ANNEXURE-1

TOR

- Standard TOR of sector specific organic synthetic chemicals prescribed by MoEFand CCE will be followed.
- To use Baseline monitoring details of A-One Chemicals for the month Dec-2016 to Feb-2017.

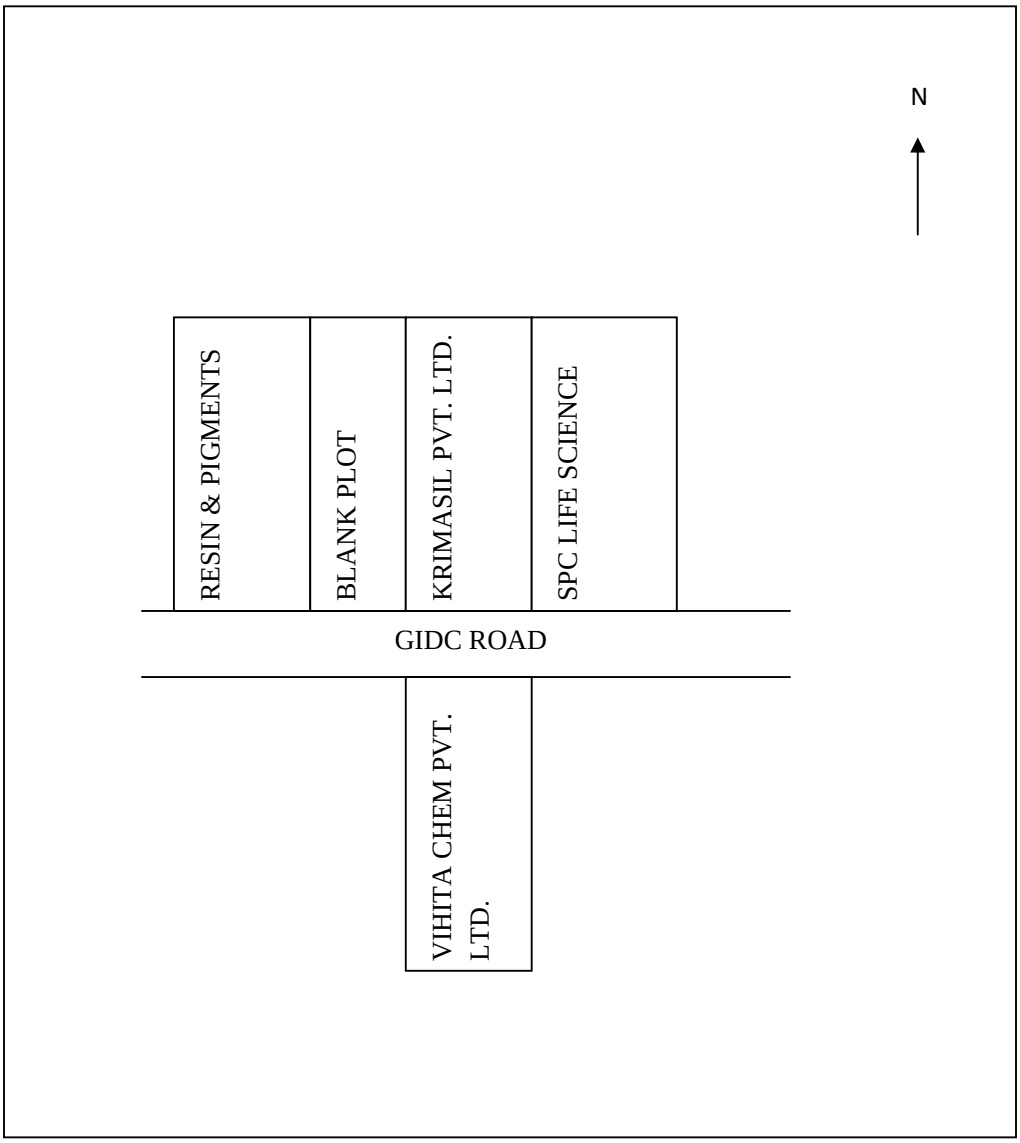
ANNEXURE-2

LIST OF DIRECTORS

Sr. No	Name	Present Residential Address	Designation	Contact No.
1.	Mr. Nagjibhai Madhabhai Ladumor	Sanskruti Cottage, 10, Advance Co-op.Hsg. Society, GIDC Ankleshwar- 393 002.	Director	98241 21717
2.	Mrs. Godavari Nagjibhai Ladumor	Sanskruti Cottage, 10, Advance Co-op.Hsg. Society, GIDC Ankleshwar- 393 002.	Director	99244 75999
3.	Mr. Dhruvesh Nagjibhai Ladumor	Sanskruti Cottage, 10, Advance Co-op.Hsg. Society, GIDC Ankleshwar- 393 002.	Director	78744 23122

