is prohibited.
- Moving in the plant area without wearing safety helmet and safety shoes is not permitted.
- Wearing of loose garments ornaments etc. in the plant area.
- Do not follow shortcuts, use proper roads, pathways, wherever provided.
- Do not wear chappals or slippers in the plant.
- No automobile vehicle should be allowed to enter in the plant area without muffler or exhaust.

7.10.3 Antidotes Details:

Following Antidotes for major hazardous chemicals shall be kept available at site.

Table 7.2 Antidotes details

Chemical	Antidote/Medical Treatment
Acids	Poisoning due to Acids can be treated by following steps: • Use alkalis, 4% solution of Sodium Hydro carbonate, oil, stimulants, demulcent drinks; large draughts of lime water or milk with whiting, baking soda or milk of magnesia; • Strong soap suds to neutralize acid; olive oil; these to be followed by demulcent drinks.

7.11 WAYS TO MINIMIZE THE MANUAL HANDLING OF THE HAZARDOUS CHEMICALS

- Forklifts will be used for unloading chemical bags, bags movements within plant, etc.
- Cranes, hoists, pallet trucks, conveyors, etc. shall be used as per the requirement, to eliminate manual handling.
- Lifting tools & tackles will be used, wherever required.
- SOPs, work instructions will be prepared and followed.
- Trainings will be provided to relevant staff, operators, workers for the risk associated with manual handling of hazardous chemicals, ways to overcome those risk, etc.

7.12 OCCUPATIONAL HEALTH & SAFETY PROGRAMME

Unit will prepare the Occupational Health Surveillance Programme which will be followed right from the project construction & erection phase.

The details of the same are described in the following sections.

7.12.1 HOSPITAL FACILITIES/FACTORY MEDICAL OFFICER & OHC

Unit will made formal agreements with nearby VIA (Vatva Industrial Association) hospitals having facilities to attend fire and toxic effect cases, emergency cases, attending the affected persons in the emergency arising out of accidents, if any, etc. Apart from it, required medical facilities applicable as per Gujarat Factories Rules and Factories Act will also be made available. All types of first aid related accessories, Medicines & Antidotes are available at conspicuous locations.

7.12.2 PERSONNEL PROTECTIVE EQUIPMENT

- Special clothing and personal protective equipment necessary for entry.
- Protective equipment should be inspected frequently to ensure that it is in good condition. Frequency of checking can be decided depending upon the usage.
- After the use of protective equipment, it should be cleaned and disinfected before being issued to another person.
- Glove materials must resist the product's active ingredients and its solvents. It should allow adequate grip so that applicators can safely carry out their jobs (e.g. change nozzles and screens).
- For protection of eyes always use goggles, polycarbonate lenses are preferred to protect eyes from flying objects. Face shields are secondary means of eye protection and are designed to be worn over safety spectacles or goggles for full face protection.
- When purchasing eye protection, make sure it complies with ANSI Z87 for occupational and educational eye and face protection.
- Sleeve guards should be use when handling hazardous materials to avoid the splashing effect of material.
- Wash contaminated clothing and other PPE daily, as soon as possible after wearing. Delay in laundering will reduce the likelihood of total residual removal.
- Follow the work instruction/checklist.
- Know about MSDS of hazardous chemicals used.
- A person not-familiar with MSDS and trained in use of appropriate shall not commence any work with hazardous chemicals.
- Frequently refer to the MSDS and use of appropriate PPE.
- Display prominently requisite information on MSDS and use of PPE through illustrations.
- It is essential that right type of PPE and in sound condition be used.
- All stocks of PPEs should be periodically inspected, serviced and maintained and unusable ones removed from stock of usable PPEs and sent for disposal.

- All PPEs should be cleaned for personal hygiene and kept packed in poly bags.
- All PPEs should be inspected before and after each use.

7.12.3 PLAN FOR PERIODIC MEDICAL CHECK-UP

Periodic Medical Examination of workers will be conducted as per the following schedule; Workers employed will be examined by a Qualified Medical Practitioner/Factory Medical Officer, in the following manner:

a. Before employment, to ascertain physical fitness of the person;

b. During employment, every six months (blood & physical examination) as per Gujarat Factories Rules, to ascertain physical fitness of the person to do the particular job;

7.12.4 SAFETY TRAININGS

Safety trainings (on Safe Material Handling, First Aid & all Safety aspects) shall be provided to Safety Officers. In addition to regular employees, limited contractor labours shall be provided safety trainings. To create safety awareness, safety films will be shown to workers and leaflets are distributed.

7.12.5 MOCK DRILLS

The consequences due to a major accident hazards may be very serious in nature. Therefore necessitates of rehearsing the mock drills involving all key members will further enhance better understanding of individual's role and responsibilities in emergency response besides improving the overall coordinated efforts.

The main objectives of mock drills are:

- Familiarizing overall plans and roles of key personnel involved in the plan with their equipment,
- Familiarizing professionals like fire fighters, medical personnel with special tactics and hazards, and enabling them to test their part of the plan.
- Ensuring efficiency of emergency response mechanisms.
- Familiarization to operational personnel on operation control and mitigation measures.
- Reviewing the total plan, including communications and logistics, so that updating, modifying and training activities can be improved.

7.13 ON-SITE EMERGENCY PLAN

7.13.1 GENERAL

The emergency is an undesirable occurrence of events of such magnitude and nature that adversely affect business, cause loss of human lives and property as well as damage to the environment. Industrial units are vulnerable to various kinds of natural and man-made emergencies. Examples of Natural disasters are flood, cyclone, earthquake, lightening etc. and manmade disasters are major fire, explosion, sudden heavy leakage of toxic/flammable gases, building collapse, human errors, vehicle crash, sabotage, etc. It is impossible to forecast the time and nature of emergency, which might strike the unit. In spite of the fact that every industry is expected to take steps to assess, minimize and, wherever feasible, eliminate risks, accidents may still occur. Risks can only be minimized; it can never be totally eliminated. However, an effective emergency plan helps to minimize the losses in terms of human lives, plant assets and environmental damage and to resume the working condition as soon as possible. In all these steps speed is the essence.

Controlling the emergency will require prompt action by the operating staff, the staff of various agencies, emergency teams and the outsiders when called for. Minimizing the effect on people may be achieved by prompt communication, rescue, evacuation etc., if the situation so warrant.

7.13.2 STATUTORY REQUIREMENT

The provisions for preparing the on-site emergency plan are explained below:

The Factories Act, 1948:

Rules 68J(12), Schedule 8 A of the Gujarat Factories Rules 1963 (Amended 1995) providing that the every occupier, who has control of an industrial activity pertaining to hazardous chemicals shall furnish the On-Site Emergency Plan detailing how major accidents shall be dealt with along with explaining specific responsibilities and actions by various persons.

The Environment (Protection) Act-1986:

Rule 13(1) under the Manufacture, Storage and Import of Hazardous Chemicals Rule 1989 (amended 1994), rules framed under The Environment (protection) Act-1986, indicates that the occupier shall prepare and keep up-to-date an on-site emergency plan containing details specified in schedule II and detailing responsibilities and actions by different person and agencies.

Chemical Accidents (Emergency Planning, Preparedness and Response) Rule 1996.

Under these rules, framed under The Environment (Protection) Act-1986, the state government has constituted a Local Crisis Group & District Crisis Group to deal with major chemical accidents and to provide expert guidance for handling chemical accidents. Further provision is made that the Major Accident Hazard units have to prepare the on-site emergency plan and submit the plan to the crisis groups. The local emergency plan will dovetail with the District off-site emergency plan.

7.13.3 PREPAREDNESS OF ON–SITE EMERGENCY PLAN

The On-site Emergency Plan describes planning, preparation and training for on-site action in the event of emergency.

For On-Site Emergency Plan Advance planning and proper training of each employee's into the emergency function is very essential to make emergency control measure more effective. It is not possible to eliminate emergency but is definitely possible to control them. The scope of onsite emergency plan is to prepare for activate the emergency time activities, to controlled and contained within the shortest time if emergency arise after failure of our pre-emergency control measures. Following stage activities are consider for the purpose, as they are co-related and provide better points for emergency preparedness.

7.13.4 EMERGENCY TIME ACTIVITIES

It is not possible to include and discuss every action, which should be taken first during emergency. It is also not possible to describe entire actions on emergency situation. The basic principle of handling emergency, that may be relied upon, who have the knowledge and experience to assess the situation and give direction as per the objectives

as quickly as possible. However, the aim is to control the situation by safest way in a limited time within existing available resources. Further, it should be handle with such a care that minimum loss of life, property and environment. In short, the objective of the plan should be successfully complied with.

7.13.5 SEQUENTIAL ACTIONS DURING EMERGENCY

7.13.5.1 Incident

There are possibilities of occurrences of various types of the accidents or mishaps in the factory premises or around the factory. Most of the occurrences will be of minor nature, while few occurrences may be of major type. If the factory is fortunate enough, there may not be a single incident or mishap during its lifespan. However, when any incident occurs, it cannot be distinguished immediately whether it is minor or major, the subsequent development, or gravity of situation, or seriousness of such occurrence is required safe handling irrespective of its nature, if it cannot be controlled. It should be general practice that whenever any person notices the accident/fire/explosion/mishap at the site, he should immediately shout "FIRE", "FIRE" or "HELP", "HELP" and such message should reach to the Supervisor/Shift Officer/Senior Person of the unit.

7.13.5.2 Responding Actions

The root cause of occurrence should be removed immediately if possible. Similarly, if any incident takes place in the premises, using available resources, within the factory as well as nearby, to their optimum, it should be so responded that the incident is contained immediately before spreading. If the incident looks severe and could not be controlled by simple efforts, the Shift Officer or Senior Personnel should rush to the place and make every effort to control the incident using various resources at the site. Further, if the incident is uncontrollable even using own resources, he should immediately call for additional helps form outside resources such as Mutual Aiders, Fire Brigade, etc. He should act the Incident Controller and immediately start the following actions:

- Sound the siren or ring the emergency bell.
- Take continuous responding actions with the use of other helps.

- Call the higher authorities and Site Main Controller.

7.13.5.3 Site Crisis

On arrival, the Site Main Controller (Factory Manager) will take the charge of Incident site. He will immediately assess the situation and manage the Situation as site crisis. The incident can be said as on-site-emergency.

- Activate the emergency teams like fire team, first aid team, communication.
- Team, rescue team, essential workers, key personnel, etc.
- The Emergency control room will communicate the messages regarding
- Prevailing situation to requisite authorities, outside resources, agencies, neighbors, etc.
- Non-essential person will rush to safe shelter and roll call will be taken.
- He will order to shut down the plant, if situation so warrants.
- Now, if the situation is uncontrollable by the management of the unit, he will immediately call for the local crisis group to handle the situation.

7.13.5.4 Messages

While conveying the messages regarding the incident, the following details should be incorporated.

- Brief description of incident
- Type of help required & direction
- Chemical involved & Quantity
- Action immediately taken
- Development of the incident

7.13.5.5 Discipline

The plan assuming certain discipline at site during emergency, as follows;

- Do not get panicky.
- Do not approach the site of incident as a observer.
- Do not engage telephone unnecessary.
- Do not move about unnecessary.
- Do not approach unnecessarily for information or more inquiry.

- Arrange medical first aid care to the injured.
- Do not allow unnecessary crowd nearby incident.

7.13.5.6 Emergency Actions

- On receiving information, the Emergency Control Centre will activate and urgently establish the contact with the required persons, agencies and authorities.
- The essential workers, responsible to carry out certain specific functions, will have to start work immediately.
- The non-essential workers should go to the assembly center.
- The cordoning the incident area will be ensured.
- The water should be sprayed on the flammable storage tank, even if not caught under fire.
- The experts for the responding to emergency situation will be consulted, if required. vii. Authentic information for incident will be provided to Press/Public by the authorized officer only.
- Removal the flammable, dangerous material, cylinders, etc. should be arranged along with isolation from fire.
- The trapped personnel, if any, in incident will be rescued.
- All assistance will be provided to the Fire Brigade to control spreading of fire.
- Any remotest possibility of re-ignition or explosion should be looked into and controlled.

7.13.6 SHUT DOWN PROCEDURE

It is advisable to shut down the plant for safety, if situation so warrants. The safe shut down procedure should be adopted during such eventualities. First of all, main electrical supply should be cut-off/switch-off. Similarly, the pipelines supplying flammable gas, liquid or chemicals should be immediately shut-off by valves and should be isolated from the process line. The water shower on flammable storage tank, if installed, to be started to keep it in cool condition, if tank is in vicinity of fire. The shutdown procedure should be laid down in the process manual, which will be useful during such emergency.

7.13.7 POST EMERGENCY ACTIVITIES

Post emergency activities comprise of step taken after the emergency is over. To Find out the reason of emergency after the investigation and suggest the preventive measure. For the investigation different level personnel from different dept, are selected and an investigation team is formed. The following steps are taken after the emergency is over.

- Collection of record
- Conducting the investigation/inquiry committee with the suggestion for preventive measure
- Making the insurance claim and necessary procedure
- Implementation of the recommendation of inquiry reports
- Rehabilitation of the affected persons within the plant and outside the plant. They are in continuous touch with the hospitalized person and give status report of them to the top management.
- Restart the plant if shut down happened

7.13.8 TRAINING, REHEARSAL AND RECORDS

7.13.8.1 Need of Training & Rehearsal

Extensive experience in the chemical industry with on-site emergency planning has proved the need and value of rehearsal of emergency procedures. When finalized, the major emergency procedure should be set down in clear, concise terms and everyone on-site made aware of them, particularly the key personnel and essential workers. They should then be put to the test. This may best be done by arranging a series of preliminary exercises to test certain system, including the alternative arrangements in cases of failure. The speed of Mobilization of the factory emergency teams, search & rescue and treatment of casualties, emergency isolation and shut down procedures. These exercises will help to define the procedures by identifying deficiencies and difficulties. At this stage, more exercises that are elaborate can be planned to involve the outside services who should be closely involved at the planning stage. Each exercise should at various positions, e.g. At the scene, the emergency control center, work entrance; assemble points or casualty reception area. A following round-the-table discussion between managers, senior officers of the emergency services, factory inspectorate

and observers will further assist to develop practical and effective procedures. It is recommended that a major emergency exercises should be conducted at regular intervals with arrangement with the outside agencies. There is much practical advantage to be gained in situations where people required working together in handling emergencies are already known to each other. Close local liaison and combined exercises are invaluable in this respect. At the same time, familiarization visits to works especially of the fire service personnel, will help enormously to acquaint with the works layout and the nature of potential hazards. Emergency plans need to be tested when first devised and thereafter to be rehearsed at suitable intervals. Their normal training and experience in day-to-day operation will generally qualify individual personnel with duties under the plans. Some duties, however, such as fire fighting for the works fire team are not routine and special training will be needed. In addition, key personnel will need training in their emergency roles both individually and as a team. For the professional emergency services the general training may be taken for granted.

Rehearsals or exercises are important for all personnel likely to be involved in an incident on or off-site because, for example:

- They familiarize on-site personnel with their roles, equipment and the details of the plans.
- They allow the professional emergency services to test their parts of the plan and the co-ordination of all the different organizations. They also familiarize them with the special hazards.
- They prove the current accuracy of the details of the plan [phone no., etc.] and the availability of special equipment.
- They give experience and build confidence in the team members. In the initial shock and confusion of a real incident, ability to fall back on established initial actions is invaluable.

Employers should ensure that the on-site emergency procedures for such process plants, storage facility, etc. are tested regularly and that all employees receive initial and refresher training. Exercises should be arranged to test each part of the emergency plan on each plant, state by state, starting with first immediate action. Emergency isolation and shut

down should be rehearsed from the emergency services, the emergency planning officer [EPO] should be invited to attend on-site exercise, and familiarization visits should be encouraged. The complete plan for each site including both on-site and off-site components should be tested. Many organizations now use tabletop exercises to test emergency plans. These are very cost effective because they do not interrupt the day-to-day running of the plant and because many events can be catered for in one session. However, they are theoretical in nature and should be communications and key personnel working from the locations they would use in an emergency. It is, of course, essential that the exercises be carefully prepared, the results analyzed and the lessons learned, circulated and discussed. Full-scale practices involving all concerned that all reasonably practicable measures have been taken. After each rehearsal of practice, the plan should be reviewed to take account of any shortcomings highlighted by the exercise. In addition, its effectiveness should be reviewed every time it is used to with a real emergency. Fix your periodicity to carry out table tope exercises and real rehearsal of this on-site and off-site emergency plan, including mutual aid agencies and mention here in this chapter.

7.14 OFF-SITE EMERGENCY PLAN

A major accident, major emergency and disaster are defined. They may affect areas outside the works. Explosions can scatter debris over wide areas, the effects of blast can cover considerable distances wild can spread burning brands of toxic gases. In some cases, e.g., as the result of an explosion, outside damage will be immediate and part of the available resources of the Emergency Services may need to be developed in the affected area. In any event, the possibility of further damage any remain, e.g., as the result of further explosion or by the effect of wind spreading burning brands of hazardous materials.

Perhaps the most significant risk to outside areas is that associated with a large release of toxic vapors. Management will usually need expert advice in drawing up plans so that if such a release occurs, they will be able to collaborate with Emergency services to estimate as far as practicable which downwind areas are at the risk. It may be necessary to

prepare in advance simple charts or tables relating the likely spread of the vapor cloud taking into account its expected buoyancy, the local topography and all possible conditions during the time of release. It may also be desirable to install instruments indicating wind speed and direction. Advice on all these matters can be obtained from the Meteorological office. The fact of the major emergency and the spread or potential spread of its effects outside the work may require that road and rail traffic past the works has to be halted or diverted. The police, taking account of the advice of the Site Main Controller. They will also, where necessary, inform the Rail. The problem is usually exacerbated by members of the public driving to the scene to view the situation. The net effect can be cause problems to those who have a real need to get to the works, including the key personnel who will have been called out. Liaison at local level will help to devise a means whereby key personnel can readily identify themselves to the police controllers. The use of a windscreen sticker of other identify label may be advantageous.

All emergency plans should consider the possible effects of incidents on the neighboring population and the remedial measures should be devised in consultation with the local authority and emergency services. The off-site emergency plan should be based on those events identified by the manufacturer, which could affect people and the environment outside his premises. The manufacturer should provide the necessary information on the nature, extent and likely effects of such incidents. The plan should cater in detail for those events identified as being the most likely but should be sufficiently flexible to allow the remedial measures to be able to be extended and increased to deal with extremely adverse combinations of circumstances and consequences. The factory inspectorate and the local authority should be satisfied that the information provided is sufficiently detailed unambiguous and clearly stated to be comprehensible and for the dangers to be provided. Several different planned responses may be necessary at a single site depending on the size and characteristics of the incidents.

Thus in brief the two main purposes of the off-site emergency plant are:

- To provide the local/district authorities, police, fire brigade, doctors, surrounding industries and the public the basic information of risk and environmental impact assessment and to appraise them of the consequences and the protection/ prevention measures and control plans and to seek their help to communicate with the public in case of a major emergency. This information from every industry enable the District Authorities to educate the public that what can go wrong the measures taken to train them of their individual role in case of emergency, and
- To assist the District Authorities for preparing the off-site emergency (Contingent) plan for the district or particular area and organize rehearsals from time to time and initiate corrective action bases on the lessons learnt.
- In charge of the on-site Emergency plan of the Site Main Controller will keep liaison, for this purpose, with the District Authorities.

7.14.1 ROLE OF THE FACTORY MANAGEMENT:

The on-site and off-site plans should dovetail so that the emergency services are summoned at the appropriate time and are provided with accurate information and a correct assessment of the situation. The responsibility for this should be with the Site Main Controller. The site main controller will provide a copy of this on-site and off-site emergency plans to the District Authorities, the factory inspectorate and the emergency services so that from information from the various annexure, such authorities will make their emergency preparedness to formulate and execute the District/Area off-site Emergency Plan. On their advice, necessary modifications may also be made to make the plan more perfected.

7.14.2 ROLE OF THE EMERGENCY CO-ORDINATION OFFICE (ECO)

The various emergency services will be co-coordinated by an emergency co-coordinating officer (ECO) who is likely to be a senior police office, but depending on the circumstances, could be a senior fire officer. The ECO will liaise closely with the Site main controller. Again, depending on local arrangements, for every severe incident with major or prolonged off-site

consequences, the external control may pass to a senior local authority administrator or even an administrator appointed by the central or state government. The emergency control Center of the factory or/and any other control centers may be utilized by the ECO to keep liaison with the site main controller.

7.14.3 ROLE OF THE LOCAL AUTHORITY

Generally, the duty to prepare the off-site plan lies with the local authorities. They may have appointed an emergency planning officer (EPO) to carry out this duty as part of the EPO's role in preparing for a whole range of different emergencies within the local authority area. The EPO will need to liaise with the works to obtain the information to provide the basis for the plan. This liaison will need to be maintained to ensure that the plan is continually kept up to date. It will be the responsibility of the EPO to ensure that all those organizations, which will be involved off-site in handling the emergency, know of their role and are able to accept it by having for example, sufficient staff and appropriate equipment to cover their particular responsibilities. Rehearsals for off-site plans are important for the same reasons, as on-site plans will need to be organized by the EPO. It will be the duty of the local authority to inform public, road/rail traffic, news media, etc., while operating off0site plan. It will also announce public protection measures; termination public awareness system will be developed. The ILO suggestion of separation distances is useful for planning (Proposed development) by the local authorities.

7.14.4 ROLE OF THE FIRE AUTHORITIES

The control of a fire is normally the responsibility of the senior fire brigade officer who would take over the handling of the fire from the incident controller on arrival at the site. The senior fire Brigade Officer may also have a similar responsibility for other events, such as explosions and toxic releases. Fire authorities having major hazards works in their area should have familiarized themselves with the location on site of all stores of flammable materials, water and foam supply points and fire-fighting equipment. They may well have been involved in on-site

emergency rehearsals both as participants and, on occasion, as observers of exercises involving only site personnel.

7.14.5 ROLE OF THE POLICE AND EVACUATION AUTHORITIES

The police normally assume the overall control of an emergency, with a senior officer designated as emergency co-coordinating officer. Formal duties of the police during an emergency include protecting life and property and controlling traffic movements. The functions include controlling by standers, evacuating the public, identifying the dead and dealing with casualties, and informing relatives of dead or injured. There may be separate authorities, agencies to carry out evacuation and transportation work.

For evacuation, the following criteria are useful:

An early decision will be required in many cases on the advice to be given to people living within range of the accident in particular whether they should be evacuated or told to go indoors. In the later case, the decision can regularly be reviewed in the event of an escalation of the incident. Consideration of evacuation may include the following factors:

In case of major fire but without explosion risk (e.g. on oil storage tank), only houses close to the fire are likely to need evacuation. Although a severe smoke hazard may require this to be reviewed periodically.

If a fire is escalating and in turn threatening a store of hazardous material, if might be necessary to evacuate people nearby, but only if there is time; if insufficient time exists, people should be advised to stay indoors and shield themselves from the fire. This latter case particularly applies if the installation at risk could produce a fireball with very severe thermal radiation. (e.g. LPG Storage). For releases or potential releases of toxic materials, limited evacuation may be appropriate downwind if there is time. The decision would depend party on the type of housing at risk Conventional housing of solid construction with windows closed offers substantial protection from the effects of a toxic cloud, while shanty houses which can exist close to factories, particularly in developing countries, offer little or no protection. The major difference between releases of toxic gas is that toxic clouds are generally hazardous down greater distances. Also a toxic cloud drifting at, say, 300 meters per

minute covers a large area or land very quickly. Any consideration of evacuation must take this into account. The shelters for evacuated persons and their welfare shall also be arranged.

7.14.6 ROLE OF THE HEALTH AUTHORITIES

Health authorities, including doctors, surgeons, hospitals, ambulances and so on, have a vital part to play following a major accident, and they should form an integral part of any emergency plan. For major fires, injuries will be the result of the effects of thermal radiation to a varying degree, and the knowledge and experience to handle this in extreme cases may be generally available in most hospitals. For major toxic releases, the effects vary according to the chemical in question, and it is important for health authorities who might be involved in dealing with the aftermath of a toxic release to be familiar with the treatment appropriate to such require medical equipment and facilities additional to those available locally, and a medical mutual aid scheme should exist to enable the assistance of neighboring authorities to be obtained in the event of an emergency.

7.14.7 ROLE OF THE MUTUAL AID AGENCIES

Various type of mutual aid available from the surrounding factories and other agencies should also be utilized, as per need, as a part of the on-site and off-site emergency plan.

7.14.8 ROLE OF THE FACTORY INSPECTORATE

The factory inspectors are likely to want to satisfy themselves that the organization responsible for producing the off-site plan has made adequate arrangements for handling emergencies for all types, including major emergencies. They may wish to see well-documented procedures and evidence of exercises undertaken to test the plan. In the event of an accident, the factory inspector will assist the District Emergency Authority for information and help in getting mutual aid from surrounding factories.

In the aftermath, factory inspectors may wish to ensure that the affected areas are rehabilitated safely. In addition, they may require items of plant and equipment essential for any subsequent investigation to be impounded for expert analysis, and may also want to interview witness as soon as practicable.

In the state of Gujarat, District Emergency Control (Contingent) plans have been formulated, and some rehearsed, for some districts and the copies are available from the local factory inspectorate. All hazardous factories needing on-site and off-site emergency plans are advised to keep constant liaison with them.

The communication system between the factory and various above role-playing authorities must be effective. Ineffective public telephone system will not be useful in emergencies. Therefore, it should be improved and other effective system like duplex (two way) radio telephone, wireless set, emergency vehicles, etc. should be maintained between important organizations.

Chapter-8
Project Benefits

8.1 INTRODUCTION

Project benefit focus on those points which will become beneficial to the surrounding area or community in terms of infrastructural development, social development, employment and other tangible benefits due to the project. Proposed expansion project has a potential for employment of skilled, semi-skilled and unskilled employees during construction phase as well as operational phase.

8.2 IMPROVEMENT IN PHYSICAL INFRASTRUCTURE

Unit has proposed to expand production capacity within the same plant premise, so direct benefit of infrastructures development is anticipated. The project proposes to employ maximum of the local people which will help to increase the income of local people & improve their standard of living. Construction & commissioning phase will require a substantial man-power and resources. The unit has proposed to employ local contractual services for this. Hence, with the growth in the economic conditions, the project may lead to growth in the social stature & improvement of the quality of life in the surrounding area. It will also help in improvement in local amenities. Thus, the project will have considerable indirect benefits to the public physical infrastructures.

8.3 IMPROVEMENT IN SOCIAL INFRASTRUCTURE

The company will conduct social welfare activities which include the funding & contribution for public infrastructure/facilities development, maintenance & improvement on basis of as & when required.

Due to proposed expansion project activity, social infrastructure will improve by means of civilization, vocational training and basic amenities.

Civilization: Due to the project, employment & other infrastructural facilities will boost up income of surrounding people and improve quality of life. This will indirectly boost up the civilization of the surrounding people.

Vocational Training: Moreover, unit will provide vocational training opportunity to the surrounding people and greed for employment will motivate the education activities that will lead the change in life style of the surrounding and affected people hence social infrastructure will be improved.

Basic Amenities: Better education facilities, proper healthcare, road infrastructure and drinking water facilities are basic social amenities for better living standard of any human being which will further increase the above amenities directly/indirectly either by providing or by improving the facilities in the area, which will help in uplifting the living standards of local communities.

8.4 EMPLOYMENT POTENTIAL

In the construction phase, direct and indirect manpower will be involved. Thus temporary and permanent employment will be generated during construction phase. The proposed manpower requirement during construction will be 15-20 nos. During the operation phase, total 55 nos. of skilled and unskilled manpower will be required. Moreover, unit will provide first priority to local workers for the employment.

Thus, proposed expansion project will result in considerable benefits in terms of employment.

8.5 OTHER TANGIBLE BENEFITS

As mentioned above, the project will have many employment & trade opportunities with the inception of the construction activities. Thus, these will eventually result in appreciable economic benefits to the local people & businesses/contractors. Indirectly, the expansion project will help the Government by paying different taxes from time to time, which is a part of revenue and thus, will help in developing the area.

The raw materials & finished goods will be moved by truck/tankers which provide indirect employment to people engaged in this sector.

The CSR activities planned by the company will be considerably beneficial to the surrounding area. These all together with the economic benefits of the proposed project will result in further benefits in terms of the literacy level, primary and middle level education and on health facilities.

Chapter-9
Environmental Cost Benefit Analysis

Environmental cost benefit analysis has not been recommended at the scoping stage and has therefore not been carried out.

Chapter-10
Environment Management Plan

10.1 INTRODUCTION

Environment Management Plan (EMP) includes the protection, mitigation and environmental enhancement measures to be implemented to nullify the adverse impact on the environment. This plan will also facilitate monitoring of environmental parameters.

Assessment of environmental and social impacts arising due to implementation of the project activities is the technical heart of EIA process. An equally essential element of this process is to develop measures to eliminate, offset or reduce impacts to acceptable levels during implementation and operation of projects. The integration of such measures into project implementation and operation is supported by clearly defining the environmental requirements within an Environment Management Plan (EMP). The EMP has been formulated considering all necessary mitigation measures to prevent/minimize/eliminate environmental impacts as well assignment of implementation stage& responsibilities. Being an existing unit, it has already formed an Environment Management Cell in order to keep a close watch on the performance of the pollution control equipment, emissions from the sources and the quality of surrounding environment in accordance with the monitoring program. EMP will be modified/upgraded as per requirement after the proposed expansion.

10.2 OBJECTIVE OF ENVIRONMENT MANAGEMENT PLAN

The objective of the Environment Management Plan is summarized hereunder,

- To comply with the stipulated enviro-legal requirements & standards.
- To limit/reduce the degree, extent, magnitude or duration of adverse impacts.
- To treat all the pollutants i.e. liquid effluent, air emissions and hazardous waste with adoption of adequate and efficient technology.
- To create good working conditions.

- To reduce any risk hazards and design the disaster management plan.
- Continuous development and search for innovative technologies for a cleaner and better environment.
- To make budgetary provision and allocation of funds for environment management system and for timely revision of budgetary provisions.

10.3 COMPONENTS OF EMP

EMP for the proposed expansion project covers following aspects:

- Description of mitigation measures for operation phase only
- Description of monitoring program
- Institutional arrangements
- Implementation schedule and reporting procedures

10.3.1 ENVIRONMENTAL MANAGEMENT SYSTEMS (EMS)

For the effective implementation of the mitigation measures and consistent functioning of the proposed expansion project, an Environmental Management System (EMS) has been proposed. The EMS will include the following:

- Environmental Management Cell
- Environmental Monitoring Program
- Personnel Training
- Regular Environmental Audits and Corrective Action Plan
- Documentation – SOPs of Environmental Management
- Plans and other records

10.3.2 ENVIRONMENTAL MANAGEMENT CELL

Unit has already set up separate Environment Management Cell. The major duties &responsibilities of EMC are as follows:

- To implement the Environmental Management Plan
- To ensure regular operation and maintenance of pollution control devices
- To assure regulatory compliance with all relevant rules and regulations
- To minimize environmental impacts of operations by strict adherence to the EMP
- To initiate environmental monitoring as per approved schedule

- Review &interpretation of monitored results and corrective measures in case monitored results are above the specified limit
- Maintain documentation of good environmental practices and applicable environmental laws as ready reference
- Maintain environmental related records
- Coordination with regulatory agencies, external consultants and monitoring laboratories
- Maintaining log of public complaints and the action taken

10.3.3 Hierarchical Structure of Environmental Management Cell

The hierarchical structure is given below in **Figure 10.1.**

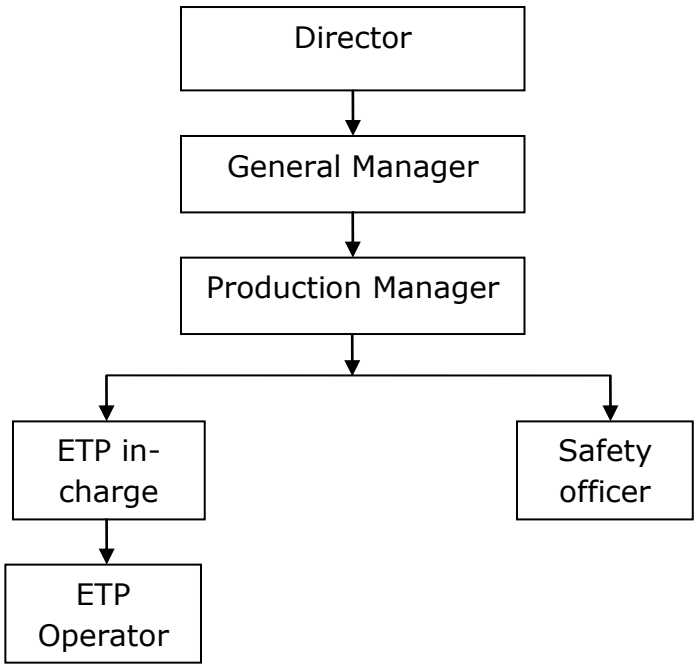


Figure 10.1: Environment Management Cell

10.3.4 Record Keeping and Reporting

Record keeping and reporting of performance is an important management tool for ensuring sustainable operation of the unit. Records are maintained for regulatory, monitoring and operational issues.

10.4 ENVIRONMENTAL MANAGEMENT DURING CONSTRUCTION PHASE

Construction phase results in temporary environmental pollution except for the permanent change in local land use pattern & aesthetics in certain cases. Such pollution is mainly due to site preparation, civil works, transportation, storage & handling of construction materials, construction worker's sanitation etc. These are usually short-term impacts.

During construction work, air pollution is expected in the form of increased suspended particulate matter concentration. Installation work will generate noise and dust but it will within working areas. To mitigate the adverse environment impact due to the construction phase, following measures will be taken:

- Regular sprinkling of the water is recommended along with the construction activities.
- Regular preventing maintenance of machinery and transportation of vehicles during construction to reduce noise pollution.
- Provision of silencer, to modulate the noise generated by the machine, if required.
- Reduce the exposure time of workers to the higher noise level by job rotation.
- To protect workers working in noisy area, personal protective equipments like earmuffs/earplugs will be provided.
- Additional tree plantation will be done in periphery of plant premises and along the roads.

Water Environment

During construction phase, existing infrastructural facilities including water supply, sewage and electrification will be utilized. Existing sanitation facilities will be utilized by construction workers to ensure minimum impact on the environment.

Safety and Health during Construction Phase

Adequate space will be provided construction workers. Unit will also supply potable water 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.

Socio-economic Environment

Management will give preference to local people through both direct and indirect employment.

10.5 ENVIRONMENTAL MANAGEMENT DURING THE OPERATIONAL PHASE

EMP proposed is detailed under the following heads:

- Air Pollution Control
- Wastewater Management
- Solid/Hazardous Waste Management
- Noise Management
- Greenbelt Development
- Occupational Safety and Health
- Implementation of EMP and monitoring programme

10.5.1 Air Pollution Management

10.5.1.1 Source of air pollution and control measures

Flue gas emission is due to the combustion of fuel. At present, bio fuel is used as fuel in stack of boiler & TFH. Multi Cyclone is installed as APCM. After expansion, existing boiler and TFH will be dismantled and unit will install new boiler of 1 TPH capacity and TFH of 10.0 lakhs kcal/hr. capacity, where the same fuel i.e. bio fuel (Briquette) will be used. To control Air pollution (PM), Multi Cyclone will be installed as APCM. Unit will explore the possibility of use of Natural gas as a fuel. Unit has also installed one stand by D.G. set (125 kVA) for emergency purpose, where diesel is used as a fuel. Emitted flue gas pollutants will be SPM, SO_2 and NOx.

At present, process gas emission is from the stack attached to reaction vessel. After expansion, one more reaction vessel having stack height of 15 m will be added. Ventury + Packed column alkali scrubber will be provided to recover Sodium bisulphite and meeting the emission norms laid down by GPCB.

In order to minimize the air pollution the unit will develop greenbelt on and around its premises considering the following guidelines,

i) Green cover should be created at all the available open spaces.

ii) Strict surveillance is made to increase the survival rate of the trees.

iii) Plants with higher height, medium and low height should be planted to ensure thick belt for attenuation of fugitive emission. This activity demands expert advice and guidance.

Measures to control fugitive emission

The fugitive pollutants such as RPM & Acid Mists are likely to emit from process area. Unit will adopt following measures -

- Regular maintenance of valves, pumps and other equipment is done to prevent leakage.
- Entire process is carried out in the closed reactors with proper maintenance of pressure and temperature.
- Pumps & motors are mechanical seal type.
- Good house-keeping, proper maintenance &continuous observation will prevent the chances of any fugitive emission from the process plant.
- Pakka road make to reduce the fugitive emission. Water sprinkler will be provided to reduce the dusting from road transportation.
- Provision of exhaust ventilation Provision of PPE.
- Regular periodic monitoring of work area to check the fugitive emission.

10.5.2 Water Environment

At present, total water requirement (Industrial + Domestic + Greenbelt) is 34.0 KLD. After expansion; it will be increased up to 105.0 KLD. Out of which, 95 KLD will be industrial water, 5 KLD domestic & Gardening 5.0 KLD. Source of water is GIDC water supply. After expansion, source of fresh water will remain same.

After proposed expansion, total wastewater generation will be increased from 34.0 KLD to 102.0 KLD. Out of which, 99.0 KLD will be industrial effluent and 3.0 KLD will be sewage effluent.

Industrial effluent will be segregated into 2 streams as per the concentration – (a) High COD effluent stream & (b) Low COD effluent stream (Dilute stream). Treatment scheme is given below:

High COD effluent stream:

From high concentrated stream, total spent Sulphuric acid generation will be tune around 47.0 KLD; out of which; 23.0 KLD will be captive use and 24.0 KLD spent Sulphuric Acid will be sent to Novel Spent Acid Management, Vatva for reuse by actual users under Rule-9.

Process effluent of 68.0 KLD after primary treatment will be sent for common spray dryer to avoid heavy load of organic and inorganic on CETP.

Dilute stream:

Dilute stream of 31.0 KLD from washing and utilities will be treated in ETP and after achieving CETP inlet norms, it will be sent to Common CETP of GESCSL, Vatva for further treatment and final disposal.

Unit has full-fledge Effluent Treatment Plant with capacity of 50 m^3/day for dilute stream and 100 m^3/day for concentrated stream. After expansion, unit will treat its effluent in exiting ETP.

Effluent treatment scheme:

ETP of high COD concentrated stream

Raw effluent from process is collected separately into collection Tank. Then it is passed through Nutch filter/filter press there by following coagulation/flocculation process in the tank. After this, process effluent wastewater will be conveyed to holding tank. Then it will be sent to common spray dryer.

ETP of dilute stream

Dilute effluent streams coming from plant and utilities are collected in collection tank. Then it is taken to Neutralization tank, where pH of the effluent is adjusted as per the acidity/alkalinity of the effluent. Then treated effluent is passed through filter press to separate out solid sludge. Clear effluent from filter press is taken to primary sump. Effluent emerging out from Primary sump shows marked reduction in COD and TDS as organic dissolved solids also gets precipitated out in filter press. Then the effluent is taken to equalization tank. Then it is passing to bioreactor, here the suitable bacterial culture is nourished & desired level of MLSS and MLVSS is maintained by adding cow dung or other nutrients like urea as and when required. To provide required amount of air for biological degradation, blower is provided. Such bioreactor will ensure into desired COD reduction. The overflow of this tank is directed to flow into secondary settling tank. Biomass is recycled back. The settled sludge is taken by sludge sump from where it is taken into sludge drying bed. Clear treated effluent is transferred to Sand Filter to remove TSS and is

passed to Activated Carbon Filter, to remove the color and other impurities and finally treated effluent is collected in overhead treated water collection tank. From where after achieving CETP inlet norms, treated effluent will be discharge to CETP drainage for further treatment and final disposal. Sludge collected at bottom of primary settling tank is sent to Sludge drying beds.

Table 10.1 ETP units

Dilute stream

Sr. No.	Particulars	Qty.	MOC	Capacity (m^3)
1.	Small Collection Tank	1	MSRLTL [Under Ground]	4
2.	Big Collection Tank	1	MSRLTL	40
3.	Neutralization vessel	1	MSRLTL	25
4.	Filter Press	1	Plate Size: 36”	-
5.	Primary Sump	1	RCC MSRL	10
6.	Equalization Tank	1	RCC	80
7.	Bio-Reactor [Mickey]	2	RCC	40
8.	Settling Tank	1	RCC	30
9.	Secondary Collection Tank	1	RCC	10
10.	Sand Filter	1	MSRL	1 MT
11.	Carbon Column	1	MSRL	1 MT
12.	Treated Waste Water Tank	1	RCC [Overhead]	20

High COD Concentration Stream

Sr. No.	Particulars	Qty.	MOC	Capacity (m^3)
1.	Collection Tank	1	MSRLTL	30
2.	Vessels (Chemical Treatment)	2	MSRLTL	7
3.	Round Tub With Filter Net	1	HDPE	500Ltr
4.	Filter Pump	1	PP PUMP	30
5.	Holding Tank	3	HDPE Spiral Tank	30

The mitigation measures for minimizing the impacts on water environment in general includes following:

- Minimization of water use
- Segregation and collection philosophy for effluent to minimize waste generation and facilitate treatment.
- Treatment philosophy to achieve mandated standards.

Some of the measures, which are to be implemented, include:

- Use of high-pressure hoses for cleaning the floor to reduce the amount of wastewater generated.
- Ensuring proper operation and maintenance schedule for the ETP.

10.5.3 Economical and Technical Viability of the Effluent Treatment System

A. Spray Drying cost of effluent per day

Unit has proposed to spray drying effluents at common spray drying facility. As per the prevailing charges charge of spray dryer operator, cost of spray drying and its commercial impact on production is summarized below.

Maximum wastewater to be spray dried = 68 KL/day x Rs. 2250 = Rs. 1,53,000/day

Cost of spray drying per month = Rs. 38,25,000/-

Additional expenditure due to spray drying is Rs. 38,25,000/day

Per kg additional cost will be 38,25,000/200000 kg per day production = Rs. 19.12 and unit is ready to bear this amount.

10.5.4 Hazardous/Solid Waste Management

Main source of hazardous waste generation will be ETP waste, used oil, discarded bags/containers/liners, Sodium Bi Sulfite (40-45%) and Sulphuric Acid (24%-65%). Storage & Disposal mode is as per Hazardous & Other Waste (Management & Transboundary Movement) Rules, 2016.

Storage of Solid/Hazardous Waste:

- Proper Hazardous waste storage area with impervious flooring and covered shed is provided for storage of solid/hazardous waste.
- Entire quantity of the hazardous waste is stored in the isolated hazardous waste storage area within premises having leachate collection system and roof cover. The storage yard shall be properly labeled for identification of wastes.
- Hazardous waste shall not be stored for a period more than 90 days. Records of the same shall be maintained and make them available for inspection.

Transportation of Solid/Hazardous Waste:

- Properly packed & labeled waste shall be transported through dedicated vehicle to authorized TSDF facility.

Disposal of Hazardous Waste:

- ETP sludge will be disposed by land filling at approved TSDF site. Discarded containers/liners will be sold to registered recycler. Used Oil will be reused as lubricant or sold to registered re-processor. Sulphuric Acid (24%-65%) will be partly reused in-house and balance qty. will be sent to Novel spent management or actual users under Rule-9 of Haz. Rules, 2016 and Sodium Bi Sulfite (40-45%) will be completely reused in-house. The unit has provided isolated area with impervious flooring & roof cover for the storage of hazardous waste.

Fly Ash management

- In existing operation, fly ash is generated around 6.0 MT/month. Total fly ash generation after proposed expansion will be 18.0 MT/month. It will be sold to brick manufacturer working in 25.0 km radius from project site and also supplied to the companies for land leveling, conditioning & road construction, etc.

10.5.5 Noise Control

The main sources of noise generation will be from installation of additional machineries and equipments, D.G. set. However, these impacts will be very minor and temporary in nature. The impact on the environment during the operational phase will be long term but of insignificant. However, to minimize the noise pollution the unit proposes the following noise control measures,

- Noise suppression measures such as enclosures, buffers and/or protective measures should be provided, if required (wherever noise level is more than 90 dB (A)).
- Extensive oiling, lubrication and preventive maintenance will be carried out for the machineries and equipments to reduce noise generation.
- Use of PPE like ear plugs and ear muffs is made compulsory near the high noise generating machines.
- Moreover, the personnel shall be provided breaks in their working hours, with the continuous exposure not increasing three hours.

- The transportation contractor shall be informed to avoid unnecessary speeding of the vehicles inside the premises.
- Acoustic enclosure shall be provided for D.G. set and similar provisions like noise attenuator wherever suitable/possible.
- Areas with high noise levels will be identified and segregated where possible and will include prominently displayed caution boards.
- Adequate Greenbelt will be developed within industrial premises and around the periphery to prevent the noise pollution.
- Periodic monitoring of noise levels as per post-project monitoring plan shall be done on regular basis.

By taking measures as mentioned above, it is anticipated that noise levels in the plant will be maintained below the permissible limit.

10.6 SPILLAGE/LEAKAGES CONTROL MEASURES

The following procedures will be followed in case of any spillages/ leakages.

- The entire plant area/process area/raw storage area/finished goods storage area/ETP area will be concreted. The open ground will be restricted to development of green belt and lawns only. No spillages will be allowed on open ground.
- Any spillages will be washed and directed to the ETP via a network of drains and pipelines.
  - Decontaminate the spillage area by appropriate procedure.
  - The reactor washings, if not reused, will be sent to the collection tank in the ETP.

10.7 GREEN BELT DEVELOPMENT PLAN

Tree plantation is one of the effective remedial measures to control the air pollution and noise pollution. It also causes aesthetics improvement of the area as well as sustains and supports the biosphere.

The unit has developed greenbelt in area of 200 m^2 and it will be increased up to 615 m^2 area. Overall greenbelt area is tune around 30% of the total area of the project. However, the unit will plan to develop the greenbelt in areas available outside the plant anywhere in GIDC. Unit has adopted part of reserve land of GIDC which is around 2000 m^2 where we

will develop around 500 saplings. Copy of letter issued by VIA is enclosed as **Annexure-XVI.**

Design of Green Belt

As far as possible, following guidelines will be considered in greenbelt development.

- The spacing between the trees will be maintained as per SPCB guideline i.e. 1 tree/4 sqm.
- Spaces, so that the trees may grow vertically and slightly increase the effective height of the greenbelt.
- Planting of trees in each row will be in staggered orientation.
- The short trees (< 10 m height) will be planted in the first two rows (towards plant side) of the green belt. The tall trees (> 10 m height) will be planted in the outer three rows (away from plant side).

Planting methodology

The plantation shall be done in pits. The pit shall be refilled with soil after the planting. The sampling of healthy, nursery raised, seedlings in polythene containers shall be transported in baskets. Planting shall be done after first monsoon showers. The level of soil is about 10 cm above of ground level. The soil around the plant shall be pressed to form a low through. About 25 gm chemical fertilizers shall be added. Watering shall be continued after plantation if any dry spells follows. Planted area shall be inspected and mortality rate ensured for each species. The dead and drying plant shall be replaced by fresh seedlings.

Selection of species for greenbelt

For the development of greenbelt, plants having simple big leaves and native species are preferred to the plants. The plants are suitable for greenbelt development based on gaseous exchange capacity of foliage which is ascertained by the following characteristics:

- The plant should be fast growing.
- It should have thick canopy cover.
- It should be perennial and evergreen.
- It should have large leaf area index.
- It should be indigenous.

- It should be efficient in absorbing pollutants without significant effects on plant growth.

