

Chain Lake Dam Upgrade Project

Chain Lake Dam Upgrade Project

Information Meeting

Friday, August 29, 2025

2:00 – 3:00

Hayes Creek Fire Hall

3950 Princeton-Summerland Road



Chain Lake Dam Upgrades

Trevor Nikodym, EIT.

- Ecora Engineering and Environmental Ltd. (Ecora) is a multi-disciplinary consulting firm providing services in Geotechnical, Hydrotechnical, Civil, and Structural Engineering, in addition to Environmental Services.
- Headquarters in Kelowna, BC.
- Trevor Nikodym, EIT. >2.0 years experience in Dam Safety Engineering. Have been on Chain Lake Dam project since March, 2024.
- Kamran Qavami P.Eng., has taken over as Hydrotechnical EOR, and has over 30 years of experience.
- Presentation will cover the why, how, and what of the Chain Lake Dam Upgrades Project.



Introduction

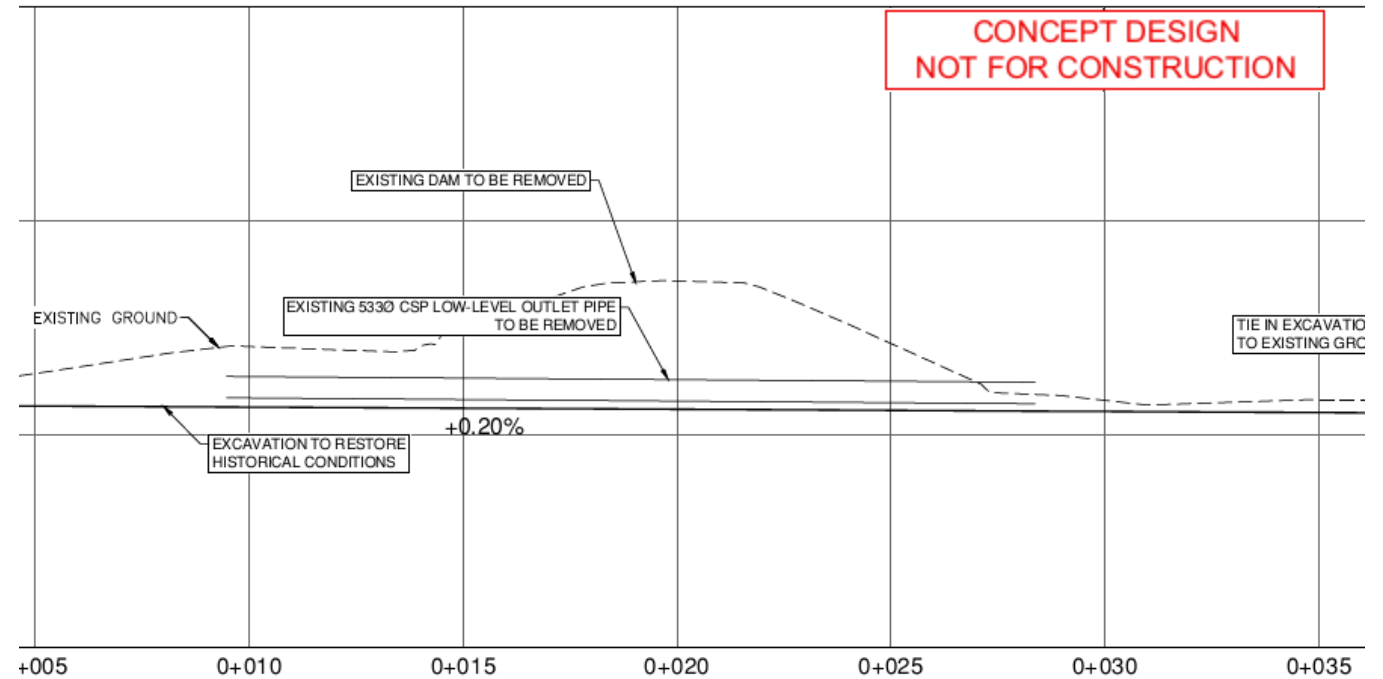
Frazer Lake Dam Construction, Kelowna, BC (2022)

- In 2021, Ecora completed a Dam Safety Inspection (DSI) of Chain Lake Dam.
- Several components had exceeded their design lifespans and deterioration was noted.
- Recommendations that came out of the DSI included:
 - Monitor the embankment, spillway channel, and Low-Level Outlet (LLO) for various failure mechanisms including sloughing and internal erosion.
 - Conduct re-occurring brush removal.
 - Install riprap along embankment toes.
 - Remove and replace the spillway to bring into accordance with BC Dam Safety Regulations. (Insufficient capacity and concrete deterioration).
 - Downstream culvert should be replaced due to exceeding its design life.
 - Replace LLO as it has exceeded its design life.



