

## Sequencing Batch Reactor



### A clean environment for the families of a remote Colombian community

#### Project: WWT Plant of Vereda Mochuelo Bajo, Columbia

Home to 4,500 residents, the Colombian community of Vereda Mochuelo Bajo is located next to the large Doña Juana municipal landfill, high in the mountains at an altitude of over 3,000 meters (9,900 feet). Isolated from any centralized sewage infrastructures, the citizens of Mochuelo have relied on the most basic wastewater disposal practices for many years. Residents, local businesses, the school, churches and the hospital disposed of their wastewater by “free discharge” – wastewater was directed via various sewage pipes and discharged untreated directly into a nearby stream and eventually into the already highly polluted Tunjuelito River.

The government of the municipality of Bogota has recently led an effort to help communities such as Mochuelo by providing more adequate public services and infrastructures.

A property of the Bogota Aqueduct Enterprise, ECOTECH System in Bogota was awarded the contract to build, operate and manage a 432 m<sup>3</sup>/d Ecoprocess™ SBR biological sewage treatment plant designed by Premier Tech Aqua (PTA) – an international leader in onsite wastewater treatment with over 25 years of expertise in SBR technology.

#### Challenges

At such high altitude, oxygen levels were very low and temperatures cold year-round. Blowers would need to be sized specifically to accommodate the oxygen solubility related to altitude and the sludge production rate related to ambient temperatures.

The mountainous terrain of the area provided very little thus flat land and space for a wastewater treatment plant was thus limited. The solution would need to be compact and odorless as it would be installed near the town’s borders and residents – a population affected for years by strong odours emanating from the landfill and all too familiar with their inconveniences.

The general operations of the plant would be supervised by ECOTECH Systems in Bogota with the support of Premier Tech Aqua in Canada, but required the support of a local operator to assure the weekly sampling requirements and inspections. Without the availability of an experienced technician on site, operations would need to be simple enough to be handled with minimal personnel requirements for control and maintenance.





## Solution

PTA designed an Ecoprocess™ SBR Treatment Plant and provided certain process equipment in addition to pre and post treatment units. PTA provided a flexible scope of supply to ECOTECH Systems, which allowed the contractor to purchase equipment from a greater number of local suppliers and further reduce the overall cost of the project.

Marrying flexibility and robustness with ease of operations, the solution consists of one Ecoprocess™ Sequencing Batch Reactor (SBR) designed to handle typical domestic sewage with BOD<sub>5</sub> of 250 mg/L. Entirely automated using Ecoprocess™ SBR technology and operated by a fully-programmed PLC control system, operations do not require constant attention from a highly-trained technician. Integrating the treatment of wastewater and sludge together in a single tank, the control system operates the reactor using the best sequence, maintains recommended conditions for the treatment and manages all alarms automatically, regardless of operator competence or presence.

The current operator is a citizen of Mochuelo who required only a few hours of training by PTA to learn how to perform all weekly environmental samplings of the mix liquor and visual and mechanical inspections of the pumps and diffusers.

At the heart of the treatment is the SwingCanter™ – a PTA-designed and non-mechanical, low-maintenance solid-exclusion floating decanter equipped with an integrated scum control system –, which removes water from the surface of the basin and drains it by gravity into a receiving stream.

## Results

### Wastewater characteristics and effluent quality from Ecoprocess™ SBR

Parameters	Influent	Effluent
BOD <sub>5</sub>	175 mg/L	≤ 40 mg/L
TSS at design flow	100 mg/L	≤ 40 mg/L

The Ecoprocess™ SBR system of Vereda Muchuelo Bajo was commissioned in 2009 and continually treats up to 432 m<sup>3</sup>/d with high efficiency today.

## Additional advantages

- Robust system ensuring both proven performances and simple, low-cost operations.
- Experienced team of process engineers and technical advisors from PTA providing expert advice and exceptional support throughout the project – before, during and after the start-up of the treatment plant, via telemetry.

*“The Mochuelo WWT plant has been in operation since 2009 and has never presented any problem with equipment, with operations or with the process itself. The effluent water analysis has provided consistent results of 97% removal of BOD and TSS from the start. The team at Premier Tech Aqua provided very professional and efficient support to ECOTECH, not only for this Mochuelo plant, but also for other projects and requirements when proposals were requested by other municipalities in the region interested in their SBR technology.”*

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