

## Comprehensive Wastewater Treatment and Policy Implementation

Water usage and care at JSS Academy of Higher Education and Research (JSS AHER) are managed by a dedicated engineering and management team that employs proactive approaches to water and wastewater treatment. The institution has implemented comprehensive wastewater treatment systems designed to handle effluent from laboratories, washrooms, animal facilities, and other sources. The wastewater treatment process incorporates both basic and advanced techniques to ensure compliance with quality parameters established by pollution monitoring authorities, including local regulations and the Government of Karnataka.

Infected wastewater generated from laboratory and clinical practices at the individual college level is treated at the source using approved disinfection units, as sanctioned by the Karnataka Pollution Control Board. These units effectively eliminate pathogens and microorganisms through the application of potent disinfecting agents. Once disinfected, the treated wastewater is directed into the drainage network, which connects to the main sewage treatment plant located on the JSS AHER campus.



**Wastewater disinfection unit at JSSAHER, Mysuru**



Wastewater from various sections of JSS Academy of Higher Education and Research (JSS AHER) is channeled to the wastewater treatment plant through a well-designed pipeline system. It undergoes a series of advanced treatment processes, including filtration, sedimentation, and disinfection, to ensure that the recycled water meets safety standards for reuse. The incorporation of cutting-edge technologies such as activated sludge processes, Dissolved Air Flotation (DAF), Anaerobic Reactors with Bio-Towers (ARBiT), and membrane filtration significantly enhances the treatment efficiency. This comprehensive approach allows JSS AHER to reduce its reliance on external water sources and conserve valuable freshwater resources for non-potable applications, such as gardening, landscaping, sports ground preparation, and construction activities. As a result, the institution effectively minimizes overall water consumption and reduces waste.



**Wastewater treatment units at JSS AHER, Mysuru**



### Campus-wise Water Storage, Consumption and Recycled Water Utilisation at JSS AHER (2024–25)

Campus	Total Storage Capacity (Liters)	Daily Usage (Liters)	Rainwater Collection Capacity (Liters)	Recycled Water Usage (Liters)
JSS Medical Institution Campus	940,000	479,600	16,000	80,000
JSS College of Pharmacy, Mysuru	200,000	120,700	5000	40,000
JSS College of Pharmacy, Ooty	100,000	44,650	5000	500
Off-Campus Buildings	61,000	58,195	24,000	10000
School of Life Sciences, Ooty	35,000	58,615	10,000	4,000
<b>Total</b>	<b>1,336,000</b>	<b>761,760</b>	<b>60,000</b>	<b>134,500</b>

#### Policy Framework for Wastewater Management

JSS AHER operates under a comprehensive **Policy for Water and Wastewater Management**, which outlines the guidelines for collection, treatment, reuse, and disposal of wastewater. This policy ensures compliance with the Karnataka State Pollution Control Board (KSPCB) regulations and integrates best practices for sustainability and environmental conservation.

#### Wastewater Treatment Process at JSS AHER

JSS AHER employs a versatile wastewater treatment approach using state-of-the-art technologies, ensuring the treatment and reuse of wastewater from various sources, including laboratories, washrooms, kitchens, and clinical facilities.



## 1. Sewage and Kitchen Wastewater Treatment with SWR Technology

- **Infrastructure:**

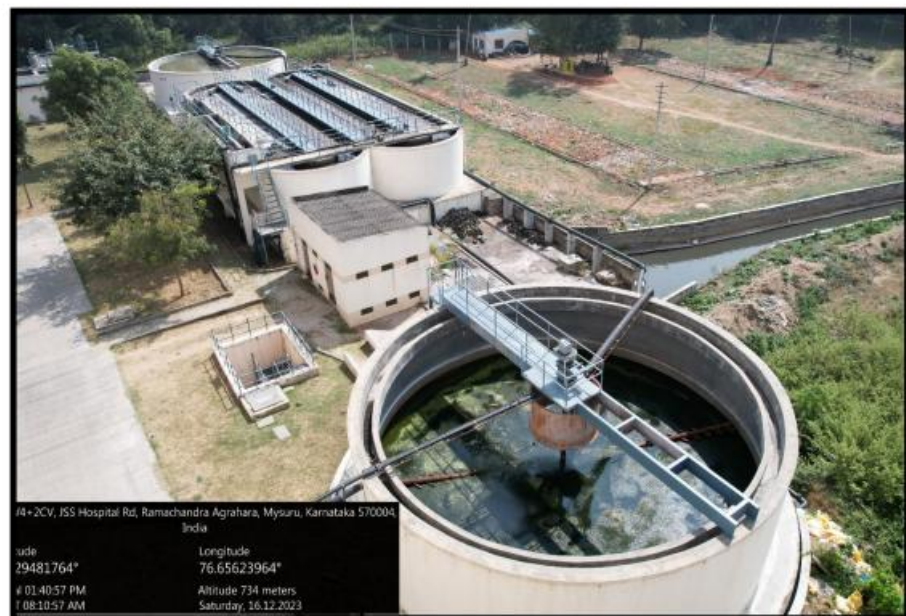
- The Sewage Treatment Plant (STP) has a capacity of **25,000 liters per day (KLD)** and employs **Submerged Aerobic Fixed Film (SWR)** technology, recognized for its efficiency in treating sewage and kitchen wastewater.

