

# PROJECT PRE-FEASIBILITY REPORT

ON

PROPOSED PROJECT FOR THE  
MANUFACTURING OF AGRO CHEMICALS &  
ORGANIC INTERMEDIATES

Category – 5 (b)

of

M/S YASHASHVI RASAYAN PVT.  
LIMITED

Located at:

Plot No. Z/96/E, DAHEJ SEZ II, Dahej Industrial Estate,

Tal: Vagra, Dist: Bharuch, Gujarat

## Project prefeasibility report for obtaining prior Environmental Clearance in terms of provisions of EIA Notification -2006

### 1. Executive Summary :

#### Name & Location:

Name of the Project : M/s. Yashashvi Rasayan Pvt. limited

Location : Plot No.- Z/96/E, SEZ II, Dahej Industrial estate,  
Ta: Vagra, Di: Bharuch, Gujarat.

#### Project

⇒ M/S YRPL intends to set up a plant for the manufacture of Agro Chemicals & Organic intermediates at Plot. No. Z/96/E, SEZ:II, Dahej Industrial estate, Ta: Vagra, Di: Bharuch, Gujarat. The unit has already obtained offer cum plot allotment letter. The unit is falling under large Scale category .

⇒ Proposed Project Cost: **Rs. 215 Crore.**

#### Applicability of EIA notification – 2006

⇒ Category as per the amended EIA notification- 2006: as proposed products (i.e. Agro Chemicals & Organic intermediates) are covered under the Category 5 (b) A. Hence, Environmental Clearance is required.

#### Project Proponent

- The company in India comprising 2 Directors
- Large Scale Unit
- **List of finished products & by- products**

Sr. No.	Product	Capacity, TPM
1	3,6 DI CHLORO METHOXY BENZOIC ACID	500.00
	OR	
2	DI POTASSIUM SALT OF 3,6 DI CHLORO SALICYLIC ACID	701.50
	OR	
3	2,5 DI CHLORO PHENOL	510.92
	OR	
4	2,5 DI CHLORO ANILINE	664.75

Manufacturing process with chemical reaction & mass balance is attached as Annexure-3

**Resource Requirement**

Components	Proposed	Resources availability
Power, KVA	1500	Will be sourced from Torrent Energy Ltd (TEL) / Dakshin Gujarat Vij Co. Ltd.
Fresh Water, kl/Day	400	Will be sourced from GIDC water supply dept.
Coal for boiler (15 TPH x 2 Nos), MT/Hr	8	Will be sourced Local Dealer
FO/LDO for Incinerator, kgs/Hr	300	Will be sourced from Local Dealer
Fuel (HSD) for D.G.Set (1500 KVA) , Kgs/Hr	270	Will be sourced from Local Dealer
Chilling plant, TR	1000	In-house
Cooling Tower, TR	3000	In house

• **Raw material Consumption**

Sr. No.	Raw Materials	Consumption	
		MT/MT	MT/Month
<b>1.0</b>	<b>For 3,6 Di Chloro Methoxy Benzoic acid</b>		
1.1	Toluene (Fresh)	0.126	62.876
1.2	Toluene (Recovered)	4.066	2033.22
1.3	Hydrogen Gas (H2)	0.045	22.70
1.4	2,5 Di chloro Nitrobenzene	1.397	698.74
1.5	Catalyst	0.0001	0.03
1.6	98% Sulphuric Acid	1.655	827.39
1.7	60% Nitric Acid	0.710	354.75
1.8	Sulphur Dioxide	0.414	206.90
1.9	Ortho Di chloro benzene (Fresh)	0.029	14.5
1.10	Ortho Di Chloro Benzene (Recovered)	0.798	399.2
1.11	Caustic Potash [KOH (46%)]	2.009	1004.67
1.12	Xylene (Fresh)	0.194	97.26
1.13	Xylene (Recovered)	6.753	3376.42

1.14	Carbon Dioxide	0.243	121.58
1.15	Sodium Hydroxide [NaOH (50%)]	0.435	217.40
1.16	30% Hydrochloric Acid	0.749	374.49
1.17	Methyl Chloride (CH <sub>3</sub> Cl)	0.630	315.00
1.18	Water	5.553	2766.5
	<b>Total</b>	<b>25.64</b>	<b>12893.63</b>
<b>2.0</b>	<b>For Di Potassium salt of 3,6 Di Chloro Salicylic acid</b>		
2.1	Toluene (Fresh)	0.095	66.814
2.2	Toluene (Recovered)	3.084	2163.417
2.3	Hydrogen gas (H <sub>2</sub> )	0.034	24.15
2.4	2,5 DCNB	1.060	743.46
2.5	Catalyst	0.000049	0.03
2.6	98% H <sub>2</sub> SO <sub>4</sub>	1.255	880.55
2.7	60% HNO <sub>3</sub>	0.538	377.54
2.8	Sulphur Dioxide (SO <sub>2</sub> )	0.314	220.19
2.9	ODCB (fresh)	0.022	15.432
2.10	ODCB (Recovered)	0.606	424.835
2.9	KOH (46%)	1.522	1067.84
2.11	Xylene (Fresh)	0.147	103.376
2.12	Xylene (Recovered)	5.116	3588.724
2.13	Carbon Dioxide (CO <sub>2</sub> )	0.184	129.23
	<b>Total</b>	<b>13.977</b>	<b>9805.59</b>
<b>3.0</b>	<b>For 2,5 Di Chloro Phenol</b>		
3.1	Toluene (Fresh)	0.143	72.831
3.2	Toluene (Recovered)	4.609	2354.851
3.3	Hydrogen gas (H <sub>2</sub> )	0.051	26.29
3.4	2,5 DCNB	1.584	809.23

3.5	Catalyst	0.00007	0.04
3.6	98% H2SO4	1.876	958.57
3.7	60% HNO3	0.804	410.99
3.8	Sulphur Dioxide (SO2)	0.469	239.70
3.9	ODCB (Fresh)	0.033	16.797
3.10	ODCB (Recovered)	0.905	462.486
	<b>Total</b>	<b>10.474</b>	<b>5351.78</b>
<b>4.0</b>	<b>For 2,5 Di Chloro Aniline</b>		
4.1	Toluene (Fresh)	0.117	77.69
4.2	Toluene (Recovered)	3.779	2512.235
4.3	Hydrogen gas (H2)	0.042	28.04
4.4	2,5 DCNB	1.299	863.36
4.5	Catalyst	0.00006	0.04
	<b>Total</b>	<b>5.237</b>	<b>3481.36</b>

**Note:**

**Since, products are on Either/Or basis, Total maximum Raw Materials Consumption will be 13508.16 TPM.**

**Water and Waste Water Management**

- Total water requirement will be 400 m3/day which is met through GIDC water supply.
- Total Industrial wastewater generation will be 257 m3/day. Out of which about 204.79 m3/day of effluent generated from the process will be collected separately, neutralized, filtered, extracted in solvent, distilled & finally taken to MEE. Balance 52.21 m3/day of normal effluent & 163.243 m3/day condensate from MEE & low boiler from distillation (Total 215.043 m3/day) will be treated in proposed primary, secondary & tertiary treatment plant & disposed off into treated Effluent Drainage line of GIDC Dahez for ultimate disposal into Arabian Sea.
- Domestic Waste water (7 m3/day) will be disposed by septic tank & soak pit.

**Air Emission and its Control Measures**

**Flue gas emission:**

- ⇒ There will be flue gas emission from 15 TPH x 2 capacities of coal fired steam boiler in the form of PM, SO<sub>x</sub> & NO<sub>x</sub>. Adequate capacity of electro static precipitator along with 55 meters height of chimney will be provided to both the boilers.
- ⇒ Also the unit will install 1500 KVA capacity of D G set, as standby. It will be used only during power failure. 270 kgs/hr of HSD will be used as a fuel & 11 meters height of chimney will be provided.

**Process gas emission:**

- ⇒ Two stage alkali scrubbers will be provided to scrub Sulphur dioxide & nitrogen oxide gas generated from the process. Two stage water followed by alkali scrubber will be provided to scrub hydrogen chloride gas generated from the process. 11 meters height of vent will be provided.
- ⇒ The unit proposes to install FO/LDO fired incineration system having capacity is 1000 kgs/hr and ventury & wet scrubber along with 30 meters height of chimney to incinerate tarry waste generated from the process & methyl chloride gas generated from the process. (Details of Air pollution control measures are attached as **Annexure-11**).

**Hazardous Wastes and its Management**

No	Type of waste	Category	Qty. MT/month	Treatment	Disposal
1	ETP waste (34.3)	34.3	1014	Dried, packed in bags	Dispose off into TSDF, BEIL, Ankleshwar & Detox, Dahej
2	Used Oil (5.1)	5.1	0.2	Packed in carboys	Incinerated into own Incineration system
3	Discarded containers (33.3)	33.3	1.0	De-contaminated, stored	Sell to authorized recycler
4	Incineration ash (36.2)	36.2	18	Packed in bags	Sell to brick manufacturer
5	Process waste & residue	29.1	352	Packed in drums/bags	Incinerated into own Incineration system
6	Spent carbon from ETP	35.3	0.5	Packed in drums/bags	Incinerated into own Incineration system
7	Used rubber hand gloves/pipes etc	X-08	0.2	Packed in drums/bags	Incinerated into own Incineration system

**2. Introduction of Project / Back Ground Information :**

(i) **Identification of Project and proponent.**

Name of the project Proponent: **Yashashvi Rasayan Pvt. Limited**

**Yashashvi Rasayan Pvt. Limited** is a Large scale proposed unit to be located at Plot. No. Z/96/E, SEZ: II, Dahej industrial estate, Ta: Vagra, di: Bharuch, Gujarat having total plot area 62526 m<sup>2</sup> & total investment for the proposed project will be Rs. 215 Crore. The proposed Agrochemicals products & organic intermediates are especially used as Herbicide as per requirement.

The unit is managed by technocrats Mr. Nilesh Patel having 33 years of experience in manufacturing and marketing of various chemicals worldwide. Team members Mr. Harshad Mavani having 38 years of experience of chemical industries.

The company has prepared lay out & design well equips production plant which will be managed by dedicated, qualified & skilled persons.

The proponent proposes to set up a plant of Agro Chemicals with total capacity of 702 MT per month.

The proposed project site lies on 21<sup>0</sup>40'07.25" N Latitude & 72<sup>0</sup>32'21.78"E Longitude. **Yashashvi Rasayan Pvt. Limited** is to be located at plot. No.Z/96/E, SEZ: II, Dahej industrial estate, Ta: Vagra, di: Bharuch in Gujarat state.

No forests, national park, wild life sanctuary, etc. are envisaged in 15 Km from the nearest boundary of the project site.

Basic facilities of infrastructure like storage area, processing area, internal roads etc. shall be developed on the project site. Transportation of raw material and finished goods will be carried out through proposed internal roads and finally through existing state highway SH-6.

During the construction phase around 100 workers and during the operational phase around 170 workers including contractors will be required. Local skilled and semi-skilled workers will be engaged during construction phase. The positives impact include enhanced direct employment for technical/administrative works and indirect employment opportunities for transporters of raw materials and finished goods.

Since the project will cater to industries in the region by providing a suitable source for import, export and coastal movement of pesticides, it will encourage industrial growth in the region and result in additional revenue for government.

Beside the rail connectivity, and 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 (Ahemdabad – Mumbai) is now six lanes, double tracked, more elevated and Jam free highway, which is developed by M/s L & T Company. This highway has given a further boost to the economic growth of this area.

**Yashashvi Rasayan Pvt. Limited** is established in 2003 and managed by a professional board of directors. It manufactures and markets a wide range of Organic intermediates. Senior personnel are available for providing support to the manufacturing unit in the areas of technology, R&D, manufacturing, quality control and quality assurance. Organic intermediates manufactured at this location are for sale in local & international market. It was co-founded by 2 technocrats.

(ii) **Brief description of nature of the Project :**

**Yashashvi Rasayan Pvt. Limited** Proposes to set up a plant for the manufacturing of Agro chemicals at plot. No. Z/96/E, SEZ: II, Dahej industrial estate, Ta: Vagra, di: Bharuch in Gujarat state.

The proposed project involves the production of “Agro Chemicals & organic intermediates” which are especially used in herbicide manufacture etc. as per requirement. As per the EIA notification- 2006 as amended products are covered under any category 5(f) requires Prior Environmental Clearance.

For the proposed project, the company intends to procure the available latest technology for manufacturing the products.

This project will manufacture various Agro Chemicals products & organic intermediates. A typical plant consists of hydrogenator, distillation, reactors, agitated nutsche filter, fractionating columns, rotary vacuum paddle dryer, Distillation columns, HDPE absorbers for hydro chloric acid, condensers, PTFE and stainless steel pumps, high vacuum steam ejectors and SS water ring vacuum pumps etc.

The industrial sector in the past 5 to 7 years has seen a drastic boom and also the keeping in mind the globalization trend, we have identified the demand for the product and with continuous R & D found that it can be developed in-house and produce commercially for domestic market as well as an eye more on export markets.

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

The proposed project provides a **potential growth** opportunity for the already running business of the company. The company is already engaged in the business of manufacturing of “**Organic intermediates**”. The project would increase the overall export and also increase the foreign revenue.

India produces about 80,000-90,000 MT of pesticides a year. India’s Agro chemicals & pesticide industries are the largest in Asia and the twelfth largest in the world. With over 400 million acres under cultivation and over 60% of the country’s population dependent on agriculture, the country’s economy depends on the agricultural sector to a substantial extent.

India loses nearly 30% of its potential crop to insects, weeds and rodent attacks. The Pesticides/Crop Protection/Agrochemicals industry plays a crucial role in protecting crops from damage by weeds, pests, insects and fungus, both before and after harvest. This

helps to increase crop yields, which is important given the rate at which cultivable land is shrinking.

(iv) **Demand –Supply Gap :**

The production of pesticides started in India in 1952 with the establishment of a plant for the production of BHC near Calcutta, and India is now the second largest manufacturer of pesticides in Asia after China. There has been a steady growth in the production of technical grade pesticides in India, from 5,000 metric tons in 1958 to 102,240 metric tons in 1998. In 1996–97 the demand for pesticides in terms of value was estimated to be around Rs. 22 billion (USD 0.5 billion), which is about 2% of the total world market. The products have very high specific demand as they are especially used as herbicide etc. as per requirement.

(v) **Imports vs. Indigenous production :**

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

(vi) **Export Possibility :**

Proposed products have high export potential. Also there products have very good potential in local market.

(vii) **Domestic / export Markets :**

The company's product is used as raw material to manufacture various herbicide and organic intermediates as per the required applications and having very good market in domestic and also having very good international markets.

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

During the construction phase around 100 workers and during the operational phase around 170 workers including contractors will be required. Local skilled and semi-skilled workers will be engaged during construction phase. The positives impact include enhanced direct employment for technical/administrative works and indirect employment opportunities for transporters of raw materials and finished goods.

