Construction Environmental Management Plan (CEMP)

Narrows Inlet Hydropower Project

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ABBREVIATIONS

Abbreviations	Description
ANFO	Ammonium Nitrate Fuel Oils
BCWQG	BC Water Quality Guidelines
BMP	Best Management Practice
CCME	Canadian Council of Ministers of the Environment
CDC	Conservation Data Centre
CEMP	Construction Environmental Management Plan
CMT	Culturally Modified Trees
CWL	Conditional Water Licence
CWP	Care of Water Plan
CWR	Comptroller of Water Rights
CWS	Canadian Wildlife Services
DFO	Department of Fisheries and Oceans
DP	Development Plan
DPT	Development Plan Template
DRM	Director of Resource Management
EA	Environmental Assessment
EAC	Environmental Assessment Certificate
EAO	Environmental Assessment Office
EI	Environmental Incident
EMP	Environmental Management Plan
EMBC	Emergency Management British Columbia
EPP	Environmental Protection Plan
EPRP	Emergency Preparedness and Response Plan
ES	Environmental Specialist
ESA	Environmentally Sensitive Areas
ESDM	Erosion, Sediment and Drainage Management
EWP	Environmental Work Plan
FDC	Fire Danger Class
GBPU	Grizzly Bear Population Unit
GWM	General Wildlife Management
HDPE	High Density Polyethylene



Abbreviations	Description
HEP	Hydroelectric Project
IE	Independent Engineer
IEM	Independent Environmental Monitor
IFR	Instream Flow Release
LTCC	Leave to Commence Construction
MBCA	Migratory Bird Conservation Area
MFLNRO	Ministry of Forests, Lands and Natural Resource Operations
ML/ARD	Metal Leaching/Acid Rock Drainage
MOE	Ministry of the Environment
MW	Megawatts
ОСР	Official Community Plan
OGMA	Old Growth Management Area
OLTC	Occupant Licence to Cut
PEP	Provincial Emergency Program
POI	Point of Interconnection
PLA	Permits, Licences and Approvals
QA/QC	Quality Assurance and Quality Control
QEP	Qualified Environmental Professional
RCMP	Royal Canadian Mounted Police
ROW	Right of Way
RUA	Road Use Agreement
RWM	Regional Water Manager
SAR	Species at Risk
SARA	Species at Risk Act
SEV	Severity-of-III-Effect Score
SDM	Statutory Decision Maker
TC	Transmission Component
тснр	Tyson Creek Hydroelectric Project
тос	Table of Conditions
TSS	Total Suspended Solids
UWR	Ungulate Winter Range
VC	Valued Component
WHA	Wildlife Habitat Area



DOCUMENT APPROVAL

This CEMP [FINAL 1.2] for the Narrow	vs Inlet Hydropower Project, Water Licence []
or File [] has bee	n reviewed by and the information presented herein is acceptable
to:	
On behalf of the Proponent / License	e and the shíshálh Nation
Signature:	Date:
Full Name:	
AND	
Signature:	Date:
Full Name:	
Position:	
On behalf of the Province of British C	olumbia (MFLNRO)
Signature:	Date:
Full Name:	
Position:	
On behalf of the Regional Water Mai	nager (or Office of the Comptroller of Water Rights)
Signature:	Date:
Full Name:	

NOTE: This Document Approval page is to be updated after each revision of the final document (excluding drafts). Superseded Document Approval pages are to be kept and stored as an appendix (Appendix A) to this CEMP. A record of revisions/updates to the CEMP are to be kept using the tracking tables provided in Section 1.3.



1.0 Introduction

As a condition of the *Conditional Water Licence* (CWL) issued by the Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) for a Clean Energy hydroelectric project in British Columbia, licensees are required to prepare a detailed Construction Environmental Management Plan (CEMP). This CEMP is to be submitted to MFLNRO for review and approval, and it must describe all phases of construction of the facility, as well as safeguards and mitigations to avoid or minimize environmental effects of construction of the facility and associated infrastructure. As minimum requirements, the CEMP must include: a description of construction of the facility infrastructure; associated timelines; relevant permits and licences; specifics on how the construction will be carried out; methods for monitoring construction to verify compliance with the *Water Act* licence and other regulatory conditions; and identification of reporting commitments.

This document has been developed to provide guidance, protection criteria and mitigation requirements to ensure that Valued Components (VC) identified within the project area are protected, and that construction impacts are adequately and effectively mitigated (i.e., in accordance with the commitments made during the EA process). This document binds BluEarth Renewables Inc. (the 'Licensee'), their employees, management consultants, construction contractor(s), and other service providers to performance-based standards, procedures and protocols that will be adhered to throughout the construction, commissioning and early operational phases of the project.

This CEMP also provides a framework that identifies project- and area-specific VCs, construction-related risks, environmental management objectives, and mitigation strategies that will be applied to minimize these risks. This framework is structured to provide measurable performance indicators that will be used throughout the course of construction to evaluate environmental performance and compliance with the project permits and EA conditions.

The CEMP provides clear and detailed information pertaining to all aspects of the construction phase up to, and including, commissioning of the project facility. This includes, but is not limited to: works to be constructed, environmental monitoring required, strategies and techniques to minimize or mitigate environmental impacts during construction, animal and plant salvage, flood handling, incident reporting, and compliance reporting.

Where applicable, this plan supersedes previous CEMP editions and/or versions developed by NI Hydro Holding Corp. for operational and ongoing (i.e., in construction) projects.



1.1 Background

BluEarth Renewables Inc., through NI Hydro Holding Corp., is currently proposing to construct three hydroelectric projects (HEPs) on Chickwat and Ramona (Upper and Lower) Creeks as part of the Narrows Inlet Hydropower Project. Including a Transmission Component (TC), these are collectively referred to as the "Project". Note that a controlling interest in the Project was acquired by BluEarth Renewables Inc. from previous shareholders in May, 2015.

The hydroelectric components are located in the Tzoonie River valley and Narrows Inlet, Sunshine Coast Regional District, in the lower Coast Range of BC. Figure 1 provides a general overview of the Project location and its relation to population centers. The Project site is 50 km north of the town of Sechelt, and is situated at the northern end of Narrows Inlet, in the Tzoonie River Valley.

NI Hydro Holding Corp. originally submitted an application of the BC Environmental Assessment Office (EAO) on 21-Aug-12 for the Narrows Inlet Hydropower Project, which consisted of five interrelated hydro-electric generating components on four creeks - located within a radius of 5 - 7 km, centered at the confluence of the Tzoonie River and Tyson Creek, plus an interconnection component. The components included in the project at the time that the application was submitted to the EAO were: Chickwat, Ramona (Upper and Lower), SS, and CC Creeks, as well as the Transmission Component.

On 18-Mar-13, NI Hydro Holding Corp. wrote to the EAO and requested that two of the six components of the proposed project, namely the CC Creek and SS Creek components, be removed and minor modifications to the Chickwat Creek and Upper Ramona Creek components be made. Removal of the CC and SS Creek components from the proposed Project was confirmed by EAO on 18-Jul-13.

The removal of the CC Creek and SS Creek components did not necessitate any changes or additions to the remaining power generation components or the interconnection. The maps showing the details of the remaining components of the Project are included in Figure 2.

One of these HEPs is a typical run-of-river facility (Chickwat Creek) and two are extreme high head low-flow projects with lake storage designs (Ramona Creek, Upper and Lower). When operating at full potential, they will have a combined generating capacity of 33 MW. These facilities will be connected to the BC Hydro grid via the TC, which includes the following transmission facilities:



Figure 1. General overview of the Project location and its relation to population centers.

-- Figure provided on the following page --





Figure 2. Detailed map depicting the Project and its components and illustrating the location of each relative to the others.

-- Figure provided on the following page --







- 25 kV transmission feeder lines to common substation;
- the common substation with 25 to 138 kV step-up transformer;
- 138 kV transmission line to a new point of interconnection by Highway 101; and
- the Skookumchuck Narrows ocean crossing.

Power will flow into the BCH Malaspina Substation and will generally be used by residential and commercial consumers on Vancouver Island and the Lower Mainland of BC.

1.2 Document Approval

The Licensee confirms that is the current version of the Narrows Inlet Hydropower Project CEMP (refer to Table 1 for details).

As shown by the supported by the signatories identified on page xiv, the Licensee confirms that this CEMP has been satisfactorily prepared, reviewed and approved by the *shishálh* Nation, the Province of British Columbia (MFLNRO), and the Regional Water Manager (or a responsible authority from Office of the Comptroller of Water Rights).

1.3 Revision Tracking Tables

Revisions of this document strictly are controlled. All changes made to the CEMP will be initiated by the Licensee, and are tracked in Tables 1 and 2.

These tables are for the use of the Licensee, MFLNRO representatives and all project personnel responsible for the compliance, monitoring and enforcement of the CEMP. Their intent and purpose is to track the document's revision history, and identify significant changes and variations dating back to the first submission of the document.



Revision Number	Date Issued	Description	Prepared by (Initials)	Ministry Review (Initials)
Final 1.0	10-Sep-15	First draft submitted to MFLNRO for review		
Final 1.1	22-Jan-16	Revision based on comments from the IEM		
Final 1.2	22-Feb-16	Revision based on comments from the IEM		

Table 1. Revision tracking table for this Construction Environmental Management Plan.

Table 2.	Revision	tracking tabl	le for appendic	es of this Constru	ction Environmental	Management Plan.
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Appendix	Revision Number	Date Issued	Description	Prepared by (Initials)	Ministry Review (Initials)
All	Final 1.0	10-Sep-15	First draft submitted to MFLNRO for review		
G	Final 1.1	22-Jan-16	Addition of Environmental Monitoring Report		
			template		
н	Final 1.1	22-Jan-16	Addition of CEMP checklist		
L	Final 1.1	22-Jan-16	Addition of Region 2 Wildlife Species		
М	Final 1.1	22-Jan-16	Addition of ESA maps		
В	Final 1.2	22-Feb-16	EAC Amendment #1, Signed Ramona Licences		
			of Occupation, Ramona Section 9 Approval		
D	Final 1.2	22-Feb-16	Updated EA TOC based on Amendment #1		
E	Final 1.2	22-Feb-16	Signed IE scope of work		
F	Final 1.2	22-Feb-16	Signed IEM scope of work		



Appendix	Revision Number	Date Issued	Description	Prepared by (Initials)	Ministry Review (Initials)
J	Final 1.2	22-Feb-16	Updated Archaeological Resources and		
			Cultural Sites Monitoring and Management		
			Plan		



2.0 Construction Environmental Management Plan

2.1 Purpose of the CEMP

The primary purpose of this CEMP is to identify the environmental values and risks associated with the Project. It is also to establish the environmental protection standards and mechanisms that will govern construction and maintenance activities associated with the Project. Together, these will be managed via a defined, performance-based Environmental Management Program.

The objective of this document is to provide guidance to all personnel, contractors, and third party providers on the environmental protection requirements of the Project. This guidance should ensure that unauthorized impacts to Valued Components (VCs) are avoided and/or effectively mitigated. In general terms, the key VCs associated with the Project include aquatic (e.g., fish, amphibian, water quality), terrestrial (e.g., mammals, birds, reptiles, vegetation), and heritage resources (e.g., burial sites, Culturally Modified Trees (CMTs), including chance findings (such as artifacts).

2.2 Document Organization

This document is organized in ten key sections, as follows:

Section 1: Introduction Section 2: Construction Environmental Management Plan Section 3: Project Overview Section 4: Project Governance and Guidance Documents Section 5: Pre-Construction Commitments Section 6: Construction Specific Guidance Section 7: Environmental Management Plans Section 8: Project Specific Environmental Considerations Section 9: Commissioning Section 10: Key Contacts

The Introduction briefly introduces the Project and CEMP. Section 2 identifies its purpose, objective, and format, while also defining the amendment and change management process that will be adhered to when modifying CEMP contents. Section 3 provides an overview of the Project, including details on the design features, components, and environmental resources



documented within the footprint of each of these. A preliminary construction schedule is also presented at the end of the section.

Section 4 describes the corporate environmental commitments and includes a summary of applicable legislation. Section 5 provides a summary of the completion status of commitments relating to pre-construction inventories, assessments, and/or surveys. In Section 6, the roles and responsibilities of all project personnel in the Environmental Management Team are described, including details on the environmental monitoring programs, reporting requirements and commitments, environmental orientation training, and meetings.

Section 7 details the Environmental Management Plans (EMP) describing the environmental protection measures that will be applied and adhered to during the construction of the Project. Each EMP outlines objectives, standard protocols and mitigation measured that are based on applicable legislation, terms and conditions of permits and approvals issued for the Project.

In Section 8, the detailed management plans needed to address Project-specific environmental concerns (focusing on identified VCs) are provided. The section if followed by Section 9, which details the commissioning process and plan prior to the full-time operation of the Project. Lastly, it is in Section 10 that contact information for key project personnel is presented.

2.3 Document Control and Distribution

Amendments and changes will be tracked following detailed document control procedures, which will be subject to quality assurance and quality control verifications. These procedures will include providing a revision number, title, and date, as well as identifying the person(s) proposing and making the changes, and the person(s) approving the changes. This information will be documented in the Revision Tracking Tables (Tables 1 and 2) provided in Section 1.3. Each document holder/recipient (as identified in Table 3) will be responsible for updating the Revision Tracking Tables in their copy of the CEMP.

The current version of the document will be shown on the cover page of the CEMP, in Table 1 and Table 2 (as applicable), and in the header of each page of the CEMP. It is important to note that the purpose of this section is not to supersede corporate or otherwise formal Document Control Programs implemented as part of the Licensee's or the contractor's day-to-day corporate business activities. These procedures should be considered complimentary to such programs.



Recipient Name	Role	Organization	Contact Information
	Contractor		
	Ecosystem Biologist		
	Environmental Coord.		
	Environmental Mgr.		
	Licensee's Site Env. Rep.		
	IEM		
	Project Manager		
	Regional Water Mgr.		
	SDM		
	shíshálh Nation		

Tahle 3	List of mandator	recinients of	⁻ current coni	es and rev	visions of the (FMP
iable 5.		/ Tecipients Of	current copi	es anu rev		

Distribution of current copies and revisions of the CEMP will be controlled and managed by the Licensee. Approved copies will be distributed to individuals and agencies identified in Table 3. Only electronic versions will be distributed. Note that the current version number of the CEMP will be communicated to project personnel/work crews during the delivery of the contractor's site environmental orientation (refer to Section 6.5.1 for further details).

It will be the sole responsibility of the recipients identified in Table 3 to manage and print hard copies of the CEMP. The Licensee commits to maintaining and keeping whole two current, hard copies of the document: (1) at its head office, and (2) at site, in the Licensee's construction office.

2.4 Change Management

The CEMP, including preliminary monitoring and reporting obligations during construction, is to be submitted for review and approval to the Statutory Decision Maker (SDM), the Engineer under the *Water Act*, and/or the Regional Water Manager for Water Allocation, prior to initiating construction. These obligations are to be finalized by the SDM prior to the Leave to Commence Construction (LTCC) being granted.

As the project proceeds through detailed design and construction, the CEMP and its appendices may need to be updated or revised in response to issues such as, but not limited to:



- Design changes resulting from differing site conditions, change orders or construction procedures and methods;
- Construction schedule changes;
- Changes to the terms and conditions of permits and approvals, including mitigation measures;
- Creation of site-specific Environmental Work Plans (EWPs) and/or Environmental Protection Plans (EPPs) by the contractor(s); and,
- Other unforeseen or unexpected requirements.

It is important to note that this CEMP is a dynamic document, and as such, it is expected that it will be amended and changed periodically throughout Project construction. At a minimum, the CEMP will be reviewed annually, and changes will be submitted to applicable agency representatives, as directed by MFLNRO. Review, amendments, distribution and tracking of amendments will be the responsibility of the Licensee. The Licensee may request that the responsibility of CEMP review, distribution, and tracking be undertaken by the IEM, if mutually agreed upon, or his Qualified Environmental Professional (QEP).

It is the responsibility of the contractor(s) to remain current and compliant with the latest, most up-to-date version of the CEMP. Amendments and changes will be disseminated via the implementation of the document control procedures described in Section 2.3. It is expected that similar procedures will be applied to the amendment of, and changes made to, contractor(s) Environmental Protection Plans (EPPs) (refer to Section 7.0).

The CEMP will be amended regularly throughout Project construction. Significant changes may be identified by the Licensee, the Licensee's Site Environmental Representative, the Independent Environmental Monitor (IEM), the contractor(s), and/or Regulatory Agencies. Amendments may be made more frequently depending on the importance/significance of the changes required. It is expected that syntax, typographical and/or grammatical errors will be captured and corrected during regular reviews; however, these will not trigger a formal document amendment and review (for approval) unless a CEMP statement is considered unclear or ambiguous as a result of such errors.

All changes proposed to the CEMP will be documented in two ways:



- 1. in a table that includes: the page number and section number where the change is proposed, the reason for the change, and the person proposing the change; or,
- 2. in an unprotected version of the CEMP master document (in MS Word or other compatible format), using the Track Changes option in the Review Menu.

Once the proposed changes have been completed, they will be summarized in a memo for distribution to recipients identified in Table 3, and will be distributed in accordance with the Distribution Process (refer to Section 2.3), for approval in accordance with the Change Approval Process discussed in Section 2.5.

2.5 Change Approval Process

It is expected that significant changes will be subject to approval by Regulatory Agencies. The IEM may approve some of these changes in lieu of Agencies (where applicable and acceptable to MFLNRO), where he/she has the authority to do so on their behalf.

It is expected that review comments will be returned to the Licensee within seven calendar days of distribution of a revised version of the CEMP. Changes to the CEMP will be considered final and approved unless comments are received within the commenting period.

Only approved versions of the CEMP will be considered current issues. Until approved, any proposed changes that are implemented by the contractor(s) are implemented at his own risk.



3.0 Project Overview

3.1 Licensee

Headquartered in Calgary, Canada, BluEarth Renewables Inc. is a private company focused on commercial-scale renewable energy development and operation. Its goal is to sustainably build, own and operate wind, run-of-river hydroelectric and solar generation projects across North America.

BluEarth Renewable Inc. principals include Kent Brown, CA, president and chief executive officer, director; Kathy Bolton, CA, chief financial officer; and Grant Arnold, M.Eng., P.Eng., MBA, chief operating officer.

3.2 **Project Description**

3.2.1 Chickwat Creek Hydroelectric Project

The Chickwat Creek HEP is a typical run-of-river generating facility and 25 kV transmission line. The transmission line will connect with the existing Tyson Creek line, at which point it will be strung on existing poles below the existing Tyson Creek line. The energy generated from the Chickwat Creek HEP will be transmitted via the existing Tyson Creek line toward the new Narrow Inlet substation, for interconnection and delivery to the BCH grid. When operating at full potential, the Chickwat Creek HEP will have a generating capacity of 19 MW. The key components of this project are described below. Project statistics are summarized in Table 4.

Parameters	Data
Generating Capacity	19 MW
Design Flow (max.)	Main penstock – 7.0 m ³ /s, Teddy Creek (C1) conduit – 0.6 m ³ /s,
	Oscar Creek (C2) conduit – 1.38 m ³ /s
Diversion Length	Main penstock – 2 km (approx.)

Table 4	Chickwat	Creek HEP	summary	v statistics
Table 4.	CHICKWat	CIEEK HEF	Summary	



Parameters	Data
Fish Habitat (species)	Yes in Chickwat (Dolly Varden and Steelhead Trout – see Section 7.14 – Fish and Fish Habitat). Teddy Creek (C1) and Oscar Creek (C2) are non-fish bearing.
Penstock Type	Initial 1200 m – HDPE pipe. Final 800 m steel pipe.
Intake Type	Main – Gate spillway weir Teddy Creek (C1) and Oscar Creek (C2) – concrete Tyrolean weirs with trash racks
Powerhouse and Generating Equipment	2, 5-jet vertical Pelton turbines
Transmission Line Length	1.1 km new and 2.9 km underbuilt (approx.)
Transmission Pole Type	25 kV line, single wood poles

a. Intake

Three intake structures will be constructed as part of the Chickwat Creek HEP. The main intake structure is located on the fish-bearing Chickwat Creek. The second and third structures are located on small non-fish bearing tributaries: C1, located approximately 3 km from the main intake, and C2 located approximately 0.5 km from the main intake. These intake structures will consist of concrete Tyrolean weirs with trash racks that will form headponds.

The Chickwat headworks arrangement will consist of a rockfill overflow weir, gated spillway weir, sluiceway and intake structure weir, sluiceway and intake structure with a sedimentation basin. The crest gate weir will have a 25 m long, 3 m high crest gate with a maximum elevation of 445.0 m and a minimum of 442.0 m. The overflow rockfill weir crest will be a nominal 0.1 m above the design full supply level to provide a buffer for level control. Water will flow over both weirs during flood events greater than the 1:1000 year flood. Together both weirs will allow for an additional 30% flood flow contingency with freeboard. A fish ladder will be integrated into the overflow rockfill weir adjacent to the crest gate weir. Should it remain a requirement, the fish ladder will be designed to accommodate the variable headpond level. Full environmental



specifications have not been determined yet. The main intake will be designed to pass the required design flow while excluding entrained air and sediment. Instream flow will be supplied through the fish ladder that will be built on the west side of the weir.

To construct the main intake on Chickwat Creek, a temporary diversion channel will be required to divert stream flows around the work zone. The temporary diversion channel will have a footprint similar to the section of the Chickwat Creek mainstem needing to be dewatered. Once the intake is built, the temporary diversion channel will be filled in and the water will be redirected to flow through the main intake weir. It is expected that construction of the C1 and C2 intakes will not require diversion channels as they are precast structures which will be installed during an instream work window. The diversion reach (length of the stream subject to diversion due to the penstock) is approximately 7% of the total length of Chickwat Creek and its 4 main tributaries.

b. Water Conveyance System

The total length of the 1.4 m (54") nominal diameter penstock is approximately 2.0 km. The initial 1200 m of penstock will consist of HDPE pipe that is appropriate for this low pressure section and the final 800 m high pressure section will be butt welded steel pipe. The penstock will be buried from the intake along the existing forest road for 1.3 km to avoid damage by susceptibility to debris slides, rock falls, vandalism, wide range of ambient temperatures, and disruption to wildlife movement. The next 0.4 km of penstock will be surface mounted on anchor blocks due to exposed bedrock and several steep cliffs. The last 300 meters to the powerhouse will be buried.

c. Powerhouse and Switchyard

Chickwat is expected to have two (2) vertical Pelton turbine-generators. The units will be supported by and cast into a reinforced concrete substructure likely founded on an engineered soil foundation. The entire footprint of the powerhouse has been designed as one integral mattype foundation to distribute loads over the base and reduce foundation bearing pressure. This will also help to dissipate vibrations within the concrete and minimize transfer to the underlying soils to mitigate the risk of vibration-induced settlement. The powerhouse will require an excavation of approximately 4 m for this particular size of Pelton turbines. The exact excavation depth will be determined once the turbine-generator supplier and design is selected during the procurement process.



The design tailwater level is approximately EL 107 m. The exact design tailwater is to be determined at a later date pending the turbine selection and associated hydraulic analysis.

The tailrace will consist of buried culverts excavated to the required depth and slope to communicate Chickwat Creek water levels into the tailrace such that the water level at the powerhouse is approximately the same as in the river.

d. Transmission Line / Interconnection

An external substation will contain a transformer to step up the 13.8 kV plant voltage to the 25 kV collector transmission line voltage. The substation will consist of a concrete transformer foundation and chamber. Plant substation power is transmitted via 25 kV transmission lines to the Narrows Inlet collector substation. The existing Tyson project 25 kV transmission line will also tie in to the Narrows Inlet substation. The Chickwat transmission line is pole mounted for 800 m then underhung on the existing Tyson transmission line poles for 3.0 km to the Narrows Inlet substation.

e. Temporary Land Use, Staging, and Laydown Areas

The construction of the powerhouse will require the building of a single staging area, totaling 0.7 ha in size, which will be established next to the powerhouse and will be used for stockpiling equipment and materials. Staging areas will be reclaimed and naturalized after construction is completed.

f. Anticipated Additional Construction Activities

Approximately 1 km of new road will need to be constructed; from the main intake to the C2 Tributary intake, a smaller section connecting the powerhouse/laydown area to an existing road and another small section along the proposed feeder transmission line. These shorter sections will be on an old rail bed. Additionally, an estimated 6 km of existing deactivated road will need to be reactivated for construction purposes and will be decommissioned back to their original state after the construction phase.

The lower 400 m of the penstock will diverge to a short span of high-gradient terrain immediately above the powerhouse. Short sections of temporary machinery-grade road may also be required to provide temporary construction access.



A new bridge will be built approximately 200 m upstream of the existing bridge. The new bridge will be built at a site of an old demolished bridge on an existing rail bed. The existing abutments of the demolished bridge will be used for the new bridge.

3.2.2 Upper Ramona Creek Hydroelectric Project

The Upper Ramona Creek HEP is a very high head and low flow hydroelectric project. The 25 kV transmission line will be built from the powerhouse and lead directly to the new Narrows Inlet substation. When operating at full potential, the Upper Ramona Creek HEP will have a generating capacity of 7 MW. The Upper Ramona Creek HEP will perform seasonal energy shaping utilizing a drawdown of the lake level from its natural elevation. The Upper Ramona Creek HEP is characterized by a very high head with a relatively short penstock. The key components of this project are described below. Project statistics are summarized in Table 5.

Parameters	Data
Generating Capacity	7 MW
Diversion Flow (max.)	1.05 m³/s
Diversion Length	2.7 km <i>(approx.)</i>
Fish Habitat (species)	No, non-fish bearing
Penstock Type	Rock-lined tunnel and steel pipe
Intake Type	Tunnel tap (constructed at the outlet o the raised bore tunnel)
Powerhouse and	1, two-jet horizontal Pelton turbine
Generating Equipment	
Transmission Line Length	7.2 km (approx.)
Transmission Pole Type	25 kV line, single wood poles

Table 5. Upper Ramona Creek HEP summary statistics.



a. Intake

A simplified intake arrangement has been designed that will be constructed at the outlet of the raised bore tunnel. The headworks have been designed to utilize the 68.1 ha headpond with a 137,000,000 m³ of storage and 23 m drawdown. The storage will allow for the plant to perform seasonal energy shaping, storing water during the freshet and prioritizing energy production to the winter months. Full Supply Level will be EL 1363.0 m and Low Supply Level will be EL 1340.0 m.

Ramona Lake forms the Project reservoir and will settle sediment and provide debris management. The intake tunnel elevation will allow for the lake to be drawn down 23 m from natural lake elevation of 1363.0 m. During construction it may be necessary to draw down the lake elevation an additional one (1) or two (2) meters but will be dependent on construction techniques and logistics.

b. Water Conveyance System

A 1000 m long drill and blast tunnel will be constructed from a downstream portal. This section of tunnel will tie into the 900 mm diameter raised bore which will connect at a 45 degree angle to the headworks intake. A tunnel plug will be constructed in the lower tunnel section and a 0.61 m (24") nominal diameter penstock will be installed in the tunnel on pedestals.

The total length is approximately 2.7 km. The penstock will be surface mounted from the outlet of the tunnel along a temporary construction trail for approximately 0.9 km, then transition to a buried penstock the remainder of its length to the powerhouse. The buried design was selected as it is less susceptible to damage from debris slides, rock falls, vandalism, can handle a wide range of ambient temperatures, and minimizes disruption to wildlife movement. The surface mounted design was used where burying the penstock was not feasible, for example in the higher elevations where the slopes are steep exposed bedrock.

c. Powerhouse and Switchyard

The Upper Ramona powerhouse is located upstream of the Lower Ramona Intake to ensure Upper Ramona plant flows are not wasted. The powerhouse is located on the right bank of the Ramona Creek (on the same side as the penstock), approximately 70 m upstream of the existing bridge and 20 m upstream of the Lower Ramona dam centerline. The powerhouse and substation final grades are to be backfilled to 470 m and integrated into the Lower Ramona dam in order to raise the powerhouse 5 m above the Lower Ramona headpond full supply level.



The Upper Ramona powerhouse will contain a single horizontal 2-jet Pelton turbine and generator. The unit will be supported by and cast into a reinforced concrete substructure likely founded on an engineered soil foundation. The entire footprint of the powerhouse was designed as one integral mat-type foundation to distribute loads over the base and reduce foundation bearing pressure. This will also help to dissipate vibrations within the concrete and minimize transfer to the underlying soils to mitigate the risk of vibration induced settlement. The powerhouse subgrade will be rockfill construction approximately 6 m above existing ground elevation.

The design tailwater level is equal to the Lower Ramona full supply level of 462 m. The tailrace will consist of a concrete chamber and small weir to ensure adequate submergence of the cooling water heat exchanger. The small weir is required as Lower Ramona Headpond elevation varies up to 3 m. The tailrace will discharge into Lower Ramona Headpond.

d. Transmission Line / Interconnection

An external substation will contain a transformer to step up the 13.8 kV plant voltage to the 25 kV collector transmission line voltage. The substation will consist of a concrete transformer foundation and chamber. Plant substation power is transmitted via 25 kV transmission lines to the Narrows Inlet collector substation. The existing Tyson project 25 kV transmission line will also tie in to the Narrows Inlet substation. The Upper and Lower Ramona transmission lines are pole mounted for 800 m and 900 m to a small collector substation located near Lower Ramona penstock station 1+200. Upper and Lower Ramona energy is then transmitted via a single pole mounted 25 kV line to the remaining 5.7 km to the Narrows Inlet substation. The Ramona transmission line is proposed to follow existing roads a portion of which is through *shishálh* Nation Lands.

e. Temporary Land Use, Staging, and Laydown Areas

It is estimated that four new laydown areas (totaling 1.7 ha in size) will be created to facilitate construction requirements and helicopter access. New laydown areas will be situated at two locations on the lake (0.2 and 0.4 ha), the penstock (0.7 ha) and at the powerhouse construction site (0.4 ha). After construction is completed, these laydown areas will be reclaimed and naturalized.



f. Anticipated Construction Activities

This project will require constructing approximately 0.7 km of new road connecting the laydown area at the end of the surface mounted penstock with the powerhouse, running adjacent to the proposed buried penstock. As a result, three new bridges will be installed and several new culverts will be required along this route. There is also an estimated 3.0 km of existing deactivated road that will need to be reactivated as part of the construction phase, the majority of which will run adjacent to the proposed new feeder line.

3.2.3 Lower Ramona Creek Hydroelectric Project

The Lower Ramona Creek HEP draws water from three sources: two intakes and the outflow of the Upper Ramona Creek HEP. The main intake will be situated on Ramona Creek proper, immediately below the powerhouse of the Upper HEP. A secondary intake will be situated on R1-Creek, a tributary of Ramona Creek. The flow from the secondary intake will be diverted into the headpond of the Lower HEP. This component is situated downstream from the Ramona Creek Upper HEP, of which the outflow travels directly into the main intake of the Lower HEP. Since the Upper and Lower HEPs are directly linked and flow is partially supplied by Ramona Lake, both projects will be subject to the operating regime adopted by the Ramona Creek Upper HEP. As part of the project, a 25 kV transmission line will be built which connects to the Upper Ramona Creek transmission line which runs to the new Narrows Inlet substation. When operating at full potential, the Ramona Creek Lower HEP will have a generating capacity of 7 MW. The key components of this project are described below. Project statistics are summarized in Table 6.

Parameters	Data
Generating Capacity	7 MW
Diversion Flow (max.)	Main penstock – 2.37 m ³ /s, Gizmo Creek conduit – 1.83 m ³ /s
Diversion Length	Main penstock – 1.9 km, Gizmo Creek conduit – 734 m (approx.)
Fish Habitat (species)	Yes (Coho, Pink, and Chum Salmon, Cutthroat Trout and sculpin)

Table 6.	Lower	Ramona	Creek HEP	summar	v statistics.
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Parameters	Data
Penstock Type	Main penstock - High density polyethylene or steel, Gizmo Creek – HDPE conduit
Intake Type	Concrete spillway weir, a Tyrolean weir and direct flow from the upper component
Powerhouse and Generating Equipment	1 –two-jet vertical Pelton turbine
Transmission Line Length	1 km
Transmission Pole Type	25 kV, single wooden poles

a. Intake

The headworks are located approximately 50 m upstream of an existing bridge over Ramona Creek, 20 m downstream of the Upper Ramona powerhouse and along an existing Forestry Road. Located at the base of a small alluvial fan as the creek transitions into a steeper more confined reach, the area is relatively flat with access to both sides of the creek. The headworks consist of a concrete intake and sluiceway, crest gate weir, rockfill weir, yard and headpond with a 3.0 m drawdown. Full Supply Level, which is the level control set point, will be EL 462.0 m and Low Supply Level will be EL 459.0 m.

The weir is required to divert water into the penstock via the intake with adequate submergence to prevent vortexing. The consequential headpond slows the water thus settling sediment, which is harmful to the turbines, out of the flow before it enters the intake and provides time to handle surface floating debris as well.

The crest gate weir will have a 10 m long, 3 m high crest gate with a maximum elevation of 462.0 m and a minimum of 459.0 m. The weir will allow for up to the 1:1000 year flood to be passed with freeboard. The crest gate weir will be of cast-in-place concrete construction with a sloped downstream face and a 3m high crest gate. The downstream slope will consist of concrete encased riprap. The hydraulic cut-off will either be a vertical trench backfilled with an impervious material or upstream impervious blanket (for example clay till or synthetic material). A concrete and rip-rap apron will be placed downstream of both weirs to further dissipate energy in the flow and prevent undermining of the weir foundation.



The dam/Upper Ramona powerhouse area and intake yard will consist of a sheetpile core with rockfill backfill. The dam/Upper Ramona powerhouse area will include a concrete retaining training wall parallel to the creek and perpendicular to the Upper Ramona tailrace, separating the headpond and powerhouse subgrade.

b. Water Conveyance System

The total length of the 0.86 m (34") nominal diameter penstock is approximately 1.9 km. The penstock will be buried along the entire route from the intake to the powerhouse. The route follows the existing forest road for 0.9 km then crosses 0.6 km of cleared cut blocks and intersecting several forestry roads before the last 0.4 km overland through dense forest and 50% slopes to the powerhouse. The buried penstock is less susceptible to damage from debris slides, rock falls, vandalism, can handle a wide range of ambient temperatures, and minimizes disruption to wildlife movement. The final route alignment will be subject to regulatory approval.

c. Powerhouse and Switchyard

The powerhouse is located at the base of waterfalls and is constrained by steep terrain and multiple private properties. The access road makes use of an old overgrown forestry service road on the Schober, property (Parcel Identifier: 007-667-612, Legal Description: Block 5 District Lot 5268 Plan 15534). The powerhouse is situated on sloped but relatively flat area compared to the nearby available terrain, approximately 5-10 m above creek level.

The Lower Ramona powerhouse will contain a single horizontal 2-jet Pelton turbine and generator. The unit will be supported by and cast into a reinforced concrete substructure likely founded on an engineered soil foundation. The entire footprint of the powerhouse was designed as one integral mat-type foundation to distribute loads over the base and reduce foundation bearing pressure. This will also help to dissipate vibrations within the concrete and minimize transfer to the underlying soils to mitigate the risk of vibration-induced settlement. The powerhouse will require an excavation of approximately 4-8 m due to the sloping ground and for this particular size of Pelton turbine. The exact excavation depth will be determined once the turbine-generator supplier and design is selected during the procurement process.

The tailrace will consist of buried culverts excavated to the required depth and slope to communicate Ramona Creek water levels into the tailrace such that the water level at the



powerhouse is approximately the same as in the river. The culverts will be designed with sufficient gradient so that they will be self-draining.

d. Transmission Line / Interconnection

An external substation will contain a transformer to step up the 13.8 kV plant voltage to the 25 kV collector transmission line voltage. The substation will consist of a concrete transformer foundation and chamber. Plant substation power is transmitted via 25 kV transmission lines to the Narrows Inlet collector substation. The existing Tyson project 25 kV transmission line will also tie in to the Narrows Inlet substation. The Upper and Lower Ramona transmission lines are pole mounted for 800 m and 900 m to a small collector substation located near Lower Ramona penstock station 1+200. Upper and Lower Ramona energy is then transmitted via a single pole mounted 25 kV line to the remaining 5.7 km to the Narrows Inlet substation. The Ramona transmission line is proposed to follow existing roads a portion of which is through *shishálh* Nation Lands.

e. Temporary Land Use, Staging, and Laydown Areas

It is estimated that four new laydown areas (totaling 3.2 ha in size) will be created to facilitate construction requirements. New laydown areas will be situated at the R1 Creek intake (0.1 ha), at a central point in the penstock (0.7 ha), east of the powerhouse (2.3 ha) and at the powerhouse (0.1 ha). After construction is completed, these laydown areas will be reclaimed and naturalized.

f. Anticipated Additional Construction Activities

This project will require the construction of approximately 0.7 km of new road to connect the powerhouse to an existing forestry road. It will also require approximately 1.2 km of temporary construction trails, a short spur connecting the laydown area to the Gizmo Creek intake, and a longer 1.0 km section from the largest laydown area to the powerhouse. There is an estimated 3 km of existing deactivated road that will need to be reactivated for the construction phase, as well as a 1.0 km section connecting the small laydown area near R1 Creek to the Upper HEP laydown area. Furthermore, it is anticipated that an additional 2.0 km section from the main intake to several laydown areas connecting to the proposed new road from the powerhouse will also need reactivation. Lastly, it is expected that one bridge will need repair and/or upgrades.



3.2.4 Transmission Component (TC) and Interconnection Project

New transmission lines will be required to connect the three Projects to the point of interconnection (POI) with the BC Hydro network. Overhead feeder transmission lines will be constructed from the substations of each Project to a new common substation (named Narrows Inlet substation). The existing Tyson hydro plant transmission line will also be connected to the new Narrows Inlet substation.

The Narrows Inlet substation steps-up from 25 kV to 138 kV. The existing Tyson line is already built to 138 kV standards to the point where a new line is required to then cross Sechelt Inlet to the point of Interconnection (POI). A new transmission line then crosses the Sechelt Inlet. The proposed crossing is near the Skookumchuck Narrows via a horizontal directional drilling crossing. From the western shoreline of the Sechelt Inlet, the line will continue through the Sechelt First Nations land then crown land over the Carren Range to the POI. To our knowledge the exact pole location of the POI has not been confirmed with BC Hydro. This section of the alignment has not been assessed and will require further ground investigation to confirm its viability and finalize the alignment.

The following are the key decisions made governing the design of the Transmission Line Project. These decisions are still being analysed and are subject to change:

- 1. The Ramona transmission line route will follow the Tzoonie Mainline road through the Sechelt First Nations land.
- 2. The Skookumchuck Narrows crossing will be done using HDD technology at the shortest crossing location daylighting at Earls Creek Camp and Sechelt Band Lands No. 27.
- 3. The transmission line after the crossing will consist of an overhead line running parallel and adjacent to the Sechelt Band Lands No.27 and the Provincial Park boundary offset by about 50 m to allow for danger tree management and visual amenity.

Power will be generated a 13.8 kV at each Project plant connected to a 13.8 kV metalclad switchgear inside each powerhouse. Each switchgear line-up will have breaker and fused-disconnect to feed 13.8 kV-600 V step-down station service transformers. The power is then stepped up to 25 kV via an outdoor, oil-filled transformer adjacent to the powerhouse. There will be a pole-mounted disconnect at each 13.8 kV to 25 kV substation.

Station service power will be supplied to each headworks (excluding Upper Ramona and the auxiliary intake) at 600 VAC via a composite power/fibre-optic cable buried along the penstock



from the powerhouse. The Lower Ramona headworks will receive station service power from the Upper Ramona powerhouse.

A backup diesel generator will be installed at Chickwat and Upper Ramona to provide emergency power to each of the plants powerhouse or headworks. All headworks will have provision to connect a portable back-up generator if necessary.

Plant substation power is transmitted via 25 kV transmission lines to the Narrows Inlet collector substation. The existing Tyson project 25 kV transmission line will also tie in to the Narrows Inlet substation (NI substation). The Chickwat transmission line is pole mounted for 800 m then underhung on the existing Tyson transmission line poles for 3.0 km to the NI substation. The Upper and Lower Ramona transmission lines are pole mounted for 800 m and 900 m to a small collector substation located near Lower Ramona penstock station 1+200. Upper and Lower Ramona energy is then transmitted via a single pole mounted 25 kV line to the remaining 5.7 km to the NI substation. The Ramona transmission line is proposed to follow existing roads a portion of which is through *shishálh* Nation Lands.

From the Narrows Inlet substation the aerial 138 kV line traverses approximately 14 km before reaching the Skookumchuck Narrows crossing. The preferred option is for the transmission line to cross the Skookumchuck Narrows north of Skookum Island near Earl's Landing. The preferred crossing will be achieved using HDD technology and then pulling the transmission line through beneath the Skookumchuck Narrows seabed floor. Alternative options for the transmission crossing include a crossing in the original location immediately north of Skookum Island and the use of a submarine cable, rather than HDD. Submarine cable could be laid on either alignment. From the Skookumchuck Narrows crossing the transmission line will continue along the border of *shishálh* Nation Land and then along deactivated forestry roads for 6.8 km over the Caren Range to the POI, 5.5 km north of Malaspina substation.

3.3 Pre-Construction Schedule and Key Milestones

Pre-construction schedule and key Project milestones include:

- A water license application was submitted in 2008 and land tenure application was submitted in 2013.
- Baseline environmental studies have been ongoing since 2008.
- An Investigative Use License (File No 2409975) was originally issued for the entire project area in 2008 and renewed for an additional 5 years in 2011.



- NI Hydro Holding Corp. originally submitted an application of the BC Environmental Assessment Office (EAO) on 21-Aug-12 for the Narrows Inlet Hydropower Project, which consisted of five interrelated hydroelectric generating components on four streams.
- On 18-Mar-13, NI Hydro Holding Corp. wrote to the EAO and requested that two of the six components of the proposed project be removed. Removal of the CC and SS Creek components from the proposed Project was confirmed by EAO on 18-Jul-13.
- On 15-Jan-14, Environmental Assessment Certificate #E13-04 was issued by the EAO.

3.4 Land

The Project area is within a rugged, fjord land setting. The Projects are located on two tributaries of the Tzoonie River which flows into the Narrows Inlet. Elevations extend from sea level on the Narrows Inlet to greater than EL 2000 m along the mountain peaks. Valley sides are typically moderately steep (50-70%) to steep (>70%). The treeline elevation varies between EL 1000-1400 m.

The bedrock geology consists predominantly of intrusive quartz-diorite and granodiorite associated with the Coast Plutonic Complex. Gambier group metavolcanic rocks are present in the northwest portion of the Chickwat Creek drainage basin which is a potential acid rock drainage source.

The surficial geology was investigated by Cordilleran Geosciences. Morainal materials in the form of lodgment tills exist on gentle to moderately steep slopes. Glaciofluvial, glaciomarine and glaciolacustrine sediments associated with the limit of marine inundation generally exist below EL 230 m. Colluvial materials associated with debris flows, rockfall or rock avalanche are found proximal to steep slopes. Fluvial deposits, consisting of boulders, cobbles and gravel are present in the valley bottoms along Chickwat and Lower Ramona Creek.

Geographical coordinate of key Project components is provided below in Table 7.

Project Components	UTM Coordinates			
Chickwat HEP – Intake (Main)	10U 448217 5522113			
Chickwat HEP – Intake (C1)	10U 448359 5520718			
Chickwat HEP – Intake (C2)	10U 447858 5521708			
Chickwat HEP - Powerhouse	10U 449131 5520393			

Table 7. Geographical coordinates of Project components.



Project Components	UTM Coordinates
Chickwat HEP - Tzoonie Substation	10U 448454 5517283
Chickwat HEP - Interconnection Point	10U 449836 5519778
Chickwat HEP – Laydown (Intake)	N/A
Chickwat HEP – Laydown (Penstock)	N/A
Chickwat HEP – Laydown (Powerhouse)	N/A
Chickwat HEP – Temporary Bridge	N/A
Chickwat HEP – -Intake Bridge	10U 448243 5521907
Chickwat HEP – PH Upper Bridge	10U 449108 5520279
Chickwat HEP – Chickwat Creek Log Bridge	10U 449326 5520286
Upper Ramona Creek HEP - Intake	10U 451594 5514489
Upper Ramona Creek HEP - Powerhouse	10U 450073 5512630
Upper Ramona Creek HEP - Interconnection Point	10U 449268 5511918
Upper Ramona Creek HEP – Laydown 0.2 ha (Lake)	N/A
Upper Ramona Creek HEP – Laydown 0.4 ha (Lake)	N/A
Upper Ramona Creek HEP – Laydown (Penstock)	N/A
Upper Ramona Creek HEP – Laydown (Powerhouse)	N/A
Upper Ramona Creek HEP – Ramona Creek Steel Bridge	10U 449984 5512520
Upper Ramona Creek HEP – Gizmo Creek Bridge	10U 449695 5512030
Lower Ramona Creek HEP – Intake (R1 Creek)	10U 450071 5511861
Lower Ramona Creek HEP – Intake (Outflow from Upper HEP)	10U 450049 5512563
Lower Ramona Creek HEP - Powerhouse	10U 448542 5511972
Lower Ramona Creek HEP – Laydown (R1 Creek)	N/A
Lower Ramona Creek HEP – Laydown (Penstock)	N/A
Lower Ramona Creek HEP – Laydown (East of Powerhouse)	N/A
Lower Ramona Creek HEP – Laydown (Powerhouse)	N/A
Transmission Component (TC) and Interconnection Project -	10U 439252 5510169
Narrows Inlet Substation (Earle Creek Substation)	
Transmission Component (TC) and Interconnection Project -	10U 437395 5508879
Interconnection Point from TL to Buried Cable	
Transmission Component (TC) and Interconnection Project -	10U 437197 5508878
Interconnection Point to Submarine Cable	
Transmission Component (TC) and Interconnection Project –	10U 435872 5507949
Interconnection Point from Submarine Cable to BCH 1L37	

The Project, as currently designed, is entirely on Crown land. This may change slightly, as Project designs may need to be modified. There is a proposal that a portion of the transmission



will be constructed on *shishálh* First Nation land and a portion of the Lower Ramona Creek powerhouse access road will be constructed through private land.

3.4.1 Commitments to Other Land Users

The following section describes how land, resources and water are currently being used surrounding the Project. The Project area is located in the Sunshine Coast region of British Columbia. The Project is entirely located within the territory of the *shishálh* Nation and the Narrows and Sechelt Landscape Units.

a. First Nation Interest

See Section 3.6 for further details.

b. Forestry

Four (4) forest licensees are active in the Tzoonie River Valley, Narrows Inlet area and towards the Northern end of the Sechelt Peninsula. Additionally, BC Timber Sales operates a fifth forest license on the Sechelt Peninsula near the Project but outside the footprint of the Project Area. The forms of tenure held by the licensees potentially affected by the Project are volume-based Forest Licenses and as such, the operating areas are not fixed and are subject to change. Licensees agree amongst themselves to restrict their forestry operations to their own operating areas.

International Forest Products Ltd (Interfor) operates in the Tzoonie River Valley and the Narrows Inlet Area under two Replaceable Forest Licenses: A19220 in the Tzoonie River Valley and north of Tzoonie Narrows and A19224 in the Narrows Inlet area generally located south of the Tzoonie Narrows. Chickwat Creek, Upper and Lower Ramona Creek, the Narrows Inlet Substation on Tzoonie River and the Shared Elements¹ between these Project components are all within Interfor's operating area. A&A Trading Ltd. has a Replaceable Forest License (A19229) with a number of operating areas in the Sunshine Coast Forest District including much of the Sechelt Peninsula. The only Project component within A&A's operating area is the Interconnection portion spanning the west side of Sechelt Inlet to the BC Hydro Grid. The *shishálh* Nation's Tsain-Ko Forest Development Corporation (Tsain-Ko) holds a Non-Replaceable Forest License (A80357). The Earle Creek substation and the Interconnection Project area at Earle Creek are within Tsain-Ko's operating area. Tsain-Ko is not active in Earle Creek at this time however this

¹ Shared Elements: Consistent with the EAC Application documents, in this context, Shared Element are those element that are shared among the projects. These include the transmission line, laydown areas, and borrow pits.



area is of interest to the *shíshálh* Nation as an area-based forest tenure in the *shíshálh* Nation's Land Use Plan (*shíshálh* Nation, 2007). Tsain-Ko also operates on the north end of the Sechelt Peninsula around Waugh Lake and North Lake and the community of Egmont. This portion of Tsain-Ko's operating area is immediately north of A&A Trading Limited's operating area. Weyerhaeuser Company Ltd. (Weyerhaeuser) holds a Forest License Non Replaceable tenure (A47297) solely for harvesting of stands comprised of more than 50% deciduous species. The operating area for this tenure covers the entire Sunshine Coast Timber Supply Area and since it is restricted to deciduous leading stands only, the operating area overlaps the operating areas of the other Licensees. Weyerhaeuser has been active in past harvesting deciduous leading stands around Narrows Inlet and in the Tzoonie River Valley. This Weyerhaeuser tenure is set to expire in July 2026.

c. Tourism

In total, 21 tourism operators were identified as operating a tourism business within the identified Project area. Four geographic areas (Tzoonie River Basin; Narrows Inlet; Skookumchuck Narrows; and Ruby and Sakinaw Lakes) were identified. Tourism activities in the Tzoonie River Basin include the following primary activities: hunting, sightseeing air tours, ATV/Argo tours, and biking. Tourism activities in the Narrows Inlet include the following primary activities: sea kayaking, accommodation, sightseeing air tours, marine boat tours, diving, and fishing. In total fifteen tour operators were identified in the Narrows Inlet. The Skookumchuck Narrows is the most significant attraction in the Project area. The Skookumchuck Narrows Provincial Park attracts nearly 25,000 visitors per year (Zumundo Consultants, 2011). Tourism activities in the Skookumchuck Narrows include surf kayaking, sightseeing air tours, sightseeing boat tours, sea kayaking, and diving. The two main tourism operators in the Ruby and Sakinaw Lakes areas are the Ruby Lake Resort and Sakinaw Lake Lodge. Combined, these operators host approximately 4,850 tourism use day visits per year.

d. Mineral Extraction and Exploration

There are several mineral claims tenures in and around the Project area. Lafarge Canada Inc. holds one Mineral Claim Tenure northeast of Skookumchuck Rapids. Donald Kenneth Bragg holds five Mineral Claim Tenures between Sechelt Inlet and the Ruby and Klein Lake areas. Four of these mineral claim tenures are in the proposed Project Footprint: DL3736, DL3735, DL3734 and DL4592. There are no Mineral Claim Tenures in the Narrows Inlet area.



e. Aquaculture

Today there are seven (7) marine fish farms located in Sechelt Inlet and Salmon Inlet. All seven farms are owned and operated by Grieg Seafood BC. Three (3) are located within the Project transportation corridor and are located on the west side of Sechelt Inlet (221 Vantage, 746 Farm 13 and 332 Salten).

There are three (3) fish hatcheries on the Sunshine Coast. The MacLean Bay Hatchery is located 8 km from the town of Sechelt in MacLean Bay and is operated by the *shishálh* Nation. This is the only listed hatchery that is associated with the marine environment of Sechelt Inlet and is considered within the Project transportation corridor. The current production targets are 200,000 coho smolts, 150,000 chinook smolts and 500,000 chum and 500,000 pink in the odd years. The other two (2) facilities are not associated with the Sechelt or Narrows Inlet marine environment. The Target Marine Hatcheries operates a land-based aquaculture facility near Gray Creek. The Sunshine Coast Salmonid Enhancement Society operates a hatchery that is located along Chapman Creek.

There are seven shellfish aquaculture farms registered in Sechelt and Narrows Inlets. Two shellfish tenures are within SMA 16-8 and five shellfish tenures are within SMA 16-6. All tenures in these two SMA harvest Pacific Oysters. Storm Bay Shellfish Co Ltd (license # AQSF 104351) also harvests Manilla Clams and Stephen Acciaroli and Richard Knutsen also harvest Pacific Scallops.

f. Hunting, Trapping and Fishing

Hunting is prevalent due to the extensive rural nature of the area. There are several areas in the vicinity of the Project that are suitable for hunting. Hunting is one of the main activities in Spipiyus Provincial Park. In addition, hunting is among the primary activities in the Tzoonie River Basin. Individuals can hold provincially issued trapline tenures. There are currently four (4) trapline areas in the vicinity of Narrows Inlet. Fishing is available due to the extensive rural nature of the area. There are several areas in the vicinity of the Project where fishing is a suitable activity. Fishing is among the primary activities in the Tzoonie River Basin.

g. Private Land Use

There are 191 private holdings in and around the Project area. They are clustered in four general areas; Ramona Creek, northeast of the Sechelt Rapids, Doriston and Klein Lake. Only the Ramona Creek area is adjacent to the Project Infrastructure. In Narrows Inlet, near the outlet of



Ramona Creek, are ten private lots, and eight cabins, which are used for recreational purposes. This area is adjacent to the proposed Ramona Creek Lower component. The properties are only accessible by water and occupants access their properties either by personal boat, water taxi, or float plane.

h. Industrial and Domestic Water Use

Most industrial uses of water would be on the municipally supplied system, as most industries would be located in or near populated centers where the municipal system extends. Additional industrial water use can occur using natural water sources; one such use in the Project area is the Tyson Creek Hydroelectric Project. This Project draws water from Tyson Lake for hydroelectric power generation. Water Licenses have been issued under the British Columbia *Water Act* by the Ministry of Environment to property owners in the Ramona Creek and Doriston areas. The Ramona creeks and properties are all within the Lower Ramona area, adjacent to the powerhouse of the Lower Ramona component. The Doriston area property owners draw from Doriston Creek and Sunbury Brook, sources that are adjacent to the proposed transmission line. These water licenses represent known use of water in and around the respective areas. However, it may be possible that there are unlicensed users drawing water that could not be identified during research conducted as part of the Application. Additionally, there are four water wells located northwest of Skookumchuck Rapids in DL: 4330 as well as 12 in the vicinity of Ruby Lake south of DL: 6643.

3.5 Zoning

The Project falls entirely within the Sunshine Coast Regional District, within the Halfmoon Bay Official Community Plan (OCP). Each of the proposed HEPs are fully situated on Crown Land. The Project falls within the Sunshine Coast Regional District Zoning Bylaw No. 310 (1987). Rezoning of the powerhouse footprints from R2 to I9 will be required and is in progress.

Contact information of the Regional District office is provided in Section 10.3.

3.6 First Nations Interests

The Project is entirely located within the territory of the *shíshálh* Nation. No other First Nation asserts a claim of aboriginal title or rights to the Project area.



The involvement of the *shishálh* is essential to ensure that Project development addresses *shishálh* values and interests, and provides economic opportunities for the people of the *shishálh* Nation. BluEarth Renewables Inc. is committed to facilitating *shishálh* involvement in the Project by providing a transparent and meaningful discussion process. Initial discussions regarding the Project began in November 2007 and subsequently a Participation Agreement, signed in April 2008, was successfully negotiated between the *shishálh* Nation and the Licensee. This has allowed the *shishálh* and the Licensee to discuss issues and concerns, identify potential solutions, and adopt options and alternatives to mitigate any concerns that have arisen with regard to the proposed Project. In January 2014, an Impact Benefit Agreement (IBA) was signed, and an updated revision is expected in the coming weeks.

To ensure that there were sufficient opportunities to discuss technical issues and concerns, staff from the *shishálh* Nation and the Licensee agreed to have regular monthly meetings to discuss issues associated with the Project. Dialogue continues in the period between designated quarterly meetings, and includes the Licensee and its consultants forwarding all Project reports and data to the *shishálh* Nation, updating the *shishálh* Nation on changes to Project infrastructure design, and meetings as requested.

Contact information of the *shishálh* Nation head office is provided in Section 10.3.

3.7 Water Requirements

Water requirements for the project will include water licences for the purpose of generating power, short term licences/approvals for the purpose of extracting water to support construction activities, as well as a water licence/approval for the purpose of providing domestic water to the work camp. Details of each licence are provided in Table 8.

Short term water use volumes for camp are estimated to be approximately 1000 to 5000 gallons per day, depending on occupancy levels.

Once the licences are issued, the Licensee will provide copies of all water-related licences and approvals to the Independent Engineer (IE) and the Independent Environmental Monitor (IEM). A complete list water-related licences and approvals issued for the project are provided in Appendix B. The CEMP will be updated with the final water licence numbers when all of the licenses under review are approved.



Table 8.	8. Detailed water requirements for the Narrows Inlet HEP, including resp	oonsible applicants and
governing	ning regulatory bodies.	

Purpose	Amount (m³/s)	Source / Stream Name	Licence/Approval Number	lssued? (Y/N)	Responsible Regulatory Party	Responsible Applicant Party
Chickwat HEP – Power generation (Main)	5.63	Chickwat Creek	C131287	Y	MFLNRO	Licensee / Owner
Chickwat HEP – Power generation (C1 Tributary)	0.37	C1 Creek	C131287	Y	MFLNRO	Licensee / Owner
Chickwat HEP – Power generation (C2 Tributary)	1.10	C2 Creek	C131287	Y	MFLNRO	Licensee / Owner
Ramona Upper HEP – Power generation	1.10	Ramona Lake		In progress	MFLNRO	Licensee / Owner
Ramona Creek Lower HEP – Power generation	2.43	Ramona Creek		In progress	MFLNRO	Licensee / Owner
Ramona Creek Lower HEP – Power generation	0.65	R1 Creek		In progress	MFLNRO	Licensee / Owner
Domestic – Work Camps		Unnamed Creek at head of Narrows Inlet or groundwater well		In progress	MFLNRO	Contractor(s)



Purpose	Amount (m ³ /s)	Source / Stream Name	Licence/Approval Number	Issued? (Y/N)	Responsible Regulatory Party	Responsible Applicant Party
 Short Term Use of Water for: Dust control Fire protection / suppression Concrete batch plant 		Water truck will fill up at principal creeks (Chickwat, Ramona) Concrete batch plant will be moved from site to site		In progress	MFLNRO	Contractor(s)

3.8 Weather and Climate

The climate in the Project area is typical of the West Coast Marine (Cfb) climate, as defined by the Köppen climate classification system. Regions with a Cfb climate is characterized by mild temperatures year round with significant precipitation in all seasons, heavy cloud cover, and high humidity.

Precipitation was characterized as adequate for hydropower generation, and reliable at all times of the year in the Cfb climate zone. The average temperature of the warmest month is less than 22°C and that of the coldest month is warmer than -3°C.

Precipitation data from three representative stations (Clowhom Falls, Merry Island Lightstation and Squamish Upper) were reviewed during the EAC Application. A summary of the results is provided below:

Clowhom Falls: The most precipitation occurred from October to January when the total precipitation was greater than 250 mm/month with the maximum in December of 328.7 mm/month. The least precipitation occurred during the months of April to September when the total precipitation was less than 150 mm/month with the minimum in August, when precipitation was 62.0 mm/month on average. The annual precipitation from 1961 to 1990 at Clowhom Falls ranged from 1407.6 mm in 1985 to 2845.3 mm in 1969. The 30-year average of annual precipitation was 2227.3 mm with a standard deviation of 317.2 mm.



Merry Island Lightstation: The period of greatest precipitation was during the months from October to January when the total precipitation was greater than 100 mm/month. The maximum precipitation was in November with an average of 148.7 mm of precipitation. The period of lowest precipitation was from June to August when the precipitation was less than 50 mm/month. The lowest monthly mean precipitation of 36.6 mm occurred in July. Annual precipitation for the most recent 30 years of data available from Merry Island Lightstation ranged from 503.3 mm in 1987 to 1319.5 mm in 1996. The 30-year average annual precipitation was 999.6 mm with a standard deviation of 180.9 mm.

Squamish Upper: The period of greatest precipitation was from November to January, when the precipitation was greater than 300 mm/month. The maximum mean precipitation of 377.9 mm occurred in November. The period of least precipitation was from June to September when the precipitation was less than 90 mm/month. The minimum mean precipitation of 55.0 mm occurred in July. Annual precipitation totals from Squamish Upper ranged from 1,332.1 mm in 1998 to 2,883.6 mm in 1999. The average annual precipitation was 2,265.0 mm with a standard deviation of 452.9 mm.

3.9 Fire Management

The Project is located within the Sunshine Coast Natural Resource District.

Historically, the Project area has been exposed to low frequency (300-600 years), high severity stand replacement fires, which have the potential to significantly alter the forests. Although the probability of large wildfires within coastal forest ecosystems is generally considered low, in many areas the consequences associated with a large wildfire would be very high. Details regarding the Fire Preparedness Plan are provided in Section 7.12.

Fire Danger Class (FDC) rating is provided

at: <u>http://bcwildfire.ca/Weather/Maps/danger_rating.htm</u>.

FDC rating is expected to be monitored daily throughout spring, summer and fall, and is the responsibility of the contractor(s) to manage its activities (and inherent risks) in accordance with the posted FDC rating.



3.10 Environmental Setting

The Project area is located in the Pacific Ranges of the southern Coast Mountains. The Coast Mountains were heavily glaciated during the Pleistocene glaciation, which ended approximately 10,000 years ago. Abundant glacial features remain throughout the landscape as a result of this last major glaciation. Within the Pacific Ranges, the highest mountain peaks projected above the ice and today these peaks tend to be steep and rugged. In contrast, the lower elevation summits tend to be more rounded and domed, reflecting the erosive force of the large ice sheet that overrode them. As the largely granitic rock of these mountains is relatively resistant to erosion, much of the sediment delivered to the valley bottom comes from past glacial activity.

The Project area is covered in predominately coniferous forest with bare rock, snow and ice cover at the highest elevations. The parent materials that can be found within the Project area are till, glaciofluvial, glaciolacustrine, glaciomarine, colluvial, fluvial lacustrine and organic. The majority of the Project area is underlain by Cretaceous-aged intrusive quartz diorite (Coast Plutonic Complex).

A comprehensive description of the Project's environmental setting, including a complete description of the entire project footprint and potential downstream areas affected by any construction activities, can be found in the EA Application. A summary of the aquatic, geophysical, terrestrial vegetation and wildlife, and heritage attributes is provided in the following subsections.

Details regarding environmentally sensitive areas (ESA) and wildlife VC species are provided in the subsections below and in Section 8.0 (Project Specific Environmental Considerations, see Appendix M for ESA/VC species maps).

3.10.1 Aquatic Environment

Results of the fisheries baseline data collection program identified that the Project would directly affect salmonid populations in two of the Project's target streams: Chickwat Creek and Lower Ramona Creek. In Chickwat Creek, both anadromous salmonids and non-anadromous char will be potentially impacted, and will require careful mitigation.

Chickwat Creek is the largest tributary to the Tzoonie River, flowing south-southwest to the confluence at 6.4 km upstream of Narrows Inlet, draining the northwest section of the Tzoonie River watershed. Chickwat Creek is a 5th order stream and drains a watershed area of 52 km².



Numerous tributaries flow into Chickwat Creek; two principal tributaries (C1 and C2) flow into the main stem within the proposed diversion reach (C2 Tributary being the largest in the watershed). C1 and C2 Tributaries both enter Chickwat Creek in the upper diversion reach, where resident fish (solely Dolly Varden) are present. Fish bearing status upstream of the intake is unlikely due to steeper gradient. Chickwat Creek is a significant source of sediment to the Tzoonie River due to debris slides and flows from the predominant logging activities in the area.

