PROJECT PRE-FEASIBILITY REPORT (PFR)

For

EXPANSION FOR CHLORINATED PARAFFIN WAX & SULPHO CHLORINATED PARAFFIN WAX

[Schedule 5 (f) Category–"A" as per EIA Notification 2006]

At

Plot No. 57/D/B, 1st Phase, GIDC Notified Industrial Area, Vapi, Dist- Valsad (Gujarat).

Land/Plot Area: 5126 m^2
Production Capacity: 250 to 2250 TPM

April – 2017
Doc. No: 2017_ECSS_EIAI2_1700009

Project pre-feasibility report for obtaining prior Environmental Clearance in terms of provisions of EIA Notification – 2006

1). EXECUTIVE SUMMARY:

Name & Location

Name of the Project : Makwell Plastisizers Pvt. Limited
Location : Plot No: 57/D/B, 1st Phase, G.I.D.C,
Vapi, Pin Code: 396195
Dist. - Valsad (Gujarat)

Project

- ⇨ Makwell Plastisizers Pvt. Limited is located in GIDC Notified Industrial Area, falling under small scale category manufacturing products as mentioned under for which the company had obtained Consent To Establish and Operate from Gujarat pollution Control Board.
- ⇨ The company proposes to enhance the capacity of existing products as well introduce new similar group of product under the category "Chlorinated Paraffin Wax".
- ⇨ Existing project cost is Rs.207.00 Lacs. Proposed Expansion Project Cost: Rs. 243.00 Lacs. Total cost after proposed expansion will be Rs. 450.00 Lacs.

Applicability of EIA Notification – 2006

- ⇨ Category as per the amended EIA notification-2006: as existing and proposed products **(i.e. Chlorinated Paraffin wax and Sulpho Chlorinated paraffin wax)** are covered under the **Category-5(f)**. Hence, Environmental clearance is required.

Project Proponent

- The company in India comprises of 6 directors
- Small scale unit

List of finished Products

S. No.	Product	Capacity in TPM		
		Existing	Proposed	Total After Proposed Expansion
1.	Chlorinated Paraffin wax	250	1500	1750
2.	Sulpho Chlorinated Paraffin wax	0	500	500
Total		**250**	**2000**	**2250**

Manufacturing process is attached as **Annexure-3.**

Resource Requirement:

Components	Existing	Proposed	Total After Proposed Expansion	Resources Availability
Power, KVA	140	60	200	Sourced from Dakshin Gujarat Vij Co. Ltd.
Fresh Water, kl/day	22	120	142	Will be sourced from GIDC water supply Dept.
Imported coal for boiler: I (3 TPH) Kgs/Hr.	500	0	500	Sourced from local dealer
Fuel (HSD) for D.G. Set, Kgs/Hr. (Capacity: 125 KVA)	8	0	8	Sourced from local dealer
Cooling Tower, TR	300	200	500	In-house

Raw material Consumption:

S. No.	Raw Materials	Quantity in TPM			
		Per tone	Existing	Proposed	Total
[A]	**For Chlorinated Paraffin Wax**				
1.0	Heavy Normal Paraffin/Paraffin wax	0.48309	120.77	724.63	845.40
2.0	Chlorine gas	1.063	265.75	1594.15	1859.9
3.0	Hydrated lime for tail scrubber	0.004	1.0	6.0	7.0
[B]	**For Sulpho Chlorinated Paraffin Wax**				
1.0	HNP/Paraffin wax	0.650	0	325.0	325.0
2.0	Chlorine gas	0.650	0	325.0	325.0
3.0	SO_2 Gas	0.1	0	50.0	50.0
4.0	Hydrated lime for tail scrubber	0.004	0	2.0	2.0

Water and Waste Water Management

- At present, the water consumption is 22 KLD sourced from GIDC Vapi. After expansion, the Raw Water requirement will be 142 KLD supply will be met from GIDC water supply dept. Copy of GIDC water supply is enclosed herewith as **Annexure- 4**
- At present, industrial waste water generation is 4 KLD. After expansion, the industrial Waste Water Generation will be 12 KLD. Entire effluent will be treated in existing primary effluent treatment plant and finally treated effluent will be disposed off into CETP Vapi.
- Domestic waste water (2 KLD) will be disposed off through Septic Tank and overflow is drained into drainage line.

Air Emission and its Control Measures

Flue gas emission:

At present, the unit has installed coal fired 3 TPH steam boiler. Adequate capacity of MDC, bag filter & 15 meters height of chimney provided. Also 125 KVA D G set is provided and kept as a standby in case of power failure. Existing 3 TPH Boiler will be utilized for expansion by increasing the boiler operating hours; hence there will be no addition of any new boiler after expansion. (Detail of Air pollution control measures is attached as **Annexure-10**)

Process gas emission:

At present, there are total four numbers of chlorinator having common water followed by alkali scrubber and 11 meters height of chimney provided. After expansion additional eight numbers of chlorinator and common water followed by alkali scrubber and 11 meters height of chimney will be provided. Thus after expansion, there will be total twelve numbers of chlorinator and two numbers of scrubbing system with 11 meters chimney will be provided.

Hazardous Wastes and its Management

S. No.	Type of Hazardous Waste	Category as H/W rules 2016	Generation, TPA		Treatment	Disposal
			Existing	Proposed		
1.	Waste from ETP	Sch: I, 35.3	3.6	5.0	Packed in HDPE bags, stored	Dispose off into TSDF Vapi
2.	Used Oil	Sch:I, 5.1	0.024	0.3	Packed in HDPE drum	Sell to registered recycler
3.	Discarded Containers	Sch I:, 33.1	5.0	10.0	Washed & stored	Utilized for packing of hazardous waste or sell to authorized recycler
4.	Sludge from wet scrubber	Sch: I, 37.1	2.0	4.0	Packed in HDPE bags, stored	Dispose off into TSDF Vapi
5	30% HCl	Sch: II, B 15	5433	45759	Stored in a tank	Sell to actual users

2). INTRODUCTION OF THE PROJECT AND THE PROPONENT.

Name of the project Proponent: **Makwell Plastisizers Pvt. Limited**

Makwell Plastisizers Pvt. Limited is a **small scale** unit is located in notified industrial estate, GIDC, Vapi, Ta: Pardi Di: Valsad, Gujarat having total plot area of **5126 m^2** & total investment after expansion will be **Rs. 450.00 Lakhs**. The proponent wishes to enhance the Production capacity of Existing Products as well as introduce new similar group of product. The Chlorinated paraffin wax and sulpho chlorinated paraffin wax is especially used in Rubber industry as a flame retardant chemical, In the paint industry in anti-corrosive and fire proof paints, In industrial lubricants like gear oil as a fire retardant chemical additive, In carbon paper as flexible coating, in PVC and Ethyl Cellulose industries as secondary plasticizer in the manufacture of shoe soles, tubing, cable wires, carpets etc. in other words, in all flexible PVC products as per requirement.

The unit is operated by technocrats having more than 25 years of experience in manufacturing and marketing of various Plastisizers. The company has established well equipped production plant which is being managed by dedicated, qualified & skilled persons. The expansion project is to enhance existing production capacity of chlorinated paraffin wax to 1750 TPM and introduce new production capacity of sulpho chlorinated paraffin wax to 500 TPM and process capabilities to manufacture plasticizer.

The expansion project site lies on $20^0$21'19.91" N Latitude & $72^0$55'12.07" E Longitude. Makwell Plastisizers Pvt. Limited is located at Plot. No. 57/D/B, 1st Phase Area, GIDC Vapi, Ta: Pardi, Di: Valsad in Gujarat state. GIDC Vapi is centrally located in the both sides of National Highway No. 8 connecting Mumbai and Ahmedabad and is surrounded by Union Territories of Daman and Diu on the western side and Dadra & Nagar Haveli on the eastern side.

Vapi is the biggest railway station in the study area. Beside the rail connectivity, the site is also well connected by road transport. There is a good network of roads in the area and contributes for the development and economic growth of the area. The National Highway No. 8 (Surat – Mumbai) is a six lane and double tracked. This highway has given a further boost to the economic growth of this area. The other major road is state highway No. 185 (Daman – Vapi – Silvasa Road) which is crosses the NH – 8 in Vapi town. Almost every village in the district is now well connected to each other by a Pucca road.

About Vapi town: Vapi Township has emerged as an Industrial hub on the Gujarat- Maharashtra border. Administratively, it is a part of Valsad district. After the establishment of GIDC estate, Vapi has gained a special status on the industrial map of the country mainly for chemical manufacturing industrial units. Over the years, it has emerged as a major cosmopolitan industrial township equipped with hospitals, school & colleges, community centres, temples, churches, mosques, cinema house, fire stations, blood banks, water filtration plants, police stations, post offices, banks, telephone exchange, hotels, guesthouses etc. The town has got a major face-lift after the completion of national highway. Other links roads are also of good standard. Mumbai, the economic capital of the country is 180 km from Vapi; whereas, the state capital "Gandhinagar" is 370 kms away. The district Head Quarter – Valsad is 30 km from Vapi town.

VAPI INDUSTRIAL ESTATE: Vapi Industrial Estate came into existence during 1967-1968. The entire estate, which was developed in phases, is now spread over 1140 hectares and houses more than 1400 industries, most of which are small-scale industrial units although some of them have grown into bigger units at later stage. The industrial township is basically a declared "Chemical Estate" where about 705 of the industrial units are either Chemical or Chemical related, such as Dyes and Dyes intermediates, pigments, pesticides, fine chemicals, pharmaceuticals, etc. The remaining 30% comprises of paper mills, packing, plastics, engineering, textiles, paints, food processing, printing, etc. One of the country's largest common effluent treatment plants has been setup in Vapi industrial estate. Being a major industrial & commercial centre, it caters to other peripheral industrial estates like Daman, Silvassa, Sarigam, Umbergaon & Dadra and Nagar Haveli, etc.

Makwell Plastisizers Pvt. Limited was started in the year of 1993.The product has been developed through strong in-house R&D. The Group's turnover is about 4500.00 Lacs for the year 2015-16. The management is concerned about Environment and Safety issues and gives utmost importance to these aspects by continuous training & improvement followed by various external Audits. We have a strong in-house R&D team. We have a small Pilot plant at this site to support the R & D activities.

(i) Identification of the project proponent :

Makwell Plastisizers Pvt. Limited is a small scale unit is located at Notified Industrial Estate, GIDC Vapi, Ta: Pardi, Di: Valsad, a well enthusiastic & professionally managed manufacturer.

List of Directors:

1. Mr. Shashikant N. Thakker (Director)
2. Mr. Kishor N. Thakker (Director)
3. Mr. Hiren S. Thakker (Director)
4. Mr. Amrish K. Thakker (Direcor)
5. Mr. Vishal S. Thakker (Director)
6. Mr. Zubin K. Thakker (Director)

Most of the members are qualified in engineering, management, safety, accounts, operations and marketing field and human relation.
Apart from these there is Expert from Field- Industries to achieve & perform better and better.

(ii) Brief description of nature of the Project :

Makwell Plastisizers Pvt. Limited proposes to enhance the production capacity at Plot No. 57/D/B, 1st phase, GIDC, Vapi-396195, Dist. - Valsad (Gujarat).

The expansion project involves the capacity enhancement of existing Products & introduce new similar group of product. As per the amended EIA notification- 2006, the proposed products are covered under category 5(f) - B, but due to applicability of general condition i.e. within the 5 kms radius of interstate boundary of Union Territory of D N & H, it is falls under Category "A" and hence require Prior Environmental Clearance.

(iii) Need for the project and its importance to the country and region:

The proposed project provides a **potential growth** opportunity for the on-going business of the company. The company is engaged in the business of manufacturing of **Epoxy Plasticizer & Chlorinated Paraffin wax.** The project would also help the company to support the Indian economy in the following way:

- Growth in Export Revenue and thereby increasing the inflow of foreign currency which is much needed by our country.
- Our products are well accepted by international users and can substitute the international speciality Grades. Thus the Domestic Industry can replace the imported Plasticizer used by them with ours and there by curtail the outflow of foreign currency spent on Plasticizer imported by them.
- Potential increase in Job opportunities for the Local surroundings.
- Boost to the Local service providers and the overall improvement in the economic activities like Local raw materials Suppliers, Transporters, contractors, clearing and forwarding agents and other allied suppliers.

The Company Objective is to achieve:

- Consolidation of Epoxy Plasticizers & Chlorinated paraffin wax business. The expansion will help the company to move towards more specialized products and there by focus on value addition which will improve the shareholder's worth.
- The Proposed increase in capacity will also assist the company to reduce the costs due to increase in the sale of manufacturing and intern make the company's products more competitive in the market.
- Considering the nature of speciality chemicals business, the proposed increase in capacity will also help the company to standardize and produce the speciality chemicals with more consistency because higher volumes will help to achieve better control over Physico-chemical conditions while manufacturing.
- To generate Local Employment

(iv) Demand –Supply Gap :

Our product is mainly used in PVC compounding industries as per requirement. Since our products are approved by quality conscious users which are multinational companies. We can cater to the ever increasing demand in India as well as in the Export Market.

(v) Imports vs. Indigenous production:

Existing products manufactured in the country will be very much economical compared to Imports of the same and also the export of the same will earn extra revenue generation for our county.

(vi) Export Possibility:

Existing products have high export potential. Also these products have very good potential in the local market.

Additional capacities of product range required over & above the unit's existing capacities, as the company expects strong growth of exports to the extent of 40-50%. Local market also shows strong growth potential.

vii) Domestic / export Markets:

The company's products are used in PVC compounding industries as per requirement. These are having very good demand in domestic as well as international markets.

viii) Employment Generation (Direct and Indirect) due to the project:

There will be very good opportunity of employment generation directly and indirectly due to expansion project. Due to proposed project there will be requirement of manager, supervisor, operator and semi-skilled workers. For this, the company will employ about additional 10 people to fulfil its need to handle the plant.

Presently there are 25 numbers of employees. There will be additional 10 numbers of employees, thus total 35 numbers of employees after expansion.

