

Detroit Temperature Control and Downstream Passage Projects

Ian Chane, Program Manager
Willamette BiOp Implementation

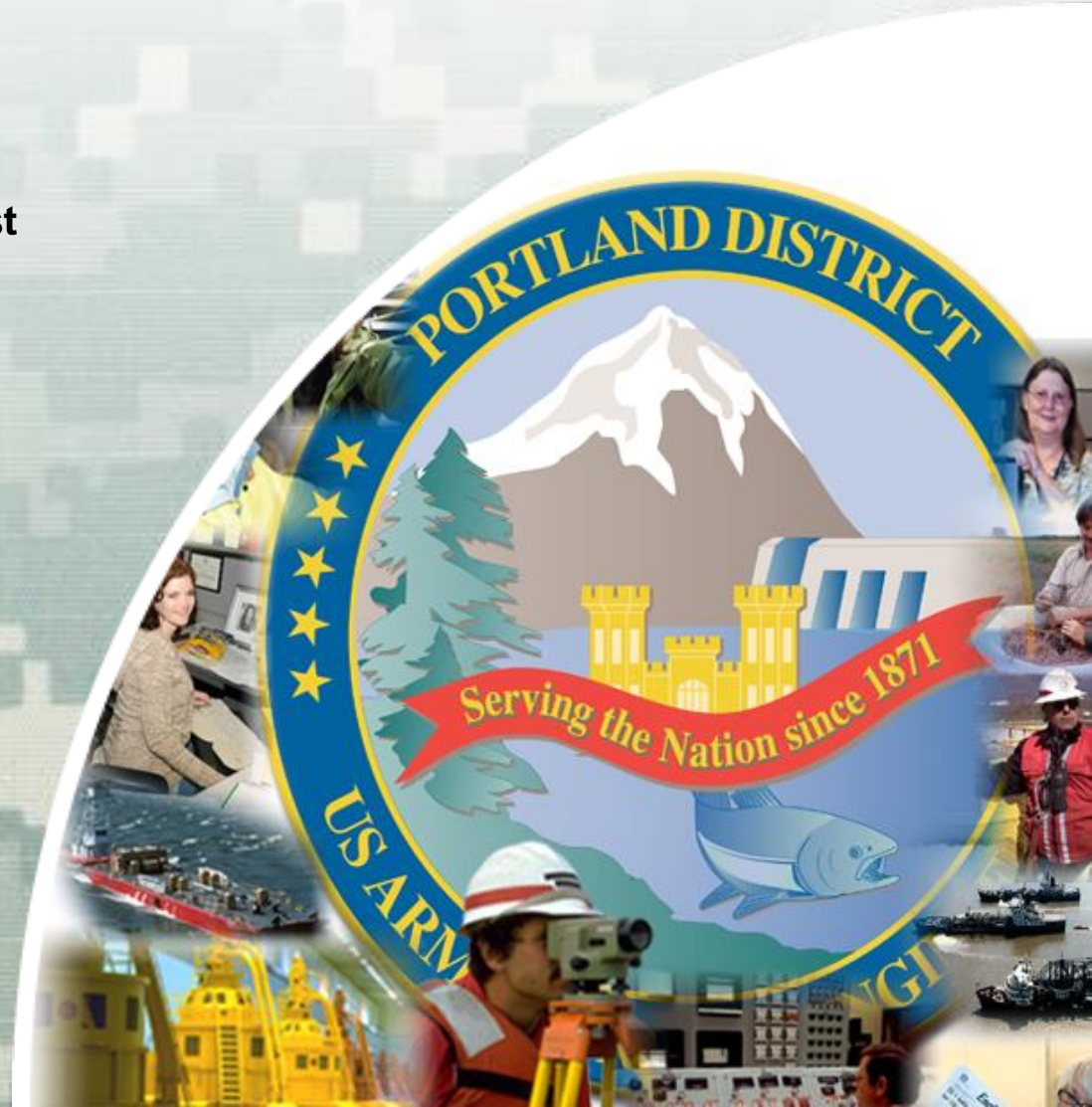
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Willamette Valley Project

North Santiam Watershed Council
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US Army Corps of Engineers
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Overview

- Willamette Valley Project
- Willamette BiOp Implementation Program
- Engineering process
- Temperature Control and Downstream Passage
 - ▶ Need
 - ▶ Status

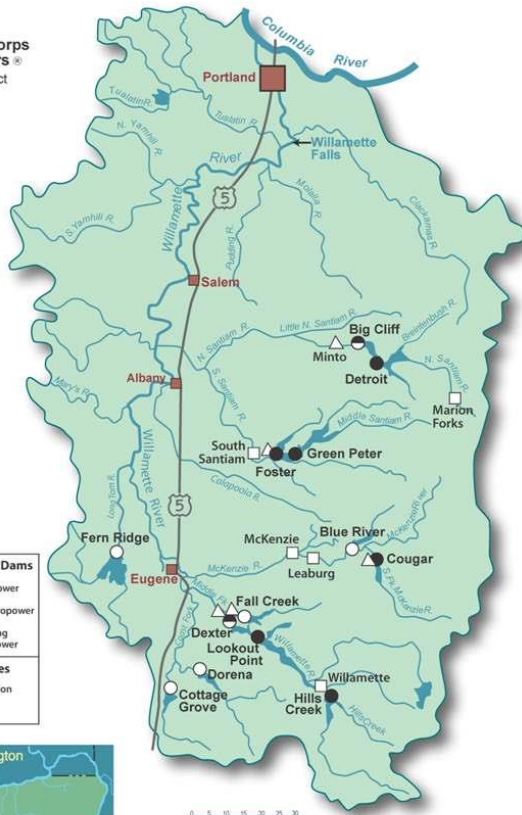


Willamette Valley Project

The Willamette River Basin



US Army Corps
of Engineers
Portland District



Multipurpose Dams	
●	With Hydropower
○	Without Hydropower
◐	Re-Regulating with Hydropower

