BEFORE THE NATIONAL GREEN TRIBUNAL
SOUTHERN ZONE, CHENNAI
Original Application No. 88 of 2020 (SZ)

IN THE MATTER OF

Meenava Thanthai K.R. Selvaraj
Kumar, Meenavar Nala Sangam ....Applicant(s)

Versus

Union of India and others. ....Respondent(s)

INDEX

Place: Chennai
Date:4-11-2020

(Dr. R. Sridhar)
Scientist 'D'
MoEF&CC,
Regional Office, Chennai

REPORT OF THE JOINT COMMITTEEIN THE MATTER OF ORIGINAL APPLICATION NO. 88 OF 2020 (SZ) TITLED AS MEENAVA THANTHAI K.R. SELVARAJ KUMAR, MEENAVAR NALA SANGAM VS UNION OF INDIA & ORS IN COMPLIANCE OF HON'BLE NGT ORDER DATED 26.06.2020

1. BACKGROUND

1.1 Hon'ble NGT Order dated26-06-2020:

The Hon'ble NGT, Southern Bench in the matter of OA No. 88 of 2020 (SZ) vide order dated 26-06-2020 (**ANNEXURE-1**) has constituted a Joint Committee to inspect the unit in question and submit a factual and action taken report, if there is any violation is found. The directions of NGT are reproduced below:

"9. Before going to the matter further, we feel it appropriate to appoint a Joint Committee comprising of Senior Officer of Regional Office, Ministry of Environment, Forest and Climate Change (MoEF&CC), any Senior Scientist form Central Pollution Control Board, Regional Office, Chennai, Senior Forest Officer not below the rank of Chief Conservator of Forest, State of Tamil Nadu who is in charge of Wild Life dealing with the Bird Sanctuary, the District Collector, Kancheepuram District, District Forest officer, Kancheepuram District and Senior Scientist of Tamil Nadu Pollution Control Board to inspect the unit in question and submit a factual and action taken report, if there is any violation is found."
"10. Regional Office, Ministry of Environment, Forest and Climate Change (MoEF&CC), Chennai will be the nodal agency for coordination for providing necessary logistics for this purpose."
"11. The committee is also directed to consider the question as to whether 4th respondent unit is having all necessary clearances and consent and other permission as required under law, whether the pollution control mechanism provided in the unit are sufficient to protect environment, whether there is any violation of up keeping the pollution control mechanism provided which results in nonconformity with the standard provided under the environmental laws, whether there was any unauthorised discharge of untreated trade effluents from the unit to the nearby agricultural fields or other water bodies, if so what is the impact of that illegality on the water quality as well as the soil quality in the locality. If there is any violation and degradation found, what are the steps to be taken for remediation and also assess environmental compensation against them in accordance with law as directed by this Tribunal in several matters of such nature."
"12. The committee is also directed to go into the question as to whether there is any violation of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, Solid Waste Management Rules, 2016, and Other Waste Management Rules, the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 by the fourth respondent."
"13. The committee is also directed to suggest recommendation for rectifying the deficiency if any, found during inspection."
"14. Two month time is granted to the committee to submit the report to this Tribunal

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through e-mail or e-filing at ngtszfiling@gmail.com on or before 01.09.2020."

1.2 Hon'ble NGT Order dated 30-06-2020 revising the joint committee's members:

In continuation of its original order dated 26-06-2020, NGT issued a corrected copy of the order (**ANNEXURE-2**), which was uploaded in its website on 29-07-2020, in relation members of the joint committee. As per this order, the joint committee members namely the District Collector (Kancheepuram) and the District Forest Officer (Kancheepuram) were replaced by the District Collector (Chengalpattu District) and the Wildlife Warden in charge of Bird Sanctuary respectively. The revised composition of the Committee is reproduced below:

*"9. Before going to the matter further, we feel it appropriate to appoint a Joint Committee comprising of Senior Officer of Regional Office, Ministry of Environment, Forest and Climate Change (MoEF&CC), any Senior Scientist form Central Pollution Control Board, Regional Office, Chennai, Senior Forest Officer not below the rank of Chief Conservator of Forest, State of Tamil Nadu who is in charge of Wild Life dealing with the Bird Sanctuary, the District Collector, ***Chengalpet District, *Wildlife Warden in charge of Bird Sanctuary, Chennai** and Senior Scientist of Tamil Nadu Pollution Control Board to inspect the unit in question and submit a factual and action taken report, if there is any violation is found."*

2. JOINT COMMITTEE

The MoEF&CC, Regional Office, Chennai, as the nodal agency, requested all concerned authorities for the nomination of the officials for the joint committee and site inspection.As per the nominations received from Regional Directorate of Central Pollution Control Board (Bengaluru), Tamil Nandu Forest Department (as communicated, Shri Debasis Jana, APCCF & Director, Arignar Anna Zoological Park is in place of Sh. Yogesh Singh, Additional Principal Chief Conservator of Forests with effect from 6.8.2020), the District Collector, Chengalpattu District (nominated three officials viz, RDO, DEE and AEE-PWD), Tamil Nadu State Pollution Control Board and including from the Regional Office, MoEF&CC, the Joint Committee consists of the following members.

1.	Shri Debasis Jana, IFS, Additional Principal Chief Conservator of Forests & Director, Arignar Anna Zoological Park, Vandalur, Chennai – 48
2.	Mrs. C. H. Padma, IFS, Wildlife Warden, Chennai and In-charge of Vednthangal Bird Sanctuary.
3.	Smt. Lakshmi Priya, Revenue Divisional Officer (RDO), Mathranthakam, Chengalpattu Dist.
4.	Shri. Vasudevan, District Environmental Engineer (DEE), TNPCB, Chengalpattu District
5.	Shri Neelmudiyon, AEE,Public Works Department (WRO), Mathuranthakam, Chengalpattu Dist.
6.	Sh. M. Malayandi, Joint Chief Environmental Engineer (Monitoring), Tamil Nadu Pollution Control Board, Chennai

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7.	Sh. V. Thiyagarajan, Deputy Director (Labs), Tamil Nadu Pollution Control Board, AEL, Chennai
8.	R. Rajkumar, Scientist 'D' Central Pollution Control Board (CPCB), Regional Directorate, Chennai
9.	Dr. R. Sridhar, Scientist 'D', MoEF&CC,Regional Office, Chennai

3. JOINT INSPECTION OF THE COMMITTEE

The joint committee visited the industrial unit, M/s Sun Pharma Industries Ltd (Sun Pharma) at Sathamai Village, Chengalpattu District (Tamil Nadu) on 31-07-2020. All the members participated in the joint inspection (**ANNEXURE-2A-ATTENADANCE**). In addition to the members, Shri Subbiah, Forest Range Officer, Vedanthangal Bird Sanctuary and staffs of DEE office (Chengalpattu) also supported the committee.

The Sun Pharma made a presentation on overview of the company and site details. It also explained various aspects of the operation including effluent generation, waste water management, zero liquid discharge (ZLD) system, effluent treatment system, solid / hazardous waste management system, air pollution control measures, solvent recovery management system and online monitoring system.The committee asked the Sun Pharma to provide copies of all necessary clearances and consent and other permission, information on pollution control mechanism in the unit, production details and information on hazardous and other waste generation. After the site inspection, the committee made a visit to nearby water bodies, agriculture fields, the Vedanthangal Bird Sanctuary and Maduranthagam lake and collected requisite water/sediment samples in the lake environment.

The Committee met again on 4-11-2020 at TNPCB Office (Arumbakkam, Chennai) and discussed the outcome of the water and soil quality analysis, Environmental Compensation and recommendations and finalised the report.

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Map showing Industry location, Vedanthangal Bird Sanctuary and Maduranthagam Lake

4. NECESSARY CLEARANCES AND CONSENT AND OTHER PERMISSION:

The Sun Pharma an existing pharmaceutical industry was established in the year 1992-93 located at Survey No. 90/2, 90/3, 90/4, 99/1, 99/2, 99/3, 99/4, 99/5, 100/1, 100/2A, 100/2B, 100/3, in Sathammai Village, Karunkuzhi Post, Maduranthagam Taluk, Chengalpattu District, Tamil Nadu. Total land area is 17.27 acres with 31.47% of greenbelt along the periphery and other areas.From the industry, the Vedanthagal Bird Sanctuary is located at 3.72 Km of west. The important water bodies like Maduranthagamlake is located south west of the industry (Maduranthagam Tank: 1.13 km SW Direction; Maduranthagam High Level Channel: 4.93 km SSW Direction)

4.1. Consent under Air and Water Acts:

Consent issued in 1992: As per the documents submitted to the Committee, initially, Consent was issued to the M/s Pradeep Exports (A unit of Pradeep drug Company Ltd), Sathamai Village (Maduranthagam Taluk) vide Consent Order No.8850 dated 9-4-1992 under the Water Act, 1974 with validity up to 31-03-1993 and thereafter modification issued on 5-6-1992. The company was later merged with/converted into M/s Sun Pharma Industries Ltd. (Copy of Consent given at **ANNEXURE -3**).

Environmental viability study: A study was conducted in June 2005 by the Anna University, Chennai to assess the environmental viability for the additional products/ processes of Sun Pharma (A copy of the report is at **ANNEXURE-4**)

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Consent issued in 2005: The TNPCB granted CTE to the Sun Pharma vide Order **No. 3094** dated **30-11-2005** with validity up to two-years or till industry obtains the CTO under the Air (Prevention and Control of Pollution) Act, 1981 as amended, whichever is earlier.

The TNPCB granted CTE to the Sun Pharma vide **Order No. 3150** dated **30-11-2005** with validity up to two-years or till industry obtains the CTO under the Water (Prevention and Control of Pollution) Act, 1974 as amended, whichever is earlier. (**ANNEXURE-5**)

Consent issued in 2006: The TNPCB granted CTO to the Sun Pharma vide **Order No 16641** dated **19-06-2006** with one-year validity upto 31-03-2007 under the Air (Prevention and Control of Pollution) Act, 1981 as amended.

The TNPCB granted Consent for altered discharge of sewage and /or trade effluent to the Sun Pharma vide **Order No. 20607** dated **19-06-2006** with one-year validity upto 31-03-2007 under the Water (Prevention and Control of Pollution) Act, 1974 as amended. (**ANNEXURE-6**)

Consent issued in 2020: The TNPCB granted CTO to the Sun Pharma vide Order No. 2005218846891 dated 02-01-2020 with one-year validity upto 31-03-2021 under the Air (Prevention and Control of Pollution) Act, 1981 as amended. The TNPCB granted CTO to the SPIL vide Order **No. 2005118846891** dated **02-01-2020** with one-year validity upto 31-03-2021 under the Water (Prevention and Control of Pollution) Act, 1974 as amended. **(ANNEXURE -7)**

The industry submitted the details of 'raw materials and consumption' for the year 2019-2020 and for the year April 2020- July 2020 for production of (i) Clomipramine (ii) Oxetacaine (iii) Sodium Valporate (**ANNEXURE -8**).

Authorization under Hazardous Waste Rules: The TNPCB granted Authorization to the Sun Pharma vide Order No. 4880 dated 18-07-2016 with validity for a period of five years from the date of issue, under the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016. **(ANNEXURE-9)**

Public Liability Insurance Act 1991: The industry has obtained public liability insurance policy for the period from July 01, 2020 to June 30, 2021 under the Public Liability Insurance Act 1991 with limit of indemnity of Rs. 15 crore (AoY) and Rs. 5 crore (AoA) for the purpose of accidents due to handling of hazardous substances in the industry.

Fire Licence: Fire licence issued by the Tamil Nadu Fire and Rescue Services valid up to 22-06-2021.

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4.2. Committee's observation:

From the above facts, it is observed that the unit started its production before 1994 and Consent was obtained from the respective State Pollution Control Board (SPCB) in 1992. As per the EIA Notification, 1994, exemption from obtaining EC, was granted to projects that were already initiated before 1994 (**ANNEXURE-10**).The Sun Pharma is operating its unit based on Consents were issued in 2005, 2006 and 2020 by the SPCBand also based on the findings of the Anna University study that the waste generated by the products / process of the Sun Pharma are less than the permitted amount of waste generation.EC requirement was not applicable for the existing operation. But, for the proposed production of the bulk drug intermediates, EC is required under the current EIA 2006 and draft EIA 2020.

The unit,in May, 2020 has applied for EC for the "Proposed Change in Product Mix and Enhancement of production capacity within the existing facility". The unit has proposed for production of bulk drug intermediates of 38.11 MTPM and also proposed for new addition and enhancement of existing capacity to 75.82 MTPM. The existing production capacity of the unit is 25.5MTPM.

5. POLLUTION CONTROL MECHANISM

The industry has separate Effluent Treatment Plant (ETP) and Sewage Treatment Plant (STP). Generated waste water is treated in Zero Liquid Discharge system [Multi Effect Evaporation (MEE) and Agitated Thin Film Dryer (ATED)]. Effluents send to ETP followed by RO. RO permeate reuse for utilities & others & RO rejects sent to MEE Plant & MEE rejects send to ATFD.

Effluent Treatment Plant (ETP): The effluent generated from manufacturing plant is collected and treated through ETP (The details of ETP Components and Specification details are given at **ANNEXURE-11).**Sewage is treated by STP. 34.5 KLD of effluent is generated by the unit which is treated by ETP and 22.5 KLD of sewage is generated and treated by STP. Treated water sent to greenbelt.

Hazardous Wastes: The industry has submitted a copy of Annual Return (Form -IV) of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 submitted to SPCB, for the year April 2018 to March 2019 and April 2019 to March 2020 (**ANNEXURE -12**). The industry generated hazardous waste viz., (i) Spent Nickel (1.5 tons) (ii) Spent Carbon (4.29 tons) (iii) Spent Organic Solvents (239 tons) (iv) Spent Oil (1.5 tons) and Discarded Barrels/ Containers used for handling hazardous wastes/chemicals (1492) and Chemical Sludge from waste water treatment (629.43) for the year April 2019 to March 2020.

The hazardous waste generated for the year April 2018 - March 19 are (i) Spent Nickel (1.5 tons) (ii) Spent Carbon (4.29 tons) (iii) Spent Organic Solvents (240 tons) (iv) Spent Oil (1.5 tons) and Discarded Barrels/ Containers used for handling hazardous

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wastes/chemicals -HDPE drums (1492) and Chemical Sludge from waste water treatment (731.19)

The hazardous wastes that are generated are sent to authorised TSDF Facilitators /Recyclers as per the details given below:

Hazardous waste/category as per HW Rules 2016	**Authorised TSDF/Recyclers**
Spent Oil (Category: 5.1)	Sri Chementor Pvt Ltd. Perumbakkam Village, Vanur Taluk, Vilupuram, Tamil Nadu
Spent Catalyst (Nickel) (Category: 28.2)	M/s Roddhi Siddhi Steels and alloys, Nagpur, Maharashtra
Spent Carbon (Category: 28.3) and Chemical sludge (Category: 35.3)	-Tamil Nadu Waste Management Ltd, Gummidipoondi, Tamil Nadu -GE Eco Services, Kadappa District, Andhra Pradesh
Spent solvent (Category: 28.6)	-Sri Chementor Pvt Ltd. Perumbakkam Village, Vanur Taluk, Vilupuram, Tamil Nadu - M/s Pentakcoat resins, Kondalankuppam Village, Vanur Taluk, Vilupuram, Tamil Nadu -OZPEC Chemical Industries Pvt Ltd Coimbatore Dist, Tamil Nadu
Discarded Barrels, Liners and fibre drums (Category: 33.1)	M/s Dhanasekaran Nadar Traders Unit-II Kancheepuram Dist, Tamil Nadu

Municipal Solid Waste: Solid Wastes generated from canteen is being utilised as manure within the premises.

Water Supply: As per the information provided to the committee, the industry has got agreement with external agency, M/s Lakshmi Waters, Mamandoor (Chengalpattu) for raw water supply for operation of the unit.

Water Balance Sheet: The industry submitted the water balance sheet stating the quantity of water used in the different processes, wastewater generation, sludge generation during the treatment, quantity of wastewater passed through RO system, quantity permeate and rejects, quantity of water recycled into the processes and the quantity of treated wastewater discharged (**ANNEXURE -13**).

Leak Detection and Repair (LDAR) programme: As per the document produced to the Committee, a leak Detection and Repair (LDAR) programme was implemented to comply with environmental regulations for reducing the fugitive emissions of targeted chemicals into the environment. This study was conducted by Glens Innovation Labs Pvt Ltd, Chennai.The study concluded that the Sun Pharma has a yearly emission of VOC was 36.20 kg/year/ and

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the percentage VOC reduction from fugitive emissions is due to LDAR study around 92%. (**ANNEXURE -14)**

Air control measures installed at site like scrubbers, cyclone separator, chimney stack as per recommendation of CPCB and for effluent, ZLD system is being operated.

5.1. Committee's observation

The hazardous wastes generated from Plant are collected, stored and disposed through authorized disposal cum recycle facilities as per the authorization from PCB and the unit has agreements with all waste disposal facilities for the same. There is no internal disposal facility available within the site. No trade and sewage effluent discharge to water or land. Domestic wastewater is treated in STP and treated water reuse for greenbelt development. Effluents send to ETP followed by RO.

It is observed that Solvent Recovery system is not working with high efficiency, so that the solvent along with the effluent is being sent to Multi Effect Evaporator system (MEE), where the solvent is collected separately and sent to recycler. The industry shall take necessary steps to optimise the operational efficiency of the Solvent Recovery system.

The unit has installed RO system, whereas the permeate is again reused and reject is sent to MEE for further treatment. In addition to the existing RO system, the industry shall install High pressure RO or any other suitable technology to increase more recycling of treated wastewater as well as it will reduce further steam consumption of MEE due to further increase in concentration of reject.

6. ISSUES ON DISCHARGE OF UNTREATED TRADE EFFLUENTS AND IMPACT ON WATER AND SOIL QUALITY

6.1 NGT's Direction:

Hon'ble NGT directed the Joint Committee to examine ***"whether there was any unauthorised discharge of untreated trade effluents from the unit to the nearby agricultural fields or other water bodies, if so what is the impact of that illegality on the water quality as well as the soil quality in the locality. If there is any violation and degradation found, what are the steps to be taken for remediation and also assess environmental compensation against them in accordance with law as directed by this Tribunal in several matters of such nature"***.

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6.2 Study to assess the presence of industrial pollutants in water, soil and sediment:

As follow up of the above direction, the Committee during its visit to the unit on 31-07-2020, investigated about the waste water/effluent disposal from the unit. The Committee inspected the ZLD system / ETP site, monitoring well, rain water drain, storage tank and other drain outlets around the industry.

It was noted that the industry manufactures wide range of Intermediates, Active Pharmaceutical Ingredients (APIs) and Drug products. The source of effluent generation from the industry is from Mother Liquor and Aqueous Layer from process, Equipment & Vessel washing, QC lab washing, Floor cleaning and Utility Blow down. Toluene is one of the major raw materials used by the industry for manufacturing chlomipramine, sodium valproate and Oxetacaine.

The Committee decided to examine the water quality as well as the soil quality by analysing industry specific parameters (Copper, Chromium, Hexavalent Chromium, Toluene, Chlorobenzene, M-Xylene, Naphthalene, other Volatile Organic Compounds), in and around the industrial unit in order to assess whether any specific industrial pollutants caused water & soil pollution. Accordingly, the following representative samples from were collected and analysed through NABL/QCI accredited Laboratory (GLens Innovation Labs, Chennai). The observed values for the water quality and soil quality parameters studied are given in **Table 1- 5**.

Samples	Locations/Name (Sampling locations are given in Map)
Ground water	Monitoring wells located within the industry site and various upstream and downstream locations of the industry
Surface water	Vedathangal Lake, Pudhupethangal eri, Hanumankuppam pond, Maduranthangam eri and open well at Pudhupet village
Sediment	Vedanthan village, Pudupettangal eri, Hanumanthakuppam and Madhuranthagam eri
Soil	New well northern side, Near muru, Francis trust- south, Ellappan site and Kandanpudupet

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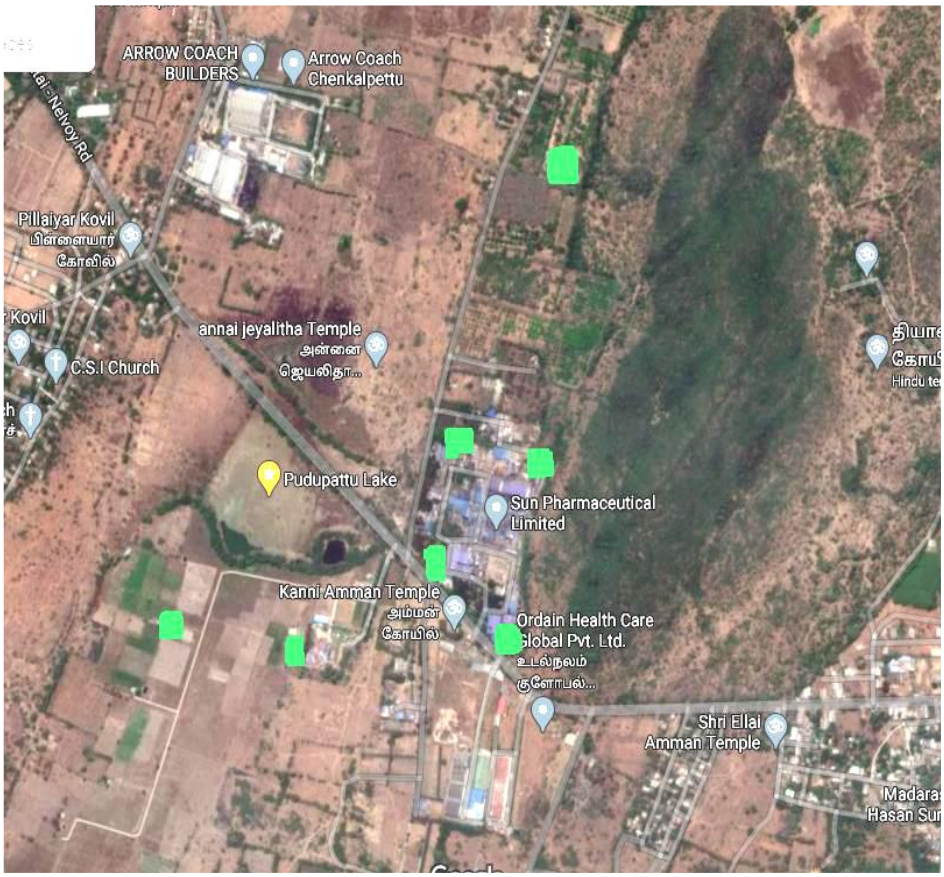
Sampling locations in nearby water bodies/lake



Ground water sampling locations in the vicinity of the industry

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Parameter	Table 1. Ground Water								
	Industries Monitoring well within premises				Upstream of industry		Downstream of industry		
	MW 1	MW 2	MW 3	MW 4	Sathammai open unused well 1	Sathammai open well 2	Frances Trust Well Side	Francis trust south side	Unused vellapan
PH	7.37	7.16	6.23	6.8	6.89	6.98	7.21	7.22	7.25
Total Dissolved Solids (mg/L)	1074	3988	7408	2176	3142	892	696	1724	1790
COD (mg/L)	28	104	118	151	61	33	28	47	57
BOD (mg/L)	7	17	15	19	7	6	5	8	8
C6H5OH (mg/L)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
TSS (mg/L)	5	15	23	20	9	2	1	11	10
Cr6+ (mg/L)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Cr (mg/L)	BDL	0.005	BDL	0.002	BDL	BDL	BDL	BDL	BDL
Cu (mg/L)	0.078	0.074	0.003	0.004	0.002	BDL	BDL	BDL	BDL
Toluene	BDL	10.89	26.19	25.49	BDL	BDL	BDL	BDL	BDL
Chlorobenzene	BDL	BDL	10.56	BDL	BDL	BDL	BDL	BDL	BDL
M-Xylene	BDL	BDL	19.27	BDL	BDL	BDL	BDL	BDL	BDL
Naphthalene	BDL	BDL	18.64	BDL	BDL	BDL	BDL	BDL	BDL

BDL: Below Detection Limit; Limit of Quantification: 10.0 µg/L

The impact of the water quality is assessed based on the signature pollutants majorly solvents used by the pharma industry.

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	Table 2. Lake (Surface Water)				
Parameter	**Vedathangal Lake**	**Pudhupethangal eri**	**Hanumankuppam pond**	**Madurantha ngam eri**	**Pudhupet village-open well**
PH	6.8	6.82	7.86	7.21	7.04
Total Dissolved Solids (mg/L)	295	710	1065	1424	852
Copper (mg/L)	BDL	0.028	BDL	BDL	BDL
Chromium (mg/L)	BDL	BDL	BDL	BDL	BDL

	Table 3. Lake Sediment			
Parameter	**Vedanthan village**	**Pudupettangal eri**	**Hanumanthakuppam**	**Madhuranthagam eri**
PH	6.68	6.88	6.67	6.82
Volatile solids	3.7	1.5	5.6	1.2

Table 4. Soil					
Parameter	**New well northern side**	**Near muru**	**Francis trust- south**	**Ellappan site**	**Kandanpudupet**
PH	7.1	6.78	7.1	7.19	7.02
EC	44.2	53.8	317	105	43.8
Sodium Absorption	1.24	1.12	3.3	1.52	2.17
Oranic Matter	0.1	0.1	0.22	0.23	0.1
CEC (meq/100g)	18.52	33.93	49.03	51.69	38.79

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	Table 5. Volatile Organic Compounds (VOCs) (µg/L) of lake, sediment, soil & ground water (Except industry monitoring well)					
S.N	**Lis of VOCs**	**Limit of Quantification (LoQ)**	**Lake (Surface water)**	**Sediment**	**Soil**	**Ground water samples**
1.	DICHLOROMETHANE,	10.0 µg/L	BDL	BDL	BDL	BDL
2.	1,1-DICHLOROETHYLENE,		BDL	BDL	BDL	BDL
3.	RANS-1,2-DICHLOROETHANE,		BDL	BDL	BDL	BDL
4.	1,1-DICHLOROETHANE,		BDL	BDL	BDL	BDL
5.	CIS-1,2-DICHLOROETHANE,		BDL	BDL	BDL	BDL
6.	2,2-DICHLOROPROPANE,		BDL	BDL	BDL	BDL
7.	1,1-TRICHLOROETHANE,		BDL	BDL	BDL	BDL
8.	CIS-1,3-DICHLOROPROPANE,		BDL	BDL	BDL	BDL
9.	1,1-DICHLOROPROPANE,		BDL	BDL	BDL	BDL
10.	CHLOROFORM,		BDL	BDL	BDL	BDL
11.	CARBONTETRACHLORIDE,		BDL	BDL	BDL	BDL
12.	BROMOCHLOROMETHANE,		BDL	BDL	BDL	BDL
13.	TOLUENE,		BDL	BDL	BDL	BDL
14.	BENZENE,		BDL	BDL	BDL	BDL
15.	1,2-DICHLOROPROPANE,		BDL	BDL	BDL	BDL
16.	TRANS-1,3-DICHLOROPROPANE,		BDL	BDL	BDL	BDL
17.	1,1,2-TRICHLOROETHANE,		BDL	BDL	BDL	BDL
18.	BROMODICHLOROMETHANE		BDL	BDL	BDL	BDL
19.	1,2-DICHLOROETHANE,		BDL	BDL	BDL	BDL
20.	TRICHLOROETHYLENE,		BDL	BDL	BDL	BDL
21.	DIBROMOMETHANE,		BDL	BDL	BDL	BDL
22.	1,3-DICHLOROPROPANE		BDL	BDL	BDL	BDL
23.	1,2-DIBROMOETHANE,		BDL	BDL	BDL	BDL
24.	DIBROMOCHLOROMETHANE,		BDL	BDL	BDL	BDL
25.	1,1,1,2-TETRACHLOROETHANE,		BDL	BDL	BDL	BDL
26.	TETRACHLOROETHENE,		BDL	BDL	BDL	BDL
27.	m-XYLENE,		BDL	BDL	BDL	BDL
28.	p-XYLENE,		BDL	BDL	BDL	BDL
29.	o-XYLENE,		BDL	BDL	BDL	BDL
30.	ETHYLBENZENE,		BDL	BDL	BDL	BDL
31.	CHLOROBENZENE		BDL	BDL	BDL	BDL
32.	BROMOBENZENE,		BDL	BDL	BDL	BDL
33.	STYRENE,		BDL	BDL	BDL	BDL
34.	1,2,3-TRICHLOROPROPANE,		BDL	BDL	BDL	BDL
35.	ISOPROPYLBENZENE,		BDL	BDL	BDL	BDL
36.	1,1,2,2-TETRACHLOROETHANE,		BDL	BDL	BDL	BDL
37.	PROPYLBENZENE,		BDL	BDL	BDL	BDL
38.	BROMOFORM,		BDL	BDL	BDL	BDL
39.	1,2,4-TRIMETHYLBENZENE,		BDL	BDL	BDL	BDL
40.	P-ISOPROPYLTOLUENE,		BDL	BDL	BDL	BDL
41.	1,4-DICHLOROBENZENE,		BDL	BDL	BDL	BDL
42.	1,3-DICHLOROBENZENE,		BDL	BDL	BDL	BDL
43.	1,3,5-TRIMETHYLBENZENE,		BDL	BDL	BDL	BDL
44.	2-CHLOROTOLUENE		BDL	BDL	BDL	BDL
45.	4-CHLOROTOLUENE,		BDL	BDL	BDL	BDL
46.	NAPHTHALENE,		BDL	BDL	BDL	BDL
47.	1,2-DIBROMO-3-CHLOROPROPANE,		BDL	BDL	BDL	BDL
48.	1,2,3-TRICHLOROBENZENE,		BDL	BDL	BDL	BDL
49.	sec-BUTYLBENZENE,		BDL	BDL	BDL	BDL

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50.	t-BUTYLBENZENE,		BDL	BDL	BDL	BDL
51.	n-BUTYLBENZENE,		BDL	BDL	BDL	BDL
52.	1,2-DICHLOROBENZENE,		BDL	BDL	BDL	BDL
53.	1,2,4-TRICHLOROBENZENE,		BDL	BDL	BDL	BDL
54.	HEXACHLORO-1,3-BUTADIENE		BDL	BDL	BDL	BDL

BDL: Below Detection Limit; Limit of Quantification: 10.0 µg/L

6.3 Committee's Observation:

(i) Impact of industrial effluent on quality of surface water and sediment of Vedanthangal lake located within the Bird Sanctuary:

The analysis of surface water and sediment collected from the Vedanthangal lake shows that **there is no specific impact from the industrial effluent**. Copper and Chromium concentration were negative and observed in below detectable limit. The common Volatile Organic Compounds (VOCs) from the industrial activity namely benzene, ethylene glycol, formaldehyde, methylene chloride, tetrachloroethylene, toluene, xylene, and 1,3-butadiene were found in below detectable level in surface water and sediment of the lake.

As per the information provided by the Tamil Nadu Forest Department, "migratory birds visit to the lake every year and nesting is noted based on monsoon dynamics. Nesting birds usually leave the nest in the morning and return back by evening, they go to farther locations mostly and few bird species prefer surrounding 1 or 2 km area. so far, **no casualty of Vedanthangal birds is noted due to any consumption of water or feed from surrounding water bodies or field area**".

Based on the analysis of water and sediment samples and above facts given by the Tamil Nadu Forest Department, the committee is of the opinion that there may be no impact of industrial pollutants to the lake by the industry and no likely threat to the migratory birds of Vedanthagal Bird Sanctuary.

(ii) Impact of industrial effluent on quality of surface water and sediment of water bodies (Pudhupethangal Eri, Hanumankuppam pond, Maduranthangam Eri and Pudhupet village - open well)

The analysis of surface water and sediment collected from the water bodies namely Pudhupethangal Eri, Hanumankuppam pond, Maduranthangam Eri and Pudhupet village (open well) shows that **there is no specific impact from the industrial effluent**. Copper and Chromium concentration were negative and observed in below detectable limit. The common VOCs from the industrial activity namely benzene, ethylene glycol, formaldehyde, methylene chloride, tetrachloroethylene, toluene, xylene, and 1,3-butadiene were found in below detectable level in surface water and sediment of the above water bodies. Committee noted that these water bodies are located downstream of Vedanthangal lake and there is no chance that the water from these water bodies gets into Vedanthangal lake/Bird Sanctuary.

(iii) Impact of industrial effluent on ground water quality:

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Ground water samples were collected from nine locations in and around the industry. (Four from the monitoring wells located within the industry site and three from downstream locations and two from the upstream locations of the industry). The samples were tested for Phenolic compound (C6H5OH), Total Suspended Solids (TSS), Hexavalent Chromium (Cr6+) Chromium (Cr), Copper (Cu) and Volatile Organic Compounds (VOCs), in addition other chemical parameters.

From the ground water quality analysis, it is observed that there is contamination of ground water observed at industry monitoring wells. Occurrence of VOCs namely Toluene, Chlorobenzene, M-Xylene and Naphthalene in monitoring wells inside the unit shows the ground water is contaminated. Highlights of chemical compounds observed are presented below:

- Phenolic compound in all ground water samples were deducted in BDL (Below Detectable Limit)

- The Chromium was negative (BDL) in all upstream and downstream samples. But it was present in industries monitoring wells viz., MW 4 (0.002 mg/l) and MW2 (0.005 mg/l) which is lower than the acceptable limit of Chromium (0.05 mg/l) present in ground water.

- The water quality analysis of Monitoring Well (MW3) shows the presence of VOCs namely Toluene (26.19), Chlorobenzene (10.56), M-Xylene (19.27) and Naphthalene (18.64) indicating the ground water of the industry site is contaminated.

It was noted that the industry utilised Solar Evaporation Pans (SEPs) till Sep 2011 for the disposal of high TDS effluent. The unit has further installed MEE followed by ATFD to achieve zero discharge as directed by the Pollution Control Board. The SEPs were existing till 2013 and completely found closed before Nov 2013 as per the google images (**Figure: Solar Evaporation Pans, Sun Pharma**).

The Committee is of the opinion that the ground water contamination in terms of VOCs at industry monitoring wells is due to the past operation/existence of Solar Evaporation Pans before Nov 2013 and damage in this system may have led to seepage and contamination of ground water and same is reflected in the analysis report (contamination at MW2, MW3 & MW4).

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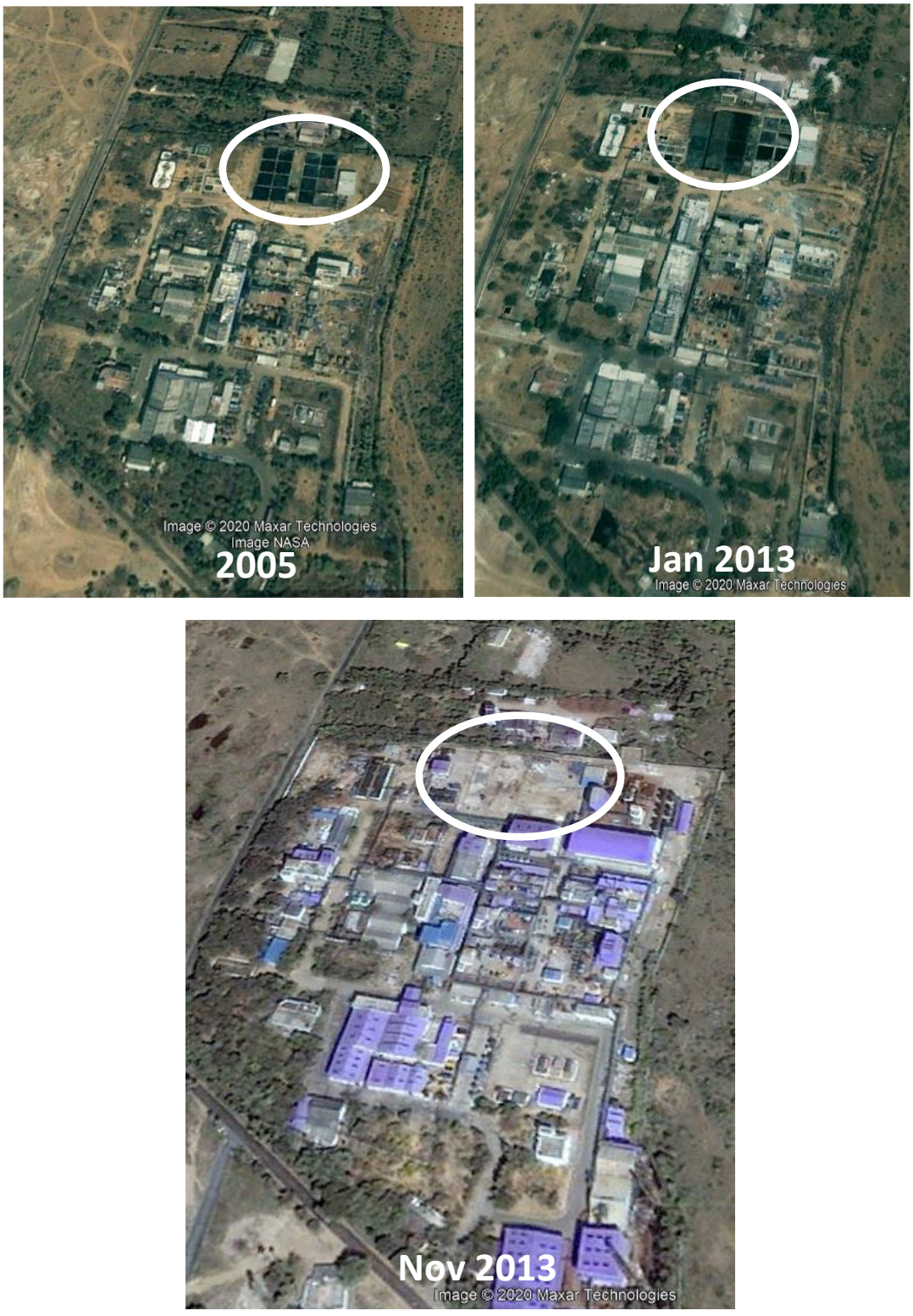

Figure: Industry's Solar Evaporation Pond (SEP),

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7. CONCLUSION AND RECOMMENDATIONS

7.1 Necessary clearances and consent and other permission:

The Sun Pharma started its production before 1994. As per the EIA Notification, 1994, exemption from obtaining Environmental Clearance, was granted to projects that were already initiated before 1994. The Sun Pharma is operating its unit based on Consents were issued in 2005, 2006 and 2020 by the SPCB and also based on the findings of the Anna University study that the waste generated by the products / process of the Sun Pharma are less than the permitted amount of waste generation. **In view of the above, it is observed that requirement of Environmental Clearance was not applicable for the existing operation.** But, for the proposed production of the bulk drug intermediates, Environmental Clearance is required under the current EIA 2006 and draft EIA 2020.

7.2 Pollution Control Mechanism:

The industry is segregating low & high TDS effluent and treating them separately. The reject from low TDS treatment system is sent to MEE & treated along with High TDS effluent. The concentrate from MEE is sent to ATFD to achieve ZLD. The domestic waste water generated in the plant is treated in Sewage Treatment Plant. The treated domestic waste water is utilised for gardening.

It is observed that Solvent Recovery System is not working with high efficiency, because of that the solvent along with the effluent is sent to MEE system where the solvent is collected separately and sent to recycler. The industry shall take necessary steps to optimise the operational efficiency of the Solvent Recovery System.

In addition to the existing RO system, the industry shall install High pressure RO or any other suitable technology to increase more recycling of treated wastewater which will also reduce further steam consumption of MEE due to increase in concentration of reject.

7.3 Impact on Vedanthangal Bird Sanctuary (Based on the facts submitted by Tamil Nadu Forest Department - ANNEXURE-15):

“The petitioner submits to Hon’ble NGT in the Para 10 of the OA 88/2020 that M/s Sun Pharmaceuticals Pvt Ltd is close to the core zone of the Vedanthangal Bird Sanctuary”.

"**There is no core zone and buffer zone demarcations in the Vedanthangal Sanctuary Notification vide G.O.Ms.No.199, E&F Dept dated 03-07-1999**. Sanctuary notification includes the water body/lake with 29.5 ha area and surrounding 5 km area (private land holdings, villages, town with intense human activity). The Sun Pharma is located at a

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distance of 3.7 kms from the sanctuary lake and is within the limits of 5 kms zone notified Sanctuary".

"Vedanthangal Lake is home to many nesting and roosting aquatic birds which are both local and distant migrant birds. Prime nesting species are Open Bill Stork, Grey Pelican, Painted Stork, White Ibis, Cormorants, Darter, Grey Heron, Large Egret, Spoonbill, Garganey Spot-billed Duck, etc".

"As observed by the staff in Vedanthangal Bird Sanctuary, nesting and roosting birds arrival to the Vedanthangal Lake depends on the water level in the lake and the feed availability. It is noted from the decadal bird data that, during a good monsoon year about 30000 birds arrive to the Sanctuary from September to December and about 70000-80000 birds (including young ones) return back between Jan-May. If the rainfall is low, only about 1000-3000 birds arrival is noted in the Sanctuary and if rainfall is moderate, about 15-20000 birds arrival is noted in the Sanctuary. Sufficient water availability in the lake also indicates good feed availability. To supplement the feed, Forest Department also releases fingerlings into the lake every year".

“In Para 13 of the OA 88/2020, the petitioner submits that the Sun Pharma discharges the trade and hazardous effluents to the near-by water bodies surrounding Vedanthangal lake. Birds use the surrounding water bodies and surrounding land area for nesting and foraging. The effluents which are discharged into the surrounding water bodies and land are threat to the birds of Vedanthangal”.

"Vedanthangal Bird Sanctuary is known for congregation of about 30-40000 birds during a good monsoon year and these are aquatic birds. Vedanthangal aquatic birds do not nest outside the lake and they nest only inside water body/lake. Other local land bird's nesting may be noted in the surrounding area. And, with respect to the point that hazardous effluents discharged by Sun Pharma to the surrounding lakes are threat to the birds, it is noted that, Vedanthangal is a centuries old Aquatic Birds nesting area and every year, migratory birds come to the lake. Nesting is noted based on monsoon dynamics. It is observed that, nesting birds usually leave the nest in the morning and return back by evening. They go to farther locations mostly and few bird species prefer surrounding 1 or 2 km area. So far, no casualty of Vedanthangal birds is noted due to any consumption of water or feed from surrounding water bodies or field area. Further, Sun Pharma is functioning in the location even before the Bird Sanctuary was declared in 1998".

“In para 14 of the OA, the petitioner submits to the Hon’ble NGT that Sun Pharma is close to water bodies like Sitheri, Puthupet thangal and Maduranthagam lake. And the above said water bodies join the Vedanthangal lake after catering to the needs of the agriculturists and villages. There is enormous pollution in these water bodies due to effluent discharge by the Sun Pharma”.

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"Vedanthangal lake is on the upstream side of Puthupet lake, Sitheri pond and Maduranthagam is the largest lake/water body into which most of the smaller water bodies drain during the good monsoon. Further, water in Maduranthagam drains towards eastern part and there is no chance that the water from these water bodies gets into Vedanthangal lake/Bird Sanctuary."

"Based on the facts and details mentioned above, it is concluded that, the submissions made in Para 10, 13 and 14 in the OA No.88/2020 by the petitioner with respect to the Vedanthangal lake/Bird Sanctuary are not based on the facts".**Committee is of the opinion that that there is no impact of industry operation on the Vedanthangal lake/Bird Sanctuary and no likely threat to the migratory birds.**

7.4 **Study to assess the presence of industrial pollutants in water, soil and sediment:**

(i) **Impact of industrial effluent on quality of surface water and sediment of Vedanthangal lake located within the Bird Sanctuary:**The analysis of surface water and sediment collected from the Vedanthangal lake shows that **there is no specific impact from the industrial effluent**. Copper and Chromium concentration were negative and observed in below detectable limit. The common Volatile Organic Compounds (VOCs) from the industrial activity namely benzene, ethylene glycol, formaldehyde, methylene chloride, tetrachloroethylene, toluene, xylene, and 1,3-butadiene were found in below detectable level in surface water and sediment of the lake.

