Addendum

Attn: Bidders

DATE: July 12, 2021 **PROJECT No.:** 0837-067
PROJECT NAME:
Benson Falls Regional Park Access Improvements
Phase 2
Tender 21-019

From: Ali Sadeghi, P.Eng.

1 Pages Following

AD-01

1. *This Addendum shall be read in conjunction with and considered as an integral part of the Contract Documents; revisions supersede the information contained in the original drawings, specifications or previously issued Addendum.*
2. *Tender Price submitted shall include all items of this Addendum.*
3. *No consideration will be allowed for any extras due to any bidder not being familiar with the contents of this Addendum.*

Addendum Information: Changes noted in **RED**

QUESTIONS & ANSWERS

Q1: *We are interested in submitting a bid for this project but won't have bonding ready in time for closing. Would the owner accept an alternate form of bonding? For example, 20% cash equivalent (bank draft etc)?*

A1: No alternatives other than the bonding requirement identified in the tender will be accepted.

Q2: *Could we please ask for one week extension to this tender closing?*

A2: There will be no extension to the tender closing date.

Q3: *I would like to request the geotechnical report and environmental report noted on Appendix C & D.*

A3: The geotechnical report and environmental report are attached to this addendum.

Q4: *Is the soil on site suitable for 1:1 backfill and sloping as shown on S14?*

A4: The note should be read as:

*"Back fill to a **minimum** slope of **1.5** to 1, Typical"*

Q5: *Can you confirm if the trees or other natural formations in the area is suitable for rope access anchor and lowering of small mobile equipment?*

A5: The project site is characterized by steep slope in section in the excess of 100%. As per Section 6 of the Special Conditions of Tender (Page SC4), it is the Bidders responsibility access the site and prepare a site specific safe work procedure for steep slopes that meets all the Works Safe BC regulations.

Q6: *Is there a preferred color of PVC coating on galvanized wire rope on delineators?*

A6: Only clear PVC coting on galvanized wire rope will be acceptable.

Q7: *Simpson WUB base does not have provisions for 19mm bolts as per detail 2, S12. Would 12mm bolts be acceptable?*

A7: 12 mm galvanized bolt will be acceptable.

END OF AD-01

Per:_____
Ali Sadeghi, P.Eng.

CC: Amy Gore- RDN
Kurtis Felker- RDN

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mail@heroldengineering.com
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TETRA TECH

TECHNICAL MEMO

ISSUED FOR USE

To:	Ali Sadeghi, P.Eng.	**Date:**	July 12, 2021
		Memo No.:	001
From:	Andrew Walker, P.Eng.	**File:**	704-ENG.VGEO3287-02
Subject:	Ammonite Falls Site – Geotechnical Assessment		

1.0 INTRODUCTION

Tetra Tech Canada (Tetra Tech) was retained by Herold Engineering Limited (Herold) for the provision of geotechnical engineering services at Benson Creek Falls Regional Park (BCFRP).

Tetra Tech had previously provided a report titled 'Preliminary Geotechnical Engineering Assessment for Benson Creek Falls Regional Park' which discussed slope stability and various options / recommendations for trail and bridge development at the Benson Creek and Ammonite Falls sites.

This memo outlines the following for the Ammonite Falls site (the Site):

- The findings of a site reconnaissance that took place on June 24, 2021 with Mr. Andrew Walker, P.Eng. of Tetra Tech and Mr. Ali Sadeghi, P.Eng. of Herold; and
- A review of Herold's drawings which provide the details for foundations, stairway and viewing platform.

Herold Issued for Review drawings titled "Falls Site – Plan and Profile Sheet 2" No. S12, and "Falls Site – Typical Details Sheet 2" were reviewed during the creation of this memo.

2.0 GENERAL CONSTRUCTION RECOMMENDATIONS

The Site has steep grades along the proposed stairway requiring crib steps and concrete footings.

2.1 Crib Steps

Some field fitting will be required to situate crib steps and the concrete footings around potential roots or boulders and in native, non-creeping soil. It is our understanding that the crib steps will be anchored in place with rebar – it is recommended that large diameter rebar (e.g., 20 mm) be utilized so that it has less potential to bend during installation with a sledge hammer. These crib step areas should be constructed in a manner to discourage the accumulation and flow of rainwater where they are situated.

