PRE-FEASIBILITY REPORT

Proposed expansion in existing production capacity and addition of new products

ATUL LIMITED

AT & POST: ATUL – 396 020, DIST: VALSAD

Contents

LIST OF ANNEXURE

Annexure No.	Description
Annexure-1	Layout plan showing existing & proposed area
Annexure-2	Manufacturing process
Annexure-3	Google map of the project site
Annexure-4	Location of the project site
Annexure-5	Water balance diagram
Annexure-6	ETP flow diagram
Annexure-7	Location of discharge point of treated effluent through pipeline
Annexure-8	Details of process emission

1. EXECUTIVE SUMMARY

Atul Ltd is a member of Lalbhai Group, one of the oldest business houses of India, with interests mainly in textiles and chemicals. The Group is strongly committed to serve the society in the fields of education, health as well as culture.

This is Multipurpose Plant with common Equipments and Multi utility facility for manufacturing of Technical Products and Bulk Formulation. This plant contains Reaction vessels, distillation setup, filtration and drying equipments. Utilities available like Cooling Water, Chilled water Plant, Chilled Brine Plant, Air Compressor, Nitrogen plant, Steam.

The pre-feasibility report includes a brief introduction of the company, need and justification of the project, manufacturing process description, required and available resources, proposed Environment Management Systems, existing land-use and proposed infrastructure, project schedule and cost estimate, and proposed Terms of reference for conducting the EIA studies.

The industry has engaged Eco Chem Sales & Services (ECSS) as their Environment Consultant to conduct the Environmental Impact Assessment (EIA) studies for obtaining Environmental Clearance(EC) for the proposed project. ECSS is a National Accreditation Board for Education & Training (NABET) accredited Environmental Consultant.

PROJECT BRIEF		
No.	**Description**	**Proposed Project Details**
1.	Name of project & Address	ATUL LIMITED. AT & POST: ATUL – 396 020, DI.: VALSAD
2.	Project Category	5–f (a) of EIA notification – 2006.
3.	Project capital cost	Rs. 1,857.00Lacs
4.	Products	Mention in 4.3.6 of section – 4.
5.	By-products	No by products
6.	Resource Requirement	
a.	Land	**Existing**
b.	Water	**Source:**River PAR **Existing:**22,569 KL/day **Proposed:**5,788.70KL/day **Total after proposed expansion:**28,357.70 KL/day
c.	Electricity	**Existing:** Power: 34 MW co-gen. Captive power plant D. G. Set: 3,100 KVA **Proposed:** Power: Approx. 15 MW from co-gen. Captive power plant.
e.	Man power	Construction phase – 200 nos. Operation phase – 50 nos.
7.	**Source of Pollution**	
a.	Waste Water Generation	**Existing:** Normal Effluent :17,283.00KL/day High COD effluent: 23.00 KL/day High TDS effluent: 97.00 KL/day Total Industrial effluent to ETP: 21,337.00 KL/day Sewage : 937.00 KL/day **Proposed:** Normal Effluent : 158.51 KL/day High COD effluent: 57.57 KL/day High TDS effluent: 1,298.95 KL/day Total Industrial effluent to ETP: 1,684.51 KL/day Sewage : 2.00 KL/day **Total after proposed expansion:** Normal Effluent : 17,441.51 KL/day High COD effluent: 80.57 KL/day High TDS effluent: 1,395.95 KL/day Total Industrial effluent to ETP: 23,021.51 KL/day Sewage : 939.00 KL/day
b.	Air Emission	Flue gas emmission: PM_{10} , $PM_{2.5}$, SOx & NOx Process gas emission: Phosgene, Cl_2, HCl, PM, SO_2, NOx, Acid mist, NH_3, Br_2,

c.	Solid Waste Generation	Mention in section – 8.
8.	**Mode of Treatment**	
a.	Waste water	**Existing:** 1. The normal effluent is treated in adequate ETP of 20 MLD capacityand the final treated effluent is collected in the guard pond and then discharged through closed pipeline to estuary zone of River Par via diffuser. 2. Domestic effluent will be treated in septic tank/soak pit system. **Proposed:** The waste water generated from the proposed expansion will be treated in existing ETP with necessary modification.
b.	Air	Air pollution control devices – Adequate scrubber with stack of sufficient height shall be provided for process gas emission to achieve GPCB norms. The details of Air pollution control measures for process gas emission and flue gas emission are mentioned in section 7.
c.	Solid Waste	The details of solid/hazardous waste for collection, storage and disposal to be carried out as per Hazardous Waste Management Rules.

2. INTRODUCTION OF THE PROJECT

2.1 Identification of project and project proponent

Atul Ltd is a member of Lalbhai Group, one of the oldest business houses of India, with interests mainly in textiles and chemicals. The Group is strongly committed to serve the society in the fields of education, health as well as culture.

Incorporated in 1947, Atul Ltd (formerly Atul Products Ltd) was founded by KasturbhaiLalbhai with a dream to make India self reliant in chemicals, generate employment on a large-scale and create wealth for the society. Atul Ltd became the first private sector company of India to be inaugurated by Jawaharlal Nehru, the first Prime Minister of the country. The Company thus commenced its business with just a few dyestuffs, the know-how of which was brought from foreign companies.

Over the years, Atul Ltd joined hands with American Cyanamid Corp (1952), Imperial Chemical Industries plc (1955) and Ciba-Geigy Ltd (1960) to form respectively 3 joint venture companies, namely, Cyanamid India Ltd, Atic Industries Ltd and Cibatul Ltd respectively. Consequent to worldwide divestment of dyes and polymers business by ZENECA plc (formerly a part of ICI plc) and Ciba Ltd respectively, Atic Industries Ltd and Cibatul Ltd were merged into Atul Ltd in 1995 and 1998 respectively.

Atul's registered office is in Ahmedabad whereas its corporate headquarters are located in Atul, Gujarat. The Company is listed on the NSE in India and has over 35,000 shareholders. Atul also has offices in the USA, UK, Germany, China and Vietnam that service its international customers.

2.2 Brief description of nature of the project

This is Multipurpose Plant with common Equipments and Multi utility facility for manufacturing of Technical Products and Bulk Formulation. This plant contains Reaction vessels, distillation setup, filtration and drying equipments. Utilities available like Cooling Water, Chilled water Plant, Chilled Brine Plant, Air Compressor, Nitrogen plant, Steam.

2.3 Need of Proposed Project

- Change in market Demand.
- Utilization of Resource

- New technology cost effective and Environmental friendly manufacturing.
- Move twords the cleaner and safer Manufacturing Processes.
- Volatile Market Situation and selective customer demands.
- Considering Export Opportunity by meeting International Quality with World class technology.

2.4 Demand Supply Gap

Existing Products:

Increased demand from Market Local and International. (Based on Forecast)

New Product:

Increase the Scope of Supply as per market demand and oppurtinity (Based on Forecast)

2.5 Employment Generation

There are possibilities to generate employment during the construction and operation phase of the proposed project. Local skilled and semi-skilled workers will be hired during construction phase, thus no need to provide housing facility to workers. Approx. 200 nos. of people will get direct employment during construction phase.

During operation phase, technical staff for plant, General staff for administrative work and other ancillary services i.e. Security, O&M contractor and maintenance services will be required. After proposed expansion, total aprox50 nos. of individuals will get direct employment during operation phase.

3. PROPOSED PROJECT & APPLICABILITY OF EIA

The company is located at Atul Complex, Valsad District, Gujarat.Atul Complex is self sufficient in meeting continuous and uninterrupted steam demand for all its chemical manufacturing processes and it also meets more than 95% of electricity demand for its housing colonies.

The unitis now planning to expansion in existing production capacity and addition of new products within existing premises. The expansion in the existing production capacity and addition of new products falls under the item no. 5 (f) i.e. Synthetic organic chemicals industry and under Category A (Located outside notified industrial area) as per the EIA notification-2006 (as amended timely).Hence it is required to apply for approval of Terms of Reference (TOR) with Form-I along with Pre-feasibility Report to the Ministry of Environment & Forest (MoEF). The EIA study is required to comply with all the approved TORs from MoEF. Public hearing for the same is necessary as per the provision of the EIA Notification dated 14thSeptember, 2006.