**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. (Land allotment letter is attached as **Annexure-9**).

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

As per the proposed project cost the project is covered under Large 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 are of final products mode of transport of raw material and finish product & characteristics of hazardous chemicals are as below:

**DETAILS ON PRODUCT/BY-PRODUCTS TRANSPORTATION**

Sr. No.	Product	Physical State	Dispatch	Means of Transportation
1	3,6 Di Chloro Methoxy Benzoic Acid	Solid	Export	Initially by Road & then by sea
2	Di potassium salt of 3,6 Di Chloro Salicylic acid	Solid	Export	Initially by Road & then by sea
3	2, 5 Di Chloro Phenol	Solid	Export & local	Initially by Road & then by sea
4	2,5 Di Chloro Aniline	Solid	Export & local	Initially by Road & then by sea

**DETAILS ON RAW MATERIAL TRANSPORTATION**

Sr. No.	Substance	Physical State	Source of Supply	Means of Transportation	Distance of supplier from project site (km)
1	Toluene	Liquid	Local	Road	Max. 100
2	Hydrogen Gas (H2)	gas	Local	Road	Max. 60
3	2,5 Di chloro Nitrobenzene	solid	Local	Road	Max. 60

4	Catalyst	solid	Local	Road	400
5	98% Sulphuric Acid	liquid	Local	road	60
6	60% Nitric Acid	liquid	Local	road	60
7	Sulphur Dioxide	gas	Local	road	300
8	Ortho Di chloro benzene	liquid	Local	road	200
9	Caustic Potash [KOH (46%)]	liquid	Local	road	200
10	Xylene	liquid	Import	By sea & road	
11	Carbon Dioxide	gas	Local	road	200
12	Sodium Hydroxide	solid	local	road	100
13	30% Hydrochloric Acid	liquid	local	road	60
14	Methyl Chloride (CH <sub>3</sub> Cl)	gas	local	road	200

**DETAILS ON STORAGE & HANDLING OF HAZARDOUS CHEMICALS**

No	Name of the Raw Materials	Quantity stored, MT		BP. °C	MP <sup>o</sup> C	Place of its Storage	State operating pressure	Possible type of hazards	Control measures provided
		Max	Actual						
1	Toluene	40	35	110	- 95	Explosive tank farm	Atm & ambient	Fire & explosion	Separate approved explosive storage area, proper earthing, lightning arrestor & FFE
2	Hydrogen Gas (H <sub>2</sub> )	1000	750	-252		On mobile rack trucks	50 bar at ambient	Fire and explosion	Gas detector, PRS, FFE
3	2,5 Di chloro Nitrobenzene	280	240	266	54.6	Tank farm	Atm & 70 C	Spillage	Tanks with bund walls & used it in liquid form in closed circuit

4	Catalyst	0.05	0.035	-	-	Ware house	Atm & ambient	flammable	Kept in wet condition
5	98% Sulphuric Acid	220	180	-	10	Tank farm	Atm & ambient	Hazardous	Proper bund area provided & handled in closed circuit
6	60% Nitric Acid	220	180	-	-38	Tank farm	Atm & ambient	Hazardous	Proper bund area provided & handled in closed circuit
7	Sulphur Dioxide	60	50	-10	-75	Approved gas storage godown	8 bar & 75 C	toxic	Separate storage place & is handled in close circuit with emergency kit and appropriate PPE provided
8	Ortho Dichloro benzene	60	55	179	-17	Tank farm	Atm & ambient	Spillage	Tanks with bund walls & used it in liquid form in closed circuit
9	Caustic Potash [KOH (46%)]	160	140			Tank farm	Atm & ambient	Hazardous	Proper bund area provided & handled in closed circuit
10	Xylene	60	55	130	-47	Explosive tank farm	Atm & ambient	Fire & explosion	Separate approved explosive storage area, proper earthing, lightning arrestor & FFE
11	Carbon Dioxide	40	35	-78	-56	Cryogenic storage tanks	40 bar & 75 C	Asphyxiant & cold bite	Separate storage place & is handled in close circuit with emergency kit and appropriate PPE provided
12	Sodium Hydroxide	90	80			Tank farm	Atm & ambient	Hazardous	Proper bund area provided & handled in closed circuit
13	30% Hydrochloric Acid	110	100		-15	Tank farm	Atm & ambient	Hazardous	Proper bund area provided & handled in closed circuit
14	Methyl Chloride (CH <sub>3</sub> Cl)	100	85	-24	-98	Approved gas storage godown	7 bar & 75 C	toxic	Separate storage place & is handled in close circuit with emergency kit and appropriate PPE provided

(vii)

**Resource optimization/ recycling and reuse envisaged in the project , if any , should briefly outlined :**

Resource optimization/recycling and reuse envisaged in the project (Solvent recovery system) in detail are as mentioned below:

- The raw materials will be stored in closed containers and will be handled through closed system to avoid the handling losses.
- The Reactor shall be connected to an efficient condenser system with cooling/chilling water/brine circulation.
- Reactor and solvent handling pumps shall have mechanical seals to prevent leakages. Also provide with breather valve to prevent losses.
- Solvent will be taken from storage tank to reactors through closed pipe line. Storage tank shall be vented through trap receiver & condenser operated on cooling water.
- The condensers shall be provided with sufficient HTA and residence time so as to prevent any loss of solvent.
- Proper earthing shall be provided where ever solvent handling is done.
- Entire plant is flameproof.
- Solvent will be stored as per statutory requirement. Solvent will be kept at a separate specified area with all the safety measures.
- Details of solvent used, recovered & recycled as under;

Product	Production MT/Month	Toluene			ODCB			Xylene		
		Used, MTD	Recovered, MTD	Loss, %	Used, MTD	Recovered, MTD	Loss, %	Used, MTD	Recovered, MTD	Loss, %
3,6 Di Chloro Methoxy Benzoic acid	500	80.665	78.235	3.01	15.922	15.354	3.57	133.676	129.937	2.80
Di potassium salt of 3,6 Di Chloro Salicylic acid	701.5	85.764	83.194	3.00	16.935	16.339	3.52	141.981	138.007	2.80
2, 5 Di Chloro phenol	510.92	93.427	90.617	3.01	18.443	17.799	3.49	0	0	0
2,5 Di Chloro Aniline	664.75	99.611	96.623	3.00	0	0	0	0	0	0

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

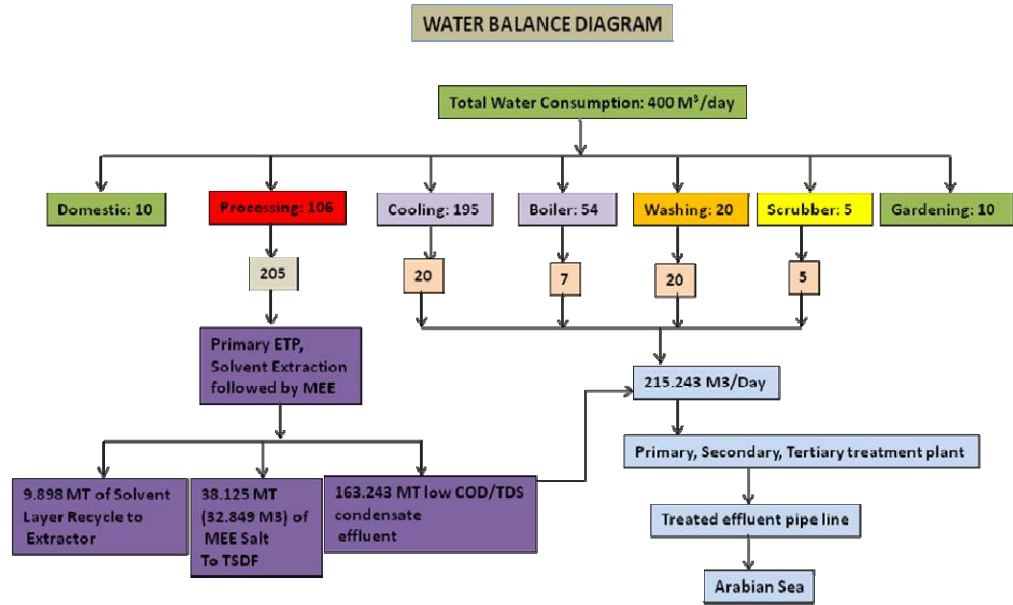
Availability of water its source, Energy/power required and its source is below. Water withdrawal permission is attached as **Annexure-4**.

**WATER CONSUMPTION (M<sup>3</sup>/DAY)**

<b>Sr. No.</b>	<b>Particulars</b>	<b>WATER CONSUMPTION, M3/DAY</b>
1.0	Domestic	10.0
2.0	Processing	106.0
3.0	Washing	20.0
4.0	Cooling Tower	195.0
5.0	Boiler	54.0
6.0	Scrubber	5.0
7.0	Gardening	10.0
8.0	<b>Total</b>	<b>400.0</b>
9.0	<b>Total Industrial</b>	<b>380.0</b>

**Note:**

- **Water consumption & effluent generation worked out on maximum water consumption & effluent generated product i.e. 3,6 Di Chloro Methoxy Benzoic acid.**



All figures are in M<sup>3</sup>/Day

**ENERGY REQUIREMENT AND ITS SOURCE**

Sr. No.	Particulars	Proposed	Source
1	Steam requirement	22000 kgs./hrs.	Proposed 15TPH x 2 capacity of coal fired steam boiler

**POWER REQUIREMENT AND ITS SOURCE**

Sr. No.	Particulars	After proposed expansion	Source
1	Power –Electricity requirement	1500 KVA	Will be 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 **Anneuxure-7**.

(x) Schematic representations of the feasibility drawing which give information of EIA purpose: A schematic representations of the feasibility drawing is attached as **Anneuxure-10**.

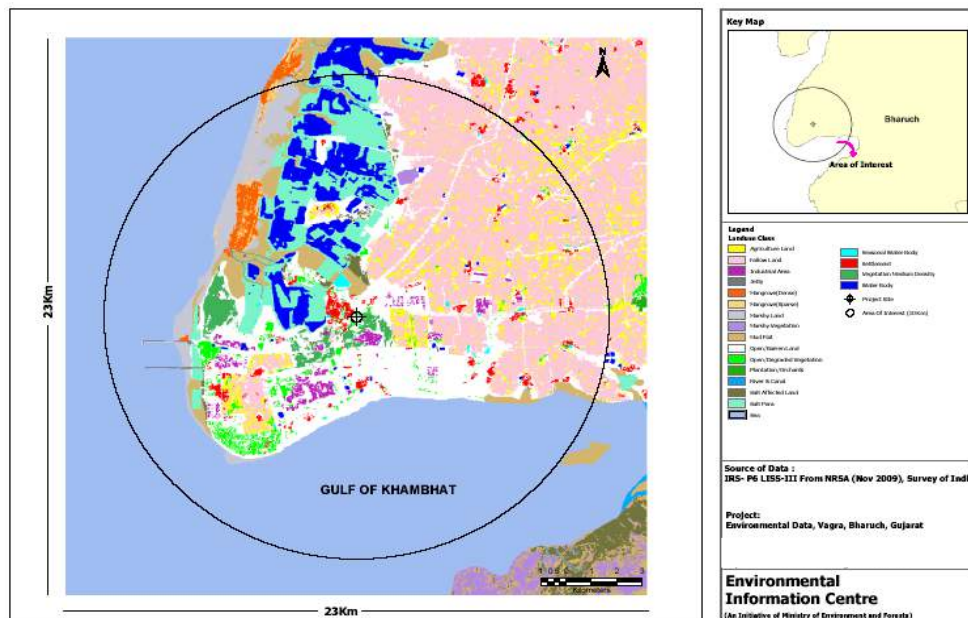
**4. Site Analysis**

**(i) Connectivity :**

The project is located in Plot. No. Z/96/E, SEZ: II, Dahej industrial estate, Ta: Vagra, di: Bharuch, Gujarat which is very well connected to National Highway no.8, Western Railways. And the nearest air port (Surat) and port are 50 KM away from the project site by road.

**(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 study area is below;

The catchment area of the proposed project site altitude is 35 m (a.m.s.l) consists of the near site is flat topped, highly dissected plateaus and dyke ridges running in a west to east direction. The Main River (Narmada) in the catchment area flows in incised meanders forming steep geomorphologically 'V' shaped valleys with steep sides. The entire catchment has a rectangular and trellis pattern of drainage depicting the influence of the structures on the drainage development. The piedmonts at the base of the steep plateaus and dyke ridges are covered with thin soils, which support agriculture in very few areas. The river valley, wherever flat, has good quality soil and is mostly cultivated based on the availability of water. The river valley fills with thick alluvium provides the only area for

cultivation.

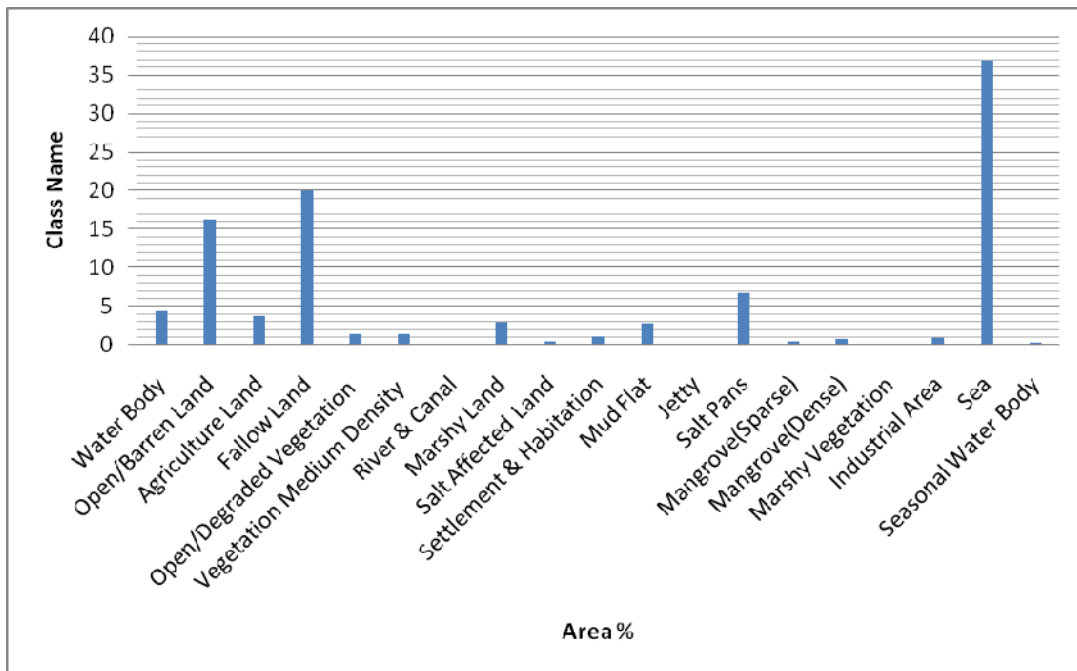
The command area of the proposed project is surrounded by moderately dissected plateaus and piedmont slopes. The slope of the land along the piedmont and the nature of flow of the streams. The Narmada River with tributaries in the piedmont slope area show parallel pattern, which are partly controlled by the lineaments. Along the river valley the flood plain consists of good quality soil, suitable for cultivation. The largest portion of the command area is the alluvial plain, which has been formed by the river Man. The alluvial plain is studded with number of residual hills with degraded forests. The river man in the command area also flows in straight channels, which shows that the river is structurally controlled. Topography map showing the elevation of the study area below. The topographical map is enclosed as Annexure-8.

- (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 proposed project to be located at SEZ:II, Dahej, Ta: Vagra, Di: Bharuch. Copy of plot allotment letter is enclosed herewith as **Annexure-9. The existing land use pattern are as under;**

Area Statistics of Land use / Land cover Map				
Sr. No.	Class Names	Area (In Hectares)	Area (In Sq.Km.)	Area %
1	Water Body	1363.73	13.64	4.34
2	Open/Barren Land	5076.01	50.76	16.17
3	Agriculture Land	1159.56	11.60	3.69
4	Fallow Land	6291.40	62.91	20.04
5	Open/Degraded Vegetation	412.59	4.13	1.31
6	Vegetation Medium Density	397.40	3.97	1.27
7	River & Canal	23.25	0.23	0.07
8	Marshy Land	919.33	9.19	2.93
9	Salt Affected Land	128.45	1.28	0.41
10	Settlement & Habitation	324.50	3.25	1.03
11	Mud Flat	863.17	8.63	2.75
12	Jetty	32.91	0.33	0.10

13	Salt Pans	2083.03	20.83	6.63
14	Mangrove(Sparse)	117.30	1.17	0.37
15	Mangrove(Dense)	223.00	2.23	0.71
16	Marshy Vegetation	46.55	0.47	0.15
17	Industrial Area	290.32	2.90	0.92
18	Sea	11589.46	115.89	36.91
19	Seasonal Water Body	59.04	0.59	0.19
	<b>Total</b>	<b>31400.99</b>	<b>314.01</b>	<b>100.00</b>



(v) **Existing Infrastructure :**

The proposed project to be located in SEZ: II, Dahez notified industrial area of Dahej has the entire available infrastructure like water, electricity, roads, rail, transportation, availability of raw material and drainage system.

