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Water Conservation and Management Policy

1. Preamble

Noida Institute of Engineering and Technology (NIET), Greater Noida, is committed to the sustainable management of its water resources. This policy outlines the comprehensive framework for water management, conservation, and wastewater treatment and reuse within the campus, aligning with environmental responsibility, government regulations, and green campus initiatives. The institution recognizes water as a finite and precious resource and aims to minimize its consumption, maximize reuse, and ensure responsible discharge.

2. Policy Objectives

i. To ensure reliable and sustainable water availability for all campus operations (academic, residential, and green initiatives).
ii. To promote efficient water utilization across all campus zones.
iii. To implement effective water conservation measures and reduce overall water footprint.
iv. To treat and reuse wastewater to the maximum extent possible, minimizing reliance on fresh water sources for non-potable uses.
v. To recharge groundwater aquifers and contribute to environmental sustainability.
vi. To foster a culture of water conservation among students, faculty, and staff.
vii. To comply with all relevant environmental regulations and local municipal norms.

3. Scope

This policy applies to all water-related activities and infrastructure within the NIET, Greater Noida campus, including water sourcing, storage, distribution, utilization, conservation practices, wastewater treatment, and disposal.

4. Water Management System

NIET employs a robust and sustainable water management system with the following key components:

4.1. Sources of Water

i. **Municipal Supply:** The primary source of water is obtained from the Greater Noida Industrial Development Authority (GNIDA) as a regular and continuous supply.
ii. **Groundwater Extraction:** Supplementary water is sourced through seven strategically installed deep borewells.
    a. **Specifications:**
        i. **Number of Functional Borewells:** 7
        ii. **Pump Type:** Submersible Pumps (Kirloskar, Lubi & Crompton)

iii. **Motor Capacity:** 5 HP, 7.5 HP, 10 HP
iv. **Depth:** Approximately 250–300 feet
v. **Locations:** Plot 14, Ground -2; Plot 19, Ground -2; Backside of B Block -1; Backside of C Block -1; Backside of Girls Hostel -1.

iii. **Rainwater:** Seven rainwater harvesting systems are installed throughout the campus to recharge groundwater and promote eco-sustainable practices.

4.2. Water Storage and Distribution System

NIET maintains a well-integrated storage and distribution system:

i. **Storage Infrastructure:**
   a. **Overhead Water Tanks:**
      i. **Number:** 10 (including 1 for Pharmacy)
      ii. **Total Capacity:** 2,90,000 liters
      iii. **Material:** Reinforced Cement Concrete (RCC)
      iv. **Location:** Atop admin block and hostels
   b. **Underground Water Tanks:**
      i. **Number:** 1
      ii. **Total Capacity:** 1,00,000 liters
      iii. **Material:** Reinforced Cement Concrete (RCC)
      iv. **Location:** Main underground & Opposite near Institute Nursery

ii. **Distribution Network:**
   a. **Piping System:** Combination of UPVC pipelines for durability and reduced leakage.
   b. **Maintenance:** Routine checks and maintenance are conducted to ensure operational efficiency and hygienic standards.

4.3. Utilization of Water in Various Areas

NIET ensures optimized water use across all major application zones:

i. **Drinking Water:**
   a. **Infrastructure:** 60 Water Coolers (80 liters/hour capacity), 7 RO Units (Pure White Titration brand, 1000 liters/hour for 5 units, 500 liters/hour for 2 units).
   b. **Technology:** RO & (RO + UV).
   c. **Locations:** Plot 19 - Block B, Block E, Block D, Girl Hostel; Plot 14 - College Building, Flat Hostel, OM Hostel.
   d. **Maintenance:** All units are covered under Annual Maintenance Contracts (AMC) with Pure White Titration for water quality compliance through routine servicing.

ii. **Washing and Sanitation:** Applied in academic washrooms, hostel bathrooms, and workshop handwashing zones.

iii. **Bathing Facilities:** Located in Boys' and Girls' Hostels.
   a. **Features:** Continuous supply via dedicated pipelines, low-flow showerheads for conservation.
   b. **Hot Water Supply:** Solar water heaters and electric geysers for energy-efficient bathing.

iv. **Gardening and Plantation (Horticulture):**
   a. **Water Source:** Recycled greywater and borewell water.
   b. **Irrigation Systems:** Sprinklers in key landscaping areas.
   c. **Key Locations:** Central Garden, green belt around the campus perimeter, plant nursery.

v. **Miscellaneous Applications:**
   a. **Vehicle Washing:** Located behind Admin Block.
   b. **Air Cooling Systems:** Located in faculty cabins and student hostels on each floor of each block, using water for efficient cooling.
   c. **Fire Hydrants:** Integrated with main underground tanks for emergency operation via motorized high-capacity pump system.

5. Water Conservation System

NIET has implemented a comprehensive water conservation system integrating Rainwater Harvesting (RWH) and a Sewage Treatment Plant (STP).