- **Process:**

- The SWR technology utilizes biological processes to break down organic matter in wastewater, ensuring treated water meets stringent quality standards.
- The treated water is reused for non-potable purposes, such as gardening and landscaping, around the **Postgraduate Guest Hostel**.

- **Impact:**

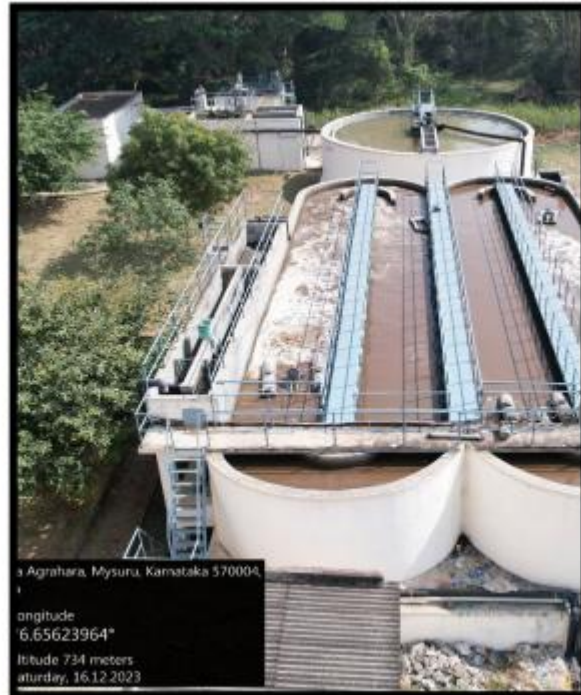
- Conserves freshwater resources by reducing demand for potable water.
- Promotes eco-friendly practices by utilizing treated water effectively.



**Sewage water treatment plant at JSS Hospital, JSS AHER, Mysuru**

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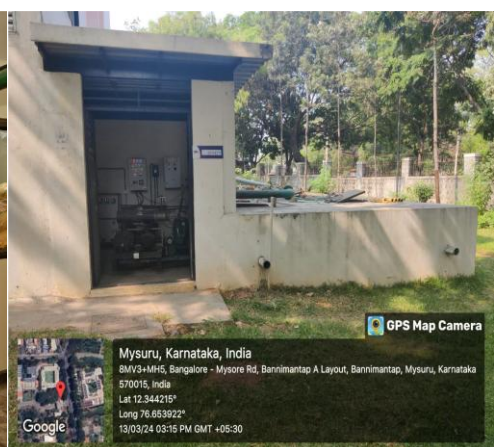
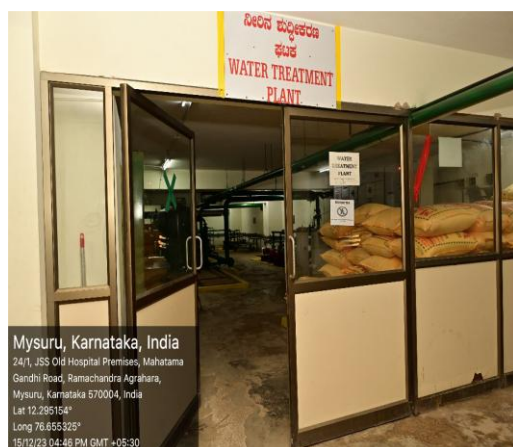
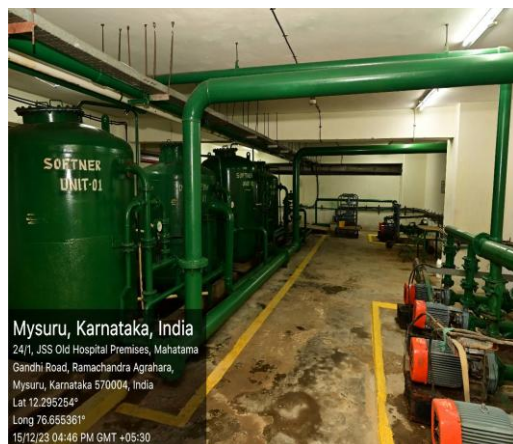


