

BUILDING A WORLD OF DIFFERENCE

MODIFYING EXISTING DAM INTAKE FOR MULTI-LEVEL WITHDRAWAL

TIM COLLINS, PORTLAND WATER BUREAU
KEVIN LARSON, PORTLAND WATER BUREAU
RICH BLACKMUN, BLACK & VEATCH

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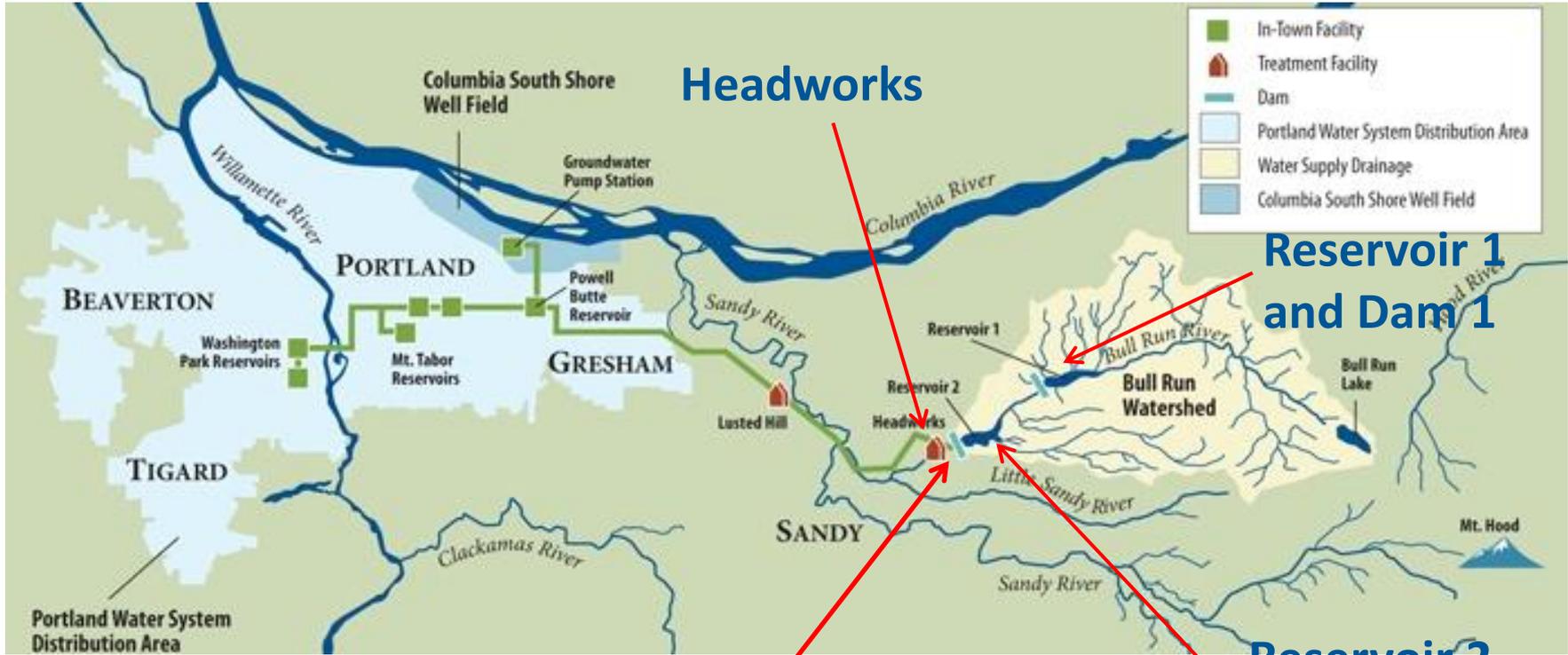
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AGENDA

- **Project Background and Drivers**
- **Design Approach**
- **Constructing in an Active Unfiltered Drinking Water Reservoir**