3). PROJECT DESCRIPTION:

i) **Type of Project including interlinked and interdependent projects, If any :**

The proposed project is an interdependent project of the company.

ii) **Location (map showing general location, Specific location, and project boundary & project site layout) with coordinates:**

The map showing general location, specific location and project boundary and project site lay out is enclosed as **Annexure-1**. Plant layout is attached as **Annexure-2**

iii) **Details of alternate sites considered and the basis of selecting the proposed site, particularly the environmental considerations gone into should be highlighted:**

The proposed activity will be accommodated in the notified industrial area having proper industrial infrastructure so; there is no alternate site consideration. Expansion will be carried out in exiting premises only. (Land allotment letter is attached as **Annexure-8**)

iv) **Size or magnitude of operation:**

As per the proposed project cost, the project is covered under small Scale category of manufacturing industries.

v) **Project description with process details (a schematic diagram/ flow chart showing the project layout components of the project etc. Should be given):**

Detailed project description with process details is enclosed as **Annexure-3**

vi) **Raw material required along with estimated quantity, likely source, marketing area of final products/s, mode of transport of raw Material and finished product:**

Detailed raw material requirement along with estimated quantity, likely source, marketing of final products, mode of transport of raw materials and finished products & characteristics of

hazardous chemicals are as below:

DETAILS ON PRODUCT TRANSPORTATION

S. No.	Product	Physical State	Dispatch	Packing & Means of transportation
1.	Chlorinated Paraffin Wax	liquid	Local/Export	Drums and transport through truck/container
2.	Sulpho Chlorinated Paraffin wax	liquid	Local/Export	Drums and transport through truck/container

DETAILS OF SAFE STORAGE & HANDLING OF HAZARDOUS CHEMICALS

S. No.	Name of Finish Products	Quantity stored (TPM)		Place of Storage	Standard Operating Pressure & Temperature	Possible Type of Hazards	Control Measures Provided
		Max.	Actual				
1.	Heavy normal paraffin/Paraffin wax	20	10	MS Storage tank	Normal at ambient	Repeated contact may cause irritation	Avoid inhalation, wash with water
2.	Chlorine gas	10	5	MS cylinders	Stable under normal condition, non-combustible	Poison gas, corrosive, irritation of eyes & mucous membranes	Avoid inhalation of vapour, cooled water sprayer & Provided PPEs
3.	Sulphur dioxide gas	10	5	Cylinders	Stable at normal condition	Non- corrosive when dry. Toxic-corrosive at high concentration are fatal	Safety glasses or face shield; rubber gloves. Suitable ventilation
4.	Hydro chloric acid	200	100	Storage tank	Stable. Avoid heat, flames	Extremely corrosive. Inhalation of vapour can cause serious injury. Ingestion may be fatal. Liquid can cause severe damage to skin and eyes	Safety glasses or face mask, gloves. Effective ventilation

vii) Resource optimization/ recycling and reuse envisaged in the project, if any, should briefly outline:

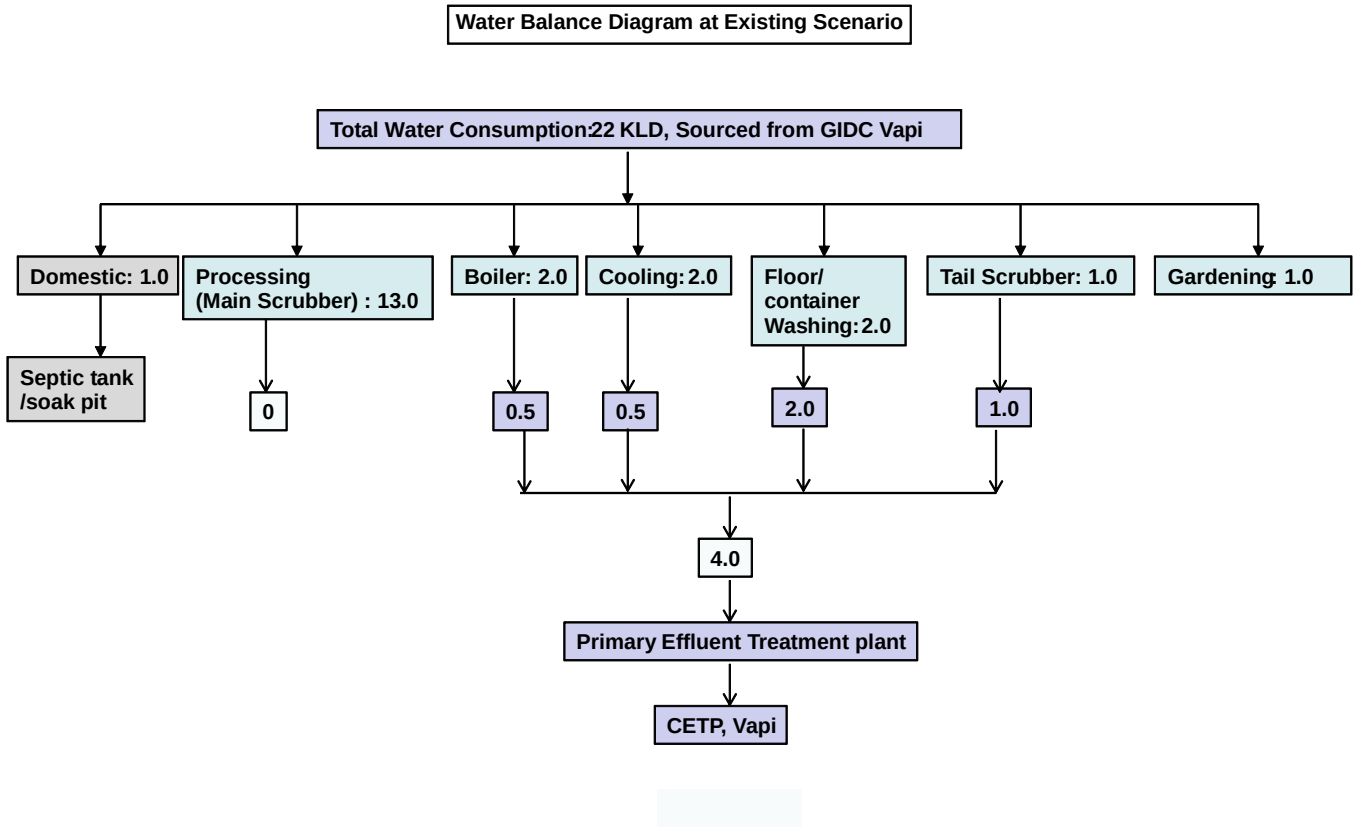
- The raw materials will be stored in closed containers and will be handled through closed system to avoid the handling losses.
- Condensate from boiler will recycled to minimize the water consumption.
- There will be no use of any solvent.
- Control of Raw materials by QC monitoring.

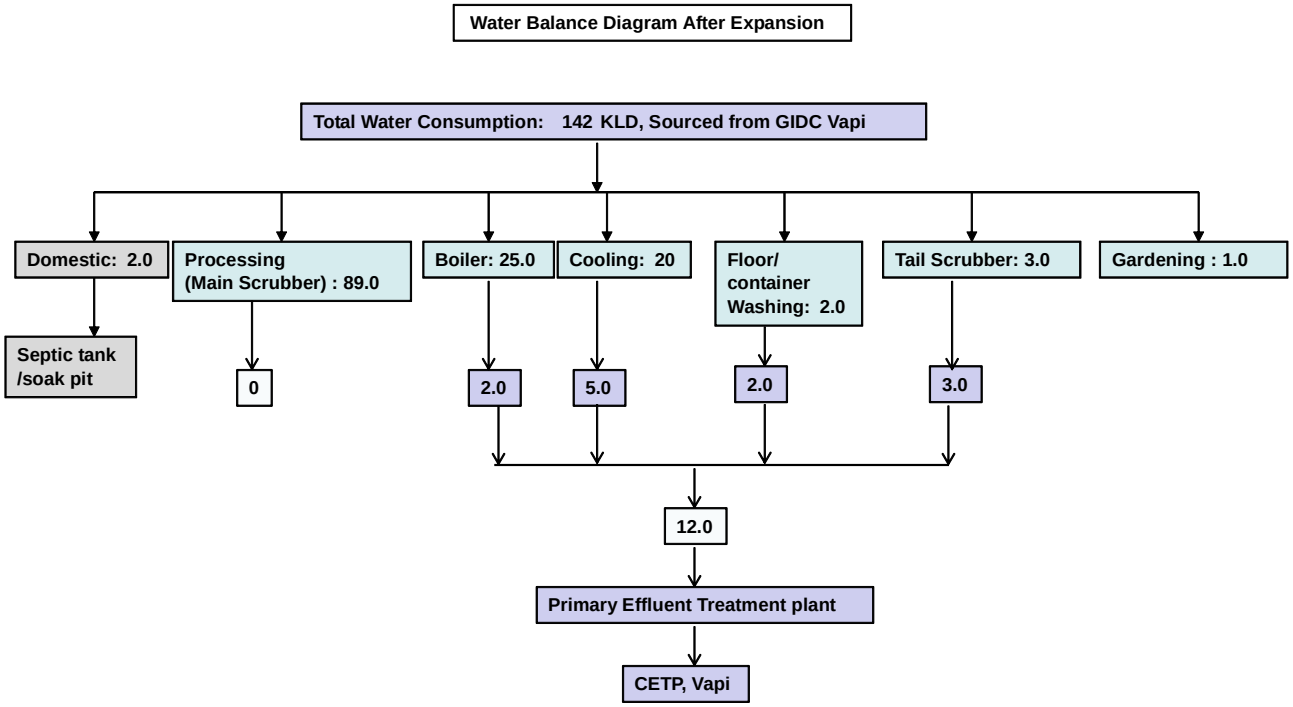
viii) Availability of water its source, Energy/power requirement and source should be given:

Availability of water its source, Energy/power required and its source is below. Water will be sourced from GIDC Notified industrial estate, Vapi. Water withdrawal Permission is attached as **Annexure: 4**

OVERALL WATER CONSUMPTION AT EXISTING & AFTER EXPANSION, KLD

S. No.	Particulars	Water Consumption, KLD		
		Existing	Proposed	Total After Expansion
1.	**Domestic**	**1.0**	**1.0**	**2.0**
2.	**Industry**			
i	Processing (Main Scrubber)	13.0	76.0	89.0
ii	Cooling	2.0	18.0	20.0
iii	Boiler	2.0	23.0	25.0
iv	Reactor/floor/container washing	2.0	0	2.0
v	Tail Scrubber	1.0	2.0	3.0
3.	**Other - Gardening**	**1.0**	**0**	**1.0**
	Total	**22.0**	**120.0**	**142.0**





af

ENERGY REQUIREMENTS AND ITS SOURCE

S. No.	Particulars	Existing Kgs/hr	After Expansion Kgs/hr	Source
1.	Steam Requirement	500	3000	Steam will be obtained from existing 3 TPH boiler

POWER REQUIREMENTS AND ITS SOURCE

S. No.	Particulars	Existing	After Expansion	Source
1	Power – Electricity Requirement	140 KVA	200 KVA	Sourced from Dakshin Gujarat Vij Co. Ltd.

ix) Quantity of waste to be generated (liquid and solid) and scheme for their Management/disposal:

Quantity of waste to be generated (liquid and solid) and scheme for their Management/ disposal is enclosed as **Annexure-5**

x) Schematic representations of the feasibility drawing which give information of EIA purpose:

A schematic representation of the feasibility drawing is enclosed as **Annexure -9**

4). SITE ANALYSIS:

i) Connectivity :

- Vapi Railway Station- 2.37 km, NW direction.
- Surat Airport – 86.60 km, NNW direction
- National Highway- NH:8, 0.51 km, West direction

ii) Land Form, Land use and Land ownership:

The land is in the form of industrial shed owned by Gujarat Industrial Development Corporation.

iii) Topography (along with map):

Topography map showing the elevation of the study area below. The topographical map is enclosed as **Annexure-7**

iv) Existing land use pattern (agriculture, non-agriculture, forest , water bodied (including area under CRZ)), shortest distances from the periphery of the project to periphery of the forest, national park, wild life sanctuary , eco sensitive areas, water bodies (distance from the HFL of the river), CRZ . In case of notified industrial area, a copy of Gazette notification should be given:

The existing land is located in the notified industrial area and a copy of which is enclosed as **Annexure-8**

v) Existing Infrastructure:

GIDC Notified Industrial Area of Vapi has available infrastructure like water, electricity, roads, rail, transportation, availability of raw material and drainage system.

vi) Soil classification:

General soil classification of the area is as under:

- **Soil Characteristics & Land use classification:** The study area is located at outer part of Dadra. Northern part of the site is fully developed for settlement with cropping pattern. Eastern part of the site location has Loamy, clay, red soil.
- The project site around 10 km radius has mixed soil type of Basalt soil and Clay soil. This type of soil is not suitable for cultivation purpose.
- The land is suitable for industrial development.

Damanganga River is located at 1.86 km distance from the site location; both side of the river has mixed soil type (Sand, Clay & Basaltic Soil).

vii) Climate data from secondary sources:

Rainfall Data:

The project site location receives annual rainfall of 1200 to 1300 mm in 35 rainy days having coefficient of variation of 65 %. There is large spatial and temporal variation in rainfall of the study area. The low rainfall areas receiving less than 500 mm rainfall are comprised of Kutch district and western parts of Banaskantha and Patan districts and parts of Jamnagar, Rajkot and Surendranagar districts. These are also characterized by arid climate. The high rainfall (> 1400 mm) receiving areas (Project site, Dang, Valsad, Navsari and Surat, Dadra & Nagar Haveli and Daman & Diu) are characterized as sub humid climate. The remaining part of the state receives rainfall between 500-1000 mm and generally falls under semi-arid climate. Considering the abnormality of weather particularly rainfall during the monsoon period, the

observed and predicted rainfall was then analysed for its validity.

Rainfall Projection for Project Site and Gujarat for 2011 (June-Oct.)

S. No.	Region	Rainfall Projection (in mm) June - Oct	Normal Rainfall (In mm)	Rainfall Projection (% Departure from normal)
1	Middle Gujarat	905.3	796	13.7
2	South Gujarat	696.3	575	21.0
3	Project site	2071.7	1433.7	44.5
4	Saurashtra	767.1	580.4	32.2
5	Gujarat State	1110.1	846.5	31.1

Source: AAU, Anand, Gujarat

Temperature Data:

The site is located in the southern part of Gujarat. The secondary data was collected from free data of Worldclim.org for the year 2010. The project site temperature regime for medium to high level temperature (30-32 °C) during the seasonal months (June to Sep).

viii) Social Infrastructure available:

- Usha Shalby Hospital, Vapi- 1.05 km, ESE direction.
- 21st Century Hospital,Vapi- 1.66 km, NNE direction.
- Haria Rotary Hospital,, Vapi- 2.84 km, NNE direction.
- Union Bank of India, Vapi- 1.77 km, North direction.
- UCO bank, Vapi- 1.99 km, North direction.
- Vidhya Vikas Hindi School, Vapi- 1.15 km, NNW direction.
- Sanskar Bharti, Vapi- 1.74 km, NW direction.
- Rofel College, Vapi- 3.05 km, NW direction.
- Natraj Professional Science College, Vapi- 1.74 km, SE direction.

