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# REQUEST FOR PROPOSAL

21 Mile Creek Flank Trail Bridge Design-Build

RFP # X179-2023

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The Resort Municipality of Whistler | March 2023

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THE PREMIER MOUNTAIN RESORT COMMUNITY  
MOVING TOWARD A SUSTAINABLE FUTURE



# 21 Mile Creek Flank Trail Bridge Design-Build RFP-X179-2023

## The Resort Municipality of Whistler (RMOW) Summary of Key Information

Request Number	RFP-X179-2023
Issued:	March 1, 2023
Voluntary Site Visit:	Monday April 3, 2023, 10:00hrs located at: Whistler Cemetery 5801 Alta Lake Road Whistler BC
Deadline for Enquiries:	16:00:00 hours; Monday April 24, 2023
Closing Time and Date:	16:00:00 hours; Monday May 1, 2023
Closing Location:	By Email <a href="mailto:parksplanningprojects@whistler.ca">parksplanningprojects@whistler.ca</a> Or hard copy to: RMOW Municipal Hall 4325 Blackcomb Way Whistler BC V8E 0X5
Contact Person:	Kevin Sibbald, <a href="mailto:parksplanningprojects@whistler.ca">parksplanningprojects@whistler.ca</a>

Proposals will be opened in private shortly after closing.

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## 1 Overview of this Request

### 1.1 Introduction

Situated within the shared, unceded territory of the Łil'wat7úl (Lil'wat People) and Skwxwú7mesh (Squamish People), the Resort Municipality of Whistler (RMOW) is a destination resort community, local government organization and leader in providing municipal programs, services, progressive planning and infrastructure for almost 14,000 permanent residents and over three million annual visitors. One of Whistler's major attractions are its recreation trails, which serve both locals and guests while highlighting the natural environment and scenic qualities that make the resort unique. Whistler's expansive recreation trail network includes a number of destination attractions such as Rainbow Falls that have witnessed tremendous increase in use over recent years as reflected in overall summer visitation.

### 1.2 Purpose of this Request

The RMOW is inviting qualified teams to provide design-build proposals for a new clear span pedestrian and cycling bridge over 21 Mile Creek located above the Rainbow Waterfall. The existing 17m span, log stringer bridge, has reached its end of life and requires removal and replacement with a new, high character, long lasting and low maintenance recreation bridge. The RMOW utilizes and encourages a diversity of bridge types to form unique user experiences on its recreation trail network. Proponents are encouraged to align their designs with the areas recreational use and natural site characteristics while ensuring the efficiency of construction is well understood and managed within the constraints of the topography and access.

The successful proponent may be highly considered for a second recreation bridge replacement in a separate location, budgeted for 2024 design-build, along with other ancillary structures.

## 2 Specific Project Requirements (SPR)

### 2.1 Scope of Work (SOW)

#### 1. General

- a) This project has a confirmed budget of \$250,000 for the design-build scope of this RFP;
- b) Proponent must understand all reports and assessments provided in this RFP;
- c) Provision of a 10% bid bond and 50% performance bond will be required.

#### 2. Design Requirements

- d) Clear span bridge with railings, length is estimated at 18m (Proponent to confirm), minimum clear deck width of 2m, railings shall be min 1.2m in height;

- e) Bridge approaches must have a fence or railing extension that flares away from the bridge ends to protect and funnel users on to the bridge;
- f) A site survey is provided in Appendix A to facilitate design work, the new bridge alignment is anticipated to be in the general location of the existing bridge. Additional survey work is at the Proponents expense;
- g) Foundations, abutments, anchors and structure design shall respect the geotechnical report (Appendix B) and the 200-year flood level indicated in the hydrology report (Appendix C). Any additional geotechnical or hydrological investigations to satisfy the design engineers will be done at the Proponent's expense;
- h) Loading requirements shall consider use by pedestrians, cyclists, and allow for crossing of a 500kg ATV. Snow load capacity shall be calculated using Appendix D using an elevation no less than 760m;
- i) Designs offering integration with the surrounding environment and enhanced or unique aesthetic qualities that promote exceptional resort experiences are encouraged. Examples of a few design precedents are provided in Appendix E. All designs that meet the requirements within this RFP will be considered;
- j) Design shall ensure the bridge can connect to the existing trail at each end;
- k) All design work by the Proponent must be completed by a registered professional engineer;
- l) Materials should be very low maintenance, long lasting, and where possible sourced locally with consideration for environmentally friendly products;
- m) 2020 Engineered Bridge Report is included as Appendix F

### 3. Construction Requirements

- a) The Proponent will be deemed to be the Prime Contractor;
- b) The Proponent is responsible for all logistics and preparation of the site and site access;
- c) The Proponent is responsible for all transportation, supply and installation of all components and for all construction activities and site restoration to previous condition as is reasonably possible;
- d) The Proponent will review the Environmental Impact Study (Appendix G) and prepare an environmental management plan;
- e) The Proponent will provide a schedule and site safety plan for the works including area closure signs and fencing. The RMOW will provide public communications of the closure and any detours through its media channels;
- f) The Proponent is responsible for removal and offsite disposal of the old bridge. Any wood free of metal fasteners may be bucked and piled for firewood to be collected by public at the start of the access road if so desired;
- g) As-built drawings to be provided in electronic format to the RMOW after completion of works;

h) Work must be completed by Nov 1 2023.

## 2.2 Project Deliverables

The project deliverables are:

1. Provide a 50% design set to the RMOW for review and comments within 30 days of award;
2. Provide a 90% design set to the RMOW for review and final comments within 50 days of award;
3. Provide a 100% design set to the RMOW for review and final comments within 60 days of award;
4. Provide a copy of the IFC drawings to the RMOW within 70 days of award;
5. Procure all materials and prepare any offsite fabrication;
6. Provide an updated schedule for construction with a completion no later than Nov 1, 2023;
7. Provide a site management plan, environmental management plan, emergency plan and a demolition plan;
8. Site preparation, bridge demolition, new bridge installation, inspection, and site restoration;
9. Submit as-built drawing record to the RMOW.

## 2.3 Milestones

Deliverable	Milestone Dates
Award of Contract	May 5, 2023
Preliminary Design (50%)	June 5, 2023
Detailed Design (90%)	June 26, 2023
Detailed Design (100%)	July 6, 2023
IFC Drawings	July 13, 2023
Start of Construction	Sept 11, 2023
Substantial Completion for Contractor	Nov 1, 2023

## 2.4 Available Resources

RMOW will provide the following resources or information:

- In addition to the site map, site survey, environmental impact study, geotechnical report, hydrological report; and condition assessment of existing bridge provided in this RFP;
- 2018 Lidar will be available upon request;
- RMOW to provide public communication of the project including detour information through RMOW media channels;
- The RMOW designated project manager to liaise with the Proponent to manage the engagement throughout the term of the contract.

## 3 Proponent Response

### 3.1 Proposal Format

Proponents are welcome to submit more than one bridge design-build proposal within their response, each proposal must provide its own section responding to Items 3.1 thru 3.9 of this RFP. The following format, sequence, and instructions should be followed in order to provide consistency in Proponent response, and ensure each proposal receives full consideration:

- Total electronic individual file size shall be less than 10MB;
- All pages should be consecutively numbered;
- An unaltered and completed Form of Proposal as the cover page;
- Table of contents;
- The proposal sections as detailed below.

### 3.2 Executive Summary

Should be a high level, concise summary of project understanding and overall proposal contents.

### 3.3 Design Offering

The proposal must include a concept design of the proposed bridge with basic details of its superstructure including materials and dimensions, and of its substructure, abutments/foundation/anchors. Renderings, imagery, drawings and sketches are welcomed.

### 3.4 Proposed Work Plan

Proposals should include a Work Breakdown Structure (WBS) or similar breakdown that will be used to define the work plan. The work plan will detail an approach/strategy and methodology to meet the objectives and will demonstrate the strength and ability to perform the Services requested. The work plan should indicate what team members will be performing each task.



### 3.5 Timeline

Proposals must include a detailed proposed project timeline based on the work plan for completion of all work and submission of all required deliverables and milestone dates. Provide a proposed start date, the total number of days required to complete each deliverable or stage of work, and a completion date.

- Gantt chart timeline or Excel spreadsheet is preferred.

### 3.6 Proposed Costs

Proposals shall provide a lump sum price to complete the work effort including a cost breakdown of the lump sum price for each of the components described in the Scope of Work (SOW).

Proponents should submit a rate sheet for all machinery, mobilization costs and active positions that are relevant for the SOW.

### 3.7 Proponent Qualifications

Proposals should include a description of the Proponent (The Firm/Company) and the Proponent's team member's qualifications that demonstrate the ability to undertake the proposed project. Resumes should be included for the Proponent's team leaders used in carrying out the various components of the project, including sub-contractors and sub-consultants. Resumes should emphasize skills that are relevant to the SOW of the project. Previous project work should include completion dates. Note that prior to any Proponent member being changed during the evaluation or post bid process, resumes must be submitted for approval to the RMOW.

### 3.8 Summary of Related Experience

The proposal shall contain at least two (2) specific project examples that the Proponent has completed that demonstrate the Proponent and the Proponent's team member's ability to undertake the proposed project. A sample of the work completed on the project examples can be included as a Proposal Appendix. Descriptions of previous projects should be relevant and related to the proposed project and dated. Descriptions of previous projects should include at a minimum:

- 1) Name of the project;
- 2) Start and completion dates;
- 3) Key individuals involved; and
- 4) One client references.

### 3.9 Addenda

The proposal shall acknowledge that they have read and understood all addendum posted by indicating in the Form of Proposal.

## 4 Project Brief

This is a Request for Proposal (RFP) and is not a contract tender call. No contractual, tort or other legal obligations are created or imposed on the RMOW by this RFP or by submission of any proposal or by consideration of, or failure or refusal to, consider any proposal by the RMOW. Further, the Contract, when executed, is the sole source of any contractual obligation on the RMOW with respect to the project.

Throughout this document reference is made to the “Proponent” as the entity preparing the response to the RFP. The term “Contractor” is used to represent the Proponent after the Contract is signed.

## 5 Evaluation and Selection

The “Preferred Proponent” is the Proponent judged to have the “best overall proposal” based on the evaluation score outlined in section 7 which will be selected to enter into negotiations leading to a Contract with the RMOW. If negotiations are unsuccessful, the next highest rated Proponent may be deemed to be the Preferred Proponent and negotiations would be commenced with them.

### 5.1 Submission & Award

The Proposal can be submitted via email to the RMOW at:

Name: Kevin Sibbald Email: [parksplanningprojects@whistler.ca](mailto:parksplanningprojects@whistler.ca)

Please clearly identify the RFP number and title when submitting your proposal(s).

The proposal should be submitted with the price quoted in \$CDN for the Specific Scope of Work and Deliverables defined in section 2 on or before: May 1, 2023 at 10:00 am.

Following the closing date, the RMOW intends to provide the Notification of Award of the contract to the preferred Proponent on or before: May 5, 2023.

### 5.2 Inquiries

All inquiries related to this RFP should be directed in writing (by email) to:

Name: Kevin Sibbald Email: [parksplanningprojects@whistler.ca](mailto:parksplanningprojects@whistler.ca)

Please clearly identify the RFP number and title when submitting a question.

### 5.3 Addenda

The final day for questions is 5 business days before the closing date. If the RMOW determines that an amendment is required to this RFP, the RMOW will post the amendment on the RMOW and BC Bid web sites no less than 3 calendar days prior to closing.

## 5.4 Duration of Proposal

The Proposal will be irrevocable and open for acceptance by the RMOW for a period of 60 calendar days from the day following the closing date, even if the Proposal of another Proponent is accepted by the owner.

## 5.5 No Contract

This RFP is an invitation for Proposals (including prices and terms) for the convenience of all parties. It is not a tender and no obligation of any kind will arise from this RFP or the submission of a Proposal. The RMOW may negotiate changes to any terms of a Proposal, including prices; and may negotiate with one or more Proponents, or may at any time invite or permit the submission of a Proposal (including prices and terms) from other parties who have not submitted Proposals before the closing date.

## 5.6 Acceptance

A Proposal will be an offer to the RMOW which the RMOW may accept within 60 days by sending a Notice of Award to the Proponent. Note that the RMOW will select the proposal that it deems, in its sole and absolute discretion, demonstrates the best combination of corporate qualifications, technical capability, project understanding, proposed approach to achieving the specified goals, and estimated total costs.

## 5.7 Right to Reject

The RMOW is not bound to accept the lowest price proposal, nor is the RMOW in any way bound to award the project to any of the Proponent proposals. The RMOW reserves the right to reject any or all proposals for any reason whatsoever.

## 5.8 Liability for Errors

The information contained in this RFP is supplied solely as a guideline for Proponents. The information is not guaranteed or warranted to be accurate by the RMOW, nor is it necessarily comprehensive.

## 5.9 Responsibility

The Proponent shall not transfer responsibility to meet the obligations of this contract to a third party without the consent, in writing, of the RMOW project manager.

## 5.10 No Collusion

Proponents shall not directly or indirectly communicate with any other Proponent regarding the preparation or presentation of their proposals, or in connection with the Proposal engage in any collusion, fraud or unfair competition.

### 5.11 Conflict of Interest

A Proponent must disclose in its Proposal any actual or potential conflicts of interest and existing business relationships it may have with the RMOW, its elected or appointed officials or employees. The RMOW may rely on such disclosure.

### 5.12 Solicitation of Council Members and RMOW Staff

Proponents and their agents will not contact any member of the RMOW Council or RMOW staff with respect to this RFP, other than the contact person named in Section 5.2 at any time prior to the award of a contract or the cancellation of this RFP.

### 5.13 Confidentiality

All Proposals become the property of the RMOW and will not be returned to the Proponent. All Proposals will be held in confidence by the RMOW unless otherwise required by law. Proponents should be aware the RMOW is a "public body" defined by and subject to the Freedom of Information and Protection of Privacy Act of British Columbia.

### 5.14 Proponents Expenses

Proponents are solely responsible for their own expenses in preparing and submitting Proposals, and for any meetings, negotiations or discussions with the RMOW or its representatives and contractors, relating to or arising from the RFP. The RMOW will not be liable to any Proponent for any claims, whether for costs, expenses, losses or damages, or loss of anticipated profits incurred by the Proponent in preparing and submitting a Proposal, or participating in negotiations for a contract, or other activity related to or arising out of this RFP.

### 5.15 Proponents Qualifications

By submitting a Proposal, a Proponent represents that it has the expertise, qualifications, resources, and relevant experience to supply the services requested.

### 5.16 Contract Terms and Conditions

The successful Proponent, prior to Notice to Proceed, will sign the Terms and Conditions as outlined in the RMOW Professional Services agreement attached in Section 10.

### 5.17 Insurance

At its' own expense and prior to the commencement of the term of the Contract, the Proponent shall obtain and maintain or cause to be obtained and maintained in force during the term of the Contract, insurance acceptable to the RMOW where the RMOW is named as additional insured with limits not less than those shown for each respective item as follows:

<b>Insurance</b>	<b>Contractor</b>
<i>Commercial General Liability (CGL)</i>	\$5 million per occurrence
<i>Automobile Liability</i>	\$2 million per occurrence
<i>Professional Liability</i>	\$2 million per claim

### 5.18 Subcontracting

Proposed subcontractors must be listed with attached resumes. A joint proposal submission must indicate which Proponent has overall responsibility of the project.

### 5.19 Signature

The legal name of the person or firm submitting the Proposal should be inserted in the Form of Proposal (Section 8). The Proposal should be signed by a person authorized to sign on behalf of the Proponent and include the following:

- If the Proponent is a corporation then the full name of the corporation should be included, together with the names of authorized signatories. The Proposal should be executed by all of the authorized signatories or by one or more of them provided that a copy of the corporate resolution authorizing those persons to execute the Proposal on behalf of the corporation is submitted;
- If the Proponent is a partnership or joint venture then the name of the partnership or joint venture and the name of each partner or joint venture should be included, and each partner or joint venture should sign personally (or, if one or more person(s) have signing authority for the partnership or joint venture, the partnership or joint venture should provide evidence to the satisfaction of the RMOW that the person(s) signing have signing authority for the partnership or joint venture). If a partner or joint venture is a corporation then such corporation should sign as indicated in subsection (a) above; or
- If the Proponent is an individual, including a sole proprietorship, the name of the individual should be included.

## 6 The RMOW's Commitment to Sustainability

The Whistler community understands that sustainability is not just about the environment; that three concepts (ecological integrity, fiscal viability, and social justice) point to a larger and integrated strategy, and that these three concepts lead to better decisions when considered together.

Working within the framework of the Official Community Plan, the community has aimed to steadily integrate the sustainability objectives broadly into all aspects of community planning and development strategies – from climate, energy and transportation strategies, to economic and visitor experience. Through the



consistent application of the sustainability objectives, our community is striving to integrate [climate change mitigation](#) into all community policies and practices. Whistler understands that we will have to find a way to do things more efficiently in order to progress towards our sustainability goals. The RMOW is looking for proposals that clearly understand our community's values and measurably move our community further along the journey toward success and sustainability as articulated within our Official Community Plan vision. More information is available at [Whistler's Vision and OCP | Resort Municipality of Whistler](#) for reference in the proposal process.

## 7 Evaluation and Selection

### 7.1 Evaluation Team

The evaluation of Proposals will be undertaken by the Evaluation Team on behalf of the RMOW. The evaluation team may consist of one or more persons at the Evaluation Team's discretion. The Evaluation Team may consult with other RMOW staff, or third party individuals at their discretion.

### 7.2 Mandatory Criteria

Any Proposal that does not satisfy all mandatory criteria will be rejected.

Required (Mandatory) Criteria	Check -✓
1. The proposal must be received by the specified closing date and time.	
2. Proposals must be in English.	

### 7.3 Weighted Criteria Benchmarks

#### Evaluation Matrix

The Evaluation Team intends to evaluate all proposals according to the evaluation matrix criteria categories outlined below. If minimum required points are not met in one or more of the evaluation criteria, the Proposal will not be considered for award.

Criteria	Available Points
Project Understanding	15
Design Offering & Work Plan	35
Qualifications and Experience	20

Timeline	10
Cost	20
TOTAL	100

### Scoring Table

The Evaluation Team intends to use the scoring table below as a guideline for determining criterion score. Prompts are provided to give the Proponents an idea as to how each criterion will be examined and scored. The weighting of the prompts in determining the criterion score is up to the discretion of the Evaluation Team unless otherwise stated.

Scoring Table		
Points Awarded (% of available)	Quality	Criteria
100%	Exceptional	Exceptional; far exceeds requirements with no added risk.
80%	Very Good	Exceeds expectations; risk deemed acceptable or no added risk.
60%	Acceptable	Meets expectations and all minimum requirements.
40%	Below	Does not meet expectations or minimum requirements.
20%	Well Below Requirements	Fails to meet minimum requirements; proposes a solution or provides explanations that is not acceptable or relevant.
0%	Unacceptable	Proposed solution deemed unacceptable in every aspect.

#### 7.3.1 Project Understanding

The Proponents will be scored on their understanding of the Proposal as described in the Overview Section 1 and Specific Project Requirements (SPR) Section 2. As a part of the Proposal, include a narrative that illustrates an understanding of the Request for Proposal requirements. The Evaluation Team will take the entire Proposal submission into consideration when evaluating the Project Understanding section.

**Scoring**

The following prompts will be used to determine the criterion score:

Prompts
Is the overall approach tailored to the needs of the RMOW as described in the RFP?
Is the Proposal easy to read and concise?
Does the submitted Proposal acknowledge all required criteria of the SPR accurately?

### 7.3.2 Design Offering & Workplan

The Proponent will be scored on their work plan to perform the project, and should express high level solution to the tasks in the SPR. The Evaluation Team will take the entire Proposal submission into consideration when evaluating the Design Offering section.

**Scoring**

The following prompts will be used to determine the criterion score:

Prompts
Does the design offering meet the requirements of the RFP?
Is the design offering compelling, suited to the environment and the desired resort experience?
Is the WBS/work plan plausible and tailored to the site location?
Is the proposed equipment to be used sufficient for the work and the site?
Have the methods described in the work plan previously been used in past projects and were they successful? Is there evidence that this is the optimal solution?

### 7.3.3 Qualifications and Experience

Qualifications of the Proponent and Proponents team are to be submitted according to section 3.7 and 3.8. Only qualifications that are relevant to the SPR will be considered when evaluating this section. References may or may not be contacted.

**Scoring**

The following prompts will be used to determine the criterion score:

Prompts
Qualifications of the personnel and how they relate to the tasks they are responsible for as described in the Proponents Proposal.
Proponent's team's experience with similar projects within the last 10 years. Submitted experience beyond the previous ten (10) years will not have weight on the scoring.
Work performed for submitted references is by the proposed team members and is within the last ten (10) years and is relevant to the SOW of the project.

#### 7.3.4 Timeline

Timelines and schedules are to be clear and concise and highlight all milestone dates. Timelines that are ahead of the milestone dates may or may not receive more marks than timelines that meet the milestone dates and is up to the discretion of the evaluation team.

#### Scoring

The following prompts will be used to determine the criterion score:

Prompts
Tasks are based on the work plan with start and end dates for each task.
Start and end dates for each task are realistic with reasonable lead times.

#### 7.3.5 Cost

Cost evaluation is broken into two parts. The lump sum and the fee schedule cost breakdown. The lump sum is worth 90% of the points available and the fee schedule is worth 10% of the points available.

#### Scoring

Prompts	Weighting
The lump sum will be evaluated using the following equation $\frac{\text{Lowest Priced Proposal}}{\text{This Proposal's Price}} \times \text{Points Available} \times 80\%$	90%
The rate sheet is detailed and clear	10%

## 7.4 Interviews

If final tabulated scores are within 5 points, the Evaluation Team may, at its discretion, invite some or all of the Proponents to appear before the Evaluation Team to provide either clarifications of their Proposals or a request to present on specified criteria and scoring. In such event, the Evaluation Team will be entitled to consider the answers received in evaluating Proposals. Interview questions and scoring may or may not be provided to the Proponent before the interview.

## 7.5 Litigation

In addition to any other provision of this RFP, the RMOW may, in its absolute discretion, reject a Proposal if the Proponent, or any officer or director of the Proponent submitting the Proposal, is or has been engaged directly or indirectly in a legal action against the RMOW, its elected or appointed officers, representatives or employees in relation to any matter.

In determining whether or not to reject a Proposal under this section, the RMOW will consider whether the litigation is likely to affect the Proponent's ability to work with the RMOW, its Contractors and representatives, and whether the RMOW's experience with the Proponent indicates that there is a risk the RMOW will incur increased staff or legal costs in the administration of the Contract if it is awarded to the Proponent.

## 7.6 Consideration of Relevant Factors

The RMOW reserves the right to decline to select any Proponent which the RMOW, acting reasonably and fairly, determines would, if selected, result in greater overall cost or material risk to RMOW as compared to another Proponent, considering any relevant factors, including a Proponent's financial resources, safety record, claims and litigation history, work history and environmental record.

## 7.7 Additional Information

The RMOW reserves the right to select the Proponent best suited for the project and intends to evaluate the proposal(s) as fairly as possible. The RMOW reserves the right to make changes to the evaluation process prior to the proposal submission date.

The RMOW has disclaimed any intention to assume contractual or other obligations to Proponents during the RFP process partly to ensure that it retains maximum flexibility in regard to whether it proceeds with one of the Proponents, or how it will evaluate proposals.

If a proposal is determined to be unclear or deficient in some aspects, but these deficiencies are capable of being clarified or rectified, the RMOW may prepare a list of questions for the Proponent, to clarify or remedy the deficiencies. If, in the opinion of the RMOW, these clarifications and rectifications do not overcome the deficiencies, the RMOW, at its sole and absolute discretion, may decide to reject the



proposal. The RMOW may contact any or all of the Proponents to seek further clarification and information before awarding the contract.

## 8 Form of Proposal

RFP Project Title: 21-Mile Creek Flank Trail Bridge Design-Build

RFP Reference No: RFP-X179-2023

Legal Name of Proponent:

Contact Person and Title:

Business Address:

Telephone:

E-Mail Address:

Dear Sir/Madam:

I/We, the undersigned duly authorized representative of the contractor, having received and carefully reviewed all of the Proposal documents, including the RFP, and the following addenda:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

*(addenda, if any)*

and having full knowledge of the Site(s), awareness and or participation of a voluntary site meeting for bidders, and having fully informed ourselves as to the intent, difficulties, facilities and local conditions attendant to performing the Services, submit this Proposal in response to the RFP.

I/We confirm that this proposal is accurate and true to best of my/our knowledge.

I/We confirm that, if I/we am/are awarded the Agreement, I/we will at all times be the “prime contractor” as provided by the Worker’s Compensation Act (British Columbia) with respect to the Services. I/we further confirm that if I/we become aware that another contractor/contractor at the place(s) of the Services has been designated as the “prime contractor/contractor”, I/we will notify the RMOW immediately, and I/we will indemnify and hold the RMOW harmless against any claims, demands, losses, damages, costs, liabilities or expenses suffered by the RMOW in connection with any failure to so notify the RMOW.

This Proposal is submitted this \_\_\_\_\_ day of \_\_\_\_\_, 2023

I/We have the authority to bind the Proponent.