(ii) **Impact of industrial effluent on quality of surface water and sediment of nearby water bodies:**

The analysis of surface water and sediment collected from the water bodies namely Pudhupethangal Eri, Hanumankuppam pond, Maduranthangam Eri and Pudhupet village (open well) shows that **there is no specific impact from the industrial effluent**. Copper and Chromium concentration were negative and observed in below detectable limit. The common VOCs from the industrial activity namely benzene, ethylene glycol, formaldehyde, methylene chloride, tetrachloroethylene, toluene, xylene, and 1,3-butadiene were found in below detectable level in surface water and sediment of the above water bodies. Committee noted that these water bodies are located downstream of Vedanthangal lake and there is no chance that the water from these water bodies gets into Vedanthangal lake/Bird Sanctuary.

(iii) **Impact of industrial effluent on ground water quality:**

Ground water samples were collected from nine locations in and around the industry. (Four from the monitoring wells located within the industry site and three from downstream locations and two from the upstream locations of the industry). The samples were tested for Phenolic compound (C6H5OH), Total Suspended Solids (TSS), Hexavalent Chromium (Cr6+) Chromium (Cr), Copper (Cu) and Volatile Organic Compounds (VOCs), in addition other chemical parameters.

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It was noted that the industry utilised Solar Evaporation Pans (SEPs) till Sep 2011 for the disposal of high TDS effluent. The unit has further installed MEE followed by ATFD to achieve zero discharge as directed by the Pollution Control Board. The SEPs were existing till 2013 and completely found closed before Nov 2013 as per the google images (**Figure: Solar Evaporation Pans, Sun Pharma**).

The Committee is of the opinion that the ground water contamination in terms of VOCs at industry monitoring wells is due to the past operation/existence of Solar Evaporation Pans before Nov 2013 and damage in this system may have led to seepage and contamination of ground water and same is reflected in the analysis report (contamination at MW2, MW3 & MW4).

7.5 **Assessment of environmental compensation:**

The Hon'ble Tribunal directed the Joint Committee to assess environmental compensation if there is any violation and degradation found. Accordingly, environmental compensation towards damage observed to the ground water resource at the industry monitoring well (due to the occurrence of VOCs in the monitoring wells of the industry), is estimated based on the pollution index method developed by CPCB in the guidelines "Policy for levying Environmental Compensation (EC) for Industries" and action plan to utilize the fund". The Hon'ble NGT has accepted the method and mentioned in the order dt 28-8-2019 in the matter of OA No. 593/2017 (W.P) (Civil) No. 375/2012, Paryavaran Suraksha samiti & anr. Versus Union of India & Ors. The following equation is used for estimating environmental compensation for the industry:

EC = PI x N x R x S x LF
PI = Pollution Index of industrial sector, since it is Red Category (PI = 80) N = Number of days of violation took place, from date of inspection 31.07.2020 to 04.11.2020 (ie., date of approval of Joint Committee Report) (N = 97) R = A factor in Rupees (₹) for EC (R = 250) S = Factor for scale of operation, Large Scale (S = 1.5) LF = Location factor, for notified ecologically sensitive areas (LF = 2) (The unit is located at a distance of 3.7 kms from the sanctuary lake and is within the limits of 5 kms zone of notified Sanctuary)
EC = 80 x 97 x 250 x 1.5 x 2
EC = Rs. 58,20,000

An interim compensation calculated by the committee is **Rs 58,20,000** and the industry may be asked to pay the interim compensation to TNPCB. The committee is of the opinion that the proposed environmental compensation amount may be utilised for conservation of Vedanthangal Bird Sanctuary.

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7.6 **Suggestions for Remediation:**

Since the traces of pollutants (volatile organic compounds) is observed within the monitoring wells, the industry may be directed to carryout ground water study through reputed institutions such as National Geo Physical Research Institute (NGRI), Central Ground Water Board (CGWB), NEERI, etc within six months. The industry shall carryout the remedial measures suggested as per study to improve the ground water quality in and around the industry premises.

By considering the above facts and observation of the Joint Committee, the Hon'ble Tribunal may pass appropriate Order (s)/Direction (s) as deemed fit.

Additional Principal Chief Conservator of Forest& Director, AAZP	**Wildlife Warden, Chennai and In-charge of Vedanthangal Bird Sanctuary**	**AEE-Public Works Department (WRO), Maduranthagam**
Revenue Divisional Officer (RDO), Maduranthagam	**District Environmental Engineer, TNPCB Chengalpattu District**	**Joint Chief Environmental Engineer (Monitoring), TNPCB, Chennai Zone**
Deputy Director (Labs), AEL, TNPCB, Chennai	**Scientist 'D' CPCB, Regional Directorate, Chennai**	**Scientist 'D', Regional Office, MoEF&CC, Chennai**

***

Joint Committee inspection at Sun Pharma

Collection of water and sediment samples by the Committee on 31-7-2020

Joint Committee visit and sample collection at Vedanthangal Bird Sanctuary/Lake

Item No.01:

ANNEXURE-1

BEFORE THE NATIONAL GREEN TRIBUNAL

SOUTHERN ZONE, CHENNAI

Original Application No. 88 of 2020 (SZ)

(Through Video Conference)

IN THE MATTER OF

Meenava Thanthai K.R. Selvaraj

Kumar, Meenavar Nala Sangam

....Applicant(s)

Versus

Union of India and others.

....Respondent(s)

Date of hearing: 26.06.2020.

CORAM:

HON'BLE MR. JUSTICE K. RAMAKRISHNAN, JUDICIAL MEMBER

HON'BLE MR. SAIBAL DASGUPTA, EXPERT MEMBER

For Applicant(s): Sri. G. Stanley Hebzon Singh

For Respondent(s): Sri. Kamalesh Kannan along with Sri. V. Jayaprakash Narayanan for R 2

Sri Abdul Saleem through Sri. Saravanan for R 3

ORDER

1. The above application has been filed by the applicant seeking the following reliefs:

(i) Issue direction to Respondent Nos.1 and 3 to initiate appropriate action against the 4th respondent for continuing illegal and unauthorized operation of plant at 90/2, 90/3, 90/4, 99/1, 99/2, 99/3, 99/4, 99/5, 100/1, 100/2A, 200/2B, 100/3 Sathammai Village, Karunkuzhi (PO), Maduranthagam (TK), Kancheepuram District, Tamil Nadu – 603 303 without obtaining the Prior Environmental Clearance as laid down under the Category 'A' of Item.5 (f) "Synthetic organic chemicals, Bulk Drug and Intermediates" of the Schedule to the EIA Notification, 2006.

(ii) Direct Respondent Nos.1 and 3 to initiate enquiry and actions against the concerned erring officials for permitting the respondent No.4 to be run and operated illegally without Environmental Clearance.

(iii) Appoint a permanent experts committee to protect the Vedanthangal lake bird sanctuary and its surrounded water bodies from the unauthorized and illegal activities.

(iv) Direct the respondent No.4 to pay Environmental damage for polluting the environment.

(v) Pass any order or orders as this Hon'ble Tribunal may deem it fit and appropriate in the facts and the circumstances of the present Application."

2. It is alleged in the application that fourth respondent had started a Pharmaceutical Industry of manufacturing of Bulk Drugs and intermediates in Survey No. 90/2, 90/3, 90/4, 99/1, 99/2, 99/3,

99/4, 99/5, 100/1, 100/2A, 200/2B, 100/3 Sathammai Village, Karunkuzhi (PO), Maduranthagam (TK), Kancheepuram District, Tamil Nadu.

3. It was categorised under the red category and the same is operating without prior environment clearance as envisaged under Category "A" of Item, 5(f) "Synthetic Organic Chemicals, Bulk Drug and Intermediates" of the Schedule to the EIA Notification, 2006. Further, the manufacturing plant of the fourth respondent is very close to the "CORE ZONE" of the Vedanthangal Bird Sanctuary declared by the Government of Tamil Nadu in G.O.Ms.No.199 dated 03.07.1999.

4. According to the applicant the running of the unit without environment clearance is against law. Further, they also alleged that there was expansion after its first establishment and for that also no environment clearance was obtained which they ought to have obtained.

5. It is also alleged in the application that they are discharging trade and hazardous effluents to the nearby water bodies including Vedandhangal Lake. They also discharge this trade effluents into nearby agricultural fields as well which is used for nesting and foraging of birds. They have relied on a paper report produced in

this regard which says that large scale discharge is being done by the fourth respondent as mentioned above.

6. They also relied on the decisions of the Hon'ble Apex Court in ***Alembic Pharmaceuticals Limited Versus Rohit Prajapati and Others***, ***Civil Appeal No. 1526 of 2016*** and other connected matters dated 01.04.2020. They have further contended that though representation has been made, no action was taken in this regard.

7. When the matter came up for hearing today for admission through Video Conference, Sri. G. Stanley Hebzon Singh appeared for the applicant and reiterated the allegations mentioned in the application. He had further submitted that even if this Tribunal is not inclined to entertain this application on the ground of non obtaining environment clearance or the legality of issuing consent orders by the Tamil Nadu Pollution Control Board, cannot be challenged at this stage, he reiterates the allegation of discharge of untreated effluents into the water bodies including Vedandhangal Lake and nearby agricultural land which causes environmental degradation which can be gone into by this Tribunal.

8. Sri. Kamalesh Kannan along with Sri. V. Jayaprakash Narayanan Tamil Nadu State Government Pleader represented 2nd respondent,

Sri Abdul Saleem through Sri. Saravanan represented 3rd respondent. The applicant is directed to take steps to issue notice to 1st respondent and also 4th respondent by email and by Dusthi and produce affidavit of copy to serve on them. The applicant is directed to submit the necessary requisite to this Tribunal to serve the notice to the respondents 1 and 4 within a week.

9. Before going to the matter further, we feel it appropriate to appoint a Joint Committee comprising of Senior Officer of Regional Office, Ministry of Environment, Forest and Climate Change (MoEF&CC), any Senior Scientist form Central Pollution Control Board, Regional Office, Chennai, Senior Forest Officer not below the rank of Chief Conservator of Forest, State of Tamil Nadu who is in charge of Wild Life dealing with the Bird Sanctuary, the District Collector, Kancheepuram District, District Forest officer, Kancheepuram District and Senior Scientist of Tamil Nadu Pollution Control Board to inspect the unit in question and submit a factual and action taken report, if there is any violation is found.

10. Regional Office, Ministry of Environment, Forest and Climate Change (MoEF&CC), Chennai will be the nodal agency for co-ordination for providing necessary logistics for this purpose.

11. The committee is also directed to consider the question as to whether 4th respondent unit is having all necessary clearances and consent and other permission as required under law, whether the pollution control mechanism provided in the unit are sufficient to protect environment, whether there is any violation of up keeping the pollution control mechanism provided which results in nonconformity with the standard provided under the environmental laws, whether there was any unauthorised discharge of untreated trade effluents from the unit to the nearby agricultural fields or other water bodies, if so what is the impact of that illegality on the water quality as well as the soil quality in the locality. If there is any violation and degradation found, what are the steps to be taken for remediation and also assess environmental compensation against them in accordance with law as directed by this Tribunal in several matters of such nature.

12. The committee is also directed to go into the question as to whether there is any violation of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, Solid Waste Management Rules, 2016, and Other Waste Management Rules, the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 by the fourth respondent.

13. The committee is also directed to suggest recommendation for rectifying the deficiency if any, found during inspection.

14. Two month time is granted to the committee to submit the report to this Tribunal through e-mail or e-filing at ngtszfiling@gmail.com on or before 01.09.2020.

15. The Registry is directed to communicate this order to the official respondents and also to the members of the committee including the 4th respondent unit in the e-mail address provided immediately, so as to enable them to appear before this Tribunal and submit their response and comply with the direction issued by this Tribunal.

16. The applicant is also directed to submit a set of papers to the members of the committee within a week. The applicant is also directed to serve copy of the application and the documents produced to the standing counsel appearing for the official respondents within a week.

17. For appearance for parties and filing of pleadings and consideration of report, post on 01.09.2020.

.....J.M.
(Justice K. Ramakrishnan)

.....E.M.
(Shri. Saibal Dasgupta)

O.A.No. 88/2020
26th June 2020. Sr.

ANNEXURE-2

Corrected Copy

Item No.01:

BEFORE THE NATIONAL GREEN TRIBUNAL

SOUTHERN ZONE, CHENNAI

Original Application No. 88 of 2020 (SZ)

(Through Video Conference)

IN THE MATTER OF

Meenava Thanthai K.R. Selvaraj

Kumar, Meenavar Nala Sangam ....Applicant(s)

Versus

Union of India and others.

....Respondent(s)

Date of hearing: 26.06.2020.

CORAM:

HON'BLE MR. JUSTICE K. RAMAKRISHNAN, JUDICIAL MEMBER

HON'BLE MR. SAIBAL DASGUPTA, EXPERT MEMBER

For Applicant(s): Sri. G. Stanley Hebzon Singh

For Respondent(s): Sri. Kamalesh Kannan along with Sri. V. Jayaprakash Narayanan for R 2

Sri Abdul Saleem through Sri. Saravanan for R 3

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(i) Issue direction to Respondent Nos.1 and 3 to initiate appropriate action against the 4th respondent for continuing illegal and unauthorized operation of plant at 90/2, 90/3, 90/4, 99/1, 99/2, 99/3, 99/4, 99/5, 100/1, 100/2A, 200/2B, 100/3 Sathammai Village, Karunkuzhi (PO), Maduranthagam (TK), Kancheepuram District, Tamil Nadu – 603 303 without obtaining the Prior Environmental Clearance as laid down under the Category 'A' of Item.5 (f) "Synthetic organic chemicals, Bulk Drug and Intermediates" of the Schedule to the EIA Notification, 2006.

(ii) Direct Respondent Nos.1 and 3 to initiate enquiry and actions against the concerned erring officials for permitting the respondent No.4 to be run and operated illegally without Environmental Clearance.

(iii) Appoint a permanent experts committee to protect the Vedanthangal lake bird sanctuary and its surrounded water bodies from the unauthorized and illegal activities.

(iv) Direct the respondent No.4 to pay Environmental damage for polluting the environment.

(v) Pass any order or orders as this Hon'ble Tribunal may deem it fit and appropriate in the facts and the circumstances of the present Application."

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99/4, 99/5, 100/1, 100/2A, 200/2B, 100/3 Sathammai Village, Karunkuzhi (PO), Maduranthagam (TK), Kancheepuram District, Tamil Nadu.

3. It was categorised under the red category and the same is operating without prior environment clearance as envisaged under Category "A" of Item, 5(f) "Synthetic Organic Chemicals, Bulk Drug and Intermediates" of the Schedule to the EIA Notification, 2006. Further, the manufacturing plant of the fourth respondent is very close to the "CORE ZONE" of the Vedanthangal Bird Sanctuary declared by the Government of Tamil Nadu in G.O.Ms.No.199 dated 03.07.1999.

4. According to the applicant the running of the unit without environment clearance is against law. Further, they also alleged that there was expansion after its first establishment and for that also no environment clearance was obtained which they ought to have obtained.

5. It is also alleged in the application that they are discharging trade and hazardous effluents to the nearby water bodies including Vedandhangal Lake. They also discharge this trade effluents into nearby agricultural fields as well which is used for nesting and foraging of birds. They have relied on a paper report produced in

this regard which says that large scale discharge is being done by the fourth respondent as mentioned above.

6. They also relied on the decisions of the Hon'ble Apex Court in ***Alembic Pharmaceuticals Limited Versus Rohit Prajapati and Others***, ***Civil Appeal No. 1526 of 2016*** and other connected matters dated 01.04.2020. They have further contended that though representation has been made, no action was taken in this regard.

7. When the matter came up for hearing today for admission through Video Conference, Sri. G. Stanley Hebzon Singh appeared for the applicant and reiterated the allegations mentioned in the application. He had further submitted that even if this Tribunal is not inclined to entertain this application on the ground of non obtaining environment clearance or the legality of issuing consent orders by the Tamil Nadu Pollution Control Board, cannot be challenged at this stage, he reiterates the allegation of discharge of untreated effluents into the water bodies including Vedandhangal Lake and nearby agricultural land which causes environmental degradation which can be gone into by this Tribunal.

8. Sri. Kamalesh Kannan along with Sri. V. Jayaprakash Narayanan Tamil Nadu State Government Pleader represented 2nd respondent,

Sri Abdul Saleem through Sri. Saravanan represented 3rd respondent. The applicant is directed to take steps to issue notice to 1st respondent and also 4th respondent by email and by Dusthi and produce affidavit of copy to serve on them. The applicant is directed to submit the necessary requisite to this Tribunal to serve the notice to the respondents 1 and 4 within a week.

9. Before going to the matter further, we feel it appropriate to appoint a Joint Committee comprising of Senior Officer of Regional Office, Ministry of Environment, Forest and Climate Change (MoEF&CC), any Senior Scientist form Central Pollution Control Board, Regional Office, Chennai, Senior Forest Officer not below the rank of Chief Conservator of Forest, State of Tamil Nadu who is in charge of Wild Life dealing with the Bird Sanctuary, the District Collector, *Chengalpet District, *Wildlife Warden in charge of Bird Sanctuary, Chennai and Senior Scientist of Tamil Nadu Pollution Control Board to inspect the unit in question and submit a factual and action taken report, if there is any violation is found.

10. Regional Office, Ministry of Environment, Forest and Climate Change (MoEF&CC), Chennai will be the nodal agency for co-ordination for providing necessary logistics for this purpose.

11. The committee is also directed to consider the question as to whether 4th respondent unit is having all necessary clearances and consent and other permission as required under law, whether the pollution control mechanism provided in the unit are sufficient to protect environment, whether there is any violation of up keeping the pollution control mechanism provided which results in nonconformity with the standard provided under the environmental laws, whether there was any unauthorised discharge of untreated trade effluents from the unit to the nearby agricultural fields or other water bodies, if so what is the impact of that illegality on the water quality as well as the soil quality in the locality. If there is any violation and degradation found, what are the steps to be taken for remediation and also assess environmental compensation against them in accordance with law as directed by this Tribunal in several matters of such nature.

12. The committee is also directed to go into the question as to whether there is any violation of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, Solid Waste Management Rules, 2016, and Other Waste Management Rules, the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 by the fourth respondent.

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14. Two month time is granted to the committee to submit the report to this Tribunal through e-mail or e-filing at ngtszfiling@gmail.com on or before 01.09.2020.

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17. For appearance for parties and filing of pleadings and consideration of report, post on 01.09.2020.

(*) Corrected as per Order

Dated: 30.06.2020.

.....J.M.
(Justice K. Ramakrishnan)

.....E.M.
(Shri. Saibal Dasgupta)

O.A.No. 88/2020
26th June 2020. Sr.

BEFORE THE NATIONAL GREEN TRIBUNAL **ANNEXURE 2A- Attendance**

SOUTHERN ZONE, CHENNAI

ORIGINAL APPLICATION NO. 88 OF 2020 (SZ)

JOINT COMMITTEE MEETING -31/JUL/2020

SR. NO	NAME	DESIGNATION	DEPARTMENT	SIGNATURE
1	D. VASUDEVAN	DEE	TNPCB MMNagar	D. Vasu 31/7/20
2.	Dr. R. Sridhar	Scientist-	MoEF&CC RO Chennai	
3	V. THIAGARAJAN	Dy Director (Law)	TNPCB Board	V. Thiagarajan 31/7/2020
4.	Mrs. C.H. PADMA, IFS	Wildlife Warden Chennai	TNFD	C.H. Padma
5	L. Asha Ismail	CSO	TNPCB	
6.	M. Madaiyandi	JCEE	TNPCB	31/7/2020.
7	Rajkumar. R	Sc 'D'	C.P.C.B Regional Director Chennai	
8	V.T. NEELMUDIYON, M.Tech,	Asst. Executive Engineer	P.W.D., W.R.D., Maduranthakam.	V.T. Neelmudiyon 31/7/2020
9	G. KUMAR	Junior Engineer	WRD Maduranthakam	
10.	S. Lakshmipriya	RDO, Madhuranthagam	Revenue	S. Lakshmipriya 31/7/2020.
11.	G. SOMBIAH	FRO, Saidapet Range ch.	Forest	G. Sombiah 31/07/2020
12.	Yogesh Singh, IFS	APCCF & Director, Arignar Anna Zoological Park.	Forest.	31.07.2020

Annex-I

ANNEXURE-3

5 JUN 1992

TAMILNADU POLLUTION CONTROL BOARD

Proceedings No.T3/CPT-MGR(S)/F-2057/W&A/dt.2.6.92.

Sub: TNPC Bd - Industries - M/s.Pradeep Exports - Sathammai, Maduranthakam Taluk - Chengalpattu M.G.R. District - Amendment issued - Regarding.

Ref: 1. T.O.Proc.No.T1/CPT-M.G.R.(S)/F-2057/W/ dated 7.4.92.

2. T.O.Proc.No.T1/CPT-M.G.R./F-2057/A/ dated 7.4.92.

££££££

Under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 and under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981, consent has been issued to the unit to manufacture the following products.

1. Furosemide - 3.0 T/M
2. Analgin - 30.0 T/M
3. Mebenezol - 3.0 T/M

Under section 27 of the Water (Preventionand Control of Pollution) Act, 1974 and under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981, the manufacturing products may be altered to read as follows:

1. Furosemide - 3.0 T/M
2. Analgin - 30.0 T/M
3. Mebenezol - 5.0 T/M

All other conditions stipulated in the consent order remain unaltered.

For CHAIRMAN.

To
The Managing Director,
M/s.Pradeep Exports,
(A unit of Pradeep Drug Company Limited,
268 Lloyds Road, Madras 600 014.

Copy to
The District Environmental Engineer,
TNPC Board, Tambaram.

Copy to
The Senior Environmental Engineer,
TNPC Board, Madras.
The Commissioner, Maduranthagam Panchayat Union,
Maduranthagam, Chengalpattu M.G.R. District.

svt/0306

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U.C.P.
By Registered Post with
Acknowledgement Due
(This document contains 12 pages)

(2)

TAMIL NADU POLLUTION CONTROL BOARD, MADRAS

CONSENT ORDER NO: 8850 DATED: 7.4.92

Proceedings No: T1/CPT-MGR(S)/F-2057/W/ DATED: 7.4.92

Consent for Existing/New ~~or Altered outlet~~/discharge of sewage and/~~or~~ trade effluent under Section 25/~~26~~ of the Water (Prevention and Control of Pollution) Act, 1974 as amended.

Sub: TAMIL NADU POLLUTION CONTROL BOARD - CONSENT - MESSRS.

Pradeep Exports
R.S.No.90/3, 90/4, 99/1,99/3,99/4,99/5,100/1, 100/2A, 100/2B, 100/3
Sathamai
Maduranthagam Taluk
Chengalpattu MGR District.

for the discharge of sewage and/~~or~~ trade effluent under Section 25/~~26~~ of the Water (Prevention and Control of Pollution) Act, 1974 (Central Act, 6 of 1974) as amended.

Ref: 1. Your Application No. 20502 dated 9.1.92

2. I.R. NO.DEE/CA(S)/F-112-10/W&A/dated 24.1.92.

~~CSC~~/Board Resolution No: 117 - 225 Dated 6.3.92

CONSENT is hereby granted under Section 25/~~26~~ of the Water (Prevention and Control of Pollution) Act, 1974 (Central Act, 6 of 1974) as amended (hereinafter referred to as "The Act") and the rules and orders made thereunder to

The Managing Director
M/s. Pradeep Exports
R.S.No.90/3,90/4,99/1,99/3,99/4,100/1,100/2A,99/5 100/2B,100/3
Sathamai
Maduranthagam Taluk
Chengalpattu MGR District.

(hereinafter referred to as "The applicant") authorising him/her/them to ~~continue to~~/~~or~~ bring into make new discharge ~~or use new/altered outlet~~ for discharge of sewage and/~~or~~ trade effluent.

This is subject to the provisions of the Act and the rules and orders made thereunder and further subject to the terms and conditions incorporated in the Special and General Conditions annexed.

This CONSENT is valid for a period ending with the 31st day of March 1993.
(Thirty First March Nineteen Ninety three).

se/7.4.92.

For CHAIRMAN
Tamil Nadu Pollution Control Board
Madras

(47)

To

The Managing Director
M/s. Pradeep Exports
(A unit of M/s. Pradeep Drug Co. Ltd.)
268, Lloyds Road
Madras - 600 014.

Copy to: The District Environmental Engineer, Tamil Nadu Pollution Control Board,
Tambaram
for information and necessary action.

Copy to: The Senior Environmental Engineer, Tamil Nadu Pollution Control Board,
.....Madras..... Region.

Copy to: The Commissioner/~~Executive Officer~~
Madurantagam Panchayat Union
Madurantagam
Chengalpattu MGR District.

Spare:

(48)

SPECIAL CONDITIONS

1. Details of the Products Manufactured

Sl.No. (1)	Description (2)	Quantity/Month (3)
1.	Furosemide	3.0 T.
2.	Analgin	30.0 T.
3.	Mebendazol	3.0 T.

This consent is valid for the manufacture of products and rate of production mentioned above. Any change in the quantity or quality of the products has to be brought to, the notice of the Board and fresh consent has to be obtained.

2. Discharge of effluent is permitted from the following outlets. The quantity of effluent discharged shall not exceed the figures mentioned below:

Outlet Number. (1)	Description of Outlet (2)	Maximum daily Discharge (in litres/day) (3)	Point of Disposal. (4)
1.	Sewage	6000	On Industry's land.
2.	Trade effluent	48500	Inland surface water.
3.			
4.			
5.			
6.			
7.			

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ANNEXURE-4

Report on

PREPARATION OF ENVIRONMENTAL VIABILITY FOR SUN PHARAMACEUTICAL INDUSTRIES LIMITED, SATHAMAI VILLAGE, MADHURANTHAKKAM TALUK

submitted to

Sun Pharmaceutical Industries Limited
(SPIL)

Prepared by

Centre for Environmental Studies

Anna University, Chennai – 600 025

June, 2005

Contents

Chapter I

Introduction

1.0 General

Sun Pharmaceuticals Industries Limited (SPIL) is an established public limited company, managing its operation in the field of bulk drugs and intermediates manufacturing in the region of Maharastra and Gujarat. The present manufacturing facility was originally established during the year of 1990 and is located at Sathammai Village under Maduranthakam Taluk in Kancheepuram District.

The SPIL is proposing to manufacture ten new pharmaceutical products at the facility in Sathamai village, Maduranthankam Taluk. The SPIL has already obtained license for three products that are

1. Frusemide
2. Analgin
3. Mebendazole

In the present scenario, the SPIL has approached Centre for Environmental Studies (CES) to evaluate ten new products that are listed below:

1. Metadoxine
2. Metaprolol Tartrate
3. Analgin Magnesium
4. Tramadol HCl
5. Carbamazepine
6. Flurbiprofen
7. Danazol
8. Clomipramine
9. Sodium Valproate
10. Oxetacaine

The scope of the study was to evaluate the processes of the ten new products and prepare an Environmental Viability Report based on the waste generated by the ten proposed process.

The scope of the present study on preparation of an Environmental Viability Report for SPIL is to evaluate stoichiometrically the reaction equations of all the processes and to check the validity of the processes. Further, based on the input given by the SPIL a detailed mass balance study was conducted for each processes and the total waste generated have been determined.

1.1 Objectives

The overall aim of the present study is to prepare an Environmental viability report based on waste generated by the ten new processes. Accordingly the following objectives have been formulated and furnished below

1. To determine stoichiometrically, the validity of the reaction equations for all the processes.
2. To conduct a mass balance study to determine the waste generated by the processes.
3. To prepare the Environmental viability report based on the information derived from the above objectives.

Chapter II

Process Evaluation

2.0 Introduction

The Sun Pharmaceutical Unit has obtained permission and environmental clearance to manufacture the following Pharmaceutical products with the rate of production per month

1. Frusemide - 3.0 T/M
2. Analgin - 30.0 T/M
3. Mebendazole - 5.0 T/M

[Vide Lr. Procs. No. T3/CPT-MGR (S)/F -2057W&A dated 2.6.92 Tamil Nadu Pollution Control Board (copy of this is annexed at the end of this report)].

The SPIL has know proposed to abandoned the existing manufacturing processes and commence production of ten new products as detailed in chapter I. It is now essential that in the event of new processing and consequently the loading of the waste into the environment has to be understood so as to ascertain the environmental quality. Hence, it is mandatory to determine the amount of waste generated by individual processes.

The following sections discuss the methodology adopted to determine the waste generated by the processes.

2.1 Methodology

The reaction equations for all the processes have been obtained (though it is confidential and not to be shared with any agencies). The equations have been checked stoichiometrically and number of moles of all the reactants in the reaction equations have been ascertained. The critical reactant has been identified and the number of moles of the yield has been checked for the validity of the reactions equations.

2.1.1 Mass Balance

Based on the data supplied by the SPIL for all the ten products, mass balance on reactants, solvents, products and waste generated have been analyzed. The summary of the waste generated by individual processes have been furnished.

2.2. Evaluation of Proposed Processes

The detailed process flow chat for all the processes have been collected and the stage wise input of all the processes have been worked out and listed in the Flow Chart. Similarly, the stage wise output from the process flow chart has been determined and furnished in the flow chart.

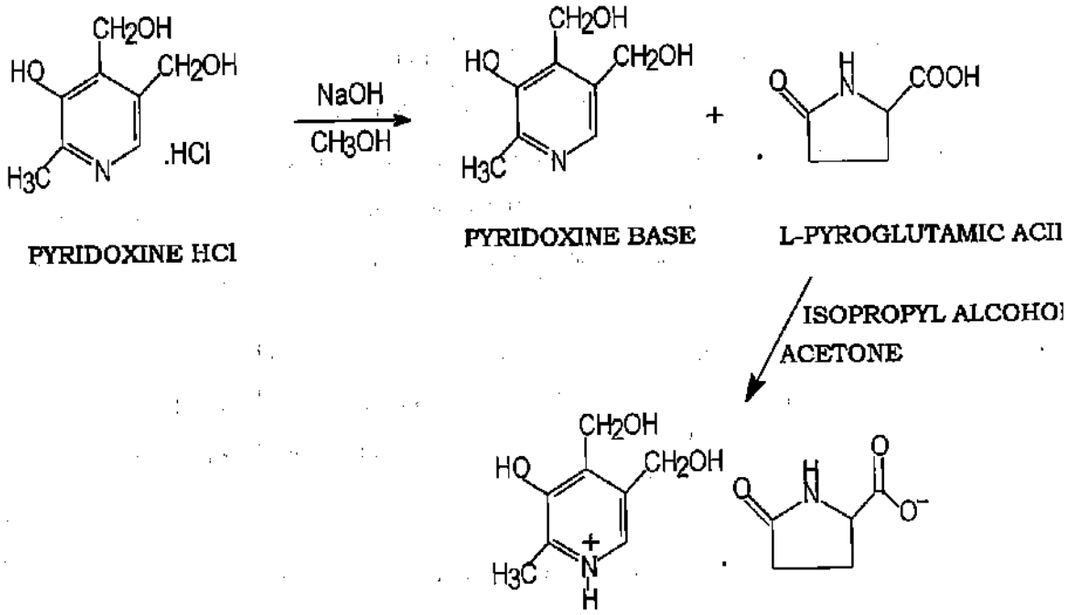
The Summary of all the input into the control volume and output from the control volume have been summarized at the end of the process evaluation. The following sections discuss the process evaluation of the ten products.

2.2.1 Metadoxine

The reaction equation (schematic diagram) for the synthesis of Metadoxine is given below. In this process 0.4866 Kg moles of Pyridoxine HCl requires 0.4866 or more of NaOH to produce 0.4866 or less of Pyridoxine base. Similarly the Metadoxine formed should be equal to or less than 0.4866 Kg moles, which in practice is only 0.335 kg moles. Hence the overall reaction is within the mass balance principles.

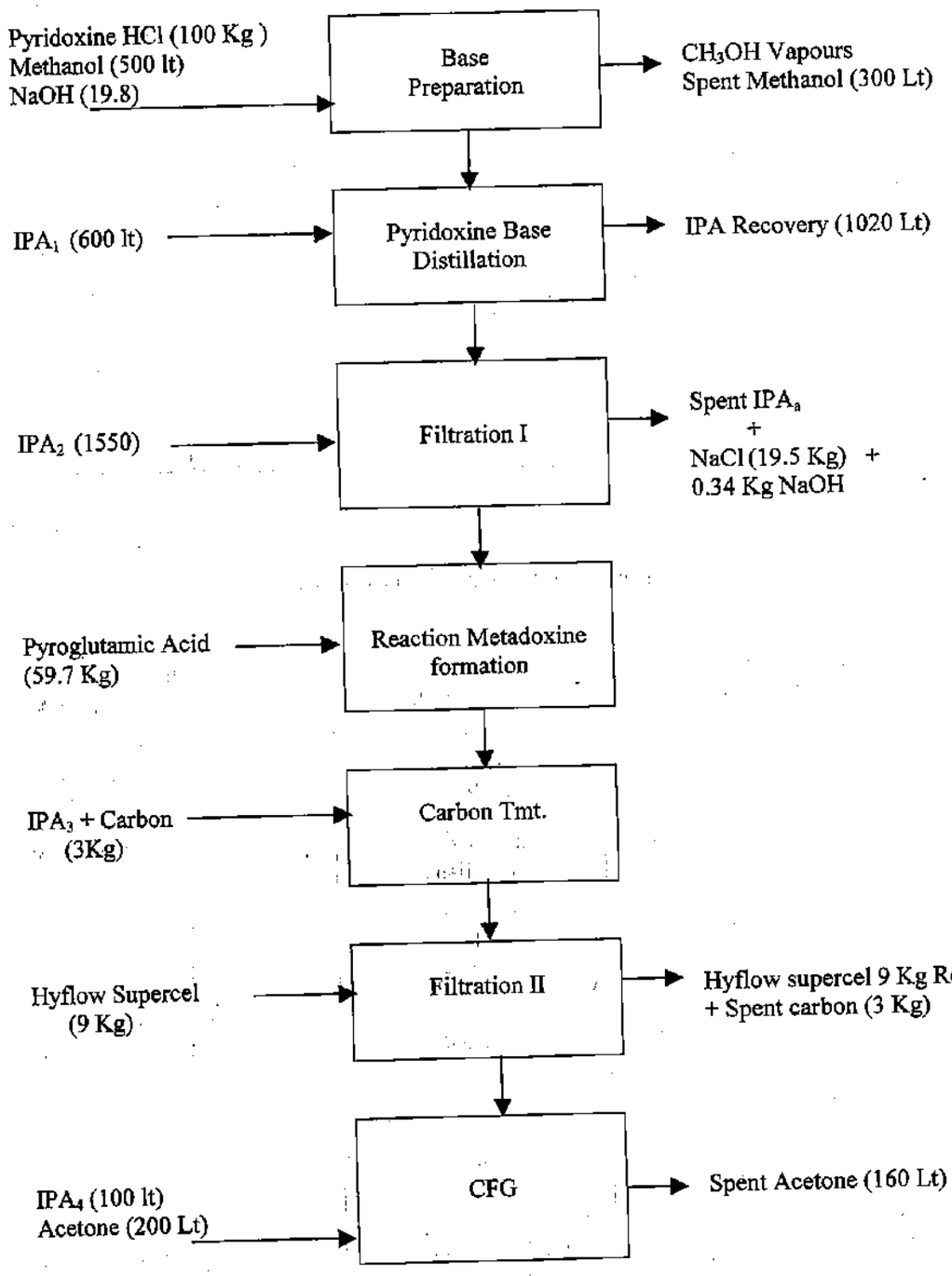
Note: In the above reaction, the amount of NaOH required to remove 0.4866 Kg mole of HCl is 0.4866 x 40 = 19.46 Kg of NaOH. Actual amount taken is 19.8 Kg to ensure complete conversion

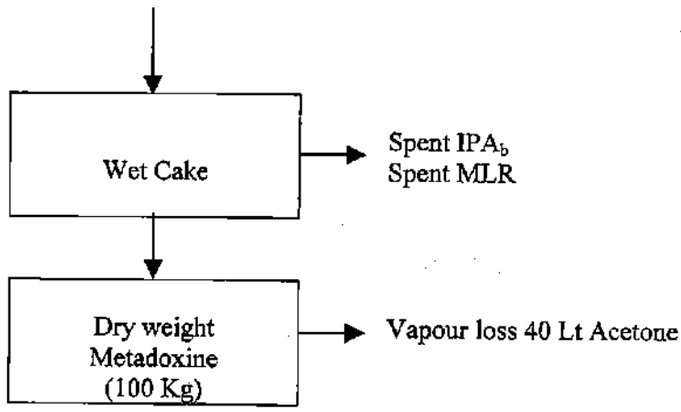
Schematic Diagram



METADOXINE

Metadoxine - Process flow diagram





Summary:

IPA_1 + IPA_2 + IPA_3 + IPA_4 = 2550 lt
(600) (1550) (300) (100)

Spent IPA_a + IPA_b = 1530 lt, IPA Rec: 1020, Tot : 2550 Lt

Total Waste:

Solid = 100 + 59.7 + 19.8 - 100 – 19.5 – 31.28 = 28.72 kg

(Note. 31.28 recovery as starting material)

Liquid = 500 + 2550 + 20 – 300 – 2550 – 160 – 100 = 140 L

Vapour loss = 100 L

Solid waste = 28.72 kg

Liquid = 140 L

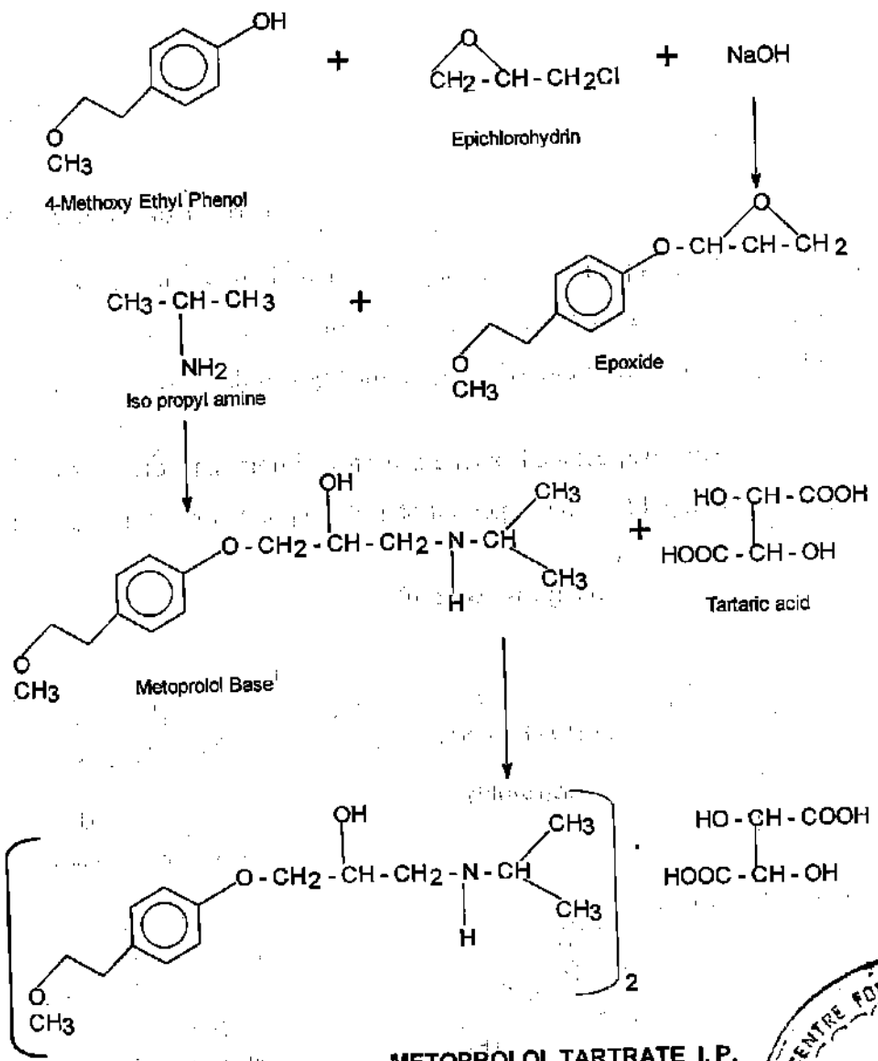
Spent Carbon = 3 kg

2.2.2 Metaprolol Tartrate

The reaction equation for the synthesis of Metaprolol Tartrate is shown below. For 1.22 Kg mole of Epichlorohydrin . 1.22 Kg mole or less of product should be formed which in turn reacts with ispropylamine (4.57 Kg mole) to yield the product.

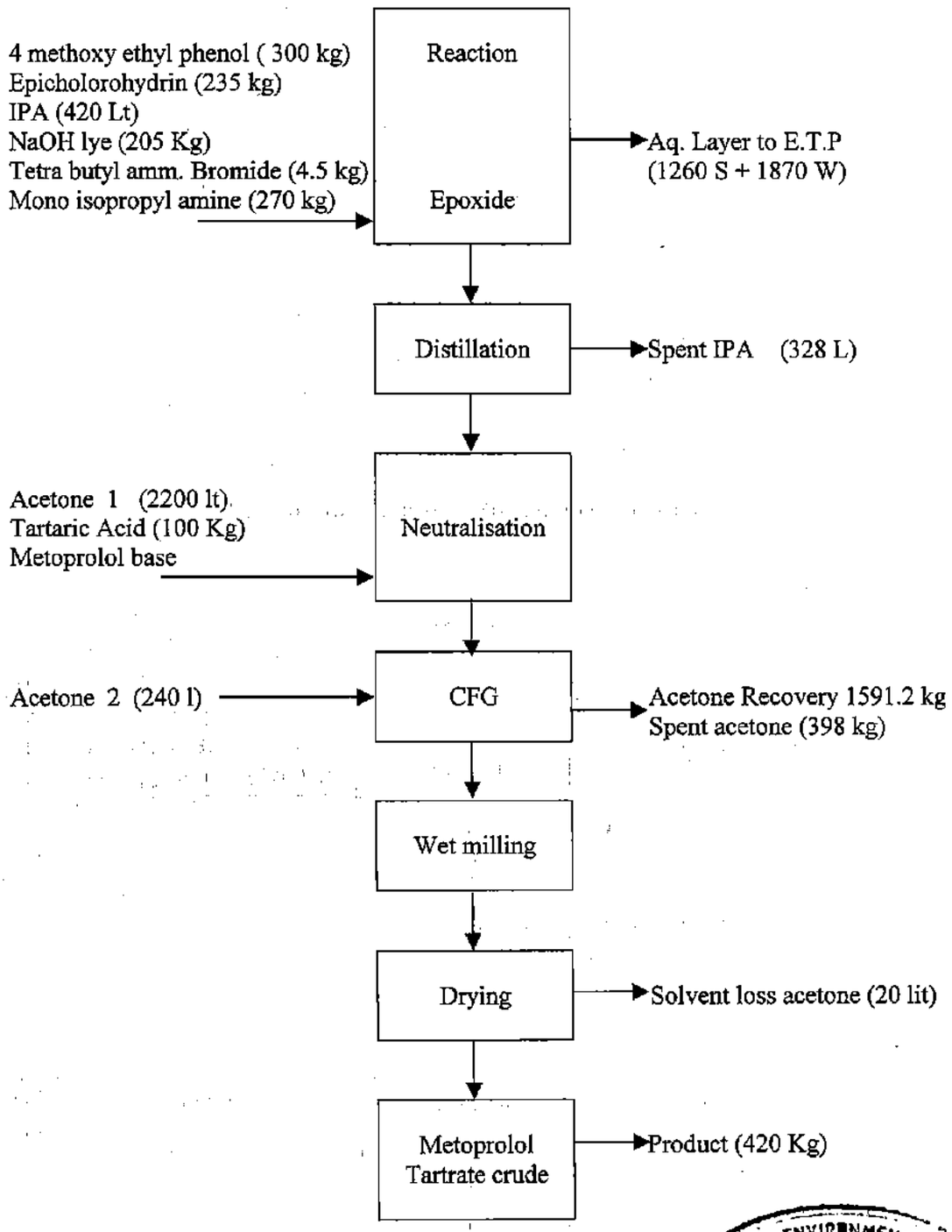
The overall reaction is within the mass balance principles. The metaprolol tartare (0.614 Kg mole) formed is quite less to the expected 1.22 Kg mole of yield.