Fish Facilities	
△	Adult Collection
□	Hatchery



0 5 10 15 20 25
APPROXIMATE MILES



- Flood damage reduction
- Hydropower
- Navigation
- Irrigation
- Recreation
- Fish & wildlife
- Water quality
- Municipal & industrial water supply



Willamette Biological Opinion

- Downstream Passage
- Upstream Passage
- Water Quality
- Flows/Ramp Rates
- Hatcheries

ESA-Listed Resident Fish Species

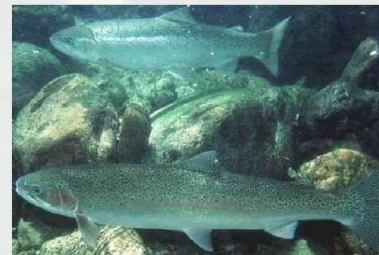


Oregon chub



bull trout

ESA-Listed Anadromous Fish Species



winter steelhead



spring Chinook salmon



Engineering Process

- Alternative development
 - ▶ Determine problem
 - ▶ Identify solutions that would solve the problem
 - ▶ Recommend solution
 - ▶ 1 to 5 years depending on data gaps/needs
 - ▶ **Downstream Passage current status**
- Solution design development
 - ▶ Develop design, confirm constructability
 - ▶ Refine/optimize the recommended solution
 - ▶ Detailed cost estimate
 - ▶ 12-18 months
 - ▶ **Temperature Control current status**



Engineering Process

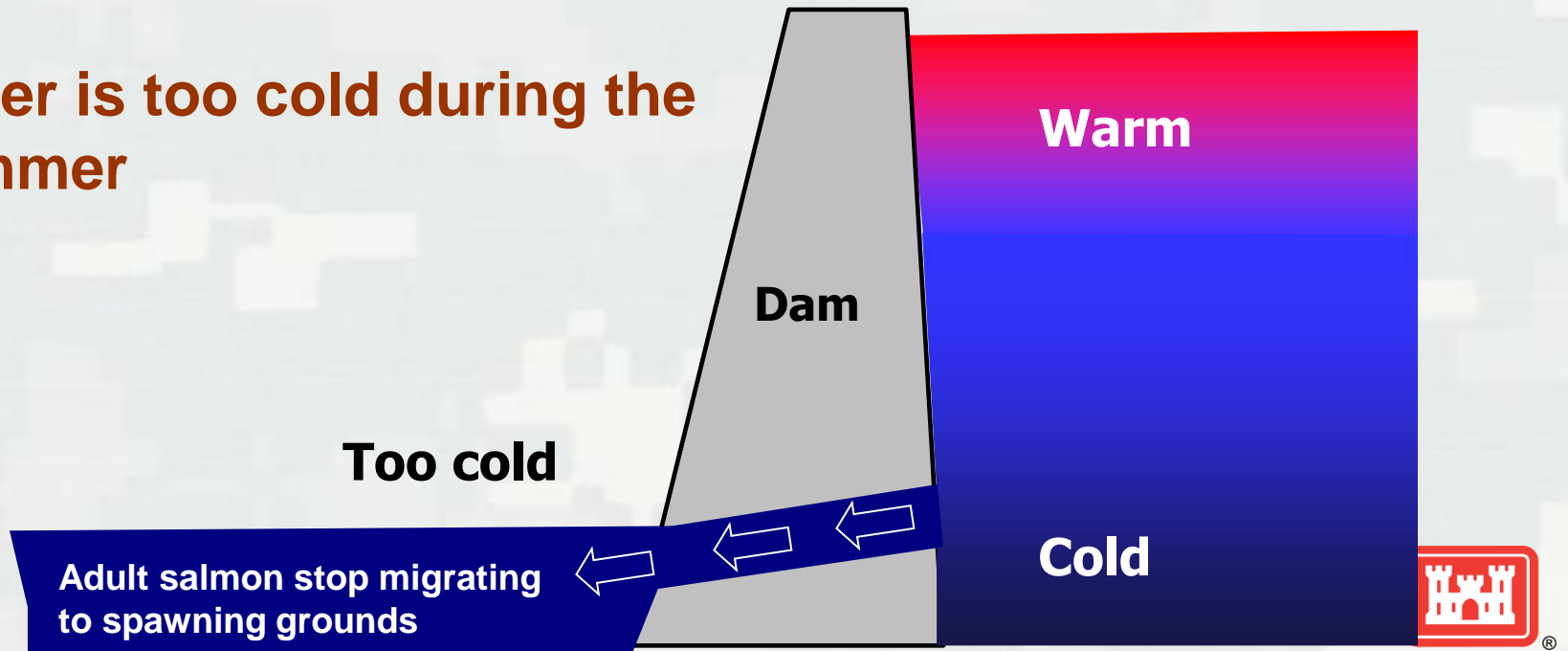
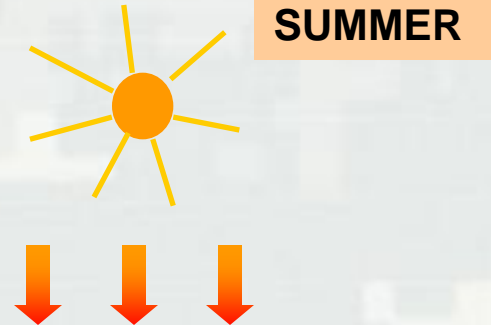
- Design refinement and specification
 - ▶ Develop the design completely
 - ▶ Drawings and specifications become legal construction contract
 - ▶ 12-18 months
- Construction
 - ▶ 18-36 months