PROJECT BACKGROUND AND DRIVERS

BULL RUN WATERSHED

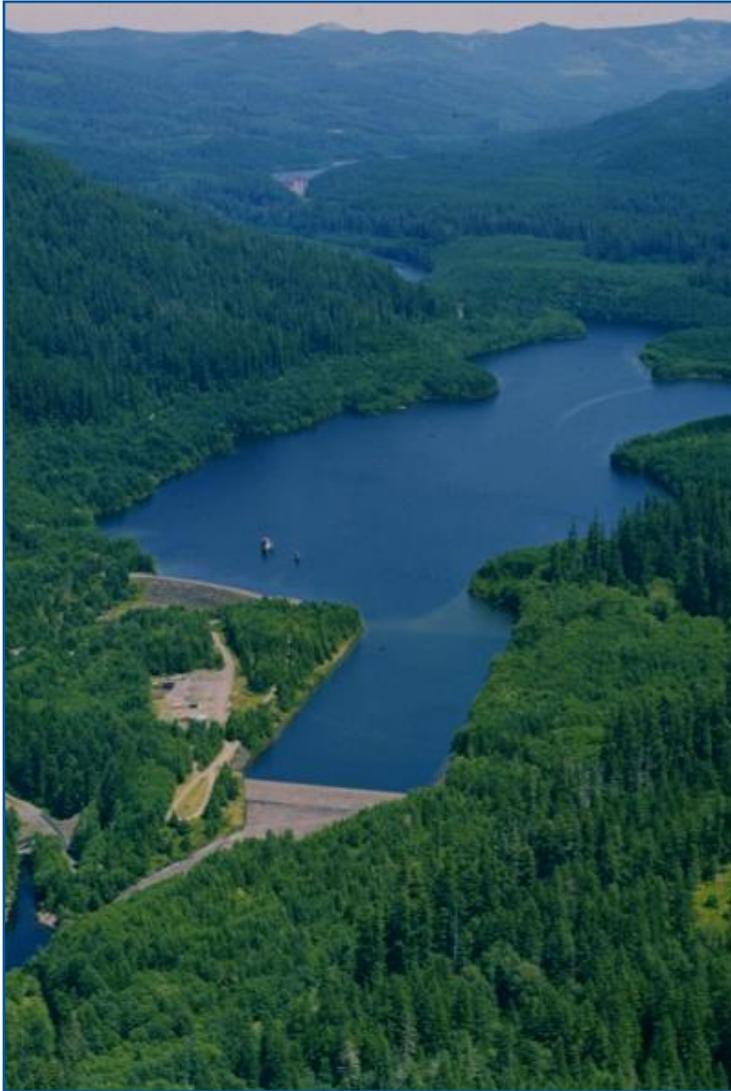


• Source: Portland Water Bureau (www.portlandoregon.gov)

Project Site

The Dam 2 Towers Improvement Project is located at the Bull Run Watershed Reservoir 2.

BULL RUN WATERSHED PARAMETERS



- Portland's primary water supply since 1895
- Serves 900,000 people
- 26 miles east of the City of Portland
- Protected by special federal legislation
- No commercial logging
- Closed to ALL public access
- Federal land co-managed with City of Portland

HABITAT CONSERVATION PLAN (HCP)

- Product of a 10-year collaborative process
- 50-year plan to protect and improve aquatic habitat
- 49 actions over the next 50 years
- The Watershed will be managed to improve the fish habitat
- Compliance with the ESA and CWA requirements
- Provide regulatory certainty for PWB operation of Bull Run Watershed