5). PLANNING BRIEF:

i) Planning Concept (Type of industries, facilities, transportation, etc.) Town and Country Planning /Development authority Classification:

There is a cluster of numerous large-scale, medium-scale and small-scale industries, engaged in the manufacture of variety of products like pharmaceuticals, dyes and chemicals, paper mills, paints, plastics, packaging, textiles, specialilty chemicals, pesticides and others in the Gujarat Industrial Development Corporation (GIDC) Notified Area of Vapi.

ii) Land use planning (breakup along with green belt etc):

The existing as well as expansion project is located within the Notified Industrial Area by Government of Gujarat and due to the proposed project there will not be any change in the land use pattern of the region. Proposed Green belt planning in the project area is as below.

For Green Belt Development as per the revised layout plan, the company proposes 770 m^2 (15%) of green belt of the total land, i.e. 5126 sq. meter. The company shall develop green belt along the periphery of the proposed site and in common premises available outside the company premises.

While selecting the plants species to be grown in the green belt zone, following points will be taken into account:

1. Climatic condition and soil characteristics of the region.
2. The air pollution emitted by the industry – gaseous and particulate matter. Plant interaction with both gaseous and particulate pollutants and to a great extent absorbs them and thus, removes them from the atmosphere.
3. Characteristics of plants including shapes of crowns considered necessary for effective absorption of pollutant gases and removal of dust particles.
4. Height of the plants should not be too high to be lethal.
5. For absorbance of gases, the duration of the foliage should be longer.
6. Vegetation controls soil erosion rates significantly. The decrease of water erosion rates with increasing vegetation cover is exponential. This review reveals that the decrease in water erosion rates with increasing root mass is also exponential. Plant species having good root system are selected, so that soil erosion can be checked.

iii) Site Plan with Area Table at Existing & After Expansion

S. No.	Particulars	Area in m^2		
		Existing	**Proposed**	**Total After Expansion**
i.	Production Plant	1600	0	1600
ii.	Office & lab area	40	0	40
iii.	Green Belt	770	0	770
iv.	Raw materials & other Storage	80	100	180
v.	Utility	150	25	175
Vi	ETP & solid waste storage area	50	0	50
vii.	Toilet block	8	0	8
viii.	Chlorine storage shed	650	200	850
ix.	Open space	1578	-425	1153
x.	Finish product storage area	80	100	180
xi.	Scrubbing system area	120	0	120
	Total plot Area	**5126**	**0**	**4576**

Note: Expansion will be carried out in existing plant by installing bigger capacity of machineries.

Plant layout showing location of storage area, production plant, greenbelt area etc. is attached as **Annexure – 2**

iv) Assessment of Infrastructure demand (Physical & Social):

There is no need for any infrastructure demand in terms of physical or social needs for the expansion.

v) Amenities/ Facilities:

GIDC notified industrial area of Vapi has the available infrastructure like water, electricity, roads, rail, transportation, availability of raw material and drainage system.

6). PROPOSED INFRASTRUCTURE:

i) Industrial Area (Processing Area).

The proposed infrastructure to manufacture products will be built with standard engineering design considering all the relevant parameters related to environment, health and safety.

ii) Residential Area (Non Processing Area) :

No residential area is involved in the expansion project.

iii) Green Belt :

Green belt will be provided and maintained at the tune of 15% of the total land area.

iv) Social Infrastructure :

- Usha Shalby Hospital, Vapi- 1.05 km, ESE direction.
- 21st Century Hospital,Vapi- 1.66 km, NNE direction.
- Haria Rotary Hospital,, Vapi- 2.84 km, NNE direction.
- Union Bank of India, Vapi- 1.77 km, North direction.
- UCO bank, Vapi- 1.99 km, North direction.
- Vidhya Vikas Hindi School, Vapi- 1.15 km, NNW direction.
- Sanskar Bharti, Vapi- 1.74 km, NW direction.
- Rofel College, Vapi- 3.05 km, NW direction.
- Natraj Professional Science College, Vapi- 1.74 km, SE direction.

v) Connectivity (Traffic and Transportation Road/Rail/ Metro/ Water ways etc):

- Vapi Railway Station- 2.37 km approx., NW direction.
- Surat Airport – 86.60 km approx., NNW direction
- National Highway- NH:8, 0.51 Km. approx., West direction

vi) Drinking Water management (Source & Supply of water) :

Source of water is from GIDC water supply services.

vii) Sewerage System :

GIDC has provided sewerage system to dispose the sewage effluent.

viii) Industrial Waste Management :

Entire Industrial liquid effluent generated after expansion will be treated in the primary, ETP and will be discharged through GIDC underground drainage to CETP Vapi (CETP Membership certificate is attached as **Annexure-6**)

Generated domestic liquid waste is being disposed off through soak pit system to drainage.

ix) Solid/Hazardous Waste Management:

S. No.	Type of Hazardous waste	Category as H/W Rules 2016	Generation, TPA		Treatment	Disposal
			Existing	Proposed		
1	Waste from ETP	Sch: I, 35.3	3.6	5.0	Packed in HDPE bags, stored	Dispose off into TSDF Vapi
2	Used Oil	Sch:I, 5.1	0.024	0.3	Packed in HDPE drum	Sell to registered recycler
3	Discarded containers	Sch I: 33.1	5.0	10.0	Washed & stored	Utilized for packing of hazardous waste or sell to authorized recycler
4	Sludge from wet scrubber	Sch: I 37.1	2.0	4.0	Packed in HDPE bags, stored	Dispose off into TSDF Vapi
5	30% HCl	Sch: II B15	5433	45759	Stored in a tank	Sell to actual users

(Membership certificate is attached as **Annexure-6**)

x) Power Requirement & Supply / Source :

Power requirement for proposed project will be taken from DGVCL.

7). REHABILITATION AND RESETTLEMENT (R&R) PLAN:

i) Policy to be adopted (Central/ State) in respect of the project affected persons including home oustees, land oustees and landless labourers (a brief outline to be given):

There will be no rehabilitation and resettlement undertaken as labours and workers from local & nearby areas for the proposed construction activity which will be minor as the expansion activity is to be undertaken at the existing site.

8). PROJECT SCHEDULE & COST ESTIMATES:

i) Likely date of start of construction and likely date of completion (Time schedule for the project to be given) :

After obtaining Environmental clearance and Consent to Establish from GPCB, the company shall start the proposed minor construction and commissioning of the project.

ii) Estimated project cost along with analysis in terms of economic viability of the project :

Estimated project cost along with the analysis in terms of economic viability of the project is given as below.

CAPITAL COST PROJECTION

S. No.	Items	Existing (INR Lacs)	Proposed (INR Lacs)	Total (INR Lacs)
1.	Land 5126 m^2	47	0	47
2.	Building	50	50	100
3.	Plant & Machinery	90	158	248
4.	Environmental Management System	20	35	55
	Total	**207**	**243**	**450**

DETAILS OF UTILITIES

S. No.	Particulars	Details		
		Existing	**Proposed**	**Total**
1.	Boiler, kgs/hr	3000	0	3000
2.	Cooling Tower, TR	300	200	500
3.	D.G. Set (Standby), KVA	125	0	125
4.	Power from DGVCL, KVA	140	60	200
5.	Fuel			
a.	Imported Coal, kgs/hr	500	0	500
b.	HSD, kgs/hr	8	0	8
6.	Water From GIDC, m^3 / day	22	120	142
7.	Waste Water, m^3 / day (industrial)	4	8	12
8.	Treatment Scheme	Primary	Primary	Primary
9.	Disposal	CETP	CETP	CETP

PROJECT VIABILITY

S. No.	PARTICULARS	AMOUNT (INR Lacs)
1	Proposed Sale	1200
2	Raw Material Cost	900
3	Power & Fuel	60
4	Labour Cost	30
5	Environmental Management System	10
6	Maintenance Cost	5
7	Selling, packing & Office Expenses	4
8	Proposed Profit	191

The company will provide budgetary provision for the recurring/operating expenses for environmental issues while planning the allocation of funds during the annual budgetary planning.

RECURRING/OPERATING COST PER ANNUM

S. No.	Component	Proposed (INR Lakhs/Annum)
1.	Environment & Safety Management System	5.0
2.	Greenbelt Maintenance	2.0
	Total	**7.0**

9). Analysis of Proposal and Final Recommendations:

i) Financial and social benefits with special emphasis on the befit to the local people including tribal population, if any, in the area:

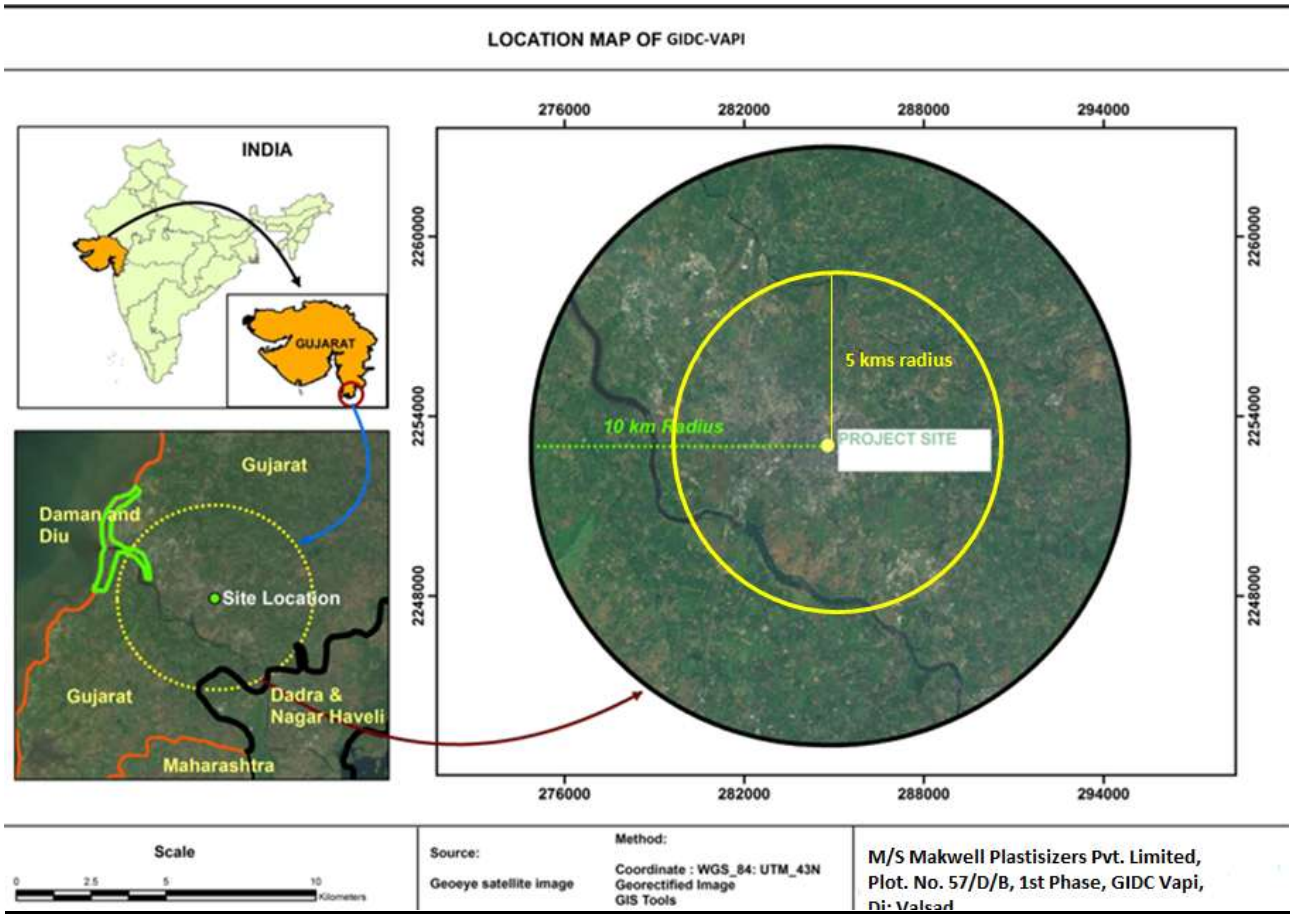
Expansion activity will provide benefits to the local people in terms of financial and social welfare.

