



ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Water

**Draft Total Maximum Daily Load Summary
Metals in Marine Sediments of Hawk Inlet near Juneau, Alaska**

What is the problem with Hawk Inlet water quality?

Increased levels of metals are present in bottom marine sediment in two areas of Hawk Inlet. At the Greens Creek Mine loading dock area there was an ore concentrate spill in 1989, which was followed by cleanup actions in 1995.

Increased levels were also found near the northern end of Hawk Inlet. The source of these metals is unknown.

How do metals affect sediment and why should I care?

Sediment is a fundamental component of the aquatic ecosystem providing habitat, feeding, spawning and rearing areas for many aquatic organisms.



Inlet sampling stations

Contaminants in the sediment can affect the ecosystem. Currently, five metals (cadmium, copper, lead, mercury and zinc) are above the screening benchmark levels recommended by the National Oceanic and Atmospheric Administration for marine sediment.

Are subsistence foods affected?

Nearly all fish and shellfish tissue data within Hawk Inlet were below EPA recreational recommended values and the Alaska Department of Health and Social Services (DHSS) recommended values (based on the 95th percentile 2012 Angoon harvest data). Cadmium and mercury concentrations were above EPA subsistence recommended values in several locations throughout the inlet. The concentration of metals are similar to pre-mining conditions in Hawk Inlet, indicating that the tissue levels may be due to natural background metal levels. The Alaska DHSS factsheet *Summary of Recommendations for the Consumption of Shellfish, Seaweed, and Harbor Seal from Hawk Inlet* can be found at http://dhss.alaska.gov/dph/Epi/eph/Documents/DHSS_DEC_2016-02-29_Angoon%20Response.pdf.

What is the Total Maximum Daily Load (TMDL)?

The TMDL is basically a “pollutant budget”. This budget is an important component of the overall recovery plan. The TMDL budget was developed using standard mathematical equations, along with extensive water, sediment and biological data from the entire inlet. The pollutant reductions in sediment needed for the inlet to meet the state’s allowed limits are shown in the table below. The draft TMDL explains these pollutant reductions in detail.

A TMDL is established to meet the requirements of Section 303(d)(1)(C) of the Clean Water Act.

TMDL summary for metals in sediment

Area of Concern		Cadmium	Copper	Lead	Mercury	Zinc
	Loading Capacity (mg/kg) ^c	1.2	34	46.7	0.15	150
S-5S & S-5N (Ore loading dock)	Existing concentration (mg/kg) ^a	15.6	506	2,180	2.2	3,390
	Reduction to meet TMDL (%) ^b	92.3	93.3	97.9	93.2	95.6
S-4 (Ore loading dock)	Existing concentration (mg/kg)	0.38	110	49.7	0.04	81
	Reduction to meet TMDL (%)	0.0	69.1	6.0	0.0	0.0
S-3 (Northern end of Hawk Inlet)	Existing concentration (mg/kg)	1.67	64.1	NA	0.13	210
	Reduction to meet TMDL (%)	28.1	47.0	NA	0.0	28.6

NA = Not Above screening levels mg/kg = milligram per kilogram

^a Existing concentration (mg/kg) = maximum observed concentration in last 5 years (2011–2015). 2010-2014 used at station S-3 because 2015 data for station S-3 were not available.

^b Percent reduction to meet TMDL targets levels (%) using maximum observed concentration in last 5 years (2011–2015). 2010-2014 used at station S-3 because 2015 data for station S-3 were not available.

^c Loading capacity is equivalent to the NOAA SQuIRT Effects Range Low marine sediment screening levels.

How will water quality be improved?

Monitored natural recovery is recommended to improve the water quality, along with continued management of Greens Creek Mine shipping and docking operations to prevent future spills. Monitored natural recovery is a remedy that uses ongoing, natural processes to contain, destroy, or reduce the contaminant toxicity or contaminants available to be absorbed by living organisms in the sediments. Additional recommended actions include restrictions on future development activity that could disturb the marine sediments, and recording the area of elevated metals in the property deed as an additional safeguard that marine sediments are not disturbed. Posting warning signs about the sediment contamination will also help reduce exposure to the area.

If natural recovery does not result in decreased metal concentrations and meeting the TMDL targets, then other options such as targeted removal should be investigated.

What else does the TMDL recommend?

To confirm that natural recovery is working, additional sampling is recommended within the two areas of concern.

- Collect water column samples and expand sediment sampling to delineate the extent of contamination in the spill area and validate natural recovery in the spill area (S-5S, S-5N, and S-4).
- Collect water and sediment samples at the north end of the inlet (S-3).

Additional tissue monitoring is recommended within the two areas of concerns and throughout the inlet to further evaluate subsistence foods. In addition, monitoring is recommended at additional sites to better quantify natural conditions in the inlet.

How can I learn more about the draft TMDL or make comments?

The draft TMDL is available at <http://dec.alaska.gov/water/wqsar/index.htm> or upon request. DEC is asking for public review and comments at this time. Written public comments must be mailed, faxed, emailed, or hand delivered to the address below **before 5:00 PM on November 14, 2016**. A public meeting is planned for **October 25, 2016 from 4:00 to 6:00 PM** at the office listed below. For those who cannot attend in person, Skype for Business will be available for visual conferencing. Please

provide your email contact prior to the meeting.

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