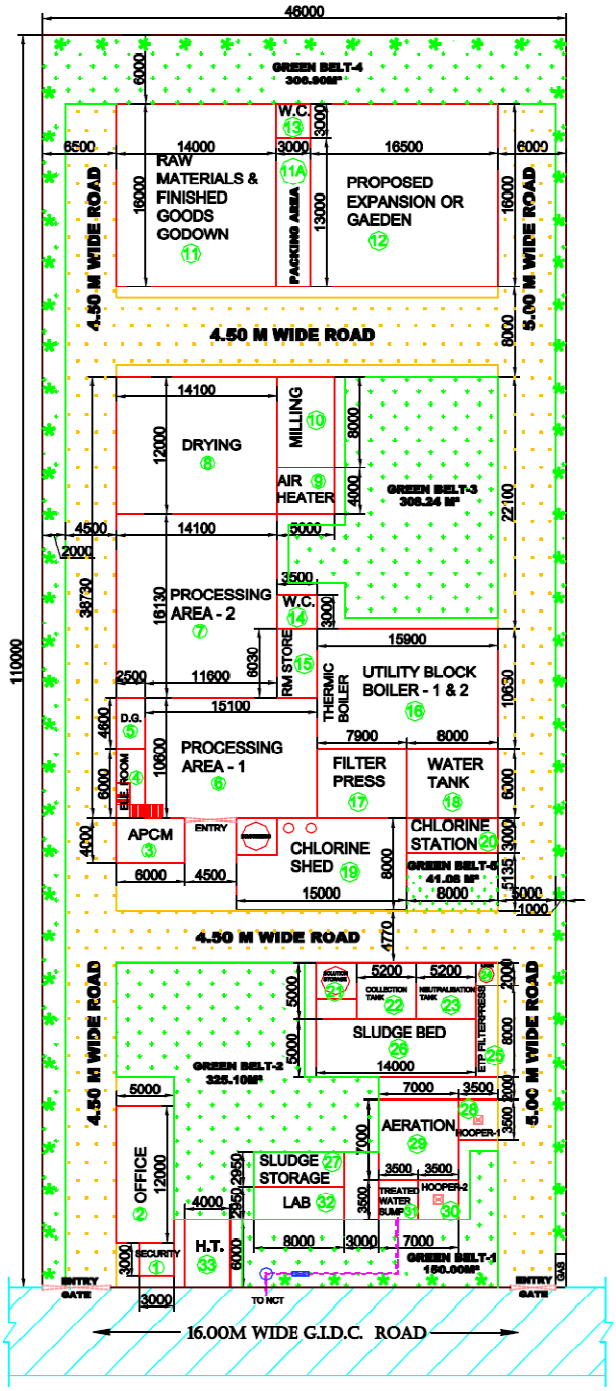
ANNEXURE-3 (A)

SITE LAYOUT



ANNEXURE-3 (B)

PLANT LAYOUT



KRIMA SIL PVT. LTD PLOT NO. - 3613		
(1)	TOTAL PLOT AREA	5060.00M²
(2)	GREEN BELT REQD. (22%)	1113.20M²
(3)	GREEN BELT PROVIDED	1131.32M²
	GREEN BELT PROVIDED / TOTAL PLOT AREA 1131.32M² / 5060.00M² PROVIDED AS PERCENTAGE OF PLOT	22.3%

GREEN BELT AREA	
SR NO.	AREA
1	150.00M²
2	325.10M²
3	308.24 M²
4	306.90M²
5	41.08M²
TOTAL	1131.32M²

AREA STATEMENT

PROPOSED BUILT UP AREA & FSI CALCULATION

STR. NO.	BUILDING NAME	GROUND FLOOR	FIRST FLOOR	STAIR CABIN	TOTAL
(1)	SECURITY CABIN	09.00M²	-	-	09.00M²
(2)	OFFICE	60.00M²	-	-	60.00M²
(3)	APCM	24.00M²	-	-	24.00M²
(4)	ELE. ROOM	15.00M²	-	-	15.00M²
(5)	D.G.	11.50M²	-	-	11.50M²
(6)	PROCESSING AREA - 1	160.06M²	160.06M²	-	320.12M²
(7)	PROCESSING AREA - 2	227.43M²	-	-	227.43M²
(8)	DRYING	169.20M²	-	-	169.20M²
(9)	AIR HEATER	20.00M²	-	-	20.00M²
(10)	MILLING	40.00M²	-	-	40.00M²
(11)	RAW MATERIALS & FINISHEDGOODS GODOWN	224.00M²	-	-	224.00M²
(11A)	PACKING AREA	39.00M²	-	-	39.00M²
(12)	PROPOSEDEXPANSION OR GAEDEN	264.00M²	-	-	264.00M²
(13)	W.C.	9.00M²	-	-	9.00M²
(14)	W.C.	10.50M²	-	-	10.50M²
(15)	RM STORE	21.10M²	-	-	21.10M²
(16)	UTILITY BLOCK BOILER - 1 & 2	169.01M²	-	-	169.01M²
(17)	FILTER PRESS	47.40M²	-	-	47.40M²
(18)	WATER TANK	48.00M²	-	-	48.00M²
(19)	CHLORINE SHED	120.00M²	-	-	120.00M²
(20)	CHLORINESTATION	24.00M²	-	-	24.00M²
(21)	SOLUTION STORAGE	263.07M² (ETP AREA)	-	-	11.52M²
(22)	COLLECTION TANK		-	-	26.00M²
(23)	NEUTRALISATION TANK		-	-	26.00M²
(24)	LIME		-	-	04.00M²
(25)	ETP FILTERPRESS		-	-	16.00M²
(26)	SLUDGE BED		-	-	70.00M²
(27)	SLUDGE STORAGE		-	-	23.60M²
(28)	HOOPER - 1		-	-	12.25M²
(29)	AERATION		-	-	49.20M²
(30)	HOOPER - 2		-	-	12.25M²
(31)	TREATED WATER SUMP		-	-	12.25M²
(32)	LAB	23.60M²	-	-	23.60M²
(33)	H.T.	24.00M²	-	-	24.00M²
TOTAL BUILT UP AREA		2022.67M²	160.06M²	-	2182.93M²

