



Preliminary Assessment of Underwater Blasting Impacts to Fishes Near the Soo Locks

ERDC Dredging Operations Technical Support Program (DOTS)

U.S. ARMY CORPS OF ENGINEERS

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Response Summary:

USACE Detroit District requested a preliminary analysis of the underwater blasting impacts to fishes near The Soo Locks on the St. Marys River, Sault Ste. Marie, Michigan (Figure 1). The locks allow vessels to transit the 21 ft elevation change between Lake Superior and the lower Great Lakes. To accommodate larger vessels, a capital dredging event is scheduled to occur in spring of 2020 which will deepen the channel on the upstream side (west) of the new Poe-sized lock.

The proposed dredging prism will require excavation of approximately 100,000 cy³ of sediment (primarily sands) and potentially 200,000 cy³ of rock. Underwater drilling and blasting may be required to fragment the rock for subsequent dredging. The Michigan Department of Natural Resources (MDNR) is concerned about ground vibration and underwater shockwaves from the blasting and the potential physical impacts to nearby fish and fish eggs in the power plant tail race and the St. Mary's Rapids immediately north of the dredging site.



Figure 1: The Soo Locks blasting area (triangle) and fish spawning habitat (box)

A contractor submitted blasting plan estimated that ground vibration limits below 0.75 in/sec would be sufficient to minimize potential impacts to fish and fish eggs near the Unit 10 power canal or the St. Mary's Rapids. ERDC conducted a review of existing data related to blasting effects on fish and fish eggs and provided insight to the contractor submitted blasting plan and available exposure-response thresholds.

Period of Performance:

February 2020 – March 2020

Benefits of the Response to the USACE Dredging/Navigation Program:

This technical response provided information to understand risks of underwater blasting plans for communication and coordination with the state resource agency (MDNR). This information was important to progress the channel deepening project on the Soo Locks.

Deliverable:

Products generated with this DOTs response included a literature review of underwater sound threshold effects to fish and fish eggs, review of the contractor submitted blasting plan, and general recommendations based on the findings. Results of this study were summarized in a memo to the USACE Detroit district with supplemental data (excel file) containing threshold effects data and blast effects calculations for larval fish and eggs.



Providing environmental and engineering technical support to the U.S. Army Corps of Engineers
Operations and Maintenance navigation and dredging missions

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