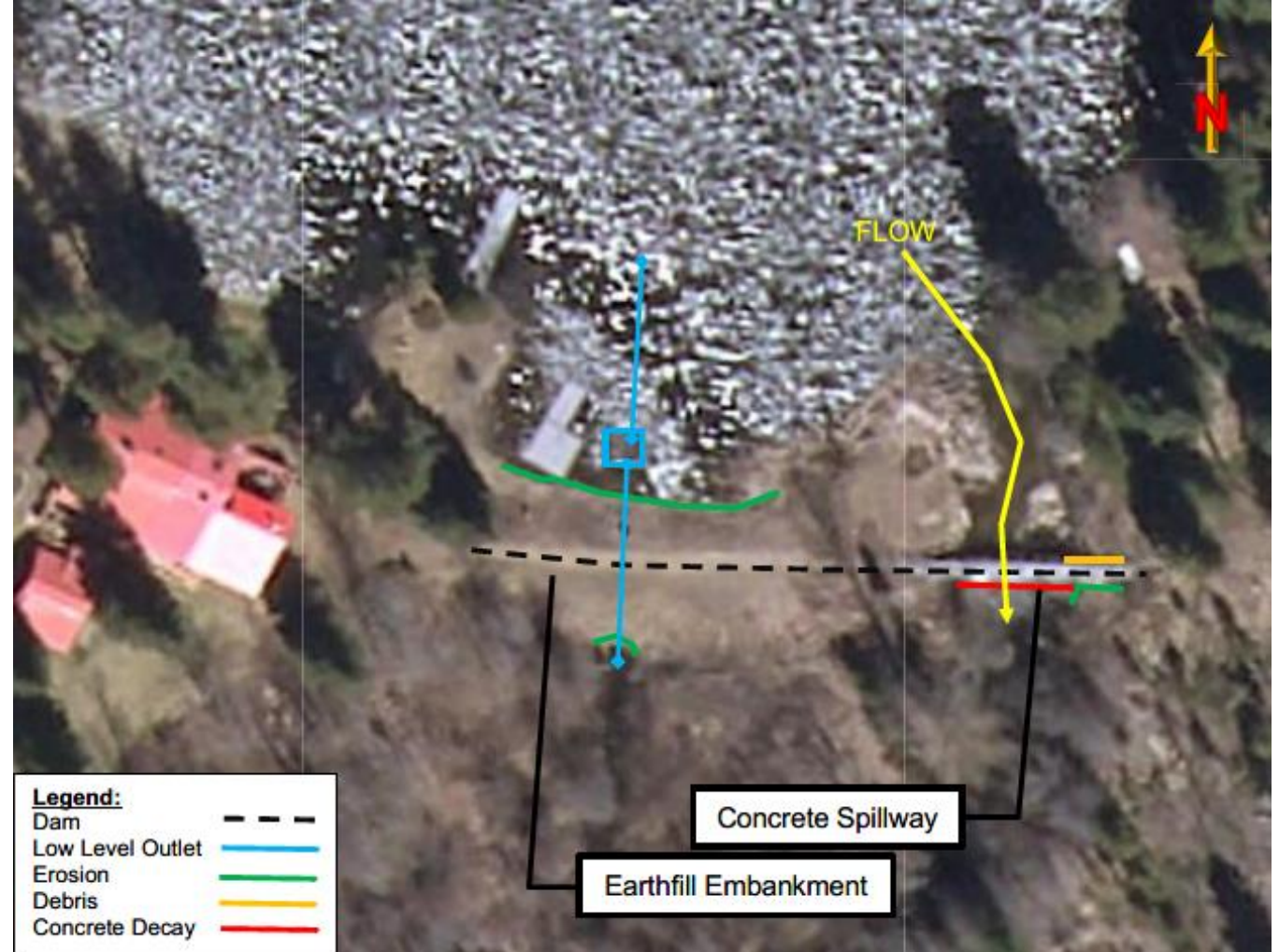
The Why

- Following the DSI, Ecora was retained to determine the feasibility of decommissioning Chain Lake Dam.
- It was determined that the lake level would be reduced by approximately 1.45 m, affecting lakeshore infrastructure.
- During a 1/200-year storm event, downstream flooding would be reduced, however flooding around the reservoir would potentially increase.
- Following discussions with the RDOS, this option was eliminated due to the possible effects to lakeshore infrastructure.