5.1. Rainwater Harvesting (RWH) System

Seven strategically designed rainwater harvesting systems are established across key zones of the campus to mitigate groundwater depletion and enhance rainwater utilization.

i. **Key Locations of RWH Structures:** Plot 14 – Main Ground - 2; Plot 19 – Main Ground - 3; Plot 19 – Backside of B Block - 1; Plot 19 – Backside of A Block - 1.

ii. **Capacity and Coverage:**
   a. **Average Rainfall in Region:** ~800 mm/year.
   b. **Number of Recharge Pits:** 7 functional pits.

iii. **System Components and Specifications:**
   a. **Catchment surfaces:** RCC rooftops and paved open areas.
   b. **Storage/Recharge Pit:** Concrete ring pit with bore recharge mechanism.
   c. **Pipes and Downspouts:** PVC pipes.

5.2. Sewage Treatment Plant (STP)

NIET has commissioned a Sewage Treatment Plant to treat wastewater from hostels, academic blocks, and washrooms, making it reusable for non-potable purposes.

i. **Location of STP:** Front of A Block near Gate No. 3.

ii. **Plant Capacity and Design:**
   a. **Treatment Capacity:** 190 KLD (Kiloliters per Day).
   b. **Type of Treatment:** Moving Bed Biofilm Reactor (MBBR) process.
   c. **Operational Mode:** Semi-automated with PLC controls.

iii. **Specifications and Process Flow:**
   a. **Equalization Tank:** 60-80 KL RCC tank with agitator.
   b. **MBBR Reactor Tank:** 2 × 30 KL tanks with bio-media.
   c. **Tertiary Treatment:** Pressure sand filter + Activated carbon filter.

d. **Treated Water Tank:** 190 KL RCC tank.
e. **Sludge Handling:** Sludge drying beds with polymer dosing.

iv. **List of Equipment Installed:** Pumps (7 x Crompton 3 HP & 7.5 HP sewage and dosing pumps), Blowers (Twin lobe root blowers from Blowback), PLC Automation Panel (Semi-auto control panel), Filters (Multi-grade and activated carbon filter units).
v. **Sustainability Integration and Reuse:** The entire treated output is used for horticulture and irrigation, and vehicle washing and pavement cleaning zones.

6. Wastewater Management System

NIET has implemented a well-integrated Wastewater Management System for responsible handling, treatment, recycling, and disposal of wastewater.

6.1. Sewage Treatment Plant (STP) - (Reiteration from Section 5.2 as backbone)

The campus features a dedicated wastewater recycling system that treats greywater from hostels, academic washrooms, and canteen facilities.

i. **Location:** Front of A Block near Gate No. 3.
ii. **Treatment Capacity:** 190 KLD.
iii. **Treatment Technology:** MBBR (Moving Bed Biofilm Reactor) with PLC-controlled semi-automated operation.
iv. **Treated Output Usage:** Gardening and cleaning.
v. **Equipment Installed:** Pumps (7 x Crompton 3 HP & 7.5 HP sewage and dosing pumps), Blowers (Everest twin-lobe blowers for aeration), Control Panel (Semi-automatic PLC panel), Filter Units (Multi-grade filter + Activated Carbon filters).

6.2. Recharge of Wastewater

NIET incorporates groundwater recharge of excess treated wastewater through specially designed recharge pits to maintain aquifer levels and prevent waterlogging.

i. **Recharge Pit Locations:** Plot 14 – Main Ground - 2; Plot 19 – Main Ground - 3; Plot 19 – Backside of B Block - 1; Plot 19 – Backside of A Block - 1.
ii. **Components Installed:** Filtration chambers, monitoring well with flow meter, geo-textile lining and silt arrestor traps.

6.3. Supply to Sewage System

For wastewater beyond internal treatment capacity or during peak periods, NIET connects its effluent to the municipal sewage infrastructure in compliance with GNIDA norms.

i. **Flow Control:** Manual sluice gate and non-return valve.
ii. **Compliance:** GNIDA-approved connection and design drawings.

7. Sustainability Initiatives

NIET is committed to ongoing sustainability efforts to further enhance water conservation:

i. **Expansion of rainwater harvesting systems:** Continuous efforts for implementation in ongoing and new buildings.
ii. **Student and faculty awareness campaigns:** Regular initiatives to promote water conservation practices and responsible water use among the campus community.
iii. **Regular Monitoring and Auditing:** Periodic monitoring of water consumption, system efficiency, and water quality to identify areas for improvement and ensure compliance.
iv. **Adoption of Water-Efficient Fixtures:** Gradual replacement of existing fixtures with low-flow and water-efficient alternatives in washrooms, kitchens, and other areas.
v. **Research and Development:** Encourage and support research in water conservation technologies and practices within the institution.

8. The Institute Infrastructure Maintenance & Sustainability Committee (IIMSC):

Responsible for overseeing and guiding the overall strategy for the institute's infrastructure, including water management systems, ensuring sustainability and long-term maintenance.

Responsibilities

i. **Administration Department:** Overall responsibility for the implementation and maintenance of the water management system, including infrastructure, equipment, and compliance.
ii. **Engineering and Maintenance Department:** Responsible for routine checks, repairs, and efficient operation of borewells, storage tanks, distribution networks, RWH systems, and STP.
iii. **Horticulture Department:** Responsible for efficient irrigation practices using treated water and implementing water-saving landscaping techniques.
iv. **Faculty and Staff:** Responsible for promoting and practicing water conservation in their daily activities and educating students.
v. **Students:** Encouraged to adopt water-saving habits and participate in awareness campaigns.

9. Policy Review

This policy will be reviewed as needed, to ensure its effectiveness, relevance, and compliance with changing regulations and best practices in water conservation and management.

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