The objectives of the industrial greenbelt are to improve the micro-environment. The success depends on the type of land available and selection of suitable tree species for pollution control. Selection of tree species for industrial areas is influenced by the nature of industry. The objective should be to ensure a green cover tolerating pollutant gases and solid particulates present in the atmosphere. It is also advisable to select suitable tree species and adopt simple techniques which require minimum investment and care.

Plantation Programme

Plantation of trees in and around the company are meant mainly to reduce air pollution caused by factory emissions, to absorb sound, to prevent soil erosion and to maintain aesthetic value for healthy living.

Floral species recommended for greenbelt

Following list of trees are suggested for the greenbelt development with respect to this particular area. They are mostly deciduous and evergreen tree types suitable to be grown in the area.

Botanical Name	Common Name
AzadiractaIndica	Neem
Mangiferaindica	Mango
Polyalthialongifolia	Asopalav
Albizialebbeck	Siris
Delonixregia	Gulmohar
Pongamiapinnata	Karanj
Syzygiumcumini	Jambu

Greenbelt Development Programme

Year	No. of trees to be planted	Area (m^2)
1^{st}	31	123
2^{nd}	31	123
3^{rd}	31	123
4^{th}	31	123
5^{th}	31	123

Survival rate of trees and post plantation care

Considering the availability of water and general survey of surrounding area, the survival rate is expected to be around 70-75%. Moreover, the

wire net guards will be provided to protect the saplings. The same will be properly manure and watered so that it can grow well.

Protection of plantation site:

- Protection from grazing will be done by erecting tree guards a rounded planted sapling.
- Though the tree suggested for plantation will require very less water, however during the first year watering will be done twice in a day. There after watering will be done twice in a week.
- The manuring will be done when plantation take up. For this propose cow dung will be dump in the pit. No other manuring will require for proposed plantation. Cow dung is easily available in the study area.
- Damaged plants will be replaced with new plants.

10.8 RESOURCE CONSERVATION AND CLEANER PRODUCTION

Steps that are undertaken by the industry are given below:

- Solid wastes e.g. powders, spills, etc. in process and packaging are to be separately collected and disposed off instead of allowing these to effluent streams. This will reduce load and increase the efficiency of treatment system.
- Liquid raw material will be charged by pumping and closed loops ad dosing by metering to avoid fugitive emissions.
- Mechanical seals will be provided to the process vessels having agitator for reduction of fugitive emissions and leakages.
- Rain water harvesting system will be adopted to reduce the fresh water requirement.
- Generated sodium bi sulphite directly use in other products.
- Spent sulphuric acid will be reused in-house and balance qty. will be sold to actual users routed through Novel.
- We have changed the process up to optimum level to reduce consumption of excess fresh acid and minimized the wastewater generation and increase the strength of spent acid. Comparison of existing process and modified process is summarized below.

Products	Existing Process			As Per the EIA report			Difference/Reduction		
	W/C Lit/ ton	W/W Lit/ ton	Spent Acid Generation	W/C Lit/ ton	W/W Lit/ ton	Spent Acid Generation	W/C Lit/ ton	W/W Lit/ ton	Spent Acid Generation
Sulpho Tobias	10250	19710	0.0	0	0	10860 (24-25%)	-10250	-19710	+10860

Acid									
J-Acid	16310	23895	0.0	5140	7625	6855 (60-65%)	-11170	-16270	+6855
Sulpho J-Acid	15000	24610	34525 (22%)	11500	0	31025 (24-25%)	-3500	-24610	-3500 (Increase the strength)

Above table clearly indicate that, there is drastic reduction in water consumption and recovery of high concentrated spent acid.

10.9 ENERGY CONSERVATION PROGRAMME

Energy conservation measures are often the easiest, quickest and cheapest way to reduce costs and be environmentally pro-active. The conservation efforts would consist of the following:

- Maximize the use of natural lighting through design.
- CFLs or LED lights are used in administration building and plant premises.
- Constant monitoring of energy consumption and defining targets for energy conservation.
- Purchase of energy efficient appliances.
- Adjusting the settings and illumination levels to ensure minimum energy used for desired comfort levels.
- Proper temperature controls will be provided to reduce load.
- Recycling of water will be done.
- Training will be given to staffs on methods of energy conservation.

10.10 OCCUPATIONAL HEALTH & SAFETY PLAN

To maintain high standard in Health, Safety and Environment, necessary key mitigation measures & action plan as EMP has been suggested as described below.

- Post-employment health check-up programs will be carried out on annually and all records & documents related with employee health check-up program will be maintained.
- As per RA report, all risk control & prevention measures in the unit will be implemented.
- Necessary PPEs, safety equipments/materials to ensure healthy & safe work conditions will be provided to employees.
- The project does not envisage conditions that could lead to excess heating. Consequently, special requirements for protection against heat stress are not anticipated. However, ventilation for heat

evacuation, suitable PPEs such as heat for occasional handling of heated equipment or materials.

- All employees will be provided with required set of PPEs like ear plug, ear muff etc. where noise levels in excess of 80 dB(A) are regularly generated.
- It is recommend that Pre-employment health check-up programs shall be carried out for every new employee and all records & documents related with employee health check-up program shall be maintained by the proponent.
- Safety documents, procedures, guidelines along with MSDS shall be provided to the associated/concerned personnel engaged in respective operational activities.
- Training programs & safety audit shall be done on regular basis to prevent impacts of the operational activities on occupational health as well as to improve workplace condition & safe work system.
- The proponent shall ensure implementation of emergency management plan with provision of fire-fighting equipment/facilities, first aid & medical facilities, evacuation procedures etc.
- Proponent shall also ensure proper implementation & functioning as well as assess effectiveness of this safety & emergency system on regular basis throughout the project operation phase.

The following precautions shall be taken to avoid foreseeable accident like spillage, fire and explosion hazards and to minimize the effect of any such accident and to combat the emergency at site level in case of emergency.

- Various emergency spots in plant area will be identified and kept in sharp and alert watch.
- Protective equipments will be regularly checked and will be kept easily accessible and easily workable during emergency.
- Safety installations like available quantity of running water will be regularly watched.
- Fire bucket and hose reels will be provided to withstand the fire or explosion conditions.
- Various types of fire extinguishers such as (Foam type, water CO_2 type, CO_2 type) will be provided inside the factory premises.

- Every pressure vessel will be provided with minimum one or more pressure relief devices. The design of the valve is made in such a way that the breakage of any part will not obstruct force discharge of the liquid under pressure. Moreover, relief valves are tested and a periodic schedule for their testing shall be maintained. The defective valves will be removed if found unsafe for the operation.

Details of the separate isolated storage area:

Unit will provide isolated storage area for corrosive chemicals. Details of storage are given in Table 7.1 of chapter-7 of EIA report. All the raw materials are stored in isolated storage area and containers are tightly closed.

10.10.1 Plans for Periodic Medical Checkup

- Part time doctor is periodically visited the plant for health check-up of each employee.
- Pre-employment health check-up will be followed by periodical health check-up with special attention to occupational health.
- Medical records of each employee will be maintained in prescribed format as per Factory Act.
- The health check-up will be conducted as per the pre-designed format which will include chest X-rays, Audiometry, Spirometry, Vision Testing, ECG, Blood and urine test etc.
- The work zone monitoring will be conducted on regular basis.

10.10.2 Monitoring of the Occupational Injury & It's Impact on workers

The action plan will be prepared to monitor the injury to workers:

- Each workplace will be evaluated for the existing work conditions.
- Unsafe Act &unsafe Practices will be identified.
- Unsafe equipment, unsafe areas, etc., will be identified.
- Area will be checked for proper Ventilation and Illumination.
- Air-borne concentration of toxic chemicals will be measured and records will be kept.
- Evaluation of training & on the job work.
- Impact of the above mentioned unsafe conditions on workers will be studied and remedial measures for the same will be adopted.

10.11 SOCIO-ECONOMIC ACTIVITIES

Corporate Social Responsibility (CSR) refers to voluntary actions undertaken by company/organization to either improve the living conditions (economically, socially, environmentally) of local communities or to reduce the negative effects of the project. Socio-economic development activities is a concept of organization whereby organizations serve the interests of society by taking responsibility for the impact of their activities on customers, employees, shareholders, communities and the environment in all aspects of their operations.

Jemby Chem Ltd. will actively contribute to improve the Socio-economic conditions of the area by providing assistance for local persons preferable from the nearby villages.

Details of expenditure for Corporate Environment Responsibility (CER) activities:

Proposed expansion cost of the project : Rs. 1.5 Crores

Expenditure earmarked towards ESC : Rs. 30 Lakhs (2% of additional investment of the project)

Outlay of CSR with year-wise budgetary provision

1. Educational Facility

Almost all the villages/habitation in the study area is being provided with the Primary & Secondary Schools. There is no educationally backward taluka in the district. Considering the achievements in the primary education, the district may now focus on providing almost universal access to secondary and higher secondary education particularly in Science stream to the children of vulnerable sections of the society in general and Vanbandhu children in particular.

Educational Facilities in the Study Area

Distance (Km)	Primary School	College	Secondary School
0 - 5 km	8	1	2

Literacy Rate of the Study Area

Distance	% Literacy	
	Male	Female
0 - 5 km	**79.0**	**64.0**

The literacy rate of the male and female is 79.0% and 64.0% respectively as shown in the above table. The literacy rate of males is more than that of females.

Conclusion: Based on the above census and primary survey data, No additional school facility is required but scholarship to students coming from economically poor families are required. So unit will plan to earmark **8.5 Lakhs Rupees** for motivation of education activities.

2. Health and Family Welfare Facilities

Based on the census data and field survey it was found that Primary Health Centre is readily available in the villages having the large number of population. For major treatment the people need to travel to Ahmedabad City. In emergency, the facilities of ambulance are always available and even several times the companies in the close proximity of the area provide their respective ambulance(s). The Health facilities in the study area are shown in below Table:

Distance	Community Health Centre	Primary Health Sub Centre	Primary Health Centre
0 - 5 km	1	4	3

According to the Census as well as primary survey, the communities Health Centre, Primary Health Sub Centre, Primary Health Centre are available within the study area. However, during rainy season, health problem like water borne diseases and malaria diseases spread in more numbers. Acute Dyhhorial Disease (ADD) generally common among children are, water borne diseases. Acute Respiratory Infections (ARI) is most frequent causing malnutrition among all categories of patients. Unit proposes to earmark **Rupees 5.0 Lakhs** towards arranging free Malaria eradication camps (collection of blood sample & detection of virus & free medicine distribution, Blood donation camp), General Health Camp for men, women & kids, Contribution towards primary Health Services depending on local needs. Unit will also provide free medicines to people living below poverty line.

3. Drinking water and Sanitation Facilities

There is lack of drinking water facilities in the surrounding areas. Also, there is absence of alternate source of water except tanker which is also

not regular according to villagers. At few habitation of the study area the existing companies provide drinking water through tanker or giving tap connection water from their companies. It was observed that that many of the families were washing clothes through pond or gutter line or blocked rain water. Drinking water facility with RO plant was also seen in few schools, but in another the facility was untidy.

The housing conditions in the study area, mainly of tribal areas are in poor condition and need to provide sanitary facilities too. The people having pucca houses generally have the toilets built in their house. The people who were living in backward areas generally do not have the toilet facility available at their homes. As far as the type of latrine is concerned, the piped sewerage is yet very limited in the district. A majority of the households reporting some type of latrine facility use septic tank. Few household had got toilet constructed under the Government Scheme but they were not in working condition because of absence in regular supply of water or not fully constructed. So they have been left with no other option except to defecate in open. It can be seen that the basic amenities of separate toilet for boys and girls and drinking water in the district are available in all primary schools across all villages. Considering this fact, unit proposes to earmark **Rupees 5.5 lakhs** towards drinking water and Sanitation Facilities.

4. **Women Empowerment & children Development activities**

   In some cases women bear larger losses in terms of educational attainment, employment and wages. In terms of employment, which is a major determinant of livelihood, Ahmedabad rural talukas shows lower than state average in Worker Participation Rates (WPR). There is distinct Gender disparity in WPR across all talukas, with women substantially under-represented in main workers category. Thus, unit proposes to provide **Rupees 6.0 Lakhs** for education and training to engage more women in employment opportunities.

5. **Preservation of Environment and Sustainable Development**

   For Preservation of Environment, unit will develop greenbelt/plantation programme in common plot area of GIDC as well as open area available within the study area. Unit proposes to earmark **Rupees 5.0 lakhs**

towards the preservation and sustainable development programme of the environment.

Table 10.2

Detailed activity wise expenditure to be incurred in 5 years

Sr. No.	Activities to be carried out	Years (Rs. in Lakhs)					Total expenditure (Rs. in Lakhs)
		1st	2nd	3rd	4th	5th	
1	Educational activities	2.0	2.0	1.5	1.5	1.5	8.5
2	Health and Family Welfare Facilities	1.0	1.0	1.0	1.0	1.0	5.0
3	Drinking water and sanitation facilities	1.1	1.1	1.1	1.1	1.1	5.5
4	Women Empowerment & children Development activities	1.2	1.2	1.2	1.2	1.2	6.0
5	Preservation of Environment and Sustainable Development	1.0	1.0	1.0	1.0	1.0	5.0
	Total	6.3	6.3	5.8	5.8	5.8	**30.0**
						Grand Total	**30.0**

10.12 POST-PROJECT ENVIRONMENTAL MONITORING

Post - project environmental monitoring suggested herewith should be as per the guideline. The highlights of the integrated environmental monitoring plan are:

- The stack monitoring facilities like ladder, platform and port-hole of all the stacks maintained in good condition.
- Regular monitoring of all gaseous emissions from stacks &fugitive emissions in the process areas.
- The performance of air pollution control equipment evaluated based on these monitoring results.
- Water consumption in the unit recorded daily.
- Analysis of untreated and treated effluent will be carried out regularly.
- Performance of effluent treatment plant units evaluated based on these analysis results.
- As far as possible, noise curbed at its source, with the help of acoustic hoods and other such noise reducing equipment. Regular noise level monitoring carried out.
- Greenbelt properly maintained and new plantation programmes undertaken frequently.

- Continued environmental awareness programmes carried out within the employees and also in the surrounding villages.
- Rain water harvesting ponds will be developed within the industrial premises and encouraged in the surrounding villages too.

10.12.1 Details of Work Place Air Quality Monitoring Plan

Work zone monitoring will be carried out by independent competent third party every month. Records will be kept in Form No. 37 as per Gujarat Factories Rules. Location for samplings will be identified. Following information will be incorporated in the format for maintaining records of work zone monitoring:

- Location/Operation monitored
- Identified contaminant
- Sampling instrument used
- Number of Samples
- Range of contaminant concentration as measured in sample
- Average concentration
- TWA concentration of contaminant (As given in Second Schedule of Factories Act)
- Reference method used for analysis
- Number of workers exposed at the location being monitored
- Signature of the person taking samples
- Other relevant details

10.13 ENVIRONMENT MANAGEMENT BUDGET ALLOCATION

Total capital cost and recurring cost/annum earmarked for environment pollution control measures will be as under.

Table 10.3: Budget Allocation for Environment Management

S. No.	Particulars	Capital Cost (Rs. in Lakhs)	Recurring Cost per annum (Rs. in Lakh)
1	Air pollution Control	10	13
2	Water pollution Control	12	459
3	Noise pollution Control	2	1
4	Solid/Hazardous waste management	8	20
5	Environment Monitoring and Management	2	3.5

6	Occupational Health	2.5	2.5
7	Green Belt Development Plan	3.5	1
8	Activities under CER	--	6.0
	Total	**40**	**506**

10.14 REPORTING SYSTEM OF NON COMPLIANCES/VIOLATIONS OF ENVIRONMENTAL NORMS

Company will develop reporting systems of non-compliances/violations of environmental norms to the Board of Directors.

The mechanism is summarized below:

1. Identify deviation/non-compliance/violation of environmental norms as lay down in consent to operate and letter of Environmental clearance. Record to communication/complain received from plausible stake holder.
2. The EHS manager will identify deviation/non-compliance/violation from failure to comply with statutory requirements.
3. Respond from EHS manager within reasonable time limit to concern authorities with c/c mark to Technical head.
4. Technical head will take it in action and give necessary guideline to comply this deviation/non-compliance/violation of environmental norms. Parallel arrange budget for necessary action to comply the condition.
5. Communication received from the EHS manager will be discussed in technical management meeting.
6. Board discussion, Decision and Action
   - The chairperson will review the information available and take a decision depending on the seriousness of the violation.
   - The decision will be taken to ensure the compliance of non-compliance/violation of environmental norms and it's safeguarded. The decision will be taken by consensus and if no consensus is arrived at, voting will be conducted.
   - Enlist measures that would undertake to ensure that deviations/ non-compliance/violations of Environmental norms and take care not to occur same violation in future.

Table 10.4 Environment Monitoring Plan

Nature of Analysis	Frequency of analysis with its analyzer	Parameters
Wastewater analysis	Monthly by external agency	pH, TDS, SS, Oil & Grease, etc.
Stack Monitoring of each stack	Monthly by external agency	PM, SO_2, NO_X
Ambient Air Quality Monitoring	Monthly for 24 hours or as per the statutory conditions by external agency	PM_{10}, $PM_{2.5}$, SO_2, NO_X
Noise level	Monthly as per the statutory conditions by external agency	Nr. Main gate, Nr. Boiler, Nr. D. G. Set, Process area etc.
Work zone fugitive monitoring	Monthly by external agency	RPM, Acid Mist
Health check-up of workers	As per the statutory guideline	All workers

Chapter-11
Summary & Conclusion

11.1 PROJECT DESCRIPTION

11.1.1 Introduction

M/s. Jemby Chem Limited is an existing unit located at Plot No. C-1/335, 336, 337, G.I.D.C. Estate, Phase-II, Vatva, Ahmedabad, Gujarat and engaged in manufacturing of Dyes Intermediates like Sulpho Tobias Acid - 2 MT/month, J-Acid - 2.528 MT/month & J-Acid derivatives - 12.67 MT/month. Now, unit proposed to expand production capacity of existing products with addition of new products. Expansion will be done in existing plant premises.

Project activity is covered under item 5(f) of the Schedule of EIA Notification, 2006 and its subsequent amendments.

11.1.2 Brief project description

1.	Total plot area	2210 m^2
2.	Production capacity	200 MT/month (total after expansion)
3.	Power requirement	Source: Torrent power Ltd. Existing: 152 KW [48 KW (ETP) & 104 KW (Production] Proposed addition: 260 KW [60 KW (ETP) & 200 KW (Production)]
4.	Total Water requirement	105 KLD (total after expansion)
5.	Total Wastewater generation	102 KLD (99 KLD Industrial + 3 KLD Domestic)
6.	Fuel requirement	Existing: Bio-fuel - 2.0 MT/day, Diesel-14 lit/hr. Proposed addition: Bio-fuel (Briquette) - 4.0 MT/day
7.	Source of Air emission	Existing: Stack of Boiler, Thermic Fluid Heater & stand by D G Set, Stack of reaction vessel Proposed: stack of new boiler& stack of reaction vessel
8.	Haz. waste generation	ETP sludge, used oil, discarded containers/drums/liners, Spent Sulphuric Acid (24%-65%), Sodium Bi Sulfite (40-45%)
9.	Total Manpower	55 nos.

11.1.3 Location of Project

Details of the project site are given in following table:

Sr. No.	Particulars	Details
1.	**Plant location**	
	Plot No.	C-1/335, 336, 337, Phase-II, G.I.D.C. Estate
	District	Ahmedabad
	State	Gujarat
2.	**Co-ordinates**	
	Latitude	22°57'9.70"N
	Longitude	72°38'11.34"E
3.	Nearest Railway Station	Vatva–0.5 km
4.	Nearest Airport	Ahmedabad–12.8 km
5.	Nearest Highway	NH8 – 4.25 km
Note: Aerial distances are given in above table.		

11.1.4 Investment of the project

Existing cost of project is Rs. 2.5 crore. The estimated cost of the proposed expansion will be around Rs. 1.5 crore. Out of this, around Rs. 0.4 crore will used for pollution control measures as capital investment and Rs. 506 lakhs will be recurring cost per annum.

11.1.5 List of products

Product details with its capacity are given in table below.

Sr. No.	Name of Product	Production Quantity (MT/month)			End use of product
		Existing	Proposed addition	Total After expansion	
01	Sulpho Tobias Acid	2	23	25	Dyes inter-mediates
02	J-Acid	2.528	47.472	50	
03	**J-Acid derivatives**	12.67	87.33	100	
	1. N-Acetyl J-Acid				
	2. N-Methyl J-Acid				
	3 N-Benzoyl J-Acid				
	4. N-Phenyl J-Acid				
04	RW-Acid (Di-J Acid)		10	10	
05	Sulpho J- Acid		10	10	
06	N-Methyl Gamma Acid	00	5	5	
	Total	**17.198**	**182.802**	**200**	

11.2 DESCRIPTION OF ENVIRONMENT

11.2.1 Baseline Environmental Study

To predict the impact of the project on the surrounding environment, the current baseline environmental status was studied by collecting the data

and carrying out monitoring during **March, 2017 to May, 2017**in the study area of 5 km radius from project site as per the TOR.

11.2.2 Air Environnent

The ambient air quality monitoring was carried out at6 AAQM locations, with a frequency of twice a week, to assess the existing sub-regional air quality status during the period of **March, 2017 to May, 2017.**

Respirable Dust Sampler & Fine Particular Sampler along with the analytical methods, prescribed by CPCB was used for carrying out air quality monitoring. At all these sampling locations; PM_{10}, $PM_{2.5,}$ SO_2 and NO_x were monitored on 24-hourly basis to enable the comparison with ambient air quality standards prescribed by the CPCB. The data on concentrations of various pollutants were processed for different statistical parameters like arithmetic mean, standard deviation, minimum and maximum concentration and various percentile values.

The results are summarized below:

Particulate Matter (PM_{10})

An average and 98th percentile value of 24-hourly PM_{10} values at all the locations varied between 68.7-81.4 $\mu g/m^3$ and 72.7-88.8 $\mu g/m^3$, which are well within the stipulated standard of CPCB, 100 $\mu g/m^3$ for PM_{10}.

Particulate Matter ($PM_{2.5}$)

An average and 98th percentile value of 24-hourly $PM_{2.5}$ values at all the locations varied between 33.2-36.7 $\mu g/m^3$ and 35.1-42.2 $\mu g/m^3$, which are well within the stipulated standard of CPCB, 60 $\mu g/m^3$ for $PM_{2.5}$.

Sulphur Dioxide (SO_2)

An average and 98th percentile value of 24-hourly SO_2 value of arithmetic mean at all the locations ranged between 15.4-20.6 $\mu g/m^3$ and 18.0-23.8 $\mu g/m^3$ respectively, which are well within the stipulated standards of CPCB, 80 $\mu g/m^3$ for SO_2.

Oxides of Nitrogen (NO_x)

An average and 98th percentile value of 24-hourly NO_x value of arithmetic mean at all the locations ranged between 20.0-23.7 $\mu g/m^3$ and 22.5-26.2 $\mu g/m^3$ respectively, which are much lower than the standards stipulated by CPCB, i.e. 80 $\mu g/m^3$ for NO_x.

Conclusion:

The quality of ambient air in the study area is compared with AAQM Standards prescribed by CPCB & found below the prescribed standards.

11.2.3 Water Environment

Surface Water Quality

Surface water sample was collected from Vinzol lake. Results of analysis are given in chapter-3.

Ground Water Quality

Ground water samples have been collected from project site, Vatva, Ghodasar, Vinzol, Ramol, Hathijan villages. Summary of the analysis is as below:

Color: All the samples were colorless meeting desirable norms.

pH: All the samples meet the desirable standards (pH ranges from 7.3 to 7.4).

Total Dissolved Solids (TDS): TDS in samples ranges from 1048 mg/L (Project Site) to 1413 mg/L (Ramol). All the samples meet the permissible limit of 2000 mg/L, (If alternate sources of potable water are not available).

Calcium: Calcium contents in the water ranges from 54 mg/L (Project site) to 68 mg/L (Vatva), all the samples meet the desirable limit of 75 mg/L.

Magnesium: Magnesium content in the water ranges from 32 mg/L (Hathijan) to 64 mg/L (Ramol). All the samples meet the permissible limit of 100 mg/L (if alternate source of potable water in not available).

Sulphate: Sulphate content in the water ranges from 57 mg/L (Ramol) to89 mg/L (Ghodasar). All the samples meet the desirable limit of 200 mg/L for drinking water.

Fluoride: Fluoride content in the water ranges from 0.48 mg/L (Vinzol) to 0.69 mg/L (Project site). All the samples meet the desirable limit (1.0 mg/L).

Total Alkalinity: Total alkalinity in the water samples ranges from 290 mg/L (Ghodasar) to 388 mg/L (Project site). All the samples are within the permissible limit of drinking water (600 mg/L) (if alternate source of portable water is not available).

Other Parameters: Potassium (ranges from 14 mg/L to 23 mg/L), Sodium (ranges from 303 mg/L to 428 mg/L) and Chloride (ranges from 401 mg/L to 554 mg/L).

Heavy metals like copper, lead, chromium, iron, nickel, manganese and zinc are found below detectable limit in all samples.

Conclusion:

Ground water samples from villages meet the permissible limit set by the authority (BIS).

11.2.4 Noise Environment

The L_{eq} (Ld) values of noise levels during day-time varied 52.4 dB(A) to 64.2 dB(A) and the night time L_{eq} (Ln) varied from 40.4 dB(A) to 56.7 dB(A)within the study area. Higher noise value of 64.2 dB(A) was recorded during day time at project site & Highest noise value of 56.7 dB(A) was also recorded during night time at project site.

11.2.5 Soil Quality

Soil samples were collected from 6 different locations and analyzed to assess the soil quality prevailing in the study area. Physical characteristics of soil have been delineated through specific parameters, viz. particle size distribution (grain size analysis), porosity, water holding capacity & permeability whereas data for chemical characterization of soil, viz. pH, electrical conductivity, cation exchange capacity and sodium absorption ratio have been analyzed.

11.2.6 Biological Environment

Baseline data for flora & fauna has been collected with its family. It was found that, none of the species of conservation importance exists in the study area and no endangered species found in the study area.

11.2.7 Socio-Economic Environment

Socio-economic study includes description of demography, available basic amenities like housing, health care services, transportation, education facilities. Information on the above said parameters has been collected to define the socio-economic profile of the study area.

11.3 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The summary of anticipated adverse environmental impacts due to proposed expansion project and mitigation measures is given below.

11.3.1 Summary of impacts on Air Environment:

(a) During construction phase & Mitigation measures

Main sources of impact are due to movement of vehicles &construction equipments, transportation material etc. Water sprinkling will be done to control dust. PUC certified vehicles will be used. Temporary barricades will be provided to reduce spreading of particulates.

(b) During operation phase & Mitigation measures

At present, flue gas emission is from stack of steam boiler and thermic fluid heater, where bio-fuel is used as fuel, so Multi cyclone is installed as APCM. After expansion, there will be addition of boiler of 1 TPH, where same fuel i.e. bio-fuel will be used as fuel, so Multi cyclone will be installed as APCM. One stand by D.G. set of 125 kVA is installed in the premises, which will be used in case of power failure/emergency only. HSD will be used as a fuel.

At present, process gas emission is from the stack attached to reaction vessel. After expansion, one more reaction vessel having stack height of 15 m will be added.

Prediction of impacts on air environment is quantified using ISCST3 model. Maximum Ground level concentrations of 24-hr average for PM, SO_2, NOx were found 1.314 µg/m^3, 0.174 µg/m^3, and 0.352 µg/m^3 respectively. The point of maximum concentration would be 1.0 km from centre of industry in E direction. The obtained GLCs are well within the 24-hourly ambient air quality standards stipulated by CPCB.

11.3.2 Summary of impacts on Water Environment

(a) Impacts during construction phase & Mitigation measures:

Temporary impacts are likely to occur due to water consumption & sewage generation. It will not be significant as water requirement would be temporary during construction phase. Proper sanitation facilities with adequate disposal system are already exists within the operational plant.

(b) Impacts during operation phase & Mitigation measures:

Water requirement of the unit is satisfy from GIDC water supply. Total water requirement after expansion will be increased from 34.0KLD to 105.0 KLD.

Total w/w generation will be increased from 34.0 KLD to102.0 KLD. Out of which, 99.0 KLD will be industrial effluent and 3.0 KLD will be sewage effluent. Industrial w/w generation will be segregated into 2 streams as per the concentration - High COD effluent stream & Low COD effluent stream (Dilute stream).

From high concentrated stream, total spent Sulphuric acid generation will be tune around 47.0 KLD; out of which; 23.0 KLD will be captive use and 24.0 KLD spent Sulphuric Acid will be sent to Novel Spent Acid Management, Vatva for reuse by actual users under Rule-9.

Process effluent of 68.0 KLD after primary treatment will be sent for common spray dryer to avoid heavy load of organic and inorganic on CETP.

31.0 KLD dilute effluent from washing and utilities will be treated in ETP and after achieving CTEP inlet norms, it will be sent to Common Effluent Treatment Plant (CETP) - GESCSL, Vatva, for further treatment and final disposal. There is no increase pollution load in terms of Hydraulic and organic compare with granted pollution load by GPCB in existing CC&A but on the contrary reduce organic load due to high TDS high COD effluent directly send to common spray drying facility. Domestic sewage-3.0 KLD will be disposed into soak pit followed by septic tank.

11.3.3 Impacts on Noise quality & Mitigation measures

(a) Impacts during construction phase & Mitigation measures:

During construction phase, major sources of noise are vehicle's movement & construction activities. High noise producing activities will be restricted to daytime only. Well maintained equipment will be used to prevent noise generation. Usage of PPEs by workers & proper maintenance of machineries will be done to reduce impact of noise.

(b) Impacts during operation phase & Mitigation measures:

During the operation phase, the noise levels may increase due to the operation of boiler, reactors and other machineries. The impact is found

to be insignificant outside the premises. Unit will provide necessary PPEs like earplugs or earmuffs to all workers where exposure is 85 dB(A) or more and selection of any new plant equipment will be made with specification of low noise levels.

11.3.4 Summary of Impacts on Land Environment

(a) Impacts during construction phase & Mitigation measures:

The construction activities like excavation, leveling & vehicular movements will change the landscape, which are expected to be of short duration and insignificant. Preliminary activities like proper storage of construction materials & proper management will be done. Therefore, impact will be negligible. Unit will provide sanitation facilities for the staff engaged in construction work which will prevent the impacts on land.

(b) Impacts during operation phase & Mitigation measures:

Hazardous wastes have significant negative impacts if disposed unsystematically. Unit has provided all required structural facilities like separate hazardous waste storage room with RCC floor, leachate collection system, concrete floors within premises. Hence, no significant negative impact is envisaged on the land environment.

11.3.5 Summary of impact on Socio Economy & Mitigation measures

As the unit is located in notified industrial area and expansion will be done in the existing premises, no Resettlement and Rehabilitation (R&R) is required. Project will generate employment opportunities for both skilled and unskilled workers living in the area. Income of the local residents will increase as well as social status will improve to a great extent. Thus, from socio-economic point of view, the project is beneficial to the people.

11.3.6 Summary of impact on Ecology

Unit is located in GIDC industrial estate. There are no protected areas like national park/wildlife sanctuary within the 10-km radial periphery of the project site so there will not be any significant impact on ecology.

11.4 ENVIRONMENT MONITORING PROGRAMME

The unit has a dedicated Environment Management Cell to monitor, evaluate the environmental performance and to supervise the environment management measures. Budgetary provision has been made

with Rs. 0.4 crore of capital cost and Rs. 506 crore recurring cost per annum. Below Post-project monitoring programme will be followed.

Environment Monitoring Program

Nature of Analysis	Frequency of analysis with its analyzer	Parameters
Wastewater analysis	Monthly by external agency	pH, TDS, SS, Oil & Grease, etc.
Stack Monitoring of each stack	Monthly by external agency	PM, SO_2, NO_X
Ambient Air Quality Monitoring	Monthly for 24 hours or as per the statutory conditions by external agency	PM_{10}, $PM_{2.5}$, SO_2, NO_X
Noise level	Monthly as per the statutory conditions by external agency	Nr. main gate, Nr. boiler, Nr. D. G. Set, Process area etc.
Work zone fugitive monitoring	Monthly by external agency	RPM, acid mist
Health check-up of workers	As per the statutory guideline	All workers

11.5 ADDITIONAL STUDIES

11.5.1 Risk Assessment

Risk analysis and study have been carried out for identification of accident hazards, selection of credible scenarios, Risk Mitigation measures etc. All the hazardous chemicals will be stored and handled as per MSDS guidelines. The detail study is prescribed in Chapter-7.

11.6 PROJECT BENEFITS

Project has a potential for employment of skilled, semi-skilled & unskilled employees. The direct employment potential after proposed expansion is estimated as 55 persons and many others will be indirectly employed. Indirectly, the proposed expansion will help the Government by paying different taxes (sales tax, excise duty, etc.) from time to time, which is a part of revenue and thus, will help in developing the area. The company will carry out CSR activities, which can lead to improve social infrastructure.

11.7 ENVIRONMENTAL MANAGEMENT PLAN

Management plan of impacts identified is detailed below:

Air Pollution Management

Bio fuel is used as a fuel and same fuel will be used after expansion also. Hence multi cyclone will be installed as APCM. Alkali Scrubber (Ventury +

Packed column) will be installed to process vent to control process emission. Proper stack height and SMF will be provided in order to achieve norms prescribed by statutory authority.

To control the fugitive emissions, unit will adopt following mitigation measures.

- Regular maintenance of valves, pumps and other equipment will be done to prevent leakages.
- Mechanical seals will be provided to all the reactors.
- Regular periodic monitoring of work area to check the fugitive emission.

Water Pollution Management

- Industrial wastewater will be treated in adequate in-house ETP.
- Regular monitoring of working of ETP.
- Unit will maintain the records for the total water consumption.
- Rain water harvesting structure is installed in the unit.
- Domestic w/w will be disposed to soak pit followed by septic tank.

Hazardous Waste Management

Entire quantity of hazardous waste will be handled and disposed as per Hazardous & Other Waste (Management & Transboundary Movement) Rules, 2016. ETP sludge is disposed off at approved TSDF site, used oil is disposed by selling to registered re-refiners. Whereas discarded drums/ containers/liners are disposed off by selling to registered recyclers. Spent Sulphuric Acid (24%-65%) will be partly reused in-house and balance qty. sent to Novel spent management or actual users under Rule-9 of Haz. Rules, 2016 and Sodium Bi Sulfite (40-45%) will be completely reused in-house. Entire quantity of the hazardous waste will be stored in the isolated hazardous waste storage area within premises with roof cover. Thus, hazardous waste management system proposed by the unit is adequate.

Noise Pollution Management

- Acoustic enclosure shall be provided for D.G. set.
- PPEs like ear plugs and ear muff will be provided to the workers working in high noise area.

- Periodic maintenance of machinery and vehicles will be undertaken to reduce the noise impact.
- Periodical noise monitoring will be done for verifying compliance with relevant laws.

Green Belt Development

The unit has developed greenbelt in area of 200 m^2 and it will be increased up to 615 m^2 area. Overall greenbelt area is tune around 30% of the total area of the project. However, the unit will plan to develop the greenbelt in areas available outside the plant anywhere in GIDC. Unit has adopted part of reserve land of GIDC which is around 2000 m^2 where we will develop around 500 saplings. Copy of letter issued by VIA is enclosed as **Annexure-XVI**.

11.8 CONCLUSION

Based on the study it is concluded that-

- There will be no major impact on water environment as High COD effluent will be sent to common spray dryer and dilute stream will be treated in in-house ETP and will be disposed to CETP for further treatment & final disposal.
- Multi Cyclone separator will be installed to the flue gas stack with adequate stack height.
- Alkali Scrubber (Ventury + Packed column) will be installed to the process vent.
- To prevent fugitive emission various steps will be taken like regular sprinkling of water and paved road.
- Adequate arrangement for handling and disposal of Hazardous solid waste.
- Fire protection and safety measures will be provided to take care of fire hazard.
- Direct and indirect employment opportunities will have positive impact.

Chapter-12
Disclosure of Consultant engaged

12.1 PREFACE

San Envirotech Pvt. Ltd. (SEPL) has been appointed by Jemby Chem Limited to carry out this Environmental Impact Assessment Study as per the EIA notification, 2006 as amended till date. SEPL is accredited as **Category-A** organization under the **QCI-NABET Scheme** for accreditation of EIA consultant Organizations: Version 3 for preparing EIA-EMP reports in 10 sectors (**Certificate No. NABET/EIA/1619/RA0084; Valid till 23.12.2019**).

12.2 DETAILS OF EIA CONSULTANT ORGANIZATION

San Envirotech Pvt. Ltd. has started its work in 1990 to serve the environment as a trustee of next generation with a small infrastructure under the dynamic leadership of Dr. Mahendra Sadaria. SEPL has wide spectrum of national and multinational clients covering the industries - Bulk Drugs and Pharmaceuticals, Dyes and Dye Intermediates, Pesticides, Fertilizers, Chemicals, Cement, Mining, and Infrastructure. During last two decades, SEPL has been taking care of client's unique problems and concerns in order to develop cost effective strategies to meet their regulatory obligations. SEPL focuses on strategic planning and comprehensive solutions to address both short and long term needs of the clients.

SEPL has in-house multi-disciplinary analytical testing laboratory that is MoEFCC approved under EP Act. SEPL is also a recognized schedule-II Environmental Auditor appointed by Gujarat Pollution Control Board as per the directives of the Honorable High Court of Gujarat. SEPL is also an ISO 9001:2008, 14001:2008 and OHSAS 18001 certified company. SEPL team consists of qualified & experienced personnel. Experts involved in the preparation of this EIA/EMP report are given in EIA report as 'declaration by experts'.

Declaration by experts contributing to the EIA of Jemby Chem Limited

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

EIA Coordinator:

Name: **Dr. Mahendra Sadaria**

Signature & Date:

Period of involvement **March, 2017**

Contact Information: 079-26583077

Functional Area Experts

Functional Areas	Name of the Expert	Involvement (Period and Task)	Signature & date
Air Pollution Monitoring & Control (AP)	Dr. Mahendra Sadaria	Planning of meteorological AAQM baseline monitoring, site visit/ survey, select monitoring locations, data verification & approval, interpretation of baseline condition of air environment. Evaluation of results of Ambient Air Quality Monitoring (AAQM). Contribution in EIA documentation.	
Air Quality Modeling and Prediction (AQ)	Diti Patel	Meteorology file generation, Air quality model (ISCST-3) run using meteorology data, identifying source & receptor. Prediction of GLC & plotting isopleths. Study of GLCs obtained & calculating cumulative concentration of pollutants. Contribution in EIA documentation.	
Water Pollution (WP)	Dr. Khyati Thacker	Site visit, selection of sampling locations, review & interpret baseline water quality, water balance calculation for the project, prediction of impacts & proposed mitigation measures, contribution in EIA documentation.	
Ecology and Bio-diversity Conservation (EB)	Dr. Khyati Thacker	Site visit/survey for ecology study, review of Greenbelt development requirement of the project-suggestion for species, type of plantation and contribution in EIA documentation.	
Solid and Hazardous Waste Management (SHW)	Dr. Mahendra Sadaria	Identified source of generation of Hazardous waste & disposal methods, studying adequacy of mitigation measures for management of hazardous waste.	
Socio Economy (SE)	Shobhana Sadaria	Site visit, data collection, evaluation of Socio-Economic status of the study area, assessment of the possible chances to socio-economic issues arising out of the proposed activity & contribution in EIA documentation.	

Functional Areas	Name of the Expert	Involvement (Period and Task)	Signature & date
Land Use (LU)	Satish Borad	Site visit, development of land use map of study area, prepare land use classification and determine LULC of the area, prediction of impact on land use pattern, Suggest mitigation measures, contribution in EIA report.	
Hydrogeology (HG & Geo)	Hardik Patel	Site visit, understanding and representing ground water conditions, identification of impacts, suggestion of mitigation measures and contribution of EIA documentation.	
Risk and Hazards (RH)	Prabhat Kumar Srivastva	Determine worst & most credible accident scenarios, Identification of modeling scenarios, consequence modeling, finalization of RA/DMP, documentation and contribution to EIA documentation.	
Noise	Ajay Dwivedi	Site visit, selection of sampling locations, review baseline noise levels, source & its compliance with permissible limits, contribution in EIA documentation.	

Declaration by the Head of the accredited consultant organization/ authorized person

I, Dr. Mahendra Sadaria, hereby confirm that the above mentioned experts prepared the EIA of Jemby Chem Limited, Plot No. C-1/335, 336, 337, Phase – II, G.I.D.C. Estate, Vatva, Dist. Ahmedabad. I also confirm that, the consultant organization shall be fully accountable for any misleading information mentioned in this statement.

Signature:	
Name:	Dr. Mahendra Sadaria
Designation:	Director, Technical
Name of the EIA Consultant organization	San Envirotech Pvt. Ltd.
NABET Certificate No. and date	NABET/EIA/1619/RA0084, Valid till 23.12.2019

Annexure-I

GIDC plot allotment letter

GUJARAT INDUSTRIAL
DEVELOPMENT CORPORATION
(A Govt. of Gujarat undertaking)

Gram : GIDC Tele : 6580591

OFFICE OF THE REGIONAL MANAGER AHMEDABAD

3rd Floor, Fadia Chambers, Ashram Road,
Ahmedabad-380009. (INDIA)

Your ref.

Our ref. No.GIDC:RM:AD:ALT:TFR:VTW:PLT:

Date 24/ 05/ 2002 2266

SUB.: TRANSFER OF PLOT No.335(Ph-II) at Vatwa Indl.Estate.

-:: OFFICE ORDER ::-

A plot of land(No.335) admeasuring about 803.98 Sq.Mtrs.was allotted to M/s Jitendra Manilal Patel. The Licence agreement was executed on 19/8/93.The licencee had applied to the Corporation for transfer of the said plot in favour of M/s Jemby Chem Limited. Permission for transfer has been given by the Regional Manager,A'bad as per letter No.RM:AS:ALT:TFR:VTW:PLT:1592 Dtd.30/03/2002.

The licencee has paid all dues of the Corporation upto 2002. He has also paid the Corporation's share in"Transfer fee" in value of the land amounting to Rs. 64,320/-. The Supplimentary agreement has therefore been executed on 2/05/2002 between the Corporation/Licencee and Transferee. The plot now therefore stands transferred in the name of M/s Jemby Chem Limited (Director) Shri Bhupendra Chaturbhai Patel with effect from 2/05/2002.

This transfer permission shall not to be considered as valid under the building bye-laws of the Corporation, if any un-authorised construction is carried out by transferee. If any un-authorised construction is carried out, the same shall not be considered that Corporation has regularised, the same, Transferee shall have to remove/demolish, non violative/violative construction or shall have to be got approved from the Corporation.

Assistant Manager(Alt)
GIDC - Ahmedabad.

To,

1) M/s Jemby Chem Limited,
Plot No.335,Ph-II,GIDC Estate, Vatwa, Ahmedabad.

2) M/s Jitendra Manilal Patel,
Plot No.335,Ph-II,GIDC Estate, Vatwa, Ahmedabad.

GUJARAT INDUSTRIAL
DEVELOPMENT CORPORATION
(A Govt. of Gujarat undertaking)

Gram : GIDC Tele : [illegible]

OFFICE OF THE REGIONAL MANAGER, [illegible]

3rd Floor, Fadia Chambers, Ashram Road,
Ahmedabad-380009. (INDIA)

Your ref. 3316

Our ref. No.GIDC:RM:AD:ALT:VTW:SHD:TFR

Date 4 /07/ 2000.

SUB.: TRANSFER OF SHED No.C1-336(Ph-II) At Vatwa Indi.Estate.

-:: OFFICE ORDER ::-

A C1 Type of Shed (No.C1-336) admeasuring about 704 Sq.Mtrs. was allotted to M/s Brig.Tejwant Singh Grewal. The hire purchase agreement was executed on 13/02/85. The hirer had applied to the Corporation for transfer of the said shed in favour of M/s Jemby Chem Limited. Permission for transfer of ~~the said shed~~ has been given by the Regional Manager, A'bad as per letter No.RM:AD:ALT:VTW:SHD:TFR:2179 Dtd.30/05/2000.

The licencee has paid all dues of the Corporation upto 2000. He has also paid the Corporation's share in "Transfer fee" in value of the land amounting to Rs.49280/-. The Supplimentary agreement has therefore been executed on 1/07/2000 between the Corporation/Licencee and Transferee. The shed now therefore stands transferred in the name of M/s Jemby Chem Limited with effect from 1/07/2000. This transfer permission shall not be considered as valid under the building bye-laws of the Corporation, if any un-authorised construction is carried out by transferee. If any un-authorised construction is carried out, the same shall not be considered that Corporation has regularised, the same, Transferee shall have to remove/demolish, non violative/violative construction or shall have to be got approved from the Corporation.

As approved by Grenaves Committee
Dt, 14/12/99 & G.M.(Alt) letter Dtd.
5/02/2000.

Assistant Manager(Alt)
GIDC - Ahmedabad.

To,

1) M/s Jemby Chem Limted,
Shed No.C1-336, Ph-II, GIDC Estate, Vatwa, Ahmedabad.

2) M/s Brig.Tejwant Singh Grewal,
Shed No.C1-336, Ph-II, GIDC Estate, Vatwa, Ahmedabad.

For, JEMBY CHEM LIMITED

Director

GUJARAT INDUSTRIAL
DEVELOPMENT CORPORATION
(A GOVT. OF GUJARAT UNDERTAKING)
Bhavani Chambers, Ashram Road,
Ahmedabad-380 009.

To,

M/s Jamby Chem Pvt.Ltd.
8,Dhupshalt Appartments,
Jodhpur Village,
AHMEDABAD

No/RM/AGALT/VTW/5[illegible]

Date : 4/8/88.

Sub :- Allotment of plot/Shed in Vatwa estate. Your application No. 1[illegible]
__ P/6t/Shed at Vatwa

Dear Sir,

We are indeed happy to welcome you in our Vatwa estate and accordingly we are sending this allotment letter to you. We are enclosing herewith the Form of Agreement/Agreement for sale in triplicate which you may duly execute and return to us. It is not necessary for you to execute this agreement in our presence but you could execute it and send it by post also.

1. The agreement forms are required to be signed by all the partners of partnership firm on each page. In case of a private/Public limited company, it is necessary to send a copy of the Resolution authorising the Director/Officer who is to be sign the agreement.

2. It may be noted that if you fail to execute the agreement within a period of 30 days from the date of allotment letter, you will be liable to pay the interest on outstanding in capital from the date of allotment till you get the allotment letter rescinded at your request.

3. The sketchmap of your plot/shed along with the relevant section of the Detailed Development plan/drawing of shed design is enclosed for your information. You have already been advised about the procedure of obtaining water/power-supply connections as well as other infrastructure conditions along with our earlier letter in the form of a printed booklet.

4. On your sending the agreements duly executed to us, we will send you a possession advice and you will be required to obtain possession from our Junior Engineer.

5. Terms of payment of the balance amount you have already paid an amount of Rs. 36832/(Rupees Thirty six thousand eight hundred thirty two only being 10 % of the total price of plot/shed. This is the offer amount. You are required to make the payment of remaining amount of Rs 276240/(Rupees Two lacs seventy six thousand two hundred forty only) in the following manner :-

(a) During the first 2 years, only interest at 17 % in 8 quarterly instalments each instalment being of Rs. 11740/- The first quarterly instalment falls due on Sept.88 and thereafter ever quarter, you will be required to send the above mentioned amount by a cheque/draft drawn in of GIDC to us. After the moratorium period of 2 years is over the balance amount of Rs 276240/- being the remaining outstanding amount shall be payable with interest on reducing balance in 32 quarterly instalments with 17 % rate of interest as mentioned in the enclosed Annexure A.