---

(Name of Proponent)

---

(Name of Proponent)

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(Signature of Authorized Signatory)

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(Signature of Authorized Signatory)

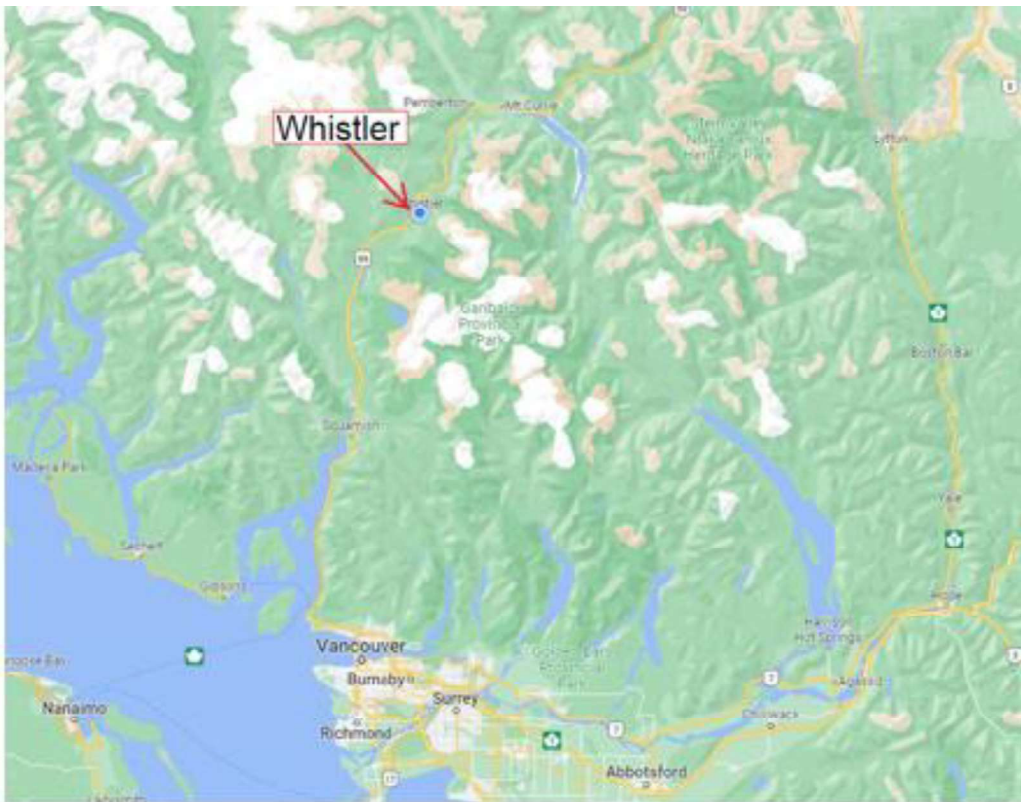
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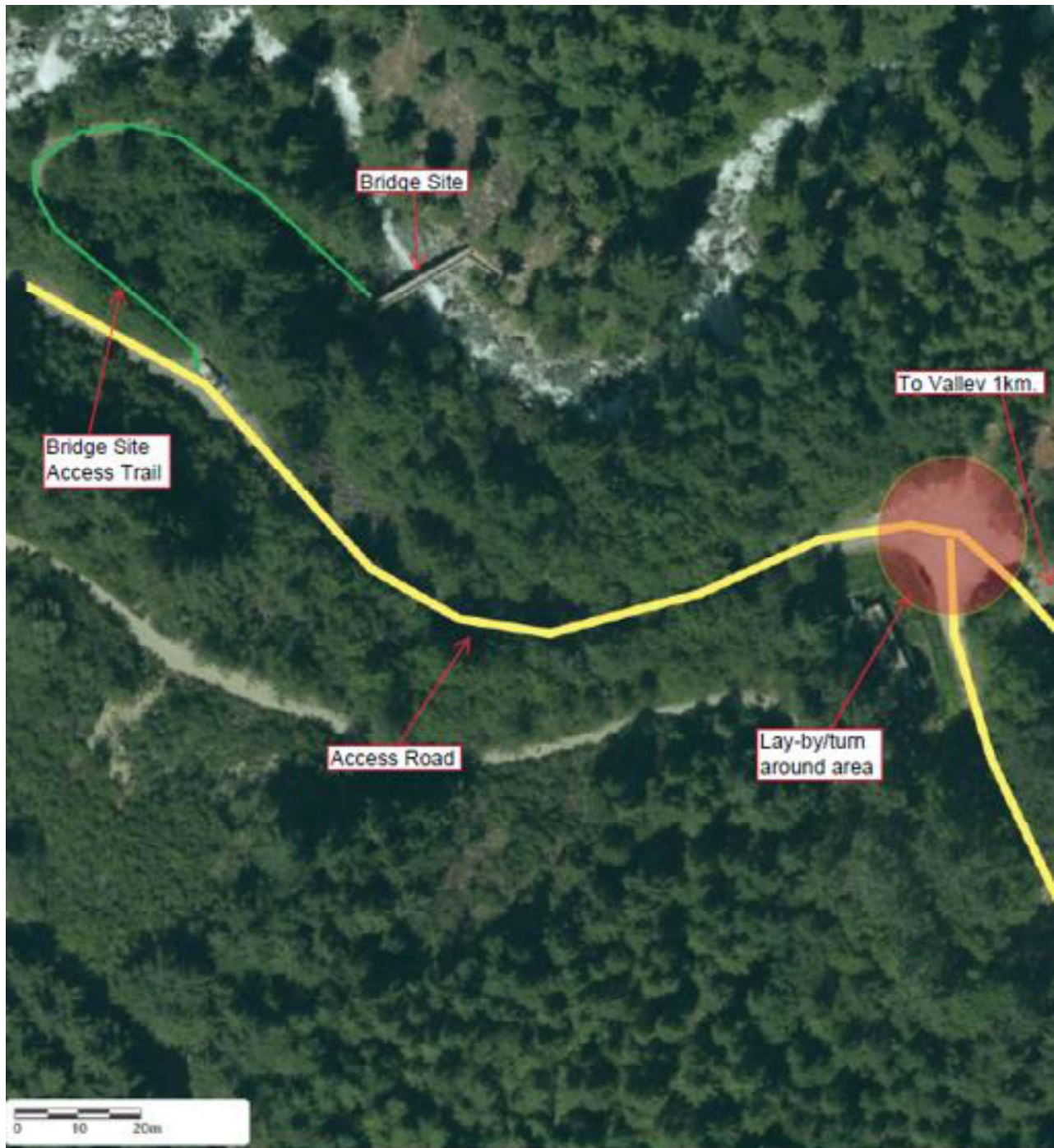
(Print Name and Position of Authorized Signatory)

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(Print Name and Position of Authorized Signatory)

## 9 Location Maps





- Site Accessible via 1km long gated Utility access road
- Two sections of up to 12% grade including 2 sharp corners
- Lay-by area 150m. from site
- Bridge site is accessed by 70m long, 1m wide trail
- Possibility of med sized excavator to re-establish access rd. to bridge site and SW landing
- No machinery access to NE landing



## 10 RMOW Consulting Services Agreement Contract Terms and Conditions Template

**CONSULTING AGREEMENT**

**[PROJECT NAME or TYPE OF SERVICES]**

**THIS AGREEMENT** is effective as of the XX<sup>th</sup> day of XXXXXXX, 2023.

BETWEEN:

**The Resort Municipality of Whistler**, having an address at 4325  
Blackcomb Way, Whistler, B.C.V8E 0X5  
(the “RMOW”)

AND:

**[Contractor Firm Name]** having an address at [Contractor’s full  
address]  
(the “Contractor”)

**WHEREAS:**

- A. Pursuant to a [Request for Proposals/Invitation to Tender...] entitled [insert title of the RFP/ITT] [Contractor/Firm Name] has been selected as the preferred Proponent to complete the “**Services**” outlined in Schedule A and;
  - A.
- B. RMOW wishes to engage the Contractor for provision of the Services on the terms and conditions herein set forth;

**NOW THEREFORE THIS AGREEMENT WITNESSES** for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties, intending to be legally bound, agree as follows:

**INTERPRETATION**

**Definitions**

In this Contract unless something in the subject matter or context is inconsistent therewith, the capitalized terms herein will have the meanings set out below:

“**Business Day**” has the meaning given in Section 16.1 of this Contract;

“**Change Order**” means a change within the general scope of Services which may alter the Services, Contract Price or Contract Time.

“Confidential Information” means:

any information, in whatever form (including written, oral or stored in any computer or other electronic, magnetic or optical storage system), which is non-public, confidential or proprietary in nature, whether marked as such or not, obtained directly or indirectly from RMOW and whether obtained by the Contractor before or after the date of this Contract, including without limitation, corporate records and employee records;

any information, in whatever form, designated by the RMOW in writing as confidential or proprietary or marked with words of like import when provided to the Contractor or any other Person;

information orally conveyed to any director, officer, employee or other representative of the Contractor, if RMOW states at the time of the oral conveyance or promptly thereafter that such information is confidential, and provides specific written confirmation thereof to the Contractor within ten (10) days of the oral conveyance; and

all Work Product as defined in this Contract, except as may be agreed in writing by the parties as falling outside the definition of Confidential Information;

but does not include information:

which was in the possession of the Contractor prior to disclosure by the RMOW;

which is already in the public domain or which subsequently becomes part of the public domain other than through disclosure by the Contractor;

which is independently developed or learned by the Contractor without use of any Confidential Information; and

which the Contractor receives from a third Person who was free to make such disclosure without breach of any legal obligation,

provided that the Contractor can demonstrate to the satisfaction of RMOW that such information falls within the scope of the exclusions set forth above.

**“Contractor’s Representative”** has the meaning given in Section 18.1 of this Contract;

**“Contract”** means this agreement including the Schedules to this agreement as amended from time to time with the written approval of the parties;

**“Contract Price”** has the meaning given in Schedule B of this Contract;

**“Dispute”** means any difference between the RMOW and the Contractor, of any claim, or any dispute, relating to or arising out of the Services or the interpretation of the Contract, or any failure by the RMOW and the Contractor to agree where the Contract call for agreement;

**“Person”** means any individual, corporation, limited-liability company, partnership, firm, joint venture, association, trust, or other entity or organization, including a government or an agency or instrumentality thereof;

**"Procurement Documents"** means the procurement documents attached hereto as Schedule F (if any);

**"Records"** has the meaning set out in Section 5.1 of this Contract;

**"RMOW Representative"** has the meaning given in Section 18.1 of this Contract;

**"Services"** has the meaning given in Schedule A to this Contract;

**"Work Product"** means all that which is prepared, produced or developed by the Contractor as a result of this Contract, whether in written or electronic form and all copies of same. Work Product includes but is not limited to reports, data (including recorded "personal information" about an identifiable individual), information, calculations, logs, working papers or finished copy documents or information of any kind prepared or acquired by the Contractor in connection with this Contract.

**"Term"** has the meaning given in Section 2.1 of this Contract

### **Headings**

The division of this Contract into articles and sections and the insertion of the recitals and headings are for convenience of reference only and shall not affect the construction or interpretation of the Contract.

### **Use of the Word "Including"**

The word "including" when following any general term or statement will not be construed as limiting the general term or statement to the specific matter immediately following the word "including" or to similar matters, and the general term or statement will be construed as referring to all matters that reasonably could fall within the broadest possible scope of the general term or statement.

### **Currency**

All transactions referred to in this Contract will be made in lawful currency of Canada.

### **Singular, Plural, Gender and Person**

Wherever in this Contract the context so requires the singular number shall include the plural number and vice versa and any gender used shall be deemed to include the feminine, masculine or neuter gender.

### **Statutes**

Each reference to a statute is deemed to be reference to that statute and to the regulations made under that statute as amended or re-enacted from time to time.

### **Schedules**

The following attached schedules (the "Schedules") are incorporated in this Contract and are deemed to be part of this Contract:

Schedule A	-	Services to be Provided
Schedule B	-	Payment and Fees Schedule
Schedule C	-	Insurance
Schedule D	-	Approved Subcontractors
Schedule E	-	Contractor's Submission

### **Order of Priority**

If there is a conflict between a provision in a Schedule to this Contract and any other provision of this Contract, the other provision of this Contract will prevail unless the provision in a Schedule expressly states that it will prevail over a conflicting provision of the Contract. If this Contract is a result of a competitive procurement process, the order of priority of documents from highest to lowest will be:

this Contract;

Schedules A, B, C, D, E and F;

the RMOW's purchase order for the Services (if any);

extracts from the Contractor's Submission respecting the Services , that are attached as a Schedule (if any); and

extracts from RMOW's Procurement Documents respecting the Services , that are attached as a Schedule (if any).

### **TERM OF CONTRACT**

#### **Term**

The term of this Contract (the "**Term**") will commence on [Month... Day 20XXX (year) and continue until Month, day, year 20XXX], subject to the following:

earlier termination in accordance with the terms of this Contract; and

renewal or extension of the Term on such terms as the parties agree to in writing. If the parties agree to an extension of the Term, then the following will apply:

the parties will mutually agree on a new Schedule B – Payment and Fees Schedule;

all other terms and conditions of this Contract not mutually amended will remain the same; and

the Term will be extended for the period(s) agreed to by the parties.

### **SERVICES PROVIDED**

**Services**

The Contractor shall provide the Services described in Schedule A in accordance with this Contract.

**Approvals**

The Contractor shall procure and pay for all approvals necessary or advisable to perform its obligations under this Contract.

**Service Standards**

The Contractor will at all times during the Term of this Contract perform the Services using standards, practices, methods and procedures to a good commercial standard, in accordance with and conforming to all applicable law and exercising that degree of care, skill and diligence which would reasonably and ordinarily be expected from a qualified, skilled and experienced person in British Columbia providing Services similar in scope, nature and complexity to the Services.

**Supervision**

The Contractor shall ensure all persons employed or retained by the Contractor to provide the Services are competent to perform them, meet all professional qualifications, and are properly trained, instructed and supervised.

**RMOW Instructions**

RMOW may from time to time give the Contractor reasonable instructions (in writing or otherwise) as to the Services required to be provided. The Contractor shall comply with those instructions; however, the Contractor shall determine the manner in which the instructions are carried out.

**RMOW Facilities**

The RMOW may, but is not required, to provide any facilities (including but not limited to work space, office equipment, computer equipment, telephone or other communication devices, or secretarial support) or other technical, accounting, transportation or other support services to the Contractor. Any instruments or tools necessary to provide the Services are the responsibility of the Contractor and are provided at the sole risk and expense of the Contractor. For certainty, the RMOW's provision of any facilities shall be for the convenience of the parties only and shall not create or be deemed to create an employment, partnership, joint venture or agency relationship between the parties.

**Security Requirements**

Only the employees of the Contractor specifically assigned to provide the Services and will be allowed on site at any of RMOW's facilities. The Contractor will inform RMOW in advance of the names of the employees that will attend RMOW's facilities in order to provide the Services. RMOW will inform the Contractor of all applicable procedures related to security. The Contractor will comply with all applicable RMOW procedures relating to security that the Contractor has been thereby informed of.

**RMOW Procedures and Policies**

The Contractor and any of its employees providing the Services will comply with all RMOW policies or procedures, including with regard to security, fire and safety, conflict of interest, standards of business conduct, human rights, harassment, workplace conduct and other policies or procedures of a like nature, that it has been provided copies of or otherwise been made reasonably aware of.

**Representations and Warranties**

The Contractor covenants, represents and warrants to the RMOW that:

the Contractor is legally entitled to carry on its business in British Columbia and is in good standing with respect to filings of annual reports according to the records of the Registrar of Companies of British Columbia;

the Contractor has the power and capacity to enter into this Contract and to comply with every term and condition of this Contract;

all necessary proceedings have been taken to authorize the Contractor to enter into this Contract and to execute and deliver this Contract;

this Contract has been properly executed by the Contractor and is enforceable against the Contractor in accordance with its terms;

any statement, representation or information, whether oral or written, made, furnished or given by the Contractor, its principals, partners, directors, officers or anyone acting on behalf of the Contractor, to the RMOW in connection with this Contract is materially correct and accurate;

the Contractor has no knowledge of any fact that materially adversely affects or, so far as can be foreseen, might materially adversely affect either its financial condition or its ability to fulfill its obligations under this Contract;

the Contractor has no knowledge of any claims against it that in either case would materially adversely affect either its financial condition or its ability to fulfill its obligations under this Contract;

the Contractor is in compliance with all tax, Workers' Compensation and other legislation, regulations and laws to which it is subject, and holds all permits, licences, consents and authorities required by law to conduct its business;

the Contractor's employees specifically assigned to provide the Services are suitably qualified to enable full and proper provision of the Services and ;

the Contractor accepts all risks within this Contract identified as being borne by the Contractor;

the Contractor will comply with all the requirements of this Contract and will perform all its obligations hereunder;

no partnership, joint venture or agency involving the RMOW is created by this Contract; and  
 all personnel hired, retained or engaged by the Contractor to provide the Services and are not the employees of the RMOW. The Contractor is solely responsible for arranging all matters arising out of the relationship of employer and employee between the Contractor and its employees specifically assigned to provide the Services and .

## **TERMS OF PAYMENT**

### **Payment**

RMOW will pay the Contractor, in full payment and reimbursement for providing the Services, the Contract Price and expenses set out in Schedule B and the Contractor hereby accepts the same as payment in full for all Services provided by the Contractor, including all profit and all costs of supervisions, labour, overhead, financing incurred in providing the Services. The Contractor will be responsible for determining whether the Services provided are subject to any applicable taxes.

### **Invoices**

Payments will be made on receipt of the Contractor's monthly itemized account or for such other periods as may be mutually agreed subject to verification by the RMOW that the Services have been satisfactorily performed. The Contractor's itemized account shall show the period the billing pertains to, specific time worked in the billing period, and work completed, and shall itemize all taxes as separate line items. Where required by the RMOW, the Contractor will deliver to the RMOW a written statement of any goods and services taxation and or business identification numbers in addition to any other billing information reasonably required by the RMOW.

### **Disbursements**

RMOW is not obliged to pay the Contractor any monies other than the Contract Price described in Schedule B. The Contractor is not entitled to reimbursement for any other expenses or disbursements of any kind except those that are necessarily and reasonably incurred due to a change in scope and have been approved in advance in writing by the RMOW or such other expenses or disbursements that have been approved in advance by the RMOW. Reimbursement is subject to submission of evidence of actual expenditures satisfactory to the RMOW and to applicable expenditure policies and procedures.

### **Non Resident of Canada**

If the Contractor is not a resident of Canada, RMOW may be required by law to withhold income tax from the fees described in Schedule B and then to remit that tax to the Receiver General of Canada on the Contractor's behalf.

### **Services Provided after Expiry of the Term**



No payment will be made for Services provided after the Term of this Contract, unless the Term has been renewed or extended in accordance with this Contract.

### **Withholding of Payments**

In the event that the Contractor fails to perform its obligations pursuant to the Contract on a timely basis the RMOW may at its discretion withhold any payments otherwise owed to the Contractor, pending performance of such obligations. No interest will be paid to the Contractor as a result of any such withholding. Any withholding of payments are in addition to and will not prejudice RMOW's other rights and remedies under this Contract.

### **Payment Due Date and Method of Payment**

Payment by the RMOW shall be net thirty (30) days from the receipt of invoices provided by the Contractor in accordance with the terms of the Contract. Payment by the RMOW will be made by direct deposit, Contractor to fill out and submit RMOW Direct Deposit Form.

## **RECORDS**

### **Records**

The Contractor will keep complete books and records (the "**Records**") relating to the provision of the Services including all performance and other reports, time records and books of account, invoices, receipts, vouchers of all expenses incurred in the form and content satisfactory to the RMOW acting reasonably and shall retain all such Records for two years following termination of the Contract, or for any longer period required by law.

### **Inform RMOW**

Upon the RMOW's request, the Contractor shall fully inform the RMOW of all work done by the Contractor or an approved subcontractor in connection with providing the Services under this Contract.

### **Inspection**

The Contractor shall permit the RMOW at all reasonable times during the Term of this Contract and for a period of two (2) years thereafter (the "Access Period"), to inspect, review and copy all Work Product and other material that has been produced or received by the Contractor and any approved subcontractor as a result of this Contract including without limitation accounting records, findings, software, data, specifications, drawings, reports and documents whether complete or not (the "Documentation"). The RMOW may make a request for access to the Documentation beyond the Access Period in which case the Contractor will, to the extent that it (a) deems the access commercially reasonable in its sole discretion and (b) has copies of the requested Documentation in its possession or reasonably accessible, provide the RMOW with copies of, or access to, the requested Documentation.

### **Audit**

The RMOW shall have the right to audit the work performed by the Contractor during the Term of this Contract and for two (2) years following expiry of the Term or any extension thereof.

## **INDEPENDENT CONTRACTOR**

### **Independent Contractor**

The Contractor is at all times an independent Contractor with control over the manner and means of the Contractor's performance. The Contractor is not an employee, servant or agent of RMOW and nothing herein shall create or be deemed to create a partnership, joint venture or agency relationship between the parties. The Contractor is primarily responsible for provision of the Services and may not delegate or assign any services or work to any other person without the prior written consent of RMOW. The Contractor will be solely liable for the wages, fringe benefits, work schedules and work conditions of any directors, officers, servants, agents and employees.

### **No Entitlement to Benefits**

As an independent Contractor, the Contractor is not entitled to any benefits or payments whatsoever over and above those specifically provided for in this Contract. Specifically the Contractor will not be entitled to any rights or privileges as are available from time to time to employees of RMOW including without limitation insurance benefits, health benefits, holidays and paid vacation.

### **Control and Direction of Employees**

The Contractor acknowledges that the Contractor is responsible for the control and direction of the Services and the control and direction of the Contractor's employees.

### **Statutory and Other Payments**

The Contractor shall be liable and responsible for payment to the proper authorities of all income tax payments, employment insurance premiums, Canada Pension Plan contributions and assessments, and all other employment expenses, statutory or otherwise in relation to the Services provided under this Contract.

### **Workers Compensation**

The Contractor will, at its own expense, procure and carry full Workers' Compensation Board coverage for the Contractor and employees of the Contractor engaged in the Services;

The Contractor shall comply with and ensure that any Subcontractors comply with and conform to all health and safety laws, by-laws or regulations of the Province of British Columbia, including without limitation the *Workers' Compensation Act* and Regulations pursuant thereto. The Contractor agrees that it is the "Prime Contractor" for the Services and pursuant to Section 118 of the *Workers' Compensation Act*.

The RMOW may, on twenty-four (24) hours written notice to the Contractor, but without notice in the event of an emergency, install devices or rectify any conditions creating an immediate hazard existing that would be likely to result in injury to any person. However, in no case will the RMOW be responsible for ascertaining or discovering, through inspections or review of the operations of the Contractor or otherwise, any deficiency or immediate hazard.

### **Termination**

If at any time Canada Revenue Agency or any other competent authority determines that the Contractor is an employee of RMOW then this Contract shall automatically terminate as of the date of such determination.

### **Contractor's Costs of Tax Compliance**

It is clearly understood and agreed that the costs to the Contractor in complying with the preceding provisions are not subject to additional reimbursement over and above the amount provided for under the terms of this Contract.

### **Risk of Liability**

The Contractor assumes all risk and liability for personal injury or damage to personal property caused by the Contractor's mishap, negligence or willful misconduct in carrying out the terms of this Contract and for which adequate levels of insurance coverage shall be obtained by the Contractor.

### **No Agency**

The Contractor will not commit or purport to commit the RMOW to pay any money unless specifically authorized by this Contract.

## **BUSINESS PREMISES/LICENCE**

### **Place of business**

Unless the RMOW will be providing facilities under Section 3.6 of this Contract, the Contractor, at its own expense, will establish and maintain during the Term, a proper place of business at a lawful place that allows for reasonable commute or accessibility to the Project site from which the business and supervision of this Contract will be carried out.

### **Business Licence**

If the Contractor maintains a place of business within the municipal boundaries of the RMOW, or generates revenue from business activity within the municipal boundaries of the RMOW, the Contractor will at all times during the Term be in possession of a valid and subsisting business licence issued to it by the RMOW and authorizing it to carry out and perform the Services required to be performed under this Contract.

## **OWNERSHIP**

**Work Product**

The Work Product, any Confidential RMOW Information and any property provided by the RMOW to the Contractor is RMOW's exclusive property. The copyright in the Work Product belongs exclusively to the RMOW and the Contractor hereby waives any moral rights in such Work Product and confirms the vesting of copyright in such Work Product in RMOW.

**Assignment of Rights in Work Product**

The Contractor hereby irrevocably assigns to the RMOW all right, title and interest worldwide in and to all Work Product. In the event the Contractor has any rights in the Work Product which cannot be assigned, the Contractor agrees to waive enforcement worldwide of such rights against RMOW and, at the request of RMOW, to grant RMOW an exclusive perpetual, fully paid up license without royalty in and to such Work Product worldwide with the right to sublicense. The Contractor shall take all actions and execute all documents as may be requested by the RMOW from time to time to fully vest in RMOW all right, title and interest worldwide in and to such Work Product. RMOW agrees, to the fullest extent permitted by law, to indemnify and hold the Contractor harmless from any claim, liability or cost directly attributable to the negligent misuse or incorrect use of the Work Product by the RMOW.

**Copyright Infringement**

The Contractor agrees that it will not infringe any third party's intellectual property rights in creating Work Product pursuant to this Contract. The Contractor agrees to indemnify RMOW from and against any loss, damage or liability for the infringement of any patent, trade mark, trade secret or copyright by RMOW arising from or in connection with RMOW's usage of the Work Product. The Contractor agrees it shall defend, settle or compromise at its own expense any action for patent, trade mark, trade secret or copyright infringement brought against RMOW or the Contractor. The Contractor warrants and represents that all Work Product provided to RMOW pursuant to this Contract do not infringe any existing patent, trade mark, trade secret or copyright registered or recognized in Canada or elsewhere.

**Surrender of Documents and Materials**

The Contractor shall not at any time or in any manner unless otherwise agreed to in writing by the RMOW, make or cause to be made copies, pictures, duplicates, facsimiles or other reproductions or recordings of any type, or any abstracts or summaries of any Work Product, reports, studies, memoranda, correspondence, manuals, records, plans or other written, printed or otherwise recorded documents, papers or materials of RMOW, or which relate in any manner to the present or prospective operations of RMOW, except as may be necessary in the provision of the Services under this Contract. The Contractor shall have no interest in any of these materials and agrees, subject to its professional obligations, to surrender any of these materials which may be in the Contractor's possession to the RMOW immediately upon termination of this Contract at the request of RMOW or at any time prior to termination at the request of RMOW.

## **CONFIDENTIALITY**

### **Confidentiality**

The Contractor will at all times during the Term and thereafter treat as confidential all Confidential Information and other reports, studies, memoranda, correspondence, manuals, records, plans or other written, printed or otherwise recorded documents, papers, materials and documents supplied to or obtained by the Contractor as a result of this Contract. The Contractor shall not at any time during the Term or thereafter permit the publication, release or disclosure of the same without the prior written consent of RMOW except as required by applicable law.

The RMOW will at times during the Term and thereafter treat as confidential and maintain the confidentiality on all information, reports, studies, memoranda, correspondence, manuals, records, plans or other written, printed or otherwise recorded documents, papers, materials and documents provided by the Contractor, orally or in writing as confidential in nature. Except as required by law, including under the *Freedom of Information and Protection of Privacy Act*, as amended, or unless the Contractor provides its written consent, the RMOW shall not at any time during the Term or thereafter permit the publication, release or disclosure of such confidential information to any third parties.

### **Non-Disclosure**

The Contractor will not, at any time either during the Term or thereafter, disclose to or discuss with anyone other than an authorized RMOW employee or representative, any Confidential Information of RMOW or its elected officials, officers or employees. The Contractor will use such Confidential Information and knowledge only for RMOW purposes unless the Contractor has obtained RMOW's prior express written authorization to do otherwise.

