



# Product Introduction.

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**Smart Eco-MBBR STP**

# About Us

**ICC Smart Eco Solutions**, the newest division of the reputable general contractor, **International Construction Consortium (Pvt) Ltd** introduces a range of Sewage Treatment Plants using German and Chinese Technology to meet every need.

These units are modular in design and can cover a large range of populations to satisfy the needs of domestic, industrial, and municipal wastewater treatment needs.

As an example, the **Nature model** for domestic use, uses NO electricity or chemicals in the treatment process. It uses bacteria available in nature and is totally eco-friendly. The effluent discharged meets all discharge standards of the world and this is certified by many independent testing houses in Europe.

Larger commercial modular units are currently operated by condominium developers and hoteliers in Sri Lanka. These units carry warranties of 15 years or more. There are many modular MBBR/FBBR units currently in use in Sri Lanka. Our systems use the least amount of chemicals, electricity, floor space and labour in comparison to conventional systems.

Although over 70% of the world's surface is covered with water, only about 1% is available for human consumption. Water is precious and we need to safeguard every drop of it.

The wastewater treatment plants we market produce effluent that could be reused for gardening, toilet flushing, vehicle washing etc. saving many thousands of cubic meters of wasted water per day.

In addition to wastewater treatment we also reprocess organic waste to fertilizer using our "Quick composters" converting organic waste to compost in 24 hours. We market machines for domestic use, processing 2kgs per cycle to tons per day for commercial use.

There is a machine to suit your every need, contact us for further information.

*Save our Nation from GARBAGE pollution, convert to Compost in 24 hours.*

## **Vision**

Respect and leverage the planets' organic cycle by catalyzing the recycling process of organic waste and free the future generations of having to live on a polluted earth.

## **Mission**

ICC Smart Eco division provides the best available technology to every household & organization at an affordable price, and in doing so, makes every citizen responsible for disposing their waste in a manner beneficial to mother earth.

# Introduction



## The ICC Smart Eco Wastewater Treatment System

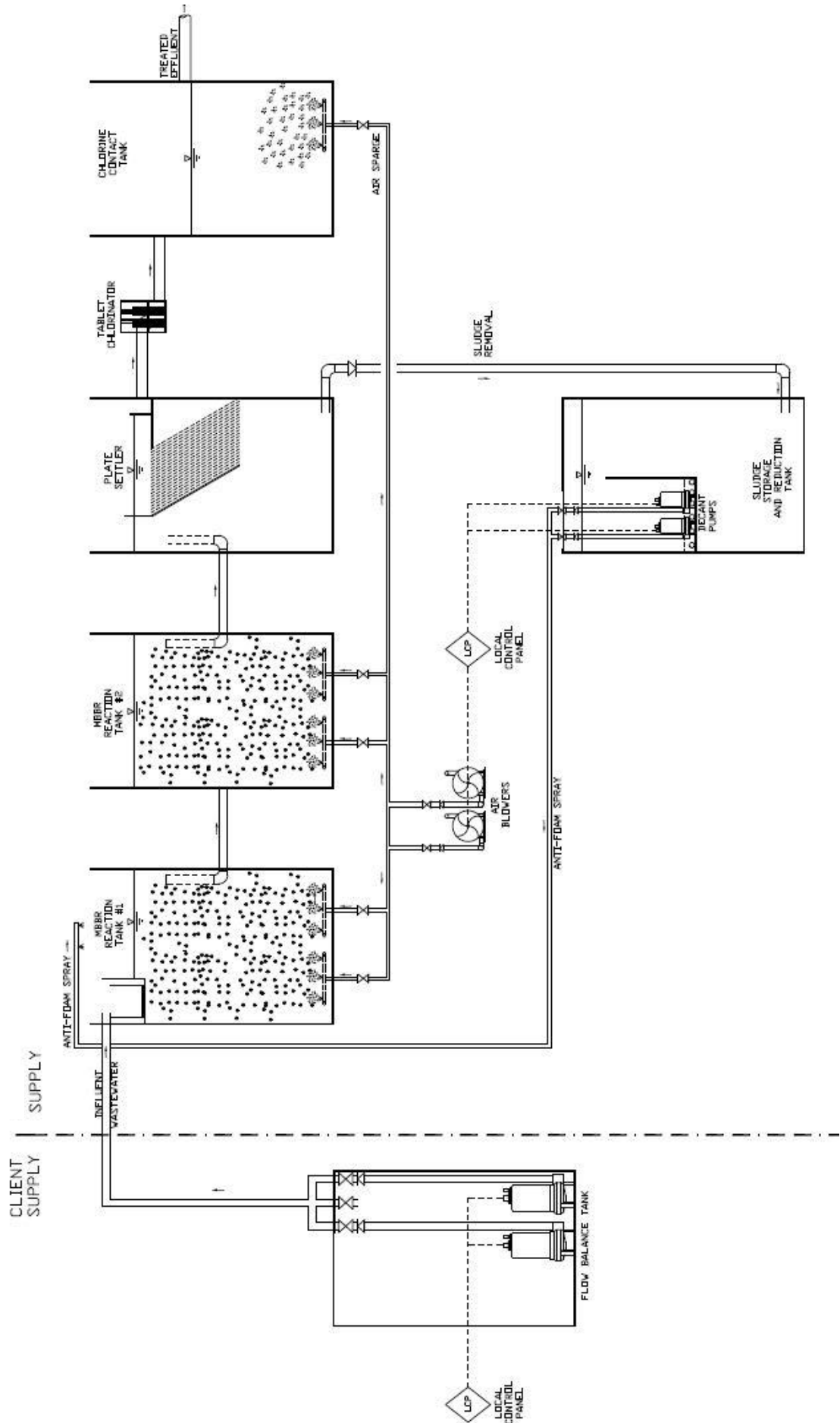
The Smart Eco Moving Bed Bio Reactor (EcoPac-MBBR) technology maintains a high concentration of biofilm within the structure of biomass carriers that are kept in motion in exceptionally low attrition surroundings inside a super aerated chamber.

