COUGAR DOWNSTREAM PASSAGE UPDATE

Scott Fielding
Fish Biologist
Portland District
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COUGAR DAM AND RESERVOIR

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FLOATING SCREEN STRUCTURE

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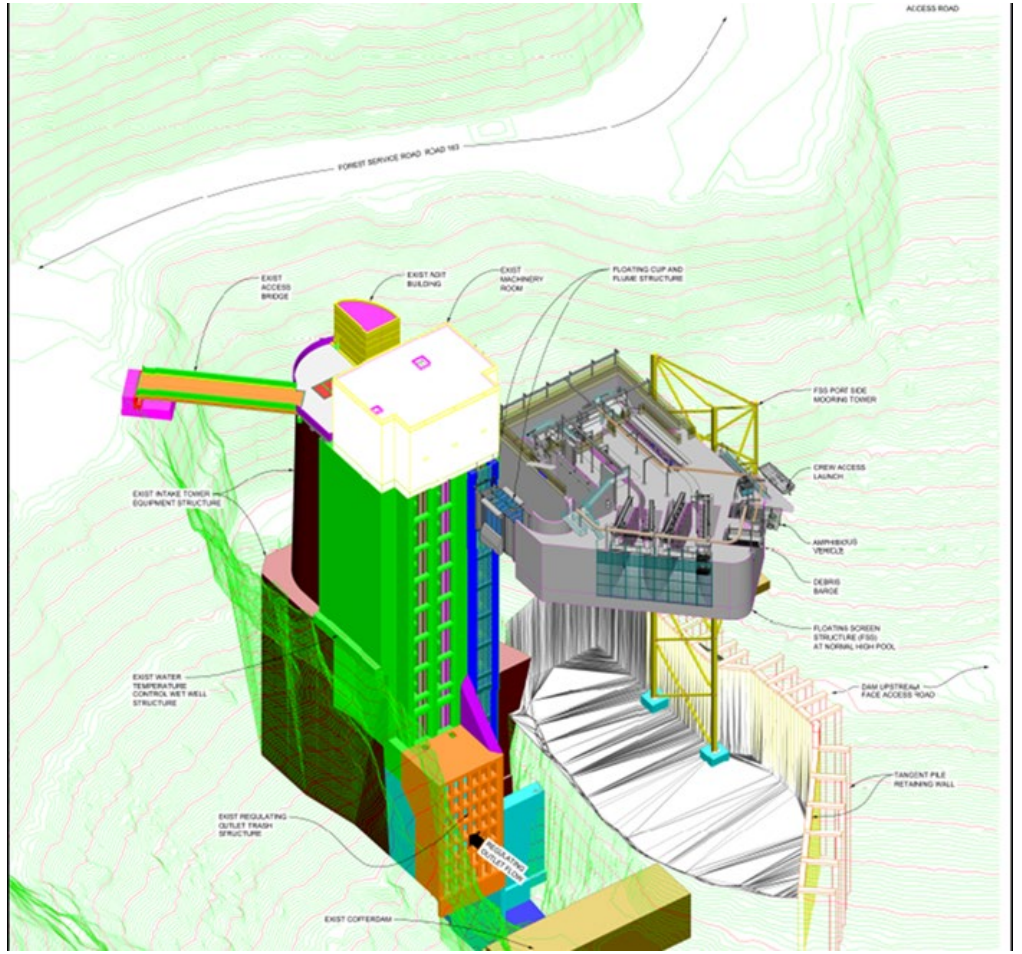
Water Temperature Control Tower and the FSS.

The FSS will float over a range of reservoir elevations to collect fish.

The FSS will pass up to 1,000 cfs with the ability to pass 400 cfs on the starboard side and 600 cfs on the port side.