KRIMA SIL PVT. LTD
PLOT NO. 3613

NNEXURE-4
LIST OF PRODUCT

Sr. No	Name of product	Existing capacity in MT/Month as per AWH-84549	Proposed capacity in MT/Month	Total capacity in MT/Month
1.	PIGMENT GREE-7 (Copper Phthalocyanine Green)	3 MT/Month	147 MT/Month	150 MT/Month
2.	Poly Aluminium Chloride **AND /OR**	---	750 MT/Month	750 MT/Month
	Aluminium Chloride Hexahydrate	---	268 MT/Month	268 MT/Month

ANNEXURE-5

LIST OF RAW MATERIAL

Sr. No.	Name of Raw Material	Quantity (KG/KG)
1.	CPC Blue	0.58
2.	Aluminium Chloride	1.9
3.	Sodium Chloride	0.4
4.	Cupric Chloride	0.07
5.	Sodium Hydroxide	0.1
6.	D. A. / Additives	0.04
7.	Mono Chloro Benzene	0.12
8.	Chlorine	0.08
Total		**3.274**

ANNEXURE-6

MANUFACTURING PROCESS

(1) PROCESS DESCRIPTION OF PHTHALOCYANINE GREEN-7

Manufacturing of Phthalocyanine Green-7 involves various unit operations and chemical reaction, which are briefly described as below.

MANUFACTURING PROCESS:

Chlorination:

- In this stage Copper phthalocyanine blue is converted to Copper phthalocyanine green by chlorination reaction.
- Chlorination of Copper phthalocyanine blue is carried out in a glass lined vessel of 3000 lit. The raw materials anhydrous Aluminum chloride, Sodium chloride, CPC Blue, cupric chloride is charged lot wise into the reactor with continuous stirring. Aluminum chloride and sodium chloride are used as solvent while cupric chloride is used as catalyst. Heating is provided simultaneously to melt the mixture up to 150 to 160^0C.
- Chlorine gas is then bubbled through the mixture. Temperature is maintained around 170^0C for 40 hours. Batch is tested at defined intervals for reaction completion. At the end of reaction chlorination is stopped.
- The gaseous emission from the gas-lined vessel will be taken to two-stage counter current scrubber for recovery of Hydrochloric acid and unreacted chlorine gas is scrubbed in alkaline scrubber. The hydrochloric acid of 5-7% strength is used in drowning operation and neutralizing the alkaline effluent stream at ETP. Thus, HCl is consumed within the premises.

1) **Drowning:**
   - 11225 lit 5-7% HCl are taken in to 50000 lit capacity MSRLBL (mild steel rubber line and brick lined) drowning vessel & stir water for about 1hr.Then it filtered out to filter press.
2) **Filtration 1:**
   - The cooled reaction mixture from drowning vessel is taken to a filter press. The filtrate Aluminum chloride solution is collected in storage tank. The cake is washed with fresh water. The washing of filter press goes to ETP. The crude wet cake of copper pthalocyanine green is transferred in the distillation vessel.
3) **Purification/Pigmentation:**
   - The crude press cake of copper phthalocyanine green is charged into distillation/pigmentation vessel. The pH of the mass is adjusted to 11 using caustic flakes. Dispersing agent Emulsolic Eco and Lorel Alcohol is then charged. The mixture is stirred and heated up to 100^0C temp and refluxed for 8 hrs. This is followed by distillation and solvent recovery for 12 hrs. The mono chlorobenzen and water mixture is collected in the receiver and recycle it.

4) **Filtration:**
   - Slurry from distillation vessel is taken to the filter press. Washing is provided to the filter cake till the pH of wash water is neutral. Filtrate and wash water, which are both, alkaline are taken to the ETP. The treated water from ETP is subjected to R.O. The R.O. permeates to recycle back and R.O. rejected send to NCTL.

5) **Drying:**
   Finished product to be dried in spin flash dryer and then packing into suitable packing material.

CHEMICALREACTION:

CHEMICAL REACTION:

$$C_{32}H_{16}CuN_{8} + 16\ Cl_2 \longrightarrow C_{32}Cl_{16}CuN_{8} + 16\ HCl$$

SCRUBBING REACTION:

$$Cl_2 + 2NaOH \longrightarrow NaCl + NaOCl + H_2O$$

MATERIAL BALANCE

MATERIAL BALANCE

Input	Kg
Aluminium Chloride	2600
Cupric Chloride	100
Sodium Chloride	500
CPC Blue Crude	800
Chlorine	1800
Total	**5800**

