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Aruba Solves Wastewater Overload

Soon after tourism started in Aruba in the 1960s, the first wastewater treatment plant on the island was built near a neighborhood of hotels on the western side of the island in the town of Bubali. It was until the mid 1990s that this plant had to be expanded to keep up with the growing influx of wastewater from the continuously expanding tourism industry.

About 2-to-3 percent of the wastewater needed to be deposited into the ocean through an open gutter at the eastern side of the island on account of the volume increase – a region of the ocean that was close to a refinery. The rest of the wastewater that wasn't treated at the Bubali plant was individually collected in home cesspools.

According to Department of Public Works Aruba Project Manager of Planning & Designing Giovanni Tromp, the influent of wastewater from the growing nation became overwhelming. "Because of the increasing tourism industry in the nineties and beginning of the new millennium, [the Bubali plant] had to be expanded again," Tromp said.

Today, however, the island is fully equipped to handle the entire country's wastewater flow. The expansion of the Bubali plant and the installation of two new state of the art SBR treatment plants featuring 13 Aquastore® structures are now successfully treating 100 percent of Aruba's centrally-located or trucked wastewater. Completed in September 2008, the new facilities helped save the Aruban government millions of dollars in installation costs, expedited the construction schedule and reduced projected O&M costs.

RESIDENT, TOURIST COMPLAINTS SPUR A CALL TO ACTION

According to Matt Whelchel of Florida Aquastore, it was important to expand the wastewater system on the island because their main source of business is tourism. "The aesthetics of their hotels, beaches, reefs and waterways are essential to the survival of the economy," said Whelchel. "Despite all of this, they only had one wastewater plant on the entire island and it was located in a hotel district."

Witteveen + Bos, a Dutch consulting firm working with Aruba, drew up a wastewater "master plan" in 1997 that estimated the amount of wastewater the country would need to treat each year up to 2015. Ab Reterink, project manager with Witteveen + Bos, was surprised to find that the island exceeded its capacity much sooner than anticipated. "It appeared that the amount of concentrated wastewater collected from septic tanks and cesspools by means of vacuum trucks was considerably larger than expected," Reterink said.

According to Tromp, complaints were beginning to surface on account of the over-utilized wastewater treatment plant. "We would get complaints [on smell] from one of the smaller hotels which was quite close to the Bubali plant," Tromp added.

FLORIDA AQUASTORE EXPANDS ISLAND'S WASTEWATER TREATMENT



In 2005, DOW Aruba issued an international tender for the design and construction of two sewage wastewater plants located away from the hotel district, as well as an expansion of the original Bubali plant. The basic designs and tender documents were prepared by Witteveen + Bos, foregoing the international tendering. The Bubali aeration plant would continue treating domestic wastewater from gravity sewer lines. The septic wastewater delivered via septic trucks would be diverted to a new sequence batch reactor (SBR) plant located near the landfill of Parkietenbos. A third SBR plant would be built in the town of San Nicholas to treat wastewater from the eastern side of the island, fed through a gravity sewer line.

Tromp felt the SBR units would diminish the odor experienced by Bubali residents and tourists with the over-extended plant. "The transportation [of septic waste by truck] is a new cost, but on the other hand, the transportation of the dewatered sludge from Bubali is eliminated," Tromp said.

Whelchel said there were two main factors involved in the DOW's decision: cost and longevity. A highly corrosive salt water/air mixture called salt spray quickly corrodes nearly all exposed materials of construction, including high-grade stainless steel. According to Whelchel, glass-fused-to-steel is one of the few tank coatings to stand up to the corrosive power of salt spray and do so cost-effectively.

After a long deliberation, Whelchel and Florida Aquastore, together with local contractors Albo and Croon, were awarded the contract and saved the Aruban government \$4 million over the next lowest bidder. "Dollar-wise, this was our biggest job ever, and certainly most difficult," Whelchel said. "It was a challenge for us, but with our experience in the area, we knew we could do it."

Reterink was commissioned by DOW Aruba to be the engineer for the project. "In my view it was possible to reconstruct the existing Bubali plant and to build two new plants at the same time according to the contractual schedule," Reterink said.

A WASTEWATER-FREE COMMUNITY

The Bubali plant capacity was increased by 750 m³/h with the addition of a 104'x15' clarifier tank and a 25'x19' sludge storage tank. Existing equipment was also updated.

Whelchel said the installations at the San Nicholas SBR plant was designed to handle domestic wastewater coming from nearby areas at a flow rate of 430 m³/h. Five tanks were installed on the site.

The septic wastewater treatment plant at Parkietenbos was designed to handle wastewater trucked in by vac-trucks up to a flow rate of 275 m³/h. A total of six tanks were installed on the site, including a sludge dewatering system and handles sludge trucked in from the Bubali and San Nicholas plants.

Given the time frame and cost, Whelchel believes Aquastore was the best choice for the Aruba project. "I do not believe that the demands set by the DOW Aruba could have been satisfied by a concrete or welded tank."



Reterink was also satisfied with the results. “No untreated wastewater is disposed directly into the sea,” Reterink said.

“It really feels good when the work you do benefits a population on multiple levels – or in this case, an entire nation,” Whelchel said. “We feel our tanks address a real economic and environmental threat to the island, and we can’t really ask for a better result than that.”

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