FSS WATER AND FISH PATH

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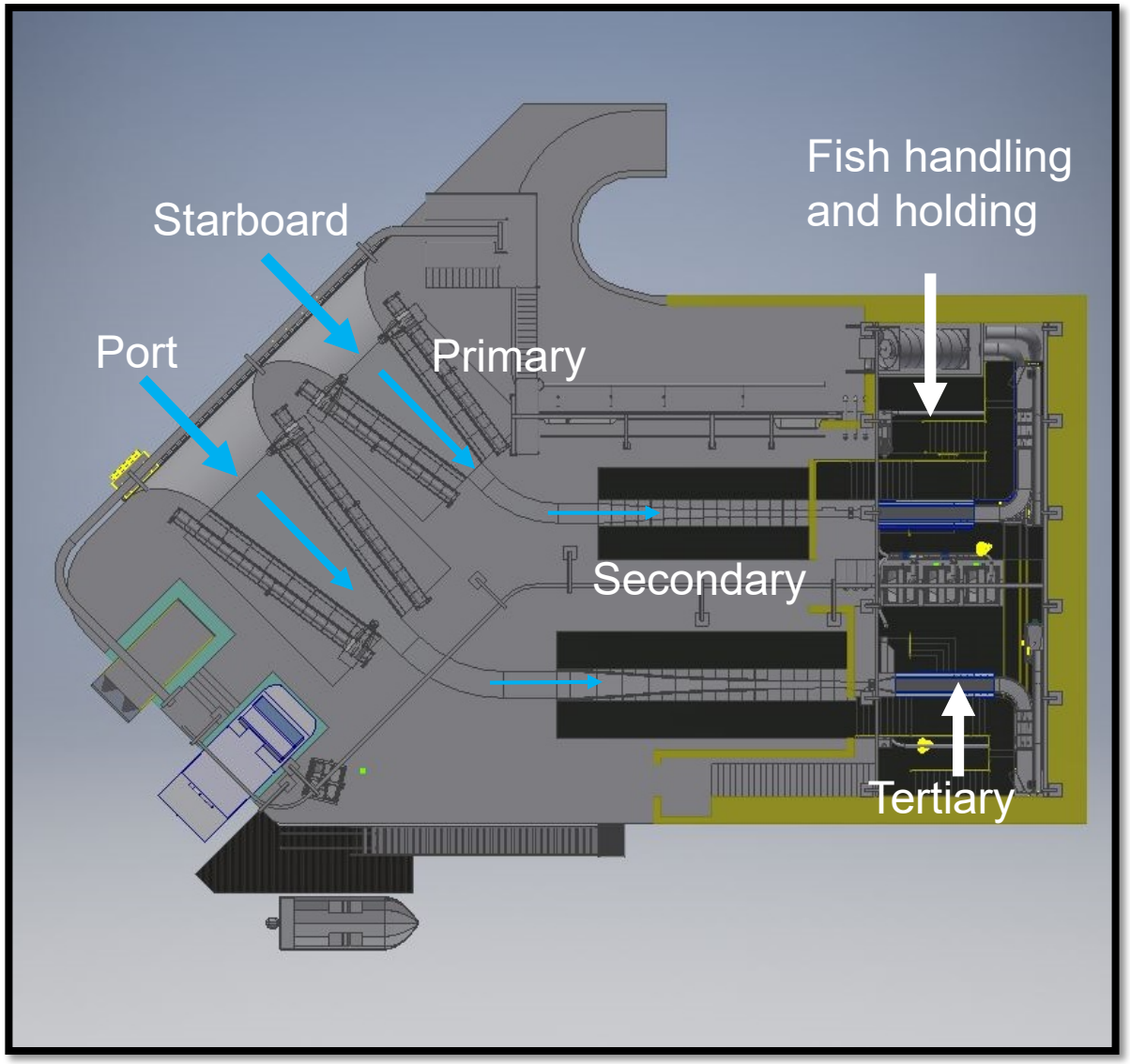
Water will pass through the primary, secondary, and tertiary screen to the fish handily area.

The starboard and port side of the FSS are mirror images.



FSS PHYSICAL MODEL

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Physical model constructed by Alden Labs in Everett, WA.

The model was used to validate head loss between the FSS and the Water Temperature Control Tower and look at entrance conditions.

The model is a 1:10 scale with the starboard barrel passing 455 cfs and the port barrel passing 605 cfs.

The secondary screens were set to withdrawal a fixed cfs throughout the tests.

The model elevations were 1,571’ and 1,532’

COUGAR FSS MODEL TEST PROGRAM

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			Starboard		Port		
Scenario	Test Flows	Reservoir Elevation (ft)	Primary Screens (cfs)	Secondary Screens (cfs)	Primary Screens (cfs)	Secondary Screens (cfs)	Total FSS Flows (cfs)
1H	Starboard and Port-max flow	1571	310	145	420	185	1060
2H	Starboard-max flow	1571	310	145	-	-	455
3H	Port-max flow	1571	-	-	420	185	605
4H	Starboard-low project outflow	1571	155	145	-	-	300
5H	Port-low project outflow	1571	-	-	115	185	300
6H	Starboard max + Port secondary	1571	310	145	-	185	640
7H	Port max + Starboard secondary	1571	-	145	420	185	750
1L	Starboard and Port max flow	1532	310	145	420	185	1060
2L	Starboard-max flow	1532	310	145	-	-	455
3L	Port-max flow	1532	-	-	420	185	605
4L	Starboard-low project outflow	1532	155	145	-	-	300
5L	Port-low project outflow	1532	-	-	115	185	300
6L	Starboard + Port secondary	1532	310	145	-	185	640
7L	Port max + Starboard secondary	1532	-	145	420	185	750

