



NAWATECH

Natural Water systems and treatment Technologies
to cope with water shortages in urbanised areas in India

Amanora Park Town



Treatment technologies

1. Membrane Bio Reactor (MBR)
2. Sequential Batch Reactor (SBR)

Systems

1. Membrane Bio Reactor (MBR)
Capacity: 30 m³/d
2. Sequential Batch Reactor (SBR)
Capacity: 10 m³/d

Intended reuse

Toilet flushing and land application (gardening)



:- RESULTS OF SAMPLE ANALYSIS :-

Sr. No.	Parameter	Unit	Inlet	Outlet MBR	Outlet SBR
1.	pH	-	7.12	7.48	7.39
2.	Biological Oxygen Demand (BOD ₃) at 27°C	mg/l	148.90	10.80	20.90
3.	Chemical Oxygen Demand (COD)	mg/l	368.30	43.20	32.60
4.	Total Suspended Solids (TSS)	mg/l	156.00	28.00	38.00
5.	Dissolved Oxygen	mg/l	0.00	3.90	3.00
6.	Phosphates as PO ₄	mg/l	2.55	0.28	0.60
7.	Total Kjeldahl Nitrogen as N	mg/l	26.10	2.20	4.10
8.	Coliform MPN	/100 ml	>1600	27	
9.	E.Coli	CFU/ml	>1600	12	



Indo-EU Science & Technology Research
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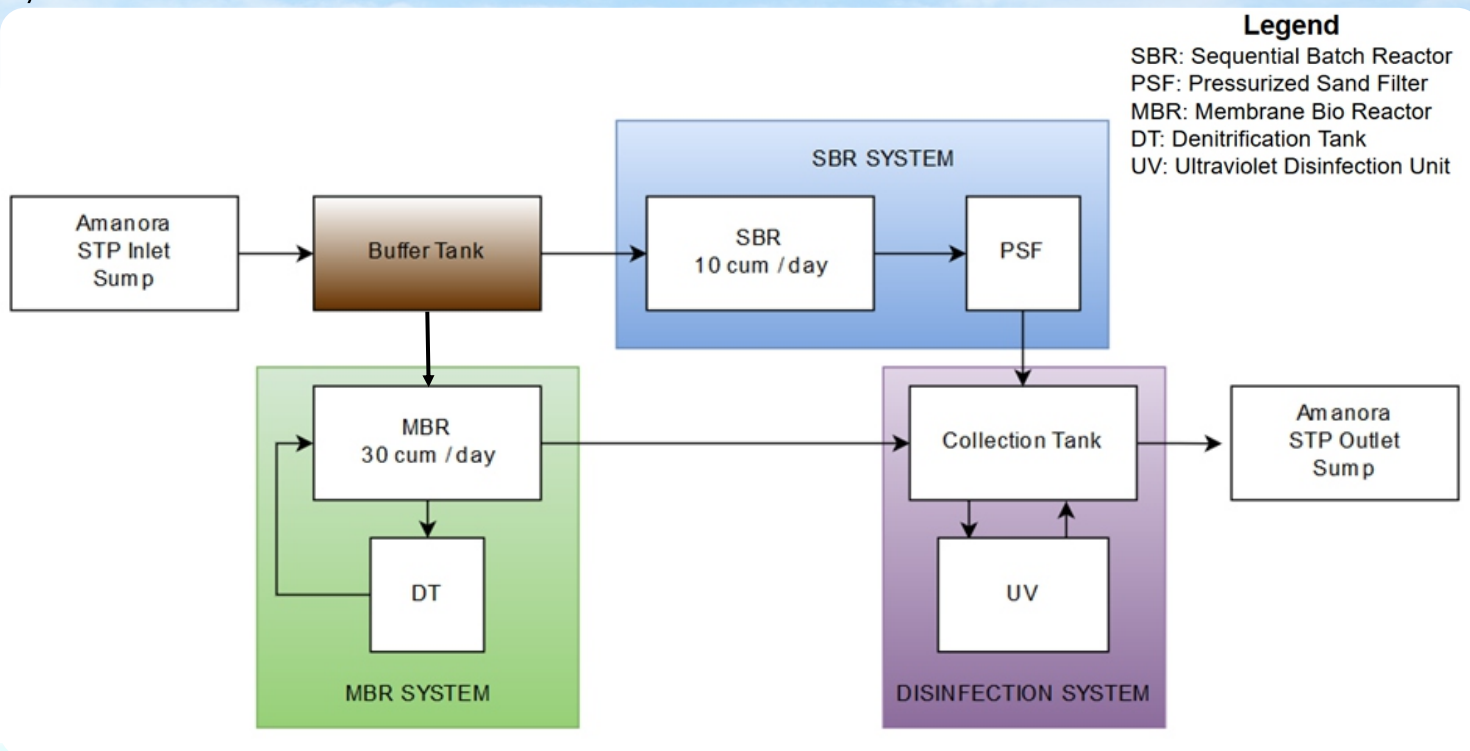


More information on: www.nawatech.net
Ecosan Services Foundation
Contact: +91 20 6400 1736
Website: ecosan@ecosanservices.org

The selected site is a residential area within Amanora Park Town, a sprawling 400-acre township located in Pune City (the second largest city of the state of Maharashtra). The surrounding area consists of several towers for apartments, buildings, school, hospital, fire station, parks, and power and water supply stations. The township has been awarded with many recognitions/awards in categories such as urban design, green projects and women empowerment.

The selected treatment system – Sequential Batch Reactor (SBR) and Membrane Bioreactor (MBR) - is currently treating mixed domestic wastewater (black water and grey water) collected for the existing STP, and it is designed to generate an effluent to be reused in toilet flushing and gardening. SBR and MBR systems represent intensive water treatment systems, allowing the effective treatment of heavily contaminated municipal wastewater, as stand-alone systems or in combination with natural extensive systems.

The SBR system has a capacity of 10 m³/d and the MBR system has a capacity of 30 m³/day. Both these systems share a Buffer Tank and a Treated Water Collection Tank.



Sequential Batch Reactor (SBR)

SBR is a variation of the well-known activated sludge system, but undertaking carbon degradation, conversion of ammonia to nitrate (nitrification) and conversion of nitrate to nitrogen gas (denitrification) in a single reactor tank. All steps occur along a specified sequence of aerobic and anoxic periods, followed by settling and decanting to separate treated water from active biomass. Phosphorus removal is also possible. The entire cycle ends when treated water is pumped to a treated water tank passing through a sand filter, which removes remaining suspended solids. Then the plant is ready for starting a new treatment cycle. The system is easy to control; it has a small land footprint, and a reliable performance for various raw wastewater qualities.

Membrane Bio Reactor (MBR)

MBR is a combination of biological treatment (normally aerobic, although anaerobic is also possible) with membrane filtration. The retention of biomass is not achieved by settling, but by using a membrane as a physical barrier. Not only biomass is retained but also viruses and bacteria (depending on pore size). The permeate pump drives water from MBR tank to the treated tank through the membrane, achieving a water quality good enough for reuse, considering that the treated water tank is equipped with an UV lamp working in continuous recirculation to assure a good disinfection rate. Very small footprints and stringent treatment requirements can be achieved with this system.



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