ALBENI FALLS DAM AND LAKE PEND OREILLE

30-31 May 2024

Spillway Gate Restrictions

Col. Kathryn P. Sanborn
Seattle District Commander

Leon Basdekas
Upper Columbia Senior Water Manager

The views, opinions and findings contained in this report are those of the authors(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation.

U.S. ARMY

US Army Corps of Engineers®

TOPICS

- Albeni Falls Dam Spillway Gate Basic Facts.
- Discovery of spillway gate defects and impacts on project safe operations.
- U.S. Army Corps of Engineers' current restrictions and purpose.
- Impact of spillway gate restrictions on lake level and river flow.
- How you can stay informed.

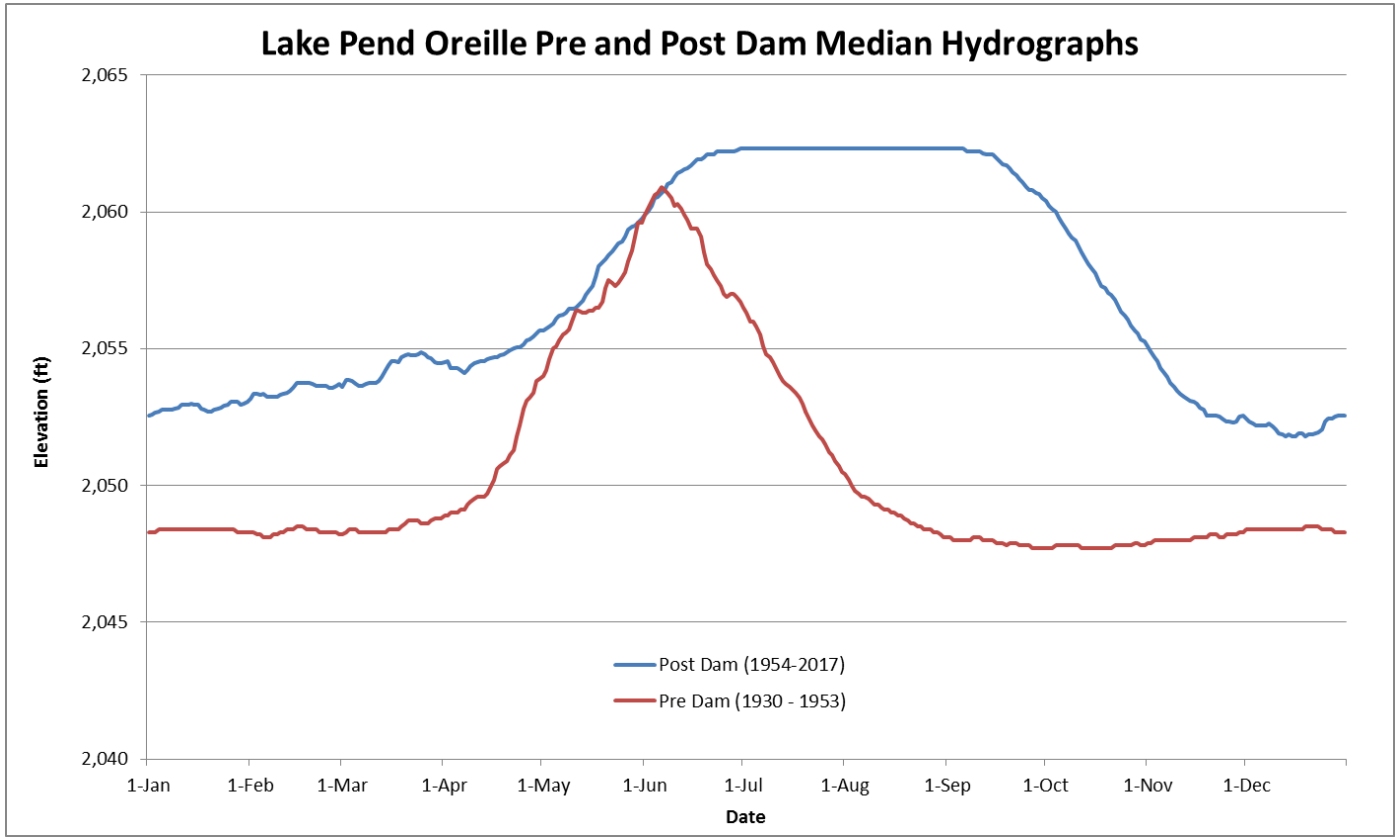
BOTTOM LINE UP FRONT

- U.S. Army Corps of Engineers has a robust maintenance program at Albeni Falls Dam.
- Maintenance inspections identified problems with the steel in the dam's spillway gates.
- These problems affect the Corps of Engineers ability to raise and lower the lake level as normal.
- Our presentation will explain what is going on with the spillway gates, how this may impact project operations and you.