4. PROJECT DESCRIPTION

The company is located atAtul Complex, Valsad District, Gujarat. The Google map of the project is attached as **Annexure – 3**.

4.1 Project Location

The company is located at Atul Complex, Valsad District, Gujarat. The location of the project site is given in the **Annexure-4.**

The project site falls in Valsad district of Gujarat and is located at 72°55′33″ E Longitude 20°36′36″ N Latitude. Nearest railway station from project site is Atulwhich is approximately 3km away from the project site, whereas Valsadrailway station is approximately 8 km away from the project site.

The site is connected by road with NH-8 which is around 0.8 km from the project site. The nearest town from project site is Valsad, which is located about 10km away from the project site.

4.2 Alternative Sites

No alternative site is required as proposed project is expansion in existing production capacity and addition of new products within existing premises.

4.3 Resource Requirement

To carry out proposed expansion various resources like raw materials, power, fuel, water, manpower,etc will be utilized.

4.3.1 Raw Material

Estimated requirements of various raw materials for expansion in existing production capacity and addition of new products are given with the manufacturing process.

4.3.2 Land Requirement

As mentioned above, expansion in existing production capacity and addition of new productsare develop within existing premises by using existing infrastructure. No additional land will be purchased/procured for the same. Plant layout is attached as **Annexure-1.**

4.3.3 Man Power

Approx200 nos. of people will get direct employment during construction phase. Based on unit organizational pattern, after proposed expansion total 50 nos. of people will be required to operate plants.

4.3.4 Electricity

a. Existing

1. **Power requirement**: 34MW co-gen. Captive power plant
2. D.G. Set – 3,100 KVA

b. Proposed

1. **Power requirement**:Approx. 15 MW from co-gen. Captive power plant.

4.3.5 Water Requirement

The total water requirement is given in following table no. 2

Table No. 2 – Total Water Consumption

Sr. No.	Particular	Existing	Proposed	Total
		(KL/Day)		
I	**Domestic**	**937.00**	**2.00**	**939.00**
II	**Industrial**			
1.	Processing + washing	16,376.00	1,281.70	17,657.70
2.	Boiler	1,170.00	1,958.00	3,128.00
3.	Cooling	2,735.00	2,047.00	4,782.00
4.	cont. & floor etc. washing	1,351.00	500.00	1,851.00
III	**Total (II)**	**21,632.00**	**5,786.70**	**27,418.70**
	Total (I+III)	**22,569.00**	**5,788.70**	**28,357.70**

4.3.6 Production details

The product details are given in following table no. 3.

Table No. 3 – Production Details

Sr. No.	Product	Capacity (TPM)		
		Existing	Proposed	Total
A	**DYES**			
1.	Azo dyes	550.00	0.00	550.00
2.	Sulfur Black	250.00	583.33	833.33
3.	Sulfur Dyes Range	25.00	0.00	25.00
4.	Napthol Range	75.00	0.00	75.00
5.	Fast Color Bases	40.00	0.00	40.00
6.	Disperse Dyes (Atul-East) + Disperse Dyes (Atul-West)	118.50	0.00	118.50
7.	Optical Brighteners	10.00	0.00	10.00
8.	Reactive Dyes	127.30	0.00	127.30
9.	Vat dyes	105.00	---	105.00
	Total Production Capacity of Dyes	**1,300.80**	**583.33**	**1,884.13**
B	**CHLORO – ALKALI INDUSTRY**			
10.	Caustic soda / Potash & Sodium Sulfide	1,800.00	2,200.00	4,000.00
11.	Liquid Chlorine / HCl	1,600.00	1,900.00	3,500.00
	Total Production Capacity of CHLORO – ALKALI INDUSTRY	**3,400.00**	**4,100.00**	**7,500.00**

Sr. No.	Product	Capacity (TPM)		
		Existing	Proposed	Total
C	**PESTICIDE TECHNICAL**			
12.	Carbamate group of Agrochemicals	33.3	10	43.3
13.	Diuron	20	200	220
14.	Isoproturon	8.30	-8.30	0.00
15.	Metoxuron	8.30	-8.30	0.00
16.	Trichlo Carbon	8.30	0.00	8.30
17.	Cartap. HCl	50.00	0.00	50.00
18.	Carbendazim	20.90	0.00	20.90
19.	Herbicides (2,4 – D & related products)	1,670.00	0.00	1,670.00
20.	Pyridine based insecticides & Herbicides chemical Imidacloprid	25.00	4.16	29.16
21.	Triazole based Fungiside	1.67	0.00	1.67
22.	Pyrethroides	10.00	0.00	10.00
23.	Sulphonyl Urea	25.00	10.25	35.25
24.	MCPA	500.00	0.00	500.00
25.	Glyphosate	50.00	15.00	65.00
26.	Isoprothiolane	8.30	10.00	18.30
27.	Fipronil	5.00	0.00	5.00
28.	Formulation	200.00	0.00	200.00
29.	Pyrazosulfurone	0.00	0.50	0.50
30.	BisPyribac Sodium	0.00	0.83	0.83
31.	Azoxystrobin	0.00	2.08	2.08
32.	Quizalofop	0.00	1.25	1.25
33.	Thiamethoxam	0.00	10.00	10.00
34.	Metribuzine	0.00	10.00	10.00
35.	Diafenthiurone	0.00	4.17	4.17
Total Production Capacity of PESTICIDE TECHNICAL		**2,644.07**	**261.64**	**2,905.71**
D	**BULK DRUGS & PHARMACEUTICALS**			
36.	Mabendazole	2.00	0.00	2.00
37.	Tolbutamide	2.50	0.00	2.50
38.	Quiniodochlor	15.00	0.00	15.00
39.	Bulk drugs & intermediates	9.60	0.00	9.60
40.	Diclofenac Sodium / Potassium	2.50	0.00	2.50
41.	Atenolol	1.70	0.00	1.70
42.	Fresamide	1.30	0.00	1.30
43.	Trimethoprim	0.90	0.00	0.90

Sr. No.	Product	Capacity (TPM)		
		Existing	Proposed	Total
44.	Para Hydroxyacetophenone	1.70	0.00	1.70
45.	Para Hydroxy Phenyl acetamide	3.00	0.00	3.00
46.	Acyclovir	5.20	0.00	5.20
47.	Bathenechol	5.20	0.00	5.20
48.	Pharma Intermediates and chemicals	300.00	0.00	300.00
	Total Production Capacity of BULK DRUGS & PHARMACEUTICALS	**350.60**	**0.00**	**350.60**
E	**RESIN**			
49.	Epoxy Resin	2,500.00	100.00	2,600.00
50.	Vinyl Ester Resins	37.50	0.00	37.50
51.	Ketone Formaldehyde Resins &Sulphonamide, Formaldehyde Resins	20.80	0.00	20.80
52.	UF/MF/PF/ Di Cyanadiamide Resins	270.90	0.00	270.90
53.	Polyamide Resins	161.70	0.00	161.70
54.	Polygrip rubber based	0.00	300.00	300.00
55.	Polygrip TPU based	0.00	41.67	41.67
	Total Production Capacity of RESIN	**2,990.90**	**441.67**	**3,432.57**
F	**OTHER CHEMICALS**			
56.	Anthraquinone, Naphthalene, Benzene Intermediates. (including Beta – Napthol& BON Acid	740.00	0.00	740.00
57.	M Hydroxy Phenol	460.00	0.00	460.00
58.	Anisole	0.00	166.00	166.00
59.	1,3 Cyclohexanedione	0.00	80.00	80.00
60.	Resoform P-18	0.00	85.00	85.00
61.	Resoform P-19			
62.	Resoform P-20			
63.	Carbamite	30.00	0.00	30.00
64.	Chlorzoxazone& other related products	5.00	0.00	5.00
65.	Agro, Pharma intermediates, Isocyanats& Carbonate esters, chloroformats etc.	100.00	315.00	415.00
	Trans-4-MCHI	----		
	p-Anisylchloroformate			
	DI-TERT-BUTYL DICARBONATE (Boc. anhydride)			
	N, N- Disuccinimidyl Carbonate			
66.	HX-13059	0.00	5.00	5.00
67.	4 Ethyl 2,3 – Diocopiperazino carbonyl chloride	3.30	0.00	3.30
68.	IminoDibenzyl 5 Carbonyl Chloride	0.80	0.00	0.80
69.	Other chemicals (DCP, MCA, MEA, DEA, PCl3, PAA,	425.00	0.00	425.00

