

**OFFICIAL COORDINATION REQUEST FOR
NON-ROUTINE OPERATIONS AND MAINTENANCE**

COORDINATION TITLE- 21 IHR 12 Unit 1 intake gate downpull testing

COORDINATION DATE- 27 July 2021

PROJECT- Ice Harbor Dam

RESPONSE DATE- 10 August 2021

Description of the problem: The intake gate hydraulic system upgrade is currently in design phase. In order to appropriately design the system, the Hydroelectric Design Center (HDC) has requested Ice Harbor to conduct downpull testing on Unit 1.

Intake gates are used to shut off flow to a turbine unit if control of the wicket gates are lost (ie- emergency closure). During an emergency closure, the water flow beneath the gate creates a downpull force that can greatly exceed normal operating loads.

The downpull test consists of lowering all three intake gates under flow at various wicket gate openings until flow stops and intake gates are on sill.

Model test data is not available and downpull forces are extremely difficult to predict and can be inaccurate using analytical calculations. Original design documentation for Ice Harbor included calculations for downpull forces, but tests conducted in 1955 on MU6 measured nearly double the estimated loads.

Type of outage required: Testing will be conducted on Unit 1, requiring Ice Harbor to operate out of priority.

Impact on facility operation: Ice Harbor will operate outside of Unit Priority on multiple occasions throughout the duration of the downpull testing (Fish Passage Plan, Chapter 6, Table IHR-4).

Impact on forebay/tailwater operation: Unit 1 is utilized as attraction flow for adult passage and will be operated at various wicket gate openings.

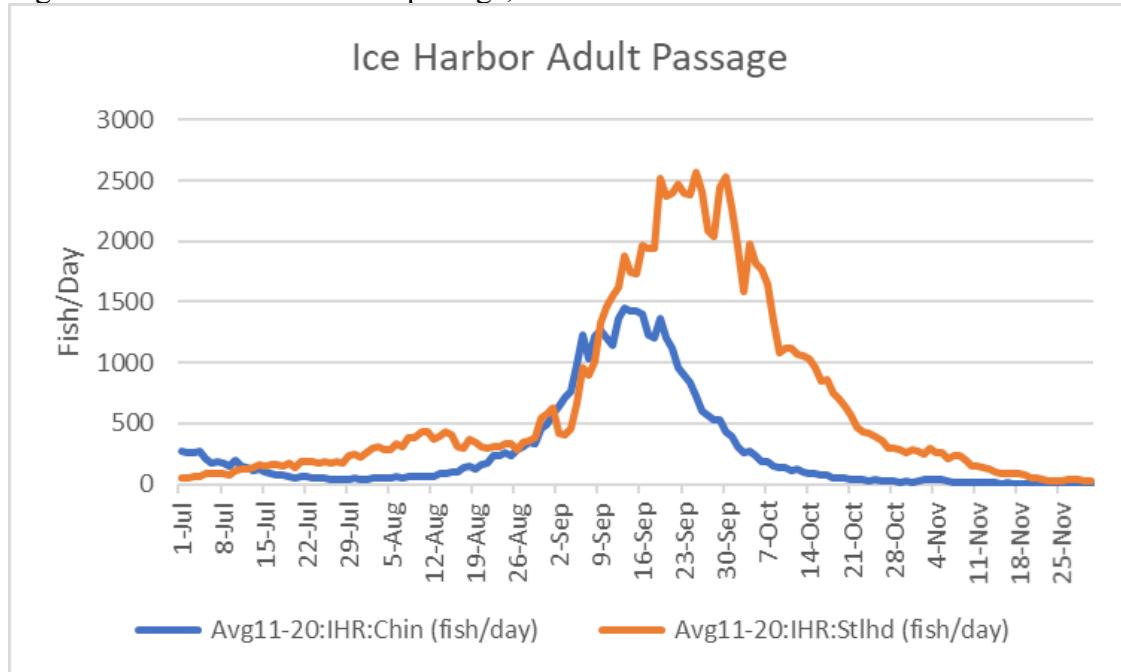
Impact on spill: None.