(b) The rate of interest mentioned above is subject to revision from time to time at the discretion of the Corporation and the interest would be payable at such revised rates from such dates as may be specified by the Corporation from time to time.

(c) You may please note that the Corporation levies penal interest at the rate of 3% over and above the normal rate for the amounts in default.

(d) You will happy to note that the Corporation gives 3% rebate on the balance price of plot/shed if the remaining amount is paid in one instalment

A-3

6. As in your case the State/Central subsidy is to be obtained from the Commissioner of Industries/General Manager, District Industries Centre, you shall pay interest at the rate of ___% on the outstanding amount of Rs. _____ untill the same is received from the office of the Industries Commissioner/General Manager, District Industries Centre.

7. You shall have comply with the provisions of water (Prevention and Control of Pollution) Act, 1974 and accordingly to obtain consent from the State Water Prevention and Control Board, Gujarat State before discharging sewage or treated effluents from your plant and you shall not discharge such sewage or treated effluents without getting such consent and failure to observe this condition would entitle the Corporation to disconnect your water-supply and to resume possession of land/shed.

8. Details about your plot/shed are as under :

a. Type of shed and shed number CI 337

b. Price of Shed Rs. ~~1,19,680/-~~ 2,40,640/-

c. Price of plot Rs 1,19,680/-

Total Rs. 3,68,320/-

c Plot Number 337 and area of plot 704

d price of land :

(i) Premium price at the rate of Rs. 170/- For 704 sq. mts. Rs 119680.00

(ii) Frontage at the rate of Rs. - For - sq. mts. Rs. -

Total Rs. 119680.00

9. According to the policy of Corporation you shall put the shed to industrial use for manufacturing the product/s mentioned in your application within a period of 6 months from the date of allotment failing which corporation is entitled to obtain the possession back. In case of plots you are required to get the building plans approved within a period of 6 months and you shall start the production at the end of 2 years from the date of allotment of the plot failing which the Corporation is entitled to take back the possession of the plot unless extention is given by the Corporation.

10. Other Points : (Please see Annex

11. The plot/shed has been alloted for putting up Chemicals Industry

The products proposed to be manufactured by the allotee are as under.

The water and power requirement as mentioned in the application is as under

Water Requirement in terms of litres per day.

Water requirement per day during	For Cooling	For Sanitation	For Process	Total
1st year	-	-	-	10,000
2nd year	-	-	-	10,000
3rd year	-	-	-	10,000

Requirement of powers in terms of K. W. for the first 3 year from the date of production

For during 1st year 130 K.W.

For during 2nd year 130 K.W.

For during 3rd year 130 K.W.

While approving the plants the executive Engineer would specifically mention on the plan itself that the plans are approved for establishing a particular project.

Once again we welcome you to our estate and we now request you send us the forms of Agreement duly executed at your earliest but not later than 30 days, in order to enable us to hand over the possession of the plot/shed.

In the meanwhile assuring you of best of our services.

We remain,

Yours faithfully,

i) Party shall have to pay Rs.80/- against delay interest payment of offer amount.

ii) 15% capital Rs.55248/-shall be paid in two yearly instl.each of Rs.27624/-with 17% interest.

REGIONAL MANAGER A'bad

Gujarat Industrial Development Corporation

Copy f.w. cs to (1) Executive Engineer GIDC A'bad Division.

(2) Dy. Engineer Vatwa Estate.

(3) Audit Officer (Recovery) GIDC Ahmedabad

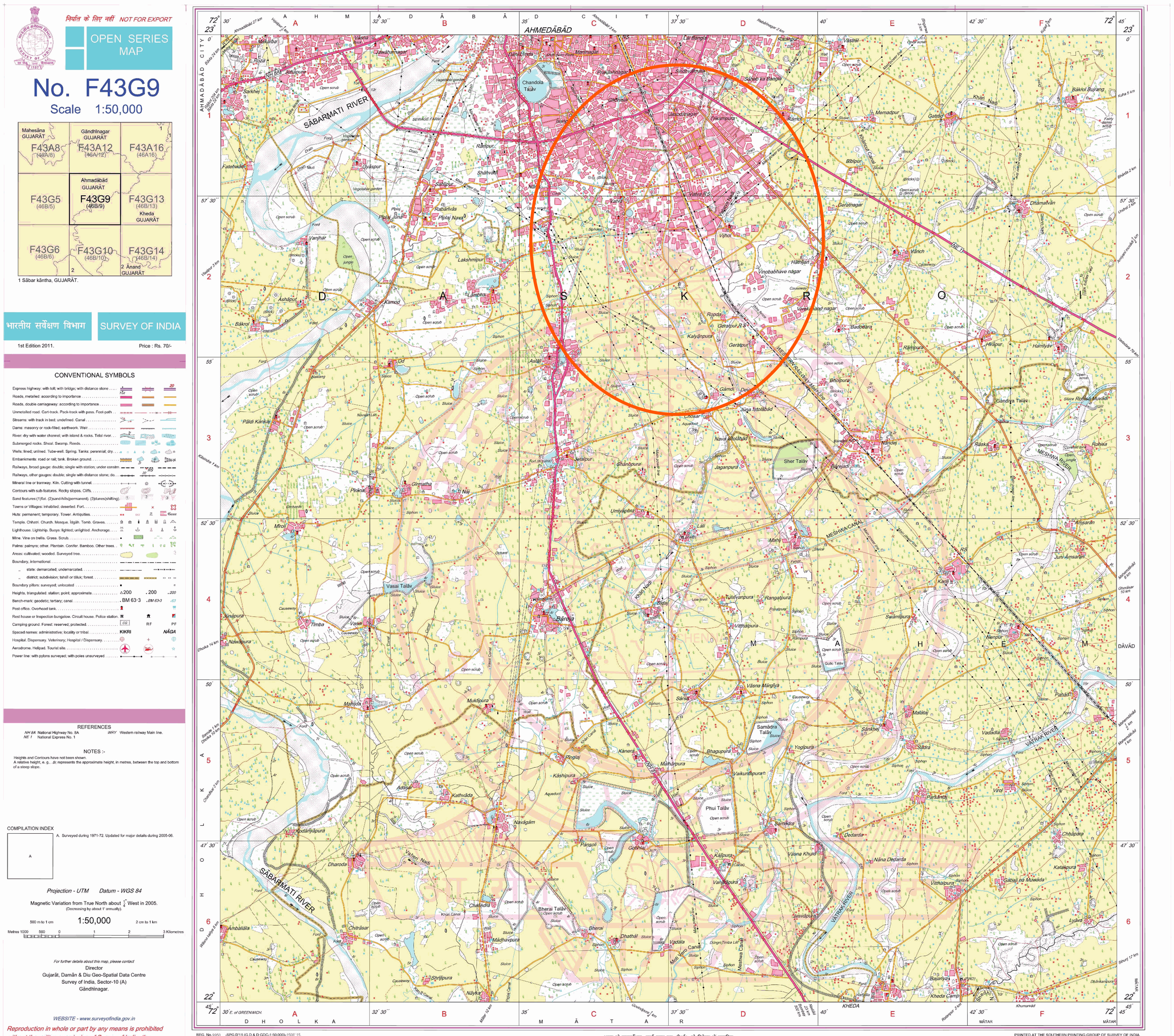
(4) Supdt. Engineer (Electrical) Fadia Chamber, Ashram Road, Ahmedabad-9.

Encl : 1. Agreement forms (in triplicate) 2. Anne e A 3. Annexure B

E. & O. E.

Annexure-II

Toposheet (1:50000) scale


निर्यात के लिए नहीं NOT FOR EXPORT
OPEN SERIES MAP
No. F43G9
Scale 1:50,000
Mahesāna GUJARĀT
F43A8 (46A/8)
Gāndhīnagar GUJARĀT
F43A12 (46A/12)
F43A16 (46A16)
F43G5 (46B/5)
Ahmadābād GUJARĀT
F43G9 (46B/9)
F43G13 (46B/13)
Kheda GUJARĀT
F43G6 (46B/6)
F43G10 (46B/10)
F43G14 (46B/14)
2 Ānand GUJARĀT
1 Sābar kāntha, GUJARĀT.
भारतीय सर्वेक्षण विभाग
SURVEY OF INDIA
1st Edition 2011.
Price : Rs. 70/-
CONVENTIONAL SYMBOLS
REFERENCES
NOTES :-
Heights and Contours have not been shown.
A relative height, e. g., 8r represents the approximate height, in metres, between the top and bottom of a steep slope.
COMPILATION INDEX
A. Surveyed during 1971-72. Updated for major details during 2005-06.
Projection - UTM Datum - WGS 84
Magnetic Variation from True North about 1 1/4° West in 2005.
(Decreasing by about 1' annually).
500 m to 1 cm
1:50,000
2 cm to 1 km
Metres 1000 500 0 1 2 3 Kilometres
For further details about this map, please contact
Director
Gujarāt, Damān & Diu Geo-Spatial Data Centre
Survey of India, Sector-10 (A)
Gāndhīnagar.
WEBSITE - www.surveyofindia.gov.in
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SĀBARMATI RIVER
MESHWA CANAL
VATRAK RIVER
DĀVĀD
DHOLKA
MĀTAR
KHEDA
REG. No. 9950 -SPG D'11 (G.D & D GDC-1:50,000)-1508' 15.
भारत के महासर्वेक्षक, स्वर्ण सुब्बा राव, बी.ई., के निदेशन में प्रकाशित,
Published under the direction of Swarna Subba Rao, B.E., Surveyor General of India,
Survey of India, Hāthībarkala Estate, Post Box No.37, Dehra Dūn-248001 (Uttarākhand)
Department of Science & Technology, Government of India.
PRINTED AT THE SOUTHERN PRINTING GROUP OF SURVEY OF INDIA.

Annexure-III

Undertaking from PP

7838

भारतीय गैर न्यायिक

एक सौ रुपये Rs. 100

रु. 100 ONE HUNDRED RUPEES

सत्यमेव जयते

भारत INDIA

INDIA NON JUDICIAL

गुजरात गुजरात GUJARAT

BC 848432

नंबर : ૫૪૬૨ ૧૦૦ રૂ.
तारीख : 31-7 सने २०१७
नाम : ગામડી ગામ કાંકરાપાર્ક
सरनामुं : ૬૨ ૬૨૫૫ SERIAL NO : 7838 /2017
ભગવતીબેન ડી. પંડ્યા
લા.નં. SB/૨૨૪/૨૨૫/૧૯૯૬
અમદાવાદ મણીનગરના સાણંદી
सही : Harish Prabhakar

ATUL K. PATEL
NOTARY
GOVT. OF GUJARAT
31 JUL 2017

NOTARY ATUL K. PATEL THROUGHT OUT AHMEDABAD CITY EAST, WEST & DASCROI TALUKA REG. NO. NTR/584/05 VALID UP TO 11-08-2020 GOVT. OF GUJARAT (INDIA)
NOTARIAL NOTARIAL

Undertaking

I Mr.Girishkumar Bahecharbhai Patel, Director of M/s.Jemby Chem Limited located at Plot No. C-1/335, 336, 337, G.I.D.C. Estate, Ph-II, Vatva, Ahmedabad, Gujarat do hereby undertake as under.

- We undertake that we will not Dug new Borwell
- We will provide separate electric meter for ETP
- We give commitment to carry out tree plantation activities outside the premises at appropriate places in the nearby area (Common plot of G.I.D.C. & Open area of G.I.D.C. and elsewhere.
- We undertake that, content including information & data of EIA report is own by us and data or information not taken from any other EIA report.

What is stated here in above is true to the best of my knowledge and the same I believe to be true.

Date: 31.07.17
Place: Ahmedabad

Name: Mr.Girishkumar Bahecharbhai Patel
Designation: Director

Signature: G Patel

First Party / SecondParty
SIGN BEFORE ME

ATUL K. PATEL
NOTARY
GOVT. OF GUJARAT
31 JUL 2017

NOTARY ATUL K. PATEL THROUGHT OUT AHMEDABAD CITY EAST, WEST & DASCROI TALUKA REG. NO. NTR/584/05 VALID UP TO 11-08-2020 GOVT. OF GUJARAT (INDIA)

NOTARY ATUL K. PATEL THROUGHT OUT AHMEDABAD CITY EAST, WEST & DASCROI TALUKA REG. NO. NTR/584/05 VALID UP TO 11-08-2020 GOVT. OF GUJARAT (INDIA)

Annexure-IV

Details of Common Facilities (CF) like CETP, MEE/spray Dryer

The Green Environment Services Co-op. Society Ltd.

(Common Effluent Treatment Plant & Secured Landfill Facility)

Shankerbhai R. Patel
Chairman

Anandbhai I. Patel
Vice-Chairman (Administration)

Yogeshbhai D. Parikh
Vice-Chairman (Solid Waste)

Rameshbhai M. Patel
Vice-Chairman (MEE)

Bhupendrabhai C. Patel
Hon. Secretary

Jitendrabhai J. Doshi
Hon. Jt. Secretary

Pankajbhai P. Dadania
Hon. Treasurer

To,
JEMBY CHEM LIMITED,
C-1/335 to 337, PHASE: II, GIDC VATVA,
AHMEDABAD

Dear Sir

With reference to your letter dated 18/07/2017, kindly find the following details as per your requirement

1	**Total Capacity**	CETP	At present 16 MLD **After Expansion 30 MLD**
		MEE/Spray Dryer	At present 540 KLD After Expansion 924 KLD
2	**Total Booked capacity and Actual load received at present**	**CETP**	**Total Booked Qty.= 24.6 MLD** **Actual Received Qty.= 19 MLD**
		MEE/Spray Dryer	Total Booked Qty.= 842.5 KLD **Actual Received Qty.= 230 KLD**
3	CETP Up gradation Scheme, if any		**Fenton Catalytic Reactor Technology (Advanced oxidation process)**
4	**Last 5 analysis reports of GPCB**		**Attached**
5	Spare Capacity to accommodate the increased waste water quantity from the proposed expansion	CETP	Spare capacity available= 5.4 MLD
		MEE/ Spray Dryer	Spare capacity available= 81.5 KLD
6	**Compliance report of last environment audit report. (Oct-16 to Mar-17)**		Attached

Thanking you
Yours faithfully

Shankerbhai R Patel
Chairman
GESCSL

GPCB ANALYSIS RESULTS							
Sr No.	Parameters	Unit	12/6/2017	9/2/2017	24/1/2017	17/1/2017	3/11/2016
1	Temperature	Centigrade	30	30	32	27	28
2	pH	pH Units	7.26	6.95	7.7	7.58	7.87
3	Colour	Pt.Co.Sc.	4000	2000	1500	2000	300
4	Total Dissolved Solids	mg/l	12330	12262	12490	12230	9544
5	Suspended Solids	mg/l	130	140	114	72	106
6	Ammonical Nitrogen	mg/l	46.98	76.72	29.12	55.44	66.08
7	Chloride	mg/l	5180	5425	4390	5080	4205
8	Sulphate	mg/l	620	323	2334	979	452
9	Chemical Oxygen demand	mg/l	735	690	785	615	422
10	Oil & Grease	mg/l	1.8	6.4	3.4	1.2	0.4
11	Phenolic Compounds	mg/l	1.17	0.78	0.69	0.74	BDL
12	Cyanide	mg/l	BDL	BDL	BDL	BDL	BDL
13	Sulphide	mg/l	1.4	0.41	0.041	0.76	0.65
14	Hexavalent Chromium	mg/l	BDL	BDL	BDL	BDL	BDL
15	B.O.D (3 Days 27 ^{0}C)	mg/l	220	199	222	175	109

Annex 12: CC&A Compliance Report

Sr. No.	Condition	Compliance Status
1	**Consent Order No:AWH-64912 date of Issue:11/09/2014**	-
2.	The consent shall be valid up to 06/05/2019 for use of outlet for the discharge of trade effluent from their common effluent treatment plant located at PLOT NO-244&251, Phase No-II, GIDC-Vatva, Ahmedabad subject to following conditions	-
3.	**CONDITIONS UNDER THE WATER ACT:**	
3.1	The quantity of the industrial effluent from member units to be discharge by CETP shall not exceed 16000 m^3 /day. The quantity of concentrated effluent stream received from member units shall not exceed 300 m^3 /day. The concentrated stream shall be evaporated in MEE	Not Complied Actual flow observed during said audit period was 18,947 m^3/d.
3.2	The quantity of Sewage effluent from the factory shall not exceed 104 m^3/day.	Complied
3.3	**TRADE EFFLUENT:**	
3.3.1	The quality of industrial effluent shall conform to the following standards: As per CC&A attached	Partially Complied
3.3.2	The effluent confirming to the above standards shall be conveyed to Naroda-Pirana Sewage Mega pipe line through closed pipe line and the from collection system to Pirana Sewage treatment plant of Ahmedabad Muicipal Corporation through closed pipeline& shall be mixed with treated so that concentration of total dissolved solids remain below 2100 mg/L before disposal into river Sabarmati	Partially Complied
3.3.3	Domestic effluent shall conform to the following standards and shall discharged into AMC underground drainage system As per CC&A attached	Complied
3.3.4	The directives issued by the Board from time to time in view of direction issued by the Honourable High Court of Gujarat in the matter of S.C.A 770/95 and any other shall have to be complies with.	–
3.3.5	The society must devise & operate regularly a system to monitor the quality of effluent from each member unit as per the desired CETP inlet norms.	Complied
3.3.6	The Society must have an arrangement/ system to continuously and regularly ascertain the quality of trade effluent from member industries and bring it to the required norms in case of non-achievement of the said quality of effluent as per CETP inlet norms by	Complied

Sr. No.	Condition	Compliance Status
	the member industries.	
3.3.7	In the event of non-achievement of quality of treated effluent at the CETP outlet as per condition no.3of this order the CETP shall arrange for bringing the entire quantity of effluent to inlet of CETP and retreat the same to achieve the required quality of effluent.	Not Feasible
3.3.8	The society shall also evolve/devise a system to reuse treated effluent of the quality as shown in condition no.3 for toilet flushing, washings and/ or any other such purpose.	Not Feasible
3.3.9	The society shall have to ensure that all the member industries are discharging the effluent as per the required CETP inlet norms into CETP only. In other words no industry shall discharge their effluent into GIDC drain or by any other such means in unauthorized manner. In the event of failure on the part of any member industry to comply with this condition the society shall immediately bring this matter to the attention of GPCB.	Noted
3.3.10	In order to enable the board to perform its ascertain the standards of effluent laid down by it for the discharge of the effluent under the condition no.3 of this order are complied with by the society while causing discharge or effluent the society shall have to submit every month the analysis report of the samples of effluent got collected and analyzed by one of the laboratories recognized by the State Board	GPCB collects samples every month from CETP & results are available.
3.3.11	The leachate collection facilities for the sludge generated during treatment shall be provided and the leachate from the hazardous solid waste shall be diverted to the inlet by CETP for further treatment.	Complied
3.3.12	The society shall be responsible for collection of effluent from all their member units as per the required CETP inlet norms.	Complied
3.3.13	The society shall have to ensure that condition of effluent from all their member units (as per the CETP inlet norms) is done through a fixed pipeline only from the entire estate. The society shall keep accurate record of their member units in respect of quantity of each product manufactured quantity of water consumption, quantity of effluent supplied to CETP and consumption of electricity on day to day basis and is required to submit the complied report for every month to CPCB on or before seventh day of the succeeding month.	Complied
3.3.14	The society shall always ensure that the quality of effluent being discharged after treatment is as per the condition no.3 of this order.	Partially Complied
3.3.15	The Magnetic flow meters shall be installed at the various stages of inlet & outlet of CETP to measure the quantity of effluent at each stage of effluent treatment plant. The society is required to provide Magnetic Flow Meter at the final outlet of CETP within 7 days from	Complied

Sr. No.	Condition	Compliance Status
	the date of receipt of this order and report to the Board.	
3.3.16	The society shall instruct & make sure that every member shall have to make storage facilities to store the effluent for at least 24 hours in an impervious acid proof brick lining tank/ HDPE tank.	Complied
3.3.17	In case of power failure, the stand-by D.G. set having power generation capacity equivalent to the requirement of power to run all the units of CETP to achieve quality of treated effluent as per condition no.3 of this order shall be installed so that CETP shall always be functional round the clock even during power failure.	Complied
3.3.18	In case of either maintenance of the CETP or process disturbance or non functioning of CETP by any reason the society shall provide impervious tanks HDPE tanks impervious guard ponds to hold effluent for at least 48 hours but shall never discharge any untreated effluent into the environment.	Not Feasible
3.3.19	The society shall inform immediately to the GPCB regarding the termination suspension of the membership of CETP of their member unit.	Complied
3.3.20	The society shall make all the requisite arrangements for the safe storage and handling of solid waste including impervious flooring and leachate collection facilities. The society shall store and handle solid waste in accordance with the provision of relevant rules in this behalf after obtaining authorization from GPCB.	Complied
3.3.21	The society shall have to use only one outlet for the discharge of its effluent and no effluent shall be discharged without requisite treatment and without meeting with the GPCB norms. Such outlet shall be near the front gate/entrance of the unit. The society shall not to keep any bypass line or system or loose or flexible pipe for discharging effluent outside or even for transporting treated or untreated effluent within the CETP and it shall also define and provide adequate sampling point for collection of samples.	Partially Complied
3.3.22	The society shall within one week from the date of issue of this order: a) Put up at the entrance the list displaying the names of the member units, details of the electricity consumer as per the record of the Torrent Power Ltd. b) Make adequate lighting arrangements all around the effluent plant.	Complied
3.3.23	The society shall (within one week from the date of issue of this order) submit GPCB the site effluent treatment plants, and also a separate plan indicating the channel through which water/effluent passes from different stages of effluent treatment process right up to the stage of its compound and near its effluent treatment plants.	--

Sr. No.	Condition	Compliance Status
3.3.24	The society shall supply to the GPCB the figures of the Consumption of electricity for running the common effluent treatment plants by having a separate meter sub-meter for such effluent treatment unit. The number of electricity units consumed by operation the diesel generating sets, if any shall also be supplied to the GPCB on monthly basis.	--
3.3.25	The society shall have to permit the employees of the GPCB, Government, Member of the monitoring committee of the high court and members of the Association of the industries to enter the premises and take samples from the unit at any time without any prior intimation and obstruction. All the watchmen/security personnel of the unit shall be given instruction of the above.	Noted and Complied
3.3.26	It shall be open to the GPCB through general instruction of circulars and to the GPCB officers inspecting the unit you give all the support instruction regarding location of the outlet and/or any other appropriate directives regarding effluent treatment plants their cooperation and processes and disposal channel and disposal system. The society shall comply with all such instructions, whether general or specific.	Complied
3.3.27	All the chemicals and nutrients which are required to the added dosed anywhere in the CETP shall be so added by using "Meter Pump". The CETP shall ensure that all these chemicals nutrients of required conc. Are present in adequate & sufficient quantity all the time. A separate register for shall be maintained for this purpose.	Complied
3.3.28	The pipeline connecting various equipments or sumps or tanks of CETP should be minimum in number. Loose connections of hose pipes, temporary connections will not be permitted.	Complied
3.3.29	In case of plants involving Bio-mass treatment for each addition of bio-mass time and quantity shall be recorded. The uptake rate of oxygen of the bio-mass in aeration basin and other parameters of biological system shall be recorded everyday and shall be easily available for inspection& verification.	Complied
3.3.30	The printed log books shall be maintained regularly and get it certified for: a) Energy/Fuel consumption/consumption of chemicals/nutrients/coagulants/flocculants etc. for treatment of effluent. b) Waste water flow at inlet & outlet of CETP. c) Quantity of sludge & leachate generated & their composition. d) Laboratory analysis/report for each of the specified parameters of liquid effluents and soil sludge samples.	Complied

THE GREEN ENVIRONMENT CO.OP. SOCIETY LTD. AHMEDABAD Plot No. 244, 251, Phase-II, GIDC, VATVA

Sr. No.	Condition	Compliance Status
3.3.31	Adequate number of influent and effluent quality monitoring stations shall be set up in consultation with the Gujarat Pollution Control Board. Regularly effluent quality monitoring shall be carried out for relevant parameters and the monitored data along with the statistical analysis and interpretation shall be submitted to the GPCB regularly every month and when asked for.	Complied
3.3.32	The ground water quality around the impervious guard ponds and landfill site shall be monitored regularly thrice a year & the data shall be submitted to this Board and comply with the instruction of GPCB in case of deterioration.	Complied
3.3.33	A secured double lined storage shall be developed within the plant premises for disposal of solid waste by providing impervious liner and leachate collection system. The leachate shall be taken to the treatment plant for further treatment. The design of the landfill site shall be submitted to the Board and the government.	Complied
3.3.34	Handling manufacturing, storage and transport of hazardous chemical shall be in accordance with the Hazardous Chemicals Rules, 1989 amended time to time.	Complied
3.3.35	Transportation of effluent, solid waste or any other goods chemicals etc. pertaining to treatment activities, shall be carried out as per central Motor Vehicle Rules-1989.	--
3.3.36	The hazardous waste shall be handled as per the Hazardous waste (Management and Handling Rules of the Environment (Protection) Act.1986.	Complied
3.3.37	On site and off site emergency plan as required under the Rules 13&14 of handling manufacturing storage and import of the Hazardous Chemicals Rules.1989 shall be prepared and approval from the competent authorities shall be obtained.	Complied
3.3.38	A community welfare scheme for improving the socio-economic environment of the surrounding area shall be worked out and report submitted to the GPCB for review.	--
3.3.39	Periodic medical checkup of all the employees/workers of the collection & analysis of samples under the supervision of competent technical personnel who will report to the chief executive from time to time.	Complied
3.3.40	The Environment Management Unit/Cell shall be setup to ensure implementation on and monitoring of environment safe guards and other condition stipulated by statutory authorities. The Environment Management Unit/Cell directly report to the Chief of the organization and shall work as a focal point for internalizing environment issues. These Cells/Units also coordinate the exercise of	Complied

THE GREEN ENVIRONMENT CO.OP.SOCIETY LTD. Plot No. 244, 251, Phase-I, GIDC, KATHWADA AHMEDABAD

Sr. No.	Condition	Compliance Status
	the environment audit and preparation of the environmental statements.	
3.3.41	The Environmental audit shall be carried out and the audit reports shall be submitted as per the Hon.High Court Order dtd.16.09.2009.	Complied
3.3.42	The funds earmarked for the environmental protection measures shall not be diverted for any other purpose and year wise expenditure shall be reported to this Board & to the Government	--
3.3.43	The Storm water shall not mixed with the industrial effluent. The disposal system for storm water shall be provided separately.	Complied
3.3.44	The good housekeeping shall be maintained within the CETP premises. All pipes, valves and drains shall be leak proof. All washings, leakages, spillages and any other activity which is likely to cause such phenomenon shall be admitted in to the effluent collection system for subsequent treatment and disposal.	Complied
3.3.45	The society shall intimate the occurrence of any accident or event resulting in discharge of poisonous, noxious or polluting matter or the likely hood of the same into a stream or well, to the Gujarat Pollution Control Board deems fit in accordance with the Section 31(1) of the Water Act-1974 & also to all the concerned agencies.	--
3.3.46	The Board reserves the right to review and/or revoke the consent and /or make variations in the condition which the Board deems fit in accordance with Section27 of the Act.	--
3.3.47	In case of change of ownership/management the name and address of the new owner/partners directors/proprietor should immediately be intimated to the Board.	Noted
3.3.48	The consent to operate the industrial plant shall lapse automatically at any time the parameters of the effluent are not within the tolerance/permissible limit specified in condition No.3 of the order or in case of non-compliance of the any condition of this order.	--
3.3.49	The society is duty bound to comply with all the condition of consent order and subjected to all the condition & directives issued by the Hon'ble High Court order dtd.5/8/95 in & subsequent order in SCA 770/95 issued from time to time.	--
3.3.50	A green belt of 10mt.width shall be provided all around the society premises & the density of plantation shall be 1000trees per acre of land.	Complied
4	**CONDITIONS UNDER THE AIR ACT:**	
4.1	Coal shall be used as fuel in boiler.	Complied
4.2	The applicant shall install & operate air pollution control system in order to achieve norms prescribed below.	Complied
4.2.1	The flue gas emission through stack shall conform to the following	Complied

THE GREEN ENVIRONMENT CO.OP.SOCIETY LTD. • AHMEDABAD • Plot No. 244, 245, Phase II, GIDC, VATVA

Sr. No.	Condition	Compliance Status
	standards: As per CC&A attached	
4.2.2	There shall be no process emission from the manufacturing process as well as any other ancillary process	Complied
4.2.3	Ambient air quality within and outside the premises of the unit shall conform National Ambient Air Quality standards notified by MOEF vide notification dated 16/11/2009 and mainly to the following standards. As per CC&A attached	Complied
4.3	The applicant hall provide portholes, ladder, platform etc at chimney(s) for monitoring the air emissions and the same shall be open for inspection to/and for use of Board's staff. The chimney(s) vents attached to various sources of emission shall be designed by numbers such as S-1,S-2, etc, and these shall be painted/ displayed to facilitate identification.	Partially Complied Noise level was slightly higher side between blower room and equalization tank & between aeration tank & blower room.
4.4	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 standards in respect of noise to less than 75dB(a) during day time and 70dB(a) during night time. Daytime is reckoned in between 6a.m. and 10 p.m. and nighttime is reckoned between 10p.m. and 6 a.m.	--
4.5	The applicant shall provide proper ventilation and exhaust facilities so as to maintain healthy working atmosphere within the factory premises.	Complied
5.	**GENERAL CONDITION:-**	
5.1	Any change in personnel, equipment or working conditions as mentioned in the consents form/order should immediately be intimated to this Board.	Complied
6	**AUTHORISATION FOR THE MANAGEMENT & HANDLING OF HAZARDOUS WASTES Form-2 (see rule 3(c) & 5(5))** Form for grant of authorization for occupier or operator handling hazardous waste	
6.1	**Number of authorization: AWH-64912 date of Issue : 11/09/2014**	
6.1.1	M/s. **THE GREEN ENVIRONMENT SERVICES CO.OP.SOCIETY LTD.(CETP),** is hereby granted an authorization to operate facility for following hazardous wastes on the premises situated at, **PLOT NO:**	Partially Complied Generation of

Sr. No.	Condition	Compliance Status
	244-251, PHASE :II, GIDC:VATVA, AHMDEDABAD:382445 As per CC&A attached	CETP sludge during said audit period was 96.3 MT/d.
6.1.2	The authorization is granted to operate a facility for collection, storage, *within the factory premises,transportation and ultimate disposal of Hazardous wastes at as mentioned above.*	Complied
6.1.3	The authorization shall be in force for a period up 06/05/2019	--
6.1.4	The authorization is subject to the conditions stated below and such other conditions as may be specified in the rules from time to time under the Environment(Protection) Act-1986	Noted
6.1.5	**TERMS AND CONDITIONS OF THE AUTHORISATION**	
a)	The application shall comply with the provisions of the Environment (Protection) Act-1986 and the rules made there under.	Complied
b)	The authorization shall be produced for inspection at the request of an officer authorized by the Gujarat Pollution Control Board.	Complied
c)	The persons authorized shall not rent, lend, sell, transfer of otherwise transport the hazardous wastes without obtaining prior permission of the Gujarat Pollution Control Board.	Complied
d)	Any unauthorized change in personnel, equipment or working conditions as mentioned in the authorization order by the persons authorized shall constitute a breach of this authorization.	Complied
e)	It is the duty of the authorized person to take prior permission of the Gujarat Pollution Control Board to close down the facility.	Complied
f)	An application for the renewable of an authorization shall be made as laid down in rule 5(6)(ii)	Complied
g)	Industry shall have to manage waste oil, discarded containers etc as per Amended Rules 2003.	Complied
h)	Industry shall submit annual report within 15 days and sub sequently by 31st January every year.	Complied

THE GREEN ENVIRONMENT CO.OP.SOCIETY LTD. Plot No. 244, 251, Phase-II, GIDC, VATVA AHMEDABAD

To,
JEMBY CHEM LIMITED,
C-1/335 to 337, PHASE: II, GIDC VATVA,
AHMEDABAD

Dear Sir

With reference to your letter dated 18/07/2017, kindly find the following details as per your requirement

1	Total Capacity	30000 Ton/month
2	Total Booked capacity and Actual load received at present	51590 Ton/month 19000 Ton/month
3	Novel Up gradation Scheme, if any	Yes
4	Last 3 analysis reports of GPCB	Attached
5	Spare Capacity to accommodate the increased Spent Acid quantity from the proposed expansion	Spare capacity available = 11000 Ton /month
6	Compliance report of last environment audit report. (Oct-16 to Mar-17)	Attached
7	Unit's Booking at Novel	600 Ton/Month (membership certificate attached)

Thanking you
Yours faithfully
For and Behalf of
Novel Spent Acid Management

Shankerbhai R Patel
Chairman

ANALYSIS REPORT FOR
WATER / WASTE WATER SAMPLE

Sample ID 205591-A for M/S Gandhara - 07/03/2017

Organic Chemicals manufacturing / LAB Inward : 50385

Gujarat Pollution Control Board,
Central Laboratory
Paryavaran Bhavan
Sector-10A
Gandhinagar-382010

Accreditation Standards & NABL Certificate Details: T-2105 / ISO/IEC 17025:2005 / 21/12/2011 / 20/12/2013

TEST REPORT

Test Report No. : 50385 Date: 07/03/2017

1. Name of the Customer : Novel Spent Acid Management - 12877
2. Address : Plot No: G1, Phase No: I,-
VATVA - AHMEDABAD-382445, Taluka : Ahmedabad-Vatva, District : Ahmedabad-\
3. Nature of Sample : REP-Representative/Grab, (Insp Type: COM-On Complaint)
4. Sample Collected By : B.R.Gajjar,R.O Head
5. Quantity of Sample Received : 5 lit
6. Code No. of the Sample : 205591
7. Date & Time of Collection & Inwarding : 17/02/2017 , (1515 to 1515) & 21/02/2017
8. Date of Start & Completion of Analysis : 21/02/2017 & 07/03/2017
9. Sampling Point : From final treated wastewater holding cum CETP discharge tank ~
10. Flow Details (Remarks) :
11. Mode of Disposal : In to CETP of GESCSL, Vatva
12. Ultimate Receiving Body : No generation of industrial wastewater
13. Temperature on Collection : 31 & pH Range on pH Strip :7 to 8 on pH strip
14. Carboys Nos for : & Color & Appearance:Dark Brown
15. Water Consumption & W.W.G (KLPD) : Ind :1810.000 , Dom :5.000 & Ind :2786.000 , Dom :3.000

Sr	Parameter	Unit	Test Method	Range of Testing	Result
1	Temperature	Centigrade	IS: 3025 (Part – 9) – 1984(Reaffirmed 2006)	Ambient oC - 60 oC	31
2	pH	pH Units	4500 H+ B APHA Standard Methods 22nd edi.2012	1 – 14 pH value As or	7.95
3	Colour	Pt.Co.Sc.	2120 B APHA Standard Methods 22nd edi. 2012	2 - to 99 Hazen & 1-50	2000
4	Total Dissolved Solids	mg/l	Gravimetric method. (2540 C APHA Standard Methoc	10 – 200000 mg/L	15298
5	Suspended Solids	mg/l	Gravimetric method. (2540 D APHA Standard Methoc	2 – 10000 mg/L	66
6	Ammonical Nitrogen	mg/l	1) Titrimetric method (4500 NH3 B & C APHA Standa	1 - 2000 mg/l.	39.2
7	Chloride	mg/l	Argentometric method. (4500 Cl? B APHA Standard M	1 - 50000 mg/l	6225
8	Sulphate	mg/l	APHA(22nd edi)4500 SO4 E	2-40mg/l	1220
9	Chemical Oxygen Demand	mg/l	APHA (22nd Edition)- 5220 B Open Reflux Method-2	5.0- 50000 mg/l	1603
10	Oil & Grease	mg/l	Liquid – Liquid Partition Gravimetric method. (5520 B	01 – 1000 mg/l	9.6
11	Phenolic Compounds	mg/l	4 Amino Antipyrene method without Chloroform Extra	0.1 – 50 mg/l	1.53
12	Cyanide	mg/l	Titrimetric method. (4500 - CN? D APHA Standard Mc	1-10 mg/l	BDL
13	Fluoride	mg/l	SPADNS method (4500-F-D APHA standard Methods	0.10-40 mg/l	0.72
14	Sulphide	mg/l	APHA (22nd Edi.)4500-s2-F –Iodometric Method	1-500.0 mg/l	0.49
15	Iron	mg/l	(3111 B APHA Standard methods 21st edi)	0.02-150mg/l	0.082
16	Zinc	mg/l	(3111 B APHA Standard methods 21st edi)	0.005-100mg/l	0.072
17	Total Chromium	mg/l	3111 B APHA Standard methods 21st edi)	0.02-150mg/l	0.010
18	Hexavalent Chromium	mg/l	APHA (22nd Edition) –3500 – Cr B : -2012 Colorimet	0.1 – 100 mg/l	BDL
19	Copper	mg/l	3111 B APHA Standard methods 21st edi)	0.01-150 mg/l	0.003
20	Nickel	mg/l	(3111 B APHA Standard methods 21st edi)	0.02-150 mg/l	0.005
21	Lead	mg/l	(3111 B APHA Standard methods 21st edi)	0.05-150 mg/l	BDL
22	B.O.D (3 Days 27oC)	mg/l	3 – Day BOD test. (IS 3025 (Part 44) 1993 Reaffirmed	05–50000 mg/l	526

NOVEL SPENT ACID MANAGEMENT • A'BAD • NSAM

Laboratory Remarks : Approved By:134-lab_134 Dt.: 07/03/2017

Meenakshi Shah, SSO

Field Observation :

Note :

1. * - These parameters are covered under the scope of NABL.
2. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.
3. Samples will be destroyed after 10 days from the date of issue of test report unless otherwise specified.
4. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Board in writing.
5. The Board is not responsible for the authenticity for the samples not collected by the Board's officials.
6. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
7. Permissible Limits: as per Schedule VI of EPA Rules, 1986 as ammended by Second and Third ammendment 1993 for Effluents
8. Physicochemical and microbiological parameters, Std.Methods for Water and Waste Water- 22nd Edition by APHA.
9. Bioassay test (for toxicity) -IS:6582:Part-2:2001; Reaffirmed 2007.

N | C

26/07/2017

ANALYSIS REPORT FOR
WATER / WASTE WATER SAMPLE

Sample ID:203817 - Analysis Completion:10/02/2017

Organic Chemicals manufacturing / LAB Inward : 49891

Gujarat Pollution Control Board,
Central Laboratory
Paryavaran Bhavan
Sector-10A
Gandhinagar-382010

Accreditation Standards & NABL Certificate Details : T-2105 / ISO/IEC 17025:2005 / 21/12/2011 / 20/12/2013

TEST REPORT

Test Report No. : 49891 Date: 10/02/2017

1. Name of the Customer : Novel Spent Acid Management - 12877
2. Address : Plot No: G1, Phase No: 1,- VATVA - AHMEDABAD-382445, Taluka : Ahmedabad-Vatva, District : Ahmedabad-V
3. Nature of Sample : REP-Representative/Grab, (Insp Type : ROU-Routine Visit)
4. Sample Collected By : I.N.Ghasura,S.O
5. Quantity of Sample Received : 5 lit
6. Code No. of the Sample : 203817
7. Date & Time of Collection & Inwarding : 20/01/2017 , (1230 to 1230) & 23/01/2017
8. Date of Start & Completion of Analysis : 23/01/2017 & 10/02/2017
9. Sampling Point : ## Final Outlet of the ETP ~
10. Flow Details (Remarks) : -
11. Mode of Disposal : In to CETP of GESCSL, Vatva.
12. Ultimate Receiving Body : No generation of industrial wastewater
13. Temperature on Collection : 30 & pH Range on pH Strip :@ 7 to 8 on ph paper strip
14. Carboys Nos for : Barcode & Color & Appearance :Dark brown
15. Water Consumption & W.W.G (KLPD) : Ind :1810.000 , Dom :5.000 & Ind :2786.000 , Dom :3.000

Sr	Parameter	Unit	Test Method	Range of Testing	Result
1	Temperature	Centigrade	IS: 3025 (Part – 9) – 1984(Reaffirmed 2006)	Ambient oC - 60 oC	30
2	pH	pH Units	4500 H+ B APHA Standard Methods 22nd edi.2012	1 – 14 pH value As or	7.26
3	Colour	Pt.Co.Sc.	2120 B APHA Standard Methods 22nd edi. 2012	2 - to 99 Hazen & 1-50	5000
4	Total Dissolved Solids	mg/l	Gravimetric method. (2540 C APHA Standard Methoc	10 – 200000 mg/L	22830
5	Suspended Solids	mg/l	Gravimetric method. (2540 D APHA Standard Methoc	2 – 10000 mg/L	276
6	Ammonical Nitrogen	mg/l	1).Titrimetric method (4500 NH3 B & C APHA Standa	1 - 2000 mg/l.	29.68
7	Chloride	mg/l	Argentometric method. (4500 Cl? B APHA Standard M	1 - 50000 mg/l	9325
8	Sulphate	mg/l	APHA(22nd edi)4500 SO4 E	2-40mg/l	1213
9	Chemical Oxygen Demand	mg/l	APHA (22nd Edition)- 5220 B Open Reflux Method-2	5.0- 50000 mg/l	3486
10	Oil & Grease	mg/l	Liquid – Liquid Partition Gravimetric method. (5520 B	01 – 1000 mg/l	7.6
11	Phenolic Compounds	mg/l	4 Amino Antipyrene method without Chloroform Extra	0.1 – 50 mg/l	5.47
12	Cyanide	mg/l	Titrimetric method. (4500 - CN? D APHA Standard Mi	1-10 mg/l	BDL
13	Fluoride	mg/l	SPADNS method (4500-F-D APHA standard Methods	0.10-40 mg/l	0.72
14	Sulphide	mg/l	APHA (22nd Edi.)4500-s2-F –iodometric Method	1-500.0 mg/l	0.22
15	Iron	mg/l	(3111 B APHA Standard methods 21st edi)	0.02-150mg/l	0.021
16	Zinc	mg/l	(3111 B APHA Standard methods 21st edi)	0.005-100mg/l	0.018
17	Total Chromium	mg/l	3111 B APHA Standard methods 21st edi)	0.02-150mg/l	0.001
18	Hexavalent Chromium	mg/l	APHA (22nd Edition) –3500 – Cr B : -2012 Colorimet	0.1 – 100 mg/l	BDL
19	Copper	mg/l	3111 B APHA Standard methods 21st edi)	0.01-150 mg/l	0.001
20	Nickel	mg/l	(3111 B APHA Standard methods 21st edi)	0.02-150 mg/l	0.002
21	Lead	mg/l	(3111 B APHA Standard methods 21st edi)	0.05-150 mg/l	BDL
22	B.O.D (3 Days 27oC)	mg/l	3 – Day BOD test. (IS 3025 (Part 44) 1993 Reaffirme	05–50000 mg/l	1573

NOVEL SPENT ACID MANAGEMENT • A'BAD • NSAM

NOVEL SPENT ACID MANAGEMENT * A'BAD * NSAM

Laboratory Remarks : Approved By:134-lab_134 Dt.: 10/02/2017

Meenakshi Shah, SSO

Field Observation :

Note :

1. * - These parameters are covered under the scope of NABL.
2. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.
3. Samples will be destroyed after 10 days from the date of issue of test report unless otherwise specified.
4. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Board in writing.
5. The Board is not responsible for the authenticity for the samples not collected by the Board's officials.
6. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
7. Permissible Limits: as per Schedule VI of EPA Rules, 1986 as ammended by Second and Third ammendment 1993 for Effluents
8. Physicochemical and microbiological parameters, Std.Methods for Water and Waste Water- 22nd Edition by APHA.
9. Bioassay test (for toxicity) -IS:6582:Part-2:2001; Reaffirmed 2007.

N I C

26/07/2017

ANALYSIS REPORT FOR
WATER / WASTE WATER SAMPLE

Sample ID: 195239 - Analysis Completion:28/09/2016

Organic Chemicals manufacturing / LAB Inward : 47793

Gujarat Pollution Control Board,
Central Laboratory
Paryavaran Bhavan
Sector-10A
Gandhinagar-382010

Accreditation Standards & NABL Certificate Details : T-2105 / ISO/IEC 17025:2005 / 21/12/2011 / 20/12/2013

TEST REPORT

Test Report No. : 47793 Date: 28/09/2016

1. Name of the Customer : Novel Spent Acid Management - 12877
2. Address : Plot No: G1, Phase No: I,-
   VATVA - AHMEDABAD-382445, Taluka : Ahmedabad-Vatva, District : Ahmedabad-\
3. Nature of Sample : REP-Representative/Grab, (Insp Type : ROU-Routine Visit)
4. Sample Collected By : A.D.Bhimani,SO
5. Quantity of Sample Received : 5 lit
6. Code No. of the Sample : 195239
7. Date & Time of Collection & Inwarding : 13/09/2016 , (1610 to 1610) & 15/09/2016
8. Date of Start & Completion of Analysis : 15/09/2016 & 28/09/2016
9. Sampling Point : ## Final Outlet of the ETP ~
10. Flow Details (Remarks) : -
11. Mode of Disposal : Into CETP
12. Ultimate Receiving Body : No generation of industrial wastewater
13. Temperature on Collection : 33 & pH Range on pH Strip :@ 7 to 8 on pH strip
14. Carboys Nos for : Barcode & Color & Appearance :Brownish
15. Water Consumption & W.W.G (KLPD) : Ind :1810.000 , Dom :5.000 & Ind :2786.000 , Dom :3.000

Sr	Parameter	Unit	Test Method	Range of Testing	Result
1	Temperature	Centigrade	IS: 3025 (Part – 9) – 1984(Reaffirmed 2006)	Ambient oC - 60 oC	33
2	pH	pH Units	4500 H+ B APHA Standard Methods 22nd edi.2012	1 – 14 pH value As or	7.59
3	Colour	Pt.Co.Sc.	2120 B APHA Standard Methods 22nd edi. 2012	2 - to 99 Hazen & 1-50	3000
4	Total Dissolved Solids	mg/l	Gravimetric method. (2540 C APHA Standard Methoc	10 – 200000 mg/L	17884
5	Suspended Solids	mg/l	Gravimetric method. (2540 D APHA Standard Methoc	2 – 10000 mg/L	446
6	Ammonical Nitrogen	mg/l	1).Titrimetric method (4500 NH3 B & C APHA Standa	1 - 2000 mg/l.	65.52
7	Chloride	mg/l	Argentometric method. (4500 Cl? B APHA Standard M	1 - 50000 mg/l	7833
8	Sulphate	mg/l	APHA(22nd edi)4500 SO4 E	2-40mg/l	1040
9	Chemical Oxygen Demand	mg/l	APHA (22nd Edition)- 5220 B Open Reflux Method-2	5.0- 50000 mg/l	1678
10	Oil & Grease	mg/l	Liquid – Liquid Partition Gravimetric method. (5520 B	01 - 1000 mg/l	1.7
11	Phenolic Compounds	mg/l	4 Amino Antipyrene method without Chloroform Extra	0.1 – 50 mg/l	1.47
12	Cyanide	mg/l	Titrimetric method. (4500 - CN? D APHA Standard M	1-10 mg/l	BDL
13	Fluoride	mg/l	SPADNS method (4500-F-D APHA standard Methods	0.10-40 mg/l	0.61
14	Sulphide	mg/l	APHA (22nd Edi.)4500-s2-F –Iodometric Method	1-500.0 mg/l	0.68
15	Iron	mg/l	(3111 B APHA Standard methods 21st edi)	0.02-150mg/l	0.042
16	Zinc	mg/l	(3111 B APHA Standard methods 21st edi)	0.005-100mg/l	0.029
17	Total Chromium	mg/l	3111 B APHA Standard methods 21st edi)	0.02-150mg/l	0.003
18	Hexavalent Chromium	mg/l	APHA (22nd Edition) –3500 – Cr B : -2012 Colorimet	0.1 – 100 mg/l	BDL
19	Copper	mg/l	3111 B APHA Standard methods 21st edi)	0.01-150 mg/l	0.001
20	Nickel	mg/l	(3111 B APHA Standard methods 21st edi)	0.02-150 mg/l	0.002
21	Lead	mg/l	(3111 B APHA Standard methods 21st edi)	0.05-150 mg/l	BDL
22	B.O.D (3 Days 27oC)	mg/l	3 – Day BOD test. (IS 3025 (Part 44) 1993 Reaffirmed	05-50000 mg/l	729

NOVEL SPENT ACID MANAGEMENT * A'BAD * NSAM

Laboratory Remarks : Approved By:134-lab_134 Dt.: 28/09/2016

Meenakshi Shah, SSO

Field Observation :

Note :

1. * - These parameters are covered under the scope of NABL.
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9. Bioassay test (for toxicity) -IS:6582:Part-2:2001; Reaffirmed 2007.