ALBENI FALLS DAM: BASIC FACTS

- Authorized purposes: hydropower, flood risk management, navigation, recreation, and fish and wildlife conservation.

- Dam allows longer periods of full pool conditions compared to pre-dam.



ALBENI FALLS DAM: BASIC FACTS

Construction was completed in 1955.

The Dam consists of:

- **The Powerhouse -** passes water through 3 turbines to generate power.
- **The Spillway** - passes water through 10 spillway gates to release water above powerhouse capacity.
- **Storage** – the lake is generally operated between 2051 feet and 2062.5 feet, unless there are flood conditions, this equals about 1.0 maf

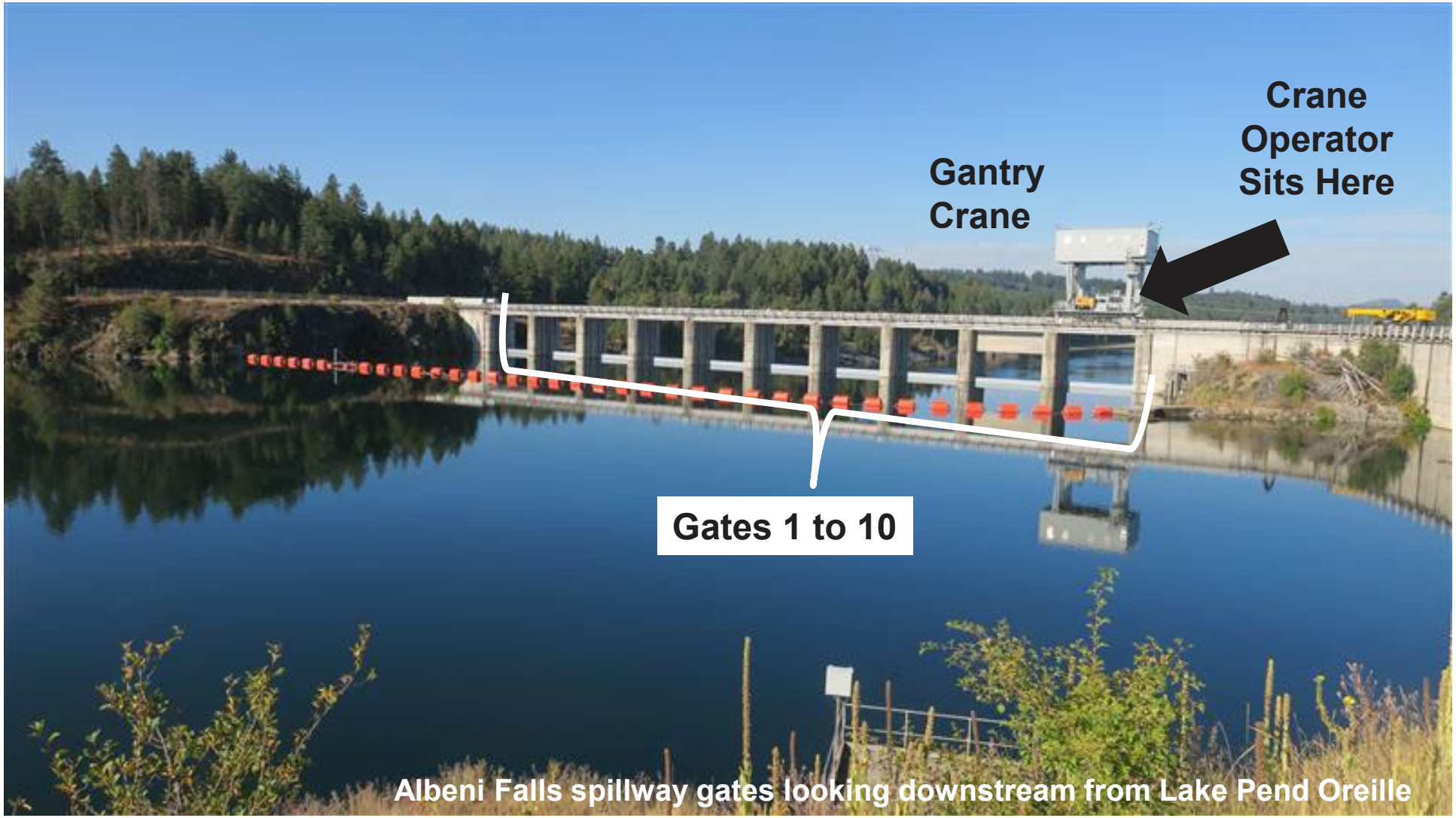
U.S. ARMY

ALBENI FALLS DAM: SPILLWAY GATE BASIC FACTS

- Ten (10) total spillway gates with one spare gate.
- Operated/lifted by gantry crane on the spillway deck.
- Opened and closed to store and release water, as needed.