Pre-Temp Control

Typical Summertime Operations and the downstream effect:

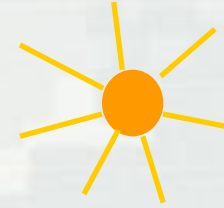
Water is too cold during the summer



Pre-Temp Control

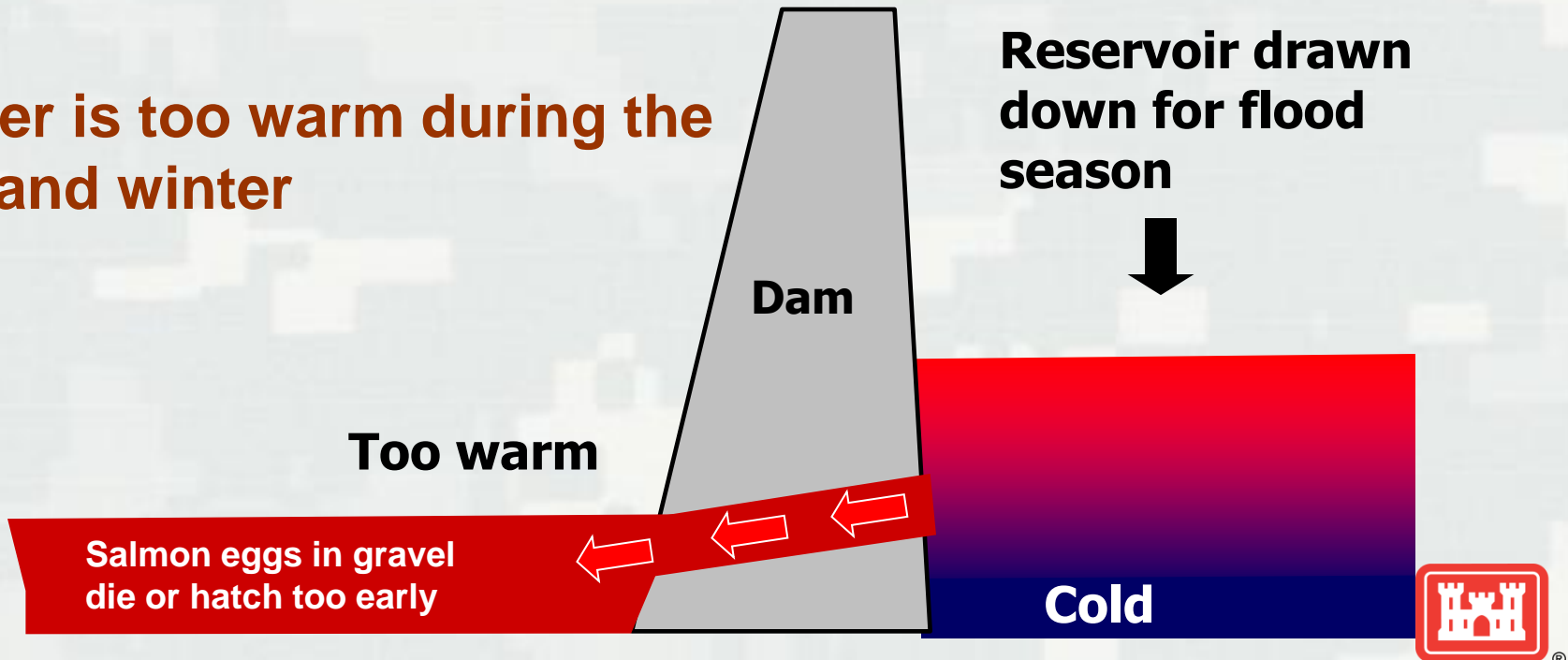
Typical Fall/Winter Operations and the downstream effect:

