

SEWAGE TREATMENT AT PRINCESS UNIVERSITY NOURAH BINT ABDULRAHMAN

The sewage treatment plant is used at Princess Nourah Bint Abdulrahman University Technology membrane bio-reactor (MBR) in wastewater treatment, where the energy maximum absorptive capacity of the plant, which started its activity in the first quarter of 2012, about 10,400 thousand cubic meters per day, according to a plan to reach the absorptive capacity in the future to 13,000 cubic meters per day.

The wastewater is received from the sewage network and the water pumping stations in the university in the sewage treatment plant, and the treated water is pumped from the station to the main irrigation water tank in the service area, where this water is used for irrigation purposes at the university, in addition to the existing water treatment membranes. In the station equipped with tanks, equipment and various equipment. As well as a control system for this station and a laboratory for analyzing water samples and quality control, which produces high-quality water sterilized with chlorine according to the required concentrations before pumping it into the irrigation tank, and the production of the sewage treatment plant from treated water ranges between 2500 to 3500 cubic meters per day, depending on the occupancy rate at the university, as production decreases during the university summer vacation.

[There is also a wastewater connection line from the King Abdullah Petroleum Studies and Research Center building with the station, where all the wastewater generated from the center is treated in the university's](#)

[sewage treatment plant, and the quantities of water that are treated during the current period are about 300 meters.](#)



Figure(1)

Environmental Sustainability Department

Energy management:

- - Activation of BMS building management system for building energy management
- - Check the performance efficiency of the cooling plant, pumps and heaters
- - Construction of wind and solar power plants
- - Review the operation of pumps and heaters and ensure that they are suitable for energy policies
- - Follow-up project (rationalization) to monitor the consumption of electricity and appropriate solutions to avoid it
- - Check automatic lighting sensors and ensure the efficiency of their work

Water management:

- - Ensure that the procedure and results of periodic examination of drinking water and use
- Review the operation and distribution of grey water plants
- Introducing products and practices that will reduce water use for irrigation and use

Environmental management:

- - Conducting an internal air quality check in buildings
- Review of collection and waste disposal procedures and their suitability for standard environmental management policies
- - Providing awareness courses in colleges to deal with waste
- Field noise tests
- - Develop policies aimed at reducing the use of carpets and curtains in buildings
- - Ensure the amount of natural and electrical lighting and the appropriateness of the type of headquarters
- - Ascertain the quantities used of pesticides, fertilizers and cleaning fluids

Garden management:

- Administrative supervision of the operation of gardens
- - Provide a study on the current need for gardens and afforestation in the university city
- Replanting desolate areas
- - Work a new aesthetic design for afforestation and green spaces and adopt and implement it
- Review periodic maintenance schedules for irrigation systems.

Setting and Infrastructure

The campus configuration and infrastructure information will provide the basic information for the university's consideration of the green environment. This indicator also shows whether the campus deserves to be called a Green Campus. The objective is to make the universities provide more spaces for vegetation and safeguard the environment, as well as the development of sustainable energy.

In order to maintain the environmental design approach, selected sustainable design criteria related environment and architecture design have been applied.

The hub and architectural design methodology of the university is fully consistent with standards of sustainable buildings and also compatible with climatic conditions and geographical location.

A 13% reduction in the total heat gain of buildings envelope for the academic buildings in Princess Nora University has been achieved. Local hurymullah and najd stones from the cities of Riyadh and Taif were used for the facade which was then covered by an Islamic art shading design. The wall contains comprised aluminum curtains, architecture cast-in-place concert canopies and glass-fiber reinforced concrete shading screens.

Unit on water protection and conservation

PNU has a unit on water protection and conservation. The unit must supervise and conduct a series of maintenance and inspection of water savings. Some of their task are as follows:

- Inspection each single piping layout within the campus for the routine works.
- Reports any failure/problem incurr during the utility bill record.
- Conduct a series of self-monitoring within the zoning and perimeter of water coverage.
- Training staff for the competencies of water works.
- Analyze the water saving level each month.
- Yearly workshop/meeting for the improvement of data collection.
- Promote the sustainable water conservation and protection.

The purpose at PNU Sewage Treatment Plant is to Treat the total raw sewage that will be collected from various university applications, both of suspended solids and biodegradable organic matters will be reduced through the treatment stages to an acceptable limit. The plant is capable to produce treated water that meets water reuse standards in volume and quality. All the treated effluent are used for irrigation with an average of 3500 m².

Water Conservation Program Implementation

Princess Nourah University has opted for policy formulation leading to the implementation plan and water conservation guidelines at the university.

Dear Villa Occupants,
As we consider Occupants' cooperation and support is a crucial element of success to the Energy Conservation Program, below are several energy saving habits, and it is appreciated if they are circulated and encouraged between building occupants:

- Keep healthy Air-conditioning thermostat setting ranges in your space (20°C-24°C).
- Make sure to turn-off the lights when leaving your villa.
- Make sure to set Air-conditioning temperature to 28 °C when leaving for long periods.
- Keep responsible use of water as a priority & water-saving as a lifestyle.
- Kindly do not waste water on activities such as: Irrigation and Floor cleaning using hoses; protecting water is our shared responsibility.
- Please note that water-use for manual car-washing is prohibited.
- Make sure to turn-off equipment when not used and avoid stand-by mode whenever possible. ("Shut down" takes a second, but makes a difference)
- Kindly cooperate with maintenance personnel; their job is for your service and benefit.
- Avoid opening windows in Air-conditioned spaces, as it disrupts air-balance, alters inside air conditions, and causes unnecessary loss of cooling energy.



Brochures posted as an energy conservation program which support the water conservation program