U.S. ARMY

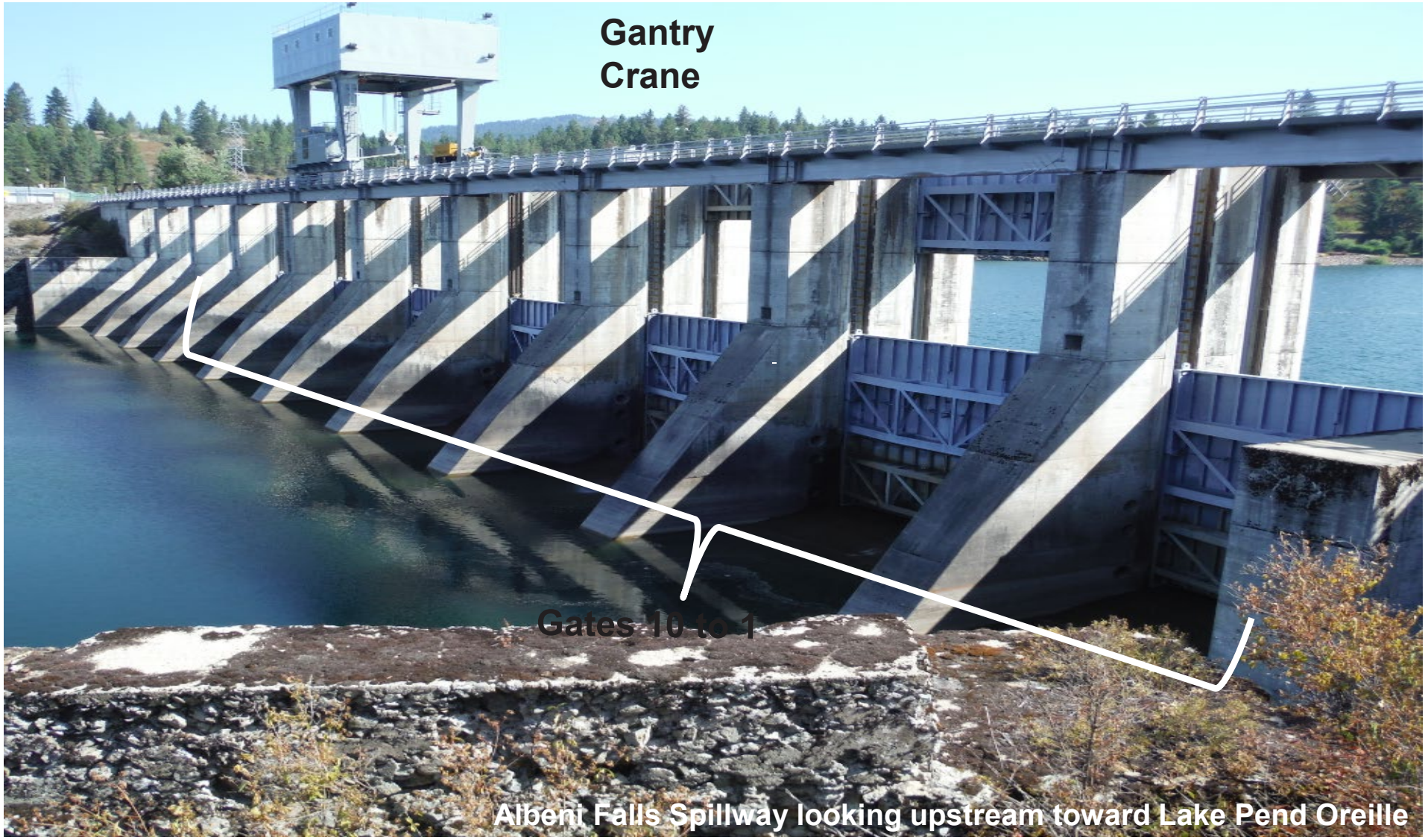
ALBENI FALLS DAM SPILLWAY GATES: BASIC FACTS