DAM 2 TOWERS IMPROVEMENTS

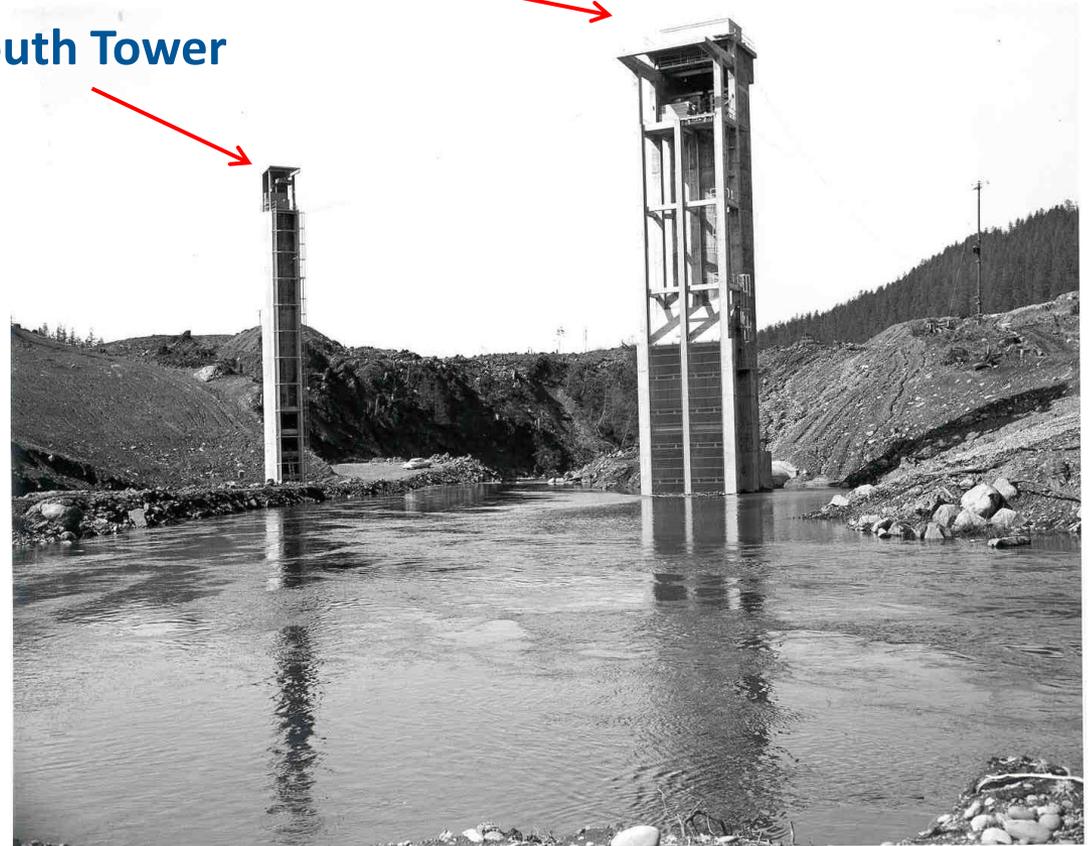
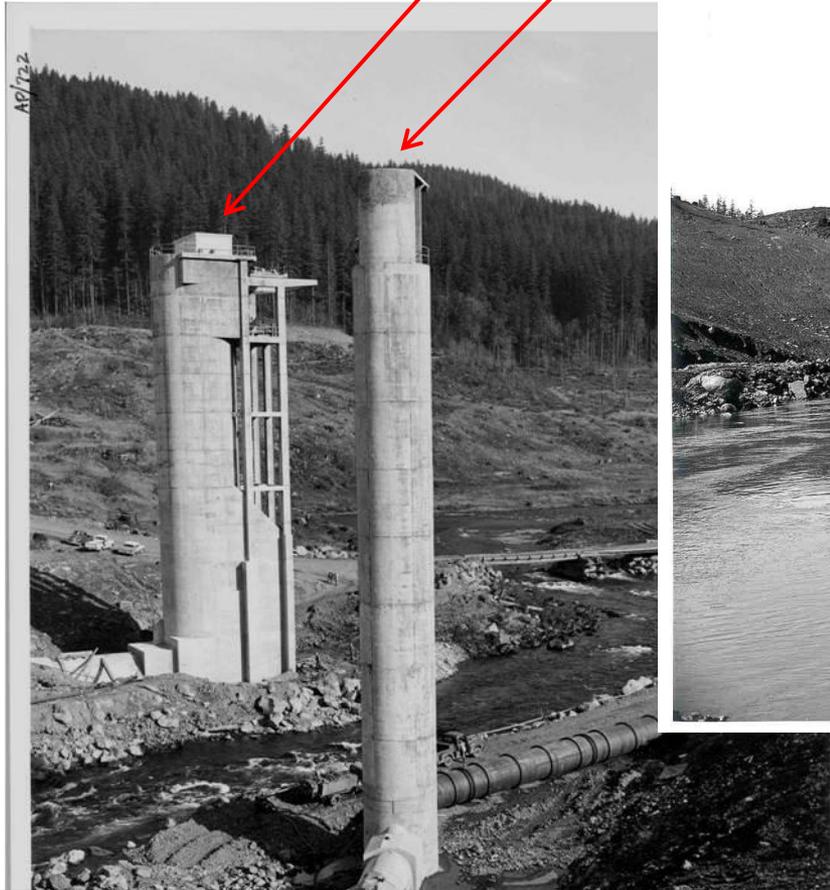
- The Bull Run Dam 2 Tower Improvement Project is one of the 49 actions of the HCP
- The project was designed to allow the City to manage water temperatures in the lower Bull Run River by adding the ability to select water from three elevations in Bull Run Reservoir No. 2
- Optimum water conditions for fish will be maintained in the lower Bull Run River