Ramona Creek flows from Ramona Lake and drains directly into Narrows Inlet. Ramona Creek is a steep gradient stream and its lower reaches branch into short multiple channels meandering through seasonal recreational properties. Lower Ramona Creek supports populations of anadromous salmonids; coho and cutthroat trout and a small number of chum salmon have been documented in Reach 1. The lower reaches of Ramona Creek and the foreshore at the confluence with Narrows Inlet are considered to have valuable sea-run cutthroat trout habitat. Upstream distribution of anadromous fish ends at the base of a steep section of the channel below the first falls in Reach 2. Fish observations collected to date indicate that all fish are located downstream of the Lower Ramona Creek powerhouse. Ramona Lake is classified as non-fish bearing.

Maps illustrating fish bearing status of Project watercourses are included within Appendix M (ESA maps).

3.10.2 Geophysical Environment

The Project area is within a rugged, fjord land setting and includes: Chickwat Creek Watershed, Ramona Upper Creek Watershed, Ramona Lower Creek Watershed, Tzoonie River Valley, Narrows Inlet, Earle Creek, Skookumchuck Narrows, and the Sechelt Peninsula. The basins are located in the southern Coast Mountains. Rainfall over the region is very high and season snowpack is typical above 800 m elevation. The dominant historical and present land-use within the watersheds is related to forest harvesting. The area has temperate maritime climate.

The project area is extremely rugged and dominated by active geomorphic processes including flooding, channel braiding/avulsion, rockfalls, snow avalanche, and debris flows. Elevations extend from sea level on the Tzoonie River estuary to >2000 masl along the ridge crests. Valley sides are typically moderately steep (50-70%) to steep (>70%). Treeline elevation varies between 1000-1400 masl.



Bedrock at the head of Narrows Inlet and in the Tzoonie River watershed is dominated by Coast Plutonic rock, consisting of quartz diorite and granodiorite. Gambier Group metavolcanic rocks are present in the northwest portion of Chickwat Creek drainage on the Chickwat-Truax Creek divide. Gambier Group rocks are also found on the Sechelt Peninsula. Regionally, the bedrock within the Project area is part of the Coast Belt and is a member of the Coast Complex Terrane, which rests adjacent to the Wrangell Terrane.

In general, the parent materials be found within the Project Area are glaciofluvial deposits, colluvial, fluvial and lacustrine materials and glaciomarine sediments. The area is ranked as moderately high for metallic mineral potential.

The groundwater flow setting within the Project area is anticipated to be diverse. Components of the Project infrastructure will be located in topographically high and low regions of the settings.

3.10.3 Terrestrial Vegetation and Wildlife

Assessment surveys were undertaken and provided as part of the EAC Application. A brief summary of terrestrial vegetation and wildlife within the Project area is provided in the following paragraphs.

Six biogeoclimatic subzones/variants occur within the Project area: Coastal Western Hemlock Dry Maritime (CWHdm), Coastal Western Hemlock Submontane Very Wet Maritime (CWHvm1), Coastal Western Hemlock Montane Very Wet Maritime (CWHvm2), Mountain Hemlock Windward Moist Maritime (MHmm1), Mountain Hemlock Windward Moist Maritime Parkland (MHmmp1), and Coastal Mountain-Heather Alpine Undifferentiated (CMAun).

There is one Old Growth Management Area (OGMA) located in the proposed Project area, approximately 100 m to the south of the western section of the proposed 1L37 interconnection transmission line on the Sechelt Peninsula. OGMAs are areas legally designated under the Land Act (1996) to maintain old growth stands and habitat and are administered by MFLNRO and BCMOE. The proposed transmission ROW was moved so that it would not impact the OGMA, thus reducing the overall environmental impact of the alignment

Wildlife species of concern within the Project area include, but are not limited to: northern goshawk, great blue heron, marbled murrelet, sooty grouse, peregrine falcon, bald eagle, western screech-owl, harlequin duck and American dipper, Pacific tailed frog, western toad,



northern red-legged frog, western painted turtle, bats, Roosevelt elk, mule deer, mountain goat, wolverine, and grizzly bear. Refer to Section 8.0 – Project Specific Environmental Considerations and Appendix M (ESA maps) for further details on the occurrence of these species within the Project area, and for wildlife management best practice guidelines and regulatory requirements.

3.10.4 Heritage Resources

The Project area is located entirely within the *shíshálh* Nation territory. The area within which the Project is located was and still is important to the *shíshálh* Nation. Currently, numerous known recorded archaeological sites are located within or in close proximity to the Project area. These sites depict the vast and complex use of the territory by the *shíshálh* Nation.

3.11 General Construction Details and Schedule

This section provides a general overview of the anticipated construction methods, key steps involved in building the Project, as well as a coarse Project schedule.

Note that the information discussed herein is not meant to provide a comprehensive work execution sequence or construction specifications. The specific construction methods and sequence will be developed by the Licensee and contractor(s) once the Project has been permitted, following the award of construction contracts.

Also please note that the schedule shown in Figure 3 has been provided by the Licensee and is subject to change. The schedule should be considered a coarse planning tool. It is the responsibility of the contractor(s) to provide the most up-to-date version of the Project construction schedule.

3.11.1 Generation Facilities and Access Construction

a. Generation Facilities

Construction of the generating facilities (i.e., intake structures, water conveyance structures, and powerhouses) will vary from project to project depending on the type and complexity of the structures to be built.

Typically, the most sensitive (both in timing and risk level) structures to build are the intake structures. The construction of all intake structures will require instream works, specifically, the construction of complete flow diversions and worksite isolations. These diversions and isolation measures may be left in place for periods extending beyond one year, and will require careful



planning and diligent work execution. Once flows are completely diverted, a substantial amount of excavation will be required. Drilling and blasting will likely be needed to anchor the intake structure to bedrock or other geotechnically suitable support. Extensive rock extraction is anticipated at most project sites. Once an adequate foundation has been established, concrete forming and pouring will take place and the intake structure will be erected. Upon completion of the intake structure, water will then be returned to the main channel, following careful planning and diligent work execution.

Constructing the water conveyance structures consists primarily of installing penstock along a defined alignment/right-of-way. Generally, the installation of penstock involves substantial vegetation clearing, grubbing, and stripping of soils, followed by trench excavation and placement of bedding materials suitable for supporting the penstock itself. Once bedding materials have been compacted, the penstock is then placed using heavy equipment, and penstock sections are welded or coupled in situ. Once bedded, the penstock and trench will be backfilled, and the surrounding soils will be re-contoured to mimic pre-disturbance land topography. The re-contoured alignment will then be reclaimed using conventional soil stabilization and revegetation techniques, ensuring that all disturbed land is re-established as free-draining and without significant environmental risks.

Sections of penstock may be left exposed were trenching it is not feasible. Examples may include where the penstock crosses a stream located at the bottom of a deep, steep-sided ravine, or along steep rock face naturally occurring within a permitted right-of-way. In these cases, the penstock may be housed in a casing (penstock bridge) that rests on concrete abutments. In other cases, high pressure steel may be anchored directly to the rock face, secured onto concrete abutments and other load-bearing anchor points. Trestles may be required in locations were significant, wide spans exist.

The construction of powerhouses typically requires significant earthworks, substantial concrete works, and complex electrical works. Following vegetation clearing, grubbing, and stripping, subsoils will be exposed and compacted to create a geotechnically suitable foundation (unless suitable bedrock is found). A concrete structure will then be formed and poured, onto which a covered, insulated structure will be built. Once built, generators will be installed, and electrical works will take place. Concurrently with the construction of the powerhouse building, a tailrace will be excavated to direct generating flows back into the river below the diversion reach. Once construction is complete, and connections between each of the structures have been made, areas exposed during earthworks will be reclaimed to stable and free-draining condition, and left without environmental risk.



b. Access Construction

All of the proposed HEPs will use existing Forestry Service Roads (FSRs) (wherever possible) for access during construction and operations, and will require re-activation of some old forestry roads, construction of some new roads, and the repair and maintenance of existing mainline roads in the respective project areas. Roads providing access to the powerhouses are to be permanent all-weather roads, while those to the intakes may be permanent seasonal roads depending on site conditions. The Licensee is committed to minimizing road construction where possible.

3.11.2 Transmission Line Construction

Transmission line construction will require vegetation falling and management, tree removal and hauling, construction of helipads, tote roads, and permanent maintenance roads (4 x 4 seasonal access roads), pole digging and associated earthworks, importing of rock and suitable construction aggregates, erecting transmission line poles, and the stringing of power lines. Cable stringing will primarily be done using conventional cranes and heavy equipment, although helicopter use may be required to assist and support the process.

In the case of the Transmission Component, transmission line construction will also include laying a section of submerged cable across Sechelt Inlet. Sections of the cable may have to be jetted into the ocean floor, while others may require placement of the cable and weighted concrete mats onto the ocean floor itself. The installation of the submarine cable will be effected using barges and/or other water vessels.

Switchyards will be constructed as part of the Project. The construction of switchyards will entail vegetation falling, clearing and grubbing. The preparation of the switchyard grounds will require some earthworks, including exposing subsoils, import and placement of aggregates, and compacting grounds to allow for the construction of structures. Significant grounding and electrical work will be required.

3.11.3 Ancillary Activities

A number of ancillary and support construction activities will occur as part of the Project. Among these may include the construction of a main camp site, satellite camps in areas with poor access (barge or land camps), and the clearing and preparation of specific sites to store spoils, tunnel muck, and waste rock. It is also expected that a number of areas will be required



as laydown sites for equipment and supplies, and for the extraction and sorting of aggregates needed to construct the Project. Barge landings may also need constructing. It is anticipated that a central site for a concrete batch plant and a mechanical maintenance shop, for Projectwide use, will be required.

Compensation habitat may also be constructed as part of the Project. Although final designs have yet to be produced, it is reasonable to expect that low lying areas near the mouths of the Project streams may be utilized to build compensatory spawning and rearing channels. These works will require particular diligence and care to ensure that environmental risks are adequately mitigated.

3.11.4 Site Restoration

Following Project construction, the Licensee will reclaim and re-vegetate all disturbed areas associated with Project components and not located within the Project's built footprint as per the Vegetation Management and Reclamation Plan (see Section 7.16 for further details). The Licensee will consult with appropriate forestry tenure holders, regarding site-specific prescriptions to be developed for reclamation seed mixes and/or replacement tree and shrub species.

3.11.5 Preliminary Work Schedule

A preliminary, high level construction schedule is provided in Figure 3. The information presented in the schedule should be interpreted with caution: start and end dates are projected construction dates (vs. firm). The schedule can, however, be considered a reasonable tool for task duration estimation and general work/phase sequencing.



Figure 3. Preliminary, high-level construction schedule.

-- The figure is provided on the following page --

22-Feb-16



CO	NFIDENTIAL	Narrows Inlet Hydro Project Provisional Construction Schedule				
ID	Task Name	Duration	5 Half 1, 2016 Half 2, 2016 Half			
1	Narrows Inlet Hydro Construction Project	93.94 wks				
2	Project Approvals and Financing	21.94 wks				
7	Construction Packages	93.94 wks				
8	Site Set Up	28.94 wks	µ −−			
13	Roads and Bridges	20 wks				
18	Main Civil Package	91 wks				
19	Procurement & Contract Negotiations	12 wks	18/12 27/03			
20	Engineering	32 wks				
25	Chickwat Construction	64 wks				
26	Clearing	4 wks	25/05 27/06			
27	Main Headworks	30 wks	28/06			
28	Construct C1 Access Road	4 wks	28/06 31/07			
29	Auxilliary Intakes & PE diversion pipe (C1 & C2) 0.66 dia HDPE 2.3km	8 wks	15/07			
30	Penstock HDPE - 1.397m dia 1.2 km	10 wks	20/09			
31	Construct Overland Penstock Access Platforms/Trails/Foundations	10 wks	30/12			
32	Penstock Steel - 1.370m OD, 1.0km (300m Surface)	16 wks	13/12			
33	Powerhouse & Substation Civil	20 wks	01/02			
34	Reclamation	6 wks				
35	Install Turbine/Generator/Auxilliaries inc Stage 2 Concrete	10 wks				
36	Commission Chickwat Hydro Plant	4 wks				
37	Upper Ramona Construction	65 wks				
38	Clearing	4 wks	23/0725/08			
39	Penstock up to Tunnel Portal - 0.610 OD, 969m	6 wks				
40	Powerhouse & Substation Civil	12 wks				
41	Reclamation	6 wks				
42	Install Turbine/Generator/Auxilliaries inc Stage 2 Concrete	6 wks				
43	Commission Upper Ramona Hydro Plant	4 wks				
44	Lower Ramona Construction	62 wks				
45	Clearing	3 wks	28/06 23/07			
46	Main Headworks	18 wks	23/07 21/			
47	Auxilliary Intake & PE diversion pipe (R1) - 0.66 OD HDPE (760m)	6 wks	20/09			
48	Penstock HDPE - 0.914 OD (547m)	6 wks	09/11 🛫 29			
49	Penstock Steel - Including Pipe Bridge - 0.864 OD (1.5km)	16 wks				
50	Powerhouse & Substation Civil	16 wks	10/02			



CON	IFIDENTIAL	Narrows Inlet Hydro Project Provisional Construction Schedule									
ID	Task Name	Duration	5 S	N	Half 1, 2	2016		Half 2,	2016	N	Half 1, 2
51	Reclamation	6 wks				141	IV		5		
52	Install Turbine/Generator/Auxilliaries inc Stage 2 Concrete	10 wks									
53	Commission Lower Ramona Hydro Plant	4 wks									
54	Narrows Inlet Common Substation 25/138kV	10 wks							1		
55	Civil Work	10 wks						30/08	\$	22/	′11
56	Balance of Plant	89 wks			_						
57	Procurement	6 wks		25/0	1 🖵	 1	5/03				
58	Design	20 wks			15/0)3 📩			30/08		
59	Chickwat	30 wks									1-
63	Upper Ramona	89 wks			_						
67	Lower Ramona	37 wks								·	
71	138 kV Shared Substation	10 wks									
73	Upper Ramona Tunnel and Headworks	80.33 wks		-	_						
74	Procurement	10 wks	07/	12 🗩		28/	02				
75	Engineering & Site Investigations	12 wks			29/02			08/06			
76	Construction	62 wks									•
85	Transmission Line	57 wks									•
86	Procurement - DB Package	8 wks		15	5/02 🦷	,	22/)4			
87	Design	14 wks				22/04	_		17/08		
88	BCH Interconnection Work	30 wks						18/08	*		
89	Chickwat - 25kV (0.8km new to Tyson Line - 3.0km under Tyson)	18 wks							Î		
93	Upper Ramona - 25KV (0.9km tie-in to Lower Ramona Line)	15 wks									-
97	Lower Ramona - 25kV (6.6km to Shared Substation)	24 wks							F		
101	New 138kV T-Line Caren Range (6.5km) to POI	28 wks							Î		
105	New 138kV Tyson to Skookumchuck Narrows Spur (2.5km)	17 wks								I	
109	HDD Crossing Skookumchuck Narrows	53.17 wks				ſ					
114	Owner Supplied Equipment Supply	72 wks			-						
115	Turbine Generators	72 wks			-						
131	Power Transformers (3 x 25kV, 1 x 138 kV)	50 wks									



3.11.6 Construction Timing Windows

Construction timing windows, or reduced risk window, are timing periods during which work can be undertaken such that harmful effects on VCs will be minimized. Constructing during appropriate timing windows reduces the risk of damage to flora and fauna, and their habitats.

Construction timing windows may vary depending on a site-specific basis, depending on which species may be present and the sensitivity of their habitat. It is important to note that for certain Species-At-Risk (SAR) there may be no period of least risk. The timing windows for the VC identified in for this Project, located in the Lower Mainland Region (Region 2), are provided in Table 9. Refer to Section 8.2 for details on wildlife management best practice guidelines and regulatory requirements.

Construction Activity and Location	Restricted Work Period	VC Presence	Applicable EMP(s)
Instream-works (Chickwat Creek Intake)	Sept 1 to June 14	Dolly Varden	Fish and Fish Habitat Protection Plan (Section 7.14)
Instream-works (Chickwat Creek Tailrace)	Sept 1 to July 31	Coho Salmon, Coastal Cutthroat Trout, Dolly Varden, Steelhead Trout	Fish and Fish Habitat Protection Plan (Section 7.14)
Instream-works (only applicable D/S of tailrace in fish-bearing section)	Nov 1 to July 31	Coastal Cutthroat Trout	Fish and Fish Habitat Protection Plan (Section 7.14)
Instream-works (C1, C2 Tributaries secondary intakes, Ramona Creek Upper/Lower Intakes, R1 Tributary secondary intake)	None. Dry period recommended.	None (Non-fish bearing waters)	Erosion, Sediment and Drainage Management (Section 7.5) Care of Water (Section 7.6)

Table 9.	Construction	timing window	s for the species of	f concern found w	vithin the project area.
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Construction Activity	Restricted Work	VC Presence	Applicable EMP(s)
and Location	Period		
Vegetation Clearing (all Project components)	Breeding bird nesting period for raptors (March 1 to July 31)	Bald Eagle, Great Blue Heron, Northern Goshawk, Wostern Screech	Vegetation Clearing Plan (Section 7.16.1) Wildlife Management Best
	to July 31). Note that the nesting period for breeding migratory birds extends to August 15.	western Screecn- owl, Sooty Grouse, American Dipper, Harlequin Duck, and all other birds (e.g. song birds).	Practice Guidelines and Regulatory Requirements – Birds (Section 8.2.2)
	During winter and the kidding/early rearing and mineral lick use periods (1 Nov. – 30 Apr., and 1 May – 15 July, respectively, maintain a 500 m buffer zone adjacent to important mountain goat habitat.	Mountain goat	Wildlife Management Best Practice Guidelines and Regulatory Requirements – Mammals (Section 8.2.3)



4.0 Project Governance and Guidance Documents

4.1 Corporate Environmental Commitment/Statement

BluEarth Renewables Inc. is committed to adhering to the terms and commitments made in this CEMP throughout all aspects of the construction of the Narrows Inlet Project. This includes all aspects of its operation, procurement chain, project and construction management services, through its external service providers and contractors, and during the early commercial operations of the Project (defined as the period between Commercial Operation Date (COD) and the date of issuance of the final Leave to Commence Operations (LCO)).

BluEarth Renewables Inc. recognizes, supports and will ensure that these terms and commitments will be implemented, monitored, and enforced from the start of construction, until the issuance of the final LCO by MFLNRO.

4.2 Summary of Applicable Legislation

The Narrows Inlet HEP will be constructed in compliance with applicable legislation, guidelines, and obligations outlined in:

- Environmental legislation and regulations listed in the following sections;
- Project permits, licences, authorization and approvals;
- Policies, guidelines and Best Management Practices established by governing agencies; and
- The EAC and EA Table of Conditions (TOC), which summarises the commitments made by the Licensee to the EAO following the Project Environmental Assessment review.

Records of all permits, approvals, and notifications obtained for the Project will be kept in a secure location, at the Licensee's head office in Calgary and on site, and will be made available at the request of the IE and/or the IEM, the Regional Water Manager (RWM), the EUWA and MFLNRO Conservation Officers or Inspectors.

A list of all permits, approvals, and notifications obtained for the Project will be routinely updated and are provided in Appendix B.



4.2.1 Provincial Legislation

A list of applicable Provincial Acts and regulations governing the development of this project is provided below.

- Environment and Land Use Act;
- Environmental Management Act;
- Fish Protection Act;
- Forest and Range Practices Act;
- Heritage Conservation Act;
- Integrated Pest Management Act;
- Pest Control Products Act;
- Transportation Act;
- Utilities Commission Act;
- Water Act;
- Weed Control Act;
- Wildlife Act;
- Wildfire Act; and
- Workers Compensation Act.

4.2.2 Federal Legislation

A list of applicable Federal Acts and regulations governing the development of this project is provided below.

- Canada Water Act;
- Canadian Environmental Assessment Act;
- Canadian Environmental Protection Act;
- Explosives Act;
- Fisheries Act;
- Hazardous Products Act;
- Migratory Birds Convention Act;
- National Fire Code of Canada;
- Navigable Waters Protection Act (NWPA) / Navigation Protection Act;
- Seeds Act;



- Species at Risk Act; and
- Transportation of Dangerous Goods Act.

4.2.3 Municipal/Regional District Legislation

A list of applicable Municipal/Regional District Acts and regulations governing the development of this project is provided below.

- Temporary Use Permits; and
- Building Permits.

4.3 Project Environmental Management Program

The following subsections describe the Project Environmental Management Program (the 'Program') that will be implemented to guide, monitor, and assure that the environmental commitments and objectives of the Project are met. These sections identify the Program's components, structure, monitoring expectations, and field communication protocols.

4.3.1 Principles and Components of the Project Environmental Management Program

This Project Environmental Management Program is founded on the principle that successful environmental management is a function of:

- Having clear objectives and goals to guide construction processes. These objectives and goals are set based on environmental legislation, regulations, and Best Management Practices,
- Having in place a process that describes how these objectives and goals will be met. To be effective, this process is to include specific details describing how environmental protection will be achieved (e.g., describing the selection and location of specific mitigation measures, and how these will function to meet the Project objectives and goals), and
- 3. Having in place a monitoring program that measures, quantifies, and reports on the environmental performance of the Project based on select performance indicators.



This CEMP is the guidance document that identifies the environmental objectives and goals of the Project. Quality assurance and quality control (QA/QC) that the guidance provided in the CEMP is implemented is governed via the Licensee's environmental program.

The process that describes specifically how impact mitigation will be achieved is the development of Environmental Protection Plans (EPPs). EPPs are documents that will be developed by the contractor(s) to demonstrate how, to the satisfaction of the Licensee, the Licensee's Site Environmental Representative, IEM, and Agencies (where applicable), construction impacts will be prevented and/or minimized. The development and implementation of Project EPPs (i.e., the measures described in each) are governed and coordinated by the contractor's environmental program. A comprehensive list of EPP required for this Project is provided in Appendix C.

The third component of the Project Environmental Management Program, the monitoring program, is the process by which Project performance is monitored and measured. The monitoring program relies on each Project party having in place a process to monitor, track and evaluate the environmental performance of the Project. This program provides feedback to the Licensee, contractor(s) and Agencies to continuously improve environmental quality during the course of construction. These principles, components and how they interrelate are illustrated in Figure 4.



Figure 4. Components and relational pathways of the Project Environmental Management Program.





4.3.2 Licensee's Environmental Program

The Licensee's environmental program is primarily one of quality assurance and quality control (QA/QC) that will guide, monitor, evaluate, and correct construction processes to ensure that the Project is built in compliance with the environmental commitments made by the Licensee during Project permitting. QA/QC will be monitored by the Licensee's Environmental Manager, who will be responsible for overseeing all aspects of environmental management during construction. The role and responsibilities of the Environmental Manager are described in Section 6.2.1.

QA/QC will be achieved via routine site inspections designed to evaluate the Licensee's environmental risk, confirm (and correct) overall and on-going environmental compliance issues, and assure that the Project objectives and goals are met.

4.3.3 Contractor's Environmental Program

The contractor(s) is expected to develop a Project-specific environmental program that includes (among others):

- 1. developing EPPs to prevent impacts to Project-specific VCs,
- 2. implementing the measures committed to in each EPP, and
- 3. monitoring the effectiveness of the environmental protection measures implemented, and
- 4. if/as needed, taking corrective actions to ensure that the environmental objectives and requirements of the Project are met.

The contractor's environmental program will include aspects of education and training, awareness, construction and implementation of mitigation measures, QA/QC, record keeping and document control, and the maintenance and repair of all environmental protection measures determined to be defective or not meeting the objectives of the CEMP.

The contractor's environmental program will be developed, administered and coordinated by the contractor's Environmental Field Supervisor. The role and responsibilities of the Environmental Field Supervisor are described in Section 6.2.1.



4.3.4 Allowance and Process for Requesting Environmental Protection Equivalencies

It is understood that meeting the environmental specifications and best management practices of the Project (see Section 7 for details) can be achieved in a multitude of ways, using different approaches and techniques, all with differing risk factors and financial implications. In Section 7 of this CEMP, the Licensee puts forward strategies to reduce environmental risk and assist the contractor(s) to achieve compliance with Project permits and environmental commitments. None of these strategies are meant to be fail-safe, but are meant to ensure adequate and effective environmental protection, compliance with Project environmental commitments, and compliance with applicable environmental legislation.

In the EPPs, contractor(s) will define the mitigation strategies that will be used as part of a given construction process or activity. Considering the constantly-changing nature of construction planning and execution, it is reasonable to expect that contractor(s) will require modifying planned environmental mitigation strategies to address existing or newly arising risks. In other cases, it may also be beneficial to allow contractor(s) to develop alternate mitigation strategies where conventional approaches may be proven to be more onerous, costly, or simply impractical. This process is meant to address the latter condition, where a contractor(s) would like to substitute an environmental protection measure that can be shown to be equivalent to another in achieving a specific objective. In both cases, if and once a substitution is approved, it is expected that EPPs will be modified to reflect any new selected measure.

This Environmental Management Program permits and enables the substitution of environmental mitigation strategies as long as the Project environmental specifications and best management practices provided in Section 7 can be met without additional, significant risk being taken by a contractor(s) or the Licensee. The process by which this may be achieved is largely based on the evaluation and understanding of environmental risk, and based on the assurance that the implementation of alternate measures can be proven to be successful. Demonstration that success can be achieved will be via the review of published literature, the collection of data, and the formulation of a defensible rationale for evaluation by the Licensee's Environmental Manager and/or Site Environmental Representative, the IEM, and Agencies (if/as needed). This information is to be provided to the Licensee, the Licensee's Site Environmental Representative, and IEM for review and consideration as part of Project EPPs. All substitution requests are to be submitted to the Licensee, the Licensee's Site Environmental Representative, and the IEM at least seven days prior to the change being required.



The review and acceptance of a substitution is at the discretion of the Licensee, Licensee's Site Environmental Representative, and the IEM. In the event that a proposed substitution request requires higher level review or input (e.g., from an agency or specialist), as determined by the IEM, the contractor(s) may be required to have the request sent to an experienced, independent specialist. It will be the responsibility of the IEM to engage with agencies directly to confirm whether their input is required.

Note that the cost of reviews by specialists will be borne by the contractor(s) making the substitution requests. It is expected that most day-to-day measures (e.g., surrounding road construction or for erosion and sediment control during the installation of the penstock) will be reviewed and accepted by the Licensee, the Licensee's Site Environmental Representative, and the IEM. Substitutions of greater significance (e.g., surrounding the installation of bridges, stream diversions, waste rock and tunnel muck management, intake construction) will likely require agency review and input. Note that in the latter case, the contractor(s) is encouraged to communicate with the IEM well in advance of a request being made, as agency review is typically a lengthy process (in excess of 45 days is conceivable).

It is important to note that the acceptance of the substitution of a measure over another does not waive or transfer any liability or responsibility to either of the Licensee, Licensee's Site Environmental Representative, IEM, experienced specialists or agencies. The contractor(s) is fully and wholly responsible for the implementation, installation, maintenance, and success of all mitigation measures he installs as part of the Project.

If concluded, upon monitoring by the IEM or Licensee's Site Environmental Representative, that a substituted measure is not functioning as intended, or that the outcome results in a noncompliance with the Project environmental objectives, criteria, and protection specifications provided in Section 7, the Licensee, in conjunction with the IEM and the Licensee's Site Environmental Representative, may elect to retract the Allowance and Process for Requesting Environmental Protection Equivalencies at any time (and for the remaining duration of the Project).

4.3.5 Environmental Disputes and Resolution Process

Disputes may occur between the Licensee, Licensee's Site Environmental Representative, contractor(s), and IEM over the course the Project. All disputes that pertain to environmental matters (e.g., environmental protection mechanisms, risk tolerance and thresholds, IEM and Licensee's Site Environmental Representative decisions, contractor(s) negligence) are to be



resolved following a typical Alternative Dispute Resolution approach that includes an escalation process with assigned resources. In this case, the proposed escalation process is simple and includes: 1) negotiation, 2) mediation, 3) collaborative law, and 4) arbitration by an independent party.

In negotiation, participation is voluntary, without third party facilitating the resolution process or imposing a resolution. In mediation, a third party is appointed as a mediator, to facilitate the resolution process and submit and mediator's proposal to assist with the dispute resolution. The mediator's proposal is not imposed, but recommended for implementation. If the dispute escalates to collaborative law, each party appoints a legal advisor to facilitate dispute resolution within specifically contracted terms. This process is part of the litigation and court system. A resolution is not imposed by either party. Should the dispute escalate to arbitration, both parties will voluntarily appoint a third party (e.g., private judge) to impose a resolution on the dispute.


5.0 Pre-Construction Commitments

The purpose of this section of the CEMP is to provide a summary of the pre-construction commitments and identify the person(s) or party(ies) responsible for signing-off on the completion of each.

5.1 **Pre-Construction Commitments**

A summary of the Narrows Inlet HEP pre-construction commitments, as well as the source where the commitment originated from, the person(s) or party(ies) responsible for signing-off on the completion of each, and the status of completion as of the date of publishing this CEMP, is presented in Table 10.

Description of Commitment	Source	Required Approval	Approved
Northern Goshawk Monitoring (prior to vegetation clearing)	EA Condition No. 1, Appendix D		
Wildlife Monitoring – Salamanders (prior to starting construction on Ramona Lake component)	EA Condition No. 2, Appendix D		
Wildlife Monitoring – Marine Sensitivity Blasting (prior to starting construction on Lower Ramona Lake components)	EA Condition No. 3, Appendix D		
Water Quality Monitoring – Methyl Mercury (MeHg)	EA Condition No. 8, Appendix D		Yes
Wildlife Mitigation – Marbled Murrelet Radar Survey	EA Condition No. 9, Appendix D		
Wildlife Monitoring and Mitigation – Grizzly Bear Contribution Agreement	EA Condition No. 23, Appendix D		
Fish Monitoring and Mitigation - OEMP baseline studies	EA Condition 12, Appendix D		Ongoing

Table 10	Commitments	relating to	nro-construction	inventories	accaccmente	and surveys
Table IU.	communents	relating to	pre-construction	inventories,	assessments,	and surveys.



Active Raptor Nests or those protected year round under Section 34 of the <i>Wildlife Act</i> - Pre-construction survey within 200 m of the Project footprint by a QEP prior to any tree-falling activities	N/A	
 Prior to starting construction in any area, a QEP must complete surveys using methodology, as determined by the QEP, and approved by MFLNRO, that the following will be detected, should they occur in the area assessed: Oregon forest snail and Pacific sideband snail; Red legged frog and western toad; and Rare plants and ecosystem as identified from Species at Risk 	EA Condition 11.2 Appendix D	
Act, and red and blue listed species. If these species and ecosystems are found within an area of the Project footprint that would be subject to clearing or other disturbances, the QP must report the findings to MFLNRO. The <i>shíshálh</i> Nation must be provided with copies of draft and final plans, unless they provide written notice to the Licensee that this is unnecessary.		



6.0 Construction-Specific Guidance

6.1 Permits, Licences and Approvals (PLAs)

A comprehensive list of all of the Project permits, including the location where these can be found and issuing agencies, is provided in Table 11.

The Licensee is committed to ensuring that all permits, licences and approvals are updated regularly, including amending these (as required) to incorporate any changes needed to meet amendments to legislative Acts and their regulations, should these occur during the course of the Project. It will be the responsibility of the Licensee to disseminate (any and all) information pertaining to changes and amendments made to PLAs to all Project parties.

Table 11. List of all of the Project permits, including information on the location where these can be found, as well as the respective issuing agencies.

Permit	Issuing Agency	Permit Location
Air Discharge Dermit	MOF	Hard copy at site
	WOL	office
Conditional Water License		Hard copy at site
		office
	DEO	Hard copy at site
DFO Section 35(2) Authorization (if required)	DFO	office
	540	Hard copy at site
Environmental Assessment Certificate(s)	EAU	office
	Hoalth Authority	Hard copy at site
Health Permit to Operate a Kitchen	Health Authority	office
	MELNIPO Landa	Hard copy at site
LOO - Major Land Tenures (3 tenures for HEPs & 1 for TC)	WIFLINKO – Lanus	office
	MOEP	Hard copy at site
LTC - Licence to Cut which covers all of LOO	WOFK	office
	MOE	Hard copy at site
MSR Registration	WOL	office
	MOEP	Hard copy at site
Road Use Agreement	WOTK	office
		Hard copy at site
Section 8 - Short-term Water Use Permit		office
	MOER	Hard copy at site
Special Use Permit		office



Permit	Issuing Agency	Permit Location
Waterworks Permit to Construct a Well	Health Authority	Hard copy at site office
shíshálh Nation Heritage Inspection Permit (SHIP)	shíshálh Nation	Hard copy at site office

6.2 Roles and Responsibilities

This section of the CEMP describes the roles and responsibilities of key Project members, and includes those of key members of the Environmental Management Team. Key Project members include:

- The Licensee:
 - o Licensee's Engineer/Design Engineer
 - o Licensee's Construction Engineer/Manager
 - Licensee's Environmental Engineer/Manager
 - o Licensee's Site Environmental Representative
- The Contractor(s):
 - Construction Engineer/Manager
 - Prime Contractor(s) and Subcontractor(s)
- Overseeing Regulatory Agencies:
 - o Provincial
 - o Federal

A visual representation of the entire Environmental Management Team structure (e.g., organizational chart) is provided in Figure 5. A description of the roles and responsibilities of the key members of the Environmental Management Team is also provided herein. Only the roles and responsibilities of those directly involved in implementing, inspecting and reporting on the effectiveness of environmental protection and mitigation measures is presented.

The roles and responsibilities of consulting specialists (Qualified Environmental Professionals (QEP) or others) are implicit in their respective titles (see Figure 5) and are not described herein. Although information on the roles and responsibilities of overseeing regulatory agencies is provided, please note that these are not described in any great details. Any enquiries and/or requests for further information can be directed to the Licensee and/or IEM.









6.2.1 Licensee

The Licensee's role and responsibilities include ensuring that all applicable permits, approvals, undertakings, and agreements are adhered to during the planning, design, construction, and operation of the Project.

a. Licensee's Engineer/Design Engineer

The Licensee's Engineer/Design Engineer role and responsibilities include designing all permanent components and accounting for the condition and restrictions of the surrounding environment and limitations as prescribed in all permits and licenses.

b. Licensee's Construction Engineer/Manager

The Licensee's Construction Manager's role and responsibilities include communicating with the Licensee, the IE, and the IEM and informing all parties of construction activities as they relate to environmental issues. They also include, but are not limited to, appropriately designing both temporary and permanent structures to meet industry standards for worker safety and eventualities such as floods, earthquakes and atypical events, organizing and conducting audits, and implementing and revising the CEMP.

c. Licensee's Environmental Engineer/Manager

As part of the Project, the Licensee is committing to appointing an Environmental Manager who will be responsible for the coordination and implementation of the Licensee's Environmental Management Program. The Environmental Manager will be responsible for overseeing all environmental aspects of the Project, including all environmental matters relating to the construction, commissioning, and initial operation of each individual HEP. This includes securing and maintaining environmental permits, and acting as QEP in any ministry Professional Reliance model used by the Province of BC. This QEP role applies in the permitting process, in ensuring regulatory compliance, in developing and implementing environmental management systems and environmental protection/monitoring programs, and when liaising with regulators, authorities and local harbours.

In conjunction with the IEM, the Environmental Manager will be responsible for assuring that work is conducted in compliance with the CEMP and applicable specifications, permit conditions, and applicable legislation. The Environmental Manager will also share the responsibility of reviewing and accepting Project EPPs submitted by the contractor(s).



The Licensee may, from time to time, require that the Environmental Manager delegate responsibilities to support personnel. Considering the spatial distribution of the Project, the Environmental Manager may appoint one (or more) staff to assist with project QA/QC monitoring and follow-up. Should support personnel be required, the Environmental Manager will be responsible for informing the IEM and contractor(s) of such changes, including clarifying the authority of any appointed support staff.

d. Licensee's Site Environmental Representative

The Licensee's Site Environmental Representative is an individual appointed to oversee the implementation of the Licensee's Environmental Management Program in the field. This individual will be responsible for conducting regular/routine site inspections, attending key site meetings, and assuring that the Licensee's Environmental Management Program is implemented as intended, and in accordance with the guidance provided in this CEMP, as well as the Permits, Licenses, and Authorizations issued for the Project.

The Licensee's Site Environmental Representative will conduct regular inspections of the work site(s), and will report his findings directly to the Environmental Manager, among others. This individual will engage routinely with the contractor(s) and IEM in the field, will support them in various capacities, and will see to the interests of the Licensee *in situ*.

e. Contractor's Environmental Field Supervisor (EFS)

The contractor(s) is expected to appoint and retain a Qualified Environmental Professional (QEP) to coordinate, implement, and oversee all of the contractor's environmental responsibilities and commitments. In general terms, the contractor's Environmental Field Supervisor will be responsible for the implementation and workmanship involved in the installation, management, and maintenance of construction mitigation measures required throughout the Project. The key responsibilities of the contractor's Environmental Field Supervisor will include (among others):

- The development of EPPs;
- The evaluation of the performance of Project mitigation measures;
- The maintenance of all measures installed under his/her supervision;
- Ensuring that construction crews are familiar with the details and commitments made in EPPs for a given task/activity;
- The regular inspection of the work to evaluate adherence to the CEMP;



- The oversight of construction activities to ensure that additional measures or controls are implemented to protect the environment (if/as needed);
- The regulation of the contractor's overall performance with regards to the environmental commitments made in EPPs;
- The contractor's adherence to permits and regulatory requirements of the Project;
- The maintenance, production, and proper control of environmental records for the project;
- The implementation of Field Communication Protocols identified in Section 6.5.2 of this CEMP;
- The notification of the Licensee, IEM, and IE of schedule changes that affect the installation or implementation of environmental measures and controls;
- The complete and proper restoration and reclamation of work sites such that completed works are left in a stable, free-draining, clean and environmentally satisfactory condition (as determined by the IEM);
- The coordination and quality assurance of work completed by the contractor's environmental foreman and work crews;
- Where applicable, the collection of samples and data to substantiate that measures are functioning as intended;
- The maintenance and submission of routine inspection reports to the Licensee upon request; and
- The maintenance, production, and distribution of all Environmental Incident Reports generated during the course of construction to the Licensee and IEM.

Recognizing that the duration of the construction of the Project will span multiple years, it is reasonable to expect (although not preferred) that the contractor's Environmental Field Supervisor may change over time and/or delegate responsibilities to support personnel. To control and assure quality and consistency of the service provided by the contractor's Environmental Field Supervisor, the process of delegating responsibilities and duties will be closely reviewed and scrutinized by the Licensee. Particularly, it is expected that scrutiny will be applied when high-level responsibilities are delegated to support personnel. The Licensee reserves the right to refuse that duties be delegated to less experienced or less skilled personnel where environmental risk is elevated or circumstances warrant it (e.g., when significant and specific experience are required to implement higher-risk environmental controls and measures).



The process of substitution of the contractor's Environmental Field Supervisor is to be done in writing, from the contractor's Environmental Field Supervisor to the Licensee. Any such requests may only be considered if provided to the Licensee at least 14 days in advance of a substitution being required. These requests must include a detailed rationale for the proposed change, with sufficient information about the suitability of the candidate assuming the transferred or additional responsibilities. The approval of these requests lies with the Licensee, although it is expected that the Licensee and contractor(s) will have a chance to thoroughly discuss and consider alternatives prior to a decision being made and approval being granted. At a minimum, the contractor's Environmental Field Supervisor will meet the requirements of a QEP, and will have at least 3 years of consecutive experience in construction management and applied environmental impact mitigation. A QEP is an applied scientist or technologist, acting alone or together with another qualified environmental professional. He or she must be registered and in good standing in British Columbia with an appropriate professional organization preferably constituted under an Act, acting under that association's code of ethics and subject to disciplinary action by that association. The applicable professional may be a professional Biologist, Agrologist, Forester, Geoscientist, Engineer, or Environmental Professional registered under the Canadian Environmental Certification Approvals Board.

f. Prime Contractor and Subcontractors

Both prime contractor(s) and subcontractor(s) have roles and responsibilities in implementing the CEMP, such as ensuring all their employees working on-site during the course of construction are familiar with the CEMP.

g. Environmental Auditor

The Licensee may, of his own volition or as requested by a regulatory agency, retain the services of an environmental auditor (or auditing team) to provide an external review of the implementation of the Project's Environmental Management Program. The auditor (or auditing team) will report directly to the Licensee, unless otherwise requested by the regulators. In the latter case, the auditor would likely report directly to the requesting agency.

It would be reasonable to expect that the Licensee will retain an auditor when recurring issues are not resolved, when items that require attention are repeatedly put in abeyance without due consideration, or if negligence is apparent and not addressed. An auditor may also be retained if systematic issues occur or to confirm that the key members of the Environmental Management Program are properly maintaining all required Project documents and records.



The Licensee may also retain an auditor to inspect and confirm the general performance of the Program.

As a requirement of this CEMP, it is important to note that the Licensee, IEM, IE, and contractor(s) will be required to grant the Auditor full access to Project environmental records. This is limited to all project documents and mandatory records specific to the construction of the Project, including all of the records described and referred to in this CEMP.

h. Environmental Specialists (ES)

As needed, the Licensee and contractor(s) may be required to retain a number of environmental specialists to assist the management team throughout Project construction. Disciplines specialists may include archeologists, fisheries, wildlife, and terrestrial vegetation consultants, hydrology and hydrotechnical engineers, geologists and geotechnical engineers, silviculturists and forestry consultants (among others). The roles and responsibilities of these specialists will be to provide advice on issues of concern that arise throughout Project construction, in each of their respective fields of practice.

Examples of situations that will require the services of discipline specialists include:

- When in need of extensions to Reduced Risk Windows,
- To develop riparian reclamation treatments/prescriptions,
- To evaluate and confirm ML/ARD potential in waste rock extracted during tunnel construction,
- To advise on procedures to safeguard archeological chance finds,
- To confirm that ramping rates can be met during commissioning tests,
- To advise on site suitability to construct fish compensation habitat,
- Etc.

6.2.2 Provincial Engineer

The Provincial Engineer under the *Water Act* has the power to regulate the construction of works, which regulation may consider the following:

• The criteria for the design and construction of works to protect the public and the environment;



- The criteria for the operation of the works to protect the interests of licensees, riparian owners and owners of land adjacent to the works, and protect the environment from adverse effects; and,
- The construction activities that may adversely affect the public, the environment and the interests of licensees, riparian owners and owners of land adjacent to the works.

The Provincial Engineer under the *Water Act* will provide direction to an Independent Engineer (IE) and an Independent Environmental Monitor (IEM) retained by the Licensee to provide information and reports as set out in the Conditional Water Licence (CWL).

6.2.3 Independent Engineer (IE)

The Licensee will appoint an IE who will be retained to act as a QEP in any Professional Reliance model utilized by the Province of BC and provide information and reports under the direction of the Provincial Engineer as set out in the CWL. The IE will provide information and reports under the direction of the Engineer under the *Water Act* regarding the design and construction of the Project.

The IE will review the design drawings for the construction of the works, and prepare reports for submission to the Regional Water Manager (RWM) of the Ministry of Natural Resources Operations (MFLNRO) prior to giving consent that construction may be undertaken. Within each construction phases of the Project, the IE will identify construction components that are critical to ensure the protection of the public and the environment, as well as the interests of licensees, riparian owners and owners of land adjacent to the works. The IE will also schedule site inspections to verify that the conditions for the construction of critical components are in accordance with the construction plans, and provide the RWM with a report on the outcome of these inspections.

As part of his/her responsibilities, the IE will review the reports produced by the IEM and advise the RWM if the construction activities are adversely affecting the environment and the interests of Licensee, riparian owners, and owners of land adjacent to the Project. The IE and the IEM will communicate with each other during the course of construction, and coordinate their activities to provide information to the RWM for proper regulation of Project construction. Particularly with regards to requesting Leaves to Commence Construction (LTCC) from the RWM, the IE and IEM will interact closely to confirm environmental compliance and due diligence of works covered under a requested LTCC.



The IE and IEM (discussed following) are empowered to stop work or adjust the plan of action to protect the environment for the duration of the CEMP and are required to be on-site for post-construction phases as per Section 9.0 of this document.

A copy of the Scope of Work for Independent Engineer and delegates is provided in Appendix E. A signed copy will be included upon retention of an IE.

The IE may require delegating responsibilities to support personnel to expedite the review of time-sensitive project components and design. Considering the spatial distribution of the Project, the various components requiring scrutiny by the IE, and the volume of work expected to occur concurrently the HEPs that form the Project, the IE may appoint one (or more) staff to assist with design review and approval. Should support personnel be required, the IE will be responsible for informing the Licensee, IEM and contractor(s) of such changes, including clarifying the authority of any appointed support staff.

If the IE and/or list of IE delegates changes during the duration the CEMP is in force, revisions will be made following the Change Management and Approval Process outlined in Sections 2.4 and 2.5.

a. Scope of Services for IE and Delegates

This section will be developed by the IE once a candidate is vetted by the Province. It will include the following details:

- A detailed workplan for the IE including specific authority, duties, and roles and responsibilities associated with acting as a QEP in providing information to be used in a provincial Professional Reliance model and with all approvals, permits, licenses, and appropriate best practices to ensure compliance with environmental agency requirements and protection of the environment.
- It will include the frequency and duration of site visits and associated activities, and all reporting requirements for each phase of the project through to the completion of the commissioning phase.
- The scope of work will describe all details of proposed construction, including but not limited to:
 - Construction phases;
 - o Timelines;



- o Activities; and
- o Mitigative strategies and safeguards for the facility and all associated works.

6.2.4 Independent Environmental Monitor (IEM)

To be compliant with the *Water Act*, and Project permits and commitments made during the EA process the Licensee is required to retain an IEM to oversee the Project (refer to EA Condition No. 4, Appendix D). The IEM is a qualified environmental representative appointed by the Licensee to provide quality assurance and administer the environmental aspects of the Project. The IEM may be an individual or a firm. The selected candidate (or firm) is subject to approval by the RWM at MFLNRO.

The authority of the IEM is limited to all environmental aspects of the Project that are bound by the Conditional Water Licence (CWL) issued for the Project (i.e., named works). The IEM has no authority on the aspects of the Project that are not specifically described in the CWL, unless specifically delegated by the Licensee in writing.

a. Role of the IEM

The IEM is an industry-based professional responsible for representing the interests of regulatory agencies involved in the permitting of the Project, particularly MFLNRO. The primary role of the IEM is to provide assurance that the environmental commitments made by the Licensee and its contractor(s) are achieved throughout the course of Project construction and commissioning. In this capacity, the IEM will be on-site, prepare inspection reports (as necessary), and liaise with the contactor(s), the Licensee, and regulatory agency representative(s) as required. Among others, the IEM is responsible for the following:

- 1. Assuring that Project construction activities are carried out in compliance with:
 - i. The processes and approach defined in this CEMP;
 - ii. Applicable permits, Provincial and Federal legislation, regulations and standards; and
 - iii. Best Management Practices (BMPs), guidelines, contract documents, and the Project environmental specifications described in Section 7 of this CEMP.
- Assuring that appropriate levels of protection are in place to prevent or minimize impacts to environmental resources throughout the course of construction of the Project.



3. Maintaining an independent role from all other Project parties in order to assess compliance and report non-compliance events to responsible parties and agencies as needed.

b. Key Responsibilities

The key responsibilities of the IEM are listed below.

- Oversee and document spill cleanup and effects, dispersal, size, etc. (as feasible and if necessary).
- Assure that waste management initiatives are properly addressed.
- Assure that emergency response supplies and equipment are available on-site and in sufficient quantities.
- Attend project-related meetings (e.g., pre-construction meetings, daily pre-work meetings, safety and tailboard meetings, etc.).
- Collect water or soil samples as part of routine construction monitoring activities or as a result of environmental emergencies.
- Communicate with the contractor(s) and Licensee in the event of an environmental incident or development of unforeseen site conditions with potential for environmental degradation.
- Communicate and liaise effectively with representatives of regulatory agencies, the Licensee, and contractor(s) on environmental issues and concerns.
- Following any spill, oversee and document all cleanup and restoration activities.
- Halt work if contractor(s) activities are, in the opinion of the IEM, posing a risk to environmental resources.
- Maintain detailed project records of daily project activities (field log, photographic data, georeferenced information, etc.).
- Provide suggestions, monitor, and oversee the implementation/installation and effectiveness of all mitigation and erosion and sediment control measures (if applicable).
- Provide environmental monitoring services throughout all environmentally sensitive activities during this project.
- Provide specialist recommendations to the Licensee and contractor(s) on an as-needed basis.
- Provide timely advice and make recommendations to help safeguard the Licensee and contractor(s) from unnecessary risks.



- Produce and submit weekly environmental monitoring reports to regulatory agencies as defined in Section 6.4 of this document, and in accordance with the Scope of Information and Reports of the IEM provided in Appendix F.
- Review contractor(s) work plans and EPPs to assure that the conditions of the CEMP are met, and make timely recommendations to address any deficiencies identified in said plans.
- The IEM may also be requested by the Licensee to:
 - Answer questions, concerns or complaints that may arise as a result of the construction activities.
- Participate in public meetings pertaining to this project.
- Participate in the training of contractor(s) staff on environmental issues.
- Work cooperatively with all project parties to resolve environmental issues and challenges.
- c. Authority

The IEM will have the authority to issue a Halt Work Order if in his opinion site conditions, or actions by the contractor(s) and/or Licensee, represent a threat to the environment. This authority is provided formally, in writing, by the Licensee (refer to Appendix F). Halt Work Orders may or may not apply to the entire work site, depending on the severity of the non-compliance.

The IEM will also make recommendations to resume the work once the cause(s) leading to the Halt Work Order has/have been identified, addressed, and controlled, and the environmental risk(s) has/have been reduced or eliminated. Work will be allowed to resume once conditions detrimental to the environment have been rectified.

d. Delegation of Duties, Substitutions, and Experience Requirements

In the event that the IEM service is provided by a company with more than one individual appointed to provide the service, an IEM designate will be named. Recognizing that the duration of the construction of the Project will span multiple years, it is reasonable to expect (although not preferred) that the IEM designate may change over time. To control and assure quality and consistency of the IEM service, the process of changing IEM designate will be closely reviewed and scrutinized by the Licensee and agencies (if/as required). It is also expected that similar scrutiny will be applied when high-level responsibilities are delegated from the IEM to its designate. The Licensee reserves the right to refuse that duties be delegated from the IEM to



less experienced or less skilled IEM designates, where environmental risk is elevated or circumstances warrant it (e.g., when significant conflict exist between an individual and the contractor(s), when specific experience is required to monitor a higher-risk construction activity).

At a minimum, the candidates sharing the responsibilities of IEM will have the following formal education and credentials, applied relevant field experience, and skills-based training (Table 12).

Role	Education	Credentials	Experience (yrs.)	Skills/Training
IEM Designate	Technology	A.Sc.T., EP,	Minimum of 5	EM For Construction
(Primary)	diploma in	R.B. Tech.,	yrs. of cumulative	Projects (delivered by
	environmental	R.P. Bio., P.	experience	Vancouver Island
	studies	Eng., P. Agr.	delivering	University)
	B.Sc. in biology, environmental, or earth sciences is preferred		environmental monitoring on construction projects	Basic skills-based training in erosion and sediment control from an accredited
			experience working around HEPs	education institution

Table 12. Minimum formal education, credentials, applied relevant field experience, and skills-based training for IEM designate.



Role	Education	Credentials	Experience (yrs.)	Skills/Training
IEM Designate	Technology	A.Sc.T., EP,	Minimum of 2	EM For Construction
(Secondary)	diploma in	R.B. Tech.,	yrs. of cumulative	Projects (delivered by
	environmental	R.P. Bio., P.	experience	Vancouver Island
	studies	Eng., P. Agr.	delivering	University)
	B.Sc. in biology, environmental, or earth sciences is preferred		environmental monitoring on construction projects Experience working around HEPs	Basic skills-based training in erosion and sediment control from an accredited post-secondary education institution
Assisting Monitors	Completed grade 12, post- secondary education preferred	N/A	Experience working around construction projects preferred	EM For Construction Projects (delivered by Vancouver Island University)

The process of substitution of IEMs, or delegation of duties among them, is to be done in writing, from the IEM designate to the Licensee and agencies (if/as required). Any such requests may only be considered if provided to the Licensee at least 14 days in advance of a delegation or substitution being required. These requests must include a detailed rationale for the proposed change, with sufficient information about the suitability of the candidate assuming the transferred or additional responsibilities. The approval of these requests lies with the Licensee, although it is expected that the Licensee and IEM will have a chance to thoroughly discuss and consider alternatives prior to a decision being made and approval being granted.

If the IEM and/or list of IEM designates changes during final design and/or during construction, revisions will be made following the Change Management and Approval Process outlined in Sections 2.4 and 2.5.

It is also recognized that the IEM may introduce and require assisting monitors to supplement his roster from time-to-time. The qualifications of, and responsibilities assigned to, assisting monitors will also be subject to evaluation and scrutiny by the Licensee and IEM team. Unless



otherwise agreed-to in writing by the Licensee, it is expected that the responsibilities of assisting monitors will largely be limited to *in situ* observing, recording, and reporting on Project progress, mostly during lower risk activities.

The name of the IEM as well as all of his/her delegates is provided in Appendix F. A copy of the Scope of Work for Independent Environmental Monitor and delegates is provided in Appendix F. A signed copy will be included upon retention of an IEM.

6.3 Project Monitoring and Environmental Monitoring Plan

6.3.1 Project Monitoring

Compliance and Project performance monitoring is the responsibility of the Licensee, contractor(s), IE, and IEM. The Licensee is responsible for monitoring the overall performance of the Project, which will be achieved by conducting regular QA/QC inspections of work activities. The frequency of these inspections will be determined based on need, and the outcomes will be shared transparently with the contractor(s), IE, and IEM. It is expected that environmental quality inspections will occur on a weekly basis (at a minimum), largely based on the environmental risk associated with a construction activity and/or seasonal weather patterns. Inspection outcomes will be disseminated in the form of reports that will be distributed in advance of scheduled environmental meetings. The Licensee's environmental quality concerns and issues may be integrated in the daily meetings defined in Section 6.5.2.

The contractor(s) is responsible for the monitoring of all impact mitigation measures he/she has implemented during the course of the Project, and for the performance of individual measures at meeting the environmental specifications and best management practices described in Section 7.0 of this document. The contractor's Environmental Field Supervisor will inspect and monitor the performance of these measures on a daily basis, and will monitor construction (in general) to confirm compliance with the CEMP requirements. Performance monitoring will include the collection of field data (e.g., soil samples, water quality data, Acid Generating Potential, photographic records, etc.) to substantiate performance claims. The Environmental Field Supervisor will produce brief daily inspection reports that will be shared transparently with the Licensee, the Licensee's Site Environmental Representative, and the IEM. Inspection outcomes will be discussed during the end-of-day meetings described in Sections 6.5.2.

The key monitoring responsibilities of the IE are defined in Appendix E (see Scope of Information and Reports of the IE). The scope of the monitoring effort of the IE is relatively narrow, and



primarily related to the construction and design of permanent (vs. interim/temporary) structures (some exceptions exist, e.g., the construction of the main stream diversion structure and coffer dam). The IE will monitor Project compliance by conducting regular verification of design drawings to ensure that the Project is built in accordance with the expectations of the Provincial Engineer under the *Water Act*. The IE will perform occasional site inspections, at a frequency that he/she determines warranted based on the significance of the works taking place. The outcomes of the IE's inspections will be disseminated to the Licensee, the Licensee's Site Environmental Representative, contractor(s), and IEM for review and discussion. The frequency and regularity of IE inspections will be determined at the commencement of Project construction, primarily based on need.

6.3.2 Environmental Monitoring Plan

The Environmental Monitoring Plan (the "Plan") is a mandatory requirement of "Appendix H" of the Guide for Waterpower Projects. The Project will be constructed under the oversight of an IEM. It is expected that the IEM retained by the Licensee will develop the Plan, upon having reviewed this CEMP. Once developed, the IEM will then submit the Plan to the RWM for review, commenting, and approval. The Terms of Reference for the IEM's Plan are provided in the "Appendix H" of the Guide for Waterpower Projects. A signed copy of "Appendix H" is also appended to this CEMP (refer to Appendix F).

Note that the following subsections provide a general overview of what is expected to be contained within the IEM's Plan.

The Environmental Monitoring Plan sets out the frequency of inspections throughout the course of construction, as well as the manner in which notice is to be given to the Project parties when a construction activity is found to be out of compliance with the environmental specifications and best management practices provided in Section 7.0 of this document. The Plan will also include a process for escalating enforcement of compliance of construction activities with the CEMP objectives, criteria, and protection specifications, while also describing the format and frequency for the preparation of Project compliance reports for distribution to the Agencies.

The IEM will monitor environmental compliance and the overall performance of construction activities on a routine basis. The IEM is expected to provide daily, full-time monitoring during all higher-risk activities, and to have a reduced presence during lower-risk activities. High risk activities include all works conducted in ESAs, or within 30 m of watercourses, as well as works that have the potential to impact significantly VCs identified during Project permitting.



The frequency of monitoring inspections will be determined by the IEM, in accordance with agency expectations. The findings of all IEM inspections will be documented in field inspection logs that will be made available to the Licensee and agencies upon request. Compliance and performance monitoring will include the collection of field data (e.g., soil samples, water quality data, photographic records, etc.) to substantiate compliance and performance claims. The IEM will convey concerns and issues to the Licensee, the Licensee's Site Environmental Representative, and contractor(s) at scheduled meetings described in Sections 6.5.2. Inspection logs will be summarized in reports that will be disseminated to the Licensee, contractor(s), IE, and agencies on a weekly basis. The IEM reporting requirements are described in Section 6.4 and in Appendix F.

6.3.3 Sampling

Routine samples will be collected by the IEM throughout the course of construction. These will consist primarily of collecting water samples from watercourses adjacent to where construction is planned. Soil samples will be collected, as needed and determined by the IEM. Water sampling sites may include streams, rivers, wetlands, lakes, and other locations determined to be relevant by the IEM and the Licensee's Site Environmental Representative. Further sampling will occur in the event that potential impacts to water quality are observed. Samples will be analyzed *in situ* for turbidity (as a surrogate for Total Suspended Solids - TSS), pH, temperature, and dissolved oxygen (if/as required) using high-resolution digital instruments. Samples may be sent to a qualified laboratory for analysis if/as required. All water quality results are to be managed in a digital database, and are to be made available to the Licensee and regulatory agencies upon request.

In areas of suspected soil contamination (should these be known or found), background soil samples will be collected in advance of construction and sent for appropriate laboratory testing, if/as required. Additional soil samples may be collected at contaminated areas at the discretion of the IEM.

In the event of an Environmental Incident, the IEM (and perhaps also the Licensee's Site Environmental Representative) may collect soil and water samples in key locations when it is safe to do so (i.e., where there are no safety concerns in accessing sample locations).



All samples collected throughout this project will be collected following procedures outlined in the BC Biological Field Sampling Manual (MWLAP 2003), following proper quality assurance and quality control procedures.

6.3.4 Specialist Monitoring

Specialist monitoring may be required during the course of Project construction. In particular, the Licensee may be required to retain specialist consultants to (among others):

- Conduct nesting surveys during the bird nesting season in the event that falling is required outside of the Reduced Risk Window;
- Conduct fish habitat utilization studies and fish salvages, if an extension to a Reduced Risk Window for Instream Works is required;
- Conduct instream flow monitoring during commissioning to ascertain compliance with permitted ramping rates;
- Monitor utilization and behavioural effects in goat habitat if blasting or helicopter flights are required in proximity to winter ranges or kidding areas; and
- Tailed frog surveys and salvages.

The IEM, in conjunction with the Licensee's Environmental Manager and/or Licensee's Site Environmental Representative, may develop a comprehensive list and schedule of specialist monitoring needs in advance of construction starting. This list and schedule would be provided to the contractor(s) in advance of the work to ensure that appropriate provisions are made to include these monitoring components during construction planning.

6.3.5 Performance Indicators and Measures

Performance indicators will be identified for each of the VCs that will be protected and monitored during the course of construction of the Project. These indicators will be identified individually (i.e., on an individual VC basis) by the IEM as part of his workplan.

It is important to note that the selection of performance indicators is subject to adaptive management, as these may change over the course of Project construction. Examples of when changes may be required include: when an indicator does not detect effectively the effects of construction on a VC because the measure is not sufficiently refined or not is insufficiently quantitative to determine success or failure. Another example may be when the temporal extent of effects extends beyond the course of construction that may affect a specific VC (e.g., measuring the performance of the measures prescribed in the Air Quality and Dust Control Plan



by looking at changes in the species assemblage of the roadside vegetation community as a result of dust accumulation on foliage). Over time, it is expected that performance indicators will become largely quantitative, with qualitative data being used in lieu for indicators that cannot readily and/or practically be measured.

For each of the VCs identified in Section 7.0, the IEM will develop a monitoring strategy/plan and will track the results of his/her monitoring efforts. As mentioned previously, this plan will be distributed to the Licensee, contractor(s) and agencies (as needed). Monitoring results will be discussed with the Licensee (and/or the Licensee's Site Environmental Representative) and agencies (as needed) at regular meetings, and outcomes will be documented in weekly IEM reports.

6.3.6 Non-Compliance with Specifications

All project activities and resulting outcomes found to be in non-compliance with the provisions of this CEMP, particularly the environmental specifications and best management practices provided in Section 7.0, or with applicable regulations and/or legislation, will be documented by the IEM and the Licensee's Site Environmental Representative. This information will be conveyed verbally to the contractor(s) and Licensee upon discovery. The IEM and/or the Licensee's Site Environmental Representative may issue a Halt Work Order if the non-compliance issue is not rectified and/or the significance of the non-compliance issue warrants it (at the sole discretion of the IEM). Once informed, the contractor(s) and Licensee, and the IEM will discuss the non-compliance event, promptly develop a remedial plan and address the issue (as necessary), remediate the site as needed, and the contractor(s) will develop a strategy (documented in the form of a plan) to prevent similar events from recurring.

6.4 Reporting

The IEM reporting requirements are outlined in Appendix F and are summarized below.

Reporting of activities documented by the IEM will include a written and photographic record to be completed after each field inspection for internal documentation purposes. Environmental issues identified by the IEM will be brought to the attention of the contractor(s), the IE, the Licensee's Site Environmental Representative, and the Licensee promptly. Any required actions will be identified, and once completed, all recommendations made to the contractor(s) and Licensee will be diligently documented. Field inspection notes will be used to summarize observations and environmental issues for the production of a weekly report. In accordance



with MFLNRO's reporting process for waterpower projects (refer to Appendix F), the IEM will submit weekly reports to MFLNRO.

The objective of the weekly IEM reports is to convey observations made in the field and to document compliance with the CEMP and overall Project performance. Vetted and signed-off by the IEM, these reports will include the following information (among others):

- The contractor's compliance and conformance record with respect to the Project environmental objectives, specifications, and protection criteria provided in the CEMP, including environmental requirements, such as timing constraints and sediment control, and actions taken to address them, as well as related communications;
- The contractor's environmental protection measures and their effectiveness, including successes, deficiencies, instructions given and results of corrective actions taken;
- A summary of Project activities inspected, construction zones, sensitive environmental features at risk (e.g., any VCs, etc.), and a brief description of the activities observed;
- Reportable spills or other environmental incidents that the contractor(s) is responsible for, including, but not restricted to: details about the magnitude of impacts, timing of the incident, actions taken or intended to be taken by the contractor(s) regarding the incident such as containment of spills, notifications made to proper authorities, actions taken to clean up and restore the environment to pre-incident conditions, investigations, stop work orders and remedial instructions by regulatory agencies, and environmental complaints by the public; and
- The discovery of existing environmental conditions such as archaeological finds and materials suspected of being contaminated, including all relevant details as to what was found and actions taken by the contractor(s), is to be communicated promptly to the Licensee's Site Environmental Representative, the Licensee, and the IEM. These sites are to be secured for further investigation. When warranted, the IEM will also report on the magnitude of impacts (e.g., such as with spills or other environmental incidents), and on the likelihood that these incidents could re-occur.