2.2 Concrete Footings

The proposed foundation design for the stairway and view platform is shown on the Herold Drawing Sheet No. 0837-067-S13. Some typical details and comments concerning the foundations are summarized as follows:

Tetra Tech Canada Inc.
#1 - 4376 Boban Drive
Nanaimo, BC V9T 6A7 CANADA
Tel 250.756.2256 Fax 250.756.2686

- Typical stairway concrete footings are a minimum 460 mm L x 460 mm W x 300 mm H when situated on approved soil subgrade. The minimum depth of embedment into native material is 457 mm from the from the front of the footing.
- If the minimum depth of embedment can't be achieved due to shallow bedrock, the typical stairway concrete footings are to be a minimum 305 mm L x 305 mm W on rock, attached to 2 x 15M dowels drilled a minimum 305 mm into rock.
- The design loads for the stairway and viewing platform footings at ULS are 85 kN per footing (50 kN per endpost) with an average end bearing of 165 kPa. These are acceptable design loads provided the recommendations in this memo are followed.
- The footings should be situated entirely within native non-creeping soil or on competent bedrock below the potential frost zone. This would mean that the footing depths may vary based on site specific conditions, if they are embedded within the native soils to the minimum depths designed. Boulders and/or roots may require some field fit adjustments. Footings should not be placed under or above roots to prevent potential root jacking.
- A geotechnical engineer will be required to assess all foundation bearing subgrades prior to pouring concrete.

3.0 CLOSING REMARKS

Since the initial site visits in 2017, the site conditions have changed considerably, with more exposed bedrock and erosion on the slope path. With the shallow bedrock and dense soil at these sites, tree root systems tend to be shallow and when trees reach a certain size they are susceptible to falling during windstorms and periods of high precipitation. When these trees fall they can trigger shallow debris flow failures. This is a part of the life cycle of trees at these sites and therefore, while every effort can be made to design and build long term infrastructure, the nature of these sites means that some uncertainty with any design remains.

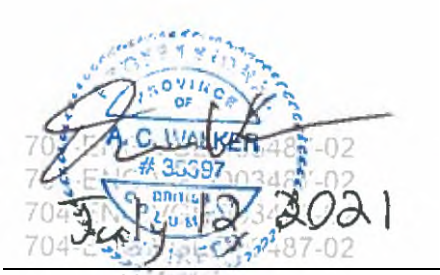
4.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Herold Engineering Limited and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Herold Engineering Limited, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in the Appendix or Contractual Terms and Conditions executed by both parties.

5.0 CLOSURE

We trust this technical memo meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully Submitted,
Tetra Tech Canada Inc.



Prepared by:
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/dr

Enclosure: Tetra Tech's Limitations on the Use of this Document

APPENDIX A

TETRA TECH'S LIMITATIONS ON THE USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

GEOTECHNICAL

1.1 USE OF DOCUMENT AND OWNERSHIP

This document pertains to a specific site, a specific development, and a specific scope of work. The document may include plans, drawings, profiles and other supporting documents that collectively constitute the document (the "Professional Document").

The Professional Document is intended for the sole use of TETRA TECH's Client (the "Client") as specifically identified in the TETRA TECH Services Agreement or other Contractual Agreement entered into with the Client (either of which is termed the "Contract" herein). TETRA TECH does not accept any responsibility for the accuracy of any of the data, analyses, recommendations or other contents of the Professional Document when it is used or relied upon by any party other than the Client, unless authorized in writing by TETRA TECH.

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1.2 ALTERNATIVE DOCUMENT FORMAT

Where TETRA TECH submits electronic file and/or hard copy versions of the Professional Document or any drawings or other project-related documents and deliverables (collectively termed TETRA TECH's "Instruments of Professional Service"), only the signed and/or sealed versions shall be considered final. The original signed and/or sealed electronic file and/or hard copy version archived by TETRA TECH shall be deemed to be the original. TETRA TECH will archive a protected digital copy of the original signed and/or sealed version for a period of 10 years.

Both electronic file and/or hard copy versions of TETRA TECH's Instruments of Professional Service shall not, under any circumstances, be altered by any party except TETRA TECH. TETRA TECH's Instruments of Professional Service will be used only and exactly as submitted by TETRA TECH.

Electronic files submitted by TETRA TECH have been prepared and submitted using specific software and hardware systems. TETRA TECH makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

1.3 STANDARD OF CARE

Services performed by TETRA TECH for the Professional Document have been conducted in accordance with the Contract, in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this Professional Document. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of the Professional Document.

If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of this Professional Document, TETRA TECH may have relied on information provided by third parties other than the Client.