FALL/WINTER



Water is too warm during the fall and winter

Reservoir drawn down for flood season



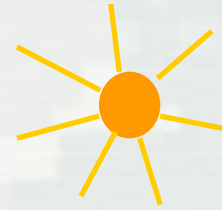
Too warm

Salmon eggs in gravel die or hatch too early

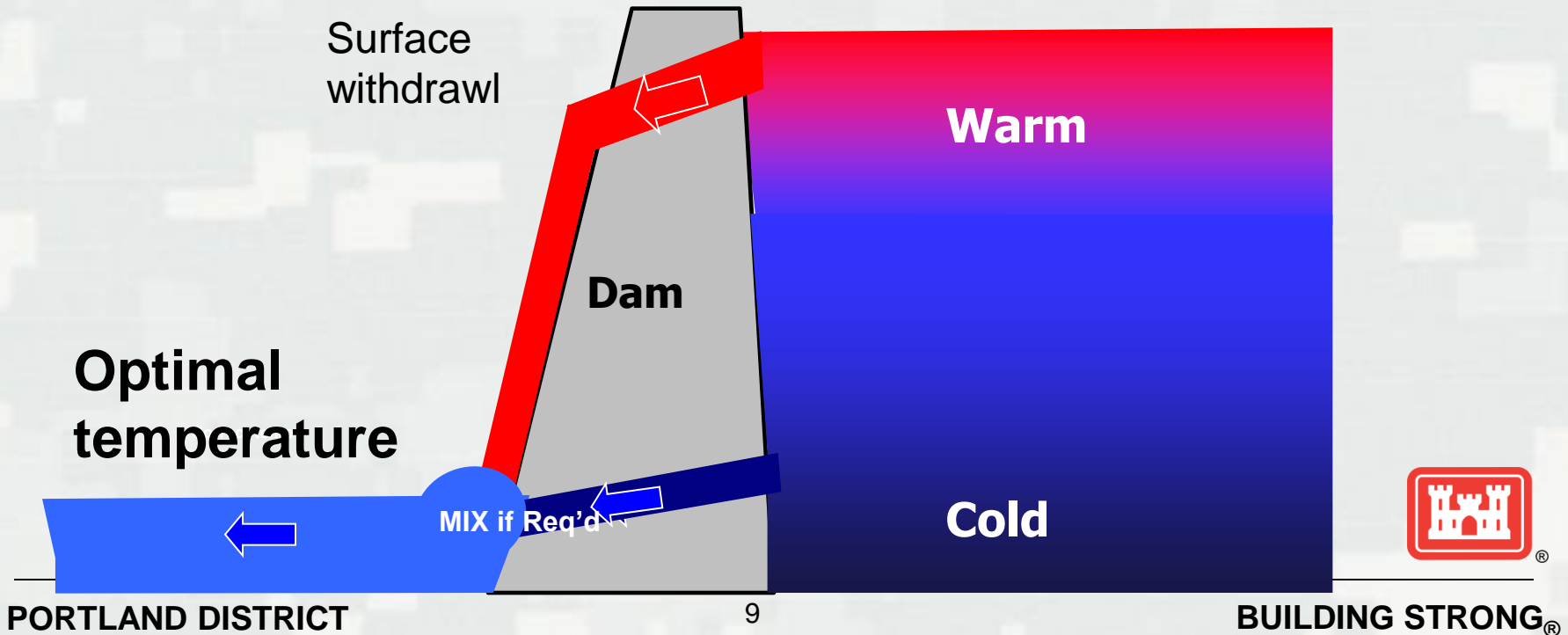
Cold

Temperature Control Operation

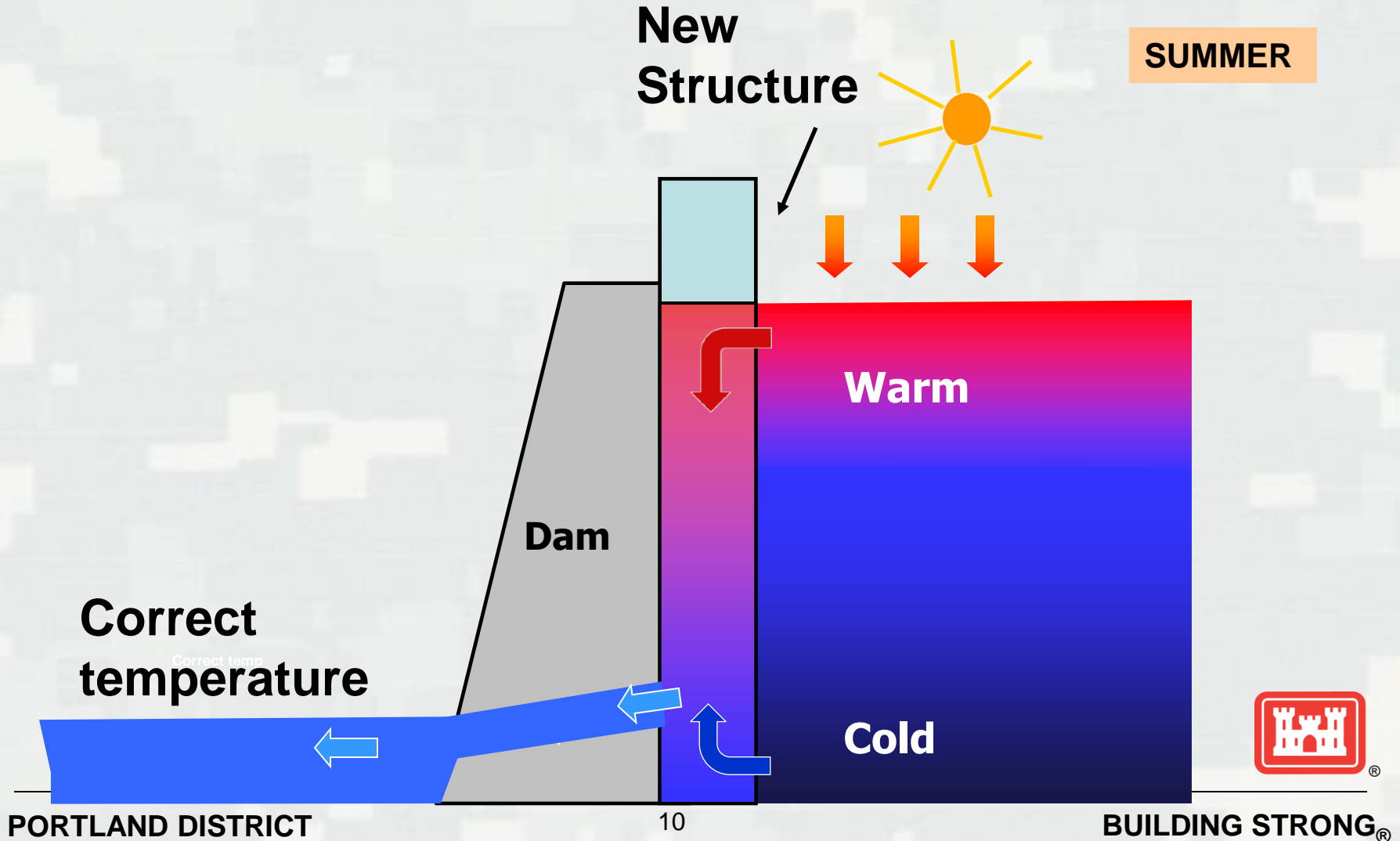
Note - Only works when water is above spillway crest