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26/07/2017

<table>
<tr><td colspan="3">Condition No. 1 Water Act 1974</td></tr>
<tr><td>Condition No. 1

Consent Order No.: WH-68505 date of Issue; 25/02/2015.

The consents shall be valid up to 24/09/2019 for use of outlet for the discharge of trade effluent & emission due to operation of industrial plant for manufacture of the following items/products;</td><td>:</td><td>--</td></tr>
<tr><td>Condition No. 2

The consents shall be valid up to 24/09/2019 for use of outlet for the discharge of trade effluent & emission due to operation of industrial plant for manufacture of the following items/ products:
<table>
<tr><th>Sr. No</th><th>Product</th><th>Quantity</th></tr>
<tr><td>1</td><td>Gypsum</td><td>8201 MT/Month</td></tr>
<tr><td>2</td><td>Re-use of Spent Sulphuric Acid</td><td>15001 MT/Month</td></tr>
</table></td><td>:</td><td>Complied</td></tr>
<tr><td>Specific Condition:

• Unit shall comply will condition mentioned in CTE order No-GPCB/ NOC/ABD/VT-2475/18798 dated: 03/07/2008.
• Unit shall obtain permission from CPCB New Delhi Under Rule-11 of Amended Hazardous Rules-2008 for recycling/reuse of Spent Sulphuric Acid.
• Unit shall comply with all guidelines/Notifications under Amended Hazardous Rules-2008 as amended from time to time.</td><td>:</td><td>Complied
Copy of permission from CPCB is attached as an Annexure – 14.</td></tr>
<tr><td colspan="3">Condition : 3 Water Act</td></tr>
<tr><td>Condition No. 3.1

The quantity of trade effluent from the factory shall not exceed 2783. 0 kL/day.</td><td>:</td><td>Complied</td></tr>
<tr><td>Condition No. 3.2

The quantity of Sewage effluent from the factory shall not exceed 3.0 kl/day.</td><td>:</td><td>Complied</td></tr>
<tr><td colspan="3">Condition No. 3.3 The Trade Effluent</td></tr>
</table>

Condition No. 3.3.1 The effluent from the industrial unit shall conform to the CETP inlet norms mentioned in column No. 1 below (in case of CETP member). The final discharge from CETP shall adhere to the prescribed standards for CETP.	:	**Complied**
Condition No. 3.3.2 In the event of the effluent from industrial unit not routed through CETP- the applicant shall treat the effluent in order to achieve the quality of the treated effluent as per GPCB norms mentioned in column No.2 and discharged into the mega pipe line Under no circumstances effluent shall be discharged in to GIDC drain/ Khari cut canal/River Khari. The table as per the Consent Order.	:	**Complied**
Condition No. 3.3.3 The effluent conforming to the above standards shall be conveyed to common effluent treatment plant through closed pipe line and then from Common Effluent Treatment Plant to Pirana Sewage treatment plant of Ahmedabad Municipal Corporation through closed pipeline & shall be mixed with treated sewage so that concentration of total dissolved solids remain below 2100 mg/L before disposal into river Sabarmati.	:	**Complied**
Condition No. 3.3.4 Domestic effluent shall he disposed off through septic tank/soak pit system	:	**Complied**
Condition No. 3.3.5 The directives issued by the Board from time to time in view of direction issued by the Honorable High Court of Gujarat in the matter of S.C.A. 770/95 and am other shall have to be complies with.	:	--
Condition No. 4 CONDITIONS UNDER THE AIR ACT:		
Condition No. 4.1 The following shall be us as fuel in boiler/furnace/heater respectively.	:	LDO Consumption Data not Available with the unit.

Sr. No.	Fuel	Quantity

1	LDO	110 L/h		
Condition No. 4.2.1 The applicant shall install & operate air pollution control system in order to achieve norms prescribed as per Consent Order			:	**Complied**
Condition No. 4.2.2 The flue gas emission through stack attached to boiler/furnace/heater shall conform to the standards shown in the Consent Order.			:	**Complied**
Condition No. 4.2.3 There shall be no Process emission.			:	The unit has obtained CTE vide order number 80992 in which there are three process vents from scrubbers.
Condition No. 4.2.4 Ambient air quality within and outside the premises of the unit shall conform National Ambient Air Quality standards notified be MOEF vide notification dated 16/1/2009 and main to the standards as per Consent Order.			:	**Partially Complied** $PM_{2.5}$ and PM_{10} was found to be on higher side during one of our monitoring.
Condition No. 4.3 The applicant shall provide portholes, ladder, platform etc at chimney(s) for monitoring the air emissions and the same shall be open for inspection to/and for use of Board's staff, The chimney(s) vents attached to various sources of emission shall be designed by numbers such as S-1, S-2, etc. and these shall be painted/displayed to facilitate identification.			:	**Complied**
Condition No. 4.4 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 standards in respect to noise to less than 75 db(A) during day time and 70 db(A) during night time. Daytime is reckoned in between 6 am and 10 am and night time is reckoned between 10 pm and 6 am			:	**Complied**

Condition No. 4.5 The applicant shall provide proper ventilation and exhaust facilities so as to maintain healthy working atmosphere within the factory	:	**Complied**
Condition No. 5: GENERAL CONDITIONS		
Condition No. 5.1 Any change in personnel, equipment or working conditions as mentioned in the Consents form/order should immediately be intimated to this Board.	:	--
Condition No. 6 **AUTHORISATION FOR THE MANAGEMENT & HANDLING OF HAZARDOUS WASTES Korm-2 (See rule 3 (c) & S (5)** Form for grant of authorization for occupier or operator handling hazardous waste		
Condition No. 6.1 Number of authorization: YVH-68S05 date of issue:25/02/2015	:	--
Condition No. 6.1.1 M/S. NOVEL SPENT AC/ID MANAGEMENT hereby granted an authorization to operate facility for hazardous wastes shown in the Consent order on the premises situated at: PLOT NO; G-I PH:I GIDC:VATVA,AHMEDABAD-382445	:	**Complied**
Condition No. 6.1.2 The authorization is granted to operate a facility for collection, storage, within factory premises, transportation and ultimate disposal on hazardous wastes at TSDF.	:	--
Condition No. 6.1.3 The authorization shall he in force for a period of 24/09/2019 from the date of application.	:	--
Condition No. 6.1.4 The authorization is subject in the conditions stated below and such other conditions as may be specified in the rules from time to time under the Environment (Protection) Act-1986.	:	--
Condition No. 6.1.5: TERMS AND CONDITIONS OF AUTHORISATION		

NOVEL SPENT ACID MANAGEMENT NSAM A'BAD

a) Applicant shall have to comply with provisions of Hazardous waste (Management & Handing) Rules-1989 as amended from time to tune	:	**Complied**
1. The Novel Spent Acid Management (NSAM) shall receive the spend acid from their member units by manifest system only as per provisions laid down under the Hazardous (M&H) Rules as amended upto 2003.	:	**Complied**
2. The NSAM shall receive the spent acid (i.e. inorganic Acid- Category D-2 Sch.II from the member units who are having valid authorization of this Board for selling the same to NSAM.	:	**Complied**
3. NSAM shall ensure that all the member units shall get their authorization amended in respect of selling of spent acid to them, if not amended.	:	**Complied**
4. The transportation of spent acid carried out only through suitably designed and dedicated vehicles: with uniform colour pattern and labels.	:	**Complied**
5. Vehicle used for transportation of spent acid shall be in accordance with Motor Vehicles Act ! 988 and rules made their under.	:	**Complied**
6. The NSAM shall inform GPCB or local authority and others concerned immediately in ease of spillage, leakage or other accidents during transportation of spent acid.	:	**Complied**
7. The driver of the vehicle engaged in transportation of spent acid shall be trained with regard to the emergency response measures to be taken during the transportation.	:	**Complied**
8. The vehicle engaged in transportation of spent acid shall have the words "HAZARDOUS WASTE" displayed on all sides of the vehicle in vernacular language, Hindi- English and should be fined with mechanical handling equipment as may be required for safe handling and transportation of hazardous waste.	:	**Complied**

NOVEL SPENT ACID MANAGEMENT NSAM A'BAD

9. Emergency phone numbers and TREM cared in Form 10 of Hazardous WASTE Rules 1989 and as amended shall be displaced proper) on vehicle engaged in transportation of spent acid.	:	--
10. Each vehicle engaged in transportation of spent acid shall carry first aid kit and spill control equipment.	:	**Complied**
11. The NSAM and their member units shall maintain the records pertaining to receiving and selling of spent acid along with its concentration and shall submit the same to the same to this Board regularly.	:	**Complied**
12. The NSAM shall specifically, maintain the records regarding the quantity of selling and treatment of spent acid and shall submit the same to the same to this Board regularly.	:	**Complied**
13. In case of any environmental damage due to illegal transportation and disposal of spent acid. The NSAM shall be responsible for the restoration of environment and shall bear the cost required tor the same.	:	--
Other Conditions		
1) Impervious flooring in the entire plant area, storage, material handling and vehicle movement area shall be provided.	:	**Complied**
2) No bore well shall be provided in the premises without prior permission from the competent authority and required water supply shall be obtained from the GIDC	:	The unit has 2 borewell in its premises. As informed by the unit, it has obtained the Permission for the same from GPCB. However the Copy of Approval from GPCB, was not available with the unit. The unit has also applied for permission from CGWA. Copy of the application is attached as an **Annexure - 18.**

3) In the event of non-achievement of quality of treated effluent at the ETP outlet as prescribed in this order, the NSAM shall arrange for bringing the entire quantity of effluent to inlet of ETP and retreat the same to achieve the required quality of effluent.	:	**Complied**
4) The leachate collection facilities in the sludge generated during treatment shall be provided and the leachate from the hazardous solid waste shall be diverted to the inlet in ETP for further treatment.	:	**Complied**
5) The Magnetic flow meters shall be installed at the various stages of inlet and outlet of ETP to measure the quantity of effluent at each stage of effluent treatment plant. The NSAM is required to provide Magnetic Mow Meter at the final outlet of ETP before commencing discharge of effluent.	:	**Partially Complied**
6) The NSAM shall instruct and make sure that every member shall have to make storage facilities to store the spent acid for at last 48 hours in an impervious acid proof brick lining tank.	:	--
7) In case of power failure, the standby DG set having power generation capacity equivalent to the requirement of power to run all the unit of ETP to achieve quality of treated effluent as per conditions of this order shall be installed, so that ETP shall always be functional round the clock, even during power failure. 11 m (from G.L.) stack shall he provided to DG Set.	:	**Complied**
8) In the case of either maintenance of the ETP or process disturbance or non functioning of ETP by any reason the NSAM shall provide impervious tanks HDPE tanks/ impervious guard ponds to hold effluent for at least 48 hours but shall never discharge and untreated effluent into the environment.	:	**Complied**
9) The NSAM shall inform immediately to the GPCB regarding the termination suspension of the membership of NSAM of their member units.	:	**Complied**

10) The NSAM shall have to use only one outlet for the discharge of its effluent and no effluent shall be discharged without requisite treatment and without meeting with the GPCB Norms. Such outlet shall preferably he near the front gate / entrance of the unit. The NSAM shall not keep any bypass line or system or loose or flexible pipe for discharging effluent outside or even for transporting treated or untreated effluent within the ETP units and it shall also define and provide adequate sampling point for collection of samples. The pipelines connecting various equipments or sumps or tanks of ETP should be minimum in number.	:	**Complied**
11) The NSAM shall: a. Maintain the updated list of the member units, their booked quantity, details of effluent treatment process of the NSAM, the names of the committee members of NSAM. The electricity consumption as per the record of the electricity supplier company. b. Make adequate lighting arrangements all around the effluent treatment plant.	:	**Complied**
12) The NSAM shall, before commencing commercial activity, submit GPCB, the site plan of effluent treatment plants, and also a separate plan indicating the channel through which water/ effluent passes from different stages of effluent treatment process right upto the stage of its final outlet Such plans shall also be displayed by the unit on a Board of adequate size within its compound and near its effluent treatment plants.	:	--
13) All the chemicals and nutrients which are required in the added/ dosed anywhere in the ETP shall be so added by using "Metering Pump". The NSAM shall ensure that all these chemicals/nutrients of required conc. are present in adequate & sufficient quantity all the time. A separate register for shall be maintained for this purpose.	:	**Complied**

14) The printed log books shall be maintained regularly and get it certified for; i. Energy/ Fuel consumption/ consumption of chemicals,' nutrients/ coagulants etc. for treatment of effluent. ii. Waste water flow at inlet and outlet of ETP iii. Quantity of sludge & leachate generated & their composition. iv. Laboratory analysis/ reports for each of the specified parameters of liquid effluents and soil sludge samples.	:	**Complied**
15) The ground water quality around the impervious guard ponds and. landfill site shall be monitored regularly thrice a year and the data shall be submitted to this Board and comply with the instruction of Gujarat Pollution Control Board in case of deterioration.	:	--
16) NSAM shall provide proper hood arrangement over the collection tanks as well as neutralization tank in order to collect the fumes during loading, unloading neutralization and storage connected with property designed alkali scrubbers and adequate (min. 11m) stack.	:	**Complied**
17) On-site and off-site emergency plan as required under the Rules 13 & 14 of handling manufacturing storage and import of the Hazardous Chemicals Rules. 1989 shall be prepared and approval from the competent authorities shall he obtained.	:	**Not Complied**
18) Periodic medical checkup of all the employees / workers of the NSAM shall he done and records maintained as a measures to provide occupational health protection to the workers.	:	**Complied**
19) The NSAM shall set up use & updated laboratory facilities for collection and analysis of samples under the supervision of competent technical personnel who will report to the chief executive from time to time.	:	**Complied**

20) The Environment Management Unit/Cell shall be set up to ensure implementation on and monitoring of environmental safe guards and other conditions stipulated by statutory authorities. The Environment Management Unit/ Cell shall directly report to the Chief of the organization and snail work as a focal point for internalizing environmental issues There ceils/ units also coordinate the exercise of the environment audit and preparation of the environment audit and preparation of the environmental statements.	:	**Complied**
21) The Environmental audit shall be carried out and the audit reports shall be submitted as per the Hon. High Court Oder dtd.16/9/99. The environmental statements pertaining to the previous year shall be submitted to the GPCB latest every year as required under the EPA-1986.	:	**Complied**
22) The Storm water shall not be mixed with the industrial effluent. The disposal system for storm water shall be provided separately.	:	**Complied**
23) The ' good housekeeping shall be maintained within the NSAM premises. All pipes, valves and drains shall he leak proof. At washings, leakages, spillages and am other activity which is likely to cause such phenomenon shall be admitted in to the effluent collection system for subsequent treatment and disposal.	:	**Complied**
24) The NSAM shall intimate the occurrence of any accident or event resulting in discharge of poisonous, noxious or polluting matter or the likely hood of the sane into a stream or well, to the Gujarat Pollution Control Board under the intimation to the Member Secretary in accordance with the Section 31(1) of the Water Act-1974 & also to all the concerned agencies.	:	**Complied**
25) The applicant shall have to submit the returns in prescribed form regarding water consumption and shall have to make payment of water cess to the Board under the Water Cess Act-1977.	:	**Complied**

26) In case of change of ownership/ management the name and address of the new owners/partners- directors/ proprietor should immediately be intimated to the Board.	:	--
27) The applicant shall however, not without the prior consent of the Board bring into use and new or altered for the discharge of effluent or gaseous emission or sewage waste from the proposed industrial plant The applicant is required to make applications to this Board for this purpose in the prescribed forms under the provisions of the Water Act-1974. The Air Act-1981 and the Environment (Protection) Act-1986.	:	**Complied**
28) The applicant also comply with the General conditions as per Annexure-I attached herewith (No.1 to 38) (whichever applicable).	:	**Complied**
29) The concentration of Noise in ambient air within the premises of industrial unit shall not exceed following levels: Between 6 a.m. and 10 p.m.: 75 dB(A) Between 10 p.m and 6 a.m. : 70 dB(A)	:	**Complied**
30) Applicant is required to comply with the manufacturing, storage and impart of Hazardous Chemicals Rules 1989 framed under the Environment (Protection) Act-1986.	:	**Complied**
31) If it is established by any competent authority that the damage is caused due to their industrial activities to any person or his properly in that case they are obliged to pay the compensation as determined by the competent authority.	:	--

"સ્વચ્છ ગુજરાત, નિર્મળ ગુજરાત"

SOCIETY FOR CLEAN AND GREEN ENVIRONMENT

Plot No. 198, Phase-2, Opp. Encore, G.I.D.C, Naroda, Ahmedabad-382 330. **Ph. : +91 98250 05148**

Reg. No. : GUJ/18893/ABD Dt.29.09.15
(COMMON EVAPORATION FACILITY)

DATE:Wednesday, August 16, 2017

To,
JEMBY CHEM LIMITED
C-1/335 TO 337, PHASE-II,
GIDC, VATVA, AHMEDABAD.

Dear Sir,

With reference to your letter dated 18.07.2017, kindly find the following details as per your requirement.

1.	Total Capacity of the CETP	At present 0.250 MLD After Expansion .500 MLD
2.	Total booked capacity and Actual load Received at present.	Total Booked Qty.=0.15MLD Actual Received Qty. 0.10MLD
3.	Last 5 Analysis report of GPCB	Attached
4.	Recommendation & Suggestion	Attached

Thanking You

Yours truly

FOR SOCIETY FOR CLEAN AND GREEN ENVIRONMENT

ANIL C AGRAWAL
SECRETARY

GPCB ANALYSIS RESULTS

Sr.No.	Parameters	16/08/2016	10/08/2016	10/07/2016	18/06/2016	Unit
1	Temperature	30	29	29	29	Centigrade
2	pH	7.41	7.55	7.81	7.81	pH Units
3	Colour	150	150	50	150	Pt.Co.Sc.
4	Total Dissolved Solids	32628	31594	43240	34718	mg/l
5	Suspended Solids	230	130	160	220	mg/l
6	Ammonical Nitrogen	2.24	46.48	41.44	29.68	mg/l
7	Chloride	14500	19800	20000	14900	mg/l
8	Sulphate	3075	1725	3594	1925	mg/l
9	Chemical Oxygen Demand	167	327	445	566	mg/l
10	Oil & Grease	8.2	1.2	1.2	4.4	mg/l
11	Phenolic Compounds	Nil	Nil	0.08	0.064	mg/l
12	Cyanide	Nil	Nil	Nil	Nil	mg/l
13	Sulphide	Nil	0.4	Nil	0.4	mg/l
14	Hexavalent Chromium	5.83	6.29	4.58	4.83	mg/l
15	B.O.D (3 Days 27oC)	46	110	-	228	mg/l

"સ્વચ્છ ગુજરાત, નિર્મળ ગુજરાત"

SOCIETY FOR CLEAN
AND GREEN ENVIRONMENT
Plot No. 198, Phase-2, Opp. Encore, G.I.D.C, Naroda,
Ahmedabad-382 330. Ph. : +91 98250 05148

Reg. No : GUJ/16893/ABD Dt.29.09.15
(COMMON EVAPORATION FACILITY)

COMPLIANCE REPORT OF THE SUGGESTION GIVEN BY TIRD PARTY AUDITOR (SNPITRC)

SR.	OBSERVATION/SUGGESTION	REPLY
1.	As the CETP has received the Expansion of the unit is requested to complete the construction activities as soon as possible and file for the CCS	CETP has already received CCA for .500 MLD on 16.06.2016
2.	Industry is advised to prepare long term as well as short term plants to reduce power and lime consumption.	We will install the high efficiency motor to reduce power consumption and also will reduce lime consumption.
3.	An industry is advised to upload the data of the unit to GPCB website.	Uploading data continuously by GPCB.

Thanking You

Yours truly

FOR SOCIETY FOR CLEAN AND GREEN ENVIRONMENT

ANIL C AGRAWAL
SECRETARY

Annexure.
TECHNICAL SPECIFICATION.

1) Model No.	WBS – 100.
2) Evaporation kg/hr. F&A 100° C.	1000.
3) Type.	Horizontal Smoke Tube Manual
4) Working Pressure.	10:54 kg/cm^2
5) Number of passes.	Three.
6) Design Code.	IBR.
7) Thermal Efficiency.	
a) Thermal Efficiency (NCV) without HRU.	88 % ± 2 %
b) Thermal Efficiency (NCV) with HRU..	92 % ± 2 %
8) Fuel Consumption.	
a) Coal India 4400 to 4500 Kcal/hr.	154 kgs.
b) Coal Imported 5800 to 6000 Kcal./hr.	120 kgs.
c) Wood 3000 – 3200 Kcal/hr.	230 kgs.
9) Steam Dryness fraction.	98 %.
10) Fuel feeding.	Manually.
11) Designed from and at.	100° C.
12) Design Based on.	Coal / Wood / multi fuel.
Heating surface area.	45.5 m^2
Grate area.	1.30 m^2
13) Materials.	
Shell.	ASTM/515/516/ G60 – 70. IS 2002.
Tube Plates.	ASTM/515/516/ G60 – 70. IS 2002.
Smoke Tube.	B.S. 3059.
Non pressure parts.	I.S. 2062.
14) I.D. fan, (Induced draft).	
Type.	V Belts Drive.
Speed.	2900.
Pressure mm WC.	200.
Flow m^3/hr.	4000
Motor kw.	5 hp. 5.62 kw.
15) Feed pumps.	
Type.	Centrifugal multi stage.
Flow Qb. mtr/hr.	1800 Lph.
Speed.	1440 Rpm.
Suction & Delivery size.	32 x 32 mm.
Motor.	2 Hp.1.5 Kw
16) Electrical.	
Voltage.	440 V50HZ.
Control.	220 V.

Contd... 12/-

17) Electric power consumption.

I.D. fan.	7.5 Hp. / 5.62 kw.
Boiler feed pump.	2 Hp. / 1.5 kw.
Total power consumption.	9.5 Hp./ 7.12 kw.

18) Boiler Tube Details.

O.D. mm	63.5.
Thickness.	3.66.
SWG.	9
Grade of tube.	Boiler Quality.
Type.	ERW.
Specification.	B.S. 3059 grade.

19) Suggestions.

Chimney	450 mm
Service water tank Qb Mtr.	3.00

20) Terminal Connection mm.

Main Steam outlet.	50 mm
Safety valves	25 mm
Fu8sible Plug.	25 mm.
Inspection Test Cock	15 mm.
Pressure Gauge	200 mm
Feed water inlet	40 mm
Feed water suction	40 mm
Blow down	25 mm
Air Vent	25 mm
Gauge glass Drain	20 mm
Mobery Drain.	15 mm
Flue gas exhaust mm dia.	400 mm

21) Overall Dimensions:-

Length mtr,	3900
Height mtr.	2750
Width mtr.	1800
Dry Weight mtr.	6.5
Operating weight mtr.	0.9

Note.
The Figures are approximate our designs are under constant improvement and are subject to change with out notice.

FOR SHIVAM ENGINEERING WORKS
Sanjeev.

MARKETING DIVISION

Contd...13/-

अहमदाबाद वस्त्र उद्योग अनुसंधान संस्थान
पी.ओ. अंबावाडी विस्तार, अहमदाबाद - 380015. भारत
फोन : (079) 2630 7921 - 7922 - 7923 - 5132
फेक्स : (079) 2630 4677 - 1969 - 5131
ई-मेल : atiraad1@sancharnet.in वेबसाईट : www.atira.in

AHMEDABAD TEXTILE INDUSTRY'S RESEARCH ASSOCIATION
P.O. : Ambawadi Vistar, Ahmedabad-380015. India
Phone : (079) 2630 7921- 7922 - 7923 -5132
Fax : (079) 2630 4677 - 1969 - 5131
E-mail : atiraad1@sancharnet.in Website : www.atira.in

ADEQUACY CERTIFICATE OF ENVIRONMENTAL MANAGEMENT SYSTEM

M/s. Ahmedabad Textile Industry's Research Association (ATIRA) P.O. Ambavadi Vistar Ahmedabad-380 015 is recognized by the GPCB, Gandhinagar under the Environmental Audit Scheme introduced by the Gujarat High Court vide its Order Dtd. 20/12/1996 and 13/03/1997 and modified vide Order Dtd. 16/09/1999, as an environmental auditor for the propose of the auditing, having carried out the environmental Audit of,

a) M/s. :- ***M/s. Society For Clean Earth,***

b) Located at :- Plot No.: 3412/1,2,3, Phase IV,
GIDC: Vatva, Ahmedabad.

&

c) Company has been granted Authorization of common Evaporation Facility treatment for effluent sprayed.

Sr No.	Name Of Product /Disposal	Capacity
1	Common Spray Dryer of Capacity 50 KL of each	100 KL/day

Having completed the environmental audit period on personal monitoring, and audit report prepared as per the direction of the Hon. High Court in Environmental Audit scheme, it is certified that the Environmental Management System (EMS) provided by this industry for the products manufactured and the capacity as stated above is adequate and efficient to achieve the quality of environment (Air + Waste water + Solid waste) as Consent / Notifications by GPCB, Gandhinagar for the following quantity of the waste generation. (Please refer Observations and Comments for further elaborations).

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- Liquid Effluent :- No Generation
- Sewage Generated :- 0.8 KL/Day
- Solid Waste
  - (i) ETP Sludge :- 3120 MT/Year
  - (ii) Used Oil :- 5 litre/Month

- Air emission (Flue Gas Stacks as well as Process Stacks) :- **Yes** as per granted consent

This certificate is valid for Audit period only. However, it is subject to automatic cancellation in case of any change in product profile / capacity, quality and quantity of effluent emission (Air + Water + Solid) and efficiency of EMS equipments.

NAME AND ADDRESS OF THE AUDITOR

Ahmedabad Textile Industry's Research Association (ATIRA)
P.O. Ambavadi Vistar
Ahmedabad-380015

SIGNATURE OF THE AUTHORISED PERSON

DATE:- 17/07/2017

PLACE:- AHMEDABAD

Vaishali Patel
Authorized Signatory
Chemistry Division

अहमदाबाद वस्त्र उद्योग अनुसंधान संस्थान
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CERTIFICATE FOR SAMPLING AND ANALYSIS

This is to certify that the following samples of the emission (air, water, waste water, solid & hazardous wastes) have been collected from **M/s. Society for Clean Earth** and analyzed as per the following details.

Sample Details	Sampling Location	Collected by	Sample Collection	
			Date	Time
➢ 1st Round				
Ambient Air	Please Refer Annexure – 11	ATIRA Team	03/05/2016	11am Onwards
Stack (Flue gas & Process)	Please Refer Annexure - 10			During 2.30 pm to 5 pm
Sludge	Please Refer Annexure – 13			During 4.45 pm to 5.15 pm
➢ 2nd Round				
Ambient Air	Please Refer Annexure – 11	ATIRA Team	23/10/2016	12.10 pm Onwards
Stack (Flue gas & Process)	Please Refer Annexure - 10			During 2.30 pm to 4.30 pm
Sludge	Please Refer Annexure – 13			During 5 pm to 5.10 pm
➢ 3rd Round				
Ambient Air	Please Refer Annexure – 11	ATIRA Team	10/02/2017	11am Onwards
Stack (Flue gas & Process)	Please Refer Annexure – 10			During 3.00 pm to 4.30 pm
Sludge	Please Refer Annexure – 13			During 5.0 pm to 5.20 pm

अहमदाबाद वस्त्र उद्योग अनुसंधान संस्थान
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E-mail : atiraad1@sancharnet.in Website : www.atira.in

- Parameters analyzed on site : pH
- Parameters analysed off site : As per Analysis report attached separately
- Whether samples were preserved as per standard procedure for off site analysis: **Yes**
- Parameters analysed by auditors team : As per Analysis report attached separately
- Parameters analysed by third party
  - Name & Address of the laboratory
  - Whether the laboratory is classified under Schedule –I of the GPCB

  } Not Applicable
- Method followed for analysis
  - Air Emission : Indian Standard (IS-5182 for Ambient & IS-11255 for stack)
  - Water/ waste water : Standard Methods by APHA-AWWA-WPCF, USA and BIS
  - Solid waste : } Leachate preparation analysed as per Standard Methods
  - Hazardous waste } by APHA-AWWA-WPCF, USA and BIS

This is to certify that the third party laboratory in which the analysis has been done is approved under EPA/Accredited by NABL/recognized under Schedule I of GPCB.

NAME AND ADDRESS OF THE AUDITOR

Ahmedabad Textile Industry's Research Association (ATIRA),
P.O. Ambavadi Vistar,
Ahmedabad-380015.

DATE:- 17/07/2017

PLACE:- AHMEDABAD

SIGNATURE OF THE AUTHORISED PERSON

Vaishali Patel
Authorized Signatory
Chemistry Division

ISO 14001 REGISTERED

SOCIETY FOR CLEAN EARTH
Reg. No. : GUJ/15767/ABD Dt.03.02.11
(COMMON EVAPORATION FACILITY)

CERTIFICATE

JEMBY CHEM LTD. Located **PLOT NO. C-1/335 TO 337 & A-1/332 , PHASE-2, GIDC, VATVA, AHMEDABAD** is member in SOCIETY FOR CLEAN EARTH. His tanker booking quantity is 10 tanker per month (10,000 Kg. each).The rate of tanker booking charges is Rs. 50,000/-, Per tanker . So total booking quantity is 1,00,000 Kg./month.

For Society For Clean Earth

Manager

Plot No. : 3412/1,2,3, Phase-IV, G.I.D.C., Vatva, Ahmedabad-382 445. **Ph. : +91 9725207305**
Regd. Off. : C-1, 91/1, Phase-1, B/h. Bank of India, G.I.D.C., Vatva, Ahmedabad - 382 445.

Annexure-V

Membership of Common Environment Infrastructure like CETP, TSDF, Common MEE/Spray dryer

SANAND ECO PROJECT LTD.

SEPL/MBR/13-14
Dt. 10/09/2013

3, samast brahmkshtriya society, narayan nagar road,
shantivan, paldi, ahmedabad - 380007. gujarat sate. INDIA
phone : 2664 17 25, 2664 17 60 fax : 91-79-2663 22 59
E-mail : s_ecoproject@rediffmail.com

TO WHOMSOEVER IT MAY CONCERN

M/s. Jemby Chem Ltd. Plot No. 335 to 337 GIDC Estate, Phase-II, Vatva, Ahmedabad have approached for disposal of their effluent at SEPL – CETP & we have given our consent to accept their effluent subject to rules, regulations & policy of our Company and GPCB from time to time.

For Sanand Eco Project Ltd.,

Membership No. J002
dt. 10-09-2013.

(Authorised Signatory)

The Green Environment Services Co-op. Society Ltd.

(Common Effluent Treatment Plant & Secured Landfill Facility)

Ref. GESCSL/ACCT/2012/ 1-5
Date: 15-02-2012

TO WHOM IT MAY CONCERN

This is to certify that M/s. Jemby Chem Ltd. (U-1), Plot No. C-1-335 to 337, Phase-2, G.I.D.C. Estate, Vatva, Ahmedabad has been enlisted as a member of the Society. The unit will avail the facilities namely the Common Effluent Treatment Plant and Secured Landfill Site. The quantity of effluent booked is 80000 liters per day and the unit falls under Category–A (Intermediate)

We shall accept the treated effluent from our member unit subject to the following conditions.

1. In case of any change in the products...
   a. The unit shall obtain prior permission from regulatory authority and society.
2. The quality of effluent shall strictly conform to the inlet norms prescribed by the GPCB from time to time. The Society may be compelled to stop accepting the effluent failing the compliance of the inlet norms.
3. The member unit will adopt and implement cleaner production practices and technology to minimize the generation of waste streams and pollution load at source.
4. The member unit will participate actively in the various programmes conducted by the Society to improve competitiveness for capacity development, energy efficiency and conservation. The unit will also actively participate in the various training programmes related to environmental issues organized by the Society.
5. Copy of consent to be submitted to Society as soon as receive.

Shankerbhai R. Patel
Chairman

Regd. Office & CETP Site : Plot No. 244-251, Phase II-GIDC Estate, Vatva, Ahmedabad - 382 445
Phone. : (079) 25892283, 25832449, 25832520, 25835652, 65491890, 65491891
Fax : (079) 25893614 Web Site : www.gescsl.com E-mail : info@gescsl.com
SLF Site : Survey No. 89 - 90 - 91, Village : Vinzol, Ahmedabad. Phone : 92278 18213

The Green Environment Services Co-op. Society Ltd.

(Common Effluent Treatment Plant & Secured Landfill Facility)

Chairman	Vice-Chairman	Vice-Chairman	Hon. Secretary	Hon. Jt.Secretary	Hon. Treasurer
Shankerbhai R. Patel	R. S. Patel	Ramesh M. Patel	Mahesh D. Desai	Shrenik P. Merchant	Hitesh D. Jobalia

September 11, 2014

To Whom It May Concern

This is to certify that **M/s Jemby Chem Ltd.**, Plot No. C-1/335 to 337 & A- 1/332, Phase: II, GIDC Estate Vatva, Ahmedabad is a member of our Multiple Effect Evaporation System located at Plot No. 242/A, Phase: II, GIDC Estate Vatva, Ahmedabad for the treatment and disposal of 20000 Liters/Day concentrated effluent stream.

We are pleased to state that concentrated effluent stream generated by **M/s Jemby Chem Ltd.** is accepted by us for the treatment in MEE Plant on regular basis.

For and behalf of
The Green Environment Services Co-op. Soc. Ltd.

JATIN PATEL
General Manager - Operations

ISOQAR QUALITY ASSURED | ISOQAR ENVIRONMENTAL SYSTEM | ISOQAR HEALTH and

Regd. Office & CETP Site : Plot No. 244-251, Phase II-GIDC Estate, Vatva, Ahmedabad - 382 445
Tele Fax : (079) 25892283, 25832449, 25832520, 25835652, 25893614, 65491890, 65491891

The Green Environment Services Co-op. Society Ltd

(Common Effluent Treatment Plant & Secured Landfill Facility

Ref : GESCSL/ADM//MEE CERTY/2017/1124
Date : 05 August, 2017

TO WHOM SO EVER IT MAY BE CONCERNED

This is to certified that Jemby Chem Limited, Plot No.: C-1/335 to 337, Phase: 2, G.I.D.C. Vatva, Ahmadabad is registered as a beneficiary of our Multi Evaporator System and quantity booked 20,000 Ltrs/Day and quantity booked 20,000 Ltrs/Day in Proposed New Spray Dryer.

Thanking you,

Yours faithfully,
For and on behalf of,
The Green Environment Services Co-op. Society Ltd.

Vinod

Vinod I. Shah
Sr. Manager (Accounts and Finance)

ISOQAR QUALITY ASSURED ISO9001 · ISOQAR ENVIRONMENTAL SYSTEM ISO14001 · ISOQAR HEALTH and SAFETY OHSAS 18001

Regd. Office & CETP Site : Plot No. 244-251, Phase II-GIDC Estate, Vatva, Ahmedabad - 382 445
Tele Fax : (079) 25892283, 25832449, 25832520, 25835652, 25893614, 65491890, 65491891
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SLF Site : Survey No. 89 - 90 - 91, Village : Vinzol, Ahmedabad. Phone : 92278 18213

ISO 14001 REGISTERED

SOCIETY FOR CLEAN EARTH
Reg. No. : GUJ/15767/ABD Dt.03.02.11
(COMMON EVAPORATION FACILITY)

CERTIFICATE

JEMBY CHEM LTD. Located **PLOT NO. C-1/335 TO 337 & A-1/332 , PHASE-2, GIDC, VATVA, AHMEDABAD** is member in SOCIETY FOR CLEAN EARTH. His tanker booking quantity is 10 tanker per month (10,000 Kg. each).The rate of tanker booking charges is Rs. 50,000/-, Per tanker . So total booking quantity is 1,00,000 Kg./month.

For Society For Clean Earth

Manager

Plot No. : 3412/1,2,3, Phase-IV, G.I.D.C., Vatva, Ahmedabad-382 445. **Ph. : +91 9725207305**
Regd. Off. : C-1, 91/1, Phase-1, B/h. Bank of India, G.I.D.C., Vatva, Ahmedabad - 382 445.

"સ્વચ્છ ગુજરાત, નિર્મળ ગુજરાત"

Reg. No. : GUJ/18893/ABD Dt.29.09.15
(COMMON EVAPORATION FACILITY)

SOCIETY FOR CLEAN AND GREEN ENVIRONMENT
Plot No. 198, Phase-2, Opp. Encore, G.I.D.C, Naroda,
Ahmedabad-382 330. Ph. : +91 98250 05148

CERTIFICATE OF TANKER BOOKING

We confirm that as a participating member in the evaporation of effluent, M/s. Jemby Chem Limited having address C-1/335 to 337 G I D C Industrial Estate, Ph-2 Vatva, Ahmadabad, Gujarat 382445 has booked 25 (Twenty Five) tankers (250000 kgs) of effluent load for evaporation during one month with the society.

For SOCIETY FOR CLEAN AND GREEN ENVIRONMENT

SOCIETY FOR CLEAN AND GREEN ENVIRONMENT Reg. No. GUJ/18893 Ahmedabad Dt. 29/9/15

ANIL C AGRAWAL

Hon. Secretary

Date:Tuesday, April 04, 2017

Place : Ahmedabad

NOVEL
SPENT ACID MANAGEMENT

Shankerbhai Patel — *Chairman*
Bhupendrabhai Patel — *Vice Chairman*
Dineshbhai Shah — *Managing Director*

26th may 2018

TO WHOM SO IT MAY CONCERN

This is to certify that,

M/S. Jemby Chem Limited

Factory: Plot No : C-1/335 to 337 , & A-1 / 332 , Phase-II , GIDC , Vatva , Ahmedabad , Gujarat (India)

Is a member of our company has total booked 600 Tons per month for discharging their Spent Sulphuric Acid for further treatment

At,

NOVEL SPENT ACID MANAGEMENT,
Vatva , Ahmedabad - 382 445.

For,
NOVEL SPENT ACID MANAGEMENT

Shri Shankerbhai Patel
[Chairman]

Eco
Infrastructures Private Limited
Building Society, Opp. Tulsidham Flats, Bhimjipura, Near Vadaj, Ahmedabad - 380 013. Gujarat, INDIA.
E-mail : ecocare@vsnl.com Website : www.ecocare.co.in

MEMBERSHIP CERTIFICATE

TO WHOM IT MAY CONCERN

This is to certify that

M/S. JAINEY CHEM LIMITED

which is situated at

Plot No-C-1, 265, 336, 337, Phae-2,

GIDC Estate, Vatva, Ahmedabad-382445.

is member of

M/S. ECOCARE INFRASTRUCTURES PVT. LTD.

for Treatment, Storage and Disposal Facility (TSDF).

This membership is valid for a period of 3 years for Cell No.: 1 situated at

Survey No. 127, Village. Ghaspur, Tal.: Dasada, Dist.: Surendranagar.

Membership No. : **ECIPL-245**

Membership Date : **25-01-2017**

Membership Expired on : **24-01-2020**

(Note: This membership is valid only for **Cell No. 1**)

FOR, ECOCARE INFRASTRUCTURES PVT. LTD.

(MANAGING DIRECTOR)

CLUSTER ENVIRO PRIVATE LIMITED

Ref.: TSDF/MEMBERSHIP/2017/CEPL- 023

May 5, 2017

TO WHOMEVER MAY CONCERN

Cluster Enviro Pvt. Ltd. set up Treatment, Storage and Disposal Facility (TSDF) at Tranja – Malavada Road, Village Tranja, Taluka Mahur, Dist.Kheda for the disposal of solid waste.

This is to certify that **M/s. Jemby Chem Limited, C-1/335 to 337, Phase – II, G.I.D.C. Estate, Vatva, Ahmedabad – 382445, Gujarat, India** is a member of our TSDF, Cell No. 1 for the disposal of solid waste.

This membership is subject to the following conditions...

1. The member unit shall comply with the conditions stipulated by GPCB while granting authorization under Hazardous Waste (Management, Handling& Transboundary Movement) Rules, 2008 and amendments made thereof.
2. The member unit shall follow the guidelines for transportation of hazardous waste (Hazardous Waste Management Series: HAZ/VAMS/33/2005-2006) published by Central Pollution Control Board.

CLUSTER ENVIRO PRIVATE LIMITED AHMEDABAD

Director
Cluster Enviro Private Ltd.

Regd.office:
18,G.I.D.C Estate, Phase-1, Vatva, Ahmedabad- 382445
Tel: 079-25832144, 25893607 | **Fax:** 079-25833643
E-mail: clusterenviro@gmail.com | **Website:** www.clusterenviro.com
TSDF Site Address : Tranja- Malavada Road, at. Tranja Dist.Kheda.
CIN: U90000GJ2012PTC069814

Maurya Enviro Project Pvt. Ltd.

Office & Corr. : Plot No. C-1/277-1, Phase II, GIDC Vatva, Ahmedabad-382445. Gujarat. India.
Phone : 079-3002 4745-41-42 • M. : 9825012366, 80980 49979 • Email : mauryaenviroproject@gmail.com
CIN No. : U24100GJ2016PTC085805

PROVISIONAL CERTIFICATE

MEPPL/PC/001

DATE : 12/06/2017

TO WHOMSOEVER IT MAY CONCERN

THIS IS TO CERTIFY THAT

JEMBY CHEM LIMITED.

C-1, 335 TO 337

PHASE-II, GIDC VATVA

AHMEDABAD

IS A VALID MAMBER OF

MAURYA ENVIRO PROJECT PVT. LTD.

FOR INTEGRATED COMMEN HAZARDOUS WASTE MANAGEMENT FACILITY.

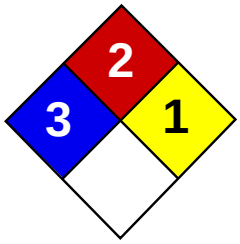
FOR, MAURYA ENVIRO PROJECT PVT. LTD.

DIRECTOR/AUTHORISED SIGNATORY

Branch Office : Survey No. 76/A/2/B, Jamiyat Pura, Taluka - Balasinor, District - Kheda

Annexure-VI

Material Safety Data Sheet



Material Safety Data Sheet
Acetic anhydride MSDS

Section 1: Chemical Product and Company Identification

Product Name: Acetic anhydride

Catalog Codes: SLA1693

CAS#: 108-24-7

RTECS: AK1925000

TSCA: TSCA 8(b) inventory: Acetic anhydride

CI#: Not available.

Synonym:

Chemical Formula: (CH3CO)2)

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Acetic anhydride	108-24-7	100

Toxicological Data on Ingredients: Acetic anhydride: ORAL (LD50): Acute: 1780 mg/kg [Rat]. DERMAL (LD50): Acute: 4000 mg/kg [Rabbit].

Section 3: Hazards Identification

Potential Acute Health Effects:
Extremely hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Very hazardous in case of skin contact (corrosive). Hazardous in case of skin contact (permeator). Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to lungs, mucous membranes. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 316°C (600.8°F)

Flash Points: CLOSED CUP: 49°C (120.2°F). OPEN CUP: 51°C (123.8°F).

Flammable Limits: LOWER: 2.7% UPPER: 10.3%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances: Flammable in presence of heat.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
Flammable liquid. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Flammable liquid. Corrosive liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep container dry. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes.

Storage:
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 5 TWA: 20 Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Strong.

Taste: Strong.

Molecular Weight: 102.09 g/mole

Color: Light.

pH (1% soln/water): Not available.

Boiling Point: 139.9°C (283.8°F)

Melting Point: -73.1 (-99.6°F)

Critical Temperature: Not available.

Specific Gravity: 1.08 (Water = 1)

Vapor Pressure: 0.5 kPa (@ 20°C)

Vapor Density: 3.52 (Air = 1)

Volatility: Not available.

Odor Threshold: 0.1 ppm

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Not available.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Not available.

Corrosivity: Not available.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 1780 mg/kg [Rat]. Acute dermal toxicity (LD50): 4000 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 1000 4 hours [Rat].

Chronic Effects on Humans: Causes damage to the following organs: lungs, mucous membranes.

Other Toxic Effects on Humans:
Extremely hazardous in case of skin contact (irritant), of ingestion, . Very hazardous in case of skin contact (corrosive). Hazardous in case of skin contact (permeator), of eye contact (corrosive), of inhalation (lung corrosive).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: Class 8: Corrosive material

Identification: : Acetic Anhydride UNNA: UN1715 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Pennsylvania RTK: Acetic anhydride Massachusetts RTK: Acetic anhydride TSCA 8(b) inventory: Acetic anhydride CERCLA: Hazardous substances.: Acetic anhydride

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):
CLASS B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F). CLASS E: Corrosive liquid.

DSCL (EEC):
R10- Flammable. R20/22- Harmful by inhalation and if swallowed. R34- Causes burns.

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 2

Reactivity: 0

Personal Protection:

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 2

Reactivity: 1

Specific hazard:

Protective Equipment:
Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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Last Updated: 05/21/2013 12:00 PM

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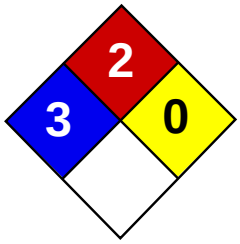

Material Safety Data Sheet
Aniline MSDS

Section 1: Chemical Product and Company Identification

Product Name: Aniline

Catalog Codes: SLA1735

CAS#: 62-53-3

RTECS: BW6650000

TSCA: TSCA 8(b) inventory: Aniline

CI#: Not applicable.

Synonym: Aminobenzene; Benzenamine; Aminophen

Chemical Name: Aniline

Chemical Formula: C6H5NH2

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Aniline	62-53-3	100

Toxicological Data on Ingredients: Aniline: ORAL (LD50): Acute: 250 mg/kg [Rat.]. 464 mg/kg [Mouse]. DERMAL (LD50): Acute: 820 mg/kg [Rabbit.]. 1400 mg/kg [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion, of inhalation. Severe over-exposure can result in death.

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (sensitizer). CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH. 3 (Not classifiable for human.) by IARC. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to blood, kidneys, liver, bladder, spleen, cardiovascular system, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to a

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Get medical attention. Finish by rinsing thoroughly with running water to avoid a possible infection.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Combustible.

Auto-Ignition Temperature: 615°C (1139°F)

Flash Points: CLOSED CUP: 70°C (158°F).

Flammable Limits: LOWER: 1.3% UPPER: 23%

Products of Combustion: These products are carbon oxides (CO, CO2), nitrogen oxides (NO, NO2...).

