
KBL
innovative environmental solutions
TITLE: ENVIRONMENTAL ENHANCEMENT PROJECT ON THE IR11 CHEAKAMUS RIVER
CANADA BEST MANAGED COMPANIES

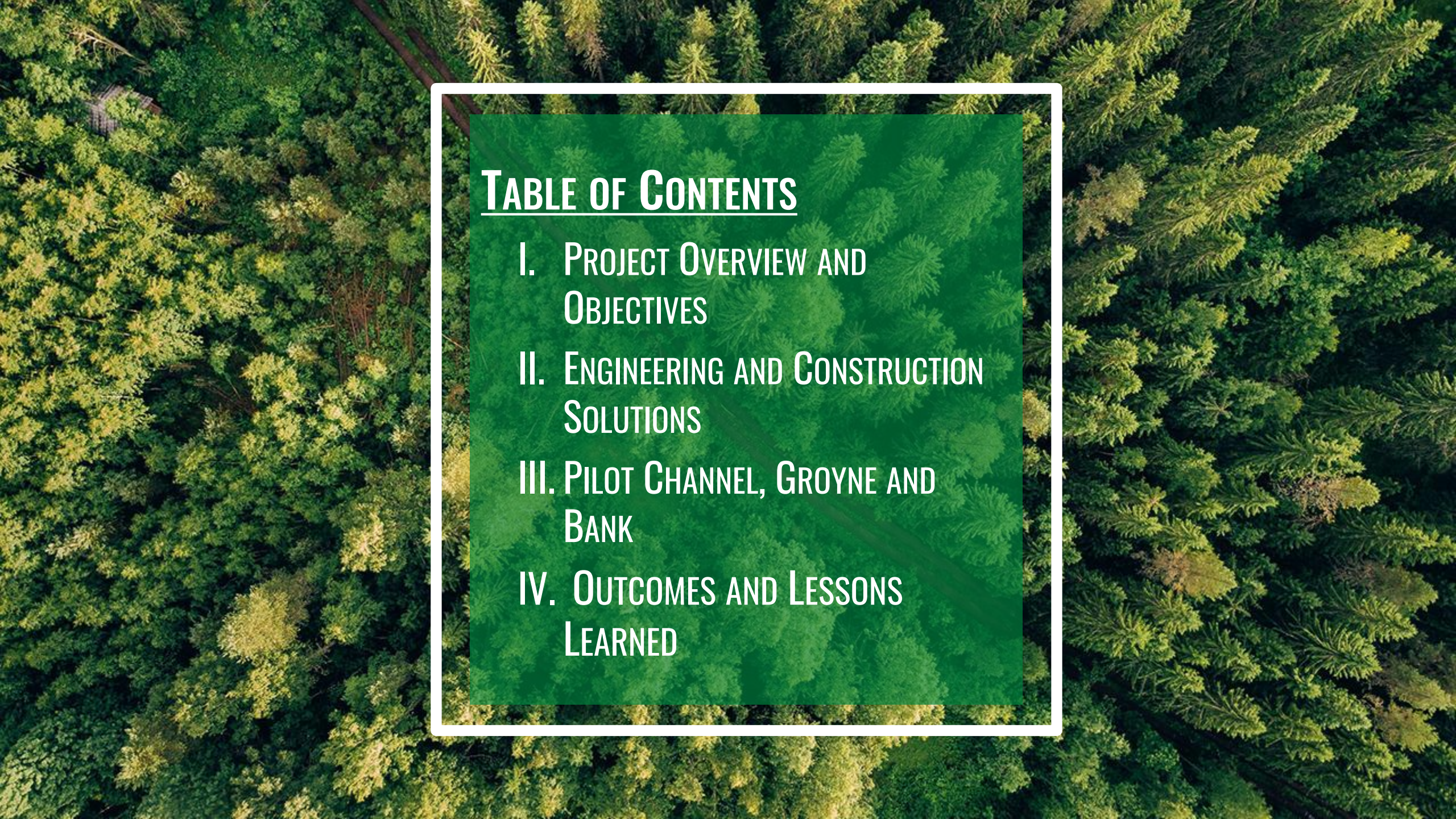


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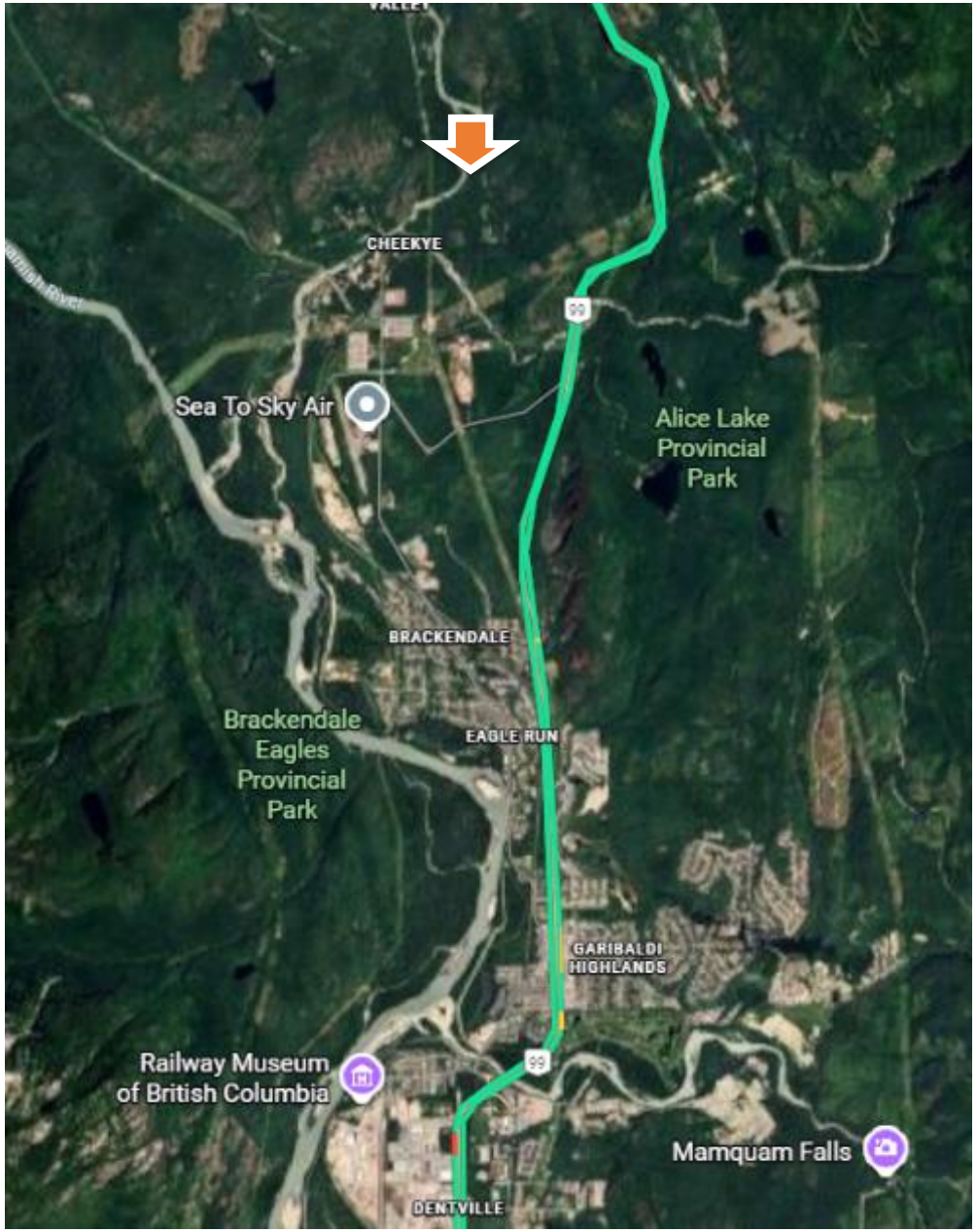


