

River of Golden Dreams Weir Installation

Construction Environmental Management Plan

Final Report November 24, 2023 KWL Project No. 29.364

Prepared for:

Resort Municipality of Whistler



Resort Municipality of Whistler River of Golden Dreams Weir Installation Construction Environmental Management Plan November 24, 2023

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1. Introduction

1.1 Project Description

The Resort Municipality of Whistler (RMOW) is proposing installation of a new weir and fishway approximately 20 m upstream of the confluence of the River of Golden Dreams (ROGD) and Twenty-One Mile Creek (Figure 1). The new weir will increase water depths within this confined reach, improve recreational navigation, reduce impacts to the channel bed and riparian vegetation from recreational users, and improve juvenile and small-bodied fish passage. In addition to weir installation the RMOW proposes to modify two existing log weirs to reduce risk to recreational users (Figure 1). At the proposed weir installation location, the addition of a dock and pathway will allow recreational users to safely navigate the weir and access the existing portage route to reduce disturbance to downstream Kokanee (*Oncorhynchus nerka*) and Rainbow Trout (*Oncorhynchus mykiss*) spawning habitat in low flow conditions and increase user safety during high flow conditions.

KWL has prepared this document as a Construction Environmental Management Plan (CEMP) to support the proposed works. This CEMP includes general guidance on the following topics:

- Environmental monitoring
- Timing of works
- Protection of fish and fish habitat
- Protection of birds and wildlife
- Tree protection and vegetation management
- Invasive plant management
- · Erosion and sediment control
- Deleterious substance control and spill management
- Clean up and restoration

1.2 Purpose of the Construction Environmental Management Plan

This Construction Environmental Management Plan (CEMP) provides overarching guidance, sets out the requirements, and measures that will be adopted to avoid, minimize, and mitigate the potential adverse environmental impacts of the Project. This plan is to be implemented by the Contractor throughout the duration of the Project and applies to the construction phase.

The CEMP is a living document and will be updated over the course of construction as planning and sequencing for work activities is adjusted and finalized, and as observations made by environmental monitors warrant changes in environmental management.

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1.3 Roles and Responsibilities

The parties involved in the Project have the following roles and responsibilities with respect to environmental management:

- 1. The Owner, RMOW shall:
 - a. ensure that the appropriate resources are available to establish, implement, maintain, and improve environmentally responsible construction practices;
 - b. liaise with the Environmental Monitor (EM), who will be a Qualified Professional (QP) overseen by a Qualified Environmental Professional (QEP), about potential impacts to environmental components during construction;
 - c. contract Qualified Professionals¹ (QPs) with specific expertise required for the Project to liaise with all QPs as needed; and
 - d. provide resources required for environmental awareness and protection training, environmental documents specific to the Project, and financial resources.
- 2. The EM (to be determined) shall:
 - a. advise the Contractor of environmental protection and monitor environmental protection measures;
 - identify environmental deficiencies of the Contractor and communicate with the Contractor on how to address deficiencies;
 - c. have written authority to halt or modify any construction activity if it is deemed necessary to protect fish and wildlife populations or their habitats; and
 - d. report to the Contract Administrator.
- 3. The Engineer of Record, KWL, shall:
 - a. have specific expertise or knowledge needed to advise and/or support the Contract
 Administrator, the EM, and the Contractor where specific engineering input is required related to environmental concerns;
 - b. consult with the EM about potential impacts to environmental components during construction; and
 - c. consult with any other QPs involved with the project as needed.
- 4. The Contractor (to be determined) includes any company and its field staff retained by the RMOW (owner) to construct a component of the Project. The Contractor shall:
 - a. plan and conduct activities in compliance with the CEMP and all applicable legislation, approvals, and best management practices;
 - b. report directly to the Contract Administrator regarding all site activities;
 - c. ensure that there is no release of deleterious substances into the ROGD or any other nearby watercourses or waterbodies;

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¹ QPs will have the expertise or knowledge needed to advise and/or support the Contract Administrator, the EM, the Contractor, and KWL with respect to environmental or other engineering concerns.