DESIGN APPROACH

NORTH AND SOUTH TOWERS 1960'S

North Tower

South Tower



NORTH AND SOUTH TOWER - 2010

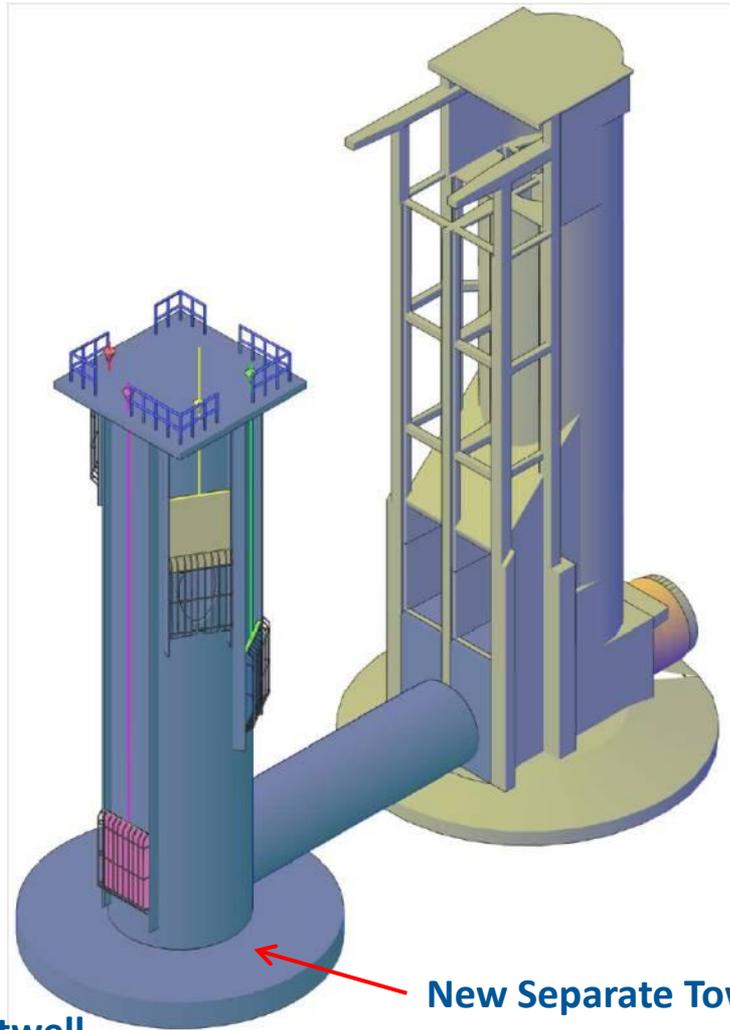
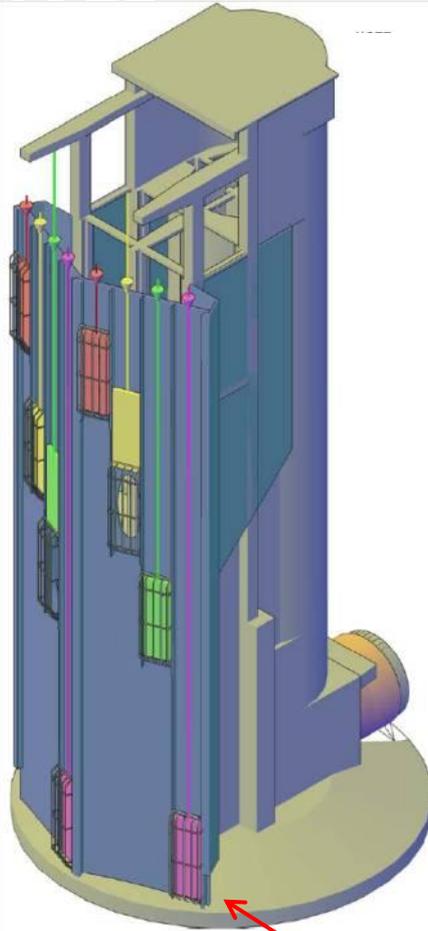
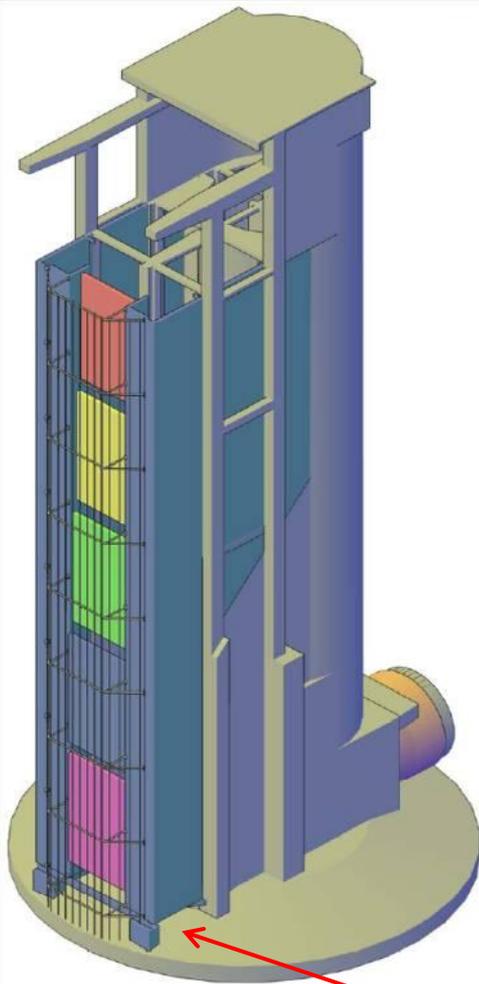
North Tower