Fire Hazards in Presence of Various Substances:
Flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards:
Ignites on contact with sodium peroxide + water. Aniline ignites spontaneously in presence of red fuming nitric acid. Sodium peroxide or potassium peroxide is spontaneouly flammable with aniline. When heated to decomposition it emits toxic fumes.

Special Remarks on Explosion Hazards:
Spontaneously explosive reactions occur with benzenediazonium -2-carboxylate, dibenzoyl peroxide, fluorine nitrate, nitrosyl perchlorate, red fuming nitric acid, peroxodisulfuric acid, and tetranitromethane. Addition of a drop of aniline to 1 gram of dibenzoyl peroxide leads to mildly explosive decompostion after a short delay. Addition of aniline to nitromethane renders it susceptible to initiation by a detonator. Anililne reacts with perchloric acid, and then formaldehyde to produce explosive and combustible condensed resin.

Section 6: Accidental Release Measures

Small Spill:
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of acetic acid.

Large Spill:
Combustible material. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Neutralize the residue with a dilute solution of acetic acid. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, metals, acids, alkalis.

Storage:
Air and light sensitive. Store in light-resistance container. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 7.6 (mg/m3) from ACGIH (TLV) [United States] SKIN TWA: 2 (ppm) from ACGIH (TLV) [United States] SKIN TWA: 2 [Canada] TWA: 7.6 (mg/m3) [Canada] TWA: 5 (ppm) from OSHA (PEL) [United States] TWA: 19 (mg/m3) from OSHA (PEL) [United States] TWA: 1 (ppm) [United Kingdom (UK)] TWA: 4 (mg/m3) [United Kingdom (UK)]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid. (Oily liquid.)

Odor: Aromatic. Amine like.

Taste: Burning.

Molecular Weight: 93.13 g/mole

Color: Colorless.

pH (1% soln/water): Basic.

Boiling Point: 184.1°C (363.4°F)

Melting Point: -6°C (21.2°F)

Critical Temperature: 425.6°C (798.1°F)

Specific Gravity: 1.0216 (Water = 1)

Vapor Pressure: 0.1 kPa (@ 20°C)

Vapor Density: 3.22 (Air = 1)

Volatility: Not available.

Odor Threshold: 2.4 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 0.9

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, methanol, diethyl ether.

Solubility: Soluble in cold water, hot water, methanol, diethyl ether.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Reactive with oxidizing agents, metals, acids, alkalis.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Air and light sensitive. May darken on exposure to light or air. Incompatible with strong oxidizing agents , strong acids, bases, aluminum, fluorine, formaldehyde, iron, nitric acid, silver perchlorate, sodium peroxide, sulfuric acid, zinc, hydrogen peroxide, benzenediazonium-2-carboxylate, boron trichloride, tetranitromethane, trichloronitromethane, diisopropyl peroxydicarbonate, hexachloromelamine, peroxomonosulfuric acid, albumin, iron salts, perchloric acid, nitrobenzene, alkalis, potassium peroxide, glycerine , fuming nitric acid, peroxydisulfuric acid, N-chloro compounds, N-bromides (e.g. n-bromosuccinimide), nitrosyl fluroide, toluene diisocyanate, performic acid. Formaldehyde + aniline reacts violently with 90% performic acid, acetic anhyride. Aniline + trichloronitromethane can produce a violent reaction. Aniline can react vigorously with oxidizing materials. Violent reactions can occur with peroxyformic acid, diisopropyl peroxydicarbonate, fluorine, trichloronitromethane, chlorosulfonic acid, peroxydisulfuric acid, FO3Cl, nitric acid + N2O4 + sulfuric acid, b-propiolactone, AgClO4.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 250 mg/kg [Rat.]. Acute dermal toxicity (LD50): 820 mg/kg [Rabbit.]. Acute toxicity of the vapor (LC50): 175 7 hours [Mouse].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH. 3 (Not classifiable for human.) by IARC. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. May cause damage to the following organs: blood, kidneys, liver, bladder, spleen, cardiovascular system, central nervous system (CNS).

Other Toxic Effects on Humans: Hazardous in case of skin contact (irritant, permeator), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:
May affect genetic materials. May cause adverse reproductive effects. It may cause cancer. However, IARC has found inadequate evidence in humans. Human: passes through the placenta.

Special Remarks on other Toxic Effects on Humans:

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Aniline UNNA: 1547 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Aniline California prop. 65 (no significant risk level): Aniline: 0.1 mg/day (value) California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Aniline Connecticut hazardous material survey.: Aniline Illinois toxic substances disclosure to employee act: Aniline Illinois chemical safety act: Aniline New York release reporting list: Aniline Rhode Island RTK hazardous substances: Aniline Pennsylvania RTK: Aniline Minnesota: Aniline Massachusetts RTK: Aniline Massachusetts spill list: Aniline New Jersey: Aniline New Jersey spill list: Aniline Louisiana RTK reporting list: Aniline Louisiana spill reporting: Aniline California Director's List of Hazardous Substances: Aniline TSCA 8(b) inventory: Aniline TSCA 8(a) IUR: Aniline TSCA 8(d) H and S data reporting: Aniline: 10/4/92 SARA 302/304/311/312 extremely hazardous substances: Aniline SARA 313 toxic chemical notification and release reporting: Aniline CERCLA: Hazardous substances.: Aniline: 5000 lbs. (2268 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F). CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):
R23/24/25- Toxic by inhalation, in contact with skin and if swallowed. R36/38- Irritating to eyes and skin. R40- Possible risks of irreversible effects. S2- Keep out of the reach of children. S28- After contact with skin, wash immediately with plenty of water. S36/37- Wear suitable protective clothing and gloves. S46- If swallowed, seek medical advice immediately and show this container or label.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 2

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 2

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References:
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -Material safety data sheet emitted by: la Commission de la SantÃ© et de la SÃ©curitÃ© du Travail du QuÃ©bec. -SAX, N.I. Dangerous Properties of Indutrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Guide de la loi et du rÃ¨glement sur le transport des marchandises dangeureuses au canada. Centre de conformitÃ© internatinal LtÃ©e. 1986. Registery of Toxic Effects of Chemical Substances (RTECS) database, REPROTEXT data base, Ariel Global View database.

Other Special Considerations: Not available.

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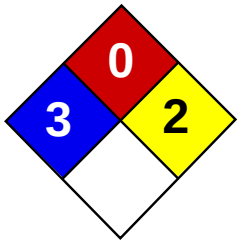

Material Safety Data Sheet
Sulfuric acid MSDS

Section 1: Chemical Product and Company Identification

Product Name: Sulfuric acid

Catalog Codes: SLS2539, SLS1741, SLS3166, SLS2371, SLS3793

CAS#: 7664-93-9

RTECS: WS5600000

TSCA: TSCA 8(b) inventory: Sulfuric acid

CI#: Not applicable.

Synonym: Oil of Vitriol; Sulfuric Acid

Chemical Name: Hydrogen sulfate

Chemical Formula: H2-SO4

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Sulfuric acid	7664-93-9	95 - 98

Toxicological Data on Ingredients: Sulfuric acid: ORAL (LD50): Acute: 2140 mg/kg [Rat.]. VAPOR (LC50): Acute: 510 mg/m 2 hours [Rat]. 320 mg/m 2 hours [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, of inhalation. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified 1 (Proven for human.) by IARC, + (Proven.) by OSHA. Classified A2 (Suspected for human.) by ACGIH. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, lungs, heart, cardiovascular system, upper respiratory tract, eyes, teeth. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged

contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion:
Products of combustion are not available since material is non-flammable. However, products of decompostion include fumes of oxides of sulfur. Will react with water or steam to produce toxic and corrosive fumes. Reacts with carbonates to generate carbon dioxide gas. Reacts with cyanides and sulfides to form poisonous hydrogen cyanide and hydrogen sulfide respectively.

Fire Hazards in Presence of Various Substances: Combustible materials

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Slightly explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards:
Metal acetylides (Monocesium and Monorubidium), and carbides ignite with concentrated sulfuric acid. White Phosphorous + boiling Sulfuric acid or its vapor ignites on contact. May ignite other combustible materials. May cause fire when sulfuric acid is mixed with Cyclopentadiene, cyclopentanone oxime, nitroaryl amines, hexalithium disilicide, phorphorous (III) oxide, and oxidizing agents such as chlorates, halogens, permanganates.

Special Remarks on Explosion Hazards:
Mixturesofsulfuricacidandanyofthefollowingcanexplode:p-nitrotoluene,pentasilver trihydroxydiaminophosphate, perchlorates, alcohols with strong hydrogen peroxide, ammonium tetraperoxychromate, mercuric nitrite, potassium chlorate, potassium permanganate with potassium chloride, carbides, nitro compounds, nitrates, carbides, phosphorous, iodides, picratres, fulminats, dienes, alcohols (when heated) Nitramide decomposes explosively on contact with concentrated sulfuric acid. 1,3,5-Trinitrosohexahydro-1,3,5-triazine + sulfuric acid causes explosive decompositon.

Section 6: Accidental Release Measures

Small Spill:
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

Large Spill:
Corrosive liquid. Poisonous liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, reducing agents, combustible materials, organic materials, metals, acids, alkalis, moisture. May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package.

Storage:
Hygroscopic. Reacts. violently with water. Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 23°C (73.4°F).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 1 STEL: 3 (mg/m3) [Australia] Inhalation TWA: 1 (mg/m3) from OSHA (PEL) [United States] Inhalation TWA: 1 STEL: 3 (mg/m3) from ACGIH (TLV) [United States] [1999] Inhalation TWA: 1 (mg/m3) from NIOSH [United States] Inhalation TWA: 1 (mg/m3) [United Kingdom (UK)]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid. (Thick oily liquid.)

Odor: Odorless, but has a choking odor when hot.

Taste: Marked acid taste. (Strong.)

Molecular Weight: 98.08 g/mole

Color: Colorless.

pH (1% soln/water): Acidic.

Boiling Point:
270°C (518°F) - 340 deg. C Decomposes at 340 deg. C

Melting Point: -35°C (-31°F) to 10.36 deg. C (93% to 100% purity)

Critical Temperature: Not available.

Specific Gravity: 1.84 (Water = 1)

Vapor Pressure: Not available.

Vapor Density: 3.4 (Air = 1)

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility:
Easily soluble in cold water. Sulfuric is soluble in water with liberation of much heat. Soluble in ethyl alcohol.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability:
Conditions to Avoid: Incompatible materials, excess heat, combustible material materials, organic materials, exposure to moist air or water, oxidizers, amines, bases. Always add the acid to water, never the reverse.

Incompatibility with various substances:
Reactive with oxidizing agents, reducing agents, combustible materials, organic materials, metals, acids, alkalis, moisture.

Corrosivity:
Extremely corrosive in presence of aluminum, of copper, of stainless steel(316). Highly corrosive in presence of stainless steel(304). Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Hygroscopic. Strong oxidizer. Reacts violently with water and alcohol especially when water is added to the product. Incompatible (can react explosively or dangerously) with the following: ACETIC ACID, ACRYLIC ACID, AMMONIUM HYDROXIDE, CRESOL, CUMENE, DICHLOROETHYL ETHER, ETHYLENE CYANOHYDRIN, ETHYLENEIMINE, NITRIC ACID, 2-NITROPROPANE, PROPYLENE OXIDE, SULFOLANE, VINYLIDENE CHLORIDE, DIETHYLENE GLYCOL MONOMETHYL ETHER, ETHYL ACETATE, ETHYLENE CYANOHYDRIN, ETHYLENE GLYCOL MONOETHYL ETHER ACETATE, GLYOXAL, METHYL ETHYL KETONE, dehydrating agents, organic materials, moisture (water), Acetic anhydride, Acetone, cyanohydrin, Acetone+nitric acid, Acetone + potassium dichromate, Acetonitrile, Acrolein, Acrylonitrile, Acrylonitrile +water, Alcohols + hydrogen peroxide, ally compounds such as Allyl alcohol, and Allyl Chloride, 2-Aminoethanol, Ammonium hydroxide, Ammonium triperchromate, Aniline, Bromate + metals, Bromine pentafluoride, n-Butyraldehyde, Carbides, Cesium acetylene carbide, Chlorates, Cyclopentanone oxime, chlorinates, Chlorates + metals, Chlorine trifluoride, Chlorosulfonic acid, 2-cyano-4-nitrobenzenediazonium hydrogen sulfate, Cuprous nitride, p-chloronitrobenzene, 1,5-Dinitronaphthlene +

sulfur, Diisobutylene, p-dimethylaminobenzaldehyde, 1,3-Diazidobenzene, Dimethylbenzylcarbinol + hydrogen peroxide, Epichlorohydrin, Ethyl alcohol + hydrogen peroxide, Ethylene diamine, Ethylene glycol and other glycols, , Ethylenimine, Fulminates, hydrogen peroxide, Hydrochloric acid, Hydrofluoric acid, Iodine heptafluoride, Indane + nitric acid, Iron, Isoprene, Lithium silicide, Mercuric nitride, Mesityl oxide, Mercury nitride, Metals (powdered), Nitromethane, Nitric acid + glycerides, p-Nitrotoluene, Pentasilver trihydroxydiaminophosphate, Perchlorates, Perchloric acid, Permanganates + benzene, 1-Phenyl-2-methylpropyl alcohol + hydrogen peroxide, Phosphorus, Phosphorus isocyanate, Picrates, Potassium tert-butoxide, Potassium chlorate, Potassium Permanganate and other permanganates, halogens, amines, Potassium Permanganate + Potassium chloride, Potassium Permanganate + water, Propiolactone (beta)-, Pyridine, Rubidium aceteylene carbide, Silver permanganate, Sodium, Sodium carbonate, sodium hydroxide, Steel, styrene monomer, toluene + nitric acid, Vinyl acetate, Thalium (I) azidodithiocarbonate, Zinc chlorate, Zinc Iodide, azides, carbonates, cyanides, sulfides, sulfites, alkali hydrides, carboxylic acid anhydrides, nitriles, olefinic organics, aqueous acids, cyclopentadiene, cyano-alcohols, metal acetylides, Hydrogen gas is generated by the action of the acid on most metals (i.e. lead, copper, tin, zinc, aluminum, etc.). Concentrated sulfuric acid oxidizes, dehydrates, or sulfonates most organic compounds.

Special Remarks on Corrosivity:
Non-corrosive to lead and mild steel, but dillute acid attacks most metals. Attacks many metals releasing hydrogen. Minor corrosive effect on bronze. No corrosion data on brass or zinc.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 2140 mg/kg [Rat.]. Acute toxicity of the vapor (LC50): 320 mg/m3 2 hours [Mouse].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified 1 (Proven for human.) by IARC, + (Proven.) by OSHA. Classified A2 (Suspected for human.) by ACGIH. May cause damage to the following organs: kidneys, lungs, heart, cardiovascular system, upper respiratory tract, eyes, teeth.

Other Toxic Effects on Humans:
Extremely hazardous in case of inhalation (lung corrosive). Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (corrosive), of ingestion, .

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:
Mutagenicity: Cytogenetic Analysis: Hamster, ovary = 4mmol/L Reproductive effects: May cause adverse reproductive effects based on animal data. Developmental abnormalities (musculoskeletal) in rabbits at a dose of 20 mg/m3 for 7 hrs.(RTECS) Teratogenecity: neither embryotoxic, fetoxic, nor teratogenetic in mice or rabbits at inhaled doses producing some maternal toxicity

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Causes severe skin irritation and burns. Continued contact can cause tissue necrosis. Eye: Causes severe eye irritation and burns. May cause irreversible eye injury. Ingestion: Harmful if swallowed. May cause permanent damage to the digestive tract. Causes gastrointestial tract burns. May cause perforation of the stomach, GI bleeding, edema of the glottis, necrosis and scarring, and sudden circulatory collapse(similar to acute inhalation). It may also cause systemic toxicity with acidosis. Inhalation: May cause severe irritation of the respiratory tract and mucous membranes with sore throat, coughing, shortness of breath, and delayed lung edema. Causes chemical burns to the repiratory tract. Inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. Cause corrosive action on mucous membranes. May affect cardiovascular system (hypotension, depressed cardiac output, bradycardia). Circulatory collapse with clammy skin, weak and rapid pulse, shallow respiration, and scanty urine may follow. Circulatory shock is often the immediate cause of death. May also affect teeth(changes in teeth and supporting structures - erosion, discoloration). Chronic Potential Health Effects: Inhalation: Prolonged or repeated inhalation may affect behavior (muscle contraction or spasticity), urinary system (kidney damage), and cardiovascular system, heart (ischemic heart leisons), and respiratory system/lungs(pulmonary edema, lung damage), teeth (dental discoloration, erosion). Skin: Prolonged or repeated skin contact may cause dermatitis, an allergic skin reaction.

Section 12: Ecological Information

Ecotoxicity: Ecotoxicity in water (LC50): 49 mg/l 48 hours [bluegill/sunfish].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Sulfuric acid may be placed in sealed container or absorbed in vermiculite, dry sand, earth, or a similar material. It may also be diluted and neutralized. Be sure to consult with local or regional authorities (waste regulators) prior to any disposal. Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Class 8: Corrosive material

Identification: : Sulfuric acid UNNA: 1830 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Illinois toxic substances disclosure to employee act: Sulfuric acid New York release reporting list: Sulfuric acid Rhode Island RTK hazardous substances: Sulfuric acid Pennsylvania RTK: Sulfuric acid Minnesota: Sulfuric acid Massachusetts RTK: Sulfuric acid New Jersey: Sulfuric acid California Director's List of Hazardous Substances (8 CCR 339): Sulfuric acid Tennessee RTK: Sulfuric acid TSCA 8(b) inventory: Sulfuric acid SARA 302/304/311/312 extremely hazardous substances: Sulfuric acid SARA 313 toxic chemical notification and release reporting: Sulfuric acid CERCLA: Hazardous substances.: Sulfuric acid: 1000 lbs. (453.6 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

DSCL (EEC):
R35- Causes severe burns. S2- Keep out of the reach of children. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S30- Never add water to this product. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 0

Reactivity: 2

Personal Protection:

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 0

Reactivity: 2

Specific hazard:

Protective Equipment:
Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

Section 16: Other Information

References:
-Material safety data sheet emitted by: la Commission de la Santé et de la Sécurité du Travail du Québec. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987.

Other Special Considerations: Not available.

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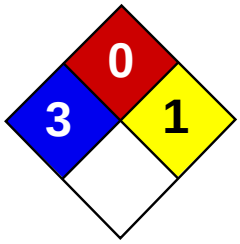

Material Safety Data Sheet
Hydrochloric acid MSDS

Section 1: Chemical Product and Company Identification

Product Name: Hydrochloric acid

Catalog Codes: SLH1462, SLH3154

CAS#: Mixture.

RTECS: MW4025000

TSCA: TSCA 8(b) inventory: Hydrochloric acid

CI#: Not applicable.

Synonym: Hydrochloric Acid; Muriatic Acid

Chemical Name: Not applicable.

Chemical Formula: Not applicable.

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Hydrogen chloride	7647-01-0	20-38
Water	7732-18-5	62-80

Toxicological Data on Ingredients: Hydrogen chloride: GAS (LC50): Acute: 4701 ppm 0.5 hours [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, . Slightly hazardous in case of inhalation (lung sensitizer). Non-corrosive for lungs. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (sensitizer). CARCINOGENIC EFFECTS: Classified 3 (Not classifiable for human.) by IARC [Hydrochloric acid]. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, Circulatory System, teeth. Repeated or prolonged exposure to the substance can produce target

organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: of metals

Explosion Hazards in Presence of Various Substances: Non-explosive in presence of open flames and sparks, of shocks.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards:
Non combustible. Calcium carbide reacts with hydrogen chloride gas with incandescence. Uranium phosphide reacts with hydrochloric acid to release spontaneously flammable phosphine. Rubidium acetylene carbides burns with slightly warm hydrochloric acid. Lithium silicide in contact with hydrogen chloride becomes incandescent. When dilute hydrochloric acid is used, gas spontaneously flammable in air is evolved. Magnesium boride treated with concentrated hydrochloric acid produces spontaneously flammble gas. Cesium acetylene carbide burns hydrogen chloride gas. Cesium carbide ignites in contact with hydrochloric acid unless acid is dilute. Reacts with most metals to produce flammable Hydrodgen gas.

Special Remarks on Explosion Hazards:

Hydrogen chloride in contact with the following can cause an explosion, ignition on contact, or other violent/vigorous reaction: Acetic anhydride AgClO + CCl4 Alcohols + hydrogen cyanide, Aluminum Aluminum-titanium alloys (with HCl vapor), 2-Amino ethanol, Ammonium hydroxide, Calcium carbide Ca3P2 Chlorine + dinitroanilines (evolves gas), Chlorosulfonic acid Cesium carbide Cesium acetylene carbide, 1,1-Difluoroethylene Ethylene diamine Ethylene imine, Fluorine, HClO4 Hexalithium disilicide H2SO4 Metal acetylides or carbides, Magnesium boride, Mercuric sulfate, Oleum, Potassium permanganate, beta-Propiolactone Propylene oxide Rubidium carbide, Rubidium, acetylene carbide Sodium (with aqueous HCl), Sodium hydroxide Sodium tetraselenium, Sulfonic acid, Tetraselenium tetranitride, U3P4 , Vinyl acetate. Silver perchlorate with carbon tetrachloride in the presence of hydrochloric acid produces trichloromethyl perchlorate which detonates at 40 deg. C.

Section 6: Accidental Release Measures

Small Spill:
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

Large Spill:
Corrosive liquid. Poisonous liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, organic materials, metals, alkalis, moisture. May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
CEIL: 5 (ppm) from OSHA (PEL) [United States] CEIL: 7 (mg/m3) from OSHA (PEL) [United States] CEIL: 5 from NIOSH CEIL: 7 (mg/m3) from NIOSH TWA: 1 STEL: 5 (ppm) [United Kingdom (UK)] TWA: 2 STEL: 8 (mg/m3) [United Kingdom (UK)]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Pungent. Irritating (Strong.)

Taste: Not available.

Molecular Weight: Not applicable.

Color: Colorless to light yellow.

pH (1% soln/water): Acidic.

Boiling Point:
108.58 C @ 760 mm Hg (for 20.22% HCl in water) 83 C @ 760 mm Hg (for 31% HCl in water) 50.5 C (for 37% HCl in water)

Melting Point:
-62.25°C (-80°F) (20.69% HCl in water) -46.2 C (31.24% HCl in water) -25.4 C (39.17% HCl in water)

Critical Temperature: Not available.

Specific Gravity:
1.1- 1.19 (Water = 1) 1.10 (20%and 22% HCl solutions) 1.12 (24% HCl solution) 1.15 (29.57% HCl solution) 1.16 (32% HCl solution) 1.19 (37% and 38%HCl solutions)

Vapor Pressure: 16 kPa (@ 20°C) average

Vapor Density: 1.267 (Air = 1)

Volatility: Not available.

Odor Threshold: 0.25 to 10 ppm

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether.

Solubility: Soluble in cold water, hot water, diethyl ether.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials, water

Incompatibility with various substances:
Highly reactive with metals. Reactive with oxidizing agents, organic materials, alkalis, water.

Corrosivity:
Extremely corrosive in presence of aluminum, of copper, of stainless steel(304), of stainless steel(316). Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Reacts with water especially when water is added to the product. Absorption of gaseous hydrogen chloride on mercuric sulfate becomes violent @ 125 deg. C. Sodium reacts very violently with gaseous hydrogen chloride. Calcium phosphide and hydrochloric acid undergo very energetic reaction. It reacts with oxidizers releasing chlorine gas. Incompatible with, alkali metals, carbides, borides, metal oxides, vinyl acetate, acetylides, sulphides, phosphides, cyanides, carbonates. Reacts with most metals to produce flammable Hydrogen gas. Reacts violently (moderate reaction with heat of evolution) with water especially when water is added to the product. Isolate hydrogen chloride from heat, direct sunlight, alkalies (reacts vigorously), organic materials, and oxidizers (especially nitric acid and chlorates), amines, metals, copper and alloys (e.g. brass), hydroxides, zinc (galvanized materials), lithium silicide (incandescence), sulfuric acid(increase in temperature and pressure) Hydrogen chloride gas is emitted when this product is in contact with sulfuric acid. Adsorption of Hydrochloric Acid onto silicon dioxide results in exothmeric reaction. Hydrogen chloride causes aldehydes and epoxides to violently polymerize. Hydrogen chloride or Hydrochloric Acid in contact with the folloiwng can cause explosion or ignition on contact or

Special Remarks on Corrosivity:

Highly corrosive. Incompatible with copper and copper alloys. It attacks nearly all metals (mercury, gold, platinium, tantalum, silver, and certain alloys are exceptions). It is one of the most corrosive of the nonoxidizing acids in contact with copper alloys. No corrosivity data on zinc, steel. Severe Corrosive effect on brass and bronze

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation.

Toxicity to Animals:
Acute oral toxicity (LD50): 900 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 1108 ppm, 1 hours [Mouse]. Acute toxicity of the vapor (LC50): 3124 ppm, 1 hours [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified 3 (Not classifiable for human.) by IARC [Hydrochloric acid]. May cause damage to the following organs: kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, Circulatory System, teeth.

Other Toxic Effects on Humans:
Very hazardous in case of skin contact (corrosive, irritant, permeator), of ingestion, . Hazardous in case of eye contact (corrosive), of inhalation (lung corrosive).

Special Remarks on Toxicity to Animals:
Lowest Published Lethal Doses (LDL/LCL) LDL [Man] -Route: Oral; 2857 ug/kg LCL [Human] - Route: Inhalation; Dose: 1300 ppm/30M LCL [Rabbit] - Route: Inhalation; Dose: 4413 ppm/30M

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive effects (fetoxicity). May affect genetic material.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Corrosive. Causes severe skin irritation and burns. Eyes: Corrosive. Causes severe eye irritation/conjuntivitis, burns, corneal necrosis. Inhalation: May be fatal if inhaled. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract. Inhalation of hydrochloric acid fumes produces nose, throat, and larryngeal burning, and irritation, pain and inflammation, coughing, sneezing, choking sensation, hoarseness, laryngeal spasms, upper respiratory tract edema, chest pains, as well has headache, and palpitations. Inhalation of high concentrations can result in corrosive burns, necrosis of bronchial epithelium, constriction of the larynx and bronchi, nasospetal perforation, glottal closure, occur, particularly if exposure is prolonged. May affect the liver. Ingestion: May be fatal if swallowed. Causes irritation and burning, ulceration, or perforation of the gastrointestinal tract and resultant peritonitis, gastric hemorrhage and infection. Can also cause nausea, vomitting (with "coffee ground" emesis), diarrhea, thirst, difficulty swallowing, salivation, chills, fever, uneasiness, shock, strictures and stenosis (esophogeal, gastric, pyloric). May affect behavior (excitement), the cardiovascular system (weak rapid pulse, tachycardia), respiration (shallow respiration), and urinary system (kidneys- renal failure, nephritis). Acute exposure via inhalation or ingestion can also cause erosion of tooth enamel. Chronic Potential Health Effects: dyspnea, bronchitis. Chemical pneumonitis and pulmonary edema can also

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Class 8: Corrosive material

Identification: : Hydrochloric acid, solution UNNA: 1789 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Hydrochloric acid Illinois toxic substances disclosure to employee act: Hydrochloric acid Illinois chemical safety act: Hydrochloric acid New York release reporting list: Hydrochloric acid Rhode Island RTK hazardous substances: Hydrochloric acid Pennsylvania RTK: Hydrochloric acid Minnesota: Hydrochloric acid Massachusetts RTK: Hydrochloric acid Massachusetts spill list: Hydrochloric acid New Jersey: Hydrochloric acid New Jersey spill list: Hydrochloric acid Louisiana RTK reporting list: Hydrochloric acid Louisiana spill reporting: Hydrochloric acid California Director's List of Hazardous Substances: Hydrochloric acid TSCA 8(b) inventory: Hydrochloric acid TSCA 4(a) proposed test rules: Hydrochloric acid SARA 302/304/311/312 extremely hazardous substances: Hydrochloric acid SARA 313 toxic chemical notification and release reporting: Hydrochloric acid CERCLA: Hazardous substances.: Hydrochloric acid: 5000 lbs. (2268 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

DSCL (EEC):
R34- Causes burns. R37- Irritating to respiratory system. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 0

Reactivity: 1

Personal Protection:

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 0

Reactivity: 1

Specific hazard:

Protective Equipment:
Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

Section 16: Other Information

References:
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -SAX, N.I. Dangerous Properties of Indutrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Guide de la loi et du règlement sur le transport des marchandises dangeureuses au canada. Centre de conformité internatinal Ltée. 1986.

Other Special Considerations: Not available.

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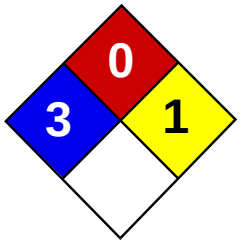

Health	3
Fire	0
Reactivity	2
Personal Protection	J

Material Safety Data Sheet

Sodium hydroxide, Pellets, Reagent ACS MSDS

Section 1: Chemical Product and Company Identification

Product Name: Sodium hydroxide, Pellets, Reagent ACS

Catalog Codes: SLS4090

CAS#: 1310-73-2

RTECS: WB4900000

TSCA: TSCA 8(b) inventory: Sodium hydroxide

CI#: Not available.

Synonym: Caustic Soda

Chemical Name: Sodium Hydroxide

Chemical Formula: NaOH

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Sodium hydroxide	1310-73-2	100

Toxicological Data on Ingredients: Sodium hydroxide LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, of inhalation. The amount of tissue damage depends on length of contact. Eye contact can result in corneal damage or blindness. Skin contact can produce inflammation and blistering. Inhalation of dust will produce irritation to gastro-intestinal or respiratory tract, characterized by burning, sneezing and coughing. Severe over-exposure can produce lung damage, choking, unconsciousness or death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to lungs. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure of the eyes to a low level of dust can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation of dust can produce varying degree of respiratory irritation or lung damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: of metals

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Slightly explosive in presence of heat.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards:
sodium hydroxide + zinc metal dust causes ignition of the latter. Under proper conditions of temperature, pressure and state of division, it can ignite or react violently with acetaldehyde, ally alcohol, allyl chloride, benzene-1,4-diol, chlorine trifluoride, 1,2 dichlorethylene, nitroethane, nitromethane, nitroparaffins, nitropropane, cinnamaldehyde, 2,2-dichloro-3,3-dimethylbutane. Sodium hydroxide in contact with water may generate enough heat to ignite adjacent combustible materials. Phosphorous boiled with NaOH yields mixed phosphines which may ignite spontanously in air. sodium hydroxide and cinnamaldehyde + heat may cause ignition. Reaction with certain metals releases flammable and explosive hydrogen gas.

Special Remarks on Explosion Hazards:
Sodium hydroxide reacts to form explosive products with ammonia + silver nitrate. Benzene extract of allyl benzenesulfonate prepared from allyl alcohol, and benzene sulfonyl chloride in presence of aquesous sodium hydroxide, under vacuum distillation, residue darkened and exploded. Sodium Hydroxde + impure tetrahydrofuran, which can contain peroxides, can

cause serious explosions. Dry mixtures of sodium hydroxide and sodium tetrahydroborate liberate hydrogen explosively at 230-270 deg. C. Sodium Hydroxide reacts with sodium salt of trichlorophenol + methyl alcohol + trichlorobenzene + heat to cause an explosion.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. If necessary: Neutralize the residue with a dilute solution of acetic acid.

Large Spill:
Corrosive solid. Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of acetic acid. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep container dry. Do not breathe dust. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If you feel unwell, seek medical attention and show the label when possible. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, reducing agents, metals, acids, alkalis, moisture.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 23°C (73.4°F).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:
Splash goggles. Synthetic apron. Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor and dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
CEIL: 2 from ACGIH (TLV) [United States] [1995] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid.

Odor: Odorless.

Taste: Not available.

Molecular Weight: 40 g/mole

Color: White.

pH (1% soln/water): 13.5 [Basic.]

Boiling Point: 1388°C (2530.4°F)

Melting Point: 323°C (613.4°F)

Critical Temperature: Not available.

Specific Gravity: 2.13 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility: Easily soluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances:
Highly reactive with metals. Reactive with oxidizing agents, reducing agents, acids, alkalis, moisture.

Corrosivity: Not available.

Special Remarks on Reactivity:
Hygroscopic. Much heat is evolved when solid material is dissolved in water. Therefore cold water and caution must be used for this process. Sodium hydroxide solution and octanol + diborane during a work-up of a reaction mixture of oxime and diborane in tetrahyrofuran is very exothermic, a mild explosion being noted on one occassion. Reactive with water, acids, acid chlorides, strong bases, strong oxidizing agents, strong reducing agents, flammable liquids, organic halogens, metals (i.e aluminum, tin, zinc), nitromethane, glacial acetic acid, acetic anhydride, acrolein, chlorohydrin, chlorosulfonic acid, ethylene cyanohydrin, glyoxal, hydrochloric acid, sulfuric acid, hydrosulfuric acid, nitric acid, oleum, propiolactone, acylonitrile, phorosous pentoxide, chloroethanol, chloroform-methanol, tetrahydroborate, cyanogen azide, 1,2,4,5 tetrachlorobenzene, cinnamaldehyde. Reacts with formaldehyde hydroxide to yield formic acid, and hydrogen.

Special Remarks on Corrosivity: Very caustic to aluminum and other metals in presence of moisture.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available. LC50: Not available.

Chronic Effects on Humans: Causes damage to the following organs: lungs.

Other Toxic Effects on Humans:
Extremely hazardous in case of inhalation (lung corrosive). Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (corrosive), of ingestion, .

Special Remarks on Toxicity to Animals:

Lowest Published Lethal Dose: LDL [Rabbit] - Route: Oral; Dose: 500 mg/kg

Special Remarks on Chronic Effects on Humans: May affect genetic material (mutagenic). Investigation as a mutagen (cytogenetic analysis), but no data available.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: May be harmful if absorbed through skin. Causes severe skin irritation and burns. May cause deep penetrating ulcers of the skin. Eyes: Causes severe eye irritation and burns. May cause chemical conjunctivitis and corneal damage. Inhalation: Harmful if inhaled. Causes severe irritation of the respiratory tract and mucous membranes with coughing, burns, breathing difficulty, and possible coma. Irritation may lead the chemical pneumonitis and pulmonary edema. Causes chemical burns to the respiratory tract and mucous membranes. Ingestion: May be fatal if swallowed. May cause severe and permanent damage to the digestive tract. Causes severe gastrointestinal tract irritation and burns. May cause perforation of the digestive tract. Causes severe pain, nausea, vomiting, diarrhea, and shock. May cause corrosion and permanent destruction of the esophagus and digestive tract.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Class 8: Corrosive material

Identification: : Sodium hydroxide, solid UNNA: 1823 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Illinois toxic substances disclosure to employee act: Sodium hydroxide Illinois chemical safety act: Sodium hydroxide New York release reporting list: Sodium hydroxide Rhode Island RTK hazardous substances: Sodium hydroxide Pennsylvania RTK: Sodium hydroxide Minnesota: Sodium hydroxide Massachusetts RTK: Sodium hydroxide New Jersey: Sodium hydroxide Louisiana spill reporting: Sodium hydroxide California Director's List of Hazardous Substances: Sodium hydroxide TSCA 8(b) inventory: Sodium hydroxide CERCLA: Hazardous substances.: Sodium hydroxide: 1000 lbs. (453.6 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): CLASS E: Corrosive solid.

DSCL (EEC):

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 0

Reactivity: 2

Personal Protection: j

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 0

Reactivity: 1

Specific hazard:

Protective Equipment:
Gloves. Synthetic apron. Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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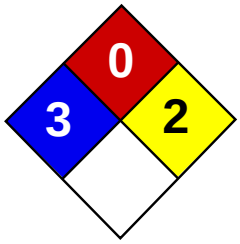

Material Safety Data Sheet
Sulfuric acid, fuming, 20% MSDS

Section 1: Chemical Product and Company Identification

Product Name: Sulfuric acid, fuming, 20%

Catalog Codes: SLS1405

CAS#: 8014-95-7

RTECS: WS5605000

TSCA: TSCA 8(b) inventory: Sulfuric acid; Sulfur trioxide

CI#: Not applicable.

Synonym: Oleum; Sulfuric Acid mixture with sulfur trioxde; Fuming Sulfuric Acid

Chemical Name: Not applicable.

Chemical Formula: H2SO4 + 20% SO3

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Sulfuric acid	7664-93-9	76-82
Sulfur trioxide	7446-11-9	18-24

Toxicological Data on Ingredients: Sulfuric acid: ORAL (LD50): Acute: 2140 mg/kg [Rat.]. VAPOR (LC50): Acute: 510 mg/m 2 hours [Rat]. 320 mg/m 2 hours [Mouse]. Sulfur trioxide LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, . Slightly hazardous in case of inhalation (lung sensitizer). Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (sensitizer). CARCINOGENIC EFFECTS: Classified 1 (Proven for human.) by IARC [Sulfuric acid, fuming]. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL

TOXICITY: Not available. The substance may be toxic to kidneys, lungs, heart, cardiovascular system, upper respiratory tract, eyes, teeth. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Slightly explosive in presence of heat, of oxidizing materials.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards:
When heated to decomposition it emits highly toxic fumes. May ignite other combustible materials.

Special Remarks on Explosion Hazards:
Mixtures of sulfuric acid and any of the following can explode: p-nitrotoluene, pentasilver trihydroxydiaminophosphate, perchlorates, alcohols with strong hydrogen peroxide, ammonium tetraperoxychromate,

mercuric nitrite, potassium chlorate, potassium permanganate with potassium chloride. Nitramide decomposes explosively on contact with concentrated sulfuric acid. 1,3,5-Trinitrosohexahydro-1,3,5-triazine + sulfuric acid causes explosive decompositon.

Section 6: Accidental Release Measures

Small Spill:
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

Large Spill:
Corrosive liquid. Poisonous liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep container dry. Keep away from heat. Keep away from sources of ignition. Keep away from direct sunlight or strong incandescent light. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. Avoid shock and friction. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, reducing agents, combustible materials, organic materials, metals, acids, alkalis, moisture. May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package.

Storage:
Keep container tightly closed. Keep container in a cool, well-ventilated area. Hygroscopic; keep container tightly closed. Will react with water or steam to produce heat and toxic fumes.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 1 (mg/m3) from NIOSH Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid. (Fuming oily liquid.)

Odor: sharp, penetrating, choking.

Taste: Not available.

Molecular Weight: 178.14 g/mole

Color: Colorless to slight yellow/brown

pH (1% soln/water): Acidic.

Boiling Point: The lowest known value is 45°C (113°F) (Sulfur trioxide). Weighted average: 254.47°C (490°F)

Melting Point: May start to solidify at 16.8°C (62.2°F) based on data for: Sulfur trioxide. Weighted average: 11.29°C (52.3°F)

Critical Temperature: The lowest known value is 217.8°C (424°F) (Sulfur trioxide).

Specific Gravity: 1.92 (Water = 1)

Vapor Pressure: Not available.

Vapor Density: The highest known value is 3.4 (Air = 1) (Sulfuric acid). Weighted average: 3.31 (Air = 1)

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility:
Easily soluble in cold water. Sulfuric is soluble in water with liberation of much heat. Reacts violently with water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Moist air, water, excess heat, incompatible materials

Incompatibility with various substances:
Reactive with oxidizing agents, reducing agents, combustible materials, organic materials, metals, acids, alkalis, moisture. The product may undergo hazardous decomposition, condensation or polymerization, it may react violently with water to emit toxic gases or it may become self-reactive under conditions of shock or increase in temperature or pressure.

Corrosivity:
Extremely corrosive in presence of copper. Highly corrosive in presence of steel, of aluminum, of stainless steel(304), of stainless steel(316). Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Hygroscopic; keep container tightly closed. Will react with water or steam to produce heat and toxic fumes. Incompatible with ACETIC ACID, ACRYLIC ACID, AMMONIUM HYDROXIDE, CRESOL, CUMENE, D I C H L O R O E T H Y L E T H E R , E T H Y L E N E C Y A N O H Y D R I N , E T H Y L E N E I M I N E , N I T R I C A C I D , 2-NITROPROPANE, PROPYLENE OXIDE, SULFOLANE, VINYLIDENE CHLORIDE, DIETHYLENE GLYCOL MONOMETHYL ETHER, ETHYL ACETATE, ETHYLENE CYANOHYDRIN, ETHYLENE GLYCOL MONOETHYL ETHER ACETATE, GLYOXAL, METHYL ETHYL KETONE, dehydrating agents, organic materials, moisture, Acetic anhydride, Acetone, cyanohydrin, Acetone +nitric acid, Acetone + potassium dichromate, Acetonitrile, Acrolein, Acrylonitrile, Acrylonitrile+water, Alcohols + hydrogen peroxide, Allyl alcohol, Allyl Chloride, 2-Aminoethanol, Ammonium hydroxide, Ammonium triperchromate, Aniline, Bromate + metals, Bromine pentafluoride, n-Butyraldehyde, Carbides, Cesium acetylene carbide, Chlorates, Cyclopentanone oxime, chlorinates, Chlorated + metals, Chlorine trifluoride, Chlorosulfonic acid, 2-cyano-4-nitrobenzenediazonium hydrogen sulfate, Cuprous nitride, p-chloronitrobenzene, 1,5-Dinitronaphthlene + sulfur, Diisobutylene, p-dimethylaminobenzaldehyde, 1,3-Diazidobenzene, Dimethylbenzylcarbinol + hydrogen peroxide, Epichlorohydrin, Ethyl alcohol + hydrogen peroxide, Ethylene diamine, Ethylene glycol, Ethylenimine, Fulminates, hydrogen peroxide, Hydrochloric acid, Hydrofluoric acid, Iodine heptafluoride, Indane + nitric acid, Iron, Isoprene, Lithium silicide, Mercuric nitride, Mesityl oxide, Mercury nitride, Metals (powdered), Nitromethane, Nitric acid + glycerides, p-Nitrotoluene, Pentasilver trihydroxydiaminophosphate Perchlorates, Perchloric acid, Permanganates + benzene, 1-Phenyl-2-methylpropyl alcohol + hydrogen peroxide, Phosphorus, Phosphorus isocyanate, Picrates, Potassium tert-butoxide, Potassium chlorate, Potassium Permanganate, Potassium Permanganate + Potassium chloride, Potassium Permanganate + water, Propiolactone (beta)-, Pyridine, Rubidium aceteylene carbide, Silver

permanganate, Sodium, Sodium carbonate, sodium hydroxide, Steel, styrene monomer, toluene + nitric acid, Vinyl acetate, Thalium (I) azidodithiocarbonate, Zinc chlorate, Zinc Iodide.

Special Remarks on Corrosivity:
Minor corrosive effect on bronze. No corrosion data for brass or zinc.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 2140 mg/kg [Rat.]. (Sulfuric acid). Acute toxicity of the vapor (LC50): 347 1 hours [Rat]. (Sulfuric Acid, fuming)

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified 1 (Proven for human.) by IARC [Sulfuric acid, fuming]. May cause damage to the following organs: kidneys, lungs, heart, cardiovascular system, upper respiratory tract, eyes, teeth.

Other Toxic Effects on Humans:
Extremely hazardous in case of inhalation (lung corrosive). Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (corrosive), of ingestion, .

Special Remarks on Toxicity to Animals:
Lowest Published Lethal Dose: LCL [Guinea Pig]- Route: Inhalation; Dose 30 mg/m3/6H (Sulfur trioxide)

Special Remarks on Chronic Effects on Humans:
Mutagenicity: Cytogenetic Analysis: Hamster, ovary = 4mmol/L Reproductive effects: May cause adverse reproductive effects based on animal data. Developmental abnormalities (musculoskeletal) in rabbits at a dose of 20 mg/m3 for 7 hrs.(RTECS) Teratogenecity: neither embryotoxic, fetoxic, nor teratogenetic in mice or rabbits at inhaled doses producing some maternal toxicity (Sulfuric acid)

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Causes severe skin irritation and burns. Continued contact can cause tissue necrosis. Eye: Causes severe eye irritation and burns. May cause irreversible eye injury. Ingestion: Harmful if swallowed. May cause permanent damage to the digestive tract. Causes gastrointestial tract burns. May cause perforation of the stomach, GI bleeding, edema of the glottis, necrosis and scarring, and sudden circulatory collapse(similar to acute inhalation). It may also cause systemic toxicity with acidosis. Inhalation: May cause severe irritation of the respiratory tract and mucous membranes with sore throat, coughing, shortness of breath, and delayed lung edema. Causes chemical burns to the repiratory tract. Inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. Cause corrosive action on mucous membranes. May affect cardiovascular system (hypotension, depressed cardiac output, bradycardia). Circulatory collapse with clammy skin, weak and rapid pulse, shallow respiration, and scanty urine may follow. Circulatory shock is often the immediate cause of death. May also affect teeth(changes in teeth and supporting structures - erosion, discoloration). Chronic Potential Health Effects: Inhalation: Prolonged or repeated inhalation may affect behavior (muscle contraction or spasticity), urinary system (kidney damage), and cardiovascular system, heart (ischemic heart leisons), and respiratory system/lungs(pulmonary edema, lung damage), teeth (dental discoloration, erosion). Skin: Prolonged or repeated skin contact may cause dermatitis, an allergic skin reaction.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Class 8: Corrosive material

Identification: : Sulfuric acid, fuming (Sulfuric acid) UNNA: 1831 PG: I

Special Provisions for Transport: Poison inhalation hazard zone B (Sulfur trioxide)

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Sulfur trioxide Illinois toxic substances disclosure to employee act: Sulfuric acid Illinois chemical safety act: Sulfur trioxide New York release reporting list: Sulfuric acid; Sulfur trioxide Rhode Island RTK hazardous substances: Sulfuric acid Pennsylvania RTK: Sulfuric acid; Sulfur trioxide Minnesota: Sulfuric acid Massachusetts RTK: Sulfuric acid; Sulfur trioxide Massachusetts spill list: Sulfur trioxide New Jersey: Sulfuric acid; Sulfur trioxide New Jersey spill list: Sulfur trioxide New Jersey toxic catastrophe prevention act: Sulfur trioxide Louisiana RTK reporting list: Sulfur trioxide TSCA 8(b) inventory: Sulfuric acid; Sulfur trioxide SARA 302/304/311/312 extremely hazardous substances: Sulfuric acid; Sulfur trioxide SARA 313 toxic chemical notification and release reporting: Sulfuric acid CERCLA: Hazardous substances.: Sulfuric acid: 1000 lbs. (453.6 kg); Sulfur trioxide: 100 lbs. (45.36 kg);

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):
CLASS E: Corrosive liquid. CLASS F: Dangerously reactive material.

DSCL (EEC):
R14- Reacts violently with water. R35- Causes severe burns. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S30- Never add water to this product. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 0

Reactivity: 2

Personal Protection:

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 0

Reactivity: 2

Specific hazard:

Protective Equipment:
Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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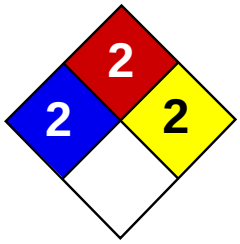
Last Updated: 05/21/2013 12:00 PM



Material Safety Data Sheet
Benzoyl chloride MSDS

Section 1: Chemical Product and Company Identification

Product Name: Benzoyl chloride

Catalog Codes: SLB2416

CAS#: 98-88-4

RTECS: DM6600000

TSCA: TSCA 8(b) inventory: Benzoyl chloride

CI#: Not available.

Synonym:

Chemical Formula: C7H5OCl

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Benzoyl chloride	98-88-4	100

Toxicological Data on Ingredients: Benzoyl chloride LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects:
Extremely hazardous in case of skin contact (corrosive, irritant), of eye contact (irritant), of ingestion, of inhalation. Very hazardous in case of skin contact (sensitizer, permeator). Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:
Extremely hazardous in case of skin contact (corrosive, irritant), of eye contact (irritant), of ingestion, of inhalation. Very hazardous in case of skin contact (sensitizer, permeator). CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to lungs, mucous membranes. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated or prolonged inhalation of vapors may lead to chronic respiratory irritation.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Combustible.