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- d. ensure all staff, including subcontractors, are familiar with the CEMP and know their responsibilities in meeting the outcomes of the plan;
- e. communicate changes in construction plans or activities that could impact the implementation of the CEMP to the Contract Administrator, the EM, and KWL as quickly as possible; and
- f. keep a copy of the CEMP on-site at all times.

1.4 Guiding Documents

The following guidance documents were used to develop the CEMP:

- Requirements and Best Practices for Making Changes In and About a Stream in British Columbia, Government of BC 2022.
- Measures to Protect Fish and Fish Habitat, Fisheries and Oceans Canada, 2019.
- A Field Guide to Fuel Handling, Transportation and Storage, Ministry of Water, Land and Air Protection, 3rd Edition, 2002.
- *B.C. Approved Water Quality Guidelines*, Ministry of Environment and Climate Change Strategy Updated 2018.
- Best Management Practices for Amphibians and Reptiles in Urban and Rural Environments in British Columbia, Ministry of Water, Land and Air Protection, 2004.
- Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia, Ministry of Environment and Climate Change Strategy, 2014.
- Land Development Guidelines for the Protection of Aquatic Habitat, Fisheries and Oceans, 2nd Edition, 1993.
- New Migratory Birds Regulations, Environment and Climate Change Canada, 2022.

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2. Project Location and Scope of Work

2.1 Project Location and Physical Setting

The ROGD (Waterbody ID: 23518), also known as Alta Creek, is a third-order stream that flows 7 km from Alta Lake to Green Lake and drains an area of 48 km² (Symko 2000). Major tributaries include Scotia Creek, Crabapple Creek, and Twenty-One Mile Creek. The watershed contains a variety of land uses including historical and contemporary logging, residential developments, water supply infrastructure, and recreation.

The Project sites are located on the ROGD within the RMOW and approximately 350 m from the outlet of Alta Lake (Figure 1). Both the weir installation and modification sites are located within a reach that is confined by the Canadian National Railway (CN) line to the North, and Valley Trail to the South (Figure 1). The existing log weir modification site contains both log weirs and is located approximately 15 m downstream of the Alta Lake outlet weir (Figure 1). The weir and fishway installation site is located approximately 20 m upstream of the ROGD confluence with Twenty-One Mile Creek.

The proposed project works consist of installation of a precast concrete weir structure within the ROGD channel and fishway. The fishway is designed to promote fish passage around the weir and is anticipated to simulate a natural riffle-pool complex with variable velocities at riffle crests and resting pool habitat to support a wide range of species, life stages and flow conditions. Proposed works also includes modification of the existing log weirs to improve navigation for recreational users. This CEMP describes the proposed works outlined above and the measures that will be put in place to mitigate any adverse environmental effects as a result of construction.

2.2 Scope and Sequence of Proposed Works

The proposed sequence of work for the log weir modification and weir and fishway installation is outlined below.

Weir and Fishway Installation

- 1. Install erosion and sediment control measures.
- 2. Complete clearing, stripping, and grubbing to facilitate access to the proposed work site limit disturbance to proposed trail alignment (if reasonable).
- 3. Install isolation measures and stream bypass.
- 4. Complete a fish salvage in the isolated area.
- 5. Excavate channel bed and banks to suitable subgrade as approved by the Geotechnical Engineer.
- 6. Place and compact Engineered Fill subgrade to design elevation (min. 300 mm thick) as directed and approved by the Geotechnical Engineer and Environmental Monitor (EM).
- 7. Place and compact (as necessary) seepage cut off wall material.
- 8. Place pre-cast concrete block wall on the right bank.
- 9. Place pre-cast concrete weir and fishway components.
- 10. Place 10 kg rounded rock bed armouring.