Each submitted report will include, at minimum, the following sections with associated detailed information:

- Project and Report Description;
- An Incident Summary in tabular form;



- Construction Stage;
- Site Inspections;
- Environmental issues;
- Incident report(s);
- Mitigation measures/activities monitored;
- Photos;
- Other Environmental Information; and,
- IE sign-off and IEM sign-off, if required.

The typical weekly IEM report production and distribution process (pathway) is illustrated in Figure 6. Every effort will be made to achieve a 7-day turnaround for finalized weekly IEM reports; however, it is recognized that delays may occur during periods of time where construction activities with requirements for monitoring increase.

An example of an Environmental Monitoring Report template is provided in Appendix G.



Figure 6. Typical weekly IEM report production and distribution process (pathway). Delays may occur during periods of increased construction activity and monitoring.





6.4.1 Environmental Incidents

For the purposes of this CEMP, an incident is defined as any activity that is a contravention of environmental legislation associated with the licence and the works. Examples of incidents could include, but not be limited to; undertaking a change in or about a stream without authority (e.g., not in accordance with those works authorized under a Water Licence, a Section 9 Approval under the *Water Act*, or following Notification in accordance with the Water Regulation), a landslide associated with road works, a fish or other wildlife kill, a sediment discharge, a deleterious substance spill, etc.

In contrast to an Environmental Incident, a non-compliance event (or activity) is defined as being non-compliant with the requirements of project EPPs or the CEMP, while not being a contravention of a Federal or Provincial Permit, Act or Regulation. A non-conformance event (or activity) is one that is not conducted in accordance with industry standards or best management practices, although not necessarily contravening environmental legislation, or the requirements of project EPPs or the CEMP.

All Environmental Incidents that will or may occur on the Project will be managed in accordance with Figure 7. The IEM is responsible for the reporting and monitoring of all incidents, and may use ministry-approved delegates to assist in the management and monitoring of the incident(s). The Licensee is responsible for all initial Agency notifications.

The Licensee is committing to ensuring that notifications are completed in accordance with governing law, and that these are submitted via email within 24 hours of the incident occurring. All email notifications will be followed by a phone call (initiated by the Licensee) to each of the concerned regulatory party.





Figure 7. Environmental incident management and notification flow chart.



6.5 Operation Training and Meetings

6.5.1 Environmental Orientation Training

The provision of environmental orientation training is an obligatory requirement of the Project Environmental Management Program. It is the responsibility of the contractor(s) to ensure that all construction personnel, including site staff, subcontractor(s) and suppliers attend the environmental orientation training prior to engaging in any Project-related work. Comprehensive records of trainees, including date and time of training, instructor name, and trainee signature is compulsory and subject to inspections by the IEM and the appointed Project Environmental Auditor (if/as applicable).

It is expected that the training will be delivered by the contractor(s) Environmental Field Supervisor (refer to Section 6.2.5 for professional qualification requirements), unless otherwise authorized by the Licensee and accepted in writing by the IEM.

a. Scope of Training

The scope of the environmental orientation training is to provide every worker that will be involved in the Project with a summary of the salient points of this CEMP. In particular, the training is to provide the following:

- Overview of the project;
- Licensee's Corporate Environmental Mission Statements;
- Environmental objectives of the project;
- An overview of all significant environmental issues relating to specific construction activities to be carried out at site (including any related environmental protection requirements needing adherence to);
- The specific obligations of all construction personnel with respect to environmental management and protection;
- An overview of applicable environmental legislation and the importance for conducting construction activities in compliance with this CEMP, and applicable regulatory requirements (e.g., protection requirements for archaeological remains under the *Heritage Conservation Act*); and
- Spill response and reporting expectations.



b. Mandatory Contents Requirements

It is mandatory that the contractor(s) ensures all personnel working on site are trained in emergency spill response, environmental incident management and reporting, and occupational health and safety issues and requirements. Further, all Project personnel are to be instructed on how to respond to wildlife, birds, and/or fish encounters during construction (including travel to and from the various Project work sites).

It is also a mandatory requirement that the environmental orientation training include the following:

- Instructions on the importance of respecting Work Windows established by regulators to prevent damage or disturbance to VCs (refer to Section 3.11.5 of this CEMP).
- Instructions on specific restrictions such as that it is not permitted to:
 - Hunt, fish, or harass animals when travelling to and from or while working on the Project sites;
 - Have firearms or pets on the work site;
 - Use recreational vehicles, such as dirt bikes, all-terrain vehicles, trucks or sportutility vehicles, for anything other than construction related transportation to and from the Project sites; and
 - Enter streams with vehicles unless absolutely necessary to do so. Stream crossings are considered high-risk activities and are to be completed in adherence to an approved procedures (reviewed and accepted by the IEM) and under the continuous oversight of the IEM.

c. Affected Parties and Training Frequency

All construction personnel, including the Licensee and Licensee's representatives, IE and IEM, support staff, site staff, subcontractors, and suppliers are required to attend the environmental orientation training prior to engaging in any Project-related work. With the exception of Agency personnel, failure to indoctrinate all Project parties will be considered a reportable non-compliance and will be reported to the Agencies.

The minimum training frequency is once per worker, at the start of involvement in the Project, or as required by the IEM and/or the Licensee's Environmental Representative in the event that a worker is found to clearly show a lack of understanding of critical environmental requirements (*e.g.*, following inappropriate spill response procedures, as a result of an environmental



incident, or resulting from a non-compliance with Project environmental objectives, specifications, and protection criteria provided in this CEMP).

6.5.2 Pre-Activity Meetings and Daily Meetings (Tailgate, Toolbox, etc.)

Effective, frequent, and regular communication are mandatory requirements of the Project Environmental Management Program. The effectiveness of the Program is largely based on the Licensee, the contractor(s), and the IEM's communication process. It is expected that the contractor(s) will engage transparently with the Licensee, the Licensee's Site Environmental Representative and the IEM regarding all environmental affairs. Specifically, the contractor(s) is expected to:

- Coordinate activity-specific planning meetings involving the IEM and Licensee (as needed), for all work proposed in Environmentally Sensitive Areas (ESA). ESAs include: riparian areas, within 30 m of flowing waters, in fish or wildlife habitat of concern, in archeologically significant areas, etc.
- Carry out Daily Field Tailboard Meetings involving the IEM and Licensee (as needed) to review all proposed daily activities (in advance of the work), with a specific placeholder to review environmental matters (e.g., risks, environmental mitigation, monitoring requirements).
- Coordinate brief end-of day progress meetings, if practicable, to review successes and issues that have occurred over the course of the day, to rectify and correct contractor(s) actions that have resulted in non-compliance issues or near-misses, and to reconcile departures from processes and measures discussed during Daily Field Tailboard Meetings.
- Communicate to the IEM and Licensee (as needed), immediately upon noticing, all noncompliance issues and environmental incidents that occur during day-to-day activities.
- Coordinate *in situ* meetings to resolve all non-compliance issues as soon as practical following the discovery of said non-compliances.
- Immediately alert the IEM and the Licensee's Site Environmental Representative upon discovery of an Environmental Incident (as per Figure 7), to ensure that proper notification and reporting takes place and to coordinate appropriate emergency response procedures.



6.6 Agency Liaisons

Agency liaisons pertaining to compliance, project performance, and environmental management will be primarily the responsibility of the IEM. Issues pertaining to Licensee permits and ongoing permitting requirements will be primarily the responsibility of the Licensee.

In the event that the Conditional Water Licence issued for the Project is not inclusive of all works required to complete Project construction, and that additional WSD permits are required postlicensing, the contractor(s) may be responsible for obtaining said additional permits. These may include: MFLNRO Section 9 Notification and/or Approvals, MFLNRO Section 8 temporary water abstraction permit, DFO Project Review Application Forms, Waste Management Permits (e.g., effluent, air), Approval for Sewage Disposal, Fuel Storage Permit, Burning Permit, Licence for Explosives Magazines, etc. In such case, liaisons with the agencies may be the responsibility of the contractor(s). A comprehensive list of potential additional permits for which the contractor(s) may be responsible will be made available, as needed.

Finally, it is expected that the MFLNRO, EAO, and DFO (if required) will be communicating regularly with the IEM on all construction-related matters. With the exception of verbal and written communications (e.g., progress update phone calls, meetings, emails), the primary vehicle for communicating Project progress to the agencies will be the weekly IEM reports.

The contact information of key agency personnel responsible for Project permitting and oversight are available in Section 10.0.



7.0 Environmental Management Plans

The Licensee commits to minimizing construction impacts through the development of, and adherence to, Environmental Management Plans (EMPs), which are detailed in the sub-sections below. Each EMP outlines specific objectives, standard protocols and mitigation measures that are based on applicable legislation, terms and conditions of permits and approvals issued for the project. As per the Provincial CEMP template for Waterpower Project, a CEMP checklist, which includes a list of EMPs is provided in Appendix H.

Prior to commencement of work activities, the Project contractor(s) will prepare activity and/or sitespecific Environmental Protection Plans (EPPs) based on the specifications outlined in these EMPs, to ensure construction works are completed in compliance with the CEMP. The EMPs presented herein are crafted as high-level plans that describe overarching environmental protection measures/requirements, while the specifics of implementing these measures (e.g., the location of onsite dumpsters, specific erosion or sediment control measures to be used around a stockpile of material) on a site-by-site basis are the responsibility of the contractor(s). Contractor-prepared EPPs are to be reviewed and accepted through the process described in Section 2.5. EPPs will be included with the CEMP submission to the IE for issuance of LCC#1.

Note that the protection specifications and best management practices found herein are provided for guidance only, and that the contractor(s) may elect to substitute these for others that may be used to meet the Project environmental objectives. The process for substituting environmental protection equivalencies is described in Section 4.3.4 of this CEMP.

The measure of Project performance will be accomplished by monitoring select performance indicators and by comparing monitoring results against the criteria developed to protect each VC. The protection of VCs is a firm commitment and cannot be modified under any circumstances, unless authorized in writing by regulatory agencies. Performance measures used to evaluate the mitigation strategies employed at site will be developed *in situ* by the IEM and the Licensee's Site Environmental Representative based on the information contained within the CEMP. The IEM will convey these measures to both the contractor(s) and Licensee as these are developed.

Note that the EMPs and mitigation strategies describes in the subsections of Section 7.0 have been developed based on the EA conditions, which are provided in Appendix D (refer to the Table of Conditions provided in the appendix).



7.1 Access and Traffic Management Plan

7.1.1 Introduction and Purpose

It is anticipated that the Project sites will be accessed via:

- Roadways (existing and new);
- Boats, barges, water taxis; and,
- Helicopters, float planes and other aircrafts.

The purpose of this Access and Traffic Management Plan is to:

• Provide measures and procedures to mitigate potential adverse effects resulting from site access and traffic during construction.

7.1.2 Applicable Permits

Applicable permits include the following:

- Road Use Permit (MOFR);
- Road Use Agreement (for private/tenured roads) and
- LOO Additional Access Roads (MFLNRO Lands).
- Transportation Act (BC);
- Motor Vehicles Act (BC);
- Forest Practices Code Act Provincial Forest Use Regulation (BC); and,
- Transportation of Dangerous Goods Act (Canada).
- Table of Conditions, conditions No. 10 and 11.

Copies of permits are provided in Appendix B.

7.1.3 Relevant Permit Details

Relevant terms and conditions from the above listed permits, licences, approvals and/or Road Use Agreements (RUAs).

• Will be provided by the Licensee, when available.



7.1.4 Specifications and Best Management Practices

Accidents or conflicts related to public access and traffic management will be mitigated through the implementation of practical management measure such as speed limits, appropriate signage, call points, maintenance of view corridors, documentation of wildlife, etc.

The following mitigation measures and best management practices will be implemented:

- (a) An Access and Traffic Management EPP will be developed by the contractor(s). This EPP is expected to address and propose measures and mitigations to reduce impacts from accessing site and traffic on the environment. All of the considerations identified below will be integrated in the EPP. Additional key items that are to be addressed include: proposed access points, boat/barge/water taxi and helicopter/float plane/air craft access, environmental protection procedures for new roads, clearing, stream crossings, sensitive wildlife habitat, deactivation, and reclamation/re-vegetation (among others). This EPP is to include commitments to self-monitoring throughout the construction phases of the Project.
- (b) It is expected that public access to Project access roads, right-of-ways and transmission lines will be restricted for the duration of the construction of the Project. Only Project employees, identified stakeholders, and approved contractors will be permitted to use these roads without escort by a contractor or Licensee safety designate. This will be achieved by monitoring traffic entering and exiting the Project area.
- (c) Unauthorized vehicles will to be monitored and reported.
- (d) Road construction and drainages practices will be followed as per Ministry of Forest's Forest Road Engineering Guidebook, second edition (BCMOF 2002).
- (e) Transmission lines and new roads will be blocked and/or decommissioned once the Project is complete to reduce the potential of hunting and poaching.
- (f) All decommissioned and blocked access points will be monitored to assess the efficacy blocking public access.
- (g) Standard operating procedures regarding site access (i.e., authorization to use the road), communication, right-of-way, passing, pull-out procedures, environmental safety considerations, speed limits, emergency response, reporting procedures, and safety considerations such as steep grades, avalanches, landslides and geohazards will be developed and distributed to all vehicle operators.



- (h) Road users will complete a training session on road usage and standard operating procedures prior to receiving authorization.
- (i) Signs will be installed to ensure road safety and compliance with road restrictions. The following types of signs will be installed and will be maintained through the construction of the Project.
 - i. Bridge capacity (weight) and lane (single/double) signs.
 - ii. Public information signs, identifying access rules and rationale. These signs will identify a contact phone number to address information request and emergencies.
 - iii. Signs identifying kilometer markers, for road users to call out when travelling.
 - iv. Signs identifying safety information to road users related to gate barriers and closure.
 - v. Signs identifying transmission line and other overhead clearance requirements.
 - vi. Signs stating that all vehicles require radio control, including the required radio frequency and safe travel speeds.
- (j) Authorizations to use the roads will granted be on a conditional basis and those who do not comply with the rules of the road will have their authorization revoked.
- (k) Off-road travel will be prohibited.
- (I) Only authorised pull-outs will be used. Pull-outs will be identified by the contractor(s) in the road design plans and drawings.
- (m) Seasonal road maintenance programs, including snow clearing and dust abatement will be conducted as required (cross reference Section 7.2 – Air Quality and Dust Control Plan).
- (n) Measures will be taken to avoid/mitigate effects on air quality (e.g., from increased vehicle traffic and idling (refer to Section 7.2 – Air Quality and Dust Control Plan) as appropriate.
- (o) Transmission line access spur roads will be sighted, where possible, to avoid sensitive habitats such as mountain goat kidding areas, ungulate winter ranges, riparian areas, spring bear habitat, wetlands, wildlife trees, etc.
- (p) Vehicle collision protocols will be developed as part of the contractor(s) EPP and will be integrated in the Human-Wildlife Interaction section within the Wildlife Management Plan (refer to Section 7.15).



- (q) Roads will be maintained in such a way that right-or-ways (ROWs) do not prevent or inhibit wildlife from crossing (e.g., if roads are ploughed, large snow banks are to be avoided unless regular, evenly spaced breaks are provided). The spread of breaks is to be determined in consultation with the IEM and Licensee's Site Environmental Representative).
- (r) Appropriate speed limits will be implemented to ensure human and wildlife safety.
- (s) Helicopter access near Ungulate Winter Ranges will follow recommendations from the Mountain Goat Management Plan (MGMT, 2010) as incorporated into the Wildlife Management Plan of this CEMP (Section 7.15).


7.2 Air Quality and Dust Control Plan

7.2.1 Introduction and Purpose

There is a potential that the Project may negatively affect local air quality due to the generation of dust (suspended particles) and/or combustion emissions (such as CO, NO_x , SO_x and VOCs).

The purpose of this Air Quality and Dust Control Plan is to:

 Provide measures and procedures to mitigate potential adverse effects resulting from site dust generation and emissions. A key objective of this plan is to prevent air emissions from exceeding national standards.

7.2.2 Applicable Permits

Applicable permits include the following:

• Table of Conditions (TOC), condition No. 11.1.

7.2.3 Relevant Permit Details

Relevant terms and conditions from the above listed permits, licences, and/or approvals.

• TOC terms and conditions are provided in Appendix D.

7.2.4 Specifications and Best Management Practices

Impacts to air quality and negative effects of dust control will be mitigated through the implementation of the mitigation measures and best management practices described below.

General:

- (a) An Air Quality and Dust Control EPP will be developed by the contractor(s) to address fugitive dust, exhaust and emissions from combustion sources and blasting/rock production. This plan will integrate all of the measures identified in Section 7.2.4 of this CEMP.
- (b) All construction personnel will be required to attend an environmental orientation training session prior to conducting any work on site. The training session is to highlight



key points of dust management emissions control strategies that will be used as part of the Project.

Fugitive Dust:

- (a) It is expected that all temporary and permanent roads will be capped using appropriate road-base cover materials and will be maintained (cleaned to remove dust generated debris or materials) per MFLNRO Road Engineering Guidebook Standards (or as otherwise stated in Project permits).
- (b) It is expected that road watering will be the primary means of managing fugitive dust generation from vehicular traffic on unsealed road surfaces (e.g., mains, access roads, penstock construction roads, transmission construction roads, spurs, and including all other areas/sources such as laydown areas, spoil and borrow sites, sort yards, etc.). Only environmentally "sensitive or inert" or approved products will be used to reduce dust along roads.
- (c) Chemical dust suppressants (e.g., calcium chloride, calcium lignosulfonate, magnesium chloride, Bunker C, DL 10, etc.) cannot be used unless accepted by the IEM and upon receipt of written approval by MOE and DFO (as needed, if near fish-bearing habitat). The contractor will provide, at a minimum, the MSDS of the proposed chemical dust suppressant(s), the proposed application rates, and spatial areas for utilization to the IEM for review and approval.
- (d) The contractor(s) will consult with MFLNRO's regional office to confirm approved roadgenerated, chemical dust suppression products.
- (e) It is expected that water be applied with a water tank truck equipped with a spray bar or similar device. The tank truck will be made available at site at all times during the dry weather season.
- (f) Watering and water application to roads (general) will be monitored to ensure that application rates provide adequate coverage while not creating pooling or runoff into Environmental Sensitive Areas (ESA). It is reasonable to expect that locations of ESAs will be clearly identified in the field by the Licensee's Environmental Specialists, unless otherwise agreed-to.
- (g) It is expected that speed limits will be enforced at all times and for all vehicular traffic travelling on unsealed road surfaces. All driving is to be done in compliance with British Columbia road use rules.



- (h) Mechanical manipulation of stockpiles of all types, but primarily those with high dustgeneration potential, is to be limited to the extent possible, particularly during high wind conditions.
- (i) If/as deemed appropriate by the IEM, stockpiles and areas exposed to wind erosion are to be covered to prevent fugitive dust generation.
- (j) It is expected that the contractor(s) will obtain all necessary permits for water abstraction (e.g., surface water abstraction for the purposes of dust suppression, MFLNRO Section 8 - Short Term Water Use Permit) (cross-reference with table in Section 3.7 on water requirements and Section 6.1).
- (k) Air Quality and Dust Control measures relating to concrete batching are detailed in Section 7.10 – Concrete Production, Handling and Wastage Plan.

Exhaust and Emissions from Combustion Sources:

- (a) All hydrocarbon-powered equipment will be fitted with emission control devices in compliance with federal, provincial, and regional district regulations and standards.
- (b) All vegetation, slash, and construction waste burning will be conducted in compliance with applicable federal, provincial, and regional district regulations and standards.
- (c) All burning will be undertaken in compliance with the BC *Environmental Management Act* Open Burning Smoke Control Regulation. See Section 7.12 (Fire Preparedness Plan) for more details on Project requirements for open burning.
- (d) It is expected that the contractor(s) will obtain necessary burning permits, as required.
- (e) The generation of greenhouse gases is to be minimized to the extent possible by using low sulphur fuels when and as possible (based on availability, cost and logistics).
- (f) It is expected that loads will be maximized in all hauling equipment to reduce wasteful trips and unnecessary emissions.
- (g) Engine idling is to be minimized whenever possible.
- (h) All hydrocarbon-powered equipment will be operated at optimum rated loads.
- (i) Electrical-powered equipment will be used whenever practical to do so.
- (j) Stationary sources of emissions (e.g. generators and incinerators) will be located as far away from sensitive receptors (e.g., known ESAs or wildlife areas of concern). Siteselection for all stationary sources of emissions will be reviewed and accepted by the IEM.



- (k) It is expected that routine maintenance (as per manufacturer specifications) will be kept up-to-date on all hydrocarbon powered equipment and incinerators.
- (I) If used, to reduce smoke generated by incinerators, it is expected that double chamber incinerators will be used.
- (m) If an incinerator is used, domestic and industrial waste will be segregated prior to incineration to prevent smoke and toxic air emissions. It is recommended that a recycling program be instilled to reduce the volume of waste to be incinerated.
- (n) The contractor(s) will be responsible for obtaining incineration permits for the burning of camp wastes prior to the start of construction (if/as applicable).
- (o) The contractor(s) will provide a list of waste materials to be incinerated as part of the Waste Management EPP and Hazardous Materials Management EPP. Alteration to the list of approved materials for incineration will be subject to consultation and acceptance by the IEM.

Blasting and Rock Generation:

- (a) It is expected that a Blasting and Rock Generation section will be developed as part of the Air Quality and Dust Control EPP to describe the mitigation procedures proposed for the management dust production during said activities.
- (b) It is expected that this section will include the following provisions and considerations:
 - i. Watering is to be considered the primary option for dust suppression and control measure during drilling and rock generation/crushing activities (as required).
 - ii. Blasting mats will be used whenever possible to limit the spreading of dust.
 - iii. Sequential delays will be applied to blasting, including using appropriate blast hole stemming to maximize the direction of energy to rock breaking.
 - iv. Rock dust from drilling will to be contained, collected, and deposited in a spoil or buried near the blast site to prevent wind/water erosion.
 - v. The distance between conveyor belts and stockpiles will be minimized during rock crushing and sorting activities.
- (c) Additional details may be provided Section 7.4 (Excavation, Borrowing, Blasting and ML/ARD Plan).



7.3 Noise and Sensory Disturbance Management Plan

7.3.1 Introduction and Purpose

Mitigation measures for constructed-related noise effects on sensitive wildlife receptors/species (e.g., raptors and mountain goats) are provided in the Blast Management Plan (Section 7.4), the Fish and Fish Habitat Protection Plan (Section 7.14), and the Wildlife Management Plan (Section 7.15).

The purpose of the Noise and Sensory Disturbance Management Plan is to:

• Provide measures and procedures to mitigate potential adverse effects resulting from site noise generation on sensitive wildlife receptors.

Unnecessary noise and sensory disturbance during Project construction activities will be mitigated through the application of practical protection measures. General measures to which the Licensee commits to are provided below.

7.3.2 Applicable Permits

Applicable permits include the following:

• Table of Conditions, condition No. 13.

7.3.3 Relevant Permit Details

Relevant terms and conditions from the above listed permits, licences, and/or approvals.

• TOC terms and conditions are provided in Appendix D.

7.3.4 Specifications and Best Management Practices

Noise impacts on sensitive receptors/wildlife will be mitigated through the implementation of the following mitigation measures and best management practices:



General:

- (a) The contractor(s) is expected to address sensory disturbance and mitigate potential impacts to fish and wildlife within the Excavation, Borrowing, Blasting and ML/ARD EPP (Section 7.4), Fish and Fish Habitat EPP (Section 7.14), and the Wildlife Management EPP (Section 7.15). These EPPs will contain mitigation procedures and strategies to manage noise and sensory disturbances generated by Project activities. These strategies are to address general construction activities, including rock breaking, blasting, and aircraft operations.
- (b) All construction personnel are expected to attend an environmental orientation training session prior to conducting any work on site. The training session is to provide details on mitigation strategies to alleviate potential impacts from noise.

General Construction Activities:

- (a) All equipment will be maintained in good working condition to ensure that noise generation is maintained with standard operating levels.
- (b) Standard practices for noise control are expected to be employed, including the use of mufflers and silencers (where applicable).
- (c) Whenever possible, drive through pathways will be created near sensitive habitat features to minimize the use of back up alarms.
- (d) Appropriate signs will be placed as required around applicable construction areas to warn recreational users of excessive noise (and safety issues), particularly during blasting activities.

Blasting:

- (a) A section will be included in the blasting section of the Excavation, Borrowing, Blasting and ML/ARD EPP (Section 7.4) that will include abatement and /or mitigation procedures for the management of noise and sensory disturbance.
- (b) The EPPs (Excavation, Borrowing, Blasting and ML/ARD Section 7.4, Fish and Fish Habitat - Section 7.14, and Wildlife Management - Section 7.15) are to address the following considerations and provisions:
 - i. Instream acoustic monitoring will be conducted under the approval and/or direction of the IEM to ensure that in or near stream blasting in fish bearing reaches does not exceed the applicable federal standards for instream acoustic overpressure and/or particle acceleration.



- ii. In-water acoustics will be monitored to ensure that noise impacts (pressure) does not exceed the working Pacific region standard of 30 kPa (if/as approved by the IEM), when blasting is conducted in or near fish-bearing waters. Refer to the guideline for further details.
- iii. The use of blasting mats is recommended to assist with noise mitigation.
- iv. It is expected that blasting will be conducted outside of sensitive wildlife periods. Refer to Table 10 (Section 3.11.5) for work windows and timing restrictions for blasting during winter and the goat kidding/early rearing and mineral lick use periods. No blasting will be conducted within 500 m of an identified GWR between November 30th and July 15th, identified sensitive overwintering, kidding, early rearing, and mineral salt lick utilization periods, unless otherwise exempted by MFLNRO.

If blasting within 500 m of an identified GWR between November 30th and July 15th is necessary, mitigation measures including blast mats, noise monitoring and goat behavioural monitoring will be conducted by a QEP between November 30 and December 1 (if fall-like or mild winter conditions are observed). If fall-like or mild winter conditions are observed (low snow pack) the goats will have adequate available habitat outside of the GWR. The mitigation measures must be approved in advance of blasting by the Licensee's Site Environmental Representative and the IEM. Refer to Section 2.2.3 Wildlife Management Best Practice Guidelines and Regulatory Requirements, Mammals.

v. Where feasible exclusion barriers will be established and sensitive fish/wildlife will be removed prior to the commencement of blasting and rock generation (including crushing) works.

Aircraft Operations:

- (a) Standard procedures and strategies are to be developed by the contractor(s) for the operation of aircrafts in the Project area.
- (b) Flight corridors are to be planned to minimize conflicts with sensitive habitat areas, and air traffic is to be managed/reduced during sensitive periods (e.g., goat breeding period). The contractor(s), collectively with the IEM and the Licensee's Site Environmental Representative, will be required to list the identified Goat Winter Ranges within the project vicinity (by number), confirm that there are no conflicting requirements by ministerial order, and identify and abide by the required flight path restrictions directly (if applicable).



- (c) Aircraft will be operated in a fashion that reduces the amount of noise as much as possible.
- (d) Additional provisions on aircraft operations and noise in relation to wildlife are provided in the Wildlife Management Plan in Section 7.15.



7.4 Excavation, Borrowing, Blasting, and ML/ARD Plan

7.4.1 Introduction and Purpose

Stripping and removal of topsoil will be conducted throughout the Project. These materials will be segregated and stockpiled as a valuable source of product for site reclamation and revegetation. Additional layers of subsoil will be removed and excavated, down to bedrock in places, and these materials will be stockpiled separately from topsoil, to be used for various construction purposes (e.g., manufacturing/stockpiling of aggregates). Bedrock will be exposed, drilled and blasted for various purposes, including manufacturing rip rap and coarse, angular construction material, tunneling, or to establish foundation onto which Project structures will be erected (among others).

The purpose of this Excavation, Borrowing, Blasting and ML/ARD Plan is to:

- Provide measures and procedures to mitigate potential adverse effects resulting from excavation and borrowing on Project VCs. This includes mitigating effects of open blasting, tunnelling and ML/ARD.
- The potential impacts on erosion and sediment transportation risk resulting from the excavation of native organics, subsoil layers, and stockpiling are addressed in a separate EPP, and mitigation measure and minimum requirements are identified in Section 7.5 (Erosion, Sediment and Drainage Management Plan).
- Land reclamation requirements are be addressed in a separate EPP (refer to Section 7.16 Vegetation Management and Reclamation Plan).

7.4.2 Applicable Permits

• Land Act (BC).

Copies of permits are provided in Appendix B.

7.4.3 Relevant Permit Details

Relevant terms and conditions from the above listed permits, licences, and/or approvals.

• TOC terms and conditions are provided in Appendix D.



7.4.4 Specifications and Best Management Practices

Excavation and borrowing impacts on VCs will be mitigated through the implementation of the following mitigation measures and best management practices:

General:

(a) The contractor(s) is expected to develop an Excavation, Borrowing, Blasting and ML/ARD EPP to address land disturbances (surface and underground, as needed) and mitigate potential impacts to fish, wildlife, and vegetation. The EPP will contain mitigation procedures and strategies to manage the impacts of excavation and borrowing resulting from Project activities. These strategies are to address general construction activities, including rock breaking and blasting, tunneling, and ML/ARD.

Blasting Management:

- (a) A section on blasting management will be included in the Excavation, Borrowing, Blasting and ML/ARD developed by the contractor(s). This EPP is to include provisions and mitigation procedures for the protection of fish, fish habitat, and wildlife. The EPP is to incorporate the measures identified in the following bullets.
- (b) Instream or near-stream blasting will be conducted outside of sensitive periods (i.e., within approved work windows for the protection of fish and fish habitat). Refer to Section 3.11.5 for details on construction timing windows.
- (c) Underwater acoustic pressure is to be monitored by the contractor(s) to ensure that it does not exceed the Pacific Region working standard of 30 kPa, if/as approved by the IEM, when blasting occurs in or near streams known to contain fish. Particle velocity considerations are to be evaluated if eggs are still present in substrates of fish-bearing streams.
- (d) Exclusion barriers will be established, if required, in consultation with the IEM. Fish will be removed/salvage by a QEP from blast sites prior to the commencement of blasting works.
- (e) Use of non-soluble gel based dynamite suspensions to prevent incomplete oxidation of explosives and generation/leaching of toxic ammonia residues to the aquatic environment will be given preference.
- (f) ANFO (Ammonium Nitrate Fuel Oils) will not be used when blasting in or within 30 m of watercourses, unless accepted by the IEM.



- (g) Site-specific blast plans will be developed for review, commenting, and acceptance by the IEM and the Licensee's Site Environmental Representative prior to any blast within 30 m of any watercourse. A minimum of 48 hours' notice will be given to the IEM and the Licensee's Site Environmental Representative prior to the advancement of blasting activities within 30 m of sensitive watercourses.
- (h) All blasting activities in or near waters will comply with the BC Water Quality Guidelines for the Protection of Aquatic Life (BCWQG). The BCWQG criteria are provided in Section 7.6 (Care of Water Plan).
- (i) The protection of air quality during blasting is addressed in Section 7.2 (Air Quality and Dust Control Plan).
- (j) Noise management measures and applicable requirements are provided in Section 7.3 (Noise Control Plan).
- (k) Wildlife management measures during blasting are addressed in Section 7.15 (Wildlife Management Plan).

ML/ARD Management:

- (a) A Metal Leachate/Acid Rock Drainage (ML/ARD) Management Plan has been developed for the project. The ML/ARD Plan identifies key risks, locations of interest, and mitigation strategies. It also proposes strategies for the detection, presence and management of ML/ARD on site, how much will be generated due to Project activities, what the potential environmental impacts could be, and what mitigation strategies should be implemented to prevent environmental impacts.
- (b) A Metal Leachate/Acid Rock Drainage (ML/ARD) Management section will be included in the Excavation, Borrowing, Blasting and ML/ARD EPP developed by the contractor(s). This EPP is to include provisions and mitigation procedures for the protection of fish, fish habitat, and wildlife. The EPP is to incorporate the measures identified in the following bullets.
- (c) It is expected that all construction personnel will attend an environmental orientation training session prior to conducting any rock extraction at site. The awareness training will provide cursory details on the mitigation strategies that will be employed to abate ML/ARD risks.
- (d) Additional guidance on this topic is provided by the Ministry of Energy and Mines: Guidelines for Metal Leaching and Acid Rock Drainage at Mine Sites in British Columbia.



Classification of Waste Rock:

- (a) The following considerations and provisions are to be taken into account and included as part of the management strategies employed by the contractor(s) during Project construction. It is important to note that none of these measures are to take precedence over that prescribed in the ML/ARD Management Plan.
- (b) Waste rock will be classified (and stockpiled) based on the acid generating potential prior to transportation to temporary or permanent disposal site. The waste rock classification methodology will be subject to review and acceptance by the IEM and the Licensee's Site Environmental Representative. If required, an onsite laboratory may need to be established.
- (c) Management and mitigation prescriptions will be appropriate for waste rock classifications encountered.
- (d) Guidance from a QEP will be sought by the contractor(s) to aid in on-site classification of material.
- (e) On site classification will be confirmed by an off-site, qualified laboratory. Off-site testing will be completed on subsample of in situ classification tests conducted (as identified in the ML/ARD Management).
- (f) Occasional and periodic visual observations of major excavations (penstock, powerhouse and intake excavations and bedrock borrow areas) will be conducted by the contractor(s) and/or contractor-commissioned QEP to identify any visual indicators of undocumented and unanticipated occurrences of Potentially Acid Generating (PAG) bedrock.
- (g) If any undocumented and unanticipated occurrences of PAG bedrock are encountered, the contractor(s) will contact the IEM and Licensee's Site Environmental Representative immediately and engage a qualified professional to develop an implementation plan with appropriate mitigation measures.

Spoiling Locations:

- (a) Appropriate spoiling locations will be selected (by the contractor(s)) in consultation with the QEP and these will be reviewed for acceptance by the IEM prior to the commencement of work.
- (b) Spoil sites will be located away from any water body, riparian area, and/or ESA to reduce the risk of deleterious materials entering watercourses.



- (c) Perimeter ditches, runoff catchments, flow diversions, settling ponds, and sampling basins will be installed as required and directed by a QEP.
- (d) Potential and confirmed ML/ARD rock will be segregated from inert spoil.
- (e) Appropriate signs will be employed to ensure that potential and confirmed ML/ARD rock is stockpiled appropriately.

Monitoring:

- (a) A short-term water quality monitoring program will be developed by the contractor(s) to manage the potential for waste rock runoff. Results of this monitoring program will be reviewed by the IEM and the Licensee's Site Environmental Representative and discussed with the Licensee and agencies periodically. Further details are provided in Section 7.6 (Care of Water Plan).
- (b) Water quality of runoff from potential and confirmed ML/ARD rock is to be assessed prior to discharge to the environment. Water quality samples should include, but are not limited to, in situ measurements such as pH as well as laboratory analyzed total and dissolved metals.

Mitigation and Reclamation Procedures:

- (a) If ML/ARD is encountered, the contractor(s) will develop, in consultation with an appropriately qualified QEP (e.g., professional geologist, geochemist, or professional geotechnical engineer), specific mitigation procedures to address impacts from ML/ARD based on the type of waste rock found on the Project site. Said procedures are to address water quality, leachate to ground, water access to stockpiles and possible alternative disposal locations (as required).
- (b) The contractor(s) and his QEP will develop ML/ARD mitigation procedures in consultation with the IEM and/or MFLNRO, and these will be signed-off by QEP prior to implementation.



7.5 Erosion, Sediment and Drainage Management Plan

7.5.1 Introduction and Purpose

The nature and location of erosion and sediment control devices and drainage features are highly dependent upon the physical characteristics and environmental sensitivities of a particular work site. These will be summarized in one overarching Erosion, Sediment and Drainage Management (ESDM) EPP. The contractor(s) will develop several worksite-specific ESDM EPPs to address risks at a site-specific scale.

The purpose of this Erosion, Sediment, and Drainage Management Plan is to:

 Provide measures and procedures to mitigate potential adverse effects resulting from soil erosion and sediment transport/deposition on Project VCs. A key objective of this plan is to prevent sediment transport and deposition from exceeding the BC Water Quality Guidelines (BCWQG, see Section 7.6 – Care of Water Plan).

7.5.2 Applicable Permits

Applicable permits include the following:

- Conditional Water Licence.
- Table of Conditions, condition No. 11.1.

Copies of permits are provided in Appendix B.

7.5.3 Relevant Permit Details

Relevant terms and conditions from the above listed permits, licences, and/or approvals.

• TOC terms and conditions are provided in Appendix D.

7.5.4 Specifications and Best Management Practices

(a) An overarching ESDM EPP will be developed by the contractor(s) prior to the commencement of Project construction. Site-specific plans will also be developed in advance of any/all work where a risk of erosion and sediment transport exists. These EPPs will describe how erosion will be managed and sediment-laden water and/or runoff will be prevented from entering any/all watercourses. No work will be



undertaken in new areas/sites until each EPP has been reviewed and accepted by the IEM and Licensee. The EPPs will integrate all of the following provisions as these are mandatory components of the ESDM.

- (b) Water Quality Monitoring: Monitoring of turbidity in receiving watercourse will be conducted by or under the direction of the IEM during periods of precipitation, when surface runoff or water pooling is apparent, and near areas with high erosion potential. If the contractor(s) or QEP conducts water quality monitoring, results will be provided to the IEM and the Licensee's Site Environmental Representative without bias, upon request.
- (c) Runoff Management: Sediment-laden water (runoff) will be directed to designated detention areas (e.g., settling ponds) or to approved vegetated areas, at least 30 m from any watercourse, wetland or drainage ditch (these locations are to be selected in consultation with the IEM and the Licensee's Site Environmental Representative).
- (d) Highly Erodible Surfaces and Areas: Highly erodible surfaces or areas susceptible to rainfall erosion will be protected to the extent possible. Exposure of erodible surfaces will be minimized to reduce risks, particularly when in close proximity to sensitive receiving environments (i.e., < 30 m of watercourses). Erodible materials and debris will be removed or placed in a stable area above the high water mark or active floodplain, as far as possible from any watercourse. No erodible materials will be stockpiled within 30 m of any watercourse without consultation with and acceptance of the IEM. Measures to protect excavated material or exposed slopes include, but are not limited to: covering with erosion blankets, tarpaulins, seeding, and native vegetation planting as well as roughening and perimeter drainage. Seed mixtures are subject to acceptance by the IEM and the Licensee's Site Environmental Representative and will be applied as per Section 7.16 (Vegetation Management and Reclamation Plan). Erosion and sediment transport protection is mandatory around all spoil areas, unless otherwise instructed by the IEM and the Licensee's Site Environmental Representative.</p>
- (e) *Control Structures:* Structures and procedures such as applying mulch over disturbed soils, surface roughening, constructing ditches to collect and control concentrated flow (lined or with check dams), installing sediment fences, geotextile berms, sand bags, erosion blankets, vegetation planting, etc. are expected to be utilized on site where appropriate. Erosion risk and flow of sediment-laden water is to be decreased to the extent as possible to reduce the potential of deposition into watercourses. Contractor personnel will be instructed on the proper installation of control structures, as the improper use or installation can result increase erosion. The contractor(s) will be



required to cache control structure materials onsite for immediate deployment, as needed. A list of cached control structure materials and quantities will be provided in the ESDM EPP and be subject to acceptance by the IEM and the Licensee's Site Environmental Representative. The cache will be routinely re-stocked as necessary over the course of construction. All control structures will be inspected for effectiveness on a regular basis by the contractor(s) (weekly at a minimum, and following all major precipitation events) and replaced as necessary.

- (f) Severe Weather Procedures (refer to Section 7.11 Emergency Preparedness and Response Plan - for additional details): Work is be postponed during severe weather if there is a risk of conditions resulting in the loss of slope stability or an increased risk of erosion in sensitive areas.
- (g) Reclamation: Disturbed areas are to be graded to a stable angle after work is completed and must be protected from erosion. Additional reclamation details are provided in Section 7.16 (Vegetation Management and Reclamation Plan).
- (h) Site Specific Plans: Site specific erosion and sediment control EPPs will be developed as needed, at the request of the IEM or the Licensee's Site Environmental Representative. At a minimum, each plan will address road surface runoff, stream crossings, cut and sill slopes, ditch erosion, road surface erosion, spoil sites, borrow sites, camp locations, areas susceptible to slope failure, and snow management (especially snow removal and stockpiling and melt runoff).
- (i) The contractor(s) will monitor weather forecasts for upcoming rainfall and suspend or adjust work schedule to reduce erosion and sedimentation risks. Weather forecast will be communicated to onsite workers at daily tailgate meetings.
- (j) Supplies of sediment and erosion control materials, including sediment fencing, erosion control matting, straw bales, pumps, etc. will be available at key worksite locations. Supplies will be monitored and managed by the contractor(s) and re-stocked as needed. Stockpiled materials and quantities to be listed in ESDM EPP.
- (k) Sediment and erosion control measures will be left in place until all disturbed areas have been stabilised.
- (I) Measures will be implemented to minimize the tracking of mud by construction vehicles near sensitive environments. Where mud, dirt and debris is tracked along local roads and areas outside of the immediate work area, contractor(s) will ensure timely cleanup.
- (m) Waste water from site and from tunnel works will be collected using pumps and will be pumped to lined settling ponds, infiltration ponds or holding tanks for treatment, and



water will be processed and monitored prior to its release into the environment. Clean seepage should be segregated from sediment-laden water to minimize treatment volumes. All process-water will meet BCWQG or site specific criterion to prevent undue harm to aquatic resources, unless otherwise accepted by the IEM and the Licensee's Site Environmental Representative (see Section 7.6 – Care of Water). The potential for passive and mechanized flocculent treatments exist and is to be considered where insufficient treatment capacity is observed to get site effluent to within BCWQGL.



7.6 Care of Water Plan

7.6.1 Introduction and Purpose

Negative effects to surface and groundwater water quality in the Project area may arise from construction activities. These potential effects will be prevented through the application of practical protection measures.

The purpose of this Care of Water Plan is to:

 Provide measures and procedures to mitigate potential adverse effects resulting from land disturbance and construction activities on watercourses, fish, fish habitat, and aquatic fauna. A key objective of this plan is to maintain water quality in watercourses within the BCWQG or Canadian Council of Ministers of the Environment (CCME) criteria where BCWQG do not exist.

7.6.2 Applicable Permits

Applicable permits include the following:

- The Conditional Water Licence, and
- The *Fisheries Act* Authorization.
- Table of Conditions, conditions No. 3, 8, 11.1, and 15.

Copies of permits are provided in Appendix B.

7.6.3 Relevant Permit Details

Relevant terms and conditions from the above listed permits, licences, and/or approvals.

• TOC terms and conditions are provided in Appendix D.

7.6.4 Specifications and Best Management Practices

(a) The contractor(s) will develop and implement a water quality and lake level monitoring program at Ramona Lake to the satisfaction of FLNRO (refer to EA Condition No. 15, Appendix D). The water quality parameters will include temperature, TSS and nutrients. The Licensee will maintain a website, accessible to MFLNRO staff, showing turbidity and lake level data. The data will be posted to the website within 24 hours of collection.



(b) A Care of Water EPP will be developed by the contractor(s) in advance of any/all work where a risk to water quality exists. This EPP will describe how water quality will be managed and construction runoff will be prevented from entering any/all watercourses. No work will be undertaken in new areas/sites until each the Care of Water EPP has been reviewed and accepted by the IEM and Licensee's Site Environmental Representative. Specific items that will need to be addressed within the Care of Water EPP include surface water protection with respect to instream works, erosion and sediment control, fuel management, blasting works, concrete works and ML/ARD management. The EPPs will also consider and integrate all of the following provisions.

Water Quality Guidelines:

- (a) The following water quality guidelines will be adhered to at all times during construction:
 - BC Water Quality Guidelines (BCWQG) for the Protection of Aquatic Life, and/or
 - CCME Water Quality Guidelines (where BCWQG do not exists for a certain parameter).

The BC Water Quality Guidelines for select water quality parameters are provided in Appendix I.

Site and/or work component-specific variance from BCWQG and/or CCME guidelines may be granted pending QEP endorsement and review/acceptance/endorsement by the IEM, the Licensee's Site Environmental Representative, MFLNR, and/or DFO.

General:

- (a) The contractor(s) will ensure that deleterious or unpermitted substances and/or materials are not allowed to enter watercourses or the surrounding environment without the prior approval of the IEM.
- (b) Procedures for fuel handling, dust control and waste management are to be followed at all times while working in and around water. Refer to Sections 7.2, 7.9, and 7.7 for further details.
- (c) All construction personnel are expected to attend an environmental orientation training session prior to conducting any instream work at site.



- (d) All instream works, without exception, are to be completed in the presence of the IEM, unless otherwise approved by the IEM, and in adherence to EPPs and specific work plans that have been reviewed and accepted by the IEM and Licensee.
- (e) The contractor(s) is responsible for providing the IEM and the Licensee's Site Environmental Representative with a notification of instream works 72 hours prior to the start of any/all construction activities planned to occur within a watercourse.
- (f) Any/all wetted areas cannot be disrupted or destroyed without prior inspection, information review and acceptance by the IEM and the Licensee's Site Environmental Representative.
- (g) All roads/bridges and natural drainages crossed by Project infrastructure (e.g., road, penstock) will be designed and maintained by an appropriate qualified professional engineer, and in accordance with the standards and practices of the Forest Road Engineering Guidebook (BCMOF, 2002). Clearspan and/or open bottom crossing structures will be preferentially installed over closed bottom crossing structures in permanent watercourses. No new closed bottom crossing structures will be installed in fish bearing watercourses.
- (h) All works must comply with guidelines provided in Standards and Best Practices for Instream Works (MWLAP, 2004).

Instream Works:

- (a) Stream diversions and stream crossing plans will be developed by the contractor(s) for each of the locations where these works are to occur (i.e., where instream works are expected to occur). The plans are expected to provide clear details on how impacts to surface water quality will be mitigated. These plans must be submitted to the Licensee, the Licensee's Site Environmental Representative, the IEM, and, where applicable, to the IE for review, commenting, and acceptance prior to the start of any of these said works. These plans will include all of the following provisions (at a minimum):
 - i. Standards and Procedures (for all equipment and machinery working in or around water): All heavy equipment and machinery are to be clean, free of fluid and leaks and in good repair prior to the commencement of instream work. All machinery is to be free of invasive species and/or noxious weeds in the tracks, undercarriage and table. If any leaks or fluid is found on machinery or equipment, it should be removed from the work area until it has been repaired (unless otherwise deemed acceptable by the IEM). Biodegradable (e.g.,



synthetic, biodegradable, low additive, or vegetable oil based) hydraulic oil will be used in all machinery conducting work in a stream or wetted area.

- No Touch Zones: No Touch Zones are to be delineated by the contractor(s)' QEP and reviewed by the IEM and the Licensee's Site Environmental Representative prior to the commencement of works in and around water. Work areas are to be clearly delineated and machines should operate from the bank of a stream to minimize impacts and better enable mitigation of erosion/sedimentation. Riparian and naturally vegetated buffer strips along watercourses are to be preserved to the extent possible, in accordance with Project permits.
- iii. Water Quality Monitoring: A water quality monitoring program will be developed by the contractor(s) for all instream works. This program will specify water quality sampling locations, sampling frequency, sampling parameters, and will reference the applicable provincial and federal water quality criteria and/or guidelines applicable to this project. All samples collected during the course of construction (e.g., during instream works and/or other works potentially affecting water quality) are required to meet the Project guidelines listed here above (in Section 7.6.4 Water Quality Guidelines). These guidelines are considered firm criteria. Among others, parameters that will be monitored will include turbidity, suspended sediments, pH, hydrocarbons from oil and grease, and metals. Instream works will be monitored by the Licensee's Environmental Site Representative and the IEM, as needed. This will include collecting *in situ* water quality samples for analysis of pH and turbidity. In the event of a spill, the Licensee's Environmental Site Representative and/or the IEM will collect water samples to be submitted for laboratory analysis of the appropriate parameters.
- iv. Worksite isolation: The work area is to be fully isolated from the streamflow prior to the commencement of instream works (to the satisfaction of the IEM). Isolation may be accomplished using diversion structures such as coffer dams and pumps. Downstream flow is to be maintained at all times while the streamflow is diverted. Detailed designs, access points, works restrictions and contingency methods must be included in the plans.
- v. *Pumping:* All pumps used within fish bearing waters are to be screened in accordance with the Freshwater Intake End-of-Pipe Fish Screen Guidelines (DFO, 1995). Short term water use is subject to Section 8 of the Water Act.
- vi. *Design Criteria:* Diversion structures should be constructed, according the specifications by qualified engineer or geotechnical engineer, to the minimum



size required while being able to allow for the diversion of a 1 in 10 year maximum daily flow for the period of works.

- (b) Stream crossings should be avoided where soil stability may be a concern (such as on floodplains, alluvial fans, meander bends and braded streams). All stream crossing structures are to be signed-off by an appropriately qualified QEP. The following provisions are to be considered and integrated into the stream crossing plans developed by the contractor(s):
 - i. Where possible, the design of crossings structures should position the structures outside of the bankfull width to avoid disturbance to the bed and banks of the stream.
 - ii. Although no longer current, adherence to DFO Operational Statements is recommended for those crossings that do not require encroachment into the bank full width of the stream.
 - iii. Crossings should be designed and constructed so that they are perpendicular to the stream flow.
 - iv. Geotextile liners and curb stringers should be used underneath crossings structures to prevent material from entering the water.
 - v. Structures should be designed to ensure that a backwater effect does not occur and there should be enough freeboard for anticipated stream flows.
- (c) Reclamation Procedures: All in-stream, active floodplain habitats and riparian areas disturbed as a result of the work are to be restored to a condition that is equal to or enhanced from the original state. All temporary structures installed during construction are to be removed after construction is complete. Refer to Section 7.16 (Vegetation Management and Reclamation Plan) for further details.

Groundwater:

(a) Groundwater quality monitoring will be conducted by the contractor(s) where/as required (e.g., if/as identified by the IEM and/or the Licensee's Site Environmental Representative, at outflow sites of pump discharge locations or ML/ARD infiltration galleries, as directed by the QEP responsible for assisting the contractor(s) if ML/ARD be detected). In the event that groundwater does not meet federal and provincial water quality requirements, groundwater will be treated and/or disposed of as directed by the QEP. If deemed necessary, the contractor(s) will be responsible for the installation of groundwater monitoring wells.



7.7 Waste Management Plan

7.7.1 Introduction and Purpose

All construction waste will be contained, identified, categorized, and segregated in accordance with the BC *Environmental Management Act*. Proper management of construction waste will be conducted through the application of effective and practical containment and disposal measures.

This Plan addresses solid and liquid waste management only. For details on the management of hazardous waste, please refer to Section 7.8 (Hazardous Materials and Waste Management Plan).

The purpose of this Waste Management Plan is to:

• Provide measures and procedures to mitigate potential adverse effects resulting from waste management and disposal as these relate to construction activities and human camp utilization. A key objective of this plan is to ensure that waste management activities are conducted in compliance with the BC *Environmental Management Act*.

7.7.2 Applicable Permits

Applicable permits include the following:

• Table of Conditions, condition No. 11.1.

Copies of permits are provided in Appendix B.

7.7.3 Relevant Permit Details

Relevant terms and conditions from the above listed permits, licences, and/or approvals.

• TOC terms and conditions are provided in Appendix D.

7.7.4 Specifications and Best Management Practices

(a) A Waste Management EPP will be developed by the contractor(s) prior to the commencement of work. This EPP will describe how solid and liquid wastes will be managed to ensure compliance with the BC *Environmental Management Act*. This EPP



will be submitted to the Licensee, the Licensee's Site Environmental Representative, and the IEM for review, commenting and acceptance. The EPPs will also consider and integrate all of the following provisions.

General:

- (b) The contractor(s) will develop and include specific, detailed procedures for waste material storage, handling and waste management for all construction waste materials, including:
 - i. All packaging (e.g., wood, metal and plastic), rock and soil, as well as solids and fluids from equipment operations.
 - ii. All waste material are expected to be disposed of in accordance with BC Environmental Management Act ([SBC 2003] Chapter 53) Special Waste Regulations (BC Reg. 63/88), BC Waste Management Act and Transportation of Dangerous Goods Act and Regulations.
- (c) The EPP is expected to include details of the policies and systems that will help focus waste management on reducing the volume and toxicity of all wastes generated at site, and to maximize the benefit of all materials used during construction.
- (d) All day-to-day waste is expected to be cleaned-up and stored in the appropriate locations at the end of every work day.
- (e) All waste material is to be stored in a designated area with adequate containment that is secure and protected from weather until removal and disposal can be arranged.
- (f) Waste should be categorized and stored into appropriate containers. All waste containers will bear appropriate labeling signage identifying the key waste streams associated with each container.
- (g) Adequate size and number of containers are to be made available to Project personnel throughout construction.
- (h) Recycling and/or re-use is to be maximized where possible.
- (i) The EPP will include details and descriptions of any use of a temporary and/or permanent working camp, including the camp's capacity for accommodation during peak construction phases, as well as the requirements for a permanent camp following the completion of construction. The Waste Management EPP will also identify all applicable permits and approvals sought by the contractor(s) for constructing, operating, managing and decommissioning the work camp, and it will clearly identify



any applicable landfill regulatory requirements (bylaws) and waste handling requirements.

(j) The Waste Management EPP, including its objectives and systems, are to be described in detail in the environmental orientation training session deliver to all Project crews, at the start of construction.

Solid Waste Management Reduction and Recycling Plan

All solid waste will be contained, and disposed of appropriately according to type and permitting requirements. This will involve the implementation of a recycling and waste management program throughout Project activities, including having clearly labelled bear-proof garbage bins, containers for food waste, and containers for recyclable office waste.

Domestic Waste:

- (a) As a component of the contractor(s) Waste Management EPP, it is expected that a section on solid waste management will be developed. This section is expected to provide details on procedures for the storage, handling and management of solid waste, including domestic and sanitary waste. This section of the EPP will consider and integrate all of the following mitigation strategies and procedures.
- (a) The handling and disposal of all other waste products other than sanitary (liquid) waste will comply with the BC *Environmental Management Act*, BC Hazardous Waste Regulation, and the Canadian and BC *Transportation of Dangerous Goods Act* and Regulations.
- (b) Littering on the jobsite is expected to be prohibited, and to be very strictly monitored. The Waste Management EPP will provide clear measures that will be implemented to prevent and control it. This will include making available refuse containers for all types of waste generated by the Project. These containers will be monitored and maintained regularly.
- (c) Refuse containers are expected to remain sealed at all times except when filling or emptying.
- (d) If any refuse containers are found to be damaged or leaking, these containers are expected to be replaced with undamaged containers until the former is repaired or replaced.
- (e) All refuse containers are expected to be clearly labeled, based on waste streams and content type.



- (f) Litter and all non-hazardous waste materials will be collected and regularly disposed of at an approved regulated landfill or incinerating facility. Unnecessary accumulation of construction at site will be avoided.
- (g) Reuse and recycling of materials is expected wherever possible.
- (h) All construction waste generated from site activities and day-to-day refuse are to be removed regularly to avoid attracting wildlife.
- (i) Feeding wildlife directly or indirectly (e.g., via improper waste management), is strictly prohibited.
- (j) The use of electric fencing should be considered around all waste storage areas. The contractor(s) will erect and maintain an electric fence around all bear attraction sites. These include, but are not necessarily limited to, food storage areas, preparation and waste areas, petroleum product and grey water storage areas, the incinerator location(s) and any camp sites. See Section 7.15 (Wildlife Management Plan) for further details.
- (k) The contractor(s) Waste Management EPP will describe general management measures related to the reduction and recycling of vegetation waste generated during clearing and grubbing. The management of felled timber and root masses is to be described in detail. Recycling of vegetation waste is to be maximized to the extent possible (e.g., grinding of root wads to create erosion protection mulch, re-use of felled timbers to create habitat complexity in compensatory fish habitat, addition of coarse woody debris to reclaimed landscapes following construction, etc.).

Liquid Waste Management Plan

Sewage will be contained and disposed of according to all permitting requirements. The handling and disposal of sanitary waste is strictly governed, and must be in compliance with the Waste Discharge Regulation of the BC *Environmental Management Act*.

General:

- (a) The contractor(s) Waste Management EPP will provide and maintain portable latrines throughout the work area, for the duration of the Project. Latrines cannot be situated within any ESAs, or within 30 m of streams, swales, ditches, or other drainages and watercourses unless otherwise accepted by the IEM and the Licensee's Site Environmental Representative due to site spatial restrictions.
- (b) Latrines are expected to be installed in areas that could potentially contain accidental spills and keep environmental risks to a minimum. The proposed location of latrines is



to be discussed with the IEM and the Licensee's Site Environmental Representative in advance of placement. All portable latrines are to be cared for appropriately and be maintained to prevent vandalism and potential sewage/solid waste release in the environment.

(c) The use of latrines is mandatory for all forms of human waste generated by workers.



7.8 Hazardous Materials and Waste Management Plan

7.8.1 Introduction and Purpose

All hazardous materials will be contained, identified, categorized, segregated, and transported in accordance with the BC *Environmental Management Act, Transportation of Dangerous Goods Act,* and the *Canadian Environmental Protection Act.* Proper management of hazardous materials will be conducted through the application of effective and practical containment and disposal measures.

The purpose of this Hazardous Materials and Waste Management Plan is to:

• Provide measures and procedures to mitigate potential adverse effects resulting from the handling, use, and storage of hazardous materials as these relate to construction activities. A key objective of this plan is to ensure that hazardous materials are managed and disposed of in compliance with the BC *Environmental Management Act*, the *Transportation of Dangerous Goods Act*, and the *Canadian Environmental Protection Act*.

7.8.2 Applicable Permits

Applicable permits include the following:

• Table of Conditions, condition No. 11.1.

Copies of permits are provided in Appendix B.

7.8.3 Relevant Permit Details

Relevant terms and conditions from the above listed permits, licences, and/or approvals.

• TOC terms and conditions are provided in Appendix D.

7.8.4 Specifications and Best Management Practices

General:

(a) A Hazardous Materials and Waste Management EPP will be developed by the contractor(s). This EPP will detail procedures for hazardous materials storage, handling, and transportation, and will consider and integrate all of the measures and procedures



described below. Specific plans will be required and developed to address fuel storage and handling, as well as concrete production and batching (refer to Sections 7.9 and 7.10 of this CEMP, respectively). This EPP (and plans) will be submitted to the Licensee, the Licensee's Site Environmental Representative, and the IEM for review, commenting and acceptance. The EPP and plans will also consider and integrate all of the following provisions.

Hazardous Materials and Waste:

- (a) Hazardous materials include all materials designated as "Dangerous Goods" under the *Transportation of Dangerous Goods Act*, as well as all materials designated as "Controlled Products" under the Occupation Health and Safety Regulation. These materials include, but are not limited to, fuels, oils, greases, fuel and oil filters, paints, solvents, bitumen, dust suppressant chemicals, lubricants, asbestos, batteries, uncured cement products, PCBs and all used spill clean-up materials.
- (b) Registration, storage, handling, and transportation of hazardous materials and waste will be in compliance with all applicable legislation including the British Columbia Fire Code, the National Fire Code of Canada and the Transportation of Dangerous Goods Act.
- (c) Disposal of hazardous materials and waste will be managed in compliance with the Hazardous Waste Regulation under the *Environmental Management Act*. Any materials or waste not in use should be removed from site as soon as possible. All fuel or lubricant contaminated materials will be collected and trucked to an approved regional disposal facility, or should be treated *in situ* using bioremediation techniques approved by an appropriately qualified roster QEP.
- (d) Contractor personnel will receive training for the storage, handling and transportation of hazardous materials.
- (e) All hazardous materials will be stored within secondary containment. Larger storage vessels should be placed within lined, diked containments that limit the potential extent of a leak. Berms or other secondary containment are expected to be impermeable and capable of containing 110% of the total volume stored. Such containments may be prefabricated, or constructed at site from non-woven, impermeable materials and available site materials.
- (f) Outdoor storage of hazardous materials and waste must be at least of 30 m from a watercourse and forested areas, and these are to be covered, fenced, and secured.



- (g) Hazardous waste will not be stored within or adjacent to a wetland area, will be above the seasonal high-water table, with a minimum separation depth of 3 m to unsaturated soils.
- (h) Fuel tanks and containers/reservoir will not be filled beyond their safe-filling capacity. It is noted that the approximate safe-filling capacity is no more than 90% of the total volume of the container/reservoir. Refer to Section 7.9 (Fuel Storage, Handling and Emergency Response Plan) for further detail.
- (i) All storage containers are to be properly labeled with the appropriate WHIMIS and TDS labels. Storage sites are expected to have visible signage.
- (j) Incompatible materials are expected to be stored separately.
- (k) All Project personnel will be made aware that all waste materials need to be segregated by waste stream.
- (I) Used oil, filters, grease cartridge lubrication containers, rags, mops and other equipment maintenance or fuel/hydrocarbon contaminated products will be collected and kept in a secure waste receptacle for later off-site disposal. This waste receptacle is to be clearly marked and its location and purpose will to be made known to all personnel.
- (m) Material Safety Data Sheets (MSDS) will be available at site for all hazardous materials found or could be encountered on site.
- (n) Smoking will be prohibited within 15 m of waste receptacles or storage of any kind.
- (o) Mitigation procedures are to be discussed with the IEM and the Licensee's Site Environmental Representative if Environmental Emergency (E2) - listed chemicals will be stored above specified threshold quantities, as defined by the *Canadian Environmental Protection Act*. At the contractor(s) responsibility, a specific Environmental Protection Plan (EPP) may be required for a particular chemical depending on the quantity that will be stored.

Contaminated Waste Management:

- (a) It is expected that a Contaminated Waste Management EPP will be developed by the contractor(s) to address site contamination. This EPP will be developed in conjunction with a Project Emergency Spill Response Plan (refer to Section 7.9 for further details on the latter). Combined, these plans are expected to address the following:
 - i. Roles and responsibilities for personnel with regards to reporting spills or suspected contaminated material and clean-up procedures.



- ii. Health and safety protocols including soil and groundwater handling.
- iii. Required documentation and reporting for the management of contaminated waste.
- iv. Regulatory requirements.
- v. Sampling procedures to confirm the presence of contaminants.
- vi. Excavation protocols for contaminated materials.
- vii. Remediation options (both on and off-site) for commonly used products.
- (b) All construction personnel will be required to attend the environmental orientation training session prior to conducting any work on site. The training session must ensure that all personnel are aware of reporting requirements and have sufficient (and adequate) training to handle contaminated waste.
- (c) Suspected and confirmed contaminated material will be sampled by the contractor(s), and will be tested by an analytical laboratory to confirm the type and level of contamination, and to determine the appropriate method of disposal. Waste known to be contaminated, such as used absorbent pads for small spill cleanups, will be disposed of within designated bins for offsite disposal at an approved facility. In such instances, laboratory testing is not needed.
- (d) Suspected contaminated materials are expected to be secured, and stored in appropriate containment on site. Once the type and level of contamination is confirmed, contaminated material are to be transported and disposed of at an appropriate facility as regulated by the BC *Environmental Management Act*. Consultation with a contaminated sites QEP on the means and methods of delivery and disposal is mandatory.
- (e) It should be expected that the IEM and the Licensee's Site Environmental Representative will request signed-off documentation on reclamation and remediation of contaminated areas to confirm due diligence to the Licensee and agencies.
- (f) As an alternative to site sampling and storage of contaminated materials, consideration may be given to a licensed contractor to test contaminated materials, remove them and dispose of them appropriately, in accordance with applicable regulations.
- (g) It is expected that the disposal of contaminated material will be received by an approved facility. All approved facilities issue chain-of-custody forms. Copies of all chain-of-custody forms are to be submitted by the contractor(s) to the IEM and the Licensee's Site Environmental Representative, upon request, for filing and reporting.