Schematic Diagram



METOPROLOL TARTRATE I. P.

Metaprolol Tartrate - Process flow diagram



Summary:

Acetone 1 + Acetone 2 = 2440 Lt

DM water = 2000 Lt

Liquid Waste Generated = 3130 L
Solid = Nil
Loss of Solvent = 20 L

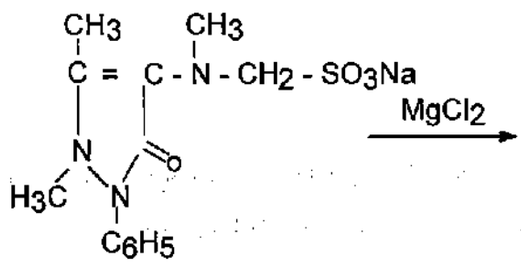
Strong Liquid Waste = 1260 L
Weak Liquid Waste = 1870 L
Solvent Loss = 20 L

Total Waste 3150 L

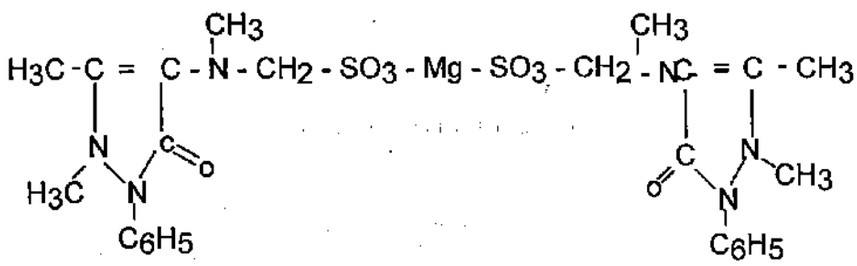
2.2.3 Analgin Magnesium

The reaction equation for the synthesis of Analgin Magnesium is given below schematically. From the molar stoichiometry, for every 1 mole of $MgCl_2$, 2 moles of substrate (Analgin) is required. In practice, for 1.355 Kg moles of analgin 0.678 (1.355/2) Kg moles of $MgCl_2$ is required. But 2.456 Kg moles of Analgin are used which is excess. However for an ideal condition 1.355 Kg mole of product formation is expected. Instead 0.698 Kg mole of product is formed which is within chemical mass balance principles. Hence O.K.

Schematic Flow Diagram

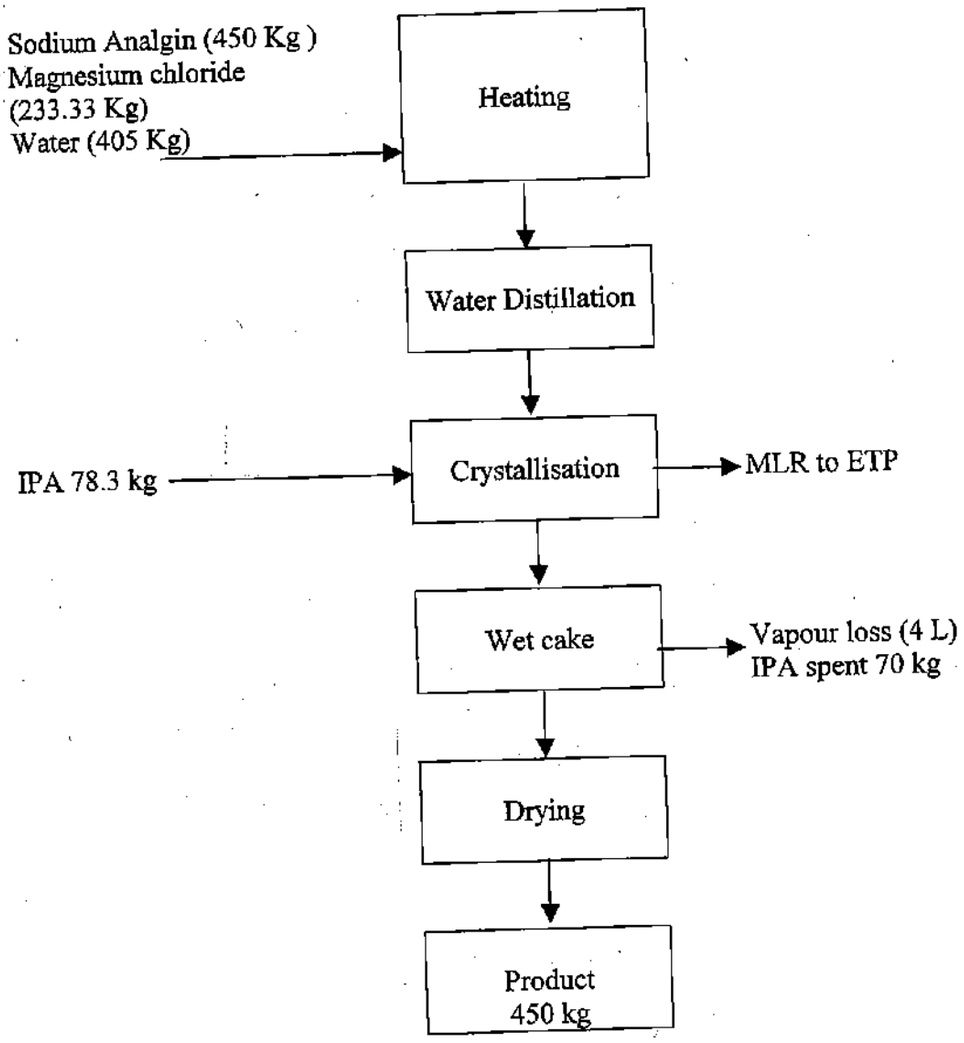


Sodium Analgin



Analgin Magnesium

Analgin Magnesium – Process flow diagram

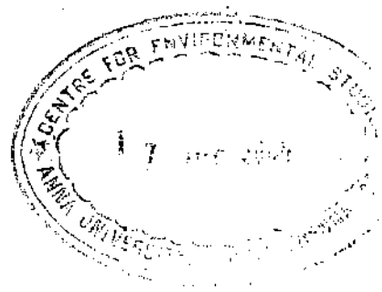


Summary of Waste Generated:

Total Waste generated = 450 + 233.33 + 405 + 78.3 – 450 – 70
= 646.63 – Vapour Loss of 4 L = 642.63 L

Liquid = 642.63 L
Loss of Solvent = 4L

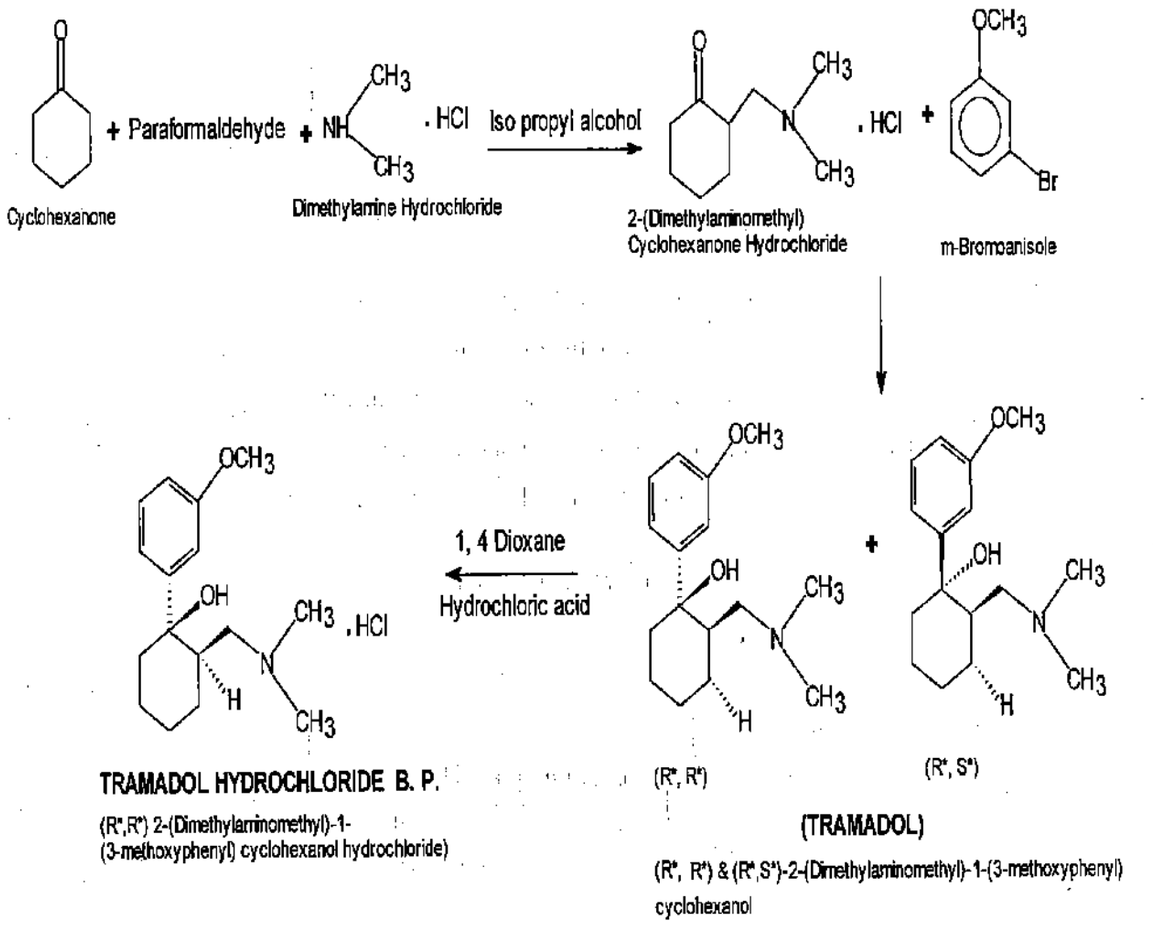
Strong liquid waste	= 172 L
Weak liquid waste	= 470 L
Solvent loss	= 4 L
Total Waste	646 Lt



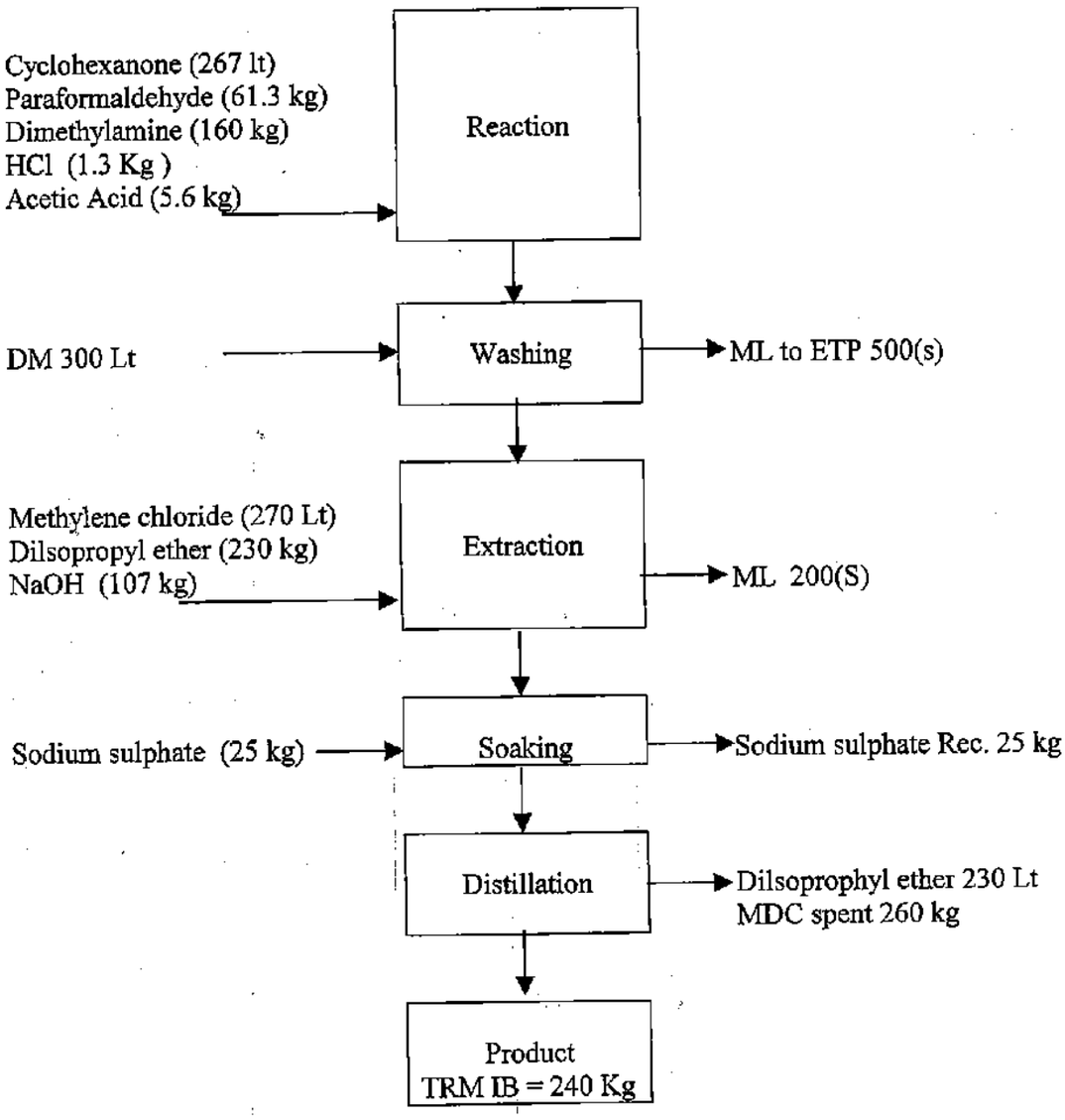
2.2.4 Tramadol Hydrochloride

The reaction equation for the synthesis of Tramadol HCL is given below. For reaction to occur ideally 1 mole of paraformaldehyde is required for every 3 moles of dimethylamine hydrochloride and 3 moles of cyclohexanone to get 3 moles of product. But it is seen that the reactants are taken in excess and the product formed in less than expected. The overall reaction is within the mass balance.

Schematic Diagram



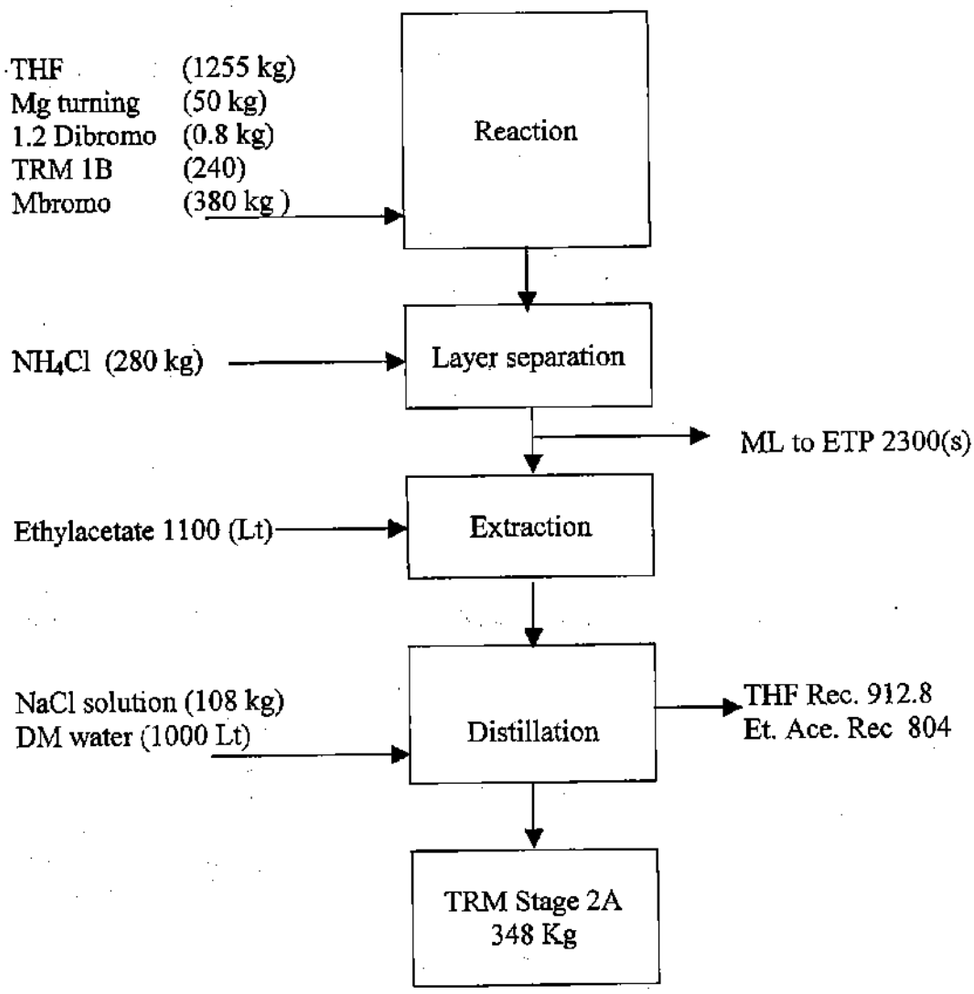
Tramadol Hydrochloride – Process flow diagram



Summary of Waste generated :

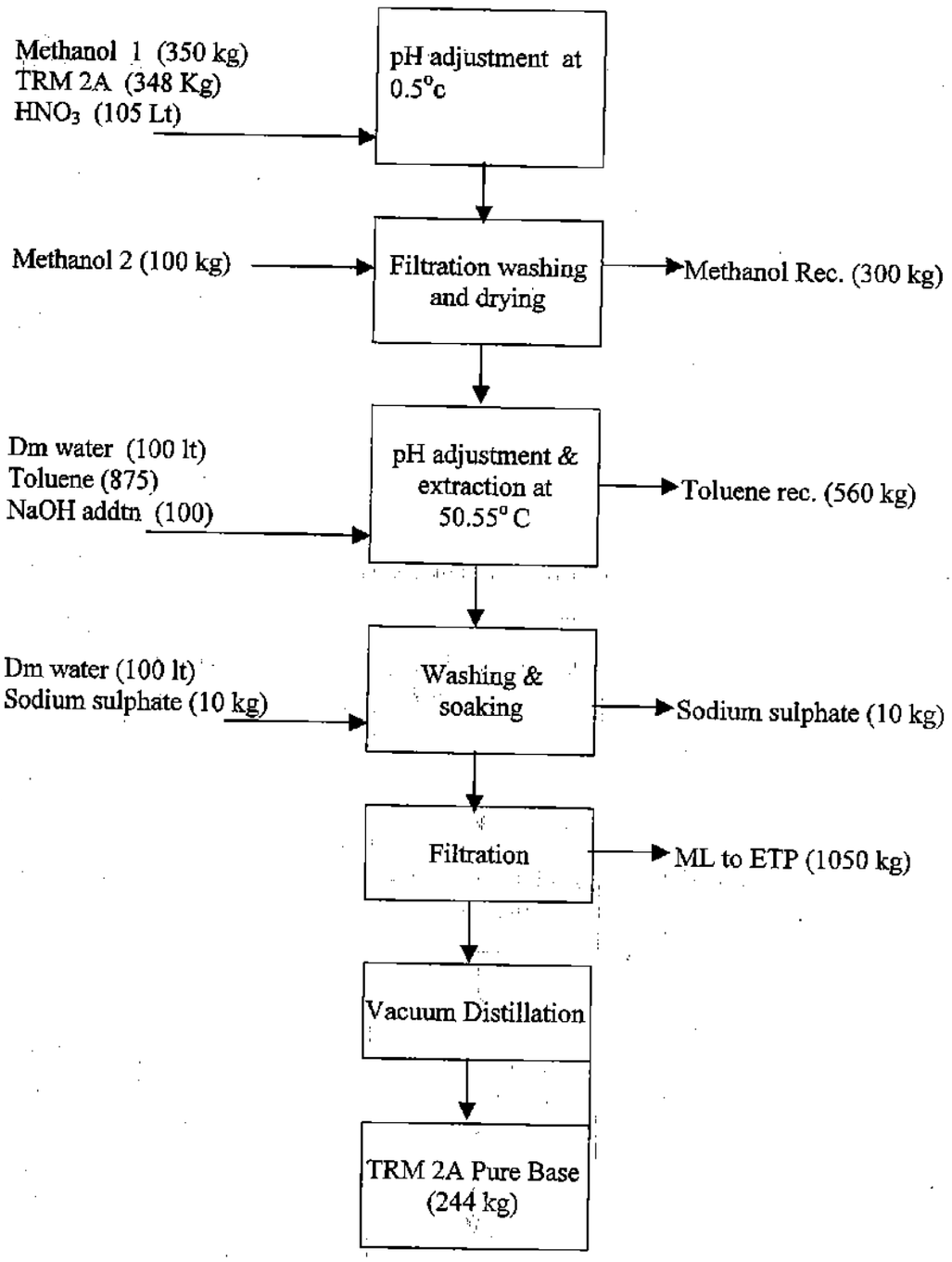
Waste from TRM IB = (267+61.3+160+1.3+5.6+300+270+230+107+25)-
(25+230+260+240)
= 672.2 L

Tramadol 2A



Waste W_2 = 2349 L

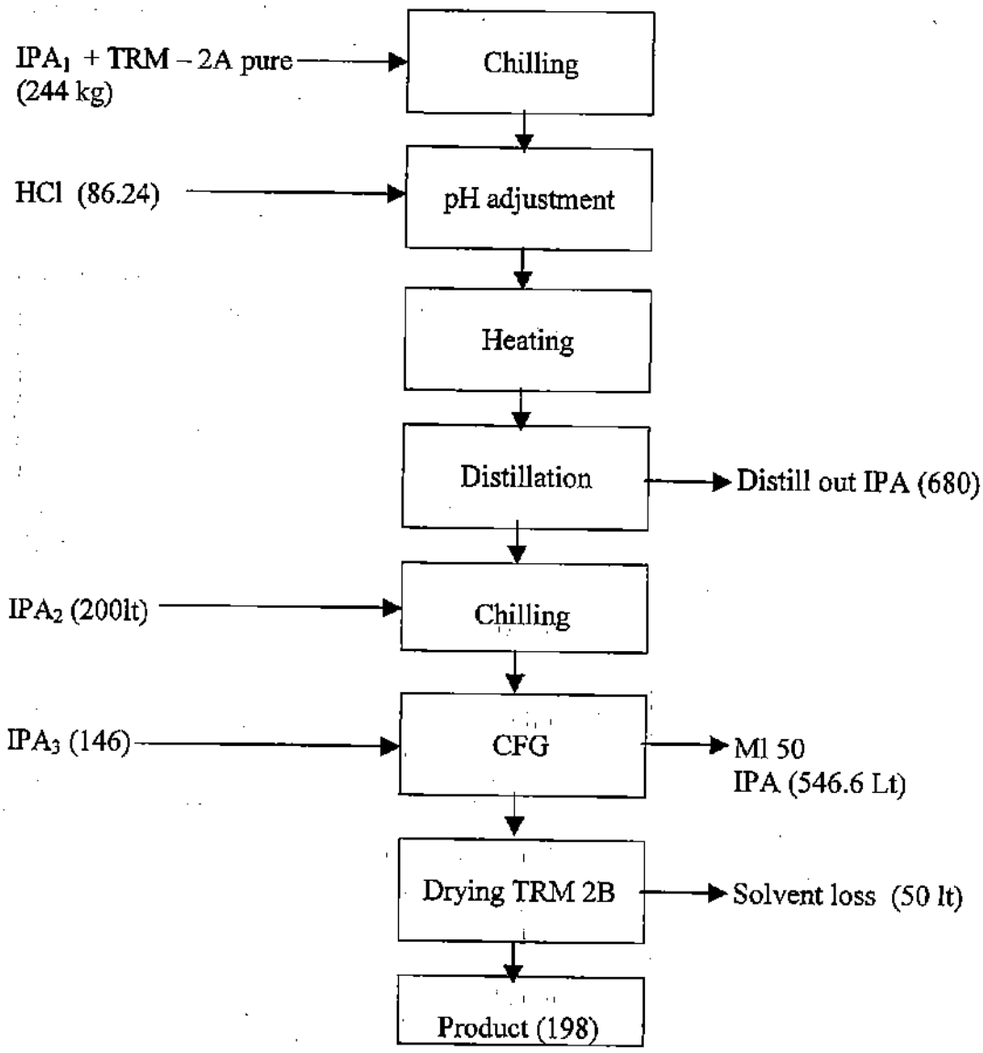
Tramadol 2A Pure Base



Methanol 1 + Methanol 2 = 450 Lt

Waste W_3 = 974 L

Tramadol 2B



Summary of Waste Generated :

$IPA_1 + IPA_2 + IPA_3 = 1146.6$

$W_4 = (900+244+86.24+200+146) - (680+546.6+198) = 151.64$

Total Waste $= 672 + 2349 + 974 + 151.64 = 4146.64$ L

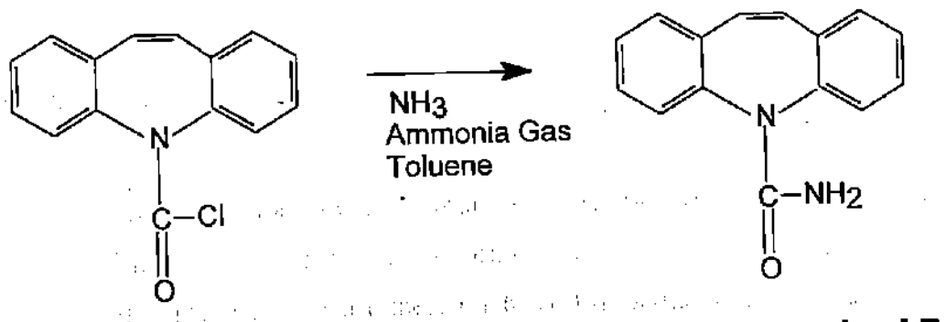
Liquid Waste $= 4146.64 - 50$ L $= 4096.64$ L

Strong Liquid Waste = 4100 L
Solvent Loss = 87 L
Total Waste 4187 L

2.2.5. Carbamazepine

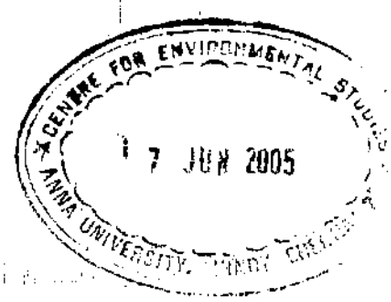
The reaction equation for the synthesis of Carbamazepine is shown below schematically. The amount of ammonia gas required for the reaction is 1.565 kg mole but 35.29 kg mole is being used because there might be losses due to gas passage over the reactant. The expected product yield is 370 kg but only 320 kg is formed. The overall reaction is within the mass balance.

Schematic Flow Diagram

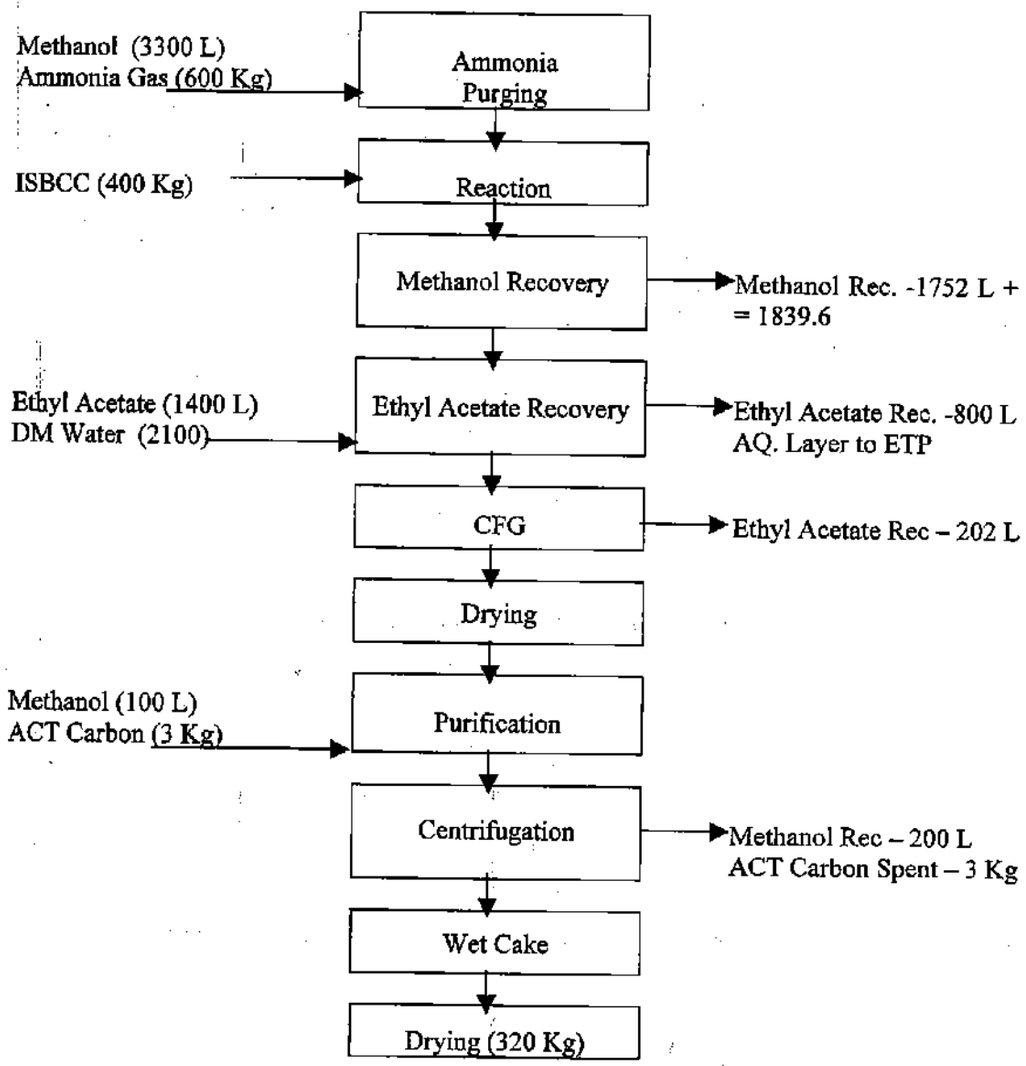


Iminostilbene Carbonyl chloride

Carbamazepine I.P.

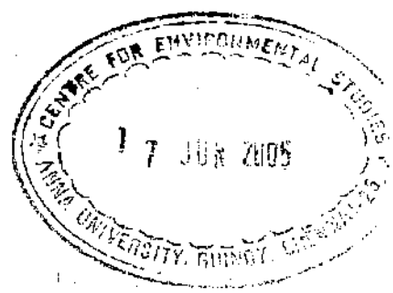


Carbamazepine – Process flow diagram



Summary of Waste Generated

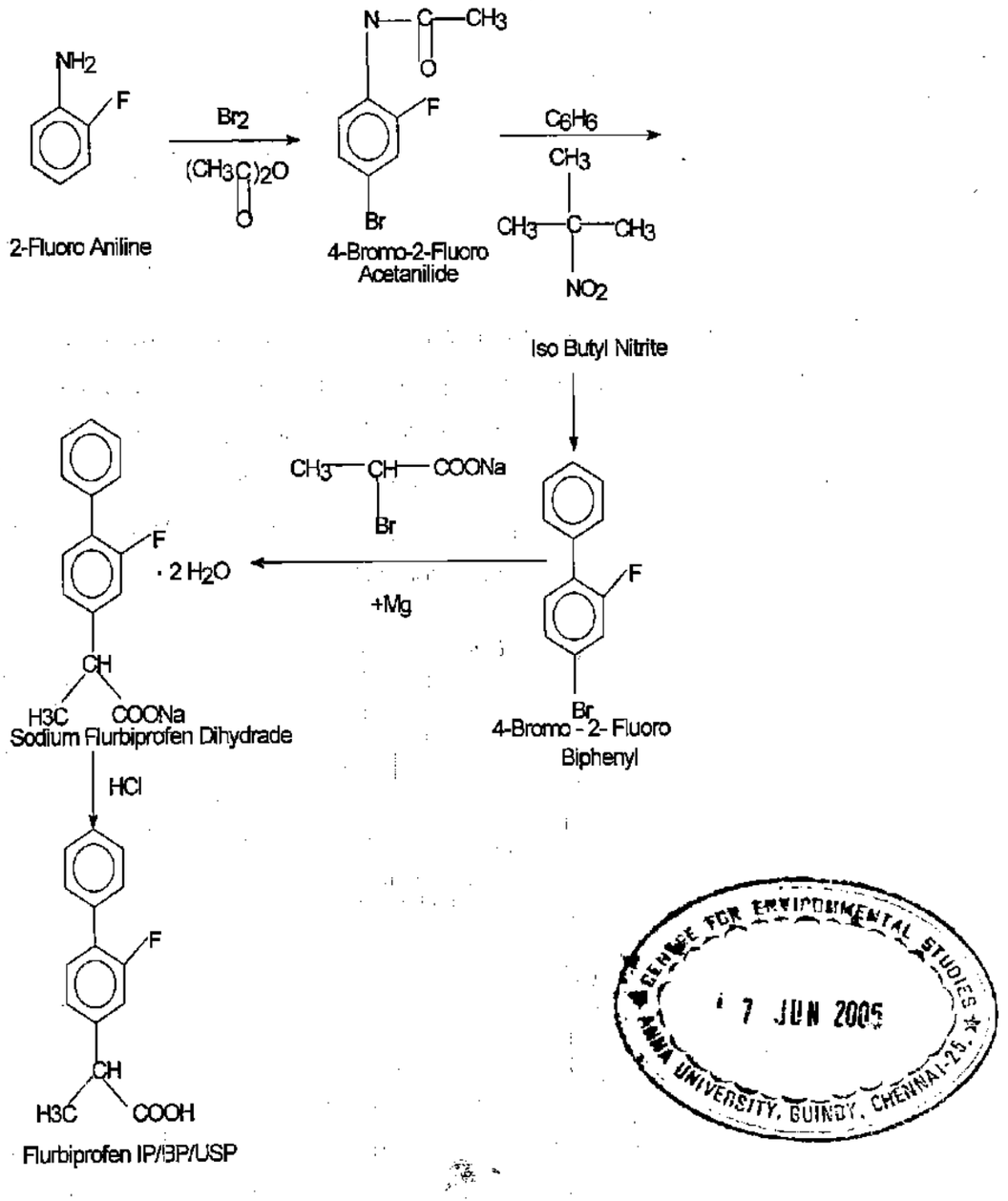
Strong Liquid Waste = 2368.4 L
Weak Liquid Waste = 1100 L
Solvent Loss = 100 L
Spent Carbon = 3 kg



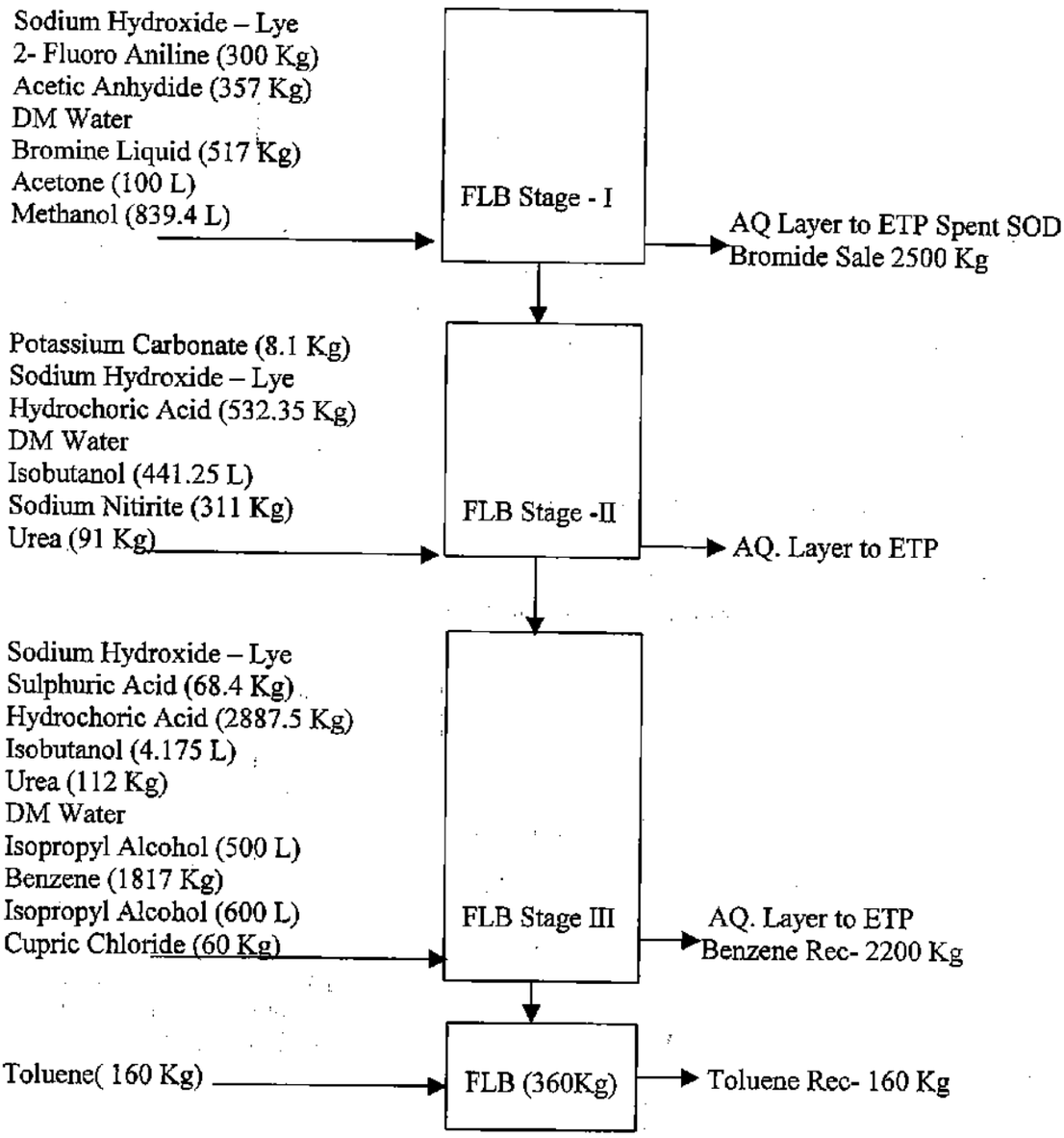
2.2.6 Flurbiprofen

The reaction equation for the synthesis of Flurbiprofen is schematically given below. Fluoro aniline is present in 2.69 kg moles as reactant. Hence 2.69 kg moles or more of Br_2 and 2.69 kg moles or more of acetic anhydride is required to form 2.69 kg moles or less of Br_2 fluoro acetamide. This trend continues and the final product flurbiprofen should be less than 2.69 kg moles as per mass balance.

Schematic Diagram



Flurbiprofen – Process flow diagram



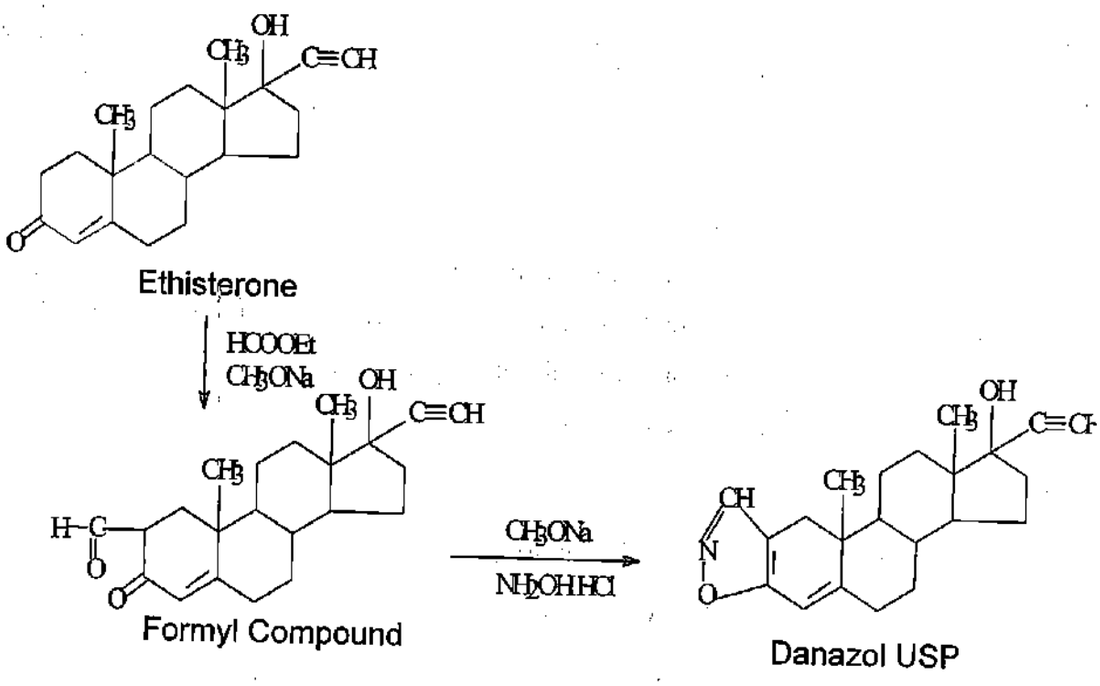
Summary of Waste Generated

Strong	5700 L
Weak	2250 L
Solid Waste	50 kg
Loss of Solvent	25 L
Spent Sodium Bromide	2500 L

2.2.7 Danazol

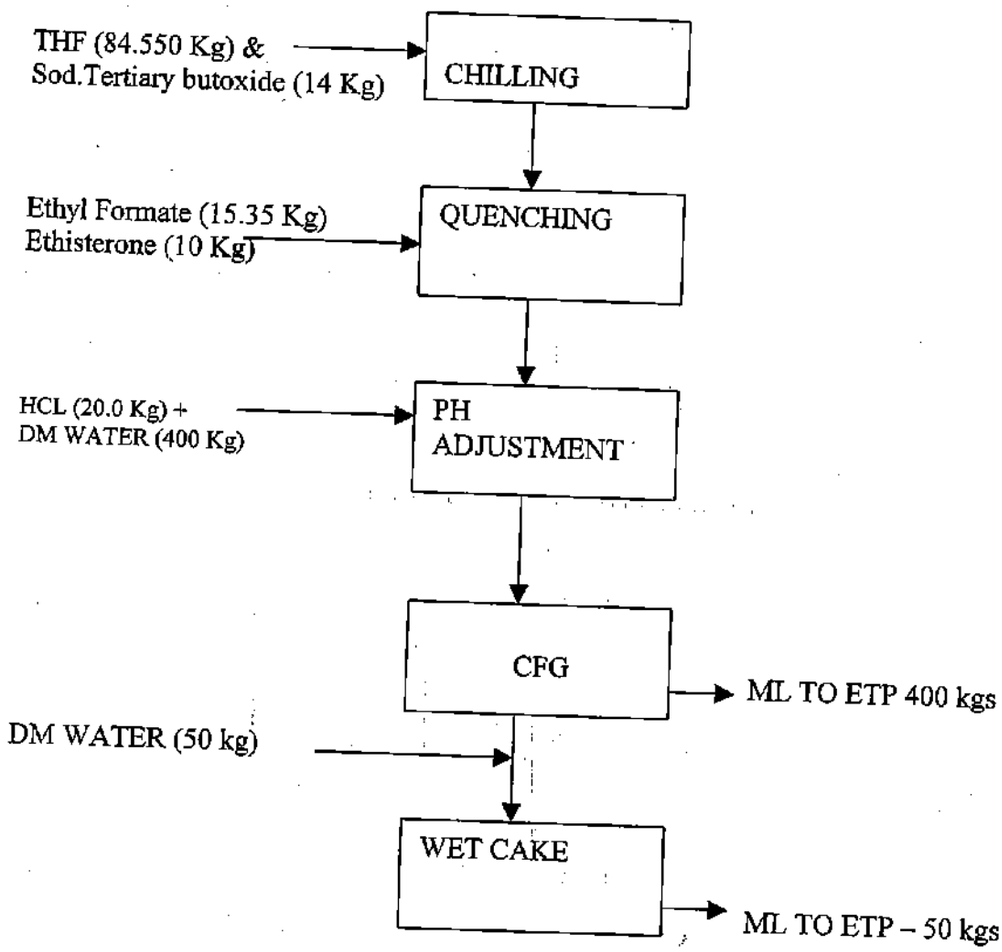
The reaction equation for the synthesis of Danazol is schematically prescribed below. In this Synthetic process, 0.032 Kg moles of ethisterone lead to the formation of 0.022 kg moles of product danazol as per the mass and stoichiometric analysis for this reaction one mole of ethisterone will yield 0.7 mole of product Danazol.