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- 11. Place compact Engineered Fill and seepage cut off materials on banks.
- 12. Place 10kg Riprap on banks.
- 13. Install/mount V-Notch Weir plate at the fishway's upstream inlet.
- 14. Place and compact (as required) fishway materials (well graded base, river stone and sand, and angular crest rock).
- 15. Remove woody debris and associated accumulated sediment and vegetation at upstream extent of proposed dock (approximately 3 m²) to accommodate ramp.
- 16. Reposition any removed large woody debris back into the channel to provide instream cover for fish.
- 17. Install stop-log weir components.
- 18. Install dock and trail as per RMOW design.
- 19. Remove stream bypass/isolation measures.
- 20. Retain erosion and sediment control measures until riparian vegetation is reestablished.

Log Weir Modification

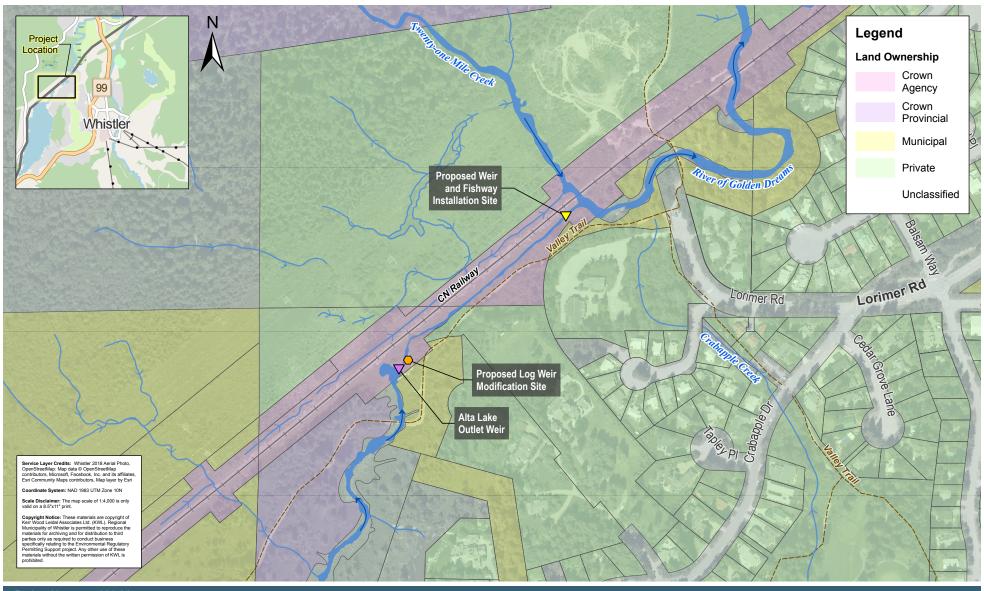
- 1. Install isolation measures. Work will be completed during low flows when water is not overtopping the weirs and stream bypass is not required.
- 2. Complete a fish salvage in the isolated area.
- 3. Complete modifications using hand tools by workers on foot.
- 4. Remove isolation measures.

2.3 Construction Timeline

Project construction is proposed to take place between August 1 and August 15, 2024 during the least risk work window for trout and Kokanee within the ROGD (MOE 2006). Riparian planting is proposed to be completed in the fall of 2024 (September–October).

Construction Environmental Management Plan





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Location Plan



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3. Regulatory Requirements

The following regulatory review and permitting will be required for this project:

• Water Sustainability Act (Section 11) Change Approval for Works In and About a Stream

The RMOW submitted an application for a Change Approval (Approval File Number: 2010783) under Section 11 of the *Water Sustainability Act* on June 22, 2023, to the Ministry of Forests (FOR) now under the Ministry of Water, Land and Resource Stewardship (WLRS). In response to the application, FOR issued a Hold Letter outlining additional requirements to be fulfilled before the application was deemed complete. This CEMP has been produced by KWL to support the RMOW's updated application under the WSA.