Dates of impacts/repairs: Week of 25 October 2021.

Length of time for repairs: Setup, testing and equipment removal will take 4-5 days, with 2-3 days of pulldown testing occurring.

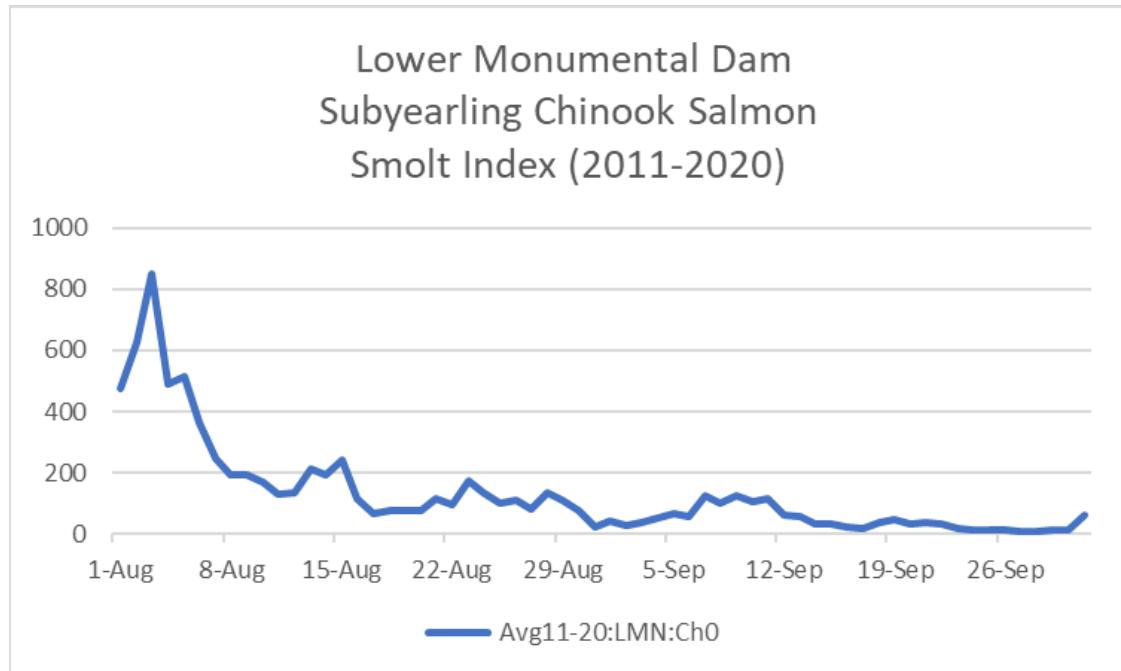
Analysis of potential impacts to fish: The 10-year average daily adult counts for October 25-29 included 24 Chinook salmon and 324 steelhead. Peak passage for fall Chinook salmon typically occurs in September with peak steelhead passage occurring in late September and early October (Figure 1).

Figure 1: Ice Harbor adult fish passage, 2011-2020.



Juvenile smolt index data is not available at Ice Harbor, and data beyond September 30 is not available at Lower Monumental. Subyearling Chinook salmon are the predominant juvenile species at the end of sampling at SMP sites in the lower Snake River, however numbers are relatively low (Figure 2).

Figure 2: Lower Monumental Dam 10-year average (2011-2020) subyearling Chinook salmon smolt index.



Summary statement - expected impacts on:

Testing is scheduled to occur after the peak passage of both adult Chinook salmon and steelhead. However, upstream migration may be delayed due to the lack of attraction water from Unit 1 during testing. Impact to juveniles should be negligible, however FGE is unknown under all of the testing operations. Additionally, impacts to bull trout and lamprey are unknown.

Comments from agencies

Final coordination results

After Action update (After action statement stating what the effect of the action was on listed species. This statement could simply state that the MOC analysis was correct and the action went as expected, or it could explain how the actual action changed the expected effect (e.g., you didn't need to close that AWS valve after all, so there was no impact of the action). List any actual mortality noted as a result of the action)

Please email or call with questions or concerns.

Thank you,
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