

Water Re-Use and Conservation Project Sets a New Standard in the Caribbean

Sustainable Solutions

Client

iPR Pharmaceuticals, Inc.

Location

Canovanas, Puerto Rico



iPR Pharmaceuticals, a division of AstraZeneca, commissioned CH Caribe, CH2M HILL's affiliate in Puerto Rico, to develop water saving strategies for the company's plant in Canovanas, Puerto Rico.

The project was necessary to reduce the iPR facility's dependence on the heavily burdened water infrastructure owned by the Puerto Rican government. Because the project was able to reduce iPR's dependence on the government's water system, it is regarded as a model for other facilities seeking to improve conservation.

The client was looking for ways to conserve and re capture as much water as possible for use within its own facility, a major pharmaceutical plant. The facility's existing system recovered some water through sources such as reverse osmosis (RO) rejects, cooling tower blowdown, rain water, and well water. The recovered water was then chlorinated and used in the cooling towers. The main challenge of this project was to address the variation in the quality of the water that was being captured for reuse. Re-capturing cooling tower blowdown as well as using well water provided hardness and silica problems that had to be mitigated through dilution with rain water or rejection of the high-solids water. Several simulations were made with different water sources to determine the optimal mix. Further, CH Caribe worked with the plant to optimize the cooling tower blowdown cycles and the RO rejection.

The Water Re-Use and Conservation project design included the installation of a new 3.79 million-liter (1 million-gallon) water storage tank; optimization of cooling tower cycles of concentration and re-use of the facility storm, air-handling-unit condensates, and RO reject waters for cooling tower operation; minimizing dependence on the Puerto Rico

Aqueduct and Sewer Authority (PRASA) supply; and providing 113,600 liters (30,000 gallons) of additional reserve for fire protection at the facility.

The project won a Best Water Conservation Project award from the Energy Alliance of the Puerto Rico Manufacturers' Association. It was also recognized for excellence in water conservation, energy, and renewable energy.

Sustainable Components

- The new water blending system enabled the facility cooling tower cycles of concentration to increase from 4.5 to 6.5. This reduced water consumption by an average of 26,500 liters per day (7,000 gallons per day) for the cooling towers' make-up water use.
- The project used the facility's existing stormwater pond, previously installed to comply with National Pollutant Discharge Elimination System regulations, to provide filtering and chlorination facilities for stormwater reuse.
- The average savings in consumption of PRASA-provided water after the project's implementation is 63 percent, with maximum savings during the rainy season of up to 100 percent.
- Implementation of the water re-use and conservation strategies has saved the iPR facility approximately US\$264,000 per year in water/sewer services. Assuming an annual interest rate of 5 percent, the project will be paid for in approximately 20 years.

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