Sr. No.	Product	Capacity (TPM)		
		Existing	Proposed	Total
	MAP etc.)			
70.	Formaldehyde and base products	3200.00	0.00	3200.00
71.	Sulfuric acid / Oleum / Chlorosulphonic acid & salts	11,550.00	0.00	11,550.00
72.	Sulpha drug intermediates	193.80	0.00	193.80
73.	Acetyl Sulphanilyl Chloride & its derivatives	1,500.00	0.00	1,500.00
74.	Acetanilide	500.00	0.00	500.00
75.	Sulpha Methyl Phenazole Sodium	1.10	0.00	1.10
76.	Pyrazole Base	10.50	0.00	10.50
77.	Sulphanilic acid	25.00	0.00	25.00
78.	Bis Phenol A	416.70	0.00	416.70
79.	Hexamine	150.00	0.00	150.00
80.	Epoxy Intermediates	23.80	0.00	23.80
81.	Hardener & Auxiliaries	500.00	0.00	500.00
82.	Hardener & Intermediates	700.00	0.00	700.00
83.	Bisphenol S & Intermediate Chemicals	16.60	0.00	16.60
Total Production Capacity of OTHER CHEMICALS		**20,551.60**	**651.00**	**21,202.60**
G	**Flavors & Fragrances**			
84.	Anethole	0.00	166.66	166.66
85.	Avobenzone	0.00	83.33	83.33
86.	Raspberry Ketone	0.00	100.00	100.00
87.	P-AnisylPropanal	0.00	100.00	100.00
88.	Octacrylene	0.00	83.33	83.33
89.	OctylMethoxyCinnamate	0.00	200.00	200.00
	Total Production Capacity of this group	**0.00**	**733.32**	**733.32**
	Total	**31,237.97**	**6,770.95**	**38,008.92**

5. MANUFACTURING PROCESS

Manufacturing process with flow diagram, chemical reaction and mass balance is attached as **Annexure – 2** for each product.

6. WATER ENVIRONMENT

6.1 Water Consumption

Water consumption detail is mentioned in table no. 2.

6.2 Wastewater Generation

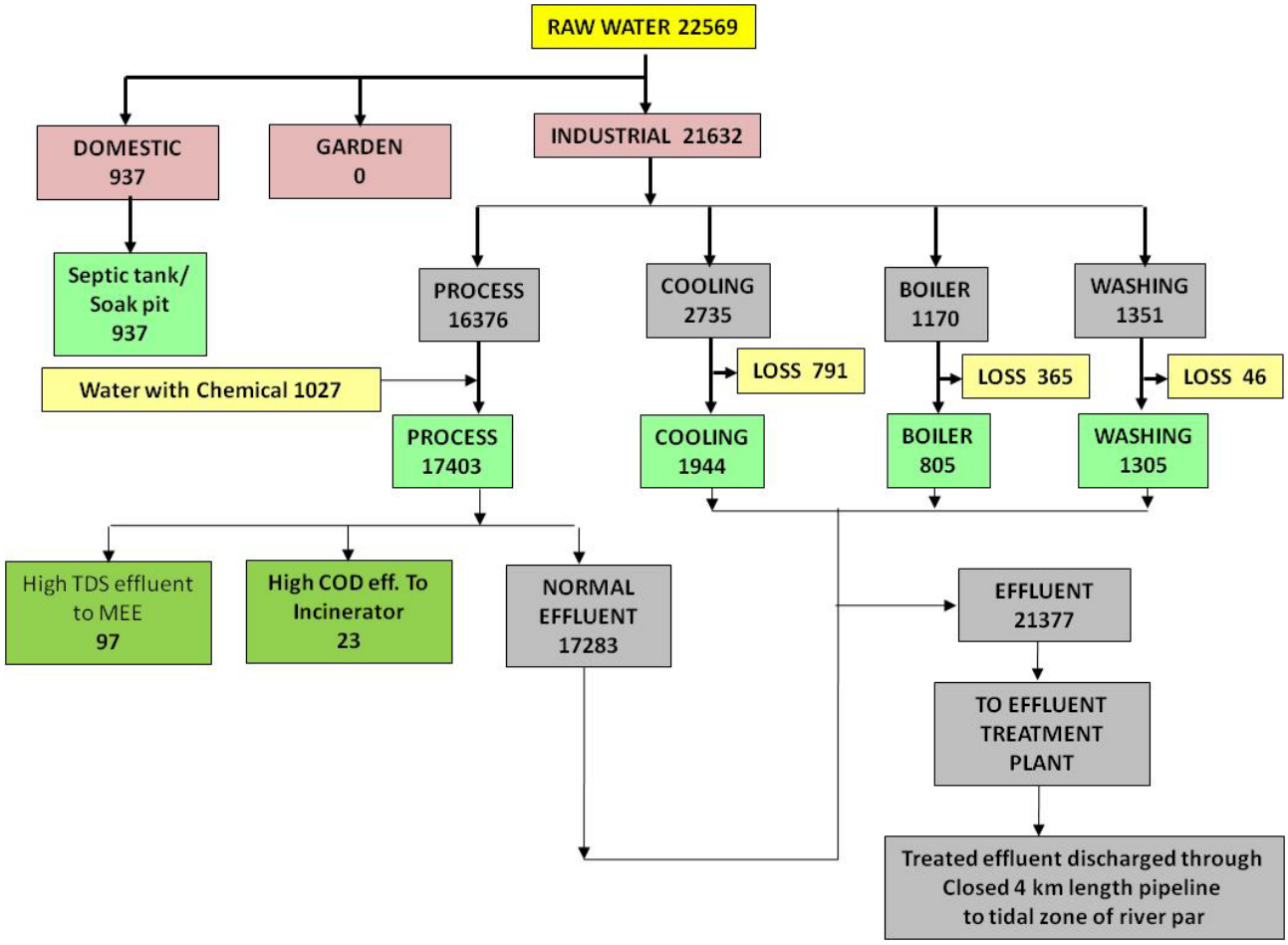
Wastewater generation with segregation of effluent streams detail is mentioned in table no. 4.