South Tower



CONCEPTUAL DESIGN – NORTH TOWER ALTERNATIVES

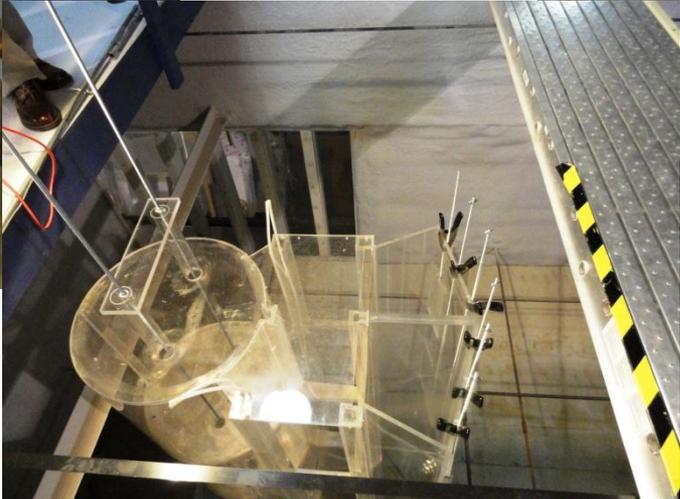
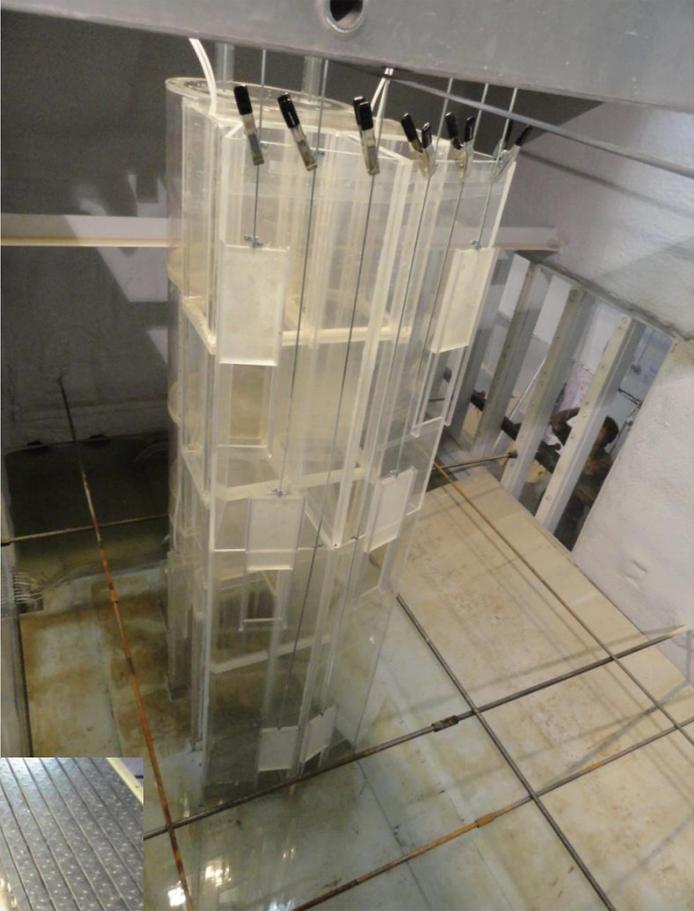
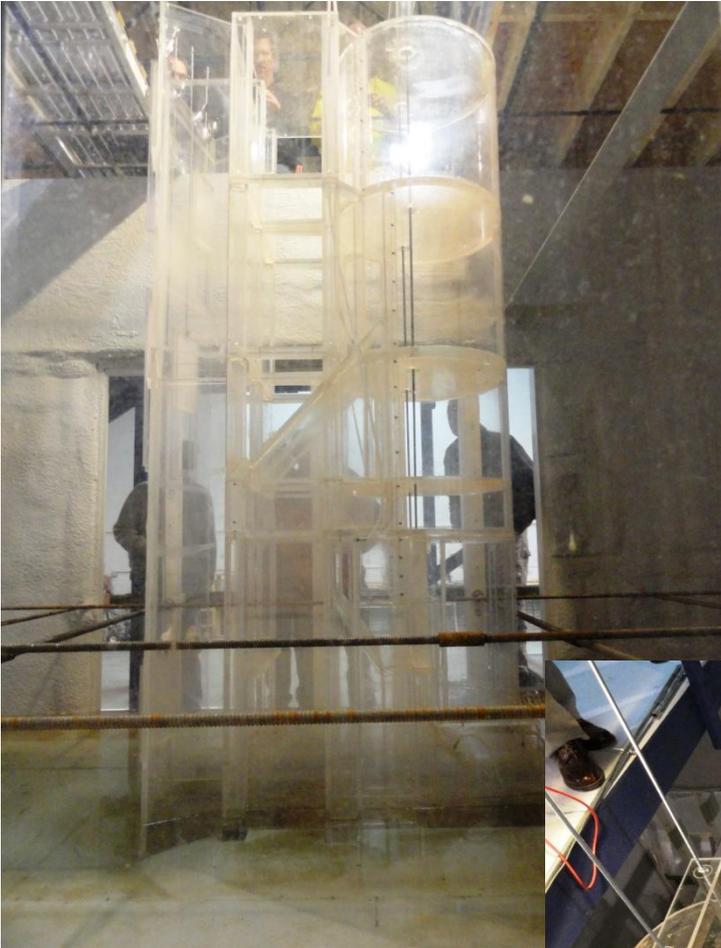


