



BATANGAS STATE UNIVERSITY'S (BATSTATEU'S) POLICY GUIDELINES FOR SUSTAINABLE DEVELOPMENT



landscaping projects of the university to encourage local biodiversity.

1.1.2.8 The University shall encourage establishment and protection of botanical gardens and arboretums whenever feasible.

1.1.2.9 Indiscriminate introduction of plants and animals as in the case of, but not limited to, random dispersal of seeds and release of animals within the campus shall not be permitted.

1.2. Water Usage and Care

The following are the specific policy guidelines for better wastewater management on the different campuses of the University:

1.2.1 Water Usage and Conservation Management

1.2.1.1 Inspection and monitoring of the water distribution system (faucets, bidets, water closets, toilet flush and pipes) shall be ensured so that no unused water leakage is wasted. Metering and other measures to detect water leakage shall be used to ensure water conservation. Reporting of leakage to the Project and Facilities Management Office (PFMO) must be done immediately for prompt action.

1.2.1.2 Regular monitoring of water consumption per building and reporting the total water usage of different campuses shall be practiced.

1.2.1.3 In the procurement of plumbing fixtures and fittings, buying water-efficient ones (water closet with dual flush, low-flow faucets or bidets, etc.) shall be prioritized.

1.2.1.4 High-pressure but low-volume spray nozzles on spray washers for cleaning the University vehicle, driveways, pathways, or pavements shall be installed.

1.2.1.5 A rainwater harvesting facility to maximize the use of available water shall be established.

1.2.1.6 The use of treated wastewater, harvested rainwater and the water from fountains for cleaning, flushing purposes and car washing shall be maximized.

1.2.1.7 Insofar as practicable, non-toxic bricks or plastic containers shall be placed in a toilet tank to reduce the amount of water used per flush. A toilet dam that creates a reservoir of water when the toilet flushes shall also be utilized in place of the displacement device.

1.2.1.8 A water efficiency management plan for the plumbing and piping system of the water being released in the water retention facility shall be developed.

1.2.2 Water Quality Monitoring

1.2.2.1 The number and location of university-wide water sampling stations based on the proximity of the campuses and possible sources of contamination shall be established. The sampling stations shall include university deep wells, artesian wells, aquifers, water districts and similar bodies of water.

1.2.2.2 A regular sampling and analysis of environmental water quality parameters using the approved and/or Standard Methods for Examination of Water and Wastewater shall be conducted.

1.2.3 Wastewater Treatment Facility

1.2.3.1 Wastewater generated from buildings shall be collected. *Provided, however, That* applicable treatment prior to its disposal through the Sewage Treatment Plant (STP) whose effluent complies with general effluent standard set by Department of Environment and Natural Resources through DENR AO 2016-08 is in place.

1.2.4 Discharging of Wastewater

1.2.4.1 Generated wastewater from the comfort rooms shall be directly discharged in a septic tank and regularly siphoned by a DENR Accredited TSD Facility.

1.2.4.2 Generated liquid waste from the laboratory in terms of liquid shall be properly stored, collected, and managed through EMU Office, then it shall be transported, and treated by a DENR-approved Treatment facility.

1.3. Wildlife Protection

1.3.1 An ecosystems-based approach to campus development shall be pursued by the University to ensure healthy and sustainable coexistence of the University population with the biodiversity on campus.

1.3.2 Conservation and protection of wildlife species and their habitats shall be paramount to promote ecological balance and enhance biological diversity.



BATANGAS STATE UNIVERSITY

The National Engineering University

WATER TREATMENT REPORT

14,289 m³

Volume of Treated Wastewater

The University has an SBR-type STP with seven lifting stations and five chambers. It treats sewage from various buildings and discharges treated wastewater for non-potable uses. Wastewater quality is monitored to comply with DENR standards.