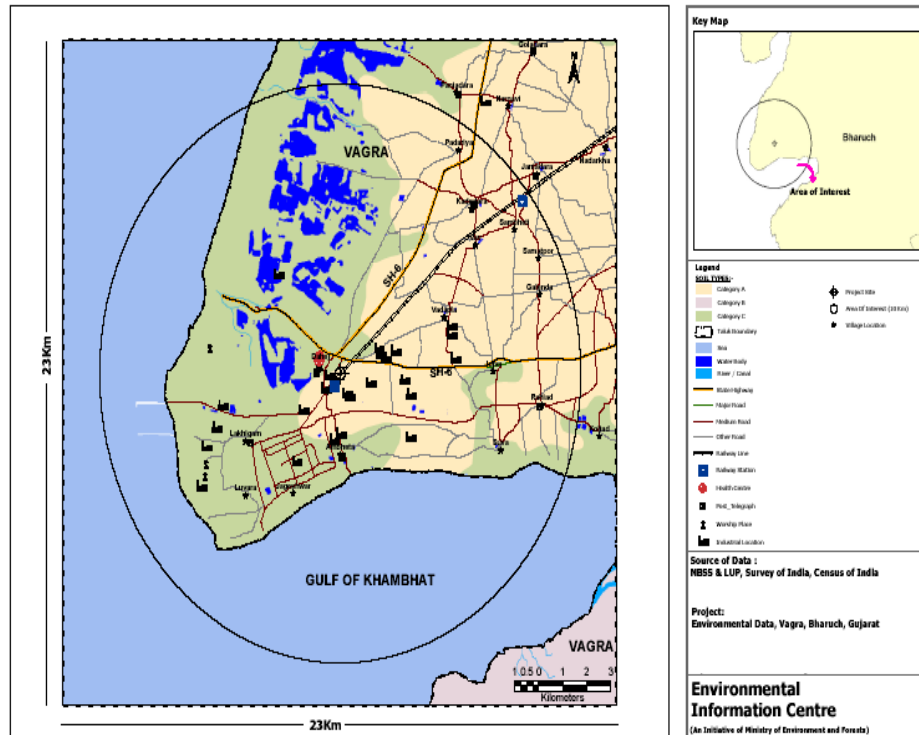
(vi) **Soil classification :**

**Soil Characteristics under Project Area are as below Table;**

CATEGORY	AREA_SQ KM	DESCRIPTION	TAXONO MY1	TAXONO MY2	CLASS	SUB_CLASS
A	88.93	Very deep, moderately well drained, calcareous, fine soils on very gently sloping alluvial plain with slight erosion and moderate salinity; associated with very deep moderately well drained, calcareous, fine soils with moderate erosion.	Fine, montmorillonitic (calcareous), hyperthermic Typic Chromusterts	Fine, montmorillonitic (calcareous) hyperthermic Udic Chromusterts	Soils of west coast (soils of Gujarat plain)	Soils of alluvial plains
C	108.64	Very deep, poorly drained, calcareous fine-loamy soils on very gently sloping coastal plain with moderate erosion and strong salinity; associated with very	Fine-loamy, mixed (calcareous), hyperthermic Aeric Haplaquepts	Fine, mixed (calcareous), hyperthermic Typic Haplaquepts	Soils of west coast (soils of Gujarat plain)	Soils of coastal plains

		deep , imperfectly drained, calcareous, fine soils with severe erosion and strong salinity.				
-	116.43	Sea	-	-	-	-

(Courtesy: Environmental Information Centre, New Delhi)



(vii) **Climate data from secondary sources :**

Climatic data from secondary sources will be incorporated in EIA Study.

(viii) **Social Infrastructure available :**

A) Natural Resource Management – The main focus of this program will be to maximize the yield returns of the farmers through efficient management of existing resources & extension of new agricultural practices.

1) Integrated Agricultural Growth Project – For improvement and use of the modern techniques and thereby would certainly contribute to prosperity in the agriculture sector and reduce the rural poverty by programs like Farmers Training, Nursery Growing Trainings, Modern agriculture equipment distribution programs etc.

2) Animal Husbandry Projects – Various programs like health checkups & treatment, vaccination program, Anti sterility camps, breed improvement etc. will be carried out.

B) Income Generation Program -

- 1) Establishment of Self help groups.
- 2) Rural Entrepreneurship Development Program
- 3) Handcrafts Development Program
- 4) Vocational Training
- 5) Business process outsourcing

C) Health, Education & Infrastructure

- 1) Aids Awareness Program
- 2) General Health Camps
- 3) Innovative Teaching Methods
- 4) Adult Education
- 5) Sanitation
- 6) Infrastructure Development Projects

5. **Planning Brief :**

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

Type of Industry: Proposed Agro Chemical & Organic Intermediates Unit

There is a cluster of numerous large-scale & medium-scale industries, engaged in manufacture of variety of products, for example pharmaceuticals, dyes and chemicals, speciality chemicals, pesticides and others in the Gujarat Industrial Development Corporation (GIDC) of Dahej.

(ii) **Population Projection :**

Name	Population (Persons)	Population Density (Person / sq. km.)	Sex ratio (No. of females per 1000 males)
Within 5 km Radius (1991)	13674	174	797
Within 10 km Radius (1991)	21790	69	855
Taluka Vagra (1991)	68874	80	927
Taluka Vagra (2001)	82569	94	916
District Bharuch (1991)	1546145	171	931
District Bharuch (2001)	1370104	210	920

(iii) **Land use Planning (breakup along with green belt etc) :**

The proposed project to be located within the SEZ:II, GIDC Dahej 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 layout plan, the company proposes **19996 sq. meter (31.9%) green belt** of the total land, i.e. **62526 sq. meters**. 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.



## Area Table

Sr. No	Particulars	Area in m <sup>2</sup>
1	Total plot area	62526
2	Production plant	3220
3	Boiler & coal storage	1000
4	Other utilities	1125
5	Solid Raw material storage	1040
6	Finished product storage	1040
7	Gas storage	2431
8	Solvent tank farm	1075
9	Liquid Raw material storage	760
10	ETP/MEE/Incineration & Solid waste storage	<b>1140</b>
11	Plantation	<b>19996</b>
12	Weigh bridge, Parking & Security area	<b>5991</b>
13	Office & Admn	<b>500</b>
14	Laboratory	<b>500</b>
15	Internal road	<b>17568</b>
16	Open space	<b>4128</b>
17	Scrap Yard	<b>1012</b>
	<b>Total</b>	<b>62526</b>

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

- Employment would be as per prevailing norms of state government for skilled and unskilled people for the proposed project activity.
- Social Welfare
- Cordial relation with the industry shall be established and representation shall be made to villagers for help for creation of facilities related to health, education, etc.

(v) Amenities/ Facilities :

Details of amenities available in study area are as under;

Taluka	Village	Educational	Medical	Drinking Water	Post & Telegraph	Communication	Approach to Village	Nearest Town	Power Supply
Vagra	Galenda	P(2),Ac, O	RP,CH W	T,W, TK	PO	BS	PR,KR	Bharuch	EA
	Samatpor	P(2),Ac	RP,CH W	W,T K	-(-5 Kms)	BS	PR,KR	Bharuch	EA
	Vav	P(2),Ac	RP,CH W	T,W, TK,H P	-(-5 Kms)	BS,RS	PR,KR	Bharuch	EA
	Jolva	P(2),Ac, O	PHS,FP C,RP,C HW	W,T K	-(-5 Kms)	BS,NW	PR,KR	Bharuch	EA
	Vadadla	P(2),Ac	CHW	W,T K	PO	BS	PR,KR	Bharuch	EA
	Dahej	P(4),H,A c(4),O	PHC,D, FPC,RP,  CHW	T,W, TK	PTO,  Phone	BS,RS,N W	PR,KR	Bharuch	EA
	Lakhigam	P(2)	PHS,RP ,CHW	W,T K	po	BS,NW	PR,KR	Bharuch	EA
	Luvara	P(2),Ac	RP,CH W	W,T K	-(-5 Kms)	BS,NW	PR,KR,NR	Bharuch	EA
	Jageswar	P(2),Ac, H	RP,CH W	W,T K	PO	BS,NW	PR,KR,NR	Bharuch	EA
	Ambheta	P(2),Ac	CHW	T,W, TK	PO	BS,NW	KR,NR	Bharuch	EA
	Suva	P(2),Ac	-(-5-10 Kms)	W,T K,R	-(-5 Kms)	BS,NW	PR,KR,NR	Bharuch	EA
	Rahiad	P(2),Ac(2 ,O	RP,CH W	W,T K	PO	BS,NW	PR,KR,NR	Bharuch	EA
	Harinagar			Un inhabite d					
	Padariya	P(2),Ac	RP,CH W	W,T K	PO	BS	PR,KR	Amod	EA
Kadodara	P(2),Ac(2 ,H	PHS,FP C, RP,CH W	W,T K	PO	BS	PR,KR	Bharuch	EA	
Sambhet	P(2),Ac	- (10+Km	W,T	PO	BS,RS	PR,KR	Bharuch	EA	

	i		s)	K					
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**ABBREVIATIONS**

**1. Education**

P-Primary Elementary School

H-Matriculation or Secondary

O-Other Educational Institution

PUC-Higher Secondary/Intermediate/pre-University/junior Collage

AC – Adult literacy class

TR – Training center

**2. Medical Facilities**

RP-Registered Private Practitioner

PHS-Primary Health Centre

FPC-Family Planning Centre

D- Dispensary

CHW - Community Health Worker/Health Worker

H - Hospital

NH - Nursing Home

MH - Maternity Home

PHC - Public Health Centre

CWC - Child Welfare Centre

TB - T.B Clinic

O - Others

**3. Drinking Water**

T-Tap Water

HP-Hand Pump

TK-Tank Water

W-Well Water

R-River Water

C-Canal

N - Nallah

S - Spring

**4. Post & Telegraph**

PO-Post Office

PTO-Post & Telegraph

Phone-Telephone Communication

**5. Transportation**

RS- Railway Station

BS-Bus Station

NW-Navigable Waterway

**6. Approach to Village**

PR-Pucca Road

KR-Kuccha Road

**7. Power Supply**

EA-Electricity for all purposes

EAG - Electricity for Agriculture

ED - Electricity for domestic

EO - Electricity for other purpose like Industrial, Commercial etc.

**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 proposed project

(iii) **Green Belt :**

Green belt will be provided and maintained at the tune of 31.9 % of the total land area.

(iv) **Social Infrastructure :**

- Water Supply by GIDC
- Power supply by TEL/DGVCL

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

The project site is very well connected by road through National Highway no. 8, railways.

Major factors involved in the selection of site are listed below:

- Site is very well connected by road
- Proximity to Raw Material suppliers
- Availability of sufficient land free from cultivation and will have single crop pattern

- Availability of power facilities
- Availability of water for industrial use

(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 :**

- Industrial liquid effluent generation during the manufacturing of proposed products will be treated and discharge into treated effluent drainage line laid down by GIDC for ultimate disposal into Arabian sea.
- Generated domestic liquid waste is being disposed off through soak pit system to drainage.

(ix) **Solid Waste Management :**

No	Type of waste	Category	Qty. MT/ month	Treatment	Disposal
1	ETP waste (34.3)	34.3	1014	Dried, packed in bags	Dispose off into TSDF, BEIL, Ankleshwar & Detox, Dahej
2	Used Oil (5.1)	5.1	0.2	Packed in carboys	Incinerated into own Incineration system
3	Discarded containers (33.3)	33.3	1.0	De-contaminated, stored	Sell to authorized recycler
4	Incineration ash (36.2)	36.2	18	Packed in bags	Sell to brick manufacturer
5	Process waste & residue	29.1	352	Packed in drums/bags	Incinerated into own Incineration system
6	Spent carbon from ETP	35.3	0.5	Packed in drums/bags	Incinerated into own Incineration system
7	Used rubber hand gloves/pipes etc	X-08	0.2	Packed in drums/bags	Incinerated into own Incineration system

(x) **Power Requirement & Supply / Source :**

Power requirement for proposed project will be taken from TEL/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 laborers (a brief outline to be given):**

There is no habitation on the proposed project activity area and it is barren land, so R & R policy is not applicable to this project.

There shall not be displacement of any population in project area. Any major activity that may lead to resettlement of the people is considered as permanent impact. Hence, there is no permanent impact on this account. The increasing industrial activity will boost the commercial and economical status of the locality up to some extent.

**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 construction and commissioning of the proposed 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;

Plant & Machinery, Pipeline & Fittings, Electrical Installation, Safety systems, etc. are the major heads considered in the Capital Cost Projection for the proposed project. Environment Protection has also been considered in planning the Cost Projection, which will include Green belt development, safety systems, etc.

**CAPITAL COST PROJECTION**

Sr. No.	Particulars	Cost in Rs.(Lacs)
1.0	Land 62526 Sq. meters	1000.00
2.0	Building	3569.00
<b>3.0</b>	<b>Plant &amp; Machinery</b>	
3.1	Equipment & machineries	6300.00
3.2	Pipes & fittings	6010.00
3.3	Utilities	2708.00
4.0	Environmental Management System	1913.00
<b>5.0</b>	<b>Total Project Cost</b>	<b>21500.00</b>
6.0	Utilities	
6.1	Boiler, kgs/hr	30000
6.2	Cooling Tower, TR	3000
6.3	D.G. Set (Standby), KVA	1500
7.0	Power from TEL/DGVCL, KVA	1500
8.0	Fuel	
8.1	Coal, kgs/hr	8000
8.2	HSD, kgs/hr	270
8.3	LDO/FO for incinerator, kgs/hr	300
9.0	Water from GIDC KL/day	400
10.0	Waste Water Generation(Industrial) KL/day	257
11.0	Waste Water Disposal(Industrial) KL/day	215

**PROJECT VIABILITY**

Sr. No.	PARTICULARS	AMOUNT IN Cr./Year
1	Proposed Sale	400
2	Raw Material Cost	223.6
3	Power & Fuel	53.0
4	Labor Cost	33.5
5	Environmental Management System	22.9
6	Maintenance Cost	6.0
7	Selling, packing & Office Expenses	26.0
8	Proposed Profit	35.0

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

#### Recurring Cost per annum

Sr. No.	Component	Proposed (Rs. In Lacs/annum)
1.	Environment & Safety Management System	1450
2.	Greenbelt Maintenance	240
3.	Solid waste Disposal	600
	<b>Total</b>	<b>2290</b>