I. Project Overview and Objectives

Project Overview

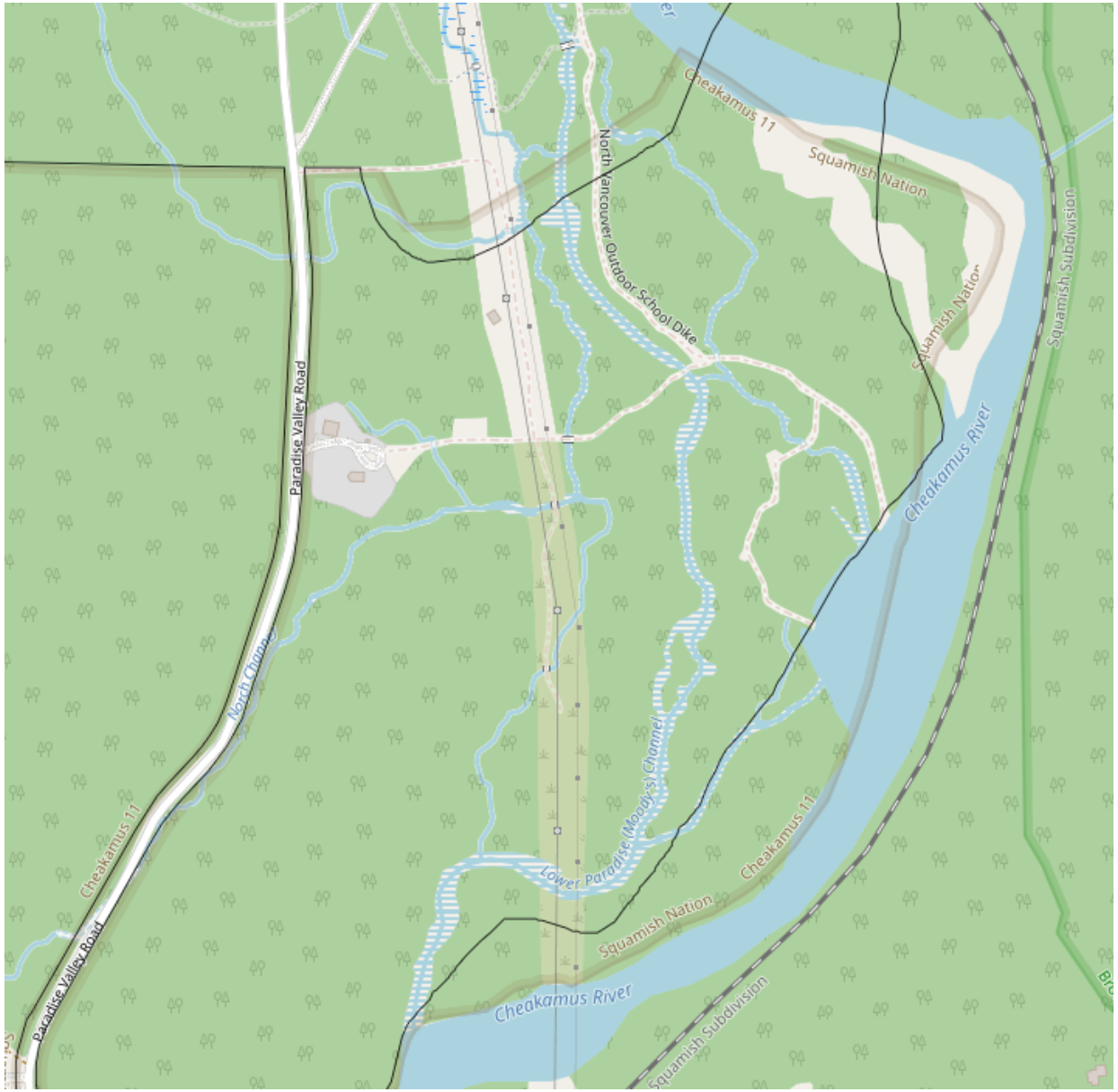
Client: Squamish Nation
Owner's Engineer: KWL – Kerr Wood Leidal
Location: Squamish Valley, Squamish, BC
Value: ~$1.1M
Schedule: June 2025 – October 2025

