DEWATSTM

Decentralised Wastewater Treatment System

An alternative to centralised wastewater treatment

Decentralised Wastewater Treatment Systems (DEWATS[™]) is a nature-based technology and approach to treat wastewater. The approach emphasizes on building many small scale systems in place of a centralised large system to treat wastewater close to the point of generation, enabling treated water to be effectively reused for gardening and toilet flushing.

How was $DEWATS^{TM}$ developed?

DEWATS[™] was collated and standardized (in the 1990s) by engineers at Bremen Overseas Research & Development Association (BORDA) after studying wastewater treatment systems in many developing countries.

BORDA developed Decentralised Wastewater Treatment System (DEWATS[™]) as a solution most suitable for India's unique conditions i.e. where electricity and skilled human resource are not easily available.

Key Features

- Simple design; using natural bacteria and plantations
- No chemicals
- No/low electricity required, can work on gravity
- Minimum maintenance
- Easy to integrate with landscaping
- Produces reusable biogas and nutrient-rich water and sludge
- Adaptable to a variety of organic wastewater characteristics
- 80% lower O&M costs than comparable technologies

Sectors of Application

System sizes from 1,000 - 1 million litres-per-day (1-1,000 KLD) can be implemented. CDD, along with its trainees and partners has set up DEWATS[™] at:

- Apartments and housing colonies
- Communities
- Colleges/universities
- Schools
- Institutions

- HospitalsTemples
- Toilet Complexes
- Open channels
- Factories and food
- processing units

Today DEWATS[™] is a proven technology and has been implemented in over 17 countries. CDD, its trainees and partners have implemented over 400 systems across India, which treat 15,000 m3 of wastewater, generated by <u>2 lac people everyday.*</u> (*as of December, 2020)

Treatment Efficiency

BOD/COD level at each stage is compliant to effluent discharge standards



Comparison with other technologies



Reuse Applications

Treated Water

- Gardening
- Construction
- Flushing
- Subsurface Irrigation

Biogas and Solids

- Cooking/Fuel
- Fertilizer
- Biogas Lamp
- Soil conditioner

DEWATS[™] Top surface area

- Playground
- Parking Space
- Market Space



Operation and Maintenance of DEWATSTM













DEWATS[™] is low in O&M and does not require skilled labour to operate the system. Unskilled labour for 1 shift is sufficient to carry out operations. There are simple regular checks and periodical maintenance activities that need to be carried out to ensure the treatment performance of the system.

The annual cost of maintenance for DEWATS[™] ranges from **Rs.70,000 to 6,20,000 /year**.

Operation and Maintenance Activities:

- 1 Cleaning blockages from the sewer line
- 2 Cleaning of inspection chamber
- 3 Removal of scum
- 4 Trimming of plants
- 5 De-sludging
- 6 Measuring the level of swivel pipe top

Key Projects

O1 DEWATS

DEWATS[™] at IIT Gandhinagar



Started in 2015, a DEWATS[™] of 3.5 MLD is planned, which will be implemented in a phased wise manner (In the 1st phase, a 0.6 MLD DEWATS[™] has been implemented for the wastewater generated by faculty, staff and students on campus.)

The design of IIT Gandhinagar's new campus was driven by three basic conditions – an exceptional aesthetic feel, function and convenience and resource efficiency such that the campus can achieve GRIHA ratings for buildings.

Keeping this in mind, there was a need for a wastewater treatment system, which enabled reuse of water. DEWATSTM was selected for its simple O&M and low maintenance costs.

DEWATS[™] at Aravind Eye Hospital, Pondicherry



Built in 2003, the DEWATSTM treats ~307m³/d of wastewater, generated by 1,500 patients and residents of the hostels and staff quarters.

The treated wastewater is reused for irrigation of the rich surrounding landscape and a garden, where vegetables and fruits are grown. A substantial quantity is re-used for toilet flushing. This helps the hospital save more than 100,000 m³ of fresh water every year — equivalent to the requirement of over 2,000 people.

DEWATS[™] for Mahadevapura Lake, Bengaluru



A 1 MLD DEWATS[™] has been set up for an open channel at Mahadevapura Lake, Bengaluru. The wastewater treatment plant includes intake structures, primary, secondary and tertiary modules, chosen and combined in order to handle the variation in pollution load. Wastewater is treated upto the tertiary level and then discharged into the lake, to help keep the lake full, through the year.

DEWATS[™] at Pristine Temple Tree Apartment, Bengaluru



Set up in 2019, the DEWATS[™] treats 15m³/d wastewater generated by 40 flats of Pristine Temple Tree Apartment.

DEWATS[™] was selected as it enabled treatment at one location as well as re-use for gardening/landscaping (with safe disposal of the remaining wastewater into the nearby municipal sewer line).

DEWATS[™] for Kuttiyadur Community (40 kms from Nagapattinam)



A DEWATS[™] system with simplified sewer lines for treatment of wastewater generated by the rehabilitated Kuttiyadur community (175 houses, 875 people) was setup in 2010. The treated wastewater is disposed in the nearby drain.







Accreditations

Dr. Mashelkar Committee

DEWATS[™] is recognised as one of the technologies accreditedby the Dr. Mashelkar Committee, a committee set up by the Prime Minister's Office to recommend clean technologies in India.

CPHEEO Manual

DEWATS[™] has been mentioned in the Central Public Health and Environmental Engineering Organisation's (CPHEEO) manual on Sewerage and Sewage Treatment.

Suchitwa Mission

Empanelled as Engineering Consultant for DPR preparation and handholding in project execution for Wastewater/ Septage Treatment projects taken up by the Local Self Government Institutions, Kerala.

DEWATS[™] Trademark

DEWATS[™] is a certified trademark of CDD Society under the Trade Marks Act, 1999 (Government of India).

Other Notable Clients

- Bangalore Metro Rail Corporation Limited (BMRCL)
- DMA, Karnataka
- Good Earth, Bangalore
- MMRDA, Mumbai
- Pune Municipal Corporation
- Seven Hills Hospital, Mumbai
- Tamil Nadu Water Supply and Drainage Board
- Kalmeshwar Municipal Corporation
- Karnataka State Habitat Center
- IIT Gandhinagar





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