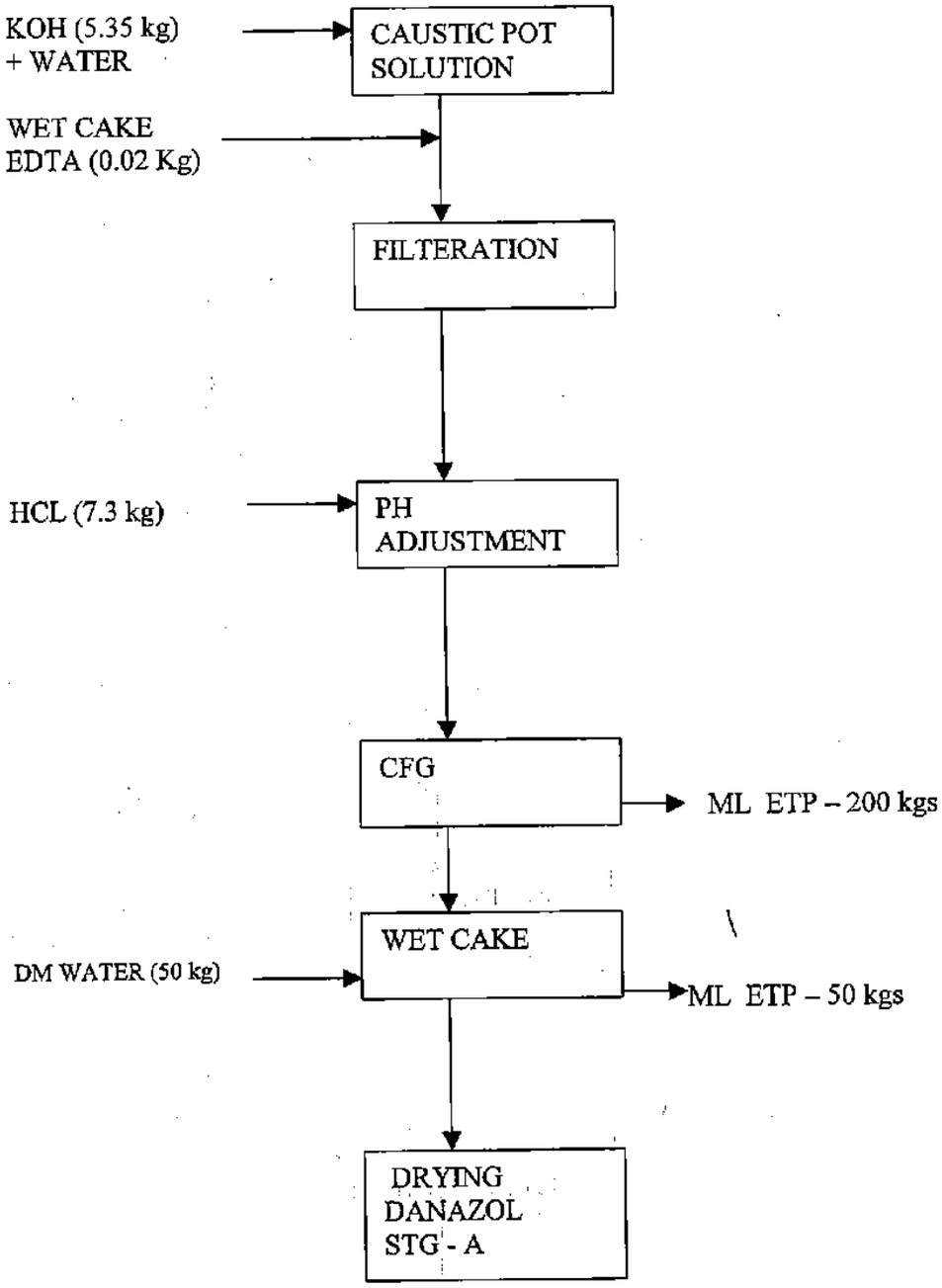
Schematic Diagram



Danazol – Process flow diagram

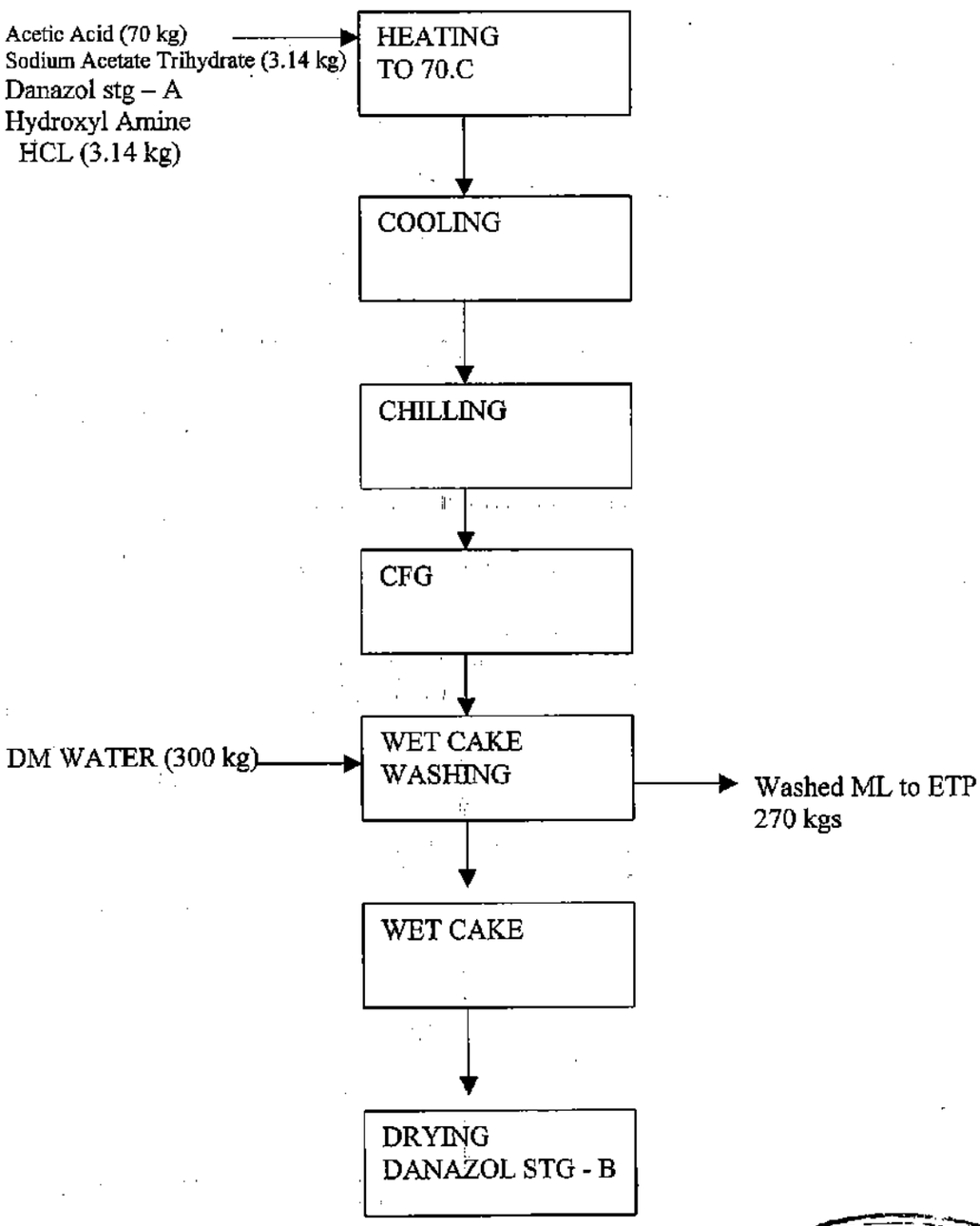
Stage - A



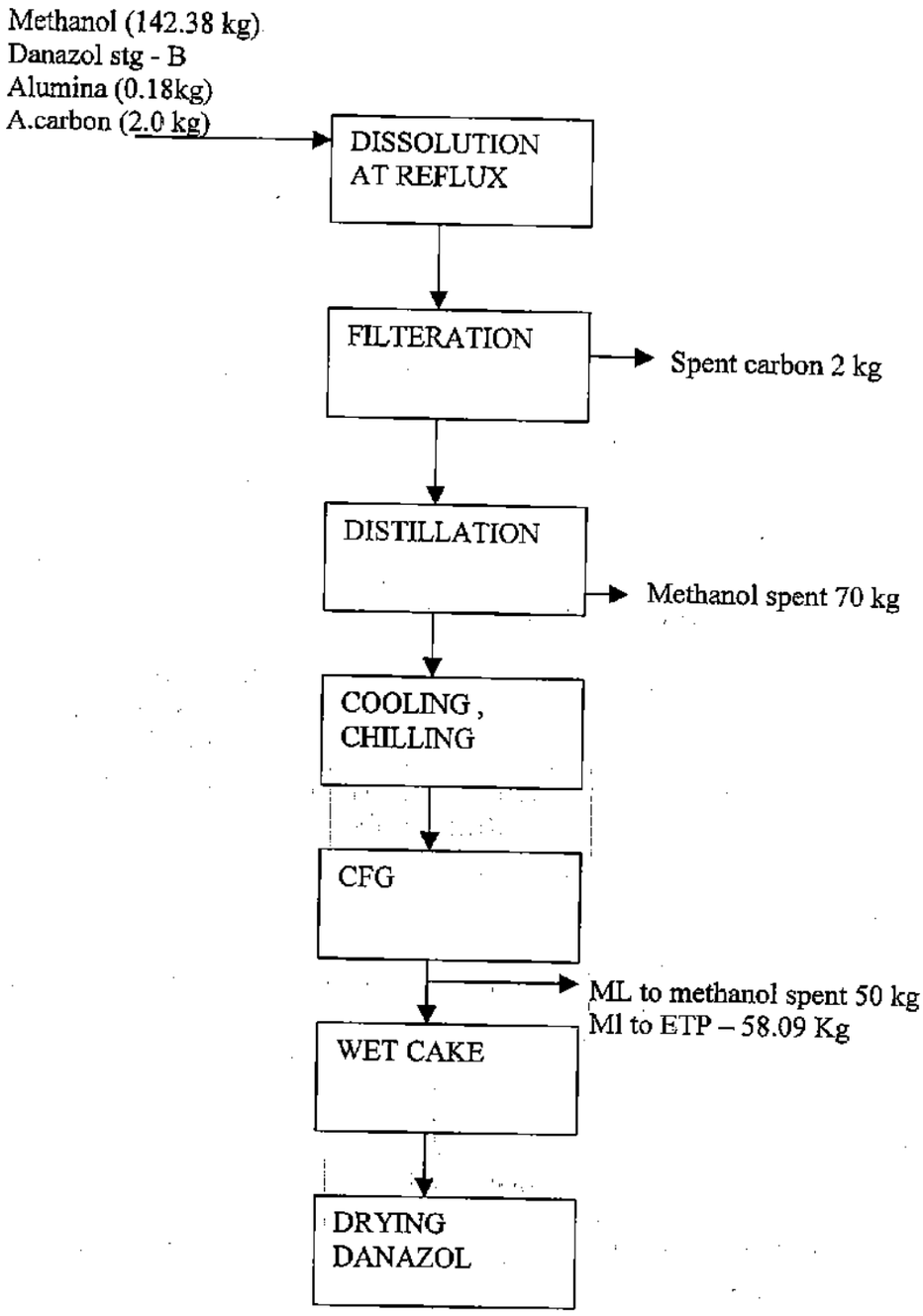


Danazol – Process flow diagram

Stage – B



Danazol – Process flow diagram



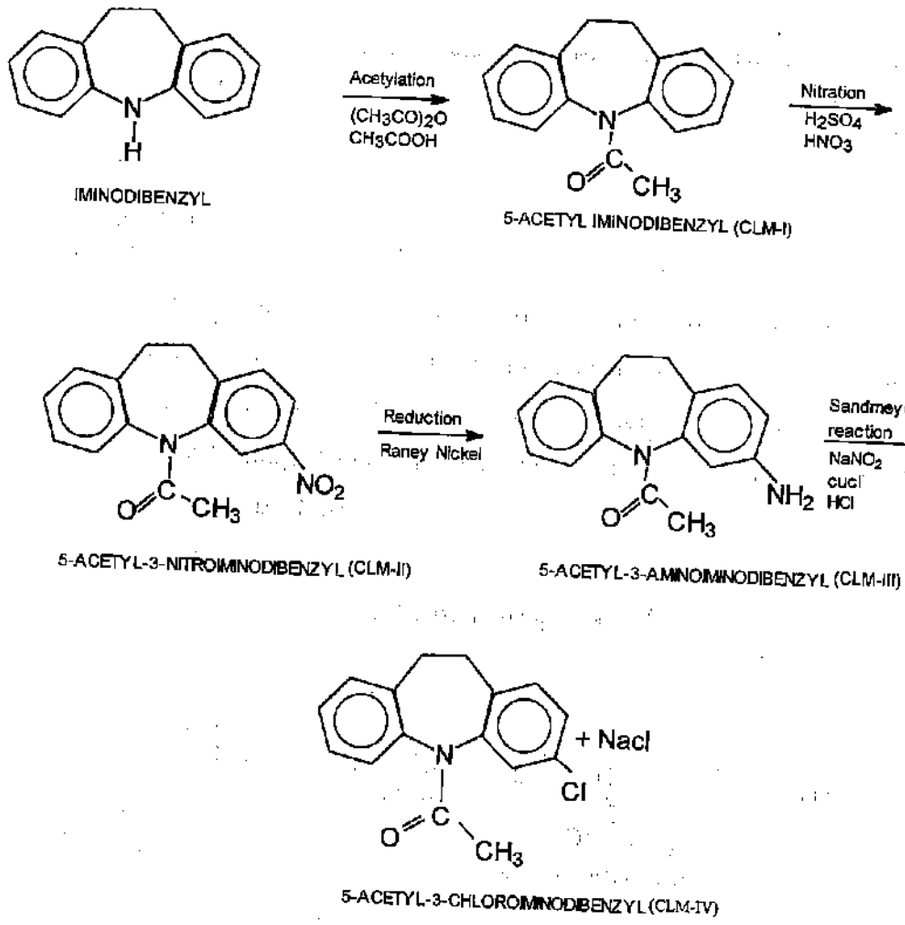
Summary of Waste Generated:

Strong stream – 870 Lt
solvent loss – 20 Lt
Weak stream– 158 Lt
spent methanol – 120 Lt
Act carbon spent – 2 kg

2.2.8 Clomipramine

The reaction equation for the synthesis of Clomipramine is represented schematically below. Stoichiometric and mass analysis from synthetic reaction reveals that 0.897 moles of imnodibenzyl reacts with 1.27 moles of acetic anhydride and 4.3 moles of acetic acid leading to the formation of 0.21 moles of CLM product. The overall reaction within the mass balance.

Schematic diagram



IMINODIBENZYL

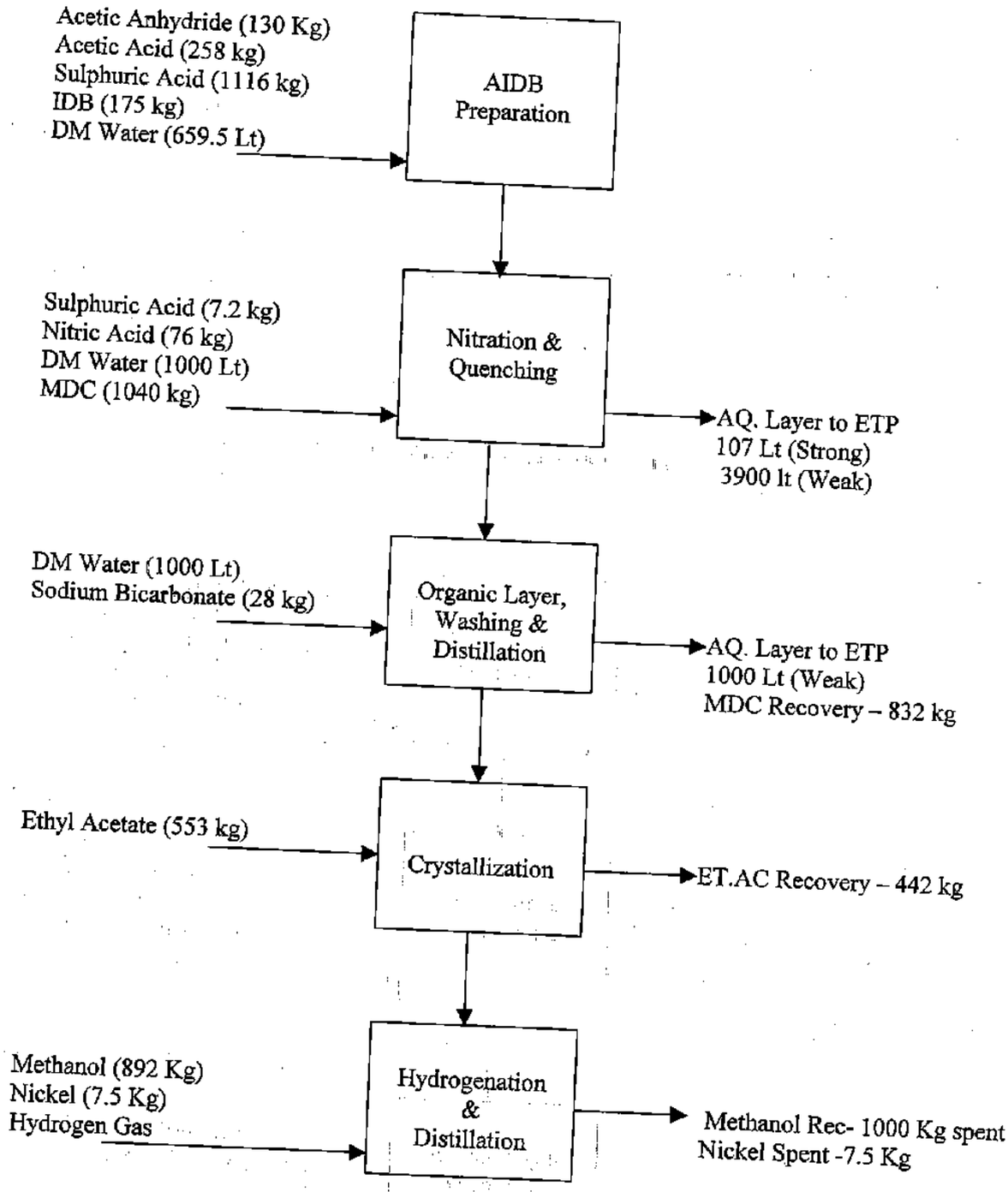
5-ACETYL IMINODIBENZYL (CLM-I)

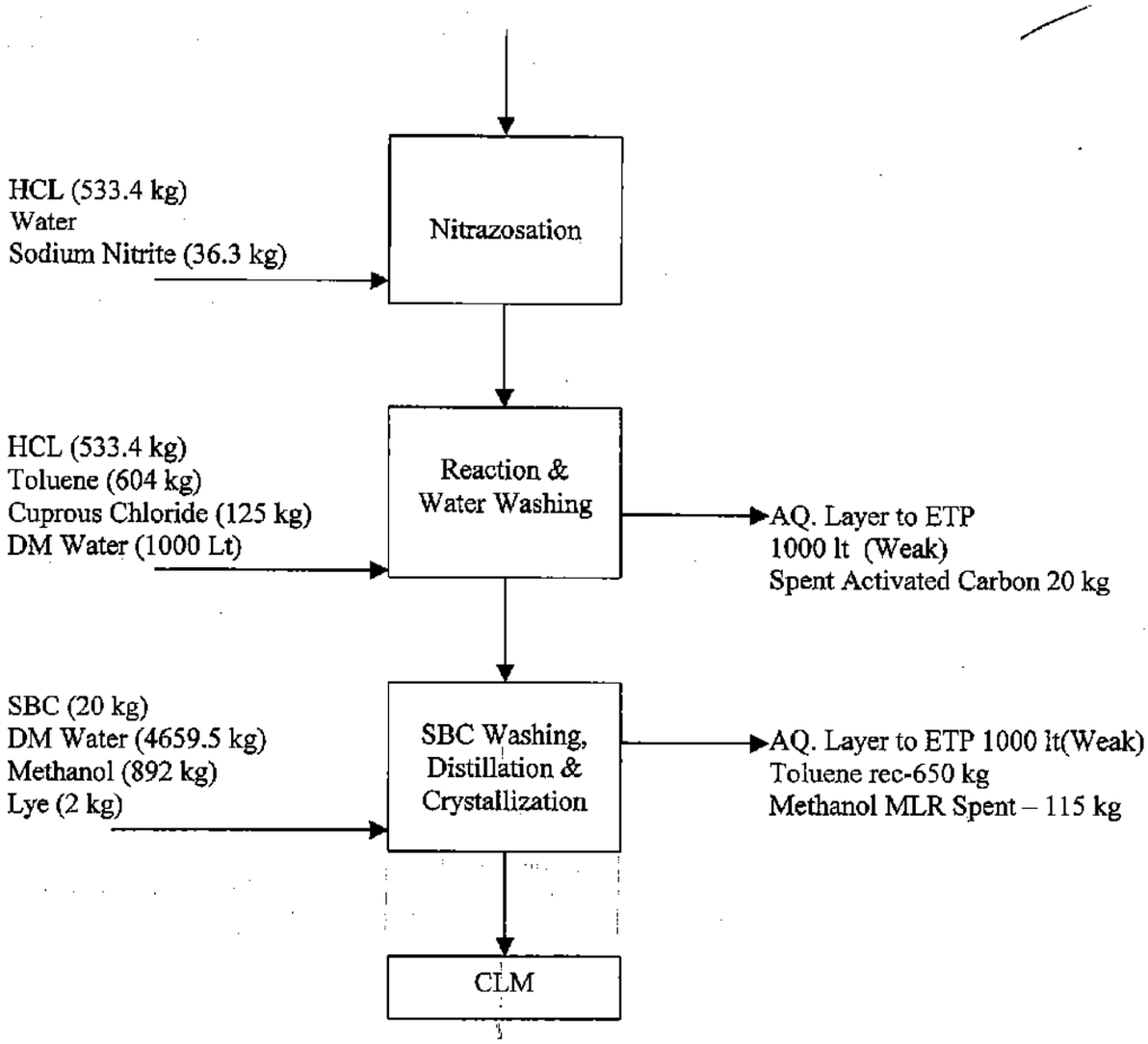
5-ACETYL-3-NITROIMINODIBENZYL (CLM-II)

5-ACETYL-3-AMINOIMINODIBENZYL (CLM-III)

5-ACETYL-3-CHLOROIMINODIBENZYL (CLM-IV)

Clomipramine –Process flow diagram





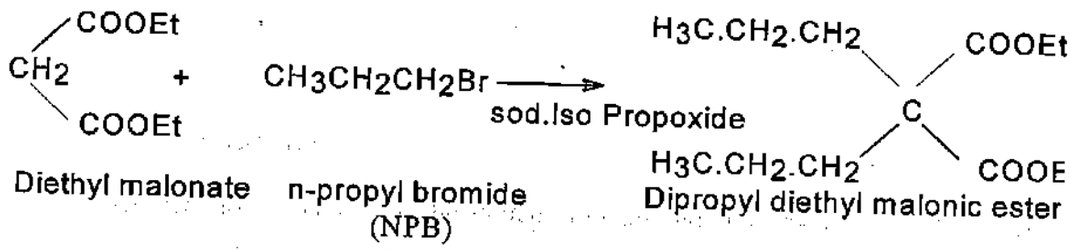
Summary of Waste Generated:

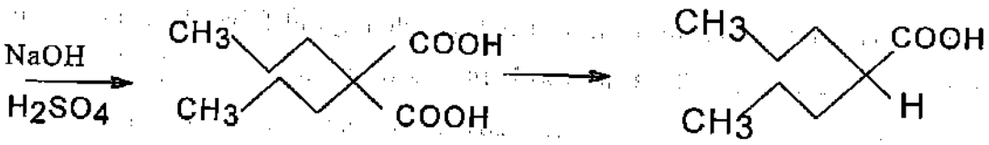
Strong	107 L
Weak	6900 L
Solid Waste	45 kg
Loss of Solvent	90 L
Nickel Spent	7.5 Kg
Spent Methanol	1115 L
Spent Act Carbon	20 kg

2.2.9 Sodium Valproate

The reaction equation for the synthesis of Sodium Valproate is furnished below. From the chemical reactions taking place in the manufacturing of Sodium Valproate and the mass employed 2.34 kg moles of dimethyl malonate and 3.05 kg moles of NPB will yield 3.25 kg moles of the product. The flow chart for the synthesis is also given below. The overall reaction is within the mass balance.

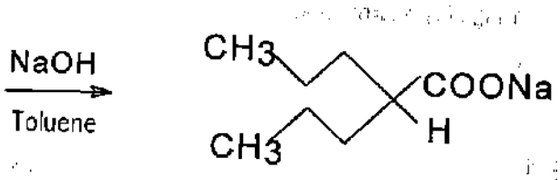
Schematic Diagram



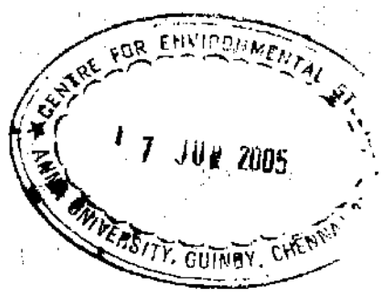


Di propyl malonic acid

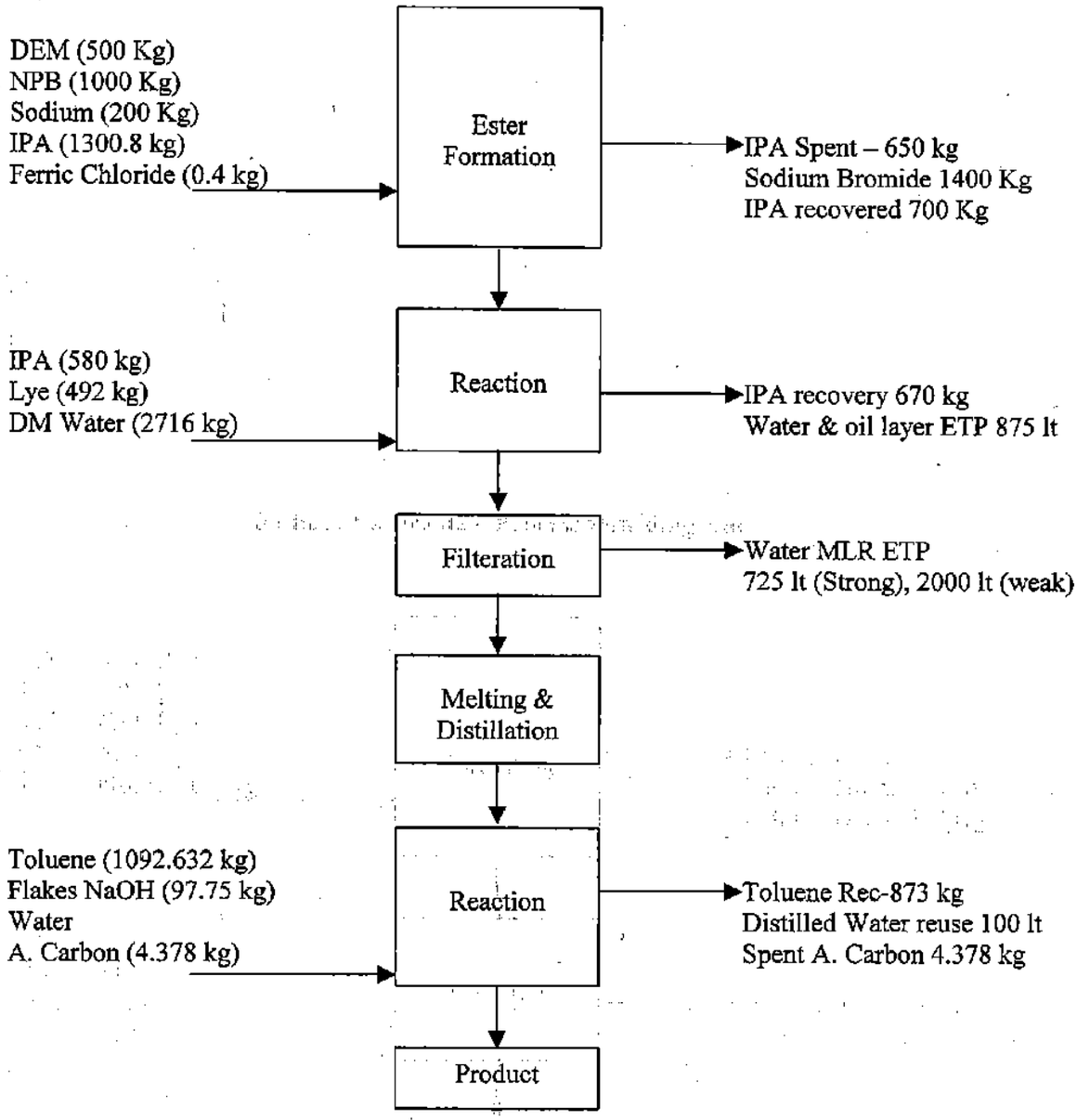
VALPROIC ACID



Sodium Valproate



Sodium Valproate – Process flow diagram



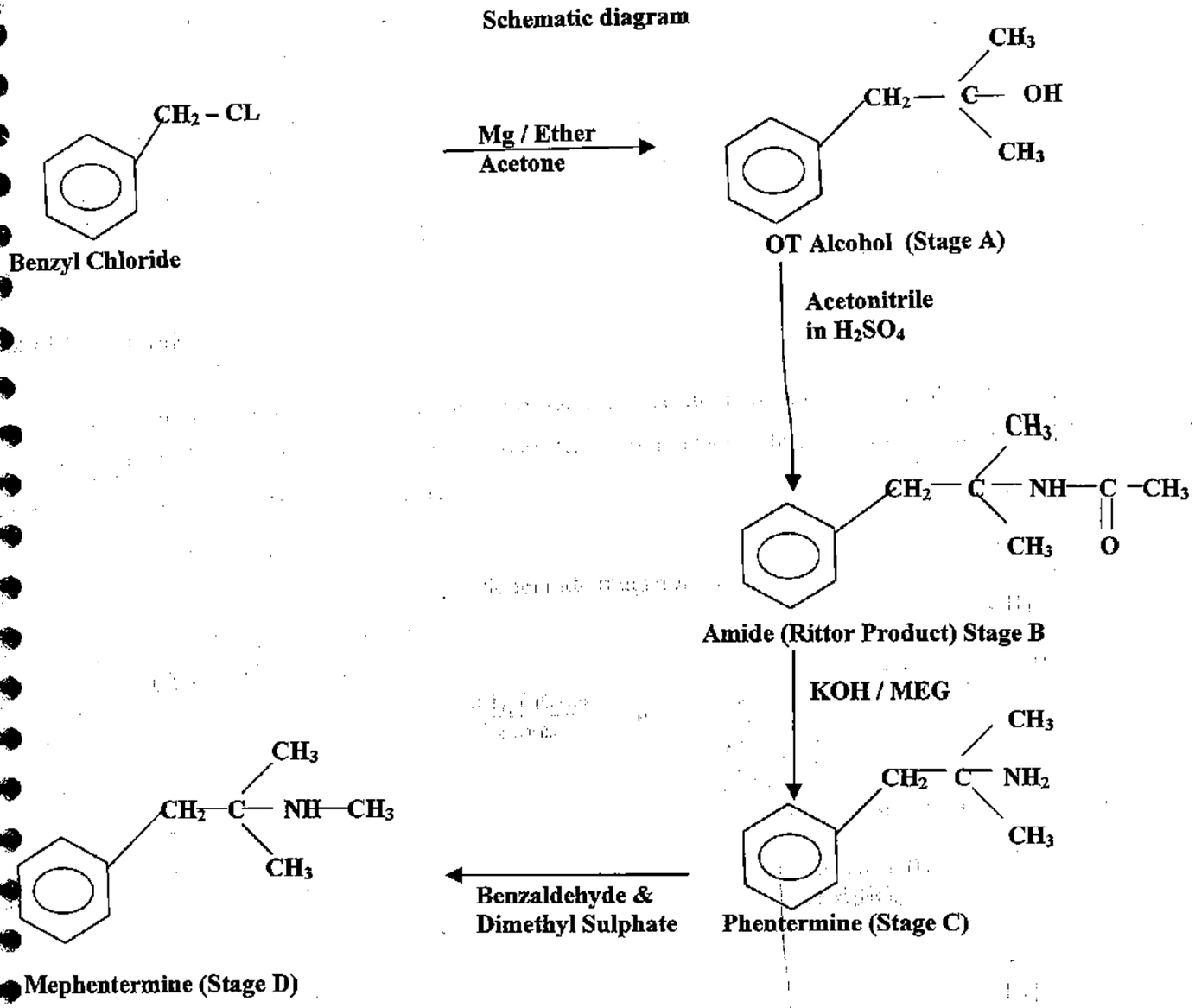
Summary of Waste Generated:

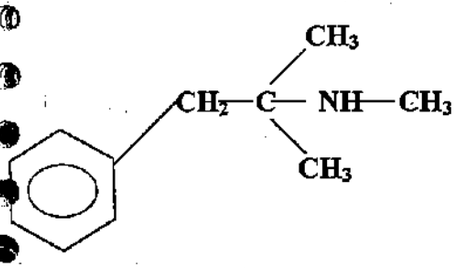
Strong Effluent	725 Lt
Weak Effluent	3175 Lt
Solid Waste	20 kg
Loss of Solvent	21 Lt
Spent Act.Carbon	4.378 kg

2.2.10 Oxetacaine

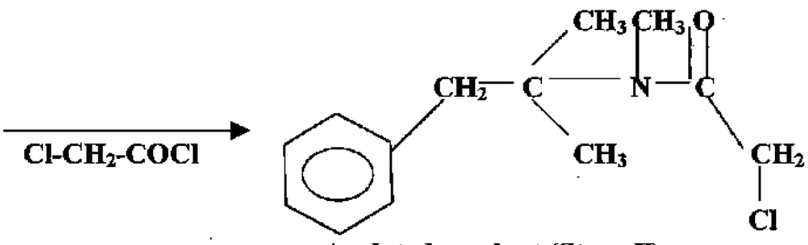
The reaction equation for the synthesis of Oxetacaine is given below. From 1.45 moles of starting material Benzyl Chloride, 0.214 moles of oxetacaine is possible. This is evident from the mass analysis stoichiometric reactions and within the overall mass balance.

Schematic diagram

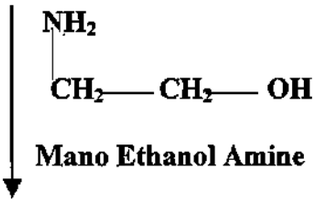




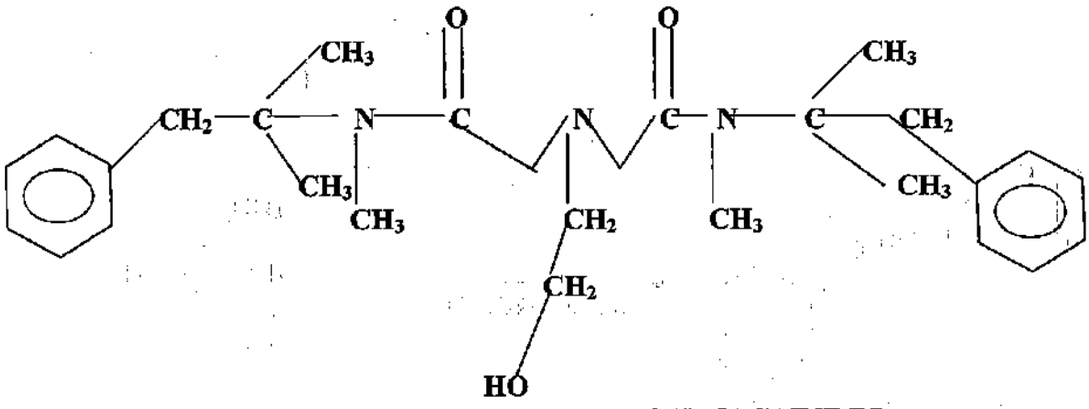
Mephentermine (Stage D)



Acylated product (Stage F)

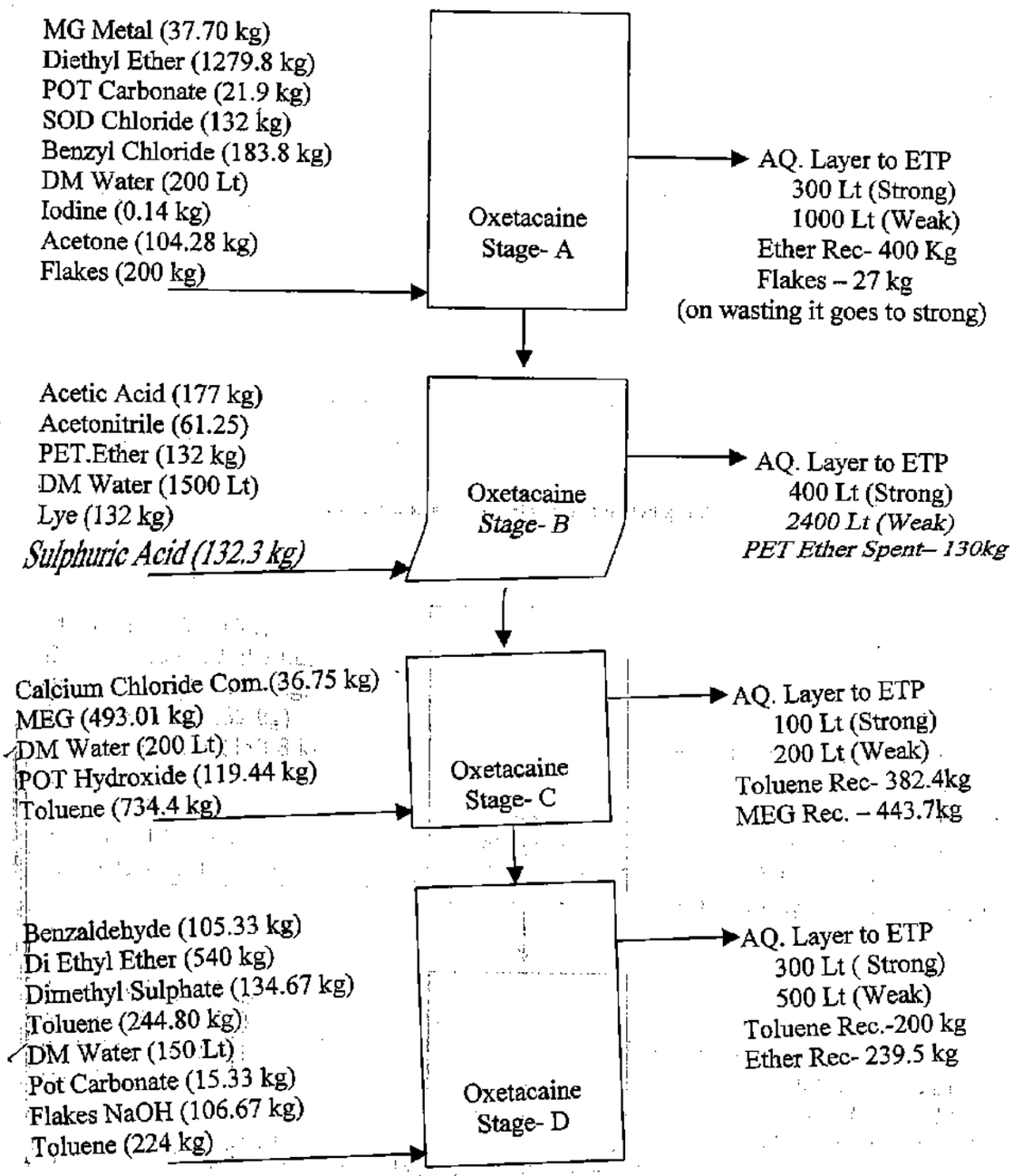


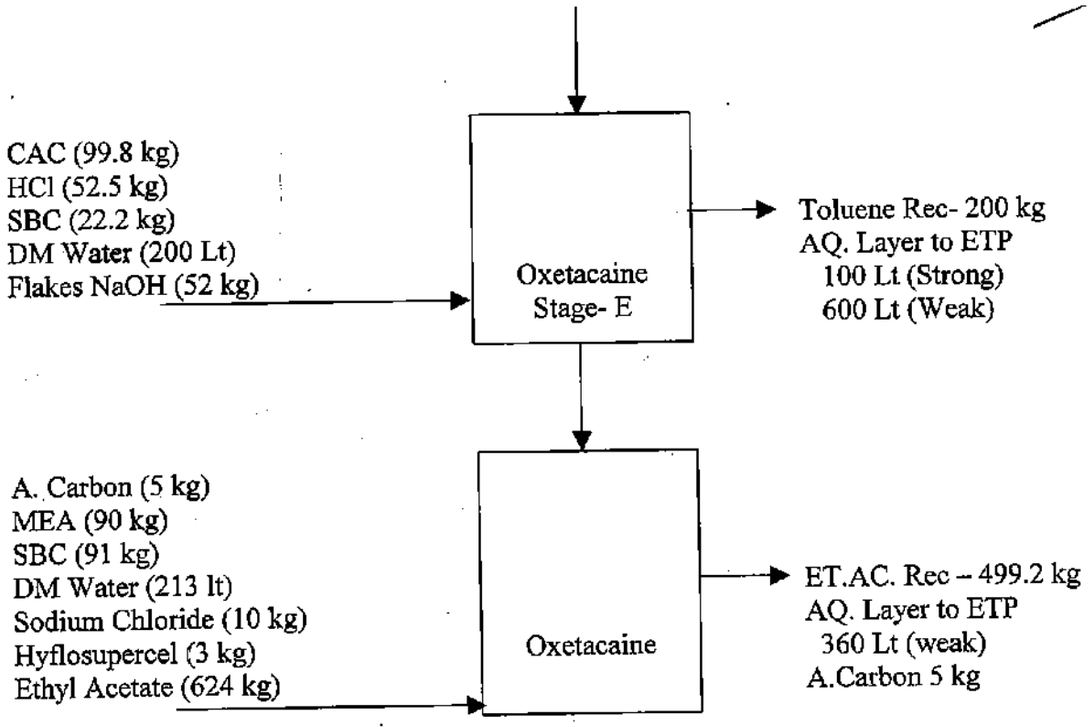
Mano Ethanol Amine



OXETACAINE BP

Oxetacaine – Process flow diagram





Summary of Waste Generated

Strong Liquid Waste =1200 Lt + 37 Lt = 1237 Lt
Weak Liquid waste =5060 Lt
Loss of Solvent =40 Lt
Solid Waste =5.0 kg
(Flakes + A.Carbon)

The Material balance (Input & Output) for the proposed ten products are furnished below in Table 2.1. The production capacities are also listed for the products per batch.