Auto-Ignition Temperature: 197°C (386.6°F)

Flash Points: CLOSED CUP: 72°C (161.6°F).

Flammable Limits: LOWER: 1.2% UPPER: 4.9%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances: Not available.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:

Combustible material. Corrosive liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Section 7: Handling and Storage

Precautions:
Keep container dry. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes.

Storage:
Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: Not available.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid. (Fuming liquid.)

Odor: Pungent.

Taste: Not available.

Molecular Weight: 140.57 g/mole

Color: Colorless.

pH (1% soln/water): Not available.

Boiling Point: 197.2°C (387°F)

Melting Point: -1°C (30.2°F)

Critical Temperature: Not available.

Specific Gravity: 1.2188 (Water = 1)

Vapor Pressure: 0.1 kPa (@ 20°C)

Vapor Density: 4.88 (Air = 1)

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Not available.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Not available.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute toxicity of the vapor (LC50): 1870 1 hours [Rat].

Chronic Effects on Humans: Causes damage to the following organs: lungs, mucous membranes.

Other Toxic Effects on Humans:
Extremely hazardous in case of skin contact (corrosive, irritant), of eye contact (corrosive), of ingestion, of inhalation (lung corrosive). Very hazardous in case of skin contact (sensitizer, permeator).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are more toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: Class 8: Corrosive material

Identification: : Benzoyl Chloride UNNA: UN1736 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Pennsylvania RTK: Benzoyl chloride Massachusetts RTK: Benzoyl chloride TSCA 8(b) inventory: Benzoyl chloride SARA 313 toxic chemical notification and release reporting: Benzoyl chloride CERCLA: Hazardous substances.: Benzoyl chloride

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):
CLASS B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F). CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

DSCL (EEC):
R20- Harmful by inhalation. R35- Causes severe burns. R43- May cause sensitization by skin contact.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 2

Reactivity: 0

Personal Protection:

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 2

Reactivity: 2

Specific hazard:

Protective Equipment:
Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:14 PM

Last Updated: 05/21/2013 12:00 PM

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for

lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.

Annexure-VII

Environment Policy of the company

Jemby Chem Ltd.

Health, Safety and Environment Policy
(As per Rule 68-O of Gujarat Factories Rules 1963)

Jemby Chem Ltd. Plot No C1 335 to 337 G.I.D.C. Phase II, Vatva, Ahmedabad, aims for excellence and leadership in health, safety and environment protection.

We are committed to protect the environment, accident due to chemical reaction and removal of risk in which we operate and to ensure the health and safety of our employees, community and interested parties.

Objectives

- *Aiming to achieve beyond statutory requirement.*
- *Process improvement to minimize the adverse effect on Health, Safety and Environment.*
- *Using and monitoring equipment, systems and facilities to provide a safe and hygienic working atmosphere.*
- *Preventing pollution, conservation of natural resources and energy. Identify hazards and its removal.*
- *Conducting management programme, audits and reviews towards improving HSE aspect.*
- *Reduction of accidents, training to company employees, periodical safety audits and awareness every employee by repeated mock drills.*
- *Seeking participation of employees to achieve HSE policy.*

Date: 7/10/2011
Place: Vatva, Ahmedabad

Mr. Bhupendra Patel
Occupier
Jemby Chem. Ltd

JEMBY CHEM LIMITED

IMS (QEHS) POLICY

We Will Strive To Delight Our Customers Through

- Supplying Them On-time, Quality Dyes & Dyes Intermediates with Effective IMS – QEHS (Integrated Management System – Quality, Environment and Occupational Health & Safety).
- Implementing Product & Process Control, Cost Effectiveness with Available Resources and Maintaining Environment Friendly, Healthy & Safe Working Processes.
- Habit of Continual Improvement from the In-House & Customers' Feedbacks, Effective Audits and Technical Veterans.
- Compliance with State, National & International Legislations.
- Preventing Pollution, Occupational Injury & Illness to Personnel and Appropriate & Subtle Usage of the Natural Resources.
- Reducing Deficiencies & Risks Associated In QEHS By Communicating Towards The Employees, Contractors & Interested Parties.
- Appropriate Use of PPE (Personal Protective Equipment) where Applicable.
- Improvement of Employees through Various Trainings.

Mr. BHUPENDRA PATEL
(Managing Director)

Date : September 01, 2011
Place: Ahmedabad

Annexure-VIII

NABET/QCI Certificate

Quality Council of India

National Accreditation Board for Education & Training

CERTIFICATE OF ACCREDITATION

San Envirotech Pvt. Ltd.

401/402/423/424/324, Medicine Market,
Opp: Shefali Centre, Paldi Cross Road, Ahmedabad

Accredited as **Category - A** organization under the QCI-NABET Scheme for Accreditation of EIA Consultant Organizations: Version 3 for preparing EIA-EMP reports in the following Sectors:

Sl. No.	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals (Opencast only)	1	1 (a) (i)	B
2	Thermal power plants	4	1 (d)	A
3	Metallurgical industries (ferrous only)	8	3 (a)	B
4	Cement plants	9	3 (b)	B
5	Chlor-alkali industry	13	4 (d)	B
6	Chemical fertilizers	16	5 (a)	A
7	Pesticides industry and pesticide specific intermediates (excluding formulations)	17	5 (b)	A
8	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
9	Isolated storage & handling of Hazardous chemicals (As per threshold planning quantity indicated in column 3 of schedule 2 & 3 of MSIHC Rules 1989 amended 2000)	28	6 (b)	B
10	Building and construction projects	38	8 (a)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RA AC minutes dated Dec. 01, 2017 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/18/0567 dated Jan. 09, 2018.The accreditation needs to be renewed before the expiry date by San Envirotech Pvt. Ltd., Ahmedabad following due process of assessment

Sr. Director, NABET
Dated: Jan. 09, 2018

Certificate No.
NABET/ EIA/1619/ RA 0084

Valid till
23.12.2019

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.

Annexure-IX

Undertaking by Consultant

UNDERTAKING

I, **Dr. Mahendra Sadaria,** EIA Coordinator of San Envirotech Pvt. Ltd. located at 424, Medicine Market, Paldi Cross Road, Paldi, Ahmedabad undertake that;

I undertake that, prescribed TORs have been complied with and the data submitted is factually correct.

I hereby declare that, what is stated herein above is true to the best of my knowledge and same I believed to be true.

Date: **01/02/2017**

Place: **Ahmedabad**

Name: **Dr. Mahendra Sadaria**

Designation: **EIA Coordinator**

Signature:

Annexure-X

Adequacy Certificate

THE ENVIRONMENTAL MANAGEMENT SYSTEM

ADEQUACY CERTIFICATE

The Environmental Audit Scheme is introduced by the Hon'ble High Court Gujarat vide its Orders dated 20/12/1996 & 13/03/1997 and modified vide Order dated 16/09/1999, as an environmental auditor for the purpose of the auditing. We are appointed by the GPCB Gandhinagar as recognized Auditor (Schedule-II Industries) for compliance of the directions of the Hon. High Court in this matter:

Plant already exists and now proposed for expansion by adding new products. We have checked the EMS of existing set up and discuss for proposed planning and carried out study of proposed EMS before issuing the certificate of;

Jemby Chem Limited

Plot No. C-1/335, 336, 337,

G.I.D.C. Estate, Phase-II, Vatva,

Ahmedabad

Manufacturing products are as under:

(A) List of Products:

List of products are given below:

Sr. No.	Name of Product	Production Quantity (MT/month)		
		Existing	Proposed addition	Total After expansion
01	Sulpho Tobias Acid	2	23	25
02	J-Acid	2.528	47.472	50
03	**J-Acid derivatives**	12.67	87.33	100
	1. N-Acetyl J-Acid			
	2. N-Methyl J-Acid			
	3 N-Benzoyl J-Acid			
	4. N-Phenyl J-Acid			
04	RW-Acid (Di-J Acid)		10	10
05	Sulpho J- Acid		10	10
06	N-Methyl Gamma Acid	00	5	5
	Total	**17.198**	**182.802**	**200**

(B) Effluent Load & Treatment:

After expansion, total wastewater generation will be increased from 34.0 KLD to 102.0 KLD. Out of which, 99.0 KLD will be industrial effluent and 3.0 KLD will be sewage effluent. Entire quantity of the industrial wastewater is segregated into -

- High COD effluent stream
- Low COD effluent stream (Dilute stream)

From high concentrated stream, total spent Sulphuric acid generation will be tune around 47.0 KLD; out of which; 23.0 KLD will be captive use and 24.0 KLD spent Sulphuric Acid will be sent to Novel Spent Acid Management, Vatva for reuse by actual users under Rule-9.

Process effluent of 68.0 KLD after primary treatment will be sent for common spray dryer to avoid heavy load of organic and inorganic on CETP.

Dilute stream of 31.0 KLD from washing and utilities will be treated in ETP and after achieving CETP inlet norms, it will be sent to Common CETP of GESCSL, Vatva for further treatment and final disposal.

There is no increase pollution load in terms of hydraulic and organic compare with granted pollution load by GPCB in existing CC&A but on the contrary reduce organic load due to high TDS high COD effluent directly send to common spray dryer. Sewage will be disposed off into soak pit through septic tank.

Details of ETP units are given below:

Dilute stream

Sr. No.	Particulars	Qty.	MOC	Capacity (m^3)
1.	Small Collection Tank	1	MSRLTL [Under Ground]	4
2.	Big Collection Tank	1	MSRLTL	40
3.	Neutralization vessel	1	MSRLTL	25
4.	Filter Press	1	Plate Size: 36”	-
5.	Primary Sump	1	RCC MSRL	10
6.	Equalization Tank	1	RCC	80
7.	Bio-Reactor [Mickey]	2	RCC	40
8.	Settling Tank	1	RCC	30
9.	Secondary Collection Tank	1	RCC	10
10.	Sand Filter	1	MSRL	1 MT
11.	Carbon Column	1	MSRL	1 MT
12.	Treated Wastewater Tank	1	RCC [Overhead]	20

High COD Concentration Stream

Sr. No.	Particulars	Qty.	MOC	Capacity (m^3)
1.	Collection Tank	1	MSRLTL	30
2.	Vessels	2	MSRLTL	7
3.	Round Tub With Filter Net	1	HDPE	500Ltr
4.	Filter Pump	1	PP PUMP	30
5.	Holding Tank	3	HDPE Spiral Tank	30

(C) Air Pollution:

Sr. No.	Stack attached to	Fuel Type	Stack Height, in m	APC measures	Probable emission
Existing					
Flue Gas Stacks					
1.	Steam Boiler*	Bio fuel	15	Multi Cyclone separator	SPM<150 mg/Nm^3 SO_2<100 ppm NO_2<50 ppm
2.	Thermic Fluid Heater (4.0 lakhs kcal/hr.)*	Bio fuel	15	Multi Cyclone separator	SPM<150 mg/Nm^3 SO_2<100 ppm NO_2<50 ppm
3.	D G set (125 kVA)	Diesel – 30 lit/hr.	11	--	SPM<150 mg/Nm^3 SO_2<100 ppm NO_2<50 ppm
Process Gas Stacks					
1.	Reaction Vessels	-	15	Alkali Scrubber (Ventury + Packed column)	SO_2<40 mg/Nm^3
Proposed					
Flue Gas Stacks					
1.	Steam Boiler	Bio fuel (Briquette) – 4 MT/day	15	Cyclone separator	SPM<150 mg/Nm^3 SO_2<100 ppm NO_x<50 ppm
2.	Thermic Fluid Heater (10.0 lakhs kcal/hr.)	Bio fuel (Briquette) – 6.5 MT/day	15	Multi Cyclone separator	SPM<150 mg/Nm^3 SO_2<100 ppm NO_2<50 ppm
Process Gas Stacks					
2.	Reaction Vessels	-	15	Alkali Scrubber (Ventury + Packed column)	SO_2<40 mg/Nm^3

* Existing boiler & TFH with capacity of 0.6 TPH & 4.0 lakhs kcal/hr. will be dismantled after expansion and unit will install boiler of 1 TPH and TFH of 10.0 lakhs kcal/hr.

(D) Hazardous waste generation:

Details of hazardous waste generation are given below:

Sr. No.	Type of waste	Waste Category	Existing Generation	Total after expansion	Disposal Facility
1.	ETP sludge	35.3	40 MT/month	290 MT/month	Sold to cement manufacturer or Disposal to TSDF site.
2.	Discarded containers/ barrels/ liners	33.1	12 nos./month Liner-8 kg/month	42 nos./month Liner-58 kg/month	Being used for packing of ETP sludge in case of excess it will be sold to approved recyclers.
3.	Used Lubricating Oil	5.1	200 Lt/yr.	400 Lt/yr.	It will be sold to approve recycler with CPCB.
4.	Spent Sulphuric Acid	26.3	--	1222 Kl/month	Collection, storage and partial reuse in-house and balance qty. sent to Novel

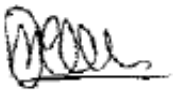
	(24%-65%)				spent management or actual users under Rule-9 of Haz. rules, 2016
5.	Sodium Bi Sulfite (40-45%)	B(15)	45 Kl/month	390 Kl/month	Collection, storage and reuse in-house

Based on study of proposed EMS, we certify that the Environmental Management System existing & proposed by this industry for the products certify as stated above will be adequate and efficacious to achieve the quality of effluents (Air + Waste Water + Solid waste) as specified by GPCB, Gandhinagar for above quantities.

This certificate is subjected to automatic cancellation in case of any change in product profile/capacity, quality & quantity of effluents (Air + Water + Solid) and efficiency of EMS equipment.

Date: 10/06/2018
Place: Ahmedabad

Name & Address of the auditor
Signature of the authorized person



Dr. Mahendra Sadaria
San Envirotech Pvt. Ltd.

Annexure-XI

Details of Show cause Notice, closure notices issued by GPCB and actions taken

SHOW CAUSE NOTICE

PCB ID : 11917

Legal ID : 3897

Gujarat Pollution Control Board
Paryavaran Bhavan, Sector-10/A,
Gandhinagar - 382010
23222756

ACT : Water

Show Cause Notice DATE : 17/08/2012

The Board has monitored your industry on **17/07/2012** it was observed that

Reason :

1. You carry out production higher than the consented quantity.
2. You carry out neutralization of the both concentrated stream and the dilute stream in the same tank means there is no separated pre-treatment of the concentrated effluent.
3. You have not provided Magnetic Flow Meter at the final outlet of ETP.
4. You do not maintain the record of the disposal of concentrated stream through evaporator - Separate meter and log sheet is required to maintain.

×	1	You are manufacturing higher quantity of product than the consented quantity

In view of the above, you are called upon to show cause within 15 days why legal action should not be initiated against your industrial unit.

For and on behalf of
Gujarat Pollution Control Board

D. M. Thaker, DEE

NO : SCN-121488 , 17/08/2012

Jemby Chem Ltd,
Plot No: C/1-335 to 337, Phase No: II,
GIDC Vatva,
AHMEDABAD,
Dist : Ahmedabad, Tal : Ahmedabad, SIDC : Vatva
Phone : 9825416600

COPY TO :-

The RO Head(P.C.B.), Ahmedabad

With a request to carryout monitoring and send the detailed I.R. & A.R. for the sample collected to this office immediately.

S/C

MANUFACTURERS & EXPORTERS OF
DYES & DYES INTERMEDIATES

Factory : C-1/335 to 337 & A-1/332, Phase-II, GIDC Estate, Vatva, Ahmedabad-382 445. Gujarat INDIA
Phone : 0091-079-25832212, 25892212, 65452045 Fax : 0091-079-25894564
Regd.Off. : E-mail : jembybcpatel@yahoo.co.in, jembychem@gmail.com
3, Charankrupa Society, Vibhag-II, Beside Silicon Velly Building,
Near Shiv Ranjani Char Rasta, Satellite, Ahmedabad - 380 015.
Phone / Fax No. : 0091-079-26752531
Web site : www.jembychemlimited.com

JEMBY CHEM LIMITED
(IS AN ISO 9001:2000 Certified Company)

Ref. No.

Date : 29/08/2012

To,
Member Secretary,
Gujarat Pollution Control Board,
Paryavaran Bhavan, Sector-10
Gandhinagar,

PW 29/8/2012
Gujarat Pollution Control Board
Sector- No. 10-A,
Gandhinagar-382010.

Kind Attn: D.M. Thakar-Unit Head

Ref: SCN-121488 Show Cause Notice dated 17/08/2012

Respected Sir,

With above reference above matter we would like to inform you that

1. With reference to production, total cumulative production for all these products is 17.198 Mt/ Month as per consent, In earlier initial years J-Acid were being manufactured in our factory and also part of our raw material of our J-Acid derivatives product. Now instead of manufacturing, we import it form outside and use it in making derivative. Past Months we have not manufactured the J-Acid in our factory. However our total cumulative production has never been above the consented quantity. We are the member of CETP, TSDF and Multi Effect Evaporator and also pollution load does not increase, there fore we request you to consider the cumulative production quantity per month for J-Acid and J-Acid derivatives.
2. With reference to your point about using of same tank for neutralization of the both concentrated stream and dilute stream, we are having separate Collection tank, filter press, and separate holding tank for both the process. We carry out sequential batch process for neutralization. We re-use distillate in our plant and process. Due to non availability space, it was difficult for us when we conceived the separation of concentrated stream distillation. For immediate measure we installed this process keeping same neutralization tank by providing separate filter press and separate holding tank for both the concentrated stream and dilute stream. In our reply, our letter 19th July 2012 to board we assure you to give the effect of your suggestion and make the separation as you instructed.

003

MANUFACTURERS & EXPORTERS OF
DYES & DYES INTERMEDIATES

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JEMBY CHEM LIMITED
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Ref. No.

Date : 29/08/2012

To,
Member Secretary,
Gujarat Pollution Control Board,
Paryavaran Bhavan, Sector-10
Gandhinagar,

Kind Attn: D.M. Thakar-Unit Head

Ref: SCN-121488 Show Cause Notice dated 17/08/2012

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29/8/12

003

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JEMBY CHEM LIMITED
(IS AN ISO 9001:2000 Certified Company)

Ref. No. **Date :**

3. With reference to your point about Magnetic Flow meter we assure you to install the magnetic flow meter with 2-3 months and same we have asserted in our earlier reply to the Board on 17th July 2012 and after installation we will submit the report to board.
4. With reference to maintenance of record of disposal of concentrated stream through evaporator, prior to visit of Boards' officer on 17th July 2012, Board also made visit on 17th April 2012 suggested us to maintain the records for stream generation and distillation. From April, we started maintaining the records and have been maintaining the same. We also submitted the last three months records to the board in our reply on 19th July 2012-Copy attached for your reference(April, May, June 2012)

We also assure to Board that we will abide to obey all the rules and regulation of the board and request the authority to consider our reply and grant the CC&A.

Thanking you
Yours truly,

For JEMBY CHEM LTD.

Bharat K Patel-Director

GPCB

GUJARAT POLLUTION CONTROL BOARD

PARYAVARAN BHAVAN
Sector 10-A, **Gandhinagar** 382010
Phone : (079) 23226295
Fax : (079) 23232156
website : www.gpcb.gov.in

SHOW CAUSE NOTICE

The Board has monitored your industry on **16/8/2013 and 07/09/2013** with respect to routine monitoring and it was observed that

- **During visit heavy fumes of ammonia was felt.**
- **You have not provided flow meter on condensate line.**
- **You have not provided fixed pipeline from storage tank to collection tank.**
- **As per AR of treated waste water sample COD-1300 mg/L, NH3-N-252 mg/L were higher than the permissible limit.**

You are therefore called upon to Show Cause within 15 days from the receipt of this notice, if you fail to make representation / explanation / reply within a period of 15 days, the Board will be constrained to take legal action which may please be noted.

You are directed to operate ETP regularly , to provide adequate treatment for removal of ammonical nitrogen and to comply consent conditions.

For and on behalf of GPCB

(R.R.Vyas)
Environmental Engineer

No. GPCB/ABD/VT/CCA-347(3)/ID:11917/ 164577 Dt. 02/11/2013

TO,
JEMBY CHEM LTD.,
PLOT NO: C/1-335 TO 337,
PHASE: II,
GIDC: VATVA,
AHMEDABAD: 382445.

MANUFACTURERS & EXPORTERS OF
DYES & DYES INTERMEDIATES

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Near Shiv Ranjani Char Rasta, Satellite, Ahmedabad - 380 015.
Phone / Fax No. : 0091-079-26752531
Web site : www.jembychemlimited.com

JEMBY CHEM LIMITED
(A GOVERMENT RECOGNISED EXPORT HOUSE)

Ref. No.

Date :

2/11/2013

To,
Member Secretary,
Gujarat Pollution Control Board,
Gandhinagar

Kind Attn: Shri R.R.Vyas-Unit Head, Gandhinagar

Sub: Show Cause Notice No. GPCB/ABD/CCA-347(3)/Id-11917/164577

Respected Sir,

With respect to observation made by Board's officers and notice served in this regard we would like to state as following

- During the visit heavy fumes of ammonia was felt: During the visit and enquiry, the officer opened the lid of storage tank of ammonia, which is being stored and re-used in further process, and that could have become reason of dispersion of ammonia into open air and due to that ammonia might have been felt.
- You have not provided flow meter on condensate Line: Earlier we provided the flow meter on both in let and out let condensate system (for that we submitted photographs to the Board dated 17/08/2013), when we used to keep separate High COD stream, Now we reuse the condensate in our process and have merged both the streams to get better mixing to keep the Norms with in the limits and Treatment process flow charts also shown and explained to board's officers.

Gujarat Pollution Control Board
Sector No. 10 A.
Gandhinagar-382 010.

MANUFACTURERS & EXPORTERS OF
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Web site : www.jembychemlimited.com

JEMBY CH
LIMITE
(A GOVERMENT RECOGNISED EXP

Ref. No.

Date :

- You have not provided fixed pipeline from storage tank to collection tank :
  The officers observed pipeline, is not in used and we have closed it down th pipe line from storage tank to collection tank.
- As per AR of treated waste water sample COD-1300 Mg/L, NH3-N 252 Mg/l were higher than permissible limit: Same Samples were got analyzed by CTC/Green Laboratory and results of Ammonical Nitrogen and COD were found respectively 32 Mg/Ltr and 1000 MG/L, which are within limits and we think that there has been some mistake in sequence analysis, for that we had discussion to Lab Head-Shri J.K. Vyas saheb,. Further to inform you that the sample Code No. 125299 and report of which is 28734, in which you have shown result 6440 mg/Ltr, but it should be nearer to around 25000 Mg/L maintaining the sequence of same two analysis reports, i.e report no. 28731 and 28733.For Same treated water as per your report No. 28732 Ammonical nitrogen was reported 148 mg/L and same treated water goes further treatment to secondary tertiary and final out let and which shows the Higher result of Ammonical nitrogen as per your report i.e 252 mg/L

Further to inform you we have already installed high efficiency Ammonia recovery system and recovered Ammonia is reused in our process as Raw Materials.

We request to do needful in this regard and not to Initiate legal action against us

Thanking you

Yours truly,

For JEMBY CHEM LTD.

BKPatel

Bharat K Patel-Director

GUJARAT POLLUTION CONTROL BOARD
PARYAVAHAN BHAVAN
Sector-10-A, Gandhinagar-382 010
Phone : (079) 23225295
Fax : (079) 23232156
Website : www.gpcb.gov.in

GPCB

કારણ દર્શક નોટીસ

આપનું એકમ જોબ્બી કેમ લી. ના નામે પ્લોટ નં- સી-૧/૩૩૬,૩૩૭, ફેઝ- ૨, જીઆઈડીસી- વટવા, અમદાવાદ- ૩૮૨૪૪૫ માં આવેલ છે.

પના એકમની બોર્ડના અધિકારીઓ દ્વારા તા: ૧૩/૦૨/૨૦૧૭ ના રોજ મુલાકાત લેવામાં આવેલ. તેમાં નીચે મુજબ ક્ષતીઓ ધ્યાન પર આવેલ છે.

1. આપના એકમમાં બોર્ડની પૂર્વ મંજૂરી મેળવ્યા વિના હાઇ કોન્સન્ટ્રેડ ગંદા પાણી ને ગ્રીન એન્વાયર્મેન્ટ સર્વીસ કો-ઓ સોસાયટી લીમીટેડ, વટવા ના કોમન CETP માં અને સોસાયટી ફોર ક્લીન-અર્થ, વટવા ના કોમન સ્પ્રે ડ્રાયર માં નિકાલ કરો છો.

ઉપરોક્ત વિગતો ધ્યાને લઇ મુલાકાત અહેવાલમાં જણાવેલ મુજબતે પૂર્તતા કરવામાં નહી આવે તો તે સજોગોમાં પાણી અધિનિયમની જોગવાઇઓના ભંગ બદલ આપશ્રી સામે કાયદેસર કાર્યવાહી કેમ ન કરવી તે અંગેનો ખુલાસો આ નોટીસ મળ્યથી દિન-૧૫માં કરવા આથી આપને જણાવવામાં આવે છે.

ગુજરાત પ્રદૂષણ નિયંત્રણ બોર્ડના વતી,

(જે.ડી.કલ્યાણી)
પર્યાવરણ ઇજનેર

નંબર: જીપીસીબી/એબીડી-સીસીએ-વીઆઇ-૪૭ (3)/આઈડી-૧૯૯૧૭/ તા.

પ્રતિ,
જોબ્બી કેમ લી.,
પ્લોટ નં- સી- ૧/૩૩૬,૩૩૭, ફેઝ- ૨,
જીઆઈડીસી- વટવા,
અમદાવાદ- ૩૮૨૪૪૫

MANUFACTURERS & EXPORTERS OF
DYES & DYES INTERMEDIATES

Factory : C-1/335 to 337 & A-1/332, Phase-II, GIDC Estate, Vatva, Ahmedabad-382 445 Gujarat INDIA
Phone : +91-79-25832212, 25892212, 65452045 Fax : +91-79-2589945[illegible]
E-mail : jembychem@gmail.com, jembyccpatel@yahoo.co.in
Regd.Off. : 3, Charankrupa Society, Vibhag-II, Beside Silicon Velly Building,
Near Shiv Ranjani Char Rasta, Satellite, Ahmedabad - 380 015
Phone / Fax No. : +91-79-26752531, Web site : www.jembychemlimited.com
CIN No U74900GJ1988PLC010792

JEMBY CHEM
LIMITED

Ref. No. **Date :** 15/07/2017

To,

J D Kalyani

Unit Head-A'bad East & Environment Engineer

Gujarat Pollution Control Board,

Paryavaran Bhavan, Sector 10-A,

Gandhinagar-382010

Sub: Reply of Show Cause Notice

Ref: Your letter no. GPCB/ABD-CCA-VT-347(3)/ID-11917/416349, dated 01.07.2017

Dear Sir,

With reference to your above referred show cause notice, we wish to give our reply as below:

1. **You are sending high concentrated wastewater to common MEE of Green Environment Service Co-operative Society Ltd., Vatva and common spray dryer of Society for Clean Earth, Vatva without obtaining prior permission of Board.**

   We have already applied for amendment for additional common evaporator/common spray dryer facility as desire by you. In addition to this, we have already applied for additional/alternative TSDF site as desire by your visited officer.

We request to not take any legal action against our unit and oblige us.

Thanking you,

Yours Faithfully,

For, **Jemby Chem Limited**

Director

15-7-17
Gujarat Pollution Control Board
Sector No. 10 A,
Gandhinagar - 382 010.

ISO 9001:2008 (QMS 009) ISO 14001:2004 (EMS 003) OHSAH 18001:2007

MANUFACTURERS & EXPORTERS OF
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CIN No : U74900GJ1988PLC010792

JEMBY CHEM LIMITED
(A GOVERMENT RECOGNISED EXPORT HOUSE)

Ref. No.

Date : 15/07/2017

To,

J D Kalyani

Unit Head-A'bad East & Environment Engineer

Gujarat Pollution Control Board,

Paryavaran Bhavan, Sector 10-A,

Gandhinagar-382010

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Yours Faithfully,

For, **Jemby Chem Limited**

Director

15-7-17
Gujarat Pollution Control Board
Sector No. 10 A,
Gandhinagar - 382 010.

A-117

Annexure-XII

Environment audit reports for last 3 years and compliance of its recommendations/suggestions

ISO 9001:2008 (QMS 009) ISO 14001:2004 (EMS 003) OHSAH 18001:2007

MANUFACTURERS & EXPORTERS OF DYES & DYES INTERMEDIATES

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Web site : www.jembychemlimited.com

JEMBY CHEM LIMITED
(A GOVERMENT RECOGNISED EXPORT HOUSE)

Ref. No.

Date : 23/01/2015

To,
Member Secretary,
Gujarat Pollution Control Board,
Gandhinagar

Sub: Submission of Environment Audit Report for the year 2014

Respected Sir,

Please find enclosed herewith three copies of periodical Environment Audit for the period of January-2014 to December-2014 with scrutiny fess of Rs. 5,000/- (Five Thousand Only) vide DD No.-000998 dated 23/01/2015 of the Kalupur Commercial Co Op Bank Ltd, In favor of Gujarat Pollution Control Board. This report has been prepared by M/s. San Envirotech Pvt. Ltd.

We hope that you will find the same is in order.

Thanking You,
Yours truly,
For Jemby Chem Ltd

(Executive Director)

30/1/15

OBSERVATIONS AND RECOMMENDATIONS

- Company have Valid CC& A no AWH-51292 Date 18/12/2012 valid up to 27/02/2017
- House keeping observed reasonably well but it needs continuous maintenance.
- It is recommended that the industry should improve the work environment for the safety point of view.
- Unit has maintained records of wastewater treated in evaporator, whenever in operation.
- Industry has maintained the records in logbook for chemical consumption at ETP.
- Unit has regularly carried out mock drill for fire, safety and first aid.
- Unit has obtained ISO 14001: 2004, 9001:2008 and OHSAS 18001:2007 certification.
- Industry has provided magnetic flow meter at the outlet of ETP.
- Unit is regularly update XGN.

MANUFACTURERS & EXPORTERS OF
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CIN No : U74900GJ1988PLC010792

JEMBY CHEM LIMITED
(A GOVERMENT RECOGNISED EXPORT HOUSE)

Compliance report of Audit recommendation and suggestion:

Year: 2014

Auditor's Name: San Envirotech Pvt. Ltd.

Sr. No.	Observation & Recommendations	Remark	Compliance Status
1.	Company has valid CC&A no. AWH-51292 date 18/12/2012 valid up to 27/02/2017.	--	--
2.	Housekeeping observed reasonably well but it need continuous maintenance	It is maintained	Complied
3.	It is recommended that the industry should improve the work environment for the safety point of view	For safety point of view area has been defined, labelling, safety information provided to all employees of organization, medical examination as per factory act, employees welfare provisions	Complied
3.	Unit has maintained records of waste water treated in evaporator whenever in operation	Records are maintained	Complied
4.	Industry has maintained the records in logbook for chemical consumption at ETP.	Records are maintained	Complied
5.	Unit has regularly carried out mock drill for fire, safety and first aid.	It is covered under factory act and ISO 18001	compiling
6.	Unit has obtained ISO 14001:2004, 9001:2008, and OHSAS 18001:2007 certification.	Regular Third party audit is being carried out for Environment-ISO and OHSAS-ISO	compiling
7.	Industry has provided Magnetic flow meter at the out of ETP	It was instructed by GPCB officials during inspectional visit of CCA Renewal in the year 2012	Complied
8.	Unit is regularly update XGN	--	--

For, **Jemby Chem Limited**

Director

O/C

ISO 9001:2008 (QMS 009) ISO 14001:2004 (EMS 003) OHSAH 18001:2007

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CIN No : U74900GJ1988PLC010792

JEMBY CHEM LIMITED
(A GOVERMENT RECOGNISED EXPORT HOUSE)

Ref. No.

Date :

28 /06/2016

To,
Member Secretary,
Gujarat Pollution Control Board,
Gandhinagar

Sub: Submission of Environment Audit Report for the year 2015-16

Respected Sir,

Please find enclosed herewith three copies of periodical Environment Audit for the period of April-15 To March-16 with scrutiny fees of Rs. 5,000/- (Five Thousand Only) vide DD No. 002068 date 21/06/2016 of the Kalupur Commercial Co Op Bank Ltd, In favor of Gujarat Pollution Control Board. This report has been prepared by M/s. Akshar Consultants

We hope that you will find the same is in order.

Thanking You,
Yours truly,
For Jemby Chem Ltd

(B.K.Patel-Director)

29/6/16
Gujarat Pollution Control Board
Sector No. 10 A,
Gandhinagar - 382 010.

AKSHAR
CONSULTANTS

ANNEXURE - U

AUDITORS' REMARK
(Observations and Recommendations)

Jemby Chem Ltd. located at GIDC estate, Vatva, Ahmedabad is a chemical (Intermediates) manufacturing unit. We conclude our findings of the environmental audit for the year – 2015-'16 with following points :

OBSERVATIONS :

- Unit is a ISO:14001 certified company.
- During the audit period, unit had manufactured only one product i.e. N-Methyl J Acid (a J Acid derivative). Production was found to be as per the Consented quantity.
- Macro level mass balance and water balance was prepared for the unit based on preliminary information given to us by the unit.
- Unit segregates its' total generated effluent into two streams – dilute effluent (low COD) stream and concentrated effluent (high COD) stream.
- For dilute effluent stream, unit has a full – fledged in-house ETP consisting of primary, secondary and tertiary treatment units. This effluent stream, after treatment in in-house ETP, goes to CETP of GIDC Estate for further treatment and final disposal. Treated effluent quality was found to be meeting CETP inlet norms.
- Concentrated effluent stream is given to common evaporators for evaporation purpose. During the audit period, unit had given this concentrated effluent stream for evaporation to common MEE of CETP, Society for Clean Earth and Sanand Eco Project Ltd. Unit is a member of all these three common facilities.
- Unit has provided separate energy meter for ETP and an electro-magnetic type flow meter is provided at the outlet of ETP.
- Quantity of concentrated effluent stream was much higher as compared to dilute effluent stream.
- Unit is using bio-coal as fuel in its' steam boiler & thermic fluid heater. Flue gas emission was found to be within norms.
- There is SO_2 emission from process for which unit has provided ventury scrubber followed by two stage packed column alkali scrubber. Unit is recovering Sodium Bi-Sulphite from scrubber. Scrubber emission was found to be meeting the norms.

- Unit has provided ETP solid waste storage area within its' premises having impervious bottom, pucca roof and leachate collection system. Unit is a member of common solid waste disposal site of M/s. The Green Env. Services Co - op. Soc. Ltd. at Vinzol and disposes off its solid waste there. It is suggested to the unit to collect, store and dispose off all waste categories as per the Authorisation granted to it and keep record of the same.

- Unit is using certain hazardous substances which are stored and handled with utmost care. Onsite emergency plan is implemented and updated. Proper colour coding of pipes, dyke walls, safety showers and other safety measures were found in place. Safety training is regularly imparted to employees and their health check-up is also periodically carried out. Unit has also taken an insurance policy under the Public Liability Insurance Act.

- Unit is paying water cess regularly to GPCB.

- Data of production, raw materials, fuel, water and waste water etc. for the audit period were given by the unit and accepted by us in good faith.

- Over-all performance of EMS of the unit was found to be satisfactory.

RECOMMENDATIONS :

- It is suggested to the unit to keep all water meters in working condition and to keep proper record of fresh water consumption, effluent generated (both streams) and effluent treated / disposed.

- It is suggested to the unit to collect, store and dispose off all wastes as per the Hazardous Waste (M, H & TM) Rules, 2008. It is also suggested to the unit to keep separate record of all waste categories.

- Unit has a very elaborate ETP set-up vis-à-vis its' present quantity of dilute effluent stream and perhaps such extensive treatment may not be required to meet CETP inlet norms. Unit is advised to explore possibility of reducing in-house treatment to its' dilute effluent stream so as to save on electricity etc.

- It is also suggested to the unit to get its' CCA amended for disposal of concentrated effluent stream to common evaporator facilities of which it is a member.

- Unit is advised to keep record of Sodium Bi-Sulphite recovered from air pollution control system and reused in process.

MANUFACTURERS & EXPORTERS OF
DYES & DYES INTERMEDIATES

Factory : C-1/335 to 337 & A-1/332, Phase-II, GIDC Estate, Vatva, Ahmedabad-382 445. Gujarat INDIA
Phone : +91-79-25832212, 25892212, 65452045 Fax : +91-79-25894564
E-mail : jembychem@gmail.com, jembybcpatel@yahoo.co.in
Regd.Off. : 3, Charankrupa Society, Vibhag-II, Beside Silicon Velly Building,
Near Shiv Ranjani Char Rasta, Satellite, Ahmedabad - 380 015
Phone / Fax No. : +91-79-26752531, Web site : www.jembychemlimited.com
CIN No : U74900GJ1988PLC010792

JEMBY CHEM LIMITED
(A GOVERMENT RECOGNISED EXPORT HOUSE)

Compliance report of Audit recommendation and suggestion:
Year: 2015-16
Auditor's Name: Akshar Consultants

Sr. No.	Observation & Recommendations	Remark	Compliance Status
1.	It is suggested to the unit to keep all water meters in working conditions and to keep proper record of fresh water consumption, effluent generated (both streams) and effluent treated/disposed.	It is misobserved, our unit maintains records for all water consumption and disposal	Compiling
2.	It is suggested to the unit to collect, store and dispose off all waste as per the Hazardous waste (M,H & TM) Rules 2008, it is also suggested to keep separate record of all waste categories	It is misobserved, our unit maintains records for all type of waste and regularly monthly return is filed for all related to production, water consumption and generation and Hazardous waste generation and disposal.	Compiling
3.	Unit has a very elaborate ETP set-up vis-à-vis its' present quantity of dilute effluent stream and perhaps such extensive treatment may not be required to meet CETP inlet norms. Units is advised to explore possibility of reducing in-house treatment to its dilute effluent stream so as to save on electricity etc.	It is good suggestion, we will definitely think over it.	-
4.	It is also suggested to the unit to get its' CCA amended for disposal of concentrated effluent stream to common evaporator facilities of which it is a member.	We had written a letter to GPCB along with membership certificate.	Complied
5.	Unit is advised to keep record of Sodium Bi-Sulphate recovered from air pollution control system and reused in process.	Will maintain the record for it.	Will be complied

For, **Jemby Chem Limited**

Director

ISO 9001:2008 (QMS 009) ISO 14001:2004 (EMS 003) JAS-ANZ OHSAH 18001:2007

MANUFACTURERS & EXPORTERS OF
DYES & DYES INTERMEDIATES

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Phone : +91-79-25832212, 25892212, 65452045 Fax : +91-79-25894564
E-mail : jembychem@gmail.com, jembybcpatel@yahoo.co.in

Regd.Off. : 3, Charankrupa Society, Vibhag-II, Beside Silicon Velly Building,
Near Shiv Ranjani Char Rasta, Satellite, Ahmedabad - 380 015.
Phone / Fax No. : +91-79-26752531, Web site : www.jembychemlimited.com
CIN No : U74900GJ1988PLC010792

JEMBY CHEM LIMITED
(A GOVERMENT RECOGNISED EXPORT HOUSE)

Ref. No. **Date :**

27th June, 2017

To,
The Member Secretary
Gujarat Pollution Control Board
ParyavaranBhavan, Opp. Bij Nigam,
CHH Road, Sector 10A,
Gandhinagar, Gujarat 382010

Sub: **Submission of Environment Audit Report for the year 2016-17 in triplicate along with the required fees.**

Dear Sir,

We are submitting herewith the Environmental Audit Report of our industry for the year 2016-17 in triplicate copies audited by M/s. Go Green Mechanisms Pvt Ltd., Ahmedabad with the payment receipt of necessary fees.

Thanking You.

Yours Truly
FOR JEMBY CHEM LIMITED

Director

Enclosures:
1. Environment Audit Report (2016-17) in triplicate
2. Online payment Receipt No: MMT/Ref/717918561630/181602000000 Dt. 28/06/17 for Rs. 5000.00

29/6/17

Gujarat Pollution Control Board
Sector No. 10 A,
Gandhinagar - 382 010.

AUDIT PROCESS

OPENING MEETING

- The first step in the audit commenced with a meeting between the audit team and the management of Jemby Chem Limited to review the purpose of the audit, the procedure and the time scheduled.

SITE INSPECTION

- The audit team carried out an overview of Jemby Chem Limited and the operations through site inspections conducted on 6th June 2016, 16th Sep 2016 and 21st Feb 2017. The site inspections formed the basis of focus on specific areas or processes that require attention.

DOCUMENT REVIEW

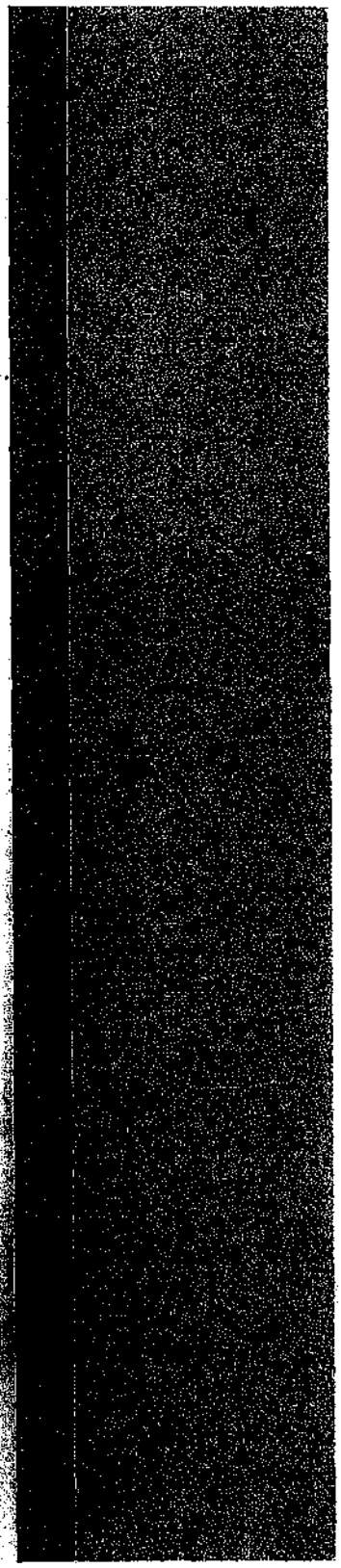
- Copy of environment audit 2014.
- Copy of Environment audit 2015-16.
- Copy of last five GPCB Inspection, SCN and Compliance Reports.
- Fuel/Gas bills along with proximate/ultimate analysis reports.
- Copies of electricity bill and utility bills
- Copy of Water Cess receipts for 2015-16 and Water Cess Returns for year 2016-17
- Water Consumption data including logs of daily consumption at different utilities/auxiliaries of the plant.
- Wastewater Generation data including logs of daily consumption at different utilities/auxiliaries of the plant.
- TSDF facility site registration & its validity.
- Electricity Consumption Records at ETP/APCM
- Chemical Consumption Records at Water/Wastewater Treatment plants
- Treatability report of Water/Wastewater Plants deployed in use
- PG Records of APC Systems deployed in use
- Records of Solid/Hazardous Waste Generation
- Raw Material Consumption Records
- Production Flow Charts and Mass Balance Diagrams
- Annual Returns – Form 4, Form 5- Submitted to the Board for 2015-16 and 2016-17

REVIEW OF PREVIOUS AUDIT RECOMMENDATIONS

An Environmental Audit for the year 2015-16 was carried out by Akshar Consultants. For M/S Jemby Chem Limited.

The Recommendations of the Auditor were as follows:

- It is suggested to the unit to keep all water meters in working condition and to keep proper record of fresh water consumption, effluent generated (both streams) and effluent treated / disposed.
- It is suggested to the unit to collect, store and dispose off all wastes as per the Hazardous Waste (M, H, & TM) Rules, 2008. It is also suggested to the unit to keep separate record of all waste categories.
- Unit has a very elaborate ETP set-up vis-à-vis its present quality of dilute effluent stream and perhaps such extensive treatment may not be required to meet CETP inlet norms. Unit is advised to explore possibility of reducing in-house treatment to its dilute effluent stream so as to save on electricity etc.
- It is also suggested to the unit to get its CCA amended for disposal of concentrated effluent stream to common evaporator facilities of which it is a member.
- Unit is advised to keep record of Sodium Bi-Sulphite recovered from air pollution control system and reused in process.



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- Unit is advised to keep record of Sodium Bi-Sulphite recovered from air pollution control system and reused in process.

- Unit is a ISO:14001 certified company.
- During the audit period, Unit had manufactured only one product i.e. N-Methyl J Acid (a J Acid derivative). Production was found to be as per the consent quantity.
- Macro level mass balance and water balance was prepared for the unit based on preliminary information given to us by the unit.
- Unit segregates its total generated effluent into two streams – dilute effluent (low COD) stream and concentrated effluent (high COD) stream.
- For dilute effluent stream, unit has a full – fledged in-house ETP consisting of primary, secondary and tertialry treatment units. This effluent stream, after treatment in in-house ETP, goes to CETP of GIDC Estate for further treatment and final disposal. Treated effluent quality was found to be meeting CETP inlet norms.
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- Quality of concentrated effluent is much higher as compare to dilute effluent stream.
- Unit is using bio-coal as fuel in its steam boiler and thermic fluid heater. Flue gas emission was found to be within norms.
- Ther is SO2 emission from process for which unit has provided ventury scrubber followed by two stage packed column alkali scrubber. Unit is recovering Sodium Bi-sulphite from scrubber. Scrubber emission was found to be meeting the norms.
- Unit has Provided ETP solid waste storage area within its premises having impervious bottom, pucca roof and leachate collection system. Unit is a member of common solid waste disposal site of M/s The Green Env. Services So-Op. Soc. Ltd. At Vinzol and disposes off its solid waste there. It is suggested to the unit to collect, store and dispose off all waste categories as per the authorization granted to it and keep record of the same.
- Unit is using certain hazardous substances which are stored and handled with utmost care. Onsite emergency plan is implemented and updated. Proper colour coding of pipes, dyke walls, safety showers and other safety measures were found in place. Safety training is regularly imparted to employees and their health check-up is also periodically carried out. Unit has also taken an insurance policy under the Public Liability Insurance Act.
- Unit is paying water cess regularly to GPCB.
- Data of Production, raw materials, fuel, water and waste water etc for the audit period were given by the unit and accepted by us in good faith.
- Overall performance of EMS of the unit was found to be satisfactory.

CLOSING MEETING

- On completion of the site investigations, the audit team presented their preliminary findings in a formal exit meeting. This meeting discussed matters which have been resolved or for which information was unavailable. The audit team has provided a general review of the findings and indicated them in detail by way of a draft Environmental Report which after approval forms the Final Environmental Audit Report due for submission to the Board no later than 30th June 2017

REVIEW OF ENVIRONMENTAL MANAGEMENT SYSTEM REPORT

LOCATION

Name of the Industry:
- M/s. Jemby Chem Limited

Location:
- Plot No. C-1/335,336,337, Phase-II, GIDC Estate, Vatva, Ahmedabad-382445

Registered Office Address:
- 3, Charankrupa Society, vibhag-II, Beside Silicon Valley Building, Near Shiv Ranjani Char rasta, Satellite, Ahmedabad-380015.

Month & Year of establishment:
- The Industry was established in October-1990.