SUMMER

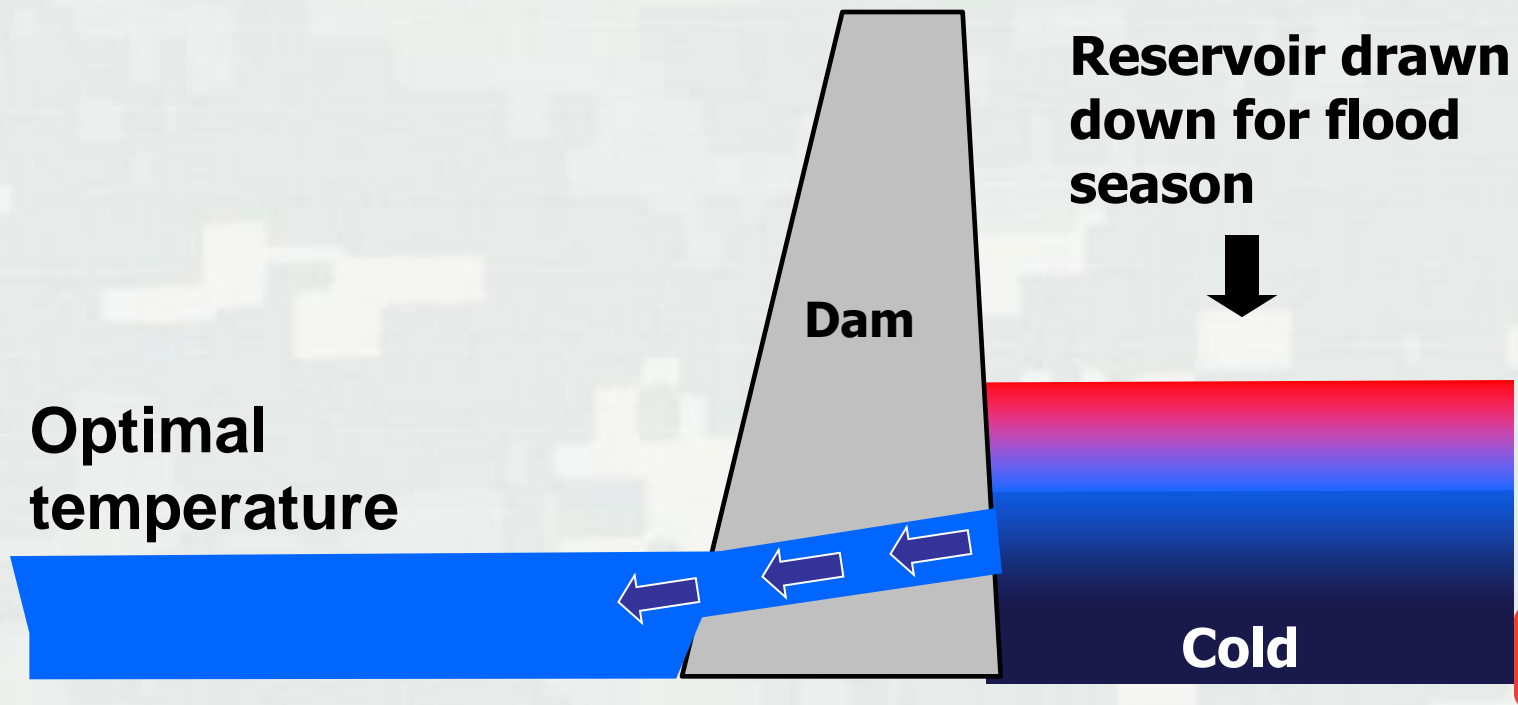
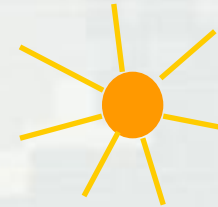