### **No Use of Information**

The Contractor shall not use Confidential Information or any other information relating to the affairs of RMOW for the Contractor's own benefit or purposes or for the benefit or purpose of any other Person whether before or during the Term or after the expiry of the Term.

### **Survival**

The provisions of this confidentiality clause shall survive termination of the Contract.

## **CONFLICT OF INTEREST**

### **No Conflict of Interest**

The Contractor represents and warrants to the RMOW that the Contractor does not have an interest, directly or indirectly either individually or in conjunction with another entity in any firm, association, syndicate, company, corporation or other business enterprise which could benefit or otherwise be affected by any decision likely to be made by the RMOW in reliance on or as a result of the Services

provided by the Contractor under this Contract. RMOW shall provide to the Contractor its conflict of interest and standards of business conduct procedures. The Contractor shall comply with RMOW's conflict of interest and standards of business conduct procedures as provided notwithstanding the Contractor is an independent Contractor and not an employee of RMOW.

#### **No Conflict with Other Relationships**

The Contractor will not, during the Term, perform a service for or provide advice to any person, firm or corporation if in the reasonable opinion of RMOW, such performance will give rise to a conflict of interest between the Contractor and RMOW, and the Contractor shall take all steps to ensure the avoidance of all direct or indirect conflicts of interest (either actual or potential) between the interests of the Contractor and its directors, officers, servants, agents and employees, and those of RMOW.

#### **Disclosure of Conflict of Interest**

The Contractor will immediately disclose all conflicts of interest and potential conflicts of interest to the RMOW as soon as any real or perceived conflict of interest arises.

#### **Good Faith**

The Contractor will discharge the Contractor's obligations to the RMOW in all dealings and transactions relating to the Services in the utmost good faith.

### **INDEMNIFICATION**

#### **General Indemnity**

The Contractor shall indemnify and save harmless the RMOW, its elected officials, officers, employees, servants and agents from and against any and all losses, claims, demands, damages, actions, causes of action, fines, penalties, liens, costs and expenses the RMOW may sustain or incur at any time, either before or after the expiration or termination of this Contract, arising directly or indirectly by reason of negligent acts, errors, or omissions or wilful misconduct of the Contractor or any agent, employee, director or officer of the Contractor in connection with this Contract including any injury to or death of any person or any damage to any and all persons or property, whether deliberate, accidental or through negligence except to the extent that any such claim arises solely from the negligence of RMOW, its other Contractor(s), assigns(s) or authorized representatives.

#### **Survival**

The provisions of this indemnity clause will survive termination of the Contract.

### **TERMINATION**

#### **Default of Contractor**

Notwithstanding any other provision of this Contract, if the Contractor is not performing the Services to the satisfaction of the RMOW or fails to perform the Services as and when reasonably requested by RMOW, or is in breach of any provision of this Contract, the RMOW may, at its option, either:

issue written notice to the Contractor requiring that such default be corrected. If within 5 Business Days after receipt of such notice such default shall not have been corrected or reasonable steps taken to correct such default, then at the sole discretion of the RMOW, the RMOW may give a further written notice to the Contractor immediately terminating this Contract, or:

terminate this Contract giving 5 Business Days' notice of termination to the Contractor.

In the event the RMOW exercises its option to terminate, the RMOW may withhold payment of any amount owing to the Contractor under this Contract for the provision of the Services, set-off any damages suffered by the RMOW against any amounts owing to the Contractor under this Contract for provision of the Services and pursue other remedies to recover damages from the Contractor for any losses caused to the RMOW as a result of the Contractor's performance under this Contract.

#### **Termination Without Cause**

Notwithstanding any other provision of this Contract, the RMOW or the Contractor may terminate this Contract for any reason upon giving not less than ten (10) days written notice of termination to the other party. The Contract may also be terminated in a shorter period of time as may be mutually agreed upon in writing by the parties. In the event that notice of termination is given pursuant to this section, the RMOW will pay the Contractor that portion of the fees and expenses described in this Contract which equals the portion of the Service that was completed to the RMOW's satisfaction before termination. Such payment will discharge the RMOW from all further liability under this Contract. Concurrently with termination by the RMOW pursuant to this Section, all obligations of the Contractor to perform the Services will terminate, excepting those performance obligations set out at Section 12.5 herein.

#### **Default of RMOW**

If the RMOW fails to make payment to the Contractor in accordance with this Contract, then the Contractor may, by written notice to the RMOW, require that such default be corrected. If within 5 Business Days after receipt of such notice such default shall not have been corrected, or reasonable steps taken to correct such default, the Contractor may, without limiting any other right or remedy it may have, give a further written notice to the RMOW to immediately terminate this Contract. In such event, in addition to any other rights or remedies the Contractor may have, the Contractor shall be paid by the RMOW for all Services performed pursuant to this Contract and remaining unpaid as of the effective date of such termination.

#### **Limitation of Liability**

The Contractor agrees that notwithstanding anything herein or any duty, principle, term or rule of law to the contrary, whether express or implied, RMOW shall not be liable to the Contractor for any loss or damage of any nature whatsoever flowing from early termination of this Contract, including without limitation any special, incidental, direct, indirect or consequential damages arising out of such early termination nor shall RMOW be under any obligation to the Contractor save and except for the payment for such Services as may have been performed in accordance with the terms of this Contract up to the date of termination.

### **Warranties to continue**

If for any reason the whole or any part of this Contract is terminated, the Contractor's obligations in this Contract as to quality, correction and warranty will continue in force after such termination with respect to the Services performed by the Contractor up to the time of termination.

## **CHANGES**

### **Right to Make Changes**

The RMOW reserves the right to request changes at any time as a result of requirements, site conditions, emergencies, government regulations or any other reasonable cause and:

The RMOW will notify the Contractor in writing as soon as reasonably possible when a change in the Services is proposed or required.

Where a proposed change in Services requires an adjustment to the Contract Price and or Contract Time, agreement to the adjustment between both parties must be recorded in a Change Order.

The RMOW shall make payment of a Change Order within 30 days of execution of the Change Order by the RMOW and completion of the change in services.

The Contractor shall not perform any changes without written authorization from the RMOW.

The RMOW will not make any payment for changes not agreed to in an executed Change Order.

## **INSURANCE**

### **Maintain Insurance**

The Contractor agrees that they shall maintain and pay for insurance on the terms, including coverage, amounts and deductibles outlined in Schedule C.

The Contractor acknowledges that any requirements of the RMOW as to the amount of coverage under any policy of insurance will not constitute a representation by the RMOW that the amount required is adequate and the Contractor acknowledges and agrees that the Contractor is solely responsible for obtaining and maintaining policies of insurance in adequate amounts. The insurance policy coverage



limits will not be construed as relieving the Contractor from responsibility for any amounts for which the Contractor may be legally liable which may exceed these limits.

#### **Evidence of Insurance**

Upon the request of RMOW, the Contractor shall provide the RMOW with evidence of insurance in a form satisfactory to the RMOW.

#### **Waiver of subrogation**

The Contractor hereby waives all rights of recourse against the RMOW for loss or damage to the Contractor's property.

#### **Notice of Claims**

If at any time during the provision of the Services or the Contractor becomes aware of a claim or potential claim against any insurance policy that the Contractor has, pursuant to this Contract, indicated to the RMOW may apply to the Services then the Contractor will immediately advise the RMOW in writing of such claim, including particulars.

### **ASSIGNMENT AND SUBCONTRACTING**

#### **Consent Required**

The Contractor will not assign this Contract or any part thereof without the prior written consent of the RMOW. The Contractor will not subcontract any of the Contractor's obligations under this Contract to any Person other than the Persons listed in Schedule D (if any) without the prior written consent of the RMOW. No assignment or subcontract, whether approved or not, shall relieve the Contractor of its obligations under this Contract except to the extent those obligations are in fact properly performed. In the event the RMOW approves a subcontractor, the Contractor shall secure compliance and enforce at its own expense for the benefit of the RMOW, each of the Contractor's contracts with subcontractors. Nothing contained in this Contract shall create any contractual relationship between the subcontractor and the RMOW. The Contractor agrees to bind every subcontractor to the terms and conditions of this Contract which are appropriate and applicable to the services to be provided by the subcontractor and the Contractor shall be fully responsible to the RMOW for the acts and omissions and errors of all subcontractors and of persons directly employed or contracted by them.

### **NOTICES**

#### **Notices**

All notices, requests, demands and other communications required or permitted to be given under this Contract shall be in writing and delivered by hand, facsimile transmission, e-mail or prepaid registered mail (return receipt requested) to the party to which it is to be given as follows:

If to the RMOW:

Kevin Sibbald

4325 Blackcomb Way, Whistler, BC, V8E0X5

[parksplanningprojects@whistler.ca](mailto:parksplanningprojects@whistler.ca)

If to the Contractor:

Contractor Primary Contact/Delegate

Contractor Address

Contractor Email.com

or at such other address as the party to whom the notice is sent may specify by notice given in accordance with the provisions of this section. Any such notice, request, demand or other communication given as aforesaid will be deemed to have been given, in the case of delivery by hand, when delivered, in the case of facsimile transmission or e-mail, when a legible facsimile or e-mail is received by the recipient if received before 5:00 p.m. on a day other than a Saturday, Sunday or statutory holiday in the Province of British Columbia or Canada (a "**Business Day**"), or on the next Business Day if such facsimile or e-mail is received on a day which is not a Business Day or after 5:00 p.m. on a Business Day, and in the case of delivery by prepaid registered mail, as aforesaid, on the date received. In the event of discontinuance of postal service due to strike, lockout, labour disturbance or otherwise, notice, demands, requests and other communications shall be delivered by hand or facsimile transmission or e-mail.

## **DISPUTE RESOLUTION**

### **Order of proceedings**

If there is any Dispute regarding the interpretation, performance or an alleged breach of this Contract, either party may give written notice of Dispute to the other party and the Contractor and the RMOW will meet within three (3) Business Days after the notice of Dispute is given and will attempt in good faith, and using reasonable efforts, to resolve the matter equitably to the satisfaction of both parties. If the parties cannot resolve the Dispute within ten (10) Business Days after they first meet, or if the parties fail to meet within 10 (ten) Business Days of the first request for a meeting, then with the consent of both parties the matter shall be submitted to mediation. Both parties agree not to make a request for arbitration or to commence litigation without first seeking agreement through the mediation process. The mediator shall be appointed by agreement of the parties. If the parties cannot resolve the dispute within 30 calendar Days following the mediation, then with the consent of both parties, the Dispute may be referred for determination through arbitration under the Arbitration Act (British Columbia), and in the event that both parties do not so consent then either party may commence litigation to have the Dispute settled. If a Dispute is submitted for arbitration, the arbitration will be governed by the British Columbia International Commercial Arbitration Centre in accordance with its Domestic Commercial Arbitrations Rules of

Procedure (“BCIAC Rules”). The arbitration shall be conducted by a single arbitrator appointed in accordance with BCIAC Rules in Vancouver, British Columbia and the award of the arbitrator including any award as to costs will be final and binding on the parties. The reference to arbitration will not preclude a party from applying to a British Columbia court of competent jurisdiction for interlocutory or interim relief.

### **Performance to continue during dispute**

The Contractor will continue performance of this Contract during all Disputes with the RMOW, and notwithstanding any dispute the Contractor will comply with all written directions from the RMOW Representative relating to the provisions of the Services without prejudice to the Contractor’s right. The timely provision of the Services may not be delayed or postponed pending resolution of any Dispute.

## **COMMUNICATION**

### **Representatives**

Each party will maintain communication with the other party in accordance with their respective obligations under this Contract. In particular:

the Contractor will appoint a representative (the “**Contractor’s Representative**”) who will have the duty of instituting and maintaining communication with the RMOW as to the requirements of this Contract, plus an alternative representative to so act in the absence or inability to act of the Contractor’s Representative; and

the RMOW will appoint a representative (the “**RMOW Representative**”) who will have the duty of instituting and maintaining communication with the Contractor as to the requirements of this Contract, plus an alternative representative to so act in the absence or inability to act of the RMOW Representative.

### **Representative's Authority**

Each party's representative will have the full power and authority to act on behalf of and to bind such party in all administrative issues and to carry out such party's obligations hereunder and each party's representative may be relied upon by the other party as the official representative of such party. Meetings between the Contractor’s Representative and the RMOW Representative may be held by telephone with the consent of all parties participating in such meetings.

### **Change of Representation**

The Contractor shall obtain written approval from the RMOW prior to changing a representative(s) or any team members by submitting a written request with resumes of each newly requested individual. The RMOW is required to approve any costs for any such un-approved Contractors or sub-contractors or other representatives. The RMOW may change its representative or alternative representative by written notice to the Contractor at any time it deems necessary.

## **DELAYS IN PERFORMANCE**

### **Force Majeure**

A party is excused from performing its obligations under this Contract if, to the extent that, and for so long as:

such party's performance is prevented or delayed by an act or event (other than economic hardship, changes in market conditions, insufficiency of funds, or unavailability of equipment and supplies) that is beyond its reasonable control and could not have been prevented or avoided by its exercise of due diligence; and

such party gives written notice to the other party, as soon as practicable under the circumstances, of the act or event that so prevents such Party from performing its obligations.

By way of illustration, and not by limitation, acts or events that may prevent or delay performance (as contemplated by this Section) include: acts of God or the public enemy, acts of civil or military authority, acts of terrorism, embargoes, epidemics, war, riots, insurrections, fires, explosions, earthquakes, floods and abnormal weather conditions where the Services are being provided (as determined by comparison to the ten (10) year average conditions indicated by Environment Canada for the area in which the Services are being provided).

## **GENERAL**

### **Right of Set Off**

In addition to any other set-off provisions in this Contract, RMOW shall be entitled to set off against a reasonable amount due or owing to the Contractor by the RMOW and for which RMOW is liable by virtue of the Contractor's failure to comply with any statutory or regulatory requirement, duty or obligation arising out of the Services under this Contract, an amount sufficient to satisfy any indemnity obligations of the Contractor in relation to such obligation as set out herein. RMOW shall also have the right to withhold any payment which relates to that portion of the Services which have not been provided by the Contractor in accordance with the terms of the Contract. When RMOW is satisfied that the Services has been performed in accordance with the terms and conditions of this Contract, RMOW will cause to be paid to the Contractor, any amount held back by the RMOW.

### **Successors and Assigns**

This Contract enures to the benefit of and binds the parties and their respective successors and permitted assigns.

### **Written Waivers**

No indulgence or forbearance by either party shall be deemed to constitute a waiver of its rights to insist on performance in full and in a timely manner of all covenants of the other party; and any such waiver must be in writing and signed by the waiving party and then such waiver shall only be effective in a specific instance and for the specific purpose for which it is given.

**Further Assurances**

Each party will execute and deliver promptly all further documents and take all further action reasonably necessary or appropriate to give effect to the provisions of this Contract.

**Remedies Cumulative**

The rights and remedies under the Contract are cumulative and are not in addition to and not in substitution for any other rights and remedies available at law or in equity or otherwise.

**Amendment**

This Contract may not be amended except by a written instrument signed by the RMOW and the Contractor.

**Entire Contract**

This Contract and all documents contemplated by or delivered under or in connection with this Contract constitute the entire agreement between the parties and supersede all prior agreements, negotiations, discussions, undertakings, representations, warranties and understandings whether written or oral, express or implied, or otherwise.

**Governing Law**

This Contract and any dispute arising out of or in connection with this Contract shall be governed exclusively by and shall be enforced, construed and interpreted exclusively in accordance with the laws of British Columbia and the laws of Canada applicable in British Columbia which will be deemed to be the proper law of this Contract.

**Attornment**

The parties agree to submit to and hereby attorn to the exclusive jurisdiction of the courts of the Province of British Columbia for any action arising out of or in connection with this Contract.

**Independent Legal Advice**

The Contractor confirms it has had an opportunity to obtain independent legal advice in entering into this Contract.

**Severability**

Each provision of this Contract is intended to be severable and if any provision is determined by a court of competent jurisdiction to be illegal or invalid or unenforceable for any reason whatsoever such provision

shall be severed from this Contract and will not affect the legality, validity or enforceability of the remainder of or any other provision of this Contract.

**Time of Essence**

Time shall be of the essence of this Contract.

**No derogation.**

The parties acknowledge and agree that nothing contained or implied in this Contract will be construed as limiting or prejudicing the rights and powers of RMOW in the exercise of its functions pursuant to the *Local Government Act* and the *Community Charter*, or any other right or power under any public or private statutes, bylaws, orders or regulations, all of which may be fully exercised as if this Contract had not been entered into.

**Counterparts**

This Contract may be executed by the parties in counterparts and may be executed and delivered by e-mail or fax and all such counterparts and e-mails and faxes together constitute one and the same agreement.

**Survival**

All obligations of each of the parties which expressly or by their nature survive termination or expiration of this Contract, will continue in full force and effect subsequent to and notwithstanding such termination or expiration or assignment and until they are satisfied or by their nature expire.

**IN WITNESS WHEREOF** this Contract has been executed and delivered by the parties as of the day and year first above written.

**RESORT MUNICIPALITY OF WHISTLER**

Per: \_\_\_\_\_

Authorized Signatory

Per: \_\_\_\_\_

Authorized Signatory

**NAME OF CONTRACTOR**

Per: \_\_\_\_\_

Authorized Signatory



## **SCHEDULE “A”**

### **SERVICES TO BE PROVIDED**

“**Services**” means the Services, tasks, labour, materials, responsibilities, functions, duties and obligations of the Contractor to be supplied or performed as set forth in this Contract, including those matters described in this Schedule A, and excluding only those items which are expressly identified as Services or tasks to be performed by or obligations owed by the RMOW.

See Schedules F: EXTRACTS OF RMOW PROCUREMENT DOCUMENTS, and SCHEDULE E: EXTRACTS OF CONTRACTOR'S SUBMISSION.

The RMOW shall provide the Contractor with unrestricted access to all locations the Contractor requires for the provision of the Services.

RMOW acknowledges and agrees that certain parts of the Services cannot be performed in poor weather conditions and the Contractor shall be temporarily excused from the provision of the Services during such conditions. Contractor shall notify RMOW in such an event and the schedule of completion shall be adjusted as necessary to account for any such weather-related delays.

**SCHEDULE “B”****PAYMENT AND FEES FOR SERVICES**Contract Price

In consideration of the Contractor satisfactorily performing the Services , the RMOW will pay the Contractor the following sums plus goods and services tax (the “**Contract Price**”):

**\$ [XX CAD] Exclusive of GST.**

The Contractor may invoice periodically for completed portions of the Services in accordance with in the invoicing procedures set out in the Contract.

The RMOW will reimburse the Contractor for expenses that are necessarily and reasonably incurred due to a change in scope and have been approved in advance by the RMOW. Reimbursement is subject to the submission of evidence of actual expenditures satisfactory to the RMOW and in accordance with applicable expenditure policies and procedures.

The pricing set out in this Schedule is inclusive of:

All Living-Out-Allowances

All travel charges and mileage

All Equipment charges

All document materials

Coordinates and site elevation shall be provided by RMOW at no cost to the Contractor.

Contractor to fill out and submit RMOW Direct Deposit Form.

**SCHEDULE “C”****INSURANCE**

The Contractor shall, without limiting its obligations or liabilities herein and at its own expense, provide and maintain the following insurances:

**Commercial General Liability**

Commercial General Liability in an amount not less than **\$5,000,000** inclusive per occurrence against bodily injury, personal injury and property damage and including liability assumed under this Agreement.

**Professional Liability**

Professional Liability for licenced professionals performing work pursuant to this Agreement in an amount not less than **\$2,000,000** per claim covering the licenced professionals' errors and omissions.

**Worker's Compensation**

The Contractor must, at its sole cost and expense, maintain Statutory Workers' Compensation Insurance and Employer's Liability Insurance for any and all persons employed directly or indirectly by the Contractor and provide the RMOW with evidence of compliance in the form of a confirmation letter from WorkSafe BC.

In the alternative, the Contractor may rely on a self-insurance program to meet those requirements, but only if the program of self-insurance complies fully with the provisions of the British Columbia Employment Standards Act (the "Act"). Determination of whether a self-insurance program meets the standards of the Act shall be solely in the discretion of the RMOW.

**Auto Liability**

The Contractor must obtain and maintain while this Agreement is in force, Automobile Insurance providing coverage for not less than **\$2,000,000** all-inclusive on owned, non-owned, or hired vehicles used in performing the services.

**General**

The foregoing insurance shall be primary and not require the sharing of any loss by any coverage provider and/or insurer of RMOW.

The CGL insurance policy must be extended to cover the Contractor's Blanket Contractual liability and contain a cross liability naming the RMOW and its officials, officers, employees, servants and agents as "Additional Insured."

All required insurance shall provide RMOW with 30 days advance written notice of cancellation on a best efforts basis.

The Contractor hereby waives all rights of recourse against RMOW with regard to damage to the Contractor's property.

Maintenance of such insurance shall not relieve the Contractor of liability under the indemnity provisions set forth in this Contract.

Any deductible amounts in the foregoing insurance which are payable by the policyholder shall be in an amount acceptable to the RMOW.

**SCHEDULE “D”**

**APPROVED SUBCONTRACTORS**

**SCHEDULE “E”**

**CONTRACTOR’S SUBMISSION**

Appendix A

Appendix B

Appendix C

Appendix D

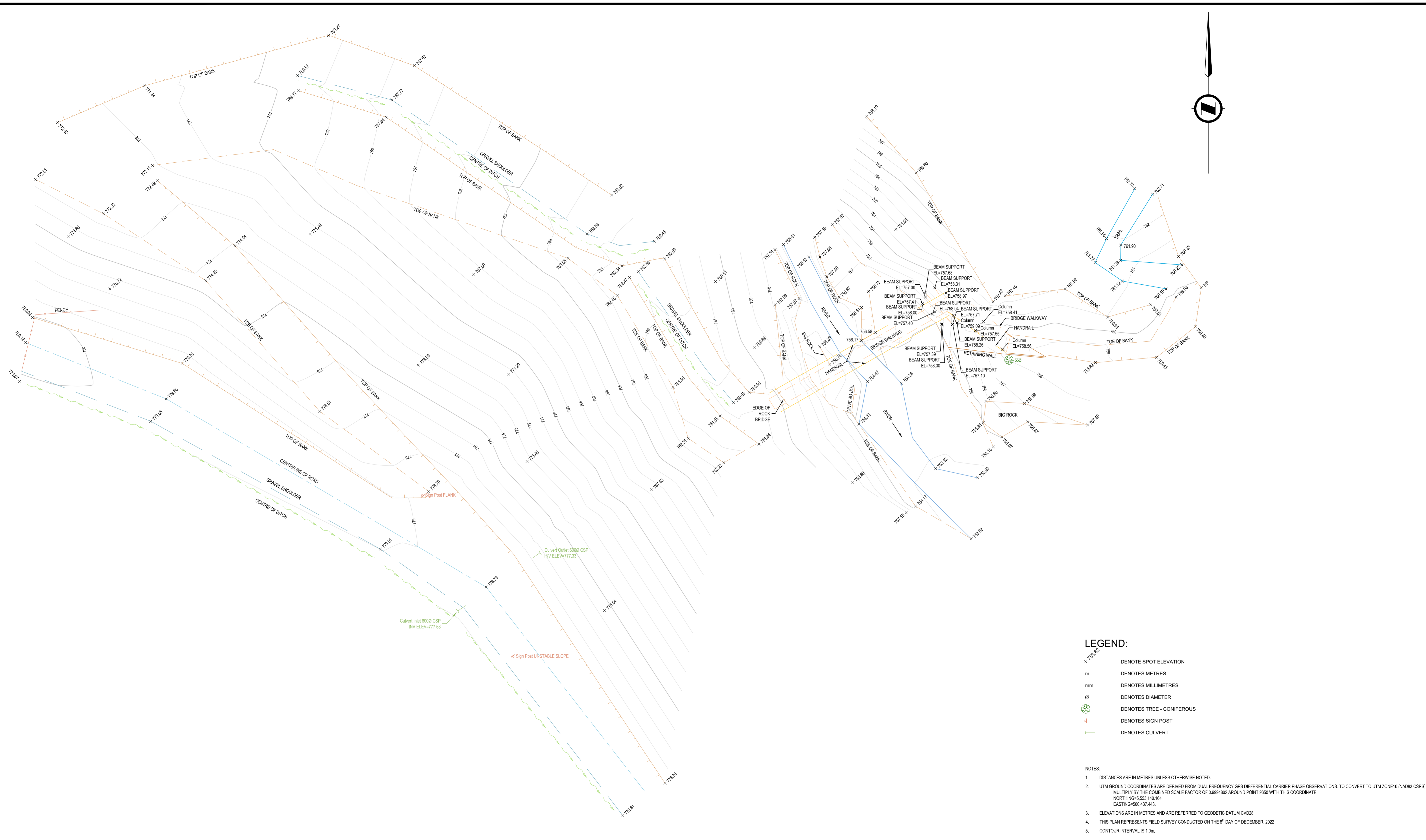
Appendix E

Appendix F

Appendix G

McElhanney ANS D - 2017-05-26

DATE: 2022-12-12 12:07 FILE: c:\pwworkspace\mch\projects\21 Mile Creek\21 Mile Creek.dwg PLOT: 21 Mile Topographic.dwg



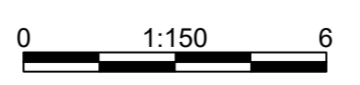
- LEGEND:**
- + 753.82 DENOTES SPOT ELEVATION
  - m DENOTES METRES
  - mm DENOTES MILLIMETRES
  - ∅ DENOTES DIAMETER
  - ⊗ DENOTES TREE - CONIFEROUS
  - ⊠ DENOTES SIGN POST
  - DENOTES CULVERT

- NOTES:**
- DISTANCES ARE IN METRES UNLESS OTHERWISE NOTED.
  - UTM GROUND COORDINATES ARE DERIVED FROM DUAL FREQUENCY GPS DIFFERENTIAL CARRIER PHASE OBSERVATIONS. TO CONVERT TO UTM ZONE 10 (NAD83 CSRS) MULTIPLY BY THE COMBINED SCALE FACTOR OF 0.9994802 AROUND POINT 9650 WITH THIS COORDINATE NORTHING=5,553,140.164 EASTING=500,437.443.
  - ELEVATIONS ARE IN METRES AND ARE REFERRED TO GEODETIC DATUM CVD28.
  - THIS PLAN REPRESENTS FIELD SURVEY CONDUCTED ON THE 8<sup>th</sup> DAY OF DECEMBER, 2022
  - CONTOUR INTERVAL IS 1.0m.