Table No. 4 – Wastewater generation with segregation of effluent streams

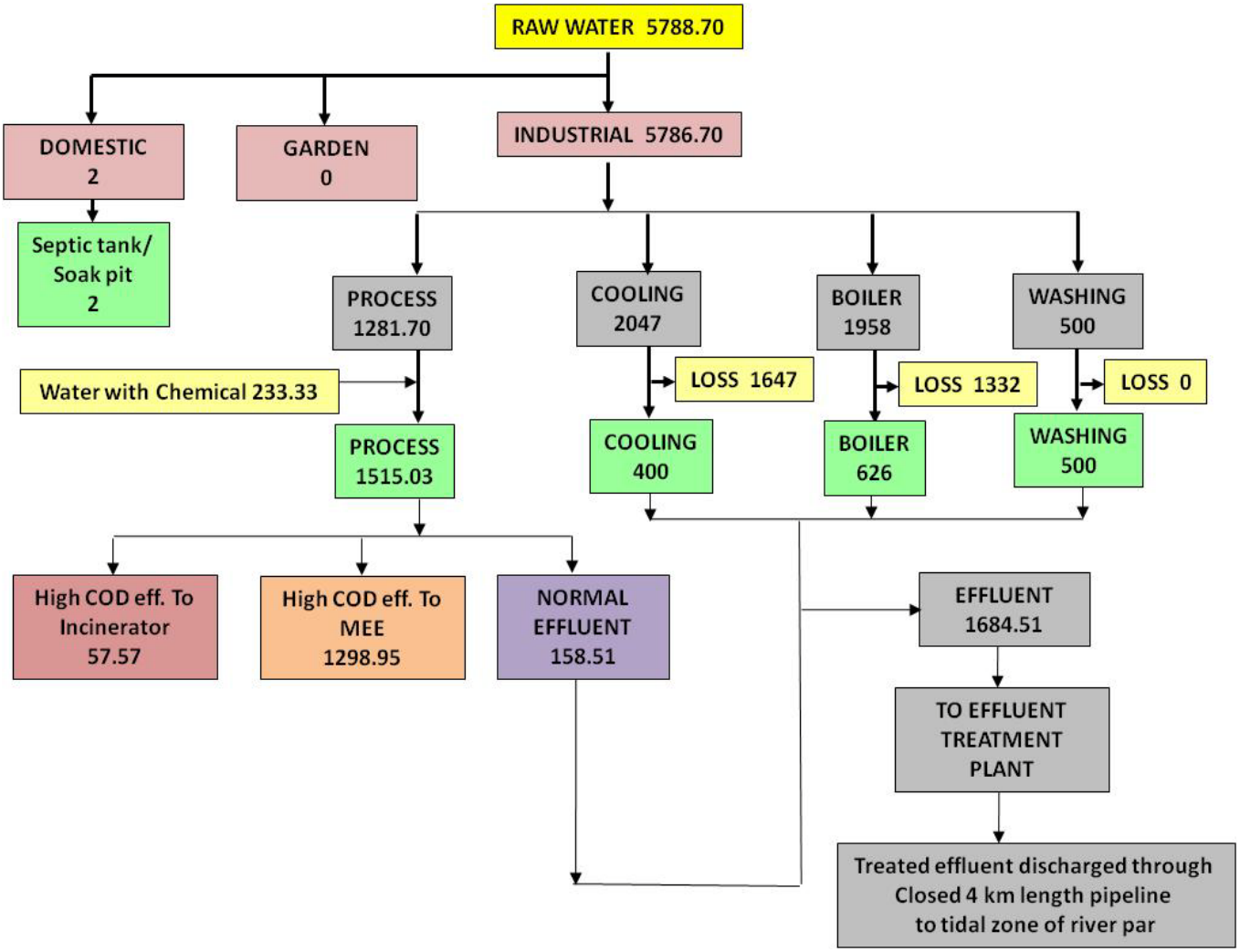
Sr. No.	Particular	Existing	Proposed	Total
		(KL/Day)		
I	**Domestic**	**937.00**	**2.00**	**939.00**
II	**Industrial**			
1.	Processing & washing	17,403.00	1,515.03	18,918.03
2.	Boiler	805.00	626.00	1,431.00
3.	Cooling	1,944.00	400.00	2,344.00
4.	Cont. & floor etc. washing	1,305.00	500.00	1,805.00
III	**Total (II)**	**21,457.00**	**3,041.03**	**24,498.03**
	Total effluent (I+III)	**22,394.00**	**3,043.03**	**25,437.03**
Segregation of con. effluent				
I	High COD effluent to Incinerator	23.00	57.57	80.57
II	High TDS effluent to MEE	97.00	1,298.95	1395.95
III	normal effluent stream to ETP	17,283.00	158.51	17,441.51
	Total segregation	**17,403.00**	**1,515.03**	**18,918.03**
Total effluent to ETP				
I	normal process effluent	17,283.00	158.51	17,441.51
II	Boiler	805.00	626.00	1,431.00
III	cooling water	1,944.00	400.00	2,344.00
IV	cont. & floor etc. washing	1,305.00	500.00	1,805.00
Total effluent to ETP(I+II+III+IV+V)		**21,337.00**	**1,684.51**	**23,021.51**

6.3 Water Balance Diagram

Water Balance Diagram for Existing (KL/Day)



Water Balance Diagram for Proposed (KL/Day)



6.4 Method of Treatment of sewage/wastewater

6.4.1 Sewage

Sewage will be expected to generate due to domestic activities of workmen and staff personnel during construction phase as well as operation phase. Existing sewage quantity of is 937 KLD during the operation phase and additional 2 KLD of sewage after proposed expansion will be generated during operation phase. Sewage generated during construction& operation phase will be treated in existing septic tank /soak pit facility.

6.4.2 Effluent

Effluent from the plant shall be properly segregated and treated individually as under:

High COD concentrated effluent stream shall be incinerated in company's own well designed (as per CPCB guidelines) existing incinerator. Existing incinerator is having sufficient capacity to take additional nominal load of proposed expansion as per CPCB guidelines. Incineration ash shall be disposed off at company's own approved land fill site.

High TDS effluent stream shall be evaporated in existing Multiple Effect Evaporation System. Evaporated salt shall be disposed off at Company's own approved land fill site. Existing MEE is having sufficient capacity to treat the additional hydraulic load from proposed expansion.

Normal effluent stream shall be treated in Normal effluent treatment plant. The existing total waste water generated from the plant is treated in full fledged Effluent Treatment Plant of 20 MLD capacity. The ETP consists of conventional primary, secondary and tertiary stage treatment units. The schematic flow diagram of existing ETP is attached as **Annexure-6**. Existing Effluent Treatment Plant is having sufficient capacity to take the additional load of proposed expansion. The final treated effluent from the ETP confirming the GPCB norms is collected in guard pond and then discharged through closed pipeline to estuary zone of river Par via a diffuser. The location of discharge point of treated effluent through pipeline is shown in **Annexure-7**.

a. Details of Existing Effluent Treatment Plant

PRIMARY:

Equalisation:

Capacity of combined equalization cum neutralization lagoons is 15,000 cubic meters. Such a high capacity is provided for avoiding shock variation due to large range of products made predominantly following batch processes. This also helps to avoid total plant stoppage in case of minor repairs on E.T. Plant.

Neutralization:

This is carried out in neutralizationtanks using two stage automatic lime stone powder / lime dosing system with incorporation of pH control instruments.

Turbo circulator:

The equalised and neutralised effluent contains traces of floating oil and suspended matter. Removal of these impurities is essential before the bio treatment step and is carried out in turbo circulator of capacity 2000 cubic meters. Turbocirculator is an efficient settling and skimming device with racking arm and provision of continuous removal of suspended matter and oil and grease. Coagulants and flocculation aids are added to promote destabilisation and agglomeration of colloidal particles.

SECONDARY:

Bio Treatment:

Here the facilities are created having 3600 cubic meters capacity for biological treatment based on Activated Sludge Process of Degremont. We have installed new bio reactor of 5000 cubic meters capacity in the system. Both the bio reactors incorporate nutrient dosing and high-speed aeration with efficient “Degremont Activator “type surface aerator.

Overflow from aeration tank is transferred by gravity to two static circular clarifies of capacity 1620 M^3 with bottom sludge racking as well as surface skimming device. Sludge is pumped for recirculation of biomass to aeration tank and removal of excess sludge for de-watering, in thickener.

TERTIARY:

Tertiary Physico Chemical Treatment:

Bio treated effluent can be subjected to tertiary Physico -chemical treatment comprising of a sludge blanket clarifier of specially designed “DegremontPulsator” with a capacity of 1450 cubic meters. Coagulants and flocculation aids are added to promote destabilisation and agglomeration of colloidal particles. This helps in further reduction of BOD/COD values by separating additional sludge and polishing the effluent. The sludge separated in Pulsator also goes to thickener by a pump.

Sludge disposal treatment:

Sludge separated at Turbocirculator, Biosettling tank and Pulsator is fed to Degremont static Thickener equipped with sludge concentrating racking arm and then taken for de-watering to the Belt filter press in addition to the seven Sludge drying beds. This biological sludge is partly used for trials as a plant growth nutrient and the balance quantity is currently stored along with hazardous waste.

Guard pond:

Tertiary treated effluent from flow measuring Parshall Flume is received in a Guard Pond of capacity ~ 10,000 m^3. This can accommodate nearly 12 hrs. Of treated effluent considering the total of industrial and domestic effluents.

Treated waste water discharge:

The final treated effluent from the ETP confirming the GPCB norms is collected in guard pond and then discharged through closed pipeline to estuary zone of river Par via a diffuser. The location of discharge point of treated effluent through pipeline is shown in **Annexure-7**.

b. Details of Existing Incinerator

i. Solid Waste Treatment:

As in the case of liquid effluent, sustained efforts are made to minimize generation / eliminate the wastes that can be reused, recycled or sold and only the balance quantity is given the following treatment:

I. Incineration
II. Land filling

Incineration:

We have installed and commissioned two numbers of hazardous waste incinerators and these have been operating regularly. Solid, liquid as well as aqueous-organic wastes are incinerated as per requirement, in these facilities. Detailed description of two of the incinerators is given below for an understanding of the environmental care being taken at Atul.