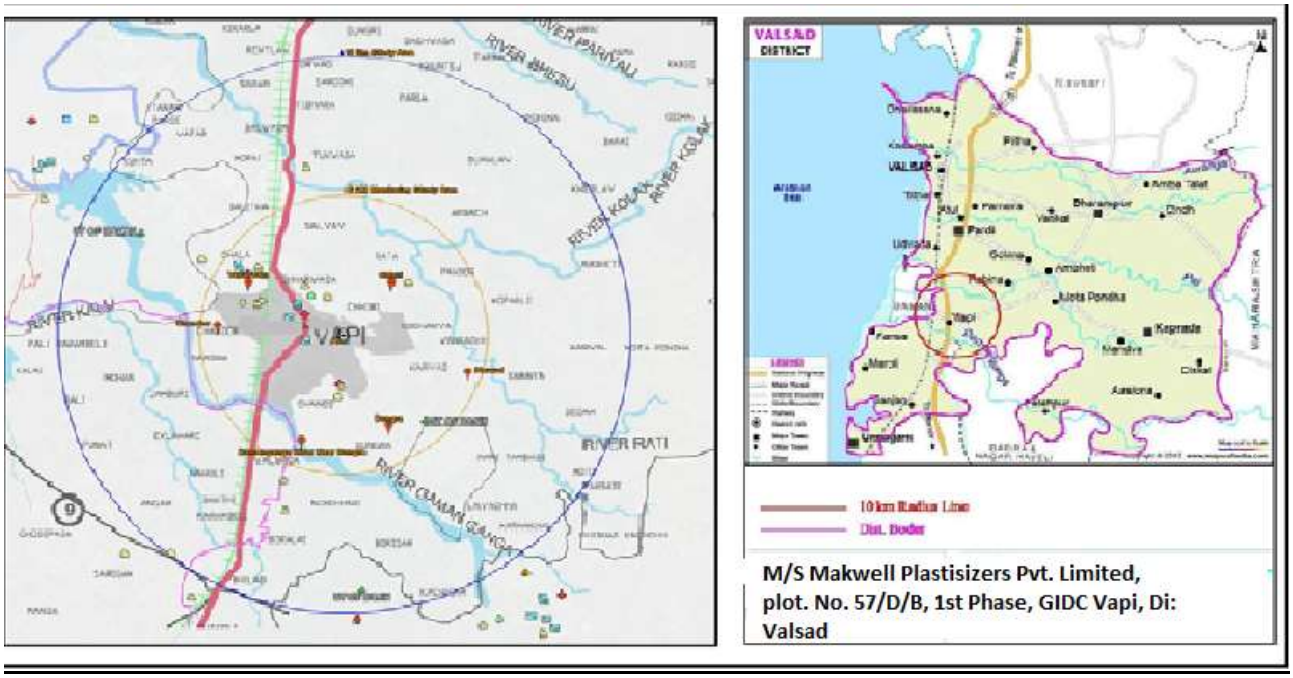
- Local people will get direct financial benefit by way of employment.
- Local people will get some contracts of supply and services to get indirect income.
- Company will contribute in improving education and health facilities in nearby area.

ANNEXURES

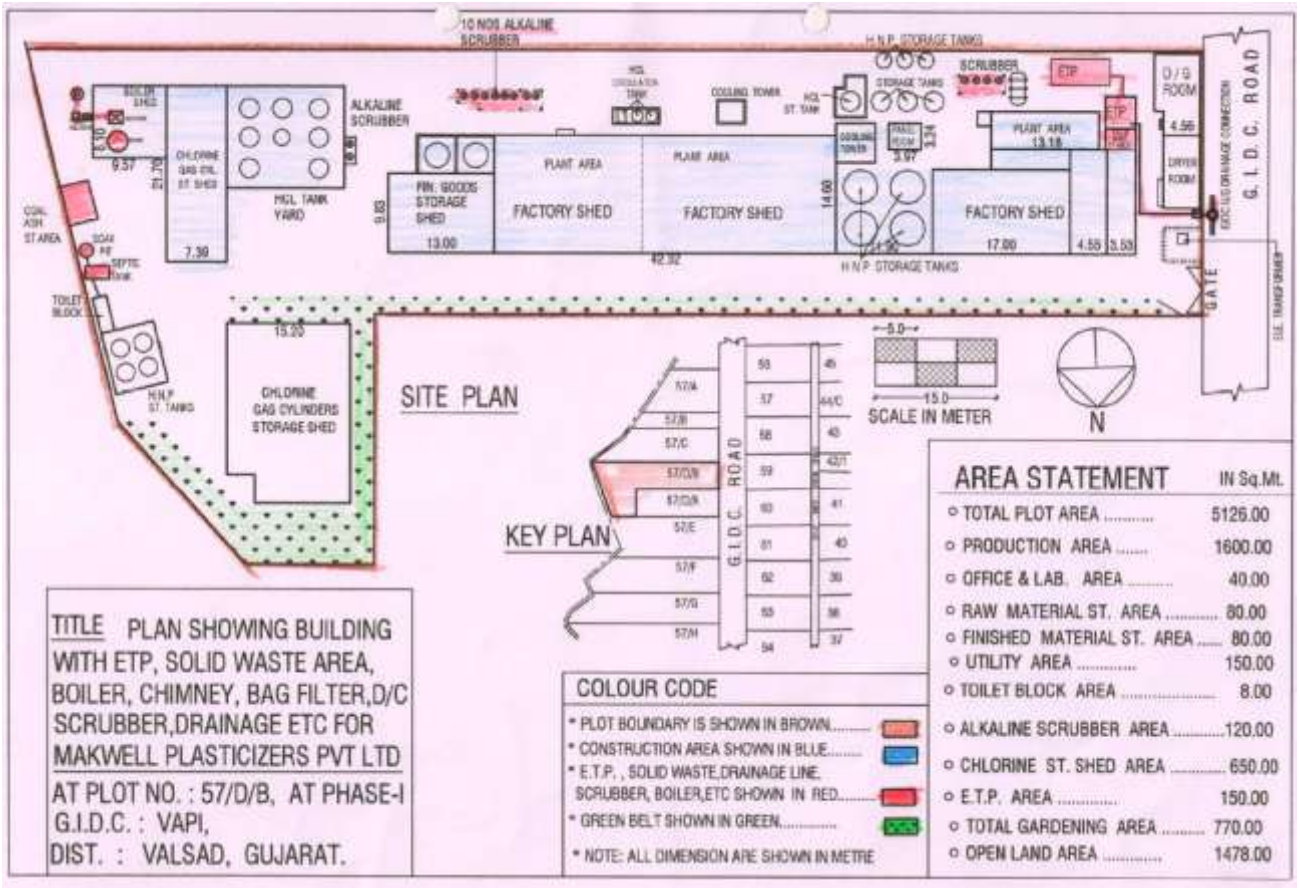
ANNEXURE: 1

LOCATION MAP SHOWING THE PROJECT SITE AND INTER-STATE BOUNDARY WITHIN 10 KMS RADIUS





ANNEXURE: 2
PLANT LAYOUT



ANNEXURE: 3
MANUFACTURING PROCESS, CHEMICAL REACTION & MASS BALANCE

Detailed project description with process details – MANUFACTURING PROCESS

The company is using the latest available process technology for the production. This chapter includes the manufacturing process of the product, chemical reactions, and material mass balance & mole balance for the product.

Manufacturing Process, Chemical Reaction & Mass Balance

1. Chlorinated Paraffin Wax:

Heavy normal paraffin wax or paraffin wax as the case may heated/melted in heating tank. About 80-85oC, the mass is charged in a lead lined chlorinator. Chlorine from toner is passed in chlorinator till required % of concentration is achieved. This is checked by specific gravity of the materials. After completion of chlorination, the mass is discharged in another lead lined vessel, where air is passed to get rid of traces of HCl & Cl2. This is an aeration process.

While the chlorination is in process, HCl gas & traces of unreacted chlorine is librated, which is scrubbed in water to get HCl as 27- 30% & excess HCl & Cl2 gas further scrubbed in alkali scrubber.

After aeration is over, the chlorinated paraffin wax is transferred to storage tank as final product.

CHLORINATED PARAFFIN WAX

$$CH_3—(CH_2)_n—CH_3 + Cl_2 +$$

$n = 14$ to 18

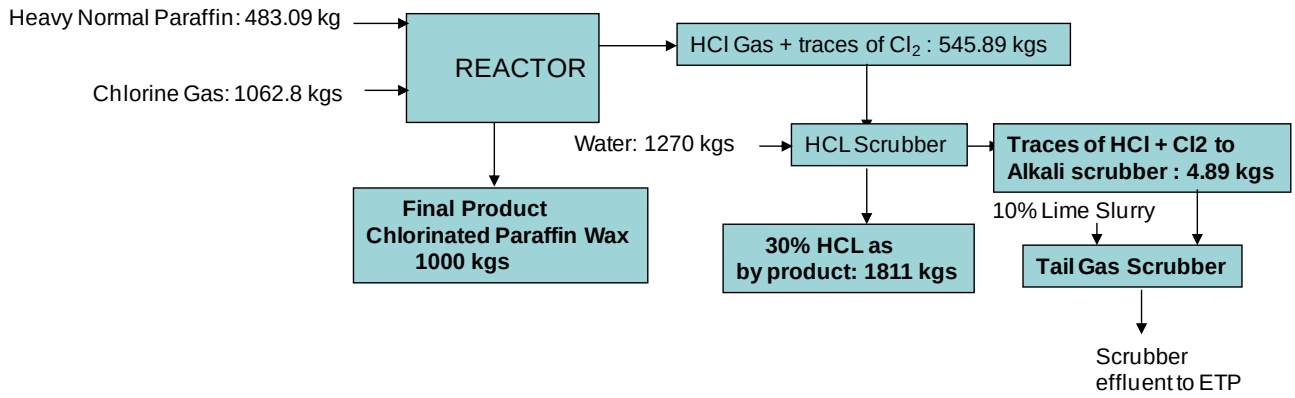
HEAVY NORMAL PARAFFIN WAX

$$CH_3—\underset{\underset{Cl}{|}}{(CH)_z}—(CH)_\Phi—(CH)_a—CH_3 \quad + \quad HCl$$

CHLORINATED PARAFFIN WAX

$Z = 5 - 6, \quad \Phi = 14 - 5, \quad a = (n – z - \Phi)$

MASS BALANCE OF CHLORINATED PARAFFIN WAX (1 TONE)



Sr. No.	Input Raw materials	Quantity in kgs	Out Put	Quantity in kgs
1	HNP	483.09	CPW	1000
2	Cl_2 gas	1062.8	30% HCl	1811
3	Water for HCl recovery Scrubber	1270	Traces of HCl/Cl2	4.89
4	**Total**	**2815.89**	**Total**	**2815.89**

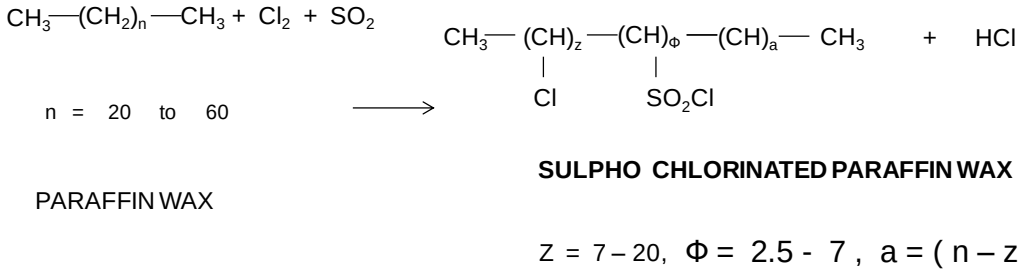
2. Sulpho Chlorinated Paraffin Wax:

Heavy normal paraffin wax or paraffin wax as the case may heated/melted in heating tank. About 80-85 0C, the mass is charged in a lead lined chlorinator. Chlorine & sulphur dioxide gas from toner/cylinder is passed in chlorinator till required % of concentration is achieved. This is checked by specific gravity of the materials. After completion of chlorination, the mass is discharged in another lead lined vessel, where air is passed to get rid of traces of HCl & Cl2. This is an aeration process.

While the chlorination is in process, HCl gas & traces of unreacted chlorine is librated, which is scrubbed in water to get HCl as 27- 30% & excess HCl & Cl2 gas further scrubbed in alkali scrubber.

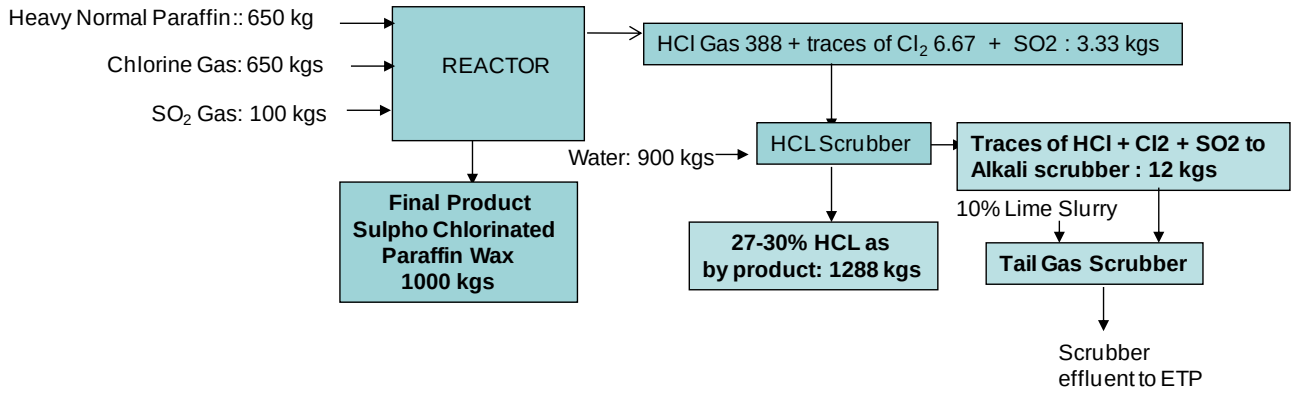
After aeration is over, the sulpho chlorinated paraffin wax is transferred to storage tank as final product.

SULPHO CHLORINATED PARAFFIN WAX



Z = 7 – 20, Φ = 2.5 - 7 , a = (n – z - Φ)

MASS BALANCE OF SULPHO CHLORINATED PARAFFIN WAX (1 TONE)



Sr. No.	Input Raw materials	Quantity in kgs	Out Put	Quantity in kgs
1	HNP/Paraffin wax	650	Sulpho CPW	1000
2	Cl_2 gas	650	30% HCl	1288
3	SO_2 Gas	100	Traces of HCl/Cl2/SO2	12
4	Water for HCl recovery Scrubber	900		
5	**Total**	**2300**	**Total**	**2300**

ANNEXURE: 4
WATER REQUIREMENT LETTER FROM NOTIFIED INDUSTRIAL ESTATE

NOTIFIED AREA AUTHORITY

Office of the Dy. Exe.Engineer(W/S)

GIDC Administrative Office, 2nd Floor, Plot No. C-5/101,
Char Rasta, VAPI-396195, Dist. Valsad.
Tel. No. 2421596, 2432670, 2432667, Fax: 2420502 Gram : Notified
E.Mail Address : chiefofficer.naovapi@yahoo.in

No. GIDC/DEE(W/S)/NA/VAPI/ 534 Date: 11-4-17

To,
M/s. Makwell Plastisizers Pvt.Ltd.,
Plot No.57/D/B
GIDC- Vapi.