Name/Residential address of all directors/partners:
- Mr. Bhupendrabhai C. Patel – 3, Charan Krupa Society-2, Opp. Jay Shefali Raw House, 132 Ft. Ring Road, Satellite, Ahmedabad.
- Mr. Jitendra Manilal Patel – B-15, Parkview Society, Nr. Gulab Park, Thaltej, Ahmedabad.
- Mr. Bharatbhai K. Patel – 19, Trishala Residency Bunglow, Opp. High Court, S.G. Highway, Sola, Ahmedabad-61.
- Mr. Mukeshbhai Babulal Patel – F-302, Sajan Apartment, Ramdev Nagar, Satellite, Ahmedabad.
- Mr. Girishbhai B. Patel – A-15, Saptak Bunglows, Opp. Sola Gam, Science City Road, Ahmedabad.
- Mr. Vivekbhai P. Patel – 55, Rachna Society, Satellite Road, Ahmedabad.
- Mr. Chandrakant J. Jani – 52, Rachna Society, Satellite Road, Ahmedabad.

MANUFACTURERS & EXPORTERS OF
DYES & DYES INTERMEDIATES

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Near Shiv Ranjani Char Rasta, Satellite, Ahmedabad - 380 015
Phone / Fax No. : +91-79-26752531, Web site : www.jembychemlimited.com
CIN No : U74900GJ1988PLC010792

JEMBY CHEM LIMITED
(A GOVERMENT RECOGNISED EXPORT HOUSE)

Compliance report of Audit recommendation and suggestion:
Year: 2016-17
Auditor's Name: Go Green Mechanisms Pvt. Ltd.

Sr No.	Observation & Recommendations	Remark	Compliance Status
1.	Unit has provided ETP solid waste storage area within its premises having impervious bottom, pucca roof and leachate collection system. Unit is a member of common solid waste disposal site of M/s The Green Env Services Co-Op Soc Ltd. At Vinzol and dispose off its solid waste there, It is suggested to the unit to collect, store and dispose off all waste as per the Hazardous waste (M,H & TM) Rules 2008, it is also suggested to keep separate record of all waste categories	It is misobserved, our unit maintains records for all type of waste and regularly monthly return is filed for all related to production, water consumption and generation and Hazardous waste generation and disposal.	Compiling
2.	Unit is using certain hazardous substances which are stored and handled with utmost care. Onsite emergency plan is implemented and updated. Proper colour coding of pipes, dyke walls, safety showers and other safety measures were found in place, Safety training is imparted to employees and their health check-up is also periodically carried out. Unit has also taken an insurance policy under the Public Liability Insurance Act.	For safety point of view area has been defined, labelling, safety information provided to all employees of organization, medical examination as per factory act, employees welfare provisions	Complied

For, **Jemby Chem Limited**

Director

Annexure-XIII

Copy CTO and its compliance

GPCB

GUJARAT POLLUTION CONTROL BOARD

PARYAVARAN BHAVAN
Sector-10-A, Gandhinagar-382 010
Phone : (079) 23226295
Fax (079) 23232156
Website : www.gpcb.gov.in

By R.O.A.D

In exercise of the power conferred under section(s) of the Water (Prevention and Control of Pollution) Act-1974 under section(s) of the Air (Prevention and Control of Pollution)-1981 and Authorization under Hazardous Waste (Management and Transboundary Movement) Rules'2016 framed under the Environmental (Protection) Act-1986

And Whereas Board has received completed consent application letter dated 19/02/2017 for the Consolidated Consent and Authorization (CC & A) of the Plant under the provisions / rules of the aforesaid Acts. Consent & Authorization are hereby granted to the

CONSENTS AND AUTHORISATION:
(under the provisions / rules of the aforesaid environmental acts)
To,

M/s.
JEMBY CHEMICALS LTD.
PLOT NO. CH-35/36/ 1ST. PHASE, G.I.D.C.
GIDC-VATVA,
AHMEDABAD- 382445

1 Consent Order No: AWH-85799 date of issue: 02/03/2017
2 the consents shall be valid up to 31/03/2022 for use of water for the discharge of trade effluent & emission due to operation of industrial plant for manufacture of the following products.

Sr.No.	Products	Quantity
1	Sulphuric Acid	20 MT/month
2	1-Acid	1,620 MT/month
3	2-Acid Dichloride	10 MT/MT month

3. CONDITIONS UNDER THE WATER ACT :
3.1 The total water consumption shall not exceed 14,550 KL/M out of which 2,475 KL/M shall be used for industrial purpose and 2,500 KL/M shall be used for domestic purpose.
3.2 The quantity of trade effluent from the Outlet shall be exceed 33,180 Lpd. Out of which High COD and high TDS streams(10,000 Lpd) shall be sent for further treatment to Nandesari Co-Project Ltd., Nandesari.
3.3 The quantity of sewage effluent from the factory shall not exceed 2000 Lpd.

3.4 TRADE EFFLUENT:
3.4.1 The trade effluent shall confirm to the following standards.

Sr. No.	Parameters	Standards	Column No. 3
	PARAMETERS	OUTLET NORMS	GPCB NORMS
01	pH	6.5 to 8.5	6.5 to 8.5
02	Temperature	40°C	40°C
03	Colour (Diluted)	300 units	300 units
04	Suspended Solids	100 mg/l	100 mg/l
05	Oil and Grease	10 mg/l	10 mg/l
06	Phenolic Compounds	1 mg/l	1 mg/l

Cyanides	0.2 mg/l.	0.2 mg/l.
Chromium	2 mg/l	2 mg/l
Sulphides	2 mg/l.	2 mg/l.
Ammoniacal Nitrogen	50 mg/l.	50 mg/l.
Arsenic	0.2 mg/l.	0.2 mg/l.
Total Chromium	2 mg/l	2 mg/l.
Mercury or Compounds	0.1 mg/l.	0.1 mg/l
Copper	3 mg/l.	3 mg/l.
Lead	0.1 mg/l	0.1 mg/l
Selenium	0.05 mg/l.	0.05 mg/l.
Nickel	3 mg/l	3 mg/l.
Zinc	5 mg/l	5 mg/l.
Cadmium	2 mg/l	2 mg/l.
BOD (3 days at 27°C)	350 mg/l	30 mg/l.
COD	1250 mg/l.	250 mg/l
Chlorides	-	600 mg/l.
Sulphates	-	1000 mg/l.
Total dissolved Solids	-	2100 mg/l.
Pesticides/Herbicides	-	Absent
Phenolic compounds	-	5 mg/l.

3.4.2 The effluent conforming to the above standards shall be discharged in to CETP-GHSCSL. Vapi for further treatment and disposal

3.4.3 Domestic effluent shall be disposed off through septic tank/soak pit system.

3.4.4 The directives issued by the Board from time to time or directions issued by the Honorable High court of Gujarat in the matter of Writ A. 7310/95 and any other statutory requirements shall be complied with

3.4.5 The unit shall maintain daily log book of water consumption, waste water generation, waste water disposal to CETP, Incineration, Common MEE, Colombo Spray dryer, Hazardous Waste Management, etc. in the prescribed Form.

4 CONDITIONS UNDER THE AIR ACT:

4.1 The following shall be observed as fuel.

Sr. No.	Fuel	Quantity
1	Agro waste (Briquettes)	0 (Zero MT/D)
2	Diesel	12 KL/D

4.2 The flue gas emission through stack attached to furnace shall conform to the following standards.

Stack No.	Stack Attached To	Stack Height in Meter	Air Pollution Control System	Parameters	Permissible Limit
1	Steam Boiler	15	Multi Cyclone separator	Particulate matter SO_2 NO_x	150 mg/Nm³ 100 ppm 50 ppm
2	Thermic fluid heater	11			
3	D.G. Set (125 KVA) Standby	4	-		

GPCB

GUJARAT POLLUTION CONTROL BOARD

PARYAVARAN BHAVAN
Sector-10-A, Gandhinagar-382 010
Phone : (079) 23226295
Fax (079) 23232156
Website : www.gpcb.gov.in

4.1 The process gaseous emission through various stacks/vents of reaction process vessel shall conform to the following standards

Stack No	Stack Attached To	Stack Height In Meter	Air Pollution Control System	Parameter	Permissible Limit
1	Reactor vessel	20	Venturi alkali scrubber + two stage packed column alkali scrubber	Particulate matter SO_2 HCl	150 mg/Nm³ 100 ppm 50 ppm
2	Reaction vessel (Unit No.)	11	Alkali scrubber + venturi system		

4.2 Ambient air quality within and outside the premises of the unit shall confirm National Ambient Air Quality standards notified by MOEF vide notification dated 16.11.2009 and latest by the following standards:

Sr. No.	Pollutant	Time Weighted Average	Concentration in Ambient air
1.	Sulphur Dioxide (SO_2) µg/m³	Annual	50
		24 Hours	80
2.	Nitrogen Dioxide (NO_2) µg/ m³	Annual	40
		24 Hours	80
3.	Particulate Matter (Size less than 10 µm) OR PM_{10} µg/m³	Annual	60
		24 Hours	100
4	Particulate Matter (Size less than 2.5 µm) OR $PM_{2.5}$ µg/m³	Annual	40
		24 Hours	60

4.3 The applicant shall provide portholes, ladder, platform etc. at chimney(s) for monitoring the air emissions and the same shall be open for inspection/visit for use of Board's staff. The chimney(s) were attached to various sources of pollution shall be designated by numbers such as S-1, S-2, etc. and these shall be painted/displayed to facilitate identification.

4.4 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 standards in respect of noise (not less than 75dB(A) during day time and 70 dB (A) during night time. Daytime is reckoned in between 6 a.m. and 10 p.m. and nighttime is reckoned between 10 p.m. and 6 a.m.

4.5 The applicant shall provide proper ventilation and sanitary facilities so as to maintain healthy working atmosphere in all the factory premises.

5. GENERAL CONDITIONS:

5.1 Any change in personnel, equipment or working conditions as mentioned in the consent/order should immediately be intimated to this Board.

6. AUTHORISATION FOR THE MANAGEMENT & HANDLING OF HAZARDOUS WASTES Form-2 (See rule 4 (1))

Form for grant of authorization for occupier or operator handling hazardous waste

6.1 Number of authorization: AWH-85709 date of issue: 02/05/2011

6.1.1 **JENBEY CHEM LTD** is hereby granted an authorization to operate facility for following hazardous wastes on the premises situated at, PLOT NO. CP-335/10 337, PHASE III, GIDC-VATVA, AHMEDABAD-382445

Sr No.	Waste	Quantity Per year	Process Category	Facility
1	ETP Sludge	480 MT/y	32.2	Collection, Storage, Decontamination, Transportation, Disposal at TSDF.
2	Discarded containers, Liners	12 nos/month 5 kg/month	33.1	Collection, Storage, Decontamination, Transportation, Disposal by selling to authorized recycler.
3	Used spent oil	150 KL/y	5.1	Collection, Storage, Transportation, Disposal by selling to Registered recycler.

6.1.2 The authorization is granted to operate a facility for collection, storage, within premises only.

6.1.3 The authorization shall be valid up to 31/03/2022

6.1.4 The authorization is subject to the conditions stated below and such other conditions as may be specified in the rules from time to time under the Environment (Protection) Act, 1986

6.1.5 TERMS AND CONDITIONS OF AUTHORISATION

a) The applicant shall comply with the provisions of the Environment (Protection) Act, 1986 and the rules made there under

b) The authorization shall be produced for inspection at the request of an officer authorized by the Gujarat Pollution Control Board.

c) The person authorized shall not rent, lend, sell, transfer or otherwise transport the hazardous wastes without obtaining prior permission of the Gujarat Pollution Control Board

d) Any unauthorized change in personnel, equipment or working conditions as mentioned in the authorization order by the person authorized shall constitute a breach of this authorization

e) It is the duty of the authorized person to take prior permission of the Gujarat Pollution Control Board to close down the facility

f) An application for the renewal of an authorization shall be made as laid down in rule 6(6) (a). Industry shall have to pay recorded conditions as per Rules 2016 and apply Authorization renewal needs to be applicable values as per the Rules with 15 days

g) Industry shall submit annual reports by 30th June of every year

For and on behalf of
Gujarat Pollution Control Board

(A. B. Rajyaguru)
Environmental Engineer

ANN. CPCB/ABDV [CTO-347018-13917]
Issued to
JENBEY CHEM LTD.
PLOT NO. CP-335/10 337, PHASE -III,
GIDC-VATVA,
AHMEDABAD- 382445

A-133

ISO 9001:2008 (QMS 009) ISO 14001:2004 (EMS 003) OHSAH 18001:2007
MANUFACTURERS & EXPORTERS OF DYES & DYES INTERMEDIATES
Factory : C-1/335 to 337 & A-1/332, Phase-II, GIDC Estate, Vatva, Ahmedabad-382 445. Gujarat INDIA
Phone : +91-79-25832212, 25892212, 65452045 Fax : +91-79-25894564
E-mail : jembychem@gmail.com, jembybcpatel@yahoo.co.in
Regd.Off. : 3, Charankrupa Society, Vibhag-II, Beside Silicon Velly Building, Near Shiv Ranjani Char Rasta, Satellite, Ahmedabad - 380 015.
Phone / Fax No. : +91-79-26752531, Web site : www.jembychemlimited.com
CIN No : U74900GJ1988PLC010792
JEMBY CHEM LIMITED
(A GOVERMENT RECOGNISED EXPORT HOUSE)

Compliance of CC&A

Vide CCA order No. AWH-85798, dated 02/05/2017, valid up to 20/03/2022

Sr. No.	Conditions	Status
1.	Consent order No. AWH-**85798**, date of issue **02/05/2017**.	-
2.	The consents shall be valid up to **20/03/2022** for use of outlet for the discharge of trade effluent & emission due to operation of industrial plant for manufacture of the following items/ products:	**Complied**

Sr. No.	Products	Quantity
1	Sulpho Tobias Acid	2.0 MT/month
2	J-Acid	2.528 MT/month
3	J-Acid Derivatives	12.67 MT/month

3.	**CONDITION UNDER THE WATER ACT:**	
3.1	The total water consumption shall not exceed 47250 L/d, out of which 44750 L/d shall be used for industrial purpose and 2500 L/d shall be used for domestic purpose.	**Complied**
3.2	The quality of trade effluent from the factory shall be exceed 33,000 L/d. Out of which high COD and high TDS stream (10,000 L/d) shall be sent for further treatment to Sanand Eco Project Ltd., Sanand.	**Complied**
3.3	The quantity of sewage effluent from the factory shall not exceed 2000 L/d.	**Complied**
3.4	**TRADE EFFLUENT**	
3.4.1	The industrial effluent shall conform to the following standards.	**Complied**

	Column No. 1	**Column No. 2**
Parameters	**CEPT Inlet Norms**	**GPCB Norms**
pH	6.5 to 8.5	6.5 to 8.5
Temperature	----	40°C
Color (pt.co. scale) in unit	----	100 units
Suspended solids	300mg/l	100mg/l
Oil and Grease	20 mg/l	10 mg/l
Phenolic Compounds	1 mg/l	1 mg/l
Cyanides	0.2 mg/l	0.2 mg/l
Fluorides	2 mg/l	2 mg/l
Sulphides	2 mg/l	2 mg/l
Ammonical Nitrogen	50 mg/l	50 mg/l
Arsenic	0.2 mg/l	0.2 mg/l
Total Chromium	2 mg/l	2 mg/l
Hexavalent Chromium	0.1 mg/l	0.1 mg/l
Copper	3 mg/l	3 mg/l
Lead	0.1 mg/l	0.1 mg/l
Mercury	0.01mg/l	0.01 mg/l
Nickel	3 mg/l	3 mg/l
Zinc	5 mg/l	5 mg/l

Cadmium	2 mg/l	2 mg/l
BOD (5 days at 20°C)	500 mg/l	30 mg/l
COD	1200 mg/l	250 mg/l
Chlorides	----	600 mg/l
Sulphates	----	1000 mg/l
Total dissolved Solids	----	2100 mg/l
Insecticide Pesticide	----	Absent
Sodium absorption ratio	----	26

3.4.2	The effluent conforming to the above standards shall be discharged into CEPT-GESCSL Vatva for further treatment and disposal.	**Complied**
3.4.3	Domestic effluent shall be disposed off through septic tank/soak pit system.	**Complied**
3.4.4	The directives issued by the Board from time to time view of direction issued by the Honorable High court of Gujarat in the matter of S.C.A. 770/95 and any other shall have to be complies with.	**Complied**
3.4.5	The unit shall maintain daily log book of water consumption, waste water generation, waste water disposal to CETP, Incinerator, Common MEE, Common Spray dryer, Novel Spent Acid Management, etc. as the case may be.	**Complied**
4.	**CONDITIONS UNDER AIR ACT:**	
4.1	The following shall be used as fuel.	**Complied**

Sr. No.	Fuel	Quantity
1	Agro waste (Briquette)	0.084 MT/h
2	Diesel	12 L/h

4.2 The flue gas emission through stack attached to boiler/heater shall confirm to the following standards: **Complied**

Stack No.	Stack attached to	Stack Height (m)	Air Pollution Control system	Parameter	Permissible Limit
1.	Steam Boiler	15	Multi Cyclone Separator	Particulate Matter	150 mg/Nm^3
2.	Thermic fluid heater	11		SO_2	100 ppm
3.	D.G. Set (125 KVA) Stand by	4	--	NO_x	50 ppm

4.3 The process gas emission through various stack/vent of reactors, process vessel shall conform to the following standards. **Complied**

Stack No.	Stack attached to	Stack height (m)	Air Pollution Control system	Parameter	Permissible Limit
1	Reaction	20	Ventral	Particulate	150 mg/Nm^3

		Vessel		alkali scrubber and two stage packed column alkali Scrubber	matter SO_2 NO_x	100 ppm 50 ppm	
	2	Reaction Vessel (Standby)	13	Alkali Scrubber, Venturi system			
4.4	Ambient air quantity within and outside the premises of the unit shall conform National Ambient Air Quantity standards notified by MOEF vide notification dated 16/11/2009 and mainly to the following standards:						**Complied**

Sr. No.	Pollutant	Time weighted Average	Concentration in Ambient Air
1.	Sulphur Dioxide (SO_2), µg/m^3	Annual 24 Hours	50 80
2.	Nitrogen Dioxide (NO_2), µg/m^3	Annual 24 Hours	40 80
3.	Particulate matter (size less than 10 µm) OR PM_{10} µg/m^3	Annual 24 Hours	60 100
4.	Particulate matter (size less than 2.5 µm) OR $PM_{2.5}$ µg/m^3	Annual 24 Hours	40 60

4.5	The applicant shall provide portholes, ladder, platform etc. at chimney(s) for monitoring the air emissions and the same shall be open for inspection to/and for use of Board's staff. The chimney(s) vents attached to various sources of emission shall be designed by numbers such as S-1, S-2, etc. and these shall be painted/displayed to facilitate identification.	**Complied**
4.6	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 standards in respect of noise to less than 75 dB(A) during day time and 70 dB(A) during night time. Daytime is reckoned in between 6 a.m. and 10 p.m. and night time is reckoned between 10 p.m. and 6 a.m.	**Complied**
4.7	The applicant shall provide proper ventilation and exhaust facilities so as to maintain healthy working atmosphere within the factory premises.	**Complied**
5	**GENERAL CONDITIONS:**	
5.1	Any change in personnel, equipment or working conditions as mentioned in the consents forms/order should immediately be intimated to this Board.	**Follow the condition**
6	**AUTHORISATION FOR THE MANAGEMENT & HANDLING OF HAZARDOUS WASTE Forn-2 (see rule 6 (2)).** Form for grant of authorization for occupier or operator handling hazardous waste	

<table>
<tr><td>6.1</td><td colspan="5">Number of authorization: AWH-85798 date of issue: 02/05/2017.</td><td>--</td></tr>
<tr><td>6.1.1</td><td colspan="5">M/s. JEMBY CHEM LTD. is hereby granted an authorization to operate facility for following hazardous wastes on the premises situated at Plot No. C-1/335 to 337, Phase-II, GIDC Vatva, Ahmedabad-382445.
<table>
<tr><th>Sr. No.</th><th>Waste</th><th>Quantity</th><th>Process Category</th><th>Facility</th></tr>
<tr><td>1.</td><td>ETP Sludge</td><td>480 MT/yr.</td><td>35.3</td><td>Collection, Storage, Transportation, Disposal at TSDF</td></tr>
<tr><td>2.</td><td>Discarded containers/ liners</td><td>12 nos./ month 8 kg/month</td><td>33.1</td><td>Collection, Storage and reuse for disposal of waste storage to TSDF site.</td></tr>
<tr><td>3.</td><td>Used Spent Oil</td><td>167 lit/yr.</td><td>5.1</td><td>Collection, Storage, Transportation, Disposal by selling to Registered re processor.</td></tr>
</table></td><td>Complied</td></tr>
<tr><td>6.1.2</td><td colspan="5">The authorization is granted to operate a facility for collection, storage, within the factory premises.</td><td>Follow the condition</td></tr>
<tr><td>6.1.3</td><td colspan="5">The authorization shall be valid up to 20/03/2022.</td><td>--</td></tr>
<tr><td>6.1.4</td><td colspan="5">The authorization is subject to the conditions stated below and such other conditions as may be specified in the rules from time to time under the Environment (Protection) Act-1986.</td><td>Follow the condition</td></tr>
<tr><td>6.1.5</td><td colspan="6">Terms and Conditions of Authorization</td></tr>
<tr><td>a)</td><td colspan="5">The applicant shall comply with provisions the Environment (Protection) Act, 1986 and the rules made there under.</td><td>Follow the condition</td></tr>
<tr><td>b)</td><td colspan="5">The authorization shall be produced for inspection at the request of an officer authorized by the Gujarat Pollution Control Board.</td><td>Noted the point</td></tr>
<tr><td>c)</td><td colspan="5">The persons authorized shall not rent, lend, sell, transfer or otherwise transport the hazardous wastes without obtaining prior permission of the Gujarat Pollution Control Board.</td><td>Follow the condition</td></tr>
<tr><td>d)</td><td colspan="5">Any unauthorized change in personnel, equipment or working conditions as mentioned in the authorization order by the persons authorized shall constitute a breach of this authorization.</td><td>Follow the condition</td></tr>
<tr><td>e)</td><td colspan="5">It is the duty of the authorized person to take prior permission of the Gujarat Pollution Control Board to close down the facility.</td><td>Follow the condition</td></tr>
<tr><td>f)</td><td colspan="5">An application for the renewal of an authorization shall be made as laid down in Rule (6) (ii). Industry shall have to manage discarded containers as per rules 2016 and apply Authorization/ submit details for all applicable waste as per the Rules within 15 days.</td><td>Follow the condition</td></tr>
<tr><td>g)</td><td colspan="5">Industry shall submit annual report by 30th June every year.</td><td>Follow the condition</td></tr>
</table>

Annexure-XIV

Copies of XGN generated Inspection reports with analysis reports of the water/Air/Hazardous samples collected by GPCB (Last 2 year).

Copies of instructions issued by GPCB in last 2 year and its compliance

ગુજરાત પ્રદૂષણ નિયંત્રણ બોર્ડ

પ્રાદેશિક કચેરી : અમદાવાદ (પૂર્વ)

ભોંયતળીયે, ઓમ શાંતિનગર-૩ પ્લસ, ફોન (૦૭૯)૨૯૨૯૫૮૮૦
દેવી માતાના મંદિરની બાજુમાં. વટવા, અમદાવાદ-૩૮૨૪૪૦

તપાસ માટે દાખલ થવાની સૂચના (નોટીસ)

નં. :

પાણી અધિનિયમ ૧૯૭૪ની કલમ-૨૩, હવા અધિનિયમ ૧૯૮૧ની કલમ-૨૪ અને પર્યાવરણ (સુરક્ષા) અધિનિયમ-૧૯૮૬ની કલમ-૧૦ હેઠળ અમોને મળેલ સત્તાની રૂએ અમો નીચે સહી કરનાર અમોને જરૂરી લાગે તેની સહાય લઈને તમામ સમયે નીચેના હેતુઓ માટે આપની જગ્યામાં દાખલ થવાનો અને તપાસ કરવાનો અધિકાર ધરાવીએ છીએ.

(૧) અમોને સોંપેલા રાજ્ય બોર્ડ-કેન્દ્ર સરકારનાં કાર્ય બજાવવાના હેતુ માટે.

(૨) આવા કોઈ કાર્યો બજાવવાના છે કે કેમ અને તેમ હોય તો કઈ રીતે તે બજાવવાના છે અથવા આ અધિનિયમ અથવા તે હેઠળ કરેલા નિયમોની અથવા આ અધિનિયમ હેઠળ બજાવેલી કોઈ નોટીસની, કરેલા કોઈ હુકમની, આદેશની અથવા આપેલા કોઈ અધિકારપત્રની કોઈ જોગવાઈનું પાલન કરવામાં આવી રહ્યું છે કે પાલન કરવામાં આવ્યું છે કે કેમ તે નક્કી કરવાના હેતુ માટે.

(૩) કોઈ સાધન સામગ્રી, ઔદ્યોગિક પ્લાન્ટ, રેકર્ડ, રજીસ્ટર, દસ્તાવેજ અથવા અન્ય કોઈ મહત્ત્વની વસ્તુની તપાસ કરવા અને તેની કસોટી કરવાના હેતુ માટે અથવા જે જગામાં તેને એમ માનવાને કારણ હોય કે આ કાયદા કે તે હેઠળ કરેલા નિયમો મુજબ કોઈ ગુનો કરવામાં આવ્યો છે અથવા થવાની તૈયારીમાં છે, તેવી કોઈ જગ્યાની ઝડતી લેવા માટે અને તેને એમ માનવાને કારણ હોય કે આ કાયદા કે તે હેઠળ કરેલ નિયમો હેઠળ શિક્ષાપાત્ર કોઈ ગુનો કર્યાનો પુરાવો, તેવા સાધન સામગ્રી, ઔદ્યોગિક પ્લાન્ટ, રેકર્ડ, રજીસ્ટર, દસ્તાવેજ અથવા અન્ય મહત્ત્વની વસ્તુ કબજે લેવા માટે અમે નીચે જણાવેલ સમયે દાખલ થઈએ છીએ.

ઉદ્યોગ/કારખાનામાં દાખલ થવાનો સમય : સવારના/સાંજના 12 : 30 તા. 26/03/2018

અમારી સાથે સહાય માટે નીચેની વ્યક્તિઓ પણ છે-

૧. શ્રી એન. ઘાસુરા (વૈ. અધિકારી)

સૂચના :- (1) છેલ્લા 3 મહિના Cons. stream W/W ના

૨. MEE, SEPL તથા ફીલ્ડ ચકીમાં મોકલાયેલ W/W ના ડેટા આપવા.

૩. (2) છેલ્લા 3 મહિના ઉત્પાદનના ડેટા આપવા.
(3) કોમન MEE પર કરવામાં આવેલ વેરીફીકેશન મુજબ આપની W/W સ્ટ્રીમમાં આવતા High ટેમ્પરેચર નાઈટ્રોજન બાબતે ખુલાસા કરવા

પ્રતિ, શ્રી (મદદનીશ કે. પ્રદેશ. ઈજનેરશ્રી)

JEMBY CHEM.I.IMITED,
Plot No. C. 1/335, 336, 337.
Phase-II, G.I.D.C. Estate,
Vatva, Ahmedabad-382445.

સહી :-

અધિકારીનું નામ :-

હોદ્દો :- આર. બી. નિવેદી
(પ્રાદેશિક અધિકારી)

નકલ મળેલ છે.

આ સૂચના (નોટીસ) મેળવનારની સહી :-

O/C

JAS-ANZ
OHSAH 18001:2007

MANUFACTURERS & EXPORTERS OF
DYES & DYES INTERMEDIATES

Factory : C-1/335 to 337 & A-1/332, Phase-II, GIDC Estate, Vatva, Ahmedabad-382 445. Gujarat INDIA
Phone : 0091-079-25832212, 25892212, 65452045 Fax : 0091-079-25894564
E-mail : jembybcpatel@yahoo.co.in, jembychem@gmail.com
Regd. Off. : 3, Charankrupa Society, Vibhag-II, Beside Silicon Velly Building,
Near Shiv Ranjani Char Rasta, Satellite, Ahmedabad - 380 015.
Phone / Fax No. : 0091-079-26752531
Web site : www.jembychemlimited.com

JEMBY CHEM LIMITED
(A GOVERMENT RECOGNISED EXPORT HOUSE

Ref. No.

Date :

CIN No: U74900GJ1988PLC010792

20/03/2015

To,

Regional Officer,
Gujarat Pollution Control Board,
Ground Floor, Om Shantinagar -3 Plus,
Nr Devi Mata Temple,
Vatva, Ahmedbad-382440

Kind Attn: Shri R.B.Trivedi-Regional Officer/ Shri I.N. Ghasura- Scientific Officer
Subject: GPCB visit dated on March 19, 2015

Respected Sirs,

This is with reference to your inspection visit made by you; we would like to furnish the details from December 2014 to February 2015 as under:

- Last three months concentrated stream waste water data; sent for further treatment at Green-MEE, SEPL and Clean Earth along photocopies of manifests.
- Last three Months production data.
- Clarification about High Ammonical Nitrogen in waste water in common MEE :

  We are not using ammonia as raw material in our process. However some of the Ammonium compounds are formed during the reaction which appears in concentrated effluent.

  This concentrated stream is sent to MEE plant for final treatment and disposal along with large quantity of effluent received at MEE plant. Thus the concentration of the ammonium compounds initially contained in our effluent stream becomes very low in the overall combined effluent fed into MEE plant. This Ammonical nitrogen is in ionic form and remains in the effluent in the form of inorganic ammonium salt. These salts separate out along with other salt during evaporation process in the MEE plant.

  Thus we have adequate arrangement for environmental management. We assure you that we will utilize and operate this arrangement for the protection of environmental quality.

Thanking you
Yours truly,
For JEMBY CHEM LTD.

Bharat K Patel-Director
Encl: As mentioned

23/3/15
GUJARAT POLLUTION CONTROL BOARD
Ahmedabad (East)

ANALYSIS REPORT FOR
WATER / WASTE WATER SAMPLE

Sample ID:159444 - Analysis Completion:18/04/2015

Dyes and Dye- Intermediates / LAB Inward : 38647

Gujarat Pollution Control Board,
Central Laboratory
Paryavaran Bhavan
Sector-10A
Gandhinagar-382010

Accreditation Standards & NABL Certificate Details : T-2105 / ISO/IEC 17025:2005 / 21/12/2011 / 20/12/2013

TEST REPORT

Test Report No. : 38647 **Date: 18/04/2015**

1. Name of the Customer : **Jemby Chem Ltd - 11917**
2. Address : **Plot No: C/1-335 to 337 ,Phase No: II,GIDC Vatva AHMEDABAD-382445, Taluka : Ahmedabad-Vatva, District : Ahmedabad-Vatva, GID**
3. Nature of Sample : **REP-Representative/Grab, (Insp Type : SCN-After SCN Inspection)**
4. Sample Collected By : **R. B. Trivedi, R.O Head**
5. Quantity of Sample Received : **5000**
6. Code No. of the Sample : **159444**
7. Date & Time of Collection & Inwarding : **19/03/2015 , (1700 to 1700) & 23/03/2015**
8. Date of Start & Completion of Analysis : **26/03/2015 & 18/04/2015**
9. Sampling Point : **## Final Outlet of the ETP ~**
10. Flow Details (Remarks) :
11. Mode of Disposal : **Into CETP**
12. Ultimate Receiving Body : **0**
13. Temperature on Collection : **31 & pH Range on pH Strip :@ 7 to 8 on pH strip**
14. Carboys Nos for : **Barcode & Color & Appearance :Brownish**
15. Water Consumption & W.W.G (KLPD) : **Ind :47.250 , Dom :5.000 & Ind :33.650 , Dom :2.000**

Sr	Parameter	Unit	Test Method	Range of Testing	Result
1	Temperature	Centigrade	IS: 3025 (Part – 9) – 1984(Reaffirmed 2006)	Ambient oC - 60 oC	31
2	pH	pH Units	4500 H+ B APHA Standard Methods 22nd edi.2012	1 – 14 pH value As or	8.08
3	Colour	Pt.Co.Sc.	2120 B APHA Standard Methods 22nd edi. 2012	2 - to 99 Hazen & 1-50	240
4	Total Dissolved Solids	mg/l	Gravimetric method. (2540 C APHA Standard Methoc	10 – 200000 mg/L	3780
5	Suspended Solids	mg/l	Gravimetric method. (2540 D APHA Standard Methoc	2 – 10000 mg/L	292
6	Ammonical Nitrogen	mg/l	1).Titrimetric method (4500 NH3 B & C APHA Standa	1 - 2000 mg/l.	6.05
7	Chloride	mg/l	Argentometric method. (4500 Cl? B APHA Standard M	1 - 50000 mg/l	1590
8	Sulphate	mg/l	APHA(22nd edi)4500 SO4 E	2-40mg/l	244
9	Chemical Oxygen Demand	mg/l	APHA (22nd Edition)- 5220 B Open Reflux Method-2	5.0- 50000 mg/l	109
10	Oil & Grease	mg/l	Liquid – Liquid Partition Gravimetric method. (5520 B	01 – 1000 mg/l	0.8
11	Phenolic Compounds	mg/l	4 Amino Antipyrene method without Chloroform Extra	0.1 – 50 mg/l	BDL
12	Zinc	mg/l	(3111 B APHA Standard methods 21st edi)	0.005-100mg/l	0.131
13	Total Chromium	mg/l	3111 B APHA Standard methods 21st edi)	0.02-150mg/l	0.125
14	Copper	mg/l	3111 B APHA Standard methods 21st edi)	0.01-150 mg/l	0.424
15	Nickel	mg/l	(3111 B APHA Standard methods 21st edi)	0.02-150 mg/l	0.065
16	B.O.D (3 Days 27oC)	mg/l	3 – Day BOD test. (IS 3025 (Part 44) 1993 Reaffirmec	05–50000 mg/l	12
17	% ACIDITY	MG/L	-	-	4.78 m/l as a

Laboratory Remarks : Approved By:434-r.o_434 Dt.: 18/04/2015

H.P.Patel,R.O Head

Field Observation :

Note :

1. * - These parameters are covered under the scope of NABL.
2. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.
3. Samples will be destroyed after 10 days from the date of issue of test report unless otherwise specified.
4. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Board in writing.
5. The Board is not responsible for the authenticity for the samples not collected by the Board's officials.
6. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
7. Permissible Limits: as per Schedule VI of EPA Rules, 1986 as ammended by Second and Third ammendment 1993 for Effluents
8. Physicochemical and microbiological parameters, Std.Methods for Water and Waste Water- 22nd Edition by APHA.
9. Bioassay test (for toxicity) -IS:6582:Part-2:2001; Reaffirmed 2007.

Gujarat Pollution Control Board

PCB Id: 11917

(Inspection Report) - Air,Water,Hazardous

(Under Section 23 of The Water Act 1974, Under Section 24 of The Air Act 1981 and Under Section 10 of EP Act 1986)

1 **Industry Details** **Jemby Chem Ltd**

Outward No: 15941-06/01/2016

Email :
jembybcpatel@yahoo.co.in

Telephone :
-

Plot No: C/1-335 to 337 ,
Phase No: II, GIDC Vatva,
AHMEDABAD - 382445
DIST : Ahmedabad-Vatva, TAL : Ahmedabad-Vatva, SIDC : Vatva

Inspection Id : 367275 (Routine Visit) **Ro Name : Ahmedabad (East)**

2 **Type / Scale / Sector / Status :** RED / SMALL / Dyes And Dye-Intermediates. / In Operation

3 **Inspection Dt & Time :** 28/12/2015 2:55 / Water **Person Contacted :** Shri Amrutbhai Patel - Supervisor

4 **Env Audit Detail : Sch : 2 , San Envriotech Pvt Ltd , Year : 2013 , On Dt : 16/02/2014**

Commissioned Dt : 01/01/1990 **Production Start Dt :** 01/01/1990 **Applicability of CRZ Rules :** No

5 **Water Consumption in Kilo Lts Per Day** Ind : 47.250 Dom : 5.000 **Borewells:** 1

6 **Waste Water generation / Discharge (klpd) :** Ind : 33.650 Dom : 2.000 **Tubewells:** 0

7 **Consumer No.(Electric Meter):** **Source of Water Supply:** Borewell, SIDC

8 **Disposal Mode of Industrial / Domestic :** Not Specified / Not Specified

9 **Discharge Pt / Final Receiving Body (Ultimate):** Green CETP / 0

10 **Status of water consent Under the Water Act,1974:** AWH-51292-20/03/2017 Last Inward:61059-18/09/2012[GRT]

11 **Effluent Treatement plant (ETP) : Units, if provided and status :**
ETP Details : P-Collection Tank,P-Filter Press,P-Holding Tank,P-Nuetralization,S-Aeration Tank,S-Filter Pressure,S-Settling Tank,S-Sludge Dry Beds,S-Sludge Holding Tank,Secondary,T-Carbon Filter,T-Sand Filter

12 **Whether Industry is a member of CETP ?** No

13 **Boilers=1 , DG Sets=1 , Flue Gas =3, Process =2 , ETP Cap = 377 , Capacity of All = 15hp**

APCM Details : Cyclone ,Natural Draft,Not provided,Scrubber

Fuel Used : Agro Waste,Diesel

Stack Attached to : Boiler,D.G. Sets,Fuel Heater(Thermic)

14 **TSDF Name :** Green Env. Co-op Soc Ltd. Vatva [14437]

15 **Lab Charges Pending : NIL** **Water Cess Charges Pending : Rs. 0.00**

16 **Last Env. Form V : 2014-2015** **Water Cess Return : 2014-2015** **HW Monthly Return : 2015-99**

17 **Last 3 Legal Action :**

Insp Dt	Act	Leg Dt	For	Insp ID	IR-Leg	Type	Out No
07/09/2013	SCN	02/11/2013	33A,,	261386	SCN	VIG	164577
25/03/2013	REV	30/05/2013	PER,	242944	REV	VIG	148841
17/07/2012	SCN	17/08/2012	,	211521	SCN	ROU	121488

Monthly Patrak Data : Last Return : 201511 **HAZD Waste Disposal : 0.000 (0 Trucks)**

Electricity Units Consumed in month	Water Consumed in month	Effluent Discharged in month
Production - 24945, ETP - 423, APCM - 0	Meter Reading - 0, Kilo Litre - 1390	Meter Reading - 0, Kilo Litre - 858

One Time Updations				
p	-	On East Direction of the location of the Company	In GIDC	
p	-	On West Direction of the location of the Company	In GIDC	
o	-	Production since (Date) or Proposed	01/01/1990	
p	-	On North Direction of the location of the Company	In GIDC	
e	-	Electric Company Name (Power Supply)	---	
0	-	Air - Water - Hazd ACTs Applicability ?	Air, Water, Haz	
p	-	On South Direction of the location of the Company	In GIDC	
k	-	**Recycler Registration Valid ??**	N.A	
d	-	Is Industry ZERO DISCHARGE Catg (If Yes, HOW ?)	No.	
m	-	W.W.G Treatment thru Pri / Sec / Tertiary / N.A :	Primary	
n	-	Nos of Flow-Meters - W.C / W.W.G / ETP =	0, 0, 0	
General Observation				
a	-	Is the Industry in Operation ??	Yes	
a	-	R.O File No	ABD-VT-71 (2)	
b	-	**Industry Operating without CCA**	No.	
c	-	**Has Production exceeded (last 3 MTHs) than CCA-Qty**	No.	
d	-	**Any products-NOT in CCA, manufactured-Last 3 MTHs**	No.	
e	-	**Foul Odour/Fugitive Emission/Bye Pass in Premises ??**	No.	
f	-	Industry Name CHANGED in recent times ??	No.	
g	-	**Has Regn with CETP or TSDF expired ??**	No.	
h	-	Seperate Energy Meter for A.P.C.M ?	No.	
h	-	Provision of any STAND-BY Pump ??	No.	
Water Parameter				
b	-	Source of Water Supply	Borewell, SIDC	
c	-	**W.W.G is EXCEEDING the CCA Limits**	No.	
d	-	**W.W Disposal as per the Consent Conditions ?**	Yes	
e	-	Was the ETP in operation ?	Yes	
f	-	Treatment System ADEQUATE to handle existing effluent	Adequate	
g	-	**Did u observe ANY ILLEGAL Discharge ??**	No.	
h	-	Nos of Samples collected	1	

Remarks :

SPENT ACID

Note: EIA 2006 / SEIAA / E.C / MOEF Applicable : Yes

Gujarat Pollution Control Board

PCB Id: 11917

(Inspection Report) - Air,Water,Hazardous

(Under Section 23 of The Water Act 1974, Under Section 24 of The Air Act 1981 and Under Section 10 of EP Act 1986)

Site Observations during Inspection , PCB-ID: (11917)

This unit is visited w.r.t. general night monitoring in GIDC Vatva area.One sample of treated w/w having Brown in colour & p H @ 7-8 on pH strip is collected from final outlet sampling point of factory outlet leading to u/g pipe line during visit. [278]-05/01/2016

W.C Notings: as per profile[589-AEE]~

Specific Instructions given to Industry at the time of visit , for Pt to Pt Compliance

1. આપના એકમની ઇટીપી ની ડીસ્ચાર્જ લાઇન થી સમ્પ માં જતી પાઇપ લાઇન માંથી w/w નું સેમ્પલ લેવામાં આવેલ તથા કાઉન્ટર સેમ્પલ આપને આપવામાં આવે છે.

Compliance Observed in this Inspections.

Instructions in Previous Visits and Reply	Insp Det	Instruction Status
3. કોમન MEE પર કરવામાં આવેલ વેરીફીકેશન મુજબ આપની w/w સ્ટ્રીમમાં આવતા High એમોનીકલ નાઇટ્રોજન બાબતે ખુલાસો કરવો.	332199(19/03/15)	Partial Compliance
2. છેલ્લા 3 માસના ઉત્પાદનના ડેટા આપવા.	332199(19/03/15)	Partial Compliance
1. છેલ્લા 3 માસના Cons. steam w/w ના MEE, SEPL તથા ક્લીન અર્થ માં મોકલાવેલ w/w ના ડેટા આપવા.	332199(19/03/15)	Partial Compliance

Gujarat Pollution Control Board

PCB Id: 11917

(Inspection Report) - Air,Water,Hazardous

(Under Section 23 of The Water Act 1974, Under Section 24 of The Air Act 1981 and Under Section 10 of EP Act 1986)

Annexure Details - Air,Stack,Hazardous Waste & Samples PCB-ID: (11917)

A Sample Details

Sr	Act	Ph/Temp/Air Sampled	Time	Type	Sampling Point	Col-Cond
1	W-17	@ 7 to 8 on ph strip / 26	0305-0305	REP	## final outlet of the etp ~ -	Brownish

B Process Stacks

Sr	Stack attached to	Mts	Remark	Details of APCM	Probable Pollutants.
1	Reaction Vessels	13	alkl scr-ventu(stand by)	SCR	SO2
2	Reaction Vessels	20	2-alkali-1-ventuary	SCR	SO2

C Flue gases Stacks

Sr	Stack attached to	Mts	Remark	APCM	Fuel	Consp-Unit	SMF
1	Boiler	15	Steam Boiler	CYC	Agro Waste	0.084 TPH	N.A
2	Fuel Heater(Thermic)	11	Consumtion as per Consent	NOT	Agro Waste		N.A
3	D.G. Sets	4	125KVA-Stand by mode	NDR	Diesel	12 Ltr/Hour	NO

D Details about Hazardous Waste Management :

Sr	Source of Hazardous Waste	Catg	Qty/Year	HW Disposal Management
1	Chemical Sludge From Waste Water Treatment	I -34.3	480.000-M.T	COL,DSS,DST,STO,TRA
2	Discarded Containers / Barrels / Liners contaminated with Hazardous Wastes/Chemicals	I -33.3	0.300-M.T	COL,DEC,DSS,STO,RRE,TRA
3	Used Spent Oil	I -5.1	0.167-M.T	COL,DSS,REU,STO,TRA
4	Spent Acid	I -36.5	7200.000-M.T	---

E Products :

Sr	Product Name	NOC Qty	CCA Qty	Applied Qty	Inspection Remark
1	J Acid	2.528	2.528 - M.T	0.000	As per crux.
2	J Acid Derivates	12.670	12.670 - M.T	0.000	As per crux.
3	Sulpho Tobias Acid	2.000	2.000 - M.T	0.000	Asw per crux.