- Squamish Nation traditional fishing grounds.
- Manmade salmon spawning habitat
- Overgrown forestry roads intersecting spawning channels & degrading access bridges



Project Goals

- Reestablish access to Squamish Nation traditional fishing grounds.
- Improve salmon spawning habitat – in main Cheakamus river and surrounding spawning channels
- Regain usable access to riverbank
- Riverbank protection and stabilization

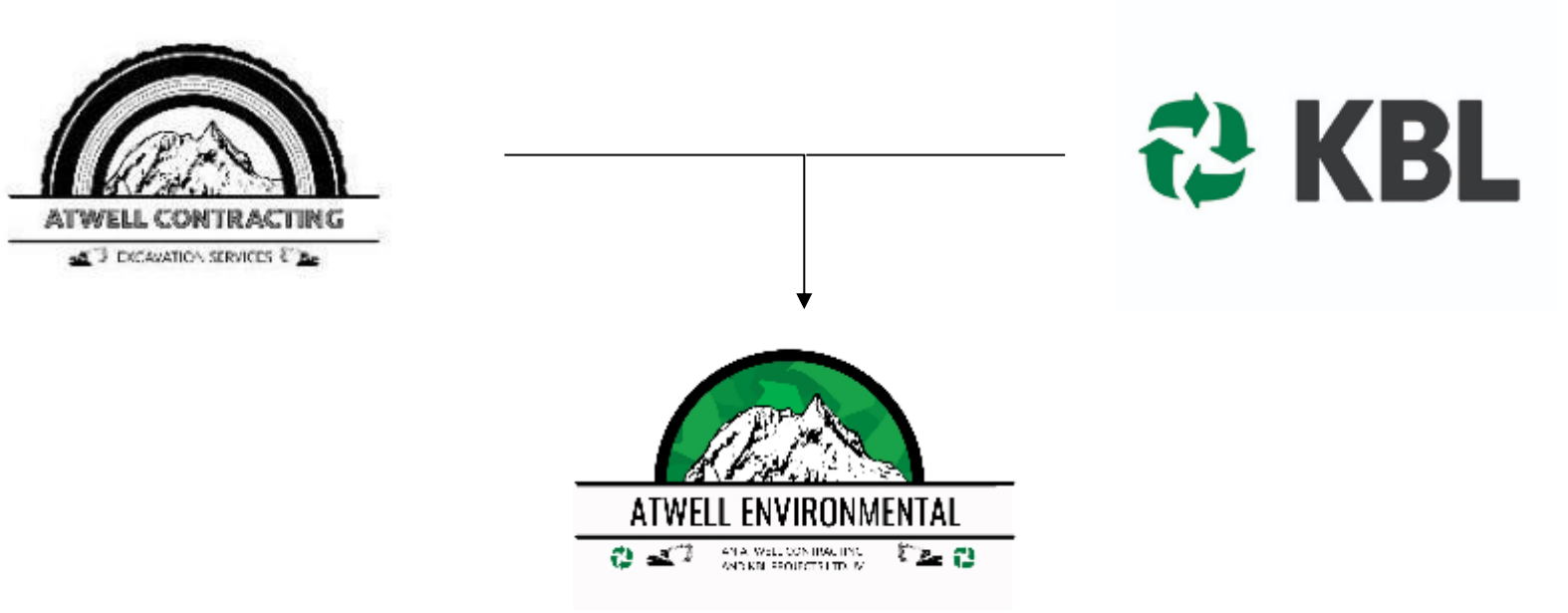


Scope of Work

- Site preparation, site access, danger tree assessment, and clearing
- Pilot channel excavation works and river groyne construction
- Water course management and spawning channel isolation
- Riverbank reinstatement and stabilization
- Infill and reclamation
- Habitat restoration



Indigenous Joint Venture



Key Subcontractors

SURESPAN

Z&R Trucking
DRIVEN BY SAFETY. POWERED BY TRUST.