Fisheries Act Request for Review for Works Near Water

The project will be submitted for review by Fisheries and Oceans Canada's Fish and Fish Habitat Protection Program. The results of that review will determine whether a *Fisheries Act* Authorization is required for the project.

Ministry of Water, Land, and Resource Stewardship (WLRS) Scientific Fish Collection Permit

This permit is required for fish salvage of provincially-managed fish species (e.g., trout, most freshwater fish species).

Fisheries and Oceans Canada (DFO) Scientific Licence for fish salvage

This permit is required for fish salvage of federally-managed fish species (e.g., Pacific salmon).

As only residential, commercial, or industrial projects are subject to the Riparian Areas Protection Regulation (RAPR), a RAPR assessment is not required for the Project.

A Species at Risk Act (SARA) Permit is not required as no tree removal is proposed within critical habitat adjacent to the site.

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4. Construction Environmental Management Plan

The following measures will be used to avoid, minimize, and mitigate potential environmental impacts of the Project and to ensure compliance with all environmental legislation, permits, and approvals.

4.1 Environmental Monitoring

Environmental monitoring will be conducted to ensure appropriate measures are being taken to protect the environment. The EM must be an appropriate QP. The EM will regularly inspect the work site for compliance with the environmental requirements of the Project. Observations will be recorded and reported to the Contract Administrator and the Contractor. The EM must be familiar with the regulatory requirements of the Project and has the responsibility to report all non-compliance events and stop work if necessary. The EM will be on-site at the project start-up and during any sensitive activity (e.g., instream work). A copy of this document will be kept on-site for the duration of the Project. Responsibilities of the EM will include, but are not limited to, the following:

- Review all permits, best management practices, and the CEMP.
- Be on site for Project start-up and critical instream works and works adjacent to sensitive areas.
- Meet with the Contractor before construction to explain all mitigation and environmental protection measures.
- Monitor project compliance with the CEMP, and address changes with the Contractor and Contract Administrator to ensure CEMP is continuously updated, as needed.
- Inspect all mitigation and erosion and sediment control (ESC) measures to ensure they are appropriate and working properly and recommend modifications and repairs when necessary.
- Have written authority to halt any construction activity if it is deemed necessary to protect fish, wildlife, and their habitat.
- Identify, monitor, and promptly report any situations of ongoing or potential damage to the environment.
- Report to the Contract Administrator and relevant regulatory agencies on environmental issues encountered during construction.
- Prepare and submit a monitoring summary report after the Project's completion to the Contract and any regulatory agencies, if required.

4.2 Timing of Works

- Instream work will occur within the least risk window for trout and Kokanee in the ROGD (August 1 to 15; MOE 2006).
- Project works will be scheduled for dry weather conditions whenever possible to reduce risk of erosion and sedimentation of the ROGD.
- Project works will be completed as quickly as possible.
- Unless necessary to proceed with project works, tree removal and vegetation clearing will be conducted outside the regional bird nesting period (March 1 to August 31) to avoid impacts to migratory birds.

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4.3 Protection of Fish and Fish Habitat

Measures to Avoid Death of Fish

- Fish exclusion fences will be installed prior to any instream works, upstream and downstream of the work areas.
- Although work is proposed prior to typical Kokanee spawning within the ROGD, monitoring for adult Kokanee migration will be conducted throughout instream works. If migrating fish are impeded by the instream isolation area the contractor will be notified immediately and measures will be implemented to facilitate upstream or downstream movement of fish.
- Fish salvage will be carried out by a QP with appropriate fish collection permits according to Fish Collection Methods and Standards (Resource Inventory Committee 1997).
- Salvaged fish will be placed in habitat of equal or better quality compared to their salvage location, outside of the exclusion zone.
- All dewatering pumps will have screens on their intakes with maximum mesh size of 2.54 cm to prevent entrainment and impingement of fish (DFO 2020).