While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this document, at or on the development proposed as of the date of the Professional Document requires a supplementary exploration, investigation, and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, TETRA TECH has not been retained to explore, address or consider and has not explored, addressed or considered any environmental or regulatory issues associated with development on the subject site.

1.8 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems, methods and standards employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. TETRA TECH does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

1.9 LOGS OF TESTHOLES

The testhole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive. Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

1.10 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of test holes and/or soil/rock exposures. Stratigraphy is known only at the locations of the test hole or exposure. Actual geology and stratigraphy between test holes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historical environment. TETRA TECH does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional exploration and review may be necessary.

1.11 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

1.12 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

1.13 INFLUENCE OF CONSTRUCTION ACTIVITY

Construction activity can impact structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer when the final design and construction techniques, and construction sequence are known.

1.14 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, and the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

1.15 DRAINAGE SYSTEMS

Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function. Where temporary or permanent drainage systems are installed within or around a structure, these systems must protect the structure from loss of ground due to mechanisms such as internal erosion and must be designed so as to assure continued satisfactory performance of the drains. Specific design details regarding the geotechnical aspects of such systems (e.g. bedding material, surrounding soil, soil cover, geotextile type) should be reviewed by the geotechnical engineer to confirm the performance of the system is consistent with the conditions used in the geotechnical design.

1.16 DESIGN PARAMETERS

Bearing capacities for Limit States or Allowable Stress Design, strength/stiffness properties and similar geotechnical design parameters quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition used in this report. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions considered in this report in fact exist at the site.

1.17 SAMPLES

TETRA TECH will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of samples can be made at the Client's expense upon written request, otherwise samples will be discarded.

1.18 APPLICABLE CODES, STANDARDS, GUIDELINES & BEST PRACTICE

This document has been prepared based on the applicable codes, standards, guidelines or best practice as identified in the report. Some mandated codes, standards and guidelines (such as ASTM, AASHTO Bridge Design/Construction Codes, Canadian Highway Bridge Design Code, National/Provincial Building Codes) are routinely updated and corrections made. TETRA TECH cannot predict nor be held liable for any such future changes, amendments, errors or omissions in these documents that may have a bearing on the assessment, design or analyses included in this report.

AQUAPARIAN
Environmental Consulting Ltd.

January 27, 2020
Revised May 2020 & June 2021

Kelsey Cramer, Parks Planner
Regional District of Nanaimo
1490 Springhill Road
Parksville BC, V9P 2T2

Via Email: kcramer@rdn.bc.ca

RE: ENVIRONMENTAL PROTECTION PLAN
BENSON CREEK FALLS REGIONAL PARK ACCESS IMPROVEMENTS PROJECT PHASE 2

1.0 INTRODUCTION

Aquaparian Environmental Consulting Ltd. (Aquaparian) was retained by the Regional District of Nanaimo (RDN) to complete an Environmental Impact and Remediation Assessment (EIA) Report for proposed trail upgrades within the Benson Creek Falls Regional Park located in Electoral Area C of the RDN.

As understood, Benson Creek Falls Regional Park has increased in popularity over recent years as a hiking destination due to growing awareness of the impressive Ammonite Falls waterfall (also known as Benson Creek Falls). Access to the waterfall is gained from a trail from the south accessed from Jameson Road (Ammonite Falls Regional Trail). The increased foot traffic has caused extensive erosion as hikers have made their own trails down the steep bank of the ravine to view the waterfall. The current situation does not only pose a danger to the public but also impacts the stream and natural vegetation negatively, increasing sedimentation to the stream, a known fish habitat, and preventing vegetation to fill in along the slope which further decreases bank stability.

The access improvements will benefit both stream health and public safety. The planned activities include the following:

- Transport of materials and tools into the park;
- Cutting and filling slopes;
- Installation of timber crib steps;
- Installation of staircases and landings;
- Installation of a viewing platform;

- Concrete pouring for staircase and viewing platform footings; and,

The purpose of the following Environment Protection Plan (EPP) is to provide the contractor with environmental protection measures that can help to minimize accidental impacts to the stream (i.e. water quality, fish habitat) or the forest while completing specific tasks. The EPP is to be considered as a living document that may need to be amended to include and/or meet any terms and conditions that may be imposed by permits, licenses, or other approvals. This document is intended to support the Environmental Impact Assessment report but has been formatted as a stand-alone document that is to be provided to the construction contractor awarded to carry out the project. The General Contractor shall be required to review and have a copy of this document on site at all times during the construction of the project. The EPP has been created to mitigate potential environmental impacts during the construction phase of the project.