Albeni Falls spillway gates looking downstream from Lake Pend Oreille

U.S. ARMY

ALBENI FALLS DAM SPILLWAY GATES: BASIC FACTS



Albeni Falls Spillway looking upstream toward Lake Pend Oreille

DISCOVERY OF SPILLWAY GATE DEFECTS

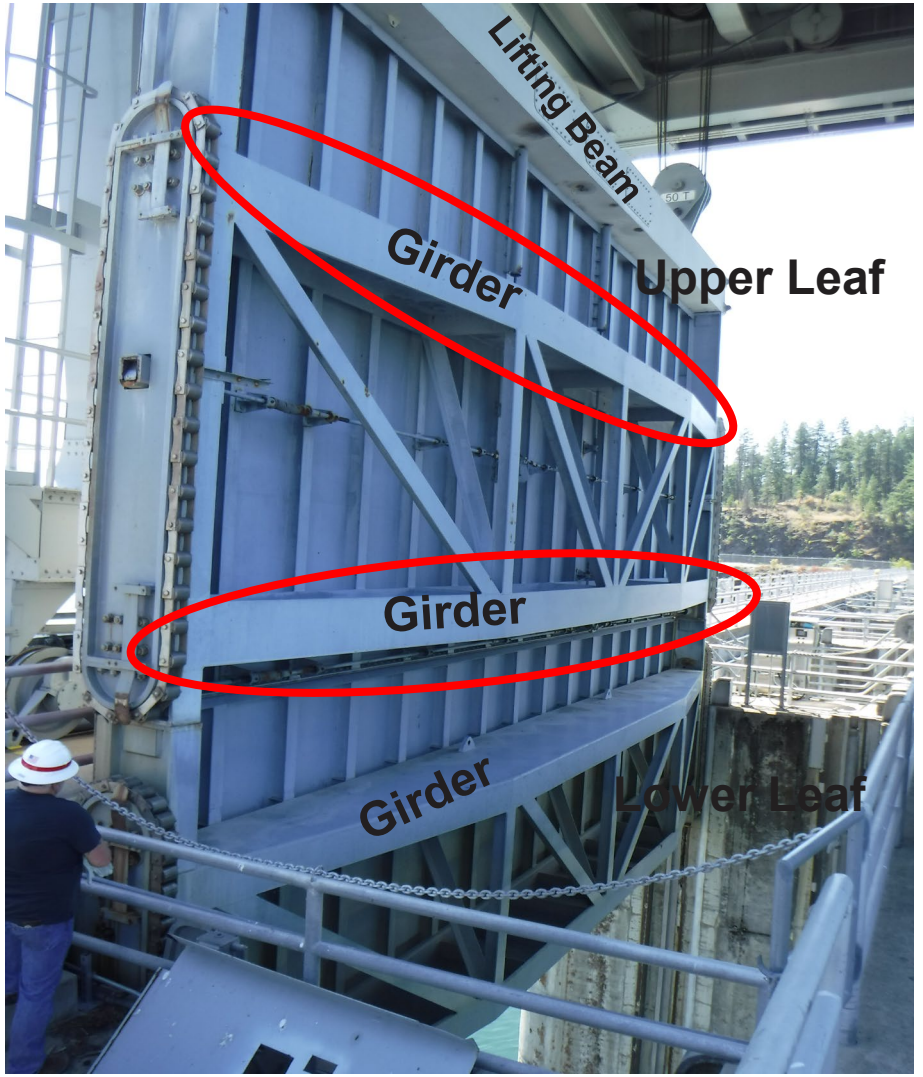
- Army Corps of Engineers initiated physical work on the gate rehabilitation contract in June 2023.
- The rehabilitation contract's purpose is to repair cracked welds identified during gate inspections and re-paint the gate.
- As part of this rehabilitation contract:
  - Removed Gate number 3.
  - Completed in-depth gate inspection, once paint removed.

- This is when steel defects were discovered in April 2024.

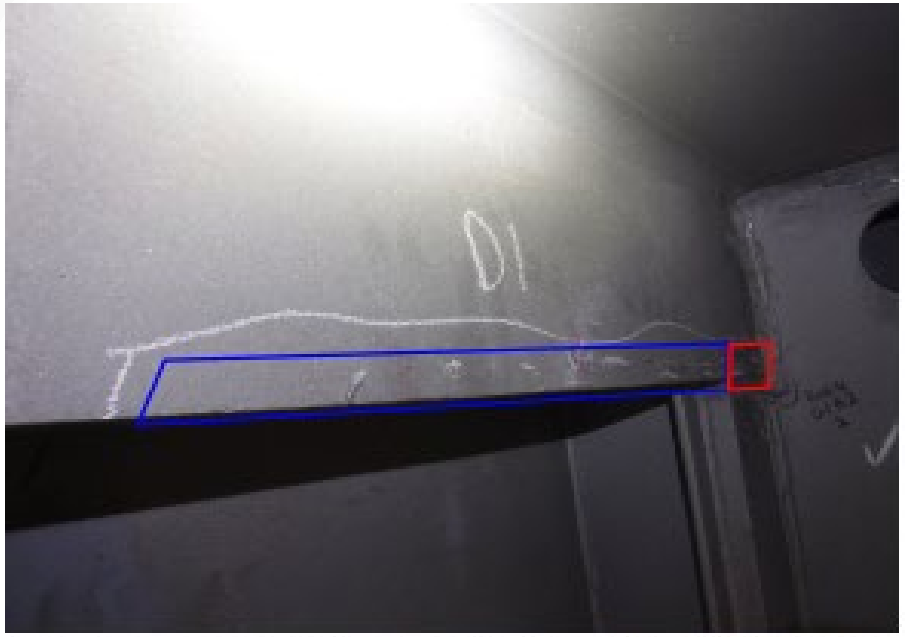
U.S. ARMY

ALBENI FALLS DAM DEFECT LOCATIONS

- Discovered in the two primary girders of Gate 3's upper leaf. (Identified in RED)
- Base metal defects (holes in the steel) in both girders.
- Defects exist throughout girder length.
- Should failure occur near girder ends, the gate could simply drop.
- Should such failure occur in either girder, this could lead to crane operator injury and/or damage to the crane and bridge.