EDITH LAKE
TREE FALLING LTD.

JBD
JUSBRAN ENT.
SQUAMISH BC

Site Preparation

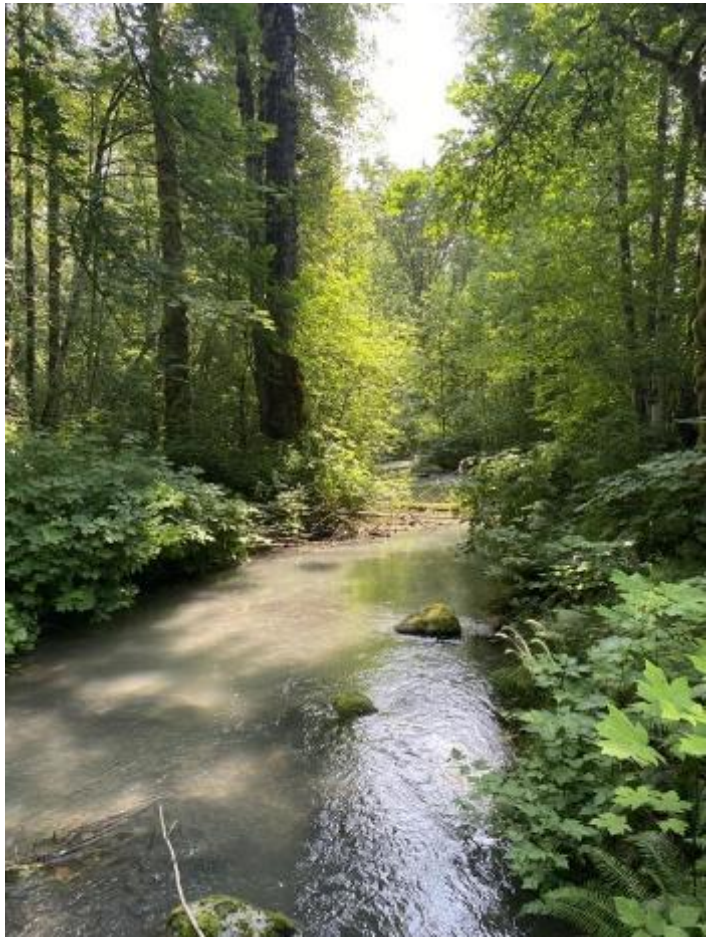
- Site Access – temporary road bridges and man bridge
- Road and site support areas clearing and grubbing
- Bird nesting survey and exclusion zones – active nesting period
- Fish management – fish netting and spawning channel isolation
- Danger tree assessment and removal
- Active fire watch and wind speed monitoring
- Wildlife awareness – black bears, elk, eagles