STARBOARD AND PORT-MAX VELOCITY

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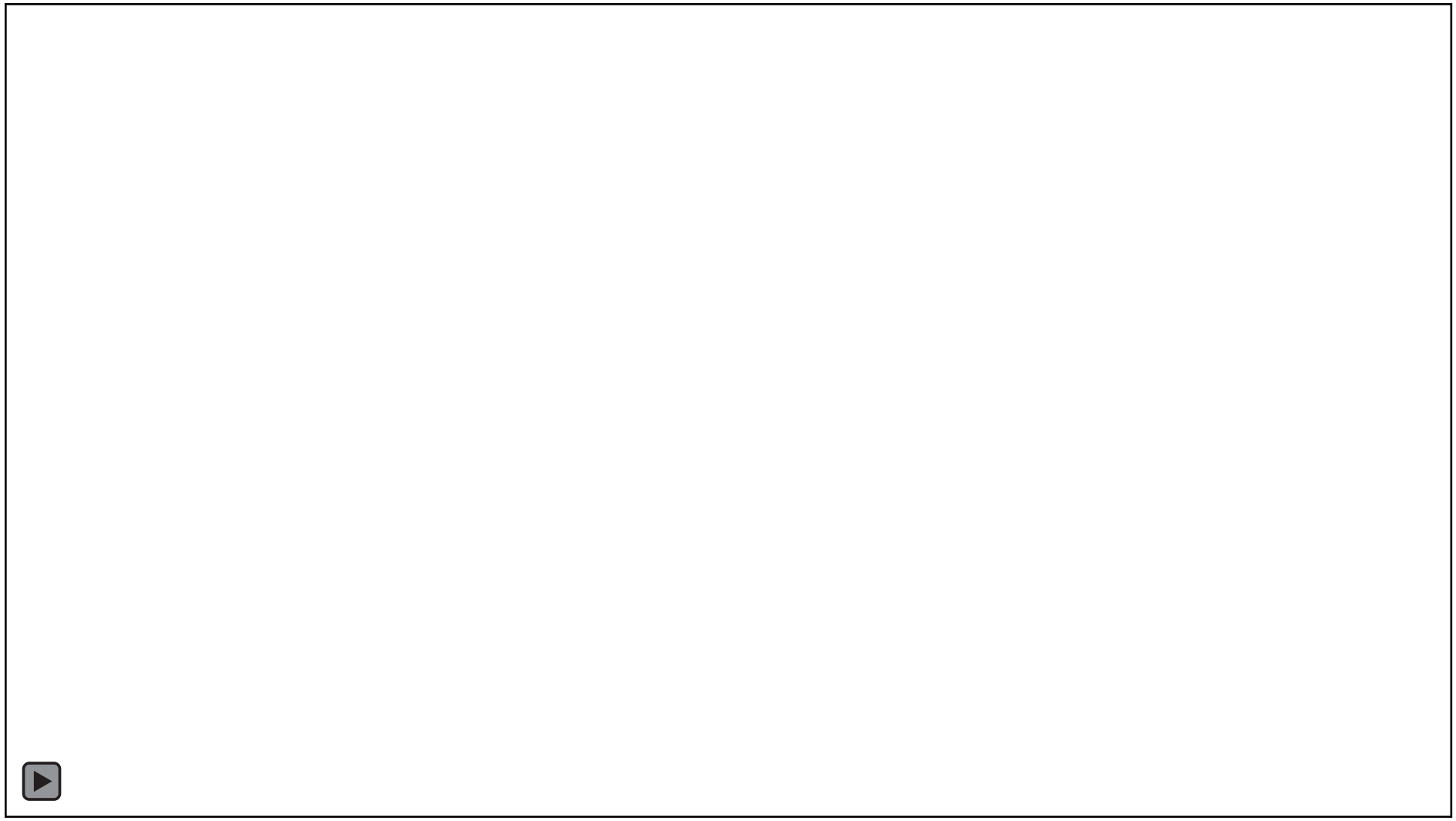