2.0 ENVIRONMENTAL MONITOR ROLES AND RESPONSIBILITIES

Environmental monitoring is expected to be completed on a part time basis. High risk activities such as concrete pouring for stair and viewing platform footings will be monitored during pour while regular inspection for erosion and sediment control during stair construction will be limited to part time inspections. Full time monitoring will be required for any activities that have the potential to impact the stream. All environmental monitoring will be completed by Aquaparian as per the RDN. The role of the Environmental Monitor (EM) is to inspect, evaluate and report on the compliance and effectiveness of work practices and environmental protection and mitigation procedures as identified in this EPP and associated permits or approvals and to recommend and oversee improvements to the plan as necessary.

The EM shall have the authority to advise the contractor(s) to modify or halt construction operations that conflict with safe environmental practices and procedures. A shut-down plan will be in place in the event of heavy rains. Mitigation measures include general objectives related to environmental protection and a site specific action plan to control impacts to fish and wildlife during construction activities.

The contractor shall review this EPP document prior to start of the project. The EM will hold a pre-construction meeting with the construction crew(s) to review environmental protection requirements identified within this document and all associated regulatory documents. During the construction phase of the project, the EM will have the primary responsibility to confirm that environmental management measures, controls and specifications are implemented in accordance with the EPP and are operating in compliance with terms and conditions of regulatory permits and approvals and Industry Best Management Practices (BMPs).

2.1 ROLES AND RESPONSIBILITIES OF THE EM

Roles and responsibilities of the EM include, but are not limited to the following:

- Have an understanding of all aspects of the project including the contract documents, project-related authorizations, agency guidelines and other documents, and confirm if all mitigation measures contained within are being appropriately implemented;
- Review the contractor's work plans to confirm if the conditions of the EPP are met, and make recommendations to address any deficiencies;
- Monitor contractor work activities as required and be on call should an emergency arise. A monitoring report is to be generated following every site inspection documenting project activities, mitigation measures and any recommendations made. Site photographs are to be included;
- Consult with the construction Project Manager should a Work Stoppage be necessary if environmental protection is compromised;
- Have a shut-down procedure in place in the event of heavy rains;
- Inventory contents of Emergency Spill Kits and confirm if they are appropriately stocked and maintained;
- Large machinery is not expected to be used for this project. Access limits the equipment to smaller, portable gas powered equipment and hand tools. Monitor on-site equipment for oil or fuel leaks and follow-up any repairs prior to machinery being mobilized on site;
- Complete Environmental Incident Reports (EIR) when required. The EM or project manager is to observe, document and report spills and spill cleanup and contact appropriate authorities (i.e. Emergency Management BC (EMBC)) in the event of an environmental incident or development of unforeseen site conditions with potential for serious environmental degradation; and,
- Review contractor final site cleanup.

2.2 CONTRACTOR ENVIRONMENTAL REPONSIBILITIES

The contractor's environmental responsibilities include:

- Be completely familiar with mitigation measures outlined in this EPP document;
- Implement and maintain mitigation measures to meet the objectives identified in this report;
- Frequent inspection of equipment for wear and leaks;
- Spill prevention and management, waste management and disposal;
- Maintain supplies of emergency spill management equipment and crew response training;
- Report spills to the EM and other relevant personnel/agencies as per the Spill Reporting Procedure (SRP); and,
- Work with the EM if additional measures are necessary to meet the guidelines set out in this report.

2.3 ENVIRONMENTAL INCIDENT REPORTS (EIR)

Spill prevention and emergency response procedures shall be communicated to all construction crew at the start of the project and thereafter at regular intervals throughout the contract. The EM will be required to report environmental incidents, including non-compliance issues to the Project Manager and to external agencies such as EMBC if required by the nature of the incident within 24 hours.

An environmental incident is one that has caused, or has the potential to cause, one or more of the following:

- Environmental damage;
- Adverse effects to fish, wildlife or other environmental resources;
- Adverse publicity with respect to the environment; and,
- Legal action with respect to violation of statutes or environmental damage.

Examples of an environmental incident include, but are not limited to:

- Spills of oil, hydraulic fluid or other hazardous chemicals; and,
- Discharges of deleterious substances into the freshwater environment.

An emergency contact list is to be generated by the contractor at the beginning of the project and the list is to be kept onsite and available to all crew members in the event of an emergency.