Erosion and Sediment Control Plan

An Erosion and Sediment Control Plan will be prepared for the Project. The purpose of the Erosion and Sediment Control (ESC) Plan is to prescribe methods to intercept and manage runoff from the construction site and off site. These methods are meant to control the risk of soil erosion and movement in surface runoff. The ESC Plan may be adapted or added to before, during, and after construction as required to fulfill its purpose, based on the recommendations of the EM. ESC measures will be set up prior to work and will be monitored regularly and maintained until all disturbed ground has been stabilized. The contractor will be responsible for providing a detailed ESC plan for the site. The ESC Plan should include the following measures:

- All instream works will be completed within an isolation during periods of low flow.
- The Contractor must ensure adequate bypass flow for the duration of the instream works during weir installation and have contingency measures in place in the case of rainfall and/or pump malfunction.
- The bypass discharge location must be adequately armoured or otherwise protected such that the channel bed is not scoured or disrupted and to avoid bank erosion.
- Erosion and sediment control (ESC) measures (e.g., straw wattles) will be installed as required during construction work (small site with confined access). Measures will be monitored regularly by a QP and maintained until all disturbed ground has been stabilized.
- Plastic sheeting will be used to temporarily cover any stockpiles of material if sediment migration is anticipated or if precipitation events are possible.
- All rocks and materials to be used will be clean and free of sediment, debris, or other substances that are harmful to aquatic life.
- During instream work associated with the weir and fishway installation and weir modification, turbidity levels in the ROGD will be checked periodically to ensure ESC measures are functional.
- All exposed sloped areas associated with project components will be seeded to stabilize areas of exposed soil upon completion before riparian planting in late autumn.

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- Any other measures needed to prevent erosion of a watercourse and work site, or sediment from entering the ROGD, as determined by the EM or engineer.
- All ESC measures will be monitored regularly by both the Contractor and the EM and maintained until all disturbed ground has been stabilized.

Guidelines and Water Quality Parameters

For the purposes of monitoring the potential impacts of construction activities on surface water quality, in situ monitoring of turbidity will be the primary indicator. As all concrete materials are proposed to be precast, monitoring of pH levels should not be required. If required, laboratory analysis for total suspended sediments (TSS) may be completed for the purposes of documenting defensible sediment load concentrations during background and elevated flow conditions.

The following criteria for in situ will apply to water around the project area, especially during construction, under the discretion of the EM.

 Induced downstream turbidity/total suspended sediment should not exceed background levels by more than 8 Nephelometric Turbidity Unit (NTU) (average) in 24 hours, or more than 25 NTU or 25 mg/L at any time during dry weather and 75 NTU or 75 mg/L during wet weather.

Additional in situ or ex situ laboratory analysis for other water quality parameters including, but not limited to, the following list will be sampled as required over the course of the project works on an as-needed basis as determined by the EM and will be subject to current working and approved BC Water Quality Guidelines for the Protection of Aquatic Life (BCWQG-AL): temperature, dissolved oxygen, specific conductivity.

Deleterious Substance Control and Spill Management

- Before arrival on site, all equipment and machinery will be in good working condition and free of leaks, excess oil, and grease.
- Equipment (e.g., excavator) will be equipped with biodegradable hydraulic fluids and operate from the top of bank and not enter the ROGD.
- Equipment refuelling, washing, and servicing locations will be sited at least 30 m or more from the high-water mark of the ROGD.
- Generators, pumps, and other stationary equipment will be placed on spill trays when located less than 30 m away from the high-water mark of the ROGD.
- All machinery will be clean, in good working condition and free of excess oil and grease. Equipment will be inspected daily and documented.
- Containers will be labelled according to the Transportation of Dangerous Good Act and Workplace Hazardous Materials Information Systems (WHMIS) regulations.
- Oil waste, filters, absorbent pads, and cartridges will be collected and disposed of off-site at an
 appropriate facility in accordance with federal, provincial, and municipal regulatory requirements.
- To prevent the release of substances toxic to fish, there will be no use of treated wood products within a watercourse.
- A spill response plan and spill kit will be on site and suitable for all substances on-site, and staff trained in its use.