New Wetwell with Temperature Control Panels

New Wetwell with Slide Gate

New Separate Tower

PHYSICAL MODEL BY NHC



VIEWING OF NHC'S MODEL



Viewing Operation
of Model

Vortex Outside
Wetwell



Vortex Inside
Wetwell

CONSTRUCTING IN AN ACTIVE UNFILTERED DRINKING WATER RESERVOIR

Electrical Control Room

Boom Crane

OVERVIEW

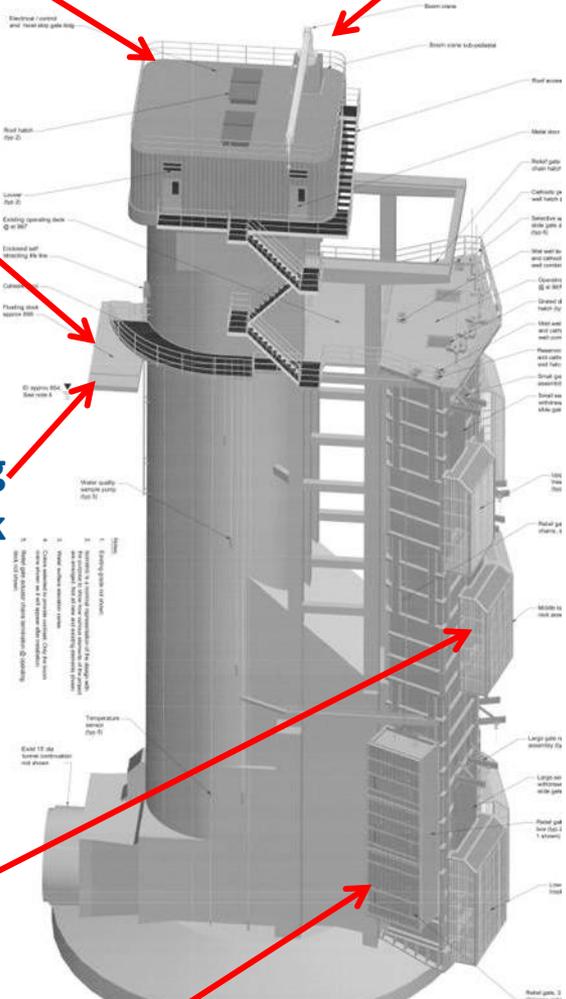
- CM/GC Contractor and Partnering Agreement
- Major Construction Activities
 - CM/GC Mobilization and Access
 - Dredging
 - Wet Well Fabrication and Installation
 - Pre-Fabricated Building Construction and Installation

Access

Floating Dock

6 Trash Racks and 6 Slide Gates

Relief Gates



CM/GC CONTRACTOR AND PARTNERING AGREEMENT

- The CM/GC Contractor selected was Advanced American Construction (AAC)
- AAC is experienced in heavy civil/marine construction, industrial and diving services
- Partnering agreement established between AAC, PWB, and B&V
- Moderated by a management consultant
- Open forum for issue and resolution as well as project planning

CM/GC MOBILIZATION AND ACCESS



CM/GC MOBILIZATION AND ACCESS



DREDGING

- **Bathymetric Survey conducted to develop dredging and grading plan**
- **Dredging required to remove accumulated sediment and material around the foundation of the tower**
- **1500 CY of Cut**
 - Removed by a clamshell bucket
 - Many large boulders were removed
- **365 CY of Fill**
 - Fill material is 6 inch quarry spalls
- **ArmorFlex articulated concrete mattress placed on top of all cut and filled areas for stabilization**