The contractor(s) will maintain a hazardous materials disposal log, which will be available to the IEM and the Licensee's Site Environmental Representative or provincial/federal agencies upon request.

7.9 Fuel Storage, Handling and Emergency Response Plan

7.9.1 Introduction and Purpose

Significant environmental impacts will be prevented through the implementation of effective practical fuel storage, handling, and spill management and response contingency measures.

The purpose of this Fuel Storage, Handling and Emergency Response Plan is to:

• Provide measures and procedures to mitigate potential adverse effects resulting from the storage, handling, and use of fuels throughout construction. A secondary purpose is to provide detailed emergency response commitments to assure that appropriate mitigation is in place in the event of a fuel-related emergency.

7.9.2 Applicable Permits

Applicable permits include the following:

• Table of Conditions, condition No. 11.1.

Copies of permits are provided in Appendix B.

7.9.3 Relevant Permit Details

Relevant terms and conditions from the above listed permits, licences, and/or approvals.

• TOC terms and conditions are provided in Appendix D.

7.9.4 Specifications and Best Management Practices

General:

(a) A Fuel Storage and Handling Management EPP will be developed by the contractor(s). It will include specific procedures for the storage and handling of fuel and other hydrocarbons throughout construction. This plan is to incorporate all of the following considerations and mitigation procedures.



Fuel and Hydrocarbon Storage:

- (a) All fuel and oil handling and storage practices will meet the requirements of BC Fire Code (1998) and A Field Guide to Fuel Handling, Transportation and Storage (MWLAP, 2002).
- (b) Storage tanks will be clearly labeled and their locations made known to all on site personnel.
- (c) Proper signage at and adjacent to fuel storage areas will include "Fuel Storage Area—No smoking within 15 meters".
- (d) A minimum of two 30-pound or four 20-pound fire extinguishers will be located and readily available at all fuel storage locations. The extinguishers will be located not less than 7.5 meters and not more than 23 meters from these locations.
- (e) A Fire Preparedness Plan will be developed by the contractor(s) and posted in all fuel storage areas. Please refer to Section 7.12 for further details.
- (f) Tools and materials to stop the flow of leaking tanks and pipes are expected to be kept at site. Such equipment may include, but not be limited to, plugs of various sizes, 3M tank patches, a hammer, assorted sizes of metal screws with rubber washers, a screwdriver, and plastic tape.
- (g) Spill kits must be located at fuel storage areas, including absorbent mats, pads, booms, absorbent crystals, and other spill response equipment which must be readily available for deployment.
- (h) All fuel storage is expected to be located >30 m from the high water mark of any watercourse within the Project area, unless otherwise accepted by the IEM upon review of site specific mitigation measures.
- (i) All hydrocarbon fuels, oils, and lubricants are expected to be stored within secondary containment. Larger storage vessels are to be placed in lined, diked containments to limit the potential extent of a leak. The berm or other secondary containment for all fuel storage must be impermeable and capable of containing 110% of the volume of the total volume stored. Such containments may be prefabricated, or constructed at site from non-woven impermeable geotextile liner and available site materials.
- (j) If earthen containment dykes are used, they are to be constructed with slopes no steeper than 3:1 (horizontal to vertical) to provide structural stability, unless otherwise specified by a QEP. A lined sump is expected to be constructed and maintained within the containment area to keep it dry and prevent ponding of water.



- (k) Secondary containments are to be maintained and drained following periods of rain precipitation. If drips or spills have occurred into rain-filled secondary containments, all accumulated water with hydrocarbon sheens should be drawn-off into drum storage for proper disposal.
- In the case of a multi-tank farm facility (the fuel storage area), the berm should contain 110% of the largest tank or 100% of the largest tank plus 10% of the aggregate volume of all the tanks within the berm, whichever is greater.
- (m) Measures to protect fuel storage and fixed dispensers are expected to be implemented. These will include appropriate signage, guard rails, concrete barriers, etc.
- (n) All storage tanks will conform to applicable industry codes. Aboveground storage tanks are to be constructed on stable foundations designed to minimize uneven settling and corrosion. The framework of a storage tank should be such that the allowable stress of the tank itself will not be exceeded.
- (o) If applicable, the dispensing line from the tank to the dispensing station must be an Underwriters Laboratories of Canada (ULC) approved steel pipeline.
- (p) The length of a dispensing hose should not exceed 4.5 m and should be suitable for hydrocarbon fuels.
- (q) The contractor(s) is to ensure that suitable bonding/grounding is in place between the tank, container, and equipment to prevent static charges.
- (r) Hoses and nozzles are to be maintained in good repair and not leak.

Fuel Handling and Dispensing:

- (a) All personnel are expected to be trained in the proper use of fuel handling equipment and be encouraged to be alert and vigilant when handling fuel and lubricants. Fuel loading and dispensing procedures should be posted at the fuel storage facility.
- (b) The contractor's Construction Manager is expected to ensure that all contractor(s) have reviewed the fuel spill prevention and response procedures.
- (c) The contractor(s) is expected to conduct weekly inspections on all equipment such as hoses, safety equipment, and containment facilities. The results of these inspections are to be recorded and any deficiencies identified are to be resolved prior to equipment use.
- (d) Absorbent pads and other spill response equipment should be readily available for deployment, and kept in all construction vehicles and heavy equipment used at sites.



- (e) Fuels are to only be dispensed by Authorized Personnel.
- (f) All vehicle fuelling is expected to occur in a location at least 30 m from any watercourses, where site grading and spill response equipment will be established to contain spillage.
- (g) Fuelling of all machinery is expected to occur >30 m of the high water mark of any watercourse. In the event that fuelling of stationary machinery located near a waterbody is unavoidable (e.g., pumps, etc.), the following measures should be implemented:
 - i. Where these are in use/place, fuelling is expected to be carried out within the containment of each machine,
 - ii. Two trained personnel should conduct the operation, with one assisting in maintaining containment of drips from the nozzle, and as well as maintaining absorbent pads at hand to absorb any drips or spills,
 - iii. When fuelling from Jerry cans one crew member should hold and pour the Jerry can, the other supports the nozzle with absorbent pads and uses all possible measures to capture drips and spills with absorbent pads.
- (h) Personnel are expected to be stationed at both ends of a hose during fuelling unless both ends are visible and readily accessible by one person.
- (i) Operators are expected to stay with the nozzle at all times while dispensing fuel.
- (j) After refueling, nozzles are expected to be stored within containment in such a way as to prevent spills.
- (k) Nozzles are expected to be secured within a drip container located within the greater secondary containment when not in use.
- (I) Non-locking, manually operated nozzles with an automatic shut-off are expected to be used. An automatic shut-off nozzle is any spring-loaded device that closes when manual pressure is released.
- (m) Hoses and nozzles are expected to be maintained in good repair and not leak. Hoses should be kept off of the ground and valves closed when not in use.
- (n) Dispensing procedures are expected to only be carried out using an approved hand operated or electric fuel pump. Only dispensing pumps designed for the products being handled should be used (i.e. water pumps for fuel is prohibited). Gravity feed systems are not permitted for dispensing fuel.


- (o) Tanks and containers should not be filled beyond their safe filling level. It is noted that the approximate safe level is no more than 90% of volume.
- (p) Ensure bonding, grounding, and isolation components are used to protect against static charges when bulk hazardous, flammable or combustible liquids are being transferred into metal tanks, vehicles, or vessels.
- (q) Routine equipment maintenance is expected to be conducted using a mobile lube truck. Significant maintenance with the potential for accidental spills (e.g., changing of hydraulic rams and major lines) is expected to be done within full vehicle containment (e.g., portable containment berms with collapsible side walls) at an area located at least 30 m from streams.
- (r) To ensure adequate response capability in the event of a spill, all fuelling and service vehicles are expected to carry a minimum of 10 kg of suitable commercial absorbent material and/or 50 absorbent pads for ground spills.
- (s) Bulk fuel should be transferred at a central fuelling facility with appropriate containment and spill response equipment.
- (t) Smoking is prohibited within 15 m of handling or dispensing facilities of any kind.

Emergency Spill Response Management:

- (a) An Emergency Spill Response Plan will be developed by the contractor(s). This Plan is expected to be specific to the Project and consider and integrate all of the mitigation measures and procedures identified below.
- (b) This plan must adhere to the Spill Reporting Regulation, BC Guidelines for Industry Emergency Response Plans (MOE, 2002) and the CAN/CSA-Z731-03 (R2009) - Emergency Preparedness and Response (CSA, 2003). It will include the following:
 - i. A sketch of the location and size of spill kits. The location of emergency spill response kits must be in areas where equipment containing fuel and oils will be working. In addition, all construction vehicles and heavy equipment must be equipped with spill response kits to catch minor leaks, drips, and spills.
 - ii. List of contents in emergency spill response kit.
 - iii. List of personnel designated to maintain spill response materials.
 - iv. Spill response procedures if a spill were to occur such as:
 - 1. Stop work and ensure safety,
 - 2. Identify and stop the source,



- 3. Secure the area,
- 4. Contain all spilled material,
- 5. Report/notify appropriate personal and clean-up.
- v. All personnel should be aware of the reporting requirements to ensure that the first responder collects the required information such as type of material, volume or mass of material, source of spill, time of spill, reason for spill, clean-up procedures used, environmental impacts, follow-up actions to prevent re-occurrence, etc. Photographs should be taken where possible. Refer to Section 6.4.1 for details on emergency reporting and notification procedures.
- vi. A detailed reporting procedure for both internal and external reporting including roles and responsibly of each person in the reporting chain and corresponding emergency contact information. Note that if the spill falls within the reportable amount then external agencies such as the Emergency Management BC (EMBC) (previously known as the PEP Provincial Emergency Program), DFO and BC MOE may need to be notified.
- vii. All spills will be reported to the IEM and the Licensee's Site Environmental Representative.
- viii. The contractor(s) will maintain a spill and corrective action log and supply its contents to the IEM, Licensee, and/or provincial/federal regulatory agencies upon request.
- ix. A list of reportable quantities for commonly used substances.
- x. General clean-up procedures for commonly used substances. Consult Section 7.8 (Hazardous Materials and Waste Management Plan) for details on contaminated waste management.
- xi. Fire prevention and suppression measures, which should be detailed in a Fire Preparedness Plan. Refer to Section 7.12 for additional details on fire abatement.
- xii. Spill kits should be area specific.
- (c) General procedures to reduce the risk of spills which should also be discussed in the environmental orientation training. These include but are not limited to the following procedures:
 - i. Inspect all machinery for leaks or worn hoses, fittings, etc., and make all repairs prior to arriving onto the site.



- ii. Inspect all machinery and hazardous material storage areas daily for leaks or worn hoses, fittings, etc., and make prompt repairs. Inspection records should be stored at site.
- iii. All equipment should to be clean (i.e., free of spilled fuel, oil, grease and debris) and leak free.
- iv. Place oil sorbent sheets and/or containers under vehicles and equipment parked in high risk areas (i.e., adjacent to watercourses, or storm drains / drainage ditches) or immediately under any vehicle or equipment that is leaking.
- v. All personnel should be trained to properly use all emergency spill response kit materials and to how to response to emergency situations.
- vi. Follow the Fuel Storage and Handling Management Plan.
- (d) All construction personnel are expected to attend an environmental orientation training session prior to conducting any work on site. The training session is to provide details on spill containment, recovery, and clean-up procedures.



7.10 Concrete Production, Handling and Wastage Plan

7.10.1 Introduction and Purpose

There is a potential that the Project may negatively affect aquatic resources due to the production, handling, and wastage of cementitious materials. Proper handling, storage, and treatment of cementitious material will be implemented to avoid impacts effects to water quality, fish, and other aquatic organisms.

The purpose of this Concrete Production, Handling, and Wastage Plan is to:

• Provide measures and procedures to mitigate potential adverse effects resulting from concrete production, handling, and wastage on aquatic resources.

7.10.2 Applicable Permits

Applicable permits include the following:

• Table of Conditions, condition No. 11

Copies of permits are provided in Appendix B.

7.10.3 Relevant Permit Details

Relevant terms and conditions from the above listed permits, licences, and/or approvals.

• MFLNRO Section 8 - Short Term Water Use Permit.

7.10.4 Specifications and Best Management Practices

The following mitigation measures and best management practices will be implemented:

- (a) A Concrete Management and Batch Plant EPP will be developed by the contractor(s) to describe the mitigation procedures that will be used to prevent the introduction of concrete and concrete-related materials into watercourses and/or the surrounding environment.
- (b) This EPP is to be developed in advance of concrete work commencing. No concrete handling or batching will be undertaken until this EPP has been reviewed and accepted



by the IEM and Licensee (or an appointed representative). The following provisions are mandatory components of the Concrete Management and Batch Plant EPP.

- (c) Water Quality Monitoring: As the batch plant will be operated within a designated pit designed to receive effluent, pH will be regularly monitored to ensure any discharge from the effluent pit to surrounding vegetation is within the BC Water Quality Guidelines. The designated pit will be constructed in a manner such that effluent will not be discharged to any watercourse or groundwater. If circumstances arise, in which effluent is discharged to any watercourse or groundwater a water quality sampling program for pH, Total Extractable Hydrocarbons, turbidity, and TSS, at least once a month, will be implemented as per the Code of Practice for the Concrete and Concrete Products Industry. The plan, developed by the contractor(s), is to be submitted and accepted by the IEM and the Licensee's Site Environmental Representative. Refer to Section 7.6 (Care of Water Plan) for additional details on water quality management requirements.
- (d) Water Runoff Management: Overland flow with potential contact with cementitious material should not be allowed to leave the plant site. Any wastewater generated at site should be directed to a pre-excavated infiltration pond. Alternatively, wastewater (process water and site runoff) is to be captured, collected wastewater collection facilities, and treated before discharge. If discharge to an aquatic environment, the discharge must meet the BC Water Quality Guidelines for the Protection of Aquatic Life (refer to Section 7.6 Care of Water for additional details).
- (e) Washwater Management: A truck wash station is to be set up such that washwater can be recycled or directed to a depression where infiltration to ground can occur. All wash down water from concrete trucks, concrete pumping equipment, and other tools and equipment is to be either infiltrated in an approved area (consult with the IEM and the Licensee's Site Environmental Representative) or disposed of at a licensed facility. Concrete and concrete equipment wash water cannot be disposed of directly or indirectly into any watercourses or within 50 m of the Top of Bank of a watercourse, or where side slopes exceed 1:1 beyond 50 m of the Top of Bank. This provision also applies to any dry watercourses, ditches, or drainages. Suitable disposal sites are to be identified in consultation with the IEM and the Licensee's Site Environmental Representative.
- (f) All concrete works that take place in and around water must comply with the BC Standards and Best Practices for Instream Works (MWLAP, 2004).



- (g) Concrete materials cast in place are expected to remain inside formed structures until fully cured if in contact with, or liable to be exposed to water (48 hrs minimum).
- (h) For additional mitigation guidance, review federal guidelines for Concrete Batch Plants such as Ready Mix Concrete Industry Environmental Code of Practice 1993 Update (Environment Canada, 1993), or Environmental Management Practices for Ready-Mixed Concrete Operations in Canada (CRMCA, 2004).
- (i) All Concrete Batch Plants that have a silo (i.e., potential airborne particle release) and/or plant process waste water (i.e., truck wash water or dust suppression water) are required under the Code of Practice for the Concrete and Concrete Products Industry to register (via an Authorization with BCMOE) to operate the plant.
- (j) No riparian vegetation is permitted to be cleared for erection of the temporary concrete batch plant. Further, machinery movement will be minimized within any nearby riparian areas: the construction footprint will be kept as small as possible.
- (k) Containment facilities are expected to be provided for the wash down water from concrete delivery trucks, concrete pumping equipment, and other tools and equipment as required.
- (I) Dust control will be required to control the generation and distribution of airborne particulate matter produced by the batch plant operation. Refer to Section 7.2 for detail on Air Quality Management and Dust Control requirements.
- (m) Any process-related runoff is likely to have a localized pH impact and must not be allowed to influence water quality in nearby watercourses or terrestrial vegetation health. Water that has come into contact with fresh grout/cement is expected to be captured and pH neutralized prior to being discharged into the terrestrial environment or watercourses.
- (n) The batch plant site is expected to not impact any rare plant or animal species identified under the Project's environmental assessment.
- (o) All grout, cement, and associated materials/components are expected to be completely contained at all times, and sheltered from the elements.
- (p) Excess/waste grout or cement wash should be re-used if possible, disposed of off-site at an approved facility, and is to be managed in accordance with the requirements of Section 7.8 - Hazardous Materials and Waste Management Plan. If deemed reasonable and appropriate by the IEM, cured waste concrete can be buried in an area where there is no potential for contact with surface or groundwater. All efforts should be made to ensure that the amount of concrete being created for each specific task should be



accurately estimated with the goal of minimizing the amount of waste concrete produced. An effective mitigation framework for excess/waste concrete is the installation of a waste concrete curing pad directly adjacent to the washdown water infiltration pit. The waste pad should include a buried poly liner, an armoured access egress route, and fencing/barrier to prevent sprawl. For ease of water management, it should be graded to drain to the adjacent infiltration pit. Concrete can be deposited to the pad, cured, broken up, and removed without disturbance to the liner, and without dealing with concrete covers, as all surface drainage enters the infiltration pit.

(q) Following the demobilization of the batch plant, the plant site is expected to be reclaimed to its original condition.



7.11 Emergency Preparedness and Response Plan

7.11.1 Introduction and Purpose

The Emergency Preparedness and Response Plan is expected to ensure that emergencies are dealt with in a rapid, safe, and effective manner and is to include warning signals, response procedures and evacuation procedures. Scenarios that are to be addressed include, but are not limited to, weather emergencies and natural hazards, wildlife and vehicle collisions, spill and spill response procedures (refer to Section 7.11 – Emergency Preparedness and Response Plan), accidents and malfunctions (refer to Section 7.11.4) and fire hazard and abatement (refer to Section 7.12 – Fire Preparedness Plan).

The purpose of this section is to:

• Provide measures and procedures to mitigate potential adverse effects of emergencies.

7.11.2 Applicable Permits

Applicable permits include the following:

• Table of Conditions, condition No. 11.1.

Copies of permits are provided in Appendix B.

7.11.3 Relevant Permit Details

Relevant terms and conditions from the above listed permits, licences, and/or approvals.

• TOC terms and conditions are provided in Appendix D.

7.11.4 Specifications and Best Management Practices

The following mitigation measures and best management practices will be implemented:

(a) It is the responsibility of the contractor(s) to ensure that an Emergency Preparedness and Response Plan (EPRP) is in place to mitigate the risk of significant emergencies and environmental incidents. It is expected that the contractor(s) will submit the EPRP to the Licensee, the Licensee's Site Environmental Representative, and the IEM for review and acceptance, in advance of mobilization to site. Note that the environmental



incident reporting and notification procedures are provided in Section 6.4.1 of this CEMP.

- (b) Applicable sections of the EPRP will comply with the following requirements of legislation and best management practices:
 - i. Emergency Program Act, 1996 and Regulations.
 - ii. Environmental Management Act 2003 and Regulations.
 - iii. BC Guidelines for Industry Emergency Response Plans, MOE, 2002.
 - iv. Emergency Planning for Industry (CAN/CSA-Z73 I -M91).
 - v. BC Emergency Response Management System, Provincial Emergency Program (PEP), BC Ministry of Public Safety and Solicitor General, 2000.
- (c) The ERPD will include a complete emergency contact list with up-to-date contact details for key Project members and authority. This list will be available and posted at the Project site office.
- (d) The Plan will include provisions to ensure that adequate emergency response materials such as oil spill kits, firefighting equipment, absorbent materials, sand bags, etc. are on site in sufficient supply.
- (e) The ERPD will include provisions to conduct risk assessments to determine if any protective measures need to be implemented for potential natural significant events (e.g. flooding, heavy rainfall or snowfall) during construction activities.
- (f) It is expected that mitigation measures will not be implemented if human safety is at risk.
- (g) The contractor(s) is responsible for the completion of an incident investigation report and will follow-up with an investigation to confirm that the procedures in place were followed during the response. Lessons-learned will be drawn from this investigation, and these will be included in reviews of emergency response procedures to continually improve the response process. This information will be provided to the Licensee, the Licensee's Site Environmental Representative and the IEM if any form of environmental degradation results from the emergency.

Accidents and Malfunctions:

(a) The EPRP prepared by the contractor(s) will include a section on Accidents, Malfunctions and Emergency Response specific to site activities and equipment used at site. The plan is to address all types of accidents and malfunctions that may occur during work



activities, including environmental accidents/incidents that are not covered under the Project Spill Response Plan (refer to Section 7.9 – Fuel Storage, Handling and Emergency Response Plan for details). It is expected that this plan will address and include the following considerations and provisions:

- i. Preventative measures that reduce the risk of an accident or malfunction that may occur during work activities.
- ii. Response procedures for each type of accident of malfunction that may occur, including medical response (emergency and non-emergency responses).
- iii. Warning procedures which may include sirens, radio signals, etc.
- iv. Reporting procedures, both internal and external, with a list of contact names and numbers.
- v. Evacuation procedures for each work location that detail evacuation routes, muster points, check-in procedures, and notification procedures.
- vi. Training requirements that will ensure that all personnel are aware of warning signals and appropriate response procedures.
- vii. First Aid kits are expected to be made available in camps, administration offices, shops, field laboratories, heavy equipment, vehicles and any other additional location as required. It is expected that when first aid kits are used, any materials consumed should be replaced immediately.
- viii. Fire extinguishers should be located at all fuel storage facilities and locations (i.e., caches), camps, other structures, equipment storage facilities, heavy equipment, vehicles and any other additional locations as required. Fire extinguishers should be of the appropriate class for the type of combustible material in the area (i.e., a Class K fire extinguishers which is designed for fires that involves cooking oils and other cooking related material should be placed in all kitchens). The Fire Preparedness Plan should detail the location of all fire extinguishers and the class of each of the fire extinguishers. All personnel should be properly trained in the use of fire extinguishers for various types of fires.
- ix. All personnel should wear appropriate PPE including CSA approved footwear, hard hat, high visibility clothing, eye protection, ear protection and any additional PPE required for specific tasks. While working in and around water, personal flotation devices are expected to be worn and rescue equipment should be at hand such as throw ropes and reach poles.



- x. All potentially dangerous areas are expected to be marked with signage to indicate the hazards.
- xi. Particularly if in close proximity to a community, all valuables including vehicles, equipment, and tools should be either removed or secured as appropriate at the end of each work day to reduce the potential for vandalism or theft.
- xii. Possession and Use of Firearms is prohibited.

Severe Weather and Natural Hazards:

- (a) The EPRP prepared by the contractor(s) will include a section on Severe Weather and Natural Hazards Management that includes site specific procedures should severe weather or natural hazards occur. Among others, these include: heavy rain or snowfall, lightning strikes, forest fire, earthquakes, landslide, avalanches, wind storms etc. This plan will address and include the following considerations, provisions, and mitigation measures:
 - i. Work is be postponed during severe weather if there is a risk of conditions resulting in the loss of slope stability or an increased risk of erosion in sensitive areas.
 - ii. A daily weather watch process with the parties responsible for reviewing and disseminating weather information identified. The distribution list must include the IE, IEM, and the Licensee.
 - iii. Procedures for the protection of personnel and Project structures for each type of severe weather or natural hazards. This includes securing all tools and equipment, shut down procedures if conditions make work unsafe, travel restriction, muster locations, evacuation routes and procedures, etc.
 - iv. A list of locations where emergencies supplies are stored, including locations of medical supplies and response crews.
 - v. A list of warning procedures and devices for each type of severe weather or natural hazards which may include alarms, radio signals, lights, etc.
 - vi. Environmental protection procedures (where applicable) such as inspections erosion and sediment control measures and water retention structures during heavy rain.
 - vii. Training requirements to ensure that all personnel are aware of protocols procedures should a severe weather system or natural hazard occur.



- viii. In the case of freezing conditions in the Inlet, a commitment that only aluminum or steel hulled boats will be used to break through an ice accumulation in order that a passageway will be kept clear and open through the ice throughout construction (to ensure that activities and access progress efficiently and safely despite the weather conditions).
- ix. Alternatives to access Project sites would be used in the case of water freezeover during operations such as using a helicopter to access the site directly and/or using a boat to access the Tzoonie wilderness camp, followed then by accessing the site by road from there.



7.12 Fire Preparedness Plan

7.12.1 Introduction and Purpose

The Fire Preparedness Plan is expected to ensure that fire-related emergencies are dealt with in a rapid, safe, and effective manner and is to include warning signals, response procedures and evacuation procedures.

The purpose of this section is to:

• Provide measures and procedures to mitigate potential adverse effects of fire-related emergencies.

7.12.2 Applicable Permits

Applicable permits include the following:

• Table of Conditions, condition No. 11.1.

Copies of permits are provided in Appendix B.

7.12.3 Relevant Permit Details

Relevant terms and conditions from the above listed permits, licences, and/or approvals.

• TOC terms and conditions are provided in Appendix D.

7.12.4 Specifications and Best Management Practices

A Wildfire Risk Management System (WRMS) was developed for the Project by B.A. Blackwell and Associates Ltd. Based on the risk assessment contained in the WRMS the contractor(s) will prepare a Fire Preparedness EPP specific to the work activities proposed and equipment used at site. This EPP will address and include the following considerations, provisions, and measures.

- (a) Identification of potential sources of fire including fuel handling and storage, accumulated combustible material (e.g., cleared vegetation, residual wood from construction, etc.), work related ignitions sources (e.g., sparks, cigarettes, mufflers, etc.) and natural sources such as lightning strikes.
- (b) Mitigation procedures for each of the potential sources identified.



- (c) The Fire Preparedness EPP will include the following:
 - i. Designated a Fire Boss and ensure to have trained staff on site throughout construction;
 - ii. Provide a comprehensive list of fire repression equipment;
 - iii. Identify clearly on maps the location of fire equipment stations;
 - iv. During the fire season, it is recommended that all major work sites (e.g. powerhouse, intake, active penstock heading, active transmission line heading, camp, material laydown etc.) have a firefighting equipment cache.
 - v. Distributed and post fire response protocols and key contacts (e.g. fire department) throughout main project areas (e.g., camp, intake, powerhouse, key muster stations);
 - vi. Clearly identify on maps the location of muster stations in case of fire; and,
 - vii. Clearly identify the training requirements for fire suppression crews.
- (d) A list of and location of firefighting equipment. Fire extinguishers should be the appropriate class for the type of combustible material in the area. All equipment should be inspected and maintained regularly and replaced as required.
- (e) Warning procedures which will be in place such as smoke detectors, fire alarms, other alarms and radio signals.
- (f) Response procedures including firefighting protocols.
- (g) Reporting procedures, both internal and external, with a list of contact names and numbers. The contact list should be posted wherever there is a possibility of a fire. Environmental incident notification and reporting procedures are provided in Section 6.4.1 of this CEMP.
- (h) Evacuation procedures for each work location that detail evacuation routes, muster points, check-in procedures and notification procedures.
- (i) Training requirements that will ensure that all personnel are trained in proper identification of sources, implementation of mitigation measures, firefighting and reporting. A minimum level of training for contractor personnel (i.e., S-1000 trained staff per number of active workers) is recommended.
- (j) A confirmation statement confirming that all activities and procedures will comply with the *Wildfire Act*.
- (k) All wildfires will be reported to the Provincial Wildfire Line at 1-800-663-5555.



- A commitment to obtaining the appropriate fire weather index rating on a daily basis. Also see Section 3.9 for additional requirements and details.
- (m) A person carrying out a high risk activity in close proximity to forest land or grass land must do so in accordance with the Wildfire Regulation. This includes ensuring that an adequate fire suppression process and system is in place at the work location, including having on hand adequate, mandatory firefighting hand tools.
- (n) During high risk activities, when the Fire Danger Class is rated as high, the contractor(s) will appoint a fire watcher who will be responsible for monitoring for fire ignition sources and safety.
- (o) Smoking on site will only be allowed in designated areas.
- (p) Anybody responsible for identifying and reporting a fire will remain available to communicate details of the fire suppression activities implemented to the Licensee, the Licensee's Site Environmental Representative, and the IEM for reporting purposes.
- (q) Temporary water use permits (Section 8 of the *Water Act*) are not required for withdrawal of surface water from watercourses for the purpose of fighting active fires, but any flow so diverted must be promptly restored to its original channel when the fire is extinguished.



7.13 Heritage, Cultural and/or Archeological Sites Management Plan

7.13.1 Introduction and Purpose

The Heritage, Cultural and/or Archeological Sites Management Plan is expected to ensure the protection of sites with historical, cultural, archaeological, paleontological, or architectural significance, whether baseline studies do or do not indicate the presence of any such sites within the project area.

All damage, loss, or impact to significant historical, cultural, archaeological, paleontological, or architectural resources will be prevented through the implementation of practical measures. Among others, these will include documentation of, and operational planning around, known sites, as well as appropriate *in situ* communications to management upon discovery of unknown sites.

The purpose of this section is to:

 Provide measures and procedures to mitigate potential adverse effects of construction activities on sites of historical, cultural, archaeological, paleontological, or architectural significance.

The Licensee, together with the *shíshálh* Nation, has developed an Archaeological Resources and Cultural Use Sites Monitoring and Management Plan (Appendix J) providing guidelines and procedures for known archaeological or heritage sites, unknown archaeological or heritage sites and surface features such as culturally modified trees (CMTs). It is compulsory that the contractor(s) follow this plan and that he consult with the *shíshálh* First Nation to ensure that regional values and processes are satisfied.

Legislation and policies outlined in the BC *Heritage Conservation Act* and the Archaeological Impact Assessment Guidelines (BCMOF, 1998) were incorporated into the plan. These are expected to be conveyed in a cursory fashion during the environmental orientation training session.

7.13.2 Applicable Permits

Applicable permits include the following:

• Table of Conditions, condition No. 11.1.



Copies of permits are provided in Appendix B.

7.13.3 Relevant Permit Details

Relevant terms and conditions from the above listed permits, licences, and/or approvals.

• TOC terms and conditions are provided in Appendix D.

7.13.4 Specifications and Best Management Practices

The following mitigation measures and best management practices will be implemented:

- (a) The Licensee and *shishálh* Nation will develop a Heritage, Cultural and/or Archeological Sites Management EPP to mitigate the risk of impacts to significant historical, cultural, archaeological, paleontological, or architectural resources. It is expected that the EPP will be submitted to the IEM for review and acceptance, in advance of mobilization to site. This EPP will confirm adherence to the Archaeological Resources and Cultural Use Sites Monitoring and Management Plan developed by the Licensee and the *shishálh* Nation, and will address and include the following considerations, provisions, and measures.
- (b) All project personnel will be informed that archaeological sites are protected from disturbance, intentional or inadvertent, by the BC *Heritage Conservation Act*.
- (c) If the location of facilities or project components required to be moved outside of the EA study area, the contractor(s) commits to completing supplementary archeological assessments. These are to be conducted by a Professional Archaeologist and member(s) of the *shishálh* Nation.

Known Archaeological or Heritage Sites:

- (a) Known sites and corresponding clearing area boundaries will be clearly flagged by a QEP retained by the contractor(s) prior to the commencement of vegetation removal. This is to include identifying all 'No Touch Zones' and clearly marking all access points.
- (b) Ground disturbance is to be avoided or minimized within the vicinity of known sites.
- (c) Sites recognized and identified as historically valuable and "to be protected" are to be monitored during construction for signs of disturbance.



Chance Find, Unknown Archaeological or Heritage Sites:

- (a) If any remains, CMTs, artefacts or items of historical interest of value are discovered during construction activities, it is expected that work will be halted immediately until an archaeological assessment by a Professional Archaeologist can be completed, and an acceptable course of action is planned. The recommended course of action upon discovery of an unknown site is as follow:
 - i. Stop all work in the area.
 - ii. Report the discovery to the contractor(s) site supervisor, the Licensee, the Licensee's Site Environmental Representative, the *shishálh* Nation, and the IEM.
 - iii. Protect the area, which may include taping-off the area to prevent further disturbance, cover the exposed site to reduce exposure to the elements and stabilize any slopes so that the site may be accessed by appropriate personnel safely.
 - iv. Carefully examine the site so that personnel may be able describe the site in detail to RCMP, first nation representation and/or archaeologist. If possible, photographs should be taken from multiple angles.
- (b) If human remains are found, it is mandatory that the incident be reported to the local RCMP immediately.



7.14 Fish and Fish Habitat Protection Plan

7.14.1 Introduction and Purpose

Construction activities may cause adverse impacts to fish and fish habitat through dewatering, degradation of water quality, erosion and sedimentation, disturbance of spawning or rearing habitat or of fish during spawning or rearing, reduced flows, and removal of riparian vegetation. Specific mitigation procedures are to be developed to prevent, eliminate, and/or reduce impacts to fish and fish habitat where these have not been approved. A number of these measures have been included in the Care of Water Plan (Section 7.6) and will be detailed in specific work plans developed for instream and near-stream works (to be developed by the contractor(s).

The purpose of this section is to:

• Provide measures and procedures to mitigate potential, unauthorized impacts to fish and fish habitat.

Fisheries Information:

The following information has been extracted from the EA Application.

a. Chickwat Creek

The diversion reach of Chickwat Creek consists of an upper non-anadromous fish-bearing section of length approximating 2,190 m. This section contains less than 100 individual fish (Dolly Varden (*Salvelinus malma*) char is not a listed or endangered species) with the average length of 150 mm. The lower section is anadromous fish-bearing, of length approximating 169 m, and was determined to be of low habitat suitability.

Coho Salmon (*Oncorhynchus kisutch*), Steelhead/Rainbow Trout (*Oncorhynchus mykiss*), Cutthroat Trout (*Oncorhynchus clarkii clarkii*), and Dolly Varden (*Salvelinus malma*) have been documented in the lower reaches of Chickwat Creek. Dolly Varden are also present in the lower diversion and downstream reaches of Chickwat Creek, and Bull Trout (*Salvelinus confluentus*) may also be present in the anadromous zone.

Chickwat Creek C1 tributary is likely non-fish-bearing. Although no fish were observed in the C2 tributary of Chickwat Creek in the 2013 sampling events, this tributary is conservatively considered to be likely fish-bearing based on the presence of fish in the mainstem, suitable



habitat in the lower portions of the stream and absence of a fish barrier under higher flow conditions.

b. Ramona Creek

Upper Ramona Creek and Ramona Lake are non-fish bearing. Ramona Creek (above the lower falls) and the R1 tributary are non-fish bearing.

Historical reports state that the downstream reach of Ramona Creek is known to support Cutthroat Trout, Coho Salmon, and Chum Salmon. Steelhead/Rainbow Trout were also included in the assessment of the fish-bearing zone as they are listed as present in the FISS database for Narrows Inlet and there was insufficient data to exclude them. In the downstream reach of Ramona Creek, Coho Salmon, Pink Salmon, Chum Salmon, Cutthroat Trout and sculpin have been observed during the 2014-2015 Ecofish baseline sampling and monitoring events.

7.14.2 Applicable Permits

Applicable permits include the following:

- Conditional Water Licence; and
- Fisheries Act Authorization.
- Table of Conditions, conditions No. 3, 11.1, 16, 17, 18, 19, 21, 24, 25.

Copies of permits are provided in Appendix B. The TOC is provided in Appendix D.

7.14.3 Relevant Permit Details

Relevant terms and conditions from the above listed permits, licences, and/or approvals.

- Prior to commencing construction of the Lower Ramona Creek components, a QEP will develop (for the Licensee) a Marine Sensitivity Blasting Management Plan for the Lower Ramona area. This plan is to focus on marine organisms that are sensitive to blasting noise and disruption in Narrows Inlet (EA Condition No. 3, Appendix D) and is to be submitted to the EAO.
- A QEP will develop and implement (for the Licensee) a fish habitat compensation plan for Chickwat Creek to the satisfaction of DFO and MFLNRO (EA Condition No. 17, Appendix D). Copies of this plan will be provided to MFLNRO and EAO.



• As part of the detailed design of the plants, the contractor(s) will ensure (for the Licensee) that the tailraces that are part of the Project prevent fish access or fish stranding during low water levels (EA Condition No. 18, Appendix D). The final design should be reviewed and endorsed by a QEP.

7.14.4 Specifications and Best Management Practices

- (a) A Fish and Fish Habitat EPP will be developed by the contractor(s). It will include specific procedures for the protection of fish and fish habitat from various construction activities occurring throughout the Project. This plan is to incorporate all of the following considerations, procedures, and mitigation procedures.
- (b) All construction personnel are required to attend an environmental orientation training session prior to conducting any work in or near streams.

Instream Works:

- (a) The contractor(s) will develop site-specific work plans to address construction processes and environmental risks for all work activities conducted within 30 m of the high-water mark of a stream (as defined under the BC *Water Act*). These plans are to be submitted to the Licensee and IEM for review, commenting and acceptance. Only works that have received an acceptance receipt from the Licensee, the Licensee's Site Environmental Representative, and the IEM may proceed.
- (b) It is a mandatory requirement that all site-specific work plans developed for work activities within 30 m of the high-water mark (e.g., Intake Construction Plan, all Stream Crossing and Diversion Construction Plans, Tailrace Connections Plans) include mitigation procedures for the protection of fish and their habitats, including habitats connecting to fish-habitat (whether utilized seasonally or continuously).
- (c) It is also a mandatory requirement that all site-specific work plans developed for work activities within 30 m of the high-water mark integrate provisions to protect fish and fish habitat from impacts cause by erosion and sediment transport (refer to Section 7.5 – Erosion, Sediment and Drainage Management Plan- for additional details).
- (d) Where applicable, reclamation commitments are to be integrated into site-specific work plans. Refer to Section 7.16 – Vegetation Management and Reclamation Plan - for additional detail on minimum requirements.
- (e) Note that consultation with the IEM and the Licensee's Site Environmental Representative is compulsory prior to any works in and around water. Further, the contractor(s) is to provide formal notification to the IEM and the Licensee's Site



Environmental Representative at least 72 hours in advance of any/all works conducted in and around water.

- (f) Fish salvage permits are to be obtained by the contractor(s) and/or the QEP detailed below in point (h).
- (g) Consultation with the IEM is expected in advance of applying for said permits.
- (h) Fish salvages and exclusion is to be conducted prior to all dewatering activities. Capture and relocation of fish species is to comply with the Drainage Management Factsheet: Fish Salvage (MAFF, 2005) and be conducted by qualified technicians or biologists.
- (i) Only screens that are compliant with the Freshwater Intake End-of-Pipe Fish Screen Guidelines (DFO, 1995) are to be installed on all pumps used to withdraw water from fish-bearing streams.
- (j) All works conducted below the high water mark of a stream (as defined under the BC *Water Act*) are to be conducted within the construction timing window (refer to Section 3.11.5), unless otherwise agreed to in writing by governing Agencies.
- (k) It is compulsory that instream flows be maintained downstream of all work sites in fishbearing streams and wetted areas flowing into fish-bearing waters.
- (I) To the extent possible, stream crossings such as bridges and culverts are to be designed to allow fish passage (in fish-bearing waters) and be constructed in accordance with industry best practices. Where possible, clear span bridge should be used to cross watercourses. Compliance with Project permits is mandatory.
- (m) All construction footprints in and around fish habitat, unless authorized by DFO, should be adjusted to avoid sensitive habitat areas such as spawning and rearing habitat.
- (n) All instream and near-stream works must comply with the guidelines outlined in the Standards and Best Practices for Instream Works (MWLAP, 2004) and Fish-stream Crossing Guidebook (BCMOF, 2002). Consultation with the IEM and the Licensee's Site Environmental Representative is expected in cases where this may not be possible.
- (o) The fish-bearing status of streams is to be clearly marked on plans and appropriate setbacks are to be provided in the field. This is to be done well in advance of construction in these areas, and should be completed by a QEP.
- (p) Unless authorized under the BC *Water Act* or the Canadian *Fisheries Act*, appropriate work setbacks are to be maintained around fish-bearing watercourses (min. 30 m) and around watercourse that flows into fish-bearing waters (min. 15 m).
- (q) All instream works are to be conduct in isolation of stream flows.



- (r) All instream works are to be completed during low flow periods or when dry, and during dry weather conditions. In the event that this cannot be achieved, the contractor(s) is to ensure that isolation measures are adequate to contain all runoff from site. If an isolated work area becomes inundated, all works are to be halted the area has been salvaged for fish by a QEP.
- (s) If replacement rock reinforcement/armouring is required to stabilize eroding or exposed areas, it is the responsibility of the contractor(s) to ensure that appropriately-sized, clean and inert rock is used; and that the rock is installed at a similar slope to maintain a uniform bank/shoreline and natural stream/shoreline alignment.
- (t) The contractor(s) will ensure that all instream or active floodplain habitats that have been disturbed during the completion of works are restored in a manner that prevents the pooling of water in a manner that may cause isolation or stranding of fish.
- (u) Instream or near-stream blasting is to be conducted outside of sensitive periods (i.e., in the Reduced Risk Window). Refer to Section 7.4 (Excavation, Borrowing, Blasting, and ML/ARD Plan) for details on the management of blasting activities in and around a watercourse.
- (v) The contractor(s) will ensure that underwater acoustic pressure will be monitored to confirm that it does not exceed the working Pacific region standard of 30 kPa, if/as approved by the IEM, when blasting occurs in or near streams known to contain fish. Cross reference Section 7.4.4.
- (w) The contractor(s) will ensure that exclusion barriers will be established and fish will be removed from blast sites/areas prior to the commencement of instream blasting works.

Water Quality:

- (a) Water quality protection and management is discussed in detail in Section 7.6 (Care of Water Plan).
- (b) Deleterious or un-permitted substances and/or materials are not allowed to enter any watercourses (e.g., ditches, stream or rivers) or the surrounding environment, unless accepted by the IEM in advance.
- (c) Procedures for dust control, waste management, fuel handling, and concrete works must be followed at all times while working in and around water. These are described in detail in Sections 7.2 (Air Quality and Dust Control Plan), 7.7 (Waste Management Plan), 7.8 (Hazardous Materials and Waste Management Plan), 7.9 (Fuel Storage, Handling and Emergency Response Plan), and 7.10 (Concrete Production, Handling and Wastage Plan).



Fish Salvage Plan:

- (a) The contractor(s) is responsible for retaining an appropriately qualified QEP to conduct fish salvage where required.
- (b) The QEP retained by the contractor(s) will be responsible for developing a fish salvage plan. This plan will be submitted to the Licensee, the Licensee's Site Environmental Representative, and the IEM for review, commenting, and acceptance.
- (c) The fish salvage plan will integrate, at a minimum, the following considerations, procedures, and mitigations.
- (d) The contractor(s) or QEP will be responsible for obtaining any/all fish collection permits from the Provincial and Federal governments, as applicable. Permits will be provided to the Licensee, the Licensee's Site Environmental Representative, and the IEM in advance of the work, and these will be held onsite during all fish salvage activities.
- (e) The QEP will commit to using fish exclusion measures and ensuring that fish salvage activities are completed to his/her satisfaction prior to the commencement of instream works. Fish will be relocated out of the immediate instream work zone into undisturbed sites nearby (generally upstream), within the same watercourse.
- (f) Fish salvage and exclusion will be conducted prior to all instream and dewatering activities. In the event that salvage is not feasible prior to complete dewatering, as may be the case for the construction of cofferdams, fish removal may be conducted concurrently with dewatering. These details are to be provided in the fish salvage plan.
- (g) The selection of salvage techniques and methods will be at the discretion of the QEP retained by the contractor(s), unless otherwise requested by agencies or the IEM. A salvage plan favouring less invasive salve and relocation techniques is recommended.
- (h) Applicable special salvage techniques will be employed for salvaging species at risk (should these be encountered in the project area). Additional federal permitting may be required. The contractor(s) or QEP will be responsible for obtaining any additional permits.



7.15 Wildlife Management Plan

7.15.1 Introduction and Purpose

Construction activities may cause adverse impacts to wildlife and wildlife habitat through several construction activities. Specific mitigation procedures are to be developed to prevent, eliminate, and/or reduce impacts to wildlife and their habitat where these have not been approved.

Direct or indirect impacts to wildlife and unnecessary impacts to wildlife habitat will be prevented through the application of practical protection measures. These will include site-specific mitigation measures and procedures to protect terrestrial habitats and wildlife throughout Project construction. Issues such as re-vegetation, restoration, wildlife collisions with construction vehicles, aircraft operations, and wildlife encounters strategies will be managed with care. All applicable mitigation measures will be developed according to applicable standards and legislation such as the BC *Wildlife Act* and the *Species at Risk Act*. Specific mitigation procedures will be in place based on the type of wildlife that is found in the Project area, and will include procedures for handling nuisance wildlife.

Further details with respect to species-specific management of amphibians, birds, and mammals is provided in Section 8.0.

The purpose of this section is to:

• Provide measures and procedures to mitigate potential direct or indirect impacts to wildlife and unnecessary impacts to wildlife habitat.

7.15.2 Applicable Permits

Applicable permits include the following:

• Table of Conditions, conditions No. 1, 2, 3, 5, 9, 11, 22, and 23.

Copies of permits are provided in Appendix B.

7.15.3 Relevant Permit Details

Relevant terms and conditions from the above listed permits, licences, and/or approvals.



- The Licensee will act in accordance with the BC Hydro document entitled: *Approved Work Practices for Routine Electrical Cable Maintenance in Freshwater and Marine Coastal Areas* in the Interconnection area of Sechelt Inlet as specified in the Certified Project Description (EA Condition No. 5a, Appendix D).
- The Licensee will lay cable only within the period Dec. 1 Feb. 15, unless written authorization is provided by the Department of Fisheries and Oceans (DFO; EA Condition No. 5b, Appendix D).
- Prior to starting construction on the Ramona Lake component, the Licensee will determine the habitat for aquatic breeding salamanders using a QEP (as per EA Condition No. 2, Appendix D).

7.15.4 Specifications and Best Management Practices

- (a) The contractor(s) is expected to prepare a comprehensive Wildlife Management EPP that will include site-specific mitigation measures and procedures to protect terrestrial habitats and wildlife during construction of the Project. Issues such as re-vegetation, restoration, wildlife collisions with construction vehicles, aircraft operations, and wildlife encounters strategies are to be included, and developed according to applicable standards and legislation such as the BC *Wildlife Act*, the *Species at Risk Act*, *Migratory Birds Act*, and others as applicable.
- (b) Specific mitigation procedures will also be in place based on the type of wildlife that is found in the Project area, including procedures for handling nuisance wildlife.
- (c) All construction personnel are required to attend an environmental awareness training session prior to conducting any work at site. This will include a Bear Awareness component.
- (d) The following mitigation measures and best management practices will be implemented.

General Wildlife Considerations:

- (a) All wildlife sightings are to be reported and recorded on a wildlife observation form. A detailed process for doing so is to be provided in the EPP.
- (b) Access road and transmission line routes are expected to, where possible, avoid mature and old growth forest and habitat features such as talus slopes, rock outcrops and wetlands.



- (c) All 'No Touch Zones' are expected to be clearly marked or flagged by a QEP retained by the contractor(s), and will reviewed by the IEM and the Licensee's Site Environmental Representative.
- (d) Access roads and transmission lines are expected to avoid sensitive habitats such as mountain goat kidding areas and ungulate winter ranges, riparian areas, critical spring habitat for bears, wetlands, wildlife trees, etc. Cross reference Section 8.2 – Wildlife Management Best Practices.
- (e) Hunting and fishing is prohibited by all Project personnel during Project construction.
- (f) During vegetation clearing, the removal or falling of wildlife trees is to be avoided where possible. Consultation with the IEM and the Licensee's Site Environmental Representative is expected.
- (g) Machines and equipment should be kept on roadways and within permitted footprint areas to the extent possible to minimize disturbance to surrounding vegetation. Consultation with the IEM and the Licensee's Site Environmental is expected when equipment is to be used outside of these areas.
- (h) Construction and decommissioning activities are to be minimized within suitable (habitat rated 3 or better) elk and deer winter habitat. Protocols will be developed by the contractor(s) in conjunction with a QEP, for review and accepted by the IEM and the Licensee's Site Environmental Representative and/or MFLNRO, to ensure that disruptive noise from Project activities does not disrupt elk and deer using suitable winter habitat. See Section 7.3 (Noise Control Plan) for details on noise management.
- (i) Construction activities are to be minimized during sensitive wildlife periods. Refer to Section 3.11.5 (Construction Timing Windows) for further details.
- (j) All disturbed locations that are expected to be reclaimed as directed in permits or contract documents, are expected to be re-vegetated within 12 weeks of completion of construction or during the next growing season. Where possible, landscape features such as woody debris are to be retained and replaced. Consultation with the IEM and the Licensee's Site Environmental Representative is expected to confirm expectations. Refer to Section 7.16 (Vegetation Management and Reclamation Plan) for further details.
- (k) Procedures for dust control, waste management, and fuel handling must be followed at all times to prevent harm to wildlife and their habitats. Refer to Sections 7.2, 7.7, and 7.9 for further details.



- (I) If roads are ploughed during the winter, they should be cleared so that snow banks do not inhibit wildlife from crossing. Berm breaks should be provided at regular intervals, and will be determined in consultation with the IEM and the Licensee's Site Environmental Representative.
- (m) It is expected that vegetation planted along roadways will consist of native species that that are the least palatable for browsing wildlife.
- (n) Food waste is to be completely segregated from construction waste. Refer to Sections
 7.7 (Waste Management Plan) and Section 7.15.6 (Human-Wildlife Interaction Management Plan) for further details.
- (o) Personal lunches are to be stored inside vehicles or other areas that cannot be accessed by wildlife.
- (p) Use integrated pest/weed management and avoid use of chemical pesticides (unless deemed acceptable to the IEM), which can be harmful to raptors, amphibians, Pacific sideband snails and other wildlife.

Blasting:

- (a) A Blasting Mitigation section is expected to be included in the Wildlife Management EPP. It is to include mitigation procedures for the management of noise and sensory disturbance. This section will include considerations for the following:
 - i. Blasting and working outside of sensitive wildlife periods including mountain goat breeding and kidding season. Refer to Section 3.11.5 for details on construction timing windows.
 - ii. Ensuring sensitive wildlife is not present in work areas prior to the start works, unless otherwise accepted by the IEM and/or provincial/federal agencies.
 - iii. Establishing exclusion barriers from work areas prior to the start of works.

Aircraft Operations:

- (a) It is expected that the Wildlife Management EPP will include procedures and strategies to minimize the disturbance from aircraft operations on wildlife in the Project area.
- (b) Disturbance management recommendations from the Management Plan for the Mountain Goat (MGMT, 2010) will be incorporated into the Wildlife Management Plan for activities within or adjacent to Ungulate Winter Range (UWR; goat specific).
- (c) Flight paths are to be planned to occur as far as possible from sensitive wildlife habitats. This is to be done in consultation with the IEM and the Licensee's Site Environmental



Representative. If flights are required within the same valley as sensitive habitats, then aircraft flights will be planned to avoid these areas to the extent possible, and travelling will be coordinated to ensure that is it on the opposite side of the sensitive areas.

- (d) It is expected that aircrafts are to be operated in a fashion that reduces the amount of noise (to the extent possible) and operated at sufficient distances to prevent sensory disturbance on wildlife and changes in wildlife behaviour.
- (e) Aircrafts are expected to avoid areas where wildlife can be seen or are known to occur consistently.

Instream Works:

- (a) All instream work site-specific plans developed by the contractor(s) (e.g., all intake construction plans, all stream crossing and diversion construction plans, tailrace connections plans, etc.) are to include mitigation procedures for the protection of amphibians and amphibian habitat, including provisions for amphibian salvage and exclusion prior to dewatering activities. These plans are to be submitted to the Licensee, the Licensee's Site Environmental Representative, and the IEM for review, commenting and acceptance prior to the start of instream works.
- (b) The following wildlife impact mitigation measures will be addressed in the contractor(s) EPP, and will be implemented for all in-stream works:
 - iv. It is expected that all cobbles and/or boulders removed or shifted during instream works will be replaced into, or redistributed throughout the system.
 - v. The natural stream substrates at all stream crossings will be maintained to the extent possible (e.g., on large permanent streams, such as Chickwat Creek, install bridges or open bottom box culverts to maintain natural streambeds, riparian habitats, the as well as the composition and flow regimes at road crossings).
 - vi. Salvages for Pacific Tailed Frog will be conducted prior to all instream works to move tadpoles and other life stages upstream, out of the areas of impact. Instreams works during the fall congregation and breeding period and springearly summer egg laying and emergence period will be avoided to the extent possible. Amphibian salvage will be conducted by a QEP under the applicable permitting. Salvage protocols will be site-specific, drafted in consultation with a QEP (species expert) and will be submitted to the Licensee, the Licensee's Site Environmental Representative, and the IEM for review, commenting, and acceptance prior to the start of instream works. Provincial interim hygiene



protocols for handling amphibians will be employed including sterilization of sampling equipment to prevent the spread of pathogens between stream systems.

Water Quality:

- (a) Water quality protection and management is discussed in detail in Section 7.6 (Care of Water Plan).
- (b) Deleterious or un-permitted substances and/or materials are not allowed to enter any watercourses (e.g., ditches, stream or rivers) or the surrounding environment, unless accepted by the IEM in advance.
- (c) Procedures for dust control, waste management, fuel handling, and concrete works must be followed at all times while working in and around water. These are described in detail in Sections 7.2, 7.7, 7.8, 7.9, and 7.10.
- (d) A detailed, site-specific invasive species mitigation section will be incorporated in the Wildlife management EPP developed by the contractor(s). It will include measures to control the introduction and spread of invasive species, including amphibian species (e.g., Bullfrogs and Green Frogs). Mitigation measures should include, but are not limited to:
 - i. Vehicle washing stations at designated locations in the Local Study Area (LSA); and
 - ii. Sterilizing of all equipment used in-stream to prevent cross-effects from working between watercourses.

7.15.5 Habitat Mitigation

Mitigation measures to minimize adverse effects of construction activities to important habitats include, but are not limited to:

- Fuelling of all machinery is expected to occur >30 m of the high water mark of any watercourse. Refer to Section 7.9 (Fuel Storage, Handling and Emergency Response);
- No Touch Zones are to be delineated by the contractor(s)' QEP and reviewed by the IEM and the Licensee's Site Environmental Representative prior to the commencement of works in and around water. Refer to Section 7.6 (Care of Water Plan).
- Erosion and sediment control measures will be applied as per Section 7.5 (Erosion, Sediment and Drainage Management) to reduce the potential for unstable slopes and



minimize the risk of mobilization of sediment-laden water to sensitive receiving environments.

- All 'No Touch Zones' around nesting sites are expected to be clearly marked or flagged by a QEP retained by the contractor(s), and will be reviewed by the IEM and the Licensee's Site Environmental Representative.
- Construction timing windows, or reduced risk window, will be used to minimize harmful effects on VCs. Refer to Section 3.11.5 (Construction Timing Windows).
- Vegetation surveys will be conducted to identify riparian areas, wetlands, rare plants and/or ecosystems (e.g. Old Growth Forests). Refer to Section 7.16 (Vegetation Management).
- Vegetation will only be removed where required to perform the work to reduce the potential creation of unstable slopes. Refer to Section 7.16 (Vegetation Management).
- Nesting and wildlife surveys will be conducted to identify sensitive nesting, rearing, staging, and mating areas and minimize harmful effects. Refer to Section 8.2 (Wildlife Management Best Practice Guidelines and Regulatory Requirements.

7.15.6 Human-Wildlife Interaction Management Plan

Human Bear Conflicts:

- (a) A Human-Bear Conflict Section (or stand-alone document) is to be developed as part of the Wildlife Management EPP, and it must include procedures and strategies for human bear encounters. It shall include procedures for bear encounters, measures for bear exclusion (fencing), bear proof containers for food and waste, etc. It is a requirement that all bear encounters be documented by the contractor(s). Encounters are to be reported to the IEM and the Licensee's Site Environmental Representative within 24 hours of their occurrence, to aid in developing and/or adjusting future mitigation procedures.
- (b) To the extent possible, all road corridors are to avoid critical habitat for bears, including spring feeding areas, to reduce the potential of bear encounters on roadways.
- (c) Construction should be avoided in upper elevation areas during hibernation season.
- (d) Intentional or unintentional feeding of wildlife is absolutely prohibited throughout the Project.
- (e) Waste, especially aromatic waste, will be removed from site on a regular basis to prevent attracting wildlife.



- (f) Should it be deemed that bear sightings are becoming uncomfortably frequent in a particular area, and that these pose a potential safety risk to field personnel, the contractor(s) will be informed and will contact the IEM, the Licensee's Site Environmental Representative, and local Conservation Officer for further guidance. See Section 10 of this CEMP for contact information of the local Conservation Officer.
- (g) Site personnel work alone in remote vegetated areas is to be discouraged. All site personnel required to work in areas where quality bear forage exists will be equipped with bear spray and trained in its use.
- (h) Bear-proof receptacles are to be provided and used to dispose of all food wastes.
- (i) Camp food products, waste, and recycling must be secured in an enclosed facility to assist in odour management and prevent bear attraction.
- (j) Electric fencing is to be erected and maintained around all bear attraction sites. This includes (but is not limited to): food storage areas, preparation and waste areas, petroleum product shelters, grey water storage areas, the incinerator site, and all camp sites.
- (k) The food wastes collected from camp will be burned immediately upon reaching incinerator site. Storage of food wastes at the incinerator is strictly prohibited.

Human Interaction with Wildlife (excluding bears):

(a) Specific procedures and strategies are to be developed and included in the Wildlife Management EPP to address interactions and encounters with wildlife such as elk, moose, deer, wolves, cougars and any other animals known to occur in the Project area.

Vehicle Collision Protocol:

- (a) All vehicles are expected to yield right-of-way to wildlife.
- (b) All personnel are expected to travel with due care and attention while at site. Appropriate speed limits are to be established and respected for all roadways (see Section 7.1 – Access and Traffic Management Plan - for details on access to site and traffic management).
- (c) All animal strikes/impacts must be reported to the IEM, the Licensee's Site Environmental Representative, and appropriate Project personnel to prevent future strikes and to determine how to manage injured or dead animals.
- (d) The contractor(s) is to review and incorporate the mitigation recommendations provided on the Wildlife Collision Prevention Program (WCPP) website (BC Conservation Association, 2011) in the Wildlife Management EPP.



- (e) The contractor(s) will maximize carpooling while at site to the reduce traffic volumes on access roads, and as a result reduce the risk of wildlife mortality from vehicle collisions.
- (f) It is the responsibility of the contractor(s) to ensure that road-kill (and other possible attractants) be removed from the road and be relocated away from active construction areas.
- (g) The contractor(s) will keep a record of locations where wildlife is encountered, and will communicate these areas to drivers at daily meetings.



7.16 Vegetation Management and Reclamation Plan

7.16.1 Introduction and Purpose

Unauthorized loss of vegetation in relation to valuable ecosystem functions will be prevented through the application of practical protection measures. Construction activities may cause adverse impacts to vegetation through several construction activities. These protection measures are to address potential impacts due to general construction activities, including clearing, grubbing, road work (etc.), erosion and sediment control; impacts to rare plants, and the control and prevention of invasive and noxious vegetation spreading.

The purpose of this section is to:

• Provide measures and procedures to mitigate potential direct or indirect impacts to vegetation in relation to valuable ecosystem functions.

7.16.2 Applicable Permits

Applicable permits include the following:

- General Area Licence of Occupation under the Land Act (BC); and
- Occupant Licence to Cut under the *Forest Act* (BC).
- Table of Conditions, conditions No. 1 and 11.1.

Copies of permits are provided in Appendix B.

7.16.3 Relevant Permit Details

Relevant terms and conditions from the above listed permits, licences, and/or approvals.

• TOC terms and conditions are provided in Appendix D.

7.16.4 Specifications and Best Management Practices

(a) The contractor(s) is expected to prepare a comprehensive Vegetation Management EPP that will include site-specific mitigation measures and procedures to protect the unauthorized loss of vegetation and the spreading of noxious plants species. The EPP will consider and integrate all of the provision identified in the following subsections.



- (b) The Vegetation Management EPP will ensure that vegetation surveys are completed to establish if any rare plants or rare ecosystems are found within the Project footprint or within areas potentially affected by the Project (e.g., Ramona Creek waterfall areas).
- (c) All vegetation surveys (pre-clearing surveys and rare/uncommon plant and ecological communities) will be based on the protocols and methodologies for rare plant surveys as described by the Electronic Atlas of the Plants of British Columbia (BC CDC and E-flora websites) and in conjunction with rare plant experts.
- (d) All attempts will be made to ensure that sites will be surveyed during the following periods: early spring, later spring, early summer, later summer, and early fall since this type of coverage will capture the flowering periods of most species, including spring ephemerals that completely disappear after flowering.
- (e) All construction personnel will attend an environmental orientation training session that will inform them of proper protocols for the mitigation of impacts to vegetation.

General Construction Activities:

- (a) Appropriate riparian buffers will be established around wetlands and associated watercourses, according to Sections 47, 48 and 49 of the Forest Planning and Practices Regulation (2010) under the *Forest and Range Practices Act* (2002).
- (b) All streams within or adjacent to the defined Project footprint will be classified and appropriate riparian buffers will be established following the FRPA (2002).
- (c) Buffer widths will vary according to stream classification but at a minimum will consist of a 20 m Riparian Management Area width (e.g., for Riparian Class S6). All wetlands within or adjacent to the defined Project footprint will be classified and appropriate riparian buffers will be established following the FRPA (2002). Buffer widths will vary according to wetland classification but at a minimum will consist of a 30 m Riparian Management Area width (i.e. for Riparian Class w2, w3, and w4). Buffer widths will be reviewed for acceptance by the IEM.
- (d) The contractor(s) is to ensure that vegetation will only be removed where required to perform the work. The contractor(s) is to leave undisturbed understory and non-target vegetation whenever compatible with the Project scope.
- (e) To the extent possible, the organic soil layer and vegetation with intact root wads is to be removed and set aside for replanting. Fallen trees and coarse woody debris are to be left in place or be placed adjacent to the Project area to provide habitat for wildlife species.
- (f) Project footprint areas, including access road and transmission line routes are to, where possible, avoid mature and old growth forest habitat.