Option Analysis

- In May 2022, Ecora completed an Options Analysis on 5 Options:
 - Retaining Existing Spillway Elevation and Width, Remove House;
 - Retain Spillway Elevation and Widen;
 - *Labyrinth Spillway, Retain Elevation and Width;*
 - Lower Spillway and Widen Spillway; and
 - Lower Spillway and Retain Existing Spillway Width.
- Option 3 was selected due to the ability to maximize flows through the spillway, address all deficiencies of the dam, and minimize impacts to residents. The weir was later changed to an ogee weir to optimize outflow.
- Based on detailed hydrological modelling, the spillway was widened in the final detailed design iteration to address capacity concerns.



Options Analysis

- The dam is currently not in compliance with BC Dam Safety Regulations as it is unable to safely pass the Inflow Design Flood (IDF) of 1/1000-year flood.
 - 1/1000-year flood is industry best practice.
 - Dam Safety Officer (DSO) requirement.
- Significant consideration to environmental impacts were included in design choices to satisfy Provincial requirements.
 - Currently only one entity (DFO) still engaging.
- No log-boom will be installed. This variance letter was approved by the DSO.
- Survey staking and SRW submitted by Ecora in 2024.
 - It is assumed that all vegetation within the SRW is to be removed during construction.

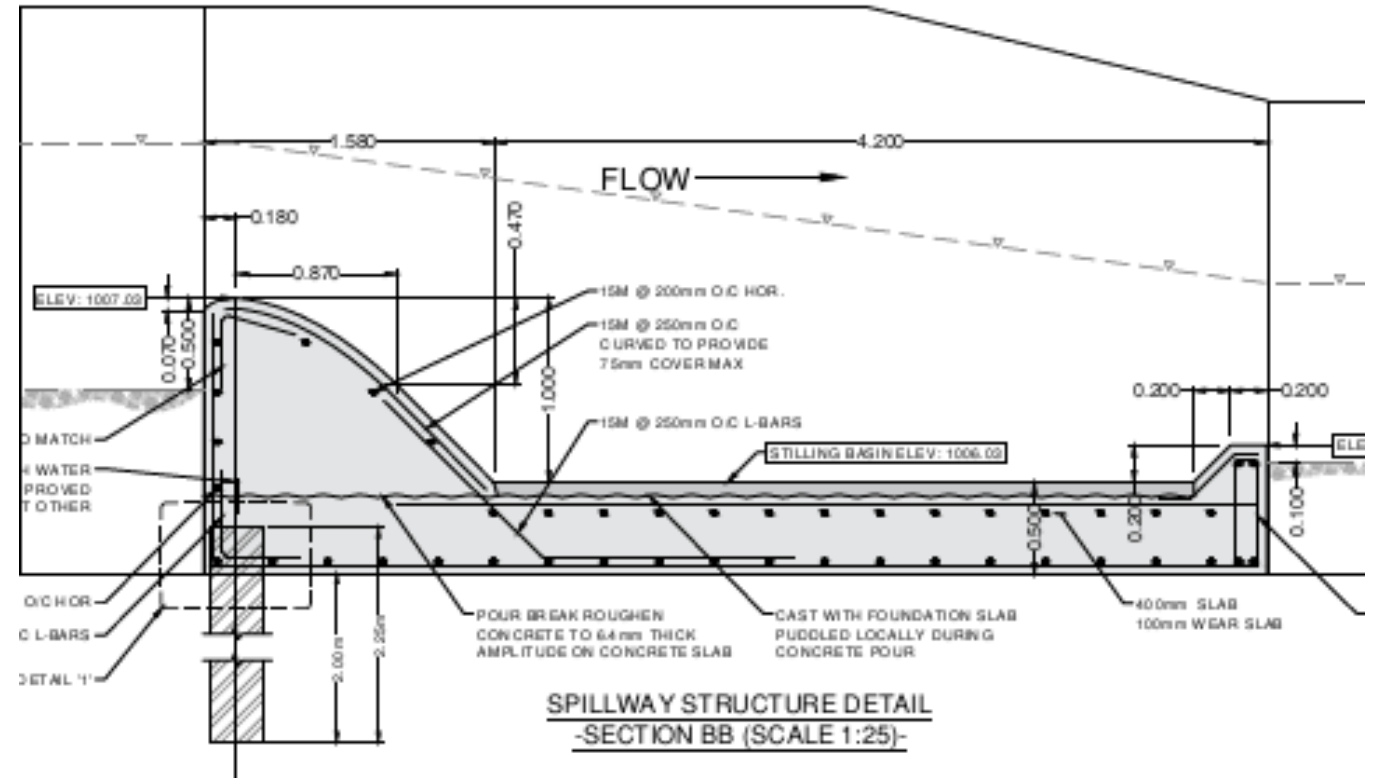
Position: 10 N 696117 5507738 (±8.1m)
Altitude: 1011m (±15.5m)
Datum: WGS-84
Azimuth/Bearing: 106° S74E 1884mils True (±16°)
Elevation Angle: -03.6°
Horizon Angle: -03.2°
Zoom: 0.5X



