

Submarine Bilgewater Discharge Summary

Description of Discharge

How is this discharge generated? The submarine bilgewater discharge contains a mixture of wastewater and leakage from a variety of sources that are allowed to drain to the lowest inner part of the hull, known as the bilge. These sources can include condensed steam from steam systems, spillage from drinking fountains, valve and piping leaks, and evaporator dumps (i.e., evaporator water that fails to meet specifications for use). From the various collection points in the bilge, this bilgewater is transferred via an auxiliary drain system to a series of holding tanks. Most submarines have the capability to segregate oily wastewater from non-oily wastewater. The non-oily waste is discharged directly overboard and the oily wastewater is collected in a tank that allows gravity separation of the oil and water. The separated water phase is then discharged overboard, as needed, and the oil phase held onboard until it can be transferred to shore facilities for disposal.

Which vessels generate this discharge? This discharge is generated by all submarines, all of which are operated by the Navy.

How often and where is this discharge generated? Approximately 60 of the submarines (the SSN 688 class) discharge the separated water phase from the bilgewater collection tanks within and beyond 12 n.m. from shore. The remaining submarines generally hold all bilgewater onboard until they are beyond 50 n.m. from shore. The frequency and volume of the discharge is highly variable, depending upon crew size, operating depth, and equipment conditions.

Analysis

Nature of Discharge: Sampling conducted onboard submarines showed concentrations of cadmium, chlorine, copper, cyanide, heptachlor, heptachlor epoxide, mercury (a bioaccumulative chemical of concern), nickel, oil, phenol, silver, and zinc that exceeded acute Federal criteria or State acute water quality criteria. The following table lists the concentrations of the discharge's constituents and the resulting annual fleet-wide mass loading for those constituents that exceeded acute Federal criteria or State acute water quality criteria.

Constituent	Concentration (mg/L)	Annual Mass Loading (lbs)
Cadmium	<0.005 - 0.2	0.75
Chlorine	0.0 - 1.6	7.9
Copper	0.065 - 15	53.4
Cyanide	<0.01 - 0.03	0.15
Heptachlor	0.000005	0.00019
Heptachlor Epoxide	0.000003	0.00014
Mercury	<0.0002 - 0.0007	0.0026
Nickel	<0.04 - 11	36.9
Oil	<5 - 820,000	1130
Phenol	<0.01 - 5.4	7.15
Silver	<0.01 - 0.035	0.23
Zinc	<0.02 - 11	51.2

Submarines use gravity separation to reduce the concentration of oil in bilgewater prior to discharge; however, this method apparently does not consistently produce a discharge that meets water quality criteria.

Discussion and Discharge Determination

Discussion: The adequacy of existing gravity separation treatment to provide effective environmental protection will be addressed by the Phase II rulemaking. The nature of this discharge is such that submarine bilgewater, if

**Submarine Bilgewater
Discharge Summary (continued)**

Discussion and Discharge Determination (continued)

untreated, could potentially impact the environment. Because of this potential to cause adverse environmental impacts, coupled with the demonstration that pollution controls are available to reduce the oil content of the discharge, EPA and DOD have determined that it is reasonable and practicable to require the use of a MPCD for submarine bilgewater.

Determination: A marine pollution control device is required.