- (g) All 'No Touch Zones' and falling boundaries are to be clearly marked or flagged in the field by the contractor(s)' QEP, to the satisfaction of the IEM and the Licensee's Site Environmental Representative.
- (h) Whenever possible, vegetation clearing should be avoided on unstable terrain. If clearing is required in these locations, appropriate mitigation procedures are to be developed to reduce the potential of landslides or avalanches. These are to be integrated in the Vegetation Management EPP.
- (i) It is expected that procedures will be developed for the disposal of cleared nonmerchantable vegetation. This may include leaving some in place, chipping or transportation to an approved location. Chipping/grinding is encouraged and is to be seriously considered, as hog fuel is an effective erosion control measure.
- (j) If trees inadvertently fall outside of the designated clearing area, fallen trees are to be removed and relocated to the clearing area or designated right-of-way.
- (k) If and where possible, plants with good reclamation potential, should be salvaged prior to clearing for use during replanting. Consult with the IEM and the Licensee's Site Environmental Representative for recommendation on which plants may be suitable.
- (I) It is expected that a brief vegetation disposal section will be included in the Vegetation Management EPP. The information provided will assist with the management of residual slash material. This section will conform to the recommendations in the Debris Management Plan produced by B.A. Blackwell and Associates Ltd. Methods of disposal to be considered in the plan include burial, scattering, or chipping. Specific environmental mitigations are to be developed for each method that will be used which include, but are not limited to, designating appropriate locations (away from watercourses) for deposition of the material.
- (m) Works should be scheduled to minimize the amount of exposed soil at any one time, and grading should be completed as soon as possible following vegetation removal. Staged seeding should be practiced in order to re-vegetate cut and fill slopes as the work progresses.
- (n) An Erosion Control, Sediment and Drainage Management EPP will be developed by the contractor(s) for the Project to prevent sediment-laden water and/or runoff entering the surrounding environment. This plan is to include erosion and sediment control measures that will be in place prior to, and throughout, the start of vegetation removal, grubbing, stripping, scarifying, etc. Refer to Section 7.5 (Erosion, Sediment and Drainage Management) for additional details.
- (o) It is also expected that brief, site-specific erosion and sediment control plans will be developed to address *in situ* needs. These plans are to address planning issues surrounding vegetation removal and the following key considerations: road surface


runoff, stream crossings, cut and sill slopes, ditch erosion, road surface erosion, spoil sites, borrow sites, camp locations, areas susceptible to slope failure, and snow management (especially snow melt runoff). These plans will be submitted as part of the contractor(s) work plans for component LTCC application/issuance through IE/IEM review.

Rare Plants and Rare Ecological Communities:

- (a) If rare plants are found or confirmed to occur within the Project area, then it is expected that protocols for identifying and protecting said plants will be developed as part of the Vegetation Management EPP. Provisions for the protection of these plants are to include a buffer strip (perimeter protection) to be established around any rare species as defined by agencies, or alternatively plants may be relocated to a similar habitat. The contractor(s) is required to consult with the IEM and the Licensee's Site Environmental Representative to discuss any proposed management strategies and develop an acceptable management process.
- (b) It is expected that these areas will be clearly flagged and discussed with the IEM and the Licensee's Site Environmental Representative in advance of any work occurring near these zones.
- (c) The EPP will incorporate the mitigation measures found in the Guidelines for Translocation of Plant Species at Risk in BC (Maslovat, 1999).
- (d) Where live or dead large trees must be removed on footprint edges, consideration will be given to creating stubs by leaving 3-5 m tall stumps, as long as this can be done safely under current WCB regulations.
- (e) Riparian vegetation clearing will be limited to the necessary footprint only to permit the construction of the works, and wildlife trees will be retained where possible.

Vegetation Clearing:

- (a) The contractor(s) Vegetation Management EPP is to include specifics relating to ensuring that vegetation removal occurs in compliance with the restrictions and survey requirements related to critical bird breeding seasons (as per Section 34.c of the BC *Wildlife Act*). Refer to Section 3.11.5 for details on construction timing windows.
- (b) If vegetation clearing activities are scheduled during the breeding bird nesting period for raptors (March 1 to July 31) or songbirds (May 1 to July 31), nest clearing surveys using a standardized protocol such as the Active Migratory Bird Nest Survey will be conducted immediately prior to clearing activities with the objective of locating any active nests. A series of three surveys will be completed within five days, allowing a "clearing window" of 3 days for vegetation removal to occur outside of the peak breeding period. During peak breeding time periods, a 24 hour window will be used to initiate clearing unless the



falling polygon is linear, in which case it may be acceptable to initiate clearing within a 3 day period (as determined by the IEM). Extensions to the "clearing window" will follow CWS (2010) recommendations. Three surveys (within a five day period) are completed for vegetation dominated by trees, two surveys are completed for shrubs, and one survey is completed for grass. If identified, active nests will require site specific mitigation measures such as the provision of spatial buffers between the feature and active construction, or other mitigation measures as proposed by a QEP. Generally, active songbird nests are given a buffer of 20 - 30 m and raptor nest are given a buffer of 200. The nest of eagle, peregrine falcon, gyrfalcon, osprey, heron or burrowing owl are protected year round. If falling is initiated within the winter months of 2016 and nest searches have not been carried out to confirm that the protected nests are not present, there is a potential for destroying a protected nest. A single nest search should be carried out at a minimum outside of the nesting windows to ensure that year round protected nests are not disturbed (as determined and accepted by the IEM). If supported by the IEM, a single search conducted by a QEP by helicopter may be acceptable.

Vegetation (including trees) which is felled and not removed (decked or hauled away) within a reasonable time period (typically within 3 days) will require a refresher survey prior to works advancement as more species of birds will target downed trees and shrubs compared to standing timber. All attempts will be made to coordinate the removal of trees immediately following falling. Leaving the trees on the ground will likely result in delays due to newly established nests within the downed trees.

The QEP will provide the results of the nest surveys in writing to the Licensee's Environmental Site Representative and the IEM following the completion of the survey and in advance of clearing.

Call-playback surveys will be used by the QEPs for detecting nesting Northern Goshawks and Western screech-owls.

- (c) The EPP is to include a firm commitment that vegetation removal will be avoided until necessary for construction to minimize soil exposure.
- (d) The contractor(s) EPP will include specifics relating to ensuring all forest clearing operations within legally designated Wildlife Habitat Areas (WHAs), Old Growth Management Areas (OGMAs) and UWRs will conform to legal requirements as described by General Wildlife Measures unless specific written exemption, under an Occupant License to Cut, has been obtained. Procedures are described under the provincial Forest and Ranges Practices Act.



- (e) The contractor(s) is committed to ensuring that clearing will be limited to the area of development set out in the Project Description. Clearing limits will be surveyed and clearly demarcated (flagged) in the field prior to undertaking any clearing work.
- (f) All felled trees, shrubs, debris, and other perishable materials will be removed from the cleared areas, except where used for reclamation purposes, unless otherwise approved by regional agencies.
- (g) The EPP will include a comprehensive description of management measures specific to the protection of forest health, including (where applicable):
 - i. Specifics regarding how trees will be felled into the proposed site wherever possible.
 - ii. Marking of danger trees and establishment of a 'No Touch Zone' of sufficient area to keep workers safely away.
 - iii. The implementation of management strategies described in the Windthrow Handbook for British Columbia Forests (Stathers et al. 1994) if the risk of increasing windthrow is high.
 - iv. Specifics relating to the removal of trees infested with mountain pine beetle within the project area and support of strategies to manage beetle infestation (e.g., 2013-2016 Provincial Forest Health Strategy) as practicable.

Invasive Plant Management:

- (a) All construction vehicles used on the Project will be carefully washed before or immediately upon arrival to site to prevent the introduction of invasive species. Special attention will be paid to wheel wells, tire treads, and tracks where mud and seeds may be lodged.
- (b) The contractor(s) will maintain and inspection log of every vehicle that comes to site. This log will be available for the IEM to review upon request.
- (c) The EPP is to include specifics regarding the prompt re-vegetation of disturbed areas and temporarily cleared construction areas not required for operation. These are to be re-vegetated using a mix of regionally suitable, non-invasive, non-persistent seed mixtures or plants. All seed mixes used to re-vegetated disturbed areas are to be regionally approved by MFLNRO. The *shishálh* Nation will be consulted on seed mixes used in the Project area.
- (d) In the event that invasive plant species need to be removed from a work area, these will be treated with extreme care and proper disposal procedures will be adhered to for the mitigation of spread. It is expected that removal and disposal activities will take place before seeds are set to ensure no seeds are spread during removal. The Invasive Plant



Council of British Columbia provides a set of information sheets which offer guidance on disposal of invasive plant material (refer to the following web link:

http://www.invasiveplantcouncilbc.ca/resources/targetedinvasive-plant-solutions-tips). Review and integration of this guidance information in the Vegetation Management EPP is expected. Invasive plants and plant parts will be bagged in heavy trash bags, making sure that no parts of the plants are exposed, and the bags are securely closed. The bagged invasive plants will be disposed of at an approved offsite location (e.g. local landfill) or, if appropriate, invasive plant debris may be burned (appropriate permits must be obtained). Safe disposal of invasive plants must be discussed with the Licensee's Site Environmental Representative and the IEM in advance.

- (e) The contractor(s) is responsible for early inspections, monitoring, and detection of invasive species established in the Project area. If invasive species are found/observed, it is expected that the contractor(s) will remove these and will dispose of them appropriately (to the satisfaction of the IEM) if found to be within Project footprint areas.
- (f) The EPP is to include specifics regarding the prompt re-vegetation of disturbed areas and temporarily cleared construction areas not required for operation. These are to be re-vegetated using a mix of regionally suitable, non-invasive, non-persistent seed mixtures or plants.
- (g) The contractor(s) is responsible for ensuring that only clean materials (e.g., soil and gravel that are free of invasive species) and initially stockpiled from Project clearing and/or excavation activities will be used for fill and/or reclamation work.
- (h) The contractor(s) will ensure that key personnel are appropriately trained in the identification of invasive and noxious weeds. Key personnel will be responsible for the establishment of an invasive species reporting procedure, including direction for the prompt removal of these. Species of particular concern to be integrated in the identification, reporting, and removal procedure include (but are not limited to) hound's tongue, knapweed, Himalayan blackberry, and sulphur cinquefoil.

Site Reclamation and Landscape Restoration Plan:

- (a) All disturbed areas, work sites and roads planned for deactivation will be reclaimed as soon as possible after the completion of construction. Failure to do so may result in surface instability and increased erosion.
- (b) It is expected that a Project Reclamation section will be included in the contractor(s) Vegetation Management EPP. This section will provide details on re-vegetation efforts, temporary (e.g., erosion control treatments) or permanent (e.g., final re-vegetation efforts) and that it will incorporate all of the considerations, procedures, and measures identified in the following subsections. This plan will be submitted to the Licensee, the



Licensee's Site Environmental Representative, and the IEM for review, commenting, and acceptance. Work covered in the EPP may only commence once formal acceptance has been issued by the IEM.

- (c) This EPP section is to include details regarding site clean-up, grading and recontouring, erosion and sediment control and re-vegetation, and more specifically cover the following topics:
 - i. Closure of construction camp(s).
 - ii. Disturbed areas.
 - iii. Use of surplus excavated material (free of contaminated soils) during construction.
 - iv. Restoration of borrow pits/sites, including the installation of appropriate drainage and erosion control measures to prevent erosion and assist natural recovery of vegetation.
 - v. All stockpiled overburden and soils. These are to be re-contoured and seed and/or fertilizer applied, where applicable.
 - vi. The management and decommissioning of access roads. Where required by Project design, all construction access roads are to be reinstated to their preconstruction condition to the extent possible.
 - vii. Restoration of temporary riparian disturbance areas with a focus on accelerated recruitment of a native and endemic self-sustaining vegetative cover in stable condition.
- (d) All construction personnel are expected to attend an environmental orientation training session prior to conducting any work on site. The training session is to provide an overview of site reclamation requirements, and the need for appropriate planning to ensure effective and sequential reclamation throughout Project construction.

Site Clean-Up:

(a) All construction areas, temporary disturbance areas, equipment laydown areas, office trailer sites, settling ponds, spoil and borrow sites, landings, and all other disturbed areas are to be cleaned and reclaimed upon completion of work, in accordance with this CEMP, contract documents, and Project permits. Among others, this includes removal of equipment, wastes, temporary erosion and sediment control measures, construction materials, fuels and fuel storage facilities, temporary buildings, fencing (where permanent fencing is not expected to remain), boundary markings, construction mitigation facilities and measures, etc. Consultation with the Licensee, the Licensee's Site Environmental Representative, and the IEM is mandatory to confirm the scope of reclamation areas and effort.



(b) All cleanup and site restoration activities, including re-vegetation, are to be completed be to the satisfaction of the IEM, Licensee, the Licensee's Site Environmental Representative, and regulatory agencies.

Grading and Recontouring:

(a) It is expected that all disturbed areas and banks will be graded and contoured to finished and stable slopes, preferably mimicking natural, pre-disturbance conditions.

Erosion and Sediment Control:

(a) A section on long-term erosion and sediment control, and drainage management will be included the Vegetation Management EPP developed by the contractor(s). It is expected that this section will include measures that will prevent sediment-laden water and/or runoff from entering the surrounding environment such that the Project site can be left without residual, undue risk. This section of the EPP is to include adequate longterm erosion protection, and must ensure that reclaimed sites are stabilized against long term erosion and appropriate provisions are made such that said protection is aligned with the final site-reclamation requirements of all permits, licenses, and approvals.

Revegetation Plan:

- (b) It is expected that the reclamation plan will include the following provisions and considerations:
 - i. Areas expected to be revegetated are to include: 1) all areas where permanent vegetative cover is needed to stabilize the soil; 2) construction areas which will not be brought to final grade for a year or more; 3) slopes designated to be treated with erosion control blankets or other similar media, or other geotechnical liners, and 4) Temporary riparian disturbance areas.
 - ii. All planting is to be supervised by a QEP (i.e., RPF), and any soil amendments are to be specified by a vegetation/soil specialist with regional experience.
 - iii. If and whenever possible, native plant species should be salvaged prior to clearing, and are to be transplanted to other areas that are being re-vegetated.
 Consultation with the IEM and the Licensee's Site Environmental Representative should be sought.
 - iv. Seeding is to be applied on potentially erodible site surfaces that will be left for dormant for 12 weeks. All seeding and seed mixes are to be approved by MFLNRO (at the region-level), and known and accepted by the IEM and the Licensee's Site Environmental Representative in advance of purchase and use. Seed mixes will be chosen to be congruent with the overall reclamation plan, and focus on establishment of native and endemic early succession species with



a propensity for nitrogen fixing and soil stabilization while promoting generation of a native and endemic forest cover. Grasses and legumes will be avoided in temporary disturbance areas slated to be reclaimed back to endemic forest.

- v. To determine optimum seeding schedule, it is expected that the contractor(s) will consult a local agronomist or erosion control specialist.
- vi. Dormant seeding is to be used for late fall or winter seeding schedules.
- vii. Permanent seeding is to be applied before seasonal rains, well in advance of when freezing weather is anticipated.
- viii. Seed mixes are expected to be appropriate to the season and site conditions. Consultation with a local agronomist or erosion control specialist is expected for seed mix selection. The seed blend may include annuals, perennials and legumes. Final reclamation goals will be considered in the seed mix selection. Grasses and legumes will be avoided in temporary disturbance areas slated to be reclaimed back to endemic forest. Use seed rates based on pure live seed (PLS) of 80%. When PLS is below 80%, seeding application rates are to be adjusted accordingly.
 - ix. Clover will be removed from any seed mixtures used to revegetate areas within 500 m of an active road and the roads to the powerhouses, to minimize the risk of grizzlies foraging in these areas.
- (c) It is expected that the following site preparation activities will be conducted prior to all seeding:
 - i. Bringing planting areas to final grade and installing all necessary long term erosion control measures.
 - ii. Diverting all concentrated flows away from areas to be seeded.
 - iii. If deemed required by a QEP, conducting soil tests to determine pH and nutrient content.
 - iv. Roughening the soil surface using heavy machinery (e.g., harrowing, tracking, grooving or furrowing).
 - v. In critical areas (as determined in conjunction with the IEM and the Licensee's Site Environmental Representative), applying amendments as needed to adjust soil pH to 6.0-7.5.
 - vi. All reclaimable surfaces are to be prepared (e.g., 76-127 mm deep seedbed), with the top layer (e.g., 76-102 mm) consisting of topsoil.
 - vii. It is expected that the seedbed will be firm but not compacted. The top three inches of soil is to be loose, moist and relatively free of large clods and stones.



- viii. The topsoil surface should be in reasonably close conformity to the lines, grades and cross sections shown on final grading plans.
- (d) Recommended planting procedures to be incorporated in the Reclamation section of the EPP are listed below:
 - i. Seed are to be applied promptly/immediately after seedbed preparation, while the soil is loose and moist. If the seedbed has been idle long enough for the soil to become compacted, the topsoil should be harrowed with a disk, spring tooth drag, spike tooth drag, or other equipment to condition the soil for seeding.
 - ii. Seed is to be applied before applying mulch or other erosion control measures.
 - iii. Seed is to be applied uniformly at the rates specified by manufacturers, using calibrated seed spreaders, cyclone seeders, mechanical drills, or hydroseeders.
 - iv. It is expected that newly seeded areas will be inspected frequently by the contractor(s) staff, to ensure that vegetation is growing, healthy, functional, and effective.
 - v. If the seeded area is damaged due to runoff, it is expected that additional water management measures will be needed and applied.
 - vi. Stabilized areas at low risk of erosion may be treated with organics and coarse woody debris to allow native seed to establish.
 - vii. Transplantation, either of nursery stock and/or local donor plants, should also be considered in the development of the EPP.
- (e) Note that it is acceptable that spot seeding be used on small areas to fill in bare spots where grass did not grow properly.



7.17 Visual Quality Protection Plan

7.17.1 Introduction and Purpose

Four locations have been identified as Valued Components as part of the Project impact assessment. These locations are shown in key maps provided in Appendix K; Zumundo Consultants, 2011). These areas are:

- Sakinwa/Ruby Lake (users)
- Sechelt Inlet (users)
- Ramona Falls/Narrow Inlet (users)
- Tzoonie Backcountry /Ramona Lake (users)

The purpose of this section is to:

• Prevent unpredicted impacts to visual quality of key landscapes surrounding the Project area.

7.17.2 Applicable Permits

Applicable permits include the following:

• Table of Conditions, condition No. 11.1.

7.17.3 Relevant Permit Details

Relevant terms and conditions from the above listed permits, licences, and/or approvals.

• TOC terms and conditions are provided in Appendix D.

7.17.4 Specifications and Best Management Practices

(a) The contractor(s) is expected to prepare a Visual Quality Protection EPP that will include site-specific mitigation measures and procedures to prevent unpredicted impacts to visual quality of key landscapes surrounding the Project area. The EPP will consider and integrate all of the provisions and commitment identified in the following subsections. The EPP will be submitted to the Licensee, the Licensee's Site Environmental Representative, and the IEM for review, commenting, and acceptance in advance of Project construction commencing.



Sakinwa/Ruby Lake (users):

- (a) Reduce the corridor width to the extent necessary to maintain safety limits for tree clearance.
- (b) Feather or scallop the corridor edges. This technique will break up the straight and geometric appearance of the corridor. Handfalling will also minimize disturbance to the understory layer for rapid establishment of brush.
- (c) Avoid road building to the pole sites and blasting. Road building exposes cut/fill slopes and blasting introduces new elements into the viewscape. These features in this viewscape can take a long time to visually recover due to the xeric climate and rocky terrain. The use of helicopters or small excavation equipment transportable by helicopter should be considered to assist in the construction to reduce the footprint of the pole sites seen from this viewpoint.
- (d) Maintain downhill side of trees (side of corridor facing the ocean) as much as possible for visual screening.
- (e) Reclaim disturbed soil promptly after construction as per the Site Reclamation and Landscape Restoration Plan (Section 7.16).
- (f) Rehabilitate all access roads and plant suitable tree species as per the Site Reclamation and Landscape Restoration Plan (Section 7.16).

Sechelt Inlet (users):

- (a) Set interconnection back from the shore and reduce the corridor to allow more screening at oceanside.
- (b) Reduce the corridor width to the extent necessary to maintain safety limits for tree clearance.
- (c) Maintain downhill side of trees (side of corridor facing the ocean) as much as possible for visual screening.
- (d) Reclaim disturbed soil promptly after construction as per the Site Reclamation and Landscape Restoration Plan (Section 7.16).
- (e) Rehabilitate all access roads and plant suitable tree species as per the Site Reclamation and Landscape Restoration Plan (Section 7.16).

Ramona Falls/Narrow Inlet (users):

(a) Reduce the corridor width – the corridor is projected to be 20 m wide, however based on the current tree height, design of the powerline and penstock, it can require less than the 20 m width. It is therefore proposed that the corridor will be reduced to the extent necessary to maintain safety limits for tree clearance.



- (b) Maintain downhill side of trees (side of corridor facing ocean) as much as possible for visual screening.
- (c) Reclaim disturbed soil promptly after construction as per the Site Reclamation and Landscape Restoration Plan (Section 7.16).
- (d) Rehabilitate all access roads and plant suitable tree species as per the Site Reclamation and Landscape Restoration Plan (Section 7.16).
- (e) Maintain at least 10% flows during the typical and significant viewing times for Ramona Falls.

Tzoonie Backcountry /Ramona Lake (users):

- (a) Reduce the corridor width the corridor is projected to be 20 m wide but, based on the current tree height, design of the powerline and penstock, can require less than the 20 m width. It is recommended that corridor be reduced to the extent necessary to maintain safety limits for tree clearance.
- (b) Maintain downhill side of trees (side of corridor facing ocean) as much as possible for visual screening.
- (c) Reclaim disturbed soil promptly after construction as per the Site Reclamation and Landscape Restoration Plan (Section 7.16).
- (d) Rehabilitate all access roads and plant suitable tree species as per the Site Reclamation and Landscape Restoration Plan (Section 7.16).
- (e) For the Narrows Inlet Hydropower Project substation, plant hedging plants, with a preference given to native and endemic species, around the fence line and provide site grading and landscaping to make the site visually appealing.
- (f) For Ramona Lake, planting of conifer and transplanting of brush plants (e.g. Vaccinium spp.) should be undertaken to promote rapid establishment along the penstock and around the dam post-construction. Refer to the Site Reclamation and Landscape Restoration Plan (Section 7.16)



8.0 Project Specific Environmental Considerations

Project-specific environmental concerns (identified VCs) not already covered by the more general EMPs provided in Section 7.0 are identified herein, and corresponding additional management requirements are provided within this section. VCs identified for the Project include wildlife and plant species-at-risk (SAR) and species of concern with the potential to sustain adverse effects from construction related activities.

VCs may include terrestrial and aquatic wildlife species, plant species (specifically SAR), and plant communities and / or specific habitats. It is common to group species with similar ecological requirements (e.g., riparian habitat) and stressors (e.g., habitat loss) together to facilitate conservation and management of specific relevant habitat types. This approach allows the use of habitat as a surrogate and, if appropriate, may obviate the necessity of species specific focused inventory, monitoring and environmental management during construction. This approach creates efficiencies for the Licensee whilst ensuring conservation values are addressed.

Regulatory consideration is required for many species in BC, as afforded by the federal *Species at Risk Act* (SARA), the Government Actions Regulation (GAR) of the *Forest and Range Practices Act* (FRPA), the *Migratory Birds Convention Act* (MBCA) or the BC *Wildlife Act* (specifically Section 34). These considerations extend to species listed on the Category of Species at Risk and on the Category of Ungulates and include legal designations such as Wildlife Habitat Areas (WHAs) and Ungulate Winter Range (UWR). In these areas General Wildlife Measures (GWMs) provide specific guidance that must be adhered to unless a variance is granted under an Occupant License to Cut. These considerations also extend to Old Growth Management Areas (OGMAs).

The BC *Wildlife Act* [R.S.B.C. 1996, c. 488] protects most vertebrates from direct harm or harassment, regulates hunting and trapping, protects nesting birds and the nests of certain bird species, and provides protection for certain species at risk. The nests of some bird species are protected provincially by the BC *Wildlife Act*, Section 34b, regardless of whether or not they are occupied. Pertinent protected nests include those used by bald eagle, osprey, and great blue heron.

It will be the responsibility of the contractor(s) to review, integrate, and implement the mitigation measures identified in the following subsections. These will be integrated and provided in the form of specific additional EPPs that will be submitted to the Licensee, the Licensee's Environmental Site



Representative, and the IEM for review, commenting and approval in advance of any work that could affect the VCs identified in the following tables being undertaken (see Tables 14, 15 and 16).

8.1 Wildlife VC Species

A number of at-risk wildlife species potentially occurring within the Project area were identified during the EAC application (Table 13). This list was developed by conducting an extensive search on the British Columbia Species and Ecosystems Explorer website for Red- and Blue-listed species, SARA (*Species at Risk Act*) Schedule 1 species, and Identified wildlife species that occur in the Sunshine Coast Forest District (BCMOE, 2011a). A comprehensive list of all wildlife species occurring in the South Coast Region (i.e., Region 2) is included in Appendix L. The British Columbia Species and Ecosystems Explorer website was searched again for COSEWIC-listed species that might occur in the Project area, as some of those species were not identified during the initial searches (BCMOE, 2011a).

A list of focal wildlife species for the Project was created based on species distribution and habitat preferences (Table 14). Some species/subspecies were grouped together for consideration of Project effects. In addition to at-risk wildlife species (e.g., those listed federally or provincially), a number of species/groups of concern were identified which have the potential to be impacted by the Project.

The Contractor is expected to retain a specialist QEP who will provide an assessment of the likelihood of presence and interaction of species identified in Table 14. The results of this assessment are to be provided to the IEM and Licensee's Site Environmental Representative for review in advance of conducting/carrying out any activities potentially affecting these species.

Maps illustrating the location of ESAs and wildlife VC are provided in Appendix M.

Table 13.	List of potential	v occurring at-risk wildlife species i	n the Project Area.
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Scientific Name	English Name	COSEWIC	BC Status	Identified Wildlife	SARA
Birds					
Accipiter gentilis laingi	Northern Goshawk, laingi subspecies	T (Nov 2000)	Red	Y (May 2004)	1



Scientific Name	English Name	COSEWIC	BC Status	Identified Wildlife	SARA
Ardea herodias fannini	Great Blue Heron, fannini subspecies	SC (Mar 2008)	Blue	Y (May 2004)	1
Brachyramphus marmoratus	Marbled Murrelet	T (Nov 2000)	Blue	Y (May 2004)	1
Branta canadensis occidentalis	Canada Goose, occidentalis subspecies		Red		
Butorides virescens	Green Heron		Blue		
Chordeiles minor	Common Nighthawk	T (Apr 2007)	Yellow		1
Contopus cooperi	Olive-sided Flycatcher	T (Nov 2007)	Blue		1
Dendragapus fuliginosus	Sooty Grouse		Blue		
Falco peregrinus anatum	Peregrine Falcon, anatum subspecies	SC (Apr 2007)	Red		1
Falco peregrinus pealei	Peregrine Falcon, pealei subspecies	SC (Apr 2007)	Blue		1
Hirundo rustica	Barn Swallow		Blue		
Megascops kennicottii kennicottii	Western Screech-Owl, kennicottii subspecies	SC (May 2002)	Blue		1
Patagioenas fasciata	Band-tailed Pigeon	SC (2008)	Blue		
Phalacrocorax auritus	Double-crested Cormorant	NAR (May 1978)	Blue		
Pinicola enucleator carlottae	Pine Grosbeak, carlottae subspecies		Blue		
Progne subis	Purple Martin		Blue		
Strix occidentalis	Spotted Owl, caurina subspecies	E (Mar 2008)	Red	Y (May 2004)	1



Scientific Name	English Name	COSEWIC	BC Status	ldentified Wildlife	SARA
Amphibians	1		1	1	
Ascaphus truei	Coastal Tailed Frog	SC (May 2000)	Blue	Y (May 2004)	1
Anaxyrus boreas	Western Toad	SC (Nov 2002)	Yellow		1
Rana aurora	Northern Red-legged Frog	SC (Nov 2004)	Blue	Y (May 2004)	1
Reptiles					
Chrysemys picta bellii	Western Painted Turtle - Pacific Coast Population	E (Apr 2006)	Red		1
Charina bottae	Rubber Boa	SC (May 2003)	Yellow	N	1
Mammals			1		
Corynorhinus townsendii	Townsend's Big-eared Bat		Blue		
Myotis keenii	Keen's Myotis	DD (Nov 2003)	Red	Y (May 2004)	3
Cervus canadensis roosevelti	Roosevelt Elk		Blue		
Gulo gulo luscus	Wolverine, luscus subspecies	SC (May 2003)	Blue	Y (May 2004)	
Martes pennanti	Fisher		Blue	Y (Jun 2006)	
Ursus arctos	Grizzly Bear	SC (May 2002)	Blue	Y (May 2004)	
Marine Mammals					
Eumetopias jubatus	Steller Sea Lion	SC (Nov 2003)	Blue		1
Orcinus orca, pop. 3	Killer Whale, West Coast transient population	Т (2008)	Red		1
Orcinus orca, pop. 5	Killer Whale, Northeast Pacific Southern resident population	E (2008)	Red		1



Scientific Name	English Name	Rationale for Inclusion		
Birds				
Accipiter gentilis laingi	Northern Goshawk, laingi	Federal and Provincial listing; possible resident in LSA;		
	subspecies	potential adverse effects of habitat loss and disturbance due		
		to vegetation clearing		
Ardea herodias fannini	Great Blue Heron, fannini	Federal and Provincial listing; possible breeder in LSA;		
	subspecies	potential adverse effects of construction-related noise on		
		nesting success		
Brachyramphus	Marbled Murrelet	Federal and Provincial listing; possible resident in LSA; species		
marmoratus		of concern on Sunshine Coast; potential adverse effects of		
		habitat loss and disturbance due to vegetation clearing		
Dendragapus	Sooty Grouse	Provincial listing; likely breeder in the LSA; potential adverse		
fuliginosus		effects of habitat loss due to forest clearing; identified as issue		
		of concern by shíshálh Nation.		
Falco peregrinus	Peregrine Falcon	Federal and Provincial listing; possible breeder in LSA due to		
		abundance of steep rocky cliffs; potential adverse effects of		
		construction-related noise on nesting success		
Haliaeetus	Bald Eagle	Species of regional concern; possible breeder in LSA; potential		
leucocephalus		adverse effects of construction-related noise on nesting		
		success		
Megascops kennicottii	Western Screech-Owl,	Federal and Provincial listing; possible resident in LSA;		
kennicottii	kennicottii subspecies	potential adverse effects of habitat loss due to vegetation		
		clearing.		
Riverine Birds (Harlequin	Duck and American Dipper)	Species of regional concern; possible breeders in LSA;		
		potential adverse effects of stream de-watering on foraging		
		success, clearing of riparian vegetation, and construction-		
		related noise in proximity to stream during nesting		
Migratory Birds		Federal concern; potential effects of habitat loss due to		
		vegetation clearing		

Table 14. Focal species (VCs) and groups for consideration, and the rationale for their selection.



Scientific Name	English Name	Rationale for Inclusion
Amphibians		
Ascaphus truei	Coastal Tailed Frog	Federal and Provincial concern; likely a resident in LSA; potential adverse effects of stream de-watering and habitat loss due to riparian vegetation clearing
Anaxyrus boreas	Western Toad	Federal concern; likely a resident in LSA; potential adverse effects of habitat loss due to vegetation clearing and infilling of wetlands, road mortality along roads adjacent to breeding ponds
Rana aurora	Northern Red-legged Frog	Federal and Provincial concern; documented resident in LSA; potential adverse effects of habitat loss due to vegetation clearing and infilling of wetlands.
Reptiles		
Chrysemys picta bellii	Western Painted Turtle - Pacific Coast Population	Federal and Provincial listing; documented resident in some lakes on Sechelt Peninsula; potential adverse effects of road mortality along roads adjacent to occupied water bodies
Mammals		
Bats		Provincial listing for 2 species; SARA listing for 1 species; habitat use is similar for most species so will treat as a group; potential effects of habitat loss due to vegetation clearing and rock blasting, and construction-related noise in proximity to maternal roosts
Cervus canadensis roosevelti	Roosevelt Elk	Introduced to area; potential effects of habitat loss due to vegetation clearing; however, not all clearing will result in permanent loss.
Odocoileus hemionus	Mule Deer	<i>shíshálh</i> Nation concern; potential effects from winter habitat loss
Oreamnos americana	Mountain Goat	Regional concern; potential adverse effects of construction- related noise in proximity to natal areas
Gulo gulo luscus	Wolverine, luscus subspecies	Federal and Provincial listing; potential adverse effects of the Project on natal denning sites



Scientific Name	English Name	Rationale for Inclusion
Ursus arctos	Grizzly Bear	Federal and Provincial listing; documented use of the LSA;
		potential effects of displacement due to increased activity in
		Project area and increased mortality due to bear-human
		interactions
Terrestrial Invertebrates		
Terrestrial Molluscs		Provincial listing of some species
Monadenia fidelis	Pacific Sideband	Provincial listingdetails to be added
Allogona townsendiana	Oregon Forestsnail	Provincial listingdetails to be added
Butterflies and Dragonflie	S	Provincial listing of some species
Rare Plants		
Rare plant species		Provincial listing of some species
Rare plant communities		Provincial listing of some species

A search was done using the BC Species and Ecosystems Explorer website for Red- and Bluelisted plant species and SARA-listed species (as of November 2011) that occur in the Sunshine Coast Forest District during the EA process. This list was further refined by a plant ecologist (Micaela Florendo) by examining ecosystem mapping for potentially suitable habitats within the LSA for each species and is included in Table 15.

Details with respect to management and mitigation measures for rare plant and ecological communities are provided in Section 7.16 (Vegetation Management and Reclamation Plan).



Table 15. Plant species at-risk potentially occurring in the Project area.

	Provincial		Project Area					
Species: common and scientific names	Status; COSEWIC	CWHdm	CWHvm1	CWHvm2	MHmm1	MHmmp1	CMA	CMAunp
upswept moonwort	Red						х	
Botrychium ascendens								
northern adder's-tongue	Blue		х	Х				
Ophioglossum pusillum								
whitebark pine	Blue	х	Х	Х	Х	Х		
Pinus albicaulis								
poison oak	Blue	х						
Toxicodendron diversilobum								
fleshy jaumea	Blue		Х	Х				
Jaumea carnosa								
field dodder	Blue	Х						
Cuscuta campestris								
western St. John's wort	Blue		х	Х				
Hypericum scouleri ssp. nortoniae								
smooth willowherb	Blue						х	Х
Epilobium glaberrimum ssp. fastigiatum								
elegant Jacob's ladder	Blue						х	Х
Polemonium elegans								
smooth douglasia	Blue				Х	Х	х	Х
Douglasia laevigata var. ciliolata								
snow bramble	Blue	х	Х	Х	Х	Х		
Rubus nivalis								
Menzies' burnet	Blue				Х	Х		
Sanguisorba menziesii								



	Provincial	Project Area						
Species: common and scientific names	Status; COSEWIC	CWHdm	CWHvm1	CWHvm2	MHmm1	MHmmp1	CMA	CMAunp
pointed broom sedge	Blue	х						
Carex scoparia								
small spike-rush	Blue		х	Х				
Eleocharis parvula								
white adder's-mouth orchid	Blue	х	Х	Х				
Malaxis brachypoda								
moss	Red				Х	Х		
Brachydontium olympicum								
moss	Blue	х						
Bryum gemmiparum								
moss	Blue	х						
Platyhypnidium riparioides								
mountain hemlock dwarf mistletoe Arceuthobium	Red				Х	Х		
tsugense ssp. mertensianae								
Carolina meadow-foxtail	Red	х						
Alopecurus carolinianus								
Kamchatka spike-rush	Blue		х	Х				
Eleocharis kamtschatica								
Payson's sedge	Blue						Х	Х
Carex paysonis								

8.2 Wildlife Management Best Practice Guidelines and Regulatory Requirements

The following sections present references to existing species or taxon-specific BMPs and other regulatory development guidelines for wildlife VCs identified for the Project area.



8.2.1 Amphibians and Reptiles

Amphibians and reptiles often use aquatic habitats and, as such, may be adversely affected by project-related activities. As indicated in Table 14, the following amphibian species have been identified as VCs for the Project area: Coastal Tailed Frog, Western Toad, and Northern Red-legged Frog.

Best Management Practices for amphibian VCs will be implemented as per BMP for Amphibians and Reptiles in Urban and Rural Environments in BC (BCMWLAP 2004). Species-specific management guidelines for the Project area are provided in Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia (BCMOE 2014). These include Factsheet #17 Tailed Frog, Factsheet #14 Northern Red-legged Frog, and Factsheet #13 Western Toad.

Amphibian and Amphibian Habitat Protection:

General:

- (a) It is critical to note that, as part of this project, all streams, wetted areas, ditches and riparian areas qualify as potential habitat for amphibians.
- (b) The mitigation procedures will be implemented by the contractor(s):
 - i. Due care will be taken to avoid unnecessary disturbance and/or mortality to amphibians.
 - ii. Riparian buffers will be established around wetlands and watercourses as per Sections 48 of the Forest Planning and Practices Regulation (2010) under the *Forest and Range Practices Act*.
 - A 30 m riparian buffer will be established on all predicted and confirmed Coastal Tailed Frog streams according to the Best Management Practices for Amphibians and Reptiles in Urban and Rural Environments in British Columbia (MWLAP, 2004).
 - iv. Should riparian vegetation clearing or disturbance to aquatic features such as streams, wetlands, ditches, etc. be unavoidable, a protocol for amphibian salvage (including all life stages) is to be developed as part of the Wildlife Management Plan (Section 7.15). This document is to be drafted in consultation with a discipline specialist and accepted by the IEM and the Licensee's Site Environmental Representative, and it must include provisions that are to be conducted prior to work commencing. Such a protocol is to include erecting



amphibian exclusion fences around work areas and visual inspections for amphibians throughout the course of construction.

- v. All amphibian surveys will be conducted according to the Best Management Practices for Amphibians and Reptiles in Urban and Rural Environments in British Columbia (MWLAP, 2004) and the appropriate RISC standards: Inventory Methods for Pondbreeding Amphibians and Painted Turtle (Version 2.0; MELP, 1998) and Inventory Methods for Tailed Frogs and Pacific Giant Salamander (Version 2.0; MELP, 2000).
- vi. It is expected that any amphibians and coarse woody debris (CWD) observed in work areas are to be moved outside of the work area prior to the commencement of the work. The exclusion fence is to be removed and CWD placed back upon completion of works.
- vii. All construction personnel are expected to attend an environmental orientation training session that will inform them of proper protocols for the mitigation of impacts to amphibians and amphibian habitats.
- (c) In the event that previously unidentified congregations of tadpoles or amphibians are reported to the IEM and the Licensee's Site Environmental Representative, appropriate setback buffers will be applied under the direction of the discipline specialist.

Coastal Tailed Frogs:

Coastal Tailed Frogs are a very common and robust species in mountainous coastal areas of southwest British Columbia. They are found in most of the smaller and steep creeks of the lower mainland. It has been confirmed that both creeks of the Project including the three tributaries C1, C2, and R1 have a resident population of Coastal Tailed Frogs. Maps illustrating results of Coastal Tailed Frog surveys are provided in Appendix M.

- (a) A Coastal Tailed Frog monitoring program will be implemented to confirm that actual Project effects within diversion reaches on Ramona Creek and Chickwat Creek are as predicted (i.e., non-significant; EA Condition No. 22, Appendix D). The inclusion of a monitoring program is considered to address concerns about uncertainty, allow for evaluation of potential Project effects on Coastal Tailed Frogs, and allow for adaptive management, if required to address any potential Project effects.
- (b) The following mitigation measures in relation to all amphibians, including Coastal Tailed Frogs, will be implemented:
 - i. Stream crossings (for streams with year-round flow) must be surveyed, or assumed to be frog bearing, prior to construction to determine tailed frog presence Water



diverted around the construction zone will be returned to the same stream immediately downstream of the work site when tailed frog tadpoles are observed.

- ii. Permits must be obtained, as required, to salvage tailed frog tadpoles (or adults) during diversion of any stream for intake or penstock construction.
- iii. Construction activities must be avoided in/around wetlands where amphibian breeding is noted. If unavoidable, construction in these areas must be scheduled after breeding is complete and toadlets and juveniles have dispersed where feasible and appropriate.
- iv. If construction cannot be rescheduled, the contractor(s) will be required to install fencing or culverts to direct amphibian migration away from roads. These measures must be monitored during peak amphibian activity to ensure they are effective.
- v. Congregations and mortality of toadlets and amphibians must be reported to the IEM and the Licensee's Site Environmental Representative. The contractor is to identify problem areas and implement additional measures.

8.2.2 Birds

Many bird species utilize aquatic habitats or nesting and foraging habitats sensitive to disturbance and, as such, may be adversely affected by Project-related activities. As indicated in Table 14, the following bird species have been identified as VCs for the Project area: Northern Goshawk, Great Blue Heron, Marbled Murrelet, Sooty Grouse, Peregrine Falcon, Bald Eagle, Western Screech-Owl, Riverine Birds (Harlequin Duck and American Dipper), and Migratory Birds. Maps illustrating the distribution of avian surveys conducted in the EA Application are provided in Appendix M (note that the avian maps included are from the original EA Application, which includes the CC and SS Creek project areas, which are no longer within the scope of the current Project). Numerous areas within the Project region were identified as having a moderate- and high- rated suitability for Marbled Murrelet habitat and moderate suitability for Northern Goshawk breeding habitat and Western Screech-Owl habitat.

Species-specific management guidelines for the Project area are provided in Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia (BCMOE 2014). These include Factsheet #10 Bald Eagles and Ospreys, Factsheet #11 Great Blue Herons, and Factsheet #12 Western Screech-owl.

BC's Coast Region Species and Ecosystems of Conservation Concern: User's Guide (2011). These include factsheets on Marbled Murrelet, Northern Goshawk, and Spotted Owl.



Prior to vegetation clearing, the contractor(s) will retain the services of a QEP who will identify high suitability Northern Goshawk habitat and conduct goshawk nest surveys (e.g. call-playback surveys) in all identified high quality areas (EA Condition No. 1, Appendix D).

Nesting, Migratory Bird Protection, and Vegetation Removal:

Section 34 of the BC *Wildlife Act* protects the nests of all birds when birds or their eggs are in the nest. As such, it is expected that clearing will be conducted in the fall, winter, and early spring, when nests are not in use. Due to a range of factors, the migratory bird breeding season in British Columbia is measurably variable. <u>Generally</u>, the period between March 15 and August 15 of any given year encompasses the nesting period for many breeding migratory birds (Environment Canada 2012). The core nesting period for birds south of Prince George begins around April 01, however, in south-western BC, the nesting period for many species begins around March 15, although for some species it is earlier than this (Environment Canada 2012). Typically, raptors, herons, cavity nesters, and other resident species begin nesting earlier than the dates provided. The disturbance, destruction or taking of the nests or eggs of migratory birds is prohibited under subsection 6(a) of the Migratory Birds Regulations (MBR) of the *Migratory Birds Convention Act*, 1994 (MBCA).

Where clearing during the core bird breeding window is unavoidable, the contractor(s) will be required to conduct surveys to determine the presence of migratory birds and their nests before activities are carried out using a scientifically sound approach, and taking into account the specific considerations related to determining the presence of nests as outlined on the Environment Canada website (Environment Canada, 2011). Buffer size for active nests is species specific and will be determined in consultation with a QEP, the CWS and the appropriate BMPs. The following mitigations will be implemented by the contractor(s):

(a) If vegetation clearing activities are scheduled during the breeding bird nesting period for raptors (March 1 to July 31) or songbirds (May 1 to July 31) (see Section 3.11.5 for details on construction timing windows), nest clearing surveys will be conducted by a QEP retained by the contractor(s). Surveys will be completed using a standardized protocol such as the Active Migratory Bird Nest Survey (CWS, 2010) and will be conducted immediately prior to clearing activities with the objective of locating any active nests. A series of three surveys will be completed within five days, allowing a "clearing window" of 10 days for vegetation removal to occur. Extensions to the "clearing window" will follow CWS (2010) recommendations. If identified, active nests will require site specific mitigation measures such as the provision of spatial buffers between the feature and active construction, or other mitigation measures as proposed by the QEP. Generally, active songbird nests are



given a buffer of 20 - 30 m (CWS 2010). Refer to Section 3.11.5 for details on construction timing windows.

- (b) Stick nest surveys are required prior to component construction throughout the Project footprint, prior to leaf-out. A single nest search should be carried out at a minimum outside of the nesting windows to ensure that year round protected nests are not disturbed. A person commits an offence if the person, except as provided by regulation, possesses, takes, injures, molests or destroys: (i) a bird or its egg, (ii) the nest of an eagle, peregrine falcon, gyrafalcon, osprey, heron or burrowing owl, or (iii) the best of a bird not referred to in (ii) when the nest is occupied by a bird or its egg. The nest of eagle, peregrine falcon, gyrafalcon, osprey, heron and burrowing owl are protected year round. If falling is initiated within the winter months of 2016 and nest searches have not been carried out to confirm that the protected nests are not present, there is a potential for destroying a protected nest. The Project's habitat is well suited for eagles, herons, and osprey.
- (c) Raptor surveys are required prior to construction and timing is species specific; buffers will be determined as per the Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia (2013).
- (d) Active nests will be adequately buffered and clearly flagged prior to commencement of vegetation removal. This is to include identifying all 'No Touch Zones' and clearly marking all access points to clearing areas.
- (e) Prior to commencing construction or decommissioning activities in close proximity to moderate or high quality habitat for Northern Goshawk, a QEP retained by the contractor(s) will conduct a survey no more than one week prior to scheduled activities and according to the appropriate RISC standards: Inventory Methods for Raptors (Version 2.0; MSRM, 2001). Surveys for each species are required as follows:
 - i. If a nest is found where construction or decommissioning activities occur within 200 m of moderate or high quality goshawk breeding habitat during the early goshawk nesting period (early April to mid-July), a 200 m no disturbance zone will be delineated around the nest until the late breeding season (late July).
 - ii. If a nest is found where construction or decommissioning activities occur within 200 m of moderate or high quality Western Screech-owl breeding habitat during the early screech-owl nesting period (mid-March to early July), a 200 m no disturbance zone will be delineated around the nest until the late breeding season (mid-July).
 - iii. If a nest is found where construction or decommissioning activities occur within 50 m of moderate or high quality Sooty Grouse habitat during the early nesting period (May/July), a 50 m no disturbance zone will be delineated around active nests until the late breeding season (mid-August).



- iv. If a nest is found where construction or decommissioning activities occur within 50 m of moderate or high quality American Dipper and Harlequin Duck habitat during the early nesting period (March/June), an appropriate buffer distance will be determined recognizing that this species will nest in human structures over or beside stream and rivers. The nest should remain buffered until the late breeding season (late July).
- (f) The survey results will be presented to the IEM and the Licensee's Site Environmental Representative for review in advance of any/all clearing (min. 24 hrs. in advance, 72 hrs. in advance if clearing is to be conducted within 30 m of a watercourse). The IEM and the Licensee's Site Environmental Representative will assure that due diligence has taken place and provide formal acknowledgment that clearing can begin.
- (g) Contractor(s) personnel are to advise their immediate supervisor and inform the IEM and the Licensee's Site Environmental Representative if suspected nests or roosts of Northern Goshawk, Harlequin Duck, Marbled Murrelet, Peregrine Falcon, Bald Eagle, Osprey, Great Blue Heron, or any migratory bird are found in close proximity to the construction areas. The IEM and the Licensee's Site Environmental Representative, in consultation with the contractor(s) QEP/discipline specialist, will communicate on approaches to appropriately mitigate construction risk.
- (h) To ensure that Goshawk nests will not be disturbed and no high quality habitat will be lost, a QEP (for the Licensee) will:
 - i. Undertake a pre-construction survey of moderate quality habitat to confirm that no Goshawk nests or high suitability habitat are present.
 - ii. Specifying a minimum buffer distance (Goshawk management area) around identified nests and core reserve areas, and treating this area in accordance with the Coast Forest Conservation Initiative guidance for managing Northern Goshawk in coastal BC.

8.2.3 Mammals

The following mammal species have been identified as VCs for the Project area: Bats, Roosevelt Elk, Mule Deer, Mountain Goat, Wolverine, and Grizzly Bear (refer to Table 14).

Grizzly Bear:

There is one Grizzly Bear Management Area in the region of the Project: the Squamish-Lillooet Grizzly Bear Population Unit (GBPU). The GBPU delineates the individual population in the region. These population units serve as the key criterion for population objective setting, for determining allowable human-caused mortality thresholds and for setting land use priorities. The Squamish-Lillooet Grizzly Bear Population Unit is currently designated "threatened",



meaning that the current population is assumed to be 1 - 50% of the potential population (Hamilton et al., 2004). The Squamish-Lillooet GBPU is provincially managed by BCMOE.

Grizzly bear spring, summer, and fall feeding habitats for the Project Area are illustrated in Appendix M (note that the grizzly feeding maps included are from the original EA Application, which includes the CC and SS Creek project areas, which are no longer within the scope of the current Project). Suitability rating classes within the Project area ranged from low up to moderately high for spring feeding habitats.

Prior to commencing construction, the Licensee will support a provincial regional grizzly bear monitoring program to assess grizzly bear habitat use and movement in the Tzoonie River Valley (EA Condition No. 23, Appendix D).

- (a) Following is a list of mitigative measures that will be implemented by the contractor(s):
 - i. Prevention of public access to and along newly constructed private roads as well as within lands to which they have legal control or ownership. Preferably, this will involve gating to preclude motorized vehicle use by non-authorized personnel.
 - ii. Application of speed restrictions of company and construction personnel to minimize the potential for wildlife-vehicle collisions. Speed limits of 50 km/h will be enforced, within and between active construction areas, with slower limits in areas such as: around blind corners; where the road bank descends steeply; where visibility along the side of the road is extremely low; or where Grizzly Bear crossings are noted. Seasonal signage of speed limits within this zone should also be clearly marked. Moreover, all Grizzly Bear sightings will be logged and reported to staff to minimize negative encounters, as outlined in the Human-Wildlife Interaction Management Plan.
 - iii. Adoption and effective communication of a policy against the carrying of firearms by personnel. Bear spray will be used as an effective defense in situations of conflict with bears.
 - iv. Employees with any potential to be subject to conflict with bears (black or grizzly) should receive mandatory training on working in bear country at least by way of the International Bear Association video on this subject. Prior to working on-site, all staff or contractors will be educated on how to prevent Grizzly Bear encounters at the Environmental Orientation. Furthermore, all pilots, staff, and contractors will be advised about the illegality, as stated in the BC Wildlife Act, of harassing Grizzly Bears (i.e., hovering over with helicopters or photographing), at the Environmental Orientation and within the Human-Wildlife Interaction Management Plan.



- v. Adopt and effectively enforce policies pertaining to the management of bear attractants such as garbage, compost, and petroleum products that can alter the movement and behaviour of bears and greatly increase the potential for immediate and/or future conflict with people. This may include incineration and/or electric fencing.
- vi. Reclamation (planned or natural revegetation) of sites that will receive any level of predictable human use or visitation should preclude preferred bear foods (e.g., clover within seed mixtures).
- vii. Any camps pertaining to the development should be located as far as possible from flood plain habitats considered to be of moderate to high quality for seasonal grizzly bear foraging. Opportunity to enhance grizzly bear forage value and/or the effectiveness (security) of important habitats and movement options.
- viii. Contribute to a grizzly bear data collection and monitoring program.

Mountain Goat:

There are several areas throughout the Project area where Mountain Goat winter range habitat occurs within 500 m of the proposed infrastructure. Goat Winter Ranges are illustrated in Appendix M (note that the maps included are from the original EA Application, which includes the CC and SS Creek project areas, which are no longer within the scope of the current Project).

Disturbance management recommendations from the Management Plan for the Mountain Goat (MGMT, 2010) will be incorporated into the Wildlife Management EPP specified in Section 7.15. These will include:

- (a) Maintain a 500 m buffer zone adjacent to important mountain goat habitat (winter range, kidding/early rearing, mineral lick use areas, and connecting trails) during winter and the kidding/early rearing and mineral lick use periods (1 Nov. 30 Apr., and 1 May 15 July, respectively). Refer to Section 3.11.5 for additional details on construction timing windows.
- (b) All blasting works, within 500 m of the GWR (U-2-002-WR 2), will be conducted outside of the Mountain Goat wintering period (November 1 April 30) and natal period (May 1 June 15). Blasting within 500 m of the GWR may be permitted during November 1 December 1 if winter conditions are considered negligible, based on snow levels, and when deemed unoccupied by a QEP. During this time period, appropriate mitigations will be discussed with the Licensee's Site Environmental Representative and IEM, including the use of blasting mats, burying explosives in the snow, or other appropriate noise mitigation in order to reduce noise and debris. If goats are seen within 500 m of blasting areas, all blasting within



500 m of the goat(s) will cease until an appropriate plan has been reviewed and accepted by the Licensee's Site Environmental Representative and IEM, and implemented.

- (c) If behavior changes are observed during blasting or during heavy construction activities in the 500 m buffer during November 1 to June 15, additional mitigation measures will be reviewed with the Licensee's Site Environmental Representative and IEM, as required.
- (d) Helicopters will maintain a 1,500 m horizontal distance setback and a 400 m vertical separation from suspected nursery groups and occupied GWR habitats during the critical wintering period (November 1 - April 30) and the kidding/early rearing period (May 1 – June 15, MGMT 2010), where practicable.
- (e) Helicopter approach paths will avoid goats and the GWR, and a helicopter landing location should be established in an area that is not within 500 m of the GWR.
- (f) As stipulated under the *BC Wildlife Act,* a zero tolerance policy will be adopted on the use of helicopters for hovering over or photographing Mountain Goats and the policy will be made clear to all pilots, staff, or contractors.
- (g) Avalanche control will avoid areas occupied by goats, including a 500 m buffer.
- (h) Staff and contractors will report any illegal hunting of Mountain Goats.
- Following the completion of construction, a QEP, retained by the contractor(s) or Licensee, will review all temporary access roads and bridges, and all roads within 500 m of Goat Winter Range, and recommend the appropriate level of deactivation (EA Condition No. 10, Appendix D).

8.2.4 Invertebrates

As indicated in Table 14, the following terrestrial invertebrate species have been identified as VCs for the Project area: terrestrial molluscs (Pacific Sideband and Oregon Forestsnail) and butterflies and dragonflies.

Molluscs:

General development guidance for most land snails in the South Coast Region can be found in the Gastropod Best Management Practices Guidebook: Oregon Forestsnail and other Land Snails at Risk in the Coastal Lowlands and the BC's Coast Region Species and Ecosystems of Conservation Concern: User's Guide (2011). These include a factsheet on Pacific Sideband and Oregon Forestsnail. The following mitigations where extracted from the factsheet for implementation by the contractor(s) where feasible:



- (a) Avoid activities in areas of high suitability or known occurrence which alter habitat and microclimate regimes (controlled burns, invasive plant removal, clearing or salvaging/relocation during summer aestivation or winter hibernation periods).
- (b) Maintain forest floor structure, including coarse woody debris, moist forest floor conditions, and connectivity.
- (c) Implement integrated pest management approaches that reduce the need for chemical pest control and potential impacts to native land snails and slug species.

8.3 Regulatory Requirements for Management of Designated Wildlife habitats

Land use management guidelines for wildlife are established by MFLNRO under the FRPA as described within the Government Action Regulation. UWRs and WHAs continue to be established for specified species. Within these spatially designated areas objectives are set to ensure acceptable forest and range practices in these areas. These objectives must be addressed under the Forest Stewardship Planning process under the FRPA for forest tenure holders, but this process is not required for holders with an Occupant Licence to Cut (OLTC). An OLTC is granted, under Section 47.4 of the *Forest Act*, at the discretion of an MFLNRO regional or district manager. This arrangement allows the provincial government to work cooperatively with independent power producers under the FRPA general bulletin #16. The Licensee acknowledges that under FRPA, all occupiers of Crown Land are required to obtain an OLTC prior to engaging in activities that would affect the land.

8.4 Mitigation Effectiveness Assessment

The Licensee commits to monitoring the effectiveness of implemented mitigation measures to ensure that impacts to VCs have been effectively addressed. This will be achieved through quality inspections conducted by the Licensee's Environment Manager, via the appointment of the IEM and the Licensee's Site Environmental Representative, by supporting the IEM's and Licensee's Site Environmental Representations, and via engagement with the contractor(s) to see the recommendations implemented adequately and in a timely fashion.

If the Licensee is required to deviate from the recommended BMPs (or other guidance for wildlife VCs) the Licensee commits to retaining a QEP to conduct an effectiveness evaluation after implementation. Appropriate effects thresholds and indicators for the VC will be chosen by the QEP as measures of mitigation effectiveness.



8.5 Adaptive Management

If the effectiveness evaluation reveals that mitigation measures for any of the selected VCs are not effective, the Licensee commits to implementing an adaptive management approach. Both species experts and relevant MFLNRO staff will be consulted to design and apply alternative mitigation measures to address Project-related effects to VCs.



9.0 Commissioning

One of the final steps before a Licensee can obtain a Leave to Commence Operation (LCO) for the fulltime operation of a project is the completion of a series of tests on all physical, mechanical, and electrical components of the project, including, but not limited to, the diversion structure(s), water conveyance system(s), generating equipment, control systems, and transmission infrastructure. This series of tests is generally referred to as "plant commissioning". Detailed step-wise descriptions of the tests associated with plant commissioning will be included in the Commissioning Plan (Section 9.1) and the Ramping Rate Study (Section 9.2). With the contractor(s), the Licensee commits to developing both plans and to deliver these plans to the IE, IEM, and appropriate agents at MFLNRO for review, commenting, and acceptance at least three months prior to commissioning and ramping testing. These documents will support a Leave to Commence Diversion which allows the Licensee to fill the penstock and headpond for wet commissioning activities.

9.1 Commissioning Plan

The Commissioning Plan will provide detailed step-by-step description of the tests associated with plant commissioning. It will also include supplementary information related to safety and the effectiveness of carrying out the tests included in the plan, as well as the measures to be implemented to avoid harm to the environment. The IE and IEM will review the Commissioning Plan and will remain in their roles for the duration of the activities included in the Commissioning Plan. At a minimum the Commissioning Plan will address the following:

- Identification of all required tests.
- Controls and procedures (e.g., testing sequence, preferred flows for certain tests).
- A communication plan.
- Measures to ensure public health and safety (i.e., security and access).
- An emergency response plan.

9.2 Ramping Rate Study Plan

The Licensee, together with the contractor(s), will provide a comprehensive plan to study the effects of flow ramping during commissioning. The ramping rate study plan will be based on the approved ramping Terms of Reference submitted prior to commencement of construction. The results of this study will be used to establish final ramping rates and the corresponding flow



ramping rates for the Project. The IE and IEM will be required to review the Ramping Rate Study terms of reference and to remain in their roles for the duration of the activities included in the Ramping Rate Study. The Licensee commits to adherence to the guidance provided in the following documents in the development of their ramping study:

- DFO Flow Ramping Study: Study of Flow Ramping Rates for Hydropower Projects (Knight Piesold, 2005); and
- Long-term Aquatic Monitoring Protocols for New and Upgraded Hydroelectric Projects (Lewis et al., 2012).



10.0 Key Contacts

The contact information of key project personnel, agency representatives (municipal, provincial, and federal), as well as stakeholders, third parties, the Licensee, and other key land users is provided in the following subsections.

10.1 Federal

The contact information for the key federal agencies/personnel is provided in Table 16, below.

Agency	Name	Phone Number	Email
Environment Canada	TBD		
Transport Canada	TBD		
Natural Resources			
Canada (Wildfire	Wildlife Branch		
Information System)			
Fisheries and Oceans			
Canada			
Royal Canadian	Sechelt detachment	011	
Mounted Police		<i>311</i>	

Table 16. Contact information for the key federal agencies/personnel.

10.2 Provincial

The contact information for the key provincial agencies/personnel is provided in Table 17, below.

Agency	Name	Phone Number	Email
Provincial Emergency	Conoral line	1 900 662 2466	
Program (PEP)	General line	1-800-883-3438	
Cultural Heritage			
Resources			
Land Officer (MFLNRO)	Julia Grant	(604) 586-4428	Julia.Grant@gov.bc.ca



Agency	Name	Phone Number	Email
Regional Water Manager (MFLNRO)	Remko Rosenboom	(604) 586-5629	Remko.rosenboom@gov.bc.ca
Provincial Engineer (MFLNRO)	James Davies	(604) 586-5637	James.davies@gov.bc.ca
Natural Resource District Office (MFLNRO)	Sunshine Coast Branch		
Conservation Office (MOE)	General information line		

10.3 Regional / Municipal

The contact information for the regional/municipal personnel is provided in Table 18, below.

Agency	Name	Phone Number	Email
Sunshine Coast Regional District (SCRD)	David Rafael	(604) 885-6804	David.Rafael@scrd.ca
Fire	N/A		
Ambulance	N/A		
Hospital	N/A		

Table 18. Contact information for the regional/municipal personnel.

10.4 First Nations

The contact information for First Nations representatives is provided in Table 19, below.

Representative	Name	Phone Number	Email
shíshálh Chief			
shíshálh Council			
Nation's technical staff			

Table 19. Contact information for First Nations representatives.



10.5 Independent Engineer

The contact information for the Independent Engineer (IE) and delegates is provided in Table 20, below.

	Name	Phone Number	Email
Independent Engineer			
(IE)			
Delegate	TBD		
Delegate	TBD		

10.6 Independent Environmental Monitor (IEM)

The contact information for the Independent Environmental Monitor (IEM) and delegates is provided in Table 21, below.

Table 21. Contact information for the Independent Environmental Monitor and dele	gates.
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	Name	Phone Number	Email
Independent			
Environmental Monitor	Alex Sartori	(604) 220-0199	
(IEM)			
Delegate	Chris Macmillian	(604) 506-3266	
Delegate	Colin Bailey	(778) 994-2428	

10.7 Licensee

The contact information for the key Licensee personnel is provided in Table 22, below


	Name	Phone Number	Email
Project Manager	Tyler Janz	(403) 880-1065	tyler@bluearth.ca
Construction Manager	TBD		
Environmental Manager	Isabelle Deguise	(778) 887-8351	Isabelle@bluearth.ca
Site Environmental	Dave Pater		
Representative	Dave Dales		

Table 22. Contact information for the key Licensee personnel.

10.8 Licensee's Engineer / Design Engineer

The contact information for the key Licensee's Engineer/Design Engineer is provided in Table 23, below.

	Name	Phone Number	Email
Engineer/Design			
Engineer			
Construction			
Engineer/Manager	ingineer/Manager		

10.9 Other Land Users

The contact information for other key land users is provided in Table 24, below.

Table 24. C	Contact informatior	n for other key	land users.
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	Name	Phone Number	Email
Tyson Creek Hydro	Jako McCillivrav	(604) 741-8880	iaka@blucarth.ca
Project Operator	Jake Micolliviay		<u>Jake@bluearth.ca</u>



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APPENDIX A. SUPERSEDED DOCUMENT APPROVAL PAGES



APPENDIX B. PERMITS, LICENCES, AND APPROVALS



File: 30050-25/NIHY-19



Reference: 296209

February 12, 2016

SENT VIA EMAIL

Ms. Isabelle Deguise Lead, Regulatory and Environment BluEarth Renewables Inc. 200, 4723 – 1 St SW Calgary AB T2G 4Y8 isabelle@bluearth.ca

Dear Ms. Deguise:

I am pleased to provide you with a signed original of Amendment #1 to the Environmental Assessment Certificate #E13-04, along with the amended Schedule A and Schedule B, for the Narrows Inlet Hydro Project. Kevin Jardine signed the amendment certificate in his capacity as the Executive Director of Environmental Assessment Office on February 12, 2016.