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Spill Response

The Contractor will be required to prepare a Spill Response Plan which includes notification procedures, contact telephone numbers, and spill report forms. The following measures will need to be incorporated into the plan:

- A spill kit will remain on site during construction. The kit will be stocked with appropriate supplies for the site size and conditions (e.g., absorbent pads, booms, granular absorbent). Staff will be trained in the proper use of the kit.
- Any spill of a toxic or deleterious substance over the reportable limits as outlined in the Ministry of Environment and Climate Change Strategy Spill Reporting Factsheet (MOE, 2021)² will be reported immediately to the BC Provincial Emergency Program 24—hour phone line at 1-800-663-3456.
- If a spill of toxic or deleterious substances occurs within a watercourse or waterbody both FOR and DFO will be notified immediately. All spills will be reported to the EM immediately.

4.4 Tree Protection and Vegetation Management

- A QP will be consulted throughout the site clearing and construction phases to minimize impacts to vegetation communities.
- Clearing will be limited to areas necessary for the works. Existing roads, trails, and other access points will be used where possible.
- A tree or other structure containing a nest of eagles, peregrine falcons, gyrfalcons, ospreys, and herons must not be felled, even outside of the breeding season for these species. This is in accordance with Section 34(b) of the Wildlife Act.
- Wildlife trees will be retained if possible. They provide essential habitat to birds and other wildlife.
- Where topping or removing dead limbs of danger trees will remove the hazard, this option is preferred over removing the entire tree.

4.5 Invasive Plant Management

 All equipment and machinery will be clean and visually inspected for invasive species and noxious weeds, before arriving on and leaving the site.

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² https://www2.gov.bc.ca/assets/gov/environment/air-land-water/spills-and-environmental-pmergencies/docs/materials/fact_sheet_spill_reporting.pdf

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4.6 Wildlife Protection

- Due to the mobile nature and low habitat suitability, the likelihood of encountering species at risk within or near the Project area is anticipated to be low.
- As project works will require removal of vegetation and trees a bird nest survey will be conducted by a
 QP prior to any vegetation clearing during the nesting window (March 1 to August 31).
 - A bird nest search will be required prior to the removal of any trees within the bird nesting period.
 The following will apply:
 - if an active nest is identified, a no-work zone buffer will be established and maintained around the active nest to minimize access and sensory disturbance;
 - the buffer distance will vary depending on the species of bird. Therefore, the buffer distance will be determined based on best management practices and the professional judgement of the QP;
 - nests will be monitored to assess nest activity and effectiveness of the buffer.
 Clearing (disturbance) can continue once the QP has determined that the nest is no longer occupied;
 - if no active nests are found in surveyed areas, vegetation clearing (disturbance) can commence, but must be complete within 36 hours of the pre-disturbance nest survey being conducted; and
 - nests of birds in Schedule 1 of the Migratory Birds Regulations (2022) will be reported as required by the regulations and will be protected for the duration of time required by the regulations (e.g., 36 months for pileated woodpecker).
- The EM will be notified of any wildlife sightings at the Project site.

4.7 Archaeological Chance Find Management Procedure

Should the Contractor discover any unanticipated archaeological, historical, or paleontological finds
during construction, the Contractor shall cease construction activities in the affected area immediately
and notify RMOW and the BC Archaeological Branch. Work in the area shall be suspended pending
investigations and recommendations by a Qualified Professional (e.g., archaeologist).

4.8 Clean Up and Restoration

- All construction materials and garbage will be removed from site after the project is complete.
- Erosion and sediment control devices and measures will be removed following stabilization of all disturbed areas.
- Riparian planting will be carried out according to the planting plan provide in Enclosure C.
- The contractor will be responsible for leaving the site in compliance with all permits, approvals, and authorizations.

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Report Submission

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Revision History

Revision #	Date	Status	Revision Description	Author
0	November 24, 2023	Final		HLK/EHAR



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