F Raw material :

Sr	Raw Material Name	Capacity - Unit / Month
1	Acetic Anhydride	0.350 - M.T
2	Activated Charcol	0.050 - M.T
3	Aniline Oil	1.200 - M.T
4	Benzoyl Chloride	0.360 - M.T
5	Causitc Soda Flacks/Lye	7.440 - M.T
6	Dry Salt/Common Salt	8.000 - M.T
7	Glober Salt	0.130 - M.T
8	HCL	8.240 - M.T
9	Hy Flow Super Cell	0.050 - M.T
10	J-Acid	15.000 - M.T
11	Mono Methyl Amine	14.000 - M.T
12	Oleum (23%)	18.040 - M.T
13	Oleum (65%)	3.300 - M.T
14	Soda Ash	11.820 - M.T
15	Sodium Acetate	0.500 - M.T
16	Sodium Bi Sulphite/Meta BS	5.640 - M.T
17	Sulphuric Acid Spent	19.990 - M.T
18	T.R.Oil	0.020 - M.T
19	tobias acid	5.480 - M.T

G Water Consumption & Generation Break up

Sr	Water Code (Qty in klpd - Kilo Ltr per Day)	WC : 52.250	WWG : 35.650	Water Source	Remark
1	Boiler Feed	10.200	1.500	SIDC	
2	Cooling Water	3.500	0.000	SIDC	
3	Mnfg Process	11.050	10.150	SIDC	
4	Others	2.500	2.000	Borewell	domestic, watering green belt
5	Wash Water	20.000	20.000	SIDC	

H Solid Waste

Gujarat Pollution Control Board

PCB Id: 11917

(Inspection Report) - Air,Water,Hazardous

(Under Section 23 of The Water Act 1974, Under Section 24 of The Air Act 1981 and Under Section 10 of EP Act 1986)

Inspection Team : N.I.Kapadia,SO - Shri Ashvin R Mistry

Signature By(N.I.Kapadia,SO)

ANALYSIS REPORT FOR
WATER / WASTE WATER SAMPLE

Sample ID:176585 - Analysis Completion:29/01/2016

Dyes and Dye- Intermediates / LAB Inward : 43017

Gujarat Pollution Control Board,
Central Laboratory
Paryavaran Bhavan
Sector-10A
Gandhinagar-382010

Accreditation Standards & NABL Certificate Details : T-2105 / ISO/IEC 17025:2005 / 21/12/2011 / 20/12/2013

TEST REPORT

Test Report No. : 43017 **Date: 29/01/2016**

1. Name of the Customer : **Jemby Chem Ltd - 11917**
2. Address : **Plot No: C/1-335 to 337 ,Phase No: II,GIDC Vatva AHMEDABAD-382445, Taluka : Ahmedabad-Vatva, District : Ahmedabad-Vatva, GID**
3. Nature of Sample : **REP-Representative/Grab, (Insp Type : ROU-Routine Visit)**
4. Sample Collected By : **N.I.Kapadia,SO**
5. Quantity of Sample Received : **5000 ml**
6. Code No. of the Sample : **176585**
7. Date & Time of Collection & Inwarding : **28/12/2015, (0305 to 0305) & 30/12/2015**
8. Date of Start & Completion of Analysis : **01/01/2016 & 29/01/2016**
9. Sampling Point : **## Final Outlet of the ETP ~ -**
10. Flow Details (Remarks) : **---**
11. Mode of Disposal : **into CETP of GESCSL of Vatva**
12. Ultimate Receiving Body : **0**
13. Temperature on Collection : **26 & pH Range on pH Strip :@ 7 to 8 on pH strip**
14. Carboys Nos for : **Barcode & Color & Appearance :Brownish**
15. Water Consumption & W.W.G (KLPD) : **Ind :47.250 , Dom :5.000 & Ind :33.650 , Dom :2.000**

Sr	Parameter	Unit	Test Method	Range of Testing	Result
1	Temperature	Centigrade	IS: 3025 (Part – 9) – 1984(Reaffirmed 2006)	Ambient oC - 60 oC	26
2	pH	pH Units	4500 H+ B APHA Standard Methods 22nd edi.2012	1 – 14 pH value As or	7.87
3	Colour	Pt.Co.Sc.	2120 B APHA Standard Methods 22nd edi. 2012	2 - to 99 Hazen & 1-50	200
4	Total Dissolved Solids	mg/l	Gravimetric method. (2540 C APHA Standard Methoc	10 – 200000 mg/L	5944
5	Suspended Solids	mg/l	Gravimetric method. (2540 D APHA Standard Methoc	2 – 10000 mg/L	70
6	Ammonical Nitrogen	mg/l	1).Titrimetric method (4500 NH3 B & C APHA Standa	1 - 2000 mg/l.	9.12
7	Chloride	mg/l	Argentometric method. (4500 Cl? B APHA Standard M	1 - 50000 mg/l	2130
8	Sulphate	mg/l	APHA(22nd edi)4500 SO4 E	2-40mg/l	820
9	Chemical Oxygen Demand	mg/l	APHA (22nd Edition)- 5220 B Open Reflux Method-2	5.0- 50000 mg/l	135
10	Oil & Grease	mg/l	Liquid – Liquid Partition Gravimetric method. (5520 B	01 – 1000 mg/l	BDL
11	Phenolic Compounds	mg/l	4 Amino Antipyrene method without Chloroform Extra	0.1 – 50 mg/l	BDL
12	Zinc	mg/l	(3111 B APHA Standard methods 21st edi)	0.005-100mg/l	0.031
13	Total Chromium	mg/l	3111 B APHA Standard methods 21st edi)	0.02-150mg/l	0.02
14	Copper	mg/l	3111 B APHA Standard methods 21st edi)	0.01-150 mg/l	BDL
15	Nickel	mg/l	(3111 B APHA Standard methods 21st edi)	0.02-150 mg/l	BDL
16	B.O.D (3 Days 27oC)	mg/l	3 – Day BOD test. (IS 3025 (Part 44) 1993 Reaffirmec	05–50000 mg/l	33
17	% ACIDITY	MG/L	-	-	A. due to 7-8 p

Laboratory Remarks : Approved By:132-lab_132 Dt.: 29/01/2016

B.J.Bhatt

Binaben Bhatt,SSO

Field Observation :

Note :

1. * - These parameters are covered under the scope of NABL.
2. The results refer only to the tested samples and applicable parameters. Endorsement of products is neither inferred nor implied.
3. Samples will be destroyed after 10 days from the date of issue of test report unless otherwise specified.
4. This report is not to be reproduced wholly or in part or used in any advertising media without the permission of the Board in writing.
5. The Board is not responsible for the authenticity for the samples not collected by the Board's officials.
6. Total liability of our laboratory is limited to the invoiced amount. Any dispute arising out of this report is subject to Gujarat Jurisdiction only.
7. Permissible Limits: as per Schedule VI of EPA Rules, 1986 as ammended by Second and Third ammendment 1993 for Effluents
8. Physicochemical and microbiological parameters, Std.Methods for Water and Waste Water- 22nd Edition by APHA.
9. Bioassay test (for toxicity) -IS:6582:Part-2:2001; Reaffirmed 2007.

Gujarat Pollution Control Board

PCB Id: 11917

(Inspection Report) - Air,Water,Hazardous

(Under Section 23 of The Water Act 1974, Under Section 24 of The Air Act 1981 and Under Section 10 of EP Act 1986)

1 **Industry Details** **Jemby Chem Ltd**

Outward No: 20305-15/02/2017

Email :
jembybcpatel@yahoo.co.in

Telephone :
-

Plot No: C/1-335 to 337 ,
Phase No: II, GIDC Vatva,
AHMEDABAD - 382445
DIST : Ahmedabad-Vatva, TAL : Ahmedabad-Vatva, SIDC : Vatva

Inspection Id : 426636 (On Application) **Ro Name : Ahmedabad (East)**

2 **Type / Scale / Sector / Status :** RED / SMALL / Dyes And Dye-Intermediates. / In Operation

3 **Inspection Dt & Time :** 13/02/2017 12:10 / Air , Water , Hazd **Person Contacted :** SHRI BHARAT K. PATEL (Director)

4 **Env Audit Detail : Sch : 2 , Go Green Mechanisms Pvt. Ltd., (Lab.) , Year : 2013 , On Dt : 16/02/2014**

Commissioned Dt : 01/01/1990 **Production Start Dt :** 01/01/1990 **Applicability of CRZ Rules :** No

5 **Water Consumption in Kilo Lts Per Day** Ind : 47.250 Dom : 5.000 **Borewells:** 0

6 **Waste Water generation / Discharge (klpd) :** Ind : 33.650 Dom : 2.000 **Tubewells:** 0

7 **Consumer No.(Electric Meter):** **Source of Water Supply:** Borewell, SIDC

8 **Disposal Mode of Industrial / Domestic :** Not Specified / Not Specified

9 **Discharge Pt / Final Receiving Body (Ultimate):** Green CETP / 0

10 **Status of water consent Under the Water Act,1974:** AWH-51292-20/03/2017 Last Inward:118070-09/02/2017[PRO]

11 **Effluent Treatement plant (ETP) : Units, if provided and status :**
ETP Details : P-Collection Tank,P-Filter Press,P-Holding Tank,P-Nuetralization,S-Aeration Tank,S-Filter Pressure,S-Settling Tank,S-Sludge Dry Beds,S-Sludge Holding Tank,Secondary,T-Carbon Filter,T-Sand Filter

12 **Whether Industry is a member of CETP ?** No

13 **Boilers=1 , DG Sets=1 , Flue Gas =3, Process =2 , ETP Cap = 377 , Capacity of All =**

APCM Details : Cyclone ,Natural Draft,Not provided,Scrubber

Fuel Used : Agro Waste/Briquettes,Diesel

Stack Attached to : Boiler,D.G. Sets,Fuel Heater(Thermic)

14 **TSDF Name :** Green Env. Co-op Soc Ltd. Vatva [14437]

15 **Lab Charges Pending : NIL** **Water Cess Charges Pending : NIL**

16 **Last Env. Form V : 2015-2016** **Water Cess Return : 2015-2016** **HW Monthly Return : 2016-99**

17 **Last 3 Legal Action :**

Insp Dt	Act	Leg Dt	For	Insp ID	IR-Leg	Type	Out No
07/09/2013	SCN	02/11/2013	33A,,	261386	SCN	VIG	164577
25/03/2013	REV	30/05/2013	PER,	242944	REV	VIG	148841
17/07/2012	SCN	17/08/2012	,	211521	SCN	ROU	121488

Monthly Patrak Data : Last Return : 201612 **HAZD Waste Disposal : 0.000 (0 Trucks)**

Electricity Units Consumed in month	Water Consumed in month	Effluent Discharged in month
Production - 34747, ETP - 141, APCM - 0	Meter Reading - 0, Kilo Litre - 1228	Meter Reading - 0, Kilo Litre - 754

One Time Updations				
e	-	Electric Company Name (Power Supply)	torrent	
p	-	On West Direction of the location of the Company	In GIDC	
o	-	Production since (Date) or Proposed	01/01/1990	
p	-	On South Direction of the location of the Company	In GIDC	
p	-	On East Direction of the location of the Company	In GIDC	
0	-	Air - Water - Hazd ACTs Applicability ?	Air, Water, Haz	
p	-	On North Direction of the location of the Company	In GIDC	
g	-	Nos of Stacks (Flue Gas & Process)	2, 1	
h	-	Regd with T.S.D.F	VAT-Green Env. Co-op Soc Ltd. Vatva [14437]	
k	-	**Recycler Registration Valid ??**	No.	
f	-	Display Board Provided at the Entrance ?	Yes	
j	-	Name & Address of MAIN Re-Cycler	-	
i	-	Recyclable Hazd Waste Disposal to	O/s State	
n	-	Nos of Flow-Meters - W.C / W.W.G / ETP =	0, 0, 0	
d	-	Is Industry ZERO DISCHARGE Catg (If Yes, HOW ?)	No.	
m	-	W.W.G Treatment thru Pri / Sec / Tertiary / N.A :	Primary	
General Observation				
a	-	R.O File No	ABD-VT-71 (2)	
a	-	Is the Industry in Operation ??	Yes	
b	-	**Industry Operating without CCA**	Applied	
c	-	**Has Production exceeded (last 3 MTHs) than CCA-Qty**	No.	
d	-	**Any products-NOT in CCA, manufactured-Last 3 MTHs**	No.	
e	-	**Foul Odour/Fugitive Emission/Bye Pass in Premises ??**	No.	
f	-	Industry Name CHANGED in recent times ??	No.	
g	-	**Has Regn with CETP or TSDF expired ??**	No.	
h	-	Seperate Energy Meter for A.P.C.M ?	No.	
h	-	Provision of any STAND-BY Pump ??	No.	
Air Related				
a	-	**Fuel Type confirmitive with CCA ?**	Yes	
b	-	**Av. Fuel Consumption EXCEEDING CCA limits**	No.	
c	-	**APC Measures confirmitive with CCA conditions ??**	Yes	
d	-	ALL APCMs are in operation	Yes	
e	-	SMF availability	Provided	
f	-	**Thick Smoke observed in Flue Gas/Processes ??**	No.	
g	-	**ph of Scrubbing Media as per requirement ??**	Yes	
h	-	Ultimate Disposal of Scrubbing Media	ETP	
i	-	Nos of Samples : Stack & Ambient	1, 0	
Haz Waste Related				
a	-	**Haz waste Catg confirmitive with CCA**	Yes	
b	-	**H.W generation exceeding CCA limits**	No.	
c	-	**Collection, Storage, Treatmnt, Disposal Facility Adequate ??**	Yes	
d	-	Reusing or Recycling of Haz Waste by Industry ?	No	
e	-	LogBook / XGN Manifests / Disposal Records TALLYING ??	Partially	
f	-	Stock of Haz-Waste @ premises/Whether EXCESS ?	as per crux	
g	-	**Recycler/ Actual user has valid Authorization under rules 6 or 9 of HOWR-2016?**	No.	
h	-	**Installed capacity of the plane based on machinery installed (Capacity of Machine,No. of Batch/Day,Annual Capacity)**	-	

i	-	**Technical capability and equipment complying with the SOP/Guideline?**	Yes	
j	-	**Is unit complying the conditions gives in SOP/Guidelines?**	Yes	
k	-	**Facility is adequate for the applied process**	Yes	
l	-	**Passbook is maintained?**	No.	
m	-	**Details of PLI, if applicable**	-	
n	-	**Details of safety spects provieded by the facility**	-	
o	-	**Seprate storage area for Haz. Waste for the utilization or generation from the process is provided?**	Yes	
p	-	**Quantity of Hazardous waste procured as per CCA?**	Yes	
Water Parameter				
b	-	Source of Water Supply	Borewell, SIDC	
c	-	**W.W.G is EXCEEDING the CCA Limits**	No.	
d	-	**W.W Disposal as per the Consent Conditions ?**	Yes	
e	-	Was the ETP in operation ?	Yes	
f	-	Treatment System ADEQUATE to handle existing effluent	Adequate	
g	-	**Did u observe ANY ILLEGAL Discharge ??**	No.	
h	-	Nos of Samples collected	1	

Remarks :

SPENT ACID

Note: EIA 2006 / SEIAA / E.C / MOEF Applicable : Yes

Site Observations during Inspection , PCB-ID: (11917)

This unit was inspected with reference to CCA- Renewal application. During inspection unit was found in operation. This unit is engaged in manufacturing of Sulpho Tobias Acid, J Acid and J Acid's Derivatives. During inspection Derivative of J Acid (N-Methyl J Acid) was going on. Unit has provided total 4 dos of reaction vessels provided as alternate batches for the same. Unit has provided Scrubber where Caustic flakes media is used as scrubbing media attached to Drowning pan from where the after first reaction the batch is dumped. One process sampling was carried out sample was collected from the same. Unit is segregating high COD and low COD stream wastewater. Unit has discontinued the previously set up in-house high COD stream wastewater treatment technology and presently high COD stream wastewater to is being sent to common facilities SEPL, Sanand for incineration and for MEE of GESCSL, Vatva, and also obtained membership of clan earth, vatva. Unit has provided 03 no's of storage tanks (each having cap. 25 kl) for cons. stream. Generated low COD stream is separately treated in to provide Primary, secondary and Tertiary ETP units. At the time of inspection all the ETP units are found in operation and treated wastewater is being collected into final treated wastewater holding cum discharge tank. One waste water sample was collected from the outlet tank. During inspection, general ambient air quality and Housekeeping was found very normal. Necessary instructions were issued. [589]-15/02/2017 ~ RO Comments/Reply : / I recommend :May be GRANTED (After making necessary verification; I agree with inspecting officer; hence issuance / renewal of Authorization to the Industry is recommended as per the provisions of Rule 6(2) of the Hazardous and Other Wastes (Management & Handling & Transboundary Movement) Rules 2016.)-15/02/2017

W.C Notings: as per profile[-]~as per profile[-]~as per profile[485-AEE]~

Specific Instructions given to Industry at the time of visit , for Pt to Pt Compliance

. 1,છેલ્લા ત્રણ માસના ઉત્પાદનની, CETP ખાતે કરેલ w/w discharge, MEE ખાતે dispose કરેલ High con. Stream તથા Hazardous waste Management ની માહીતી આપવી.

Compliance Observed in this Inspections.

Gujarat Pollution Control Board

PCB Id: 11917

(Inspection Report) - Air,Water,Hazardous

(Under Section 23 of The Water Act 1974, Under Section 24 of The Air Act 1981 and Under Section 10 of EP Act 1986)

Annexure Details - Air,Stack,Hazardous Waste & Samples PCB-ID: (11917)

A Sample Details

Sr	Act	Ph/Temp/Air Sampled	Time	Type	Sampling Point	Col-Cond
1	W-1	@ 7 to 8 on ph strip / 30	1220-1220	REP	## final outlet of the etp ~	Brownish
2	W-17	@ 7 to 8 on ph strip / 30	1220-1220	REP	## final outlet of the etp ~	Brownish
3	A-1	for so2 - 20 litrs /	1250-1300	REP	stack attach to reaction vessels ~ common vent attached to drowning vessel - 4 nos.	-

B Process Stacks

Sr	Stack attached to	Mts	Remark	Details of APCM	Probable Pollutants.
1	Reaction Vessels	13	alkl scr-ventu(stand by)	SCR	SO2
2	Reaction Vessels	20	2-alkali-1-ventuary	SCR	SO2

C Flue gases Stacks

Sr	Stack attached to	Mts	Remark	SMF	APCM	Fuel	Consp-Unit	Insp Remk
1	Boiler	15	Steam Boiler	N.A	CYC	Agro Waste/Briquettes	0.084 TPH	
2	Fuel Heater (Thermic)	11	Consumtion as per Consent	N.A	NOT	Agro Waste/Briquettes		
3	D.G. Sets	4	125KVA-Stand by mode	NO	NDR	Diesel	12 Ltr/Hour	

D Details about Hazardous Waste Management :

Sr	Source of Hazardous Waste	Catg	Qty/Year	HW Disposal Management
1	Chemical sludge from waste water treatment	I -35.3	480.000-M.T	Collection, Disposal, Generation, Recovery, Storage, Transportation,
2	Empty barrels/containers/liners contaminated with hazardous chemicals /wastes	I -33.1	0.300-M.T	Collection, Disposal, Generation, Recovery, Storage, Transportation,
3	Used or Spent Oil	I -5.1	0.167-M.T	Collection, Disposal, Generation, Recovery, Storage, Transportation,

E Products :

Sr	Product Name	NOC Qty	CCA Qty	Applied Qty	Inspection Remark
1	J Acid	2.528	2.528 - M.T	0.000	As per crux.
2	J Acid Derivates	12.670	12.670 - M.T	0.000	As per crux.
3	Sulpho Tobias Acid	2.000	2.000 - M.T	0.000	Asw per crux.

F Raw material :

Sr	Raw Material Name	Capacity - Unit / Month
1	Acetic Anhydride	0.350 - M.T
2	Activated Charcol	0.050 - M.T
3	Aniline Oil	1.200 - M.T
4	Benzoyl Chloride	0.360 - M.T
5	Causitc Soda Flacks/Lye	7.440 - M.T
6	Dry Salt/Common Salt	8.000 - M.T
7	Glober Salt	0.130 - M.T
8	HCL	8.240 - M.T
9	Hy Flow Super Cell	0.050 - M.T
10	J-Acid	15.000 - M.T
11	Mono Methyl Amine	14.000 - M.T
12	Oleum (23%)	18.040 - M.T
13	Oleum (65%)	3.300 - M.T
14	Soda Ash	11.820 - M.T
15	Sodium Acetate	0.500 - M.T
16	Sodium Bi Sulphite/Meta BS	5.640 - M.T
17	Sulphuric Acid Spent	19.990 - M.T
18	T.R.Oil	0.020 - M.T
19	tobias acid	5.480 - M.T

G Water Consumption & Generation Break up

Sr	Water Code (Qty in klpd - Kilo Ltr per Day)	WC : 52.250	WWG : 35.650	Water Source	Remark
1	Boiler Feed	10.200	2.800	Borewell	
2	Cooling Water	3.500	0.000	SIDC	
3	Mnfg Process	11.050	10.500	SIDC	
4	Others	2.500	2.000	Borewell	domestic, watering green belt
5	Wash Water	20.000	19.700	SIDC	

H Solid Waste

Inspection Team : Shri Ashvin R Mistry - H.P.Maisuria,SSA

I hereby, that all the PDF, Data mentioned above, fees paid has been checked & certified.

Signature By(Shri Ashvin R Mistry)

Jemby Chem Ltd.

Sample Results

(Sample collection date: 13/02/2017 from final outlet of the ETP)

Para Cd	Parameter Name	Unit	Result	Employee	Test Method	Perm Value
1	Temperature (std)	Centigrade	30 (14/02/2017)	475-F.M.Majmudar,SSA	IS: 3025 (Part – 9) – 1984(Reaffirmed 2006)	
2	pH (std)	pH Units	7.35 (14/02/2017)	326-A.G. OZA, SO	4500 H+ B APHA Standard Methods 22nd edi.2012	8.50
3	Colour (std)	Pt.Co.Sc.	120 (14/02/2017)	326-A.G. OZA, SO	2120 B APHA Standard Methods 22nd edi. 2012	
9	Total Dissolved Solids (std)	mg/l	3978 (27/02/2017)	405-R.M.RAMANUJ,S.S.A.	Gravimetric method. (2540 C APHA Standard Methods 22nd edi.)2012	
11	Suspended Solids (std)	mg/l	20 (27/02/2017)	405-R.M.RAMANUJ,S.S.A.	Gravimetric method. (2540 D APHA Standard Methods 22nd edi.)2012	300.0
13	Ammonical Nitrogen (std)	mg/l	1.68 (23/02/2017)	415-T.A.Trivedi,SO	1).Titrimetric method (4500 NH3 B & C APHA Standard Methods 22nd edi.)-2012	50.0
25	Chloride (std)	mg/l	1725 (02/03/2017)	444-K.N. Pandya, S.S.A	Argent metric method. (4500 Cl? B APHA Standard Methods 22nd edi.)-2012	
26	Sulphate (std)	mg/l	232 (02/03/2017)	444-K.N. Pandya,S.S.A	APHA(22nd edi)4500 SO4 E	
35	Chemical Oxygen Demand (std)	mg/l	111 (27/02/2017)	382-P.H.Parmar,SSA	APHA (22nd Edition)- 5220 B Open Reflux Method-2012	1200.0
36	Oil & Grease (std)	mg/l	0.4 (02/03/2017)	674-Dr. Sunita J. Varjani	Liquid – Liquid Partition Gravimetric method. (5520 B APHA Standard Methods 22nd edi.)-2012	20.000
37	Phenolic Compounds	mg/l	BDL (27/02/2017)	524-P.I.Shaikh. SSA	4 Amino Antipyrene method without Chloroform Extraction (Direct Photometric method) (5530 D APHA Standard Methods 22nd edi.) -2012	1.00
44	Zinc	mg/l	0.031 (28/02/2017)	631-Ms. Shukla Dipali M	(3111 B APHA Standard methods 21st edi)	5.000
45	Total Chromium	mg/l	BDL (28/02/2017)	631-Ms. Shukla Dipali M	3111 B APHA Standard methods 21st edi)	2.00
47	Copper	mg/l	BDL (28/02/2017)	631-Ms. Shukla Dipali M	3111 B APHA Standard methods 21st edi)	3.00
48	Nickel	mg/l	BDL (28/02/2017)	631-Ms. Shukla Dipali M	(3111 B APHA Standard methods 21st edi)	3.000
55	B.O.D (3 Days 27oC)	mg/l	39 (01/03/2017)	405-R.M.RAMANUJ,S.S.A.	3 – Day BOD test. (IS 3025 (Part 44) 1993 Reaffirmed 1999)-2009	
95	% ACIDITY	MG/L	Result Repeated	392-A.D.Khandhediya,SSA	-	

Sample Result

(Sample collection date: 13/02/2017,

collected from Stack attach to Reaction Vessels ~ Common Vent attached to Drowning vessel - 4 nos.)

Para Cd	Parameter Name	Unit	Result	Employee	Test Method	PERM Val ApC
22	SO2-Stack	MG/NM3	BDL (23/02/2017)	415-T.A.Trivedi,SO	IS:11255(Part-2),1985	40.0

Annexure-XV

Copy of Terms of Reference (TOR)

Dr. GAURAV DAHIYA, IAS
MEMBER SECRETARY
SEIAA (GUJARAT)

सत्यमेव जयते

STATE LEVEL ENVIRONMENT
IMPACT ASSESSMENT
AUTHORITY
GUJARAT

Government of Gujarat

By R P A D

No. SEIAA/GUJ/TOR/5(f)/ 522/2017 **Date: 30/04/2017**

Sub: Terms Of Reference to the Jemby Chem Limited, Plot No. C-1/335, 336, 337, GIDC Estate, Phase-II, Vatva, Ahmedabad. **Time Limit**

Ref: Your Proposal No: SIA/GJ/IND2/18911/2017

Dear Sir,

This has reference to your online application dated 21-03-2017 along with Form-I submitted to SEIAA. The project activity is covered in 5(f) and is of 'B' Category.

The SEAC, Gujarat vide their letter dated 29-04-2017 had recommended to the SEIAA, Gujarat, to grant the Terms Of Reference for the above-mentioned project based on its meeting held on 19-04-2017.

The proposal was considered by SEIAA, Gujarat in its meeting held on 30-04-2017 at Gandhinagar. After careful consideration, the SEIAA hereby accords Terms Of Reference to above project under the provisions of EIA Notification dated 14th September, 2006. The copy of Terms Of Reference is attached herewith.

With regards,
Yours sincerely,

(Dr. Gaurav Dahiya, IAS)
Member Secretary

Encl: As Above

Issued to:
Jemby Chem Limited
3, Chandrakrupa Society,
Vibhag-II, Beside silicon Valley Building,
Nr. Shivranjini Char Rasta,
satelite Ahmedabad,

Copy to:-
The Secretary, SEAC, C/O. G.P.C.B. Gandhinagar - 382010.

(Dr. Gaurav Dahiya, IAS)
Member Secretary

MEMBER SECRETARY
State Level Environment
Impact Assessment Authority
(SEIAA-Gujarat)
Gujarat Pollution Control Board
"Paryavaran Bhawan"
Sector-10-A, Gandhinagar-10

Sub: Terms of Reference (TOR) to **M/s:Jemby Chem Ltd.,** for setting up of **'Synthetic Organic Chemicals'** manufacturing plant at Plot No C-1/335, 336, 337, G.I.D.C. Estate, Phase- II, GIDC Vatva, Dist. Ahmedabad

Category of the unit : 5(f)
Project status: Expansion

I. This office has received an application vide their online proposal no. SIA/GJ/IND2/18911/2017 dated 23/03/2017 regarding grant of Environmental Clearance.

II. This is an existing unit engaged in Synthetic organic chemicals and now proposes for expansion as tabulated below:

Sr. No.	Name of Product	Existing Production MT/Month	Proposed addition MT/Month	Total After expansion MT/Month	CAS no.
01	Sulpho Tobias Acid	2	23	25	171570-11-9
02	J-Acid	2.528	47.472	50	87-02-5
03	**J-Acid derivatives**	12.67	87.33	100	
	1. N-Acetyl J-Acid				6334-97-0
	2. N-Methyl J-Acid				22346-43-6
	3. N-Benzoyl J-Acid				132-87-6
	4. N-Phenyl J-Acid				119-40-4
04	RW-Acid (Di-J Acid)		10	10	87-03-6
05	Sulpho J- Acid		10	10	6535-70-2
06	N-Methyl Gamma Acid	00	5	5	6259-53-9
	Total	**17.198**	**182.802**	**200**	

III. The project falls under Category B of project activity 5(f) as per the schedule of EIA Notification 2006.

IV. PP was called for presentation in the SEAC meeting dated 19/04/2017.

V. Salient features of the project are as under:

Total cost of Proposed Project (Rs. in Crores)	Existing: 2.5 crore Proposed expansion: 1.5crore
Total Plot area (sq. meter)	2210 m^2
Green belt area,/Tree Plantation area (sq. meter)	665 m^2
Water	
Source of Water Supply (GIDC, Bore well, Surface water etc...)	GIDC water supply
Water consumption (KL/day)	

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Gujarat Pollution Control Board,
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Category	Existing KL/Day	*Proposed (Additional) KL/day	*Total after Expansion KL/day
(A) Domestic	2.5	2.5	5.0
(B) Gardening	1.0	4.0	5.0
(C) Industrial			
Process	19.0	26	45.0
Washing	1.5	18.5	20.0
Boiler	9.0	1	10.0
Cooling	1.0	14	15.0
Others			
Water treatment	0	5.0	5.0
Total (A+B+C)	**34.0**	**71.0**	**105.0**

*Ignore in case of New projects.

Waste water generation (KL/day)

Category	Existing KL/Day	*Proposed (Additional) KL/day	*Total after Expansion KL/day
(A) Domestic	2.0	1.0	3.0
(B) Gardening	00	00	00
(C) Industrial			
Process	16.0	76.0	92.0
Washing	15.0	5.0	20.0
Boiler	0.5	0.5	1.0
Cooling	0.5	4.5	5.0
Others			
Water treatment	0	5.0	5.0
Total Industrial wastewater	**32.0**	**91.0**	**123.0**
Total wastewater	**34.0**	**92.0**	**126.0**

*Ignore in case of New projects.

Treatment facility with capacity (ETP, CETP, MEE, STP etc).	ETP (Dilute stream) having Primary, tertiary treatment units. ETP (Concentrated stream) having Primary treatment units.
Mode of Disposal & Final meeting point	Domestic: Soak pit Industrial:CETP, Vatva 24.0 KLD Dilute Sulphuric Acid will be sent to NOVEL for reuse by actual users or for treatment and 68.0 KLD after primary treatment will be sent for common MEE/evaporator to achieve zero discharge and 31.0 KLD dilute effluent from washing and utilities will be sent for final treatment and final disposal to CETP-GESCSL, Vatva
Reuse/Recycle details (KL/day)	Nil
Air	

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No. of Boilers/TFH/Furnaces/DG sets etc. with capacities viz. TPH, Kcal/hr, MT/hr, KVA etc.	Existing: Boiler-0.6 TPH, Thermic Fluid heater Proposed: Boiler – 1.0 TPH
Fuel consumption Solid Fuel: MT/Day Gaseous Fuel: SCM/day Liquid fuel: KL/day	Fuel: Existing: Bio fuel– 2.0 MT/day Diesel-14 lit/hr. Proposed: Bio fuel– 4.0 MT/day
APCM for flue gas	Cyclone separator
Process gas/Fugitive emission details i.e. Type of pollutant gases (SO_2, HCl, NH_3, Cl_2, NO_xetc.)	Existing: Reaction vessel - SO_2<40 mg/Nm^3 Proposed addition: Reaction vessel - SO_2<40 mg/Nm^3
APCM for process gas/fugitive gaseous emission details	Alkali Scrubber (Ventury + Packed column)
Hazardous waste (as per the Hazardous and Other Wastes (Management and Transboundary Movement) Rules 2016.	

Sr. no.	Type/Name of Hazardous waste	Source of generation	Category and Schedule as per HW Rules	Quantity (MT/Annum)		Disposal Method
				Existing	Total after expansion	
1.	ETP sludge	ETP	35.3	40 MT/Month	290 MT/Month	Sold to cement manufacturer or Disposal to TSDF site Eco Care, Surendranagar.
2.	Used Oil	Machineries	5.1	12 nos. Liner-8 kg/Month	42 nos. Liner-58 kg/Month	Being used for packing of ETP sludge in case of excess it will be sold to approved recycler or traders
3.	Discarded containers/ drums/ liners	RM storage	33.1	200 Lt/Year	400 Lt/Year	It will be sold to approved recycler With CPCB

Quantity of discarded containers must be in **MT/Annum**.

Membership details of **CETP, TSDF, CHWIF, Common MEE** etc.	Unit has obtained membership of CETP, Vatva for disposal of effluent and have membership of Eco Care, Surendranagar for disposal of Hazardous waste.
Details of Non-Hazardous waste & its disposal (MSW and others)	---

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While discussing regarding fuel to be used, PP agreed to use Bio-Coal only as a fuel and also they will explore the possibilities for Natural gas as a fuel. Further PP assured that the waste water discharge quantity to CETP will not be increased after proposed expansion.
The project proponent presented that they have already started baseline environmental monitoring from March 2017 and requested to allow them to use the same for the preparation of the EIA report which was agreed to by the committee.

Considering the above project details, after detailed discussion, the terms of reference (ToR) were prescribed as below and as per Annexure-I for the EIA study to be done covering **5 Km** radial distance from the project boundary.

1. Sound management of spent acid as per the hazardous and other Wastes (Management and Transboundary Movement) Rules 2016.
2. Explore the possibility for maximum reuse/recycle of treated waste water.
3. Ensure that there is no increase in waste water discharge (to CETP) quantity than ceiling capacity of existing CC&A.

The TOR prescribed as above and as per Annexure – I and the model ToRs available in the MoEF's sector specific EIA Manual for **'Synthetic Organic Chemical Industry'** shall be considered as generic TORs for preparation of the EIA report in addition to all the relevant information as per the generic structure of EIA given in Appendix III in the EIA Notification, 2006. The project shall be appraised on receipt of the final EIA report.

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"Paryavaran Bhawan"
Sector-10-A, Gandhinagar-10

Annexure – I

1. A tabular chart with index for point-wise compliance of below mentioned TORs.
2. Executive summary of the project – giving a prima facie idea of the objectives of the proposal, use of resources, justification, etc. In addition, it should provide a compilation of EIA report, including EMP and the post-project monitoring plan in brief.
3. Justification for selecting the proposed product and unit size.
4. Land requirement for the project including its break up for various purposes, its availability and optimization.
5. Land possession documents. Copy of NA order showing permission to use the project land for industrial purpose. If located in GIDC, copy of plot holding certificate obtained from GIDC Authority.
6. Location of the project site and nearest habitats with distances from the project site to be demarcated on a toposheet (1: 50000 scale).
7. Topography details of the project area.
8. Geological features and geo-hydrological status of the study area.
9. In case of project located outside notified area: Legal Undertaking stating that unit is complying the three conditions [i.e. water consumption less than 25 M^3/day; Fuel consumption less than 25 TPD; and not covered in the category of MAH units as per the Management, Storage, Import of Hazardous Chemical Rules (MSIHC Rules), 1989] as per the amendment to EIA Notification, 2006 vide SO 1599 (E) dated 25/06/2014.
10. Present land use pattern of the study area shall be given based on satellite imagery.
11. Layout plan of the factory premises clearly demarcating various units within the plant. Provision of separate entry & exit and adequate margin all round the periphery for unobstructed easy movement of the emergency vehicle / fire tenders without reversing back. Mark the same in the plant layout.
12. Technical details of the plant/s along with details on best available technologies (BAT), proposed technology and reasons for selecting the same.
13. Product spectrum (Proposed products along with production Capacity) and processes.
14. Chemical name of each proposed product to be manufactured. Details on end use of each product. (Provide CAS number of all the products & raw materials. In case of Dyes, CI number).
15. Details on raw materials, source and storage within the premises.
16. Details of complete manufacturing process / operations of each product along with chemical reactions, process flow diagram describing each unit processes and unit operations along with material balance, consumption of raw materials etc.
17. Details on strategy for the implementation of cleaner production activities.
18. Assessment of source of the water supply with adequacy of the same to meet with the requirements for the project. Permission obtained from the concern authority for supply of raw water.
19. Undertaking stating that no bore well shall be dug within the premises (If project is located within the Industrial estate).

20. Details on water balance including quantity of effluent generated, recycled & reused. Details of methods to be adopted for the water conservation.
21. Explore the possibilities for Zero Liquid Discharge (ZLD) or Efforts to minimize effluent discharge and to maintain quality of receiving water body.
22. Segregation of waste streams, characterization and quality with specific treatment and disposal of each stream including action plan for maximum recycle of treated waste water and minimum discharge for effluent.
23. Capacity of ETP in KL/day. Details of ETP including dimensions of each unit along with schematic flow diagram. Inlet, transitional and treated effluent qualities with specific efficiency of each treatment unit in reduction in respect of all concerned/regulated environmental parameters. Inlet effluent quality should be based on worst case scenario considering production of most polluting products that can be manufactured in the plant concurrently.
24. In case of discharge into GIDC drainage / Pipeline:
    I. Copy of permission letter with quantity (KL/day) from the concern authority of drainage network / pipeline with confirmation for spare capacity available to take additional effluent.
    II. Characteristics of the combined effluent and treated water to be sent to Common pipeline with reference to the MoEFCC/CPCB/GPCB discharge norms.
25. In case of waste water sent to Common Facilities (CF) like CETP, MEE, Spray Dryer etc. Details of Common facilities including (1) Total capacity of the CF (2) Copy of CC&A of the CF. (3) Actual load at present (Qualitative and Quantitative – KL per day) (4) Booked quantity & Spare capacity of CF (5) Copies of XGN generated Inspection reports with analysis reports of the water/Air/Hazardous samples collected by GPCB (Last 2 year). Copies of instructions issued by GPCB in last 2 year and point wise compliance thereof. (6) Copies of Show- cause notices, closure notices etc. served by the GPCB and its compliance (6) Recommendations and suggestions of the last two Environment Audit reports of CETP and its compliance report. (7) Common Facility Up gradation scheme, if any.
26. In case of Zero Liquid Discharge (ZLD) :
    I. Action plan for 'Zero' discharge of effluent shall be included. Notarized undertaking for assuring that underground drainage connection will not be taken in the unit.
    II. Economical and technical viability of the effluent treatment system to achieve Zero Liquid Discharge (ZLD).
    III. Certification of adequacy of proposed ZLD scheme through credible institutes of National repute.
    IV. To estimate & monitor ground water quality & its contamination status, piezometer wells, one on up gradient of the groundwater flow and other three on the down gradient side of the ground water flow of the proposed project at different depth based on available ground water depth shall be established and

all the parameters mentioned in IS 10:500 for potable water standard shall be monitored.

27. In case of in-house MEE/Spray dryer for waste water treatment: Capacity of MEE/Spray dryer in KL/hr. Technical details of MEE including evaporation capacity, steam required for evaporation, adequacy of the proposed boiler to supply steam for evaporation in addition to the steam required for the process etc. Techno-economical viability of the evaporation system. Control measures proposed for the evaporation system in order to avoid/reduce gaseous emission/VOC from evaporation of industrial effluent containing solvents & other chemicals.
28. Technical details of ATFD/Crystallizer/ spray Dryer, RO/NF system etc. (If any).
29. Undertaking stating that a separate electric meter will be provided for the waste water treatment system viz. ETP, RO, MEE, Spray dryer etc. (Whichever is applicable)
30. Economical and technical viability of the effluent treatment system.
31. Plans for management, collection and disposal of waste streams to be generated from spillage, leakages, vessel washing, used container washing etc. Measures proposed for preventing effluent discharge during unforeseen circumstances.
32. Action plan for reuse of liquid waste streams like Spent acids, Poly Aluminium Chloride etc. within premises to convert into valuable products instead of sending outside to actual end-users.
33. One season Site-specific micro-meteorological data using temperature, relative humidity, hourly wind speed and direction and rainfall should be incorporated.
34. Anticipated environmental impacts due to the proposed project/production may be evaluated for significance and based on corresponding likely impacts VECs (Valued Environmental Components) may be identified. Baseline studies may be conducted within the study area for all the concerned/identified VECs and likely impacts will have to be assessed for their magnitude in order to identify mitigation measures.
35. One complete season base line ambient air quality data (except monsoon season) to be given along with the dates of monitoring. The parameters to be covered shall be in accordance with the revised National Ambient Air Quality Standards (NAAQS) as well as project specific parameters like NH3, HCl, CL2, HBr, VOC etc. Locations of the monitoring stations should be so decided so as to take into consideration the pre-dominant downwind direction, population zone and sensitive receptors. There should be at least one monitoring station in the upwind direction. There should be at least one monitoring station in the pre dominant downwind direction at a location where maximum ground level concentration is likely to occur.
36. Modeling indicating the likely impact on ambient air quality due to proposed activities. The details of model used and input parameters used for modeling should be provided. The air quality contours may be shown on location map clearly indicating the location of sensitive receptors, if any, and the habitation. The wind rose showing pre-dominant wind direction should also be indicated on the map. Impact due to vehicular movement shall also be

included into the prediction using suitable model. Results of Air dispersion modeling should be superimposed on satellite Image / geographical area map.

37. Base line status of the noise environment, impact of noise on present environment due to the project and proposed measures for noise reduction including engineering controls.
38. Specific details of
    a) Process gas emission from each unit process with its quantification.
    b) Air pollution Control Measures (APCM) proposed for process gas emission. Adequacy of the air pollution control measures (APCM) for process gas emission measures to achieve the GPCB norms.
    c) Details of the utilities required.
    d) Type and quantity (MT/hr & MT/Day) of fuel to be used for each utility.
    e) Flue gas emission rate emission from each utility.
    f) Air Pollution Control Measures (APCM) proposed to each of the utility along with its adequacy
    g) List the project specific sources of fugitive emission along with its quantification and proposed measures to control it.
    h) Details on tail gas treatment.(If any)
39. Action plan for odour control to be submitted.
40. Management plan for solid/hazardous waste including storage, handling, utilization and safe disposal as per the Hazardous and Other Wastes (Management and Transboundary Movement) Rules 2016. CPCB guidelines in respect of specific treatment, such as solar evaporation, incineration, etc., need to be followed. How the manual handling of the hazardous wastes will be minimized. Methodology of de-contamination and disposal of discarded containers and its record keeping.
41. Membership of Common Environmental Infrastructure like TSDF, Common Incineration Facility (CHWIF), MEE, Spray dryer etc.
42. Name and quantity of each type of solvents to be used for proposed production. Details of in-house solvent recovery system including mass balance, solvent loss, recovery efficiency (% recovery), feasibility of reusing the recovered solvents etc. for each type of solvent.
43. Appropriate monitoring network has to be designed and proposed, to assess the possible residual impacts on VECs.
44. A detailed EMP including the protection and mitigation measures for impact on human health and environment as well as detailed monitoring plan and environmental management cell proposed for implementation and monitoring of EMP. The EMP should also include the concept of waste-minimization, recycle/reuse/recover techniques, energy conservation, and natural resource conservation. Total capital cost and recurring cost/annum earmarked for environment pollution control measures.
45. Details of in-house monitoring capabilities and the recognized agencies if proposed for conducting monitoring.
46. Permission from PESO, Nagpur for storage of solvents, other toxic chemicals, if any.

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47. Occupational health impacts on the workers and mitigation measures proposed to avoid the human health hazards along with the personal protective equipment to be provided. Provision of industrial hygienist and monitoring of the occupational injury to workers as well as impact on the workers. Plan for periodic medical checkup of the workers exposed. Details of work place ambient air quality monitoring plan as per Gujarat Factories Rules.
48. Details on volatile organic compounds (VOCs) from the plant operations and occupational safety and health protection measures. Proposal for Leak Detection and Repair (LDAR) program as per the CPCB guidelines.
49. Risk assessment including prediction of the worst-case scenario and maximum credible accident scenarios should be carried out. The worst-case scenario should take into account the maximum inventory of storage at site at any point of time. The risk contours should be plotted on the plant layout map clearly showing which of the facilities would be affected in case of an accident taking place. Based on the same, proposed safeguard measures including On-Site / Off-Site Emergency Plan should be provided.
50. MSDS of all the products and raw materials.
51. Details of hazardous characteristics and toxicity of raw materials and products to be handled and the control measures proposed to ensure safety and avoid the human health impacts. This shall include the details of Antidotes also.
52. Details of quantity of each hazardous chemical (including solvents) to be stored, Material of Construction (MoC) of major hazardous chemical storage tanks, dyke details, threshold storage quantity as per schedules of the Manufacture, Storage & Import of Hazardous Chemicals Rules of major hazardous chemicals, size of the biggest storage tank to be provided for each raw material & product etc. How the manual handling of the hazardous chemicals will be minimized?
53. Details of the separate isolated storage area for flammable chemicals. Details of flame proof electrical fittings, DCP extinguishers and other safety measures proposed. Detailed fire control plan for flammable substances and processes showing hydrant pipeline network, provision of DG Sets, fire pumps, jockey pump, toxic gas detectors etc.
54. Submit checklist in the form of Do's & Don'ts of preventive maintenance, strengthening of HSE, manufacturing utility staff for safety related measures.
55. Detailed five year greenbelt development program including annual budget, planning schedule, species, width of plantations, number of trees to be planted, area under green belt development [with map], budgetary outlay etc. along with commitment of the management to carry out the tree plantation activities outside the premises at appropriate places in the nearby areas and elsewhere.
56. Action plan for the greenbelt development – species, width of plantations, planning schedule, etc., in accordance to CPCB published guidelines.
57. Detailed socio-economic development measures including community welfare program most useful in the project area for the overall improvement of the environment. Submit a detailed plan for social corporate responsibilities, with appropriate budgetary provisions for

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the next five years and activities proposed to be carried out; specific to the current demographic status of the area.

58. (a) 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. (b). 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.
59. What is the hierarchical system or administrative order of the company to deal with the environmental issues and for ensuring compliance with the EC conditions. Details of this system may be given.
60. Does the company have a 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 should be detailed in the EIA Report.
61. Phase wise project implementation schedule with bar chart and time frame, in terms of site development, infrastructure provision, EMS implementation etc.
62. Certificate of accreditation issued by the NABET, QCI to the environmental consultant should be incorporated in the EIA Report.
63. An undertaking by the Project Proponent on the ownership of the EIA report as per the MoEF&CC OM dated 05/10/2011 and an undertaking by the Consultant regarding the prescribed TORs have been complied with and the data submitted is factually correct as per the MoEF&CC OM dated 04/08/2009.
64. In case of Expansion of the project
    a. Need for the proposed expansion should be justified in detail.
    b. Adequacy of existing EMS (Environmental Management System).
    c. Records of any legal breach of Environmental laws i.e. details of show- cause notices, closure notices etc. served by the GPCB to the existing unit in last five years and actions taken then after for prevention of pollution.
    d. Copies of Environmental Clearances obtained for the existing plant, its point wise compliance report.
    e. Environmental audit reports for last 3 years and compliance of its recommendations/Suggestions. (Include latest audit report and its compliance.)
    f. Copy of Consent to Operate (CC&A) obtained along with point wise compliance status of all the conditions stipulated therein.
    g. Compliance of MoEFCC circulars vide No: J-11011/618/2010-IAII (I) dated 30/05/2012 and J-11013/41/2006-IA-II(I) dated 20/10/2009.
    h. Copies of XGN generated Inspection reports with analysis reports of the water/Air/Hazardous samples collected by GPCB (Last 2 year). Copies of instructions issued by GPCB in last 2 year and point wise compliance thereof.
65. In case of project is located in Ankleshwar-Panoli, Vatva-Narol & Vapi GIDC.

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(A) Compliance of MOEFCC's OM no. J-11013/5/2010-IA.II (I) dated 25/11/2016 regarding lifting of moratorium on the consideration of projects for environmental clearance.

(B) Compliance of direction under section 18 (1) (b) of the Water (Prevention and Control of Pollution) act, 1974 issued by CPCB dated 31/03/2016 regarding compliance of CETP.

a) Action initiated by GPCB, if any, against proposed unit regarding non-compliance of prescribed standards under the various environmental laws.
b) Performance of CETP with respect to current hydraulic load & prescribed standards with No Objection Certificate of CETP regarding incorporation of the proposed unit for acceptance of waste water.
c) Performance of TSDF site with respect to current load & prescribed standards with No Objection Certificate of TSDF site regarding incorporation of the proposed unit for acceptance of hazardous waste to the common infrastructure.
d) Copies of quarterly action report taken for the above points submitted to the CPCB.
e) Report of GPCB which have conducted monitoring as per the said direction by CPCB dated 31/03/2016.

Validity of ToR:

- The ToRs prescribed for the project will be valid for a period of three years for submission of EIA & EMP report. ToR will lapse after three years from the date of issue.
- The period of validity could be extended for a maximum period of one year provided an application is made by the applicant to the Regulatory Authority, at least three months before the expiry of valid period together with an updated Form-I, based on proper justification and also recommendation of the SEAC.

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Annexure-XVI

Copy of letter issued by VIA for greenbelt development

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VIA
VATVA INDUSTRIES ASSOCIATION
REGD. NO. : F/10120

વીઆઇએ/૨૦૧૭-૧૮/૮૩-એ/૫૮૭
તા. ૨. ૭. ૨૦૧૮

પ્રતિ,
મે. જેમ્બી કેમ લી.
પ્લોટ નં. સી૧/૩૩૫ થી ૩૩૭, એ૧/૩૩૨, ફેઝ-૨,
જીઆઇડીસી એસ્ટેટ, વટવા,
અમદાવાદ-૩૮૨૪૪૫.

વિષય : વટવા જીઆઇડીસી એસ્ટેટ ખાતે વૃક્ષા રોપણ માટે જગ્યા ફાળવવા બાબત
સંદર્ભ : આપનો તા. ૮. ૬. ૨૦૧૮ ના પત્ર અનુસંધાને

મહાશય,

ઉપરોકત વિષય પરત્વેના આપના સંદર્ભ પત્ર અનુસંધાને જણાવવાનું કે વટવા જીઆઇડીસી વસાહતમાં ફેઝ-૪ ખાતે સેન્ટર ઓફ એકસલન્સ બિલ્ડીંગની પાછળના ભાગમાં તથા નવા નિરમાની પાછળ આવેલા રોડની સાઇડની જગ્યા ઉપર વૃક્ષારોપણ માટે જગ્યા ફાળવવામાં આવે છે. જયા આપ આશરે ૫૦૦ થી વધારે વૃક્ષોનું વાવેતર કરી શકશો. જે આપની જાણ સારૂ.

આભાર સહ.

આપનો વિશ્વાસું,
વટવા ઇન્ડસ્ટ્રીઝ એસોસીએશન વતી,

અંકિત એસ. પટેલ
પ્રમુખ

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