United States Department of the Interior
FISH AND WILDLIFE SERVICE
Juneau Fish & Wildlife Field Office
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January 6, 2009

Heidi Firstencel
US Army Corps of Engineers
Juneau Field Office
Regulatory Division (1145)
CE-POA- RD
8800 Glacier Highway, Suite 106
Juneau, Alaska 99801

Re: POA-2000-495-M3 Gastineau Channel Douglas Harbor Improvements

Dear Ms. Firstencel,

The U.S. Fish and Wildlife Service (USFWS) has reviewed the December 8, 2009, permit application for the Douglas Harbor dredging project. The applicant, the City and Borough of Juneau, proposes to dredge 30,000 cubic yards of sediments from the 5.2 acre harbor and dispose of them in Gastineau Channel. We have joined the applicant, the Corps, EPA, and others in pre-application discussions for this project for the past year. We offer these comments under provisions of the Fish and Wildlife Coordination Act (48 Stat 401, as amended: 16USC, 661 et seq.).

The City and Borough of Juneau assessed the risks to marine organisms from mercury in harbor sediments in the 2009 report, Dredged Material Evaluation for the Douglas Harbor Marina Juneau, Alaska (Newfields 2009). The report fails to fully address mercury bioaccumulation in crab and shrimp, and the associated risks to residents who use these resources for food.

We request a 30-day extension for comments on this permit notice while the consultant addresses these concerns. We need to gather additional information on mercury bioaccumulation for invertebrate species inhabiting the disposal zone, and further review the discussion of alternatives to Gastineau Channel disposal of dredged sediments. We request a public hearing for this permit application to consider the public risk posed by methylmercury bioaccumulation in marine organisms.

The following comments pertain to the proposed disposal of dredged harbor sediments. Our major concern is that disposal of mercury-contaminated harbor sediments will result in uptake of mercury by marine invertebrates (e.g., Dungeness and king crab, spotted and coonstripe shrimp) and bottom-feeding fish (e.g., Pacific halibut) that are used for human consumption.

Harbor sediment samples' methylmercury concentrations were 4 to 8 times higher (1.08 to 3.46 ng/g (ppb)) than reference sediment samples (0.277 to 0.445 ng/g). These data confirm mercury contamination in Douglas Harbor sediment. Because of concern for methylmercury bioaccumulation in marine invertebrates and fish, Newfields (2009) conducted a bioaccumulation study using a clam and a polychaete, both standard bioassay species. These tests resulted in bioaccumulation after 28-day exposure tests, but at concentrations that were below the ADEC fish advisory level of 0.32 ppm.

Other mercury bioaccumulation research has reported additional mercury uptake over time periods longer than the 28-day bioassay period. Because Dungeness crabs have an estimated life span of 8 to 13 years, (www.adfg.state.ak.us/pubs/notebook/shellfsh/dungie.php), mercury uptake could exceed bioassay result concentrations reported in Newfields 2009. We request that the applicant provide information on mercury uptake rate by crabs over longer time periods than a 28-day bioassay.

It is important to note that bioaccumulated methylmercury is tightly bound to tissue and thus is not likely to be depurated or released by aquatic species. Several recent studies have found elevated concentrations of mercury in muscle tissue of blue crabs (Karouna-Reiner et al., 2007 and Sastre et al., 1999) and green crabs (Coelho et al., 2008), indicating bioaccumulation by these species. A study of blue crabs (Reichmuth et al., 2009 on-line citation date) found higher mercury concentrations occurred in the muscle than in the hepatopancreas. This was unexpected as the hepatopancreas is one of the main storage sites for other toxics (Brouwer and Lee, 2007). In Reichmuth et al., (2009 on-line citation date) crabs fed clean food or transplanted into the clean environment did not show a significant decrease in mercury, which indicates that mercury may be harder or slower to depurate than to accumulate. Similar findings were seen in the estuarine fish mummichogs (Smith and Weis 1997). Once marine organisms bioaccumulate mercury, they are unlikely to lose mercury back to the environment.

These data have major implications for assessment of disposal of mercury-contaminated sediment in Gastineau Channel and other sites around Juneau, because the area is heavily used by Juneau residents for harvest of crab, shrimp and fish. We recommend that the Corps hold a public meeting to evaluate public interest in this issue.

The U.S. Fish and Wildlife Service will be providing additional remarks on this permit application if the comment period is extended. If you have any questions about our

comments or requests, please contact Deborah Rudis of my staff at Deborah_rudis@fws.gov or at 907-780-1183. Thank you for considering these comments.

Sincerely,

Steve Brockmann
Acting Field Office Supervisor

References:

Brouwer, M. and R.F. Lee. 2007. Responses to toxic chemicals at the molecular, cellular, tissue, and organismal level. In: V.S. Kennedy and L.E. Cronin, Editors, *The Blue Crab, Callinectes sapidus*, Maryland Sea Grant College, College Park, Maryland. pp. 565–654.

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Smith, G.M. and J.S. Weis. 1997. Predator–prey relationship in mummichogs (*Fundulus heteroclitus* (L.)): effects of living in a polluted environment, *Journal of Experimental Marine Biology and Ecology* 209:75–87.

cc:
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