CHLORINATOR

Output	Kg
Reaction Mass	5167
Chlorine	106
HCl gas	527
Total	**5800**

Input	Kg
Reaction Mass	5167
HCL Solution	11225
Total	**16392**

DROWNING

Output	Kg
Mass	16255
HCl gas	137
Total	**16392**

Input	Kg
Mass	16255
Washing water from previou batch	10080
Total	**26335**

ACIDIC FILTRATION & WASHING

Output	Kg
Cake crude Green	1885
AlCl3 solution	14220
Wash water	10230
Total	**26335**

Input	Kg
Crude Cake	1885
Recycled MCB (Recover) + Water	8018
MCB	165
Fatty acid/Additives	60
Caustic Flakes	112
Steam	2291
Total	**12531**

PURIFICATION (DISTILLATION)

Output	Kg
Slurry	4348
MCB + Water	8018
MCB Loss	165
Total	**12531**

Input	Kg
Mass	4348
Water	14283
Total	**18631**

FILTERPRESS-2

Output	Kg
Cake	2219
Filtrate	6332
Washing(reused in next batch)	10080
Total	**18631**

Input	Kg
Mass	2219
Total	**2219**

DRYING (SFD)

Output	Kg
Product	**1389**
Evaporation loss	830
Total	**2219**

MATERIAL BALANCE AT SCRUBBER SYSTEM

Input	Kg
Chlorine	106
HCl gas	527
Water	4798
TOTAL	**5431**

SCRUBBER 1

Input	Kg
Chlorine	106
HCl Solution in Drowning vessel	5325
	.
TOTAL	**5431**

Input	Kg
Chlorine	106
NaOH Solution(10% Caustic Solution)	200
	800 water
TOTAL	**1106**

SCRUBBER 2

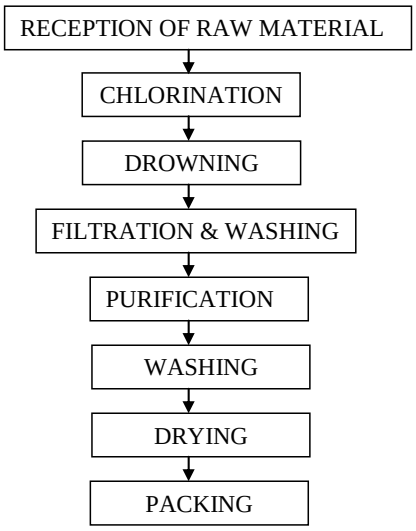
Input	Kg
Sodium Hypo Solution	1106
TOTAL	**1106**

Input	Kg
HCl gas	137
Water	5763
TOTAL	**5900**

SCRUBBER 3

Input	Kg
HCl Solution in Drowning vessel in next batch	5900
TOTAL	**5900**

PROCESS FLOW DIA-GRAM OF PHTHALOCYANINE GREEN-7



(2) POLY ALUMINIUM CHLORIDE

MANUFACTURING PROCESS:

- Manufacturing process of Poly Aluminum Chloride is briefly described as below.

MANUFACTURING PROCESS:

1) Exothermic reaction

Take liquid Aluminum Chloride solution in vessels. Then add Aluminumhydroxide. Then add sulphuric acid-98% stirred well up to dissolved at room temperature.Then add Soda Ashstirred well up to dissolved at room temperature. After the reaction filter it. Recover back aluminumhydroxideand use again in the next batch. Collect the finished Poly Aluminum Chloride in Storage tank

CHEMICAL REACTION

$$AlCl_3 + Al(OH)_3 \longrightarrow Al_2(OH)_3Cl_3$$

MATERIAL BALANCE

MATERIAL BALANCE

Input	Kg
Aluminium Chloride solution(14 to 15%)	1000
Aluminium hydroxide	50
Sluphuric acid-98%	50
Soda ash	100
Total	**1200**

MIXING IN VESSEL

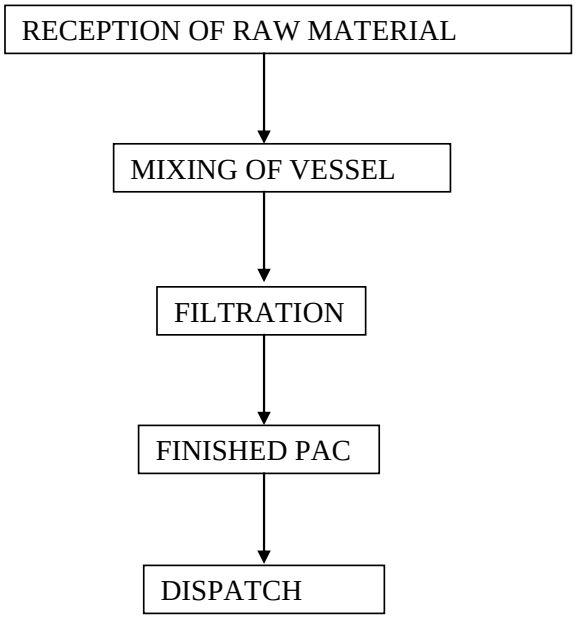
Output	Kg
Reaction Mass	1200
Total	**1200**

Input	Kg
Reaction mass	1200
Total	**1200**

FILTERATION

Output	Kg
Product(PAC)	**1150**
Aluminium hydroxide(recycled in next batch)	50
Total	1200

PROCESS FLOW DIA-GRAM OF POLY ALUMINIUM CHLORIDE



(3)ALUMINIUM CHLORIDE HEXAHYDRATE:

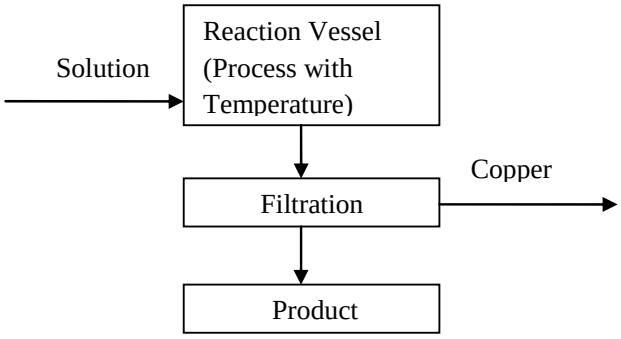
MANUFACTURING PROCESS:

Take liquid Aluminium Chloride solution in vessels and the temperature is given to aluminium chloride. The copper separate from it and gets clear solution of Aluminium Chloride Hexahydrate.

CHEMICAL REACTION:

$AlCl_3 + 6H_2O \longrightarrow AlCl_3.\ 6H_2O$

PROCESS FLOW DIAGRAM OF ALUMINIUM CHLORIDE HEXAHYDRATE



ANNEXURE-7

WATER CONSUMPTION

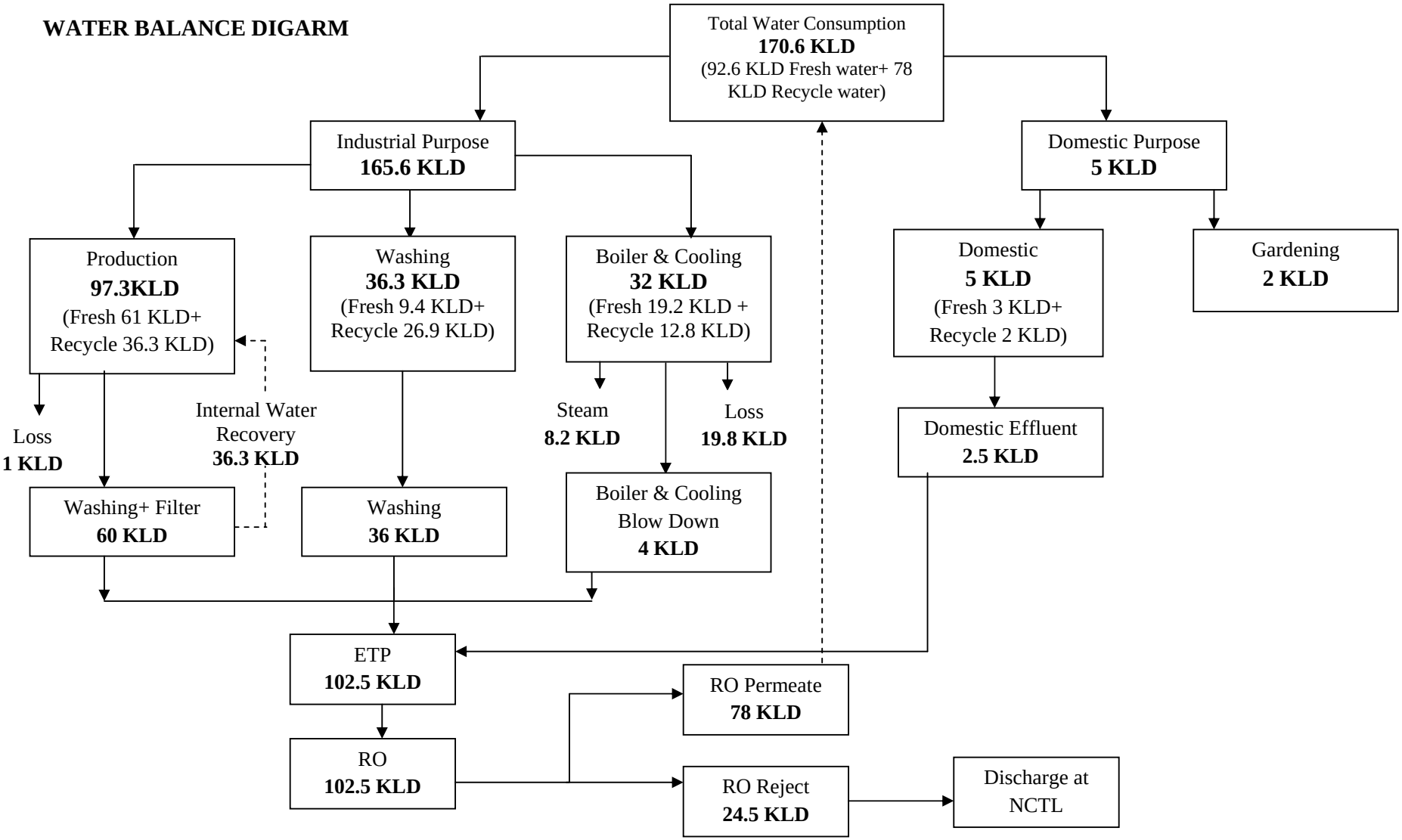
Sr. No	Particulars	Existing Water Consumption KL/ Day	Proposed Water Consumption KL/Day			Total Water Consumption KL/Day		
			Fresh	**Recycle**	**Total**	**Fresh**	**Recycle**	**Total**
1.	**Domestic**	**1.5**	**1**	**0.5**	**1.5**	**2.5**	**0.5**	**3**
	Gardening	0	0.5	1.5	2	0.5	1.5	2
2.	**Industrial**							
1)	Process	15	46	36.3*	82.3	61	36.3*	97.3
2)	Washing	6.5	2.9	26.9*	29.8	9.4	26.9*	36.3
3)	Boiler & Cooling	9.5	9.7	12.8*	22.5	19.2	12.8*	32
	Total Industrial	31	58.6	76	134.6	89.6	76	165.6
	Total Water Consumption (Domestic + Industrial)	**32.5**	**138.1**			**170.6 KLD (Fresh Water 92.6 KLD + Recycle Water 78 KLD)**		