The resulting biomass content within the MBBR system ranges from 40-50% of tank volume compared to low levels in conventional extended aeration systems. The stable biofilm accelerates the breakdown of organics, therefore allowing the MBBR system to have up to double the capacity of an extended aeration plant with the same footprint.

The system also generates quick-settling colonies of sludge solids. The volume of the sludge removed from the clarifier in an EcoPac MBBR system is 80% less than the volume of the sludge removed from the clarifier in an extended aeration system. These exceptionally low sludge volumes reduce the need for onsite sludge dewatering, transportation, and disposal costs.

Lower power consumption, the operating cost of an EcoPac MBBR system is less than 50% of the operating cost of conventional wastewater treatment plants.

# System Schematic



The ICC EcoPac comprises of following five sections, all of which are contained within one concrete tank.

**1. MBBR Reactor 1**

*Filtration, Aeration and Primary BOD Reduction*

**2. MBBR Reactor 2**

*BOD5 Reduction to <10 mg/l and full Nitrification*

**3. Lamella Plate Settler**

*Solid / Liquid Separation with Saran Filter, TSS <15 mg/l.*

**4. Sludge Reduction Reactor**

*6 Months Reduction and Storage of Sludge*

**5. Chlorine Contact Tank**

*Full Sterilization of the Treated Wastewater*

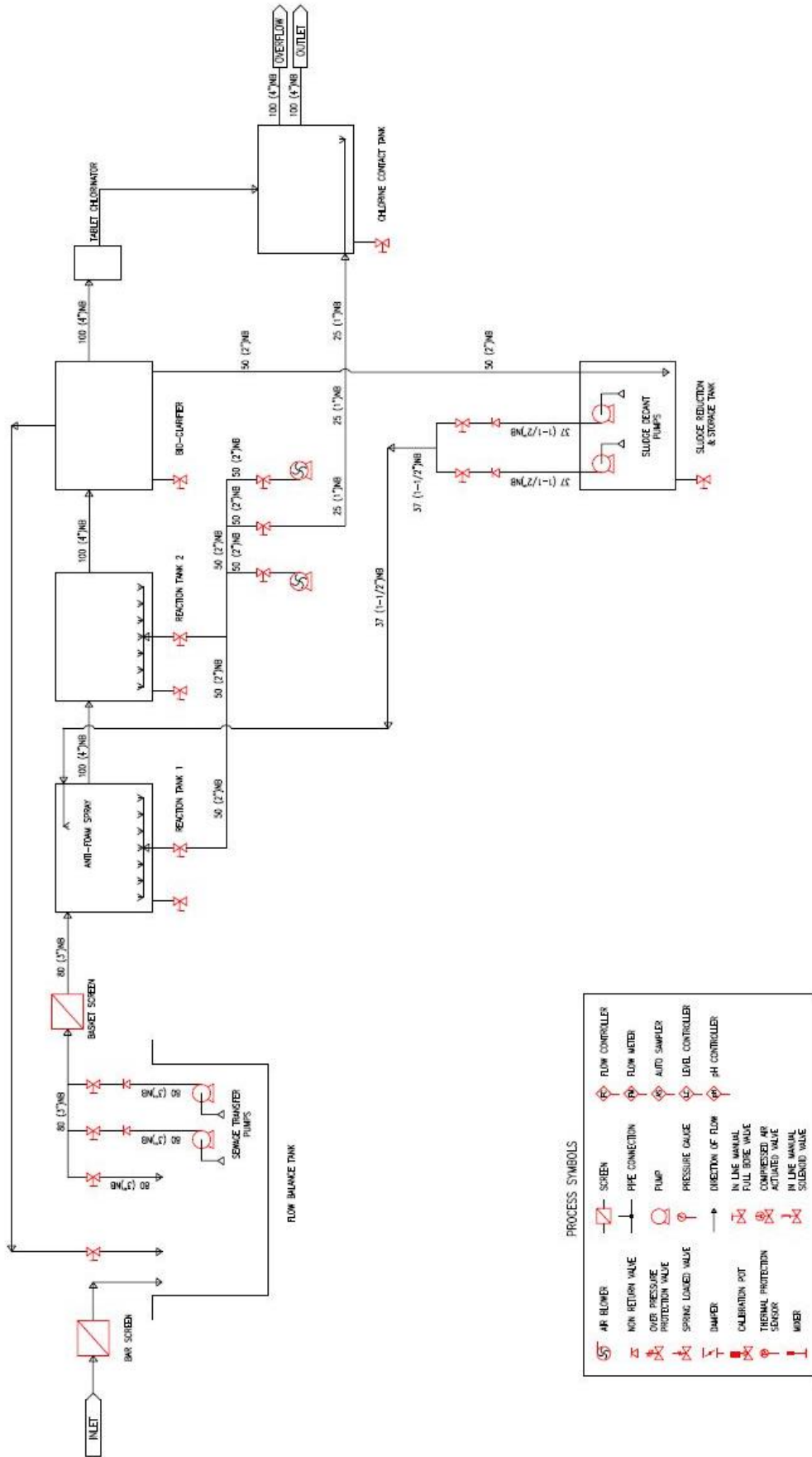
The EcoPac system is the most compact “all in one” system available, The Moving Bed Biofilm (MBBR) system incorporates a significant step forward in modular system technology, offering a major improvement in performance combined with a reduced footprint and overall lower cost basis.