#### 9. Analysis of Proposal ( Final Recommendations):

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

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

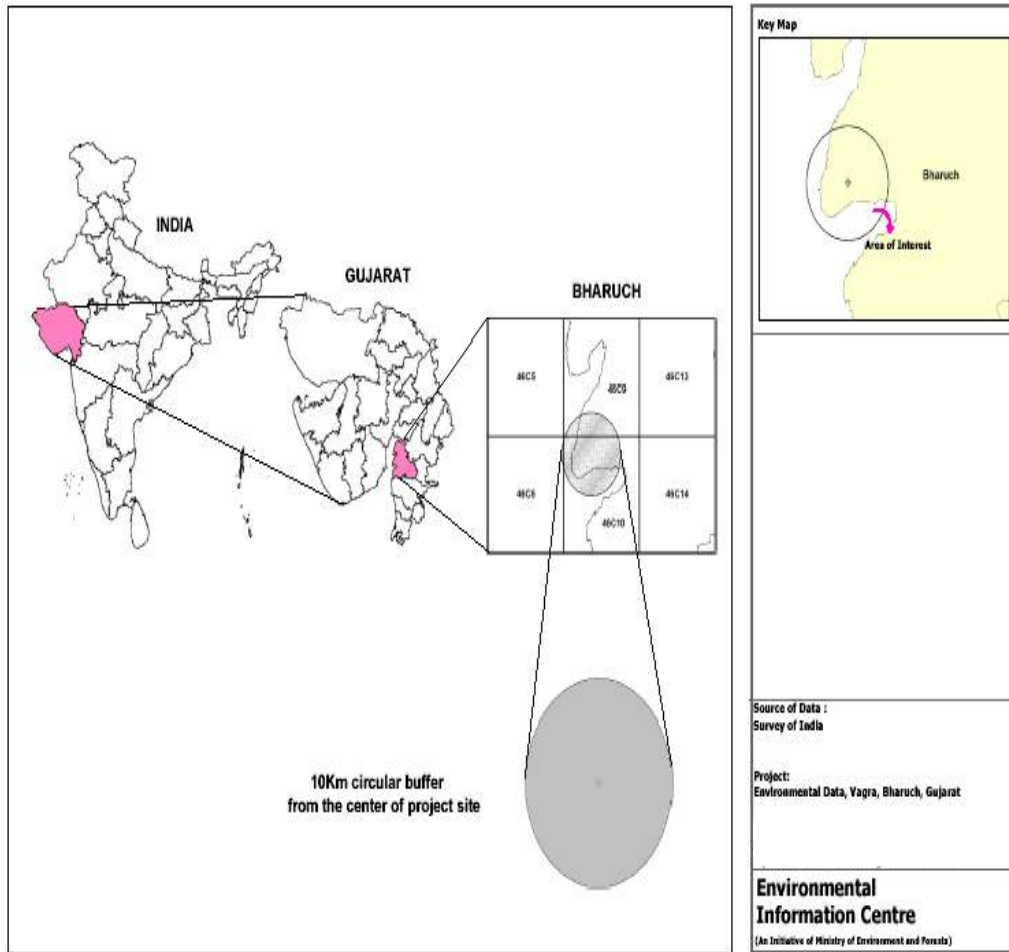
- Local people will get direct financial benefit by way of employment.
- Local people will get some contracts of supply and services to get indirect income.
- Company will contribute in improving education and health facilities in nearby area.

# ANNEXURES

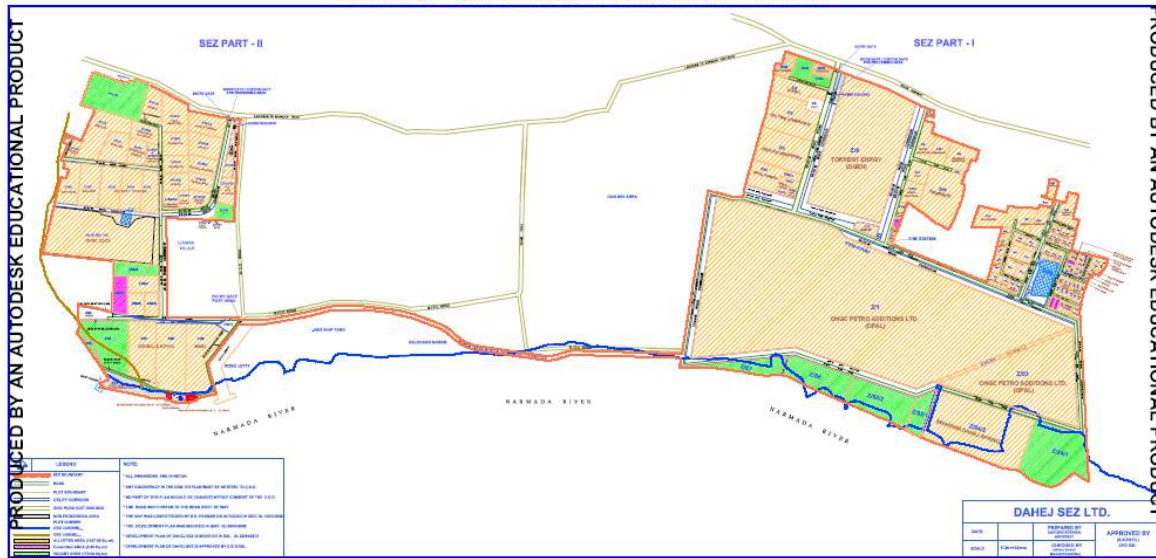
**ANNEXURE-1**

The map showing general location, specific location and project boundary and project site layout of M/s. **Yashashvi Rasayan Pvt. Limited**, located at Plot. No. Z/96/E, SEZ: II, Dahej industrial estate, Ta: Vagra, di: Bharuch, Gujarat. The location of the project site can be viewed in Figure 1.1

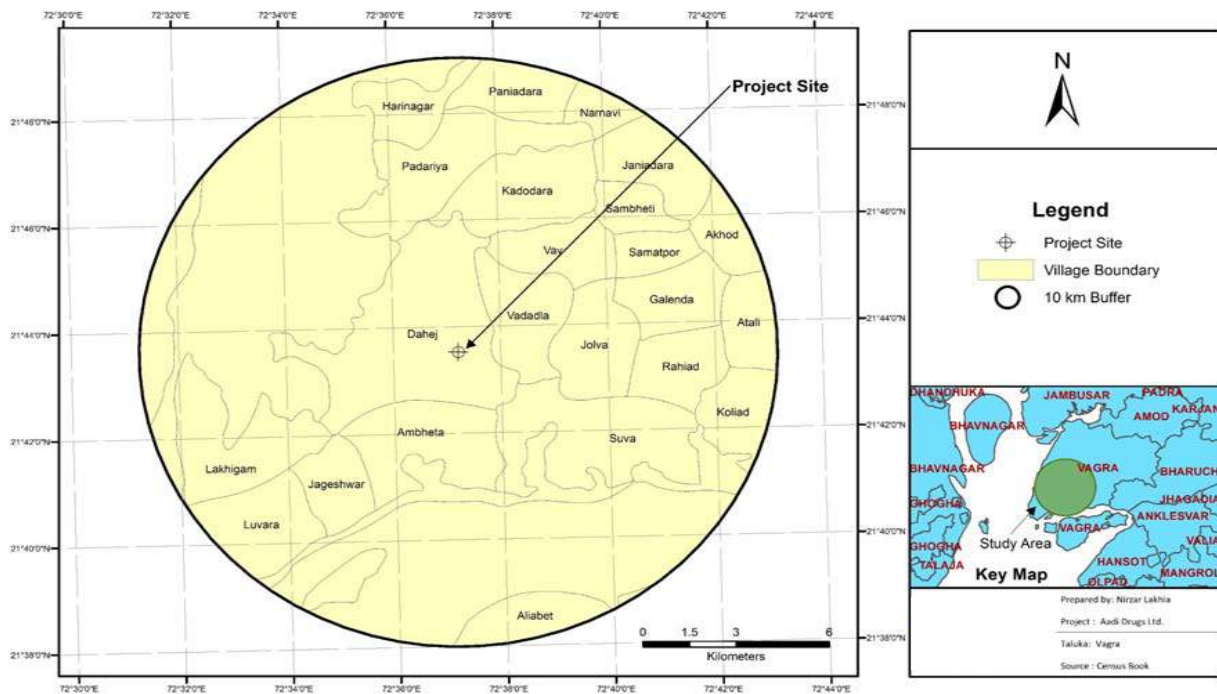
**Fig. 1.1: Location map showing the Project site**



DAHEJ SEZ DEVELOPMENT PLAN



VILLAGE MAP OF STUDY AREA





## Area Table

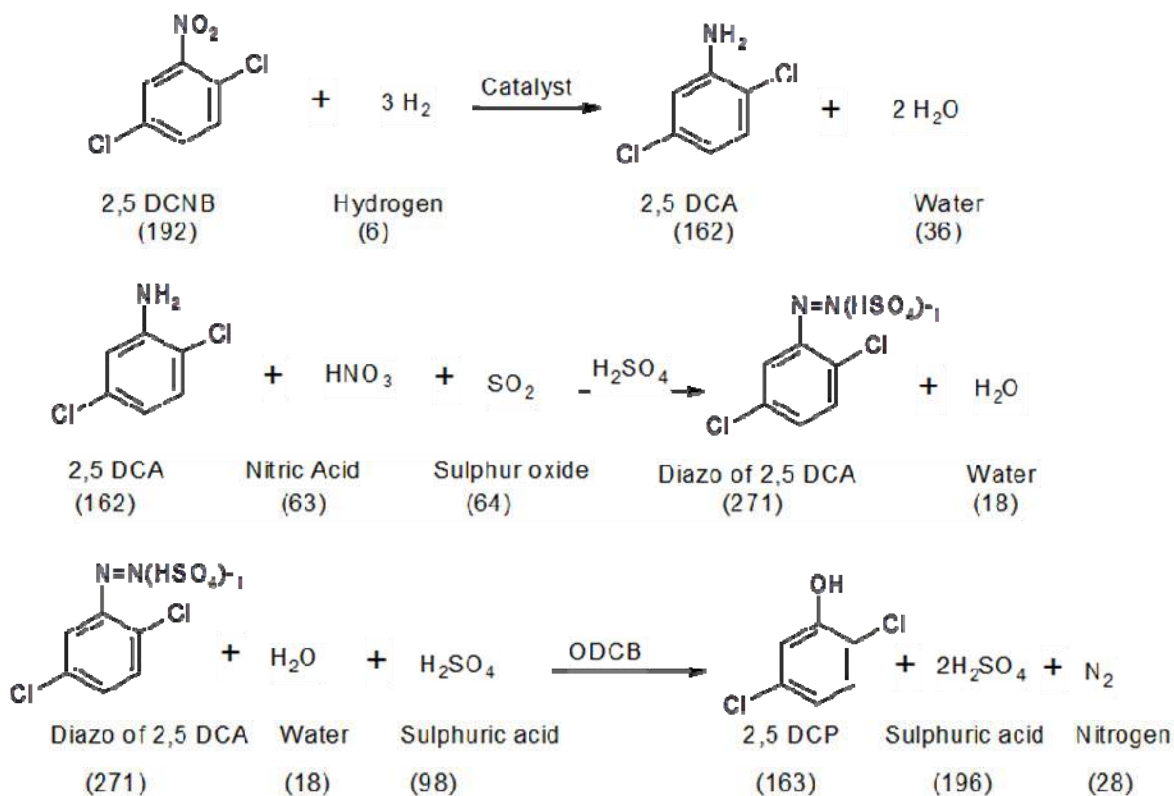
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	<b>Total</b>	<b>62526</b>

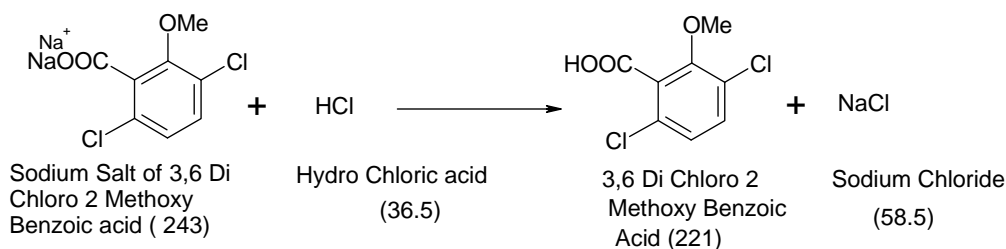
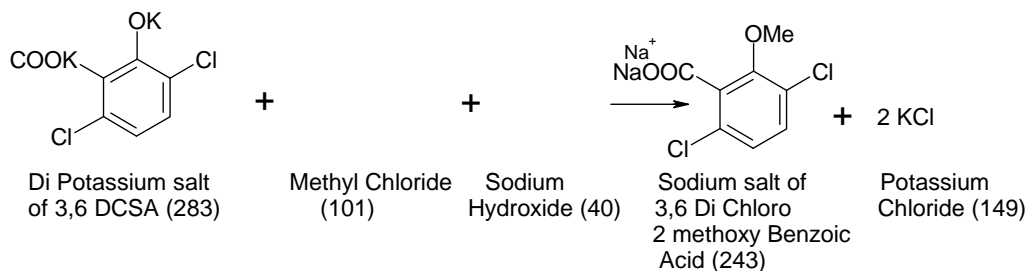
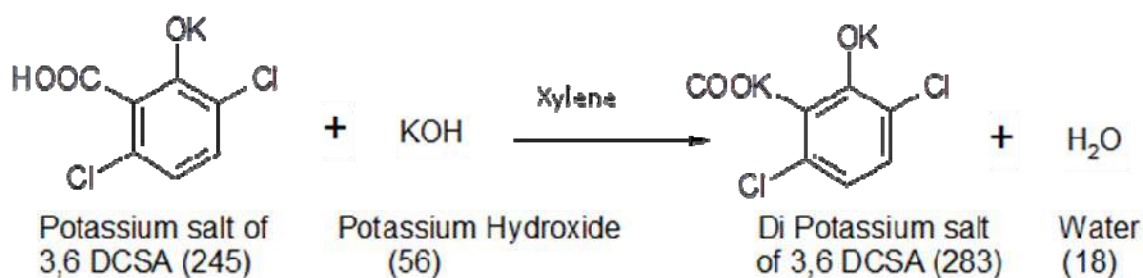
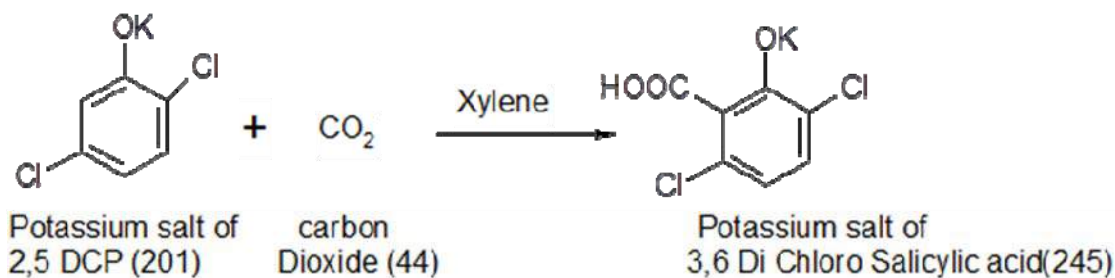
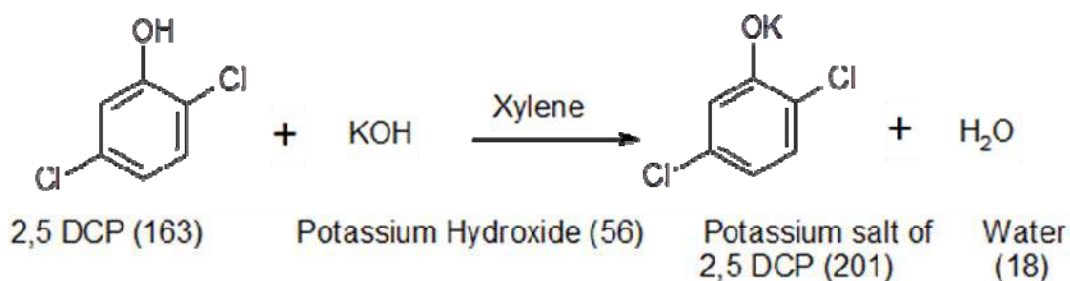
ANNEXURE-3