Sub: Water requirement on your Plot No. 57/D/B, GIDC-VAPI.
Connection No. 11671

Ref: Your letter dtd. 10/04/2017

Dear Sir,

In context to your letter quoted under reference , it is to inform you that GIDC is able to provide qnty of water upto 150 K.l. per day at your Plot No.57/D/B located in phase-I , GIDC-Vapi provided necessary permission from concern authority is to be taken and any addition or alteration & infrastructure if needed is to be beared by the unit at the time of actual water connection & availibity of water at the time of actual requiremnent.

This is for your information and further necessary action please.

Thanking You,

Yours faithfully,

DY.EXE.ENGINEER(W/S)
N.A. GIDC-VAPI.

223

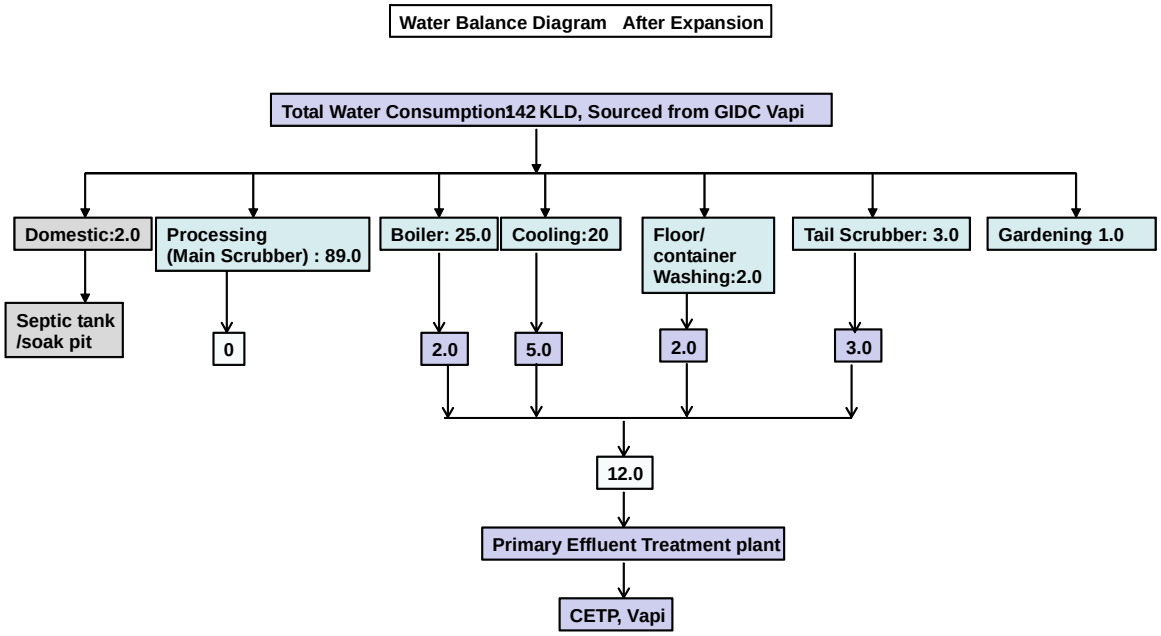
ANNEXURE: 5
WASTEWATER MANAGEMENT

- Quantity of Wastewater (liquid waste) generation and its management :

S. No.	Particulars	Wastewater generation, KLD		
		Existing	Proposed	Total After Expansion
1.	**Domestic**	**1.0**	**1.0**	**2.0**
2.	**Industrial**			
i.	Processing (Main Scrubber)	0	0	0
ii.	Cooling	0.5	4.5	5.0
iii.	Boiler	0.5	1.5	2.0
iv.	Reactor/floor/container washing	2.0	0	2.0
v.	Tail Scrubber	1.0	2.0	3.0
	Total Industrial	**4.0**	**8.0**	**12.0**
	Total	**5.0**	**9.0**	**14.0**

Note:

- Domestic effluent is passes through adequate capacity of septic tank/soak pit.
- There is no use water in the process and also no generation of any waste water from the process.
- Waste water generation from boiler blow down, cooling tower blow down, tail scrubber and occasionally floor, container washing only having very negligible pollution potential.
- After Expansion, there will be generation of total 12 KLD of industrial effluent, which is treated in primary effluent treatment plant and discharge into underground effluent drainage line to CETP for further treatment.



Details of Effluent Treatment Plant

Design Criteria:

- ⇨ Product : Plasticizer
- ⇨ Source of Effluent : Boiler, Cooling washing & tail scrubber
- ⇨ Design Flow of Effluent : **12 KLD Max.**
- ⇨ Design Parameters : As under

Effluent Characteristics:

S. No.	Effluent parameters	Domestic	Tail scrubber	Boiler + cooling	Equip + floor + cont. wash	Combined Industrial Effluent
1.	pH	6.8	8.7	8.1	6.5	8.3
2.	Color	80	150	60	100	275
3.	TDS	800	4300	2400	2100	3850
4.	S/S	255	564	121	456	306
5.	Oil/grease	12.5	11.2	13.6	14.8	9.78
6.	BOD	-	32	10	150	80
7.	COD	-	256	124	603	440
8.	Ammonical nitrogen	25	ND	8	ND	9
9.	Phenolic compound	ND	ND	ND	ND	ND
10.	Chloride	120	1800	560	510	1600
11.	Sulphate	180	125	240	180	280

Based on the above criteria Effluent Treatment Plant having under mentioned specification is required to install:

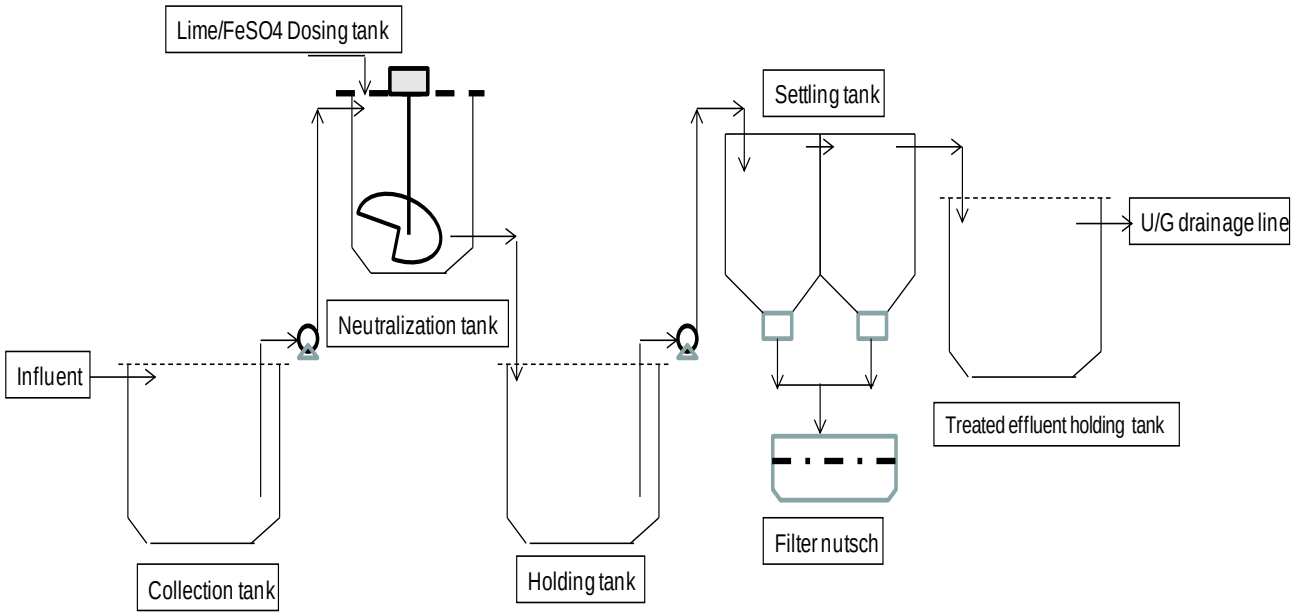
Details of effluent treatment plant for normal industrial effluent stream:

S. No.	Name of Equipment	Capacity in (KL)	MOC
1.	Oil & Grease tank	0.5	RCC
2.	Collection Tank	5.0	HDPE
3.	Neutralization tank with stirrer	15	HDPE
4.	Settling tank x 2	5	MS/FRP
5.	Filter nutsch x 2	2	MSFRP
6.	Final Treated effluent holding tank	5	HDPE

Treatment Scheme:

The waste water generation from boiler blow down, cooling tower blow down, tail scrubber and occasionally floor washing only, having very low pollution potential. As the effluent is discharge into CETP and most of the parameters meeting the norms of CETP inlet norms. The effluent is collected in a collection tank, and then taken into neutralization cum flocculation tank for precipitation. Neutralized effluent is taken into settling tank to settle down solid particles. Clear effluent is taken to secondary settling tank and finally discharged into underground effluent drainage line to CETP. Solid waste slurry is taken to filter nutsch for drying and finally dispose off into TSDF.

Flow Diagram of Effluent Treatment plant



ANNEXURE: 6
MEMBERSHIP CERTIFICATE OF CETP, VAPI

VAPI GREEN ENVIRO LIMITED
Formerly known as Vapi Waste & Effluent Mgt. Co. Ltd.
VIA House, Plot No. 135, Char Rasta, GIDC VAPI - 396 195. Gujarat. INDIA
Mob.: 9714000828 | Tel.: (0260) 2428950, Telefax : (0260) 2429950 | Email : admin@vgelvapi.com
Website : www.vgelvapi.com | www.coevapi.com | CIN : U74210GJ1997GAP031525

Ref. No.CETP_Memb.Certi/ 0816 04-02-2017

Mem No.-243
B.V-16kl/Day

TO WHOMSOVER IT MAY CONCERN

MEMBERSHIP CONFIRMATION CERTIFICATE

This is to certify that M/s. Makwell Plastisizers Pvt.Ltd. Plot No.57/D/B, GIDC,Vapi is a Member of VGEL for Common Effluent Treatment Plant and Common Solid Waste Projects Site and Membership No is 243.

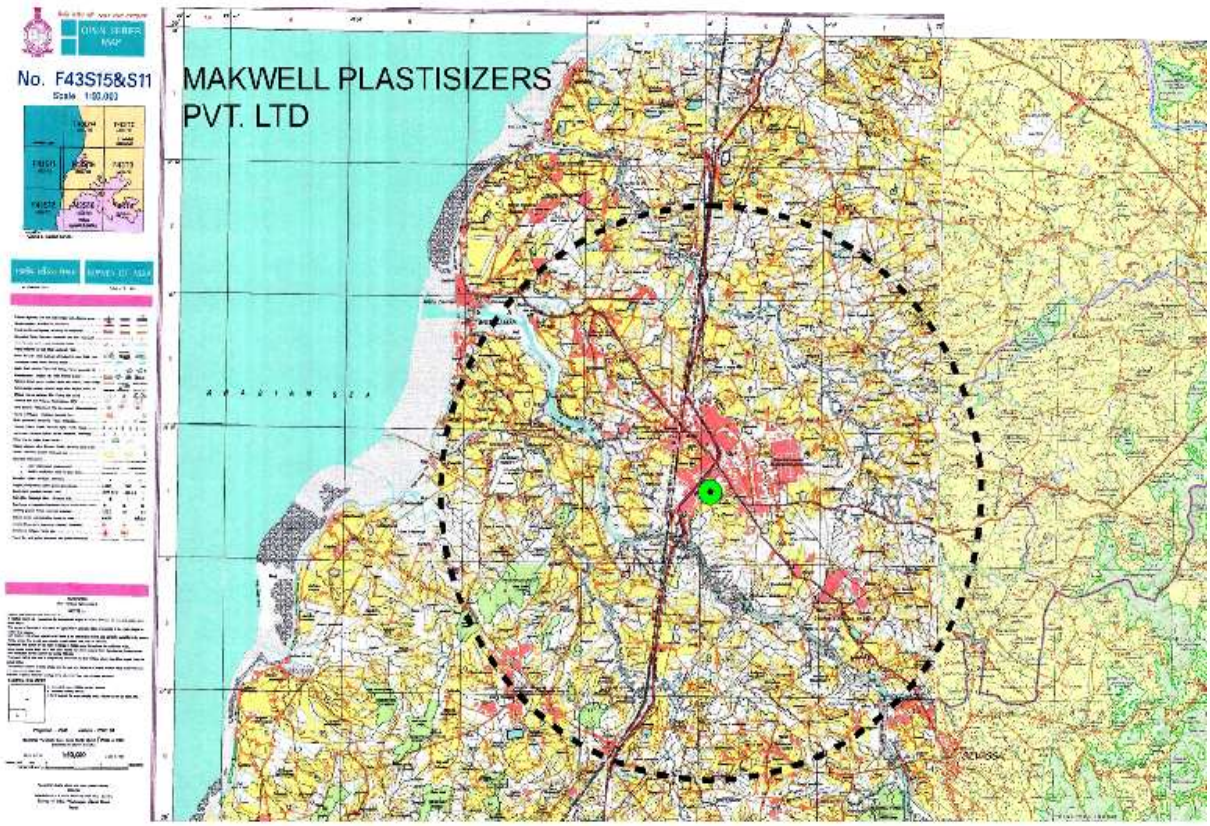
This certificate is issued at the specific request of the above party.

For Vapi Green Enviro Ltd.

Authorized Signatory.

COMMON EFFLUENT TREATMENT PLANT : "CETP" N.H. No. 8, Near Damanganga Bridge, GIDC, VAPI - 396 195. Tel.: (0260) 2432950 Telefax : 2434929
COMMON SOLID WASTE PLANT : "CSWP", Plot No. 4807 etc. Phase IV, GIDC, VAPI - 396 195. Mob.: 9714006781
CENTRE OF EXCELLENCE : "COE", Near Water Filtration Plant, 1st Phase, GIDC, Vapi - 396 195. Mob.: 9714007068 Tel.: (0260) 2431597

ANNEXURE: 7
TOPOSHEET



ANNEXURE: 8

COPY OF PLOT ALLOTMENT LETTER ISSUED BY GIDC

Gram: GIDC Telex : 183-237 Tel. 22670 / 20895

Gujarat Industrial Development Corporation
(A Govt of Gujarat Undertaking)
OFFICE OF THE DEPUTY MANAGER
GIDC Guest House Shop., Vapi Industrial Estate
VAPI-396 195, Dist. Valsad.

BY R.P.A.D.

No : GIDC:DYM:VPI:GR:TEN: 3855

Date 27 AUG 1993

-: O F F I C E O R D E R :-

Sub:- Transfer of plot at Vapi.