Table 2.1

Metadoxine - 100 Kgs

S.No	RAW MATERIAL	QTY	UNIT	OUT PUT MATERIAL	QTY	UOM
1	ACETONE	200.000	KGS	SPENT ACETONE	160.00	KGS
2	ACTIVATED CARBON	3.000	KGS	SPENT ACTIVATED CARBON	3.00	KGS
3	HYFLOSUPERCEL	9.000	KGS	SPENT HYFLOSUPERCEL	9.00	KGS
4	ISOPROPYL ALCOHOL	2550.000	KGS	ISOPROPYL ALCOHOL REC	1020.00	KGS
5	L - PYROGLUTAMIC ACID	59.700	KGS	SPENT METHANOL	350.78	KGS
6	METHANOL	500.000	KGS	SPENT IPA	1530.00	KGS
7	PYRIDOXINE HYDROCHLORIDE (VITAMIN B6)	100.000	KGS	METADOXINE	100.00	KGS
8	SODIUM HYDROXIDE-FLAKES	19.800	KGS	WASTE LIQUID	140.00	KGS
				SOLVENT LOSS	100.00	KGS
				SOLID WASTE	28.72	KGS
	TOTAL MATERIAL BALANCE	**3441.500**			**3441.50**	

Metoprolol Tartrate - 420 Kgs

1	4-METHOXY ETHYL PHENOL	300.00	KGS			
2	ACETONE	1989.00	KGS	ACETONE REC	1591.20	KGS
3	EPICHLOROHYDRIN	235.00	KGS	SPENT IPA	328.86	KGS
4	ISOPROPYL ALCOHOL	328.86	KGS	WASTE LIQUID	3130.00	KGS
5	L (+) NATURAL TARTARIC ACID	100.00	KGS	METOPROLOL TATRATE	420.00	KGS
6	MONO ISOPROPYLAMINE	270.00	KGS	SPENT ACETONE	397.80	KGS
7	SODIUM HYDROXIDE-LYE	205.00	KGS	SOLVENT LOSS	20.00	KGS
8	TETRA BUTYL AMMONIUM BROMIDE	4.50	KGS			
9	DM WATER	2455.50	KGS			
	TOTAL MATERIAL BALANCE	**5887.86**			**5887.86**	

Analgin Magnesium - 400 Kgs

	ANALGIN SODIUM	450.00	KGS	ANALGIN MAG WET	450.00	KGS
	MAGNESIUM CHLORIDE	233.33	KGS	WASTE LIQUID ML - STRONG EFF	172.00	KGS
	ISOPROYL ALCOHOL	78.30	KGS	WASTE LIQUID ML - WEAK EFF	470.63	KGS
	DM WATER	405.00	KGS	SPENT IPA	70.00	KGS
				SOLVENT LOSS	4.00	KGS
	TOTAL MATERIAL BALANCE	**1166.63**			**1166.63**	

Tramadol Hydrochloride - 198 Kgs

	CYCLO HEXANONE	240.30	KGS	SPENT MDC	360.00	KGS
	PARAFORMALDEHYDE	61.30	KGS	THF REC	792.80	KGS
	DIMETHYL AMINE HCL	160.00	KGS	DI ISO PROPYL ETHER	184.00	KGS
	DI ISOPROPYL ETHER	230.00	KGS	ET.AC REC	704.00	KGS
	HYDROCHLORIC ACID - CP GRADE	1.37	KGS	TOLUENE REC	560.00	KGS
	METHYLENE CHLORIDE	351.00	KGS	IPA REC	733.44	KGS
	SODIUM HYDROXIDE-FLAKES	107.00	KGS	WASTE LIQUID	4100.00	KGS
	HYFLOSUPERCEL	3.00	KGS	PRODUCT	198.00	KGS
	SODIUM SULPHATE COMM	25.00	KGS	METHANOL REC	300.00	KGS
	ACETIC ACID	5.60	KGS	SOLVENT LOSS	87.00	KGS
	DM WATER	300.000	KGS			
	META BROMO ANISOLE	380.00	KGS			
	MAGNESIUM METAL TURNNINGS	50.00	KGS			
	TETRAHYDROFURAN	991.00	KGS			
	ETHYL ACETATE	880.00	KGS			
	1,2 DIBROMOETHANE	0.80	KGS			
	AMMONIUM CHLORIDE	280.00	KGS			
	SODIUM CHLORIDE COMM GRD	108.00	KGS			
	DM WATER	1367.02	KGS			
	METHANOL	355.50	KGS			
	NITRIC ACID	105.00	KGS			
	SODIUM HYDROXIDE-LYE	100.00	KGS			
	TOLUENE	700.00	KGS			
	SODIUM SULPHATE	10.00	KGS			
	DM WATER	200.00	KGS			
	ISOPROPYL ALCOHOL	916.80	KGS			
	HYDROCHLORIC ACID	90.55	KGS			
	TOTAL MATERIAL BALANCE	**8019.24**	KGS		**8019.24**	KGS

Carbamazepine - 320 Kgs

1	IMINOSTILBENE CARBONYL CHLORIDE	400.00	KGS	ETHYL ACETATE REC	1002.40	KGS
2	METHANOL	2689.40	KGS	METHANOL REC	2151.52	KGS
3	ETHYL ACETATE	1253.00	KGS	ACTIVATED CARBON SPENT	3.00	KGS
4	AMMONIA GAS	600.00	KGS	WASTE LIQUID & SOLID	3468.48	KGS
5	ACTIVATED CARBON	3.00	KGS	CARBAMAZEPINE	320.00	KGS
6	DM WATER	2100.00	KGS	SOLVENT LOSS	100.00	KGS
	TOTAL MATERIAL BALANCE	**7045.40**			**7045.40**	

Flurbiprofen - 360 Kgs

				BENZENE REC	2200.00	KGS
	2-FLUORO ANILINE	300.00	KGS	TOLUENE REC	160.00	KGS
	ACETIC ANHYDRIDE	357.00	KGS	SOD BROMIDE	2500.00	KGS
	BROMINE LIQUID	517.00	KGS			
	ACETONE	80.00	KGS	WASTE LIQUID	7950.00	KGS
	METHANOL	671.50	KGS	PRODUCT	360.00	KGS
	POTASSIUM CARBONATE	8.10	KGS	SOLVENT LOSS	25.00	KGS
	HYDROCHLORIC ACID	532.35	KGS	SOLID WASTE	50.00	KGS

	ISOBUTANOL	353.00	KGS			
	SODIUM NITIRITE	311.00	KGS			
	UREA	91.00	KGS			
	METHANOL	79.00	KGS			
	SULPHURIC ACID	68.40	KGS			
	HYDROCHLORIC ACID	2887.50	KGS			
	ISOBUTANOL	3.34	KGS			
	UREA	112.00	KGS			
	ISOPROPYL ALCOHOL	400.00	KGS			
	BENZENE-NITRATION GRADE	1817.00	KGS			
	METHANOL	237.00	KGS			
	ISOPROPYL ALCOHOL	480.00	KGS			
	CUPRIC CHLORIDE	60.00	KGS			
	TOLUENE	160.00	KGS			
	METHANOL	79.00	KGS			
	DM WATER	3640.80	KGS			
	TOTAL MATERIAL BALANCE	**13245.0**	**KGS**		**13245.000**	**KGS**

Danazol - 7.5 Kgs

	ACETIC ACID	70.000	KGS	PRODUCT	7.50	KGS
	ACTIVATED CARBON	0.180	KGS	WASTE LIQUID & SOLID	1028.09	KGS
	ALUMINA	0.180	KGS	SPENT METHANOL	120.00	KGS
	DM WATER	800.00	KGS	SOLVENT LOSS	20.00	KGS
	E.D.T.A.DI SODIUM SALT	0.020	KGS	SPENT ACT CARBON	2.00	KGS
	ETHISTERONE	10.000	KGS			
	ETHYL FOMATE	15.350	KGS			
	HYDRO CHLORIC ACID CP GRADE	27.300	KGS			
	HYDROXHYLAMINE HCL	3.140	KGS			
	METHANOL	142.380	KGS			
	POTASSIUM HYDROXIDE FLAKES	5.350	KGS			
	SODIUM ACETATE TRIHYDRATE	3.140	KGS			
	SODIUM TERTIARY BUTOXIDE	14.000	KGS			
	TETRAHYDROFURAN	84.550	KGS			
	ACT CARBON	2	KGS			
	TOTAL MATERIAL BALANCE	**1177.590**			**1177.590**	

Cim - 77.00 Kgs

	IMINODIBENZYL	175.000	KGS	PRODUCT	77.00	KGS
				MDC REC	832.00	KGS
	SULPHURIC ACID COMM. GRADE	1116.000	KGS	ET.AC REC	442.40	KGS
	SULPHURIC ACID-C.P.GRADE	7.200	KGS	TOLUENE REC	650.00	KGS
	ACETIC ANHYDRIDE	130.000	KGS	SPENT METHANOL	1115.00	KGS
	NITRIC ACID 70%	76.000	KGS	A.CARBON	20.00	KGS
	SODIUM BICARBONATE	20.000	KGS	HYFLOW	3.00	KGS
	ACETIC ACID	258.000	KGS	NICKEL	7.50	KGS
	METHYLENE CHLORIDE	1040.000	KGS	WASTE LIQUID	7007.00	KGS
	ETHYL ACETATE	553.000	KGS	SOLVENT LOSS	90.00	KGS
	ACTIVATED CARBON	20.000	KGS	SOLID WASTE	45.00	KGS
	CUPROUS CHLORIDE	125.000	KGS			
	HYDROCHLORIC ACID	533.400	KGS			

	HYFLOSUPERCEL	3.000	KGS			
	METHANOL	892.000	KGS			
	NITRIC ACID 70%	3.000	KGS			
	RANEY NICKEL	7.500	KGS			
	SODIUM BICARBONATE	28.000	KGS			
	SODIUM HYDROXIDE-FLAKES	2.000	KGS			
	SODIUM NITIRITE	36.300	KGS			
	TOLUENE	604.000	KGS			
	DM WATER	4659.500	KGS			
	TOTAL MATERIAL BALANCE	**10288.900**			**10288.900**	

Sodium Valproate - 375.0 Kgs

	DIETHYL MALONATE	500.000	KGS	PRODUCT	375.00	KGS
	FERRIC CHLORIDE ANHYDROUS	0.400	KGS	IPA REC	1370.00	KGS
	ISOPROPYL ALCOHOL	1300.800	KGS	SPENT SOD BROMIDE	1400.00	KGS
	N PROPYL BROMIDE	1000.000	KGS	SPENT IPA	650.00	KGS
	SODIUM METAL	200.000	KGS	WASTE LIQUID	3900.00	KGS
	SULPHURIC ACID COMM. GRADE	18.000	KGS	TOLUENE REC	873.60	KGS
	SODIUM HYDROXIDE-LYE	492.000	KGS	A.CARBON	4.38	KGS
	SULPHURIC ACID COMM. GRADE	612.000	KGS	SOLVENT LOSS	20.98	KGS
	ISOPROPYL ALCOHOL	580.000	KGS	SOLID WASTE	20.00	KGS
	SODIUM HYDROXIDE-FLAKES	97.751	KGS			
	ACTIVATED CARBON	4.378	KGS			
	TOLUENE	1092.632	KGS			
	DM WATER	2716.00	KGS			
	TOTAL MATERIAL BALANCE	8613.960	KGS		8613.960	KGS

Oxetacaine - 100 Kgs

	ACETIC ACID	105.00	KGS	PRODUCT	100.00	KGS
	ACETONE	104.28	KGS			
	BENZYL CHLORIDE	183.80	KGS	WASTE LIQUID	6297.00	KGS
	DI ETHYL ETHER (SOLVENT ETHER)	1279.80	KGS	ETHER REC	639.50	KGS
	SODIUM HYDROXIDE-FLAKES	200.00	KGS	SPENT PET ETHER	130.00	KGS
	IODINE RESUBLIMED	0.14	KGS	MEG REC	443.70	KGS
	MAGNESIUM METAL TURNNINGS	37.70	KGS	TOLUENE REC	782.40	KGS
	POTASSIUM CARBONATE	21.90	KGS	ET.AC REC	499.20	KGS
	SODIUM CHLORIDE COMM GRD	132.00	KGS	SOLVENT LOSS	40.00	KGS
	SODIUM HYDROXIDE-FLAKES	132.00	KGS	SOLID WASTE	5.00	KGS
	ACETIC ACID	177.63	KGS			
	ACETONITRILE	61.25	KGS			
	PETROLIUM ETHER (60-80)	132.00	KGS			
	SULPHURIC ACID COMM. GRADE	132.30	KGS			
	CALCIUM CHLORIDE COMMERCIAL	36.75	KGS			
	MONO ETHYLENE GLYCOL	493.01	KGS			
	POTASSIUM HYDROXIDE FLAKES	119.44	KGS			
	TOLUENE	734.40	KGS			
	BENZALDEHYDE	105.33	KGS			
	DI ETHYL ETHER (SOLVENT ETHER)	540.00	KGS			
	DIMETHYL SULPHATE	134.67	KGS			

	POTASSIUM CARBONATE	15.33	KGS			
	SODIUM HYDROXIDE-FLAKES	106.67	KGS			
	TOLUENE	244.80	KGS			
	CHLORO ACETYL CHLORIDE	99.80	KGS			
	HYDROCHLORIC ACID	52.50	KGS			
	SODIUM BICARBONATE	22.20	KGS			
	SODIUM HYDROXIDE-FLAKES	52.10	KGS			
	TOLUENE	224.00	KGS			
	ACTIVATED CARBON	5.00	KGS			
	MONO ETHANOL AMINE	90.00	KGS			
	SODIUM BICARBONATE	61.00	KGS			
	SODIUM CHLORIDE COMM GRD	10.00	KGS			
	HYFLOSUPERCEL	3.00	KGS			
	ETHYL ACETATE	624.00	KGS			
	DM WATER	2463.01	KGS			
	TOTAL MATERIAL BALANCE	**8936.80**	**KGS**		**8936.80**	

The waste to be generated in the ten proposed processes are summarized below in the Table 2.2

Table 2.2. Summary of Waste generation

S. No.	Product	Cumulative Waste		Solvent Loss Lt.	Total
		Solid Kg.	Liquid (Weak + Strong)		
1.	**Metadoxine**	40.72	140(W) + 0 (S)	100	40.72 kg + 240 L
2.	**Metaprolol Tartrate**	Nil	1870 (W) + 1260 (S)	20	3150 L
3.	**Analgin Magnesium**	Nil	470 (W) + 172 (S)	4	646 L
4.	**Tramadol HCL**	Nil	0 (W) + 4100 (S)	87	4187 L
5.	**Carbamezepine**	3.0	1100 (W) + 2368.4 (S)	100	3 kg + 3568.4 L
6.	**Flurbiprofen**	50	2250 (W) + 5700 (S)	25	50 kg + 7975 L
7.	**Danazol**	2.0	158 (W) + 870 (S)	20	2 kg + 1048 L
8.	**Clomipramine**	65.0	6900 (W) + 107 (S)	90	65 kg + 7097 L
9.	**Sodium Valporate**	24.4	3175 (W) + 725 (S)	21	24.4 kg + 3921 L
10.	**Oxetacine**	5.0	5060 (W) + 1237 (S)	40	5 kg + 6297 L
	Total Waste	190	21123 (W) + 16539.4 (S)	507	190 kg + 38169.4 L

Waste oil – Apart from the process waste pump operation (maintenance section) generates waste oil to the extent of 0.125 ton per month.

Chapter III

Summary and Conclusion

3.0 Introduction

The detailed calculation based on stoichiometry of the new processes (10 no's) and the relevant information is furnished by the SPIL. The waste generated per batch size of production has been arrived at and summed up in chapter II. The total waste generated by the processes for their varying target. The product wise waste generation has been worked out and the details of which is furnished in table 3.1.

3.1 Waste Comparison

The Table 3.1 reveals the total effluent in the form of liquid, solid and other losses for all the proposed processes per month.

The total Solid waste generated = 1315 Kg

The total Liquid waste generated = 10,36,380 Lt

The total Solvent Loss generated= 4646 Lt

The Wastewater generation during the present and future scenario is provided in table 3.2.

The above figures have been compared with the permitted discharge of effluent by the TNPCB is shown in table 3.3 below. To ensure the minimization of solvent loss to atmosphere, proper scrubber system should be in operation.

0Table 3.3

Comparison of permitted waste Vs Generated by process reactions

Permitted Waste by TNPCB	Proposed Waste to be generated (per day)
Trade effluent - 48,500 L/day Sewage - 6,000 L/day	Liquid Waste = 34546 Lt Solvent Loss = 155 Lt Sewage = 6000 Lt (no change)
Total 54,500 L/day	Total 40689 Lt

Note: 44 Kg of Solid Waste generated per day to be managed as per TNPCB norms.

Effluent details

Table 3.1 Product Wise Effluent Details

S. No	Product	Unit	Batch Size	Target per month	Per Batch					Total Effluent / month				
					Spent carbon	Solid	Solvent	Strong	Weak	Spent Carbon	Solid	Solvent	Strong	Weak
1	Sodium Valproate	KGS	375.00	8000.00	4.380	20.000	21.000	725.000	3175.000	93.44	426.67	448.00	15466.00	67733.00
2	Oxetacaine	KGS	100.00	1000.00	0.000	5.000	40.000	1237.000	5060.000	0.00	58.00	400.00	12370.00	49920.00
3	Clomipramine	KGS	77.00	1000.00	20.000	45.000	90.000	107.000	6900.000	259.74	584.42	1168.83	1390.00	90200.00
4	Flurbiprofen	KGS	360.00	1000.00	0.000	50.000	25.000	5700.000	2250.000	0.00	138.89	69.44	15833.33	6250.00
5	Analgin Magnesium	KGS	400.00	6000.00	0.000	0.000	4.000	172.000	470.000	0.00	0.00	60.00	2580.00	7050.00
6	Carbamazepine	KGS	320.00	4000.00	3.000	0.000	100.000	2368.400	1100.000	37.50	0.00	1250.00	29605.00	13750.00
7	Metoprolol Tartrate	KGS	420.00	3000.00	0.000	0.000	20.000	1260.000	1870.000	0.00	0.00	143.00	9000.00	13357.14
8	Tramadol HCL	KGS	198.00	1000.00	0.000	0.000	87.000	4100.000	0.000	0.00	0.00	440.00	20707.07	0.00
9	Metadoxine	KGS	100.00	400.00	12.000	28.720	100.000	0.000	140.000	48.00	114.88	400.00	0.00	560.00
10	Danazol	KGS	7.50	100.00	2.000	0.000	20.000	870.000	158.000	26.67	0.00	266.67	11600.00	2106.67
				25500	41.38	148.72	507	16539.4	21123	429.347	1314.86	4646	118551.4	248820.1

Vessel Cleaning	0.00	459000.00
Hand Washing & others	0.00	120000.00
Boiler blow down	15000.00	0.00
Cooling tower	0.00	15000.00
DM Water	30000.00	30000.00
	163551.4	872820.14
Per day	5451.71	29094.00
	5452 L	29094 L

Table 3.2 – Wastewater generation during the present and future scenario.

S. No	Waste Category	Quantity (KLD) Present Scenario		Quantity (KLD) Future Scenario	
		Weak Effluent	Strong Effluent	Weak Effluent	Strong Effluent
1	Process Waste Water	20.0	18.2	8.3	3.95
2	Plant & Vessel Washings	7.0	Nil	19.3	Nil
3	Boiler Blow Down	Nil	0.8	Nil	0.5
4	Cooling Tower Bleed	0.5	Nil	0.5	Nil
5	DM Regeneration	Nil	2.0	1.0	1.0
6	Sewage	6.0	Nil	6.0	Nil
Total Wastewater Generation		27.5 + 6.0	21.0	29.1+6.0	5.45
		48.5 KLD Trade Eff. + 6.0 KLD Sewage		34.55 KLD Trade Eff. + 6.0 KLD Sewage	

3.2 Conclusion:

It is observed from the above Table 3.2 that the waste generated by the proposed processes are less than the permitted amount of waste generation by TNPCB vide Annexure I enclosed.

TNPCB has given consent for the three approved products namely Frusemide, Analgin, Mebendazole for discharge of trade effluent of 48,500 L/day and Sewage of 6000 L/day.

The liquid waste likely to be generated in view of the new proposed activity is worked out to be 34500 L/day which is less than is less than the earlier permitted effluent discharge load. This trade effluent and sewage are to be managed as per discharge standards of TNPCB.

The solid waste likely to be generated because from the process of the new proposed activity is worked to be 22.09 T/year. This is also in the limit of TNPCB earlier approved quantity of 46.8 T/year. The waste oil to be managed per year is 1.5 ton. This is also within the permitted limit of 1.5 ton. These solid waste and waste oil are to be managed as per hazardous waste rule.

The waste generation is expected to be reduced during the production of the proposed new product in the place of the existing products.

Annex-I

TAMILNADU POLLUTION CONTROL BOARD

Proceedings No.T3/CPT-MGR(S)/F-2057/W&A/dt.2.6.92.

Sub:- TNPC Bd - Industries - M/s.Pradeep Exports - Sathammai, Maduranthakam Taluk - Chengalpattu M.G.R. District - Amendment issued - Regarding.

Ref: 1. T.O.Proc.No.T1/CPT-M.G.R.(S)/F-2057/W/ dated 7.4.92.

2. T.O.Proc.No.T1/CPT-M.G.R./F-2057/A/ dated 7.4.92.

££££££

Under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 and under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981, consent has been issued to the unit to manufacture the following products.

1. Furosemide - 3.0 T/M
2. Analgin - 30.0 T/M
3. Mebenezol - 3.0 T/M

Under section 27 of the Water (Preventionand Control of Pollution) Act, 1974 and under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981, the manufacturing products may be altered to read as follows:

1. Furosemide - 3.0 T/M
2. Analgin - 30.0 T/M
3. Mebenezol - 5.0 T/M

All other conditions stipulated in the consent order remain unaltered.

For CHAIRMAN.

To
The Managing Director,
M/s.Pradeep Exports,
(A unit of Pradeep Drug Company Limited,
268 Lloyds Road, Madras 600 014.

Copy to
The District Environmental Engineer,
TNPC Board, Tambaram.

Copy to
The Senior Environmental Engineer,
TNPC Board, Madras.
The Commissioner, Maduranthagam Panchayat Union,
Maduranthagam, Chengalpattu MGR District.

svt/0306

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Annex–II

TAMILNADU POLLUTION CONTROL BOARD

THIS DOCUMENT CONTAINS — 5 — PAGES

AUTHORISATION No. 2136/2004 DATED : 21.4.2004

PROCEEDINGS No. TNPC B/HWM/009783/KPN/2004 DATED : 21.4.2004

Sub : TNPC BOARD–M/s. Sun Pharmaceutical Industries Ltd., Sethammai Village, Madurantagam Taluk, Kancheepuram D.T.

Authorisation for operating a facility for Collection / Reception / Treatment / Storage / Transport and Disposal of Hazardous Waste under Rule 3 (c) and 5 (3) of Hazardous Wastes (Management and Handling) Rules, 1989 as amended in 2003 issued under Environment (Protection) Act, 1986, as amended from time to time.

Ref : 1. Application No. dt. 16.9.2004 from M/s. Sun Pharmaceutical Industries Ltd., Sethammai Village, Madurantagam Taluk, Kancheepuram D.T.

In accordance with Hazardous Wastes (Management and Handling) Rules, 1989, as amended in 2003 authorisation is issued to The Occupier, M/s. Sun Pharmaceutical Industries Ltd., Sethammai Village, Madurantagam Taluk, Kancheepuram District.

He / She / They shall handle hazardous wastes as specified below:

Sl. No.	Details of process generating hazardous waste as listed in column 2 of Schedule 1 of the amended rules / class of waste as per Schedule 2	Details of Waste Stream as indicated in column 3 of Schedule 1 / Identity of waste as per Schedule 2	Quantity generated / handled per year	Activity for which authorisation is issued
1.	35 Disposal of barrels/ Containers used for handling of haz. water/Chemicals Wastes	35.2 Sludge from treatment of waste water arising from cleaning of containers & Vessels	46.80/T.yr.	Collection Storage
2.	28 Productions/formulations of drugs/ Pharmaceuticals	28.2 Spent Carbon	3.0 T/yr.	Collection Storage
		28.2 Spent Nickel catalyst	5.0 T/year	Collection & Stor
3.	5 Industrial operation using mineral synthetic oil as lubricant in hydraulic systems or other applications.	5.1 Used/Spent oil	1.5 T/yr	Collection Storage and disposal

The authorisation is issued subject to the terms and conditions specified in Form-2 and special conditions if any annexed.

FOR MEMBER SECRETARY
TAMILNADU POLLUTION CONTROL BOARD,
CHENNAI

CENTRE FOR ENVIRONMENTAL STUDIES ANNA UNIVERSITY 17 JUN 2005

50

To

The Managing Director
M/s. Pradeep Exports
(A unit of M/s. Pradeep Drug Co. Ltd.)
268, Lloyds Road
Madras - 600 014.

Copy to: The District Environmental Engineer, Tamil Nadu Pollution Control Board,

Tambaram

for information and necessary action.

Copy to: The Senior Environmental Engineer, Tamil Nadu Pollution Control Board,

Madras Region.

Copy to: The Commissioner/Executive Officer
Maduranthagam Panchayat Union
Maduranthagam
Chengalpattu MGR District.

Spare:

(48)

SPECIAL CONDITIONS

1. Details of the Products Manufactured

Sl.No. (1)	Description (2)	Quantity/Month (3)
1.	Furosemide	3.0 T.
2.	Analgin	30.0 T.
3.	Mebendazol	3.0 T.

This consent is valid for the manufacture of products and rate of production mentioned above. Any change in the quantity or quality of the products has to be brought to the notice of the Board and fresh consent has to be obtained

2. Discharge of effluent is permitted from the following outlets. The quantity of effluent discharged shall not exceed the figures mentioned below:

Outlet Number. (1)	Description of Outlet (2)	Maximum daily Discharge (In litres/day) (3)	Point of Disposal (4)
1.	Domestic	6000	On Industry's land.
2.	Trade effluent	48500	Inland surface water.
3.			
4.			
5.			
6.			
7.			

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Annex–II

TAMILNADU POLLUTION CONTROL BOARD

THIS DOCUMENT CONTAINS 5 7 PAGES

AUTHORISATION No. 2136/2004 DATED : 21.4.2004

PROCEEDINGS No. TNPC B/HWM/009783/KPM/2004 DATED : 21.4.2004

Sub : TNPC BOARD–M/s. Sun Pharmaceutical Industries Ltd., Sethammai Village, Madurantagam Taluk, Kancheepuram D.T.

Authorisation for operating a facility for Collection / ~~Reception~~ / ~~Treatment~~ / Storage / ~~Transport~~ and Disposal of Hazardous Waste under Rule 3 (c) and 5 (5) of Hazardous Wastes (Management and Handling) Rules, 1989 as amended in 2003 and also under Environment (Protection) Act, 1986.

Ref : 1. Application No. — dt. 16.8.2004 from M/s. Sun Pharmaceutical Industries Ltd., Sethammai Village, Madurantagam Taluk, Kancheepuram D.T.

In accordance with Hazardous Wastes (Management and Handling) Rules, 1989, as amended in 2003 authorisation is issued to The Director, M/s. Sun Pharmaceutical Industries Ltd., Sethammai Village, Madurantagam Taluk, Kancheepuram District.

He / ~~She / They~~ shall handle hazardous wastes as specified below:

Sl. No.	Details of process generating hazardous waste as listed in column 2 of Schedule 1 of the amended rules / class of waste as per Schedule 2	Details of Waste Stream as indicated in column 3 of Schedule 1 / Identity of waste as per Schedule 2	Quantity generated / handled per year	Activity for which authorisation is issued
1.	35 Disposal of barrels/ Containers used for handling of haz. waste/Chemicals Wastes	35.2 Sludge from treatment of waste water arising from cleaning of containers & Vessels	46.80/T.yr.	Collection Storage
2.	28 Productions/formulations of drugs/ Pharmaceuticals	28.2 Spent Carbon 28.2 Spent Nickel catalyst	3.0 T/yr. 5.0 T/year	Collection Storage Collection & Storage
3.	5 Industrial operation using mineral/ synthetic oil as lubricant in hydraulic systems or other applications.	5.1 Used/Spent oil	1.5 T/yr	Collection Storage and disposal

The authorisation is issued subject to the terms and conditions specified in Form-2 and special conditions annexed.

FOR MEMBER SECRETARY
TAMILNADU POLLUTION CONTROL BOARD,
CHENNAI.

CENTRE FOR ENVIRONMENT ANNA UNIVERSITY 17 JUN 2005

50

TAMIL NADU POLLUTION CONTROL BOARD

By Registered Post with
Acknowledgement Due
(This document contains _ Pages)

To

THE MANAGER-OPERATION,
M/S.SUN PHARMACEUTICAL INDUSTRIES LIMITED,
SATHAMMAI VILLAGE, KAYARKUZHI POST,
MADURANTAGAM TALUK,
KANCHEEPURAM DISTRICT.

TAMILNADU POLLUTION CONTROL BOARD

CONSENT ORDER NO. : 3094 DATED : 30/11/2005

Proceedings No. : TIN/TNPCBO/F2057/KPM/A DATED : 30/11/2005

Consent For Establishment under Section 21 of the AIR (Prevention and control of Pollution) Act,1981 as amended in 1987.

Sub : TNPC Board - Consent for establishment
MESSRS SUN PHARMACEUTICAL INDUSTRIES LIMITED,
S.NO.90/3 ETC., SATHAMMAI VILLAGE,
MADURANTAGAM TALUK,
KANCHEEPURAM DISTRICT.

Copy to : The District Environmental Engineer, Tamil Nadu Pollution Control Board
KANCHEEPURAM DISTRICT.

For information and necessary action.

For the establishment or take steps to establish the industry under Section 21 of the AIR (Prevention and Control of Pollution) Act, 1981 as amended in 1987.

Ref : 1.YOUR APPLICATION NO.698 DATED 22.6.2005
2.IR NO.DEE/TNPCB/KPM/RN-84/WIA/2003 DATED 25.7.2005
3.SUBCOMMITTEE RESOLUTION NO.2-30 DATED 16.11.2005

Copy to : The Joint Chief Environmental Engineer, TNPCB,

BOARD RESOLUTION NO : DATED :

Consent to establish or take steps to establish is hereby granted under Section 21 of the AIR (Prevention and Control of Pollution) Act, 1981 as amended in 1987 and the Rules and Orders made there under to

Copy to : The Commissioner / Executive Officer,
MADURANTAGAM PANCHAYAT UNION, KANCHEEPURAM DISTRICT.

THE MANAGER-OPERATION,
M/S.SUN PHARMACEUTICAL INDUSTRIES LIMITED,

(hereinafter referred to as 'The Applicant') authorising his/her/them to establish or take steps to establish the industry in the site mentioned below:
S.NO.90/3 ETC., SATHAMMAI VILLAGE,
MADURANTAGAM TALUK,
KANCHEEPURAM DISTRICT.

This consent to establish is valid for TWO years, or till the industry obtains consent to operate under Section 21 of the AIR (Prevention and Control of Pollution) Act, 1981 as amended in 1987 whichever is earlier.

Chairman

For MEMBER SECRETARY
TAMIL NADU POLLUTION CONTROL BOARD
CHENNAI

ANNEXURE-5

TAMIL NADU POLLUTION CONTROL BOARD

By Registered Post with
Acknowledgement Due
(This document contains __ Pages)

05/12/05

To

THE MANAGER-OPERATION,
M/S.SUN PHARMACEUTICAL INDUSTRIES LIMITED,
SATHAMMAI VILLAGE, KAKUNKUZHI POST,
MADURANTAGAM TALUK,
KANCHEEPURAM DISTRICT.

TAMILNADU POLLUTION CONTROL BOARD

CONSENT ORDER NO. : 3150 DATED : 30/11/2005

Proceedings No. : T10/TNPCDD/F2057/KPM/W DATED : 30/11/2005

Consent for Establishment under Section 25 of the WATER (Prevention and control of Pollution) Act,1974, as amended in 1988.

Sub : TNPC Board - Consent For establishment
MESSERS SUN PHARMACEUTICAL INDUSTRIES LIMITED,
S.NO.90/3 ETC., SATHAMMAI VILLAGE,
MADURANTAGAM TALUK,
KANCHEEPURAM DISTRICT.

Copy to : The District Environmental Engineer, Tamil Nadu Pollution Control Board
KANCHEEPURAM DISTRICT.

For information and necessary action.

for the establishment or take steps to establish the industry under Section 25 of the WATER (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act 53 of 1988).

Ref : 1.YOUR APPLICATION NO.2292 DATED 22.6.2005
2.IR NO.DEE/TNPCB/KPM/RR-84/WIA/2005 DATED 25.7.2005
3.SHOCOMMITTEE RESOLUTION NO.2-30 DATED 18.11.2005

தமிழ்நாடு

Copy to : The Joint Chief Environmental Engineer, TNPCB,

Board Resolution No : DATED :

Copy to : The Commissioner / Executive Officer,

Consent to establish or take steps to establish is hereby granted under Section 25 of the WATER (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act 53 of 1988) (hereinafter referred to as 'The Act') and the Rules and Orders made there under to
THE MANAGER-OPERATION,
M/S.SUN PHARMACEUTICAL INDUSTRIES LIMITED,
(hereinafter referred to as 'The Applicant') authorising him/her/them to establish or take steps to establish the industry in the site mentioned below:
S.NO.90/3 ETC., SATHAMMAI VILLAGE,
MADURANTAGAM TALUK,
KANCHEEPURAM DISTRICT.

MADURANTAGAM PANCHAYAT UNION, KANCHEEPURAM DISTRICT.

Spare :

This Consent to establish is valid for TWO years, or till the Industry obtains consent to operate under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 whichever is earlier.

Chairman

for MEMBER-SECRETARY
TAMIL NADU POLLUTION CONTROL BOARD
CHENNAI

2/12

TAMIL NADU POLLUTION CONTROL BOARD

By Registered Post with
Acknowledgement Due
(This document contains 0 Pages)

TAMILNADU POLLUTION CONTROL BOARD

CONSENT ORDER NO. : 16641 Dated 19/06/2006

Proceedings No. : T10/TNPCB/F2057/KPM/A/2006 Dated 19/06/2006

Consent for Existing / New operation of the plant under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 as amended.

Sub : TAMIL NADU POLLUTION CONTROL BOARD - CONSENT -
MESSERS SUN PHARMACEUTICAL INDUSTRIES LIMITED,
S.NO.90/3 ETC.,
SATHANMAI VILLAGE,
MADURANTAGAM TALUK,
KANCHEEPURAM DIST.
for the existing/new operation of the plant under Section 21 of the Air (Prevention and Control of Pollution) Act.1981 as amended.

Ref : 1.YOUR APPLICATION NO.698 DT.22.6.2005
2.PROC.NO.T10/TNPCB/F2057/KPM/A DT.30.11.2005
3.IR NO.BEE/TNPCBO/KPM/BL-137/WBA/2006 DT.3-6-2006

Board Resolution No : dated / /

CONSENT is hereby granted under Section 21 of the Air (Prevention and Control of Pollution Act, 1981 (Central) Act 14 of 1981) as amended (hereinafter referred to as 'The Act') and the rules and orders made thereunder to

THE MANAGER-OPERATION,
M/s. SUN PHARMACEUTICAL INDUSTRIES LIMITED,
S.NO.90/3 ETC.,
SATHANMAI VILLAGE,
MADURANTAGAM TALUK,
KANCHEEPURAM DIST.
(hereinafter referred to as 'The Applicant') authorising him/her/them to operate his/her/their industrial plant in the Air Pollution Control Area as notified by the Government and to continue to make existing discharge of emission/make new discharge of emissions from the stacks/chimneys.

This is subject to the provisions of the Act and the rules and orders made thereunder and further subject to the terms and conditions incorporated in the Special and General Conditions annexed.

This CONSENT is valid for a period ending with the 31st day of March 2007 (Thirty first day of March Two Thousand Seven)

For MEMBER SECRETARY Chairman
TAMIL NADU POLLUTION CONTROL BOARD
CHENNAI

27/6/2006

To

THE MANAGER-OPERATION,
M/S.SUN PHARMACEUTICAL INDUSTRIES LIMITED,
SATHANMAI VILLAGE, KARUMKUZHI POST,
MADURANTAGAM TALUK,
KANCHEEPURAM DISTRICT.

Copy to : The District Environmental Engineer, Tamil Nadu Pollution Control Board
KANCHEEPURAM
for information and necessary action

Copy to : The Joint Chief Environmental Engineer, Tamil Nadu P. .ution Control Board

Copy to : The Commissioner/Executive Officer/District Collector
MADURANTAGAM PANCHAYAT UNION, KANCHEEPURAM DISTRICT.

Spare :

ANNEXURE-6

TAMIL NADU POLLUTION CONTROL BOARD

By Registered Post with
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(This document contains __ Pages)

01/07/06

TAMILNADU POLLUTION CONTROL BOARD

CONSENT ORDER NO. : 20607 dated 19/06/2006

Proceedings No. : T10/TNPCB/F2057/KPM/W/2006 dated 19/06/2006

Consent for ~~Existing/Renewal~~ Altered ~~outlet~~/discharge of sewage and/or trade effluent under Section 25/26 of the WATER (Prevention and Control of Pollution) Act, 1974 as amended.

Sub : TAMIL NADU POLLUTION CONTROL BOARD - CONSENT
MESSERS SUN PHARMACEUTICAL INDUSTRIES LIMITED,
S.NO.90/3 ETC.,
SATHAMMAI VILLAGE,
MADURANTAGAM TALUK,
KANCHEEPURAM DIST.

for the discharge of sewage and/or trade effluent under Section 25/26 of the WATER (Prevention and Control of of Pollution) Act, 1974 (Central Act, 6 of 1974) as amended.

Ref : 1.YOUR APPLICATION NO.2292 DT.22.6.2005
2.PROC.NO.T10/TNPCB/F2057/KPM/W DT.30.11.2005
3.IR NO.DEE/TNPCBB/KPM/RL-137/W&A/2006 DT.3-6-2006

Board Resolution No : DATED : / /

CONSENT is hereby granted under Section 25/~~26~~ of the WATER (Prevention and Control of Pollution Act, 1974 (Central Act 6 of 1974) as amended (hereinafter referred to as 'The Act') and the rules and orders made thereunder to

THE MANAGER-OPERATION,
M/s. SUN PHARMACEUTICAL INDUSTRIES LIMITED,
S.NO.90/3 ETC.,
SATHAMMAI VILLAGE,
MADURANTAGAM TALUK,
KANCHEEPURAM DIST.

(hereinafter referred to as 'The Applicant') authorising him/her/them to ~~continue to or bring into~~ make ~~new discharge or use new~~ altered ~~outlet for~~ discharge of sewage and/~~or~~ trade effluent.

This is subject to the provisions of the Act and the rules and orders made thereunder and further subject to the terms and conditions incorporated in the Special and General Conditions annexed.

This CONSENT is valid for a period ending with the 31st day of March 2007
(Thirty first day of March Two Thousand Seven)

For ~~MEMBER SECRETARY~~ Chairman
TAMIL NADU POLLUTION CONTROL BOARD
CHENNAI

29/6/2006

To

THE MANAGER-OPERATION,
M/S.SUN PHARMACEUTICAL INDUSTRIES LIMITED,
SATHAMMAI VILLAGE, KARUNKUZHI POST,
MADURANTAGAM TALUK,
KANCHEEPURAM DISTRICT.

Copy to : The District Environmental Engineer, Tamil Nadu Pollution Control Board
KANCHEEPURAM

for information and necessary action

Copy to : The Joint Chief Environmental Engineer, Tamil Nadu Pollution Control Board

Copy to : The Commissioner/Executive Officer/District Collector
MADURANTAGAM PANCHAYAT UNION, KANCHEEPURAM DISTRICT.

Spare :

ANNEXURE-7

Category of the Industry :

RED

CONSENT ORDER NO. 2005118846891 DATED: 02/01/2020.

PROCEEDINGS NO.T5/TNPCB/F.0148SPR/RL/SPR/W/2020 DATED: 02/01/2020

SUB: Tamil Nadu Pollution Control Board –CONSENT TO OPERATE – DIRECT -M/s. SUN PHARMACEUTICAL INDUSTRIES LTD , S.F.No. S.NO. 90/3 etc, SATHAMAY villageMaduranthagam Taluk and Kancheepuram District - Consent for the operation of the plant and discharge of sewage and/or trade effluent under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act 6 of 1974) – Issued- Reg.

Ref: 1. PROCEEDINGS NO.T5/TNPCB/F.0148SPR/RL/SPR/W&A/2018 DATED: 13/04/2018
2. Unit's application No. 18846891, dated 17-12-2018 / 11-05-2019.
3. IR.No : F.0148SPR/RL/JCEE-M/SPR/2019 dated 30/01/2019.
4. Report of JCEE(M) on 29-03-2019 and 25-07-2019
5. Board's (Technical Sub Committee) Resolution Item No. 176-01, dated: 30.10.2019.
6. PROCEEDINGS NO.T5/TNPCB/F.0148SPR/RL/SPR/W&A/2019 DATED: 03/12/2019
7. Unit's letter dated 05.12.2019

CONSENT TO OPERATE is hereby granted under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 as amended in 1988 (Central Act, 6 of 1974) (hereinafter referred to as "The Act") and the rules and orders made there under to

The General Manager,
M/s . SUN PHARMACEUTICAL INDUSTRIES LTD
S.F No.S.NO. 90/3 etc,
SATHAMAY Village,
Maduranthagam Taluk,
Kancheepuram District.

Authorising the occupier to make discharge of sewage and /or trade effluent.

This is subject to the provisions of the Act, the rules and the orders made there under and the terms and conditions incorporated under the Special and General conditions stipulated in the Consent Order issued earlier and subject to the special conditions annexed.

This CONSENT is valid for the period ending March 31, 2021

R. Kannan Digitally signed by R. Kannan Date: 2020.01.02 14:46:43 +05'30'

For Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai

To
The General Manager,
M/s.SUN PHARMACEUTICAL INDUSTRIES LTD,
SPARC, Tandalja ,
Vadodara,

Gujarat,

Pin: 390020

Copy to:

1.The Commissioner, MADURANTHAGAM-Panchayat Union, Maduranthagam Taluk, Kancheepuram District .

2. The District Environmental Engineer, Tamil Nadu Pollution Control Board, SRIPERUMBUDUR.

3. The JCEE-Monitoring, Tamil Nadu Pollution Control Board, Chennai.

4. File

Category of the Industry :

RED

CONSENT ORDER NO. 2005218846891 DATED: 02/01/2020.

PROCEEDINGS NO.T5/TNPCB/F.0148SPR/RL/SPR/A/2020 DATED: 02/01/2020

SUB: Tamil Nadu Pollution Control Board –CONSENT TO OPERATE –DIRECT -M/s. SUN PHARMACEUTICAL INDUSTRIES LTD , S.F.No. S.NO. 90/3 etc, SATHAMAY villageMaduranthagam Taluk and Kancheepuram District - Consent for operation of the plant and discharge of emissions under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 as amended in 1987 (Central Act 14 of 1981) –Issued- Reg.