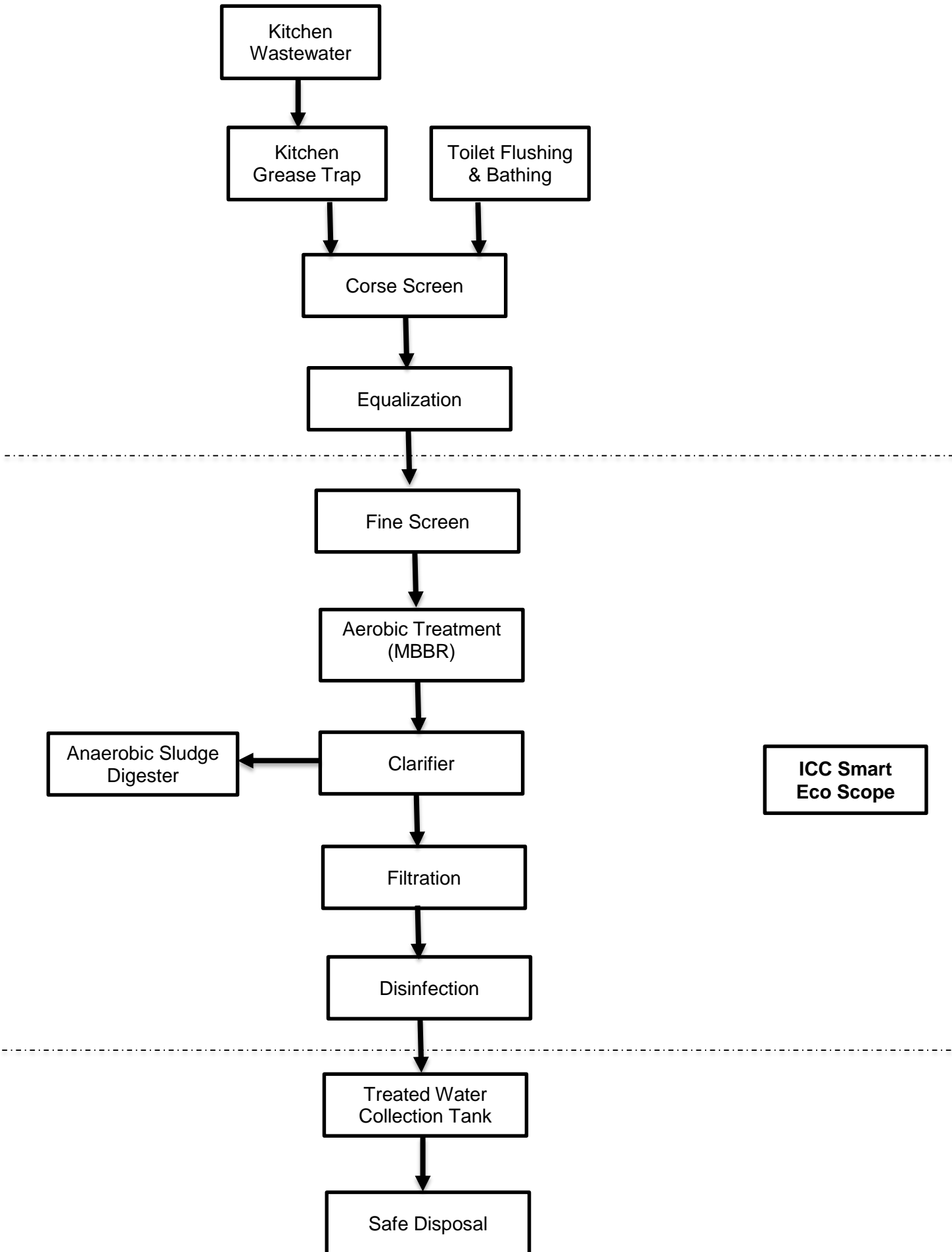
# Line Diagram



**PROCESS SYMBOLS**




# PROCESS FLOW DIAGRAM



## Parameters

Sewage Quality	BOI STD		
<u>Parameter</u>	<u>Influent</u>	<u>Effluent</u>	<u>Effluent</u>
BOD 5days	≤ 300mg/l	≤ 30mg/l	30
COD @ 4:1 ratio	≤ 1200mg/l	≤ 250mg/l	250
TSS	≤ 230mg/l	≤ 50mg/l	50
NO3	≤ 20mg/l	≤ 10mg/l	150K nitrogen N
NH3	≤ 40mg/l	≤ 10mg/l	
PO4	≤ 20mg/l	≤ 10mg/l	5
FOG	≤ 30mg/l	≤ 10mg/l	10
FaecalCF count		≤ 40MPN/100ml	40MPN/100ml
pH		6.0 - 8.0	6.0 - 8.5
Residual chlorine		1	1

SCHEDULE I

TOLERANCE LIMITS FOR THE DISCHARGE OF INDUSTRIAL WASTE IN TO INLAND SURFACE WATERS

No.	Parameter	Unit type of limit	Tolerance Limit values
01.	Total suspended solids	mg/l, max.	50
02.	Particle siz of the total suspended solids	µm, less than	850
03.	pH at ambient temperature	-	6.0 - 8.5
04.	Biochemical oxygen demand (BOD <sub>5</sub> in five days at 20°C or BOD <sub>3</sub> in three days at 27°C)	mg/l, max.	30
05.	Temperature of discharge	°C, max.	Shall no exceed 40° C in any section of the stream within 15 m down stream from the effluent outlet.
06.	Oils and greases	mg/l, max.	10