PORT-LOW PROJECT OUTFLOW

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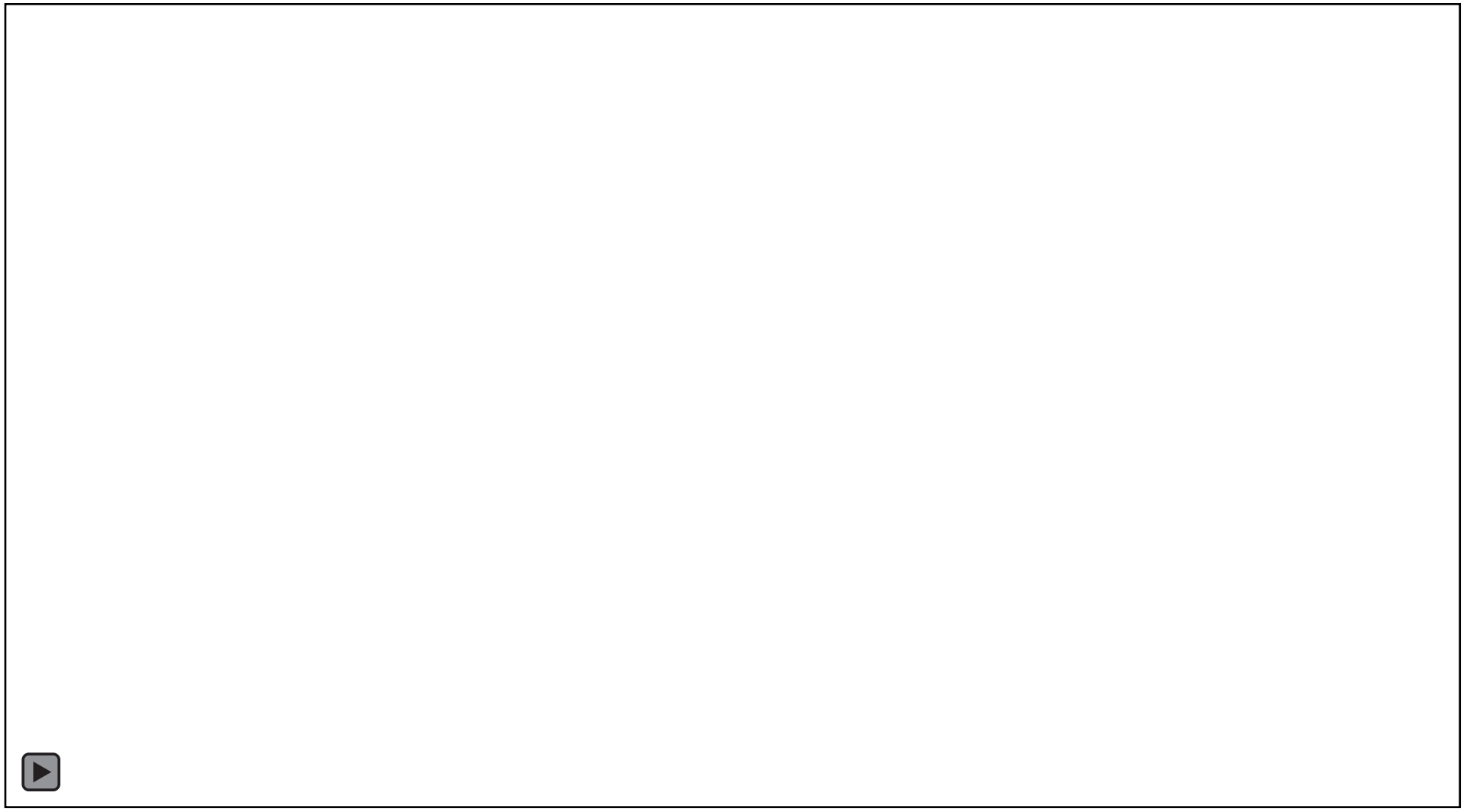

