# Integrated Water Resources Management Practices at the Universidad Autónoma de Occidente

Universidad AUTÓNOMA de Occidente

ACREDITACIÓN INSTITUCIONAL DE ALTA CALIDAD
Vigilada MinEducación.
Res. No. 16740, 2017-2021.

# Introduction

In September 2010, the Universidad Autónoma de Occidente (UAO), developed and implemented a corporate environmental management model.

In 2015 the University launched, the "Sustainable Campus" program articulating actions and projects generated by faculties, research groups and the internal operation areas of the University.

Finally, in 2016 “Sustainable Campus” consolidated itself as a program addressing 8 components, one of them is efficient an rational use of water.

Sustainability is a focus at UAO.

CAMPUS SOSTENIBLE
UNIVERSIDAD AUTÓNOMA DE OCCIDENTE

# Integrated Water Resources Management at UAO

The Integrated Water Resources Management concept is at the core of the university environmental policy.

The UAO provide all water services without any support from the municipal water works company, while fulfilling all environmental regulations related to drinking water treatment and supply, and wastewater treatment and reuse.

The IWRM system is composed of:

- The deep well for groundwater supply
- The drinking water plant
- Hydraulic and sanitary installations
- Sanitary sewerage
- The wastewater treatment plant (includes biosolid treatment and management)
- Pluvial sewerage
- Rainwater storage pond.


# The drinking water supply system

The university drinking water supply system takes raw water from a deep well of 143 meters with a vertical pencil-type pump located 42 meters from the surface.

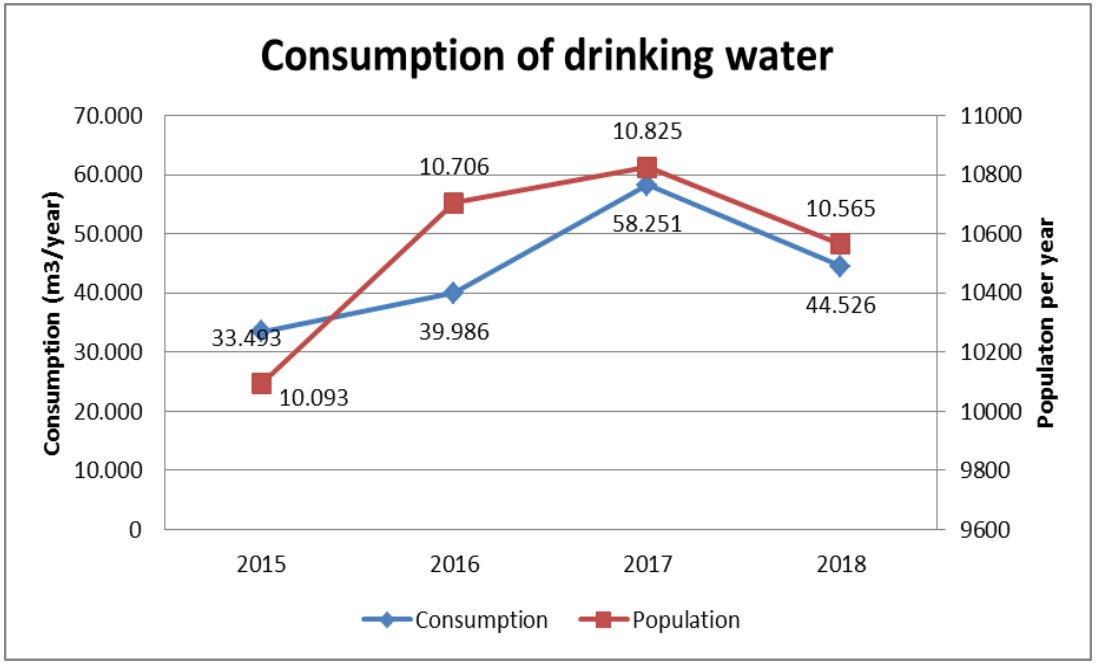
The Potable Water Treatment Plant (PWTP) was designed to work at high load, with a capacity of 480 GPM for a population equivalent to 9.000 people.

The drinking water treatment is carried out through the following unit operations: sand filtration, storage and chlorination.

# The drinking water supply system

In the year 2017, the highest consumption was presented due to a high number of academic events held by the university and to civil works undertaken in that year for infrastructure improvement.

Similarly, in 2018 there was an effect on water consumption taking into account the behavior that occurred in the previous years (2015 - 2016).



# The wastewater treatment plant

The University has a wastewater treatment plant (WWTP) that treats the wastewater produced by bathrooms and kitchens of the campus and the chemical waters from the laboratories located in the basement of the central building (Q=1,55 $Ls^{-1}$).

In the case of chemical waters from laboratories located in the basement and semi-basement of the central building, they are stored, neutralized and then conducted to the WWTP in small doses for treatment.

The wastewater is conducted by a sanitary sewer system, which works by gravity, to a stabilization tank.

# The wastewater treatment plant

The WWTP is conformed by the following operation units:

- Coarse solid removal grids
- Primary sedimentation
- Grease trap
- Aeration tank (i.e. mechanical aeration)
- Secondary sedimentation
- Rapid sand filtration
- Compact ultraviolet light disinfection system
- Treated wastewater storage tank for subsequent use in campus gardens irrigation
- Treated wastewater discharge system
- Four drying beds for the biosolids treatment. Once the biosolids have been dried, they are mixed with organic solid waste produced in the kitchens for a composting process.

# Rainwater management and recycling water program

The rainwater falling on roof and on paved areas the university campus are conducted through a storm sewer system to a storage tank with has a $600m^3$ volume capacity.

With regard to the water recycling program, the university currently establishes formal policies focusing on the use of recycled water for the irrigation of gardens and sports areas exclusively.

30% of the wastewater treated in the WWTP is also used in the irrigation of gardens and sports areas of the campus.

# Concluding Remarks

Since 2010 the UAO has implemented an environmental university management plan in order to have a campus operation which fulfill all environmental legal requirements imposed by the regional environmental authority. As an evolution of this environmental management plan, the university launched in 2015 the Sustainable Campus Program in order to strength the university commitment in relation to sustainability and to sustainable development.

IWRM is a key component in the Sustainable Campus Program. The university is autonomous in all water management aspects, from drinking water supply for all activities to wastewater treatment and reuse, including rainwater.

The main challenges for the next few years in terms of IWRM are: i) increasing the efficiency in water uses through the reduction of water consumption per capita, and ii) increasing the reuse of treated wastewater in uses different from gardens irrigation.

# References


- Universidad Autónoma de Occidente, 2018. Informe general de la Gestión integrada del Recurso Hídrico durante los últimos 4 años en la Universidad Autónoma de Occidente

- Universidad Autónoma de Occidente, 2016. Políticas para el uso eficiente y racional del recurso hídrico en la Universidad

- Programa Campus Sostenible, 2018. Reporte anual de Sostenibilidad. Universidad Autónoma de Occidente

- Universidad Autónoma de Occidente, 2013. Manual de Agua Potable de la Universidad Autónoma de Occidente

- Universidad Autónoma de Occidente, 2013. Manual Sistema de Tratamiento de Agua Residuales de la Universidad Autónoma de Occidente

Universidad AUTÓNOMA de Occidente

ACREDITACIÓN INSTITUCIONAL DE ALTA CALIDAD
Vigilada MinEducación.
Res. No. 16740, 2017-2021.

# CAMPUS SOSTENIBLE

## UNIVERSIDAD AUTÓNOMA DE OCCIDENTE