07.	Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l, max.	1
08.	Chemical oxygen demand (COD)	mg/l, max.	250
09.	Colour	Wavelength Range	Maximum spectral absorption coefficient
		436 nm (Yellow range)	7m <sup>-1</sup>
		525 nm (Red range)	5m <sup>-1</sup>
		620 nm (Blue range)	3m <sup>-1</sup>
10.	Dissolved phosphates (as P)	mg/l, max.	5
11.	Total Kjeldahl nitrogen (as N)	mg/l, max.	150
12.	Ammoniacal nitrogen (as N)	mg/l, max.	50
13.	Cyanide (as CN)	mg/l, max.	0.2
14.	Total residual chlorine	mg/l, max.	1.0
15.	Flourides (as F)	mg/l, max.	2.0
16.	Sulphide (as S)	mg/l, max.	2.0
17.	Arsenic (as As)	mg/l, max.	0.2
18.	Cadmium (as Cd)	mg/l, max.	0.1
19.	Chromium, total (as Cr)	mg/l, max.	0.5
20.	Chromium, Hexavalent (as Cr <sup>6+</sup> )	mg/l, max.	0.1
21.	Copper (as Cu)	mg/l, max.	3.0
22.	Iron (as Fe)	mg/l, max.	3.0
23.	Lead (as Pb)	mg/l, max.	0.1
24.	Mercury (as Hg)	mg/l, max.	0.0005
25.	Nickel (as Ni)	mg/l, max.	3.0
26.	Selenium (as Se)	mg/l, max.	0.05



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**ICC SMART ECO SOLUTIONS**

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