Yours truly

Monica Perry Executive Project Director

Attachments (3)

cc: Jasmine Paul, Rights and Title Director, *shishalh* Nation jpaul@secheltnation.net

May Darling, Project Assessment Officer, Environmental Assessment Office <u>May.Darling@gov.bc.ca</u>

Mailing Address: PO Box 9426 Stn Prov Govt Victoria BC V8W 9V1

IN THE MATTER OF THE ENVIRONMENTAL ASSESSMENT ACT, S.B.C. 2002, c. 43 (Act)

AND

IN THE MATTER OF ENVIRONMENTAL ASSESSMENT CERTIFICATE #E13-04 HELD BY THE NARROWS INLET HYDRO HOLDING CORP. FOR THE NARROWS INLET HYDRO PROJECT (Project)

AMENDMENT #1 TO ENVIRONMENTAL ASSESSMENT CERTIFICATE #E13-04

WHEREAS:

- A. On January 14, 2014, Narrows Inlet Hydro Holding Corp. was issued Certificate #E13-04 (Certificate) respecting the Project.
- B. In 2015, BluEarth Renewables Inc. acquired majority ownership of the Narrows Inlet Hydro Holding Corp.
- C. On September 9, 2015, BluEarth Renewables Inc., as majority owner of Narrows Inlet Hydro Holding Corp., submitted an application to amend Certificate #E13-04 as follows:
 - Schedule A, Certified Project Description, to improve general clarity, identify change in the Project boundary and realignment of an access road, change the design of the Chickwat Creek component of the Project, and add a floating worker camp; and
 - Schedule B, Table of Conditions, to reflect updated findings and recommendations for mitigation measures and monitoring programs for potential effects.
- D. Under Sections 19(3) and (4) of the Act, the undersigned has considered the application.

NOW THEREFORE:

I amend, as attached, Schedule A and Schedule B.

Kevin Jardine Executive Director, Environmental Assessment Office

Issued this 12th day of February, 2016

Appendix A. Updated Schedule A – Certified Project Description



Schedule A

Certified Project Description

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Appendix A – Project Maps

1. OVERVIEW

Narrows Inlet Hydro Holding Corporation (the Certificate Holder) is certified to develop the Narrows Inlet Hydro Project (the Project) in the vicinity of the Tzoonie Valley at the head of Narrows Inlet, approximately 75 kilometres (km) north-west of Vancouver, British Columbia (Map 1 in Appendix A).

The project will include the following infrastructure:

- Up to three hydroelectric generating stations with a combined design capacity of 33 megawatts (MW):
 - Chickwat Creek A conventional run-of-river hydroelectric generating station with a design capacity of 19 MW;
 - Upper Ramona Creek A hydroelectric generating station which uses Ramona Lake as its water source with a design capacity of 7 MW;
 - Lower Ramona Creek A run-of-river hydroelectric generating station which uses water from Ramona Creek and the outflow from the Upper Ramona Creek component as its water sources with a design capacity of 7 MW.
- Up to three 25 kilovolt (kV) transmission lines, connecting each of the three new powerhouses, will feed into a new collector substation at the mouth of the Tzoonie River, along the existing Tyson Creek transmission line;
- The existing 25 kV line from Tyson Creek will be upgraded to 138 kV to transmit electricity from the Project to the point of interconnection with BC Hydro 1L37, less than 6 km north of the Malaspina substation;
- One Operator's Residence;
- Upgraded and new roads and bridges for temporary construction activity and permanent operations; and
- Temporary construction facilities, including a land and floating construction camps, concrete batch plants, laydown and staging areas, borrow pits, and spoil areas.

With the exception of existing roads and bridges that do not require upgrades, all Project infrastructure must be located within the red Project boundaries identified on Map 2 to 5 in Appendix A. The location of permanent roads, new and replacement bridges, and temporary roads approximately 1,000 metres (m) or longer associated with the components are shown on the maps; however, temporary roads or tracks less than 1,000 m are not shown. Permanent Project infrastructure, as listed above and described for each component, will be constructed within 100 m of locations shown on the Project's component maps (Map 2 to 5 in Appendix A). This 100 m leeway is intended to allow relatively fine-scale adjustment of infrastructure location based on conditions and logistical limitations that may be encountered in the field during final design. In all cases, the 100 m leeway refers to all portions of the infrastructure in question such that any point within the structure could be transposed a maximum of 100 m in any direction. Existing access roads to be used by the Project are shown on the maps. Requirements for new access roads are introduced under each component but their detailed restrictions are specified in Section 4.

The Project life has three phases: construction, operation, and decommissioning. The construction phase is defined as the period of time during which any of the following activities occur that are related to the building of new Project components and upgrades to existing infrastructure: vegetation clearing, earthworks, building, installing, replacing, repairing, altering, maintaining or removing works that modifies the land, vegetation and/or natural environment. Operation begins once the Leave to Commence Operation, associated with the *Water Act* license, is issued. Decommissioning begins once the Project shuts down operations and begins removing permanent Project infrastructure and rehabilitating the Project area.

2. DESCRIPTION OF THE HYDROELECTRIC COMPONENTS

2.1. CHICKWAT COMPONENT

The Chickwat Creek hydroelectric component will be composed of the following infrastructure, all of which must be located entirely within the red outlined Project boundary: upstream works, waterways, powerhouse and switchyard, and feeder transmission line (Map 2 in Appendix A).

<u>Upstream Works</u>. The upstream works will include three separate intakes, the main intake on Chickwat Creek and a tributary intake on each of two un-named tributaries to Chickwat Creek (referred to as C1 and C2 respectively), and associated headponds.

Main Intake. The main intake will be located on Chickwat Creek approximately 3 km upstream of the confluence with the Tzoonie River, and within 100 m of UTM NAD 83 5522113 Northing, 448217 Easting, zone 10. It will be constructed of reinforced concrete. It will include a traditional lateral intake with an Obermeyer type gated overflow weir, an intake channel, and sluiceway. A fish ladder will be installed to support upstream and downstream fish migration, and mitigate potential fish entrainment at the intake. The intake will also maintain an instream flow release (IFR). Access to the intake will be through an existing logging road unless the location of the intake changes. If the location changes by less than 100 m, a new permanent (less than 300 m) access road will be created to connect to the existing logging road.

Tributary Intakes. The intakes on C1 and C2 tributaries will be located within 100m of UTM NAD 83 5520719 Northing, 448359 Easting, and of UTM NAD 83 5521709 Northing, 447858 Easting, zone 10, respectively. The two tributary intakes will allow for maintenance of an IFR. Access to the C1 Tributary will follow an upgraded road and will require the construction of a short new permanent road (less than 500 m). Access to the C2 Tributary will be via an access track (less than 800 m) adjacent to the C2 penstock.

<u>Waterways</u>. There will be a total of three penstock pipes. A penstock pipe will convey water from each of the two tributary intakes to the main intake, and another from the main intake to the powerhouse. The pipes may have both buried and above ground sections. Their locations, within a 100 m leeway, are shown on Map 2 in Appendix A.

<u>Powerhouse</u>. The powerhouse will be located on the east side of Chickwat Creek approximately 1 km upstream of the confluence with the Tzoonie River and within 100 m of UTM NAD 83 5520401 Northing, 449138 Easting, zone 10. The powerhouse will contain no more than two turbines and two generators,

and associated control equipment. The control equipment must allow for the regulation of flow rates during start-up and shut-down so that ramping rates in Chickwat Creek, as specified in the Table of Conditions, are not exceeded. Access to the powerhouse will be provided by reactivating a decommissioned logging road and rail bed. The transformer will be located in a switchyard located outside of the powerhouse.

Water from the turbine(s) will be released into a tailrace and returned to Chickwat Creek.

<u>Feeder Transmission Line</u>. The electricity generated at the Chickwat powerhouse will be transmitted along a new 25 kV transmission line, maximum of 2 km long, that will tie into the existing Tyson Creek transmission line approximately 3 km from the new collector 138 kV substation at the mouth of the Tzoonie River (Map 4).

2.2. UPPER RAMONA COMPONENT

The Upper Ramona hydroelectric component will be composed of the following infrastructure, all of which must be located entirely within the red outlined Project boundary: upstream works, waterway, powerhouse and switchyard, and feeder transmission line (Map 3 in Appendix A).

<u>Upstream Works</u>. The upstream works will include an intake located on Ramona Lake within 100 m of UTM NAD 83 5514670 Northing, 451718 Easting, zone 10. It will consist of no more than three pumps installed on a floating platform which will be anchored. IFR will be provided by a gravity fed tunnel/pipe off the main intake. Access to the intake will be by helicopter during construction and operation. No permanent roads will be built but no more than 1,000 m of temporary access roads may be constructed, if required.

<u>Waterway</u>. A penstock pipe will convey water from the intake to the powerhouse. It will have both buried and above ground sections. Its location, within 100 m, is shown on Map 3 in Appendix A. A short permanent road (less than 1,000 m) will be constructed to connect the penstock to the powerhouse.

<u>Powerhouse</u>. The powerhouse will be located on the north side of Ramona Creek approximately 3 km upstream of the confluence with Narrows Inlet and within 100 m of UTM NAD 83 5512612 Northing, 450054 Easting, zone 10. The powerhouse will contain a turbine, a generator, a transformer and associated control equipment. The control equipment will include regulation of flow rates during start-up and shut-down so that ramping rates, as specified in the Table of Conditions, are not exceeded. The transformer will be located in a switchyard outside the powerhouse. Access to the powerhouse will be provided by an existing logging road that will be reactivated unless the location of the powerhouse changes. If the location changes, a new access road (less than 500 m) will be created to connect to the existing logging road.

A tailrace will return the water to Ramona Creek above the main intake of the Lower Ramona component.

<u>Feeder Transmission Line</u>. The electricity generated at the Upper Ramona powerhouse will be transmitted to the collector 138 kV substation at the mouth of the Tzoonie River via a new single pole overhead 25 kV transmission line with maximum length of 10 km. The feeder transmission line will

follow one of the two alignments shown, within 100m, as options on Map 3 in Appendix A. The option preferred by the Certificate Holder is "Option B".

2.3. LOWER RAMONA COMPONENT

The Lower Ramona hydroelectric component will be composed of the following infrastructure, all of which must be located entirely within the red outlined Project boundary: upstream works, waterways, powerhouse and switchyard, and feeder transmission line (Map 3 in Appendix A).

Upstream Works. The upstream works will include two separate intakes and associated headponds.

Main intake. The main intake will be located on Ramona Creek approximately 3 km upstream of the confluence with Narrows Inlet and within 100 m of UTM NAD 83 5512563 Northing, 450051 Easting, zone 10. It will be constructed of reinforced concrete. An IFR pipe will be included to meet IFR requirements. Access to will be provided by an existing logging road that will be reactivated unless the location of the intake changes. If the location changes by less than 100 m, a new access road (less than 500 m) will be created to connect to the existing logging road.

Tributary Intake. One tributary intake will be located on an un-named tributary of Ramona Creek (referred to as R1) within 100 m of UTM NAD 83 5511955 Northing, 449912 Easting, zone 10. (Map 3 in Appendix A). It will be constructed of reinforced concrete. Access to will be provided by a new no more than 1,000 m permanent road.

<u>Waterways</u>. A penstock pipe will convey water from the tributary intake to the main intake and another pipe from the main intake to the powerhouse. Both penstocks may have both buried and above ground sections. Their locations, within 100 m, are shown on Map 3 in Appendix A.

<u>Powerhouse</u>. The powerhouse will be located on the south side of Ramona Creek approximately 500 m upstream of the confluence with Narrows Inlet and within 100 m of UTM NAD 83 5511987 Northing, 448538 Easting, zone 10. The powerhouse will contain a turbine, a generator, a transformer and associated control equipment. The control equipment design will provide regulation of flow rates during start-up and shut-down so that specified ramping rates in Ramona Creek are not exceeded. The transformer will be located in a switchyard located inside or outside of the powerhouse.

A tailrace will return the water to Ramona Creek. The design and operation protocol that ensures that fish are not stranded will be approved by a Qualified Professional (QP). Access to the powerhouse will be provided by a new no more than 1,000 m permanent road.

<u>Feeder Transmission Line</u>. The electricity generated at the Lower Ramona powerhouse will be transmitted to the 138 kV new collector substation at the mouth of the Tzoonie River via the same single pole overhead transmission line as the Upper Ramona component. A maximum of 10 km of new feeder 25 kV transmission line will be constructed to bring the power from the Lower Ramona powerhouse to a connection point on the Upper Ramona feeder transmission line. A temporary road (construction track) less than 1,000 m will be required to construct this new transmission line segment between the existing road and the main penstock.

3. SUBSTATION AND TRANSMISSION COMPONENT

The 25 kV transmission lines (See Map 2, Map 3 and Map 4 in Appendix A) from each of the three new powerhouses and the existing Tyson Creek powerhouse will all feed into a new collector substation located near the mouth of the Tzoonie River approximately 2 km upstream from the head of Narrows Inlet (Map 4 in Appendix A). Here the voltage will be increased to 138 kV. The substation will consist of a 3-phase step-up transformer, approximately 100 MW in capacity, and associated cooling heat exchangers, three phase breakers, disconnect switches, and manual and automatic controls.

Electricity will be transmitted from the collector substation to the point of interconnection with BC Hydro's transmission grid via a 138 kV transmission line (Map 5 in Appendix A). The point of interconnection is located on the Sechelt Peninsula near Ruby Lake. The transmission line will connect with BC Hydro 1L37, less than 6 km north of the Malaspina substation. The 138 kV transmission line will consist of the following elements:

- No more than 20 km of existing line built for the Tyson Creek Project;
- No more than 15 km of new single pole overhead line;
- No more than 3 km of new submarine cable under Sechelt Inlet; and
- No more than 500 m of buried cable where the cable enters and leaves Sechelt Inlet.

Access to the majority of the transmission line will be by existing roads (at the request of shishalh Nation). However, temporary access tracks will be required to install some poles, while others may require helicopter access.

4. ACCESS INFRASTRUCTURE

A combination of existing access roads and newly constructed permanent and temporary roads and tracks will be required to access Project locations. Map 2 to 5 in Appendix A identify the locations (within 100 m) of all permanent roads, and all temporary roads that may be 1,000 m or longer. Temporary roads or tracks that will be less than 1,000 m are not shown on the maps. New and replacement bridges associated with access to the hydroelectric components are also shown on the maps.

Temporary roads and tracks are defined as those that are only required for Project construction. Permanent roads and bridges are defined as those that are required for Project operation, and may also be used for Project construction. All temporary, new, and upgraded roads will be located within the red Project boundary. The use of existing permanent access roads and forestry roads that do not require upgrades may occur outside of the red Project boundary.

Access road restrictions are specified at the level of the entire Project and not individually restricted in terms of length, width, or start and end points. A maximum of 10 km of new permanent road and 5 km of new temporary roads and tracks will be constructed for the Project. Permanent and temporary reactivation of existing roads will occur in the vicinity of all Project components.

A permanent helipad may be required to access the Upper Ramona intake, with maximum size of 1 ha. Temporary helicopter landing pads and staging areas (helipads) may also be required during the construction of the transmission line.

5. TEMPORARY PROJECT COMPONENTS

Temporary project components are those facilities which are required only during the construction phase of the Project. The temporary components shown on Map 2 to 5 in Appendix A (construction camps and certain laydown areas) will be located within 100 m of the locations indicated. Locations of some of the temporary Project components not shown on maps are described below. All temporary project components must be located entirely within the red Project boundary. Temporary project components include:

- <u>Construction Camp</u> The Project will require two temporary camps. A temporary land camp designed to house up to 99 workers will be built at the staging area at the head of Narrows Inlet (Map 4 in Appendix A). The temporary land camp shall have a footprint not exceeding 5 ha. A floating camp will accommodate up to 50 workers.
- <u>Concrete Batch Plants</u> No more than three concrete batch plants will be required to produce the concrete needed for construction of Project infrastructure.
- <u>Laydown and Staging areas</u> Laydown areas are used to temporarily store construction material and equipment. There are several laydown areas associated with each hydroelectric component.
- <u>Borrow pits and spoil areas</u> Borrow pits are used to source the aggregate required during construction. Spoil areas are used to store excavated soil either temporarily or permanently. There are several borrow pits and spoil areas associated with each Project component.

5.1. Decommissioning of Temporary Project Components

At the end of the construction phase all temporary project components will be removed and the sites rehabilitated to the standards described in the Construction Environmental Management Plan (CEMP).

Temporary facilities that will be decommissioned are:

- Temporary access roads and tracks;
- Temporary bridges;
- Temporary helipads;
- Temporary concrete batch plant sites;
- Temporary borrow pits and spoil areas;
- Temporary laydown and staging areas; and
- Temporary construction camps.

6. OPERATOR'S RESIDENCE

An operator's residence will accommodate no more than five persons during Project operation. The operator's residence will be located on the same site as the temporary construction camp. The residence will use the septic field and water source installed for the construction camp.

Appendix A – Project Maps



Path: M:\Projects-Active\1132 Narrows Inlet Hydro Project\MXD\Overview\1132_NIL_OverviewProjectExtents_2015Aug12.mxd







Path: M:\Projects-Active\1132 Narrows Inlet Hydro Project\MXD\ComponentMaps\1132_RAM_Components_2015Aug14.mxd



Schedule B Table of Conditions: Narrows Inlet Hydro Project

SCHEDULE B

TABLE OF CONDITIONS

Interpretation

In this Schedule:

(a) The phrase "to the satisfaction of" means, where it is used in relation to a document, that the Holder must provide a document, or any amendment to the document, to the reviewing entity referenced in the condition. That entity may: reject the document, or amendment, and require the Holder to resubmit it; or require the Holder to make changes to the document, or the amendment. If no such requirement is communicated to the Holder by the entity, the Holder need not obtain further approval of the document.

(b) Columns 3 to 6 (Timing, Application Section/Supporting Documents, Provincial Compliance Agencies, Subject), in the table below are for convenience of reference only, and do not form a part of the condition.

(c) The term "Qualified Professional" (QP) means a person who has training, experience and expertise in a discipline relevant to the field of practice set out in the condition, and who is registered with the appropriate professional organization in British Columbia, is acting under that organization's code of ethics and is subject to disciplinary action by that organization.

No.	Condition	Timing	Application Section or Supporting Documents	Provincial Compliance Agencies	Subject
1	 Prior to vegetation clearing, the Holder must: (a) identify high suitability goshawk habitat by using habitat suitability models following Inventory Methods for Raptors (Resource Inventory committee, 2001) and by using a qualified professional (QP); (b) undertake goshawk nest surveys in all identified high quality habitat using a QP; (c) maintain an area of undisturbed forest surrounding all active and alternate nest sites within an identified breeding area determined by the Ministry of Forests, Lands and Natural Resource Operations (FLNR); and (d) implement suitable habitat replacement for any high suitability goshawk habitat that is proposed to be cleared, prior to undertaking clearing of or construction to the satisfaction of FLNR. The Holder may not conduct harvesting of trees during nesting season in the area referred to in paragraph (c). 	Pre-Construction Construction	Application Volume I, Sections 2.4.1.2, 6.6.4.1.5, 6.7.4.1.5, 6.8.4.1.4, 6.9.4.1.4, 6.10.4.1.4, 6.11.4.1.3, 6.14.4.1.4, 6.15.4.1.3, 11.3.5, 12.3.5, 13.3.5, 14.3.5, 15.3.5, 16.3.5, 17.3.4 and 18.3.3.5	EAO FLNR	Northern Goshawk Monitoring
2	Prior to starting construction on the Ramona Lake component, the Holder must:	Pre-Construction Construction	Application Volume I, Sections 6.9.4.1.2, 6.10.4.1.2 and 14.3.4	EAO FLNR	Wildlife Monitoring

No.	Condition	Timing	Application Section or	Provincial Compliance	Subject
			Supporting	Agencies	
			Documents		
	(a) determine the habitat for aquatic breeding				
	salamanders using a QP;				
	(b) evaluate the risk of egg-mass stranding resulting				
	from lake drawdown during the period from				
	egg-laying to hatching for that area using a QP;				
	(c) submit a report to FLNR documenting habitat				
	quantity and quality for salamanders, and				
	potential nabitat loss resulting from lake				
	(d) submit a report to ELNB documenting risk of				
	(u) submit a report to FLNK documenting fisk of				
	impacts from project operations: and				
	(e) develop and implement a compensation plan for				
	the loss of high quality habitat for aquatic				
	breeding salamanders, and for impacts from				
	egg-mass mortality. The plan, including any				
	proposed changes, must be prepared and				
	implemented to the satisfaction of FLNR.				
3	Prior to commencing construction of the Lower	Pre-Construction	Application Volume I,	EAO	Wildlife
	Ramona components, the Holder must provide to	Construction	Sections 6.10.5, 14.4		Monitoring
	EAO a Marine Sensitivity Blasting Management Plan		and 22.2.8		
	for the Lower Ramona area focussed on marine				
	organisms that are sensitive to blasting noise and		Ecosystem Dynamics		
	disruption in Narrows Inlet.		Inc. letter report		
			(Marine Issues		
	Frequencies has been a latter report (Marine		Responses) dated		
	ECOSYSTEM Dynamics inc. letter report (Marine Issues Pespenses) dated Sentember 26, 2012		September 26, 2013		
	issues hesponses ualed september 20, 2015.				

Supporting Agencies	
Documents	
The plan, including any proposed changes, must be prepared and implemented to the satisfaction of EAO.	
4 The Holder must retain the services of an Independent Environmental Monitor (IEM), with demonstrated experience and knowledge of environmental monitoring for construction projects in BC, commencing three months prior to construction, throughout the construction and decommissioning phases. Pre-Construction N/A EAO The IEM must monitor compliance with the Construction Environmental Management Plan (CEMP) plans in Condition 11. The IEM must also review, evaluate and report to the Holder the effects of Project activities and effectiveness of the mitigation measures specified in the plans, and compliance with the conditions with the EA Certificate and other regulatory permits, approvals and authorizations that apply. If during monitoring, the IEM observes that mitigation measures are ineffective; the IEM must in writing, permit the IEM to halt work if environmental monitoring indicates that there is a current or imminent impact to the environment that has not been approved as part of the Certified Project or part environment that has not been approved as part of the Certified	Monitoring and Compliance Enforcement

No.	Condition	Timing	Application Section or Supporting	Provincial Compliance Agencies	Subject
			Documents	U	
	permits, approvals or authorizations that apply. The IEM must document the mitigation measures that have been implemented and their effectiveness and provide summary recommendations to EAO and FLNR and interested First Nations (<i>shíshálh</i> Nation), on an annual basis during the construction and decommissioning phases of the Project.				
5	 The Holder must: (a) act in accordance with the BC Hydro document entitled: <i>Approved Work Practices for Routine Electrical Cable Maintenance in Freshwater and Marine Coastal Areas</i> in the Interconnection area of Sechelt Inlet as specified in the CPD; and (b) lay cable only within the period Dec. 1 – Feb. 15, unless written authorization is provided by the Department of Fisheries and Oceans (DFO). 	Construction	Application Volume I, Sections 2.3.6 and 2.4.2.6 BC Hydro document entitled: Approved Work Practices for Routine Electrical Cable Maintenance in Freshwater and Marine Coastal Areas	EAO	Marine Fauna
6	 The Holder must communicate information to the public on the status of the Project in order to provide public awareness of ongoing activities and construction schedules and to ensure general safety in and surrounding the Project area. The Holder must set up a public web site and notify the general public of the existence of the website through advertisements in local newspapers. The Holder must post the following to the website: construction schedule and list of activities during construction and the locations; 	Pre-Construction Construction Operations Decommissioning	Application Volume I, Sections 19.2.3, 19.2.4, 19.2.5 and 19.2.6	EAO	Information Management

No.	Condition	Timing	Application Section or Supporting	Provincial Compliance Agencies	Subject
	 final plans required under the CEMP; and results of studies conducted prior to and during construction. The Holder must also communicate in writing with the Narrows Inlet Users Group regarding timing of activities related to the construction of the powerhouse, transmission line and other infrastructure in the Lower Ramona Creek area. If, for safety reasons, road or trail access must be restricted during the construction phase, the Holder must provide written notice to Ramona Creek and Doriston property owners and the Narrows Inlet Users Group. Notification must be provided on the public web site and placed at entry/exit points to all roads and trails that are to be restricted no less than 14 days in advance of access restriction.		Documents		
7	The Holder must develop and maintain access to a protected File Transfer Protocol (FTP) site or equivalent protected medium containing all Project reports and documents identified in the Table of Conditions and allow access to FLNR, EAO, DFO and other parties as required by EAO. The FTP site must be in place prior to commencing construction and remain during operations through to decommissioning.	Pre-Construction Construction Operations Decommissioning	N/A	EAO FLNR	Water Quality Monitoring
8	The Holder must conduct a study to determine:	Pre-Construction	Section FID1 of Supplemental report	EAO FLNR	Water Quality Monitoring

No.	Condition	Timing	Application Section or	Provincial Compliance	Subject
			Supporting	Agencies	
			Documents		
	(a) whether elevated methyl mercury (MeHg) levels		submitted July 2013		
	relative to background are found in				
	sediment/soils surrounding Ramona Lake				
	(including organic soils in the northern tributary				
	to Ramona Lake in areas that will be flooded);				
	(b) the potential MeHg pathways into Ramona				
	Lake; and				
	(c) whether flooding of Ramona Lake could lead to				
	the release of MeHg into Ramona Lake.				
	The study must be conducted by a laboratory with				
	capacity to do sediment and soil analysis. The				
	interpretation of results with respect to pathways				
	and consequences for Ramona Lake must be				
	conducted by a QP.				
	, .				
	Prior to commencing construction of the Ramona				
	Lake component of the Project, the Holder must				
	submit the study to FLNR, EAO and the shishalh				
	Nation unless they provide written notice to the				
	Holder that this is unnecessary.				
	If the study concludes that:				
	in the study concludes that.				
	 there are elevated MeHg levels in the 				
	sediments and soil that would be flooded;				
	• there are potential pathways for MeHg to				
	enter Ramona Lake; and				
	 flooding could lead to mercury 				
	concentrations in Ramona Lake higher than				
	those set out in Health Canada Standards for				

No.	Condition	Timing	Application Section or	Provincial Compliance	Subject
			Supporting	Agencies	
	Courselieus Durishin e Western Queslitu		Documents		
	Canadian Drinking Water Quality,				
	Then the Holder must not construct the weir or				
	flood Ramona Lake.				
9	The Holder must: (a) conduct two radar surveys (one horizontal and	Pre-Construction Construction	Application Volume I, Sections 11.3.5.5 and 15.3.5.5	EAO FLNR	Wildlife Mitigation
	surveys, conducted by a QP, at the head of Narrows Inlet. Survey methods must be conducted according to Inventory Methods for				
	Marbled Murrelet Radar Surveys (Resource Inventory Committee (2006)) or as set out in the Nesting and Migratory Bird Protection Plan in the CEMP as required in Condition 11:				
	 (b) prepare a report by a QP using the results from these surveys with recommendations for mitigation requirements, including design changes to transmission line heights or bird diverters and monitoring of effectiveness of mitigation; and 				
	(c) implement recommendations from (b) above to the satisfaction of FLNR.				
10	Following the completion of construction, a QP retained by the Holder must review all temporary access roads and bridges, and all roads within 500 m of Goat Winter Range, and recommend the appropriate level of deactivation. The QP must	Post Construction	Application Volume I, Sections 2.7 and 14.3.6	EAO FLNR	Temporary Road Deactivation
	consult with active logging companies in the area				

No.	Condition	Timing	Application Section or Supporting	Provincial Compliance Agencies	Subject
	 before making his or her recommendation. The QP must then prepare and implement site specific deactivation plans to the satisfaction of FLNR. The QP must oversee the deactivation, and provide FLNR with an opinion report confirming if the deactivation has been completed in accordance with the plans. 		Documents		
11.1	The Holder must minimize construction impacts by developing, submitting and adhering to a CEMP as detailed in Volume 1: section 22.2 of the Holder's Application for an EA Certificate. The CEMP, and any amendments to it, must be prepared and implemented to the satisfaction of EAO and FLNR. The Holder must provide this draft CEMP to <i>shishálh</i> Nation for review a minimum of 90 days prior to the planned commencement of construction. The Holder must provide the updated CEMP to EAO, FLNR, and shishalh Nation within 30 days of the commencement of construction. The Holder must implement the CEMP and adhere to the requirements of all component plans.	Pre-Construction Construction	Application Volume I, Section 22.2 and Volume II, Appendix 16	EAO FLNR	Construction Environmental Management Plan

No.	Condition	Timing	Application Section or	Provincial Compliance	Subject
			Supporting	Agencies	
			Documents		
11.2	The CEMP must include the requirement that, prior to	Pre-Construction	Application Volume I,	EAO	Construction
	starting construction in any area, a QP must complete	Construction	Section 22.2 and	FLNR	Environmental
	surveys using methodology (i.e. survey design		Volume II, Appendix 16		Management Plan
	including but not limited to considerations for				
	seasonal and weather conditions, and localized				
	conditions), as determined by the QP, and approved				
	by FLNR, to detect the following species (should they				
	occur) within the area proposed for construction:				
	• Oregon forest snail and Pacific sidehand snail				
	 Red legged frog and western toad: and 				
	Rare plants and ecosystem as identified from				
	Species at Risk Act, and red and blue listed				
	species.				
	If these species and ecosystems are found within an				
	area of the project footprint that would be subject to				
	clearing or other disturbances, the QP will indicate				
	which mitigation measures outlined in the				
	environmental protection plans, as part of the CEMP,				
	will be implemented. The results of the surveys and				
	applied actions will be reported in the weekly IEM				
	reports. If the actions identified by the QP require				
	identified in the CEMP then encreavel from ELNP will				
	he required prior to implementation				
	ne required prior to implementation.				
	The <i>shíshálh</i> Nation must be provided with copies of				
	draft and final plans				
12	The Holder must submit an Operational Parameters	Prior to Operation	Application Volume I	FAO	Operational
12	The nonder must submit an Operational Parameters	Filor to operation	Application volume I,	EAU	Operational

No.	Condition	Timing	Application Section or	Provincial Compliance	Subject
			Supporting	Agencies	
			Documents		
	and Procedures report (OPPR) and an Operational		Section 22.3	FLNR	Parameters and
	Environmental Monitoring Plan (OEMP) considering				Operational
	each Project hydroelectric component as listed in the				Environmental
	CPD, Table of Contents, to EAO and FLNR, at least				Monitoring plan
	30 days prior to commissioning. The plans included				
	within the OPPR and OEMP must:				
	 be specific to the Project component(s); 				
	• adhere to the FLNRO "Operating Parameters				
	and Procedures Template [DRAFT] 2013", and				
	the DFO guidelines, "Long term Aquatic				
	Monitoring Protocols for New and Upgraded				
	Hydroelectric Projects, 2013", or as replaced				
	or amended from time to time; and				
	 be developed and implemented to the 				
	satisfaction of EAO and FLNR.				
	The OPPR must include a requirement to measure				
	instream flows every 15 minutes throughout				
	Operations. The OPPR must also document mitigation				
	measures to be followed during routine maintenance				
	activities, and to minimize environmental effects				
	associated with the operation of the Project (including				
	those arising from malfunctions and accidents).				
	The Holder must provide the draft OPPR and OEMP to				
	FLNR and shishalh Nation for review a minimum of				
	30 days prior to the commencement of				
	commissioning, unless written notice is provided to				
No.	Condition	Timing	Application Section or	Provincial Compliance	Subject
-----	---	--	---------------------------------------	-----------------------	------------------
			Supporting	Agencies	
			Documents		
	the Holder advising that this provision is unnecessary.				
	The Holder must provide the undated OPPP and OEMP				
	to EAO. ELND, and shishalk Nation a minimum of				
	to EAO, FLINR, and shishain Nation a minimum of				
	30 days prior to the commencement of operations				
	unless written notice is provided to the Holder				
	advising that this provision is unnecessary.				
13	 Prior to the start of construction the Holder must complete and implement a Noise and Sensory Disturbance Management Plan as described in Volume 1: section 22.2.8 of the Holder's Application for an EA Certificate. The Holder must ensure that sound levels at the Lower Ramona powerhouse do not exceed BC Oil and Gas Commission guidance for permissible sound levels in rural areas¹ by incorporating the following noise abatement mitigation in the design of the powerhouse as determined by a QP: acoustical louvres on the powerhouse; double curtain wall on the tailrace; ventilation to allow doors to be closed; partial underground embedment of the powerhouse; and 	Pre-Construction Construction Operations	Application Volume I, Section 10.1	EAO	Noise Mitigation
	constructing tailrace orientation away from private properties.	0		540	
14	The Holder may only draw down Ramona Lake in	Operations	Application Volume I,	EAU	Water Quality

¹ The Oil and Gas Commission's *British Columbia Noise Control Best Practices Guideline* (March 2009).

No.		Condition	Timing	Application Section or	Provincial Compliance	Subject
				Supporting	Agencies	
				Documents		
	accordanc	e with the following conditions:		Sections 2.5.2.4 and	FLNR	
				14.2.2		
	(a) the m	aximum daily drawdown is less than or				
	equal	to 1 m/day;				
	(b) subjec	ct to paragraph (c), lake drawdown must				
	be cor	nducted in order to allow lake levels to be				
	at the	following levels during the listed year of				
	opera	tions:				
	Year	Drawdown Level				
	1	(i) above 1361 m above sea level				
		(masl) on October 1st; and				
		(ii) not less than 1353 masl for the				
		remainder of that year.				
	2	A maximum lake drawdown of 16 m				
		from the natural lake level which is to				
		be determined in year 1.				
	(c) in yea	rs 3 and following, no incremental lake				
	drawd	lown may be conducted unless approved				
	by FLN	NR and the maximum drawdown for				
	Ramo	na Lake must not exceed 45 m; and				
	(d) the Ho	older must not draw down Ramona Lake if				
	at any	time the total suspended solids (TSS)				
	values	s measured at the outlet monitoring points				
	specif	ied below in Condition 15 exceed site-				
	specif	ic water quality guidelines for freshwater				
	aquati	ic life (BC Water Quality Guidelines).				
15	The Holde	er must develop and implement a water	Prior to Operations	Application Volume I,	EAO	Water Quality
	quality an	d lake level monitoring program at	Operations	Sections 2.5.2.4 and	FLNR	
	Ramona L	ake to the satisfaction of FLNR. All		14.2.2		
	monitorin	g instrumentation associated with this				
	program r	nust be installed and be operational prior				

No.	Condition	Timing	Application Section or	Provincial Compliance	Subject
			Supporting	Agencies	
			Documents		
	to the start of operations. The water quality				
	parameters must include temperature, TSS and				
	nutrients. The monitoring program must include the				
	following:				
	 at least one water quality monitoring station 				
	at the Upper Ramona tailrace, and one				
	station at the Ramona Lake outlet;				
	 the frequency and location of temperature 				
	and nutrient monitoring must be determined				
	by a QP;				
	at least one lake level monitoring station in				
	Ramona Lake at the Lake pump/intake				
	structure;				
	 a minimum turbidity monitoring frequency of event 20 minutes. 				
	every 30 minutes;				
	 a minimum take level monitoring frequency of overv 1 hour; and 				
	of every 1 nour, and				
	• full blutty trigger levels at which operational responses (to be specified by ELNR) and				
	supplemental TSS sampling are carried out				
	supplemental 155 sampling are carried out.				
	The Holder must maintain a website, accessible to				
	FLNR staff. showing turbidity and lake level data.				
	The data must be posted to the website within				
	24 hours of collection.				
16	Unless otherwise authorized by FLNR, the Holder	Pre-Construction	Application Volume I,	EAO	Fish Mitigation
	must design and construct the pumping system for	Construction	Section 2.5.2.4	FLNR	
	Ramona Lake based on contingencies described in	Operations			
	the letter of November 14, 2013, from the Holder to		Letter dated		
	EAO to maintain IFR flows in Ramona Creek.		November 14, 2013,		

No.	Condition	Timing	Application Section or	Provincial Compliance	Subject
			Supporting	Agencies	
			Documents		
			from the Holder to		
			EAO		
			A 11		
1/	The Holder must:	Prior to Operations	Application Volume I,	EAO	Fish Mitigation
	(a) develop and implement a fish habitat		Sections 11.2 and	FLNK	
	compensation plan (plan) for the Chickwat		Volume II, Appendix 59		
	Creek facility to the satisfaction of DFO and				
	FLNR;				
	(b) provide FLNR and EAO with copies of the plan;				
	and				
	(c) provide any proposed changes to the plan to				
	DFO and FLINK for review. Changes to the plan				
	Thust be implemented to the satisfaction of				
	to the plan to DEO and ELNE for review				
	Changes to the plan must be implemented to				
	the satisfaction of DEO and ELNR				
18	The Holder must ensure that the tailraces that are	Pre-Construction	N/A	EAO	Fish Mitigation
	part of the Project prevent fish access or fish	Construction		FLNR	
	stranding during low water levels.	Operations			
19	The Holder must adhere to Fisheries and Oceans	Prior to Operations	Application Volume I,	EAO	Fish Mitigation
	Canada Flow Ramping Study: Study of Flow Ramping	Operations	Sections 2.5.2.1,	FLNR	
	Rates for Hydropower Developments, Knight Piesold,		2.5.2.4 and 2.5.2.5.		
	2005, unless otherwise authorized by FNLR.				
			Fisheries and Oceans		
			Canada Flow Ramping		
			Study: Study of Flow		
			Ramping Rates for		
			Hydropower		
			Developments, Knight		

No.	Condition	Timing	Application Section or	Provincial Compliance	Subject
			Supporting	Agencies	
			Documents		
			Piesold, 2005		
20	During Project operations, the Holder must maintain	Operations	Application Volume I,	EAO	Fish Mitigation
	at least the following IFRs and diversion rates during		Sections 2.5.2.1,	FLNR	
	the periods specified below, as measured below the		2.5.2.4 and 2.5.2.5		
	point of diversion:				
	Chickwat Creek:				
	IFR: 0.61CMS from April 1 to July 31				
	0.44 CMS Oct 17 to Nov 17				
	0.32 CMS for the rest of the year				
	Maximum Rate of Diversion: 7.1 CMS				
	Upper Ramona Creek:				
	IFR: 0.03 CMS				
	Maximum Rate of Diversion: 2.0 CMS				
	Lower Ramona Creek:				
	IFR: 0.12 CMS				
	Maximum Rate of Diversion: 3.7 CMS				
	The Holder must cease diverting water (in the case				
	of Chickwat Creek) or pumping water (in the case of				
	upper and lower Ramona Creeks) if it is unable to				
	maintain the minimum IFR. If minimum IFR is not				
	maintained, the Holder must report this to DFO,				
	FLNR and EAO within 24 hours.				
	The Holder must not divert water at a rate greater				

No.	Condition	Timing	Application Section or	Provincial Compliance	Subject
			Documents	Agencies	
	than the maximum rate of diversion set out above during operations and commissioning. If the Holder diverts water greater than the maximum rate, the Holder must advise DFO and FLNR within 24 hours of the diversion and mitigate effects as required by EAO, DFO or FLNR.				
21	The Holder must construct and monitor the effectiveness of a fish passage structure at the Chickwat Intake, to ensure upstream and downstream fish passage. The fish passage structure must allow the upstream and downstream movement of adult Dolly Varden char.	Pre-Construction Operations	Application Volume I, Sections 11.2 and Section 24, Table 24-1	EAO FLNR	Fish Mitigation
22	 The Holder must design and implement a study (Before-After Control-Impact Study) (BACI) for coastal tailed frog (CTF) in Ramona Creek. This study, intended to measure any effects post-construction, must be designed and conducted by a QP and be consistent with the recommended methods of general program design outlined in Appendix A of the "Guidelines for the Collection and Analysis of Fish and Fish Habitat Data for the Purpose of Assessing Impacts from Small Hydropower Projects in British Columbia" or as may be replaced or amended from time to time. This study must follow the study design and methods outlined in the Upper and Lower Ramona OEMP. The program must include the following: BACI design; power analysis which meets the specified statistical criteria in Appendix A of the "Guidelines 	Pre-Construction Construction Operations	Application Volume I, Sections 11.3.4, 14.3.4, 15.3.4, 16.3.4 and 17.3.3	EAO FLNR	Wildlife Monitoring

No.	Condition	Timing	Application Section or	Provincial Compliance	Subject
			Supporting	Agencies	
	 for the Collection and Analysis of Fish and Fish Habitat Data for the Purpose of Assessing impacts from Small Hydropower Projects in BC", or as may be replaced or amended from time to time; estimates of habitat variables causing any observed changes to tadpole population; a minimum of one year of baseline monitoring prior to any construction in Ramona Creek and five years of post-construction monitoring in Ramona Creek; CTF surveys to be completed within 30m of diversion reaches in Ramona Creek; identification of stream reaches where the Project may impact CTF; collection and transplanting of CTF to undisturbed habitat in potential impact areas prior to disturbance; and measures to avoid or mitigate any confirmed statistically significant impacts of the Project on CTF populations or habitat. 				
	The Holder must implement the mitigation measures identified in the program to the satisfaction of FLNR.				
23	Prior to commencing construction, the Proponent must enter into a contribution agreement with FLNR, in the amount of \$75,000 distributed over 5 years, to support a provincial regional grizzly bear monitoring program to assess grizzly bear habitat use and movement in the Tzoonie River Valley. Once	Pre-Construction Construction Operations	Section WSS1 of Supplemental report submitted June 7, 2013	EAO FLNR	Wildlife Monitoring and Mitigation

No.	Condition	Timing	Application Section or Supporting Documents	Provincial Compliance Agencies	Subject
	complete, the results of the monitoring program, including identified mitigations, such as road closures, must be incorporated into an updated version of the project Human-Bear Conflict Management Plan specified as a requirement of the OEMP under Condition 11. The updated Human- Bear Conflict Management Plan must be provided to the <i>shishálh</i> Nation unless they advise the Holder in writing that this is unnecessary.				
24	 Prior to the operation of the Chickwat Creek powerhouse, the Holder must do one of the following two things with respect to the anadromous Reach in Chickwat Creek as identified in the "Analysis of the Effects of Upstream Pumping of IFR – Chickwat Creek" (Ecofish, July, 2013): 1. provide compensation as per DFO compensation guidelines²; 2. initiate the pumping proposal of 4 cms from the tailrace to the location set out in the report entitled "Analysis of the Effect of Upstream Pumping of IFR - Chickwat Creek" (Ecofish, July, 2013). 	Prior to Operations	Section FID2 and FID3 of Supplemental report submitted May 16, 2013 and July 4, 2013	EAO FLNR	Fish Mitigation
	The implementation of either 1 or 2 must be to the satisfaction of FLNR or DFO.				

² DFO Guide: An Application Guide to Submitting an Application for Authorization under Paragraph 35(2)(b) of the *Fisheries Act* - see guide for submitting an "offsetting plan".

No.	Condition	Timing	Application Section or	Provincial Compliance	Subject
			Supporting	Agencies	
			Documents		
25	 The Holder must design and implement a study using a QP to assess the effects of low stream flows affecting stream connectivity on macro invertebrate survival in Ramona and Chickwat Creeks by doing the following: determine sites in Ramona and Chickwat Creeks sensitive to low flow effects on macroinvertebrate habitat; monitor these sensitive sites for loss of macroinvertebrate habitat at low flow conditions created when intake and powerhouse systems are tested during start up conditions; if there is a potential for loss of macroinvertebrate habitat created under low flow conditions, the Holder must note the locations and flows and extent of invertebrate losses predicted and report these to FLNR; if effects are noted, the Holder must increase flows to reduce effects on macroinvertebrate habitat or provide compensation as required by the OPPR; and the Holder must prepare and implement an adaptive management plan, including any proposed changes, to the satisfaction of FLNR and EAO to address seasonal effects of low flows on macroinvertebrate habitat proposing a combination of flow augmentation and/or compensation. 	Prior to Operations	Documents Section FID6 of Supplemental report submitted June 10, 2013	EAO FLNR	Fish Monitoring and Mitigation

No.	Condition	Timing	Application Section or	Provincial Compliance	Subject
			Supporting	Agencies	
			Documents		
26	(a) At least one year prior to the end of Project	Decommissioning			Decommissioning
	operations, the Holder must submit a				Plan
	Decommissioning and Abandonment Plan to				
	EAO and FLNR for review;				
	(b) the plan must identify how each Project				
	component will be assessed to determine which				
	components should be removed to sustain				
	natural aquatic and terrestrial ecosystem				
	(a) the Den must include details about the type and				
	(c) the Plan must include details about the type and				
	following components:				
	 full or partial removal of instream works 				
	• Tuil of partial removal of instream works				
	 full or partial removal of salvageable 				
	components equipment and materials from				
	the intake nowerhouse switchvard and				
	ancillary facilities;				
	 permanent closure of the penstock at all 				
	access points;				
	• full or partial removal of above ground				
	transmission lines;				
	 full or partial removal of submerged 				
	transmission line;				
	 closure of all private access roads; and 				
	 reclamation of all disturbed areas where such 				
	activities are consistent with paragraph (a).				
	A draft plan, and any proposed changes, must be				
	forwarded to EAO, identified federal and provincial				
	agencies and shíshálh Nation for review and				

No.	Condition	Timing	Application Section or Supporting Documents	Provincial Compliance Agencies	Subject
	comment. The Holder must prepare and implement the Decommissioning and Abandonment Plan to the satisfaction of EAO and FLNR.				



Province of British Columbia Water Act

CONDITIONAL WATER LICENCE

The holder of a Crown Land Tenure, to which this licence is appurtenant, is hereby authorized to divert and use water as follows:

- a) The streams on which the rights are granted are Chickwat Creek, Kid s-xwixwtl'ay-ulh Creek, and Mountain Goat s-xwitl'ay Creek
- b) The points of diversion are, Chickwat Creek denoted by PD80728 at an elevation of 438 masl, Mountain Goat s-xwitl'ay Creek denoted by PD80727, and Kid s-xwixwtl'ay-ulh Creek denoted by PD80726, located as shown on the attached plan.
- c) The date from which this licence shall have precedence is April 17, 2007.
- d) The purpose for which this licence is issued is Power (general), which is to be generated with the Chickwat Creek Generating System.
- e) The maximum quantity of water which may be diverted and used under this licence is 7.1 cubic metres per second, subject to the following:
 - 1. A maximum quantity of water of 5.63 cubic metres per second from Chickwat Creek
 - 2. A maximum quantity of water of 1.10 cubic metres per second from Mountain Goat s-xwitl'ay Creek
 - 3. A maximum quantity of water of 0.37 cubic metres per second from Kid s-xwixwtl'ay-ulh Creek
 - 4. The licensee shall maintain in Chickwat Creek, Mountain Goat s-xwitl'ay Creek and Kid s-xwixwtl'ay-ulh Creek, measured immediately downstream of the point of diversion, or at a location as specified in the OPPR:
 - a) a minimum flow as per Schedule "A"; or
 - b) a minimum flow as ordered under clause (o).
- f) The period of the year during which the water may be used is the whole year.
- g) The land upon which the water is to be used and to which the licence is appurtenant is the land on which the powerhouse of the Chickwat Creek Generating System is situated, described as that parcel or tract of land tenured under the Land Act, held under Lands File No. 2409412

- h) The works authorized for the Chickwat Creek Generating System are:
 - 1. an intake (dam);
 - 2. a power penstock;
 - 3. two tributary intakes;
 - 4. diversion pipes for the tributary intakes;
 - 5. access roads;
 - 6. a powerhouse, tailrace and switch yard;
 - 7. 25 kV transmission line from powerhouse to the Narrows Inlet Substation; and
 - 8. 138 kV transmission line to the Sechelt Peninsula near Ruby Lake Substation, jointly shared with the Tyson Creek Generating System;

which shall be located approximately as shown on the attached plan.

- i) The construction of the said works shall be completed and the water shall be beneficially used prior to December 31, 2018. Thereafter, the licensee shall continue to make regular beneficial use of the water in the manner authorized herein.
- j) Before commencing construction of the works authorized under clause (h) of this licence, the licensee must to the satisfaction of the Engineer under the Water Act (the "Engineer") or the Regional Water Manager:
 - 1. Retain a Professional Engineer registered in the Province of British Columbia (the "Independent Engineer") who will provide services to the Engineer for the regulation of construction of the works;
 - 2. Retain a person with professional qualifications (the "Environmental Monitor") who will monitor environmental impacts from the construction of works;
 - 3. Submit, the following:
 - a) plans that show the general arrangement of the works;
 - b) criteria for the design of the works;
 - c) criteria for the operation of the works;
 - d) a schedule for the construction of the works; and
 - e) a Construction Environmental Management Plan (CEMP) for the management and mitigation of construction impacts;
 - f) an Interim Operational Environmental Management Plan (OEMP);
 - g) Terms of Reference for a Hydraulic Connectivity Study, describing the methodology to be used;
 - h) Terms of Reference for the Macroinvertebrates Connectivity Study as per your Environmental Certificate E13-04, Schedule B, Condition 25, describing the methodology to be used;
 - i) the proposed Dam Failure Consequences Classification for the Chickwat Creek intake.
 - 4. Obtain Leave to Commence Construction (LTCC) in writing from the Engineer.

- k) Before undertaking construction of any component of works for which LTCC issued under clause (j) (4), the licensee must:
 - 1. Ensure that the design drawings for the works to be constructed are signed and sealed by a Professional Engineer registered in the Province of British Columbia (the "Design Engineer");
 - 2. Ensure that a Professional Engineer registered in the Province of British Columbia (the "Construction Engineer") supervises the construction of the works; and
 - 3. Obtain letter from the Independent Engineer that the actual construction of that component work may proceed.
- 1) Before commencing the diversion and use of water for commissioning of the works authorized under clause (h) of this licence, the licensee must:
 - 1. Submit a functional Operating Parameters and Procedures Report (OPPR) for acceptance by the Regional Water Manager for the operation of the works;
 - 2. Submit an updated Fish Adaptive Management Plan for acceptance by the Regional Water Manager;
 - 3. Submit a Ramping Study for acceptance by the Regional Water Manager;
 - 4. Submit the baseline analysis for the Macroinvertebrates Connectivity Study, and the monitoring plan to be used during the operations of the project;
 - 5. Submit an Operational Environmental Monitoring plan (OEMP) for acceptance by the Regional Water Manager;
 - 6. Submit an updated Dam Failure Consequences Classification for the Chickwat Creek intake; and
 - 7. Obtain Leave to Commence Diversion (LTCD) and the use of water, in writing, from the Regional Water Manager.
- m) The licensee must:
 - 1. Design an OEMP to determine the nature of any impacts on fish, macroinvertebrates, and fish habitat, which includes data to allow for statistically supportable quantification of impact to baseline conditions over time to the satisfaction of the Regional Water Manager;
 - 2. Implement the program to the satisfaction of the Regional Water Manager;
 - 3. Continue the program for 5 years following the commencement of operation of the works or to the satisfaction of the Regional Water Manager;
 - 4. Submit annual reports summarizing the results of the monitoring program to the Regional Water Manager, within 30 working days of the date of precedence (April 17) specified in clause (c).
- n) Before commencing operation of the works authorized under clause (h), the licensee must:
 - 1. Submit a report for acceptance by the Regional Water Manager on the operational parameters and procedures (OPPR) for the operation of the works;
 - 2. Submit and implement an Operational Environmental Monitoring Plan (OEMP) to

the satisfaction of the Regional Water Manager;

- 3. Submit a draft Operation, Maintenance and Surveillance (OMS) Manual, and an Emergency Preparedness Plan (EPP) for acceptance by the Regional Water Manager;
- 4. Submit the field verification report from the Hydraulic Connectivity Study for acceptance by the Regional Water Manager; and
- 5. Submit the field verification report from the Macroinvertebrates Connectivity Study for acceptance by the Regional Water Manager; and
- 6. Obtain Leave to Commence Operations (LTCO) of the Chickwat Creek Generating System, in writing from the Regional Water Manager.
- o) The diversion of water authorized under this licence may be restricted or prohibited at any time by an Order in writing of an Engineer under the Water Act or the Regional Water Manager, for the regulation of the diversion, rate of the diversion, and use of the water as may be required for the preservation of fish, wildlife, macroinvertebrates, or navigation.
- p) The dam authorized under clause (h) are subject to the Dam Safety Regulations and shall be designed, constructed and maintained to the satisfaction of a Dam Safety Officer under the Water Act and in accordance with the Canadian Dam Association Guidelines.
- q) Final construction drawings, Operation, Maintenance and Surveillance Manual and Emergency Preparedness Plan must be submitted to the Dam Safety Officer during the first year of operation.
- r) Based on the results of the Macroinvertebrate Connectivity Study, the Regional Water Manager may require the licensee to:
 - 1. Develop and execute a monitoring plan or specifically to evaluate the potential influence of connectivity changes on invertebrate habitat; or
 - 2. Develop and implement a Macroinvertebrate Adaptive Management Plan to address seasonal effects of flows on macroinvertebrate habitat.
- s) Based on the results of the Hydraulic Connectivity Study, the Regional Water Manager may require the licensee to:
 - 1. Develop and execute a monitoring plan, in addition to those specified in the Operational Environmental Monitoring Program, specifically to evaluate the potential influence of connectivity changes on fish migration and invertebrate drift; and
 - 2. Implement pulse flows if the magnitude and frequency of connectivity changes are predicted to result in likely adverse ecological effects (such as reduction in fish migration and invertebrate drift) than as history have been present.

- t) The licencee must prepare a Fish Adaptive Management Plan that is to be used for the regulation of the minimum flow requirement, for acceptance by the Regional Water Manager:
 - 1. This Fish Adaptive Management Plan must be implemented at the time of the first diversion of water for the production of power.
 - 2. The minimum flow requirement specified in clause (e) and listed on Schedule A, columns (1), (3), and (4), are to be supplemented by Schedule A, Column (2), if required by the Fish Adaptive Management Plan;
 - 3. The analysis of the monitoring data for assessing the metrics for the Abundance Action Threshold of the Fish Adaptive Management Plan, must be prepared for a January 1st implementation of a minimum flow requirement;
 - 4. The Regional Water Manager must be informed of the minimum flow requirement to be implemented, and provided a copy of the supporting analysis.
- u) The licensee must submit a Compensation Plan to compensate for the project impacts to the satisfaction of the Regional Water Manager, and part of this plan may be required to be implemented prior to the Leave to Commence Diversion (LTCD) being issued.
- v) The drawings of record that show the works as they were constructed, must be stored and archived, and shall be provided for review when directed by the Regional Water Manager.
- w) The term of this licence is 40 years from the date of issuance of this licence.

RM

Remko Rosenboom, M.Sc., A.Ag. Regional Water Manager





Schedule "A" Minimum Flow Requirements Chickwat Creek Power Project Conditional Water Licence: C131287 Water File: 2002916 Land File: 2409412

Minimum flow measured at the works, or immediately below the respective point of diversion, or as specified in the OPPR will be:

	Minimum Instantaneous Flow, cubic metres per second [m3/s]						
Month	Chickwat	Chickwat	Kid	Mountain Goat			
	Creek	Creek	s-xwixwtl'ay-ulh	s-xwitl'ay			
			Creek	Creek			
	PD80728	"multi-route	PD80726	PD80727			
		obstacle"					
		downstream of					
		anadromous fish					
		barrier					
	(1)	(2)	(3)	(4)			
January 1 st	0.32	0.6	0.01	0.03			
January 7 th	0.32	0.6	0.01	0.03			
January 8 th	0.32	0.0	0.01	0.03			
February	0.32	0.0	0.01	0.03			
March	0.32	1.9	0.01	0.03			
April	0.61	1.9	0.01	0.03			
May 1 st	0.61	1.9	0.01	0.03			
May 7 th	0.61	1.9	0.01	0.03			
May 8 th	0.61	0.2	0.01	0.03			
June	0.61	0.2	0.01	0.03			
July	0.61	0.2	0.01	0.03			
August	0.32	0.2	0.01	0.03			
September	0.32	0.2	0.01	0.03			
October 1 st	0.32	0.2	0.01	0.03			
October 23 rd	0.32	0.2	0.01	0.03			
October 24 th	0.44	0.6	0.01	0.03			
November	0.44	0.6	0.01	0.03			
December	0.32	0.6	0.01	0.03			

Notes:

- 1. Column (2) flows are in addition to Column (1) flows, i.e. 0.32 + 0.6 = 0.93 m3/s, if required by the Chickwat Creek Fish Adaptive Management Plan
- 2. Column (2) flows are implemented on January 1st in accordance with the analysis in the Chickwat Creek Fish Adaptive Management Plan, or as approved by the Regional Water Manager.

Remko Rosenboom Regional Water Manager Dated at Surrey, British Columbia, this 16th day of December, 2015

Suite 200, 10428 - 153 St Surrey BC V3R 1E1 Phone: (604) 586-4400 Fax: (604) 586-4434



Water Act

File: 2004039

APPROVAL

WATER ACT - Subsection 9(1), Clauses (a), (b) and (c) (Changes in and about a stream)

NI Hydro Holding Corp.

is hereby authorized to make changes in and about a stream as follows:

- (a) The name of the stream is Chickwat Creek, tributaries to Chickwat Creek, Tzoonie River, tributaries to Tzoonie River, Unnamed Streams to Narrows Inlet (Sea), herein referred to as "the stream".
- (b) The changes to be made in and about the stream are:

The removal, construction, and the maintenance of bridges, CMP culverts, WBC culverts as listed on Schedule A of this Approval, on Chickwat Creek, tributaries to Chickwat Creek, on the Tzoonie River, tributaries to Tzoonie River, tributaries to Narrows Inlet (sea), for restoring access on the Tzoonie Mainline, within Land Tenures 2409412 and 2409775.

- (c) This Approval does not authorize entry on privately held land or Crown land.
- (d) This Approval does not constitute authority of any other agency. The holder of this Approval shall have the necessary permits from other agencies concerned prior to the commencement of the works authorized herein.
- (e) The holder of this Approval must have permits or other written consent from any affected right-of-way holders before commencing work that could affect utilities or other structures within the right-of-ways.
- (f) This Approval does not authorize the alteration or removal of any works held under a water licence.
- (g) The holder of this Approval shall take reasonable care to avoid damaging any land, works, trees, or other property and shall make full compensation to the owners for any damage or loss resulting from the exercise of rights granted hereunder.
- (h) The work authorized shall be completed on or before December 31, 2018, and the holder of this Approval shall advise the Water Information Technician (604-586-4400) when the changes have been completed.
- (i) A copy of this Approval (and associated plans/drawings listed on this Approval) must be available for inspection, upon request, at any location where the authorized changes in and about a stream are being undertaken.

(j) Work in the stream channel shall occur:

(1) During the period of August 1 to September 15, so that the fisheries interests are protected; or

(2) Outside of the reduced risk window (as stated above) in order to accommodate the project schedule, subject to the following:

(i) The Environmental Monitor shall provide advice to the holder of this Approval on the timing of the work based on: the nature of the works, environmental values (including fish, amphibians, wildlife, any listed species present), water quality, channel stability, weather conditions, water levels, and any other relevant factors); and

(ii) The Environmental Monitor shall also provide additional construction mitigation advice to the holder of this Approval, and daily or full-time supervision of all work in or near the stream; and

(iii) Work must be timed and planned appropriately, the stream must be completely dry or have marginal flows for the duration of the construction activities; and

(iv) The advice of the Environmental Monitor on construction timing (as per (i) above) and mitigation measures (as per (ii) above), as well as the timing of work and the presence of the Environmental Monitor, must be documented in writing. This documentation must be retained for at least 2 years following construction, and if requested by this office, provided for our review.

- (k) All works shall comply with "Narrows Inlet Hydro LP, Road Upgrade Prescription Overview," August 18, 2015 in the September 17, 2015 application, prepared by Hedberg Associates, and the works authorized are those stream crossings listed on Schedule A of this Approval.
- (I) The works shall be designed and installed so as not to restrict fish passage and/or lead to fish stranding.
- (m) Equipment and machinery used in or near the stream channel must be in good operating condition and free of leaks, excess oil and grease.
- (n) Care shall be exercised during all phases of the work to prevent the release of silt, sediment, sediment-laden water, raw concrete, concrete leachate or any deleterious substances.
- (o) All excavated material and debris removed from the site, must be placed in a stable area above the high water mark of the stream and mitigative measures to protect the excavated material and debris from erosion and reintroduction into the watercourse shall be used, such as, but not limited to, covering the material with erosion blankets or seeding and planting with native vegetation.
- (p) All temporary works (including a ford, stream crossing, flow bypass) shall be removed on completion of the project, and the stream channel restored to its natural condition.

- (q) A spill containment kit or drip tray must be readily accessible on-site and no equipment or machinery refueling shall take place within 10 meters of any watercourse.
- (r) If dewatering or isolation of flow will be conducted, and the stream is known or suspected to contain fish and/or amphibians, the holder of this Approval will designate an appropriately qualified environmental professional to salvage any fish and amphibians present, prior to commencement of work in the stream channel. It is the responsibility of the holder of this Approval to obtain any permits needed prior to the salvage.
- (s) The holder of this Approval shall retain a qualified Environmental Monitor to supervise all in-stream works authorized under this Approval. In the event of an environmental incident or non-compliance with any of the terms or conditions of this Approval, the Environmental Monitor shall notify the Assistant Regional Water Manager (604-586-4400), within 24 hours.
- (t) The Environmental Monitor is hereby granted authority to stop the work authorized under this Approval if deemed necessary by the Environmental Monitor to address risks to the environment.
- (u) Archeological sites (both recorded and unrecorded) are protected under the Heritage Conservation Act and must not be altered or damaged without a permit from the Archeology Branch. The holder of this Approval must advise everyone who will be involved in ground-disturbance and construction that if archeological materials are encountered, activities must be halted and the Archeology Branch contacted at 250-953-3334 for direction.
- The holder of this Approval must provide a brief post-construction report within 60 days of completion of the works.

That report shall include a signed statement from the Environmental Monitor summarizing: the in-stream works undertaken, the timing of those works, the total instream area directly affected, the frequency of monitoring; whether or not they observed or were otherwise aware of any non-compliance with the terms and conditions of this Approval; and a description of any environmental incidents, non-compliance or other difficulties, and how these were addressed and reported. The report shall be provided as a hard copy addressed to James Davies, Regional Hydrologist, labelled with the file number of this Approval.

Remko Rosenboom, M.Sc., A.Ag. Regional Water Manager

Approval File No.: 2004039 Date Issued: November 18, 2015 Approval No.: 2004039 Precinct: 29D - Jervis

13 UC-13	46 C-9	12 UC-12	137 LC-9	47 C-10	157 TU-5	183 C-17	10 0C-10	48 C-11	e-01/6	a uc-s	182 C-16	134 110-6	7100-7	6JUC-6	158 TU-6	133 LC-5	s uc-s	51 (C-14	186 UC-4	4 UC-4	159 TU-7	132 LC-4	2 UC-2	131 10-3	109 Chickwat PH Unner		54 TA 45	50 TM-5	61 TM-6	62 TM-7	63 TM-8	64 TM-9	65 TM-10	66 TM-11	67 TM-12	68 TM-13	F9 TM-14	20 Sanih Cart	71-101121	84) TMC-6	73 TM-18	55 3+900 Bridge 2	76 Tzoonie River	77 TM-22	. 75 TM23	78 TM-23	101 RM1	98 RM-1	100 RM-2	102 RM-4	103 RM-5	104 RM-6	105 RM-7
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Water Act Approval 2004039 Schedule A List of Bridges, CMP culverts, WBC culverts under this Approval

Water Act Approval 2004039 Schedule A

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List of Bridges, CMP culverts, WBC culverts under this Approval Reference Map: Narrows Inlet Hydro LP, Road Upgrade Prescription Overview, dated August 18, 2015, prepared by Hedberg Associates Type Length Culv_Size WBC_Size Action

	87 (C)-2	88 CCI-3	37 Chickwat Intake	36 UC-36	152 C-33	38 (C-1	35 UC-35	34 00-34	24-52	Te-2 061	150 2 11		22-11-22	385	A0 0.4	154 TU-2	146 C-27	31{UC-31	30 UC-30	28 UC-28	E-01165	144 (C-25	4174	2/10-2/	22 JU 22	35 JU 36		74 HC-34	23 UC-23	142 C-23	21 UC-21	43 C-6	20 UC-20	141 C-22	89 TMC-8	140 C-21	1/100-17	44 0-/	07-70 AEY	120 - 0	75 C.º	15/10-15	156 TU-4	138 C-19	
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Remko Rosenboorn, M.Sc., A.Ag. Regional Water Manager aller

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PROVINCE OF BRITISH COLUMBIA Water Act

PERMIT AUTHORIZING THE OCCUPATION OF CROWN LAND FOR A CHANGE IN AND ABOUT A STREAM APPROVAL

SECTION 26 of the WATER ACT

The holder of the following Section 9 Water Approval, which authorizes changes in about the following streams, Chickwat Creek, tributaries to Chickwat Creek, on the Tzoonie River, tributaries to Tzoonie River, and tributaries to Narrows Inlet (sea), is hereby authorized to occupy Crown land by constructing, maintaining and operating thereon the works authorized under the said Approval.