- ***Recycle water from R.O.**

WASTE WATER GENERATION

Sr. No	Particulars	Existing Waste Water Generation KL/ Day	Proposed Waste Water Generation KL/day	Total Waste Water Generation KL/Day
1.	**Domestic**	**1.5**	**1**	**2.5**
	Gardening	--	--	
2.	**Industrial**			
	Process	14.5	45.5	60
	Washing	5.5	30.5	36
	Boiler & Cooling	3	1	4
	Total Industrial	**23**	77	100
	Total Waste Water Generation (Domestic + Industrial)	**24.5**	**78**	**102.5**

WATER BALANCE DIGARM



ANNEXURE – 8

EFFLUENT TREATMENT PLANT

ETP DESCRIPTION:

Raw effluent from plant is collected in collection tank. Then, neutralized by lime and transferred to pre-primary clarifier. Upper layer i.e. clear water is transferred to primary treated holding sump and bottom layer is passed though filter press, whereby clear water is allowed to go into primary treated water sump whereas sludge from filter press is transferred to sludge drying bed, dried and shifted to solid waste storage area, which is then disposed of at TSDF site BEIL time to time.

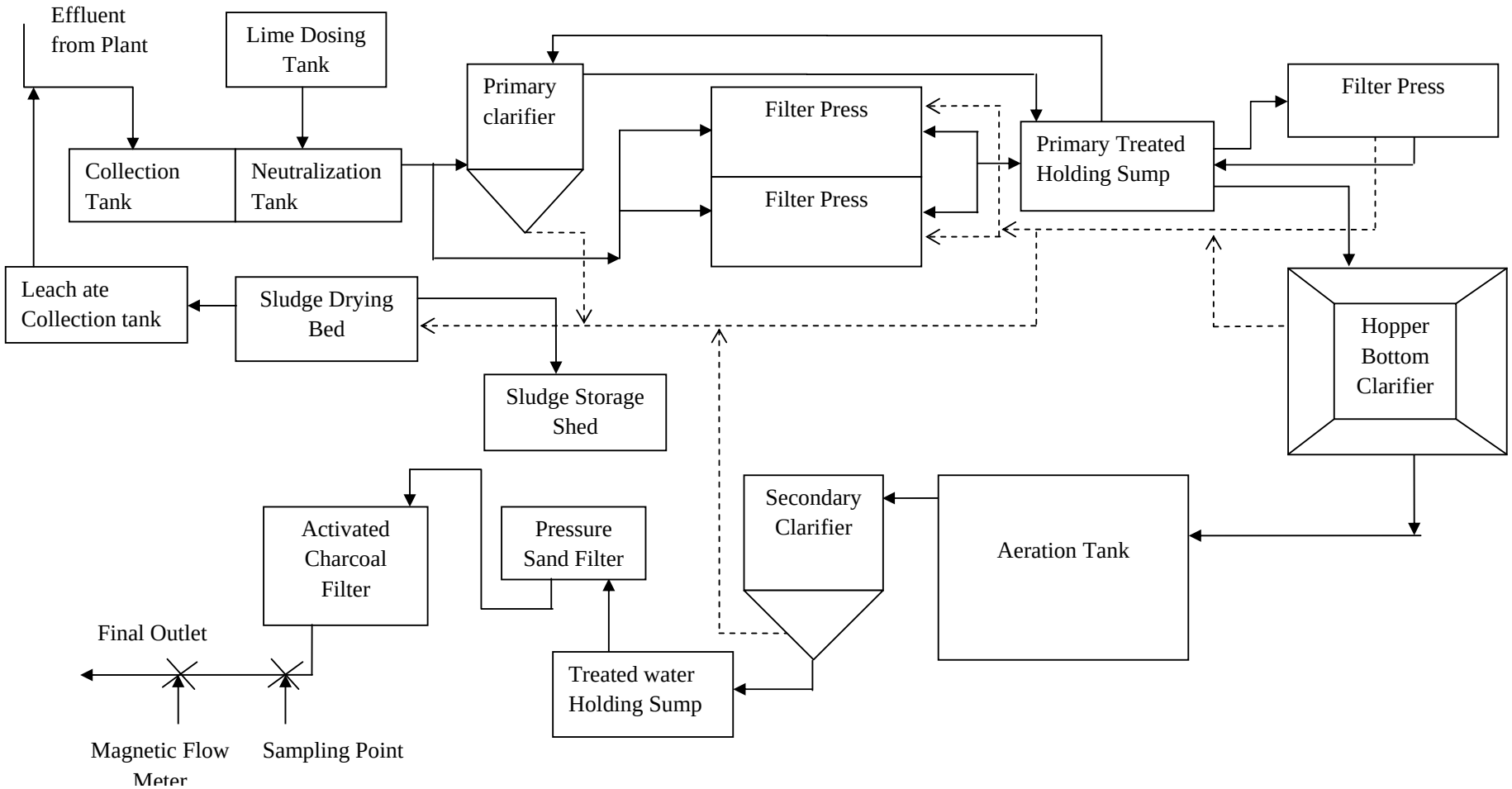
The primary treated water is gradually added in to aeration tank for the bacterial treatment with enough retention time and then allowed this treated water in to secondary clarify with circulation arrangement from Bottom.