STARBOARD-LOW PROJECT OUTFLOW

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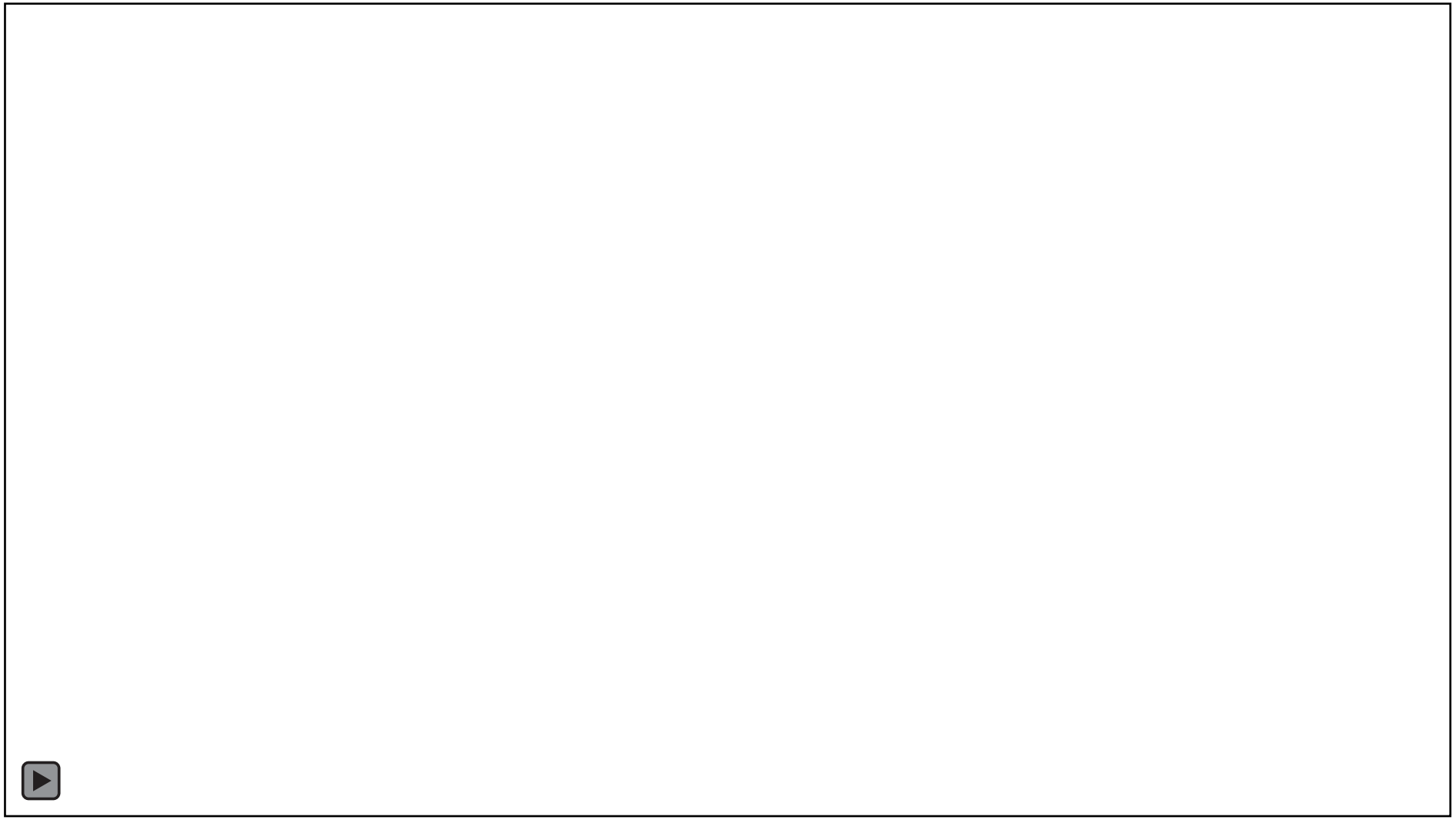

PRODUCT DELIVERY TEAM

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- Chris Budai-Project Manager
- Erica Tarbox-Technical Lead
- April Bardy-Mechanical Engineer
- Dave Bardy-Chief Technical and Contracts
- Sally Bird-Gauvin-Archeologist
- Joseph Brackin-Electrical Engineer
- Jeremy Britton-TL/Geotechnical Engineer
- Norm Buccola-Hydraulic Engineer
- David Croker-Environmental Health and Safety Specialist
- Sean Crosley-Structural Engineer
- Natalie Ehrlich-Geotechnical Engineer
- Ray Flint-Mechanical Engineer
- Leanne Holm-Attorney
- Kelly Janes-Physical Scientist
- Louis Landre-Economist
- Ben Leake-Mechanical Engineer
- Aaron Litzenberg-Hydraulic Engineer
- James McMahon-Engineering Technician-Civil
- Robert McPherren-Contract Specialist
- Erica Medley-Geologist
- Marie Phillips-Hydraulic Engineer
- Todd Pierce-Fisheries Biologist
- Joel Prusi-Structural Engineer
- Eugene Rimkeit-Electrical Engineer
- Michael Schoch-Structural Engineer
- Mary Karen Scullion-Hydraulic Engineer
- Jeff Sedey-Civil Engineer
- Gavin Smith-Structural Engineer
- Ryan Souders-Mechanical Engineer
- Nathan Stormzand-Civil Engineer
- Greg Taylor-Fisheries Biologist
- Chris Walker-Fisheries Biologist
- Brent Welton-Mechanical Engineer
- Kenji Yamasaki-Civil Engineer
- Kelli Zak-Architect