Ref: 1. PROCEEDINGS NO.T5/TNPCB/F.0148SPR/RL/SPR/W&A/2018 DATED: 13/04/2018
2. Unit's application No. 18846891, dated 17-12-2018 / 11-05-2019.
3. IR.No : F.0148SPR/RL/JCEE-M/SPR/2019 dated 30/01/2019.
4. Report of JCEE(M) on 29-03-2019 and 25-07-2019
5. Board's (Technical Sub Committee) Resolution Item No. 176-01, dated: 30.10.2019.
6. PROCEEDINGS NO.T5/TNPCB/F.0148SPR/RL/SPR/W&A/2019 DATED: 03/12/2019
7. Unit's letter dated 05.12.2019

CONSENT TO OPERATE is hereby granted under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 as amended in 1987 (Central Act 14 of 1981) (hereinafter referred to as "The Act") and the rules and orders made there under to

The General Manager,
M/s . SUN PHARMACEUTICAL INDUSTRIES LTD
S.F No.S.NO. 90/3 etc,
SATHAMAY Village,
Maduranthagam Taluk,
Kancheepuram District.

Authorizing the occupier to operate the industrial plant in the Air Pollution Control Area as notified by the Government and to make discharge of emission from the stacks/chimneys.

This is subject to the provisions of the Act, the rules and the orders made there under and the terms and conditions incorporated under the Special and General conditions stipulated in the Consent Order issued earlier and subject to the special conditions annexed.

This CONSENT is valid for the period ending March 31, 2021

R. Kannan Digitally signed by R. Kannan Date: 2020.01.02 14:45:23 +05'30'

For Member Secretary,
Tamil Nadu Pollution Control Board,
Chennai

To
The General Manager,
M/s.SUN PHARMACEUTICAL INDUSTRIES LTD,
SPARC, Tandalja ,
Vadodara,
Gujarat,

Pin: 390020

Copy to:

1.The Commissioner, MADURANTHAGAM-Panchayat Union, Maduranthagam Taluk, Kancheepuram District .

2. The District Environmental Engineer, Tamil Nadu Pollution Control Board, SRIPERUMBUDUR.

3. The JCEE-Monitoring, Tamil Nadu Pollution Control Board, Chennai.

4. File

ANNEXURE-8

M/s Sun Pharmaceutical industries ltd,
Madhuranthagam

List of raw materials and consumption (2019 – 2020)

S. No	Name of product	Raw material name	Total consumption in Kg
1	Clomipramine	Acetic anhydride	16120
2		Acetic acid	31992
3		Sulphuric acid	138384
4		Imino di Benzyl	21700
5		Sulphuric acid CP grade	893
6		Nitric acid	9424
7		Methylene di Chloride	25792
8		Sodium bicarbonate	3472
9		Ethylacetate	13764
10		Methanol	3968
11		Raney Nickel	930
12		Sodium nitrite	4501
13		Hydrochloric acid	66142
14		Toluene	2976
15		Cuprous chloride	15500
16		Sodium bicarbonate	2480
17		Sodium hydroxide flakes	248
18		Activated carbon	2480
19		Hyflow supercel	372
20		Nitric acid 70%	372

M/s Sun Pharmaceutical industries ltd,
Madhuranthagam

List of raw materials and consumption (2019 – 2020)

S. No	Name of product	Raw material name	Total consumption in Kg
1	Oxetacaine	Acetic acid	23173
2		Acetone	8544
3		Diethyl ether	26240
4		Sodium hydroxide flakes	40237
5		Sodium chloride	10824
6		Acetonitrile	5018
7		Sulphuric acid	10849
8		Mono ethylene glycol	4100
9		Pottasium hydroxide	9791
10		Toluene	16646
11		Benzaldehyde	8635
12		Dimethylsulphate	11037
13		Choro acetyl chloride	8184
14		Hydrochloric acid	4305
15		Sodium bicarbonate	1820
16		Activated carbon	410
17		Mono ethanol amine	7380
18		Sodium bicarbonate	5002
19		Sodium chloride	820
20		Hyflow super cel	246
21		Ethylacetate	6068

M/s Sun Pharmaceutical industries ltd,
Madhuranthagam

List of raw materials and consumption (2019 – 2020)

S. No	Name of product	Raw material name	Total consumption in Kg
1	Sodium valproate	Diethyl malonate	126000
2		N propyl bromide	252000
3		Iso propyl alcohol	128772
4		Tetra Butyl Ammonium Bromide	12600
5		Sodium hydroxide lye	123984
6		Toluene	45360
7		Sodium hydroxide flakes	103370
8		Activated carbon	1084
9		Sulphuric acid	158760

M/s Sun Pharmaceutical industries ltd,
Madhuranthagam

List of raw materials and consumption (April 2020 – July 2020)

S. No	Name of product	Raw material name	Total consumption in Kg
1	Clomipramine	Acetic anhydride	6240
2		Acetic acid	12384
3		Sulphuric acid	53568
4		Imino di Benzyl	8400
5		Sulphuric acid CP grade	345
6		Nitric acid	3648
7		Methylene di Chloride	9984
8		Sodium bicarbonate	1344
9		Ethylacetate	5328
10		Methanol	1536
11		Raney Nickel	360
12		Sodium nitrite	1742
13		Hydrochloric acid	25603
14		Toluene	1152
15		Cuprous chloride	6000
16		Sodium bicarbonate	960
17		Sodium hydroxide flakes	96
18		Activated carbon	960
19		Hyflow supercel	144
20		Nitric acid 70%	144

SUN PHARMACEUTICAL INDUSTRIES Madhuranthakam

M/s Sun Pharmaceutical industries ltd,
Madhuranthagam

List of raw materials and consumption (April 2020 – July 2020)

S. No	Name of product	Raw material name	Total consumption in Kg
1	Oxetacaine	Acetic acid	6217
2		Acetone	2292
3		Diethyl ether	7040
4		Sodium hydroxide flakes	10795
5		Sodium chloride	2904
6		Acetonitrile	1346
7		Sulphuric acid	2911
8		Mono ethylene glycol	1100
9		Pottasium hydroxide	2627
10		Toluene	4466
11		Benzaldehyde	2317
12		Dimethylsulphate	2961
13		Choro acetyl chloride	2196
14		Hydrochloric acid	1155
15		Sodium bicarbonate	488
16		Activated carbon	110
17		Mono ethanol amine	1980
18		Sodium bicarbonate	1342
19		Sodium chloride	220
20		Hyflow super cel	66
21		Ethylacetate	1628

SUN PHARMACEUTICAL INDUSTRIES Madhuranthakam

M/s Sun Pharmaceutical industries ltd,
Madhuranthagam

List of raw materials and consumption (April 2020 – July 2020)

S. No	Name of product	Raw material name	Total consumption in Kg
1	Sodium valproate	Diethyl malonate	41500
2		N propyl bromide	83000
3		Iso propyl alcohol	42413
4		Tetra Butyl Ammonium Bromide	4150
5		Sodium hydroxide lye	40836
6		Toluene	14940
7		Sodium hydroxide flakes	34047
8		Activated carbon	357
9		Sulphuric acid	52290

SUN PHARMACEUTICAL INDUSTRIES Madhuranthakam

M/s Sun Pharmaceutical Industries Ltd,
Madhuranthagam

Production 2019 – 2020

S. No	Month	Clomipramine (Kg)
1	April'19	860
2	May'19	990
3	June'19	980
4	July'19	995
5	Aug'19	925
6	Sept'19	930
7	Oct'19	990
8	Nov'19	835
9	Dec'19	0
10	Jan'20	0
11	Feb'20	995
12	Mar'20	990

M/s Sun Pharmaceutical Industries Ltd,
Madhuranthagam

Production 2019 – 2020

S. No	Month	Oxetacaine (Kg)
1	April'19	595
2	May'19	590
3	June'19	620
4	July'19	0
5	Aug'19	525
6	Sept'19	310
7	Oct'19	940
8	Nov'19	988
9	Dec'19	725
10	Jan'20	990
11	Feb'20	985
12	Mar'20	998

M/s Sun Pharmaceutical Industries Ltd,
Madhuranthagam

Production 2019 – 2020

S. No	Month	Sodium valproate (Kg)
1	April'19	7940
2	May'19	7960
3	June'19	7920
4	July'19	7850
5	Aug'19	7935
6	Sept'19	7970
7	Oct'19	7900
8	Nov'19	7920
9	Dec'19	7955
10	Jan'20	7910
11	Feb'20	7970
12	Mar'20	7935

M/s Sun Pharmaceutical Industries Ltd,
Madhuranthagam

Production April 2020 – July 2020

S. No	Month	Clomipramine (Kg)
1	April'20	990
2	May'20	942
3	June'20	935
4	July'20	856

M/s Sun Pharmaceutical Industries Ltd,
Madhuranthagam

Production April 2020 – July 2020

S. No	Month	Oxetacaine (Kg)
1	April'20	985
2	May'20	975
3	June'20	90
4	July'20	0

SUN PHARMACEUTICAL INDUSTRIES * Madhuranthakam

M/s Sun Pharmaceutical Industries Ltd,
Madhuranthagam

Production April 2020 – July 2020

S. No	Month	Sodium valproate (Kg)
1	April'20	7920
2	May'20	7900
3	June'20	7925
4	July'20	7350

ANNEXURE-9

TAMILNADU POLLUTION CONTROL BOARD

This document contains 13 pages

AUTHORIZATION No. 4880 DATED: 18.7.2016

PROCEEDINGS No. T2 /TNPCB/F.35114/MMN/RL/HWM/2016, Dt: 18.7.2016.

Sub: TNPCB – Industries – **M/s. Sun Pharmaceutical Industries Limited** - S.F.No.90/2,3,4,99/1,2,3,45,100/1,2A,2B,3 Saathamai Village, Maduranthagam Taluk, Kancheepuram District - Authorization for operating a facility for Collection, Storage Transport and Disposal of Hazardous Wastes under Hazardous and other Wastes (Management & Transboundary Movement) Rules, 2016 enacted under Environment (protection) Act, 1986 – Reg.

Ref: 1. Units application Dt:13.9.2013 and unit's Letter dated: 31.5.2016

2. IR No.:JCEE(M)/CHN/F.HWM1060-03/17AT/SPR-RL/2013dated: 04.10.2013.

In accordance with Hazardous and other Wastes (Management & Transboundary Movement) Rules, 2016, authorization is issued to

The **Deputy General Manager-Operation,**
M/s. Sun Pharmaceutical Industries Limited,
S.F.No.90/2,3,4,99/1,2,3,45,100/1,2A,2B,3
Saathamai Village,
Maduranthagam Taluk,
Kancheepuram District.

He shall handle hazardous wastes as specified below.

Sl. No.	Details of process generating hazardous waste as listed in column 2 of Schedule 1 of the amended rules/class of waste as per Schedule 2	Details of Wastes Stream as indicated in column 3 of Schedule 1 / identity of waste as per Schedule 2	Solid/ Semi Solid/ Liquid/ Oily/ Tarry/ Slurry/ Others	Quantity generated/ handled per year	Activity for which authorization is issued
1.	5 Industrial operations using mineral/ synthetic oil as lubricant in hydraulic systems	5.1 Used / Spent oil	Oily	1.5 T /Year (0.625T -Accumulated quantity as on 31.05.2016)	Collection, Storage, Transport and Disposal to authorized /registered recyclers

2.	28 Production / formulation of drugs / pharmaceuticals & health care product	28.2 Spent catalyst	Solid	1.5 T /Year (0.393 T - Accumulated quantity as on 31.05.2016)	Collection, Storage, Transport and Disposal to authorized /registered recyclers
3.		28.3 Spent carbon	Solid	4.29 T /Year (2.0T - Accumulated quantity as on 31.05.2016)	Collection, Storage, transport and disposal to TSDF, Gummidipoondi for incineration
4.		28.6 Spent Solvents	Liquid	243 T /Year Accumulated quantity 21T as on 31.05.2016	Collection, Storage, Transport and Disposal to authorized /registered recyclers
5.	33 Disposal of barrels / containers used for handling of hazardous wastes / chemicals	33.1 Discarded containers / barrels / liners contaminated with hazardous wastes/ chemicals	Solid	1500 Nos /Year (20 Nos. Accumulated quantity as on 31.05.2016)	Collection, Storage, Transport and Disposal to authorized /registered recyclers
6.	34 Purification and treatment of exhaust air, water & waste water from the processes in this schedule and CETPs	35.3 Chemical sludge from waste water treatment	Sludge	720 T (1.6T - Accumulated quantity as on 31.5.2016)	Collection, Storage, transport and disposal to TSDF, Gummidipoondi for secured land fill

The authorization is issued subject to the terms and conditions specified in Form 2 and special conditions annexed.

Date: 18.7.2016

Sd/-xxxx
Member Secretary

//Forwarded by Order//

For Member Secretary

TAMILNADU POLLUTION CONTROL BOARD

FORM 2
[See rule 6(2)]

FORM FOR GRANT OF AUTHORIZATION FOR OCCUPIER OR OPERATOR FOR HANDLING HAZARDOUS WASTES

1. Authorization No.4880 and date of issue 18.07.2016
2. The Deputy General Manager-Operation, M/s. Sun Pharmaceutical Industries Limited, is hereby granted an authorization for collection, storage, Transport and disposal of hazardous wastes generated by the unit in its premises situated at S.F.No.90/2,3,4,99/1,2,3,45,100/1,2A,2B,3 , Saathamai Village, Maduranthagam Taluk, Kancheepuram District .The authorization is granted for generation, collection, storage, Transport and disposal of hazardous wastes.
3. The authorization shall be in force for a period of FIVE years from the date of issue.
4. The authorization is subject to the conditions stated below and such conditions as may be specified in the rules for the time being in force under the Environment (Protection) Act, 1986.

TERMS AND CONDITIONS OF AUTHORIZATION:

1. The unit shall take measures to transport and dispose the accumulated hazardous waste to the TSDF facility immediately.
2. The unit shall comply with the general term and conditions stipulated in Form 2 special conditions specified in the authorization order for on site, storage requirements, general packaging requirements, transportation requirements and record keeping and reporting and with the following additional conditions.
3. The unit shall take effective raw materia ,and water conservative measures to minimize the generation of Hazardous wastes.
4. The unit shall ensure that all provisions of Hazardous and other Wastes (M, &TM) Rules, 2016 are complied with while handling hazardous waste.
5. The unit shall ensure that the hazardous waste generated shall not be stored more than three months as stipulated in Hazardous and other Wastes (M, &TM) Rules, 2016.
6. The unit shall ensure that the waste in any form is not stored outside the unit's premises.
7. The hazardous wastes shall be stored in impervious lined pit to prevent pollution of ground water and surface soil.
8. The unit shall adopt dry cleaning operation for cleaning container used for storing hazardous chemicals and wastes.
9. The residues arising from waste cleaning operation shall be stored in compatible container.

10. The authorization is subject to the industry complying with all conditions of Consent issued under the Water and Air Acts.
11. The used/spent oil shall be disposed only to such facilities that are authorized by TNPCB and are registered with CPCB, MoEF/ SPCB as actual user facilities adopting environmentally sound management practices for reclaiming used oil.
12. The unit shall sent back the discarded containers /barrels used for chemicals to the original suppliers and ensure that no cleaning operations shall be carried out inside the factory premises.
13. The unit shall update the details in the display board showing the hazardous waste details as per the Supreme Court Directions.

Sd/-xxxx
Member Secretary

//Forwarded by order//

For Member Secretary

SPECIAL CONDITIONS

PART – 1

ON SITE GENERAL STORAGE REQUIREMENTS

1. Any increase in quantity, change in category handling operations shall be brought to the notice of the Board and fresh authorization is to be obtained.
2. The unit may store hazardous waste on site for a maximum period of 90days a maximum quantity of 10,000kgs or a truck load whichever is less.
3. The unit shall not store the hazardous waste on open ground. It shall be stored in closed containers in an isolated area earmarked for the purpose within the premises(it shall not be accessible to rain water)
4. The unit shall mark each container holding the hazardous wastes with marking "Hazardous Wastes" both in English and Tamil. The containers shall be labelled as per the rules prescribed in motor Vehicles Rules, 1989.
5. The storage area should be fenced properly and a sign of danger should be placed at the storage site.
6. The containers holding the hazardous wastes should be kept in good condition and made of materials which can withstand the physical and environmental conditions during storage and transportation.

ANNEXURE-10

INDIA

THE ENVIRONMENTAL IMPACT ASSESSMENT NOTIFICATION, 1994

(As amended on 4-5-94)

Government of India
Ministry of Environment & Forests
New Delhi

MINISTRY OF ENVIRONMENT & FORESTS

NOTIFICATION

ON

Environmental Impact Assessment of Development Projects

New Delhi, the 27th January, 1994.

(as amended on 04/05/1994)

1. S.O.60(E) Whereas a notification under clause (a) of sub- rule (3) of rule 5 of the Environment (Protection) Rules,1986 inviting objections from the public within sixty days from the date of publication of the said notification, against the intention of the Central Government to impose restrictions and prohibitions on the expansion and modernization of any activity or new projects being undertaken in any part of India unless environmental clearance has been accorded by the Central Government or the State Government in accordance with the procedure specified in that notification was published as S.O. No. 80(E) dated 28th January, 1993;

And whereas all objections received have been duly considered;

Now, therefore, in exercise of the powers conferred by sub-section (1) and clause (v) of sub-section (2) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986) read with clause (d) of sub-rule (3) of rule 5 of the Environment (Protection) Rules, 1986, the Central Government hereby directs that on

and from the date of publication of this notification in the Official Gazette expansion or modernization of any activity (if pollution load is toexceed the existing one) or a new project listed in Schedule I of this notification shall not be undertaken in any part of India unless it has been accorded environmental clearance by the Central Government in accordance with the procedure hereinafter specified in this notification.

2. Requirements and procedure for seeking environmental clearance of projects:

I.(a) Any person who desires to undertake any new project or the expansion or modernisation of any existing industry or project listed in Schedule I shall submit an application to the Secretary, Ministry of Environment and Forests, New Delhi.

The application shall be made in the proforma specified in Schedule II of this notification and shall be accompanied by a project report which shall, inter alia, include an Environmental Impact Assessment Report/Environment Management Plan prepared in accordance with the guidelines issued by the Central Government in the Ministry of Environment and Forests from time to time.

(b) Cases rejected due to submission of insufficient or inadequate data and plans may be reviewed as and when submitted with complete data and plans. Submission of incomplete data or plans for the second time would itself be a sufficient reason for the Impact Assessment Agency to reject the case summarily.

II. In case of the following site specific projects:

(a) mining;

(b) pit-head thermal power stations;

(c) hydro-power, major irrigation projects and/or their combination,

including flood control;

(d) ports and harbours (excluding minor ports);

(e) prospecting and exploration of major minerals in areas above 500 ha.,

The project authorities will intimate the location of the project site to the Central Government in the Ministry of Environment and Forests while initiating any investigation and surveys. The Central Government in the Ministry of Environment and Forests will convey a decision regarding suitability or otherwise of the proposed site within a maximum period of thirty days. The said site clearance shall be granted for a sanctioned capacity and shall be valid for a period of five years for commencing the construction, operation or mining.

III.(a) The reports submitted with the application shall be evaluated and assessed by the Impact Assessment Agency, and if deemed necessary it may consult a Committee of Experts, having a composition as specified in Schedule-III of this Notification. The Impact Assessment Agency (IAA) would be the Union Ministry of Environment and Forests. The Committee of Experts mentioned above shall be constituted by the IAA or such other body under the Central Government authorised by the IAA in this regard.

(b) The said Committee of Experts shall have full right of entry and inspection of the site or, as the case may be, factory premises at any time prior to, during or after the commencement of the operations relating to the project.

(c) The Impact Assessment Agency shall prepare a set of recommendations based on technical assessment of documents and data, furnished by the project authorities, supplemented by data collected during visits to sites or factories, if undertaken, and interaction with affected population and

environmental groups, if necessary. Summary of the reports, the recommendation and the conditions, subject to which environmental clearance is given, shall be made available subject to the public interest to the concerned parties or environmental groups on request. Comments of the public may be solicited, if so decided by Impact Assessment Agency, within thirty days of receipt of proposal, in public hearings arranged for the purpose after giving thirty days notice of such hearings in at least two newspapers. Public shall be provided access, subject to the public interest, to the summary of the reports/ Environmental Management Plans at the Headquarters of the Impact Assessment Agency.

The assessment shall be completed within a period of ninety days from receipt of the requisite documents and data from the project authorities and completion of public hearing, where required, and decision conveyed within thirty days thereafter.

The clearance granted shall be valid for a period of five years for commencement of the construction or operation.

No construction work, preliminary or otherwise, relating to the setting up of the project may be undertaken till the environmental and/or site clearance is obtained.

IV. In order to enable the Impact Assessment Agency to monitor effectively the implementation of the recommendations and conditions subject to which the environmental clearance has been given, the project authorities concerned shall submit a half-yearly report to the Impact Assessment Agency. Subject to the public interest, the Impact Assessment Agency, shall make compliance reports publicly available.

V. If no comments from the Impact Assessment Agency are received within the time limit, the project would be deemed to have been approved as proposed by project authorities.

3. Nothing contained in this Notification shall apply to:

(a) any item falling under entry nos. 3,18 and 20 of the Schedule-I to be located or proposed to be located in the areas covered by the Notifications S.O. No. 102(E) dated 1st February, 1989; S.O. 114(E) dated 20th February, 1991 S.O. No. 416(E) dated 20th June, 1991 and S.O. No. 319(E) dated 7th May, 1992.

(b) any item falling under entry Nos. 1,2,3,4,5,7,9,10,12,13,14,16,17,19,21,25 and 27 of Schedule-I if the investment is less than Rs. 50 crores.

(c) any item reserved for Small Scale Industrial sector with investments less than Rs. 1 crore.

4. Concealing factual data or submission of false, misleading data/reports, decisions or recommendations would lead to the project being rejected. Approval, if granted earlier on the basis of false data would also be to be revoked. Misleading and wrong information will cover the following:

-- False information.
-- False data.
-- Engineered reports.
-- Concealing of factual data.
-- False recommendations or decisions.

(No. Z-12013/4/89-IA-I)

R. RAJAMANI, Secy.

SCHEDULE -I

(See paras 1 and 2)

LIST OF PROJECTS REQUIRING ENVIRONMENTAL CLEARANCE FROM THE CENTRAL GOVERNMENT

1. Nuclear Power and related projects such as Heavy Water Plants, nuclear fuel complex, rare earths.

2. River Valley projects including hydel power, major irrigation and their combination including flood control.

3. Ports, Harbours, Airports (except minor ports and harbours).

4. Petroleum Refineries including crude and product pipelines.

5. Chemical Fertilizers (Nitrogenous and Phosphatic other than single superphosphate).

6. Pesticides (Technical).

7. Petrochemical complexes (Both Olefinic and Aromatic) and Petro-chemical intermediates such as DMT, Caprolactam, LAB etc. and production of basic plastics such as LDPE, HDPE, PP, PVC.

8. Bulk drugs and pharmaceuticals.

9. Exploration for oil and gas and their production, transportation and storage.

10. Synthetic Rubber.

11. Asbestos and Asbestos products.

12. Hydrocyanic acid and its derivatives.

13.(a) Primary metallurgical industries (such as production of Iron and Steel, Aluminium,Copper,Zinc, Lead and Ferro Alloys).

(b) Electric arc furnaces (Mini Steel Plants).

14. Chlor-alkali industry.

15. Integrated paint complex including manufacture of resins and basic raw materials required in the manufacture of paints.

16. Viscose Staple fibre and filament yarn.

17. Storage batteries integrated with manufacture of oxides of lead and lead antimony alloy.

18. All tourism projects between 200m--500 meters of High Tide Line or at locations with an elevation of more than 1000 meters with investment of more than Rs. 5 crores.

19. Thermal Power plants.

20. Mining projects (major minerals) with leases more than 5 hectares.

21. Highway Projects.

22. Tarred Roads in Himalayas and/or Forest areas.

23. Distilleries.

24. Raw Skins and Hides.

25. Pulp, paper and newsprint.

26. Dyes.

27. Cement.

28. Foundries (individual).

29. Electroplating.

SCHEDULE -II

(See Sub-para I(a) of Para 2)

APPLICATION FORM

1. (a) Name and Address of the project proposed:

   (b) Location of the project:
   Name of the place:
   District, Tehsil:
   Latitude/Longitude:
   Nearest Airport/Railway Station:

   (c) Alternate sites examined and the reasons for selecting the proposed site:

   (d) Does the site conform to stipulated land use as per local land use plan:

2. Objectives of the project:

3. (a) Land Requirement:
   Agriculture Land:
   Forest land and Density of vegetation:
   Other (specify):

   (b) (i) Land use in the Catchment/within 10 kms. radius of the proposed site:

   (ii) Topography of the area indicating gradient, aspects and altitude:

   (iii) Erodability classification of the proposed land;

   (c) Pollution sources existing in 10 km. radius and their impact on quality of air, water & land:
   (d) Distance of the nearest National Park/Sanctuary Biosphere

Reserve/Monuments/heritage site/Reserve Forest:

(e) Rehabilitation plan for quarries/borrow areas:

(f) Green belt plan:

(g) Compensatory afforestation plan:

4. Climate and Air Quality:

(a) Windrose at site;
(b) Max./Min./Mean annual temperature
(c) Frequency of inversion:
(d) Frequency of cyclones/tornadoes/cloud burst:
(e) Ambient air quality data:
(f) Nature & concentration of emission of SPM,Gas (CO, CO_2, NO_x, CHn etc.) from the project.

5. Water balance:

(a)' Water balance at site:
(b) Lean season water availability:
(c) Source to be tapped with competing users (River,Lake, Ground, Public supply):

(d) Water quality:
(e) Changes observed in quality and quantity of ground water in the last 15 years and present charging and extraction details:
(f) (i) Quantum of waste water to be released with treatment details:

(ii) Quantum of quality of water in the receiving body before and after disposal of solid waste:

(iii) Quantum of waste water to be released on land and type of land:

(g) (I) Details of reservoir water quality with necessary Catchment Treatment Plan;

(II) Command Area Development Plan;

6. Solid wastes :
   (a) Nature and quantity of solid wastes generated.
   (b) Solid waste disposal method:

7. Noise and Vibrations:

   (a) Sources of noise and vibrations;
   (b) Ambient noise level:
   (c) Noise and Vibration control measures proposed;
   (d) Subsidence problem if any with control measures:

8. Power requirement indicating source of supply: Complete environmental details to be furnished separately, if captive power unit proposed:

9. Peak labour force to be deployed giving details of:
   -- Endemic health problems in the area due to waste water/air/soil borne diseases:
   -- Health care system existing and proposed:

10. (a)Number of village and population to be displaced:
    (b)Rehabilitation Master Plan:

11. Risk Assessment Report and Disaster Management Plan:

12. (a) Environmental Impact Assessment } Report prepared as per
    (b) Environment Management Plan: } guidelines of MOEF
    (c) Detailed Feasibility Report: } issued from time to time
    (d) Duly filled in questionnaire }

13. Details of Environmental Management Cell:

I hereby give an undertaking that the data and information given above are true to the best of my knowledge and belief and I am aware that if any part of the data/information submitted is found to be false or misleading at any stage, the project be rejected and the clearance given, if any, to the project is likely to be revoked at our risk and cost.

Signature of the applicant
with name and full address

Date:
Place:

Given under the seal of
organisation on behalf of
whom the applicant is signing

In respect to item for which data are not required or is not available as per the declaration of project proponent, the project would be considered on that basis.

SCHEDULE III

(See sub-para III(a) of Para 2)

COMPOSITION OF THE EXPERT COMMITTEES FOR ENVIRONMENTAL IMPACT ASSESSMENT

1. The Committees will consist of experts in the following disciplines:

(I) Eco-System Management

(II) Air/Water Pollution Control

(III) Water Resource Management

(iv) Flora/Fauna Conservation and Management

(v) Land Use Planning

(vi) Social Sciences/Rehabilitation

(vii) Project Appraisal

(viii) Ecology

(ix) Environmental Health

(x) Subject Area Specialists.

(xi) Representatives of NGOs/Persons Concerned With Environmental Issues.

2. The Chairman will be an outstanding and experienced ecologist or environmentalist or technical professional with wide

managerial experience.

3. The representative of IAA will act as Member - Secretary.

4. Chairman and members will serve in their individual capacities except those specifically nominated as representatives.

5. The membership of a Committee shall not exceed 15.

EXPLANATORY NOTE REGARDING THE IMPACT ASSESSMENT NOTIFICATION DATED 27TH JANUARY, 1994

1. Expansion and modernisation of existing projects

A project proponent is required to seek environmental clearance for a proposed expansion/modernisation activity if the resultant pollution load is to exceed the existing levels. The words "pollution Load" will in this context cover emissions, liquid effluents and solid or semi-solid wastes generated. A project proponent may approach the concerned State Pollution Control Board (SPCB) for certifying whether the proposed modernisation/expansion activity as listed in Schedule-I to the notification is likely to exceed the existing pollution load or not. If it is certified that no increase is likely to occur in the existing pollution load due to the proposed expansion or modernisation, the project proponent will not be required to seek environmental clearance, but a copy of such certificate issued by the SPCB will have to be submitted to the Impact Assessment Agency (IAA) for information. The IAA will however, reserve the right to review such cases in the public interest if material facts justifying the need for such review come to light.

2. Availability of Summary Feasibility Report, EIA/EMP Report etc. to concerned parties or groups

The project proponent will have to submit an executive summary incorporating in brief the essence of project details and findings of environmental impact assessment study which could be made available to concerned parties or environmental groups on request.

3. Clarification about concerned parties or environmental groups

The concerned parties or environmental groups will be the bonafide residents located at or around the project site or

site of displacement or site of alleged adverse environmental impact.

4. **Public Hearing**

Public hearings could be called for in case of projects involving large displacement or having severe environmental ramifications.

5. **Requisite information required for site clearance/project clearance.**

(a) Site Clearance:

Site clearance will be given for site specific projects as mentioned in para-2(ii) of the notification. Project proponents will be required to furnish informatioin according to the environmental appraisal questionnaires for site clearance, as may be prescribed by the IAA from time to time. Additional information whenever required by the IAA will be communicated immediately to the project proponents who will then be required to furnish the same within the time frame specified.

(b) Project clearance:

In addition to the application form as mentioned in Schedule II to the notification, project proponents are required to furnish the following information for environmental appraisal:

(i) EIA/EMP report (20 copies);

(ii) Risk Analysis report (20 copies): however, such reports if normally not required for a particular category of project, project proponents can state so accordingly, but the IAA's decision in this regard will be final;

(iii) NOC from the State Pollution Control Board;

(iv) Commitment regarding availability of water and electricity from the competent authority;

(v) Summary of Project report/feasibility report (one copy);

(vi) Filled in questionnaire (as prescribed by the IAA from time to time) for environmental appraisal of the project;

(vii) Comprehensive rehabilitation plan, if more than 1000 people are likely to be displaced, otherwise a summary plan would be adequate.

As a Comprehensive EIA report will normally take at least one year for its preparation, project proponents may furnish Rapid EIA report to the IAA based on one season data (other than monsoon), for examination of the project. Comprehensive EIA report may be submitted later, if so asked for by the IAA.

The requirement of EIA can be dispensed with by the IAA, in case of project which are unlikely to cause significant impacts on the environment. In such cases, project proponent will have to furnish full justification for such exemption, for submission of EIA. Where such exemption is granted, project proponents may be asked to furnish such additional information as may be required.

6. Submission of Insufficient or Inadequate data

Regarding cases liable to be rejected due to inadequacy of data, it is clarified that the IAA will make such rejection within 30 days from the date of submission of the proposal. While rejecting a proposal due to insufficient or inadequate data after the first evaluation, the IAA may also stipulate additional requirement of information/clarification for impact assessment purposes if deemed essential due to the specific nature of location of the proposed project whose data as prescribed is

not available. the IAA can examine the project on the basis of available data.

7. **Application Form**

(i) In order to remove any hardship to the project proponent in providing any information, the project proponent may, where some information is not available or would cause inordinate delay, mention this in their application form. The IAA may consider the project proposal based on the information available.

(ii) Quality and quantity of ground water

If 15 years data on the quantity and quality variation of ground water is not available with the concerned Department or Authorities, the project proponent may mention this accordingly in the application form prescribed in Schedule-II to the notification. Further, in case of projects, where ground water is not to be used, and effluents are not to be discharged on the land, the requirement of ground water variation data for the previous 15 years will be dispensed with.

(iii) A project proponent may write the words "Not Applicable" while filling the application form as mentioned in Schedule-II to the notification in respect of items which are not relevant for the purposes of the proposed project.

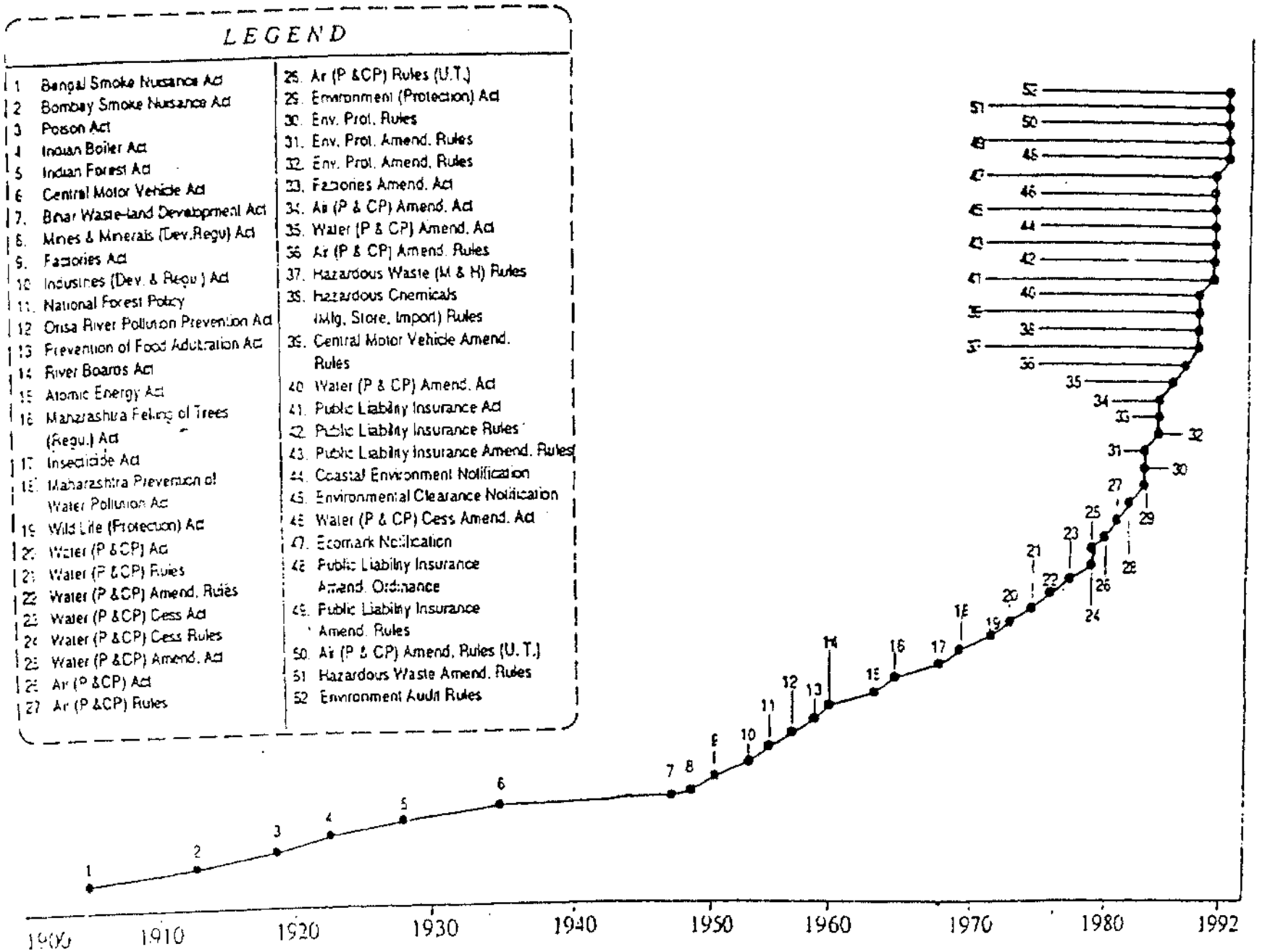
8. **Exemption for projects already initiated**

For projects listed in Schedule-I to the notification in respect of which the required land has been acquired and all relevant clearances of the State Government including NOC from the respective State Pollution Control Boards have been obtained before 27th January, 1994, a project proponent will not be required to seek environmental clearance from the IAA. However those units who have not as yet commenced production will inform the IAA.

50. Air (P & CP) Amend. Rules (U.T).
51. Hazardous Waste Amend. Rules.
52. Environment Audit Rules.

Note: 'P' and 'C.P' - 'Prevention and Control of Pollution'.

Reference: The above listing is adapted
From:
'Environmental Audit' (An overview) (page 12)
by 'Ashok Keshav Mhaskar',
M/s.'MEDIA ENVIRO',
Pune.


LEGEND
1 Bengal Smoke Nuisance Act
2 Bombay Smoke Nuisance Act
3 Poison Act
4 Indian Boiler Act
5 Indian Forest Act
6 Central Motor Vehicle Act
7. Bihar Waste-land Development Act
8. Mines & Minerals (Dev.Regu) Act
9. Factories Act
10 Industries (Dev. & Regu.) Act
11. National Forest Policy
12 Orisa River Pollution Prevention Act
13 Prevention of Food Adulteration Act
14 River Boards Act
15 Atomic Energy Act
16 Maharashtra Felling of Trees (Regu.) Act
17 Insecticide Act
18 Maharashtra Prevention of Water Pollution Act
19 Wild Life (Protection) Act
20 Water (P &CP) Act
21 Water (P &CP) Rules
22 Water (P &CP) Amend. Rules
23 Water (P &CP) Cess Act
24 Water (P &CP) Cess Rules
25 Water (P &CP) Amend. Act
26 Air (P &CP) Act
27 Air (P &CP) Rules
28. Air (P &CP) Rules (U.T.)
29. Environment (Protection) Act
30. Env. Prot. Rules
31. Env. Prot. Amend. Rules
32. Env. Prot. Amend. Rules
33. Factories Amend. Act
34. Air (P & CP) Amend. Act
35. Water (P & CP) Amend. Act
36 Air (P & CP) Amend. Rules
37. Hazardous Waste (M & H) Rules
38. Hazardous Chemicals (Mfg, Store, Import) Rules
39. Central Motor Vehicle Amend. Rules
40 Water (P & CP) Amend. Act
41. Public Liability Insurance Act
42. Public Liability Insurance Rules
43. Public Liability Insurance Amend. Rules
44. Coastal Environment Notification
45. Environmental Clearance Notification
46 Water (P & CP) Cess Amend. Act
47. Ecomark Notification
48 Public Liability Insurance Amend. Ordinance
49. Public Liability Insurance Amend. Rules
50. Air (P & CP) Amend. Rules (U.T.)
51 Hazardous Waste Amend. Rules
52 Environment Audit Rules
1900
1910
1920
1930
1940
1950
1960
1970
1980
1992

ANNEXURE-11

Details of Effluent Treatment Plant			
ETP Components and Specification details			
S. No	**Name of the component**	**Numbers available**	**Specifications**
Weak Effluent Treatment system – 60 KLD			
1	Collection tank	3 1	1.6m Ø X 2.5m - 5 KL 2m Ø X 3.3m - 10 KL Transfer Pumps - 5 KL/hr
2	Storage tank	7	3m Ø X 2.85m - 20 KL Transfer pump – 5 KL/hr
3	Equalization Tank	1	3m X 2.32m X 2.94m - 20 KL.
4	Flash Mixer	1	1m X 1m X 1m - 1KL.
5	Clarifloculation Tank	1	3m Ø X 2.5m – 17.66 KL.
6	Aeration tank I	1	26m X 13.5m X 3m – 1053 KL.
7	Clarifier I	1	3m Ø X 2.5m – 17.66 KL.
8	Aeration Tank II	1	7.5m x 7.5m x 2.5m – 140 KL
9	Clarifier II	1	3m Ø X 2.5m – 17.66 KL.
	Sludge Handling Unit		
1	Filter press	1	36" X 36" Recessed Type. 600 KG cake holding capacity.
2	Slurry tank	1	1m x 1m x 1.5m – 1.5 KL
3	Feed pump	1	2 m^3 / hr.
4	Decanter Centrifuge	1	5 m^3 / hr.
RO Plant – Capacity 40 KLD			
1	Feed tank	1	2m Ø X 3.3m - 10 KL Transfer pump – 5 KL/hr.
2	Plate and tube type RO	1	Capacity – 2 KL/hr.
3	Pressure Sand filter	2	Capacity – 2 KL/hr
4	Cartridge Filter	2	Capacity – 10 µ
5	Modules	9	Capacity – 180 Disc and 179 Membranes. Capacity – 2 KL/hr. Recovery rate – 55 %
6	Permeate collection tank	1	2m Ø X 2.5m – 8 KL.
7	SPRO	1	Capacity – 1.125 KL/hr
8	Cartridge filter	1	Capacity – 10 µ spun

9	Modules	2	Poly amide thin film composite. Recovery rate – 90 %
10	De Gasser tank	1	Packed column 0.31m Ø X 3.1m Blower – 1 HP, Tank capacity – 2 KL.
11	Final permeate collection tank	1	2.5m Ø X 2m – 10 KL. Transfer pump – 5 KL/hr.
High COD Effluent Treatment system components – 80KLD			
1	Collection tank	3 1	1.6m Ø X 2.5m - 5 KL 2m Ø X 3.3m - 10 KL Transfer Pumps - 5 KL/hr
2	Storage tanks	12	3m Ø X 2.85m - 20 KL Transfer pump – 5 KL / hr. 2 No.
3	Lye tank	1	2m Ø X 3m – 9 KL. Transfer pump – 2 KL/hr. – 2 No.
4	Neutralization & sedimentation	2	3.15m X 3.15m X 1.96m.
5	Feed collection tank	1	2m Ø X 3.3m - 10 KL Transfer pump – 5 KL/hr
Stripper - Removal of Low boilers from the Effluent			
1	Feed Tank	1	1.4m x 1.1m Ø - 1.3 KL
2	Re - boiler	1	0.01905m Ø X 3m X 48 tubes. Heat Transfer area – 8 m^2. Circulation Pump – 35 m^3 /Hr
3	Flash vessel	1	0.6m Ø X 0.75m
4	Packed column	1	0.355m Ø X 6.85m.
5	Condenser	1	0.01905m Ø X 3m X 80 – 14 m^2
6	Spent Collection tank	1	2.7m Ø X 3.5m – 20 KL. Transfer pump – 5 KL/hr
7	Ejector	1	450 mmHG.
Multiple Effect Evaporator - Three Stage Forced Circulation Evaporator.			
1	Pre heaters	4	0.01905m Ø X 6m X 6 tubes – 2.4 m^2 0.01905m Ø X 6m X 12 tubes – 4 m^2
2	Calandria I	1	0.0254m Ø X 7.5m X 98 tubes Heat Transfer area – 58.65 m^2 Circulation pump – 400 m^3 /Hr
3	Calandria II	1	0.0254m Ø X 7.5m X 38 tubes Heat Transfer area – 22.74 m^2 Circulation pump – 180 m^3 /Hr
4	Calandria III	1	0.0254m Ø X 7.5m X 38 tubes Heat Transfer area – 22.74 m^2

			Circulation pump – 180 m^3 /Hr
5	Primary condenser	1	0.01905m Ø X 6m X 75 tubes Heat Transfer area – 26 m^2
6	Secondary Condenser	1	0.01905m Ø X 3m X 24 tubes Heat Transfer area – 4 m^2
7	Condensate storage tank	1	Capacity – 10 KL. Transfer pump – 5 KL/hr
8	Concentrate tank	1	1.13m Ø X 0.74m – 0.741 KL
9	Ejector	2	750 mmHg
Agitated Thin Film Driers - Agitator with scrappers			
1	ATFD	1	Agitator – 30 HP
2	Condenser	1	0.01905m Ø X 3m X 150 tubes – 27 m^2
3	Water jet ejector	1	Capacity – 760 mmHg
Cooling tower – 305 m^3 /hr			
1	Tower	1	FRP with fan – 25 HP
2	Cooling tower tank	1	5m X 2.4m X 1.2m – 14 KL. Circulation pump – 2 No X 60 HP
Sewage Treatment Plant – 40 KLD			
1	Collection tank	3	Capacity – 30 KL
2	Bar screen	1	0.5m X 0.5m X 0.7m
3	Equalization cum Anaerobic tank	1	1.6m X 1.8m X 3.5m
4	Aeration feed tank	1	0.8m X 0.8m X 3.5m
5	Aeration tank	2	1m X 1m X 3.5m.
6	Clarifier	1	0.8m X 0.8m X 3.5m
7	Filter feed tank	1	1.0m X 1.0m X 2.0m
8	Pressure Sand Filter	1	0.5m Ø x 1.2m, 2 m^3 / hr.
9	Activated Carbon Filter	1	0.5m Ø x 1.2m, 2 m^3 / hr.