For incidents that pose a threat to the environment or human safety as identified by the *Environmental Management Act* Spill Reporting Regulation, the first external call shall be made to the EMBC (formerly PEP) 1-800-663-3456 (24 hour).

The Project Manager or EM (if on site) should be notified as early as possible following an incident and the spill must be documented by Environmental Incident Report (EIR). In addition, it may be necessary in some situations for the EM to notify regulatory agencies with respect to environmental incidents. Agency reporting requirements are provided in Table 1 and shall be included in any Spill Prevention and Emergency Response documentation prepared for the project.

TABLE 1. SPILL REPORTING MATRIX

Substance	Quantity	External Reporting Requirements	Internal Reporting Requirements
Any spill into water	Any	EMBC	EIR
Oil & waste oil	>100L	EMBC	EIR
Oil with >50ppm PCB	>1kg	EMBC	EIR
Flammable or non- flammable gas	10kg	EMBC	EIR
Toxic or corrosive waste	>5kg	EMBC	EIR
Hazardous waste	>5L	EMBC	EIR

Where a spill occurs, the person who immediately before the spill had possession, charge or control of the spilled substance shall take all reasonable and practical action, having due regard for the safety of the public and of himself or herself, to stop, contain and minimize the effects of the spill. Environmental incidents are to be reported to the project team within 24 hours. The incident report is to include the following information:

(a) The reporting person's name and telephone number,

(b) The name and telephone number of the person who caused the spill,

(c) The location, date and time of the spill,

(d) The type and quantity of the substance spilled,

(e) The cause and effect of the spill,

(f) Details of action taken or proposed to comply with Section 3,

(g) A description of the spill location and of the area surrounding the spill,

(h) The details of further action contemplated or required,

(i) The names of agencies on the scene, and

(j) The names of other persons or agencies advised concerning the spill.

3.0 ENVIRONMENTAL PROTECTION PLANS (EPPS)

3.1 GENERAL ENVIRONMENTAL PROTECTION MEASURES

- Aquaparian will be monitoring on a full-time basis for all activities with potential to impact the freshwater environment and part-time for all other activities to ensure that sediment and erosion control measures are in place due to the presence of a fish bearing stream downslope from the project area. The EM is to conduct a project start-up meeting with the contractors to review requirements of this EPP and verify environmental protection equipment is on site including spill prevention kits, filter fabric, site safety signage, hazardous material storage, garbage storage, permits etc;

- Inspect and verify all equipment is in good working order, clean and free of leaks prior to mobilizing on site;

- Store food and food waste in a secure container during works and remove off site when personnel are not on site to prevent attracting wildlife;

- Prepare a plan to remove equipment, fuel supplies and/or waste materials from the forest and project area at night to prevent wildlife from accessing it or causing a spill;

- Complete regular inspection of the emergency response plan and spill containment / recovery equipment, and spill response training programs;

- Inspection of the effectiveness of contractor's construction waste management program;

- Completion of monitoring reports and incident reports as necessary;

- Hazardous waste material generated in the course of the project (oil adsorbent pads, oily & grease covered rags, containers, etc.) shall be disposed of in compliance with hazardous waste regulations; and,

- A Spill Response Plan and Emergency Response Plan are to be developed by the contractor and kept in the site foreman's vehicle.

3.2 EXCAVATION OF SOILS AND VEGETATION REMOVAL

- Clearing of trees or understory vegetation should be done outside of the migratory bird nesting season (March 1 – August 15). If not, a nesting survey must be completed within a week of the proposed clearing date, preferably no more than three days prior;
- Sediment and erosion control measures are to be put in place during earthworks along the slope. This includes the following measures:
    - Earthworks are to be completed in dry weather whenever possible;
    - If there is sufficient room at the top of the slope to stockpile soils temporarily, soil stockpiles are to be protected from erosion during heavy rain i.e. covered with poly or tarp; and,
    - A silt fence will be necessary at the toe of slope to prevent sediment migration into the stream due to the steep slope of the ravine during periods of rain. It may also be necessary to cover exposed soils with poly sheeting overnight or over weekends if heavy rain is forecast.
- Upon completion, exposed soils should be covered with straw or composted bark mulch to protect the slope from erosion. The recommended restoration area is to be replanted upon completion with native plants suitable for shady understory including sword fern, dull Oregon-grape and salal. Planting density should be at least 2 plants per square meter or one plant per square meter for sword fern. The exact area of the planting requirement unknown at this time and will be determined following the completion of construction activities.