Solid Waste Incinerator:

We have two solid waste incinerators with common chimney. The new incinerator was commissioned with a view to have better control and efficiency of the thermal distraction. Mainly the new incinerator was set up with a view to have excess safety measures and to avoid manual handling as much as possible. This is a pyrolytic solid / liquid injection incinerator. Heart of the unit is a furnace, which has three sections viz., pyrolytic section, liquid injection section (middle chamber) and post combustion chamber. All working parts of incineration system i.e., furnace, quench tower, water and caustic

scrubbers, stack and interconnecting ducting are acid brick / refractory lined. Efficient turbulence is ensured through provision of baffles in the furnace.

The primary chamber is meant for handling liquid or semi-solid wastes, which can be sprayed. The liquid wastes are directly fired using low-pressure burners with air atomization. The semi-solid wastes are heated in a melter made pump able and then incinerated as liquid waste. An average temperature of 900-950 ^{o}C is maintained in this section. The atomized liquid partly burns in this section with total thermal degradation being ensured at PCC.

At PCC a temperature of 1100-1200 ^{o}C is ensured by direct firing of diesel. The residence time available is 2 seconds. This is sufficient to complete the combustion of organic vapors emanating from pyrolyser section and some unburnt products of liquid injection system.

The flue gases from PCC of incinerator furnace are cooled in quench tower using direct water spray then passed through water scrubber followed by scrubbing with 10% caustic lye. The wastewater from quench tower and scrubbers is drained to central effluent treatment plant.

Aqueous Waste Incinerator:

This equipment consists of a combustion furnace (with 2 fuel injection nozzles and two effluent spray nozzles.), a venturi tank cum venturi scrubber, air blower, induced draft fan, chimney and filter Nutch. The venturi scrubber acts as a quencher for the flue gases and as a concentrator for the incoming aqueous waste material.

After starting both the diesel-fired burners of liquid waste Incinerator to get a temperature of at least 300^{o}C, aqueous effluent from venturi tank is pumped and sprayed in combustion chamber. The organic matter gets burnt at the flame temperature 900 to 950^{o} C and the residual melted salts are drained from the bottom of Incinerator.

The flue gases are cooled to ~ 150^{o}C (above the dew point) with incoming effluent in venturi scrubber. This helps in partly concentrating the aqueous effluent. The residual gas is discharged to chimney by induced draft blower.

This aqueous waste Incinerator has a capacity of evaporating ~1000 Lit/hr.

c. Details of Existing Landfill site

Secured Landfill Site (TSDF):

Atul has developed a site for disposal of solid wastes by land filling. The site was selected on the basis of a technical Environment Impact Assessment (EIA) study done by National Productivity Council (NPC). NPC also has given the detailed design of the site. On the basis of this technical EIA and the design, site for TSDF was approved by the state level committee and Gujarat Pollution Control Board.

After analyzing the solid wastes for any residual toxic pollutants as well as moisture content, they are sent to disposal site for land filling.

The waste materials are dumped at the site considering their compatibility with each other compacted and covered with plastic liners to minimize Leachate formation in the rainy season. Greenery existing around the TSDF site can be seen in both the photographs.

d. DETAILS OF MULTIPLE EFFECT EVAPORATION SYSTEM:

Multiple Effect Evaporation - 4850 kg/hr Evaporation

Basis of Design

Type of system: Triple effect forward feed evaporator(First stage rising film and last two stages Forced circulation)

CAPACITY

Evaporation rate: 3500 Kg/hr

Feed rate: 4850 Kg/hr

Salt from Evaporator: 1350 kg/hr wet solids

FEED PROPERTIES

Solid content range: 28% w/w

From: Clear solution with totally dissolved solids

Solvent: Water

Specific gravity: 1.15

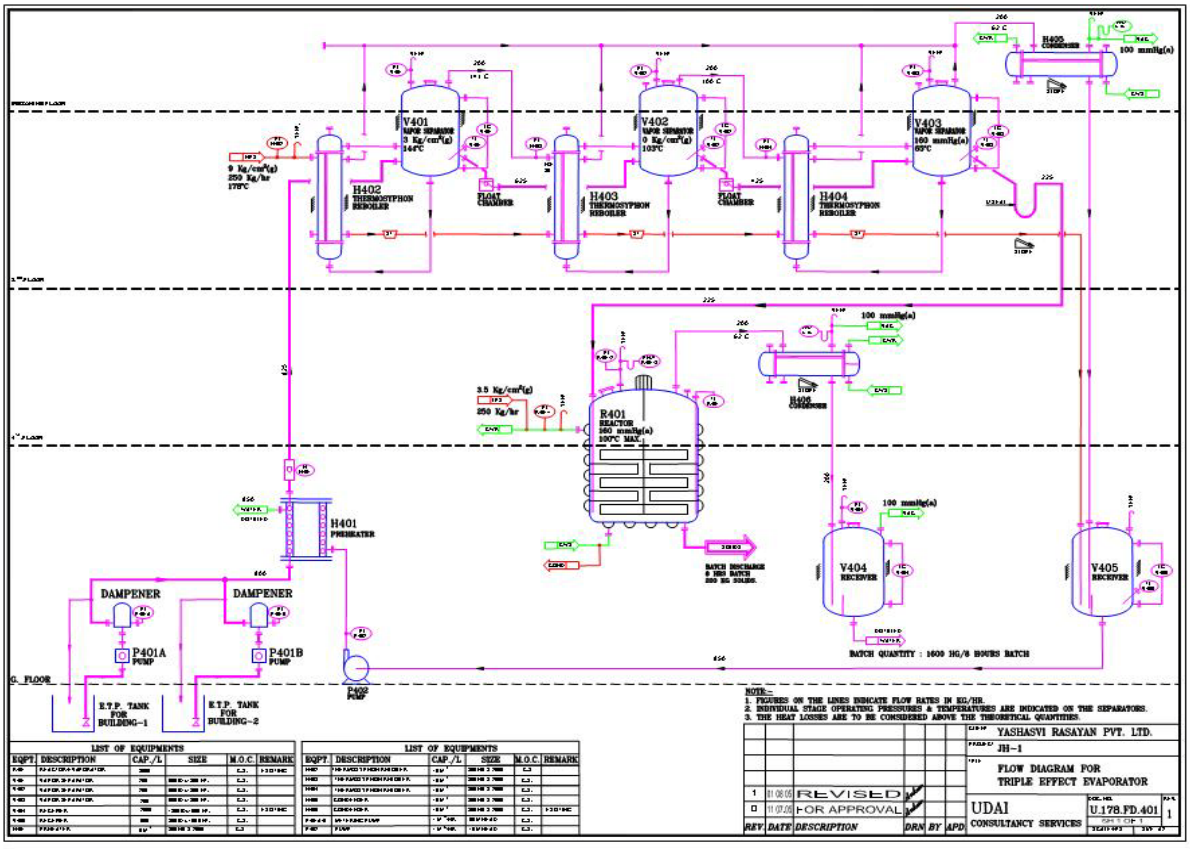
Temperature: 30^{o}C

OPERATING CONDITIONS

Mode of heating: Dry saturated steam

Steam: 7 kg/cm^{2} (g) at the inlet of thermoCompressor.

The schematic diagram of MEE:



7. AIR ENVIRONMENT

The flue gas emission and its control measures are mentioned in below Table No. 5.

Table No. 5 – Details of flue gas emission

Sr. No.	Stack attached to	Capacity (TPH)	Type of fuel	Stack height (m)	Conc. of pollutants			Air Pollution Control system
					PM (mg/m^3)	SO_2 (ppm)	NOx (ppm)	
A	**EAST SITE**							
1.	FBC boiler E1	34	Coal & lignite	56	150	100	50	Electrostatic precipitator
2.	FBC boiler E2	34	Coal & lignite	56	150	100	50	Electrostatic precipitator
3.	FBC boiler E3	50	Coal & lignite	80.3	150	100	50	Electrostatic precipitator
4.	Hot oil Unit (Resorcinol Plant)	32.5	FO	32.5	150	100	50	---
B	**WEST SITE**							
5.	FBC boiler W1	45	Coal	70	150	100	50	Electrostatic precipitator
6.	Coal fired boiler W1	18.18	Coal	35	150	100	50	---
7.	Coal fired boiler W2	18.18	Coal	35	150	100	50	---
8.	Hot Oil Plant Shed B	19	FO	19	150	100	50	---
9.	Oil Burner Shed B (stand by)	17	LDO	17	150	100	50	---
C	**NORTH SITE**							
10.	Thermic Fluid Heater of DCO/DAP Plant	12	LDO	12	150	100	50	

Electrostatic Precipitators (ESP)

Each Steam generating unit shall be installed with one (1) electrostatic precipitator. Each Steam generation unit shall be provided with Electrostatic Precipitator having single stream with Four (4) fields in series for collection of fly ash. The ESP will have a collection efficiency of around 99.91%. The ESP shall be operated efficiently to ensure that particulate matter emission does not exceed the

GPCB norms. The outlet dust concentration of ESP will be maintained well within the prescribed limits of 150 mg/nm^3.