Detailed project description with process details - MANUFACTURING PROCESS

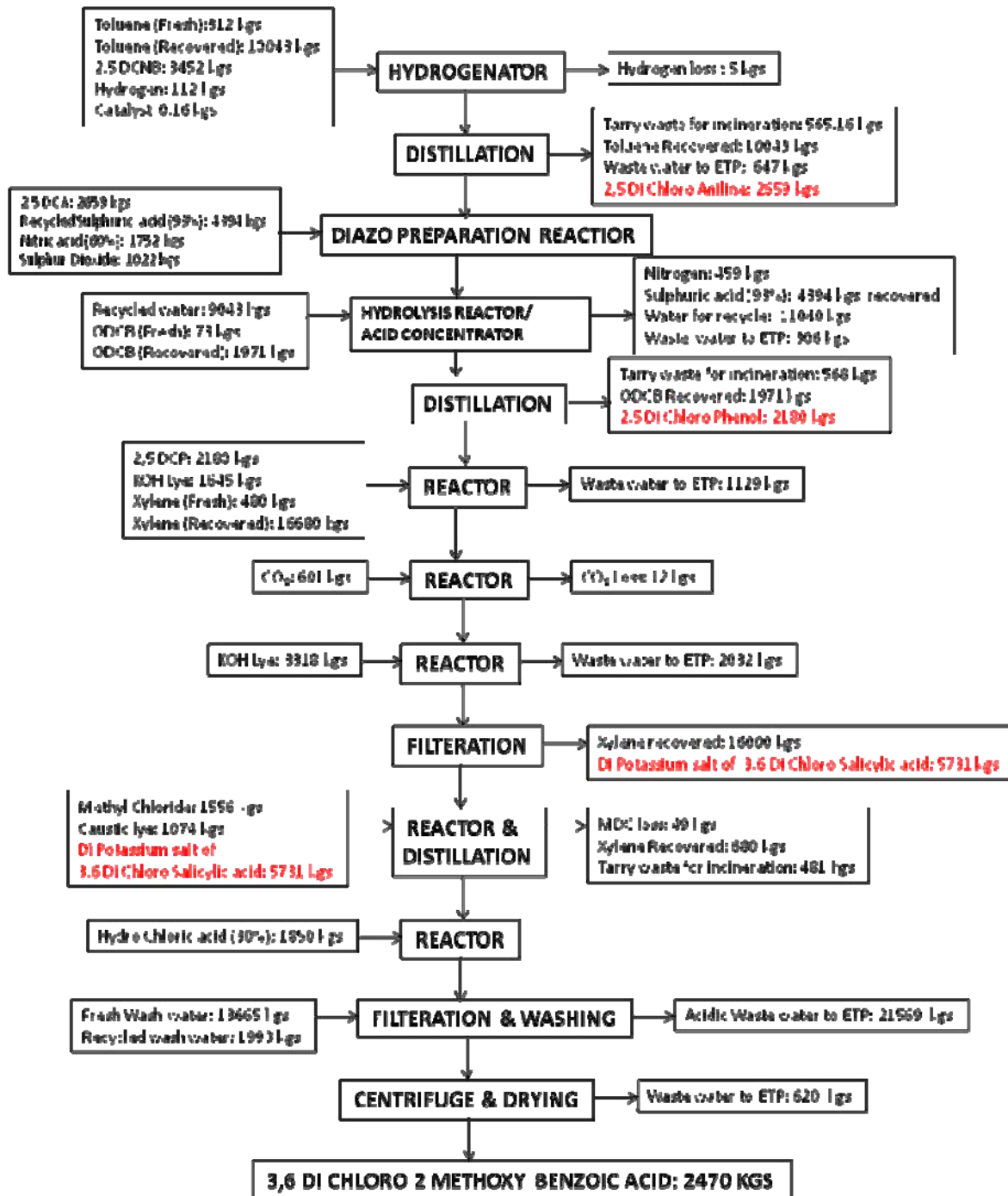
The company is using the latest available process technology for the production. This chapter includes the manufacturing process of the product, chemical reactions, and material mass balance for the product.

CHEMICAL REACTION FOR 3,6 DI CHLORO METHOXY BENZOIC ACID

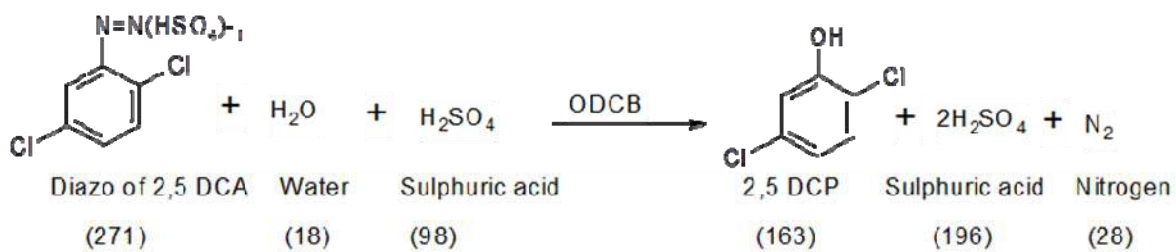
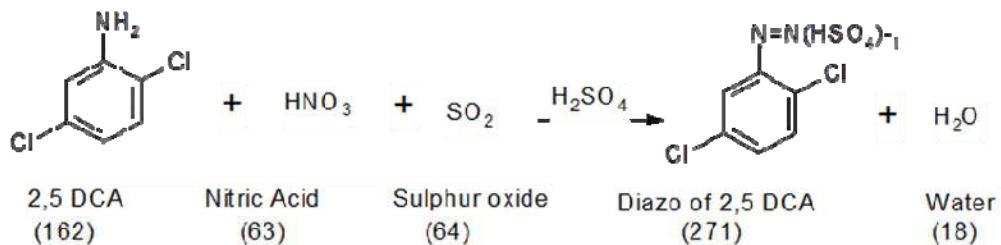
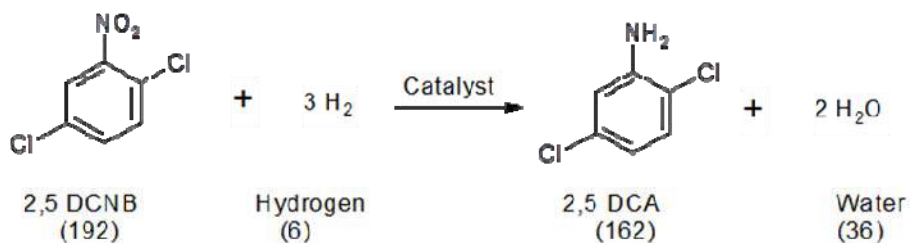


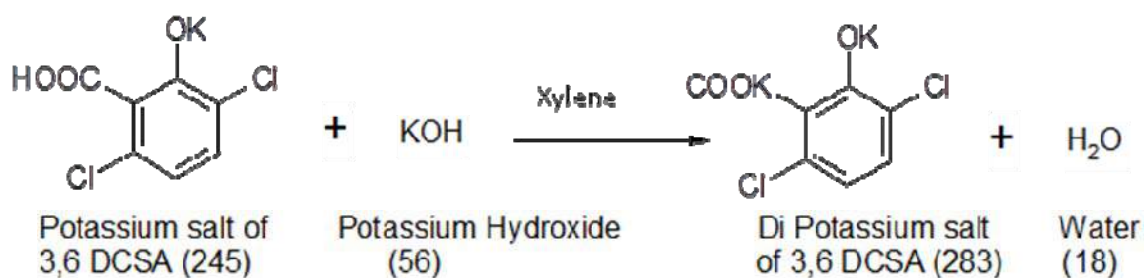
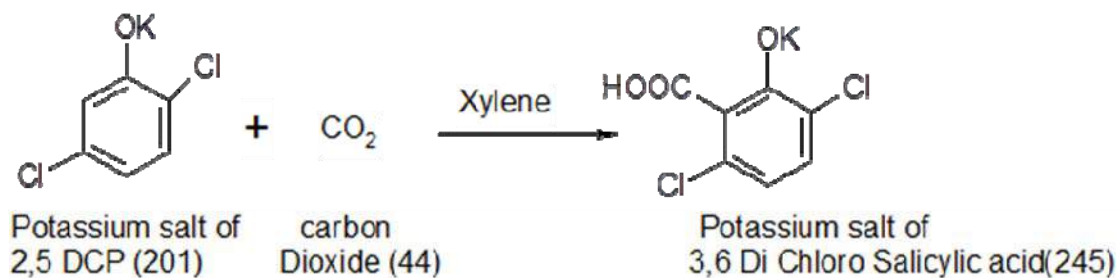
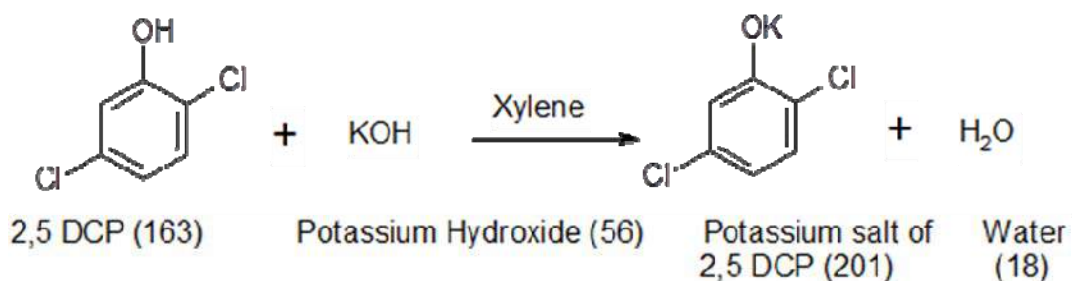


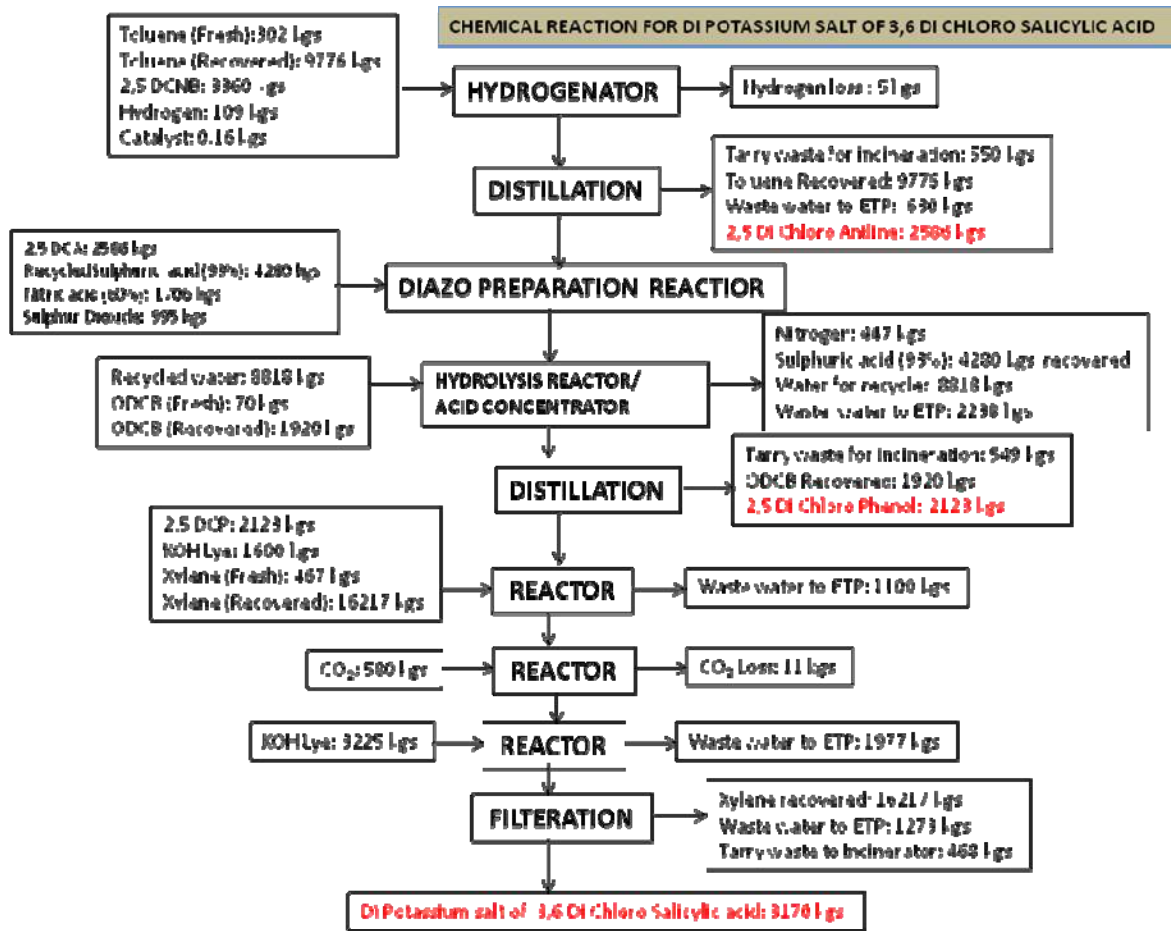
MASS BALANCE FOR 3,6 DI CHLORO METHOXY BENZOIC ACID