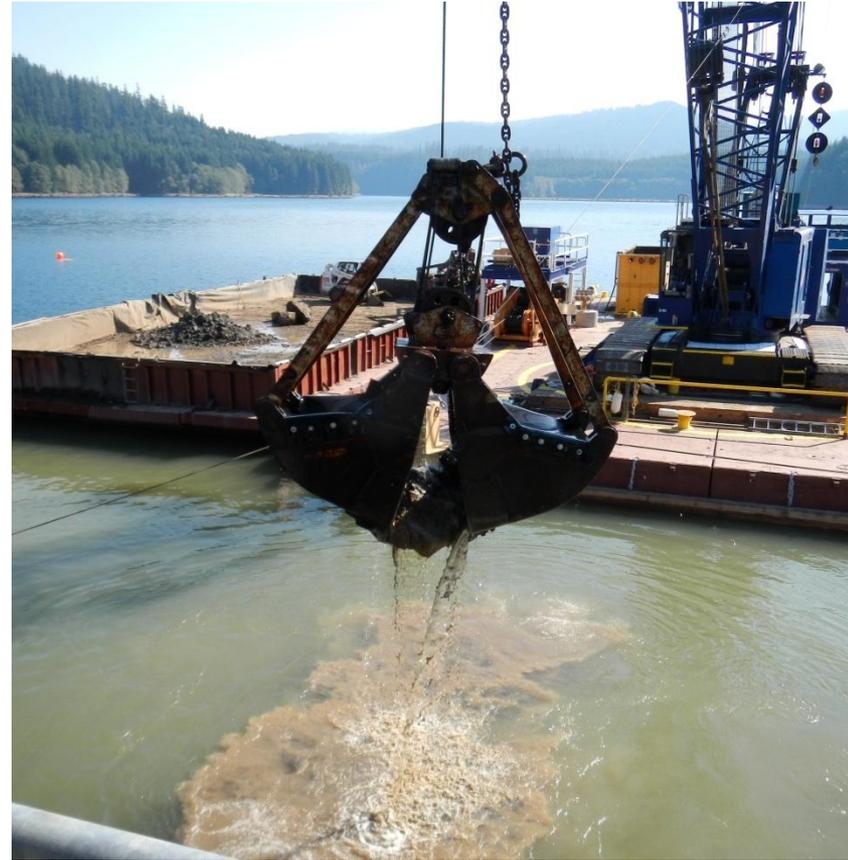
DREDGING (CON'T)

- **During dredging work, a silt curtain was installed**
 - The silt curtain encompassed the work area and extended from the water surface all the way down to the reservoir bottom
- **Turbidity Monitoring**
 - Turbidity levels were monitored using turbidity buoys and hand held monitors
 - PWB monitored and checked turbidity levels throughout the work
 - South tower was online during dredging work
- **All material removed was transported to material barges and then loaded into sealed dump trucks**

DREDGING WORK



DREDGING WORK



WET WELL FABRICATION AND INSTALLATION

- **Wet well is being fabricated at Oregon Iron Works (OIW)**
- **OIW created a SolidWorks model of wet well structure**
 - Model assisted in identifying conflicts as well as determining a solution, prior to fabrication
- **Wet well was divided into eight sections plus the base**
 - Size of sections were based on maximum allowable size able to be transported by truck

WET WELL BASE FABRICATION



WET WELL SECTION 2 - FABRICATION



WET WELL FABRICATION PAINT PREPARATION



Surface preparation important to ensure adherence of coating

WET WELL SECTION IN TRANSIT TO SITE



WET WELL BASE DELIVERY



WET WELL BASE INSTALLATION



PRE-FABRICATED BUILDING INSTALLATION



Pre-fabricated building being transferred to material barge

NORTH TOWER



NEXT STEPS

- Complete fabrication and installation of remaining wet well sections
- Installation of all mechanical and electrical equipment
- Substantial completion – August 2013
- Commissioning
 - System startup and testing
 - Operation & Maintenance Manual

Thank you!





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Together



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