A plot of land (No.57/D) admeasuring about 8035 sqmts. was allotted to M/s. Makwell in our Vapi Indl. Estate.

The licence agreement was executed on 16-7-1973. The licencee had applied to the Corporation to sub-division and transfer of the said plot in favour of (1) M/s.Makwell Organics P. Ltd.Plot No.57/D/A admeasuring 4576 sq.mts.(2) Makwell Plastisizers Pvt.Ltd.Plot No.57/D/B admeasuring 5126 sq.mts.

Permission for transfer has been given by the Regional Manager-I, as per letter No.21478 dated 23-4-93. The licensee has paid all dues of the Corporation up till now. The Supplementary Agreement has executed on 25-8-93 between the Corporation/Licencee & Transferee.

The plot now, therefore, stands transferred in the name of 1). M/s. Makwell Organics Pvt.Ltd.Plot No.57/D/A 4576 sq.mtrs. 2).M/s. Makwell Plastisisers Pvt.Ltd.Plot No.57/D/B admeasuring 5126 sq.mtrs.with effect from 23-4-1993.

DY.MANAGER,
GIDC/VAPI.

T o,

1). M/s.Makwell Organics Pvt.Ltd.
Plot No.57/D/A,
G I. D.C.
Vapi.(Dist:Valsad)

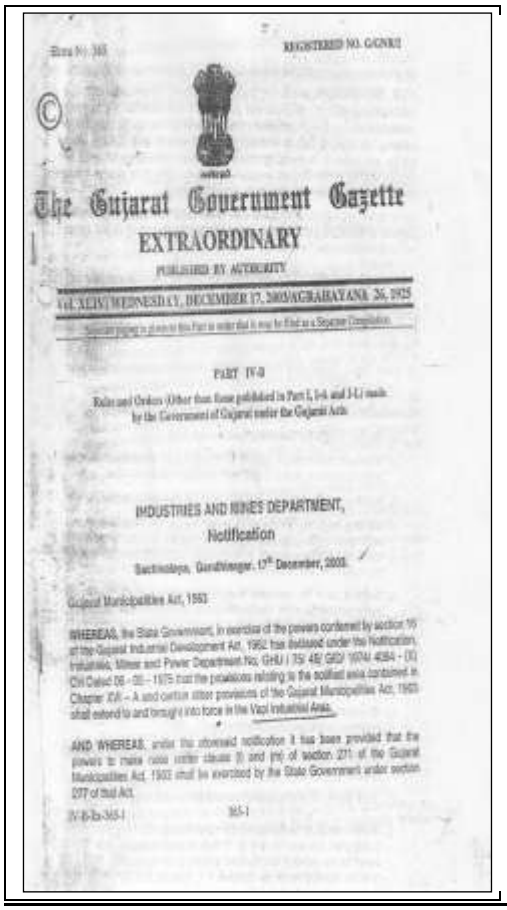
2)- M/s Makwell Plastisizers Pvt.Ltd,
Plot No.57/B/A,
G.I.D.C.
Vapi. (Dist:Valsad)

For MAKWELL ORGANIC PVT. LTD.

Authorised Signatory

Head Office : Udyog Bhavan, Block 3, 4, 5, Sector No. 11, 'GH' Road, Gandhinagar-382 011. Ph. No. 25813 to 25817.

COPY OF NOTIFICATION REGARDING THE UNIT IS LOCATED IN NOTIFIED INDUSTRIAL AREA



REGISTERED NO. GUJ/RMS

The Gujarat Government Gazette

EXTRAORDINARY

PUBLISHED BY AUTHORITY

Vol. XLIV] WEDNESDAY, DECEMBER 17, 2003/AGRAHAYANA 26, 1925

PART IV-B

Rules and Orders (Other than those published in Part I, I-A and I-L) made by the Government of Gujarat under the Gujarat Acts

INDUSTRIES AND MINES DEPARTMENT,

Notification

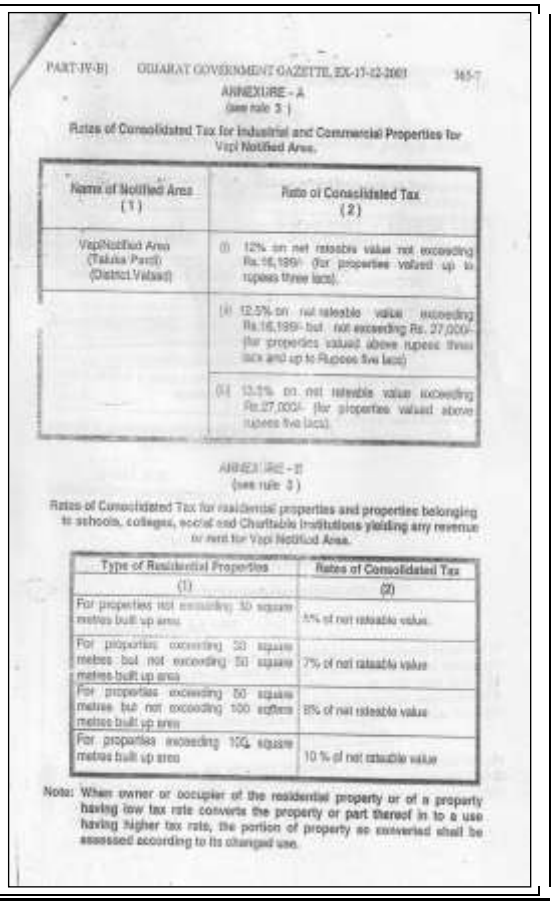
Sachivalaya, Gandhinagar, 17th December, 2003.

Gujarat Municipalities Act, 1963

WHEREAS, the State Government, in exercise of the powers conferred by section 16 of the Gujarat Industrial Development Act, 1962 has declared under the Notification, Industries, Mines and Power Department No. GHU / 35/ 48/ GID/ 10701 4084 - (D) Cht Dated 06 - 05 - 1975 that the provisions relating to the notified area contained in Chapter XVI – A and certain other provisions of the Gujarat Municipalities Act, 1963 shall extend to and brought into force in the Vapi Industrial Area.

AND WHEREAS, under the aforesaid notification it has been provided that the powers to make rules under clause (i) and (m) of section 271 of the Gujarat Municipalities Act, 1963 shall be exercised by the State Government under section 277 of that Act.

IV-B-Ex-365-1 365-1



PART IV-B] GUJARAT GOVERNMENT GAZETTE, EX-17-12-2003 365-7

ANNEXURE - A

(see rule 3)

Rates of Consolidated Tax for Industrial and Commercial Properties for Vapi Notified Area.

Name of Notified Area (1)	Rate of Consolidated Tax (2)
VapiNotified Area (Taluka Parcel) (District Valsad)	(i) 12% on net rateable value not exceeding Rs.16,199/- (for properties valued up to rupees three lacs).
	(ii) 12.5% on net rateable value exceeding Rs.16,199/- but not exceeding Rs. 27,000/- (for properties valued above rupees three lacs and up to Rupees five lacs)
	(iii) 13.5% on net rateable value exceeding Rs.27,000/- (for properties valued above rupees five lacs).

ANNEXURE - B

(see rule 3)

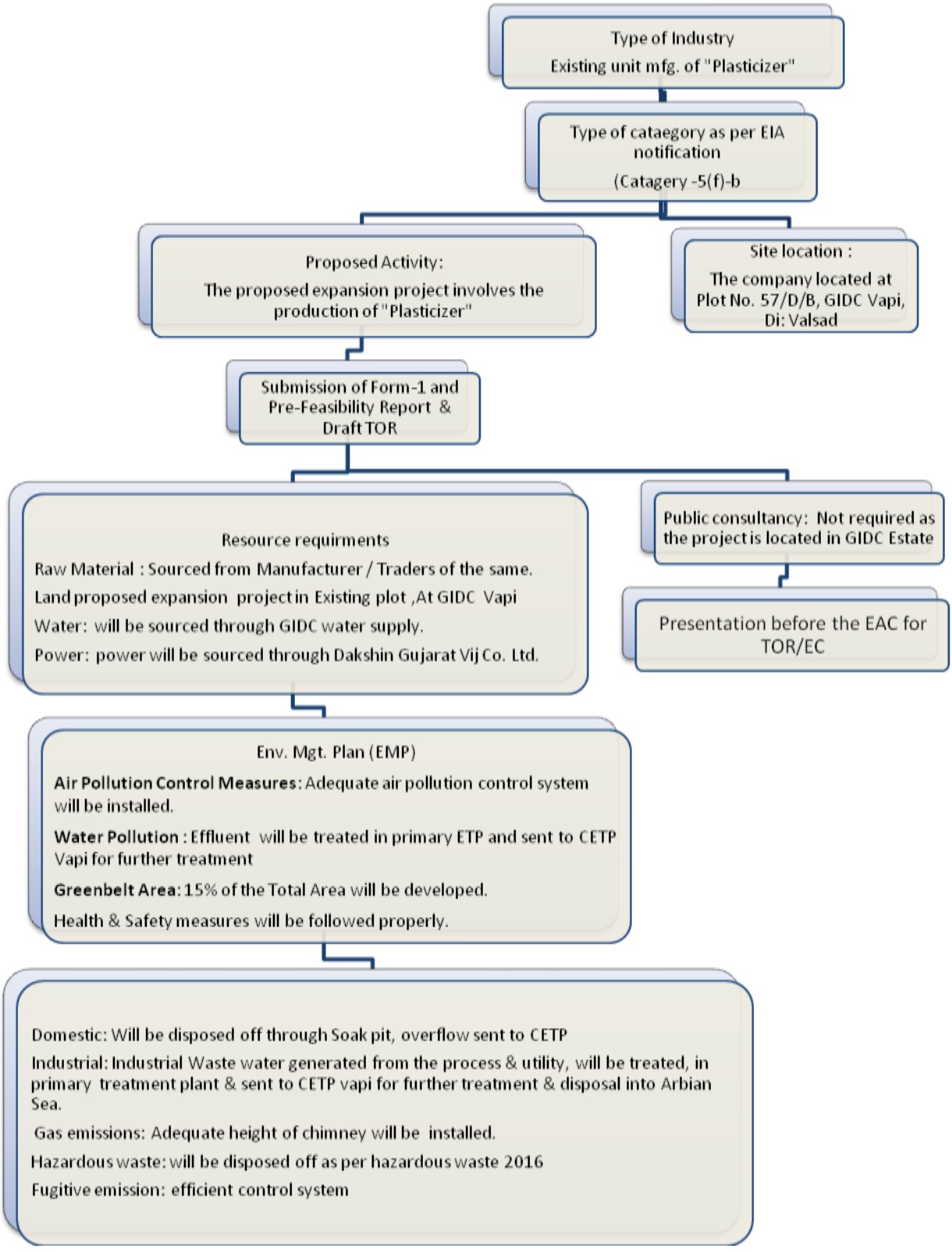
Rates of Consolidated Tax for residential properties and properties belonging to schools, colleges, social and Charitable institutions yielding any revenue or rent for Vapi Notified Area.

Type of Residential Properties (1)	Rates of Consolidated Tax (2)
For properties not exceeding 50 square metres built up area	5% of net rateable value.
For properties exceeding 50 square metres but not exceeding 50 square metres built up area	7% of net rateable value
For properties exceeding 50 square metres but not exceeding 100 sqfeet metres built up area	8% of net rateable value
For properties exceeding 100 square metres built up area	10 % of net rateable value

Note: When owner or occupier of the residential property or of a property having low tax rate converts the property or part thereof in to a use having higher tax rate, the portion of property so converted shall be assessed according to its changed use.

ANNEXURE: 9

A SCHEMATIC REPRESENTATION OF THE FEASIBILITY DRAWING



ANNEXURE: 10

DETAILS OF AIR POLLUTION & ITS CONTROL MEASURES FOR EXISTING & EXPANSION

Flue gas emission:

At present, the unit has installed coal fired 3 TPH steam boiler. Adequate capacity of MDC, bag filter & 15 meters height of chimney provided. Also 125 KVA D G set is provided and kept as a standby in case of power failure.

Existing 3 TPH boiler will be utilized for proposed by increasing the boiler operating hours; hence there will be no addition of any new boiler after expansion.

Process gas emission:

At present, there are total four numbers of chlorinator having common water followed by alkali scrubber and 11 meters height of chimney provided.

After expansion additional eight numbers of chlorinator and common water followed by alkali scrubber and 11 meters height of chimney will be provided.

Thus after expansion, there will be total twelve numbers of chlorinator and two numbers of scrubbing system with 11 meters chimney will be provided.