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Project Constraints



Existing Waterways



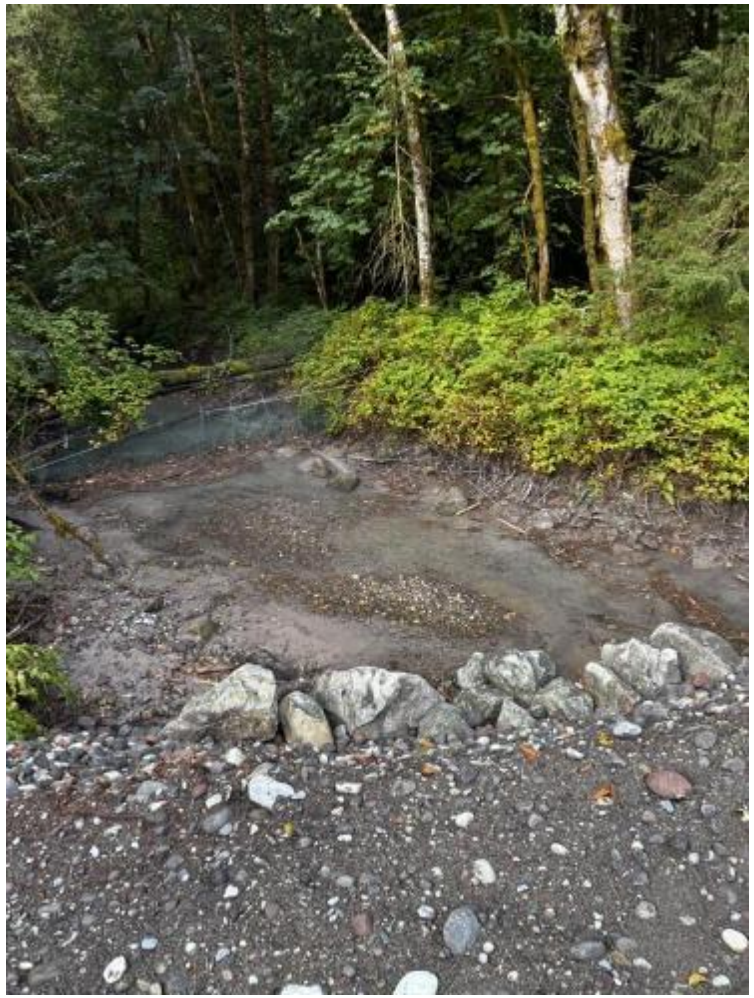
Access Bridges



Nesting Period

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Project Constraints



Salmon Spawning



Tree Clearing & Danger Tree Assessment



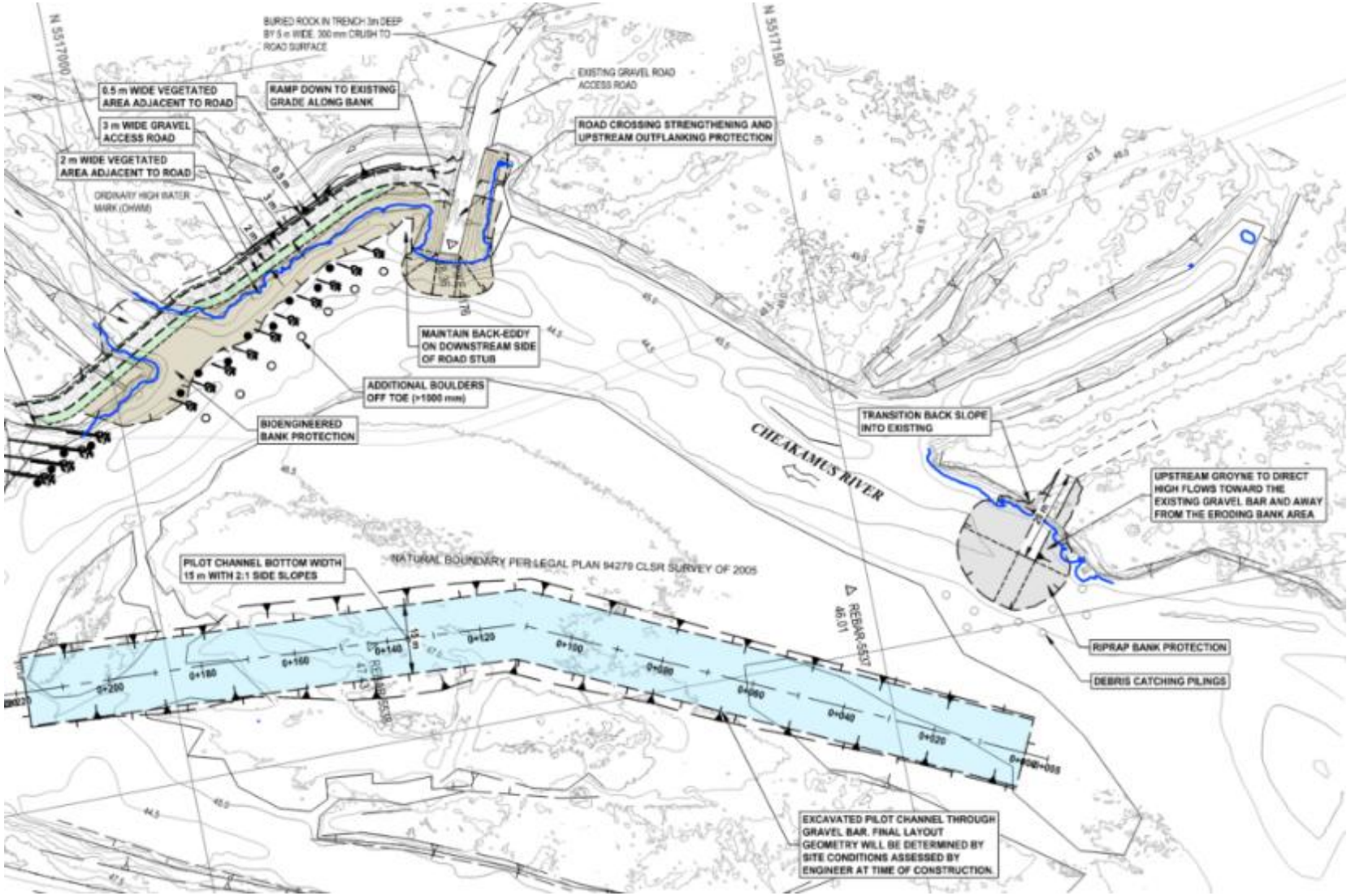
Watercourse Construction

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II. Engineering and Construction Solutions

Design Drawing



Temporary Access Solutions



Temporary Road Bridges



100ft Pedestrian Bridge

Ford Installation For Equipment Access

- Machinery Ford – Site Access – <100 rock truck loads of native riprap
- Machinery access limitations and expectations
- Refueling machinery – 100m from watercourse
- Fording Issues – Bank Erosion
- Waterway users – DFO fish surveyors, rafting tours – Portage installation



Bridge Installation

- 100ft man bridge manufactured off site
- Sand bar crew access – surveying and environmental monitoring
- Site evacuation and emergency personnel route
- Bank erosion – bridge abutments and extension – 100ft to 120ft crossing
- BC Hydro upstream discharge flow control during high rainfall periods



Bridge And Ford Installation For Equipment Access



Installed River Ford and Pedestrian Bridge



III. Pilot Channel, Groyne and Bank Stabilization

Pilot Channel Excavation



- 120m pilot channel excavated to divert river flow from main channel
- Survey and layout of most effectively modelled channel
- Depth range – 1.2m to 2m
- Change of flow direction - dammed spawning channel
- Turbidity monitoring during salmon spawning season
- Fish isolation issues and fish salvage

Pilot Channel Excavation



Gravel Removal





- Excavated material used as infill for bank stabilization and road construction
- Exported to Squamish nation gravel it for storage

Groyne Construction



- River Groyne – ‘rigid, man-made structures built perpendicular to riverbanks to control erosion, protect banks, and maintain navigable channels by directing flow and trapping sediment.’
- Upstream groyne constructed to channel river flow to new pilot channel
- Fallen trees, root wads, riprap core and capped with native fill excavated from gravel bar

Groyne Construction





Bank Stabilization

- Rip rap bank reinforcement topped with native river bar material
- Road reinstated to cross eroded spawning channel
- Root wads installed to improve fish habitat
- Vertical tree piles installed - prevent future bank erosion
- Native soil slurry mixed and placed on bank slope for future planting – Planned Spring 2026