The secondary treated water is collected in a guarded pound (sump) is passed through sand filter and then through activated carbon from the tertiary treatment and such treated water, After proposed Expansion R.O will be installation for further treatment . R.O. which will be generating permeates which will be reused and R.O. reject will be discharge into GIDC underground drainage through magnetic flow meter. There will be no Change in water discharge.

PARTICULARS OF EFFLUENT TREATMENT PLANT

Sr. No	Name of the Unit	Capacity
1.	Acid proof brick lined Collection Tank	3.1 x 3.1 x 3.12 = 30 M^3
2.	Acid proof brick lined equalization cum Neutralization Tank	3.1 x 3.1 x 3.12 = 30 M^3
3.	Lime Tank/ Flash Mixer	1.5∅ x 1.8 H = 3 M^3
4.	Primary Clarifier/ Hopper bottom setting Tank	2.0∅x 3.2 H = 10 M^3
5.(a)	Filter Press	36” x 36“ x 47 PP Plate
5.(b)	Filter Press	36” x 36“ x 47 PP Plate
6.	Aeration Tank wit Root blower + compressor Air sparging in creased	5 HP/120 CFM 7.5 HP/ 72 CFM
7.	Chemical Dosing Tank	1.0 x1.0 x 1.2 = 1.2 M^3
8.	Primary Clarifier	3.5 M x 3.5 M x 3.27 M= 40 M^3
9.	Sludge Drying Bed	4 No. each of Size: 3.0 M x 2.0 M x 0.5 M
10.	Sludge Storage Shed	3.5 x 7.0 x 3=73.5 M^3
11	Aeration tank with surface aerator	7.0 x 7.0 x 3.3= 161.7 M^3 Working Volume
.12.	Secondary Clarifier (With re-circulation arrangement)	3.5 x 3.5 x3.27 = 40 M^3
13.	Treated water holding sump	3.5 x 3.5 x 3.27 = 40 M^3
14.	Pressure sand filter	1.4 ∅ x 2 H= 3 M^3
15.	Activated Charcoal Column	1.2 ∅ x 1.8 H = 2 M^3
16.	Final Outlet Sampling Point	1”∅
17.	Magnetic flow meter	50 MM ∅

ETP FLOW DIAGRAM



WASTE WATER CHARACTERISTICS

Sr. No	Parameters	Units	Before Treatment	After Treatment
1.	Temperature	Centigrade	35°C	33 °C
2.	p^H	p^H Units	3.7	7.55
3.	Colour	Pt. Co. Sc.	18	<2.5
4.	Total Dissolved Solid	mg/Lit	8324	2270
5.	Suspended Solid	mg/Lit	145	12
6.	Ammonical Nitrogen	mg/Lit	32	4
7.	Chloride	mg/Lit	6230	2150
8.	Sulphate	mg/Lit	140	55
9.	Chemical Oxygen Demand	mg/Lit	272	104
10.	Oil & Grease	mg/Lit	2	BDL
11.	Copper	mg/Lit	97	N. A.
12.	Biological Oxygen Demand (3days 27 °C)	mg/Lit	85	27

ANNEXURE- 9

FUEL CONSUMPTION

SR. NO	FUEL	QUANTITY (As per CCA No:- AWH-84549)	QUANTITY (As per proposed expansion)	TOTAL QUANTITY
1.	Natural Gas	150 M^3/ Day	1250 M^3/ Day	1400 M^3/ Day
2.	Wood/ Agro Waste/ Briquettes	0.7 MT/ day	14.3 MT/ Day	15 MT/ Day
3.	Diesel	---	0.2 KL/Day	0.2 KL/Day
POWER CONSUMPTION				
1.	Electricity	100 KW	150 KW	250 KW

ANNEXURE-10

FLUE GAS EMISSION

Sr. No	Stack Attached To	Stack Height in Meter	Type Fuel	Air Pollution Control System	Parameter	Permissible Limit
EXISTING EQUIPMENTS						
1.	Boiler/ Air Heater	12	Agro Waste/ Briquettes / Natural Gas	Multi Cyclone separator	Particulate Matter SO_2 NO_X	150 mg/Nm^3 100 ppm 50 ppm
2.	Thermic Fluid Heater	12	Natural Gas	----		
PROPOSED EQUIPMENT						
1.	Boiler 1 (1 MT/hr per each) And Air Heater (6lacs K. Cal/hr)	12	Agro Waste/ Briquettes Natural Gas	Multi Cyclone separator	Particulate Matter SO_2 NO_X	150 mg/Nm^3 100 ppm 50 ppm
2.	Thermic Fluid Heater (3 lacs K. Cal/hr) And Boiler * (3 MT/hr)	12	Wood/ Natural Gas	Multi Cyclone separator		
3.	D. G. Set* (125 KVA)	12	Diesel	----		

* There are Boiler and D. G. Set standby facilities. There will be alternative fuel for Boiler. Wood/ Agro Waste, and Natural gas will be used alternatively.