7.1 Process Emission

Layout diagram for process emission is attached as **Annexure – 8.**Detail of process emission is mentioned in below table:

Table No. 6 – Details of Process Emission

Sr. No.	Stack attached to	Stack height (m)	Stack Dia. (mm)	Air Pollution Control system	Parameter	Permissible limit	Unit
I	**PROPOSED**						
A	**EAST SITE**						
a.	**MPP**						
1.	**MPP Plant**	**21**	**150**	**Acidic Scrubber**	**HCl**	**20**	**mg/NM^3**
II	**EXISTING**						
A	**EAST SITE**						
a.	**Phosgene plant**						
1.	Phosgene plant	15	300	Alkali & water scrubber	$COCl_2$	0.1	ppm
b.	**Caustic soda plant**						
2.	Dechlorination plant	35	350	Hypo scrubber	Cl_2	9	mg/NM^3
					HCl	20	mg/NM^3
3.	Common stck of HClSigri Unit-1 & 2	25	100	Water scrubber	Cl_2	9	mg/NM^3
					HCl	20	mg/NM^3
c.	**FCB plant**						
4.	Foul gas scrubber	26.5	600	Caustic scrubber	SO_2	40	mg/NM^3
					NOx	25	mg/NM^3
d.	**Sulfuric acid**						

Sr. No.	Stack attached to	Stack height (m)	Stack Dia. (mm)	Air Pollution Control system	Parameter	Permissible limit	Unit
5.	Sulfuric acid plant	30	500	Water scrubber with DCDA system	SO_2	2 kg/ton of conc. (100% acid product)	
					Acid mist	50	mg/NM^3
6.	Chloro sulfonic acid plant reactor	11	150	Water scrubber	Cl_2	9	mg/NM^3
					HCl	20	mg/NM^3
7.	Incinerators	40	300	Alkali & water scrubber	PM	150	mg/NM^3
					SO_2	40	mg/NM^3
					NOx	25	mg/NM^3
e.	**NI plant**						
8.	Foul gas scrubber	26.5	60	Caustic scrubber	SO_2	40	mg/NM^3
					NOx	25	mg/NM^3
f.	**NBD Plant**						
9.	Spray dryer	21	540	water scrubber	PM	150	mg/NM^3
g.	**2,4 D Plant**						
10.	Chlorinator, 2,4-D Plant	26.5	150	Caustic scrubber	Cl_2	9	mg/NM^3
					HCl	20	mg/NM^3
11.	Chlorinator, 2,4-D Plant	26.5	150	Caustic scrubber	Cl_2	9	mg/NM^3
					HCl	20	mg/NM^3
12.	Chlorinator, 2,4-D Plant	26.5	150	Caustic scrubber	Cl_2	9	mg/NM^3
					HCl	20	mg/NM^3
13.	Chlorinator, 2,4-D Plant	26.5	150	Caustic scrubber	Cl_2	9	mg/NM^3
					HCl	20	mg/NM^3
14.	Chlorinator, 2,4-D	26.5	150	Caustic scrubber	Cl_2	9	mg/NM^3

Sr. No.	Stack attached to	Stack height (m)	Stack Dia. (mm)	Air Pollution Control system	Parameter	Permissible limit	Unit
	Plant				HCl	20	mg/NM^3
15.	Common scrubber , 2,4-D Plant	5	20	Caustic scrubber	Cl_2	9	mg/NM^3
					HCl	20	mg/NM^3
16.	Dryer-1	26.5	350	Bag filter, water scrubber	PM with pesticide compound	20	mg/NM^3
17.	Dryer-2	26.5	500	Cyclone, bag filter, caustic scrubber	PM with pesticide compound	20	mg/NM^3
18.	Dryer-3	26.5	550	Cyclone, bag filter, caustic scrubber	PM with pesticide compound	20	mg/NM^3
19.	Dryer-4	26.5	750	Cyclone, bag filter, caustic scrubber	PM with pesticide compound	20	mg/NM^3
20.	Common scrubber , 2,4-D Plant	5	20	Caustic scrubber	Phenol	-	-
h.	**CP plant**						
21.	MCPA	19	150	Alkali & water scrubber	Cl_2	9	mg/NM^3
					HCl	20	mg/NM^3
					SO_2	40	mg/NM^3
22.	Fipronil	19	150	Alkali & water scrubber	SO_2	40	mg/NM^3
					HCl	20	mg/NM^3
23.	Imidacloprid	20	80	Water followed by acid scrubber	NH_3	175	mg/NM^3

Sr. No.	Stack attached to	Stack height (m)	Stack Dia. (mm)	Air Pollution Control system	Parameter	Permissible limit	Unit
24.	Pyrathroids	19	150	Alkali & water scrubber	SO_2	40	mg/NM^3
					HCl	20	mg/NM^3
25.	Stack at Amine plant	5	150	Caustic scrubber	NH_3	175	mg/NM^3
i.	**MPSL plant**						
26.	Phosgene scrubber at MPSL	7	150	Caustic scrubber	Phosgene	0.1	ppm
27.	Central scrubber at MPSL	7	150	Caustic scrubber	Phosgene	0.1	ppm
j.	**NICO plant**						
28.	Central scrubber at NICO plant	12	150	Water scrubber	Acetonitrile, IPA	-	-
k.	**Ester plant**						
29.	Scrubber at Ester plant for Glyphosate	12	150	Water scrubber	Formaldehyde	10	mg/NM^3
30.	Central scrubber of MCPA plant	19		Caustic scrubber	HCl	20	mg/NM^3
B	**WEST SITE**						
31.	Shed A 7/14/41 (Reaction Pan/D tank)	19		Caustic scrubber	Br_2	2	mg/NM^3
					NOx	25	mg/NM^3
32.	Shed B 2/12/24 Reaction Vessel	19	150	Caustic scrubber	Cl_2	9	mg/NM^3
					HCl	20	mg/NM^3

Sr. No.	Stack attached to	Stack height (m)	Stack Dia. (mm)	Air Pollution Control system	Parameter	Permissible limit	Unit
33.	Shed C C5/20/15 Chlorinator	19	150	Alkali & water scrubber	Cl_2	9	mg/NM^3
					HCl	20	mg/NM^3
34.	Shed D NIRO Spray Dryer No. 45	19	360	water scrubber	PM	150	mg/NM^3
35.	Shed D NIRO Spray Dryer No. 50	19	360	water scrubber	PM	150	mg/NM^3
36.	Shed E 7/12/49 Spray Dryer	19		water scrubber	PM	150	mg/NM^3
37.	Shed F F6/1/15 Reaction vessel	19	150	Alkali & water scrubber	Cl_2	9	mg/NM^3
					HCl	20	mg/NM^3
38.	Shed G G10/8/1 (receiver)	11	150	Alkali & water scrubber	Cl_2	9	mg/NM^3
					HCl	20	mg/NM^3
39.	Shed H 11/6/17 Chlorinator	19	150	Alkali & water scrubber	Cl_2	9	mg/NM^3
					HCl	20	mg/NM^3
40.	Shed K K-13/3/4 Final of Sulfuric acid plant	50	500	Alkali & water scrubber	SO_2	2 kg/ton of concentrated (100% Acid product)	
					Acid mist	50	mg/NM^3
C	**NORTH SITE**						
41.	UF plant Exhaust fan of UF Plant	22		Cyclone separator followed by water scrubber	PM	150	mg/NM^3
42.	N-FDH Plant	31.5	150	Bag filter	PM	150	mg/NM^3

Sr. No.	Stack attached to	Stack height (m)	Stack Dia. (mm)	Air Pollution Control system	Parameter	Permissible limit	Unit
	Catalytic Incinerator				SO_2	40	mg/NM^3
					NOx	25	mg/NM^3
					Formaldehyde	10	mg/NM^3
43.	PHIN Plant	15.5	350	Water scrubber followed by two stage caustic scrubber with Ammonia/steam injection at stack	Phosgene	0.1	ppm
44.	DCDPS Plant	30	650	Alkali & water scrubber	SO_3	-	-
45.	DDS Plant	20	80	water followed by acid scrubber	NH_3	175	mg/NM^3
46.	SPIC II plant	30	650	Alkali & water scrubber	SO_3	-	-
47.	SPIC I plant	30	50	water scrubber	NH_3	175	mg/NM^3

8. SOLID/HAZARDOUS WASTE

The details of solid/hazardous waste to be generated from proposed activities are mentioned in following table no. 7.