THIS DRAWING AND DESIGN IS THE PROPERTY OF McELHANNEY AND SHALL NOT BE USED, REUSED OR REPRODUCED WITHOUT THE CONSENT OF McELHANNEY. McELHANNEY WILL NOT BE HELD RESPONSIBLE FOR THE IMPROPER OR UNAUTHORIZED USE OF THIS DRAWING AND DESIGN.

THIS DRAWING AND DESIGN HAS BEEN PREPARED FOR THE CLIENT IDENTIFIED. TO MEET THE STANDARDS AND REQUIREMENTS OF THE APPLICABLE PUBLIC AGENCIES AT THE TIME OF PREPARATION. McELHANNEY, ITS EMPLOYEES, SUBCONSULTANTS AND AGENTS WILL NOT BE LIABLE FOR ANY LOSSES OR OTHER CONSEQUENCES RESULTING FROM THE USE OR RELIANCE UPON, OR ANY CHANGES MADE TO, THIS DRAWING BY ANY THIRD PARTY, INCLUDING CONTRACTORS, SUPPLIERS, CONSULTANTS AND STAKEHOLDERS, OR THEIR EMPLOYEES OR AGENTS, WITHOUT McELHANNEY'S PRIOR WRITTEN CONSENT.

INFORMATION ON EXISTING UNDERGROUND FACILITIES MAY NOT BE COMPLETE OR ACCURATE. McELHANNEY, ITS EMPLOYEES AND DIRECTORS ARE NOT RESPONSIBLE NOR LIABLE FOR THE LOCATION OF ANY UNDERGROUND CONDUITS, PIPES, CABLES OR OTHER FACILITIES WHETHER SHOWN OR OMITTED FROM THIS PLAN. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL EXPOSE LOCATIONS OF ALL EXISTING FACILITIES BY HAND DIGGING OR HYDROVAC AND ADVISE THE ENGINEER OF POTENTIAL CONFLICTS.



ORIGINAL DWG SIZE: ANSI D (22" x 34")

**McElhanney**

Suite 205  
1055 Millar Creek Road  
Whistler BC  
Canada V0N 0K7  
T 604 932 5426

Resort Municipality of Whistler  
4325 Blackcomb Way, Whistler, BC, V8E 0X5

**21 MILE CREEK CROSSING  
TOPOGRAPHIC SURVEY PLAN**

Approved Sealed

Drawing No. **V-07**

Project Number 2113-04217-00 Rev. 0

Rev	Date	Description	Drawn	Surv'd	App'd
0	2022-12-12	INITIAL SUBMISSION	AR	ES	TB





1 – 38920 Queens Way  
Squamish, BC V8B 0K8  
604-898-1093

Resort Municipality of Whistler  
4325 Blackcomb Way  
Whistler, BC  
V8E 05X

January 27, 2023  
File: 1927

Attention: Lorne Russell

**RE: Preliminary Geotechnical Recommendations Report,  
Proposed New Pedestrian Bridge, 21 Mile Flank Trail Bridge, Whistler**

## **1.0 INTRODUCTION**

We understand that it is being considered to replace the existing pedestrian bridge across 21 Mile Creek on the Rainbow Falls Flank Trail in Whistler, BC and that a preliminary geotechnical site assessment in the area of the proposed bridge, along with preliminary geotechnical recommendations, are required for the project. Frontera Geotechnical Inc. (Frontera) has been engaged to provide a high-level geotechnical review of, and provide preliminary recommendations, for the project.

A project information document and a survey drawing prepared by McElhanney, dated December 12, 2022, have been reviewed in preparing this report. Design drawings were not available at the time of writing this report as it is understood that this report will be used by the design team to assist in determining a location and type of bridge suitable for the crossing.

This report has been prepared exclusively for our client and for the use of others within their design and construction team, however, it remains the property of Frontera Geotechnical Inc.

## **2.0 SITE DESCRIPTION**

The proposed bridge will cross 21 Mile Creek approximately 50 m upstream of the nearby waterfall and downstream of a drinking water intake. The new replacement bridge will be part of the Flank Trail – a popular multi-use connector trail located on the west side of Whistler.

The replacement bridge is proposed to be within approximately +/- 20 m of the existing bridge. The existing bridge crosses perpendicular to 21 Mile Creek and is located approximately 110 m off of a gravel access road (following the alignment of the Flank Trail) and has a span of approximately 17 m. The bridge has been in place for approximately 20 years and has been supported on large boulders and timber cribbing.

Based on the survey drawing, the northeast and southwest banks of 21 Mile Creek, along the alignment of the existing trail, are at approximate elevations of +759 m and +760.5 m geodetic (GD), respectively. The gravel access road, located southwest of the existing bridge, is at an approximate elevation of +779 m GD. There are steep slopes on both banks – on the southwest bank there is a slope from the bridge up to the access road with a gradient of approximately 80%; on the northeast bank a rock outcrop slopes upwards from south to north and is near vertical in areas. The existing trail has been routed around this rock outcrop.

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### 3.0 SOIL CONDITIONS & GROUNDWATER

#### 3.1 Soil Conditions

With reference to surficial geology mapping by Blais-Stevens<sup>1</sup>, the site is underlain by ice-contact deposits consisting of sand and gravel, stratified to massive and commonly faulted; generally greater than 3 m thick, forming hummocky surfaces. The underlying bedrock consists of andesitic volcanic rocks, of the Gambier Group.

Frontera visited the site on October 16<sup>th</sup>, 2022, to review the soil conditions near the existing bridge. The proposed bridge is expected to be founded on the creek banks where the ground is at elevations approximately 4 m to 6 m above the river level at the time of surveying. On both banks, where the existing bridge joins the trail, a deposit of silty, fine to medium-grained sand and rounded gravel and cobbles overlies bedrock – probing of the subgrade indicates that the soils are compact to dense.

Bedrock can be observed on the northeast bank, immediately behind the existing bridge, within 21 Mile Creek, and at the base of the southwest bank. The observed bedrock on the northwest bank, at and above the existing bridge elevation, appears massive with few fractures. Bedrock within the centre of 21 Mile Creek is heavily fractured, but few discontinuities are observed in the bedrock at the base of both creek banks. Some unsupported boulders above the bridge were noticed on the rock outcrop along the northeast bank.

A scree/riprap slope on the southwest bank, both north and south of the existing bridge has been observed. The boulders are large and angular; the soils/rock beneath them could not be observed at the time of review. West of the existing bridge is a steep slope that is covered in dense vegetation. The observed trees all showed signs of bending, indicating some slope movement. In general, the slope appears to consist of loose rocks and soils up to approximately 0.6 m deep, however, the underlying rock and soils could not be observed.

#### 3.2 Groundwater Conditions

The water table is expected to be well below foundation elevations, however, perched water on top of bedrock should be expected.

Minor seepage was observed at the toe of the slope on the southwest bank, immediately west of the existing bridge. It is expected that this seepage will increase following prolonged periods of precipitation.

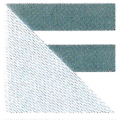
### 4.0 DISCUSSION

We understand that the bridge options will be founded within approximately +/- 20 m of the existing bridge and above the 200-year flood elevation. Due to the exposed bedrock likely being too steep for a levelled bench, the existing bridge is supported on stacked rock boulders and timber cribbing. The soils at the potential bridge abutment locations would primarily consist of silty, fine to medium-grained sand and rounded gravel and cobbles or bedrock.

At the potentials bridge locations, the risk of bank erosion appears to be low. Along both banks there are large boulders/riprap and intact bedrock is observable in many areas. On the northwest bank, the observed soils overlying the bedrock show signs of erosion from high flow level events. Therefore, the

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<sup>1</sup> Blais-Stevens, A., 2008. *Surficial geology and landslide inventory of the upper Sea to Sky corridor, British Columbia*; Geological Survey of Canada, Open File 5324, scale 1:50,000.



new bridge should be founded either directly onto competent bedrock or, if supported on soil, beyond areas that may be susceptible to erosion.

Following our preliminary review, we are of the opinion that the new bridge location would be best situated close to the existing bridge due to steep slopes and large boulders on both banks directly adjacent to the existing bridge. From a geotechnical standpoint, we are of the opinion that bridge construction would be feasible at the proposed location. Once the preferred bridge location has been selected, we recommend a more detailed geotechnical test-pit based excavation be completed to confirm the depths to bedrock and to characterize the underlying soils. Following the investigation, we would prepare a report which provides recommendations for the foundations which would be suitable for the structural engineer for design.

We anticipate that foundations could be concrete bearing directly onto bedrock or dense soils. If founded on bedrock, the bedrock would most likely require level benches and/or dowelled connections between the new footings and the bedrock. We are of the opinion that the bedrock is of sufficient quality that anchored foundations could also be considered.

Riprap for erosion protection may be required depending on the location of the footings.

Some images from our investigation have been included following the text of this report; more images can be provided upon request.

## 5.0 CLOSURE

This report is prepared solely for use by our client and their design team for this project as described to the general standards of similar work for similar projects in this area and no other warranty of any kind is expressed or implied. Frontera Geotechnical Inc. accepts no responsibility for any other use of this report.

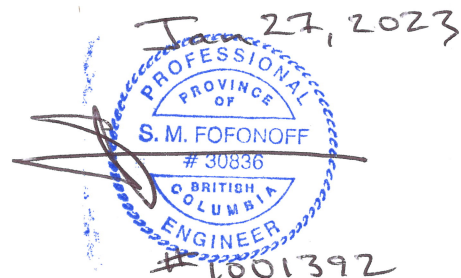
We are pleased to assist you with this project, and we trust this information is helpful and sufficient for your purposes at this time. Please do not hesitate to call the undersigned if you require clarification or additional details.

Yours truly,

**Frontera Geotechnical Inc.**

Cathal Donnelly, B.Eng.  
Project Manager

Reviewed by:



Steven Fofonoff, M.Eng., P.Eng.  
Principal





Figure 1: Southwest creek bank. Existing bridge is supported on stacked rocks on top of bedrock or large boulders.



Figure 2: South of the existing bridge on the southwest bank, the slope is covered in large angular rocks.

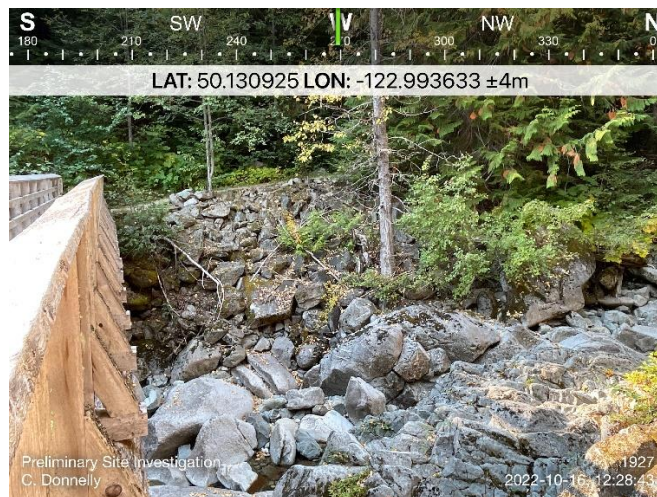


Figure 3: North of the existing bridge, the slope is covered in large angular rocks, but bedrock could be observed in areas.



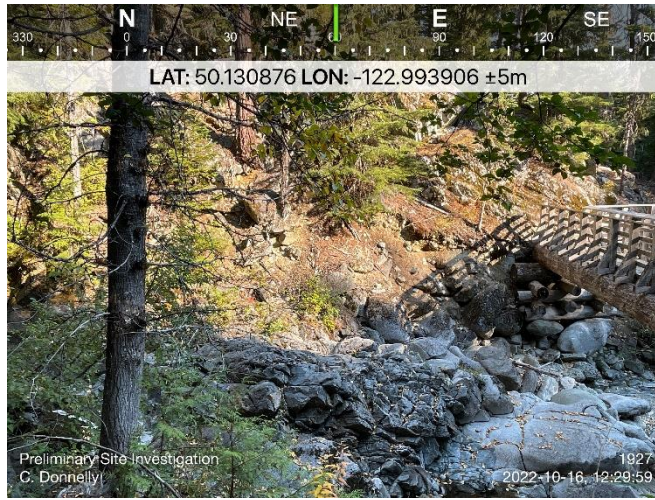


Figure 4: Slope consists of steep bedrock with an overlying layer of silty sand and gravel with some cobbles.

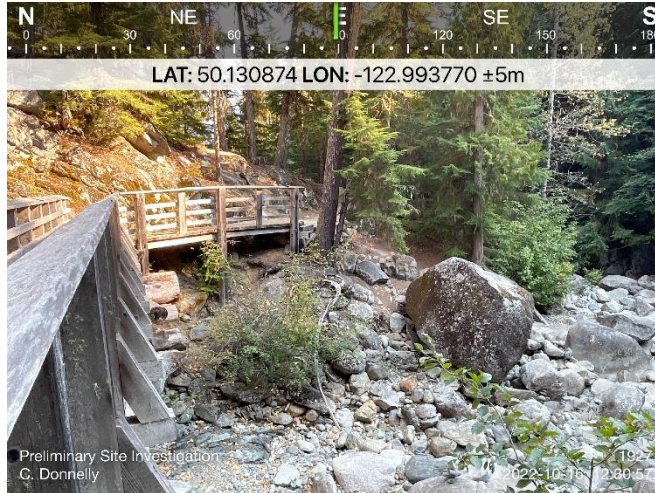


Figure 5: South of the existing bridge, the bedrock is less steep, and the slope is covered in silty sand and gravel.

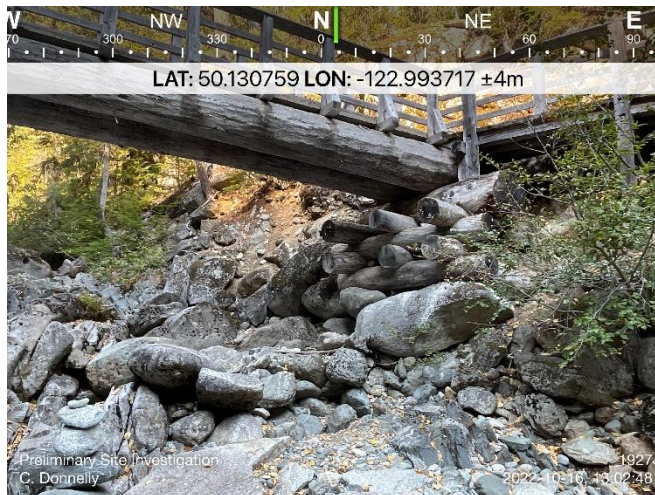


Figure 6: Existing bridge is supported on large boulders and timber cribbing.



## TECHNICAL MEMORANDUM

<b>Project</b>	Resort Municipality of Whistler 21 Mile Creek Hydrological Analysis - Draft Memo		
<b>To</b>	Lorne Russell Resort Municipality of Whistler	<b>From</b>	Parsa Mivehchi and James Ogilvie, MEng, PEng
<b>Date</b>	12 Jan 2023	<b>File ref</b>	Client File # PO #X17901 Water Street File # 335.300
<b>Version</b>	A	<b>Status</b>	Draft

## 1. INTRODUCTION

### 1.1. PURPOSE

Water Street Engineering Ltd. (Water Street) was engaged by the Resort Municipality of Whistler (RMOW) to carry out a hydrological and hydraulic analysis of 21 Mile Creek to support the planned replacement of the Flank Trail bridge across 21 Mile Creek.

This technical memorandum summarizes the findings of the hydrological and hydraulic analysis of 21 Mile Creek. The purpose of the analyses was to estimate the 100-year and 200-year flood flows and water levels at the location of the existing Flank Trail bridge. The findings will be used to inform the desired height of a new bridge being planned to replace the existing log bridge in 2023.

### 1.2. LIMITATIONS

This technical memorandum summarizes analyses undertaken based on available hydrometric data from Water Survey of Canada and topographic survey of the project site provided by RMOW. It must be read with the Statement of Limitations below.

## 2. BACKGROUND REVIEW

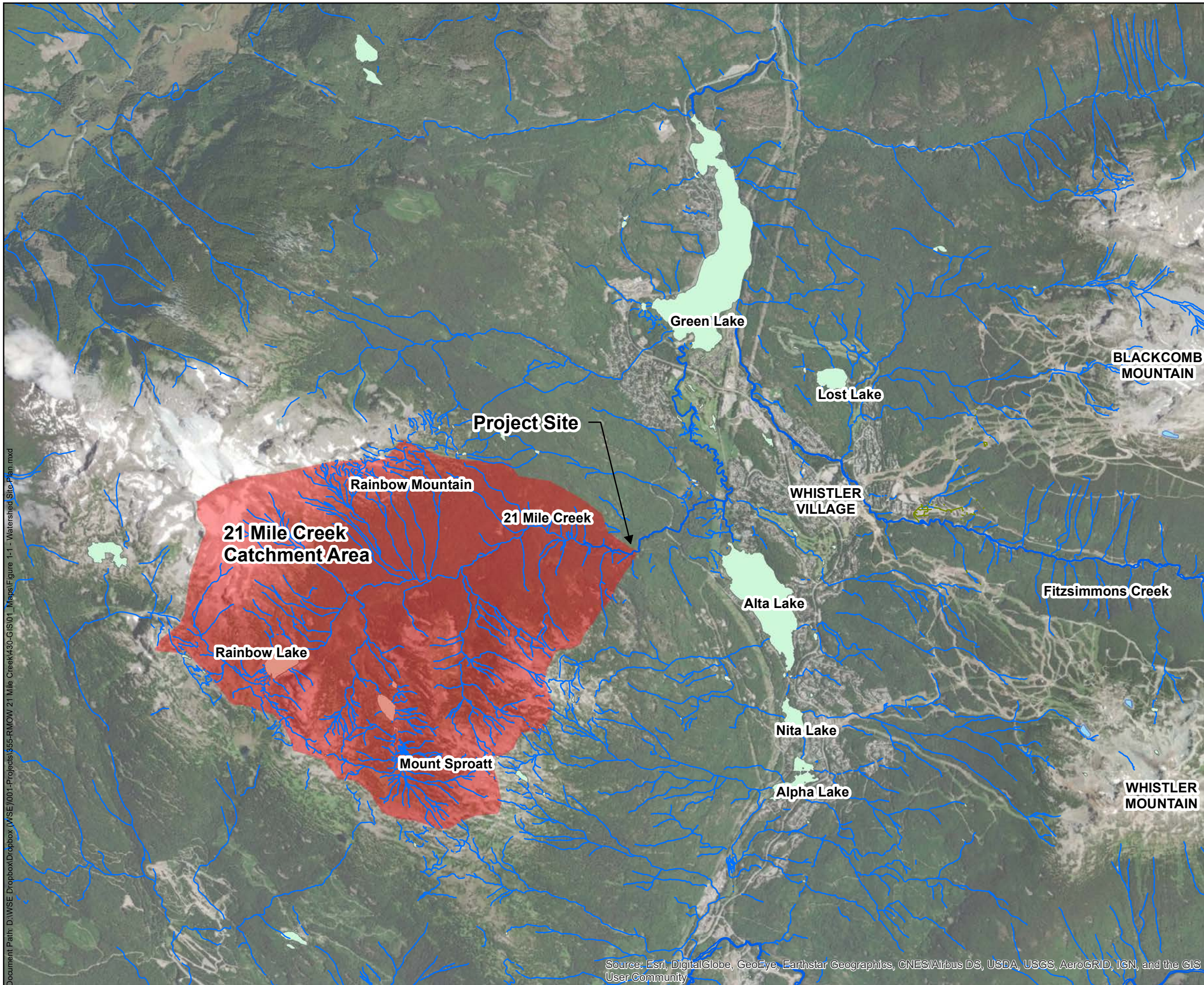
The study area for this analysis is the 21 Mile Creek Watershed, a medium-sized catchment located in the Coast Mountains of southwestern British Columbia. The 21 Mile Creek watershed drains the area between Rainbow Mountain and Mount Sproatt, flowing down the mountain towards Whistler village and beneath Alta Lake Road before entering the River of Golder Dreams (Alta Creek) and discharging into Green Lake.

Previous hydrological or hydraulic studies focusing on 21 Mile Creek were not available for review, although 21 Mile Creek is referenced in some previous work by others, including the Alta Creek Flood Control Options Assessment (LCI, 2015) and the Whistler Flood Mapping study (KWL, 2020).

Topographic survey of the project site was collected on 08 Dec 2022 (McElhanney, 2022). Water Street carried out a site visit on 18 Dec 2022 to review the channel conditions against the survey data provided and ground-truth the cross sections developed for use in the hydraulic model. Selected photos from our site visit are included in Attachment 1.

The 21 Mile Creek watershed area was estimated using available topographic mapping and regional watercourse data. Based on this, the watershed area at the project site was estimated to be 27.4 km<sup>2</sup>. Figure 1 provides a site plan of the 21 Mile Creek Watershed, showing the watershed and surrounding area, the estimated watershed boundary, and the alignment of 21 Mile Creek and its contributing tributaries.





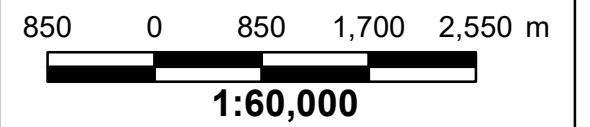
Document Path: D:\WSE Dropbox\Dropbox (WSE)\001-Projects\955-RMOW\_21 Mile Creek\430-GIS\01 - Maps\Figure 1-1 - Watershed Site Plan.mxd

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



**Legend**

- Rivers and Streams
- 21 Mile Creek Catchment Area
- Lakes



**Resort Municipality of Whistler  
21 Mile Creek Hydrological  
Analysis**

**Watershed Site Plan**

PROJECT NO. 355	DATE 12 JAN 2023	REVISION A
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**Figure 1**



### 3. HYDROLOGICAL ANALYSIS

#### 3.1. PREVIOUS WORK

Previous work used regional analysis methods to estimate design flows for 21 Mile Creek. LCI estimated design flows at the mouth of 21 Mile Creek, and their work estimated a 100-year flow of 126 m<sup>3</sup>/s and a 200-year flow of 137 m<sup>3</sup>/s (LCI, 2015). KWL also used regional analysis methods to estimate design flows for 21 Mile Creek, and their work estimated a 100-year flow of 84 m<sup>3</sup>/s and a 200-year flow of 98 m<sup>3</sup>/s (KWL, 2020). Detailed information or calculations from these respective analyses were not available, so it is not possible to comment on the range of values presented by previous work.

#### 3.2. HYDROMETRIC DATA

There is no current or long-term historical streamflow record available on 21 Mile Creek. There was a hydrometric station previously, but it only operated between 1974 and 1985. Historical hydrometric data from a range of hydrometric stations in southwestern British Columbia were obtained from the Water Survey of Canada to characterize the hydrology of the study area.

Hydrometric stations were selected based on their proximity to the project site, overall period of record, comparable drainage area size, and comparable catchment characteristics such as catchment terrain and level of attenuation. A total of 8 regional hydrometric stations, as listed in Table 1, were selected for use in the analysis and instantaneous peak flow data was downloaded for each station.

**Table 1: Regional hydrometric stations**

Station ID	Station Name	Drainage Area (km <sup>2</sup> )
08GA064	Stawamus River below Ray Creek	40.4
08GA057	Mashiter Creek near Squamish	38.9
08MG021	Twentyone Mile Creek at 670 m Contour	28.2
08GA077	Seymour River Below Orchid Creek	63
08GB013	Clowhom River Near Clowhom Lake	147
08HE008	Zeballos River at Mook Peak	14.6
08MH141	Coquitlam River above Coquitlam Lake	52.5
08GA010	Capilano River above Intake	173

For each hydrometric station data record, a frequency analysis was carried out to estimate design flows for a range of recurrence intervals. The hydrometric data was analyzed using the Log-Pearson Type III statistical analysis method to estimate return-period design flows at each of the selected hydrometric stations. This is a standard method that involves using observed annual peak flow discharge data to calculate statistical information including mean values, standard deviations, and skewness. These statistical data are used to develop frequency distributions that provide the likelihood of various discharges as a function of recurrence intervals or exceedance probabilities.

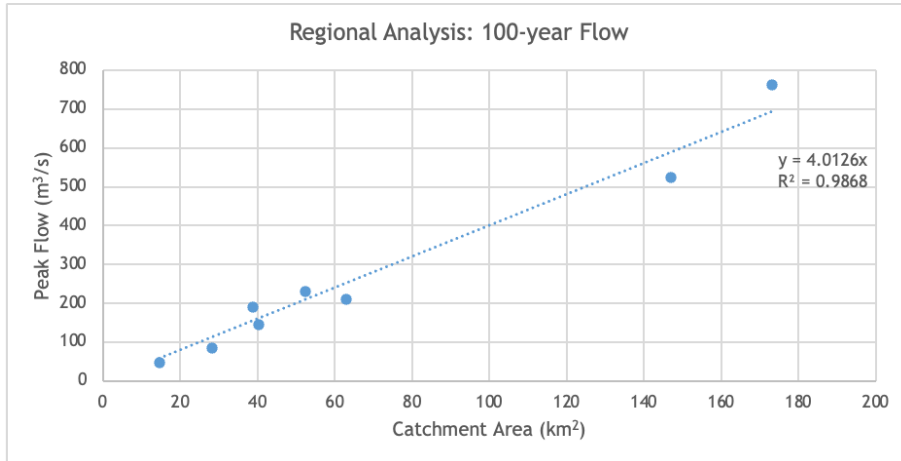
#### 3.3. REGIONAL ANALYSIS

A regional analysis was carried out to determine the design flows for 21 Mile Creek for the 100-year and 200-year flow events. This analysis was based on the frequency analysis of the regional hydrometric data described above and determination of the relationship between estimated peak flow and catchment area for the selected hydrometric stations.

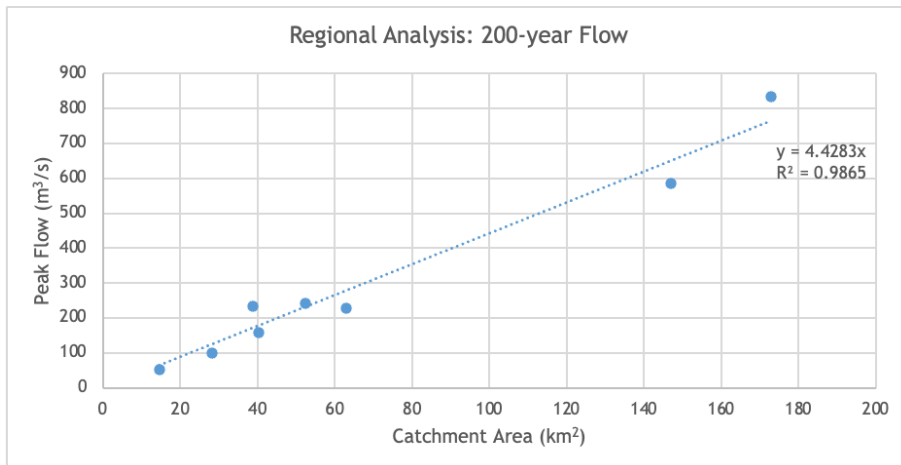
A linear regression method was used to estimate the 100-year and 200-year design flow for 21 Mile Creek. Figure 2 and Figure 3 shows the regional analysis linear regression method that was used.