**Sewage water treatment plant at JSS Hospital, JSS AHER, Mysuru**

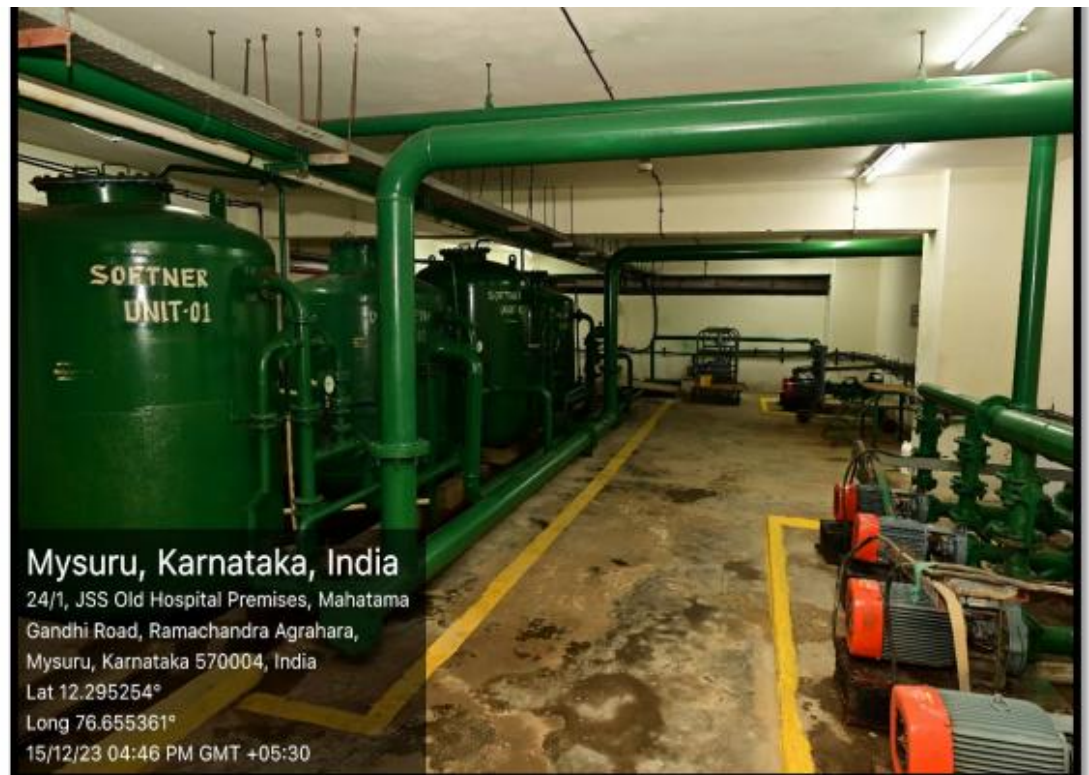
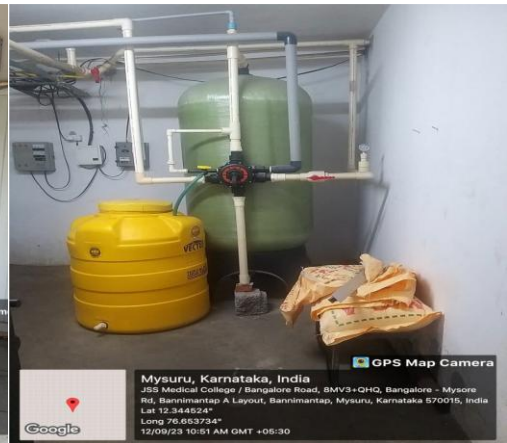




**Sewage water treatment plant at JSS Hospital, JSS AHER, Mysuru**







**Sewage water treatment plant at JSS Hospital, JSS AHER, Mysuru**





**Wastewater treatment units at JSS AHER, Mysuru**



**Secondary clarifier unit of water at JSS Hospital, JSS AHER, Mysuru**

## 2. Reuse of RO Rejected Water



- **Infrastructure:**

- A **10,000-liter capacity tank** has been installed to store and reuse wastewater generated from Reverse Osmosis (RO) systems.

- **Process:**

- RO rejected water, often considered waste, is repurposed for gardening and landscaping around the campus.

- **Impact:**

- Reduces wastewater generation.
- Demonstrates responsible water management by utilizing RO rejected water for sustainable practices.



### 3. Advanced Wastewater Treatment for Laboratories and Clinical Facilities

- **Disinfection Units:**

- Infected wastewater from laboratories and clinical practices is treated at the source using **approved disinfection units**, ensuring the elimination of pathogens.





## Wastewater disinfection unit at JSSAHER, Mysuru

- **Main Treatment Plant:**

- Treated wastewater is then channeled to the main STP, where advanced technologies such as **Activated Sludge Processes**, **Dissolved Air Flotation (DAF)**, **Anaerobic Reactors with Bio-Towers (ARBiT)**, and **Membrane Filtration** are employed to achieve high-quality standards for reuse.