U.S. ARMY



INSPECTION OBSERVATIONS

- Present defects were likely created during the rolling of the steel in the 1950s and worsened over time.
- All spillway gates and the spillway bridge were built at the same time (1950s) using the same Federal Specification QQ-S-741a or ASTM A7 Steel.
- Present defects are only effectively located and identified with the paint removed from the gate; REQUIRING the gate to be removed.
- Present defects can increase/grow through gate use and subjecting them to load from water pressure.
- Operating the gates to control water flow creates dynamic loads on the gates, increasing risk/stress on them.

USACE RESPONSE

- Until each gate is inspected, the Corps of Engineers must presume the other gates have this defect.
- Current engineering regulations and standards guide our presumption.

Because:

- Safety of our operators and dam operations are paramount.
- Fulfilling the project's authorized purposes balancing our personnel's safety and safe project operations, is essential
- Operating conservatively today reduces the risk of a catastrophic failure that could impair the dam's ability to fulfill its authorized purposes in future years....

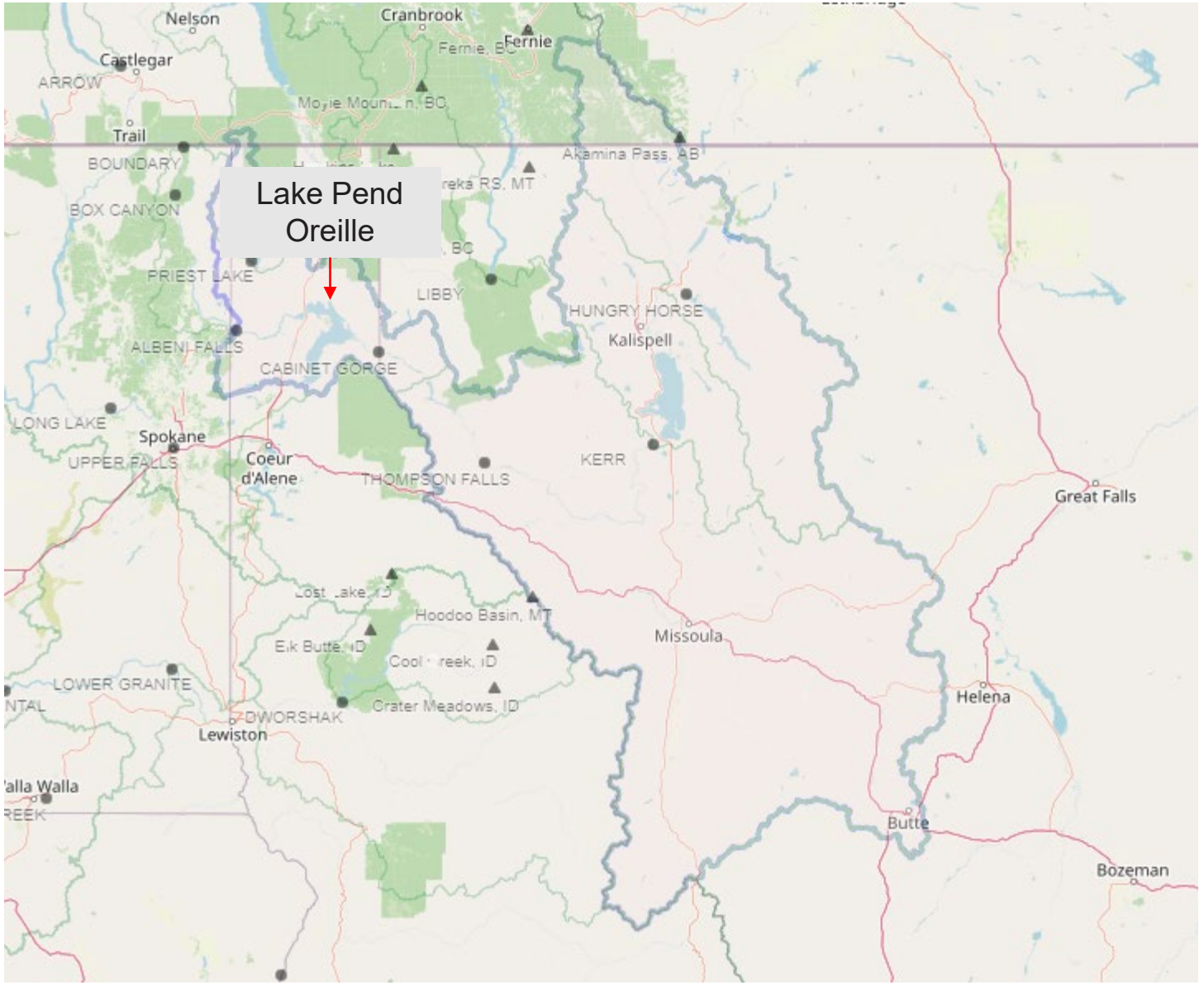
We are minimizing gate movements

KEY RESTRICTIONS DURING 2024 REFILL

- Minimize the risk of gate failure by minimizing gate use.
  - Gate failure would result in losing the ability to manage lake levels

- Only move gates when necessary to control lake refill and manage flood risk.
- Only move one gate at a time.
- When possible, only have gates moved to fully open or fully closed.
- Unlikely, but make use of lake storage up to minor flood stage of 2063.5 ft, during a late season and high inflow event.

PEND OREILLE BASIN

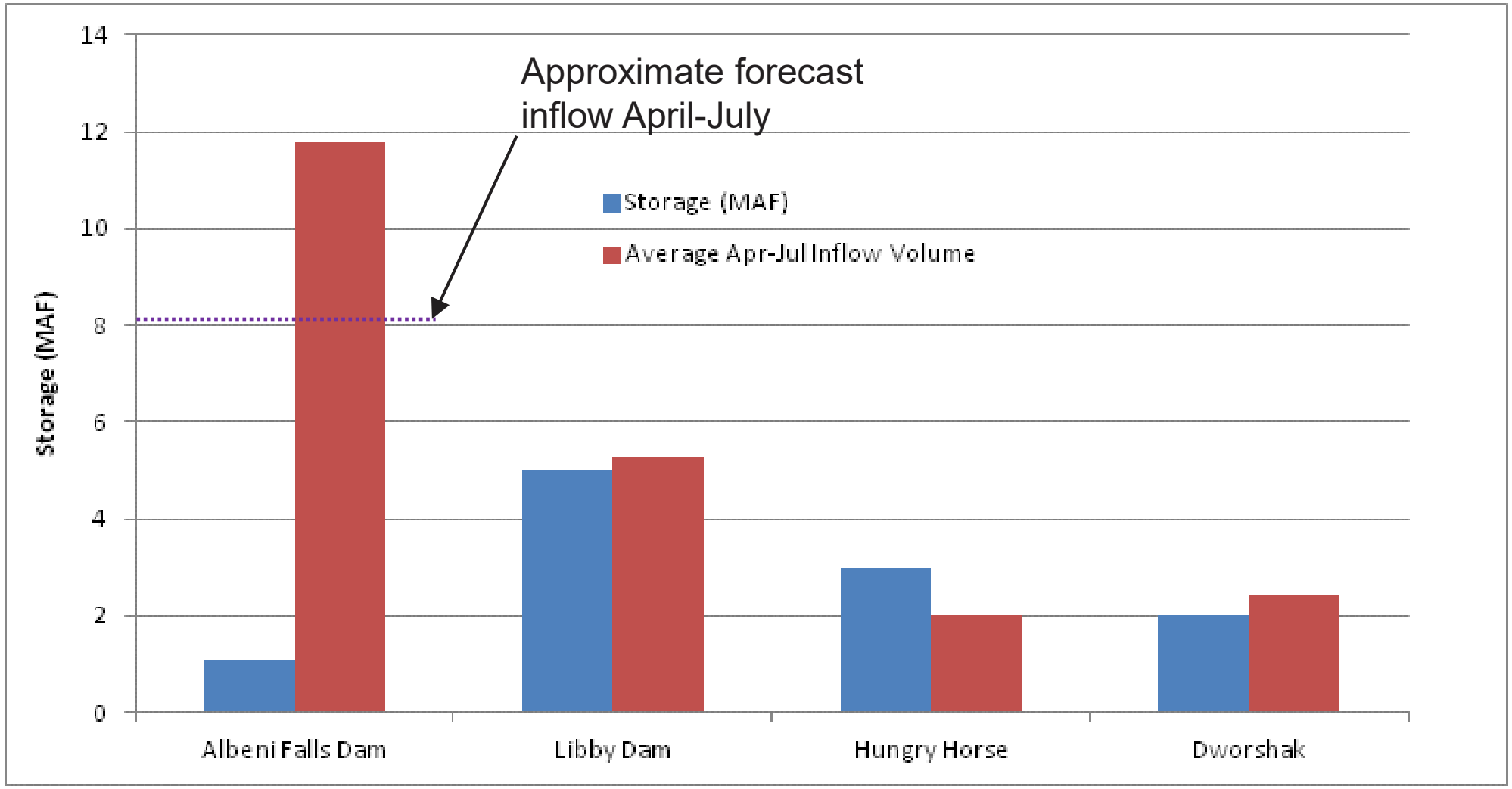


U.S. ARMY

ALBENI FALLS DAM AND LAKE PEND OREILLE

U.S. ARMY

COLUMBIA RIVER PROJECTS STORAGE VS SPRING RUNOFF



U.S. ARMY

WHAT THIS MEANS FOR THE 2024 REFILL

Given gate restrictions, we have been approved to deviate from our general operations:

- May exceed "ramping rates" for lake level and river outflows since we are not doing partial gate changes.
- May see lake levels above 2062.5 feet with the goal of staying below 2063.5 feet.
- May need to shift the one-half foot summer range (2062.0 - 2062.5 ft) down by one quarter to one half foot.

WHAT THIS MEANS FOR SPRING

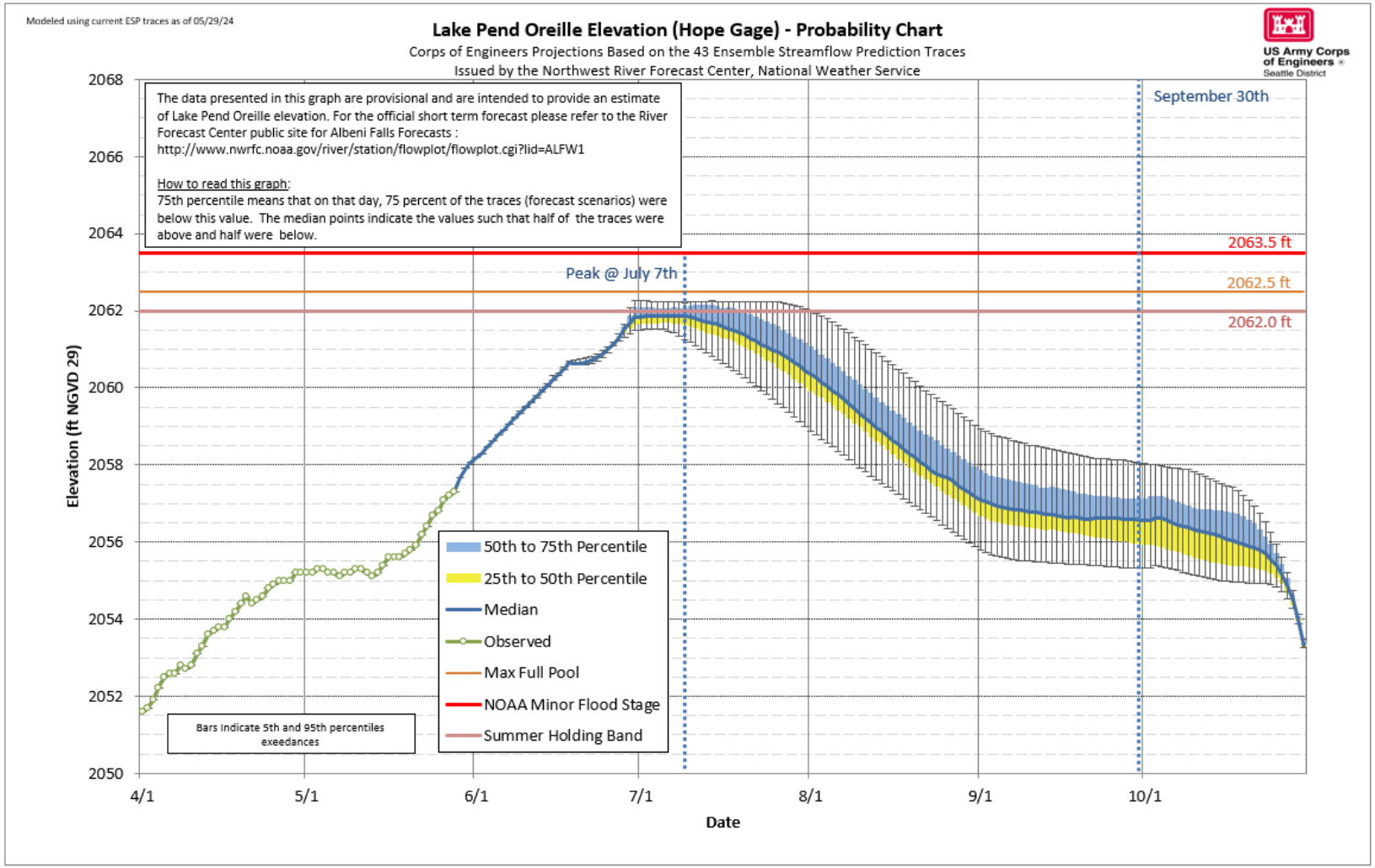
Upstream

- Goal for intermediate 2060.0 ft. level by early to mid-June.
- Goal for summer pool 2062.0 ft. by June 30.
- Both goals could be earlier or later; subject to change based on hydrologic conditions.

