NAVFAC
Naval Facilities Engineering Command

ENVIRONMENTAL COMPLIANCE

BioDetoxification of Oily Sludge

Background

Thousands of tons of oily sludge are generated by the Navy each year at wastewater treatment facilities, shipyards, fuel depots and other maintenance activities. Sources include bilge water treatment facilities, oil sumps, load equalization tanks, wash racks, drum cleaning, and fuel tank bottoms.

For the Navy and other DoD activities, oily sludge represents significant disposal costs ($6M per year for Navy alone).

The NAVFAC Engineering Service Center has demonstrated that these wastes can be aerobically degraded using a Sequencing Batch Reactor (SBR) to harmless by-products of carbon dioxide, water, and biomass.

Technology

The SBR system is a Navy patented and licensed system consisting of a bioreactor tank, receiving tank, pH controller, ultra-filtration unit, and compost VOC filter.

Oily wastes are typically blended for treatment within the bioreactor tank with fresh or wastewater, to achieve an acceptable range of between 2K-20K ppm hydrocarbon.

Treatment begins with the addition of air and nutrients (fertilizer). The pH is monitored and adjusted as organisms, already present in the oily sludge, grow and multiply. Within three to four days, the sludge is degraded to a biomass solid, carbon dioxide, and clean water for recycling or discharge to the sewer. Post treatment, laboratory testing for residual hydrocarbons typically measure non-detect (less than 5 ppm).

Biological treatment of oily sludge can be characterized as a zero-discharge system, as clean water effluent is recycled back into the process or discharged to the sewer, and residual solids (mainly biomass) can be used as nutrients at composting facilities or land filled.

This technology becomes economically feasible for facilities, when their oily sludge disposal fees exceed $75K per year.

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Technology Benefits

A full scale demonstration of this technology has shown the potential to:

- Reduce oily sludge disposal costs which normally range from $0.20 to $1.50 per pound, to less than $0.08 per pound
- Biodegrade large quantities of oily waste sludge to non-toxic by-products that can be used as nutrients for composting
- Eliminate long-term liability associated with storage and disposal of oily waste sludge

Costs

For facilities that meet the $75K (minimum) requirement for oily sludge disposal costs, startup costs begin at:

- Capital Equipment: $300K
- Operator Training: $20K
- Site Support: $10K

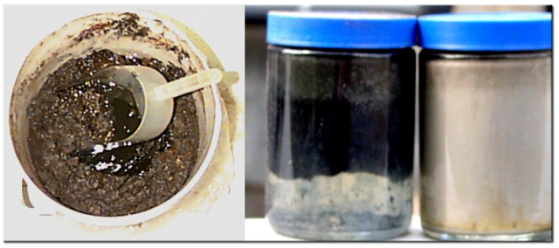
Payback on capital equipment is estimated to be under 5 years.

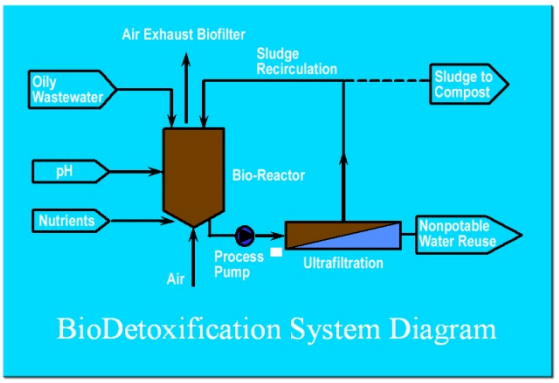
Availability

Equipment can be purchased from the Navy's current licensee:

Wastewater Resources Inc., Scottsdale, AZ.
http://www.h2oreuse.com/
POC: Mr. Randall J. Jones, President - (480) 391-9939

NAVFAC Engineering Service Center is presently working with this licensee to provide equipment to Navy and Marine Corps activities under a lease agreement. When the lease agreement terms are finalized, it is expected that qualifying activities could lease equipment for up to 5 years, after which, the activity would own the equipment. Lease rates would likely be consistent with current disposal fees.





BioDetoxification System Diagram

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