Temperature Control – Structural Modification

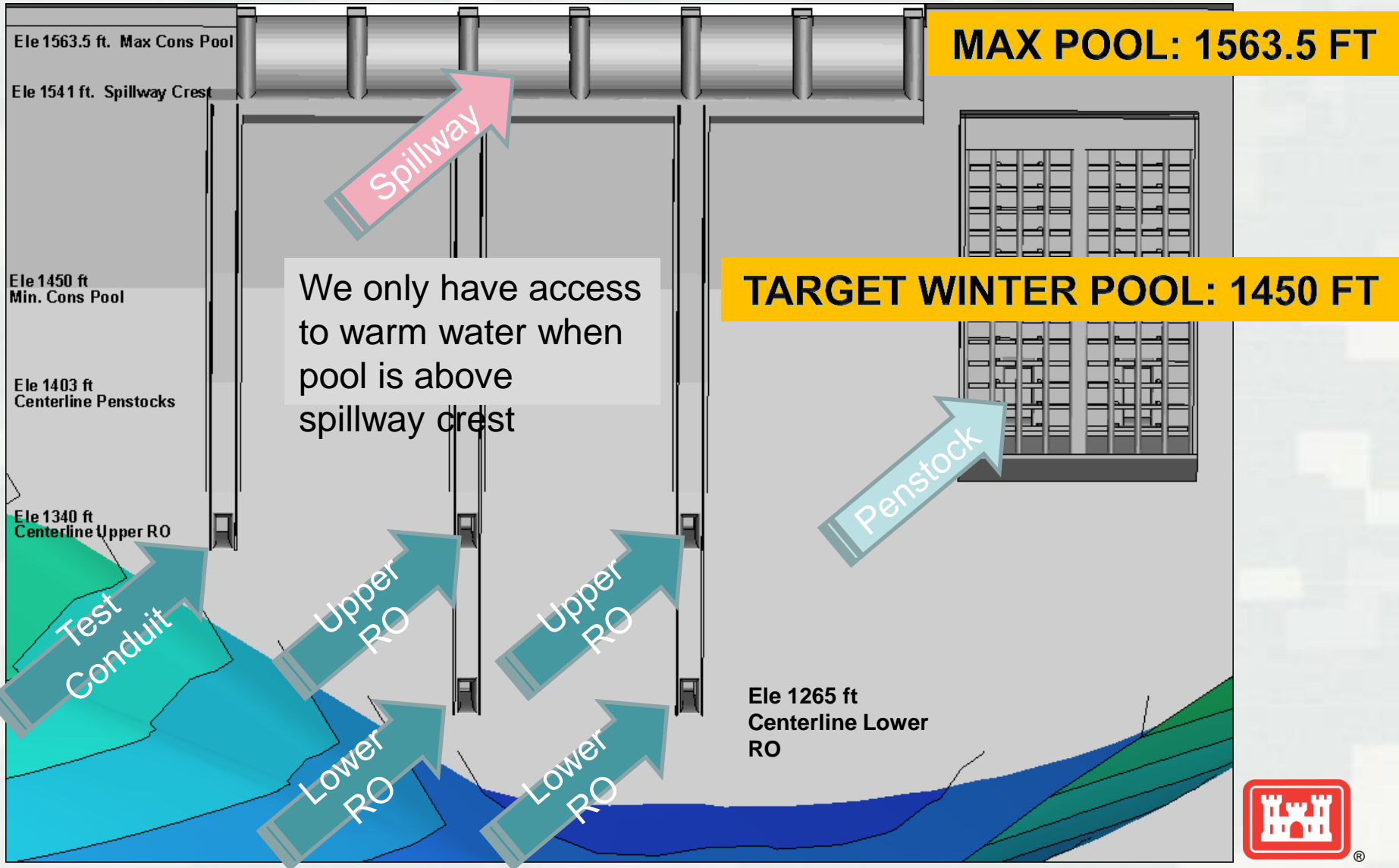


Temperature Control Operation

FALL/WINTER



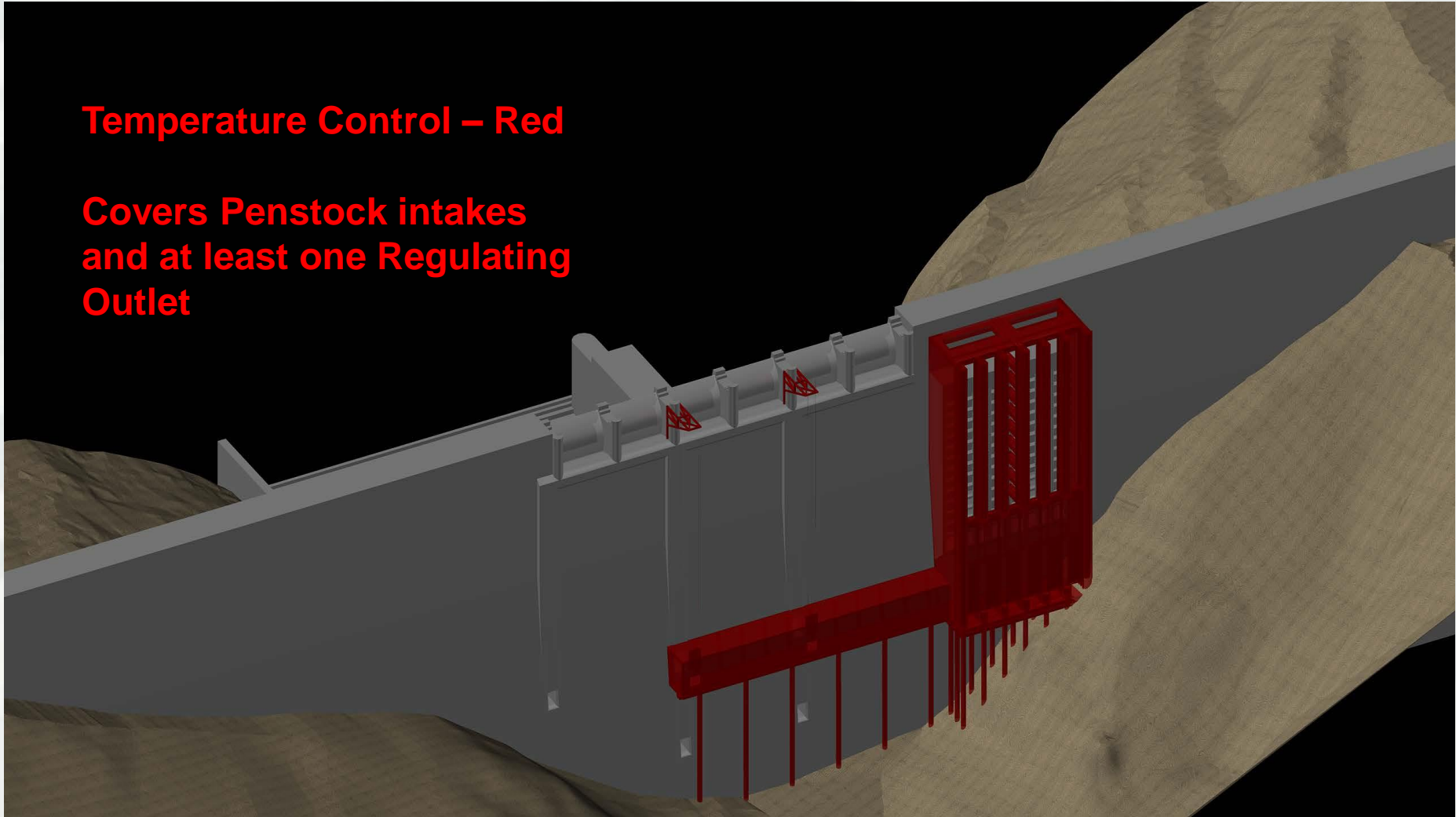
Existing Project: Upstream Face



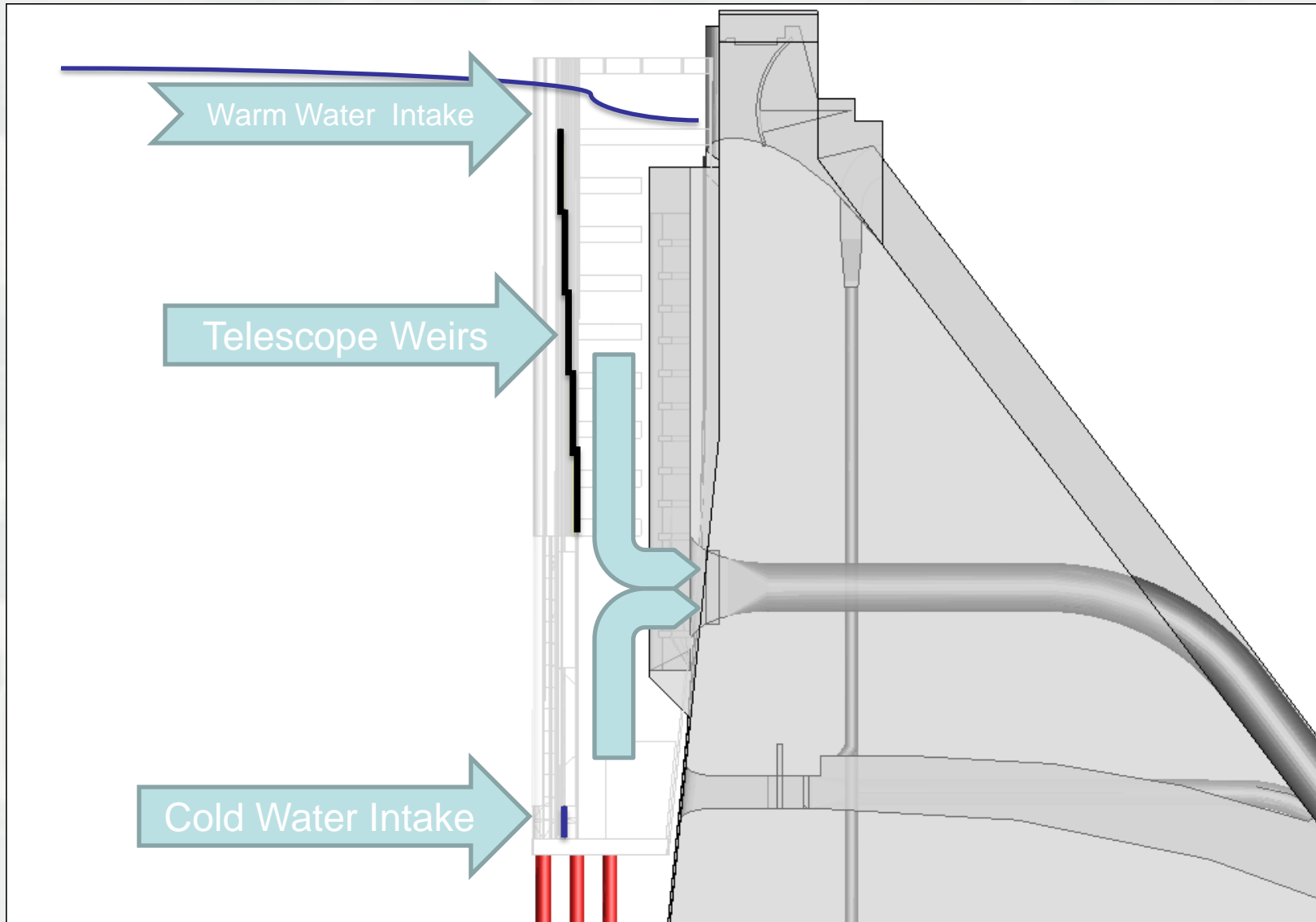
Temperature Control System

Temperature Control – Red

**Covers Penstock intakes
and at least one Regulating
Outlet**

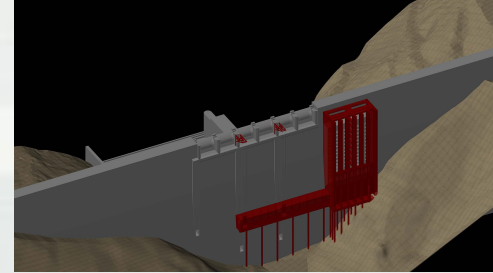


Temperature Control Structure : Side View



Temperature Control - Current Status

- Refining design and constructability
 - ▶ Selecting major construction materials
 - Likely Concrete – Due to longevity/minimal maintenance
 - ▶ Investigating possible construction methods
 - Unique construction techniques to get above minimum pool
 - ▷ Possible underwater foundation construction
 - ▷ Possible precast concrete sections – floated into place
 - Looking for a balance of impacts
 - ▷ Construction cost/quality
 - ▷ Lower than normal pool elevations
 - ▷ Hydropower impacts