Magnetic flow meter			
1	Electro Magnetic Flow meter	4	Installed at MEE (Stripper Feed, MEE feed, MEE condensate and ATFD feed.
2	PC	1	Installed for Magnetic flow meter data capturing.
3	Magnetic flow meter	3	Installed at RO (Feed , permeate and SPRO feed)
4	Electro Magnetic Flow meter	4	Inlet and Outlet of ETP and STP
Total Volatile Organic Compound analyzer & CEMS			
1	TVOC meter	2	Installed near the process & ETP area.
2	Particulate Matter	1	Installed at Boiler Stack
3	SOx Analyzer	1	Installed at Boiler Stack
4	NOx Analyzer	1	Installed at Boiler Stack
5	PC	1	Connected for online data capturing
6	Broadband	1	Data transfer to Care Air Centre
Web Camera			
1	Web Camera	1	Installed at Discharge point of treated RO permeate 360 ° Rotatable with 30 days playback period

ANNEXURE-12

Sun Pharmaceutical Industries Ltd.
Sathammai Village, Karunkuzhi Post, Madhuranthagam Taluk
Kancheepuram District, Tamil Nadu - 603 303, INDIA.
Tel. : 91 - 44 - 30323800
Fax : 91 - 44 - 27567044
www.sunpharma.com
CIN : L24230GJ1993PLC019050

SUN PHARMA

24/JUN/2019

The District Environmental Engineer,
Tamilnadu Pollution Control Board,
Plot no: CP-5B
SIPCOT INDUSTRIAL GROWTH CENTRE,
Vandalur- Walajabad Road,
Oragadam
Sriperumbadur Taluk.
Kanchipuram District.

Dear Sir,

Sub: Submission of Form IV (Rule 9(2)) of Hazardous Waste (Management & Handling) Rules – reg.

We are herewith Filing the Annual Returns in Form IV for the Hazardous Waste generated at our unit from **April 2018-March 2019.**

This is for your kind information and records.

Thanking You,

Yours Faithfully,
For Sun Pharmaceutical Industries Ltd.

M A JOY
General Manager – Operations.
Encl: as above .

24 JUN 2019

Form - 4

FORM FOR FILING RETURNS BY THE OCCUPIER OR OPERATOR OF FACILTIY

[to be submitted by Occupier / Operator of Disposal Facility to State Pollution Control Board by June 30th of every year for the preceeding year April to March]

[For the period from April 2018-March 19]

1	Name and Address of the Generator / Operator of Facility	M/s Sun Pharmaceutical Industries Ltd, Sathammal Village, Karunkuzhi Post, Maduranthakam Taluk, Kanchipuram District-603 303				
2	Name of the Authorised person and full address with telephone and fax nn:	M A Joy,M/s Sun Pharmaceutical Industries Ltd,Sathammal Village, Karunkuzhi Post, Maduranthakam Taluk, Kanchipuram District-603 303, Ph no: 044 3032 3932/800				
3	Description of Hazardous waste	Physical Form with Description		Chemical Form		
		a) Spent Nickel-[28.2] - Slurry Solution		Catalyst		
		b) Spent Carbon-[28.3],Dry Black Powder		Inorganic Solids		
		c) Spent Organic Solvents-[28.6], Liquid		Organic Solvents		
		d) Spent Oil- [5.1),Liquid		Oil with solvents mix-up		
		e) Discarded Barrels / containers used for handling Hazardous wastes/ chemicals-[33.1], HDPE Drums.		Not Applicable		
		f) Chemical Sludge from Waste Water Treatment -[35.3],Dry Salt.		Inorganic Solids		
4	Quantity of Hazardous Waste.	Types of Hazardous Waste.	Opening Balance as on 1st April 2018 in Tons.	Generation during the Financial Year in Tons 2018-19	Sale / Disposal during the Financial year in Tons 2018-19.	Closing Balance as on 31st March 2019 in Tons.
		a) Spent Nickel [28.2]	1.48	1.5	0	2.98
		b) Spent Carbon [28.3]	5.5	4.29	0.00	9.79
		c) Spent organic Solvents [28.6]	0	240	240	0.00
		d) Spent Oil [5.1]	1.97	1.5	3.47	[0.42) tons of pure oil], due to higher side of moisture content in the spent Oil, the suppliers are not lifting material. The accumulated spent oil is physically separated through the reactor and the aqueous layer is separated out and sent to ETP for further treatment and the oil is separated and collected in Drums. Hence the stock at the site has reduced.
		e) Discarded Barrels / containers used for handling Hazardous wastes/ chemicals-[33.1], HDPE Drums.	22	1492	1489	25
		f) Chemical Sludge from Waste Water Treatment -[35.3],Dry Salt.	18.36	731.19	690.71	58.84

5	Description of Storage of Hazardous waste	The ***Hazardous waste*** is stored in elevated Above Ground Level shed with compartments each for collecting and storing the individual Hazardous waste. The Hazardous Waste shed is covered by all sides by Blue sheets to avoid any rain water entering the shed. The Hazardous shed is provided with a Turbo ventilator for ventilation.The Hazardous waste is directly filled in the Tamilnadu Waste Management Ltd Rental Vehicle and transported regularly for Secured Landfilling in TNWML , Gummidipoondi and the daily generated quantity is kept in the elevated Hazardous shed when the vehicle is not received.. The ***Spent Carbon*** is stored in LDPE and kept in ther daignated compartment in the Hazardous shed. The ***Spent Nickel*** in the original container with water filled upto the lid and kept in the Hazardous shed. The ***Spent Oil*** is kept in the MS drums in the plants area for easy transporatation to the authorised vendor. The ***Discarded Barrels*** are kept in the scrap area with area allocated for storing and removal by authorised recyclers.					
6	Description of Treatment of Hazardous Waste	At our site, we are not performing any Treatment of Hazardous Waste. The Generated Hazardous Waste is collected in cement bags/LDPE bags & solid sludge is further stored in TNWML Rental Container and spent Carbon in LDPE bags , MS Drums for Oil and Spent solvents in MS vertical 30 kl tank and HDPE carboyl for Spent Nickel. The Hazardous Waste is safely handled and kept in Hazardous shed in the alloted compartment for further disposal to authorised recyclers.				
7	Details of Transporatation of Hazardous Waste	Name and Address of Consignee	Mode of Packing	Mode of Transporatation	Date of Transporatation	Quanity [MT]
		Solid Waste: Tamilnadu Waste Management Ltd,Plot no-5-15,28-33 ,EPIP Building , SIPCOT Industrial Complex,, Gummidipoondi- 601201, Thiruvallur Disirict, Tamilnadu	LDPE Bags/ Direct Rental containe	Special container of TSDF TNWML, Gummidipoondi (10 PLT Rental Container)	refer attachment-I	690.71
		Spent Carbon:Tamilnadu Waste Management Ltd,Plot no-5-15,28-33 ,EPIP Building , SIPCOT Industrial Complex,, Gummidipoondi- 601201, Thiruvallur Disirict, Tamilnadu	LDPE Bags	TNWML special truck	Nil	0.00
		Spent Nickel: M/s Monarch Catalysts Pvt Ltd, F-1/2 , MIDC Phase-1, Dombivli[E], Thane - 421203.	HDPE Drum	Truck Vehicle		0
		Spent Oil: M/s Sesi Industries, Plot No - 12,New No 41-A ,SIDCO Industrial Estate , Dindigul, Tamilnadu	MS/ HDPE Drums	Truck Vehicle	nil	0.42
		Spent Solvents: Sri Chemenlor Pvt Ltd, Perumbakkam Village ,Vanur Taluk,Villupuram Disirict, Tamilnadu.	MS Storage tanks	Tankers	Refer Allachment- II	240
		Discarded Barrels: R K Trading Company, Near H P Petrol Pump, Dhavali, Ponda, GOA- India	Scrap Yard	Truck Vehicle		1489

8	Details of Disposal of Hazardous Waste	Name and Address of Consignee	of Packing	Mode of Transporatation	Date of Transporatation -	Quantity [MT]
		Solid Waste: Tamilnadu Waste Management Ltd,Plot no-5-15,28-33 ,EPIP Building , SIPCOT Industrial Complex,, Gummidipoondi- 601201, Thiruvallur District, Tamilnadu	The Hazardous Waste generated from MEE is packed in LDPE bags and Cement bags	The accumulated Solid sludge from MEE is sent to TSDF Gummidipoondi ,as soon as the sludge load of 10 tons is accumulated in Hazardous waste Rental Container	refer Attachment I	690.71
		Spent Carbon: M/s Bharathi Cements corporation Ltd, Nallalingayapalli, Kadappa Dist , Anndhra Pradesh	The accumulated spent carbon after filteration is collected in LDPE bags,neatly tied and stored in the alloted compartment in the Hazardous shed.	The accumulated spent carbon from the Hazardous shed is transported to the authorised site in the vehicle with complete packing to avoid any leak on transit	Nil	0.00
		Spent Nickel: M/s Riddhi Siddhi Steels and Alloys, # B - 44, M I D C , Kalmeshwar , Nagpur- 441501, Maharasthra	The Spent Nickel is collected in the original container with 50% volume of water to keep the material wet to avoid fire ignition.	The Spent Nickel is transported in vehicle with complete safety ensuring that the containers are never without water.		0
		Spent Oil: M/s Sasi Industries, Plot No - 12,New No 41-A ,SIDCO Industrial Estate , Dindigul, Tamilnadu	The Spent Oil is collected in MS /HDPE drums with tight lids.	The accumulated Spent Oil is transported to the authorised buyer with leak proof packing and with lids.	nil	0.42
		Spent Solvents: Sri Chemenior Pvt Ltd, Perumbakkam Village ,Vanur Taluk,Villupuram District, Tamilnadu.	The Spent Solvents are collected in MS vertical tanks in plant area	The accumulated Spent Solvents are send to authorised buyers for further disposal	Refer Attachment- II	240
		Discarded Barrels: R K Trading Company, Near H P Petrol Pump, Dhavali, Ponda, GOA- India	The Discarded Barrels / containers are kept in the dedicated Scrap yard	The accumulated barrels / containers are sent to the authorised buyers for further disposal		1489
9	Quantity of Useful Materials sent back to the Manufacturer's and others	Name & type of Material sent back to Manufacturer's and others				Quantity [MT]
	NIL	Nil				NIL

Place: Madhavaadhakam

Date: 24-06-2019

Signature :

M A Jay

Designation: General Manager- Operations.

Sun Pharmaceutical Industries Ltd , Maduranthakam				
Hazardous waste details for 2018 -19 , attachment - I				
Sl.No.	Date	Manifest No	Hazardous waste in Tons	
1	12-04-2018	54469	11.56	
2	18/04//2018	53669	13.99	
3	24-04-2018	53541	9.16	
4	29-04-2018	53638	15.9	50.71
5	05-May-18	54169	16.25	
6	07-May-18	54717	8.78	
7	14-May-18	54197	6.10	
8	19-May-18	53139	7.53	
9	21-May-18	55038	9.39	
10	23-May-18	53144	9.62	59.67
11	June 18 no load to TNPWML		0	
12	06-Jul-18	55725	22.24	
13	12-Jul-18	56441	9.17	
14	14-Jul-18	55749	6.73	
15	14-Jul-18	56550	16.55	
16	14-Jul-18	56765	16.75	
17	16-Jul-18	52332	23.53	
18	28-Jul-18	56356	9.86	
19	31-Jul-18	56451	8.82	115.67
20	31-Aug-18	56726	20.32	20.32
23	01-Sep-18	56131	9.95	
24	03-Sep-18	56190	9.90	
25	04-Sep-18	57682	10.34	
26	10-Sep-18	56377	9.73	
27	12-Sep-18	56946	9.82	
28	14-Sep-18	56142	9.36	
29	17-Sep-18	56125	7.18	
31	21-Sep-18	56002	8.97	
33	23-Sep-18	55997	6.84	
34	26-Sep-18	56176	9.09	
35	29-Sep-18	56289	7.44	100.32
36	04-Oct-18	55614	6.54	
37	06-Oct-18	55617	8.17	
38	13-Oct-18	55850	7.20	
39	24-Oct-18	56755	9.92	
40	25-Oct-18	56767	8.34	
41	26-Oct-18	56676	8.48	
42	29-Oct-18	56694	7.59	56.24
43	01-Nov-18	56770	7.77	
44	07-Nov-18	55024	8.55	
45	13-Nov-18	57451	9.3	
46	16-Nov-18	57425	8.38	
47	19-Nov-18	57219	13.03	
48	21-Nov-18	57220	11.91	58.94
49	14-Jan-19	604	26.45	
50	25-Jan-19	1350	14.14	
51	26-Jan-19	605	18.48	
52	29-Jan-19	1910	19.13	
53	30-Jan-19	1905	22.09	
54	31-Jan-19	1911	20.79	121.08
55	01-Feb-19	1594	19.24	
56	03-Feb-19	1883	19.2	
57	06-Feb-19	1711	20.48	
58	08-Feb-19	1895	8.15	
59	09-Feb-19	2040	15.00	82.07
60	08-Mar-19	607	25.69	25.69
Grand Total			690.71	690.71

Sun Pharmaceutical Industries Ltd, Maduranthakam					
Spent solvent details for the year 18-19					
Invoice numbers	Invoice date	Customer Name	Name of the Product	Unit	Quantityl(Kgs)
160005906	03-05-2018	SRI CHEMENTOR PRIVATE LIMITED	R-MIX SOLVENT	KG	17160.00
160006415	30-05-2018	SRI CHEMENTOR PRIVATE LIMITED	R-MIX SOLVENT	KG	16840.00
160006972	28-06-2018	SRI CHEMENTOR PRIVATE LIMITED	R-MIX SOLVENT	KG	15280.00
160007557	30-07-2018	SRI CHEMENTOR PRIVATE LIMITED	R-MIX SOLVENT	KG	17390.00
160007645	03-08-2018	SRI CHEMENTOR PRIVATE LIMITED	R-MIX SOLVENT	KG	16870.00
160008466	18-09-2018	SRI CHEMENTOR PRIVATE LIMITED	R-MIX SOLVENT	KG	17240.00
160008878	09-10-2018	SRI CHEMENTOR PRIVATE LIMITED	R-MIX SOLVENT	KG	15270.00
160009735	20-11-2018	SRI CHEMENTOR PRIVATE LIMITED	R-MIX SOLVENT	KG	21790.00
160010094	06-12-2018	SRI CHEMENTOR PRIVATE LIMITED	R-MIX SOLVENT	KG	18070.00
160010783	05-01-2019	SRI CHEMENTOR PRIVATE LIMITED	R-MIX SOLVENT	KG	24370.00
160011546	07-02-2019	SRI CHEMENTOR PRIVATE LIMITED	R-MIX SOLVENT	KG	21360.00
160012159	05-03-2019	SRI CHEMENTOR PRIVATE LIMITED	R-MIX SOLVENT	KG	18660.00
160012324	12-03-2019	PENTAKCOAT RESINS	R-MIX SOLVENT	KG	19610.00
		Total in KGS			239910.00
		Total in Tons			239.91

o/c

Sun Pharmaceutical Industries Ltd.
Sathammai Village, Karunkuzhi Post, Madhuranthagam Taluk
Kancheepuram District, Tamil Nadu - 603 303, INDIA.
Tel. : 91 - 44 - 30323800
Fax : 91 - 44 - 27567044
www.sunpharma.com
CIN : L24230GJ1993PLC019050

SUN PHARMA

18/JUN/2020

The District Environmental Engineer,
Tamilnadu Pollution Control Board,
Maraimalai Adigalar Street,
Next to Municipal Office,
Maraimalai Nagar,
Chengalpattu District,
Pin code -603 209.

Dear Sir,

Sub: Submission of Form IV (Rules 9(2) of Hazardous Waste (Management & Handling) Rules – reg.

We are herewith Filing the Annual Returns in Form IV for the Hazardous Waste generated at our unit from **April 2019 - March 2020.**

This is for your kind information and records.

Thanking You,

Yours Faithfully,

For Sun Pharmaceutical Industries Ltd.

M A JOY.

General Manager – Operations.

Encl: as above

18 JUN 2020

Form - 4						
FORM FOR FILING RETURNS BY THE OCCUPIER OR OPERATOR OF FACILTIY						
[to be submitted by Occupier / Operator of Disposal Facility to State Pollution Control Board by June 30th of every year for the preceeding year April to March]						
[For the period from April 2019--March 20]						
1	Name and Address of the Generator / Operator of Facility	M/s Sun Pharmaceutical Industries Ltd, Sathammai Village, Karunkuzhi Post, Maduranthakam Taluk, Kanchipuram District-603 303				
2	Name of the Authorised person and full address with telephone and fax nn:	M A Joy, M/s Sun Pharmaceutical Industries Ltd,Sathammai Village, Karunkuzhi Post, Maduranthakam Taluk, Kanchipuram District-603 303, Ph no: 044 3032 3832/800				
3	Description of Hazardous waste	Physical Form with Description		Chemical Form		
		a) Spent Nickel-[28.2] - Slurry Solution		Catalyst		
		b) Spent Carbon-[28.3],Dry Black Powder		Inorganic Solids		
		c) Spent Organic Solvents-[28.6], Liquid		Organic Solvents		
		d) Spent Oil- [5.1],Liquid		Oil with solvents mix-up		
		e) Discarded Barrels / containers used for handling Hazardous wastes/ chemicals-[33.1], HDPE Drums.		Not Applicable		
		f) Chemical Sludge from Waste Water Treatment -[35.3],Dry Salt.		Inorganic Solids		
4	Quantity of Hazardous Waste.	Types of Hazardous Waste.	Opening Balance as on Ist April 2019 in Tons.	Generation during the Financial Year in Tons 2018-19	Sale / Disposal during the Financial year in Tons 2018-19	Closing balance as on 31 st March 2020 in Tons.
		a) Spent Nickel [28.2]	2.98	1.5	3.25	1.23
		b) Spent Carbon [28.3]	9.79	4.29	0.00	14.08
		c) Spent organic Solvents [28.6]	0	239	239	0.00

		d) Spent Oil [5.1]	2.98	1.5	4.48	[0.52) tons of pure oil], due to higher side of moisture content in the spent Oil, the suppliers are not lifting material. The accumulated spent oil is physically separated through the reactor and the aqueous layer is separated out and sent to ETP for further treatment and the oil is separated and collected in Drums. Hence the stock at the site has reduced.
		e) Discarded Barrels / containers used	25	1492	1489	28
		f) Chemical Sludge from Waste Water	58.84	629.43	663.17	25.10
5	Description of Storage of Hazardous waste	The **Hazardous waste** is stored in elevated Above Ground Level shed with compartments each for collecting and storing the individual Hazardous waste. The Hazardous Waste shed is covered by all sides by Blue sheets to avoid any rain water entering the shed. The Hazardous shed is provided with a Turbo ventilator for ventilation.The Hazardous waste is directly filled in the Tamilnadu Waste Management Ltd Rental Vehicle and transported regularly for Secured Landfilling in TNWML , Gummidipoondi and the daily generated quantity is kept in the elevated Hazardous shed when the vehicle is not received.. The **Spent Carbon** is stored in LDPE and kept in ther designated compartment in the Hazardous shed. The **Spent Nickel** in the original container with water filled upto the lid and kept in the Hazardous shed. The **Spent Oil** is kept in the MS drums in the plants area for easy transporatation to the authorised vendor. The **Discarded Barrels** are kept in the scrap area with area allocated for storing and removal by authorised recyclers.				
6	Description of Treatment of Hazardous Waste	At our site, we are not performing any Treatment of Hazardous Waste. The Generated Hazardous Waste is collected in cement bags/LDPE bags & solid sludge is further stored in TNWML Rental Container and spent Carbon in LDPE bags , MS Drums for Oil and Spent solvents in MS vertical 30 kl tank and HDPE carboyl for Spent Nickel. The Hazardous Waste is safely handled and kept in Hazardous shed in the alloted compartment for further disposal to authorised recyclers.				
7	Details of Transporatation of Hazardous Waste	Name and Address of Consignee	Mode of Packing	ode of Transporatati	Date of Transporatation	Quantity [MT]

		Solid Waste: Tamilnadu Waste Management Ltd,Plot no-5-15,28-33 ,EPIP Building , SIPCOT Industrial Complex,, Gummidipoondi- 601201, Thiruvallur District, Tamilnadu	LDPE Bags/ Direct Rental container	Special container of TSDF TNWML, Gummidipoondi [10 PLT Rental Container]	**Refer Attachment-I**	**663.17**
		Spent Carbon:Tamilnadu Waste Management Ltd,Plot no-5-15,28-33, EPIP Building , SIPCOT Industrial Complex, Gummidipoondi- 601201, Thiruvallur District, Tamilnadu.	LDPE Bags	TNWML special truck	Nil	**0.00**
		Spent Nickel: M/s Monarch Catalysts Pvt Ltd, F-1/2 , MIDC Phase-1, Dombivli[E], Thane - 421203.	HDPE Drum	Truck Vehicle		**3.25**
		Spent Oil: M/s Sasi Industries, Plot No -12,New No 41-A ,SIDCO Industrial Estate , Dindigul, Tamilnadu.	MS/ HDPE Drums	Truck Vehicle	Nil	**0.52**
		Spent Solvents: Sri Chementor Pvt Ltd, Perumbakkam Village, Vanur Taluk,Villupuram, District, Tamilnadu.	MS Storage tanks	Tankers	**Refer Attachment- II**	**239**
		Discarded Barrels: R K Trading Company, Near H P Petrol Pump, Dhavali, Ponda, GOA- India.	Scrap Yard	Truck Vehicle		**1489**
8	**Details of Disposal of Hazardous Waste**	**Name and Address of Consignee**	**Mode of Packing**	**Mode of Transporatation**	**Date of Transporatation**	**Quantity [MT]**

		Solid Waste: Tamilnadu Waste Management Ltd,Plot no-5-15,28-33, EPIP Building , SIPCOT Industrial Complex,, Gummidipoondi- 601201, Thiruvallur District, Tamilnadu.	The Hazardous Waste generated from MEE is packed in LDPE bags and Cement bags	The accumulated Solid sludge from MEE is sent to TSDF Gummidipoondi ,as soon as the sludge load of 10 tons is accumulated in Hazardous waste Rental Container	**Refer Attachment-I**	**663.17**
		Spent Carbon: M/s Bharathi Cements corporation Ltd, Nallalingayapatti, Kadappa Dist , Anndhra Pradesh	The accumulated spent carbon after filteration is collected in LDPE bags,neatly tied and stored in the alloted compartment in the Hazardous shed.	The accumulated spent carbon from the Hazardous shed is transported to the authorised site in the vehicle with complete packing to avoid any leak on transit	Nil	**0.00**
		Spent Nickel: M/s Riddhi Siddhi Steels and Alloys, # B - 44, M I D C , Kalmeshwar , Nagpur- 441501, Maharasthra	The Spent Nickel is collected in the original container with 50% volume of water to keep the material wet to avoid fire ignition.	The Spent Nickel is transported in vehicle with complete safety ensuring that the containers are never without water.		**3.25**
		Spent Oil: M/s Sasi Industries, Plot No -12,New No 41-A ,SIDCO Industrial Estate , Dindigul, Tamilnadu	The Spent Oil is collected in MS /HDPE drums with tight lids.	The accumulated Spent Oil is transported to the authorised buyer with leak proof packing and with lids.	Nil	**0.42**

		Spent Solvents: M/s Pentakcoat Resins,RS no:801/,80/2, Kondalankuppam Village, Vanur Taluk, Villupuram Dist. Pincode : 605 502	The Spent Solvents are collected in MS vertical tanks in plant area	The accumulated Spent Solvents are send to authorised buyers for further disposal	Refer Attachment-II	239
		Discarded Barrels: R K Trading Company, Near H P Petrol Pump, Dhavali, Ponda, GOA- India	The Discarded Barrels / containers are kept in the dedicated Scrap yard	The accumulated barrels / containers are sent to the authorised buyers for further disposal	*	1489
9	**Quantity of Useful Materials sent back to the Manufacturer's and others**	**Name & type of Material sent back to Manufacturer's and others**				**Quantity [MT]**
	NIL	**Nil**				**NIL**

Place: **Madhuranthakam**
Date **18/06/2020**

Signature

AJOY PHARMACEUTICAL INDUSTRIES LTD.

M.A.JOY
General Manager-Operations

M A Joy
General Manager - Operations

Attachment No : I

Sun Pharmaceutical Industries Ltd , Maduranthakam

Hazardous waste details for 2019-20

sl no	Date	Manifest No	Hazardous waste in Tons	Total
1	08/04/2019	2017609	26.14	
2	25/04/2019	2019/610	25.47	51.61
3	03/05/2019	612	25.53	
4	14/05/2019	614	24.22	
5	27/05/2019	3448	8.28	58.03
7	17/06/2019		27.13	
8	27/06/2019	619	25.04	52.17
9	06-Jul-19	2016/619	26.65	
10	19-Jul-19		24.99	
11	20-Jul-19	58847	8.13	59.77
12	06/08/2019	60738	6.83	
13	09/08/2009	20151619	24.99	
14	16/08/2019	61217	8.57	
15	22/08/2019	61220	9.23	
16	24/08/2019	61392	8.98	58.60
17	05-Sep-19	61397	7.69	
18	09-Sep-19	61911	7.96	
19	18-Sep-19	62043	8.18	
20	26-Sep-19	9	21.96	
21	27-Sep-19	61430	7.35	53.14
22	10-Oct-19	162	24.74	
23	22-Oct-19	163	26.88	51.62
24	15-Nov-19	165	27.41	
25	19-Nov-19	63140	6.48	
26	26-Nov-19	62941	8.12	
27	27-Nov-19	0	12.09	54.1
28	16-Dec-19	0	36.26	
29	16-Dec-19	69024	7.88	
30	24-Dec-19	62233	7.55	
31	28-Dec-19	63153	7.54	59.23
42			498.27	498.27
			Total	498.27

Sun Pharmaceutical Industries Ltd , Maduranthakam

Hazardous waste details for 2019-20

sl no	Date	Manifest No	Hazardous waste in Tons	Total
1	02/01/2020	62463	7.41	
2	11/01/2020	63157	6.17	
3	18/01/2020	68275	7.36	
4	22/01/2020	68438	7.59	
5	22/01/2020	68305	9.69	
7	29/01/2020	70911	9.81	48.03
8	10-Feb-20	163	25.72	
9	18-Feb-20	169	26.31	
10	28-Feb-20	68597	6.89	58.92
11	04-Mar-20	0	24.7	
12	14-Mar-20	191	26.48	
13	16-Mar-20	68723	6.77	57.95
				164.90
			Total	164.90
		Total	663.17	

Total Hazardous waste from ETP transported to TSDF during 2019-20

For SUN PHARMACEUTICAL INDUSTRIES LTD.

M.A.JOY
General Manager - Operations

Attachment no : II

Sun Pharmaceutical Industries Ltd, Maduranthakam

Spent solvent details for the year 2019-20

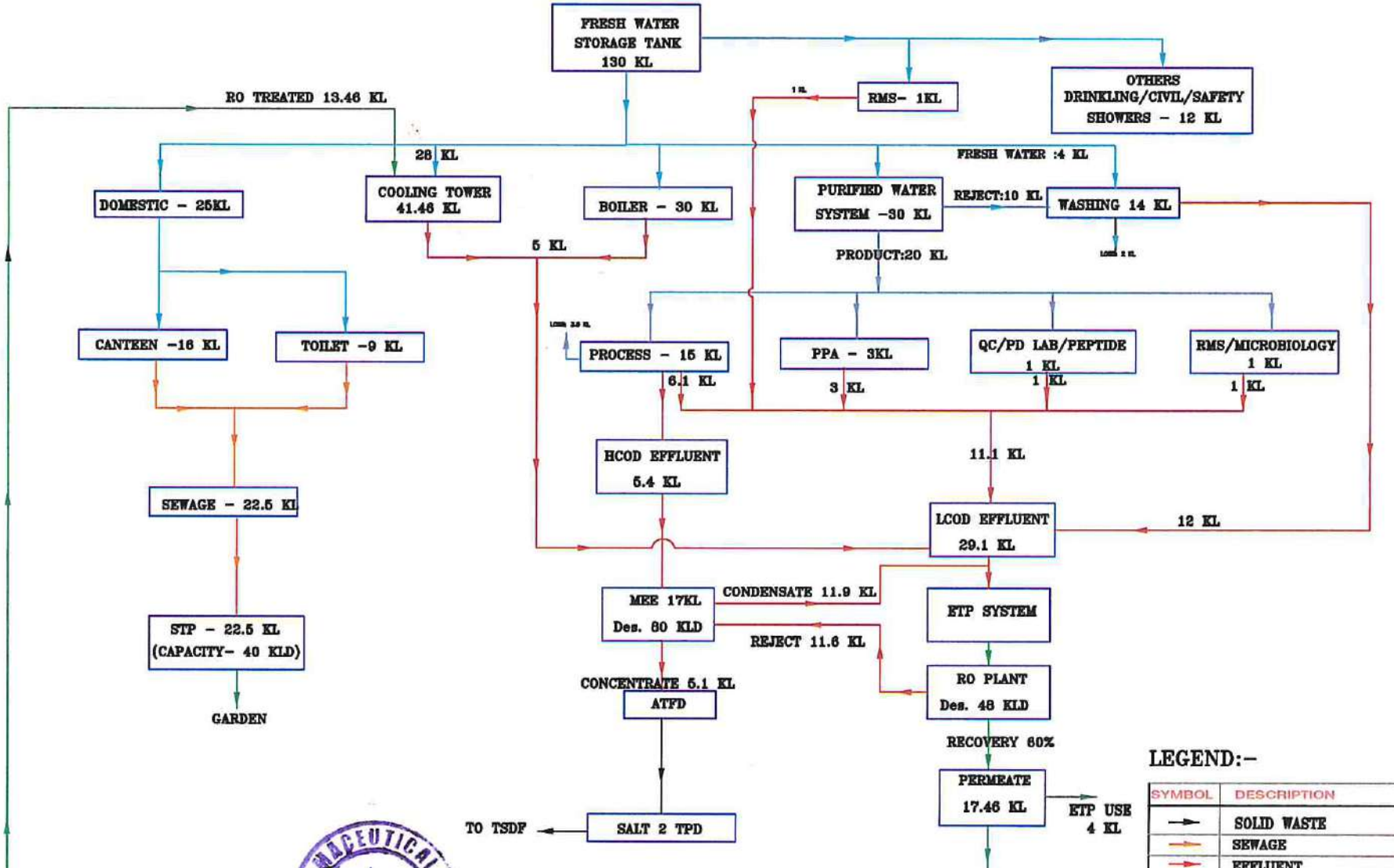
Invoice numbers	Invoice date	Customer Name	Name of the Product	Unit	Quantity in (Kgs)
160013107	19-Apr-19	PENTAKCOAT RESINS	R-MIX SOLVENT	KG	18680
160013722	15-May-19	PENTAKCOAT RESINS	R-MIX SOLVENT	KG	17630
160014131	01-Jun-19	PENTAKCOAT RESINS	R-MIX SOLVENT	KG	19230
160014978	12-Jul-19	PENTAKCOAT RESINS	R-MIX SOLVENT	KG	20850
160015880	22-Aug-19	PENTAKCOAT RESINS	R-MIX SOLVENT	KG	22860
160016285	09-Sep-19	PENTAKCOAT RESINS	R-MIX SOLVENT	KG	18700
160017153	17-Oct-19	PENTAKCOAT RESINS	R-MIX SOLVENT	KG	22550
160017867	16-Nov-19	PENTAKCOAT RESINS	R-MIX SOLVENT	KG	15810
160018670	17-Dec-19	PENTAKCOAT RESINS	R-MIX SOLVENT	KG	16450
160019241	08-Jan-20	PENTAKCOAT RESINS	R-MIX SOLVENT	KG	9106
160019760	28-Jan-20	PENTAKCOAT RESINS	R-MIX SOLVENT	KG	8184
160020169	13-Feb-20	OZPEC CHEMICAL INDUSTRIAL PVT LTD	R-MIX SOLVENT	KG	6580
160020339	20-Feb-20	OZPEC CHEMICAL INDUSTRIAL PVT LTD	R-MIX SOLVENT	KG	2950
160020468	26-Feb-20	OZPEC CHEMICAL INDUSTRIAL PVT LTD	R-MIX SOLVENT	KG	6205
160020616	02-Mar-20	OZPEC CHEMICAL INDUSTRIAL PVT LTD	R-MIX SOLVENT	KG	8091
160020797	11-Mar-20	OZPEC CHEMICAL INDUSTRIAL PVT LTD	R-MIX SOLVENT	KG	8500
160020829	12-Mar-20	OZPEC CHEMICAL INDUSTRIAL PVT LTD	R-MIX SOLVENT	KG	8861
160021016	20-Mar-20	OZPEC CHEMICAL INDUSTRIAL PVT LTD	R-MIX SOLVENT	KG	7554
				In KGS	**238791**
				In Tons	**238.791**

For SUN PHARMACEUTICAL INDUSTRIES LTD.

M.A.JOY
General Manager - Operations

M/S SUN PHARMACEUTICAL INDUSTRIES LTD. SATHAMMAI VILLAGE
KARUNKUZHI POST, MADURANTHAGAM TALUK, KANCHEEPURAM DISTRICT, TAMIL NADU

WATER BALANCE CHART



LEGEND:-

SYMBOL	DESCRIPTION
→	SOLID WASTE
→	SEWAGE
→	EFFLUENT
→	TREATED EFFLUENT
→	WATER

PREPARED BY: Mr. A.KALAIVANAN	APPROVED BY: Mr. JOY MA	SCALE: NOT TO SCALE
SIGN: A. Kalaivanan	SIGN:	DRG.NO: 01

ANNEXURE-13

ANNEXURE-14

Report

On

LEAK DETECTION AND REPAIR PROGRAMME [LDAR]

To

SUN PHARMACEUTICAL INDUSTRIES LTD.

SUN PHARMACEUTICAL INDUSTRIES LTD - MADHURANTHAGAM,

Conducted By

GLens Innovation Labs Pvt Ltd.

GLens Innovation Labs Pvt Ltd
Chennai

SUN PHARMACEUTICAL INDUSTRIES Maduranthakam

1.0 INTRODUCTION

About LDAR :

Leak Detection and Repair (LDAR) is a program implemented to comply with environmental regulations for reducing the fugitive emissions of targeted chemicals into the environment. Several standards such as *Maximum Achievable Control Technology* (MACT) standards, *New Source Performance Standards* (NSPS), *National Emissions Standards for Hazardous Air Pollutants* (NESHAP) and Central Pollution Control Board (CPCB) require the monitoring and reporting of these fugitive emissions from process equipment.

LDAR is a work practice designed to identify leaking equipment so that emissions can be reduced through repairs. A component that is subject to LDAR requirements must be monitored at specified, regular intervals to determine whether it is leaking. Any leaking component must then be repaired or replaced within a specified time frame.

The bulk drug industry has successfully reduced its emissions of total volatile organic compounds (TVOC), one of the precursors to surface level ozone formation, by focusing on reduced venting, vapor recovery and better storage controls. In order make further reductions, the industry is now focusing its efforts on the control of fugitive emissions (leaks) which can contribute up to one third of the remaining site TVOC emissions. Fugitive emissions are generated at plant components which are supposed to be leak-tight (like pump or compressor seals, valve packing, flanges, sample points, etc.). Whilst a typical site would have 10,000+ such components, only a few of these contribute to the bulk of fugitive emissions. Identifying these few leaks for repair is difficult and time consuming, as they are spread out over the entire site, including hard to access locations.

Two methodologies are currently available to detect leaking equipment in so-called LDAR (Leak Detection and Repair) programs in which the present study has been conducted as per the below method.

• Method 21 (i.e. Sniffing), uses a hydrocarbon ionization detector; this methodology was developed by the US-EPA and was the first historically. It is a widely accepted method, key elements of which are adopted in the European Standard EN 15446:2008.

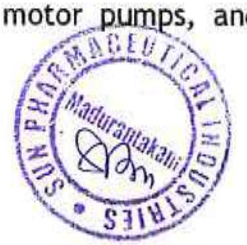
WHY REGULATE EQUIPMENT LEAKS?

EPA has determined that leaking equipment, such as valves, pumps, and connectors, are the largest source of emissions of volatile organic compounds (VOCs) and volatile hazardous air pollutants (VHAPs) from petroleum refineries and chemical manufacturing facilities. Emissions from equipment leaks exceed emissions from storage vessels, wastewater, transfer operations, or process vents. VOCs contribute to the formation of ground-level ozone. Ozone is a major component of smog, and causes or aggravates respiratory disease, particularly in children, asthmatics, and healthy adults who participate in moderate exercise. Many areas where refineries and chemical facilities are located, do not meet the National Ambient Air Quality Standard (NAAQS) for ozone. Ozone can be transported in the atmosphere and contribute to nonattainment in downwind areas. Some species of VOCs are also classified as VHAPs. Some known or suspected effects of exposure to VHAPs include cancer, reproductive effects, and birth defects. The highest concentrations of VHAPs tend to be closest to the emission source, where the highest public exposure levels are also often detected. Some common VHAPs emitted from refineries and chemical plants include acetaldehyde, benzene, formaldehyde, methylene chloride, naphthalene, toluene, and xylene.

HOW ARE EMISSIONS FROM EQUIPMENT LEAKS REDUCED?

Facilities can control emissions from equipment leaks by implementing a leak detection and repair (LDAR) program or by modifying/replacing leaking equipment with "leak less" components. Most equipment leaks regulations allow a combination of both control methods.

• Leaks from open-ended lines, compressors, and sampling connections are usually fixed by modifying the equipment or component. Emissions from pumps and valves can also be reduced using "leak less" valves and "seal less" pumps. Common leak less valves include bellows valves and diaphragm valves, and common seal less pumps are diaphragm pumps, canned motor pumps, and



magnetic drive pumps. Leaks from pumps can also be reduced by using dual seals with or without barrier fluid.

• Leak less valves and seal less pumps are effective at minimizing or eliminating leaks, but their use may be limited by materials of construction considerations and process operating conditions. Installing leak less and seal less equipment components may be a wise choice for replacing individual, chronic leaking components.

VOLATILE ORGANIC COMPOUNDS (VOCS)

VOC DEFINITION: For the purpose of this study the term VOC is considered to be defined as in the standard EN 15446:2008: "all products of which at least 20% m/m has a vapor pressure higher than 0.3 kPa at 20°C. The streams concerned in these studies do not contain methane so strictly the study addresses non-methane volatile hydrocarbons (NMVOC).

Diffuse VOC Emissions: "Non-channeled VOC emissions that are not released via specific emission points such as stacks. They can result from 'area' sources (e.g. tanks) or 'point' sources (e.g. pipe flanges)" In the descriptive section on VOC monitoring. "Diffuse VOC emissions are emissions arising from direct contact of gaseous or liquid volatile organic compounds with the environment (atmosphere, under normal operating circumstances). These can result from:

• Inherent design of the equipment (e.g. uncovered oil/water separators);

• Operating conditions (e.g. non collected vent of a fixed roof tank during loading); or fugitive emission caused by an undesired gradual loss of tightness from a piece of equipment and a resulting leak. Fugitive emissions are a subset of diffuse emission. Emissions from point sources include leaks from components which are not fully sealed: pipe flanges, valve stems, pump and compressor seals, etc.

In **SUN PHARMACEUTICAL INDUSTRIES LTD - MADHURANTHAGAM.** unit of about 522 process components points are monitored on 02.01.2020 and covered 522 components in the process plant.

A typical chemical unit can emit some tons per year of VOCs from leaking equipment, such as valves, connectors, pumps, sampling connections, compressors, pressure relief devices and open-ended lines.

The environmental regulations are prescribed LDAR programs as a means of reducing emissions have very specific standards and applied to a monitoring and repair program. The LDAR study included the following protocols:

- Chemical streams that must be monitored
- Types of components (pumps, valves, connectors, etc.) to be monitored
- Measured concentration in PPM that indicates a leak
- Frequency of monitoring
- Method of monitoring
- Actions to be taken if a leak is discovered
- Length of time in which an initial attempt to repair the leak must be performed
- Length of time in which an effective repair of the leak must be made
- Actions that must be taken if a leak cannot be repaired within guidelines
- Record-keeping and reporting requirements

VOCs are contributed to the formation of ground level ozone. Many of the areas where Refineries are located do not meet the NAAQ standards for ozone. Ozone can be transported in the atmosphere and contribute to nonattainment in downwind areas.

Affected Sources: Each pump, compressor, pressure relief device, sampling connection system, open-ended valve or line, flange and connector that contains or contacts a fluid or gas. That is exceedingly more than 5000ppm of pump and compressor seals and 3000 ppm other components is an affected source.

SOURCES OF EQUIPMENT LEAKS.	
Pumps are used to move fluids from one point to another. Two types of pumps extensively used in petroleum refineries and chemical plants are centrifugal pumps and positive displacement, or reciprocating pumps.	Leaks from pumps typically occur at the seal.
Valves are used to either restrict or allow the movement of fluids. Valves come in numerous varieties and with the exception of connectors, are the most common piece of process equipment in industry.	Leaks from valves usually occur at the stem or gland area of the valve body and are commonly caused by a failure of the valve packing or O-ring.
Connectors are components such as flanges and fittings used to join piping and process equipment together. Gaskets and blinds are usually installed between flanges.	Leaks from connectors are commonly caused from gasket failure and improperly torqued bolts on flanges.
Sampling connections are utilized to obtain samples from within a process.	Leaks from sampling connections usually occur at the outlet of the sampling valve when the sampling line is purged to obtain the sample.
Compressors are designed to increase the pressure of a fluid and provide motive force. They can have rotary or reciprocating designs.	Leaks from compressors most often occur from the seals.
Pressure relief devices are safety devices designed to protect equipment from exceeding the maximum allowable working pressure. Pressure relief valves and rupture disks are examples of pressure relief devices.	Leaks from pressure relief valves can occur if the valve is not seated properly, operating too close to the set point, or if the seal is worn or damaged. Leaks from rupture disks can occur around the disk gasket if not properly installed.
Open-ended lines are pipes or hoses open to the atmosphere or surrounding environment.	Leaks from open-ended lines occur at the point of the line open to the atmosphere and are usually controlled by using caps, plugs, and flanges. Leaks can also be caused by the incorrect implementation of the block and bleed procedure.

Equipment Leak: A leak is defined as greater than or equal to 3,000 & 5000 ppmv as methane, for organic compounds, as determined by EPA Reference Method 21. Most of the emissions are from valves and connectors because these are most prevalent components and can number in the thousands. The major cause of emissions from valves and connectors is seal or gasket failure due to normal wear or improper maintenance. More than 90% of emissions from the leaking equipment with valves are being the most significant source. The open-ended lines and sampling connections account for as much as 5 - 10% of total VOC emissions from equipment leaks.