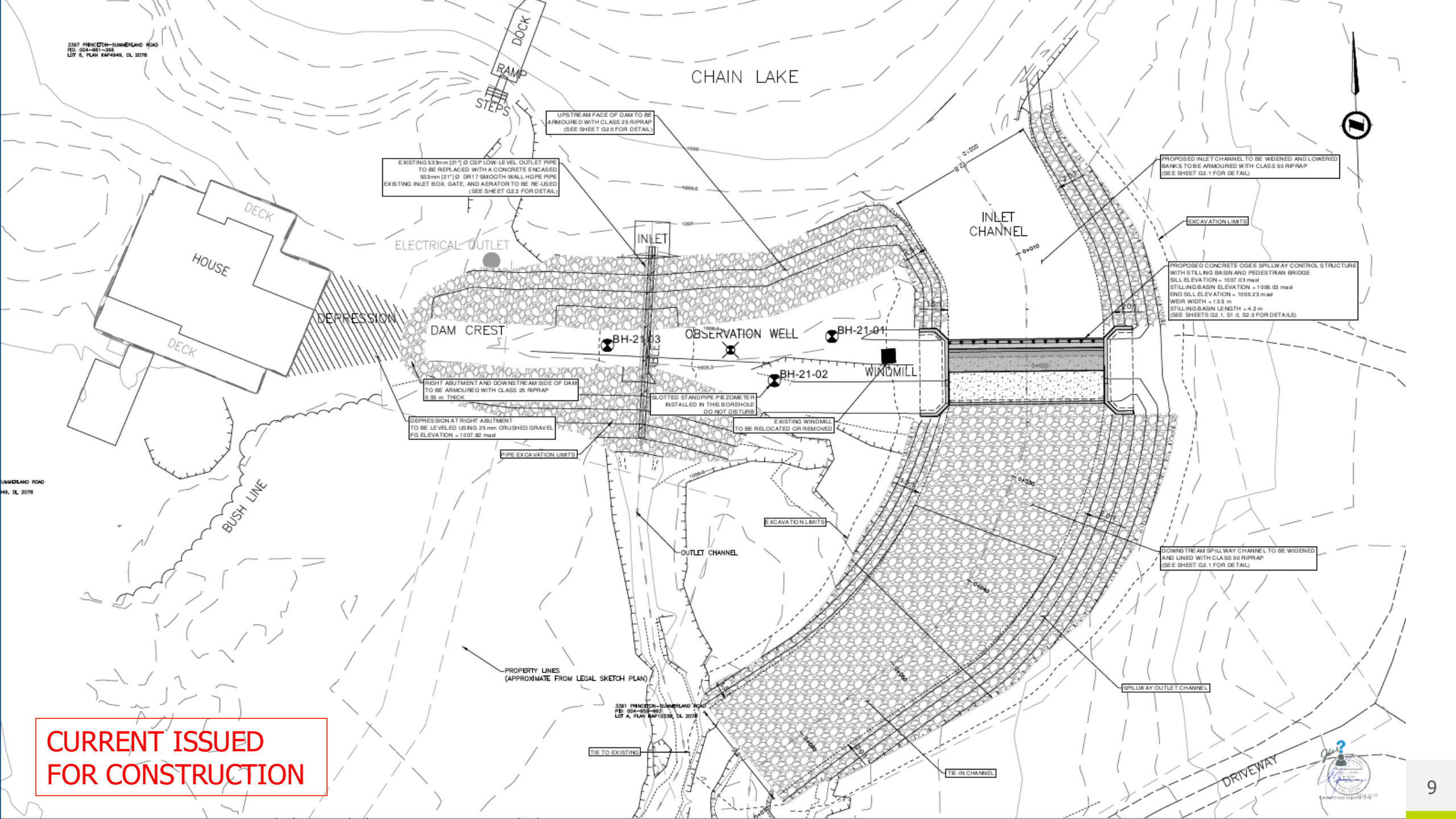
Project Overview

Surveying Site Inspection (April 2024)

- The following upgrades are included in the current Issued For Construction design:
 - Replace spillway structure with concrete ogee spillway, including a stilling basin and pedestrian bridge.
 - Widen spillway and lower inlet channel to accommodate the IDF. Spillway sill elevation is not changing.
 - Armour spillway banks with riprap to provide protection from erosion.
 - Upstream and downstream faces of dam to be armoured with riprap to provide protection from erosion due to high flows and backwatering due to hydraulic restrictions downstream of the dam.
 - Replace LLO pipe due to exceeding lifespan and noted deterioration.



