

Non-Oily Machinery Wastewater Discharge Summary

Description of Discharge

How is this discharge generated? This intermittent discharge is composed of water leakage from the operation of equipment such as distillation plants, water chillers, valve packings, water piping, low- and high-pressure air compressors, and propulsion engine jacket coolers. Only wastewater that is not expected to contain oil is collected in this system. The discharge is captured in a dedicated system of drip pans, funnels, and deck drains to prevent mixing with oily bilgewater. Non-oily machinery wastewater from systems and equipment located above the waterline is drained directly overboard. Non-oily machinery wastewater from systems and equipment below the waterline is directed to collection tanks prior to overboard discharge. In limited cases, steam condensate generated when a vessel is in port is directed to the non-oily machinery wastewater collection tank. See steam condensate discharge summary for additional information on steam condensate discharges.

Which vessels generate this discharge? Nuclear-powered Navy surface vessels and some conventionally powered vessels have dedicated non-oily machinery wastewater systems. Most other Armed Forces vessels have no dedicated non-oily machinery wastewater system, so this type of wastewater drains directly to the bilge and is part of the bilgewater discharge.

How often and where is this discharge generated? Non-oily machinery wastewater is discharged in port, during transit, and at sea. This discharge is generated whenever systems or equipment are in use, and varies in volume according to ship size and the level of machinery use.

Analysis

Nature of Discharge: Pollutants, including copper, nickel, silver, bis(2-ethylhexyl)phthalate, and zinc were present in concentrations that exceed acute Federal criteria or State acute water quality criteria. Nitrogen (in the form of ammonia, nitrates and nitrites, and total Kjeldahl nitrogen) and total phosphorus were present in concentrations exceeding the most stringent State water quality criteria. Mercury (a bioaccumulative chemical of concern) was also detected, but at concentrations that did not exceed Federal or State water quality criteria. There was significant variability in sampling data, and flow rate data were insufficient for reliably estimating mass loadings for this discharge.

Non-Oily Machinery Wastewater Discharge Summary (continued)

Analysis (continued)

The following table lists the mean concentrations of constituents that exceed water quality criteria and the resulting estimated annual fleet-wide mass loadings of constituents.

Constituent	Concentration	Annual Mass Loading (lbs)
Classicals (mg/L)		
Ammonia as nitrogen	0.1 - 1.0	275
Nitrate/Nitrites	0.19 - 0.56	295
Total Kjeldahl nitrogen	0.55 - 2.3	8.49
Total Nitrogen ^A		303
Total Phosphorous	0.14 - 11	833
Organics (µg/L)		
Bis(2-ethylhexyl) Phthalate	BDL - 75	8.71
Mercury (ng/L)		
Mercury*	BDL - 2,135	0.0036
Metals (µg/L)		
<i>Copper</i>		
Dissolved	34.35 - 1,065	120
Total	34.2 - 3,045	485
<i>Nickel</i>		
Dissolved	BDL - 237	61.5
Total	BDL - 404	74.9
<i>Silver</i>		
Total	BDL - 54.85	4.37
<i>Zinc</i>		
Dissolved	23 - 847	113
Total	90.85 - 6,125	502

BDL = below detection limit

** Mercury was not found in excess of water quality criteria; mass loading is shown because mercury is a bioaccumulator.*

Discussion and Discharge Determination

Discussion: System design changes to control the types and numbers of contributing systems and equipment, and implementation of management practices to reduce the generation of non-oily machinery wastewater are potential options for reducing the potential impact of this discharge on the environment.

Determination: A marine pollution control device is required.