**Figure 2: Regional analysis for 100-year flow data**



**Figure 3: Regional analysis for 200-year flow data**

The high correlation ( $R^2$  of 0.99) in both graphs indicates a very strong relationship between peak flow and catchment area for the selected hydrometric stations. These relationships were used to estimate the design flows for the 21 Mile Creek catchment for the 100-year and 200-year flow events.

### 3.4. CLIMATE CHANGE CONSIDERATION

With a changing climate, it is anticipated that there will be variations from the historical temperature and rainfall characteristics of local watersheds. These variations could lead to changes in the hydrological regime considered in this analysis. The Engineers and Geoscientists BC guidelines (EGBC, 2018) acknowledge that it is difficult to apply large-scale global climate model projections to possible future local conditions.

In the absence of historical statistical trends, the guidelines suggest that a 10% upward scaling factor be applied to the design flow estimate (EGBC, 2018). Based on this, a 10% scaling factor was added to the design flow estimates for 21 Mile Creek.

### 3.5. DESIGN FLOW ESTIMATES

Based on the analysis above, the following flows were estimated:

100-year flow event: **121.0 m³/s**

200-year flow event: **133.6 m³/s**



## 4. HYDRAULIC MODELLING

### 4.1. MODEL DEVELOPMENT

Hydraulic modelling was carried out using HEC-RAS river modelling software to estimate flood water depths during the design flows. HEC-RAS is developed by the US Army Corps of Engineers and is an industry-standard software for hydraulic modelling of this nature.

The hydraulic model for the study area was developed using the following information and assumptions:

- Topographic survey data of the study area provided by RMOW for this project (McElhanney, 2022). Survey data was provided in metres and referenced to geodetic datum CVD28.
- Channel cross sections taken from the topographic survey data using AutoCAD Civil3D. The existing bridge structure was excluded from the hydraulic model to avoid impacting the modelled hydraulics.
- Upstream and downstream boundary conditions were set to normal depth with an upstream slope of 0.20 and a downstream slope of 0.03.
- Manning’s roughness coefficient of 0.075 was selected, based on observations of a steep, mountainous creek with medium to large boulders in the channel. This value is consistent with technical literature and with roughness values selected for modelling of similar creeks in previous work (KWL, 2020).
- Design flow rates were applied at the upstream boundary.

### 4.2. MODEL RESULTS

The HEC-RAS model was run with the 100-year and 200-year design flows. Figure 4 shows the hydraulic profile from the HEC-RAS model, showing the modelled water surface (WS), energy grade line (EG), and critical depth (Crit) for each modelled flow event.

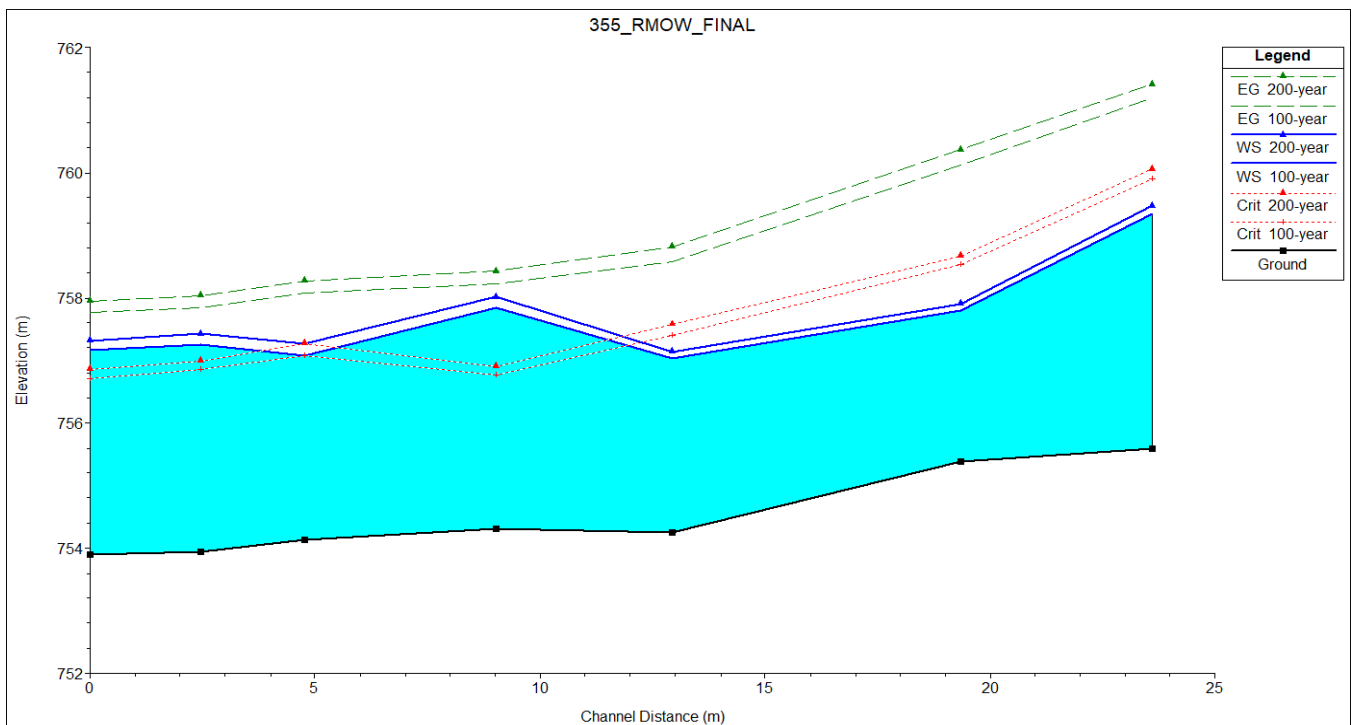


Figure 4: HEC-RAS model results



The location of the existing bridge is at an approximate channel distance of 13 m on Figure 4 (EGBC, 2018). The model indicates a hydraulic jump occurs somewhere downstream of the bridge location where the channel grade changes from a steep channel to a shallow and wider channel. A hydraulic jump occurs when flow transitions from supercritical to subcritical and is a common phenomenon in steep mountain creeks with high roughness (i.e., boulders and debris) and changing slopes, as observed here.

Due to the uncertainty in exactly where the hydraulic jump will occur, it is recommended that the design flood level accounts for the modelled water level downstream of the bridge location instead of the modelled water level in the exact location of the existing bridge. Based on this, the modelled water levels are estimated as follows:

100-year flow event: **757.84 m**

200-year flow event: **758.01 m**

## 5. CONCLUSIONS

This technical memorandum summarizes the findings of the hydrological and hydraulic analysis of 21 Mile Creek. The purpose of the analyses was to estimate the 100-year and 200-year flood flows and water levels at the location of the existing Flank Trail bridge.

These were estimated as summarized in Table 2.

**Table 2: Summary of analyses**

Flow Event	Flood Flow (m <sup>3</sup> /s)	Flood Water Level (m)
100-year	121.1	757.84
200-year	133.6	758.01

## 6. CLOSURE

We trust this document meets your present requirements. Please contact the undersigned with any questions or comments.

**WATER STREET ENGINEERING LTD.**

Parsa Mivehchi  
 Engineering Assistant

James Ogilvie, MEng, PEng  
 Principal, Senior Water Resources Engineer

*EGBC permit to practice number 1000830*



## ATTACHMENTS

Attachment 1: Site Visit Photos

## REFERENCES

EGBC. (2018). *Legislated Flood Assessments in a Changing Climate in BC, Version 2.1.*

KWL. (2020). *Whistler Flood Mapping, Final Report, KWL Project No. 0029.298-300.*

LCI. (2015). *RMOW Alta Creek Floodplain Flood Control Options Assessment. LCI File 15.02.*

McElhanney. (2022). *21 Mile Creek Crossing Topographic Survey Plan, Drawing V-07, Project No. 2113-04217-00.*

## STATEMENT OF LIMITATIONS

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## REVISION HISTORY

Version	Status	Date	Description of Revisions	Author
A	Draft	12 Jan 2023	Original	JO

Dropbox (WSE)/001-Projects/355-RMOW 21 Mile Creek/300-deliverables/Draft memo/21 Mile Creek Memo.docx





## ATTACHMENT 1: SITE VISIT PHOTOS



**Photo 1:** Overview of study area from above (21 Mile Creek flows from right to left)

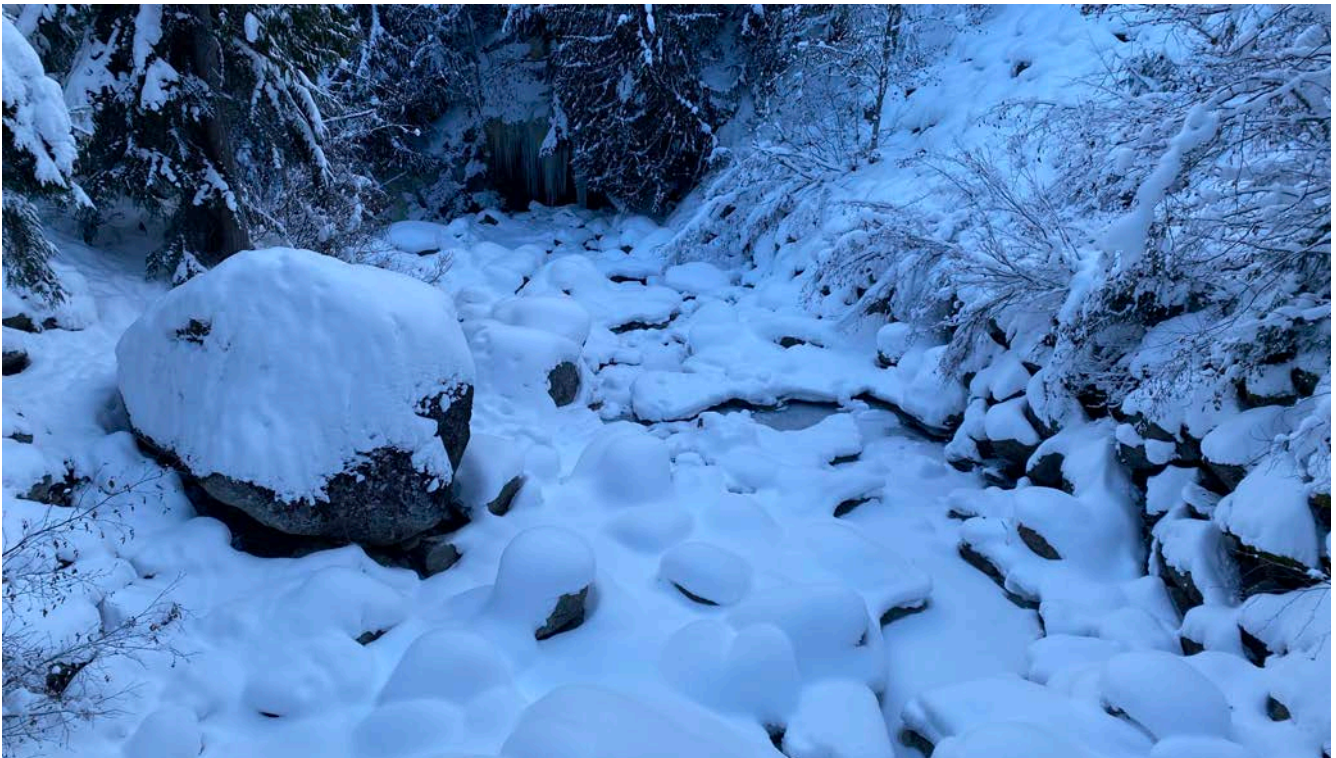


**Photo 2:** Overview of study area looking upstream at existing Flank Trail bridge





**Photo 3:** Upstream channel



**Photo 4:** Downstream channel



## PERMITS AND INSPECTIONS BULLETIN

### RMOW Building Department bulletin regarding Snow Loading

This bulletin is published to provide clarification of the 2018 BC Building Code Snow Load requirements in the Resort Municipality of Whistler.

#### Code Requirements:

Section 9.4 of the 2018 BC Building code addresses the specified loads for Part 9 Housing and Small Buildings of traditional light frame wood construction. The simplified snow load calculation in Article 9.4.2.2. anticipates the use of the prescriptive structural requirements outlined in Part 9 and is rarely seen in Whistler construction.

The high ground snow load in Whistler far exceeds the prescriptive requirements of Part 9 of the BC Building Code. Therefore, structural design of all Part 9 buildings and structures shall be designed to the loads outlined in Part 4 unless approved in writing by the Building Official. Utilize the specified snow load calculation outlined in **Article 4.1.6.2.:**

$$S = I_s [S_s (C_b C_w C_s C_a) + S_r]$$

#### Ground Snow Load:

For all buildings at an elevation between 600m and 1000m (above mean sea level), Environment Canada has provided the RMOW with a calculation for Ground Snow Load (GSL) based on Elevation, in meters.

$$\begin{aligned} S_s \text{ (50-year, kPa)} &= 0.0143 * z \\ S_r \text{ (50-year, kPa)} &= 0.66 + 0.00033 * z \end{aligned}$$

z = Mean Sea Level Elevation, in meters

**For buildings above 1000m, please contact Environment Canada (416-739-4365 or [ec.services.climatiques-climate.services.ec@canada.ca](mailto:ec.services.climatiques-climate.services.ec@canada.ca)) to determine the appropriate ground snow load.**

**Conclusion: All Part 3 and 9 buildings in Whistler shall be designed by a licensed Professional Engineer to Part 4 due to the high snow loads in Whistler; unless approved in writing by the Building Official. Please include site elevation, ground snow load values and specified snow load calculation on all Structural Drawings.**





Environment  
Canada

Environnement  
Canada

Reference Number  
WhistlerKlassen20170208

**Whistler, BC**

**Latitude: 50 ° 7 ' 12 " N**

**Longitude: 122 ° 57 ' 36 " W**

**Elevation (Metres): 665**

<b>Design element</b>	<b>Design value</b>
January 2.5% design dry bulb temperature °C	
January 1% design dry bulb temperature °C	
July 2.5% design dry bulb temperature °C	
July 2.5% design wet bulb temperature °C	
Annual total degree days below 18 °C	
Maximum 15 minute rainfall (mm)	
Maximum one day rainfall (50 years) (mm)	
Annual rainfall (mm)	
Annual total precipitation (mm)	
Moisture Index	
Driving Rain wind pressure 1/5 years (Pa)	
Ground snow load, snow component S <sub>s</sub> (30 years) (kPa)	
Ground snow load, rain component S <sub>r</sub> (30 years) (kPa)	
Ground snow load, snow component S <sub>s</sub> (50 years) (kPa)	<b>9.5</b>
Ground snow load, rain component S <sub>r</sub> (50 years) (kPa)	<b>0.9</b>
Hourly wind pressure 1/10 (kPa)	<b>0.25</b>
Hourly wind pressure 1/30 years (kPa)	
Hourly wind pressure 1/50 years (kPa)	<b>0.32</b>
Hourly wind pressure 1/100 years (kPa)	

Please note that the recommended values may differ from the legal requirements established by the municipal or provincial (territorial) building authorities. The design values may have been interpolated from calculated values at surrounding locations with subjective modification. Topographic effects may introduce local variations in the design values. Environment Canada has not made and does not make any representation or warranties, either expressed or implied, arising by law or otherwise, respecting the accuracy of climatic information. In no event will Environment Canada be responsible for any prejudice, loss or damage which may occur as the result of the use of climatic information.

$S_s$  (50-yr, kPa) = 0.0143\*z,  $S_r$  (50-yr, kPa) = 0.66 + 0.00033\*z  
 where z is the elevation above Mean Sea Level in metres and 600 < z (m) < 1000.

**February 9, 2017**



## Recreation Bridge Design Precedents

**Train Wreck Suspension Bridge, Whistler BC**



**MAADI Group, Arched Aluminum Truss Bridge, Montreal Qu.**





**Legacy Trail Glulam Bridge, Banff Ab.**



**Sea to Sky Trail, Suspension Bridge, Whistler BC**





**Shelly Creek, Aluminum Truss Bridge, Parksville BC**



**Sky Pilot Suspension Bridge, Sea to Sky Gondola, Squamish BC**





# Glulam Bridge, Banff



# Serlachius Museum Bridge, Finland




**Curved Suspension Bridge, Connecticut**





**BRIDGE INFORMATION:**


---

<b>Bridge No./Name</b>	36 / 21 Mile Creek – Rainbow Falls Loop Bridge	
<b>Location</b>	Rainbow Falls Loop Trail <b>Lat:</b> 50.130892° N <b>Long:</b> 122.99374° W	
<b>Inspection Date</b>	July 1, 2020	
<b>Inspected By</b>	Mike Hanson, P.Eng. Andrew Brabandt, C.Tech.	
<b>Temperature (°C)</b>	18	
<b>Access Method</b>	Ground Level	
<b>Year Built</b>	2000	
<b>Bridge Orientation</b>	North/South	
<b>Design Loading</b>	Pedestrian Only	
<b>Number of Spans</b>	1 <b>Span Length (m)</b> 18.90	
<b>Superstructure</b>	2 Douglas Fir log stringers (de-barked), approximately 700 mm diameter.	
<b>Deck</b>	Cedar decking, approximately 75 x 250 mm. Clear width 0.9 m	
<b>Curb/ Handrail</b>	Cedar posts, 150 x 150 mm diameter with timber horizontal rails, spaced 300 mm. Railing height is 1.2 m.	
<b>Abutments</b>	Cedar log cribs and sill at the North abutment. Single cedar sill log at the South abutment.	
<b>Utilities</b>	None	

GENERAL BRIDGE CONDITION:

<b>Bridge Element</b>	<b><u>Previous</u></b>	<b><u>Current</u></b>
<b>Superstructure</b>	--	Poor
<b>Substructure</b>	--	Poor
<b>Deck</b>	--	Fair
<b>Load Posting</b>	--	--
<b>Date for Next Detailed Inspection</b>	--	2022

BRIDGE INSPECTION SUMMARY:

The bridge is in poor condition with decay noted throughout the timber components. We noted 75 mm of sapwood rot on the upstream stringer and 25 to 50 mm of sapwood rot on the downstream stringer, indicating the bridge is nearing the end of its useful life. Coring was not completed to verify the extent of decay throughout the cross section of the stringers.

Further decay was noted on the sills, cribs and jump span timber components. No immediate structural concerns were noted.

Based on the current condition of the structure and typical life span of old growth douglas fir stringers, the bridge will likely have a design life of 25 years and therefore need to be replaced by 2025, which is indicative of the conditions observed.

We recommend the RMOW plan for replacement within 5 years and inspects this bridge annually to monitor the deterioration in the stringers. A professional engineer should inspect the bridge in 2 years, and annually after the next inspection until the bridge is replaced.

INSPECTION NOTES:**Approaches:**

- The approaches are generally in fair condition.
- Good visibility and sightlines from both approaches.
- The timber boardwalk on the North approach is in fair condition with rot noted at the ends of the timber posts/footings where they are in direct contact with the bedrock and soil.

**Deck:**

- The deck is in fair condition.
- General weathering and decay noted throughout the deck and handrails, however no significant rot noted.

**Abutments:**

- The abutments are in poor condition.

- North abutment crib is undermined and at risk of wash out due to erosion.
- North abutment sill log has 300 mm of heartwood rot noted on the downstream end, no crushing noted.
- No issues noted at the South abutment.

**Log Stringers:**

- The log stringers are in poor condition.
- The upstream log stringer has 75 mm of sapwood rot, primarily at the ends and along the upper portion of the stringer.
- The downstream stringer typically has 25 to 50 mm of sapwood rot throughout.
- No significant live load deflection/ movement noted.

LIST OF MAINTENANCE/ REPAIR ITEMS:

Item No.	Description	Priority
1	Plan for replacement within 2 to 5 years	High

LIST OF MONITORING ITEMS:

1. Monitor extent of decay in stringers and for signs of overstressing such as sag/ deflection, and crushing in the sills and stringers.

Prepared by:



Mike Hanson, P.Eng.  
Lead Bridge Inspector

Reviewed by:

A handwritten signature in blue ink, appearing to read "Michael Foster".

Michael Foster, P.Eng.  
Supervising Engineer





**Photo 1**  
Bridge elevation



**Photo 2**  
North approach



**Photo 3**  
South approach



**Photo 4**  
Looking upstream



**Photo 5**  
Typical deck condition



**Photo 6**  
Typical handrail condition





**Photo 7**  
Railing condition



**Photo 8**  
North abutment



**Photo 9**  
South abutment



**Photo 10**  
North abutment sill



**Photo 11**  
North approach boardwalk



**Photo 12**  
North approach boardwalk





**Photo 13**  
North approach boardwalk



**Photo 14**  
North approach boardwalk post condition



**Photo 15**  
Upstream stringer condition



**Photo 16**  
Downstream stringer condition



**CASCADE ENVIRONMENTAL**  
RESOURCE GROUP LTD

# Environmental Impact Study

## Flank Trail Bridge Replacement, Whistler, BC



**Prepared by:**

Cascade Environmental Resource Group Ltd.  
Unit 3 – 1005 Alpha Lake Road  
Whistler, BC, V8E 0H5

**Prepared for:**

Resort Municipality of Whistler  
4325 Blackcomb Way  
Whistler, BC, V8E 0X5

**Project Number:** 013-28-23

**Date:** November 22, 2022

[WWW.CERG.CA](http://WWW.CERG.CA)

**WHISTLER:** UNIT 3 - 1005 ALPHA LAKE ROAD WHISTLER BC CANADA V8E 0H5  
**SQUAMISH:** UNIT 205 - 39480 QUEENS WAY SQUAMISH BC CANADA V8B 0Z5

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TEL 604.815.0901







## Statement of Limitations

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This Document should not be construed to be:

- A Phase 1 - Environmental Site Assessment
- A Stage 1 – Preliminary Site Investigation (as per the Contaminated Sites Regulations of the Waste Mgt. Act)
- An Environmental Impact Assessment



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## 1. Introduction

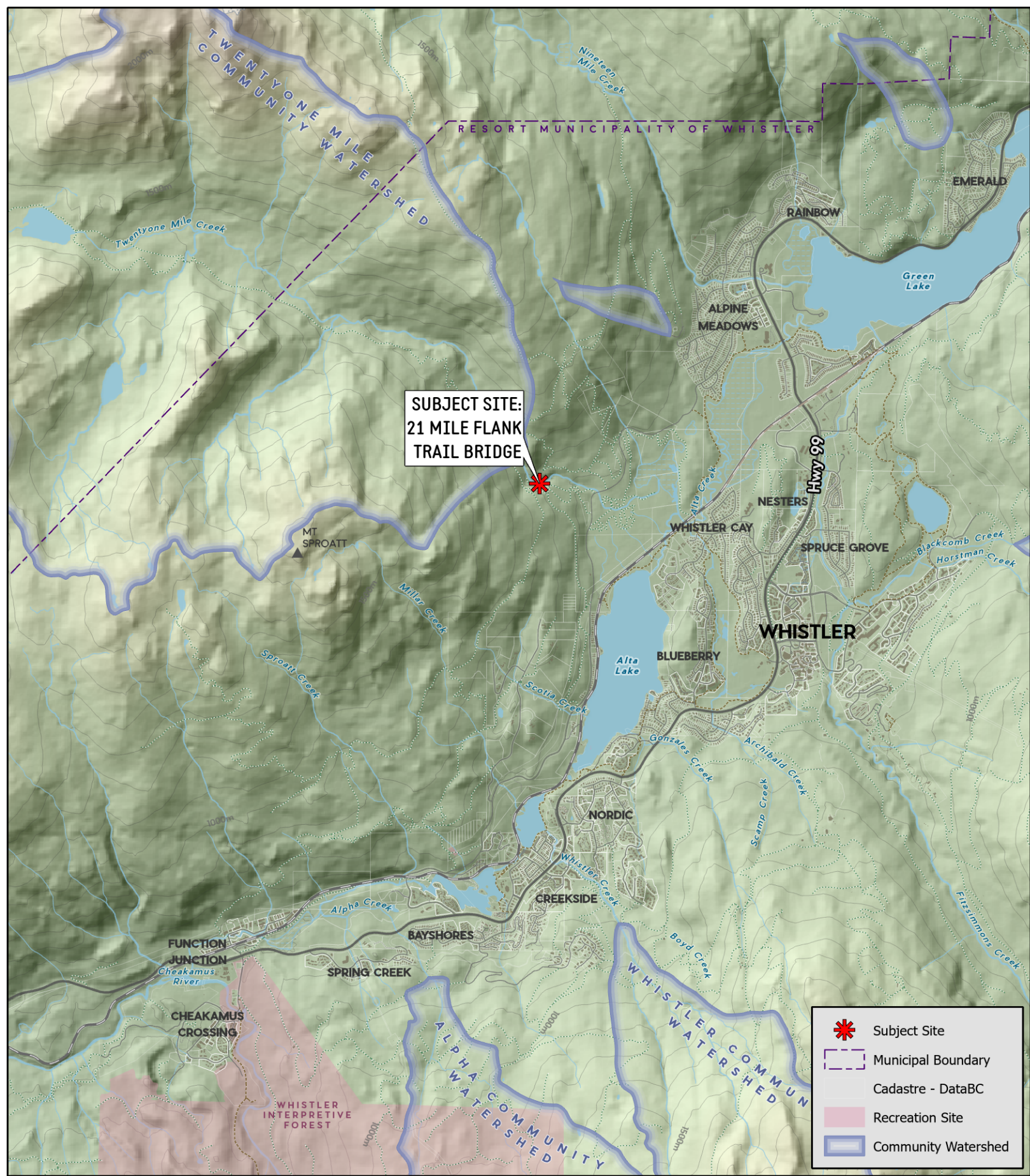
The Resort Municipality of Whistler (RMOW) propose to replace the Flank Trail bridge over Twentyone Mile Creek in Whistler, BC. The recently updated Whistler Land Use Procedures and Fees Bylaw states that “If development is proposed to occur within 30 metres of the high water mark of a stream in the Protection of Riparian Ecosystems Development Permit Area or the Land Use Procedures and Fees Bylaw No. 2205, 2022 Page 7 Protection of Sensitive Ecosystems Development Permit Area under the Official Community Plan, a Qualified Environmental Professional (QEP) must submit an environmental impact study in relation to the development consistent with the assessment methods of the Riparian Areas Protection Regulation” (RMOW, 2022).