- **Applications:**

- Recycled water is used for **gardening, landscaping, sports ground preparation, and construction activities.**

### Key Outcomes and Benefits

1. **Environmental Sustainability:**

- Comprehensive wastewater treatment reduces the university's reliance on external water sources and conserves freshwater resources.
- Treated wastewater is effectively reused for non-potable applications, minimizing waste and contributing to sustainability.

2. **Compliance with Regulatory Standards:**

- Adherence to local pollution control guidelines ensures safe treatment and reuse of wastewater.

3. **Reduction in Environmental Footprint:**



- Implementation of advanced technologies minimizes the university's water consumption and promotes eco-friendly practices.

## **Community and Educational Initiatives**

### **1. Awareness and Training:**

- Regular guest lectures and panel discussions, such as the **Environmental Sanitation and Safety** lecture by Dr. Sunitha Singh and the **Global Handwashing Day** event with UNICEF and SIRD, emphasize the importance of wastewater management and hygiene practices.

### **2. Student Engagement:**

- Hands-on training in wastewater treatment and environmental health is integrated into undergraduate and postgraduate curricula to educate future leaders in sustainable water management.

### **3. Research and Development:**

- Ongoing studies, such as the **ICMR-funded project on water quality and health**, further the understanding of water resource management and contribute to policy development.



## CHLORINATION OF WATER SUPPLY SOURCES

Chlorination is a crucial process in providing clean and safe water which supports health by preventing waterborne diseases and improving overall public health.

### Purpose of Chlorination

- Prevents waterborne diseases
- Improves public health

### Implementation at JSSMC & Hospital

Key initiative for safety of patients, staff, and visitors

### Application Stage

Chlorination applied before water enters storage tanks and sumps

### Pre-Chlorination Assessment

Tests water quality before disinfection

### Disinfection Process

Chlorination of stored water in tanks and sumps

### Regular Assessments

Evaluate system efficiency and water quality

### Equipment Inspections

Prevent malfunctions and ensure optimal performance



## CHLORINE WATER TANK



Recent log book for reuse of sewage water:

Paryaavarneer Engineers & Consultants Private Limited											
Log book of JSS Pharmacy College Sewage Treatment Plant (120 KLD)											
Date	Treated water flow meter		Raw sewage pump		Air blower		SBR decant pump				
Time	Flow, m <sup>3</sup>	No.	Start	Stop	No.	Start	No.	Start	Stop	No.	Start
08:00		1	7:30	8:00	1	8:00	1	7:00	7:50		
08:10		2	2:30	3:00	2	3:00	2	2:00	2:50		
08:20		3	9:30	10:00	3	10:00	3	9:00	9:50		
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TOTAL											
SWI	Energy meter final reading		Sodium hypochlorite used in kg		Today's Work Report						
pH	Total energy consumption, kWh		Sodium hypochlorite stock in kg								
1st shift Op	2nd shift Operator										



Paryaavarneer Engineers & Consultants Private Limited											
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Time	Final	Flow, m <sup>3</sup>	No.	Start	Stop	No.	Start	Stop	No.	Start	Stop
00:00			1	7-30	8-00	1	8-00	10-00	1	7-00	7-30
01:00			2	2-30	3-00	2	3-00	5-00	2	2-00	2-30
02:00			3	9-30	10-00	3	10-00	12-00	3	9-00	9-30
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07:00	5167.15										
08:00	5171.25										
09:00	5175.25										
10:00	5179.00										
11:00	5182.88										
12:00	5187.99										
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TOTAL											
SVI	Energy meter final reading		Sodium hypo used in kg		Today's Work Report						
pH	Total energy consumption, kW		Sodium hypo stock in kg								
1st shift Op.	2nd shift Operator										

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01:00			2	2:30	3:00	2	3:00	5:00	2	2:00	2:30
02:00			3	9:30	10:00	3	10:00	12:00	3	9:00	9:30
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05:00											
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07:00	4718.40										
08:00	4722.53										
09:00	4726.73										
10:00	4730.00										
11:00	4734.14										
12:00	4738.15										
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1st shift Op.	2nd shift										

## A Model for Sustainable Wastewater Management

JSS AHER exemplifies a comprehensive approach to wastewater management through its advanced treatment processes, policy framework, and commitment to sustainability. By integrating cutting-edge technologies, policy guidelines, and educational initiatives, the university ensures efficient wastewater treatment and reuse while minimizing its environmental footprint.

These efforts position JSS AHER as a leader in responsible water resource management, demonstrating its dedication to environmental sustainability and compliance with national and global standards.