Water Approval No.: 2004039

- (a) The Crown land which is authorized to be occupied under this permit is that parcel or tract of land in the vicinity of District Lot 8158, Group 1, New Westminster District, in the vicinity of Sechelt Band Land 8, and in the vicinity of Sechelt Band Land 9.
- (b) The approximate dimensions of the Crown land authorized to be occupied under this permit are:
 - (i) To the west of Sechelt Band Land 8, 650 metres in length by 15 metres in width for an area of 0.975 hectare (2.409 acres)
 - To the south of Sechelt Band Land 9, 1375 metres in length by 15 metres in width for an area of 2.0625 hectare (5.0965 acres)
- (c) Prior to the cutting or destruction of any timber, necessary to permit construction and maintenance of the said works, the permittee shall apply for and obtain a licence to cut timber from FrontCounterBC. The amount of stumpage, royalty and/or compensation payable to the Crown in respect of trees, including merchantable or young growth, cut, removed, damaged, or destroyed by the permittee, shall be the sum or sums fixed by the Forest Service of the Province of British Columbia.
- (d) This permit is appurtenant to the land to which the aforesaid water approval is appurtenant.
- (e) This permit shall become void if the water approval with respect to which the permit is issued should terminate, be abandoned or cancelled, or amended so as to render this permit unnecessary.
- (f) This permit is issued and accepted on the understanding that the permittee shall indemnify and save harmless the Government of the Province of British Columbia for all loss, damage to works, cost or expense suffered by the permittee by reason of the Crown land or any portion thereof being submerged or damaged by erosion.
- (g) The holder of this permit shall not be entitled to compensation if the Crown grants permits to other persons to occupy the land affected by this permit.
- (h) In the event of a dispute at any time with respect to the area or boundaries of the land affected by this permit, the holder shall, at his own expense, have the said land surveyed by a duly authorized surveyor.

Remko Rosenboom, M.Sc. A.Ag Regional Water Manager



LICENCE OF OCCUPATION

Licence No.:

242886

File No.: 2409412 Disposition No.: 864234

THIS AGREEMENT is dated for reference September 11, 2015 and is made under the Land Act.

BETWEEN:

HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF BRITISH COLUMBIA, represented by the minister responsible for the Land Act, Parliament Buildings, Victoria, British Columbia

(the "Province")

AND:

NI HYDRO HOLDING CORP.

(Inc. No. BC0814633) 200 4723 1st Street SW Calgary, AB T2G 4Y8

(the "Licensee")

The parties agree as follows:

ARTICLE 1 - INTERPRETATION

1.1 In this Agreement,

"Agreement" means this licence of occupation;

"Commencement Date" means November 1, 2015;

"disposition" has the meaning given to it in the Land Act and includes a licence of occupation;

"Fees" means the fees set out in Article 3;

- "Hazardous Substances" means any substance which is hazardous to persons, property or the environment, including without limitation
 - (a) waste, as that term is defined in the Environmental Management Act; and

UTILITY LICENCE

Page 1 of

Licent	· 2428	86	File No.: 2409412
-	~14U	00	Disposition No.: 864234
	(b) any or r con app	y other hazardous, toxic or other dan release into the environment of whi atrolled or regulated under any laws plicable to, or having jurisdiction in	ngerous substance, the use, transportation ch, is now or from time to time prohibited s or by any governmental authority, relation to, the Land;
	"Improvements" added to, in and also in or ditching	includes anything made, constructon, on or under the Land, and attached cludes any clearing, excavating, dig of, in, on or under the Land;	ed, erected, built, altered, repaired or ed to it or intended to become a part of it, gging, drilling, tunnelling, filling, grading
	"Land" means tha by bold lin Schedule" of highway	at part or those parts of the Crown I be on, the schedule attached to this a except for those parts of the land the ys (as defined in the <i>Transportation</i>	and either described in, or shown outlined Agreement entitled "Legal Description hat, on the Commencement Date, consist a Act);
	"Realty Taxes" m charged, at the Land, t applicable	neans all taxes, rates, levies, duties, t any time, by any government auth he Improvements or both of them a laws;	charges and assessments levied or ority having jurisdiction which relate to and which you are liable to pay under
	"Security" means accordance	the security referred to in section 6 e with section 6.5;	5.1 or 6.2, as replaced or supplemented in
	"Term" means the	e period of time set out in section 2	.2;
	"wc", "us" or "ou Province a	ur " refers to the Province alone and nd the Licensee: that combination	never refers to the combination of the is referred to as "the parties"; and
	"you" or "your" i	refers to the Licensee.	
1.2	In this Agreement, other legal represe wherever the singu plural or feminine parties require.	, "person" includes a corporation, p entatives of a person to whom the co ular or masculine form is used in th or neuter form, as the case may be,	partnership or party, and the personal or ontext can apply according to law and is Agreement it will be construed as the , and vice versa where the context or
1.3	The captions and h define or in any wa	neadings contained in this Agreeme ay limit the scope or intent of this A	ent are for convenience only and do not Agreement.
1.4	This Agreement w	vill be interpreted according to the la	aws of the Province of British Columbia.
1.5	Where there is a re this Agreement, th	eference to an enactment of the Pro- at reference will include a reference	vince of British Columbia or of Canada in e to every amendment to it, every

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Lice	nce 242886	File No.: 2409412
		Disposition No.: 864234

regulation made under it and any subsequent enactment of like effect and, unless otherwise indicated, all enactments referred to in this Agreement are enactments of the Province of British Columbia.

- 1.6 If any section of this Agreement, or any part of a section, is found to be illegal or unenforceable, that section or part of a section, as the case may be, will be considered separate and severable and the remainder of this Agreement will not be affected and this Agreement will be enforceable to the fullest extent permitted by law.
- 1.7 Each schedule to this Agreement is an integral part of this Agreement as if set out at length in the body of this Agreement.
- 1.8 This Agreement constitutes the entire agreement between the parties and no understanding or agreement, oral or otherwise, exists between the parties with respect to the subject matter of this Agreement except as expressly set out in this Agreement and this Agreement may not be modified except by subsequent agreement in writing between the parties.
- 1.9 Each party will, upon the request of the other, do or cause to be done all lawful acts necessary for the performance of the provisions of this Agreement.
- 1.10 Any liabilities or obligations of either party arising, or to be performed, before or as a result of the termination of this Agreement, and which have not been satisfied or remain unperformed at the termination of this Agreement, any indemnity and any release in our favour and any other provision which specifically states that it will survive the termination of this Agreement, shall survive and not be affected by the expiration of the Term or the termination of this Agreement.
- 1.11 Time is of the essence of this Agreement.
- 1.12 Wherever this Agreement provides that an action may be taken, a consent or approval must be obtained or a determination must be made, then you or we, as the case may be, will act reasonably in taking such action, deciding whether to provide such consent or approval or making such determination; but where this Agreement states that you or we have sole discretion to take an action, provide a consent or approval or make a determination, there will be no requirement to show reasonableness or to act reasonably in taking that action, providing that consent or approval or making that determination.
- 1.13 Any requirement under this Agreement for us to act reasonably shall not require us to act in a manner that is contrary to or inconsistent with any legislation, regulations, Treasury Board directives or other enactments or any policy, directive, executive direction or other such guideline of general application.

UTILITY LICENCE

Page 3 of ____

Licence 242886

ARTICLE 2 - GRANT AND TERM

- 2.1 On the terms and conditions of this Agreement, we grant you, your employees, agents and contractors a licence to occupy the Land only for the purposes of excavating for, constructing, operating, removing, replacing, reconstructing, repairing and safeguarding the Improvements necessary for a Clean Energy Project as set out in the most recently approved Development Plan held on file by us and for telecommunications equipment necessary for the operation of such Improvements; and you acknowledge this licence of occupation does not grant you exclusive use and occupancy of the Land.
- 2.2 The term of this Agreement commences on the Commencement Date and terminates on the 3rd anniversary of that date, or such earlier date provided for in this Agreement. We reserve the right to terminate this Agreement in certain circumstances as expressly provided in this Agreement.

ARTICLE 3 - FEES

- 3.1 You will pay to us
 - (a) for the first year of the Term, Fees of \$182,809.23, payable in advance on the Commencement Date; and
 - (b) for each year during the remainder of the Term, the Fees either determined by us under section 3.2 or established under section 3.3, payable in advance on each anniversary of the Commencement Date.
- 3.2 We will, not later than 15 days before each anniversary of the Commencement Date during the Term, give written notice to you specifying in our sole discretion the Fees payable by you under subsection 3.1(b) for the subsequent year of the Term and we will establish such Fees in accordance with our policies applicable to your use of the Land under this Agreement.
- 3.3 If we do not give notice to you under section 3.2, the Fees payable by you under subsection 3.1(b) for the year for which notice was not given will be the same as the Fees payable by you for the preceding year of the Term.

ARTICLE 4 - COVENANTS

4.1 You must

(a) pay, when due,

UTILITY LICENCE

Page 4 of ____

- (i) the Fees to us at the address set out in Article 10,
- (ii) the Realty Taxes, and
- (iii) all charges for electricity, gas, water and other utilities supplied to the Land for use by you or on your behalf or with your permission;
- (b) deliver to us, immediately upon demand, receipts or other evidence of the payment of Realty Taxes and all other money required to be paid by you under this Agreement;
- (c) observe, abide by and comply with
 - (i) all applicable laws, bylaws, orders, directions, ordinances and regulations of any government authority having jurisdiction in any way affecting your use or occupation of the Land or the Improvements including without limitation all laws, bylaws, orders, directions, ordinances and regulations relating in any way to Hazardous Substances, the environment and human health and safety, and
 - (ii) the provisions of this Agreement;
- (d) in respect of the use of the Land by you or by any person who enters upon or uses the Land as a result of your use of the Land under this Agreement, keep the Land and the Improvements in a safe, clean and sanitary condition satisfactory to us, and at our written request, rectify any failure to comply with such a covenant by making the Land and the Improvements safe, clean and sanitary;
- (e) not commit any wilful or voluntary waste, spoil or destruction on the Land or do anything on the Land that may be or become a nuisance to an owner or occupier of land in the vicinity of the Land;
- (f) use and occupy the Land only in accordance with and for the purposes set out in section 2.1;
- (g) not construct, place, anchor, secure or affix any Improvement in, on, or to the Land or otherwise use the Land in a manner that will interfere with any person's riparian right of access over the Land and you acknowledge and agree that the granting of this Agreement and our approval of the Improvements under this Agreement, whether through our approval of a Management Plan (where applicable) or otherwise, do not:
 - (i) constitute a representation or determination that such Improvements will not give rise to any infringement of any riparian right of access that may exist over the Land; or
 - (ii) abrogate or authorize any infringement of any riparian right of access that may

UTILITY LICENCE

Page 5 of A

exist over the Land;

and you remain responsible for ensuring that you will not cause any infringement of any such riparian right of access;

- (h) pay all accounts and expenses as they become due for work performed on or materials supplied to the Land at your request, on your behalf or with your permission, except for money that you are required to hold back under the *Builders Lien Act*;
- (i) if any claim of lien over the Land is made under the Builders Lien Act for work performed on or materials supplied to the Land at your request, on your behalf or with your permission, immediately take all steps necessary to have the lien discharged, unless the claim of lien is being contested in good faith by you and you have taken the steps necessary to ensure that the claim of lien will not subject the Land or any interest of yours under this Agreement to sale or forfeiture;
- (j) not cut or remove timber on or from the Land without being granted the right under the *Forest Act* to harvest Crown timber on the Land;
- (k) obtain our prior written consent, which consent may be unreasonably withheld, before permitting any other person to use the Land or the Improvements (including without limitation, any copper, coaxial, fibre optic or similar material or device) for any telecommunications purpose;
- (l) obtain our prior written consent, which consent may be unreasonably withheld, before using the Land or the Improvements for any telecommunications purpose other than a telecommunications purpose which is necessary for your operation of the Improvements;
- (m) if any soil is disturbed by you as a result of your construction or maintenance of the Improvements, at your expense, restore the surface of the Land to a condition satisfactory to us;
- (n) permit the free and unrestricted use by the general public of the banks of Chickwat Creek and Tzoonie Creek for recreational and fishing purposes;
- (o) deliver to us surveys for certain components of the Clean Energy project (including, but not limited to, the powerhouse, penstock, intake and transmission lines) on the Land prepared by a British Columbia Land Surveyor, in a form satisfactory to us, not later than 30 days prior to the expiration of this Agreement;
- (p) notwithstanding Article 3 of this Agreement, submit fees for removal of material as outlined in the Additional Fees and Rents, attached hereto as Schedule A, Additional Fees & Rents;

UTILITY LICENCE

Page 6 of _____

Licence	242886	File No.: 2409412
	242000	Disposition No.: 864234
(q)	be in compliance with a Water Licence held on	Water File No. 2002916;
(r)	not conduct any activities, or install any Improv receipt of a "Leave to Commence Construction' the Assistant Regional Water Manager;	vements on the Land until you are in " or express written consent from from
(s)	adhere to the conditions contained in the Enviro E13-04 Table of Conditions dated November 25 thereto, held on file by us;	onmental Assessment Certificate No. 5, 2013, and subsequent revisions
(t)	submit to us a copy of any approved revisions to Certificate Table of Conditions, dated November approval;	o the Environmental Assessment er 25, 2013, within thirty (30) days of
(u)	adhere to the conditions contained in the "reque measures" letter dated April 23, 2014, and subs us;	est for exemption from general wildlife equent revisions thereto, held on file by
(v)	submit to us a copy of any approved revisions to general wildlife measures" letter dated April 23 approval;	o the "request for exemption from , 2014, within thirty (30) days of their
(w)	have a qualified professional (coast) design any standards as outlined in the Ministry of Forests applicable legislation;	access roads and bridges to the and Range Engineering Manual and
(x)	upon completion of construction of the access r qualified professional's report, similar to an 'As qualified professional, stating that the construct legislation;	oads and bridges, submit to us a Built Certificate' signed and sealed by a ion conforms to the standards and
(y)	prior to beginning construction leading onto any permit from the District Engineer, Ministry of T Highways District in which the Land is situated	y public highway, obtain an access Fransportation and Infrastructure for the l;
(z)	not construct access roads to a width exceeding without our prior written consent;	20 metres plus 3 metres for cuts and fill
(aa)	deactivate access roads, in accordance with the Forests and Range Engineering Manual and app satisfaction of the District Manager, Sunshine C of the access roads no longer be required, or up	standards outlined in the Ministry of blicable legislation, and to the Coast Forest District, should some or all on termination of this Agreement;
UTILITY LIC	ENCE	Page 7 of

Licence	242	886	File No.: 2409412
	- +		Disposition No.: 864234
(bb)) take a mater on or admin	all reasonable precautions to avoid disturb rial found on or under the Land and, upon under the Land, you must immediately n nistering the <i>Heritage Conservation Act</i> ;	oing or damaging any archaeological discovering any archaeological material otify the ministry responsible for
(cc)	perm the L grour or ad oblig we ta	it us, or our authorized representatives, to and and the Improvements, including with adwater and other materials and substance visable for us to determine whether or not ations under this Agreement with respect ke reasonable steps to minimize any disru-	enter on the Land at any time to inspect hout limitation to test and remove soil, es, where the inspection may be necessary t you have complied with your to Hazardous Substances, provided that uption of your operations;
(dd)) inden claim solici	nnify and save us and our servants, emplo us, actions, causes of action, losses, damag itors and other professional advisors, arisi	oyees and agents harmless against all ges, costs and liabilities, including fees of ng out of one or more of the following:
	(i)	any breach, violation or non-performar	nce of a provision of this Agreement,
	(ii)	any conflict between your use of the La use of the Land by any other person, ar	and under this Agreement and the lawfulnd
	(iii)	any personal injury, bodily injury (inclusion of the La occurring or happening on or off the La occupation of the Land,	uding death) or property damage and by virtue of your entry upon, use or
	and the immo	he amount of all such losses, damages, co ediately upon demand; and	osts and liabilities will be payable to us
(ee)) on th	e termination of this Agreement,	
	(i)	peaceably quit and deliver to us posses paragraphs (ii), (iii) and (iv), the Impro condition,	sion of the Land and, subject to ovements in a safe, clean and sanitary
	(ii)	within 30 days, remove from the Land the Improvement was placed on or mac tenant's fixture normally removable by (other than as a tenant's fixture) or part this Agreement,	any Improvement you want to remove, if de to the Land by you, is in the nature of a v tenants and is not part of a building t of the Land and you are not in default of
	(iii)	not remove any Improvement from the Agreement, unless we direct or permit	Land if you are in default of this you to do so under paragraph (iv),
	(iv)	remove from the Land any Improveme	nt that we, in writing, direct or permit vo

to remove, other than any Improvement permitted to be placed on or made to the Land under another disposition, and

(v) restore the surface of the Land as nearly as may reasonably be possible, to the condition that the Land was in at the time it originally began to be used for the purposes described in this Agreement, but if you are not directed or permitted to remove an Improvement under paragraph (iii), this paragraph will not apply to that part of the surface of the Land on which that Improvement is located,

and all of your right, interest and estate in the Land will be absolutely forfeited to us, and to the extent necessary, this covenant will survive the termination of this Agreement.

- 4.2 You will not permit any person who enters upon or uses the Land as a result of your use of the Land under this Agreement to do anything you are restricted from doing under this Article.
- 4.3 You must not use all or any part of the Land
 - (a) for the storage or disposal of any Hazardous Substances; or
 - (b) in any other manner whatsoever which causes or contributes to any Hazardous Substances being added or released on, to or under the Land or into the environment from the Land;

unless

- (c) such storage, disposal, release or other use does not result in your breach of any other provision of this Agreement, including without limitation, your obligation to comply with all laws relating in any way to Hazardous Substances, the environment and human health and safety; and
- (d) we have given our prior written approval to such storage, disposal, release or other use and for certainty any such consent operates only as a consent for the purposes of this section and does not bind, limit, or otherwise affect any other governmental authority from whom any consent, permit or approval may be required.
- 4.4 Despite any other provision of this Agreement you must:
 - (a) on the expiry or earlier termination of this Agreement; and
 - (b) at any time if we request and if you are in breach of your obligations under this Agreement relating to Hazardous Substances;

promptly remove from the Land all Hazardous Substances stored, or disposed of, on the Land,

UTILITY LICENCE

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Licence 242886

or which have otherwise been added or released on, to or under the Land:

- (c) by you; or
- (d) as a result of the use of the Land under this Agreement;

save and except only to the extent that we have given a prior written approval expressly allowing specified Hazardous Substances to remain on the Land following the expiry of the Term.

- 4.5 We may from time to time
 - (a) in the event of the expiry or earlier termination of this Agreement;
 - (b) as a condition of our consideration of any request for consent to an assignment of this Agreement; or
 - (c) if we have a reasonable basis for believing that you are in breach of your obligations under this Agreement relating to Hazardous Substances;

provide you with a written request to investigate the environmental condition of the Land and upon any such request you must promptly obtain, at your cost, and provide us with, a report from a qualified and independent professional who has been approved by us, as to the environmental condition of the Land, the scope of which must be satisfactory to us and which may include all such tests and investigations that such professional may consider to be necessary or advisable to determine whether or not you have complied with your obligations under this Agreement with respect to Hazardous Substances.

- 4.6 You must at our request from time to time, but not more frequently than annually, provide us with your certificate (and if you are a corporation such certificate must be given by a senior officer) certifying that you are in compliance with all of your obligations under this Agreement pertaining to Hazardous Substances, and that no adverse environmental occurrences have taken place on the Land, other than as disclosed in writing to us.
- 4.7 We will not do anything on the Land that will interfere materially with the Improvements or your use of the Improvements, or that creates a public hazard.

ARTICLE 5 - LIMITATIONS

5.1 You agree with us that

 in addition to the other reservations and exceptions expressly provided in this Agreement this Agreement is subject to the exceptions and reservations of interests,

UTILITY LICENCE

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Licence	212885	File No.: 2409412
	242000	Disposition No.: 864234

rights, privileges and titles referred to in section 50 of the Land Act;

(b) other persons may hold or acquire rights to use the Land in accordance with enactments other than the Land Act or the Ministry of Lands, Parks and Housing Act, including rights held or acquired under the Coal Act, Forest Act, Geothermal Resources Act, Mineral Tenure Act, Petroleum and Natural Gas Act, Range Act, Water Act or Wildlife Act (or any prior or subsequent enactment of the Province of British Columbia of like effect); such rights may exist as of the Commencement Date and may be granted or acquired subsequent to the Commencement Date and may affect your use of the Land;

(c) other persons may hold or acquire interests in or over the Land granted under the Land Act or the Ministry of Lands, Parks and Housing Act; such interests may exist as of the Commencement Date; following the Commencement Date we may grant such interests (including fee simple interests, leases, statutory rights of way and licences); you acknowledge that your use of the Land may be affected by such interests and the area or boundaries of the Land may change as a result of the granting of such interests;

(d) you have no right to compensation from us and you release us from all claims, actions, causes of action, suits, debts and demands that you now have or may at any time in the future have against us arising out of any conflict between your use of the Land under this Agreement and any use of, or impact on the Land arising from the exercise, or operation of the interests, rights, privileges and titles described in subsections (a), (b), and (c);

 this Agreement does not limit any right to notice, compensation or any other benefit that you may be entitled to from time to time under the enactments described in subsection (b), or any other applicable enactment;

(f) you will not commence or maintain proceedings under section 65 of the Land Act in respect of any interference with your use of the Land as permitted under this Agreement that arises as a result of the lawful exercise or operation of the interests, rights, privileges and titles described in subsections (a), (b) and (c);

(g) you will not without our prior written consent, which consent may be unreasonably withheld, permit any other person to use the Land or the Improvements (including, without limitation, any copper, coaxial, fibre optic or similar material or device) for any telecommunications purpose;

 (h) you will not without our prior written consent, which consent may be unreasonably withheld, use the Land or the Improvements for any telecommunications purpose other than a telecommunications purpose which is necessary for your operation of the Improvements;

(i) upon completion of construction and the requisite surveys, we will prepare documents

UTILITY LICENCE

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Licence	242886	File No.: 2409412
	242000	Disposition No.: 864234
	for Rights of Way for the penstock and intake, a Leas for any other subsequent tenures required for this pro issued for terms to coincide with the term of your Ele	se for the powerhouse and Licences oject, these documents will be ectricity Purchase Agreement;
(j)	this Agreement is subject to the Right of Way grante defined on Plan EPP10446 on file in the Vancouver l	d to Tyson Creek Hydro Corp. as Land Title Office;
14	this Agreement is subject to the prior rights of Altag	a Peneuvahle Pouver Corn as

- (k) this Agreement is subject to the prior rights of Altaqua Renewable Power Corp. as holder of a Licence of Occupation on file 2409508 issued for the purpose of investigating a Clean Energy Project;
- this Agreement is subject to the prior rights of Altaqua Renewable Power Corp. as holder of a Licence of Occupation on file 2409522 issued for the purpose of investigating a Clean Energy Project;
- (m) this Agreement is subject to the prior rights of Altaqua Cleanergy Corp. as holder of a Licence of Occupation on file 2409882 issued for the purpose of investigating a Clean Energy Project;
- (n) you will not remove or permit the removal of any Improvement from the Land except as expressly permitted or required under this Agreement;
- (o) any interest you may have in the Improvements ceases to exist and becomes our property upon the termination of this Agreement, except where an Improvement may be removed under paragraph 4.1(ee)(ii), (iii) or (iv) in which case any interest you may have in that Improvement ceases to exist and becomes our property if the Improvement is not removed from the Land within the time period set out in paragraph 4.1(ee)(ii) or the time period provided for in the direction or permission given under paragraph 4.1(ee)(iii); and
- (p) if, after the termination of this Agreement, we permit you to remain in possession of the Land and we accept money from you in respect of such possession, a tenancy from year to year will not be created by implication of law and you will be deemed to be a monthly occupier only subject to all of the provisions of this Agreement, except as to duration, in the absence of a written agreement to the contrary.

ARTICLE 6 - SECURITY AND INSURANCE

- 6.1 On the Commencement Date, you will deliver to us Security in the amount of \$150,000.00 which will
 - (a) guarantee the performance of your obligations under this Agreement;

UTILITY LICENCE

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- (b) be in the form required by us; and
- (c) remain in effect until we certify, in writing, that you have fully performed your obligations under this Agreement.
- 6.2 Despite section 6.1, your obligations under that section are suspended for so long as you maintain in good standing other security acceptable to us to guarantee the performance of your obligations under this Agreement and all other dispositions held by you.
- 6.3 We may use the Security for the payment of any costs and expenses associated with any of your obligations under this Agreement that are not performed by you or to pay any overdue Fees and, if such event occurs, you will, within 30 days of that event, deliver further Security to us in an amount equal to the amount drawn down by us.
- 6.4 After we certify, in writing, that you have fully performed your obligations under this Agreement, we will return to you the Security maintained under section 6.1, less all amounts drawn down by us under section 6.3.
- 6.5 You acknowledge that we may, from time to time, notify you to
 - (a) change the form or amount of the Security; and
 - (b) provide and maintain another form of Security in replacement of or in addition to the Security posted by you under this Agreement;

and you will, within 60 days of receiving such notice, deliver to us written confirmation that the change has been made or the replacement or additional form of Security has been provided by you.

- 6.6 You must
 - (a) without limiting your obligations or liabilities under this Agreement, at your expense, purchase and maintain during the Term the following insurance with insurers licensed to do business in Canada:
 - Commercial General Liability insurance in an amount of not less than \$5,000,000.00 inclusive per occurrence insuring against liability for personal injury, bodily injury (including death) and property damage, including coverage for all accidents or occurrences on the Land or the Improvements. Such policy will include cross liability, liability assumed under contract, provision to provide 30 days advance notice to us of material change or cancellation, and include us as additional insured;
 - (b) ensure that all insurance required to be maintained by you under this Agreement is

UTILITY LICENCE

Page 13 of ____

Licen	ce é	242886	File No.: 2409412 Disposition No.: 864234	
		primary and does not require the sharing of an	y loss by any of our insurers:	
	(c)	within 10 working days of Commencement Da evidence of all required insurance in the form Columbia Certificate of Insurance";	ate of this Agreement, provide to us of a completed "Province of British	
	(d)	if the required insurance policy or policies exp Term of this Agreement, provide within 10 we expiration, evidence of new or renewal policy form of a completed "Province of British Colu	bire or are cancelled before the end of the orking days of the cancellation or or policies of all required insurance in the umbia Certificate of Insurance";	
	(e)	notwithstanding subsection (c) or (d) above, if copies of the required insurance policies.	f requested by us, provide to us certified	
6.7	We may, acting reasonably, from time to time, require you to			
	(a)	change the amount of insurance set out in sub-	section 6.6(a); and	
	(b)	provide and maintain another type or types of to the insurance previously required to be mai	insurance in replacement of or in addition ntained by you under this Agreement;	
	and you will, within 60 days of receiving such notice, cause the amounts and types to be changed and deliver to us a completed "Province of British Columbia Certificate of Insurance for all insurance then required to be maintained by you under this Agreement.			
6.8	You shall provide, maintain, and pay for any additional insurance which you are required by law to carry, or which you consider necessary to insure risks not otherwise covered by the insurance specified in this Agreement in your sole discretion.			
6.9	You waive all rights of recourse against us with regard to damage to your own property.		rd to damage to your own property.	
		ARTICLE 7 - ASSIGN	MENT	
7.1	You must not sublicense, assign, mortgage or transfer this Agreement, or permit any persuse or occupy the Land, without our prior written consent, which consent we may withhout		r this Agreement, or permit any person to asent, which consent we may withhold.	
7.2	Prior to considering a request for our consent u certain conditions, including without limitation environmental condition of the Land as provide		ection 7.1, we may require you to meet you provide us with a report as to the ection 4.5.	
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UTIL	ITY LIC	ENCE	Page 14 of	

12.03

ARTICLE 8 - TERMINATION

- 8.1 You agree with us that
 - (a) if you
 - (i) default in the payment of any money payable by you under this Agreement, or
 - (ii) fail to observe, abide by and comply with the provisions of this Agreement (other than the payment of any money payable by you under this Agreement),

and your default or failure continues for 60 days after we give written notice of the default or failure to you,

- (b) if, in our opinion, you fail to make diligent use of the Land for the purposes set out in this Agreement, and your failure continues for 60 days after we give written notice of the failure to you;
- (c) if you fail to maintain in good standing any disposition issued by us to you for the use and occupation of Crown land;
- (d) if you
 - become insolvent or make an assignment for the general benefit of your creditors,
 - (ii) commit an act which entitles a person to take action under the Bankruptcy and Insolvency Act (Canada) or a bankruptcy petition is filed or presented against you or you consent to the filing of the petition or a decree is entered by a court of competent jurisdiction adjudging you bankrupt under any law relating to bankruptcy or insolvency, or
 - (iii) voluntarily enter into an arrangement with your creditors;
- (e) if you are a corporation,
 - a receiver or receiver-manager is appointed to administer or carry on your business, or
 - (ii) an order is made, a resolution passed or a petition filed for your liquidation or winding up;
- (f) if you are a society, you convert into a company in accordance with the Society Act without our prior written consent;

UTILITY LICENCE

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- (g) if this Agreement is taken in execution or attachment by any person; or
- (h) if we require the Land for our own use or, in our opinion, it is in the public interest to cancel this Agreement and we have given you 60 days' written notice of such requirement or opinion;

this Agreement will, at our option and with or without entry, terminate and your right to use and occupy the Land will cease.

- 8.2 If the condition complained of (other than the payment of any money payable by you under this Agreement) reasonably requires more time to cure than 60 days, you will be deemed to have complied with the remedying of it if you commence remedying or curing the condition within 60 days and diligently complete the same.
- 8.3 You agree with us that
 - (a) you will make no claim against us for compensation, in damages or otherwise, upon the lawful termination of this Agreement under section 8.1; and
 - (b) our remedies under this Article are in addition to those available to us under the Land Act.

ARTICLE 9 - DISPUTE RESOLUTION

- 9.1 If any dispute arises under this Agreement, the parties will make all reasonable efforts to resolve the dispute within 60 days of the dispute arising (or within such other time period agreed to by the parties) and, subject to applicable laws, provide candid and timely disclosure to each other of all relevant facts, information and documents to facilitate those efforts.
- 9.2 Subject to section 9.5, if a dispute under this Agreement cannot be resolved under section 9.1, we or you may refer the dispute to arbitration conducted by a sole arbitrator appointed pursuant to the *Commercial Arbitration Act*.
- 9.3 The cost of the arbitration referred to in section 9.2 will be shared equally by the parties and the arbitration will be governed by the laws of the Province of British Columbia.
- 9.4 The arbitration will be conducted at our offices (or the offices of our authorized representative) in Surrey, British Columbia, and if we or our authorized representative have no office in Surrey, British Columbia, then our offices (or the offices of our authorized representative) that are closest to Surrey, British Columbia.
- 9.5 A dispute under this Agreement in respect of a matter within our sole discretion cannot, unless we agree, be referred to arbitration as set out in section 9.2.

UTILITY LICENCE

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ARTICLE 10 - NOTICE

10.1 Any notice required to be given by either party to the other will be deemed to be given if mailed by prepaid registered mail in Canada or delivered to the address of the other as follows:

to us

MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS 200-10428 153 St Surrey, BC V3R 1E1;

to you

NI HYDRO HOLDING CORP. 200 4723 1st Street SW Calgary, AB T2G 4Y8;

or at such other address as a party may, from time to time, direct in writing, and any such notice will be deemed to have been received if delivered, on the day of delivery, and if mailed, 7 days after the time of mailing, except in the case of mail interruption in which case actual receipt is required.

- 10.2 In order to expedite the delivery of any notice required to be given by either party to the other, a concurrent facsimile copy of any notice will, where possible, be provided to the other party but nothing in this section, and specifically the lack of delivery of a facsimile copy of any notice, will affect the deemed delivery provided in section 10.1.
- 10.3 The delivery of all money payable to us under this Agreement will be effected by hand, courier or prepaid regular mail to the address specified above, or by any other payment procedure agreed to by the parties, such deliveries to be effective on actual receipt.

ARTICLE 11 - MISCELLANEOUS

11.1 No provision of this Agreement will be considered to have been waived unless the waiver is in writing, and a waiver of a breach of a provision of this Agreement will not be construed as or constitute a waiver of any further or other breach of the same or any other provision of this Agreement, and a consent or approval to any act requiring consent or approval will not waive or render unnecessary the requirement to obtain consent or approval to any subsequent same or

UTILITY LICENCE

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similar act.

Licence

- 11.2 No remedy conferred upon or reserved to us under this Agreement is exclusive of any other remedy in this Agreement or provided by law, but that remedy will be in addition to all other remedies in this Agreement or then existing at law, in equity or by statute.
- 11.3 The grant of a sublicence, assignment or transfer of this Agreement does not release you from your obligation to observe and perform all the provisions of this Agreement on your part to be observed and performed unless we specifically release you from such obligation in our consent to the sublicence, assignment or transfer of this Agreement.
- 11.4 This Agreement extends to, is binding upon and enures to the benefit of the parties, their heirs, executors, administrators, successors and permitted assigns.
- 11.5 If, due to a strike, lockout, labour dispute, act of God, inability to obtain labour or materials, law, ordinance, rule, regulation or order of a competent governmental authority, enemy or hostile action, civil commotion, fire or other casualty or any condition or cause beyond your reasonable control, other than normal weather conditions, you are delayed in performing any of your obligations under this Agreement, the time for the performance of that obligation will be extended by a period of time equal to the period of time of the delay so long as
 - (a) you give notice to us within 30 days of the commencement of the delay setting forth the nature of the delay and an estimated time frame for the performance of your obligation; and
 - (b) you diligently attempt to remove the delay.
- 11.6 You acknowledge and agree with us that
 - this Agreement has been granted to you on the basis that you accept the Land on an "as is" basis;
 - (b) without limitation we have not made, and you have not relied upon, any representation or warranty from us as to
 - the suitability of the Land for any particular use, including the use permitted by this Agreement;
 - (ii) the condition of the Land (including surface and groundwater), environmental or otherwise, including the presence of or absence of any toxic, hazardous, dangerous or potentially dangerous substances on or under the Land and the current and past uses of the Land and any surrounding land and whether or not the Land is susceptible to erosion or flooding;

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Licence	242886	File No.: 2409412 Disposition No.: 864234
	(iii) the general condition and state of al Land or which serve the Land;	l utilities or other systems on or under the
	(iv) the zoning of the Land and the byla to the development, use and occupa	ws of any government authority which relate tion of the Land; and
	(v) the application of any federal or Pro	ovincial enactment or law to the Land;
(c)	you have been afforded a reasonable oppor such other audits, investigations, tests and s investigate those matters set out in subsecti into this Agreement;	tunity to inspect the Land or to carry out surveys as you consider necessary to on (b) to your satisfaction before entering
(d)	you waive, to the extent permitted by law, with a "site profile" under the <i>Environment</i> under that act;	the requirement if any, for us to provide you tal Management Act or any regulations made
(e)	we are under no obligation, express or imp contribute toward the cost of servicing, cre Improvements and you are solely responsib your use of the Land and the Improvements and	lied, to provide financial assistance or to ating or developing the Land or the ble for all costs and expenses associated with s for the purposes set out in this Agreement;
(f)	we are under no obligation to provide acces improve existing access roads.	ss or services to the Land or to maintain or
11.7 You parti	You agree with us that nothing in this Agreement constitutes you as our agent, joint venturer or partner or gives you any authority or power to bind us in any way.	
11.8 This are o	This Agreement does not override or affect any powers, privileges or immunities to which you are entitled under any enactment of the Province of British Columbia.	

The parties have executed this Agreement as of the date of reference of this Agreement.

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Licence

File No.: 2409412 Disposition No.: 864234

SIGNED on behalf of HER MAJESTY THE QUEEN IN RIGHT OF THE **PROVINCE OF BRITISH COLUMBIA** by the minister responsible for the Land Act or the minister's authorized representative

Minister responsible for the Land Act or the minister's authorized representative

SIGNED on behalf of NI HYDRO HOLDING CORP. by a duly authorized signatory

Authorized Signatory

Sheri Wise Controller

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LEGAL DESCRIPTION SCHEDULE

THAT PARCEL OR TRACT OF LAND IN THE VICINITY OF DISTRICT LOT 8158, TOGETHER WITH UNSURVEYED FORESHORE OR LAND COVERED BY WATER BEING PART OF THE BED OF CHICKWAT CREEK AND TZOONIE RIVER, GROUP 1, NEW WESTMINSTER DISTRICT, CONTAINING 747.686 HECTARES, MORE OR LESS



Scale = 1.60,000 BEGS MAPSINGET 926.082

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SCHEDULE A

ADDITIONAL FEES AND RENTS

"Operating Period" means the first twelve month period of the Term beginning on the Commencement Date and each successive twelve month period thereafter

"Production Report" means a report that contains

a detailed statement showing the quantity of material removed from the Quarry Land during the Operating period covered by the report, and

your Statutory Declaration in a form satisfactory to us confirming without qualification that the statement contained in the Production Report is true

"Quarry Land" means land identified as quarry, or uses included with the Land identified in the Legal Description which includes but is not limited to land identified as Borrow Pits.

"Royalty Fee" means \$1.00 per metric tonne

A Royalty Fee is payable for all aggregate material that is:

removed from Quarry Land;

used in the production of concrete; and

moved from its original position and used in another location of the Land, however,

A Royalty Fee is not payable for aggregate material that is:

- (a) used to build and maintain public roads; and
- (b) located immediately beneath the area of the intake, penstock, powerhouse;
- (c) not used in concrete production and ultimately used in the same position (i.e. penstock bedding); and
- (d) material that is stored passively on the Land and shown in the "Legal Description Schedule"

You will within 15 days after the end of each Operating Period deliver to us a Production Report for that Operating Period together with a payment in a sum equal to the Royalty Fee payable.

STANDARD LICENCE

Page Dof





Our File: 2409421

February 1, 2016

NI Hydro Holding Corp 200 4723 1 St SW Calgary, AB T2G 4Y8

Dear NI Hydro Holding Corp:

It is my pleasure to enclose your original copy of Licence No. 242944 duly executed on behalf of the Minister which will expire on October 1, 2049.

The Licence is issued for a term of 32 years and 10 months for Run-of-River Waterpower purposes at the rental of \$44,488.82 for the first year of the term.

This licence covers that parcel or tract of land in the vicinity of District Lot 5268, together with unsurveyed foreshore or land covered by water being part of the bed of Ramona Creek, Group 1, New Westminster District, containing 218.351 hectares.

Do not hesitate to contact me at 604 586-4411 or <u>maxine.davie@gov.bc.ca</u> if you have any questions or require assistance. It continues to be our pleasure to be of service.

Yours truly,

ann Nom2

Maxine Davie Senior Portfolio Administrator

Enclosures

pc: BC Assessment Authority, North Shore/Squamish Valley Sunshine Coast Regional District Vancouver Coastal Health Ministry of Jobs, Tourism and Skills Training

Ministry of Forests, Lands and Natural Resource Operations South Coast Natural Resource Region

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Suite 200, 10428 - 153 St Surrey BC V3R 1E1 Phone: (604) 586-4400 Fax: (604) 586-4444



LICENCE OF OCCUPATION

Licence No .:

242944

File No.: 2409421 Disposition No.: 864560

THIS AGREEMENT is dated for reference December 15, 2015 and is made under the Land Act.

BETWEEN:

HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF BRITISH COLUMBIA, represented by the minister responsible for the *Land Act*, Parliament Buildings, Victoria, British Columbia

(the "Province")

AND:

NI HYDRO HOLDING CORP. (Inc. No. BC0814633) 200 4723 1 St SW Calgary, AB T2G 4Y8

(the "Licensee")

The parties agree as follows:

ARTICLE 1 - INTERPRETATION

1.1 In this Agreement,

"Agreement" means this licence of occupation;

"Commencement Date" means January 1, 2016;

"disposition" has the meaning given to it in the Land Act and includes a licence of occupation;

"Fees" means the fees set out in Article 3;

- "Hazardous Substances" means any substance which is hazardous to persons, property or the environment, including without limitation
 - (a) waste, as that term is defined in the Environmental Management Act; and

UTILITY LICENCE

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- (b) any other hazardous, toxic or other dangerous substance, the use, transportation or release into the environment of which, is now or from time to time prohibited, controlled or regulated under any laws or by any governmental authority, applicable to, or having jurisdiction in relation to, the Land;
- "Improvements" includes anything made, constructed, erected, built, altered, repaired or added to, in, on or under the Land, and attached to it or intended to become a part of it, and also includes any clearing, excavating, digging, drilling, tunnelling, filling, grading or ditching of, in, on or under the Land;
- "Land" means that part or those parts of the Crown land either described in, or shown outlined by bold line on, the schedule attached to this Agreement entitled "Legal Description Schedule" except for those parts of the land that, on the Commencement Date, consist of highways (as defined in the *Transportation Act*);
- "Realty Taxes" means all taxes, rates, levies, duties, charges and assessments levied or charged, at any time, by any government authority having jurisdiction which relate to the Land, the Improvements or both of them and which you are liable to pay under applicable laws;
- "Security" means the security referred to in section 6.1 or 6.2, as replaced or supplemented in accordance with section 6.5;

"Term" means the period of time set out in section 2.2;

"we", "us" or "our" refers to the Province alone and never refers to the combination of the Province and the Licensee: that combination is referred to as "the parties"; and

"you" or "your" refers to the Licensee.

- 1.2 In this Agreement, "person" includes a corporation, partnership or party, and the personal or other legal representatives of a person to whom the context can apply according to law and wherever the singular or masculine form is used in this Agreement it will be construed as the plural or feminine or neuter form, as the case may be, and vice versa where the context or parties require.
- 1.3 The captions and headings contained in this Agreement are for convenience only and do not define or in any way limit the scope or intent of this Agreement.
- 1.4 This Agreement will be interpreted according to the laws of the Province of British Columbia.
- 1.5 Where there is a reference to an enactment of the Province of British Columbia or of Canada in this Agreement, that reference will include a reference to every amendment to it, every

UTILITY LICENCE

Page 2 of _2]

regulation made under it and any subsequent enactment of like effect and, unless otherwise indicated, all enactments referred to in this Agreement are enactments of the Province of British Columbia.

- 1.6 If any section of this Agreement, or any part of a section, is found to be illegal or unenforceable, that section or part of a section, as the case may be, will be considered separate and severable and the remainder of this Agreement will not be affected and this Agreement will be enforceable to the fullest extent permitted by law.
- 1.7 Each schedule to this Agreement is an integral part of this Agreement as if set out at length in the body of this Agreement.
- 1.8 This Agreement constitutes the entire agreement between the parties and no understanding or agreement, oral or otherwise, exists between the parties with respect to the subject matter of this Agreement except as expressly set out in this Agreement and this Agreement may not be modified except by subsequent agreement in writing between the parties.
- 1.9 Each party will, upon the request of the other, do or cause to be done all lawful acts necessary for the performance of the provisions of this Agreement.
- 1.10 Any liabilities or obligations of either party arising, or to be performed, before or as a result of the termination of this Agreement, and which have not been satisfied or remain unperformed at the termination of this Agreement, any indemnity and any release in our favour and any other provision which specifically states that it will survive the termination of this Agreement, shall survive and not be affected by the expiration of the Term or the termination of this Agreement.
- 1.11 Time is of the essence of this Agreement.
- 1.12 Wherever this Agreement provides that an action may be taken, a consent or approval must be obtained or a determination must be made, then you or we, as the case may be, will act reasonably in taking such action, deciding whether to provide such consent or approval or making such determination; but where this Agreement states that you or we have sole discretion to take an action, provide a consent or approval or make a determination, there will be no requirement to show reasonableness or to act reasonably in taking that action, providing that consent or approval or making that determination.
- 1.13 Any requirement under this Agreement for us to act reasonably shall not require us to act in a manner that is contrary to or inconsistent with any legislation, regulations, Treasury Board directives or other enactments or any policy, directive, executive direction or other such guideline of general application.

UTILITY LICENCE

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ARTICLE 2 - GRANT AND TERM

- 2.1 On the terms and conditions of this Agreement, we grant you, your employees, agents and contractors a licence to occupy the Land only for the purposes of excavating for, constructing, operating, removing, replacing, reconstructing, repairing and safeguarding the Improvements necessary for a Clean Energy Project as set out in the most recently approved Development Plan held on file by us and for telecommunications equipment necessary for the operation of such Improvements; and you acknowledge this licence of occupation does not grant you exclusive use and occupancy of the Land.
- 2.2 The term of this Agreement commences on the Commencement Date and terminates on the 32 year 10 month anniversary of that date, or such earlier date provided for in this Agreement. We reserve the right to terminate this Agreement in certain circumstances as expressly provided in this Agreement.

ARTICLE 3 - FEES

- 3.1 You will pay to us
 - (a) for the first year of the Term, Fees of \$44,488.82, payable in advance on the Commencement Date; and
 - (b) for each year during the remainder of the Term, the Fees either determined by us under section 3.2 or established under section 3.3, payable in advance on each anniversary of the Commencement Date.
- 3.2 We will, not later than 15 days before each anniversary of the Commencement Date during the Term, give written notice to you specifying in our sole discretion the Fees payable by you under subsection 3.1(b) for the subsequent year of the Term and we will establish such Fees in accordance with our policies applicable to your use of the Land under this Agreement.
- 3.3 If we do not give notice to you under section 3.2, the Fees payable by you under subsection 3.1(b) for the year for which notice was not given will be the same as the Fees payable by you for the preceding year of the Term.

ARTICLE 4 - COVENANTS

4.1 You must

(a) pay, when due,

UTILITY LICENCE

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- (i) the Fees to us at the address set out in Article 10,
- (ii) the Realty Taxes, and
- (iii) all charges for electricity, gas, water and other utilities supplied to the Land for use by you or on your behalf or with your permission;
- (b) deliver to us, immediately upon demand, receipts or other evidence of the payment of Realty Taxes and all other money required to be paid by you under this Agreement;
- (c) observe, abide by and comply with
 - (i) all applicable laws, bylaws, orders, directions, ordinances and regulations of any government authority having jurisdiction in any way affecting your use or occupation of the Land or the Improvements including without limitation all laws, bylaws, orders, directions, ordinances and regulations relating in any way to Hazardous Substances, the environment and human health and safety, and
 - (ii) the provisions of this Agreement;
- (d) in respect of the use of the Land by you or by any person who enters upon or uses the Land as a result of your use of the Land under this Agreement, keep the Land and the Improvements in a safe, clean and sanitary condition satisfactory to us, and at our written request, rectify any failure to comply with such a covenant by making the Land and the Improvements safe, clean and sanitary;
- (e) not commit any wilful or voluntary waste, spoil or destruction on the Land or do anything on the Land that may be or become a nuisance to an owner or occupier of land in the vicinity of the Land;
- (f) use and occupy the Land only in accordance with and for the purposes set out in section 2.1;
- (g) not construct, place, anchor, secure or affix any Improvement in, on, or to the Land or otherwise use the Land in a manner that will interfere with any person's riparian right of access over the Land and you acknowledge and agree that the granting of this Agreement and our approval of the Improvements under this Agreement, whether through our approval of a Management Plan (where applicable) or otherwise, do not:
 - (i) constitute a representation or determination that such Improvements will not give rise to any infringement of any riparian right of access that may exist over the Land; or
 - (ii) abrogate or authorize any infringement of any riparian right of access that may

UTILITY LICENCE

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exist over the Land;

and you remain responsible for ensuring that you will not cause any infringement of any such riparian right of access;

- (h) pay all accounts and expenses as they become due for work performed on or materials supplied to the Land at your request, on your behalf or with your permission, except for money that you are required to hold back under the *Builders Lien Act*;
- (i) if any claim of lien over the Land is made under the Builders Lien Act for work performed on or materials supplied to the Land at your request, on your behalf or with your permission, immediately take all steps necessary to have the lien discharged, unless the claim of lien is being contested in good faith by you and you have taken the steps necessary to ensure that the claim of lien will not subject the Land or any interest of yours under this Agreement to sale or forfeiture;
- (j) not cut or remove timber on or from the Land without being granted the right under the *Forest Act* to harvest Crown timber on the Land;
- (k) obtain our prior written consent, which consent may be unreasonably withheld, before permitting any other person to use the Land or the Improvements (including without limitation, any copper, coaxial, fibre optic or similar material or device) for any telecommunications purpose;
- obtain our prior written consent, which consent may be unreasonably withheld, before using the Land or the Improvements for any telecommunications purpose other than a telecommunications purpose which is necessary for your operation of the Improvements;
- (m) if any soil is disturbed by you as a result of your construction or maintenance of the Improvements, at your expense, restore the surface of the Land to a condition satisfactory to us;
- (n) notwithstanding Article 3 of this Licence, submit fees for removal of material as outlined in the Additional Fees and Rents, attached hereto as Schedule A, Additional Fees & Rents;
- (o) remain in compliance with a Water Licence held on Water File No. 2002919 throughout the term of this Agreement;
- (p) obtain a Leave to Commence Construction or the written approval of the Regional Water Manager prior to commencing any construction activities on the Land;
- (q) adhere to the conditions contained in the Environmental Assessment Certificate No.

UTILITY LICENCE

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E13-04, and subsequent revisions thereto, held on file by us;

- submit to us a copy of any approved revisions to the Environmental Assessment Certificate within thirty (30) days of their approval;
- (s) adhere to the conditions contained in the "request for exemption from general wildlife measures" letter dated April 23, 2014, and subsequent revisions thereto, held on file by us;
- (t) submit to us a copy of any approved revisions to the "request for exemption from general wildlife measures" letter dated April 23, 2014, within thirty (30) days of their approval;
- (u) have a qualified professional (coast) design any access roads and bridges to the standards as outlined in the Ministry of Forests and Range Engineering Manual and applicable legislation;
- upon completion of construction of the access roads and bridges, submit to us a qualified professional's report, similar to an 'As Built Certificate' signed and sealed by a qualified professional, stating that the construction conforms to the standards and legislation;
- (w) prior to beginning construction leading onto any public highway, obtain an access permit from the District Engineer, Ministry of Transportation and Infrastructure for the Highways District in which the Land is situated;
- not construct access roads to a width exceeding 20 metres plus 3 metres for cuts and fill without our prior written consent;
- (y) deactivate any access roads, in accordance with the standards outlined in the Ministry of Forests and Range Engineering Manual and applicable legislation, and to the satisfaction of the District Manager, Sunshine Coast Forest District, should some or all of the access roads no longer be required, or upon termination of this Agreement;
- (z) take all reasonable precautions to avoid disturbing or damaging any archaeological material found on or under the Land and, upon discovering any archaeological material on or under the Land, you must immediately notify the ministry responsible for administering the *Heritage Conservation Act*;
- (aa) permit us, or our authorized representatives, to enter on the Land at any time to inspect the Land and the Improvements, including without limitation to test and remove soil, groundwater and other materials and substances, where the inspection may be necessary or advisable for us to determine whether or not you have complied with your obligations under this Agreement with respect to Hazardous Substances, provided that

UTILITY LICENCE

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we take reasonable steps to minimize any disruption of your operations;

- (bb) indemnify and save us and our servants, employees and agents harmless against all claims, actions, causes of action, losses, damages, costs and liabilities, including fees of solicitors and other professional advisors, arising out of one or more of the following:
 - (i) any breach, violation or non-performance of a provision of this Agreement,
 - (ii) any conflict between your use of the Land under this Agreement and the lawful use of the Land by any other person, and
 - (iii) any personal injury, bodily injury (including death) or property damage occurring or happening on or off the Land by virtue of your entry upon, use or occupation of the Land,

and the amount of all such losses, damages, costs and liabilities will be payable to us immediately upon demand; and

- (cc) on the termination of this Agreement,
 - (i) peaceably quit and deliver to us possession of the Land and, subject to paragraphs (ii), (iii) and (iv), the Improvements in a safe, clean and sanitary condition,
 - (ii) within 30 days, remove from the Land any Improvement you want to remove, if the Improvement was placed on or made to the Land by you, is in the nature of a tenant's fixture normally removable by tenants and is not part of a building (other than as a tenant's fixture) or part of the Land and you are not in default of this Agreement,
 - (iii) not remove any Improvement from the Land if you are in default of this Agreement, unless we direct or permit you to do so under paragraph (iv),
 - (iv) remove from the Land any Improvement that we, in writing, direct or permit you to remove, other than any Improvement permitted to be placed on or made to the Land under another disposition, and
 - (v) restore the surface of the Land as nearly as may reasonably be possible, to the condition that the Land was in at the time it originally began to be used for the purposes described in this Agreement, but if you are not directed or permitted to remove an Improvement under paragraph (iii), this paragraph will not apply to that part of the surface of the Land on which that Improvement is located,

and all of your right, interest and estate in the Land will be absolutely forfeited to us,

UTILITY LICENCE

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and to the extent necessary, this covenant will survive the termination of this Agreement.

- 4.2 You will not permit any person who enters upon or uses the Land as a result of your use of the Land under this Agreement to do anything you are restricted from doing under this Article.
- 4.3 You must not use all or any part of the Land
 - (a) for the storage or disposal of any Hazardous Substances; or
 - (b) in any other manner whatsoever which causes or contributes to any Hazardous Substances being added or released on, to or under the Land or into the environment from the Land;

unless

- (c) such storage, disposal, release or other use does not result in your breach of any other provision of this Agreement, including without limitation, your obligation to comply with all laws relating in any way to Hazardous Substances, the environment and human health and safety; and
- (d) we have given our prior written approval to such storage, disposal, release or other use and for certainty any such consent operates only as a consent for the purposes of this section and does not bind, limit, or otherwise affect any other governmental authority from whom any consent, permit or approval may be required.
- 4.4 Despite any other provision of this Agreement you must:
 - (a) on the expiry or earlier termination of this Agreement; and
 - (b) at any time if we request and if you are in breach of your obligations under this Agreement relating to Hazardous Substances;

promptly remove from the Land all Hazardous Substances stored, or disposed of, on the Land, or which have otherwise been added or released on, to or under the Land:

- (c) by you; or
- (d) as a result of the use of the Land under this Agreement;

save and except only to the extent that we have given a prior written approval expressly allowing specified Hazardous Substances to remain on the Land following the expiry of the Term.

UTILITY LICENCE

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- 4.5 We may from time to time
 - (a) in the event of the expiry or earlier termination of this Agreement;
 - (b) as a condition of our consideration of any request for consent to an assignment of this Agreement; or
 - (c) if we have a reasonable basis for believing that you are in breach of your obligations under this Agreement relating to Hazardous Substances;

provide you with a written request to investigate the environmental condition of the Land and upon any such request you must promptly obtain, at your cost, and provide us with, a report from a qualified and independent professional who has been approved by us, as to the environmental condition of the Land, the scope of which must be satisfactory to us and which may include all such tests and investigations that such professional may consider to be necessary or advisable to determine whether or not you have complied with your obligations under this Agreement with respect to Hazardous Substances.

- 4.6 You must at our request from time to time, but not more frequently than annually, provide us with your certificate (and if you are a corporation such certificate must be given by a senior officer) certifying that you are in compliance with all of your obligations under this Agreement pertaining to Hazardous Substances, and that no adverse environmental occurrences have taken place on the Land, other than as disclosed in writing to us.
- 4.7 We will not do anything on the Land that will interfere materially with the Improvements or your use of the Improvements, or that creates a public hazard.

ARTICLE 5 - LIMITATIONS

- 5.1 You agree with us that
 - (a) in addition to the other reservations and exceptions expressly provided in this Agreement this Agreement is subject to the exceptions and reservations of interests, rights, privileges and titles referred to in section 50 of the *Land Act*;
 - (b) other persons may hold or acquire rights to use the Land in accordance with enactments other than the Land Act or the Ministry of Lands, Parks and Housing Act, including rights held or acquired under the Coal Act, Forest Act, Geothermal Resources Act, Mineral Tenure Act, Petroleum and Natural Gas Act, Range Act, Water Act or Wildlife Act (or any prior or subsequent enactment of the Province of British Columbia of like effect); such rights may exist as of the Commencement Date and may be granted or acquired subsequent to the Commencement Date and may affect your use of the Land;

UTILITY LICENCE

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- (c) other persons may hold or acquire interests in or over the Land granted under the Land Act or the Ministry of Lands, Parks and Housing Act; such interests may exist as of the Commencement Date; following the Commencement Date we may grant such interests (including fee simple interests, leases, statutory rights of way and licences); you acknowledge that your use of the Land may be affected by such interests and the area or boundaries of the Land may change as a result of the granting of such interests;
- (d) you have no right to compensation from us and you release us from all claims, actions, causes of action, suits, debts and demands that you now have or may at any time in the future have against us arising out of any conflict between your use of the Land under this Agreement and any use of, or impact on the Land arising from the exercise, or operation of the interests, rights, privileges and titles described in subsections (a), (b), and (c);
- this Agreement does not limit any right to notice, compensation or any other benefit that you may be entitled to from time to time under the enactments described in subsection (b), or any other applicable enactment;
- (f) you will not commence or maintain proceedings under section 65 of the *Land Act* in respect of any interference with your use of the Land as permitted under this Agreement that arises as a result of the lawful exercise or operation of the interests, rights, privileges and titles described in subsections (a), (b) and (c);
- (g) you will not without our prior written consent, which consent may be unreasonably withheld, permit any other person to use the Land or the Improvements (including, without limitation, any copper, coaxial, fibre optic or similar material or device) for any telecommunications purpose;
- (h) you will not without our prior written consent, which consent may be unreasonably withheld, use the Land or the Improvements for any telecommunications purpose other than a telecommunications purpose which is necessary for your operation of the Improvements;
- upon completion of construction and the requisite surveys, we will prepare documents for Rights of Way for the penstock and intake, a Lease for the powerhouse and Licences for any other subsequent tenures required for this project, these documents will be issued for terms to coincide with the term of your Electricity Purchase Agreement;
- (j) you will not remove or permit the removal of any Improvement from the Land except as expressly permitted or required under this Agreement;
- (k) any interest you may have in the Improvements ceases to exist and becomes our property upon the termination of this Agreement, except where an Improvement may be removed under paragraph 4.1(cc)(ii), (iii) or (iv) in which case any interest you may

UTILITY LICENCE

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have in that Improvement ceases to exist and becomes our property if the Improvement is not removed from the Land within the time period set out in paragraph 4.1(cc)(ii) or the time period provided for in the direction or permission given under paragraph 4.1(cc)(ii); and

(l) if, after the termination of this Agreement, we permit you to remain in possession of the Land and we accept money from you in respect of such possession, a tenancy from year to year will not be created by implication of law and you will be deemed to be a monthly occupier only subject to all of the provisions of this Agreement, except as to duration, in the absence of a written agreement to the contrary.

ARTICLE 6 - SECURITY AND INSURANCE

- 6.1 On the Commencement Date, you will deliver to us Security in the amount of \$150,000.00 which will
 - (a) guarantee the performance of your obligations under this Agreement;
 - (b) be in the form required by us; and
 - (c) remain in effect until we certify, in writing, that you have fully performed your obligations under this Agreement.
- 6.2 Despite section 6.1, your obligations under that section are suspended for so long as you maintain in good standing other security acceptable to us to guarantee the performance of your obligations under this Agreement and all other dispositions held by you.
- 6.3 We may use the Security for the payment of any costs and expenses associated with any of your obligations under this Agreement that are not performed by you or to pay any overdue Fees and, if such event occurs, you will, within 30 days of that event, deliver further Security to us in an amount equal to the amount drawn down by us.
- 6.4 After we certify, in writing, that you have fully performed your obligations under this Agreement, we will return to you the Security maintained under section 6.1, less all amounts drawn down by us under section 6.3.
- 6.5 You acknowledge that we may, from time to time, notify you to
 - (a) change the form or amount of the Security; and
 - (b) provide and maintain another form of Security in replacement of or in addition to the Security posted by you under this Agreement;

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and you will, within 60 days of receiving such notice, deliver to us written confirmation that the change has been made or the replacement or additional form of Security has been provided by you.

- 6.6 You must
 - (a) without limiting your obligations or liabilities under this Agreement, at your expense, purchase and maintain during the Term the following insurance with insurers licensed to do business in Canada:
 - (i) Commercial General Liability insurance in an amount of not less than \$5,000,000.00 inclusive per occurrence insuring against liability for personal injury, bodily injury (including death) and property damage, including coverage for all accidents or occurrences on the Land or the Improvements. Such policy will include cross liability, liability assumed under contract, provision to provide 30 days advance notice to us of material change or cancellation, and include us as additional insured;
 - (b) ensure that all insurance required to be maintained by you under this Agreement is primary and does not require the sharing of any loss by any of our insurers;
 - (c) within 10 working days of Commencement Date of this Agreement, provide to us evidence of all required insurance in the form of a completed "Province of British Columbia Certificate of Insurance";
 - (d) if the required insurance policy or policies expire or are cancelled before the end of the Term of this Agreement, provide within 10 working days of the cancellation or expiration, evidence of new or renewal policy or policies of all required insurance in the form of a completed "Province of British Columbia Certificate of Insurance";
 - (e) notwithstanding subsection (c) or (d) above, if requested by us, provide to us certified copies of the required insurance policies.
- 6.7 We may, acting reasonably, from time to time, require you to
 - (a) change the amount of insurance set out in subsection 6.6(a); and
 - (b) provide and maintain another type or types of insurance in replacement of or in addition to the insurance previously required to be maintained by you under this Agreement;

and you will, within 60 days of receiving such notice, cause the amounts and types to be changed and deliver to us a completed "Province of British Columbia Certificate of Insurance" for all insurance then required to be maintained by you under this Agreement.

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- 6.8 You shall provide, maintain, and pay for any additional insurance which you are required by law to carry, or which you consider necessary to insure risks not otherwise covered by the insurance specified in this Agreement in your sole discretion.
- 6.9 You waive all rights of recourse against us with regard to damage to your own property.

ARTICLE 7 - ASSIGNMENT

- 7.1 You must not sublicense, assign, mortgage or transfer this Agreement, or permit any person to use or occupy the Land, without our prior written consent, which consent we may withhold.
- 7.2 Prior to considering a request for our consent under section 7.1, we may require you to meet certain conditions, including without limitation, that you provide us with a report as to the environmental condition of the Land as provided in section 4.5.