Minimum Requirements for an Acceptable Organic LDAR Program:

- Each affected source is screened initially using Method 21. Sources that are unsafe to monitor is not screened, but documentation is provided to substantiate the unsafe nature.

- Monthly visual inspections have to be performed by industry on each affected source for signs of leakage (e.g. dripping liquid, spraying, misting, clouding, ice formation, distinctive odors, etc.).

- Monitoring of each affected source is to be conducting quarterly using Method 21.

All potential leak points associated with a component must be identified and screened for leaks. The detected leaks by Method 21 test was tagged and repaired. The leak sources are measured after repair and the same is recorded.

METHODOLOGY OF THE STUDY:

EPA has found significant widespread noncompliance with Leak Detection and Repair regulations and more specifically noncompliance with Method 21 requirements.

Step 1: Preparation of LDAR project

- Information exchange meeting
- Project introduction
- Project scooping
- Coding & naming conventions
- Prepare technical information (medium, stream, drawings,)
- Stream composition
- YTD production time per stream
- Leak definition, repair definition and tag definition per stream
- Detection equipment to use

Step 2: Database preparation:

- Build site structure (unit - sections - drawings - streams)
- Prepare Basic data
- Prepare Customer data

Step 3: Source inventory:

- Project kick-off meeting
- Safety training
- Site visit
- Define monitoring routes
- Start inventory program
- Prepare monitoring phase

Step 4: Unit monitoring phase

- Prepare detection devices and gather relevant information
- Start monitoring program
- Regular status meetings
- Database update

Step 5: First repair attempt

- Prepare tightening lists (sources with leak-rate > repair definition)
- Guide mechanical/operator to leaking sources
- Perform on-line reparation
- Re-monitoring after repair attempt

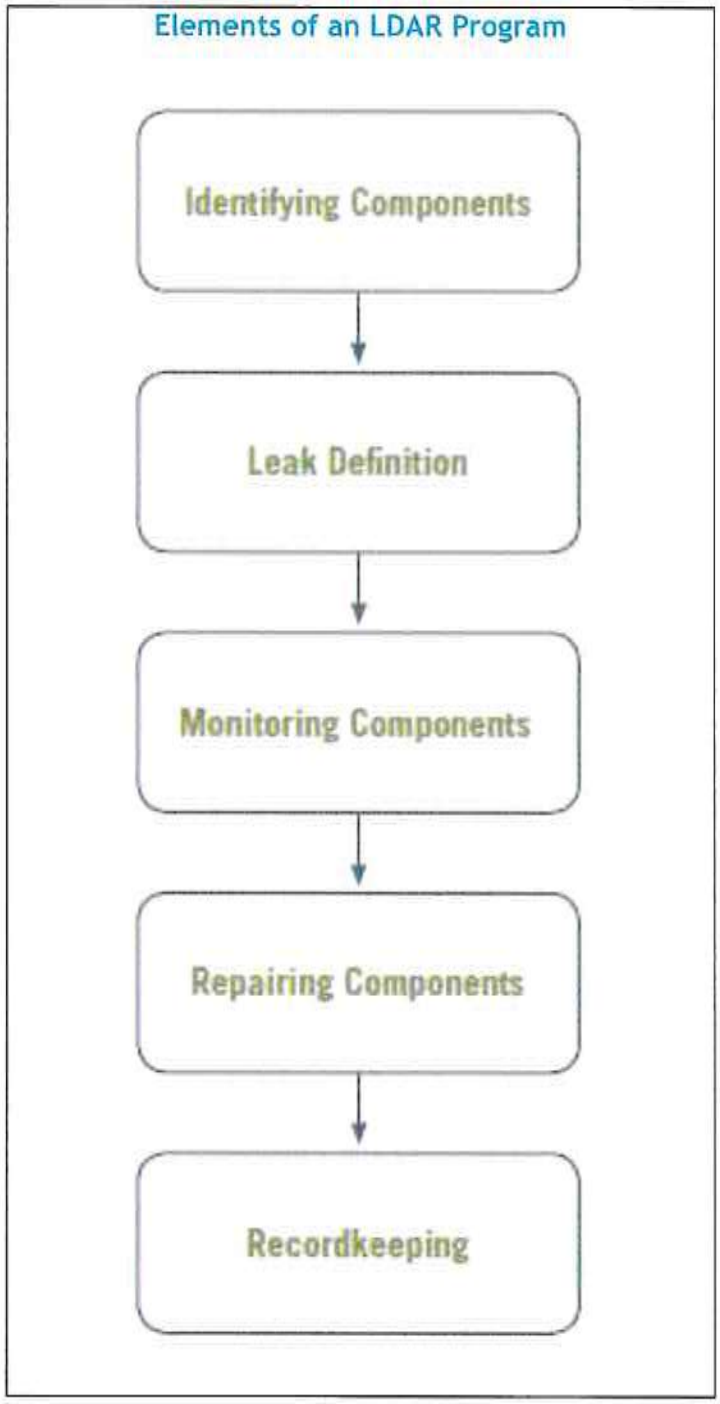
Step 6: Reporting

- Consolidate all gathered data
- Prepare lessons learned
- Create LDAR report
- Detail list of all leaking sources
- Repair orders
- Equipment overview per EPA source
- Top leakers (in costs and losses)
- Sort on most leaking equipment (EPA sources)

Sampling Methodology:

Initial Screening: Screening tests must be conducted initially and include:

1. The type of affected source (e.g. pump, compressor, etc.).
2. Site specific ID of each affected source.
3. Date of the Method 21 test.
4. Type of Method 21 detector.
5. Calibration results of Method 21 detector.
6. Screening results in ppmv.



1. IDENTIFYING COMPONENTS:

Current Requirements

- Assign a unique identification (ID) number to each regulated component.
- Record each regulated component and its unique ID number in a log.
- Physically locate each regulated component in the facility, verify its location on the piping and instrumentation diagrams (P&IDs) or process flow diagrams, and update the log if necessary. Some states require a physical tag on each component subject to the LDAR requirements.
- Identify each regulated component on a site plot plan or on a continuously updated equipment log.
- Promptly note in the equipment log when new and replacement pieces of equipment are added, and equipment is taken out of service.

Best Practices

- Physically tag each regulated equipment component with a unique ID number.
- Write the component ID number on piping and instrumentation diagrams.
- Periodically perform a field audit to ensure lists and diagrams accurately represent equipment installed in the plant.

2. LEAK DEFINITION:

Current Requirements

- Method 21 requires VOC emissions from regulated components to be measured in parts per million (ppm). A leak is detected whenever the measured concentration exceeds the threshold standard (i.e., **leak definition**) for the applicable regulation.

- Leak definitions vary by regulation, component type, service (e.g., light liquid, heavy liquid, gas/vapor), and monitoring interval.
- Most NSPS have a leak definition of 10,000 ppm. Many NESHAP use a 500-ppm or 1,000-ppm leak definition.
- Many equipment leaks regulations also define a leak based on visual inspections and observations (such as fluids dripping, spraying, misting or clouding from or around components), sound (such as hissing), and smell.

Note: The LDAR requirements specify weekly visual inspections of pumps, agitators, and compressors for indications of liquids leaking from the seals.

Best Practices

- Utilize a leak definition lower than what the regulation requires.
- Simplify the program by using the lowest leak definition when multiple leak definitions exist.
- Make the lowest leak definition conservative to provide a margin of safety when monitoring components.
- Keep the lowest leak definition consistent among all similar component types. For example, all valves in a facility might have a leak definition of 500 ppm.

3.0 MONITORING COMPONENTS:

Current Requirements

- For many NSPS and NESHAP regulations with leak detection provisions, the primary method for monitoring to detect leaking components is EPA Reference Method 21 (40 CFR Part 60, Appendix A).

- Method 21 is a procedure used to detect VOC leaks from process equipment using a portable detecting instrument.

- Monitoring intervals vary according to the applicable regulation, but are typically weekly, monthly, quarterly, and yearly. For connectors, the monitoring interval can be every 2, 4, or 8 years. The monitoring interval depends on the component type and periodic leak rate for the component type.

Best Practices

- Although not required by Method 21, use an automatic (electronic) data logger to save time, improve accuracy, and provide an audit record.

- Audit the LDAR program to help ensure that the correct equipment is being monitored, Method 21 procedures are being followed properly, and the required records are being kept.

- Monitor components more frequently than required by the regulations.

- Perform QA/QC of LDAR data to ensure accuracy, completeness, and to check for inconsistencies.

- Eliminate any obstructions (e.g., grease on the component interface) that would prevent monitoring at the interface.

- If a rule allows the use of alternatives to Method 21 monitoring, Method 21 should still be used periodically to check the results of the alternative monitoring method.

REPAIRING COMPONENTS:

Current Requirements

- Repair leaking components as soon as practicable, but not later than a specified number of calendar days (usually 5 days for a first attempt at repair and 15 days for final attempt at repair) after the leak is detected.

- First attempts at repair include, but are not limited to, the following practices where practicable and appropriate:
- Tightening bonnet bolts
- Replacing bonnet bolts
- Tightening packing gland nuts
- Injecting lubricant into lubricated packing
- If the repair of any component is technically infeasible without a process unit shutdown, the component may be placed on the Delay of Repair list, the ID number is recorded, and an explanation of why the component cannot be repaired immediately is provided. An estimated date for repairing the component must be included in the facility records.
- Note: The "drill and tap" method for repairing leaking valves is generally considered technically feasible without requiring a process unit shutdown and should be tried if the first attempt at repair does not fix the leaking valve.
- The component is considered to be repaired only after it has been monitored and shown not to be leaking above the applicable leak definition.

Best Practices

- Develop a plan and timetable for repairing components.
- Make a first attempt at repair as soon as possible after a leak is detected.
- Monitor components daily and over several days to ensure a leak has been successfully repaired.
- Replace problem components with "leakless" or other technologies.

RECORD KEEPING

Current Requirements

For each regulated process:

- Maintain a list of all ID numbers for all equipment subject to an equipment leak regulation.
- For valves designated as "unsafe to monitor," maintain a list of ID numbers and an explanation/review of conditions for the designation.
- Maintain detailed schematics, equipment design specifications (including dates and descriptions of any changes), and piping and instrumentation diagrams.
- Maintain the results of performance testing and leak detection monitoring, including leak monitoring results per the leak frequency, monitoring leak less equipment, and non-periodic event monitoring.

For leaking equipment:

- Attach ID tags to the equipment.
- Maintain records of the equipment ID number, the instrument and operator ID numbers, and the date the leak was detected.
- Maintain a list of the dates of each repair attempt and an explanation of the attempted repair method.
- Note the dates of successful repairs.
- Include the results of monitoring tests to determine if the repair was successful.

Best Practices

- Perform internal and third-party audits of LDAR records on a regular basis to ensure compliance.

- Electronically monitor and store LDAR data including regular QA/QC audits.
- Perform regular records maintenance.
- Continually search for and update regulatory requirements.
- Properly record and report first attempts at repair.
- Keep the proper records for components on Delay of Repair lists.

METHOD 21—DETERMINATION OF VOLATILE ORGANIC COMPOUND LEAKS:

Scope: This method is applicable for the determination of VOC leaks from process equipment. These sources include, but are not limited to, valves, flanges and other connections, pumps and compressors, pressure relief devices, process drains, open-ended valves, pump and compressor seal system degassing vents, accumulator vessel vents, agitator seals, and access door seals.

Summary of Method

A portable instrument is used to detect VOC leaks from individual sources. The instrument detector used in this study is PID which will meet the specifications and performance criteria. A leak definition concentration based on a reference compound is specified in each applicable regulation. This method is intended to locate and classify leaks only, and is not to be used as a direct measure of mass emission rate from individual sources.

Equipment and Supplies

VOC monitoring instrument meeting the following specifications is required:

- The VOC instrument detector is responding to the compounds being processed. Detector which are used to measure TVOC is photoionization.
- The instrument can measure the leak definition concentration specified in the regulation.

- The scale of the instrument meter is readable to ±2.5 % of the specified leak definition concentration.

- The instrument is equipped with an electrically driven pump to ensure that a sample is provided to the detector at a constant flow rate. The nominal sample flow rate, as measured at the sample probe tip, shall be 0.10 to 3.0 l/min (0.004 to 0.1 ft 3 /min) when the probe is fitted with a glass wool plug or filter that may be used to prevent plugging of the instrument.

- The instrument is equipped with a probe or probe extension or sampling not to exceed 6.4 mm (1/4 in) in outside diameter, with a single end opening for admission of sample.

The instrument is intrinsically safe for operation in explosive atmospheres as defined by the National Electrical Code by the National Fire Prevention Association or other applicable regulatory code for operation in any explosive atmospheres that may be encountered in its use.

Sample Collection, Preservation, Storage, and Transport

Instrument Performance Evaluation. Assemble and start up the instrument according to the manufacturer's instructions for recommended warmup period and preliminary adjustments.

Response Factor. A response factor is to be determined for each compound that is to be measured, either by testing or from reference sources. The response factor tests are required before placing the analyzer into service, but do not have to be repeated at subsequent intervals.

Calibrate the instrument with the reference compound as specified in the applicable regulation (Iso-butylene). Introduce the calibration gas mixture to the analyzer and record the observed meter reading. Introduce zero gas until a stable reading is obtained. Make a total of three measurements by alternating between the calibration gas and zero gas. Calculate the response factor for each repetition and the average response factor.

The instrument response factors for each of the individual VOC to be measured is less than 10 unless otherwise specified in the applicable regulation. When no instrument is available that meets this specification when calibrated with the reference VOC specified in the applicable regulation, the available instrument may be calibrated with one of the VOC to be measured, or any other VOC, so long as the instrument then has a response factor of less than 10 for each of the individual VOC to be measured.

LEAK DETECTION METHODS:

Two main methodologies are currently available to detect the emissions from leaking equipment and presently used this methodology based on Sniffing: the detection is done by drawing an air sample past a hydrocarbon ionization detector to detect the VOC concentration in the vicinity of the leak source (called screening value). This methodology was first developed by the US Environmental Protection Agency (EPA) and is referred to as "Method 21".The European LDAR Standard EN 15446:2008 is a modified version of Method 21 where the frequency of the surveys and the leak repair threshold are not fixed but can be adapted based on analysis of the previous survey

SNIFFING DETECTION INSTRUMENTS:

Many different types of Sniffing analysers can be used to detect fugitive VOC emissions. The most common types are flame- or photo-ionization detectors (FID, PID) and infrared absorption monitors. The choice of the instrument type should be based on the type of chemical species to be surveyed. In this study has been used Photo Ionization Detector (PID) for the quantification of TVOCs in the fugitive emission.

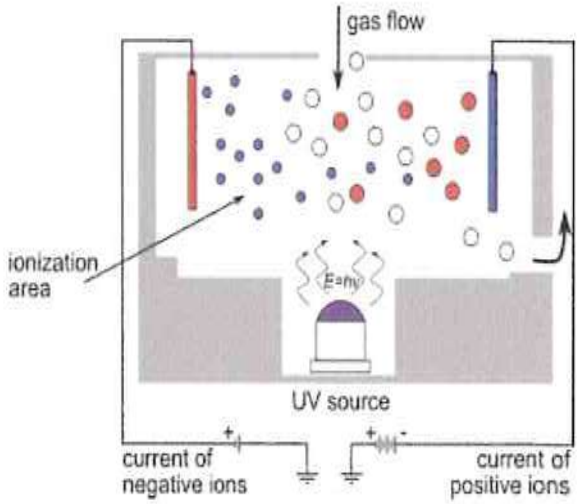
PHOTO IONIZATION DETECTOR (PID):

The PID consists of a short-wavelength ultraviolet (UV) lamp shining onto a small cell containing the gas sample. The UV light photo ionizes trace organic compounds, in general, any compound with ionization energy (IE) lower than that of the lamp photons can be measured. The PID analyzer are calibrating by using either Isobutylene or Methane and the final result from the PID is to be as Isobutylene.

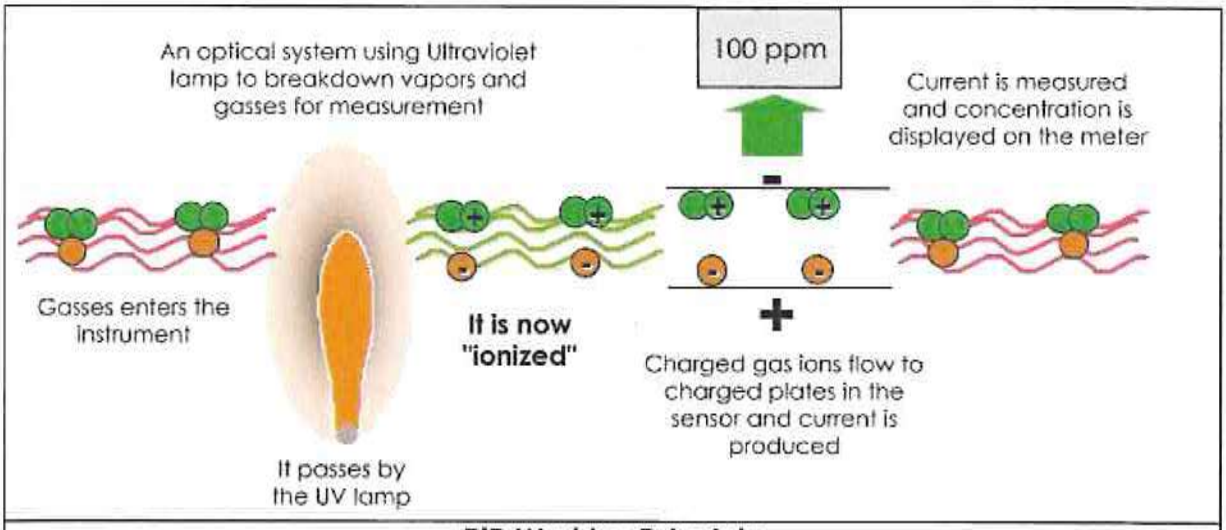
$$VOC + h\gamma \rightarrow VOC^* \rightarrow VOC^{*.} + e^-$$

The Ion-science handheld VOC detector is a handheld gas detection instrument for the rapid, accurate detection of volatile organic compounds (VOCs) within the harshest of environments.

Ion-Science : PhoCheck Tiger TVOC PID Analyser



Basic Principle of Photo Ionization Detector



PID Working Principle

The Ion-Science patented photoionization detection (PID) sensor technology with humidity resistance and anti-contamination design, proven to dramatically extend run time in the field.

A robust VOC detector Ion-science provides a dynamic detection range of 0 to 20,000 parts per million (ppm) with a minimum sensitivity of 0.001ppm (1 ppb). This handheld VOC detector has the fastest response time of two seconds and is just as quick to clear down. The instrument can be connected directly to a PC via the USB offering extremely fast data download capabilities.

Ion-science has been designed for the safe replacement of batteries in hazardous environments. Long-life rechargeable Li-ion batteries give up to 24 hours of use. Fast battery charging allows the instrument to be fully charged in 6.5 hours, while 8 hours of use can be achieved from 1.5 hours charge.

RESPONSE FACTORS:

The detectors (PID) used to obtain the screening values are calibrated with isobutylene (PID). However, the detector will respond differently to other hydrocarbon compounds and a correction to the calibration is required. Therefore, a response factor has to be applied to adjust an instrument reading from ppmv of Isobutylene equivalent to ppmv of total volatile organic compound(s) before the quantification method correlations are used. Response factors are given below. Use of the response factors might cause some uncertainty to the screening value if the hydrocarbon composition is unknown.

The screening value (SV) concentration in Valves is 2600 ppm

= RF(% of VOC Flow/100)*0.0000023*SV^0.746

RF = Response Factor = 1

Response Factors of Different Volatiles:	
Gasoline Vapours	1.05
Naphta	1.0
Heavy Oil	1.1
Petrol & Diesel	0.8
Gasoline Vapours 2	0.7
Light Oil	1.0

LEAK QUANTIFICATION/ESTIMATION METHODS:

Leak emission estimation based on the Sniffing techniques:

The Sniffing technique involves placing a detecting instrument probe close to the surface of a piece of process equipment where there is the potential for a leak (e.g. at flange seal). The VOC concentration of the leak is measured by moving the probe along the surface. The maximum instrument reading in ppmv is recorded. This is referred to as the "screening value". A record is also made of the type of equipment device (valve, flange, pump seal etc.). A leak is considered to occur when the screening value measured is above a given concentration (e.g. 10,000 ppmv). The leak definition criterion can vary from one site to another and is usually set in the environmental permit. Above that given concentration threshold the equipment is identified as leaking and must be repaired.

Components which give screening values below the leak definition are considered as non-leakers and repairs are not required. This detection method requires every potential leaking point included in the database (a listing of all sources) to be surveyed and therefore this procedure is very expensive and labor-intensive. The equipment to be monitored by Sniffing is listed in a database and is restricted to:

- Accessible points (e.g. not under insulation, able to be reached without scaffolding).

• The lines containing a light hydrocarbon (20% of the fluid m/m has a vapour pressure higher than 0.3 kPa at 20°C).

According to the EPA "Leak Detection and Repair - A Best Practices Guide" the common problems and factors affecting leak detection by Sniffing are:

- Not following Method 21 properly.
- Failing to monitor at the maximum leak location.
- Not monitoring for long enough to identify a leak.
- Holding the detection probe too far away from the component interface. The reading must be taken at the interface.
- Not monitoring all potential leak interfaces.
- Using an incorrect or an expired calibration gas for the detection instrument.
- Not monitoring all regulated components.
- Not completing monitoring if the first monitoring attempt is unsuccessful due to equipment being temporarily out of service.

The other external influences affecting leak detection by Sniffing are e.g. the ambient temperature and the relative humidity.

EPA CORRELATION APPROACH (METHOD 21):

The monitoring and emissions estimating methodology 'Method 21' is described in EPA4- 453/R95-017 (US). The correlation equations or factors used to estimate the emissions from leaking components originated from the 1995 US EPA Protocol for Equipment Leak Emission Estimates.

In order to use the correlation equations, the screening value and component type are required. The correlation equation can be applied to leaks with a screening value (SV) in the range of 1 ppmv to 100,000 ppmv. For screening values above 100,000 ppmv, the correlation is not valid and a simple factor (pegged value) is used to determine the leak emission rate. The correlation equation applicable to screening values between 1-100,000 ppmv.

CALCULATION:

Component Type	Default Zero Factor [Kg/hr]	Correlation Equation [Kg/hr]
Valves	[7.8E-06]	[2.27E-06(SV)^0.747]
Pump Seals	[1.9E-05]	[5.07E-05(SV)^0.622]
Others	[4.0E-06]	[8.69E-06(SV)^0.642]
Connectors	[7.5E-06]	[1.53E-06(SV)^0.736]
Flanges	[3.1E-07]	[4.53E-06(SV)^0.706]
Open-ended Lines	[2.0E-06]	[1.90E-06(SV)^0.724]

The default zero factors apply only when the screening value (SV) corrected for background equals 0 ppmv.

The correlation equations apply for actual screening values, corrected for background.

The "other" component type includes instruments, loading arms, pressure relief valves, vents, compressors, dump lever arms, diaphragms, drains, hatches, meters and polished rods stuffing boxes. This "other" component type should be applied for any component type other than connectors, flanges, open-ended lines, pumps or valves.

% of VOC Flow = material passing on that particular pipe line.

0.00000227 = Correlation factor

SV = Screening Value in ppm

If we will apply all the values in the below formula

= RF (% of VOC Flow/100)*0.0000023*SV^0.746

= 1 (100/100)*0.0000023*2600^0.746

= 0.000815 kg/hr

Total hours of operation per year are 8760 (24 hours x 365 days)

The volatile emission = 7.139 Kg/year.

BENEFITS OF AN LDAR PROGRAM

When the LDAR requirements were developed, EPA estimated that chemical facilities could reduce VOC emissions by minimum 56% by implementing such a program. Emissions reductions from implementing an LDAR program potentially reduce product losses, increase safety for workers and operators, decrease exposure of the surrounding community, reduce emissions fees, and help facilities avoid enforcement actions.

Reducing Product Losses: In the petrochemical industry, saleable products are lost whenever emissions escape from process equipment. Lost product generally translates into lost revenue.

Increasing Safety for Facility Workers and Operators: Many of the compounds emitted from refineries and chemical facilities may pose a hazard to exposed workers and operators. Reducing emissions from leaking equipment has the direct benefit of reducing occupational exposure to hazardous compounds.

Decreasing Exposure for the Surrounding Community: In addition to workers and operators at a facility, the population of a surrounding community can be affected by severe, long-term exposure to toxic air pollutants as a result of leaking equipment. Although most of the community exposure may be episodic, chronic health effects can result from long-term exposure to emissions from leaking equipment that is either not identified as leaking or not repaired.

Potentially Reducing Emission Fees: To fund permitting programs, some states and local air pollution districts charge annual fees that are based on total facility emissions. A facility with an effective program for reducing leaking equipment can potentially decrease the amount of these annual fees.

CONCLUSION:

Based on our LDAR study the major leaks are found in Block-1,2,3&4 Top Dummy, Reactor Vent and Level Indicator. The total loss of VOC due to major leaks is 188.26 kg/year.

Medium leaks are found in Block-1,2,3&4, SRS Storage tank area Fresh Solvent Storage Area and ETP Area, View Glass, Flange, Dummy, Vent Line, Pump Indicator and Level Indicator. The total loss of VOC due to medium leaks is 215.0 kg/year.

Minimum leaks are found in Block-1,2,3&4, Solvent Storage Area, SRS Storage tank area Fresh Solvent Storage Area and ETP Area, Sampling Point, Bottom Flange, Top flange, Flow Glass, Dummy, Manhole, Drain Line. The total loss of VOC due to minimum leaks is 61.27 kg/year.

The PID consists of a short-wavelength ultraviolet (UV) lamp shining onto a small cell containing the gas sample. The UV light photoionized trace organic compounds, in general, any compound with ionization energy (IE) lower than that of the lamp photons can be measured. The PID analyser are calibrating by using either Isobutylene or Methane and the result from the PID is to be as Isobutylene.

$$VOC + h\gamma \rightarrow VOC^* \rightarrow VOC^{*.} + e^-$$

Generally, the background TVOC concentration in the production block and ETP area is around 30ppm.The results are submitted component wise before and after repair in the enclosed Annexure-I.

Based on the calculation and concentrations of VOC in the equipment, we took default value 1 for Response Factor (RF). **M/s. SUN PHARMACEUTICAL INDUSTRIES LTD - MADHURANTHAGAM,** has a yearly emission of VOC before Repair was 464.53 kg/year and after Repair yearly emission of VOC was 36.20 kg/year. The percentage VOC reduction from fugitive emissions is due to LDAR study is around 92%.

SUN PHARMACEUTICAL INDUSTRIES Madhuranthakam

List of Solvents and recovery (2019 – 2020)

S. No	Name of solvent	Consumption (Kg)	Recovery (Kg)	Spent (Kg)	Percentage %
1	Methanol	110608	106626	1217	97.5
2	Iso Propyl Alcohol	474012	345222	114711	97.0
3	Methylene Di Chloride	128960	103168	21020	96.3
4	Ethyl acetate	119740	99118	17934	97.8
5	Toluene	448978	383864	52917	97.4
6	Acetone	8528	0	8426	98.8
7	Diethyl ether	149240	122973	21789	97.0
8	Mono ethylene glycol	40426	36343	3678	99.0

SUN PHARMACEUTICAL INDUSTRIES Madurantakam

List of Solvents and recovery (April 2020 – July 2020)

S. No	Name of solvent	Consumption (Kg)	Recovery (Kg)	Spent (Kg)	Percentage %
1	Methanol	40140	38695	522	97.7
2	Iso Propyl Alcohol	156123	113704	39031	97.8
3	Methylene Di Chloride	46800	37440	8564	98.3
4	Ethyl acetate	38613	32002	6073	98.5
5	Toluene	144365	123927	17469	97.7
6	Acetone	2288	0	2240	97.9
7	Diethyl ether	40040	32993	5726	96.7
8	Mono ethylene glycol	10846	9751	879	98.0

SOLVENT RECOVERY PLANT

Solvent recovery column			
Description	**SSFC-101**	**SSFC-102**	**SSFC-103**
Column Dia (mm)	700	550	590
Column Height (M)	16	10	12.94
MOC	SS316	SS304	SS304
Design Temperature	150^0 C	150^0 C	143^0 C
Design Pressure	2Kg Cm^2	5Kg Cm^2	5Kg Cm^2
Reboiler/Kettle capacity(m2)	20	19	25
Primary condenser capacity(m2)	50	50	33
Secondary condenser capacity(m2)	6	6	7.5
Sub cooler capacity(m2)	2	1	1

Controls in Solvent Recovery Plant

1. **Steam pressure controls**
   If temperature raised more than set temperature Steam cuts off through solenoid valve and control the evaporation rate.

2. **Safety Relief Valve:**
   If pressure raise auto puff out of pressure through Safety Relief valve.

3. **Rupture Disk:**
   In case of sudden raise in pressure rupture disc will burst and release pressure out.

4. **LEL detector controls**:
   LEL meter installed at secondary condenser vent, in case of any vapour escaped from condenser immediately LEL detects and buzzer hooter and cut off steam supply by operating solenoid valve.

5. **Condenser cooling water failure**:
   Immediately steam cut off in case of cooling water/ cooling water circulation failure. Activates Buzzer/ hooter.

Following controls measures are available in solvent storage area.

License obtained from PESO and Validity is up to 31.12.2022.

1. **Flame proof motors:**
   Site has provided flame proof electrical motors for solvent pumping purpose.
2. **Overflow control**:
   During solvent pumping in tank, 85% level exceeds alarm/hooter buzzers, level exceeding to 90% auto cut off system being activated and stops the pump operation.
3. **Breather valves:**
   This valve controls vapour emission out, by withstanding pressure surge during temperature raise. Give breathing effect during loading and unloading of the tank Prevents loss of vapour from Solvent tanks.
4. **Fire Protection**:
   Site has Fire protection system installed Medium Velocity Water spray (MVWS) system, it activates by auto operating by Deluge valve and protect from Radiant Heat from surrounding tanks fire.
5. **Foam compound**
   Foam making branch hose with Foam monitor is available to Quench In case of any fire occurs in solvent storage tanks area.
6. **Water storage**
   capacity 450KL and Auto Main pump (motor) capacity of 171M^3/Hr and 273 M^3 /Hr & DG operated in case of no power 273M^3 /Hr Capacity pumps are in always kept in auto mode.

TAMIL NADU FIRE AND RESCUE SERVICES

F IRE LICENCE

Under section 13 of the Tamil Nadu Fire Service Act No. 40.1985 and with Tamil Nadu F ire Service Rules 1990 - Appendix -III

Licence No: 551 / 2020 Date: 23 : 06 : 2020

Ref. No: 6916/ C /2020

Licence here by granted under section 13 of the Tamil Nadu Fire and Rescue Service Act 1985 for Other Items MANUFACTURING OF BULK DRUGS within the Jurisdiction of SATHAMAI Panchayat at the Name of M/s.SUN PHARAMACEUTICALS INDUSTRIES LIMITED ..Primises No: SATHAMAI VILLAGE, KARUNGUZHI POST.MADURANTAKAM TALUK, CHENGALPET DISTRICT. subject to the conditions noted there on and such other as may be prescribed Inspected by StationOfficer Transport, Madhuranthakam on 06.06.2020 and this licence is valid upto 22.06.2021.

CONDITIONS

1. இந்த தீ உரிமம் வழங்கப்பட்ட நாளிலிருந்து ஒரு ஆண்டிற்கு மட்டுமே.
2. நேஷனல் பில்டிங் கோடு ஆப் இந்தியா -2005 Part IV தீ மற்றும் உயிர் பாதுகாப்பு விதிகளின்படி நிறுவப்பட்டுள்ள சாதனங்கள் நல்ல நிலையில் பராமரிக்கப்பட வேண்டும்.
3. இந்திய தரக்கட்டுப்பாடு 2190 – 92 விதிகளின்படி தீயணைப்பு கருவிகள் பொருத்தி பராமரிக்கப்பட வேண்டும்.
4. தீயணைப்பு கருவிகள் பராமரிப்பு குறித்து தனி பதிவேடு ஒன்று பராமரிக்கப்பட வேண்டும்.
5. போலி ஒத்திகை பயிற்சி ஆண்டுக்கு ஒருமுறை இத்துறையுடன் இணைந்து நடத்தி இதற்கான பதிவேடு ஒன்று உரிய படிவத்தில் பராமரிக்கப்பட வேண்டும்.
6. தொழிலாளர்களுக்கு இத்துறையில் அரசு ஆணை எண்: 713 (காவல் துறை – 17) நாள்: 17.08.2005 ன்படி அடிப்படை தீ பாதுகாப்பு மற்றும் தீ தடுப்பு பயிற்சி பெற்றிருக்க வேண்டும்
7. தீயணைப்பு பணிக்கான 24 மணி நேரமும் செயல்படக் கூடிய தீயணைப்பு அலுவலர் நியமிக்கப்பட வேண்டும்.

(Office seal)

23 JUN 2020

District Officer,
Fire & Rescue Services,
Kanchipuram District,
Kanchipuram.

To

M/s. SUN PHARMACEUTICALS INDUSTRIES LIMITED,
SATHAMAI VILLAGE,KARUNGUZHI POST,
MADURANTAKAM TALUK,
CHENGALPET DISTRICT.

copy to: The Deputy Director, N.W.Region,T.N.F.R.S. Vellore

ANNEXURE-15

TAMIL NADU FOREST DEPARTMENT

From
Thiru. Debasis Jana, I.F.S.,
Additional Principal Chief Conservator of Forests & Director,
Arignar Anna Zoological Park,
Vandalur, Chennai – 600 048.

To
Dr. Sreedhar,
Scientist 'C' & Nominated Officer by
MoEFCC Regional Office for NGT,
#34, HEPC Campus,
Cathedral Garden Road,
Nungambakkam, Chennai – 600 034.

Ref. No. 152/2020/D2, Dated: 21.08.2020.

Sir,

Sub: Forests – Wildlife – Hon'ble NGT (SZ) Revised order dated. 26.06.2020 in the matter of O.A. No. 88 of 2020 by Th.K.R. Selvaraj – Joint Committee constituted including Wildlife Warden, Chennai, in-charge of Vedanthangal Bird Sanctuary – Committee inspection held on 31.07.2020 – Relevant facts with respect to the para's related to Vedanthangal Sanctuary – Reg.

Ref :
1. Special Govt. Pleader, Forests, Chennai Letter. O.A. No. 88 of 2020, dated. 28.07.2020.
2. Principal Chief Conservator of Forests and Chief Wildlife Warden, Chennai Ref. No. WL5/15024/2020, dt. 29.07.2020.
3. Wildlife Warden, Chennai Ref. No. C. No. 2346/2009/D1, dt. 20.08.2020.

*****

The report received from the Wildlife Warden, Chennai regarding the relevant facts to be considered while submitting report to Hon'ble National Green Tribunal is sending herewith for your perusal and necessary action.

Yours faithfully,
Sd/- Debasis Jana
Additional Principal Chief Conservator of Forests & Director

Encl : as above

Copy to Wildlife Warden, Guindy, Chennai for information.

//t.c.b.o.//

Senior Draughting Officer

TAMIL NADU FOREST DEPARTMENT

From,

Mrs.C.H.Padma, IFS
Wildlife Warden
Wildlife Division
Chennai

To

Dr.Sreedhar
Scientist & Nominated Officer by
MoEFCC Regional Office for NGT
Chennai

(Through),

Additional Principal Chief Conservator of Forests & Director & Nominated Senior Officer for Joint Committee, NGT
Arignar Anna Zoological Park
Vandalur.

C.No.2346/2009/D1 dated 20.08.2020

Sir,

Sub; Forests- Wildlife – Hon'ble NGT (SZ) Revised Order dated 26.06.2020 in the matter of O.A.No.88 of 2020 by Thiru.K.R.Selvaraj – Joint Committee constituted including Wildlife Warden, Chennai, in-charge of Vedanthangal Bird Sanctuary – Committee inspection held on 31.07.2020 – relevant facts with respect to the para's related to Vedanthangal Sanctuary – reg.

Ref; 1. Special Govt Pleader, Forests, Chennai Letter- O.A.No.88 of 2020 dated 28.07.2020
2. Additional Principal Chief Conservator of Forests & Director, Arignar Anna Zoological Park, Vandalur, Ref.no.152/2020/D2 dated 29.07.2020.
3. Principal Chief Conservator of Forests & Chief Wildlife Warden, Chennai Ref.No.WL5/ 15024 / 2020, dated 29.07.2020

With respect to the above subject, in continuation of the inspection of the members of the Joint Committee constituted by Hon,ble NGT(SZ) in the matter of O.A.No.88/2020 carried out on 31.07.2020 in M/s Sun Pharmaceutical Industries, Vedanthangal Bird Sanctuary and surrounding areas, I herewith cite following relevant facts to be considered in the report to be submitted to the Hon,ble NGT;

- The petitioner submits to Hon,ble NGT in the Para 10 of the O.A 88/2020 that, M/s Sun Pharmaceuticals Pvt Ltd is close to the core zone of the Vedanthangal Bird Sanctuary.

There is no core zone and buffer zone demarcations in the Vedanthangal Sanctuary Notification vide G.O.Ms.No.199, E&F Dept dated 03.07.1999. Sanctuary notification includes the water body/lake with 29.5 ha area and surrounding 5km area (private land holdings, villages, town with intense human activity). Sun Pharma is located at a distance of 3.7 kms from the Sanctuary Lake and is within the limits of 5kms zone notified Sanctuary.

Vedanthangal Lake is home to many nesting and roosting aquatic birds which are both local and distant migrant birds. Prime nesting species are Open Bill Stork, Grey Pelican, Painted Stork, White Ibis, Cormorants, Darter, Grey Heron, Large Egret, Spoonbill, Garganey, Spot-billed Duck, etc.

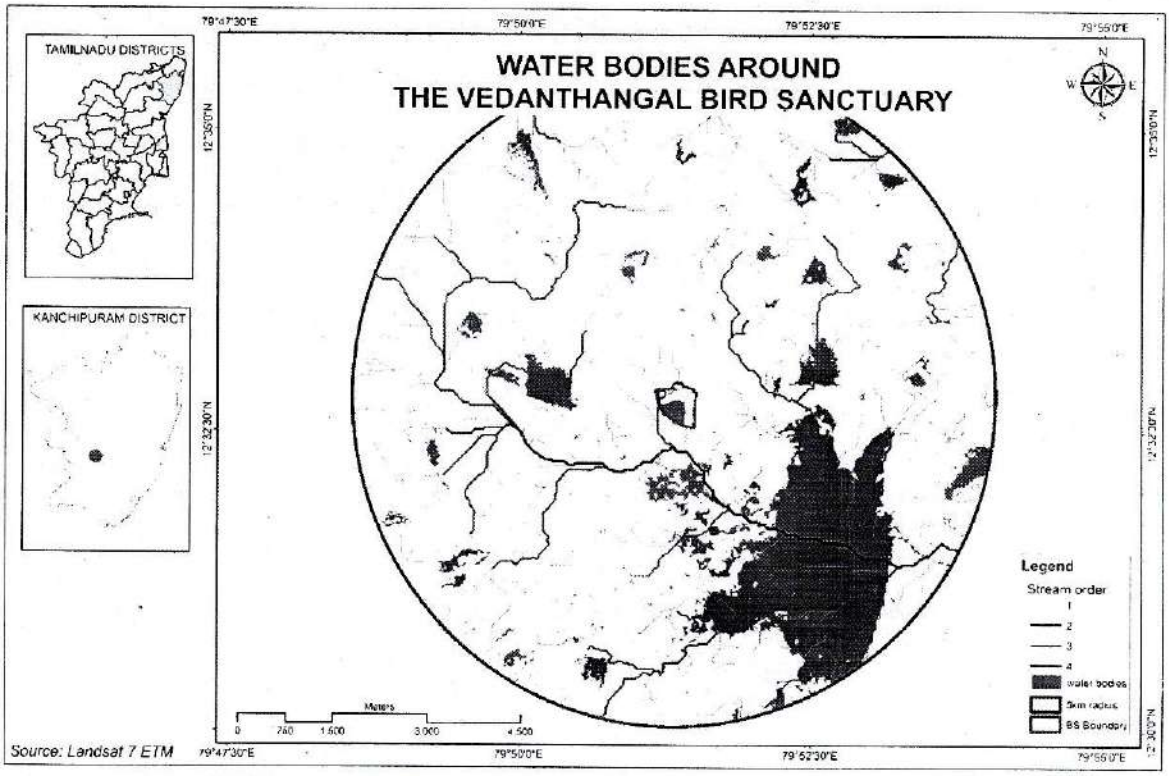
As observed by the staff in Vedanthangal Bird Sanctuary, nesting and roosting birds arrival to the Vedanthangal Lake depends on the water level in the lake and the feed availability. It is noted from the decadal bird data that, during a good monsoon year about 30000 birds arrive to the Sanctuary from September to December and about 70000-80000 birds (including young ones) return back between Jan-May. If the rainfall is low, only about 1000-3000 birds arrival is noted in the Sanctuary and if rainfall is moderate, about 15-20000 birds arrival is noted in the Sanctuary. Sufficient water availability in the lake also indicates good feed availability. To supplement the feed, Forest Department also releases fingerlings into the lake every year.

- In Para 13 of the O.A 88/2020, the petitioner submits that, the Sun Pharma discharges the trade and hazardous effluents to the near-by water bodies surrounding Vedanthangal lake. Birds use the surrounding water bodies and surrounding land area for nesting and foraging. The effluents which are discharged into the surrounding water bodies and land are threat to the birds of Vedanthangal.

Vedanthnagal Bird Sanctuary is known for congregation of about 30-40000 birds during a good monsoon year and these are aquatic birds. Vedanthangal aquatic birds do not nest outside the lake and they nest only inside water body/lake. Other local land bird's nesting may be noted in the surrounding area. And, with respect to the point that, hazardous effluents discharged by Sun Pharma to the surrounding lakes are threat to the birds, it is noted that, Vedanthangal is a centuries old Aquatic Birds nesting area and every year, migratory birds come to the lake. Nesting is noted based on monsoon dynamics. It is observed that, nesting birds usually leave the nest in the morning and return back by evening. They go to farther locations mostly and few bird species prefer surrounding 1 or 2 km area. So far, no casualty of Vedanthangal birds is noted due to any consumption of water or feed from surrounding water bodies or field area. And further, Sun Pharma is functioning in the location even before the Bird Sanctuary was declared in 1998.

- In Para 14 of the O.A, the petitioner submits to the Hon,ble NGT that, Sun Pharma is close to water bodies like Sitheri, Pudhupet-thangal and Maduranthangam lake. And the above said water bodies joins the Vedanthangal lake after catering to the needs of the agriculturists and villages. There is enormous pollution in these water bodies due to effluent discharge by the Sun Pharma.

Vedanthangal Lake is on the upstream side of Puthupet lake, sitheri pond and Maduranthagam is the largest lake/water body into which most of the smaller water bodies drain during the good monsoon. Further, water in Mathuranthangam drains towards eastern part and there is no chance that the water from these water bodies gets into Vedanthangal lake/Bird Sanctuary.



Map showing Vedanthangal Lake /Bird Sanctuary on upstream side (marked in red) of Mathuranthagam lake (largest), Puthupet lake (above Mathurangam lake) on the downstream side.

Based all on the facts and details mentioned above, it is concluded that, the submissions made in Para 10, 13 and 14 in the O.A No.88/2020 by the petitioner with respect to the Vedanthangal Lake/ Bird Sanctuary are not based on the facts.

This is for favour of kind information.

Yours faithfully,
Sd//C.H.Padma, IFS
Wildlife Warden
Chennai Wildlife Division

Copy Submitted to the Principal Chief Conservator of Forests & Chief Wildlife Warden for favour of kind information.

Copy Submitted to the Additional Principal Chief Conservator of Forests & Director, Arignar Anna Zoological Park, Vandalur for favour of kind information.

// True copy / by order //

Superintendent

20/8/20