

Navy Wastewater Treatment Plant, Joint Base Pearl Harbor-Hickam, Oahu, Hawaii

August 2013

Located on Joint Base Pearl Harbor-Hickam (JBPHH), near the entrance to Pearl Harbor in the Ewa district of Oahu, is the Navy's Wastewater Treatment Plant (WWTP). It is owned, operated, and maintained by Naval Facilities Engineering Command (NAVFAC) Hawaii.

The facility covers approximately 4.7 hectares (ha) of land or 11.61 acres and accepts both domestic (household) and industrial wastewater. It provides advanced secondary treatment through the use of clarifiers, an activated sludge process, and effluent filtration for approximately 5.5 million gallons of wastewater per day.



Headworks and Primary Clarifier

History

The WWTP was built in increments starting in 1969. Its original capacity was 28,000 m³/day or 7.5 million gallons per day. With the completion of large-scale construction projects in 1997, the facility's current capacity is 49,000 m³/day or 13 million gallons per day. In January 2005, the WWTP's deep-water outfall was brought online moving the dispersal of its effluent 1.5 miles off shore.

Main Components of Facility:

◆ Headworks	1	◆ Aeration/Anoxic Tanks/ Basins	4	◆ Sand Filters	3
◆ Primary Clarifiers	3	◆ Anaerobic Digesters	3	◆ Ultraviolet (UV) Light Channels	6
◆ Secondary Clarifiers	6	◆ Centrifuges	2	◆ Outfall	1



Left - Secondary Clarifiers

*Right - Aeration/
Anoxic
Tanks*



A deep ocean outfall was constructed from February 2002 – December 2003. It is 2.4 miles (12,000 feet) long and extends approximately 2,400 meters (almost 1.5 miles) from shore, to an ocean depth of 150 ft. Brought online January 2005, it reduces pollutant discharge into the Pearl Harbor estuary, improves the harbor's water quality, and takes effluent into deeper waters where it will be disbursed with the help of ocean currents.

The Navy's 42-inch diameter high-density polyethylene pipeline was transported into deep ocean waters before being sunk in an underwater trench. (Healy Tibbitts Builders photograph)

Wastewater Points of Generation:

- Joint Base Pearl Harbor-Hickam - all Navy, Air Force and tenant commands/organizations (i.e. Hawaii Air National Guard) at Pearl Harbor, including Ford Island and the Ship Wastewater Collection Ashore Abatement System (SWWCAA).
- U.S. Marine Corps Base, Camp Smith.
- Navy, Air Force, and Coast Guard military family housing units near JBPHH.

Treatment Process

- (1) Wastewater is pumped to the plant through two force mains.
- (2) Once the wastewater arrives, the Headworks screen it, removing unwanted, non-organic products, such as cloth, rags, rocks and debris.
- (3) Then the Primary Clarifiers remove settled solids (primary sludge) from the wastewater and the Degritter removes heavy inorganic matter such as sand and cinder that are abrasive to downstream equipment.
- (4) Wastewater is moved into Aeration/Anoxic Tanks aerate (add oxygen) and biologically convert (with micro organisms) suspended and dissolved organic matter into a settled biomass (secondary sludge).
- (5) The Secondary Clarifiers remove secondary sludge from the treated wastewater.
- (6) The Traveling Bridge and Sand Filters further removes any remaining particulate matter from the treated water/effluent.
- (7) The Ultra Violet (UV) light system disinfects the effluent prior to discharge into the ocean.
- (8) Sludge collected during the process is moved to the Dissolved Air Flotation Thickener where it thickens the sludge.
- (9) Anaerobic Digesters stabilize and condition both primary and secondary sludge prior to dewatering.
- (10) To reduce the sludge's water content, Centrifuges take the digested and thickened sludge and produce a cake (block) of approximately 17 percent solids. The material (biosolids) is taken to the Navy's Biosolids Treatment Facility at Kalaeloa (formerly known as Barbers Point) on Oahu and turned into compost.



Headworks (above) with Odor Reduction Biofilters (below).



Permitting

A National Pollutant Discharge Elimination System (NPDES) permit is required by the Hawaii State Department of Health (HDOH) to operate this WWTP. The current permit took effect on Oct. 7, 2011. This permit expires on Sept. 6, 2016.

Benefits

The WWTP's primary, secondary, and tertiary treatment (or advanced cleaning, such as Sand Filtration and Ultraviolet Disinfection) of both domestic and industrial wastewater is beneficial to the U.S. Navy and the State of Hawaii, keeping the island's ocean waters clean.



Ultraviolet (UV) Light Channels (left) and Sand Filter (right)



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