Table No. 7 – Details of Hazardous/Solid Waste Generation and management

Sr. No.	Description	Category	Quantity (MT/Month)			Method of storage	Method of disposal
			Existing	Proposed	Total after expansion		
1.	Graphite granules from decomposer	16.1	0.0417	0	0.04	Collection, Storage	Own TSDF
2.	Sludge from recycle unit, ground floor &scak filter	16.1	0.014	0	0.01	Collection, Storage	Own TSDF after mercury recovery
3.	Sludge from Demercurisation Plant	16.1	1	0	1.00	Collection, Storage	Recycle
4.	Membranes	16.2	6	0	6.00No./month	Collection, Storage	Own TSDF
5.	Waste Resin	16.2	0.05	0	0.05	Collection, Storage	Incineration
6.	Sulfurised Carbon	16.2	0.003	0	0.00	Collection, Storage	Incineration
7.	Activated Carbon	16.2	0.0104	0	0.01	Collection, Storage	Incineration
8.	Brine purification sludge	16.3	22.5	0	22.50	---	Own TSDF
9.	Sulphur sludge	17.1	5.833	0	5.83	Stored for melting and reuse.	Reuse
10.	Hot Gas filter Ash	17.1	0.0208	0	0.02	Collection, Storage	Own TSDF
11.	Bottom Sludge after recovery of Sulphur Sludge	17.1	0.5	0	0.50	---	Own TSDF
12.	Waste Catalyst	17.2	0.083	0	0.08	Collection, Storage	Own TSDF
13.	Spent Solvents	20.2	5	0	5.00kl/month	Recover	Recovery
14.	OCBC / OCT distillation	20.3	0.042	1,822.432	1,822.47	Collection, Storage	Incineration.

Sr. No.	Description	Category	Quantity (MT/Month)			Method of storage	Method of disposal
			Existing	Proposed	Total after expansion		
	residue						
15.	Waste residue Bulk Intermediate (meta hydroxy phenol) (Tar)	20.3	15	0	15.00	Sell	Sell to reuser having GPCB permission
16.	Waste residue	20.3	15	0	15	Collection, Storage	Sell to reuser having GPCB permission
17.	Urea Formaldehyde Polymer product	23.1	0.25	0	0.25	---	Incineration.
18.	Sludge containing higher amino compound	23.1	0.417	0	0.417	---	Incineration.
19.	Filter cake of Epoxy resins with resin contamination	23.1	0.833	0	0.833	---	Incineration.
20.	Epoxy Resin (Filter Cake with resin contamination)	23.1	130.29	0	130.29	Collection, Storage	Incineration.
21.	Aluminum Hydroxide	26.1	15.417	0	15.417	---	Own TSDF
22.	Iron sludge	26.1	80	0	80	---	Own TSDF
23.	Brass residue	26.1	0.667	0	0.667	---	Own TSDF
24.	Still / Other residue	26.1	8.67	0	8.67	---	Incineration.
25.	Darco / filter aid sludge	26.1	2.083	0	2.083	---	Incineration.
26.	Dust	26.1	3	0	3	Collection, Storage	Own TSDF
27.	Iron Residue	26.1	62.5	0	62.5	Collection, Storage	Own TSDF
28.	PER crystal residue	26.1	0.4	0	0.4	Collection, Storage	Incineration.
29.	Hyflo sludge	26.1	0.5	0	0.5	Collection, Storage	Incineration.
30.	Filter aid sludge for Hg recovery	26.1	1	0	1	Recovery of mercury	Recovery of mercury

Sr. No.	Description	Category	Quantity (MT/Month)			Method of storage	Method of disposal
			Existing	Proposed	Total after expansion		
31.	Sludge from waste water treatment	26.2	5	0	5	---	Own TSDF
32.	Dust from Air Filtration System	26.3	0.001	0	0.001	Reprocessed	Reprocessed, reused within industry
33.	Spent carbon	28.2	40	0	40	Incineration.	Captive incineration/ Collections, storage, Disposal by selling to authorized cement industries for coprocessing
34.	Date expired, discarded and off- specification product	28.4	0.008	0	0.008	Incineration.	Incineration.
35.	Spent Mother Liquor	28.5	19.75	0	19.75kl/month	ETP after recovery	ETP after recovery
36.	Spent Solvent	28.6	19.75	0	19.75kl/month	Solvent recovery	Incineration.
37.	Still / Other residue	29.1	10	0	10	Incineration.	Incineration.
38.	Pyridine based insecticides & herbicides (Darco / Filter aid Sludge)	29.1	3.62	0	3.62	Incineration.	Incineration.
39.	Sulfonyl Urea (Residue)	29.1	14.27	0	14.27	Incineration.	Incineration.
40.	Triazole based Fungicides (Residue)	29.1	1.28	0	1.28	Incineration.	Incineration.
41.	Pyrethroids	29.1	0.6	0	0.6		Incineration.
42.	Hyflo	29.1	15.75	0	15.75	Collection, Storage	Own TSDF
43.	Dust from Air Filtration System	29.3	0.008	0	0.008	Collection, Storage	Incineration.
44.	Chemical containing residue from	33.1	0.0008	0	0.0008	Collection, Storage	Incineration.

Sr. No.	Description	Category	Quantity (MT/Month)			Method of storage	Method of disposal
			Existing	Proposed	Total after expansion		
	decontamination and disposal						
45.	Liners /Bags	33.3	9500	0	9500No./month	Collection, Storage, Decontaminated, detoxification	After decontamination reuse / Sell to authorized party
46.	Drums /HDPE Carboys	33.3	250	0	250No./month	Collection, Storage, Decontaminated, detoxification	After decontamination reuse / Sell to authorized party
47.	Flue gas cleaning residue	34.1	0.0008	0	0.0008	---	Own TSDF
48.	Toxic metal containing residue from used-ion exchange material; in water purification	34.2	0.001	0	0.001	Collection, Storage	Own TSDF
49.	Sludge from ETP	34.3	41.667	0	41.667	---	Own TSDF
50.	Gypsum from ETP	34.3	2	0	2	---	Own TSDF
51.	MEA distillation residue	35.1	1.667	0	1.667	---	Incineration.
52.	Spent Catalyst	35.2	0.002	0	0.002	---	Own TSDF
53.	Sludge from wet scrubber	36.1	0.02	0	0.02	---	Own TSDF
54.	Incineration ash	36.2	4.62	0	4.62	---	Own TSDF
55.	Sludge & filters contaminated with oil	3.3	0.005	0	0.005	---	Incineration.
56.	Used oil	5.1	2	0	2kl/month	---	sell to registered refiners
57.	Wastes / residues containing oil	5.2	0.001	0	0.001	---	Incineration.
58.	Aluminium Ash	B30	2.6	0	2.6	---	Own TSDF