3.3 SPILL PREVENTION & REPORTING

- The contractor is to have Spill Prevention & Reporting procedures and Emergency Response Plan in place prior to the start of works;
- All work will be conducted in a manner that does not result in the deposit of a toxic or deleterious substance into the waters frequented by fish;

- Equipment fueling is assumed to use Gerry cans and will be completed in the upland away from the top of slope;

- Gerry cans of fuel will be stored in a Rubbermaid tub with a tight fitting lid when not in use to prevent spillage;

- The Environmental Monitor (EM) is to be made aware of all fuel, oil and / or chemical spills that occur during the project;

- Containment, recovery and clean-up procedures are to be in place prior to the start of work;

- At least one spill containment boom should be on site for immediate deployment into the stream in case of accidental spill; and

- If a fuel or hydraulic oil spill occurs, the operator of the machine or equipment shall stop work immediately, address the immediate containment and clean-up of the spill and undertake the repair or replacement of the machinery before work is allowed to continue. The following spill response procedure is to be followed:

1. MAKE THE AREA SAFE
2. STOP THE FLOW (when possible)
3. SECURE THE AREA
4. CONTAIN THE SPILL
5. NOTIFY/REPORT
6. CLEAN-UP
7. SPILL REPORT

1. MAKE THE AREA SAFE

- Evaluate risk to Personal/Public and Environmental Safety;
- Wear appropriate Personal Protective Equipment (PPE);
- Never rush in, always determine the product spilled before taking action;
- Warn people in the immediate vicinity; and,
- Ensure no ignition sources if spill is a flammable material.

2. STOP THE FLOW (when possible and safe to do so)

- Act quickly to reduce the risk of environmental impacts;
- Close valves, shut off pumps or plug holes/leaks; and,
- Stop the flow or the spill at its source.

3. SECURE THE AREA

- Limit access to the spill area; and,
- Prevent unauthorised entry onto the site.

4. CONTAIN THE SPILL

- Prevent spilled material from entering the stream;
- Use spill sorbent material or containment boom to contain the spill;
- If necessary, use a dyke or any other method to prevent any discharge on site; and,
- Make every effort to minimize contamination.

5. NOTIFY/REPORT

- Verbally report all spills to the EM and the Project Manager immediately. All spills to the freshwater environment are to be reported to **EMBC (1-800-663-3456)**.

6. CLEAN-UP

- Determine required cleanup options;
- Mobilize recovery equipment and cleanup crew and direct cleanup activities;
- Dispose of all equipment and/or material used in clean up (e.g., used sorbent, oil containment materials, etc.) in accordance with MFLNRO requirements;
- Accidental spills may produce hazardous wastes (e.g., material with > 3% oil by mass) and contaminated soil. All waste disposals must comply with the *Environmental Management Act* and Regulations; and
- Replenish spill response kits and equipment.

7. SPILL REPORT

- Provide necessary spill details. A spill report should be completed and submitted to the Project Manager within 24 hours of the incident documenting the type and volume of spill, clean up and if external reporting was required; and,
- The EM will have the authority to shut down the work should fish or fish habitat be at risk. If directed by the project manager, the EM will make an external call to EMBC if necessary.

3.4 Concrete Management

- No uncured concrete or concrete pour water is to enter the stream. High pH caused by uncured concrete is harmful to fish. Manage concrete pours (i.e. viewing platform and stair footings) to prevent spillage (ensure adequate seals, cover drying concrete with plastic when necessary to protect from rain etc);

- All concrete poured on site must remain in sealed formed structures or otherwise be contained to prevent migration toward the riparian area;

- The contractor will be required to have a concrete pouring management plan in place before the pouring takes place in order to mitigate concrete laden pour water from being released to the freshwater environment;

- No concrete equipment / tools are to be washed down near the stream. Waste concrete will not be allowed to enter the stream and will be disposed of offsite; and

- Work in dry (no or low precipitation) weather conditions if possible during concrete pours.

4.0 CONCLUSION

This EPP has been formulated using standard environmental protection guidelines and regulations for working within and around a stream. Based on our findings in the Environmental Impact Assessment, the project is not expected to result in a negative impact to fish and fish habitat if all precautions outlined in this document are followed. Additionally, this project is not expected to affect the forest or wildlife habitat if the above precautions are followed.

The contractor(s) will be required to review this document and the Environmental Protection Measures outlined within it prior to the commencement of works. The contractor is to have a copy of this document on site at start-up.

If there are any questions regarding the content of the EPP, please contact the undersigned.

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