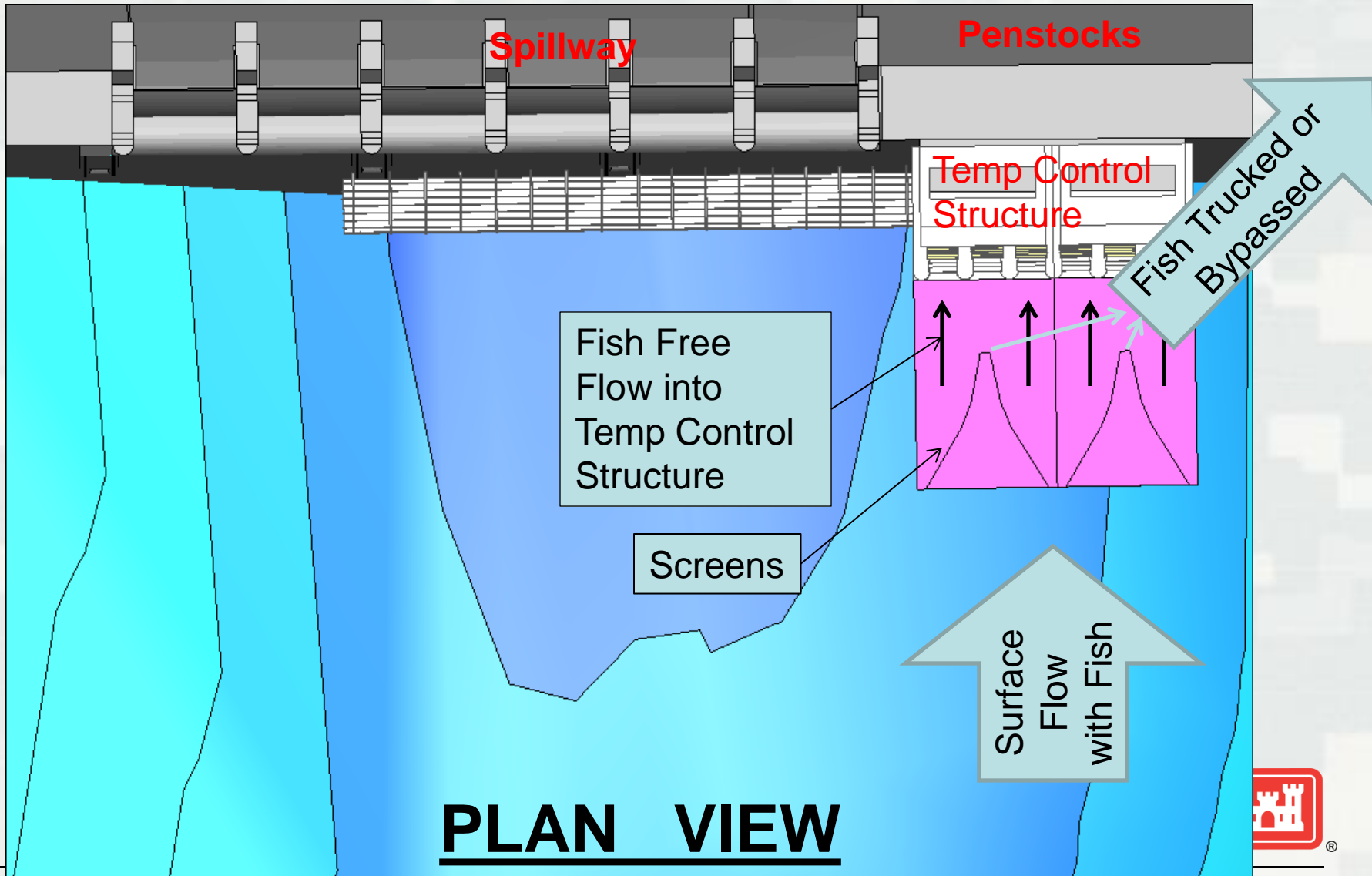


Downstream Fish Passage

- Current passage routes
 - ▶ Spillway
 - ▶ Penstocks
 - ▶ Regulating outlets
- Investigating current route survival
 - ▶ Expect: Current route survival not BiOp acceptable
- Provide equipment/means and methods for safe passage for juvenile salmon and steelhead to pass downstream for migration to the ocean



Detroit Temperature Control Structure Combined with Downstream Fish Collector Concept



PLAN VIEW

Summary

- Progressing on Temp Control System design
 - ▶ Minimum of 2-3 years until start of construction
 - ▶ Investigating unique construction techniques to minimize impacts
 - ▶ Need for reservoir drawdown is unknown at this time
- Performing research to determine ways to safely pass juvenile fish downstream
- All Corps actions subject to authorization and appropriation



Questions?

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