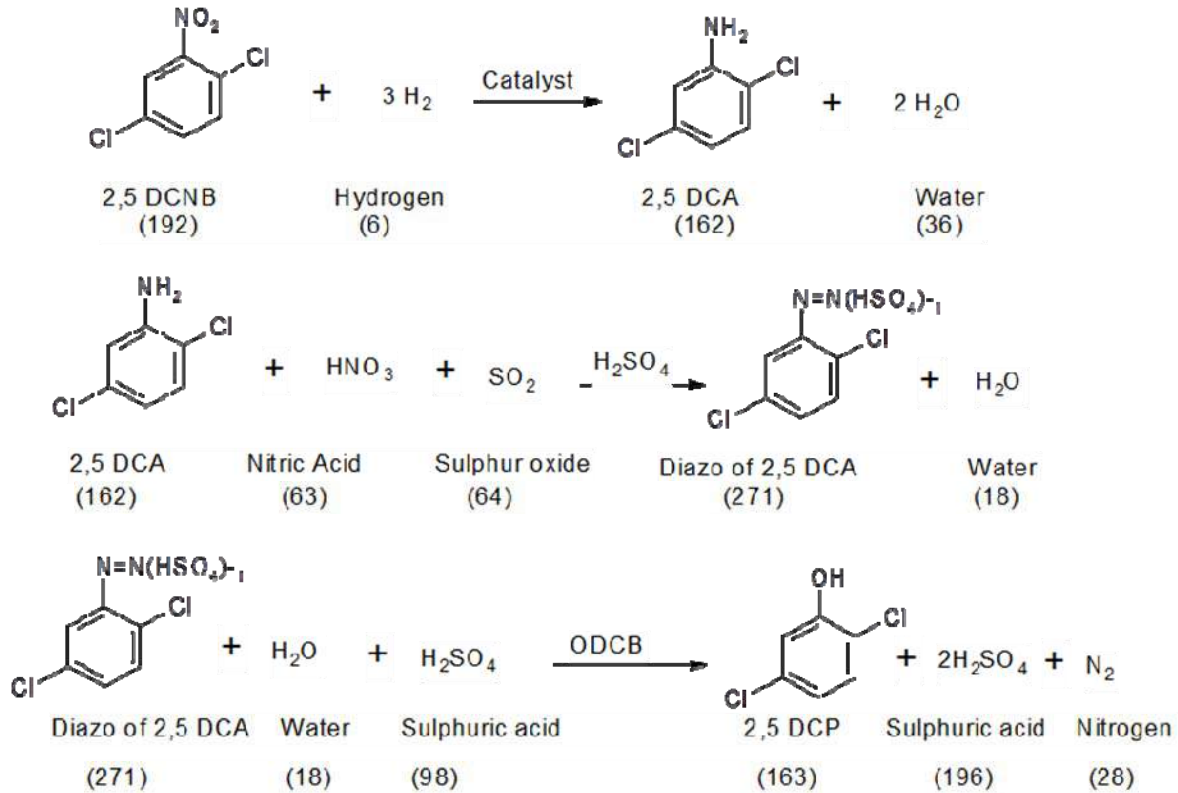
CHEMICAL REACTION FOR DI POTASSIUM SALT OF 3,6 DI CHLORO SALICYLIC ACID



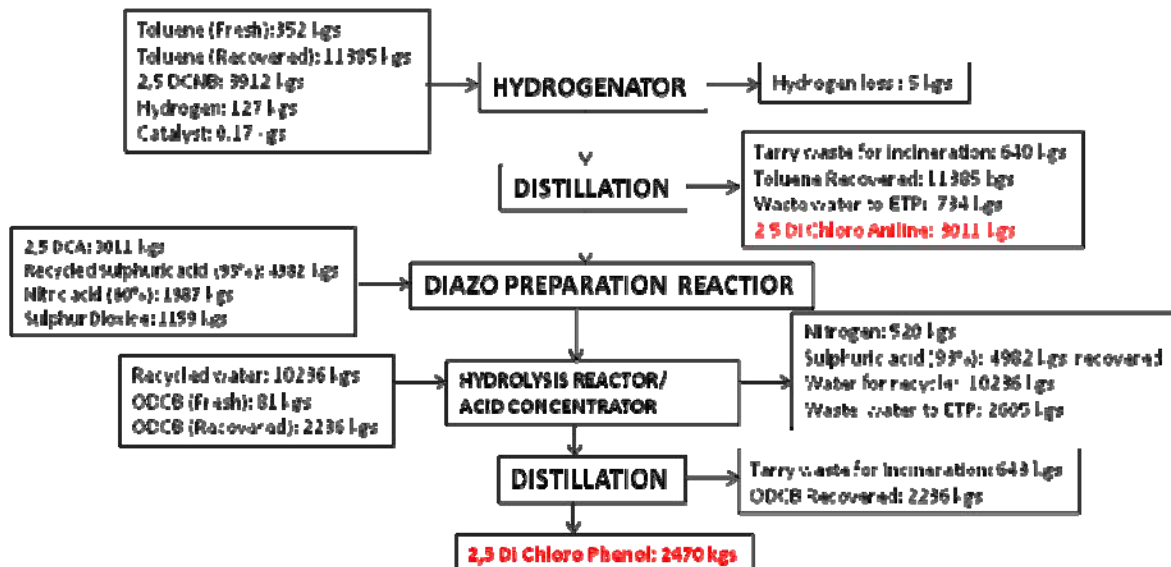




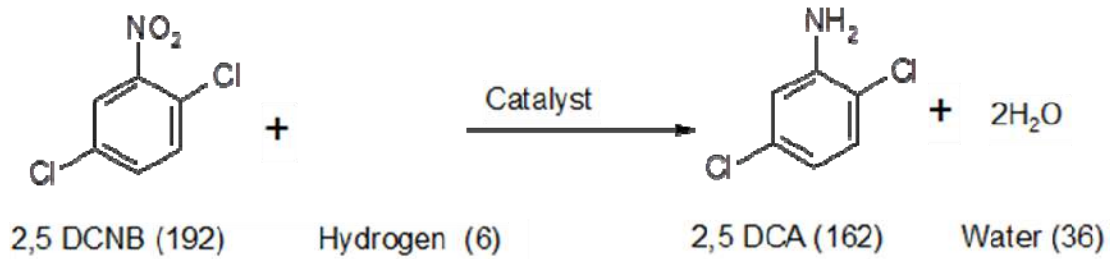
CHEMICAL REACTION FOR 2,5 DI CHLORO PHENOL



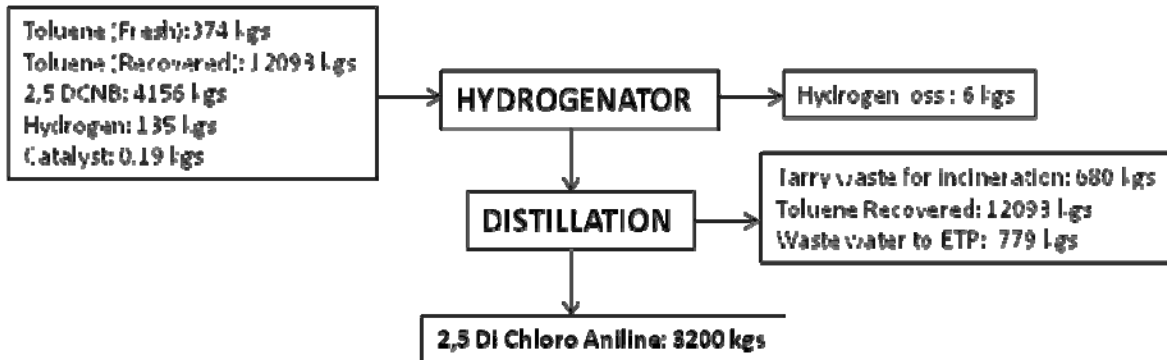
CHEMICAL REACTION FOR 2,5 DI CHLORO PHENOL



**CHEMICAL REACTION FOR 2,5 DI CHLORO ANILINE**



**CHEMICAL REACTION FOR 2,5 DI CHLORO ANILINE**



**ANNEXURE-4**

**Permission for withdrawal of fresh water from SEZ (Industrial estate)**

6. According to the policy of DSL, you are required to get the building plans approved within a period of 3 months from Dahej SEZ Development Committee. You shall commence the production within 3 years from the date of allotment and shall intimate the date of production, failing which DSL is entitled to take back the possession of the plot unless extension is granted in writing.

7. Please note that DSL has considered pipeline cost of water supply capacity of 33,000 litres per day/hect. and Effluent Disposal Pipeline (EDP) facility of 30,000 litres per day/hect. under the allotment price charged to you. Any higher requirement over and above this entitlement is to your account.

Area Sq.Mtrs.	Entitlement		Your requirement	
	Water	EDP	Water	EDP
1	2		3	
62526.19 (Tentative)	0.198 MLD	0.18 MLD	0.500 MLD	0.370 MLD

Your water and effluent disposal requirement is higher than the entitlement.

Excess quantity of water requirement will be considered on availability with DSL and on payment of extra charges which will be decided. You will undertake to pay the extra charge for the excess quantity of water as fixed by DSL. The decision of DSL shall be binding and that company shall not raise any dispute legally or otherwise for additional charges.

You will be required to execute a separate agreement for water connection with DSL / GIDC, Bharuch.

8. If not submitted, you shall have to produce the project report and certificate indicating authorized, subscribed & paid up capital of the company, name of directors/share holders and their holding in the company.

9. M/s. YRPL is required to construct approach road at its own cost and maintain an access road leading from the said land. Approach road is from plot no. Z/92/1 maximum upto 20 mtr. from East – South end of plot no. Z/96/E

10. Before acceptance of this offer-cum-allotment letter, you may inspect the plot and shall execute undertaking in the enclosed Performa to that effect.

**ANNEXURE-5**

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

❖ Quantity of Waste Water (liquid waste) generation and its management :

Sr. No.	Particulars	Effluent generation
1.0	Domestic	7.0
2.0	Processing	205.0
3.0	Washing	20.0
4.0	Cooling Tower	20.0
5.0	Boiler	7.0
6.0	Scrubber	5.0
<b>7.0</b>	<b>Total</b>	<b>264.0</b>
<b>8.0</b>	<b>Total Industrial</b>	<b>257.0</b>

**Note:**

- Water consumption & effluent generation worked out on maximum water consumption & effluent generated product i.e. 3,6 Di Chloro Methoxy Benzoic acid.
- This Industrial Effluent will be segregated into Dilute & Concentrated streams and then accordingly treated and finally disposed off into GIDC Treated Effluent Drainage line of GIDC Dahez for ultimate disposal into Arabian Sea.
- Total 254 m<sup>3</sup>/day of industrial effluent generated. Out of which about 205 m<sup>3</sup>/day of effluent generated from the process will be collected separately, neutralized, filtered, extracted in solvent, distilled & finally taken to MEE. Balance 52 m<sup>3</sup>/day of normal effluent & 163.243 m<sup>3</sup>/day of condensate from MEE & low boiler from distillation (total 215.243 m<sup>3</sup>/day) will be treated in proposed primary, secondary & tertiary treatment plant & disposed off into GIDC Treated Effluent Drainage line of GIDC Dahez for ultimate disposal into Arabian Sea.
- About 20.1 MT/day of Extracted solvent will be recycled into plant.
- 0.202 MT/day of organic waste during distillation of effluent will be taken to Incineration.
- 38.125 MT/day (32.849 M3/day) of salt from MEE will be sent to TSDF.
- 163.243 m<sup>3</sup>/day of low COD & low TDS condensate from MEE & low boilers from distillation will be sent to effluent treatment plant.

- Thus 215.243 m<sup>3</sup>/day of normal effluent will be treated in proposed primary, secondary & tertiary treatment plant & disposed off into GIDC Treated Effluent Drainage line of GIDC Dahez for ultimate disposal into Arabian Sea.

**AANEXURE: 6**

**DETAILS OF PROPOSED EFFLUENT TREATMENT PLANT FOR DILUTE EFFLUENT STREAM**

**Design Criteria :**

- Product : Agro Chemicals & Organic intermediates
- Source of Effluent : Process & Utilities
- Design Flow of Effluent : **215 KL/day Max.**
- Design Parameters : As under
- **Effluent Characteristics:**

No	Effluent Parameter	Untreated combined normal effluent	PCB norms
1	pH	5.0	6.5 to 8.5
2	Color pt. Co	600	<100
3	Suspended solids , Mg/L	500-600	<100
4	Total dissolved solids, Mg/L	6000-7000	<2100
5	Oil and grease, Mg/L	3-4	<10
6	NH3-N, Mg/L	30-40	<50
7	BOD , Mg/L	1200-1500	<30
8	COD , Mg/L	4000-5000	<100
9	Heavy metal, Mg/L	0.1	<0.1
10	Phenolic Compounds, Mg/L	2-3	<1

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

**Process of normal effluent stream:**

Industrial effluent is generated from various sources like - Process, Washings, Boiler blow-down, Cooling blow-down and Others (scrubbed liquor,etc). It is segregated as per its characteristics into two streams, namely,

- 1) Concentrated stream (high TDS, moderate COD) &
- 2) Dilute stream (low TDS, low COD)

It is mainly generated from Washings, Boiler blow-down, Cooling blow-down and Others (scrubbed liquor,etc). It has low COD and low TDS level. It is collected in Collection Tanks, equalized / neutralized in Equalization / Neutralization tanks. Neutral effluent is then filtered to remove suspended solids as ETP Sludge (to be subsequently dried, packed in bags, stored & finally dispatched to approve Land-fill site for disposal). After this Primary Treatment, the effluent is sent for Secondary Biological Treatment of Aeration - where activated bio sludge degrades the organic content. The effluent passes from Aeration tank to the Settling tank where the settled sludge (ETP Sludge) is partially recycled back to the Aeration Tank (to maintain active bio sludge content) and the major portion is dried in the Sludge Beds and subsequently packed in bags, stored & finally dispatched to approved Land-fill site for disposal. The filtrate from these beds is recycled back to the Aeration tank. The overflowing effluent from the Settling tank is passed through Sand Bed & Activated Carbon Bed to further decrease COD. The treated effluent, thus obtained, is collected in a Hold tank. It is tested for various parameters like COD, BOD, TSS etc and, if found meeting the GPCB parameters, it is sent to the Guard Tank and finally disposed off into the GIDC Effluent Drainage - ultimately to the Arabian Sea.

❖ **DETAILS OF PROPOSED EFFLUENT TREATMENT PLANT FOR NORMAL EFFLUENT**

- Average hydraulic load, m<sup>3</sup>/day : 215 m<sup>3</sup>/day
- Design hydraulic load, m<sup>3</sup>/day : 250 m<sup>3</sup>/day
- Average Inlet BOD, mg/l : 1200-1500
- Average Inlet COD, mg/l : 3000-4000

Sr. No	Name of the unit	Size in meter	Nos	Capacity	MOC
1	Oil/Grease trap	1 x 1 x 1	1	1	RCC/TL
2	Collection cum equalization tank with air sparger	7 x 7 x 5	1	245	RCC/TL
3	Floculator	1.5 m dia x 2 m ht	3	10.59	MSRL
4	Neutralization tank with stirer	2 m dia x 3 m ht	3	30	RCC/TL

5	Chemical dosing tank	1 x 1 x 1	1	3	HDPE
6	Primary settling tank	3 x 3 x 4.5	2	80	RCC
7	Filter press	36 x 36	1	-	PP
8	Aeration tank with diffuser system	5 x 5 x 4	3	300	RCC
9	Secondary settling tank	3 x 3 x 4.5	2	80	RCC
10	Holding tank	3 x 3 x 4.5	2	80	RCC
11	Sand bed filter	2 m dia x 3 m ht	2	20	MSRL
12	Activated carbon filter	2 m dia x 3 m ht	2	20	MSRL
13	Final treated effluent holding tank	3 x 3 x 4.5	2	80	RCC
14	Effluent transfer pump	10 HP & 5 HP	6	-	CI/PP
15	Air Blower	10 HP	2 Nos	20 HP	CI

**DETAILS OF PROPOSED EFFLUENT TREATMENT PLANT/SOLVENT EXTRACTION & MEE FOR  
CONCENTRATED EFFLUENT STREAM**

**Design Criteria :**

- Product : Agro Chemicals
- Source of Effluent : Process
- Design Flow of Effluent : **205 KL/day Max.**
- Design Parameters : As under
- **Effluent Characteristics:**

No	Effluent Parameter	Untreated combined Concentrated effluent
1	pH	4.5
2	Color pt. Co	600
3	Suspended solids , Mg/L	600-800
4	Total dissolved solids, %	15-16%
5	Oil and grease, Mg/L	10-12
6	NH3-N, Mg/L	10-15

7	BOD , Mg/L	7500-8000
8	COD , Mg/L	25000-30000
9	Heavy metal, Mg/L	ND
10	Phenolic Compounds, Mg/L	8-12

Based on the above criteria Effluent Treatment scheme having under mentioned specification is required to install.

It is mainly generated from the production processes. It is collected in Collection Tanks, equalized / neutralized in Equalization / Neutralization tanks. Neutral effluent is then filtered to remove suspended solids as ETP Sludge (to be subsequently dried, packed in bags, stored & finally dispatched to approved Land-fill site for disposal), and sent for solvent extraction. The effluent is extracted in the batch Extractors with suitable solvent (for partial removal of organics and simultaneous reduction in COD) and allowed to settle. Bottom solvent layer is separated out and is recycled back in the process. The top effluent layer is taken for partial fractional distillation. Here, the first fraction - a mixture of organic solvent & water - is collected, settled and separated in two layers. The organic solvent layer is recycled back in the process whereas the aqueous layer (still containing dissolved organics) is sent as Aq. Organic Waste to the approved Common Incinerator site. The second fraction - mainly water but still contaminated with some dissolved organics - is sent to the aeration treatment along with the dilute effluent stream. The remaining effluent will be left with very low COD but high TDS. It is then taken to a Multi Effect Evaporator (MEE). Maximum possible water is evaporated which may still contain very low concentration of COD and TDS. Hence it is sent to the aeration treatment along with the dilute effluent stream. The semi solid residue left at the end of evaporation is mainly inorganic sludge (ETP Sludge) which is subsequently dried, packed in bags, stored & finally dispatched to approved Land-fill site for disposal.