Sr. No.	Description	Category	Quantity (MT/Month)			Method of storage	Method of disposal
			Existing	Proposed	Total after expansion		
59.	Gypsum (From Meta Hydroxy Phenol Plant)	D1	840	0	840	---	Reuse & sell to GPCB authorized actual reusers only
60.	Sodium Sulfite	D1	550	0	550	---	Reuse & sell to GPCB authorized actual reusers only
61.	salt from TEE	---	0	825	825	---	OWN TSDF
62.	Spent Acid	D2	400	0	400	Collection, Storage	Diaposal by sell to the units having permission from CPCB, New Delhi under rule 11 of Hazardous waste rule 2008.
63.	Chemical Gypsum	34.3	4930 (dry basis)	0	4930 (dry basis)	---	Own TSDF/ Collections, storage, Disposal by selling to authorized cement industries
64.	Copper Hydroxide wet cake	B3	40	0	40	Collection, Storage	Diaposal by sell to the units having permission from CPCB, New Delhi under rule 11 of Hazardous waste rule 2008.
65.	Spent organic solvent	28.5	24.75	0	24.75	Collection, Storage	Diaposal by sell to the units having permission from CPCB, New Delhi under rule 11 of Hazardous waste rule 2008.
66.	2,6 Dichloro Phenol	---	94.355	0	94.355	---	Sell to actual users
67.	2,4,6-Trichloro phenol	---	45.925	0	45.925	---	Sell to actual users
68.	p-CBSA/Na-salt	---	127	0	127	---	Sell to actual users

9. NOISE ENVIRONMENT

The noise generation inside plant ranges from 75-85 dB(A) due to heavy machinery operations. Use of PPE like ear plugs and ear muffs is made compulsory near the high noise generating machines. Moreover, the personnel are provided breaks in their working hours, with the continuous exposure not increasing three (3) hours.

Due to power plant operations, noise pollution arises from Turbine, compressor, generator room, etc. Higher noise level will be felt only near the active working areas. However at distance away from the source, the level gets considerably reduced. The plant and equipment will be specified and designed with a view to minimize noise pollution.

Noise generation is also high during operation of soot blowers, safety blow off valves, pressure release valves etc. To reduce such noise, pipe lines will be liberally sized for low velocities. Safety blow off valves, discharge pipes, relief valves, etc. will be equipped with silencers. Hearing Conservation program will be imparted where noise level exceeds 90dB(A).

10. SOLVENT MANAGEMENT PLAN

- All the solvents are directly distillate from product mix and purified in packed column with the help of reflux and therefore there is no generation of any distillation residue from the solvent distillation.
- The solvent distillation system is designed so as to achieve minimum 95 – 96 % recovery of solvent.
- Pure solvent, crude solvent and distilled (recovered) solvent shall be stored only in storage tanks and we shall not be using drums at any stage in the Solvent Management System.
- Wherever required, the solvents shall be directly pumped into day tanks from the storage tanks and shall be charged into the reactors without involving any manual handling.
- All the pumps shall be mechanical seal type to avoid any leakage of solvent.
- All necessary fire fighting systems shall be provided with alarm system. Flame proof wiring and flame proof electrical accessories shall be provided to avoid any mishap.
- All the storage tank and day tank shall be connected to a vent system through chilled water/chilled Brine condensers to prevent loss of solvents in the atmosphere.
- All the distillation column vents are also connected to chilled water/chilled Brine condensers for maximum possible recovery of the solvents.

11. OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT

The company is very much concerned in terms of health, safety and environment protection. ATUL LTD. commitment towards safety can be reflected from its 'Health, Safety & Environment Policy' prepared for the existing project.

From theirprevious performance same dedication is to be continued for the proposed expansion. Tomaintain high standard in Health, Safety and Environment, various activities areundertaken at the site. Similar practice will be followed for the proposed activities.

The following key safety measures are implemented in the existing plant and the sameshall be a part of proposed activities:

1. Safety Training is provided to the employees.

2. Safety Sirens with Alarm System in case of emergency are provided.

3. Emergency Control Room is established.

4. Assembly point is provided.

5. Sprinkler Systems will be provided as needed

6. Fire Hydrant System is installed.

7. Fire Extinguishers are provided.

8. Mock drills are periodically conducted and factors like response time areevaluated.

9. Fire squad team is formed for handling any emergency situation.

10. First Aid Facility and training are provided.

11. Personal protective gears and equipments are provided to employees.

12. Health check ups are organized at regular intervals.

13. Safety / Health records and MSDS are maintained.

14. On line stack analyzer installed.

15. Foam extinguisher for lub oil tank.

12. SITE ANALYSIS

12.1 Connectivity

The project location is well connected with road, rail and air route to transport raw materials, machineries etc. and hence, it exhibits good potential for industrial growth. The salient features mentioned below indicate favorable condition for industrial development at the project location. Detail of connectivity is as shown in table:

Particulars	Details
Approx. Geographical Co-ordinates	72°55′33″ E Longitude 20°36′36″ N Latitude
Village	Atul
Nearest Town	Valsad
River/Streams	River Par
Nearest Highway	NH- 08
Nearest Railway Station	Atul&Valsad
Nearest Airport	SuratAirpot
Tourist places	Daman&Silvassa
Protected areas (National parks/ sanctuaries)	None within 10 km radial periphery
Nearest state boundary	None within 10 km radial periphery
Defense installations	No defense Installation.
Sites of Historical/ Archaeological Importance	None within 10 km radial periphery
Densely Populated or built – up Area	Valsad city

12.2 Topography

The location is at 20°36′36″ N Latitude and 72°55′33″ E Longitude having elevation of 25 meters above sea level. The overall project site is located on plain barren land devoid of any permanent and economically useful vegetation. The topography of the proposed site for project is plain terrain.

No other forests, national park or wild life sanctuary is located within 10 km periphery of the proposed project site. No change in land use/Topography will be observed as the proposed project is expansion project.

12.3 Existing Infrastructure

Key infrastructures available around the:

Sr. No.	Description	Available within 10 km around the project
1	Railway station	Yes (Atul&Valsad)
2	Bus Station	Yes
3	National Highways	National highway No-8
4	School/College	Atul Village has primary, secondary, higher and CBSC schools. Valsad city has also primary, secondary, higher and CBSC schools as well as Engineering, Arts, Commerce & Science colleges.
5	Hospital	In the study area villages have either primary health centers or sub centers. Some villages have medical facilities within distance of 3-5 Km. Civil Hospital and private experts of every medicine are available in the area.
6	Religious place	Yes

12.4 Soil Classification

The soil quality of the area is not considered fertile for agricultural activities. No evidence of any influence of contaminant has been noticed. In overall area the agricultural productivity is very less due to absence of fertilization practices & poor fertility of soil.

12.5 Climate data from the secondary source

Climate	Semi Arid
Seismic Zone	II
Maximum temperature, ^{0}C	42 °C
Minimum temperature, °C	8.5°C
Relative Humidity	Max.:- 89%; Min.:- 56%
Max Rain Period	June to October

13. PROPOSED INFRASTRUCTURE

Sr. No.	Infrastructure	Description
1	Industrial area (processing area)	Existing
2	Green belt	Larger green belt has been already developed in & around the proposed plot and more green belt will be developed.
3	Connectivity	As mention in 12.
4	Drinking water management	Source: River Par
5	Sewerage system	Adequate Septic tank/Soak Pit has been provided.
6	Industrial waste management	Adequate size of ETP has been provided.
7	Solid waste management	Proper EMP shall be in place.

14. PROJECT SCHEDULE & COST ESTIMATES:

14.1 Project Schedule

Proposed project activities will be started in the month of September 2016.

14.2 Project Cost Estimation

Sr. No.	Project	Estimate cost (Rs. in Lacs)
1.	Project Cost for expansion in existing capacity and addition of new products	1,857
2.	Expenditure for Environment Pollution abatement	100

14.3 Financial &Social Benefits

- More employment opportunities.
- The proposed activities will be carried out in the existing unit itself. Hence, noadditional land is to be purchased.
- The company has allocated some budget for CSR activities, which canlead to improved social infrastructure, if planned properly.
- Employment to approx. 50 local people is direct benefit to local people.

15. CONCLUSION

As summarized in above sections, it has been noticed that the proposed expansion in existing production capacity and addition of new productswill not have any major impacts, which can lead to serious issue of environmental pollution or any other hazards.

Considering the probability of impacts, proponent has planned adequate mitigationmeasures and EMP. Further, it has also been planned by proponent to organize CSRprograms, rainwater harvesting, energy conservation, which will have considerablebeneficial impacts. Looking to the employment potentials and other allied developmentalpotentials, it has been noticed that the proposed project will significantly help inimproving social status of the region.