

Kailua Regional Wastewater Treatment Plant

Design Data

Location: **Kailua, Hawaii**

Startup date: **1965**

Service population: **106,000**

Number of employees: **750 employees in the City and County of Honolulu Department of Environmental Services**

Design flow: **106 million L/d (28 mgd)**

Average daily flow: **53 million L/d (14 mgd)**

An aerial photograph of the Kailua Regional Wastewater Treatment Plant. The facility is a large industrial complex with several large circular tanks, rectangular buildings, and a network of pipes. In the background, a large green mountain rises above a residential area. The sky is clear and blue.

The Kailua Regional Wastewater Treatment Plant provides preliminary, primary, and secondary treatment. It was built in 1965 to serve the town of Kailua and the surrounding communities.

In 1994, water resource recovery facilities (WRRFs) in nearby Ahuimanu and Kaneohe were converted to preliminary treatment facilities and the Kailua facility was expanded to handle flows from these areas.

On June 21, 2018, this facility completed the largest wastewater system upgrade in the City and County of Honolulu. The \$375 million Kaneohe-Kailua Wastewater Conveyance and Treatment Facilities Project addressed a U.S. Environmental Protection Agency consent decree to improve Windward Oahu's wastewater collection and treatment system by June 30, 2018.

“This first-of-its-kind project in Hawaii is one the entire community can be proud of,” said Honolulu Mayor Kirk Caldwell. “Our team has created a world-class sanitation facility that will last for generations, while also protecting the environment that’s so important to our island lifestyle.”

The Kailua facility receives wastewater from 26 pump stations and two preliminary treatment facilities. It provides regional treatment for the Koolau-poko District, as well as the areas of Ahuimanu, Kaneohe, Kailua, Aikahi Park, Maunawili, Kailua Heights, Enchanted Lake, and Lanikai.



To eliminate discharge of treated wastewater into Kaneohe Bay, a 1200-mm-diameter (48-in.-diameter) pipe at the Mokapu Outfall extends 1549 m (5083 ft) offshore at an average depth of 34 m (110 ft) to release effluent. The effluent is aerated in the final 300 m (983 ft) of the pipe system by diffusers.



Preliminary treatment at the facility includes grinders, band screens, and vortex stacked-tray grit removal. Primary treatment includes rectangular primary clarifiers. The trickling filter/solids contact process provide secondary treatment.



The Kaneohe-Kailua Wastewater Conveyance and Treatment Facilities Project was awarded in 2011. The design team consisted of Wilson Okamoto Corp. (Honolulu) as the prime consultant; Brown and Caldwell (Walnut Creek, Calif.), which worked on pump stations and treatment systems design; and McMillen Jacobs Associates (San Francisco), which worked on gravity sewer tunnel design.



The project connected the Kailua facility to the Kaneohe Wastewater Pretreatment Facility through a 5-km-long (3-mi-long), 3-m-diameter (10-ft-diameter) gravity sewer tunnel to increase the region's wastewater conveyance and storage capacity while reducing overflows. The project also featured a deep tunnel influent pump station, headworks, generator building, and odor control facilities. The tunnel route travels under Oneawa Hills to avoid potential overflows into the environmentally sensitive Kaneohe Bay.



Homes and an elementary school neighbor the facility. The project involved extensive community outreach that began during the planning stages. Early input from residents helped the city revise the initial tunnel alignment to address concerns raised and stay on schedule.



To minimize construction concerns, the project team implemented a noise and vibration monitoring program, a 24-hour phone hotline, a screening wall, and a project website to provide updates. Long-term facility considerations included an enclosed, sound-attenuated, and odor-controlled headworks facility to minimize effects on the neighboring properties.



The project, which included three construction phases, was completed within budget and on schedule to meet the consent decree. It has reduced energy consumption and helps protect the environment. Watch a video that describes the project at goo.gl/9H41LG.

Brown and Caldwell



A new tunnel influent pump station shaft has been constructed as part of the Kaneohe-Kailua Wastewater Conveyance and Treatment Facilities Project. Bowers + Kubota