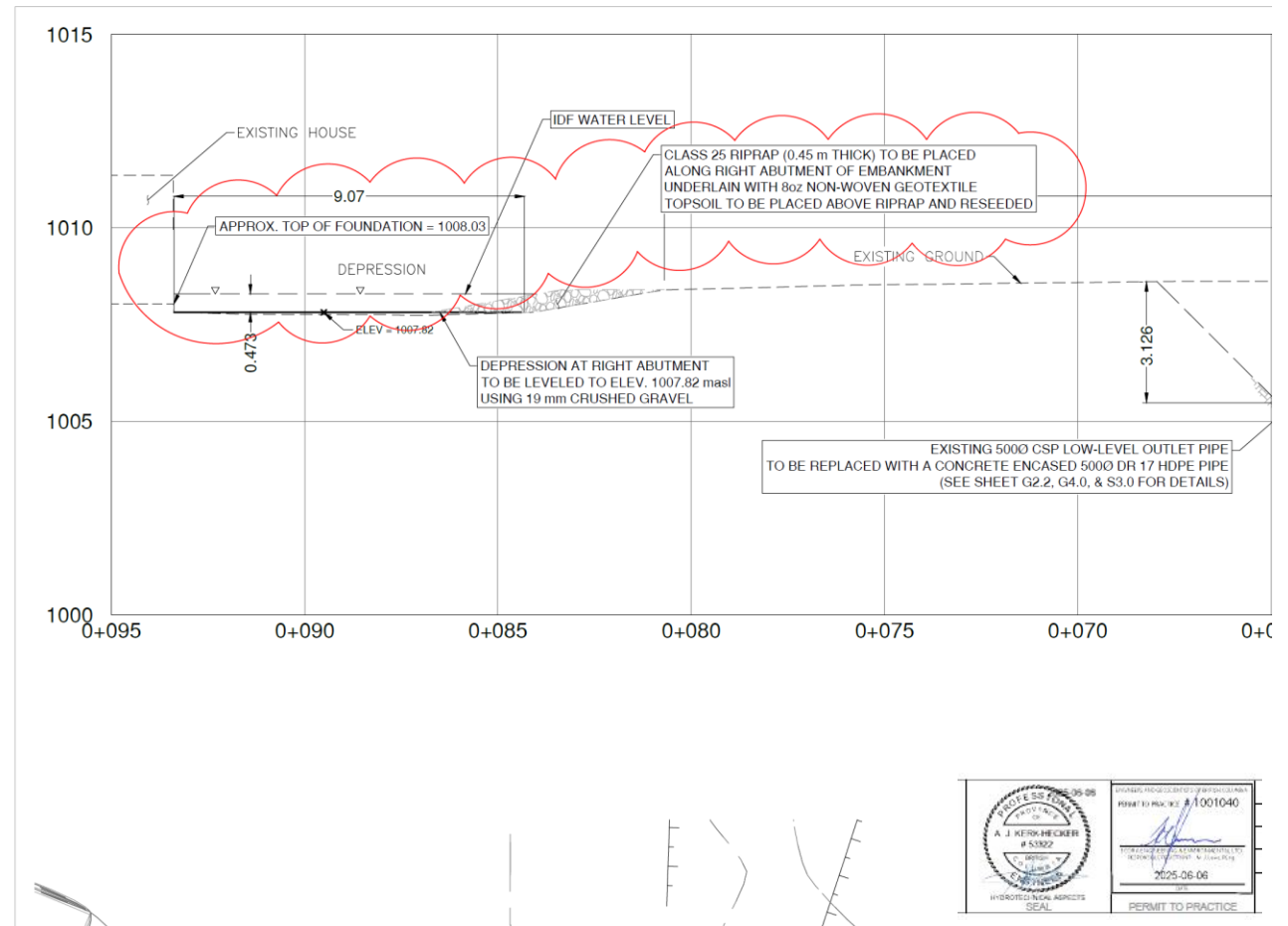
Project Overview



**CURRENT ISSUED
 FOR CONSTRUCTION**

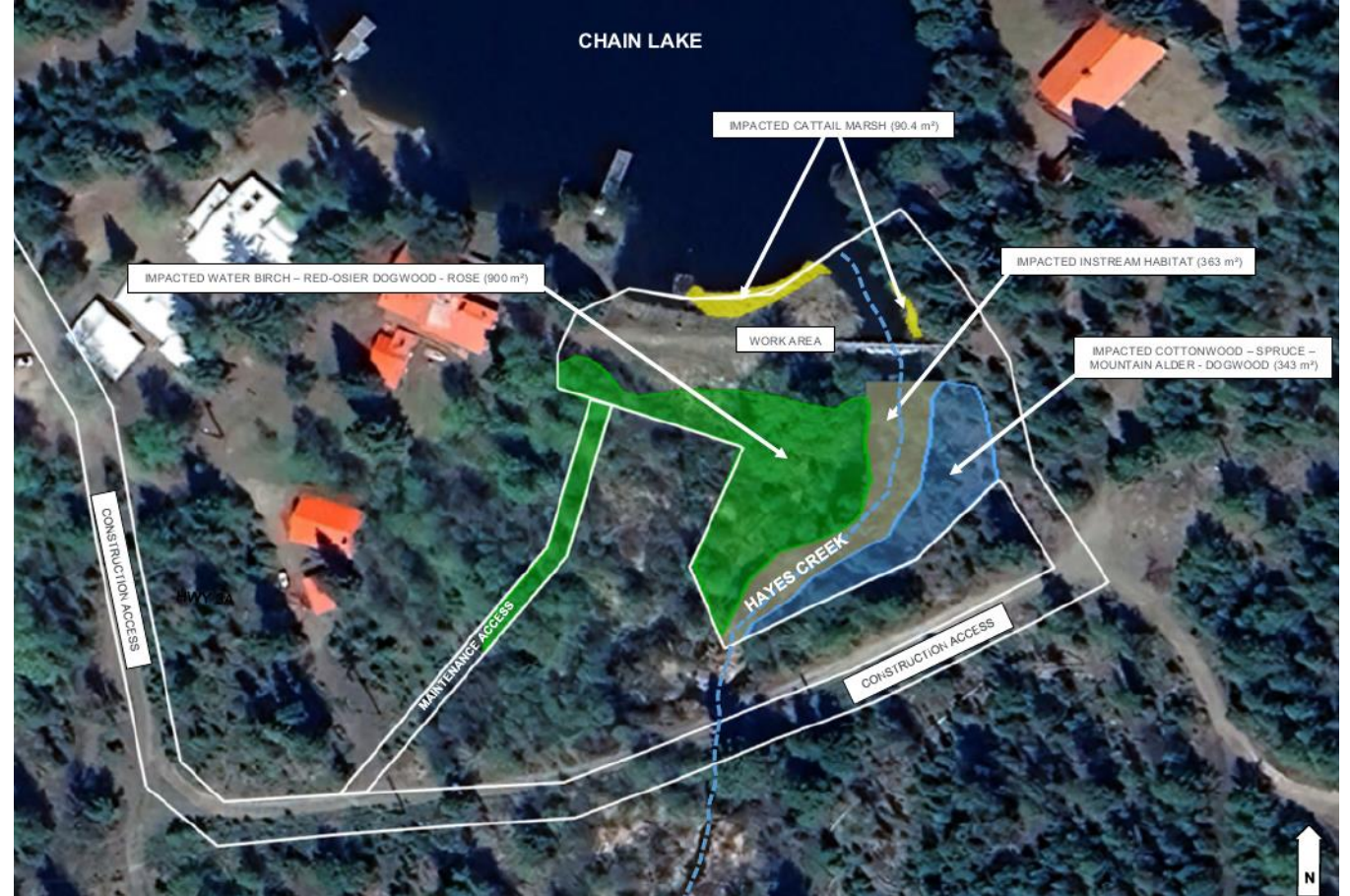


- To keep costs as low as reasonably possible, several components of the existing dam are intended to be reused, including the LLO aerator, LLO gate mechanism, concrete pedestal, and intake structure.
- Low-point along the right abutment will be leveled and raised using 25 mm crushed gravel, covered in topsoil. As per updated drawing, the rise will remain below the houses' top of concrete foundation.
- Windmill is not included within Ecora's scope of work, and will be discussed between RDOS, contractor, and residents.
- Project access primarily via Princeton-Summerland Highway from the west (lower access).
 - Lower costs.
 - Shorter construction schedule.



Project Overview

- Construction is now tentatively scheduled for August 2026.
- Construction schedule is assumed at approximately 8 weeks, including reservoir drawdown, mobilization, and de-mobilization. However, this is dependent on contractors' construction methodology.
- Construction will require the Shinish Diversion to be closed and the lake to be temporarily drawn down.