**DETAILS OF PROPOSED EFFLUENT TREATMENT SCHEME FOR CONCENTRATED EFFLUENT STREAM:**

<b>Sr. No</b>	<b>Name of the unit</b>	<b>Capacity</b>	<b>MOC</b>
1	Collection tank	800	RCC/TL
2	Neutralizer	60	RCC/TL
3	Filter	10 M <sup>2</sup> filter area	MSRL
4	Hold tank	200	RCC/TL
5	Solvent charging tank	5	HDPE
6	Extraction reactor	60	RCC
7	Extracted solvent tank	5	PP

8	Extracted effluent hold tank	200	RCC
9	Distillation with column (6 mt height)	60	RCC
10	Receiver for low boilers	8	RCC
11	Receiver for 2nd cut	100	MSRL
12	Hold tank for the feed for MEE	200	MSRL
13	MEE	6 m <sup>3</sup> /hr	Titanium
14	Hold for the effluent from MEE to Aeration	100	Cl/PP

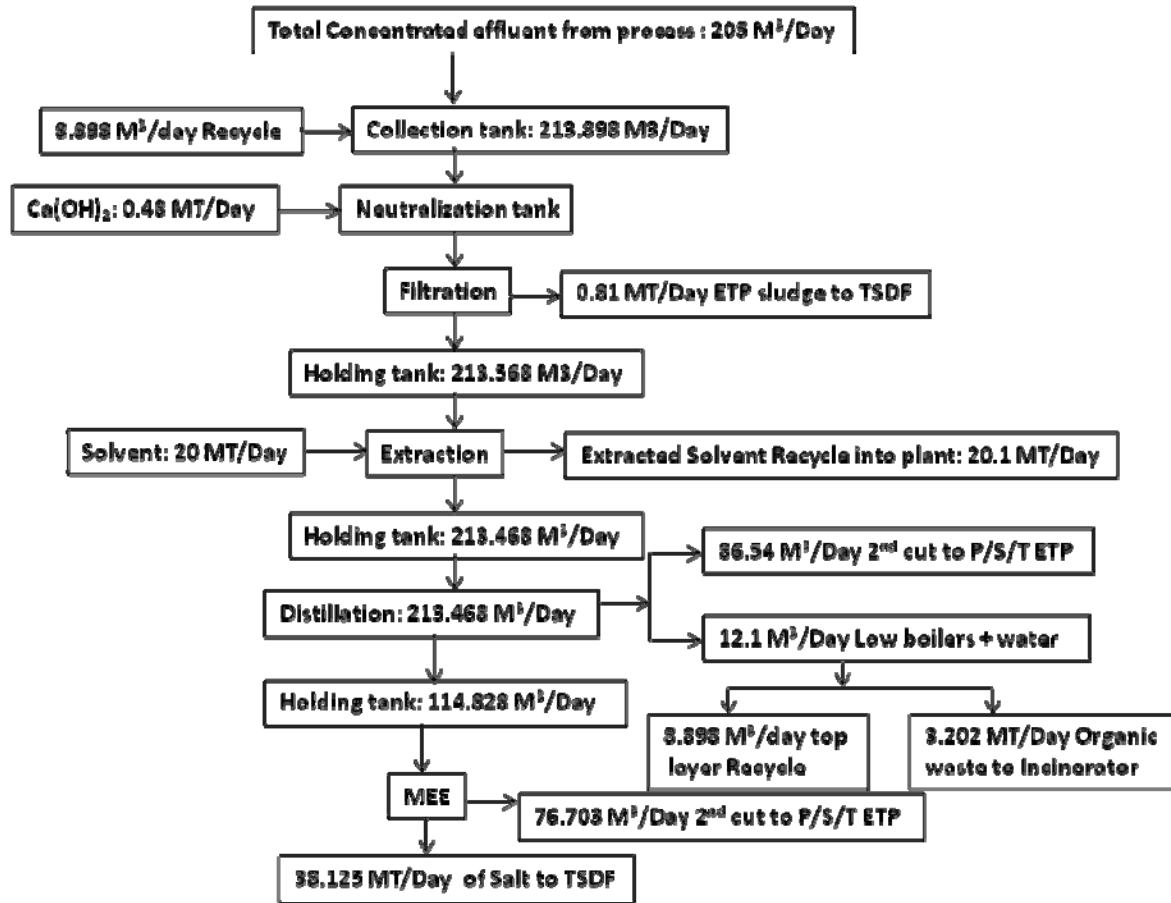
**DETAILS OF MEE**

Sr. No.	Name of the unit	Dimension in meters	Capacity, M <sup>3</sup>	MOC
1	Calandria- 1	0.656 X 8.44	150 KLD	Ti-clad
2	Calandria- 2	0.573 X 8.36	150 KLD	Ti-clad
3	Calandria- 3	0.473 X 8.36	150 KLD	Ti-clad
4	ATFD	0.866X 6.7	150KLD	SS 316

**DETAILS OF PROPOSED INCINERATION SYSTEM**

Sr. No.	Particulars	Details
<b>1.0</b>	<b>Capacity of Incinerator</b>	<b>1000 kgs / hr residue</b>
1.2	Process	Thermal destruction of organic matter by heat transfer
1.3	Design Temperature	1200°C
1.4	Operation temperature in primary chamber	850°C
1.5	Applied HP	21 HP
1.6	Control	Manual with digital temperature digital indicator
1.7	Fuel consumption	300 kgs/hr (LDO/FO)
<b>2.0</b>	<b>Primary Combustion chamber</b>	
2.1	Material of construction	MS
2.2	Installation	Vertical Fired, Circular Refractory lined
2.3	Lining	Inside portion of chamber duly lined with fire bricks and fire insulation bricks
2.4	Maintenance & Ash Door	01 no each
2.5	Combustion Burner	Low air pressure burner, manually operated (01 nos.)
2.6	Operating Temperature	850°C
	Liquid Spray Nozzle	Air atomized, external mix (02 Nos.)
<b>3.0</b>	<b>Secondary Combustion Chamber</b>	
3.1	Material of Construction	Mild Steel
3.2	Installation	Vertical Fired, Circular Refractory lined
3.3	Lining	Inside portion of chamber duly lined with fire bricks and fire insulation bricks
3.4	Maintenance & Ash Door	01 no each
3.5	Combustion Burner	low air pressure burner, manually operated (01 nos.)
3.6	Operating Temperature	1200 °C
3.7	ID Fan	01 No., 7000-8000 cfm
3.8	Holding Tank	16000 liters
<b>4.0</b>	<b>Type of Ventury Scrubber</b>	<b>Pressure Shower</b>
4.1	Throat Diameter	1140 mm x 1500 x 3300 tower
4.2	Height	7000 mm bottom discharge, 500 mm dia
<b>5.0</b>	<b>Stack</b>	<b>Conical Base, Guy Support, 30 m height 500 mm dia.</b>
5.1	Measuring Equipment	Waste Water meter, Fuel meter, Power meter
5.2	Sampling Port	100 mm dia

**FLOW DIAGRAM OF EFFLUENT TREATMENT PLANT**



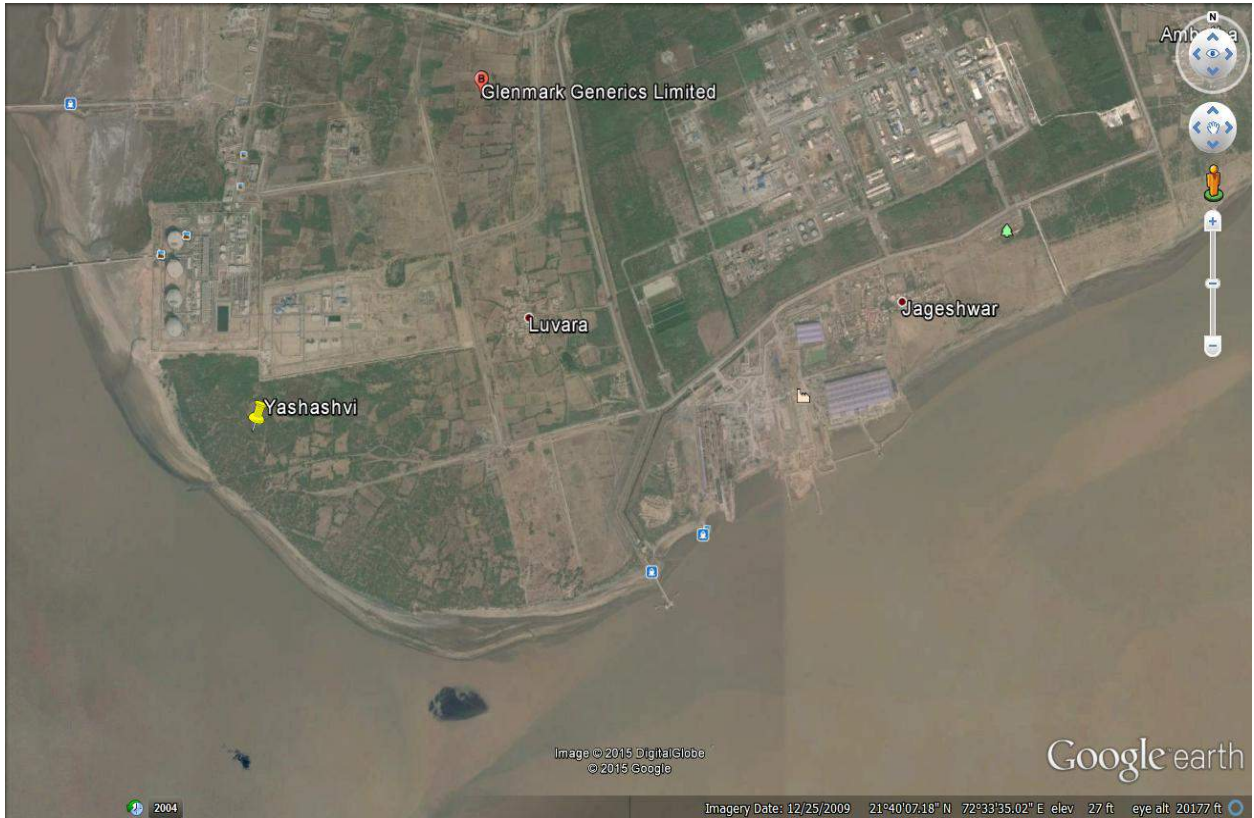
ANNEXURE: 7**Quantity of Solid Waste generation and its management**

No	Type of waste	Category	Qty. MT/ month	Treatment	Disposal
1	ETP waste (34.3)	34.3	1014	Dried, packed in bags	Dispose off into TSDF, BEIL, Ankleshwar & Detox, Dahej
2	Used Oil (5.1)	5.1	0.2	Packed in carboys	Incinerated into own Incineration system
3	Discarded containers (33.3)	33.3	1.0	De- contaminat ed, stored	Sell to authorized recycler
4	Incineration ash (36.2)	36.2	18	Packed in bags	Sell to brick manufacturer
5	Process waste & residue	29.1	352	Packed in drums/bags	Incinerated into own Incineration system
6	Spent carbon from ETP	35.3	0.5	Packed in drums/bags	Incinerated into own Incineration system
7	Used rubber hand gloves/pipes etc	X-08	0.2	Packed in drums/bags	Incinerated into own Incineration system

**Note:** We will apply for membership of approved TSDF site of M/S BEIL, Ankleshwar & Detox Corporation Limited, Dahej for disposal of Hazardous waste.



**GOOGLE IMAGE OF THE PLOT**





1. Offer amount:-

- (a) The offer price for plot area of 62,526.19 sq. mtrs. @ Rs. 1320/- per sq.mt. works out to Rs. 8,25,34,571/- at 100% of the total price of the plot. M/s. YRPL is required to make payment of Rs. 8,20,34,571/- after adjusting deposit of Rs. 5,00,000/- paid by M/s. YRPL.
- (b) M/s. YRPL is also required to make payment of contribution towards Gujarat PCPIR Welfare Society @ Rs. 15/- per sq.mt. which works out to Rs. 9,37,893/-
- (c) M/s. YRPL will be required to make payment of offer amount as above within 30 days from the date, failing which interest at rate of 13% per annum will be charged per day till the time dues are paid.
- (d) M/s. YRPL will be required to make payment towards boundary wall constructed by DSL. The amount will be indicated separately.
- (e) M/s. YRPL may make payment by DD / Cheque in favor of Dahej SEZ Ltd. payable at Gandhinagar.

Procedure of obtaining possession:-

- 2. On receipt of this letter, you will be required to pay the offer amount as mentioned above. While sending the offer amount, please send the "Acceptance-cum-Undertaking of offer letter" which is enclosed.
- 3. Please note if the offer amount is not received by us within a period of 60 days from issue of this letter, the offer will stand automatically cancelled, deposit amount will be forfeited and you will not be entitled to get land at the offered price and will also lose priority. Your application shall be automatically treated as closed.
- 4. You will be required to execute "Agreement" in triplicate as per the enclosed format each on Rs. 100/- stamp paper as per DSL policy. It is not necessary for you to execute this agreement in our presence but you can execute it and send it by post. You will be issued Possession Advice on execution of Agreement.
- 5. The plot is offered in processing area of Part -II of Dahej SEZ where you will set up an industrial unit for manufacturing of i. Dicamba, ii. 3,6 Dichloro Salicylic Acid, iii) 2,5 Dichloro Phenol and 2,5 Dichloro Aniline as per LoA. The sketch showing location of Plot No. Z/96/E is enclosed. The area of the plot is tentative and subject to survey and measurement. You will be required to pay the difference of land price as may be required.

6. According to the policy of DSL, you are required to get the building plans approved within a period of 3 months from Dahej SEZ Development Committee. You shall commence the production within 3 years from the date of allotment and shall intimate the date of production; failing which DSL is entitled to take back the possession of the plot unless extension is granted in writing.
7. Please note that DSL has considered pipeline cost of water supply capacity of 33,000 litres per day/hect. and Effluent Disposal Pipeline (EDP) facility of 30,000 litres per day/hect. under the allotment price charged to you. Any higher requirement over and above this entitlement is to your account.

Area Sq.Mtrs.	Entitlement		Your requirement	
	Water	EDP	Water	EDP
1	2		3	
62526.19 (Tentative)	0.198 MLD	0.18 MLD	0.506 MLD	0.370 MLD

Your water and effluent disposal requirement is higher than the entitlement.

Excess quantity of water requirement will be considered on availability with DSL and on payment of extra charges which will be decided. You will undertake to pay the extra charge for the excess quantity of water as fixed by DSL. The decision of DSL shall be binding and that company shall not raise any dispute legally or otherwise for additional charges.

You will be required to execute a separate agreement for water connection with DSL / GIDC, Bharuch.

8. If not submitted, you shall have to produce the project report and certificate indicating authorized, subscribed & paid up capital of the company, name of directors/share holders and their holding in the company.
9. M/s. YRPL is required to construct approach road at its own cost and maintain an access road leading from the said land. Approach road is from plot no. Z/92/1 maximum upto 20 mtr. from East – South end of plot no. Z/96/E.
10. Before acceptance of this offer-cum-allotment letter, you may inspect the plot and shall execute undertaking in the enclosed Performa to that effect.

(1) Special Conditions :

- (a) Dahej SEZ Ltd. has allotted the Plot No. Z/96/E to you on your production of Letter of Approval No. Dahej SEZ/II/009/2014-15/589 dated 27-01-2015 issued by the Office of the Development Commissioner, Dahej Special Economic Zone, Government of India, Ministry of Commerce & Industry, 4<sup>th</sup> Floor, Fadia Chambers, Ashram Road, Ahmedabad -380 009.
- (b) You shall strictly adhere to all the terms and conditions stipulated in the aforesaid Letter of Permission and submit copies of compliance report. You will also have to follow all provisions under the SEZ Act, 2005, SEZ Rules, 2006 and Gujarat SEZ Act, 2004.
- (c) The detailed terms and conditions for allotment of land in Dahej SEZ along with the Application Form and Undertaking signed by you shall form a part of the Allotment Letter.
- (d) You will obtain all environmental clearances concerning the project at your cost. You will be permitted to start construction of your building only on submission of certified copy of the environmental clearance from MoEF / competent authority and copy of Consent to Establish (NOC) from Gujarat Pollution Control Board. You will adhere to all the terms and conditions stipulated in the said environmental clearances.
- (e) You are required to set up all pollution mitigation machinery, including necessary treatment to gaseous, liquid or solid waste, as stipulated on the environment clearance.
- (f) You will be required to develop and install the rain water harvesting system.
- (g) In case of failure to adhere to the terms and conditions of the environment clearance/s and consequent direction by Central Pollution Control Board or Gujarat Pollution Control Board or any other enforcement agency, DSL shall be competent to withhold water and/or power supply, refuse to accept the effluents in the collection and disposal system and also stop all services provided in SEZ.
- (h) DSL does not propose to operate any Common Effluent Treatment Plant. Treatment of effluents will primarily be the responsibility of the allottee.
- (i) DSL does not propose to operate any Solid Waste Disposal Site. You shall have to make your own arrangement for treatment and disposal of the solid waste at your own expense. For the purpose, you have the option to take the benefit of the Solid Waste Disposal Site developed at Ankleshwar, GIDC Estate.