Source: Environmental Management Unit

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BATANGAS STATE UNIVERSITY

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SEWAGE TREATMENT PLANT

(SEQUENCING BATCH REACTOR)



The Sewage Treatment Plant plays a vital role for sustainable wastewater management and ensuring public health protection. This facility is designed to collect and treat wastewater generated by buildings and ensures its safe disposal. By subjecting the wastewater to different treatment processes, the treated effluent is ensured to meet the standards set by the Department of Environment and Natural Resources which is outlined in **DENR AO 2016-08** and **DENR AO 2021-19**.



300 m³

CAPACITY

Sewage Treatment Plant is positioned behind the Higher Education Building. The facility operated continuously, functioning 24 hours a day to provide efficient treatment of wastewater generated from various activities within the campus premises, which includes the usage of comfort rooms, baths, kitchens, and other areas where water consumption occurs.



The **treatment process** at the facility consists of six distinct stages, each playing a crucial role in the overall function of the plant. This provision of the STP in the school conforms to the **Target 6.3 of Sustainable Development Goal No. 6: Clean Water and Sanitation** that focuses on the improvement of wastewater treatment and **Target 14.2 of Sustainable Development Goal No. 14: Life Below Water** that centers on marine and coastal ecosystem protection

PROCESS

The operation starts at the tail end of the primary sewer line of every building, where the wastewater converges from the **lifting stations** to the main lifting station of the Sewage Treatment Plant. Those significant portions of the wastewater funnelled into the STP is coming from the usage of comfort rooms. The overall process consists of **six (6) distinct stages**, each of which plays a critical role in the plant operations.

6 DISTINCT STAGES

7 LIFTING STATIONS

The **plant's equalization tank** is a critical component which is a key element that is kept in a constantly aerated condition through submerged aeration, made possible by strategically positioned coarse bubble diffusers. It utilizes 2 Hp Submersible Sewage Transfer Pumps, one for SBR-1 and another for SBR-2. With the provision of the quick disconnect system, the other pump is easily transferable to the other port by the operator in case of the breakdown of the other pump. Also, installment of liquid level control is included for the regulation of pumps.

PUMPS



Those lifting stations that are deliberately positioned for easing the upward movement of wastewater thru submersible pumps.

Source: Environmental Management Unit - PB

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SEWAGE TREATMENT PLANT

(SEQUENCING BATCH REACTOR)

The **Sequencing Batch Reactor (SBR) tank** functions in a dual purpose mechanism as it also becomes an equalization basin and treatment vessel during the filling phase and subsequent cycles, respectively. In this system, processing water to become less concentrated the Sequencing Batch Reactor (SBR) tank functions in a dual purpose mechanism as it also becomes an equalization basin and treatment vessel during the filling phase and subsequent cycles, respectively. In this system processing water to become less concentrated.

Then, the **chlorination tank** follows wherein the one-step chlorination as a final stage takes place as it serves as a potent disinfection process. The killing of harmful microorganisms such as bacteria, viruses, parasites and other potentially harmful microbes present in the wastewater is being performed in this step to discharge a safe effluent.

EQUALIZATION TANK



SBR TANK



CHLORINATION TANK



Then, an effluent sampling is being conducted as one of the stringent quality control measures in order to monitor the compliance of the facility to the standards included in **DENR AO 2016-08** and **DENR AO 2021-19**. There is also a designated Water Retention Facility that will store the effluents coming from the STP and being discharged into the nearby canal to complete the process.

QUARTERLY

EFFLUENT SAMPLING



On a weekly basis, a manual cleaning of lifting stations is performed. This action is made to alleviate the potential occurrence of clogging and inconvenience in the system. This maintenance duty is vital to the performance of the equalization tank that serves as a buffer and accumulates raw wastewater coming from each lifting station. Furthermore, it also regulates flow, prevent hydraulic shock, improves pumping efficiency, produces preliminary settling and prevention of operational issues in the STP especially in the upstream treatment system. Introduction of enzymes is being executed in this tank for mitigating of odor, and aeration that is meant for aerobic biodegradation of pollutants.



Source: Environmental Management Unit - PB

WEEKLY
MANUAL CLEANING

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