

Bilge and Oily Wastewater Treatment System (BOWTS)

OVERVIEW

The Bilge and Oily Wastewater Treatment System (BOWTS) is an integrated system of off-the-shelf components providing state of the art and highly effective removal capabilities for pollutants in bilge water. BOWTS reduces costs to the Navy for disposal of this waste and help meets the activity's National Pollutant Discharge Elimination System (NPDES) permit requirements for oily waste water and metals. BOWTS enables direct discharge of treated water to a Publicly Owned Treatment Works (POTW) facility or sanitary sewer system instead of costly treatment. Based on a site that generates 15 million gallons per year of waste water and a disposal cost of \$0.24/gallon, the estimated cost savings when using BOWTS is \$3 million dollars per year, with a return on investment of less than 1 year. Navy ships produce millions of gallons of bilge and oily wastewaters each year comprising one of the Navy's largest waste streams. The main pollutants found in bilge water are free and emulsified oils and greases, coagulated and dissolved heavy metals such as copper, nickel, lead, and zinc, and suspended solids. BOWTS was developed in 1997 to replace the practice of using oily wastewater rafts referred to as "donuts" for treating bilge water prior to discharge to local harbors. Naval installations currently use BOWTS or other shore-side treatment systems to treat bilge water discharged from naval vessels in port. BOWTS is being successfully used at: Naval Station (NAVSTA) San Diego, NAVSTA Pearl Harbor, and Commander Fleet Activities (CFA) Yokosuka. In 2012, the Naval Facilities Engineering and Expeditionary Warfare Center (NAVFAC EXWC) designed and built an upgraded BOWTS for CFA Yokosuka that treats 100gpm of bilge and industrial wastewater.

DESCRIPTION

The system consists of a modified oil water separator, chemical treatment tanks, chemical metering systems, a clarification unit, sand filters, activated carbon beds, and a dewatering system (Figures 1, 2, and 3). Automated controls and sensors are integrated into the system to simplify operations and prevent spillage. This results in a more efficient system with minimal operator oversight and costs.



Figure 1. BOWTS Major Components



Figure 2. BOWTS Polishing System

BENEFITS

BOWTS provides a cost effective method to reduce wastewater treatment costs and constituents in bilge water and enables compliance with POTW pretreatment standards.

Other benefits include:

- System can be designed as a stationary or mobile unit
- Recovered oil can be recycled
- Reduced waste disposal costs
- Flexible design can accommodate the wastewater volume requiring treatment
- Automated system requires minimal labor to operate

RECOMMENDATIONS

Recommend naval facilities receiving bilge water from ships contact the NAVFAC EXWC to determine how BOWTS can be a cost effective alternative to current treatment processes.

NAVFAC EXWC can provide expertise in designing, upgrading, trouble-shooting, and optimizing bilge and oily waste treatment systems. Naval installations that are having problems with their treatment systems can contact NAVFAC EXWC for consultation.

REFERENCES

User Data Package for Bilge and Oily Wastewater Treatment System (BOWTS), February 1997

Operations and Maintenance Manual for BOWTS at SRF-Yokosuka, Japan August 2012



Figure 3. BOWTS Dewatering System

POINTS OF CONTACT

For more specific information about this technology or technical consultation related to bilge and industrial wastewater treatment solutions, contact the Technology Integrator or Principal Investigator listed below:

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