Downstream

- Will most likely look like normal operations.
- We are operating to constrain flows within the established riverbanks.
- We are operating to avoid a 'worse case' scenario of gate failure leading to uncontrolled outflows, by minimizing gate movement.

POTENTIAL LAKE LEVEL IMPACTS IF ONE GATE FAILS



For illustrative purposes only

- Modeled loss of spill way gate on May 29.
- Peak July 7, around 2062.0 ft. and start to decline as inflows drop.
- Typically start soft draw down third week in September. However, with gate loss, ~2057.0 ft.

U.S. ARMY

LONG-TERM PLANNING SOLUTIONS

- Actively developing temporary engineering solution for short term corrective action to provide limited gate usage.
- Pursuing funding actions for permanent corrective action for the gates.

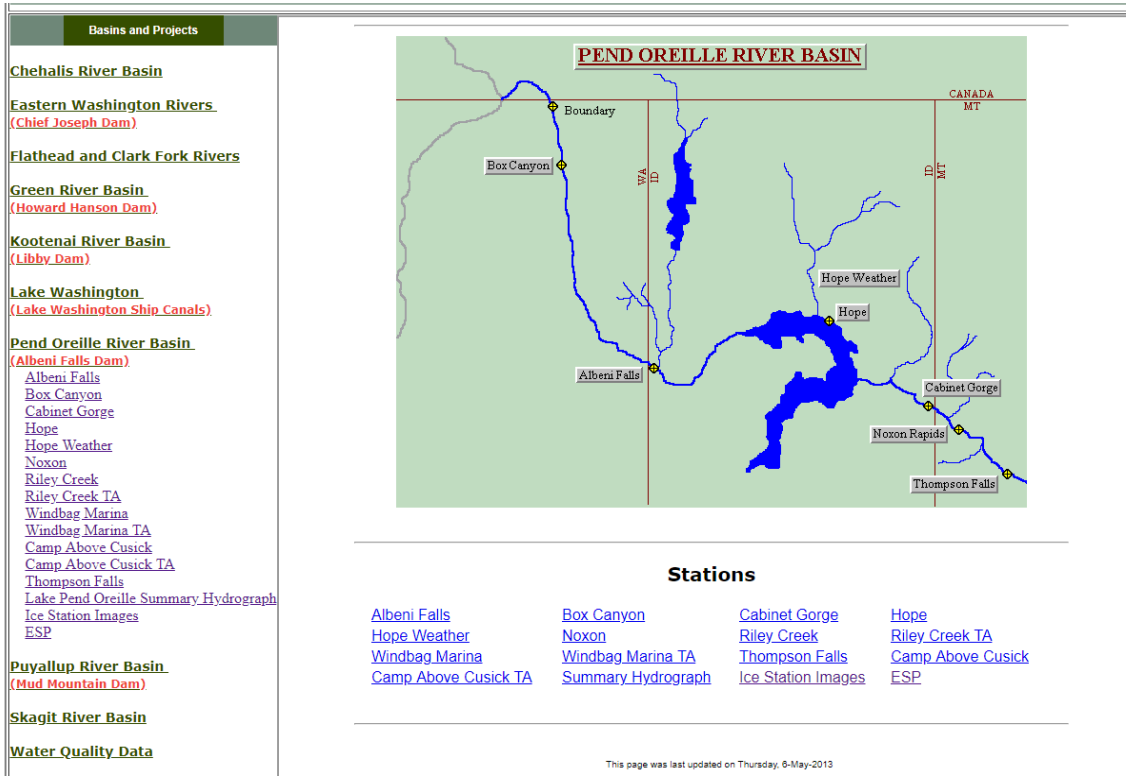
HOW CAN YOU STAY INFORMED?

- Email us to receive emails about release changes and lake levels: **UpperColumbiaWM@usace.army.mil**
- Have general questions? Call us at **206-764-3750**.
- Check our district water management data webpage: **http://www.nwd-wc.usace.army.mil/nws/hh/www/index.html#**
- Follow us online:
  - FB: **https://www.facebook.com/AlbeniFallsDam/**
  - Twitter: **@SeattleDistrictUSACE**
  - Public website: **https://www.nws.usace.army.mil/Media/News-Releases/**

U.S. ARMY

HOW CAN YOU STAY INFORMED?

More info at our Seattle District water management data website:
http://www.nwd-wc.usace.army.mil/nws/hh/www/index.html#



U.S. ARMY

QUESTIONS?