S. No.	Particulars	Details			Remarks
		Existing	Proposed	Total After Expansion	
	FLUE GAS EMISSION				
1.0	**Steam Boiler, TPH**	**3**	**0**	**3**	**Existing**
i.	Fuel used	Imported coal	0	Imported coal	
ii.	Fuel Consumption	500 kgs/hr	0	500 kgs/hr	
iii.	Pollutants	PM: 100mg/NM^3 SO_2: 100 ppm NOx: 50 ppm	PM: 100mg/NM^3 SO_2: 100 ppm NOx: 50 ppm	PM: 100mg/NM^3 SO_2: 100 ppm NOx: 50 ppm	
iv.	APC	MDC & Bag filter	0	MDC & Bag filter	
v.	Height of Chimney	15 meter	0	15 meter	
2.0	**D G Set**	**125 KVA**	**0**	**125 KVA**	**Existing**
i.	Fuel used	HSD	0	HSD	
ii.	Fuel Consumption	8 kgs/hr	0	8 kgs/hr	
iii.	Pollutants	PM: 100mg/NM^3 SO_2: 100 ppm NOx: 50 ppm	PM: 100mg/NM^3 SO_2: 100 ppm NOx: 50 ppm	PM: 100mg/NM^3 SO_2: 100 ppm NOx: 50 ppm	
iv.	APC	Exhaust	0	Exhaust	
v.	Height of Chimney	11 meter	0	11 meters	
	PROCESS GAS EMISSION				
1.0	**Stack attached to**	**Chlorinator: I,II,III,IV**	**Chlorinator: V, VI, VII, VIII, IX,X,XI,XII**	**Chlorinator: I,II,III,IV, V, VI, VII, VIII, IX,X,XI,XII**	**Total two numbers**
i.	Pollutants	HCl/Cl_2	HCl/Cl_2	HCl/Cl_2	
ii.	APC	Graphite/FRP/HDPE water scrubber followed by alkali scrubber	Graphite/FRP/HDPE water scrubber followed by alkali scrubber	Graphite/FRP/HDPE water scrubber followed by alkali scrubber	
iii.	Height of vent	11 meter	11 meter	11 meter	

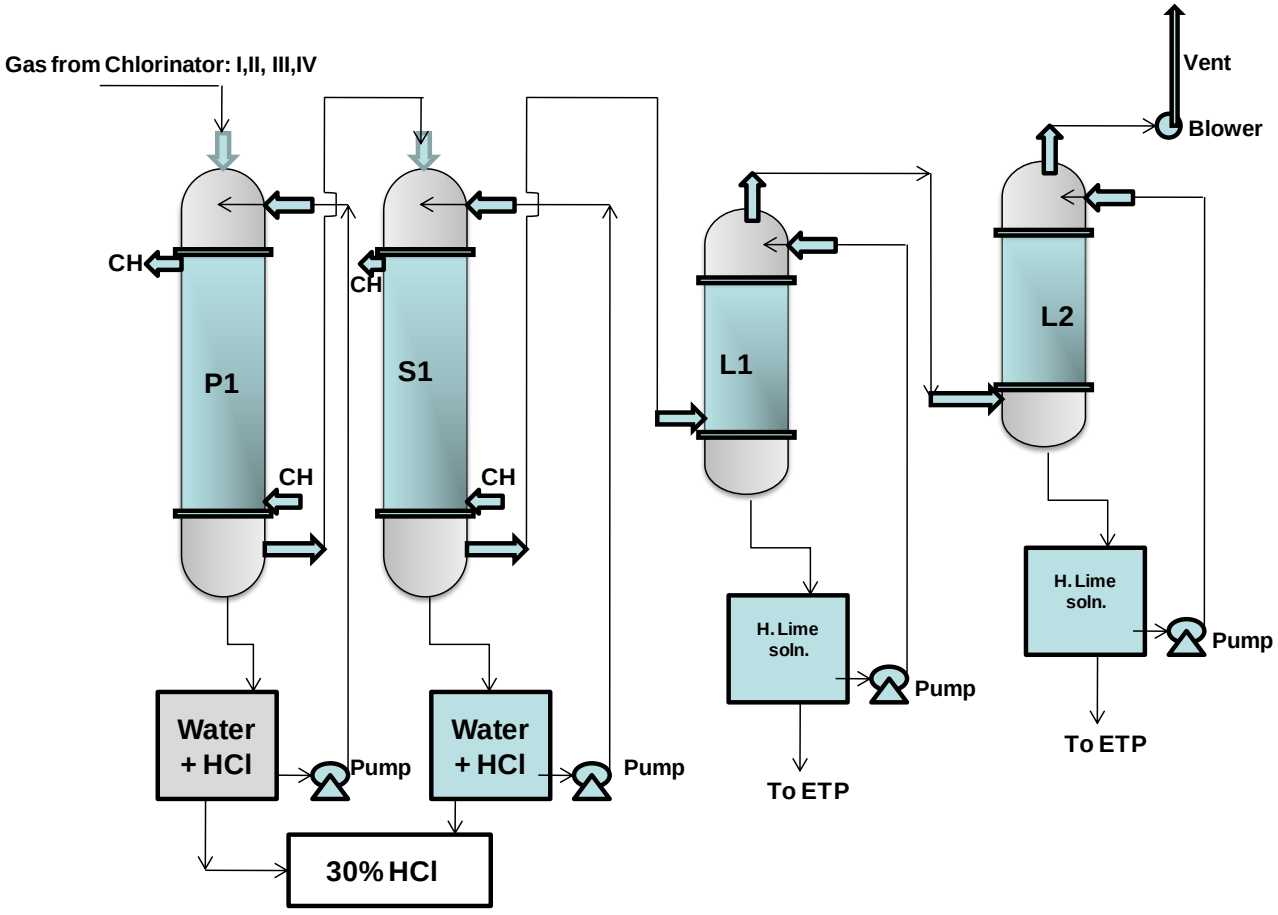
Details of Multi Cyclone Separator & Bag Filter Attached to Coal Fired Boiler

S. No.	PARTICULARS	BOILER
1	Capacity	3000 kgs/hr
2	Fuel Used	Coal
3	Fuel Consumption	500 kgs/hr
4	Calorific Value	4200 kcal/kg
5	Inlet to dust collector	250 ^{o}C
6	Stack Temperature	160 ^{o}C
7	Diameter of chimney	800 mm
8	Flue gas Value	10500 m^3/hr
9	ID Fan	10900 cfm
10	Efficiency	65 %
11	Stack height	30 meters
12	APC	Multi Cyclone Separator
13	Overall dimensions	1.2m x 1.2 m x 2.0 m
14	No. of clones	9
15	Size of clone	125 mm
16	Size of Bag filter	2.475 x 2.3 x 8.61 meters
17	MOC	Mild Steel
18	Size of Gas inlet	0.81 x 0.64 mm
19	Size of gas out let	2.716 x 0.346 mm
20	Total unit weight	7.6 MT
21	Hopper volume	9.72 m^3
22	Designed gas volume	13500 Am^3/hr
23	Maximum designed temp	250 ^{o}C
24	Number of filter bags	108 Nos (500 gms/m^2 filter glass)
25	Size of filter bags	149 mm dia x 3.65 m length
26	No. of cages	120
27	Pressure drop	150 mm
28	Air to cloth ratio	1.03 m^3/min/m^2
29	Flue gas emission	PM: < 150 mg/Nm^3

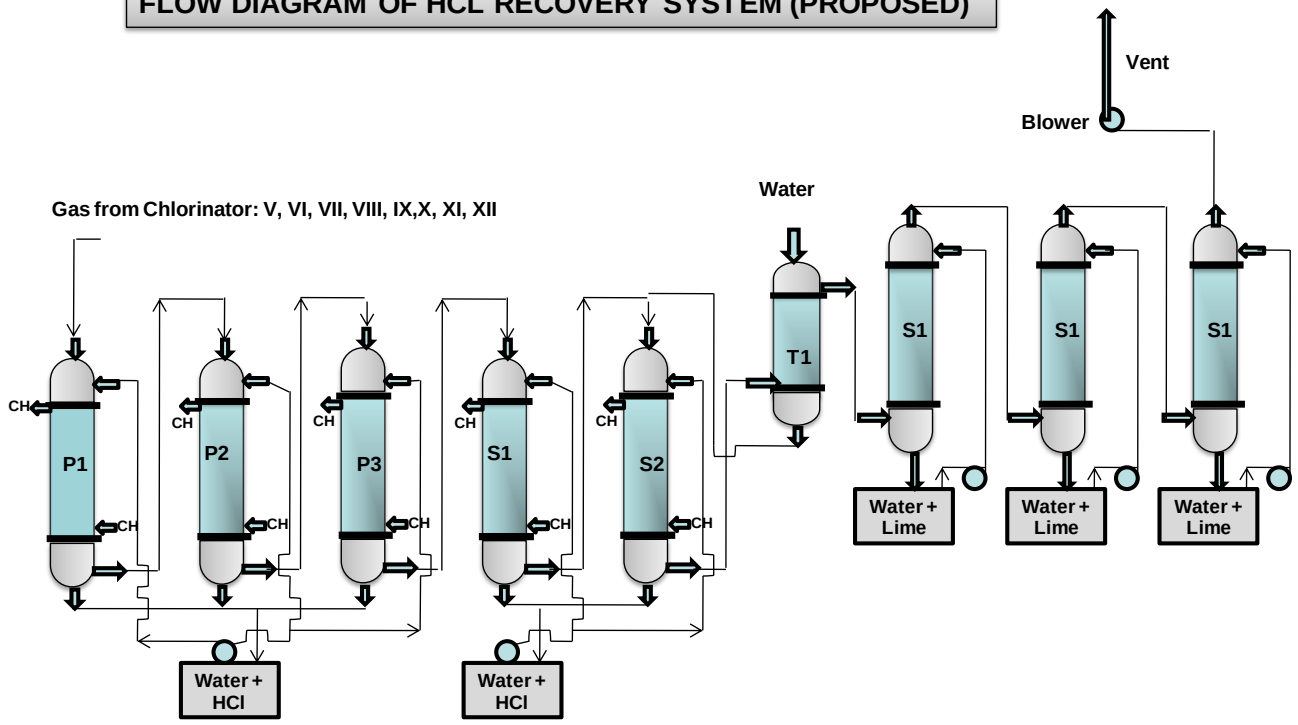
Details of Scrubbing System

S. No.	Particulars	Details
1.0	**Size of primary Absorber**	**2ø x 5 m ht.**
1.1	MOC	MS powder coated body with Graphite tubes
1.2	No. of tubes	85
2.0	**Size of secondary Absorber**	**1 ø x 4 m ht.**
2.1	MOC	Graphite tubes FRP body
2.2	No. of tubes	25
3.0	**Size of Tail scrubber**	**1 ø x 4 m ht.**
3.1	MOC	PP/FRP
3.2	Packing	2” intalax saddles
3.4	Packing height	2 m
4.0	**Size of alkali scrubber**	**1 ø x 4 m ht.**
4.1	MOC	PP/FRP
4.2	Packing	2” intalax saddles
4.3	Packing height	2 m
5.0	**Water circulation tank**	PP/FRP, 5000 lit
6.0	**Blower**	5 HP
7.0	**Height of vent**	**11 meters**

FLOW DIAGRAM OF HCL RECOVERY SYSTEM (EXISTING)



FLOW DIAGRAM OF HCL RECOVERY SYSTEM (PROPOSED)



COPY OF EXISTING CCA

GPCB

GUJARAT POLLUTION CONTROL BOARD
PARYAVARAN BHAVAN
Sector 10-A, Gandhinagar 382010
Phone : (079) 23226295
Fax : (079) 23232156
website : www.gpcb.gov.in

By R.P.A.D.

In exercise of the power conferred under section-25 of the Water (Prevention and Control of Pollution) Act-1974, under section-21 of the Air (Prevention and Control of Pollution)-1981 and Authorization under rule 5(4) of the Hazardous Waste (Management, Handling & Transboundary Movement) Rules-2008, framed under the Environmental (Protection) Act-1986.

And whereas Board has received CC& A application dated **22/05/2013** for the Consolidated Consent and Authorization (CC & A) of this Board under the provisions / rules of the aforesaid Acts. Consents & Authorization are hereby granted as under:

CONSENTS AND AUTHORISATION:
(Under the provisions /rules of the aforesaid environmental acts)

To,
M/s. MAKWELL PLASTISIZERS PVT LTD,
Plot No. 57/D/B, PHASE-I,
GIDC Estate, Vapi- 396 195,
Dist.Valsad.

1. **Consent Order No.: AWH-54784, Date of issue: 7/6/2013.**
2. The consents shall be valid up to **21/05/2018** for use of outlet for the discharge of trade effluent & emission due to operation of industrial plant for manufacture of the following items/products:

Sr.No.	Product	Quantity
1.	Chlorinated Paraffin Wax	250 MT/Month

3 **CONDITIONS UNDER THE WATER ACT:**

3.1 The quantity of trade effluent from the industry shall not exceed **6000 lits/day.**

3.2 The quantity of Sewage effluent from the industry shall not exceed **1000 lits/day.**

3.3 **TRADE EFFLUENT**

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.

3.3.2 In the event, if the effluent from industrial unit not routed through CETP, the applicant shall provide adequate effluent treatment system in order to achieve the quality of the treated effluent as per GPCB norms mentioned in column No.3.

PARAMETERS	CETP INLET NORMS	GPCB NORMS
pH	6.5 TO 8.5	6.5 TO 8.5
Temperature	40° C	40° C
Color (pt.co.scale) in units	*	100 units
Suspended Solids	300 mg/l	100 mg/l
Oil and Grease	10 mg/l	10 mg/l
BOD (5 days at 20°C)	400 mg/l	30 mg/l
COD	1000 mg/l	250 mg/l
Chlorides	600 mg/l	600 mg/l
Sulphates	1000 mg/l	1000 mg/l
Total dissolved Solids	2100 mg/l	2100 mg/l
Toxic Substances	---	90% Survival of fish after 96 hrs in 100% effluent.

Clean Gujarat Green Gujarat

3.3.3 All efforts shall be made to remove color & unpleasant odor as far as practicable.

3.3.3 The final treated effluent confirming to the above standards shall be discharged into GIDC underground drainage system & shall ultimately be conveyed into tidal zone of river Damanganga through CETP.

3.3.4 Domestic effluent shall be disposed off through septic tank/soak pit system or it shall be treated along with industrial effluent or it shall be treated separately to conform to the following standards and shall discharge into GIDC under ground drainage system.

4 CONDITIONS UNDER THE AIR ACT:

4.1 The following shall be used as fuel in boiler.

Sr.No.	Fuel	Quantity
1.	Coal	30 TPM

4.2 The applicant shall install & operate air pollution control system in order to achieve norms prescribed below:

4.3 The flue gas emission through stack shall conform to the following standards:

Stack no.	Stack attached to	Stack height in Meter	Air Pollution Control System	Parameter	Permissible Limit
1.	Boiler (1 TPH)	15	Multi Cyclone Separator followed by Bag Filter	PM SO_2 NO_x	150 mg/NM^3 100 ppm 50 ppm

4.4 The Process emission through various stacks/vent of reactors, 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.	Chlorinator-I	19	Water scrubber followed by Alkali scrubber	HCl	20 mg/NM^3
2.	Chlorinator-II	19		Cl_2	09 mg/NM^3
3.	Chlorinator-III	19			

4.5 The concentration of the following substances in the ambient air within the premises of the industry and at a distance of 10 meters from the source (other than the stack / vent with height of more than 9 meters from the ground level) shall not exceed the following levels:

PARAMETER	PERMISSIBLE LIMIT
Oxides of Sulphar	080 Microgram Per cubic meter
Oxides of Nitrogen	080 Microgram Per cubic meter
RSPM	100 Microgram Per cubic meter

4.6 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.

4.7 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 and70 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.

5 GENERAL CONDITIONS: -

5.1. Any change in personnel, equipment or working conditions as mentioned in the consents form/order should immediately be intimated to this Board.

