



## Karunya INSTITUTE OF TECHNOLOGY AND SCIENCES

(Declared as Deemed to be University under Sec.3 of the UGC Act, 1956)

MoE, UGC & AICTE Approved

NAAC A++ Accredited

### Water Reuse and Measurement

Karunya Institute of Technology and Sciences (KITS) is a 720-acre, fully residential campus operating a closed-loop water circulation system, ensuring efficient consumption, continuous monitoring, and zero untreated wastewater discharge.

Campus Population Considered for Calculation: 8087. The institutional approach prioritizes reuse-first water management, reducing dependence on freshwater withdrawals and ensuring long-term aquifer sustainability.

#### Water Supply, Treatment, and Reuse Network

| Stage                  | Infrastructure                               | Functional Capacity           | Measurement System               |
|------------------------|----------------------------------------------|-------------------------------|----------------------------------|
| Freshwater Input       | Siruvani /TWAD + 19 Borewells + 5 Open Wells | 1.4–1.6 MLD                   | Operational Time and capacity    |
| Treatment              | 4 STPs (Total: 2,450 KLD)                    | Domestic wastewater recycling | Flow meter                       |
| Potable Production     | RO Plants (2000 & 500 LPH)                   | Drinking & cooking supply     | Sensors and RO Logbook Registers |
| Storage & Distribution | 8 Sumps + 46 OHTs + 14 Pumps                 | Internal distribution network | 119 IoT Level Controllers        |
| Reuse Network          | 113 Reuse Outlets                            | Irrigation                    | -                                |

KITS reuses 91.5% of total water demand — demonstrating near-zero discharge performance.

#### STP and Reuse Output Distribution

| STP Unit           | Installed Capacity (KLD) | Annual Output (m <sup>3</sup> /year) | End-Use Application         |
|--------------------|--------------------------|--------------------------------------|-----------------------------|
| JMR Hostel         | 1000                     | 132,525                              | Irrigation, lawns etc.      |
| FDR Hostel         | 400                      | 79,729                               | Hostel & garden irrigation  |
| Ladies Hostel STP  | 450                      | 61,778                               | Mess cleaning               |
| PR GARG Campus STP | 600                      | 111,171                              | Farm Irrigation (329 acres) |
| Total              | 2,450 KLD                | 385,204 m <sup>3</sup> /year         | 100% Recycled and Reused    |

RO Treated Drinking Supply: 2,618 m<sup>3</sup>/year

Monitoring Tools: FREHNIG IoT Flow Transmitters + Database (LPS + cumulative flow).



### Reuse Water Quality and Standards

Treated water is tested once in 6 months for compliance with TNPCB reuse standards:

| Parameter      | Range (mg/L) | TNPCB Standard |
|----------------|--------------|----------------|
| pH             | 7.0–7.6      | 6.5–8.5        |
| BOD            | 8–12         | ≤ 20           |
| COD            | 35–45        | ≤ 100          |
| TSS            | 12–18        | ≤ 50           |
| Total Coliform | Nil          | <100 MPN/100ml |

All STP-treated water is safe for irrigation and gardening purposes.