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- (j) You will endeavour to recycle the liquid effluents to the extent possible to minimise the use of water. You will also make efforts to apply non-conventional sources of energy. You will endeavour for construction of green buildings. You will ensure maximum tree plantation.
- (k) As a developer of the SEZ, DSL is required to submit various returns/information to the Development Commissioner, Govt. of India, Ministry of Commerce & Industry, 4<sup>th</sup> Floor, India Chambers, Ashram Road, Ahmedabad-380 009. You will ensure submission of periodic information about your unit as may be required. The details would be communicated to you separately.
- (l) On taking possession of the plot of land, please ensure to carry out joint survey & measurement of demarcated plot by DSL. You shall also go ahead with securing various clearances for your project, including environment clearances, prepare building plans, obtain approval from the Dahej SEZ Development Committee of the building plans in conformity with the General Development Control Regulations for SEZ published by Govt. of Gujarat, start construction of your factory buildings etc. DSL has put in place internal infrastructure in the SEZ. DSL will not entertain any dispute about infrastructure in SEZ.
- (m) You will be required to pay the installation and service charges as well as the repairs and maintenance of the infrastructure created in SEZ, salary/ remuneration paid to the Development Commissioner for deployment of staff in the SEZ, expenditure incurred for maintenance of security personnel, office expenditure of Dahej SEZ Ltd., expenditure of DSL employees etc. and all other expenses incurred by DSL for management, maintenance & operation of SEZ, as may be fixed by the Dahej SEZ Development Committee. Bills for service charges depending on the area of the plot allotted to you will be issued on quarterly or annual basis which shall be paid within 30 days failing which DSL will recover interest @ 13% per annum on the amount under default.
- (n) You will be required to pay Non-Agricultural Assessment and such other revenue charges as may be levied by the Govt. of Gujarat / GIDC. Similarly, at a later date, you will pay the Notified Area Tax as may be fixed by DSL, SEZ being a deemed Notified Area, under the Gujarat SEZ Act, 2004.
- (o) DSL will execute in your favour lease-deed for an initial tenure of thirty years on 100% payment of land price and additional cost of infrastructure, if any. On expiry of the 30 years' tenure, the lease-deed shall be extended for a further period of 30 years. Meanwhile, you are required to pay lease-rent @ Rs. 1/- per sq.mtr. per annum for the first 5 years and as modified from time to time thereafter. Lease-rent shall be payable every quarter along with service charges.

(p) As regards supply of water, the allottee shall abide by the conditions of Gujarat Industrial Development Corporation (Supply of Water to the Industrial Estate) Regulation, 1991 and its amendments from time to time.

On failure to pay the minimum charges, the purchaser shall be liable to the actions including Termination of Agreement and subsequent steps. Water Supply Rules framed by GIDC will apply *mutatis mutandis*.

(q) For obtaining drainage connection in the effluent disposal pipeline, the allottee shall treat the effluent to the standards of NOC consent of the Gujarat Pollution Control Board and the rules and regulations covered under (The Water Prevention and Control of Pollution Act, 1974) and (The Air Prevention and Control Pollution Act, 1981 and E.P. Act 1986) with all latest amendments and any other laws that may be in force from time to time. Failure on this part to comply with such provisions shall entitle DSL to disconnect the drainage connection to the allottee. DSL would also take any such action as required or as directed by Development Commissioner, Dahej SEZ under any statute or as directed by any statutory, competent authority. The allottee shall have to take Drainage Connection when intimated by DSL and shall have to pay all the necessary charges towards capital amount recovery and shall have to pay regular drainage cess as fixed by the Company from time to time. While taking drainage connection, the allottee shall have to comply with all regulations contained in Drainage Regulations 1990 of GIDC.

(r) In case of power supply, the allottee may approach to Torrent Energy Ltd. (TEL) and follow procedure as under:-

(i) The allottee has to complete formalities of signing Agreement, payments of Security Deposit and complete wiring of electrical installation as per I.E. rules and submit the test report for wiring from licensed electrical contractor before release of power connection.

(ii) the allottee is liable to pay the charges for the power supply to the co-developer as per applicable rules and regulations.

(iii) the supply of voltage and source of power supply shall be decided by the Co-developer.

(iv) the allottee has to pay for cost of augmentation of sub-station on its pro-rata demand basis and at the rate and policy prevalent in the Company / Co-Developer.

(v) the allottee will not hold DSL responsible for delay in availability of power.

(s) The allottee shall engage local persons to the maximum extent possible. "A Local Person" means a person domiciled in Gujarat State for a minimum period of 15 years. So far as menial workers,

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such as watchman, labour, sweepers, drivers, etc. are concerned, preference should be given to land-losers (including their family members) or local villagers.

- (i) It is in the interest of the allottee to acquaint himself about various provisions of Acts, Rules etc. Some of the important Acts/Rules are stated below.

Sr. No.	Particulars	Website
1.	SEZ Act, 2005 & SEZ Rules, 2006	sezindia.ic.in
2.	Gujarat SEZ Act, 2004 & GDCR for SEZ's	ic.gujarat.gov.in
3.	GIDC Water Supply Rules and GIDC Drainage Rules	gide.gov.in.

- (ii) In the unlikely event of any dispute, the competent court for jurisdiction purpose will be the designated court for SEZ's in Gujarat when notified. In the meanwhile, the jurisdiction shall be a competent court at Gandhinagar or Ahmedabad in Gujarat. Once again we welcome you to Dahej SEZ and request you to send us the forms of agreement duly executed along with offer acceptance/undertaking at your end at the earliest but not later than 30 days in order to enable us to hand over the possession of the plot to you.

Thanking you,

Yours faithfully,



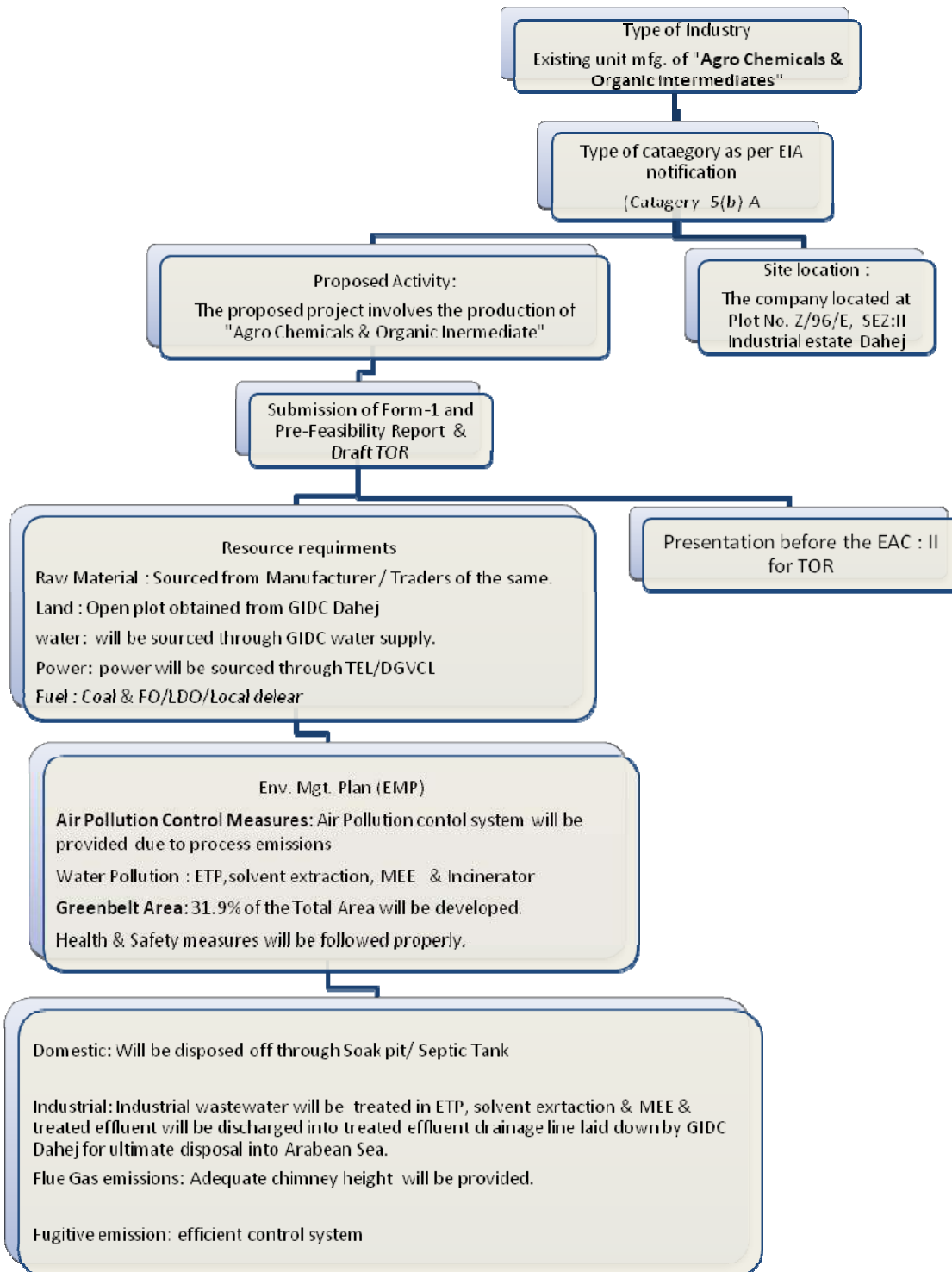
S. N. Patil  
Chief Executive Officer

- Encl: 1. Sketch showing location of land  
2. Acceptance Letter (Specimen Copy)  
3. Draft Agreement (Specimen Copy)

Copy f.w.as. to:

1. Development Commissioner, Dahej SEZ, Ahmedabad
2. The Executive Engineer, GIDC, Bharuch
3. Manager (Infrastructure), Dahej SEZ Ltd., Dahej, Bharuch

**ANNEXURE-10**  
**A schematic representation of the feasibility drawing**



ANNEXURE-11

Details of flue gas/process gas emission & its control measures

Sr. No.	Particulars	Details
<b>1.0</b>	<b>Capacity of steam boiler</b>	<b>15 TPH x 2</b>
1.1	Fuel used	Coal
1.2	Consumption	8000 kgs/hr
1.3	APC provided	MDC & ESP
1.4	Height of chimney	55 meters x 2
<b>2.0</b>	<b>Capacity of Incinerator</b>	<b>1000 kgs/hr solid</b>
2.1	Fuel used	LDO/FO
2.2	Consumption	300 kgs/hr
2.3	APC	Ventury scrubber
2.4	Chimney	21 meter
<b>3.0</b>	<b>Capacity of D G set</b>	<b>1500 KVA</b>
3.1	Fuel used	HSD
3.2	Consumption	270 lits/hr
3.3	APC	Exhaust
3.4	Height	11 meters
<b>4.0</b>	<b>Stack attached to</b>	<b>Reaction vessel</b>
4.1	APC	Two stage alkali scrubber
4.2	Height of vent	11 meters
<b>4.3</b>	<b>Pollutants</b>	SO <sub>2</sub> < 40 mg/Nm <sup>3</sup> NO <sub>x</sub> : < 25 mg/Nm <sup>3</sup>
<b>5.0</b>	<b>Stack attached to</b>	<b>Reaction vessel</b>
5.1	APC	Two stage water followed by alkali scrubber
5.2	Height of vent	11 meters
5.3	Pollutants	HCl: < 20 mg/Nm <sup>3</sup>

**DETAILS OF AIR POLLUTION CONTROL SYSTEM ATTACHED TO EACH COAL/LIGNITE FIRED BOILER**

Boiler	:	15000 kg of steam/hour
Coal/lignite consumption	:	4000 kgs/hr
Calorific value	:	4200 kcal/kg
Inlet to dust collector	:	280°C
Stack temp	:	180°C
Diameter of chimney	:	750mm
Flue Gas Volume	:	6107Am <sup>3</sup> /hr
I.D. Fan	:	15254 m <sup>3</sup> /hr
Stack diameter	:	850Ømm
Stack height provided	:	55 meters
Efficiency	:	Thermal Efficiency of Boiler 82±2%

**1.0 Air Pollution control System: Multi Cyclone Dust Collector (Grit Arrestor)**

Cyclone tube diameter	:	1100 Ø mm
Height of tube	:	660 mm
No of tubes	:	1no
Dia of tubes	:	587Ø mm
Dimensions	:	3175IX1215WX1215Ht
Collection efficiency	:	60-70% (over 40micron)
Expected outlet dust load	:	150 < mg/nm <sup>3</sup> at out let of bag filter
Inlet Dust load	:	25-40 gms/nm <sup>3</sup>
Density	:	600kg/ m <sup>3</sup>
Fines	:	(< 1 mm)

**2.0 Air Pollution control System: Electro static Precipitator**

ESP model	:	SC-11-16-24(G) (3x9.125) 1.2 P
Design volume	:	60588 Am <sup>3</sup> /hr
Design Temperature	:	150 <sup>0</sup> C
Maximum Inlet Dust Load	:	13.01 Gm/ Nm <sup>3</sup>
Outlet Emission	:	50 Mgm/ Nm <sup>3</sup>
Moisture in Gas	:	15.83% V/V
Collection area	:	1399 m <sup>2</sup>
Specific collection area	:	83.1 m <sup>2</sup> /m <sup>3</sup> /s
No of gas passages	:	11
Velocity through ESP	:	0.49 M/s
No of fields	:	3
Migration velocity	:	5.37 Cm/s
Residence time	:	16.9 Sec
Dust collection efficiency	:	98.8%
Expected emission	:	PM: < 50 mg/Nm <sup>3</sup>
	:	SOx: < 100 ppm
	:	NOx: < 50 ppm

**DETAILS OF SCRUBBING SYSTEM FOR SO<sub>2</sub> & NO<sub>x</sub>**

Sr. No	Name of the system	Dimensions, mm	Capacity, m <sup>3</sup>	MOC	No	Remarks
1	Scrubber column	300 dia x 3000 ht	0.21	CSHDPE	2	
2	Scrubber tank	1800 dia x 1120 ht	3	CS	2	
3	Circulation pump	-	10 mt head / 2 m <sup>3</sup> /hr	SS 316	2	
4	Vent (stack)	150 dia x 11000 long	-	HDPE	2	

**DETAILS OF SCRUBBING SYSTEM FOR HCL**

Sr. No	Name of the system	Dimensions, mm	Capacity, m <sup>3</sup>	MOC	No	Remarks
1	Scrubber column	300 dia x 3000 ht	0.21	CSHDPE	2	
2	Scrubber tank	1800 dia x 1120 ht	3	CS	2	
3	Circulation pump	-	10 mt head / 2 m <sup>3</sup> /hr	PTFE / HDPE lined	2	
4	Vent (stack)	150 dia x 11000 long	-	HDPE	2	