- Post-construction environmental monitoring will be required to satisfy Provincial Environmental permitting.



Construction



ecora

**Thank
You**

 <http://www.ecora.ca>

Project Capital Costs

Capital Costs	
April 2025 construction cost estimate	\$ 1.75 million
Grant: Growing Communities Fund	\$ 498,000
Grant: Agriculture Water Infrastructure Program (IAF)	\$ 550,000
Estimated funds to be borrowed	\$ 750,000

Estimated Annual Costs

Capital Costs - Total Borrowed Amount	\$ 750,000
Annual capital debt payment for 30 years*	\$ 51,460
Annual capital payment per property for 30 years*	\$ 830
Annual operating costs over next 15+ years	\$ 14,000-24,000
Estimated annual operating cost per property	\$ 242 to 387
Estimated total annual cost per property	\$ 1,070 to \$1,220

*Based on 30-year borrowing at 4.95% interest (MFA-August 28, 2025)

Project Next Steps

- Revise engineering drawings to reflect removal of spillway bridge
- Resubmit engineering drawing package to province for re-approval
- Complete Archaeological Impact Assessment
- Finalize outstanding statutory right of ways
- Re-tender the construction project in early 2026

Once these steps are complete, the bylaw and petition process can proceed.

Petition Process

- Borrowing bylaw amended for updated construction costs
- RDOS Board of Directors approval required for the amendment and bylaw to proceed to third reading
- Petitions to be mailed out late winter/early spring 2026 with copies of the proposed bylaws

Petitions and Owners

- Signing the petition constitutes approval by the property owner(s) to the adoption of the bylaw(s)
- When there are multiple owners on title, a majority of the owners must sign the petition

Petitions and Corporations

- If the property is owned by a corporation, the petition must be signed by the corporation's authorized signatories

How Many Petitions Needed?

- Returned petitions from:
 - at least 50% of the properties and
 - at least 50% of the net taxable value of land and improvements
- If sufficient petitions received, borrowing bylaw will proceed to adoption by Board

Project Next Steps

After a successful petition process:

- Lake level will be lowered in late July/early August 2026
- Construction begins August 2026
 - Limited to 8-week fish window
- Expected construction completion – fall 2026

Questions and Information

Petition process: corporateofficer@rdos.bc.ca

General project: utilities@rdos.bc.ca

Information website: rdosregionalconnections.ca

RDOS phone: 250-492-0237