5.2 Applicant shall also comply with the general conditions given in annexure I.

6. AUTHORISATION FOR THE MANAGEMENT & HANDLING OF HAZARDOUS WASTES Form-2 (5 (4))

6.1 Number of authorization: **AWH-54784 Date of issue: 7/6/2013.**

M/s. MAKWELL PLASTISIZERS PVT LTD is hereby granted an authorization to operate

Sr. No	Waste	Quantity	Schedule-I Process No.	Facility
1	ETP Sludge	3.6 MT/Yr	34.3	Collection, storage, transportation, disposal at TSDF-VWEMCL-Vapi.
2	Used Oil	24 Lit/Yr	5.1	Collection, Storage, Transportation, Disposal by selling to registered reprocessors.
3	Discarded Container/Bags	80 Nos/Yr	33.3	Collection, Storage, Decontamination & reuse or sold to actual users.
4	Sludge from wet scrubber	1.92 MT/Yr	36.1	Collection, storage, transportation, disposal at TSDF-VWEMCL-Vapi.

6.2 The authorization is granted to operate a facility for collection, storage within factory premises transportation and ultimate disposal of Hazardous wastes at TSDF developed by the Vapi Waste & Effluent Management Co. Ltd –Vapi.

6.3 The authorization shall be valid up to **21/05/2018.**

6.4 The authorization is subject to the conditions stated below and such other conditions as may be pecified in the rules from time to time under the Environment (Protection) Act-1986.

6.5 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 persons authorized shall not rent, lend, sell, and transfer of 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 persons 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-7.

6.6 In addition to above terms and conditions Industry shall also comply following directives issued by the Supreme Court of India dated.14.10.2003.

a) Industry shall have to display the relevant information with regard to hazardous waste as indicated in the Court's order in W.P. No.657 of 1995 dated 14th October 2003.

b) Industry shall have to display on-line data outside the main factory gate with regard to quantity and nature of hazardous chemicals being handled in the plant, including wastewater and air emissions and solid hazardous wastes generated within the factory premises.

For and on behalf of
Gujarat Pollution Control Board

(T. B. SHAH)
Environmental Engineer

NO: GPCB/CCA-VSD-95/ID: 23862/152398
dt: 4/7/15

Issued to:
M/s. MAKWELL PLASTISIZERS PVT LTD,
Plot No. 57/D/B, PHASE-I,
GIDC Estate, Vapi- 396 195,
Dist.Vulsad.

COPY OF ENVIRONMENTAL CLEARANCE FOR EXPANSION

12/7/2016

F. No. J-11011/86/2009- IA II (I)
Government of India
Ministry of Environment and Forests
(I.A. Division)

Paryavaran Bhawan
CGO Complex, Lodhi Road
New Delhi – 110 003
E-mail : plahujarai@yahoo.com
Telefax: 011 – 2436 3973
Dated: April 9, 2009

To,
The Director
M/s Makewell Plasticizers Pvt. Limited
Plot no. 57/D/B, 1st phase, Industrial estate
GIDC Vapi 396195
District Valsad, Gujarat

E-mail : hiren@makewellgroup.com

Subject: Expansion of plasticizer manufacturing unit at plot no. 57/D/B, 1st phase, industrial estate, GIDC Vapi in District Valsad in Gujarat by M/s Makwell Plastisizers Pvt. Limited- reg Environmental Clearance

Sir,

This has reference to your letter no. nil dated 9th February, 2009 along with Form-1 and pre-feasibility report on the above mentioned subject seeking environmental clearance under the Environmental Impact Assessment Notification, 2006.

2.0 The Ministry of Environment and Forests has examined your application. It is noted that M/s Makwell Plastisizers Pvt. Limited have proposed for expansion of Chlorinated paraffin wax and sulpho chlorinated paraffin wax manufacturing unit at industrial estate, GIDC Vapi, in District Valsad in Gujarat. The production of chlorinated paraffin wax wil increase from 250 MTPM to 1750 MTPM and sulpho chlorinated paraffin wax will be 500 MTPM. Besides the production capacity of 30 % HCl from chlorinated paraffin wax will icrease to 3169.25 MTPM and production capacity of 30 % HCl from sulfo-chlorinated paraffin wax would be 644 MTPM. The total capacity of 30 % HCl as by-product after expansion would be 3813.25 MTPM. No eco-sensitive areas are located within 10 km radius of the plant. River Damanganga flows at a distance of 3.5 km from the unit. Proposed expansion will be carried within the existing unit having land area of 4728 m2, of which green belt will be developed in 1420.4 m2 of the land area. The Vapi, has been identified as critically polluted area by CPCB. The total cost of the project will be Rs. 432.00 lacs, of which an amount of Rs 45.00 lacs will be utilized for environmental protection measures.

3.0 The water requirement of 111 m3/day will be met from the GIDC water supply. The wastewater generation will be 7 m3/day. The effluent will be treated in ETP for primary, secondary and tertiary treatment and treated effluent will be sent to CETP for further treatment and disposal into Arabian sea.. Power requirement of 170 HP will be met through the DGVCL. Fuel requirement for boilers will be coal (30 TPM) and for 125 KVA DG set will be HSD (8 lt/ hr.)The process emissions in the form of HCl and Cl2 will be controlled by three stage scrubbing system. It is

-2-

http://environmentclearance.nic.in/Auth/openletter.aspx?EC=2179

proposed to install additional reactor in series with chlorinator for recovery of 2-3 % unreacted chlorine. Multi cyclone separator with bag filter and stack height of 15m is proposed for the boiler o control the particulate emissions. Stack height of 11m is proposed for the DG set for dispersion of gaseous emissions.

4.0 Solid waste generation will be in the form of ETP waste (4.6 MT/year) and will be sent to TSDF site, Vapi. Spent Oil (30 kgs/year) will be sold to registered recyclers. Discarded containers (180 nos/month) will be sold to authorized recyclers. Lime sludge from tail (wet) scrubber (13.20 MT/year) will be sent to TSDF site, Vapi .

5.0 The project activity is listed at serial no. 5(f) of schedule of EIA Notification, 2006 and categorized under "A" or "B" category depending upon the location of the plant outside or inside the notified industrial area. In the instant case the plant is located within the notified industrial area, GIDC Vapi and covered under category "B". But the Vapi is an identified critically polluted area; hence, as per general condition of EIA Notification, 2006, the proposal was appraised at center.

6.0 The proposal was considered by the Expert Appraisal Committee (Industry) in its 92nd meeting held on 18th -20th March, 2009. The EAC (I) recommended the proposal for grant of environmental clearance. As the unit is located in the industrial estate, the public hearing/ consultation of the project is not required as per para 7 (i)-III (b) Stage (3) – public consultation of EIA Notification, 2006.

7.0 Based on the information submitted by the project authorities, the Ministry of Environment and Forests hereby accords environmental clearance to above project under the provisions of EIA Notification, dated 14th September 2006 subject to the compliance of the following Specific and General Conditions:

A. SPECIFIC CONDITIONS:

i. The industrial effluent generation shall not exceed 7 m3/d. The effluent shall be treated in the ETP for primary, secondary and tertiary treatment and treated effluent shall conform to the industry specific discharge standards notified under the Environment (Protection) Act, 1986. The domestic effluent shall be disposed through septic tank/soak pit.

ii. GPCB shall not permit any new discharge from new industries or expansion of existing industries in the area that lead to CETP until the said CETP meet the required standards and meet the hydraulic capacity.

iii. Process emissions in the form of HCl and Cl2 shall be scrubbed with water scrubbers followed by alkali scrubber. HCl and chlorine concentration shall be monitored from the vents periodically and data submitted to the Ministry. Cl2 detectors shall be installed. For dispersion of gaseous emissions from the steam from the coal fired boilers shall be controlled by multicyclone separator with bag filter and adequate stack height as per CPCB standards shall be provided. The gaseous emissions from the DG set shall be dispersed through stack of adequate height as per CPCB standards. Acoustic enclosures shall be provided to the DG set to control the noise pollution.

i. The proponent shall upload the status of compliance of the stipulated environmental clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional office of MOEF, the respective Zonal office of CPCB and the State Pollution Control Board. The criteria pollutant levels namely; SPM, RSPM, SO2, NOx (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the project shall be monitored and displayed at a convenient location near the main gate of the company in the public domain.

ii. The Company shall obtain Authorization for collection, storage and disposal of hazardous waste under the Hazardous Waste (Management, Handling and Trans boundary movement) Rules, 2008 for management of hazardous wastes and prior permission from GPCB shall be obtained for disposal of solid / hazardous waste in the TSDF. The concerned company shall undertake measures for fire fighting facilities in case of emergency.

iii. The project authorities shall strictly comply with the rules and guidelines under Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 *as* amended in October, 1994 and January, 2000. All Transportation of Hazardous Chemicals shall be *as per* the MVA, 1989.

iv. The company shall undertake following Waste Minimization measures :-

Metering and control of quantities of active ingredients to minimize waste.
Reuse of by-products from the process as raw materials or as raw material substitutes in other processes.
Use of automated filling to minimize spillage.
Use of "Close Feed" system into batch reactors.
Venting equipment through vapour recovery system.
Use of high pressure hoses for equipment clearing to reduce wastewater generation.

v. Fugitive emissions in the work zone environment, product, raw materials storage area etc. shall be regularly monitored. The emissions shall conform to the limits imposed by GPCB.

vi. During transfer of materials, spillages shall be avoided and garland drains be constructed to avoid mixing of accidental spillages with domestic waste and storm drains.

vii. The adequate financial provisions shall be made in the budget of the project for implementation of the above suggested environmental safeguards. Fund so earmarked shall not be diverted for any other purposes.

-4-

viii. Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.

ix. The company shall make the arrangement for protection of possible fire hazards during manufacturing process in material handling.

x. Training shall be imparted to all employees on safety and health aspects of chemicals handling. Pre-employment and routine periodical medical examinations for all employees shall be undertaken on regular basis. Training to all employees on handling of chemicals shall be imparted.

xi. Usage of PPEs by all employees/ workers shall be ensured.

xii. The company shall undertake rainwater harvesting measures to recharge the ground water as well as reduced consumption of water.

B. GENERAL CONDITIONS:

i. The project authorities shall strictly adhere to the stipulations made by the State Pollution Control Board.

ii. No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment and Forests. In *case* of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.

iii. At no time, the emissions shall exceed the prescribed limits. In the event of failure of any pollution control system adopted by the unit, the unit shall be immediately put out of operation and shall not be restarted until the desired efficiency has been achieved.

iv. The gaseous emissions (NOx, SO2 and SPM) and Particulate matter along with RSPM levels from various process units shall conform to the standards prescribed by the concerned authorities from time to time. At no time, the emission levels shall go beyond the stipulated standards. In the event of failure of pollution control system(s) adopted by the unit, the respective unit shall not be restarted until the control measures are rectified to achieve the desired efficiency. Stack monitoring for SO2, NOx and SPM shall be carried.

12/7/2016

v. The locations of ambient air quality monitoring stations shall be decided in consultation with the State Pollution Control Board (SPCB) and it shall be ensured that at least one stations is installed in the up wind and downwind direction as well as where maximum ground level concentrations *are* anticipated.

-5-

vi. Dedicated scrubbers and stacks of appropriate height as per the Central Pollution Control Board guidelines shall be provided to control the emissions from various vents. The scrubbed water shall be sent to ETP for further treatment.

vii. The overall noise levels in and around the plant *area* shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under Environment (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).

viii. The project proponent shall also comply with all the environmental protection measures and safeguards proposed in the project report submitted to the Ministry. All the recommendations made in respect of environmental management and risk mitigation measures relating to the project shall be implemented.

ix. The company will undertake all relevant measures for improving the Socio-economic conditions of the surrounding area. CSR activities will be undertaken by involving local villages and administration

x. The company shall undertake eco-developmental measures including community welfare measures in the project area for the overall improvement of the environment.

xi. A separate Environmental Management Cell equipped with full fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions.

xii. The project authorities shall earmark adequate funds to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so provided shall not be diverted for any other purpose.

xiii. The implementation of the project vis-a-vis environmental action plans shall be monitored by the concerned Regional Office of the Ministry/SPCB / CPCB. A six monthly compliance status report shall be submitted to monitoring agencies and shall be posted on the website of the Company.

xiv. A copy of the clearance letter shall be sent by the proponent to concerned Panchayat, Zila Parisad/Municipal Corporation, Urban local Body and the local NGO, if any, from who suggestions representations, if any , were received while processing the proposal.

-6-

xv. The project proponent shall also submit six monthly reports on the status of compliance of the stipulated E C conditions including results of monitored data (both in hard copies as well as by e-mail) to the respective Regional Office of MoEF, the respective Zonal Office of CPCB and the State Pollution Control Board.

xvi. The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB/Committee and may also be seen at Website of the Ministry at http://envfor.nic.in. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional Office of the Ministry.

xvii. The project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of start of the project.

8.0 The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.

9.0 The Ministry reserves the right to stipulate additional conditions, if found necessary. The company in a time bound manner will implement these conditions.

10.0 Any appeal against this environmental clearance shall lie with the National Appellate Authority, if preferred, within a period of 30 days as prescribed under section 11 of the National Environment Appellate Authority Act, 1997.

13/7/2016

11 .0 The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, Air (Prevention &. Control of Water Pollution) Act, 1981, the Environment (Protection) Act, 1986 Hazardous Wastes (Management and Handling) Rules, 2003/ 2008 and the Public Liability Insurance Act, 1991 along with their amendments and rules.

(Dr.P.L. Ahujarai)
Director

-7-

Copy to:

1. The Secretary, Forests & Environment Department, Government of Gujarat, Sachivalaya, 8th Floor, Gandhi Nagar-382 010, Gujarat.
2. The Chief Conservator of Forests (Western Zone), Ministry of Environment & Forests, Regional Office, E-5, Arera Colony, Link Road -3, Bhopal -462 016, M.P.
3. The Chairman, Central Pollution Control Board Parivesh Bhavan, CBD-cum-Office Complex, East Arjun Nagar, New Delhi - 110 032.
4. The Chairman, Gujarat State Pollution Control Board, Paryavaran Bhawan, Sector 10 A, Gandhi Nagar-382 043, Gujarat.
5. Monitoring Cell, Ministry of Environment and Forests, Paryavaran Bhavan, *CGO* Complex, New Delhi.
6. Guard File/Monitoring File/Record File.

(Dr.P.L. Ahujarai)
Director