Bank Stabilization



Vertical piles – Prevent Bank Erosion



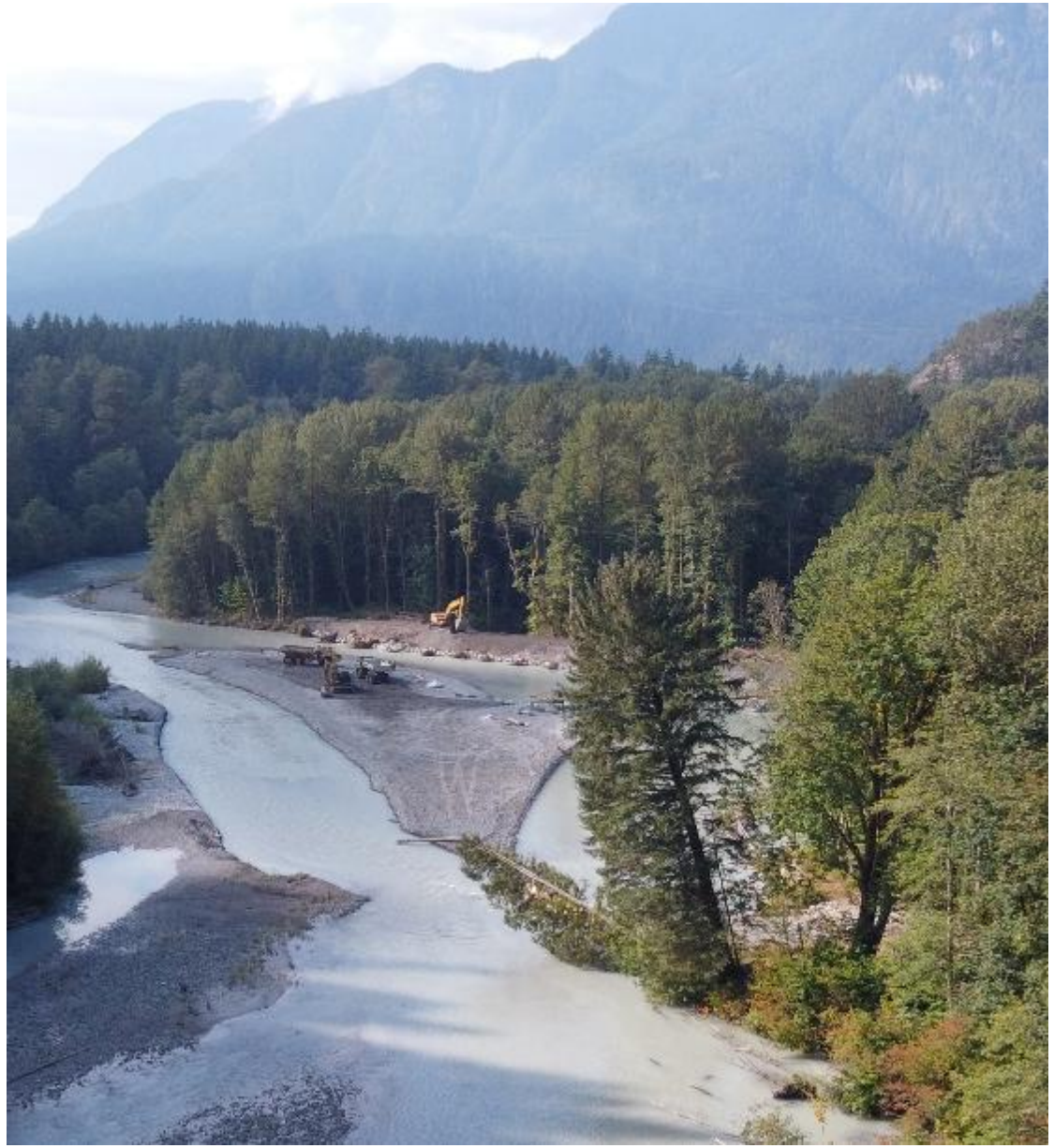
Soil Slurry – Bank Planting, Off Site Native Material



IV. Outcomes and Lessons Learned

Outcomes and Lessons learned

- Access to Squamish Nation traditional fishing restored
- Aquatic environment improved
- Spawning channel works suspended due to salmon self cleaning deposited material from main channel flow
- Excavated pilot channel contributes to main channel flow, removing energy previously impacting riverbank and spawning channels.



Restoring Access To Squamish Native Fishing Grounds




Questions?