PROCESS GAS EMISSION

Sr. No	Stack Attached To	Stack Height in Meter	Air Pollution Control System	Parameter	Permissible Limit
	Existing Equipment				
1.	Glass Lined Reactor	17	Two Stage water scrubber + Caustic Scrubber	HCl Cl_2	20 mg/ Nm^3 09 mg/ Nm^3
	Proposed Equipment				
1.	Glass Lined Rector	17	Two Stage water scrubber + Caustic Scrubber	HCl Cl_2	20 mg/ Nm^3 09 mg/ Nm^3

ANNEXURE-11

HAZARDOUS WASTE GENERATION

Sr. No	Waste	Category	Quantity/ Month (As per Existing)	Quantity/ Month (As per Proposed Expansion	Total Month	Facility
1.	ETP Waste	35.3	120 MT/Month	780 MT/Month	900 MT/ Month	Collection, Storage, Transportation, Disposal at TSDF- BEIL, Ankleshwar
2.	Used oil	5.1	3 KL/Year	--	3KL/Year	Collection, Storage, Transportation, Disposal by selling to Registered re-finer.
3.	Aluminium Chloride Solution (If the AlCl3 will not be sold, then It will be sold after converted into PAC or Aluminium Chloride Hexahydrate)	B30	60 MT/ Month	725 MT/ Month	785 MT/ Month	Collection, Storage, Transportation, either by sell out to authorized users who is having authorization with valid CCA and rule 9 permission to receive this waste.
4.	Hypo Chloride	B7	6 MT/ Month	54 MT/Month	60 MT/ Month	Collection, Storage, And reused in process as captive consumption within unit
5.	Spent Hydrochloric Acid	B10	--	100 MT/ Month	100 MT/Month	Collection, Storage, Transportation, either by sell out to authorized users who is having authorization with valid CCA and rule 9

						permission to receive this waste.
6.	Discarded Bags/ Liners	33.1	600 Nos./Year (4.8 MT/Year)	5400 Nos./Year (43.2 MT/Year)	6000 NOs/ Year (48 MT/Year)	Collections, Storage , Transportation, Disposal either by selling to actual end users such as M/S Quality Chemical Industry, GIDC - Chitra, Bhavnagar Through manifest.
7.	Copper Metal recovery	---	---	8 MT/Month	8 MT/Month	Sell to Authorize Vendor.
8.	Activated Carbon Waste	28.3	6 MT/Month	----	6MT/Month	Collection, Storage, Transportation, Incineration

ANNEXURE-12
LIST OF HAZARDOUS CHEMICALS

Sr. No	Name of Chemicals
1.	Mono Chloro benzene
2.	Aluminium Chloride
3.	Chlorine
4.	Copper dichloride
5.	Sodium Hydroxide

ANNEXURE-13

AIR POLLUTION CONTROL MEASURES

There is one No. of IBR type Boiler and one Thermic heater (TFH) in the plant and Natural Gas is used as fuel at the rate of approx. 850 M^3/ Day. A stack of 8 mt height is provided attached to the Boiler and stack Monitoring facilities are provided in the said stack. The pollutants are well within the tolerance limit specified by the Board.

Water and alkali scrubber provided at glass lined reactor. During chlorination process, HCl out of gas mixture of HCl + Cl_2 is scrubbed out by adsorption in to counter current spray of re circulation water form dilute HCl. The unabsorbed HCl + Cl_2 gases are scrubber with counter current spray of re circulating dilute NaOH solution Hypochlorite is produced. Drawing vessel gas line also connected with this scrubbing system.

DETAILS AND SIZE OF SCRUBBING SYSTEM

Sr. No	Name of Equipment	Size	Capacity
Primary System			
1.	HCl/ Intermediate Tank Tank- A		800 lit
2.	HCl Tank (30 % HCl) Tank- A		5000 lit
3.	HCl Scrubber P-1	880 mm dia x 5 mtr	
4.	Intermediated Pump	1 HP	3 m^3/hr
5.	HCl Pump (Venture Pump)	3 HP	15 m^3/hr
6.	HCl Scrubber pump	3 HP	15 m^3/hr
Secondary System			
1.	Water Scrubber P-2	300 mm dia x 3 mtr	
2.	Caustic Scrubber P-3	300 mm dia x 3 mtr	
3.	HCl Tank. Tank- C		4000 lit
4.	Caustic Tank. Tank- D		3 KL
5.	Water recirculation pump	1 HP	8 m^3/hr
6.	Ejector Pump	3 HP	15 m^3/hr
7.	Blower	3 HP	15 m^3/hr (gas 5)

DIAGRAM OF AIR PPLLUTION MEASURE