As the proposed bridge to be replaced is located within the 30 m Riparian Ecosystem Protection Area (REPA) of Twentyone Mile Creek, Cascade Environmental Resource Group Ltd. (Cascade) was retained to conduct a preliminary riparian assessment and address the REPA requirements for the proposed development within this Environmental Impact Study (EIS).

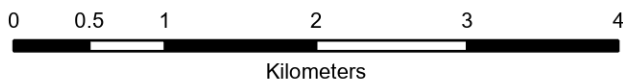
The purpose of an EIS is to assist RMOW staff in the evaluation of project environmental impacts. This report reviews and assesses the biophysical conditions, ecosystem integrity, habitat potential, species present (plant and animal), and aquatic features on or adjacent to the subject site. It includes a discussion of the environmental regulatory framework that may affect development activities and provides alternatives for mitigation or resolution where necessary. Potential constraints are identified and recommendations are provided to inform and facilitate the environmental review and approval process.

This report is based on the Whistler Ecosystem Mapping data available and a site visit conducted on October 26, 2022. Site series were inferred from the Whistler Ecosystem Mapping data and site visit. The assessment was conducted by Vicki Legris, B.Sc., R.P.Bio., E.P and Adrien Baudouin, M.Sc., R.P.Bio., E.P. Mapping support was provided by Oliver Chew, B.Sc., Adv. Dip. All project team members have extensive experience in conducting environmental inventories, reviews and assessments.





GIS Cartographer: Oliver Chew  
 Date: 2022-10-20  
 CERG File #: 013-28-23  
 Projection: NAD 1983 UTM Zone 10N





## **2. Existing Environmental Conditions**

### **2.1. Physical Environment**

#### **2.1.1. Climate**

The study area lies within the Eastern Pacific Ranges Ecosection within the Coast Mountains Ecoprovince in southern British Columbia (Demarchi, 1996). This Ecosection is comprised of a rugged inland area that has a transitional climate, falling between the rain shadowed Southern Interior Ecoprovince to the east, and the high rainfall associated with the Southern Pacific Ranges Ecosection to the west (Demarchi, 1996). The climate is principally influenced by frontal systems moving in from the Pacific Ocean and over the Coast Mountains to the Interior (Green and Klinka 1994). This transitional climate is characteristically moist and cool in the winter. The climate is also associated with heavy snowfall at higher elevations (Green and Klinka, 1994). Summers are relatively cool, although hot dry spells are frequent. The meteorological records from the Whistler weather station record an average annual total precipitation of 1228 mm. The heaviest precipitation occurs in the month of November (192.1 mm average), while July is the driest month (44.7 mm average). Precipitation as snow can occur from October until May. The mean annual temperature is 6.7°C, with the highest mean monthly temperature occurring in August (16.5°C mean daily average; 24.0 mean daily maximum) and the lowest mean monthly temperature occurring in December (-2.8°C mean daily average; -5.4 mean daily minimum) (Environment Canada, 2022).

#### **2.1.2. Geology**

The subject property is located within the Southern Coast Mountains, underlain by granitic rock of the Coast Plutonic Complex. This complex is characterized by gneisses and granitoid rocks with pendants and septae of metavolcanic and metamorphosed rocks. These reflect a complex history of volcanic activity, magmatic intrusion and uplift (Monger and Journeay, 1994).

The Whistler Valley was formed during Pleistocene epoch glaciations and subsequent glacial-fluvial action and mass-wasting in the form of rock and debris flow released by frost heaving, erosion, and seismic activity. The resulting features of the terrain consist of glacial till, glycologenic colluvial soils overlying morainal materials or bedrock. The subject site is located at a mid-slope position within the Twentyone Mile Creek fluvial ravine. Ravine slopes are approximately 70% in the project area.

#### **2.1.3. Hydrology**

Hydrology of the site includes groundwater flow to Twentyone Mile Creek. Twentyone Mile Creek flows through the bridge replacement site. No groundwater wells are located on or near the subject site (iMapBC, 2022).



## 2.2. Terrestrial Environment

### 2.2.1. Soils

The general soil type for the Coast Mountain and Islands physiographic region is of the Podzolic Order, residing in the Humo-Ferric Great Group (Luttmerding, 1971). These soils overlay igneous intrusive rock which is resistant to weathering, thus retarding soil development. Over time however, physical and chemical weathering has produced a coarse textured acidic soil (Luttmerding, 1971). The project area contains well to rapidly drained, shallow soils.

### 2.2.2. Vegetation

During the site visit conducted on October 26, 2022, it was determined that the area surrounding the subject site is forested, with riparian areas at each of the bridge on/off ramps. Field investigations identified plant species on site (Table 1) and terrestrial ecosystems present were determined based on Whistler ecosystem mapping classifications.

**Table 1: Vegetation identified on and around the subject site**

Common Name	Scientific Name
<b>Trees</b>	
Douglas-fir	<i>Pseudotsuga menziesii</i>
Western hemlock	<i>Tsuga heterophylla</i>
Sitka alder	<i>Alnus alnobetula ssp. sinuata</i>
Western redcedar	<i>Thuja plicata</i>
Amabilis fir	<i>Abies amabilis</i>
Western white pine	<i>Pinus monticola</i>
<b>Shrubs</b>	
Red huckleberry	<i>Vaccinium parvifolium</i>
Vaccinium	<i>Vaccinium spp.</i>
Black gooseberry	<i>Ribes lacustre</i>
Red-osier dogwood	<i>Cornus sericea</i>
Falsebox	<i>Paxistima myrsinites</i>
<b>Forbs</b>	
Lady fern	<i>Athyrium filix-femina</i>



Sword fern	<i>Polystichum munitum</i>
Prince's Pine	<i>Chimaphila umbellata</i>
Twinflower	<i>Linnaea borealis</i>
Pearly everlasting	<i>Anaphalis margaritacea</i>
Wintergreen	<i>Pyrola sp.</i>
<b>Mosses and Lichens</b>	
Pipecleaner moss	<i>Rhytidiopsis robusta</i>



**Photo 1. View of the vegetation on the eastern (river left) project area. October 26, 2022.**





Photo 2. View of the vegetation at the western (river right) project area. October 26, 2022.

### Biogeoclimatic Zone Classification (CWHms1)

The subject site is part of the Coastal Western Hemlock (CWH) Moist Submaritime (ms) Southern (1) – CWHms1 – Variant (Green & Klinka, 1994). The CWH zone occurs in subarctic areas of the Coast Mountains at elevations ranging from approximately 650 to 1,350 meters. Within the ms1 subzone and variant, a number of different site series exist. The site series classification represents subtle changes in microclimate, soil conditions and associated vegetation. The different site series are further classified by the provincial Biogeoclimatic Ecosystem Classification Program (BEC) into Terrestrial Ecosystem Units based on the structural stage of the vegetation and the terrain of the site. The RMOW has produced corresponding Whistler Ecosystem Mapping units. Whistler Ecosystem Mapping units were ground-truthed during field surveys and adjusted to identify the site series given below, as shown on Map 2.

### Whistler Ecosystem Units

The area encompassing the east (river left) side of the bridge was designated Polygon 1, with the area encompassing the west (river right) side of the bridge designated Polygon 2. As the existing and replacement bridge are free span, works will not be conducted in the river site series between Polygons 1 and 2. This site series is designated as 60% gravel bar and riparian area and 40% river.

The Whistler Ecosystem codes for Polygons 1 and 2 are given in Table 2 below. Explanations of the codes are given in Table 3 to Table 6

Table 2 Vegetation Units

Polygon #	Whistler Ecosystem Code	BEC Code	BEC Site Series Name/Description	Structural Stage
1	03 sl 7C	DFk7C	03 – FdHw – Falsebox	Old Forest
2	03 sl 5C	DFk5C	03 – FdHw – Falsebox	Young forest



Derivation of the Whistler Ecosystem Code

03 sl	7C
-------	----

- 03 sl refers to the *site series* designation, which denotes subtle changes in microclimate and soil conditions, as reflected by changes in vegetation present.
- 7C refers to the *structural stage* designation, which denotes the general age and structure of the forest stand.

Table 3 Site Series Explanation

Whistler Ecosystem Code Designation	BEC Site Series	Interpretation (typical conditions – assumed modifiers)
03	03 - DF	-the soil nutrient regime is classified as poor to medium -the soil moisture regime is moderately dry -the soil nutrient availability is moderate -the soil texture is medium -the soil is deep with no root restricting layer -the aspect is warm -the slopes are significant

Table 4 Site Modifiers

Whistler Ecosystem Code Designation	Interpretation
sl	-slope – sites with slopes 35-70%

Table 5 Structural Stages

TEM Code Designation	Interpretation
5 – Young Forest	-self thinning has become evident -forest canopy has begun differentiation into distinct layers -trees between 40 and 80 years old
7 – Old Forest	-structurally complex stands composed mainly of shade-tolerant and regenerating tree species -snags and coarse woody debris in all stages of decomposition typical -time since disturbance >250 years

Table 6 Stand Composition Modifiers

TEM Code Designation	Interpretation
C – Coniferous	-greater than ¾ of total tree layer cover is coniferous
M – Mixed	-neither coniferous or broadleaf account for greater than ¾ of total tree layer cover

B – Broadleaf	-greater than ¼ of total tree layer cover is broadleaf
---------------	--

**Polygon 1 Whistler Ecosystem code: 03 sl 7C**

The forested area surrounding the eastern portion of the subject site is designated site series **03 sl 7C**. The corresponding provincial Terrestrial Ecosystem site series is DFk7C (FdHw – Falsebox). The FdHw – Falsebox site series occurs on drier sites than typical for the CWH zone, with shallower soils.

A ground-truthing plot conducted in Polygon 1 during the site visit on October 26, 2022, found that the slope in this area is moderately steep (55%), with an easterly to southeasterly aspect. Soils consisted of silt that is well to rapidly drained. Average stand height in this polygon is 25 m. A typical western hemlock in this polygon was determined to be 285 years old, with a diameter at breast height (DBH) of 45 cm.



**Photo 3. View of the old growth forest and steep slope in Polygon 1. October 26, 2022.**





**Photo 4. Soils are drier than typical for the CWH zone in Polygon 1. October 26, 2022.**

**Polygon 2 Whistler Ecosystem Mapping code: 03 sl 5C**

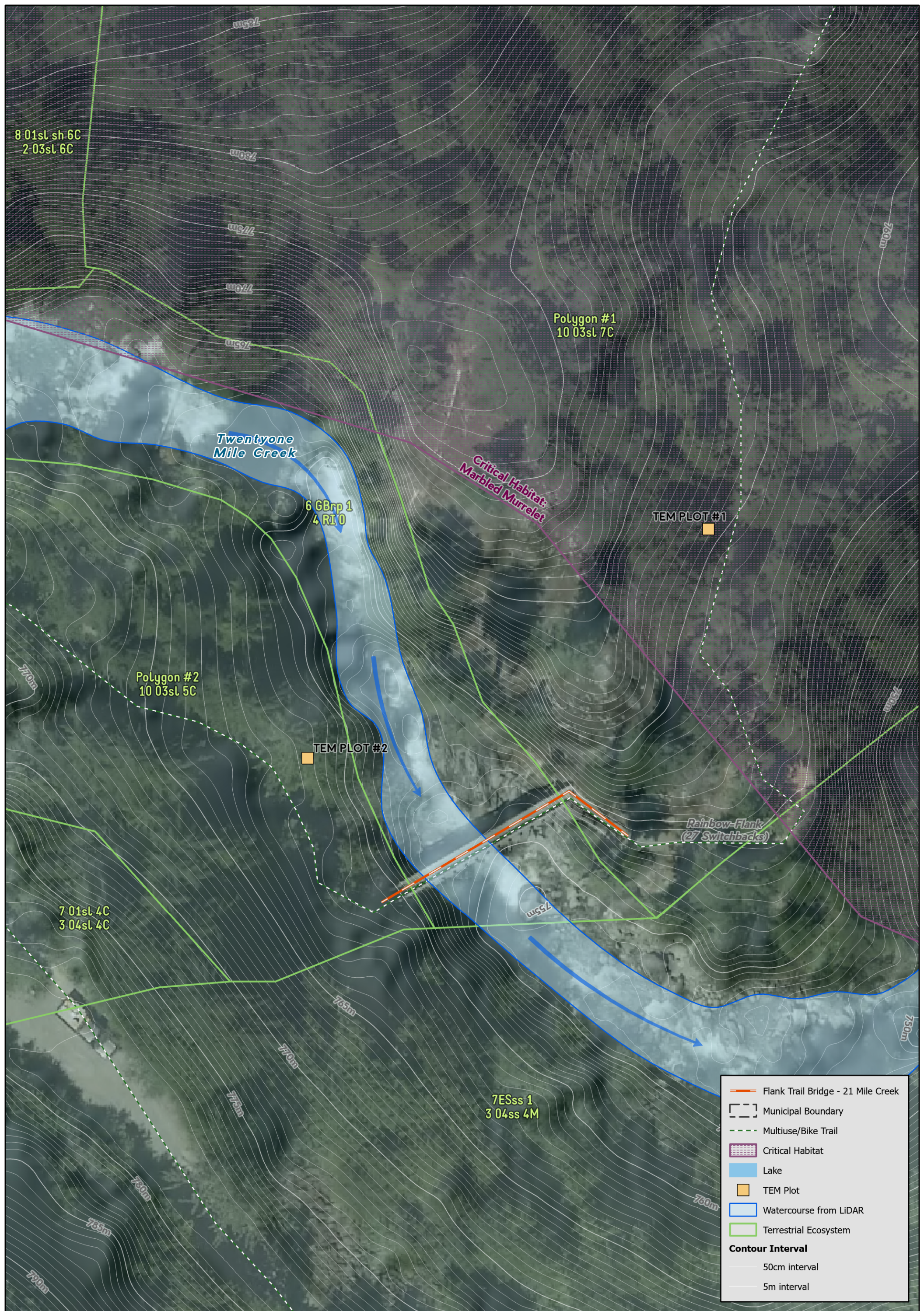
This ecosystem unit surrounds the western portion of the subject site and is described by the site series 03 sl 5C. The corresponding provincial Terrestrial Ecosystem site series is DFK5C (FdHw – Falsebox). The FdHw – Falsebox site series occurs on drier sites than typical for the CWH zone, with shallower soils.

The ground-truthing plot conducted in this polygon was located on a moderate slope (36%) with a northerly aspect. Soils consisted of well drained silt. Average stand height in this polygon is 15 m. A typical western hemlock in this polygon was determined to be 74 years old, with a DBH of 23.5 cm.



**Photo 5. View of the young forest and moderate slope Polygon 2. October 26 2022.**





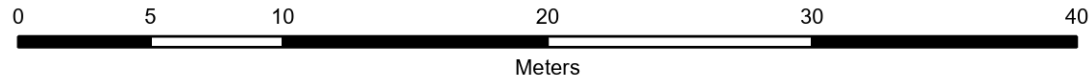
	Flank Trail Bridge - 21 Mile Creek
	Municipal Boundary
	Multiuse/Bike Trail
	Critical Habitat
	Lake
	TEM Plot
	Watercourse from LiDAR
	Terrestrial Ecosystem
<b>Contour Interval</b>	
	50cm interval
	5m interval

GIS Cartographer: Oliver Chew  
 Date: 2022-11-17  
 CERG File #: 013-28-23  
 Projection: NAD 1983 UTM Zone 10N



**Map 2 - Existing Environmental Conditions**

21 Mile Creek  
 Whistler  
 British Columbia







## Rare and Endangered Plant Species

In BC, there are two governing bodies involved with the ranking of species and/or ecological communities at risk. At the national level, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) provides advice in regards to the *Species at Risk Act* (SARA), and at the provincial level, the Conservation Data Centre (CDC) manages the BC Status List.

The Canadian government created SARA in 2002 to complement the Accord for the Protection of Species at Risk (a national effort to identify and protect threatened and endangered wildlife and their associated habitats across the country). COSEWIC is the scientific body responsible for assigning the status of species at risk under SARA. This system uses the following terminology:

- Extinct (XX)
- Extirpated (XT)
- Endangered (E)
- Threatened (T)
- Special concern (SC)
- Not at risk (NAR)
- Data deficient (DD)

A species that is listed as Endangered, Extirpated or Threatened is included on the legal list under Schedule 1 of SARA and is legally protected under SARA with federal measures to protect and recover these species in effect.

The BC CDC designates provincial red or blue list status to animal and plant species, and ecological communities of concerns (BC MOE, 2022). The red list includes indigenous species or subspecies considered to be endangered or threatened. Endangered species are facing imminent extirpation / extinction, whereas threatened groups or species are likely to become endangered if limiting factors are not reversed. The blue list includes taxa considered to be vulnerable because of characteristics that make them particularly sensitive to human activities or natural events. Although blue listed species are at risk, they are not considered endangered or threatened. Yellow listed species are all others not included on the red or blue lists and may include species which are declining, increasing, common, or uncommon. Table 7 to Table 9 below include the CDC listed (i.e. rare and threatened) species that have the potential to occur on the subject site; species designated as SARA Schedule 1 are also noted. Potentially occurring species are based on broad habitat preferences delineated by forest district and biogeoclimatic zone, and refined by habitat type available in the subject site. Forest and anthropogenic terrain were selected as habitat type to identify potential listed species for the purposes of this report.

Potential occurrences are then designated as unlikely or possible based upon species specific habitat requirements and an on-site assessment of those habitats. Note that a comprehensive evaluation of the study area for each species was not possible due to time constraints, seasonal migration patterns, and the transient nature of some species.

The CDC iMap (BC Gov, 2022b) does not list any rare and endangered plant species on or around the subject site. A list of potentially occurring plant species at risk in the area of the subject site is provided below in Table 7. However, none of these species has the potential to occur on site due to specific habitat requirements.



**Table 7: Plant species at risk potentially occurring on the site**

Common Name <i>Scientific name</i>	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA Status		
Tall bugbane <i>Actaea elata</i> var. <i>elata</i>	Red	Endangered	Moist forests in the lower montane zone; rare in extreme SW BC, known only from the Cultus Lake-Chilliwack River area.	<b>Unlikely</b> - closest record in the lower mainland.
Vancouver Island beggarticks <i>Bidens amplissima</i>	Blue	Special Concern	moist edges of marshes, in bogs, along stream and river banks, in pond edges and in ditches. Known occurrences in Whistler.	<b>Unlikely</b> – never documented in the RMOW*.
Roell's brotherella <i>Brotherella roellii</i>	Red	Endangered	Occurs only on hardwoods and rotten logs in remnant second-growth stands within urban areas near Fraser River and Howe Sound.	<b>Unlikely</b> – not found near Whistler.
Slender spike-rush <i>Eleocharis nitida</i>	Blue		Peaty or sandy places; wet soil and shallow water.	<b>Unlikely</b> - no suitable habitat on site.
Banded cord-moss <i>Entosthodon fascicularis</i>	Blue	Special Concern	Extremely local on periodically humid or damp earth of terraces of exposed outcrop knobs in open stand of <i>Arbutus menziesii</i> and <i>Quercus garryana</i> on southern and eastern Vancouver Island. On soil to 700m.	<b>Unlikely</b> - no suitable habitat on site.
Poor pocket moss <i>Fissidens pauperculus</i>	Red	Endangered	Bare, moist soil banks, often growing with <i>Fissidens bryoides</i> .	<b>Unlikely</b> - closest record in the lower mainland.
Leafy miterwort <i>Mitellastra caulescens</i>	Blue		Wet to moist meadows and woodlands in the lowland and montane zones; rare on S Vancouver Island and the lower Fraser Valley.	<b>Unlikely</b> - no suitable habitat on site.
Whitebark pine <i>Pinus albicaulis</i>	Blue	Endangered	Montane forests and on thin, rocky, cold soils at or near timberline at an elevation of 1300-3700 m in the sub-alpine to alpine zones.	<b>Unlikely</b> - subject site at elevation of approximately 800 m.



Common Name <i>Scientific name</i>	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA Status		
Lance-leaved figwort <i>Scrophularia lanceolata</i>	Blue		Moist to mesic roadsides, clearings, thickets and forest edges in the lowland and montane zones.	<b>Unlikely-</b> Closest record in the lower mainland.

Source: BC Ecosystems Explorer, Ministry of Environment.

### Rare and Endangered Ecological Communities

The term "ecological" is a direct reference to the integration of biological components with non-biological features such as soil, landforms, climate and disturbance factors. The term "community" reflects the interactions of living organisms (plants, animals, fungi, bacteria, etc.), and the relationships that exists between the living and non-living components of the community. Currently, the most common ecological communities that are known in BC are based on the Vegetation Classification component of the Ministry of Forests and Range Biogeoclimatic Ecosystem Classification, which focuses on the terrestrial plant associations of BC's native plants.

Large tracts of undisturbed plant communities are considered ecologically more important than disturbed/fragmented or second growth communities. Vegetation on the subject site consists of young forest in Polygon 2 and old growth forest in Polygon 1. There is one blue listed ecological community of concern associated with the site series that exists on and around the subject site (Table 8).

**Table 8: Ecological Communities at Risk Occurring on and around the subject site**

Scientific Name	English Name	BC List	BGC	TEM Code
<i>Pseudotsuga mesziesii</i> – <i>Tsuga heterophylla</i> / <i>Paxistima myrsinites</i>	Douglas-fir - western hemlock / falsebox	Blue	CWHms1/03	DF

### 2.3. Wildlife and Wildlife Habitats

The subject site contains potential wildlife habitat in Polygons 1 and 2 due to the presence of:

- Young and old growth forest
- Available forage (e.g. berries)
- Coarse woody debris
- Wildlife trees
- Aquatic and riparian areas





### **2.3.1. Mammals**

Coastal Western Hemlock zone (CWH) is common habitat for black bear (*Ursus americanus*), which could potentially use the subject site and surrounding area for foraging, denning and as a corridor between high and low elevation habitats. Other medium to large mammals that are commonly found in the CWH and could potentially use the area surrounding the site include lynx (*Lynx canadensis*), bobcat (*Lynx rufus*), cougar (*Felis concolor*), black-tailed deer (*Odocoileus hemionus* ssp. *columbianus*), coyote (*Canis latrans*), raccoon (*Procyon lotor*) and snowshoe hare (*Lepus americanus*).

Smaller species likely to occur within the area surrounding the subject site include common and dusky shrews (*Sorex cinereus* and *S. monticolus*), little brown and western long-eared myotis (*Myotis lucifugus* and *M. evotis*), ermine (*Mustela erminea*), long-tailed vole (*Microtus longicaudis*), southern red-backed vole (*Clethrionomys gapperi*), Keen's and deer mouse (*Peromyscus keeni* and *P. maniculatus*), Pacific jumping mouse (*Zapus trinotatus*), bushy-tailed woodrat (*Neotoma cinerea*), yellow-pine chipmunk (*Tamias amoenus*), American pika (*Ochotona princeps*) and Douglas squirrel (*Tamiasciurus douglasii*).

### **2.3.2. Birds**

The Coastal Western Hemlock ecosystem surrounding the Whistler area is considered to have the greatest diversity and abundance of habitat elements in British Columbia. This habitat diversity results in a broad diversity of bird species. The forest in and around the subject site could provide habitat for a number of avian species. A nest survey was not undertaken as part of this report, but raptor nests were not observed within the project area during the site visit.

### **2.3.3. Amphibians and Reptiles**

A comprehensive survey for amphibians and reptiles (herpetiles) was not conducted as part of this report. No amphibians or reptiles were observed during the site visit; however, the following species could potentially occur:

- western toad (*Bufo boreas*)
- red-legged frog (*Rana aurora*)
- coastal tailed frog (*Ascaphus truei*)
- northwestern salamander (*Ambystoma gracile*)
- long-toed salamander (*Ambystoma macrodactylum*)
- Pacific treefrog (*Hyla regilla*)
- northern alligator lizard (*Gerrhonotus coeruleus*)
- common garter snake (*Thamnophis sirtalis*)

### **2.3.4. Rare and Endangered Wildlife Species**

A search was conducted for potentially occurring wildlife species at-risk through the BC Conservation Data Centre based on the site's biogeoclimatic zone and the habitat available on and around the subject site. Potentially occurring wildlife species are provided in Table 6.



**Table 9: Wildlife Species at Risk Potentially Occurring on the Subject Site**

Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Northern goshawk <i>Accipiter gentilis laingi</i>	Red	Threatened	Coastal forests of BC, especially central and northern coastal islands. Habitat consists of extensive forests with large stands of mature trees and dense canopies, large trees are important in providing nesting and perching platforms.	<b>Possible</b> – extensive old growth forest east of the subject site.
Green sturgeon <i>Acipenser medirostris</i>	Blue	Special Concern	Found in estuaries, lower reaches of large rivers, and in salt or brackish water off river mouths.	<b>None</b> – no suitable habitat on site.
White sturgeon <i>Acipenser transmontanus</i>	-	Endangered	Occurs along the Pacific Coast of British Columbia. Significant populations are restricted to large river systems.	<b>None</b> – no suitable habitat on site.
Northwestern pond turtle <i>Actinemys marmorata</i>	Red	Extirpated	Two specimen were collected in the lower Fraser Valley in the 1930s and another observed in 1966. There have been no other sightings in BC.	<b>Unlikely</b> – not observed in the Whistler area.
Western grebe <i>Aechmophorus occidentalis</i>	Red	Special Concern	Marshes, lakes, and bays; in migration and winter also sheltered seacoasts, less frequently along rivers (Subtropical and Temperate zones).	<b>Unlikely</b> – not observed in Whistler area.
White-throated swift <i>Aeronautes saxatalis</i>	Blue	-	Primarily mountainous country, especially near cliffs and canyons where breeding occurs; forages over forest and open situations in a variety of habitats (Subtropical and Temperate zones).	<b>Possible</b> – surrounding the Twentyone Mile Creek canyon.
Oregon forestsnail <i>Actinemys marmorata</i>	Red	Endangered	Habitat requirements of <i>A. townsendiana</i> are poorly known. It occupies mixedwood and deciduous forests, typically dominated by Bigleaf Maple ( <i>Acer macrophyllum</i> ).	<b>Unlikely</b> – no bigleaf maple on site.
Nelson’s sparrow <i>Ammospiza nelsoni</i>	Red	-	BREEDING: Freshwater marshes and wet meadows in interior and brackish marshes along coast. Nests on ground in matted bed of rushes or under mat of grasses, in dense grass or sedges, or several centimeters above wet ground in dense clump of grass.	<b>Unlikely</b> – no marshes, meadows or dense grass on site.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Western toad <i>Anaxyrus boreas</i>	Yellow	Special Concern	Various upland habitats around ponds, lakes, reservoirs, and slow-moving rivers and streams.	<b>Unlikely</b> – Twentyone Mile Creek is fast-moving in the area of the subject site.
Mountain beaver <i>Aplodontia rufa</i>	Yellow	Special Concern	This subspecies is associated with coniferous, mixed and Red Alder forests on moist slopes or hillsides near small streams or seeps. Humid sites with a dense understory are ideal. An important requirement is deep soils suitable for excavating burrow systems and tunnels.	<b>Unlikely</b> – habitat range is Fraser Valley area.
Great blue heron <i>Aredea herodias fannini</i>	Blue	Special Concern	Aquatic areas <0.5 m deep, fish bearing streams and rivers, undisturbed nesting in tall trees.	<b>Unlikely</b> – fish passage barriers to Twentyone Mile Creek at the locate of the subject site.
Emma’s dancer <i>Argia emma</i>	Blue	-	Along rivers, creeks and sometimes wave-washed lake beaches.	<b>Unlikely</b> – no known occurrences in Whistler area
Vivid dancer <i>Argia vivida</i>	Blue	Special Concern	Rare. Associated with cool or hot springs. Montane. Southern B.C. from the Coast Mountains to the Rockies.	<b>Unlikely</b> – no springs on site.
Coastal tailed frog <i>Ascaphus truei</i>	Yellow	Special Concern	Although they may be found in fish-bearing streams, tailed frogs typically occur in non-fish bearing, permanent, cold, fast flowing mountain streams that flow over rocky substrates.	<b>Likely</b> – within Twentyone Mile Creek.
Short-eared owl <i>Asio flammeus</i>	Blue	Special Concern	In general, any area that is large enough, has low vegetation with some dry upland for nesting, and that supports suitable prey may be considered potential breeding habitat, although many will not have breeding short-eared owls. Nearby water is a requirement for nesting habitat.	<b>Unlikely</b> – not found in the Whistler area*.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Burrowing Owl <i>Athene cunicularia</i>	Red	Endangered	Habitat includes open grasslands, especially prairie, plains and savanna, sometimes other open areas such as vacant lots near human habitation or airports.	<b>Unlikely</b> – not found in the Whistler area*.
Upland sandpiper <i>Bartramia longicauda</i>	Red	-	Preferred habitat includes large areas of short grass for feeding and courtship with interspersed or adjacent taller grasses for nesting and brood cover.	<b>Unlikely</b> – not known in the Whistler area.
American bittern <i>Botaurus lentiginosus</i>	Blue	-	Nests primarily in inland freshwater wetlands, sometimes in tidal marshes or in sparsely vegetated wetlands or dry grassy uplands.	<b>Unlikely</b> – no known sightings in Whistler area.
Marbled murrelet <i>Brachyramphus marmoratus</i>	Blue	Threatened	Coastal areas within 2 km of shore, occasionally on rivers and lakes within 20 km of the ocean in old growth forest. Closest known occurrence is Toba River.	<b>Unlikely</b> – provincially listed Marbled murrelet habitat east of the subject site; however, site is not within 20 km of the ocean and this species has no known occurrences in Whistler*.
Brant <i>Branta bernicla</i>	Blue	-	In winter, this species occurs primarily in marine situations that are marshy, along lagoons and estuaries, and on shallow bays, often in areas with eelgrass. Areas dominated by large freshwater lakes and estuaries provide important summer molting areas.	<b>Unlikely</b> – no suitable habitat on site.
Rough-legged hawk <i>Buteo lagopus</i>	Blue	-	Grasslands, field, marshes, sagebrush flats, and open cultivated areas; sometimes rat-infested garbage dumps. Nests on cliffs (typically) or in trees in arctic and subarctic, in tundra, mountain sides, forests with plenty of open ground.	<b>Unlikely</b> – not observed in Whistler area.





Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Green heron <i>Butorides virescens</i>	Blue	-	Aquatic areas, especially slow moving, shallow waters with good riparian cover. Known to occur in the Whistler area*.	<b>Unlikely</b> – Twentyone Mile Creek not slow moving.
Smith's longspur <i>Calcarius pictus</i>	Blue	-	BREEDING: Dry, grassy, and hummocky tundra. NON-BREEDING: in migration and winter in grassy and weedy areas, fields, prairies and airports.	<b>Unlikely</b> – no suitable habitat on site.
Red knot <i>Calidris canutus</i>	Red	Threatened / Endangered	Primarily seacoasts on tidal flats and beaches, less frequently in marshes and flooded fields. On sandy or pebbly beaches, especially at river mouths; feeds on mudflats, loafs and sleeps on salinas and salt-pond dikes.	<b>None</b> – no suitable habitat on site.
Western pine elfin <i>Callophrys eryphon sheltonensis</i>	Blue	-	Alpine/Tundra / Krummholtz / Unknown Grassland/Shrub / Shrub - Natural / Unknown Wetland / Bog / Facultative - frequent use.	<b>Unlikely</b> – no suitable habitat.
Johnson's hairstreak <i>Callophrys johnsoni</i>	Red	-	Primary habitat consists of older coniferous forests, especially those with Western Hemlock ( <i>Tsuga heterophylla</i> ) that are infected by dwarf mistletoe ( <i>Arceuthobium tsugense</i> ). However, it is also found in other forest types, most notably in Ponderosa Pine ( <i>Pinus ponderosa</i> ) or Gray Pine ( <i>P. sabiniana</i> ) forests infected with Western Dwarf Mistletoe ( <i>A. campylopodum</i> ).	<b>Unlikely</b> – not known to occur in the Whistler area.
Canada warbler <i>Cardellina canadensis</i>	Blue	Threatened	In migration, this warbler uses various forest, woodland, scrub, and thicket habitats, mostly in humid areas. In winter, it occurs in forested areas of foothills and mountains.	<b>Unlikely</b> – not known to occur in the Whistler area.
Western thorn <i>Carychium occidentale</i>	Blue	-	In low elevation forests in rich, relatively undisturbed leaf litter; usually dominated by Bigleaf maple.	<b>Unlikely</b> – no suitable habitat on site.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Mountain sucker <i>Catostomus platyrhynchus</i>	Blue	Special Concern	This sucker appears to prefer clear, cold creeks and small to medium rivers with clear rubble, gravel or sand substrate.	<b>Unlikely</b> – not known in Whistler area.
Salish sucker <i>Catostomus</i> sp. 4	Red	Threatened	Habitat includes lowland streams and associated ponds and (in Washington) lakes.	<b>Unlikely</b> –not observed in Whistler area.
Common wood-nymph <i>Cercyonis pegala incana</i>	Red	-	Common Woodnymphs occur across southern BC in grassy forest openings, clearcuts, roadsides, meadows, and stream banks.	<b>Unlikely</b> – not known in Whistler area.
Roosevelt elk <i>Cervus elaphus roosevelti</i>	Blue	-	Roosevelt Elk, inhabiting the southern coastal rainforests, are usually found in valley bottoms in most seasons, even in summer in some areas. Herbs and stands of shrub seedlings, along with riparian areas, provide the main foraging areas for Roosevelt Elk, while older forests supply security cover against predators.	<b>Possible</b> – old growth forest east of the subject site.
Northern rubber boa <i>Charina bottae</i>	Yellow	Special Concern	Rubber Boas are most often associated with low elevation mountainsides. Here they can take advantage of warm aspect slopes.	<b>Unlikely</b> – closest known location is Pemberton.
Hoffman's checkerspot <i>Chlosyne hoffmanni</i>	Red	-	Openings and meadows in valleys in Canadian Zone forest.	<b>Unlikely</b> – not known to occur in the Whistler area.
Lark sparrow <i>Chondestes grammacus</i>	Blue	-	Nests are either on the ground or close to the ground (most often within 4 meters) in woody vegetation. Ground nests may be located in areas of sparse ground cover such as those areas associated with burning, moderate to heavy grazing, or poor or eroded soils.	<b>Unlikely</b> – not known to occur in the Whistler area.
Common nighthawk <i>Chordeiles minor</i>	Yellow	Threatened	Mountains and plains in open coniferous forest, savanna, grassland and towns. Nesting occurs on the ground on a bare site in an open area.	<b>Possible</b> – coniferous forest in and around the subject site.
Painted turtle <i>Chrysemys picta</i> pop. 1	Red	Endangered	Painted turtles live in slow-moving, shallow waters with soft bottoms, basking sites, and aquatic vegetation.	<b>Unlikely</b> – not known in the Whistler area.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Hairy-necked tiger Beetle <i>Cicindela hirticollis</i>	Blue	-	Associated with sand beaches	<b>Unlikely</b> - no suitable habitat.
Evening grosbeak <i>Coccothraustes vespertinus</i>	Yellow	Special Concern	Coniferous (primarily spruce and fir) and mixed coniferous- deciduous woodland, second growth, and occasionally parks; in migration and winter in a variety of forest and woodland habitats, and around human habitation.	<b>Possible</b> - foraging and nesting habitat in and around the subject site.
Yellow-billed cuckoo <i>Coccyzus americanus</i>	Red	-	Open woodland (especially where undergrowth is thick), parks, deciduous riparian woodland; in the West, nests in tall cottonwood and willow riparian woodland. Nests in deciduous woodlands, moist thickets, orchards, overgrown pastures; in tree, shrub, or vine, an average of 1-3 meters above ground.	<b>Unlikely</b> – not known in Whistler area.
Sharp-tailed snake <i>Contia tenuis</i>	Red	Endangered	In British Columbia, the Sharp-tailed Snake occurs in low-elevation woodland habitats dominated by Douglas-fir, arbutus and/or Garry oak. The snakes are often found in small openings on talus rocky outcrops and on warm hillsides	<b>Unlikely</b> – outside of distribution range.
Olive-sided flycatcher <i>Contopus cooperi</i>	Blue	Threatened	Mixed coniferous-deciduous forest with old growth snags along forest edges. Known to occur in the Whistler area*.	<b>Possible</b> – in old forest of Polygon 2.
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	Blue	-	On the West Coast, Townsend's big-eared bats are found regularly in forested regions and buildings, and in areas with a mosaic of woodland, grassland, and/or shrubland. In California and Washington, they are known from limestone caves, lava tubes, and human-made structures in coastal lowlands, cultivated valleys, and nearby hills covered with mixed vegetation.	<b>Unlikely</b> – no cliffs, caves or structures on site.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Coastrange sculpin ( <i>Cultus</i> ssp.) <i>Cottus aleuticus</i> pop. 1	Red	Threatened	Confined to the deeper waters of a low elevation montane lake.	<b>Unlikely</b> – not known in the Whistler area.
Puget oregonian <i>Cryptomastix devia</i>	Red	Extirpated	In the US, it is a mature forest specialist; inhabits moist old-growth and late successional forests and riparian areas at low and mid elevation; in course woody debris and leaf litter.	<b>Unlikely</b> – no known sightings in the Whistler area.
Black swift <i>Cypseloides niger</i>	Blue	Endangered	Nests behind or next to waterfalls and wet cliffs, on sea cliffs and in sea caves.	<b>Unlikely</b> - not near ocean or suitable cliff nesting habitat.
Monarch <i>Danaus plexippus</i>	Red	Special Concern	In general, breeding areas are virtually all patches of milkweed in North America and some other regions. The critical conservation feature for North American populations is the overwintering habitats, which are certain high altitude Mexican conifer forests or coastal California conifer or Eucalyptus groves as identified in literature.	<b>Unlikely</b> - no suitable habitat.
Coastal giant salamander <i>Dicamptodon tenebrosus</i>	Blue	Threatened	Larvae and paedomorphic adults usually inhabit clear, cool or cold, well-oxygenated streams and often take cover under stones.	<b>Unlikely</b> – not known in the Whistler area.
Bobolink <i>Dolichonyx oryzivorus</i>	Blue	Threatened	This species generally selects habitat with moderate to tall vegetation, moderate to dense vegetation, and moderately deep litter.	<b>Unlikely</b> – not known in the Whistler area.
Alkali bluet <i>Enallagma clausum</i>	Blue	-	Lakes / Pond/Open Water / Facultative - frequent use Other Unique Habitats / Alkali Ponds/Salt Flats / Facultative - frequent use.	<b>Unlikely</b> – not known in the Whistler area.
Silver-Spotted Skipper <i>Epargyreus clarus californicus</i>	Red	-	Pretty much any place with lots of the major foodplants which are usually ROBINIA or AMORPHA whether wild or cultivated, native or not. Strays possible in any habitat.	<b>Unlikely</b> – site does not contain robina or amorpha.





Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Horned Lark <i>Eremophila alpestris strigata</i>	Red	Endangered	Habitat consists of large expanses of bare or thinly vegetated land, including fields, prairies, dunes, upper beaches, airports, and similar areas with low/sparse grassy vegetation.	<b>Unlikely</b> – not known in Whistler area.
Propertius Duskywing <i>Erynnis propertius</i>	Red	-	Butterfly; Open oak or mixed woodlands with the foodplant oaks.	<b>Unlikely</b> – no oak on site.
Western Pondhawk <i>Erythemis collocata</i>	Blue	-	Around ponds and marshy lakes, especially where floating plants occur.	<b>Unlikely</b> – not known in the Whistler area.
Steller Sea Lion <i>Eumetopias jubatus</i>	Blue	Special Concern	Marine habitats include coastal waters near shore and over the continental slope.	<b>None</b> – no marine habitat.
Rusty Blackbird <i>Euphagus carolinus</i>	Blue	Special Concern	Breeds in habitats that are dominated by coniferous forest with wetlands nearby including bogs, marshes and beaver ponds. During the winter, it is found in wet woodlands, swamps, and pond edges and often forages in agricultural lands.	<b>Unlikely</b> – unlikely to be resident in whistler*.
Dun Skipper <i>Euphyes vestris</i>	Blue	Threatened	The Dun Skipper is known from southern Vancouver Island, the Lower Mainland, and the Fraser River canyon upstream to Lillooet.	<b>Unlikely</b> – not known in Whistler.
Prairie Falcon <i>Falco mexicanus</i>	Red	-	Primarily open situations, especially in mountainous areas, steppe, plains or prairies. Typically nests in pot hole or well-sheltered ledge on rocky cliff or steep earth embankment.	<b>Unlikely</b> – no cliff areas on subject site.
Peregrine Falcon <i>Falco peregrinus anatum</i>	Red	Special Concern	Cliff edges near water, interior rivers and wetlands*.	<b>Unlikely</b> – unlikely to be present in Whistler*.
Gyrfalcon <i>Falco rusticolus</i>	Blue	-	Usually nests on cliff ledges, ideally beneath sheltering overhang; sometimes nests in trees or on man-made structures.	<b>Unlikely</b> – not known in the Whistler area*.
Tufted Puffin <i>Fratercula cirrhata</i>	Blue	-	Nests on offshore islands or along the coast.	<b>Unlikely</b> – no suitable habitat.
Northern Fulmar <i>Fulmarus glacialis</i>	Red	-	Pelagic. Nests in colonies primarily on sea cliffs, less frequently on low flat rocky islands.	<b>Unlikely</b> – no suitable habitat.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Prairie Fossaria <i>Galba bulimoides</i>	Blue	-	Physical barriers, particularly for flowing water, is presence of upland habitat between water connections. High waterfalls and anthropogenic barriers to water flow such as dams are barriers as they limit movement in an upstream direction.	<b>Unlikely</b> – barrier of waterfalls restrict from Whistler.
Dusky Fossaria <i>Galba dalli</i>	Blue	-	Physical barriers, particularly for flowing water, is presence of upland habitat between water connections. High waterfalls and anthropogenic barriers to water flow such as dams are barriers as they limit movement in an upstream direction.	<b>Unlikely</b> – barrier of waterfalls restrict from Whistler.
Pygmy Fossaria <i>Galba parva</i>	Blue	-	On wet mud flats, lakeshores and riverbanks.	<b>Unlikely</b> – no Whistler observations*.
Wolverine <i>Gulo gulo luscus</i>	Blue	Special Concern	A range of habitat types from valley bottoms to alpine meadows, strongly associated with the presence of large ungulate prey.	<b>Possible</b> – known to occur in Whistler area*.
Star Gyro <i>Gyraulus crista</i>	Blue	-	Habitat is freshwater.	<b>Unlikely</b> – no Whistler observations.
Northern Abalone <i>Haliotis kamtschatkana</i>	Red	Endangered	Habitat is predominantly kelp beds along outer well-exposed coasts.	<b>Unlikely</b> – no suitable habitat.
Pale Jumping-Slug <i>Haliotis kamtschatkana</i>	Blue	-	In dry to moist coniferous forests, on and around mossy stumps, rocks and logs; also in leaf litter.	<b>Unlikely</b> – habitat range is southeast BC.
Western Branded Skipper <i>Hesperia Colorado oregonia</i>	Red	-	A butterfly of open arid land habitats, this skipper is especially common on hillsides and in valleys.	<b>Unlikely</b> – no known occurrences in the Whistler area*.
Barn Swallow <i>Hirundo rustica</i>	Blue	Threatened	Open areas, fields, ponds with vertical nesting habitat, especially buildings. Known to occur in the Whistler area.*	<b>Unlikely</b> - no suitable habitat.
Caspian Tern <i>Hydroprogne caspia</i>	Blue	-	Seacoasts, bays, estuaries, lakes, marshes, and rivers.	<b>Unlikely</b> - no suitable habitat.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Yellow-breasted chat <i>Icteria virens</i>	Red	Endangered	Associated with shrubby and riparian habitats with open canopies and dense subcanopy layers	<b>Unlikely</b> - no suitable habitat.
California gull <i>Larus californicus</i>	Blue	-	Seacoasts, bays, estuaries, mudflats, marshes, irrigated fields, lakes, ponds, dumps, cities, and agricultural lands	<b>Unlikely</b> - no suitable habitat.
Hoary bat <i>Lasiurus cinereus</i>	Blue	-	Habitat includes primarily deciduous and coniferous forests and woodlands, including areas altered by humans. Foraging habitat includes various open areas, including spaces over water and along riparian corridors	<b>Unlikely</b> – no known occurrences in Whistler.
Snowshoe hare, washingtonii subspecies <i>Lepus americanus washingtonii</i>	Red	-	Dense cover of coniferous or mixed forests, with abundant understory vegetation. Non-fragmented, adequately sized patches of forests, deciduous woodlands, orchards, tree plantations, and riparian woodlands provide the preferred range of foraging and breeding habitats.	<b>Unlikely</b> – no known occurrences in the Whistler area.
Short-billed Dowitcher <i>Limnodromus griseus</i>	Blue	-	mudflats, estuaries, shallow marshes, pools, ponds, flooded fields and sandy beaches. Prefers shallow salt water with soft muddy bottom, but visits various wetlands during migration.	<b>Unlikely</b> - no suitable habitat.
Hudsonian Godwit <i>Limosa haemastica</i>	Red	Threatened	Nests on grassy tundra, near water. Bogs and marshes. Near coast or river. Nests on the ground in a sparsely lined depression, in or under edge of prostrate dwarf birch or on dry top of hummock in sedge marsh	<b>Unlikely</b> - no suitable habitat.
Western Screech-Owl <i>Megascops kennicottii kennicottii</i>	Blue	Threatened	Associated with riparian zones with Broadleaf Maple or Black Cottonwood	<b>Possible</b> – known to occur in the Whistler area*.
Lewis's Woodpecker <i>Melanerpes lewis</i>	Blue	Threatened	Three distinct habitats are used in British Columbia: open areas with scattered trees, riparian forests adjacent to open areas; and burns	<b>Unlikely</b> – outside summer breeding distribution range.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Black Scoter <i>Melanitta americana</i>	Blue	-	Mostly coastal waters, less commonly on large inland lakes and rivers when not breeding. Nests near lakes and pools on grassy or bushy tundra and in northern taiga	<b>Unlikely</b> - no suitable habitat.
Surf Scoter <i>Melanitta perspicillata</i>	Blue	-	Primarily marine littoral areas, less frequently in bays or on freshwater lakes and rivers	<b>Unlikely</b> - no suitable habitat, normally found migrating on lakes.
Long-tailed weasel <i>Mustela frenata altifrontalis</i>	Red	-	Cultivated field, alpine, tundra, conifer forest, grassland, rocky habitat and wetlands	<b>Unlikely</b> - only known to occur in the lower mainland.
Southern Red-backed Vole <i>Myodes gapperi occidentalis</i>	Red	-	Conifer forest, riparian area, bog	<b>Unlikely</b> - only known to occur in the lower mainland.
Little brown myotis <i>Myotis lucifugus</i>	Yellow	Endangered	Summer roosts are in buildings and other man-made structures, tree cavities, rock crevices, caves and under the bark of trees. Uses underground habitat such as caves for hibernacula.	<b>Possible</b> – known to occur in the Whistler area*.
Yuma myotis <i>Myotis yumanensis</i>	Blue	-	Found in a wide variety of upland and lowland habitats, including riparian, desert scrub, moist woodlands and forests, usually near open water.	<b>Unlikely</b> – no known occurrences in Whistler*.
Double-crested Cormorant <i>Nannopterum auritum</i>	Blue	-	Lakes, ponds, rivers, lagoons, swamps, coastal bays, marine islands, and seacoasts; usually within sight of land. Nests on the ground or in trees in freshwater situations, and on coastal cliffs	<b>Possible</b> – river habitat around subject site.
Long-billed Curlew <i>Numenius americanus</i>	Blue	Special Concern	Prairies and grassy meadows, generally near water.	<b>Unlikely</b> – no suitable habitat.
Black-crowned Night-heron <i>Nycticorax nycticorax</i>	Red	-	Marshes, swamps, wooded streams, mangroves, shores of lakes, ponds, lagoons; salt water, brackish, and freshwater situations. Roosts by day in mangroves or swampy woodland	<b>Unlikely</b> – not known in Whistler area*.





Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Grappletail <i>Octogomphus specularis</i>	Red	-	Along wooded streams draining lakes	<b>Unlikely</b> – not known in Whistler area*.
Audouin's Night-stalking Tiger Beetle <i>Omus audouini</i>	Red	Threatened	Low elevation coastal terrain. All sites in B.C. are less than 20 m above sea level and within 3 km of the saltwater shoreline	<b>Unlikely</b> – no suitable habitat.
Cutthroat trout <i>Oncorhynchus clarkii clarkii</i>	Blue	-	Sea-run populations, freshwater-resident populations (lacustrine and fluvial) and headwater stream populations.	<b>Unlikely</b> – fish passage barriers to Twentyone Mile Creek in the area of the subject site.
Sinuuous snaketail <i>Ophiogomphus occidentis</i>	Blue	-	Fly along clear streams and sandy lakeshores; uncommon in settled areas, at least partly because the burrowing larvae are sensitive to changes in water flow and siltation.	<b>Unlikely</b> – never been documented in Whistler*.
Mountain goat <i>Oreamnos americanus</i>	Blue	-	Alpine and subalpine habitat; steep grassy talus slopes, grassy ledges of cliffs, or alpine meadows. Usually at timberline or above. May seek shelter and food in stands of spruce or hemlock in winter.	<b>Unlikely</b> - site is not above timberline.
Sage Thrasher <i>Oreoscoptes montanus</i>	Red	Endangered	Sagebrush plains, primarily in arid or semi-arid situations, rarely around towns.	<b>Unlikely</b> – no suitable habitat.
Blue Dasher <i>Pachydiplax longipennis</i>	Blue	-	Ponds and lakes with abundant vegetation in the water and along the shore.	<b>Unlikely</b> – no suitable habitat.
Indra Swallowtail <i>Papilio indra</i>	Red	-	Caterpillar Hosts: Aromatic herbs of the parsley family (Apiaceae) growing among rocks. Adult Food: Flower nectar	<b>Unlikely</b> – no suitable habitat.
Clodius parnassian <i>Parnassius clodius pseudogallatinus</i>	Blue	-	Populations on the coast occur in moist riparian habitats along low-elevation streams. Wet subalpine meadows and subalpine riparian habitats are used at higher elevations.	<b>Possible</b> – in Twentyone Mile Creek.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Band-tailed pigeon <i>Patagioenas fasciata</i>	Blue	Special Concern	Coniferous and mixed deciduous lowland forests. Known to occur in the Whistler area.*	<b>Possible</b> - coniferous lowland forest in and around subject site.
American White Pelican <i>Pelecanus erythrorhynchos</i>	Red	-	Habitat includes rivers, lakes, reservoirs, estuaries, bays, and open marshes, sometimes inshore marine habitats	<b>Unlikely</b> – not known to occur in Whistler area*.
Red-necked Phalarope <i>Phalaropus lobatus</i>	Blue	-	Primarily pelagic, sometimes occurring in migration on ponds, lakes, open marshes, estuaries, and bays	<b>Unlikely</b> – no suitable habitat.
Rocky mountain physa <i>Physella propinqua</i>	Blue	-	This species is found in permanent, cool water habitats, most often in lakes. Pools in medium rivers or shallow water of lakes.	<b>Unlikely</b> – no known occurrence in or near Whistler*.
Sunset physa <i>Physella virginea</i>	Blue	-	The type locality of this species is Mountain Lake, but otherwise the habitat needs of this species are unknown.	<b>Unlikely</b> – no known occurrence in or near Whistler*.
Gopher snake, catenifer subspecies <i>Pituophis catenifer catenifer</i>	Red	Extirpated	Known habitats include agriculture, cultivated field, rock, talus.	<b>Unlikely</b> – no suitable habitat.
Meadow Rams-horn <i>Planorbula campestris</i>	Blue	-	This species is found in vegetated vernal ponds, swamps, and springtime flooded portions of permanent water bodies	<b>Unlikely</b> – no suitable habitat.
American Golden-Plover <i>Pluvialis dominica</i>	Blue	-	Short grasslands, pastures, golf courses, mudflats, sandy beaches, and flooded fields	<b>Unlikely</b> – no suitable habitat.
Eared grebe <i>Podiceps nigricollis</i>	Blue	-	Marshes, ponds and lakes; in migration and winter also salt lakes, bays, estuaries and seacoasts	<b>Unlikely</b> – not known in Whistler area.
Purple Martin <i>Progne subis</i>	Blue	-	A wide variety of open and partly open situations, frequently near water or around towns	<b>Possible</b> – observed in the Whistler area*.
Cassin's Auklet <i>Ptychoramphus aleuticus</i>	Red	Special Concern	Mostly pelagic, less frequently along rocky seacoasts	<b>Unlikely</b> – no suitable habitat.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Northern red-legged frog <i>Rana aurora</i>	Blue	Special Concern	Wetlands, pools, and riparian areas of upland forests	<b>Unlikely</b> - no occurrences north of Callaghan Valley.
Oregon Spotted Frog <i>Rana pretiosa</i>	Red	Endangered	Usually it occurs in vegetated shallows or among grasses or sedges along the margins of streams, lakes, ponds (including those behind beaver dams), oxbows, springs, and marshes	<b>Unlikely</b> – not observed in the Whistler area*.
American Avocet <i>Recurvirostra americana</i>	Blue	-	Lowland marshes, mudflats, ponds, alkaline lakes, and estuaries	<b>Unlikely</b> - no suitable habitat.
Nooksack Dace <i>Rhinichthys cataractae</i> - <i>Chehalis</i> lineage	Red	Endangered	Adult habitat is riffles, typically with a loose coarse-gravel substrate and a flow of around 0.25 m/sec; young occur in shallow margins of the tail ends of pools with mud/sand substrates; eggs usually are found near the top ends of riffles	<b>Unlikely</b> – no known occurrence in Whistler.
Bull trout <i>Salvelinus confluentus</i>	Blue	-	The bottom of deep pools in cold rivers and large tributary streams, often in moderate to fast currents with temperatures of 45-50 F; also large coldwater lakes and reservoirs.	<b>Unlikely</b> – fish passage barriers to this location on Twentyone Mile Creek.
Bull trout <i>Salvelinus confluentus</i> pop. 28	Blue	Special Concern	The Southcoast British Columbia populations inhabit the Skagit, Squamish, Ryan, Lillooet, Pitt and Lower Fraser Rivers, the Pitt, Birkenhead, Chilliwack, and Chehalis Lakes, and Phelix and Ure Creeks.	<b>None</b> – not known in the Whistler area.
Townsend's Mole <i>Scapanus townsendii</i>	Red	Endangered	Pastures, prairies, and shrub habitats in lowlands and flood plains, and occasionally in true fir (ABIES) forests	<b>Unlikely</b> - only known to occur in the lower mainland.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Black-throated Green Warbler <i>Setophaga virens</i>	Blue	-	Breeds in coniferous, mixed coniferous-deciduous, and entirely deciduous forests, including forest edge, second growth, hemlock forest, cedar-grown pastures, larch bogs, and swamps. In migration and winter, occurs in various open forest, woodland, scrub, second growth, and thicket habitats ; prefers forest canopy and edges, pasture trees, and semi-open, sometimes in low scrubby second growth	<b>Unlikely</b> - nearest record in Fort Saint John.
Pacific water shrew <i>Sorex bendirii</i>	Red	Endangered	Inhabits the coastal lowlands of northern California, Oregon, Washington and British Columbia, where it is restricted to the lower Fraser River valley.	<b>Unlikely</b> – restricted to southern and lower elevation habitat.
Olympic shrew <i>Sorex rohweri</i>	Red	-	Mixed deciduous forest of red alder, birch, Sitka spruce, western hemlock; Sitka spruce-western hemlock forest; lodgepole pine forest; and in canary grass bordering a ditch ~15 m from a mixed forest	<b>Unlikely</b> - only known to occur in the lower mainland.
Trowbridge's shrew <i>Sorex trowbridgii</i>	Blue	-	Mature forest (dry or moist) with abundant ground litter; forested canyons and ravines, and swampy woods; deep rank grass near salmonberry thickets (Destruction Island off Washington); riparian fringe areas (but not streamside); under chaparral (at southern edge of range); cut forest if sufficient ground cover present	<b>Unlikely</b> - only known to occur in the lower mainland.
Zerene Fritillary <i>Speyeria zerene bremnerii</i>	Red	-	Deciduous forest, grassland and meadow	<b>Unlikely</b> - no suitable habitat.
Herrington Fingernailclam <i>Sphaerium occidentale</i>	Blue	-	vernal pools and ditches, among grass and leaves	<b>Unlikely</b> - no known occurrence in Whistler.





Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Rocky Mountain Fingernailclam <i>Sphaerium patella</i>	Red	-	lakes, rivers, sloughs, and streams	<b>Unlikely</b> - no know occurrence in Whistler.
Striated fingernailclam <i>Sphaerium striatinum</i>	Blue	-	Thrives in both lotic and lentic environments and on mud, sand, gravel and rock substrates and is most abundant at water depths of less than 2 m.	<b>Unlikely</b> - no know occurrence in Whistler or near Whistler*.
Pygmy Longfin Smelt <i>Spirinchus</i> sp. 1	Red	-	Large, oligotrophic, fiord lakes	<b>Unlikely</b> - no known occurrences in Whistler.
Widelip Pondsnaill <i>Stagnicola traski</i>	Blue	-	Unknown	<b>Unlikely</b> - no known occurrences in Whistler.
Forster's Tern <i>Sterna forsteri</i>	Red	-	Freshwater and salt marshes, in migration and winter also seacoasts, bays, estuaries, rivers and lakes.	<b>Unlikely</b> – nearest record is in kelowna.
Spotted owl <i>Strix occidentalis</i>	Red	Endangered	Dense forest and deep wooded canyons; generally in mature stands or old growth; requires cool summer roosts. Nests on broken tree top, cliff ledge, in natural tree cavity, or in tree on stick platform, often the abandoned nest of hawk or mammal; sometimes in cave.	<b>Unlikely</b> – unlikely to occur in Whistler*.
Autumn Meadowhawk <i>Sympetrum vicinum</i>	Blue	-	In ponds, slow streams and lakes with dense, emergent vegetation	<b>Unlikely</b> - no suitable habitat.
Ancient Murrelet <i>Synthliboramphus antiquus</i>	Blue	Special Concern	Mostly offshore or pelagic, mainly over the continental shelf and slope; also close to shore in some areas. In winter, commonly within sight of land, especially around Vancouver Island.	<b>Unlikely</b> - no suitable habitat.
Black Petaltail <i>Tanypteryx hageni</i>	Blue	-	Found in seepage areas and bogs, flat or on hillsides, often associated with streams and usually not under forest canopy in wet mountain ranges.	<b>Unlikely</b> - no suitable habitat.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Eulachon <i>Thaleichthys pacificus</i>	Blue	-	Found near shore and in coastal inlets and rivers. Possibly to 625 m depth. Spends most of its life in the sea, returning to freshwater streams to spawn.	<b>Unlikely</b> - not known to occur in the Whistler area.
Wandering Tattler <i>Tringa incana</i>	Blue	-	Mostly restricted to the alpine zone, usually breeds along rocky or scrubby vegetated edges of mountain streams and lakes; frequents rapidly-flowing streams and tundra habitats, wet meadows, moraine deposits, scree slopes, braided rivers, sometimes found in forest clearings away from water.	<b>Unlikely</b> – not within usual range.
Barn Owl <i>Tyto alba</i>	Red	Threatened	Fields of dense grass. Open and partly open country (grassland, marsh, lightly grazed pasture, hayfields) in a wide variety of situations, often around human habitation	<b>Unlikely</b> - no suitable habitat.
Common Murre <i>Uria aalge</i>	Red	-	Pelagic and along rocky seacoasts. Nests in the open or in crevices on broad and narrow cliff ledges, on stack (cliff) tops, and on flat, rocky, low-lying islands	<b>Unlikely</b> - no suitable habitat.
Grizzly bear <i>Ursus arctos</i>	Blue	Special Concern	Non-forested or partially forested sites with a wide range of foraging opportunities and choice of habitats.	<b>Possible</b> - grizzly bear have been spotted in the RMOW.

All references from CDC BC ecosystems explorer (BC MOE, 2022) except \*references from Brett 2020.



## **2.4. Valued Ecosystem Components**

### **2.4.1. Wildlife Trees**

Wildlife trees include significant standing snags, veteran trees, and trees with broken tops, holes or cavities. These trees are important for various reasons such as perching, foraging, and nesting sites for birds and mammals. No wildlife trees were noted in the footprint of the project area during the site visit on October 26, 2022; however, the forest habitat surrounding the subject site is expected to contain wildlife trees.

### **2.4.2. Coarse Woody Debris**

Coarse Woody Debris (CWD) on the forest floor is an indicator of potential species richness in forested areas. Microhabitats, decay and nutrient cycling provide a range of life-cycle opportunities for smaller ground-dwelling wildlife (e.g. squirrels, shrews, and voles) and vegetation. CWD was observed in the forest surrounding the subject site during the site visit on October 26, 2022 (Photo 6).



**Photo 6: View of the CWD in Polygon 1 at TEM plot #1. October 26, 2022.**

### **2.4.3. Wildlife Movement Corridors**

Wildlife tend to use routes with particular features when moving across the landscape to forage for food, disperse, find mates, or locate breeding sites. These features can include such things as cover, shade, vegetation, water or surface characteristics. Scale is also a significant factor in determining the suitability of a landscape; larger animals with home ranges covering hundreds of kilometres have far different movement corridor requirements than some reptiles, whose corridor requirements are measured in metres. The riparian corridor of Twentyone Mile Creek may provide a movement corridor from upland to lowland areas, but the steepness of the ravine banks limits this potential.

#### 2.4.4. Rock slopes

Rock slopes provide specialized habitat for many species. A scree slope was noted on the river right bank of Twentyone Mile Creek approximately 10 m downstream of the Flank Trail bridge.



Photo 7. Scree rock slope downstream of the Flank Trail bridge. October 26, 2022.

#### 2.4.5. Sensitive Ecosystem Protection Area

The RMOW Official Community Plan (OCP) defines Sensitive Ecosystem Protection Areas (SEPAs) as land which may contain species at risk habitat; ecosystems at risk; raptor's nesting sites; core forest habitat; CWH forest; cottonwoods; and forested floodplain (RMOW, 2019). Schedule K of the OCP identifies the subject site and surrounding area as a SEPA. The area surrounding the proposed development site contains potential species at risk habitat, with Polygon 1 also containing a blue-listed ecosystem at risk, core forest habitat and CWH forest, as defined by the OCP.

### 2.5. Aquatic Environment

Twentyone Mile Creek flows through the project area from north to south. Twentyone Mile Creek drains Rainbow Lake and flows into Alta Creek (a.k.a. River of Golden Dreams), which drains into Green Lake. The creek flows through a ravine with high bedrock walls in a step-pool morphology to the subject site, downstream of which step pools flow through a more open channel. Alta Creek is known to contain kokanee (*Oncorhynchus nerka*), rainbow trout (*O. mykiss*), bull trout (*Salvelinus confluentus*), threespine stickleback (*Gasterosteus aculeatus*), prickly sculpin (*Cottus asper*). Due to the presence of waterfalls downstream of the subject site, fish are not expected to migrate from Alta Creek upstream to the project site. However, Rainbow Lake was historically stocked with rainbow trout, which still populate the lake and are occasionally washed downstream through Twentyone Mile Creek. Twentyone Mile Creek provides habitat for these rainbow trout, as well as a food and nutrient source for downstream fisheries resources.

The RMOW OCP defines a Riparian Ecosystem Protection Area (REPA) as 'Land within 30 metres of the high water mark of a stream as mapped by the municipality and shown on Schedule J' of the OCP.





REPAs are protected from development due to the potential for high biodiversity and range of habitat features offered by these areas. Schedule J identifies a 30 m REPA setback for Twentyone Mile Creek in the area of the subject site.

Provincially, the Riparian Areas Protection Regulation (RAPR) of the *Riparian Areas Protection Act* is the governing legislation to determine setbacks on watercourses that contain fish or are connected to watercourses that contain fish. The purpose of the RAPR is “to protect the many and varied features, functions and conditions that are vital for maintaining stream health and productivity”.

Watercourses are also protected provincially under the *Water Sustainability Act*, which applies to all natural watercourses from top of bank to top of bank. The federal *Fisheries Act* protects fish and fish habitat by providing a framework for management of fisheries and conservation and protection of fish and fish habitat, including by preventing pollution.



**Photo 8. View of Twentyone Mile Creek in the project area. October 26, 2022.**

## **2.6. Socio-Economic Conditions**

### **2.6.1. Cultural and Heritage Resources**

The area of the subject site is within the traditional territories of the Squamish and Lil'wat Nations, as mapped within their respective Land Use Plans. They have historical ties to the land that includes utilization of the natural resources of the Whistler Valley area (Squamish Nation, 2001) (St'át'imc First Nation, 2004).

An archeological investigation was not conducted as part of this study. The site of proposed bridge replacement is within an existing modified trail footprint and an archaeological site is unlikely to be located within the development area. However, archaeological sites are protected under the *Heritage Conservation Act*, and should such a site be discovered during development of the subject site works must be halted and the archaeology branch must be contacted immediately ([archaeology@gov.bc.ca](mailto:archaeology@gov.bc.ca)).



## **2.6.2. Other Undertakings in the Area**

### **Mining**

No current coal, mineral and placer claims exist in the area of the subject site (BC Gov, 2022a).

### **Recreation and Tourism**

The Flank Trail is a popular multi-use non-motorized recreational trail, predominantly used for mountain biking and hiking. This trail is commonly used to access the Lord of the Squirrels destination trail on the west side of Sproatt Mountain.

### **Forestry Management**

The site is located within Forestry Development Units associated with Whistler and the Sea to Sky area. No forestry management occurs on or around the subject site (BC Gov, 2022a).

### **Ground Water**

No groundwater wells are located on or around the subject site (iMapBC, 2022).

### **Anthropogenic Features**

The subject site is altered anthropogenically by the Flank Trail and existing bridge over Twentyone Mile Creek.

### **Adjacent Land Use**

The subject site is located approximately 200m downstream of the municipal drinking water intake on Twentyone Mile Creek. The water intake treatment facility is located 80 m southeast of the bridge replacement site.

## **3. Environmental Constraints**

### **3.1. Physical Environment**

#### **3.1.1. Climate**

The climate in the study area has high levels of precipitation however climate is not considered a constraint to the proposed development.

#### **3.1.2. Geology**

The geology of the site includes steep slopes within the Twentyone Mile Creek ravine, which may constrain the design of the replacement bridge. The proponent will obtain a geotechnical report if necessary.



### **3.1.3. Hydrology**

Hydrology does not pose a constraint to the proposed development. The constraints posed by the aquatic and riparian conditions of the subject site are discussed in Section 3.5 below.

## **3.2. Terrestrial Environment**

### **3.2.1. Soils**

An assessment of the soils of the site is outside the scope of this Environmental Impact Study; soils on the subject site should be addressed under a separate geotechnical report, if required.

### **3.2.2. Vegetation**

The area surrounding the subject site consists of young forest to the west and old growth forest to the east. Should bridge replacement works occur within the footprint of the existing bridge, impacts to vegetation within the forested areas of Polygon 1 and Polygon 2 are expected to be minimal. Impacts may include disturbance of shrub and herbaceous vegetation that has regenerated since the installation of the existing bridge.

### **Rare and Endangered Plant Species**

A list of plant species at risk that are known to occur within the geographical region of the site's forest district and biogeoclimatic zone is provided in Table 7. However, none of these species has the potential to occur on site due to specific habitat requirements.

### **Rare and Endangered Ecological Communities**

The site series identified in and around the subject site is associated with ecological communities of concern when in a climax successional stage. The forest of Polygon 1 is in an old growth, climax successional stage and the blue-listed ecological community in this Polygon should be considered constraining to development. However, should works occur within the footprint of the existing bridge, no impacts to this blue-listed ecological community are expected.

## **3.3. Wildlife and Wildlife Habitat**

### **3.3.1. Mammals**

Mammals inhabiting the forest surrounding the bridge replacement site are not constraining to the proposed development. Best management practices for working around wildlife should be implemented during works, as detailed in Section 4 below.

### **3.3.2. Birds**

All trees on the subject property provide potential nesting sites for a range of bird species. The BC *Wildlife Act* states:



*A person commits an offence if the person, except as provided by regulation, possesses, takes, injures, molests or destroys*

- (a) *A bird or its egg,*
- (b) *The nest of an eagle, peregrine falcon, gyrfalcon, osprey, heron or burrowing owl or,*
- (c) *The nest of a bird not referred to in paragraph (b) when the nest is occupied by a bird or its egg.*

Should the proposed bridge replacement works occur within the footprint of the existing bridge, removal of trees is not expected to be required. No bird nests were noted in the fringe vegetation in the project area during the site visit on October 26, 2022. However, should any vegetation removal occur within the nesting bird season of April 1 to September 1, a songbird nesting survey should be conducted by a Qualified Environmental Professional (QEP) to avoid contravention of the *Wildlife Act*.

### **3.3.3. Amphibians and Reptiles**

Amphibians and reptiles potentially inhabiting the forest surrounding the bridge replacement site are not constraining to the proposed development. Best management practices for working around wildlife should be implemented during works, as detailed in Section 4 below.

### **3.3.4. Rare and Endangered Wildlife Species**

There are many at-risk wildlife species with the potential to occur within the geographic region and biogeoclimatic zone of the subject site. The following species have the potential to occur in the forested areas surrounding the subject site:

- Northern goshawk
- White-throated swift
- Coastal tailed frog
- Marbled murrelet
- Roosevelt elk
- Common nighthawk
- Evening grosbeak
- Olive-sided flycatcher
- Western screech-owl
- Little brown myotis
- Double-crested cormorant
- Clodius parnassian
- Band-tailed pigeon
- Purple martin
- Grizzly bear

A species that is listed as Endangered, Extirpated or Threatened within Schedule 1 of *Species At Risk Act* (SARA) is legally protected under the Act by certain prohibitions. A species that is listed within Schedule 1 of SARA with the classification of Special Concern will not receive protection under the SARA general prohibitions.

SARA contains prohibitions that make it an offence to:





- kill, harm, harass, capture, or take an individual of a species listed in Schedule 1 of SARA as endangered, threatened or extirpated;
- possess, collect, buy, sell or trade an individual of a species listed in Schedule 1 of SARA as endangered, threatened or extirpated;
- damage or destroy the residence (e.g. nest or den) of one or more individuals of a species listed in Schedule 1 of SARA as endangered, threatened or extirpated, if a recovery strategy has recommended the reintroduction of that extirpated species.

Should the proposed bridge replacement works occur within the footprint of the existing bridge and trail footprint, no impacts to species at risk, or species at risk habitat is expected. Any fringe shrub vegetation in the vicinity of the existing bridge that may be impacted or require removal in the bird nesting season should be subject to a nest survey by a QEP prior to works.

### **3.4. Valued Ecosystem Components**

#### **3.4.1. Wildlife Trees**

Works are not expected to impact any wildlife trees should the proposed bridge replacement works occur within the footprint of the existing bridge and trail the subject site.

#### **3.4.2. Coarse Woody Debris**

No coarse woody debris is located within the proposed development area in Polygon 2. Coarse woody debris in Polygon 1 will not be impacted by the proposed works.

#### **3.4.3. Rock Slopes**

The scree rock slope identified downstream of the existing bridge is not constraining to the proposed development as it will not be impacted by bridge replacement works.

#### **3.4.4. Wildlife Movement Corridors**

The proposed development will not impact the potential wildlife movement corridors provided by the Flank Trail and the Twentyone Mile Creek riparian corridor.

#### **3.4.5. Sensitive Ecosystem Protection Area (SEPA)**

The subject site is located within a SEPA delineated under Schedule K of the OCP. Although the area surrounding the subject site contains SEPAs as defined in the OCP, the area of the existing bridge and trail do not contain any SEPAs. As bridge replacement works require submission of a Notification of Approved Changes under the *Water Sustainability Act* (see Section 3.5.2 below), the following SEPA exemption applies to the project:

- (i) Works in or about a stream approved under the *Water Sustainability Act*.



### **3.5. Aquatic Environment**

#### **3.5.1. Riparian Areas Protection Regulation**

The RAPR applies to residential, commercial and industrial development. The proposed bridge replacement works are considered institutional development, and the RAPR does not apply to, or constrain, the project.

#### **3.5.2. Water Sustainability Act**

A Notification of Approved changes for construction, maintenance or removal of a clear span bridge must be submitted to FrontCounter BC at least 45 days prior to works in order to ensure compliance with the WSA. Works must meet all the following conditions in order to qualify for a Notification, if not an Approval application must be submitted (approximately 12-18 month turnaround time):

- (i) the equipment used for site preparation, or for construction, maintenance or removal of the bridge is situated in a dry stream channel or operated from the top of the bank;
- (ii) the bridge and its approach roads do not produce a back water effect or increase the head of the stream;
- (iii) the hydraulic capacity of the bridge is equivalent to the hydraulic capacity of the stream channel, or is capable of passing the 1 in 200 year maximum daily flow;
- (iv) the height of the underside of the bridge is adequate to provide free passage of flood debris and ice flows;
- (v) the bridge is made of materials that meet the applicable standards of the Canadian Standards Association (BC Gov, 2022c).

#### **3.5.3. Fisheries Act**

Once the bridge replacement plans are finalized, a Request for Review should be submitted to Fisheries and Oceans Canada (DFO) in order to ensure compliance with the *Fisheries Act*.

#### **3.5.4. Riparian Ecosystem Protection Area**

The Whistler municipal OCP designates a 30 m REPA for Twentyone Mile Creek. As bridge replacement works require submission of a Notification of Approved Changes under the Water Sustainability Act, the following REPA exemption applies to the project:

- (j) Works in or about a stream approved under the *Water Sustainability Act*.

### **3.6. Socio-Economic Conditions**

#### **3.6.1. Cultural and Heritage Resources**

No archaeological sites are expected to be located in the proposed development area should works occur within the existing bridge and trail footprint. However, if an archaeological site is encountered during any development of the subject site, activities must be halted and the appropriate authorities consulted as archaeological sites are protected under the *Heritage Conservation Act*.

### 3.6.2. Other Undertakings in the Area

#### Timber Harvesting

Timber harvesting presents no constraints or concerns for the proposed works.

#### Mining

Mining presents no constraints or concerns for the proposed works.

#### Recreation and Tourism

Recreation and tourism present no constraints or concerns for the proposed works.

#### Anthropogenic Features and Adjacent Land Users

Works consist of maintenance upgrades of an existing trail system. Anthropogenic features and adjacent land users are not constraining to the proposed development.

## 4. Conclusions and Recommendations

This report details the baseline conditions and identifies potential environmental constraints for the proposed Flank Trail bridge replacement works in Whistler, BC. Proposed works consist of replacing the existing clear span bridge over Twentyone Mile Creek. Based on the conditions observed on the site and the information reviewed, the site appears to be suitable for the proposed works subject to the following recommendations:

1. Construction of the new bridge should occur within the footprint of the existing bridge in order to avoid impacts to the Sensitive Ecosystem Protection areas surrounding the site.
2. All works and laydown areas should be located within the existing disturbed footprint.
3. Impacts to riparian vegetation in the surrounding area should be minimized.
4. Should any vegetation removal be required in the forest fringe habitat surrounding the worksite, a QEP should conduct a nest survey prior to disturbance of vegetation to ensure compliance with the *Wildlife Act*, and a survey for rare and endangered wildlife to ensure compliance with the *Species At Risk Act*.
5. Exposed soils or stockpiles of organic material should be covered with polyethylene liner, or equivalent, during inclement weather in order to prevent mobilisation of sediment into Twentyone Mile Creek.
6. Construction works should follow guidelines and recommendations outlined in *Develop with Care: Environmental Guidelines for Urban and Rural Land Development in British Columbia* (MOE, 2014) and the *Land Development Guidelines for the Protection of Aquatic Habitat* (DFO, 1993).
7. Avoid impacts to wildlife by following recommended management plans and adhering to the *RMOW Garbage Disposal and Wildlife Attractants Bylaw* (RMOW, 2008).

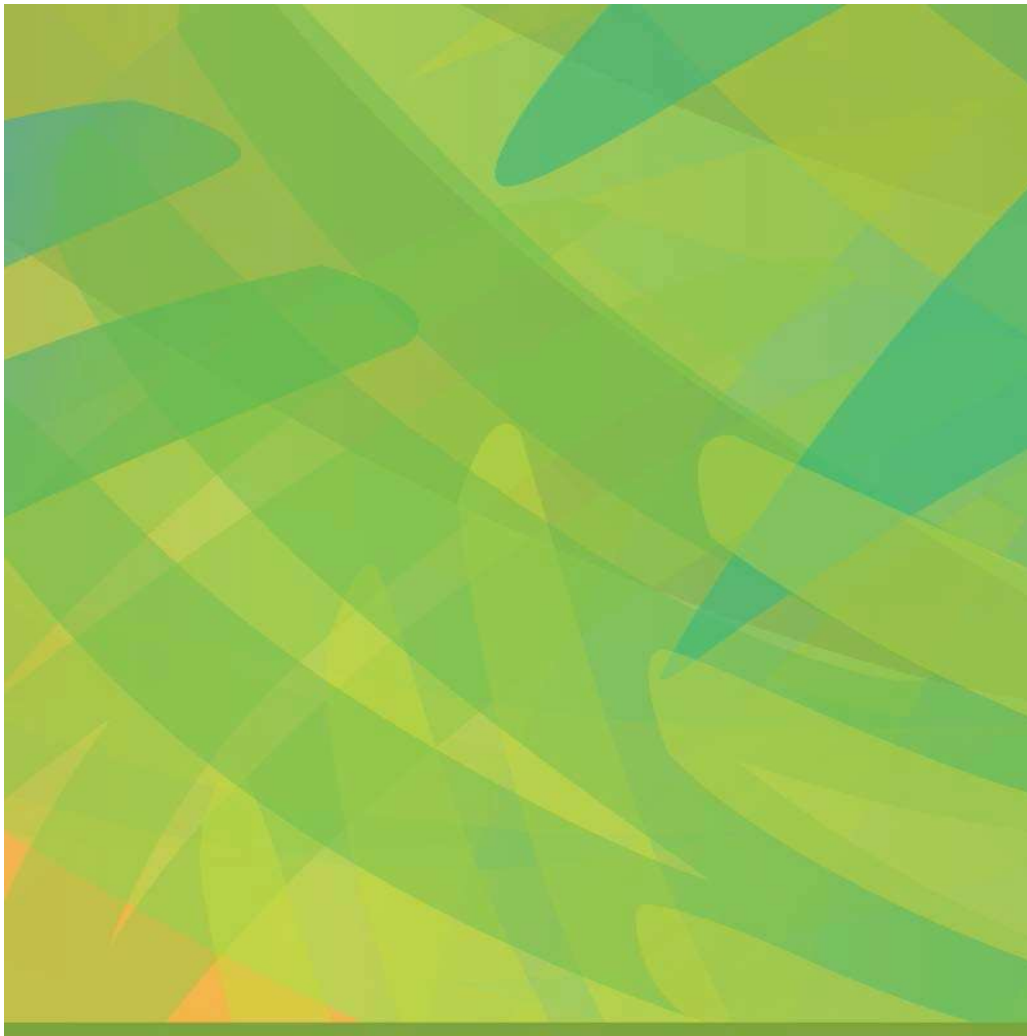


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