ARTICLE 8 - TERMINATION

- 8.1 You agree with us that
 - (a) if you
 - (i) default in the payment of any money payable by you under this Agreement, or
 - (ii) fail to observe, abide by and comply with the provisions of this Agreement (other than the payment of any money payable by you under this Agreement),

and your default or failure continues for 60 days after we give written notice of the default or failure to you,

- (b) if, in our opinion, you fail to make diligent use of the Land for the purposes set out in this Agreement, and your failure continues for 60 days after we give written notice of the failure to you;
- (c) if you
 - (i) become insolvent or make an assignment for the general benefit of your creditors,
 - (ii) commit an act which entitles a person to take action under the Bankruptcy and Insolvency Act (Canada) or a bankruptcy petition is filed or presented against you or you consent to the filing of the petition or a decree is entered by a court of competent jurisdiction adjudging you bankrupt under any law relating to

UTILITY LICENCE

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bankruptcy or insolvency, or

- (iii) voluntarily enter into an arrangement with your creditors;
- (d) if you are a corporation,
 - (i) a receiver or receiver-manager is appointed to administer or carry on your business, or
 - (ii) an order is made, a resolution passed or a petition filed for your liquidation or winding up;
- (e) if you are a society, you convert into a company in accordance with the *Society Act* without our prior written consent;
- (f) if this Agreement is taken in execution or attachment by any person; or
- (g) if we require the Land for our own use or, in our opinion, it is in the public interest to cancel this Agreement and we have given you 60 days' written notice of such requirement or opinion;

this Agreement will, at our option and with or without entry, terminate and your right to use and occupy the Land will cease.

- 8.2 If the condition complained of (other than the payment of any money payable by you under this Agreement) reasonably requires more time to cure than 60 days, you will be deemed to have complied with the remedying of it if you commence remedying or curing the condition within 60 days and diligently complete the same.
- 8.3 You agree with us that
 - (a) you will make no claim against us for compensation, in damages or otherwise, upon the lawful termination of this Agreement under section 8.1; and
 - (b) our remedies under this Article are in addition to those available to us under the Land Act.

ARTICLE 9 - DISPUTE RESOLUTION

9.1 If any dispute arises under this Agreement, the parties will make all reasonable efforts to resolve the dispute within 60 days of the dispute arising (or within such other time period agreed to by the parties) and, subject to applicable laws, provide candid and timely disclosure to each other of all relevant facts, information and documents to facilitate those efforts.

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- 9.2 Subject to section 9.5, if a dispute under this Agreement cannot be resolved under section 9.1, we or you may refer the dispute to arbitration conducted by a sole arbitrator appointed pursuant to the *Commercial Arbitration Act*.
- 9.3 The cost of the arbitration referred to in section 9.2 will be shared equally by the parties and the arbitration will be governed by the laws of the Province of British Columbia.
- 9.4 The arbitration will be conducted at our offices (or the offices of our authorized representative) in Surrey, British Columbia, and if we or our authorized representative have no office in Surrey, British Columbia, then our offices (or the offices of our authorized representative) that are closest to Surrey, British Columbia.
- 9.5 A dispute under this Agreement in respect of a matter within our sole discretion cannot, unless we agree, be referred to arbitration as set out in section 9.2.

ARTICLE 10 - NOTICE

10.1 Any notice required to be given by either party to the other will be deemed to be given if mailed by prepaid registered mail in Canada or delivered to the address of the other as follows:

to us

MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS 200-10428 153 St Surrey, BC V3R 1E1;

to you

NI HYDRO HOLDING CORP. 200 4723 1 St Sw Calgary, AB T2G 4Y8;

or at such other address as a party may, from time to time, direct in writing, and any such notice will be deemed to have been received if delivered, on the day of delivery, and if mailed, 7 days after the time of mailing, except in the case of mail interruption in which case actual receipt is required.

10.2 In order to expedite the delivery of any notice required to be given by either party to the other, a concurrent facsimile copy of any notice will, where possible, be provided to the other party but nothing in this section, and specifically the lack of delivery of a facsimile copy of any notice, will affect the deemed delivery provided in section 10.1.

UTILITY LICENCE

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10.3 The delivery of all money payable to us under this Agreement will be effected by hand, courier or prepaid regular mail to the address specified above, or by any other payment procedure agreed to by the parties, such deliveries to be effective on actual receipt.

ARTICLE 11 - MISCELLANEOUS

- 11.1 No provision of this Agreement will be considered to have been waived unless the waiver is in writing, and a waiver of a breach of a provision of this Agreement will not be construed as or constitute a waiver of any further or other breach of the same or any other provision of this Agreement, and a consent or approval to any act requiring consent or approval will not waive or render unnecessary the requirement to obtain consent or approval to any subsequent same or similar act.
- 11.2 No remedy conferred upon or reserved to us under this Agreement is exclusive of any other remedy in this Agreement or provided by law, but that remedy will be in addition to all other remedies in this Agreement or then existing at law, in equity or by statute.
- 11.3 The grant of a sublicence, assignment or transfer of this Agreement does not release you from your obligation to observe and perform all the provisions of this Agreement on your part to be observed and performed unless we specifically release you from such obligation in our consent to the sublicence, assignment or transfer of this Agreement.
- 11.4 This Agreement extends to, is binding upon and enures to the benefit of the parties, their heirs, executors, administrators, successors and permitted assigns.
- 11.5 If, due to a strike, lockout, labour dispute, act of God, inability to obtain labour or materials, law, ordinance, rule, regulation or order of a competent governmental authority, enemy or hostile action, civil commotion, fire or other casualty or any condition or cause beyond your reasonable control, other than normal weather conditions, you are delayed in performing any of your obligations under this Agreement, the time for the performance of that obligation will be extended by a period of time equal to the period of time of the delay so long as
 - (a) you give notice to us within 30 days of the commencement of the delay setting forth the nature of the delay and an estimated time frame for the performance of your obligation; and
 - (b) you diligently attempt to remove the delay.
- 11.6 You acknowledge and agree with us that
 - (a) this Agreement has been granted to you on the basis that you accept the Land on an "as

UTILITY LICENCE

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is" basis;

- (b) without limitation we have not made, and you have not relied upon, any representation or warranty from us as to
 - the suitability of the Land for any particular use, including the use permitted by this Agreement;
 - (ii) the condition of the Land (including surface and groundwater), environmental or otherwise, including the presence of or absence of any toxic, hazardous, dangerous or potentially dangerous substances on or under the Land and the current and past uses of the Land and any surrounding land and whether or not the Land is susceptible to erosion or flooding;
 - (iii) the general condition and state of all utilities or other systems on or under the Land or which serve the Land;
 - (iv) the zoning of the Land and the bylaws of any government authority which relate to the development, use and occupation of the Land; and
 - (v) the application of any federal or Provincial enactment or law to the Land;
- (c) you have been afforded a reasonable opportunity to inspect the Land or to carry out such other audits, investigations, tests and surveys as you consider necessary to investigate those matters set out in subsection (b) to your satisfaction before entering into this Agreement;
- (d) you waive, to the extent permitted by law, the requirement if any, for us to provide you with a "site profile" under the *Environmental Management Act* or any regulations made under that act;
- (e) we are under no obligation, express or implied, to provide financial assistance or to contribute toward the cost of servicing, creating or developing the Land or the Improvements and you are solely responsible for all costs and expenses associated with your use of the Land and the Improvements for the purposes set out in this Agreement; and
- (f) we are under no obligation to provide access or services to the Land or to maintain or improve existing access roads.
- 11.7 You agree with us that nothing in this Agreement constitutes you as our agent, joint venturer or partner or gives you any authority or power to bind us in any way.
- 11.8 This Agreement does not override or affect any powers, privileges or immunities to which you

UTILITY LICENCE

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are entitled under any enactment of the Province of British Columbia.

The parties have executed this Agreement as of the date of reference of this Agreement.

SIGNED on behalf of HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF BRITISH COLUMBIA by the minister responsible for the *Land Act* or the minister's authorized representative

Minister responsible for the Land Act or the minister's authorized representative

SIGNED on behalf of **NI HYDRO HOLDING CORP.** by a duly authorized signatory

Authorized Signatory

Sheri Wise Vice President, Controller

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242944

File No.: 2409421 Disposition No.: 864560

LEGAL DESCRIPTION SCHEDULE

THAT PARCEL OR TRACT OF LAND IN THE VICINITY OF DISTRICT LOT 6468, TOGETHER WITH UNSURVEYED FORESHORE OR LAND COVERED BY WATER BEING PART OF THE BED OF RAMONA CREEK, GROUP 1, NEW WESTMINSTER DISTRICT, CONTAINING 218.35 HECTARES, MORE OR LESS



UTILITY LICENCE

242944

File No.: 2409421 Disposition No.: 864560

SCHEDULE A

ADDITIONAL FEES AND RENTS

"Operating Period" means the first twelve month period of the Term beginning on the Commencement Date and each successive twelve month period thereafter

"Production Report" means a report that contains

a detailed statement showing the quantity of material removed from the Quarry Land during the Operating period covered by the report, and

your Statutory Declaration in a form satisfactory to us confirming without qualification that the statement contained in the Production Report is true

"Quarry Land" means land identified as quarry, or uses included with the Land identified in the Legal Description which includes but is not limited to land identified as Borrow Pits.

"Royalty Fee" means \$1.00 per metric tonne

A Royalty Fee is payable for all aggregate material that is:

removed from Quarry Land;

used in the production of concrete; and

moved from its original position and used in another location of the Land, however,

A Royalty Fee is not payable for aggregate material that is:

- (a) used to build and maintain public roads; and
- (b) located immediately beneath the area of the intake, penstock, powerhouse;
- (c) not used in concrete production and ultimately used in the same position (i.e. penstock bedding); and
- (d) material that is stored passively on the Land and shown in the "Legal Description Schedule"

You will within 15 days after the end of each Operating Period deliver to us a Production Report for that Operating Period together with a payment in a sum equal to the Royalty Fee payable.

UTILITY LICENCE

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RECE

FEB 1 6 2016

Our File: 2409711

February 1, 2016

NI Hydro Holding Corp 200 4723 1 St SW Calgary, AB T2G 4Y8

Dear NI Hydro Holding Corp:

It is my pleasure to enclose your original copy of Licence No. 242943 duly executed on behalf of the Minister which will expire on October 1, 2049.

The Licence is issued for a term of 32 years and 10 months for Run-of-River Waterpower purposes at the rental of \$73,358.20 for the first year of the term.

This licence covers that parcel or tract of land in the vicinity of District Lot 5268 and 6468, together with unsurveyed foreshore or land covered by water being part of the bed of Ramona Creek, Group 1, New Westminster District, containing 360.042 hectares.

Do not hesitate to contact me at 604 586-4411 or <u>maxine.davie@gov.bc.ca</u> if you have any questions or require assistance. It continues to be our pleasure to be of service.

Yours truly,

lans

Maxine Davie Senior Portfolio Administrator

Enclosures

pc: BC Assessment Authority, North Shore/Squamish Valley Sunshine Coast Regional District Vancouver Coastal Health Ministry of Jobs, Tourism and Skills Training Archaeology Branch Ministry of Energy, Mines and Natural Gas

Ministry of Forests, Lands and Natural Resource Operations South Coast Natural Resource Region

Suite 200, 10428 - 153 St Surrey BC V3R 1E1 Phone: (604) 586-4400 Fax: (604) 586-4444

.../2



LICENCE OF OCCUPATION

Licence No.: 242943

File No.: 2409711 Disposition No.: 868953

THIS AGREEMENT is dated for reference December 11, 2015 and is made under the Land Act.

BETWEEN:

HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF BRITISH COLUMBIA, represented by the minister responsible for the *Land Act*, Parliament Buildings, Victoria, British Columbia

(the "Province")

AND:

NI HYDRO HOLDING CORP. (Inc. No. BC0814633) 200 4723 1 St SW Calgary, AB T2G 4Y8

(the "Licensee")

The parties agree as follows:

ARTICLE 1 - INTERPRETATION

1.1 In this Agreement,

"Agreement" means this licence of occupation;

"Commencement Date" means January 1, 2016;

"disposition" has the meaning given to it in the Land Act and includes a licence of occupation;

"Fees" means the fees set out in Article 3;

- "Hazardous Substances" means any substance which is hazardous to persons, property or the environment, including without limitation
 - (a) waste, as that term is defined in the Environmental Management Act; and

UTILITY LICENCE

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- (b) any other hazardous, toxic or other dangerous substance, the use, transportation or release into the environment of which, is now or from time to time prohibited, controlled or regulated under any laws or by any governmental authority, applicable to, or having jurisdiction in relation to, the Land;
- "Improvements" includes anything made, constructed, erected, built, altered, repaired or added to, in, on or under the Land, and attached to it or intended to become a part of it, and also includes any clearing, excavating, digging, drilling, tunnelling, filling, grading or ditching of, in, on or under the Land;
- "Land" means that part or those parts of the Crown land either described in, or shown outlined by bold line on, the schedule attached to this Agreement entitled "Legal Description Schedule" except for those parts of the land that, on the Commencement Date, consist of highways (as defined in the *Transportation Act*);
- "Realty Taxes" means all taxes, rates, levies, duties, charges and assessments levied or charged, at any time, by any government authority having jurisdiction which relate to the Land, the Improvements or both of them and which you are liable to pay under applicable laws;
- "Security" means the security referred to in section 6.1 or 6.2, as replaced or supplemented in accordance with section 6.5;

"Term" means the period of time set out in section 2.2;

"we", "us" or "our" refers to the Province alone and never refers to the combination of the Province and the Licensee: that combination is referred to as "the parties"; and

"you" or "your" refers to the Licensee.

- 1.2 In this Agreement, "person" includes a corporation, partnership or party, and the personal or other legal representatives of a person to whom the context can apply according to law and wherever the singular or masculine form is used in this Agreement it will be construed as the plural or feminine or neuter form, as the case may be, and vice versa where the context or parties require.
- 1.3 The captions and headings contained in this Agreement are for convenience only and do not define or in any way limit the scope or intent of this Agreement.
- 1.4 This Agreement will be interpreted according to the laws of the Province of British Columbia.
- 1.5 Where there is a reference to an enactment of the Province of British Columbia or of Canada in this Agreement, that reference will include a reference to every amendment to it, every

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regulation made under it and any subsequent enactment of like effect and, unless otherwise indicated, all enactments referred to in this Agreement are enactments of the Province of British Columbia.

- 1.6 If any section of this Agreement, or any part of a section, is found to be illegal or unenforceable, that section or part of a section, as the case may be, will be considered separate and severable and the remainder of this Agreement will not be affected and this Agreement will be enforceable to the fullest extent permitted by law.
- 1.7 Each schedule to this Agreement is an integral part of this Agreement as if set out at length in the body of this Agreement.
- 1.8 This Agreement constitutes the entire agreement between the parties and no understanding or agreement, oral or otherwise, exists between the parties with respect to the subject matter of this Agreement except as expressly set out in this Agreement and this Agreement may not be modified except by subsequent agreement in writing between the parties.
- 1.9 Each party will, upon the request of the other, do or cause to be done all lawful acts necessary for the performance of the provisions of this Agreement.
- 1.10 Any liabilities or obligations of either party arising, or to be performed, before or as a result of the termination of this Agreement, and which have not been satisfied or remain unperformed at the termination of this Agreement, any indemnity and any release in our favour and any other provision which specifically states that it will survive the termination of this Agreement, shall survive and not be affected by the expiration of the Term or the termination of this Agreement.
- 1.11 Time is of the essence of this Agreement.
- 1.12 Wherever this Agreement provides that an action may be taken, a consent or approval must be obtained or a determination must be made, then you or we, as the case may be, will act reasonably in taking such action, deciding whether to provide such consent or approval or making such determination; but where this Agreement states that you or we have sole discretion to take an action, provide a consent or approval or make a determination, there will be no requirement to show reasonableness or to act reasonably in taking that action, providing that consent or approval or making that determination.
- 1.13 Any requirement under this Agreement for us to act reasonably shall not require us to act in a manner that is contrary to or inconsistent with any legislation, regulations, Treasury Board directives or other enactments or any policy, directive, executive direction or other such guideline of general application.

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ARTICLE 2 - GRANT AND TERM

- 2.1 On the terms and conditions of this Agreement, we grant you, your employees, agents and contractors a licence to occupy the Land only for the purposes of excavating for, constructing, operating, removing, replacing, reconstructing, repairing and safeguarding the Improvements necessary for a Clean Energy Project as set out in the most recently approved Development Plan held on file by us and for telecommunications equipment necessary for the operation of such Improvements; and you acknowledge this licence of occupation does not grant you exclusive use and occupancy of the Land.
- 2.2 The term of this Agreement commences on the Commencement Date and terminates on the 32 year 10 month anniversary of that date, or such earlier date provided for in this Agreement. We reserve the right to terminate this Agreement in certain circumstances as expressly provided in this Agreement.

ARTICLE 3 - FEES

- 3.1 You will pay to us
 - (a) for the first year of the Term, Fees of \$73,358.20, payable in advance on the Commencement Date; and
 - (b) for each year during the remainder of the Term, the Fees either determined by us under section 3.2 or established under section 3.3, payable in advance on each anniversary of the Commencement Date.
- 3.2 We will, not later than 15 days before each anniversary of the Commencement Date during the Term, give written notice to you specifying in our sole discretion the Fees payable by you under subsection 3.1(b) for the subsequent year of the Term and we will establish such Fees in accordance with our policies applicable to your use of the Land under this Agreement.
- 3.3 If we do not give notice to you under section 3.2, the Fees payable by you under subsection 3.1(b) for the year for which notice was not given will be the same as the Fees payable by you for the preceding year of the Term.

ARTICLE 4 - COVENANTS

4.1 You must

(a) pay, when due,

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ARTICLE 2 - GRANT AND TERM

- 2.1 On the terms and conditions of this Agreement, we grant you, your employees, agents and contractors a licence to occupy the Land only for the purposes of excavating for, constructing, operating, removing, replacing, reconstructing, repairing and safeguarding the Improvements necessary for a Clean Energy Project as set out in the most recently approved Development Plan held on file by us and for telecommunications equipment necessary for the operation of such Improvements; and you acknowledge this licence of occupation does not grant you exclusive use and occupancy of the Land.
- 2.2 The term of this Agreement commences on the Commencement Date and terminates on the 33 year 10 month anniversary of that date, or such earlier date provided for in this Agreement. We reserve the right to terminate this Agreement in certain circumstances as expressly provided in this Agreement.

ARTICLE 3 - FEES

- 3.1 You will pay to us
 - (a) for the first year of the Term, Fees of \$73,358.20, payable in advance on the Commencement Date; and
 - (b) for each year during the remainder of the Term, the Fees either determined by us under section 3.2 or established under section 3.3, payable in advance on each anniversary of the Commencement Date.
- 3.2 We will, not later than 15 days before each anniversary of the Commencement Date during the Term, give written notice to you specifying in our sole discretion the Fees payable by you under subsection 3.1(b) for the subsequent year of the Term and we will establish such Fees in accordance with our policies applicable to your use of the Land under this Agreement.
- 3.3 If we do not give notice to you under section 3.2, the Fees payable by you under subsection 3.1(b) for the year for which notice was not given will be the same as the Fees payable by you for the preceding year of the Term.

ARTICLE 4 - COVENANTS

4.1 You must

(a) pay, when due,

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- (i) the Fees to us at the address set out in Article 10,
- (ii) the Realty Taxes, and
- (iii) all charges for electricity, gas, water and other utilities supplied to the Land for use by you or on your behalf or with your permission;
- (b) deliver to us, immediately upon demand, receipts or other evidence of the payment of Realty Taxes and all other money required to be paid by you under this Agreement;
- (c) observe, abide by and comply with
 - (i) all applicable laws, bylaws, orders, directions, ordinances and regulations of any government authority having jurisdiction in any way affecting your use or occupation of the Land or the Improvements including without limitation all laws, bylaws, orders, directions, ordinances and regulations relating in any way to Hazardous Substances, the environment and human health and safety, and
 - the provisions of this Agreement;
- (d) in respect of the use of the Land by you or by any person who enters upon or uses the Land as a result of your use of the Land under this Agreement, keep the Land and the Improvements in a safe, clean and sanitary condition satisfactory to us, and at our written request, rectify any failure to comply with such a covenant by making the Land and the Improvements safe, clean and sanitary;
- not commit any wilful or voluntary waste, spoil or destruction on the Land or do anything on the Land that may be or become a nuisance to an owner or occupier of land in the vicinity of the Land;
- (f) use and occupy the Land only in accordance with and for the purposes set out in section 2.1;
- (g) not construct, place, anchor, secure or affix any Improvement in, on, or to the Land or otherwise use the Land in a manner that will interfere with any person's riparian right of access over the Land and you acknowledge and agree that the granting of this Agreement and our approval of the Improvements under this Agreement, whether through our approval of a Management Plan (where applicable) or otherwise, do not:
 - (i) constitute a representation or determination that such Improvements will not give rise to any infringement of any riparian right of access that may exist over the Land; or
 - (ii) abrogate or authorize any infringement of any riparian right of access that may

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exist over the Land;

and you remain responsible for ensuring that you will not cause any infringement of any such riparian right of access;

- (h) pay all accounts and expenses as they become due for work performed on or materials supplied to the Land at your request, on your behalf or with your permission, except for money that you are required to hold back under the *Builders Lien Act*;
- (i) if any claim of lien over the Land is made under the Builders Lien Act for work performed on or materials supplied to the Land at your request, on your behalf or with your permission, immediately take all steps necessary to have the lien discharged, unless the claim of lien is being contested in good faith by you and you have taken the steps necessary to ensure that the claim of lien will not subject the Land or any interest of yours under this Agreement to sale or forfeiture;
- (j) not cut or remove timber on or from the Land without being granted the right under the *Forest Act* to harvest Crown timber on the Land;
- (k) obtain our prior written consent, which consent may be unreasonably withheld, before permitting any other person to use the Land or the Improvements (including without limitation, any copper, coaxial, fibre optic or similar material or device) for any telecommunications purpose;
- obtain our prior written consent, which consent may be unreasonably withheld, before using the Land or the Improvements for any telecommunications purpose other than a telecommunications purpose which is necessary for your operation of the Improvements;
- (m) if any soil is disturbed by you as a result of your construction or maintenance of the Improvements, at your expense, restore the surface of the Land to a condition satisfactory to us;
- (n) at our request and at your expense, have a British Columbia Land Surveyor conduct a survey of the Land within one year;
- notwithstanding Article 3 of this Licence, submit fees for removal of material as outlined in the Additional Fees and Rents, attached hereto as Schedule A, Additional Fees & Rents;
- (p) remain in compliance with a Water Licence held on Water File No. 2003015 throughout the term of this Agreement;
- (q) obtain a Leave to Commence Construction or the written approval of the Regional

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Water Manager prior to commencing any construction activities on the Land;

- (r) adhere to the conditions contained in the Environmental Assessment Certificate No. E13-04, and subsequent revisions thereto, held on file by us;
- (s) submit to us a copy of any approved revisions to the Environmental Assessment Certificate within thirty (30) days of their approval;
- (t) adhere to the conditions contained in the "request for exemption from general wildlife measures" letter dated April 23, 2014, and subsequent revisions thereto, held on file by us;
- submit to us a copy of any approved revisions to the "request for exemption from general wildlife measures" letter dated April 23, 2014, within thirty (30) days of their approval;
- (v) have a qualified professional (coast) design any access roads and bridges to the standards as outlined in the Ministry of Forests and Range Engineering Manual and applicable legislation;
- (w) upon completion of construction of the access roads and bridges, submit to us a qualified professional's report, similar to an 'As Built Certificate' signed and sealed by a qualified professional, stating that the construction conforms to the standards and legislation;
- prior to beginning construction leading onto any public highway, obtain an access permit from the District Engineer, Ministry of Transportation and Infrastructure for the Highways District in which the Land is situated;
- (y) not construct access roads to a width exceeding 20 metres plus 3 metres for cuts and fill without our prior written consent;
- (z) deactivate any access roads, in accordance with the standards outlined in the Ministry of Forests and Range Engineering Manual and applicable legislation, and to the satisfaction of the District Manager, Sunshine Coast Forest District, should some or all of the access roads no longer be required, or upon termination of this Agreement;
- (aa) take all reasonable precautions to avoid disturbing or damaging any archaeological material found on or under the Land and, upon discovering any archaeological material on or under the Land, you must immediately notify the ministry responsible for administering the *Heritage Conservation Act*;
- (bb) permit us, or our authorized representatives, to enter on the Land at any time to inspect the Land and the Improvements, including without limitation to test and remove soil,

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groundwater and other materials and substances, where the inspection may be necessary or advisable for us to determine whether or not you have complied with your obligations under this Agreement with respect to Hazardous Substances, provided that we take reasonable steps to minimize any disruption of your operations;

(cc) indemnify and save us and our servants, employees and agents harmless against all claims, actions, causes of action, losses, damages, costs and liabilities, including fees of solicitors and other professional advisors, arising out of one or more of the following:

- (i) any breach, violation or non-performance of a provision of this Agreement,
- (ii) any conflict between your use of the Land under this Agreement and the lawful use of the Land by any other person, and
- (iii) any personal injury, bodily injury (including death) or property damage occurring or happening on or off the Land by virtue of your entry upon, use or occupation of the Land,

and the amount of all such losses, damages, costs and liabilities will be payable to us immediately upon demand; and

- (dd) on the termination of this Agreement,
 - peaceably quit and deliver to us possession of the Land and, subject to paragraphs (ii), (iii) and (iv), the Improvements in a safe, clean and sanitary condition,
 - (ii) within 30 days, remove from the Land any Improvement you want to remove, if the Improvement was placed on or made to the Land by you, is in the nature of a tenant's fixture normally removable by tenants and is not part of a building (other than as a tenant's fixture) or part of the Land and you are not in default of this Agreement,
 - (iii) not remove any Improvement from the Land if you are in default of this Agreement, unless we direct or permit you to do so under paragraph (iv),
 - (iv) remove from the Land any Improvement that we, in writing, direct or permit you to remove, other than any Improvement permitted to be placed on or made to the Land under another disposition, and
 - (v) restore the surface of the Land as nearly as may reasonably be possible, to the condition that the Land was in at the time it originally began to be used for the purposes described in this Agreement, but if you are not directed or permitted to remove an Improvement under paragraph (iii), this paragraph will not apply to

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that part of the surface of the Land on which that Improvement is located,

and all of your right, interest and estate in the Land will be absolutely forfeited to us, and to the extent necessary, this covenant will survive the termination of this Agreement.

- 4.2 You will not permit any person who enters upon or uses the Land as a result of your use of the Land under this Agreement to do anything you are restricted from doing under this Article.
- 4.3 You must not use all or any part of the Land
 - (a) for the storage or disposal of any Hazardous Substances; or
 - (b) in any other manner whatsoever which causes or contributes to any Hazardous Substances being added or released on, to or under the Land or into the environment from the Land;

unless

- (c) such storage, disposal, release or other use does not result in your breach of any other provision of this Agreement, including without limitation, your obligation to comply with all laws relating in any way to Hazardous Substances, the environment and human health and safety; and
- (d) we have given our prior written approval to such storage, disposal, release or other use and for certainty any such consent operates only as a consent for the purposes of this section and does not bind, limit, or otherwise affect any other governmental authority from whom any consent, permit or approval may be required.
- 4.4 Despite any other provision of this Agreement you must:
 - (a) on the expiry or earlier termination of this Agreement; and
 - (b) at any time if we request and if you are in breach of your obligations under this Agreement relating to Hazardous Substances;

promptly remove from the Land all Hazardous Substances stored, or disposed of, on the Land, or which have otherwise been added or released on, to or under the Land:

- (c) by you; or
- (d) as a result of the use of the Land under this Agreement;

save and except only to the extent that we have given a prior written approval expressly

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allowing specified Hazardous Substances to remain on the Land following the expiry of the Term.

- 4.5 We may from time to time
 - (a) in the event of the expiry or earlier termination of this Agreement;
 - (b) as a condition of our consideration of any request for consent to an assignment of this Agreement; or
 - (c) if we have a reasonable basis for believing that you are in breach of your obligations under this Agreement relating to Hazardous Substances;

provide you with a written request to investigate the environmental condition of the Land and upon any such request you must promptly obtain, at your cost, and provide us with, a report from a qualified and independent professional who has been approved by us, as to the environmental condition of the Land, the scope of which must be satisfactory to us and which may include all such tests and investigations that such professional may consider to be necessary or advisable to determine whether or not you have complied with your obligations under this Agreement with respect to Hazardous Substances.

- 4.6 You must at our request from time to time, but not more frequently than annually, provide us with your certificate (and if you are a corporation such certificate must be given by a senior officer) certifying that you are in compliance with all of your obligations under this Agreement pertaining to Hazardous Substances, and that no adverse environmental occurrences have taken place on the Land, other than as disclosed in writing to us.
- 4.7 We will not do anything on the Land that will interfere materially with the Improvements or your use of the Improvements, or that creates a public hazard.

ARTICLE 5 - LIMITATIONS

5.1 You agree with us that

- (a) in addition to the other reservations and exceptions expressly provided in this Agreement this Agreement is subject to the exceptions and reservations of interests, rights, privileges and titles referred to in section 50 of the *Land Act*;
- (b) other persons may hold or acquire rights to use the Land in accordance with enactments other than the Land Act or the Ministry of Lands, Parks and Housing Act, including rights held or acquired under the Coal Act, Forest Act, Geothermal Resources Act, Mineral Tenure Act, Petroleum and Natural Gas Act, Range Act, Water Act or Wildlife Act (or any prior or subsequent enactment of the Province of British Columbia of like

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effect); such rights may exist as of the Commencement Date and may be granted or acquired subsequent to the Commencement Date and may affect your use of the Land;

(c) other persons may hold or acquire interests in or over the Land granted under the Land Act or the Ministry of Lands, Parks and Housing Act; such interests may exist as of the Commencement Date; following the Commencement Date we may grant such interests (including fee simple interests, leases, statutory rights of way and licences); you acknowledge that your use of the Land may be affected by such interests and the area or boundaries of the Land may change as a result of the granting of such interests;

(d) you have no right to compensation from us and you release us from all claims, actions, causes of action, suits, debts and demands that you now have or may at any time in the future have against us arising out of any conflict between your use of the Land under this Agreement and any use of, or impact on the Land arising from the exercise, or operation of the interests, rights, privileges and titles described in subsections (a), (b), and (c);

 this Agreement does not limit any right to notice, compensation or any other benefit that you may be entitled to from time to time under the enactments described in subsection
(b), or any other applicable enactment;

(f) you will not commence or maintain proceedings under section 65 of the *Land Act* in respect of any interference with your use of the Land as permitted under this Agreement that arises as a result of the lawful exercise or operation of the interests, rights, privileges and titles described in subsections (a), (b) and (c);

(g) you will not without our prior written consent, which consent may be unreasonably withheld, permit any other person to use the Land or the Improvements (including, without limitation, any copper, coaxial, fibre optic or similar material or device) for any telecommunications purpose;

 (h) you will not without our prior written consent, which consent may be unreasonably withheld, use the Land or the Improvements for any telecommunications purpose other than a telecommunications purpose which is necessary for your operation of the Improvements;

 upon completion of construction and the required surveys, we will make offers to you of rights of way for penstock and intake, lease for powerhouse and licences for any other subsequent tenures required for this project, for terms to coincide with the term of your Electricity Purchase Agreement;

 (j) you will not remove or permit the removal of any Improvement from the Land except as expressly permitted or required under this Agreement;

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- (k) any interest you may have in the Improvements ceases to exist and becomes our property upon the termination of this Agreement, except where an Improvement may be removed under paragraph 4.1(dd)(ii), (iii) or (iv) in which case any interest you may have in that Improvement ceases to exist and becomes our property if the Improvement is not removed from the Land within the time period set out in paragraph 4.1(dd)(ii) or the time period provided for in the direction or permission given under paragraph 4.1(dd)(iii); and
- (1) if, after the termination of this Agreement, we permit you to remain in possession of the Land and we accept money from you in respect of such possession, a tenancy from year to year will not be created by implication of law and you will be deemed to be a monthly occupier only subject to all of the provisions of this Agreement, except as to duration, in the absence of a written agreement to the contrary.

ARTICLE 6 - SECURITY AND INSURANCE

- 6.1 On the Commencement Date, you will deliver to us Security in the amount of \$150,000.00 which will
 - (a) guarantee the performance of your obligations under this Agreement;
 - (b) be in the form required by us; and
 - (c) remain in effect until we certify, in writing, that you have fully performed your obligations under this Agreement.
- 6.2 Despite section 6.1, your obligations under that section are suspended for so long as you maintain in good standing other security acceptable to us to guarantee the performance of your obligations under this Agreement and all other dispositions held by you.
- 6.3 We may use the Security for the payment of any costs and expenses associated with any of your obligations under this Agreement that are not performed by you or to pay any overdue Fees and, if such event occurs, you will, within 30 days of that event, deliver further Security to us in an amount equal to the amount drawn down by us.
- 6.4 After we certify, in writing, that you have fully performed your obligations under this Agreement, we will return to you the Security maintained under section 6.1, less all amounts drawn down by us under section 6.3.
- 6.5 You acknowledge that we may, from time to time, notify you to
 - (a) change the form or amount of the Security; and

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(b) provide and maintain another form of Security in replacement of or in addition to the Security posted by you under this Agreement;

and you will, within 60 days of receiving such notice, deliver to us written confirmation that the change has been made or the replacement or additional form of Security has been provided by you.

- 6.6 You must
 - (a) without limiting your obligations or liabilities under this Agreement, at your expense, purchase and maintain during the Term the following insurance with insurers licensed to do business in Canada:
 - (i) Commercial General Liability insurance in an amount of not less than \$5,000,000.00 inclusive per occurrence insuring against liability for personal injury, bodily injury (including death) and property damage, including coverage for all accidents or occurrences on the Land or the Improvements. Such policy will include cross liability, liability assumed under contract, provision to provide 30 days advance notice to us of material change or cancellation, and include us as additional insured;
 - (b) ensure that all insurance required to be maintained by you under this Agreement is primary and does not require the sharing of any loss by any of our insurers;
 - (c) within 10 working days of Commencement Date of this Agreement, provide to us evidence of all required insurance in the form of a completed "Province of British Columbia Certificate of Insurance";
 - (d) if the required insurance policy or policies expire or are cancelled before the end of the Term of this Agreement, provide within 10 working days of the cancellation or expiration, evidence of new or renewal policy or policies of all required insurance in the form of a completed "Province of British Columbia Certificate of Insurance";
 - (e) notwithstanding subsection (c) or (d) above, if requested by us, provide to us certified copies of the required insurance policies.
- 6.7 We may, acting reasonably, from time to time, require you to
 - (a) change the amount of insurance set out in subsection 6.6(a); and
 - (b) provide and maintain another type or types of insurance in replacement of or in addition to the insurance previously required to be maintained by you under this Agreement;

and you will, within 60 days of receiving such notice, cause the amounts and types to be

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changed and deliver to us a completed "Province of British Columbia Certificate of Insurance" for all insurance then required to be maintained by you under this Agreement.

- 6.8 You shall provide, maintain, and pay for any additional insurance which you are required by law to carry, or which you consider necessary to insure risks not otherwise covered by the insurance specified in this Agreement in your sole discretion.
- 6.9 You waive all rights of recourse against us with regard to damage to your own property.

ARTICLE 7 - ASSIGNMENT

- 7.1 You must not sublicense, assign, mortgage or transfer this Agreement, or permit any person to use or occupy the Land, without our prior written consent, which consent we may withhold.
- 7.2 Prior to considering a request for our consent under section 7.1, we may require you to meet certain conditions, including without limitation, that you provide us with a report as to the environmental condition of the Land as provided in section 4.5.

ARTICLE 8 - TERMINATION

- 8.1 You agree with us that
 - (a) if you
 - (i) default in the payment of any money payable by you under this Agreement, or
 - (ii) fail to observe, abide by and comply with the provisions of this Agreement (other than the payment of any money payable by you under this Agreement),

and your default or failure continues for 60 days after we give written notice of the default or failure to you,

- (b) if, in our opinion, you fail to make diligent use of the Land for the purposes set out in this Agreement, and your failure continues for 60 days after we give written notice of the failure to you;
- (c) if you
 - (i) become insolvent or make an assignment for the general benefit of your creditors,
 - (ii) commit an act which entitles a person to take action under the Bankruptcy and

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Insolvency Act (Canada) or a bankruptcy petition is filed or presented against you or you consent to the filing of the petition or a decree is entered by a court of competent jurisdiction adjudging you bankrupt under any law relating to bankruptcy or insolvency, or

- (iii) voluntarily enter into an arrangement with your creditors;
- (d) if you are a corporation,
 - (i) a receiver or receiver-manager is appointed to administer or carry on your business, or
 - (ii) an order is made, a resolution passed or a petition filed for your liquidation or winding up;
- (e) if you are a society, you convert into a company in accordance with the *Society Act* without our prior written consent;
- (f) if this Agreement is taken in execution or attachment by any person; or
- (g) if we require the Land for our own use or, in our opinion, it is in the public interest to cancel this Agreement and we have given you 60 days' written notice of such requirement or opinion;

this Agreement will, at our option and with or without entry, terminate and your right to use and occupy the Land will cease.

- 8.2 If the condition complained of (other than the payment of any money payable by you under this Agreement) reasonably requires more time to cure than 60 days, you will be deemed to have complied with the remedying of it if you commence remedying or curing the condition within 60 days and diligently complete the same.
- 8.3 You agree with us that
 - (a) you will make no claim against us for compensation, in damages or otherwise, upon the lawful termination of this Agreement under section 8.1; and
 - (b) our remedies under this Article are in addition to those available to us under the Land Act.

ARTICLE 9 - DISPUTE RESOLUTION

9.1 If any dispute arises under this Agreement, the parties will make all reasonable efforts to resolve the dispute within 60 days of the dispute arising (or within such other time period

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agreed to by the parties) and, subject to applicable laws, provide candid and timely disclosure to each other of all relevant facts, information and documents to facilitate those efforts.

- 9.2 Subject to section 9.5, if a dispute under this Agreement cannot be resolved under section 9.1, we or you may refer the dispute to arbitration conducted by a sole arbitrator appointed pursuant to the *Commercial Arbitration Act*.
- 9.3 The cost of the arbitration referred to in section 9.2 will be shared equally by the parties and the arbitration will be governed by the laws of the Province of British Columbia.
- 9.4 The arbitration will be conducted at our offices (or the offices of our authorized representative) in Surrey, British Columbia, and if we or our authorized representative have no office in Surrey, British Columbia, then our offices (or the offices of our authorized representative) that are closest to Surrey, British Columbia.
- 9.5 A dispute under this Agreement in respect of a matter within our sole discretion cannot, unless we agree, be referred to arbitration as set out in section 9.2.

ARTICLE 10 - NOTICE

10.1 Any notice required to be given by either party to the other will be deemed to be given if mailed by prepaid registered mail in Canada or delivered to the address of the other as follows:

to us

MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS 200-10428 153 St Surrey, BC V3R 1E1;

to you

NI HYDRO HOLDING CORP. 200 4723 1 St SW Calgary, AB T2G 4Y8;

or at such other address as a party may, from time to time, direct in writing, and any such notice will be deemed to have been received if delivered, on the day of delivery, and if mailed, 7 days after the time of mailing, except in the case of mail interruption in which case actual receipt is required.

10.2 In order to expedite the delivery of any notice required to be given by either party to the other,

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a concurrent facsimile copy of any notice will, where possible, be provided to the other party but nothing in this section, and specifically the lack of delivery of a facsimile copy of any notice, will affect the deemed delivery provided in section 10.1.

10.3 The delivery of all money payable to us under this Agreement will be effected by hand, courier or prepaid regular mail to the address specified above, or by any other payment procedure agreed to by the parties, such deliveries to be effective on actual receipt.

ARTICLE 11 - MISCELLANEOUS

- 11.1 No provision of this Agreement will be considered to have been waived unless the waiver is in writing, and a waiver of a breach of a provision of this Agreement will not be construed as or constitute a waiver of any further or other breach of the same or any other provision of this Agreement, and a consent or approval to any act requiring consent or approval will not waive or render unnecessary the requirement to obtain consent or approval to any subsequent same or similar act.
- 11.2 No remedy conferred upon or reserved to us under this Agreement is exclusive of any other remedy in this Agreement or provided by law, but that remedy will be in addition to all other remedies in this Agreement or then existing at law, in equity or by statute.
- 11.3 The grant of a sublicence, assignment or transfer of this Agreement does not release you from your obligation to observe and perform all the provisions of this Agreement on your part to be observed and performed unless we specifically release you from such obligation in our consent to the sublicence, assignment or transfer of this Agreement.
- 11.4 This Agreement extends to, is binding upon and enures to the benefit of the parties, their heirs, executors, administrators, successors and permitted assigns.
- 11.5 If, due to a strike, lockout, labour dispute, act of God, inability to obtain labour or materials, law, ordinance, rule, regulation or order of a competent governmental authority, enemy or hostile action, civil commotion, fire or other casualty or any condition or cause beyond your reasonable control, other than normal weather conditions, you are delayed in performing any of your obligations under this Agreement, the time for the performance of that obligation will be extended by a period of time equal to the period of time of the delay so long as
 - (a) you give notice to us within 30 days of the commencement of the delay setting forth the nature of the delay and an estimated time frame for the performance of your obligation; and
 - (b) you diligently attempt to remove the delay.

UTILITY LICENCE

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- 11.6 You acknowledge and agree with us that
 - (a) this Agreement has been granted to you on the basis that you accept the Land on an "as is" basis;
 - (b) without limitation we have not made, and you have not relied upon, any representation or warranty from us as to
 - (i) the suitability of the Land for any particular use, including the use permitted by this Agreement;
 - (ii) the condition of the Land (including surface and groundwater), environmental or otherwise, including the presence of or absence of any toxic, hazardous, dangerous or potentially dangerous substances on or under the Land and the current and past uses of the Land and any surrounding land and whether or not the Land is susceptible to erosion or flooding;
 - (iii) the general condition and state of all utilities or other systems on or under the Land or which serve the Land;
 - (iv) the zoning of the Land and the bylaws of any government authority which relate to the development, use and occupation of the Land; and
 - (v) the application of any federal or Provincial enactment or law to the Land;
 - (c) you have been afforded a reasonable opportunity to inspect the Land or to carry out such other audits, investigations, tests and surveys as you consider necessary to investigate those matters set out in subsection (b) to your satisfaction before entering into this Agreement;
 - (d) you waive, to the extent permitted by law, the requirement if any, for us to provide you with a "site profile" under the *Environmental Management Act* or any regulations made under that act;
 - (e) we are under no obligation, express or implied, to provide financial assistance or to contribute toward the cost of servicing, creating or developing the Land or the Improvements and you are solely responsible for all costs and expenses associated with your use of the Land and the Improvements for the purposes set out in this Agreement; and
 - (f) we are under no obligation to provide access or services to the Land or to maintain or improve existing access roads.
- 11.7 You agree with us that nothing in this Agreement constitutes you as our agent, joint venturer or

UTILITY LICENCE

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partner or gives you any authority or power to bind us in any way.

11.8 This Agreement does not override or affect any powers, privileges or immunities to which you are entitled under any enactment of the Province of British Columbia.

The parties have executed this Agreement as of the date of reference of this Agreement.

SIGNED on behalf of HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF BRITISH COLUMBIA by the minister responsible for the *Land Act* or the minister's authorized representative

Minister responsible for the Land Act or the minister's authorized representative

SIGNED on behalf of NI HYDRO HOLDING CORP. by a duly authorized signatory

11. here Authorized Signatory

Sheri Wise Vice President, Controller

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File No.: 2409711 Disposition No.: 868953

LEGAL DESCRIPTION SCHEDULE

1 1 1

242943

THAT PARCEL OR TRACT OF LAND IN THE VICINITY OF DISTRICT LOTS 5268 AND 6468, GROUP 1, NEW WESTMINSTER DISTRICT, CONTAINING 360.042 HECTARES, MORE OR LESS



5cale = 1:50,000 MAPSHEETG) 929,072;929.082

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242943

44

File No.: 2409711 Disposition No.: 868953

SCHEDULE A

ADDITIONAL FEES AND RENTS

"Operating Period" means the first twelve month period of the Term beginning on the Commencement Date and each successive twelve month period thereafter

"Production Report" means a report that contains

a detailed statement showing the quantity of material removed from the Quarry Land during the Operating period covered by the report, and

your Statutory Declaration in a form satisfactory to us confirming without qualification that the statement contained in the Production Report is true

"Quarry Land" means land identified as quarry, or uses included with the Land identified in the Legal Description which includes but is not limited to land identified as Borrow Pits.

"Royalty Fee" means \$1.00 per metric tonne

A Royalty Fee is payable for all aggregate material that is:

removed from Quarry Land;

used in the production of concrete; and

moved from its original position and used in another location of the Land, however,

A Royalty Fee is not payable for aggregate material that is:

- (a) used to build and maintain public roads; and
- (b) located immediately beneath the area of the intake, penstock, powerhouse;
- (c) not used in concrete production and ultimately used in the same position (i.e. penstock bedding); and
- (d) material that is stored passively on the Land and shown in the "Legal Description Schedule"

You will within 15 days after the end of each Operating Period deliver to us a Production Report for that Operating Period together with a payment in a sum equal to the Royalty Fee payable.

STANDARD LICENCE

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LICENCE OF OCCUPATION

Licence No .:

File No.: 2411641 Disposition No.: 922632

THIS AGREEMENT is dated for reference September 11, 2015 and is made under the Land Act.

BETWEEN:

HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF BRITISH COLUMBIA, represented by the minister responsible for the *Land Act*, Parliament Buildings, Victoria, British Columbia

(the "Province")

AND:

NI HYDRO HOLDING CORP. (Inc. No. BC0814633) 200 4723 1st Street SW Calgary, AB T2G 4Y8

(the "Licensee")

The parties agree as follows:

ARTICLE 1 - INTERPRETATION

1.1 In this Agreement,

"Agreement" means this licence of occupation;

"Commencement Date" means November 1, 2015;

"disposition" has the meaning given to it in the Land Act and includes a licence of occupation;

"Fees" means the fees set out in Article 3;

- "Hazardous Substances" means any substance which is hazardous to persons, property or the environment, including without limitation
 - (a) waste, as that term is defined in the Environmental Management Act; and

UTILITY LICENCE

Page 1 of 2

- (b) any other hazardous, toxic or other dangerous substance, the use, transportation or release into the environment of which, is now or from time to time prohibited, controlled or regulated under any laws or by any governmental authority, applicable to, or having jurisdiction in relation to, the Land;
- "Improvements" includes anything made, constructed, erected, built, altered, repaired or added to, in, on or under the Land, and attached to it or intended to become a part of it, and also includes any clearing, excavating, digging, drilling, tunnelling, filling, grading or ditching of, in, on or under the Land;
- "Land" means that part or those parts of the Crown land either described in, or shown outlined by bold line on, the schedule attached to this Agreement entitled "Legal Description Schedule" except for those parts of the land that, on the Commencement Date, consist of highways (as defined in the *Transportation Act*);
- "Realty Taxes" means all taxes, rates, levies, duties, charges and assessments levied or charged, at any time, by any government authority having jurisdiction which relate to the Land, the Improvements or both of them and which you are liable to pay under applicable laws;
- "Security" means the security referred to in section 6.1 or 6.2, as replaced or supplemented in accordance with section 6.5;
- "Term" means the period of time set out in section 2.2;
- "we", "us" or "our" refers to the Province alone and never refers to the combination of the Province and the Licensee: that combination is referred to as "the parties"; and

"you" or "your" refers to the Licensee.

- 1.2 In this Agreement, "person" includes a corporation, partnership or party, and the personal or other legal representatives of a person to whom the context can apply according to law and wherever the singular or masculine form is used in this Agreement it will be construed as the plural or feminine or neuter form, as the case may be, and vice versa where the context or parties require.
- 1.3 The captions and headings contained in this Agreement are for convenience only and do not define or in any way limit the scope or intent of this Agreement.
- 1.4 This Agreement will be interpreted according to the laws of the Province of British Columbia.
- 1.5 Where there is a reference to an enactment of the Province of British Columbia or of Canada in this Agreement, that reference will include a reference to every amendment to it, every

UTILITY LICENCE

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regulation made under it and any subsequent enactment of like effect and, unless otherwise indicated, all enactments referred to in this Agreement are enactments of the Province of British Columbia.

- 1.6 If any section of this Agreement, or any part of a section, is found to be illegal or unenforceable, that section or part of a section, as the case may be, will be considered separate and severable and the remainder of this Agreement will not be affected and this Agreement will be enforceable to the fullest extent permitted by law.
- 1.7 Each schedule to this Agreement is an integral part of this Agreement as if set out at length in the body of this Agreement.
- 1.8 This Agreement constitutes the entire agreement between the parties and no understanding or agreement, oral or otherwise, exists between the parties with respect to the subject matter of this Agreement except as expressly set out in this Agreement and this Agreement may not be modified except by subsequent agreement in writing between the parties.
- 1.9 Each party will, upon the request of the other, do or cause to be done all lawful acts necessary for the performance of the provisions of this Agreement.
- 1.10 Any liabilities or obligations of either party arising, or to be performed, before or as a result of the termination of this Agreement, and which have not been satisfied or remain unperformed at the termination of this Agreement, any indemnity and any release in our favour and any other provision which specifically states that it will survive the termination of this Agreement, shall survive and not be affected by the expiration of the Term or the termination of this Agreement.
- 1.11 Time is of the essence of this Agreement.
- 1.12 Wherever this Agreement provides that an action may be taken, a consent or approval must be obtained or a determination must be made, then you or we, as the case may be, will act reasonably in taking such action, deciding whether to provide such consent or approval or making such determination; but where this Agreement states that you or we have sole discretion to take an action, provide a consent or approval or make a determination, there will be no requirement to show reasonableness or to act reasonably in taking that action, providing that consent or approval or making that determination.
- 1.13 Any requirement under this Agreement for us to act reasonably shall not require us to act in a manner that is contrary to or inconsistent with any legislation, regulations, Treasury Board directives or other enactments or any policy, directive, executive direction or other such guideline of general application.

UTILITY LICENCE

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Licence

ARTICLE 2 - GRANT AND TERM

- 2.1 On the terms and conditions of this Agreement, we grant you, your employees, agents and contractors a licence to occupy the Land only for the purposes of constructing, erecting, stringing or otherwise installing, operating, maintaining, removing and replacing the Improvements necessary for the transmission of electric energy and for telecommunications equipment necessary for your transmission of electric energy; and you acknowledge this licence of occupation does not grant you exclusive use and occupancy of the Land.
- 2.2 The term of this Agreement commences on the Commencement Date and terminates on the 3rd anniversary of that date, or such earlier date provided for in this Agreement. We reserve the right to terminate this Agreement in certain circumstances as expressly provided in this Agreement.

ARTICLE 3 - FEES

- 3.1 You will pay to us
 - (a) for the first year of the Term, Fees of \$94,178.71, payable in advance on the Commencement Date; and
 - (b) for each year during the remainder of the Term, the Fees either determined by us under section 3.2 or established under section 3.3, payable in advance on each anniversary of the Commencement Date.
- 3.2 We will, not later than 15 days before each anniversary of the Commencement Date during the Term, give written notice to you specifying in our sole discretion the Fees payable by you under subsection 3.1(b) for the subsequent year of the Term and we will establish such Fees in accordance with our policies applicable to your use of the Land under this Agreement.
- 3.3 If we do not give notice to you under section 3.2, the Fees payable by you under subsection 3.1(b) for the year for which notice was not given will be the same as the Fees payable by you for the preceding year of the Term.

ARTICLE 4 - COVENANTS

4.1 You must

- (a) pay, when due,
 - (i) the Fees to us at the address set out in Article 10,

- (ii) the Realty Taxes, and
- (iii) all charges for electricity, gas, water and other utilities supplied to the Land for use by you or on your behalf or with your permission;
- (b) deliver to us, immediately upon demand, receipts or other evidence of the payment of Realty Taxes and all other money required to be paid by you under this Agreement;
- (c) observe, abide by and comply with
 - (i) all applicable laws, bylaws, orders, directions, ordinances and regulations of any government authority having jurisdiction in any way affecting your use or occupation of the Land or the Improvements including without limitation all laws, bylaws, orders, directions, ordinances and regulations relating in any way to Hazardous Substances, the environment and human health and safety, and
 - (ii) the provisions of this Agreement;
- (d) in respect of the use of the Land by you or by any person who enters upon or uses the Land as a result of your use of the Land under this Agreement, keep the Land and the Improvements in a safe, clean and sanitary condition satisfactory to us, and at our written request, rectify any failure to comply with such a covenant by making the Land and the Improvements safe, clean and sanitary;
- not commit any wilful or voluntary waste, spoil or destruction on the Land or do anything on the Land that may be or become a nuisance to an owner or occupier of land in the vicinity of the Land;
- (f) use and occupy the Land only in accordance with and for the purposes set out in section 2.1;
- (g) not construct, place, anchor, secure or affix any Improvement in, on, or to the Land or otherwise use the Land in a manner that will interfere with any person's riparian right of access over the Land and you acknowledge and agree that the granting of this Agreement and our approval of the Improvements under this Agreement, whether through our approval of a Management Plan (where applicable) or otherwise, do not:
 - (i) constitute a representation or determination that such Improvements will not give rise to any infringement of any riparian right of access that may exist over the Land; or
 - (ii) abrogate or authorize any infringement of any riparian right of access that may exist over the Land;

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and you remain responsible for ensuring that you will not cause any infringement of any such riparian right of access;

- (h) pay all accounts and expenses as they become due for work performed on or materials supplied to the Land at your request, on your behalf or with your permission, except for money that you are required to hold back under the *Builders Lien Act*;
- (i) if any claim of lien over the Land is made under the *Builders Lien Act* for work performed on or materials supplied to the Land at your request, on your behalf or with your permission, immediately take all steps necessary to have the lien discharged, unless the claim of lien is being contested in good faith by you and you have taken the steps necessary to ensure that the claim of lien will not subject the Land or any interest of yours under this Agreement to sale or forfeiture;
- (j) not cut or remove timber on or from the Land without being granted the right under the *Forest Act* to harvest Crown timber on the Land;
- (k) obtain our prior written consent, which consent may be unreasonably withheld, before permitting any other person to use the Land or the Improvements (including without limitation, any copper, coaxial, fibre optic or similar material or device) for any telecommunications purpose;
- obtain our prior written consent, which consent may be unreasonably withheld, before using the Land or the Improvements for any telecommunications purpose other than a telecommunications purpose which is necessary for your operation of the Improvements;
- (m) if any soil is disturbed by you as a result of your construction or maintenance of the Improvements, at your expense, restore the surface of the Land to a condition satisfactory to us;
- (n) permit the free and unrestricted use by the general public of the banks of Chickwat Creek and Tzoonie Creek for recreational and fishing purposes;
- (o) deliver to us a survey of the constructed transmission line, on the Land, prepared by a British Columbia Land Surveyor, in a form satisfactory to us, not later than 30 days prior to the expiration of this Agreement;
- (p) not conduct any activities, or install any Improvements on the Land until you are in receipt of a "Leave to Commence Construction" or express written consent from from the Assistant Regional Water Manager;
- (q) adhere to the conditions contained in the Environmental Assessment Certificate No.

E13-04 Table of Conditions dated November 25, 2013, and subsequent revisions thereto, held on file by us;

- submit to us a copy of any approved revisions to the Environmental Assessment Certificate Table of Conditions, dated November 25, 2013, within thirty (30) days of approval;
- (s) adhere to the conditions contained in the "request for exemption from general wildlife measures" letter dated April 23, 2014, and subsequent revisions thereto, held on file by us;
- submit to us a copy of any approved revisions to the "request for exemption from general wildlife measures" letter dated April 23, 2014, within thirty (30) days of their approval;
- have a qualified professional (coast) design any access roads and bridges to the standards as outlined in the Ministry of Forests and Range Engineering Manual and applicable legislation;
- (v) upon completion of construction of the access roads and bridges, submit to us a qualified professional's report, similar to an 'As Built Certificate' signed and sealed by a qualified professional, stating that the construction conforms to the standards and legislation;
- (w) prior to beginning construction leading onto any public highway, obtain an access permit from the District Engineer, Ministry of Transportation and Infrastructure for the Highways District in which the Land is situated;
- not construct access roads to a width exceeding 20 metres plus 3 metres for cuts and fill without our prior written consent;
- (y) deactivate access roads, in accordance with the standards outlined in the Ministry of Forests and Range Engineering Manual and applicable legislation, and to the satisfaction of the District Manager, Sunshine Coast Forest District, should some or all of the access roads no longer be required, or upon termination of this Agreement;
- (z) take all reasonable precautions to avoid disturbing or damaging any archaeological material found on or under the Land and, upon discovering any archaeological material on or under the Land, you must immediately notify the ministry responsible for administering the *Heritage Conservation Act*;
- (aa) permit us, or our authorized representatives, to enter on the Land at any time to inspect the Land and the Improvements, including without limitation to test and remove soil, groundwater and other materials and substances, where the inspection may be necessary

or advisable for us to determine whether or not you have complied with your obligations under this Agreement with respect to Hazardous Substances, provided that we take reasonable steps to minimize any disruption of your operations;

- (bb) indemnify and save us and our servants, employees and agents harmless against all claims, actions, causes of action, losses, damages, costs and liabilities, including fees of solicitors and other professional advisors, arising out of one or more of the following:
 - (i) any breach, violation or non-performance of a provision of this Agreement,
 - (ii) any conflict between your use of the Land under this Agreement and the lawful use of the Land by any other person, and
 - (iii) any personal injury, bodily injury (including death) or property damage occurring or happening on or off the Land by virtue of your entry upon, use or occupation of the Land,

and the amount of all such losses, damages, costs and liabilities will be payable to us immediately upon demand; and

- (cc) on the termination of this Agreement,
 - (i) peaceably quit and deliver to us possession of the Land and, subject to paragraphs (ii), (iii) and (iv), the Improvements in a safe, clean and sanitary condition,
 - (ii) within 30 days, remove from the Land any Improvement you want to remove, if the Improvement was placed on or made to the Land by you, is in the nature of a tenant's fixture normally removable by tenants and is not part of a building (other than as a tenant's fixture) or part of the Land and you are not in default of this Agreement,
 - (iii) not remove any Improvement from the Land if you are in default of this Agreement, unless we direct or permit you to do so under paragraph (iv),
 - (iv) remove from the Land any Improvement that we, in writing, direct or permit you to remove, other than any Improvement permitted to be placed on or made to the Land under another disposition, and
 - (v) restore the surface of the Land as nearly as may reasonably be possible, to the condition that the Land was in at the time it originally began to be used for the purposes described in this Agreement, but if you are not directed or permitted to remove an Improvement under paragraph (iii), this paragraph will not apply to that part of the surface of the Land on which that Improvement is located,

UTILITY LICENCE

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and all of your right, interest and estate in the Land will be absolutely forfeited to us, and to the extent necessary, this covenant will survive the termination of this Agreement.

- 4.2 You will not permit any person who enters upon or uses the Land as a result of your use of the Land under this Agreement to do anything you are restricted from doing under this Article.
- 4.3 You must not use all or any part of the Land
 - (a) for the storage or disposal of any Hazardous Substances; or
 - (b) in any other manner whatsoever which causes or contributes to any Hazardous Substances being added or released on, to or under the Land or into the environment from the Land;

unless

- (c) such storage, disposal, release or other use does not result in your breach of any other provision of this Agreement, including without limitation, your obligation to comply with all laws relating in any way to Hazardous Substances, the environment and human health and safety; and
- (d) we have given our prior written approval to such storage, disposal, release or other use and for certainty any such consent operates only as a consent for the purposes of this section and does not bind, limit, or otherwise affect any other governmental authority from whom any consent, permit or approval may be required.
- 4.4 Despite any other provision of this Agreement you must:
 - (a) on the expiry or earlier termination of this Agreement; and
 - (b) at any time if we request and if you are in breach of your obligations under this Agreement relating to Hazardous Substances;

promptly remove from the Land all Hazardous Substances stored, or disposed of, on the Land, or which have otherwise been added or released on, to or under the Land:

- (c) by you; or
- (d) as a result of the use of the Land under this Agreement;

save and except only to the extent that we have given a prior written approval expressly allowing specified Hazardous Substances to remain on the Land following the expiry of the

UTILITY LICENCE

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Term.

- 4.5 We may from time to time
 - (a) in the event of the expiry or earlier termination of this Agreement;
 - (b) as a condition of our consideration of any request for consent to an assignment of this Agreement; or
 - (c) if we have a reasonable basis for believing that you are in breach of your obligations under this Agreement relating to Hazardous Substances;

provide you with a written request to investigate the environmental condition of the Land and upon any such request you must promptly obtain, at your cost, and provide us with, a report from a qualified and independent professional who has been approved by us, as to the environmental condition of the Land, the scope of which must be satisfactory to us and which may include all such tests and investigations that such professional may consider to be necessary or advisable to determine whether or not you have complied with your obligations under this Agreement with respect to Hazardous Substances.

- 4.6 You must at our request from time to time, but not more frequently than annually, provide us with your certificate (and if you are a corporation such certificate must be given by a senior officer) certifying that you are in compliance with all of your obligations under this Agreement pertaining to Hazardous Substances, and that no adverse environmental occurrences have taken place on the Land, other than as disclosed in writing to us.
- 4.7 We will not do anything on the Land that will interfere materially with the Improvements or your use of the Improvements, or that creates a public hazard.

ARTICLE 5 - LIMITATIONS

- 5.1 You agree with us that
 - (a) in addition to the other reservations and exceptions expressly provided in this Agreement this Agreement is subject to the exceptions and reservations of interests, rights, privileges and titles referred to in section 50 of the *Land Act*;
 - (b) other persons may hold or acquire rights to use the Land in accordance with enactments other than the Land Act or the Ministry of Lands, Parks and Housing Act, including rights held or acquired under the Coal Act, Forest Act, Geothermal Resources Act, Mineral Tenure Act, Petroleum and Natural Gas Act, Range Act, Water Act or Wildlife Act (or any prior or subsequent enactment of the Province of British Columbia of like effect); such rights may exist as of the Commencement Date and may be granted or

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acquired subsequent to the Commencement Date and may affect your use of the Land;

- (c) other persons may hold or acquire interests in or over the Land granted under the *Land Act* or the *Ministry of Lands, Parks and Housing Act*; such interests may exist as of the Commencement Date; following the Commencement Date we may grant such interests (including fee simple interests, leases, statutory rights of way and licences); you acknowledge that your use of the Land may be affected by such interests and the area or boundaries of the Land may change as a result of the granting of such interests;
- (d) you have no right to compensation from us and you release us from all claims, actions, causes of action, suits, debts and demands that you now have or may at any time in the future have against us arising out of any conflict between your use of the Land under this Agreement and any use of, or impact on the Land arising from the exercise, or operation of the interests, rights, privileges and titles described in subsections (a), (b), and (c);
- this Agreement does not limit any right to notice, compensation or any other benefit that you may be entitled to from time to time under the enactments described in subsection (b), or any other applicable enactment;
- (f) you will not commence or maintain proceedings under section 65 of the *Land Act* in respect of any interference with your use of the Land as permitted under this Agreement that arises as a result of the lawful exercise or operation of the interests, rights, privileges and titles described in subsections (a), (b) and (c);
- (g) you will not without our prior written consent, which consent may be unreasonably withheld, permit any other person to use the Land or the Improvements (including, without limitation, any copper, coaxial, fibre optic or similar material or device) for any telecommunications purpose;
- (h) you will not without our prior written consent, which consent may be unreasonably withheld, use the Land or the Improvements for any telecommunications purpose other than a telecommunications purpose which is necessary for your operation of the Improvements;
- upon completion of construction and the requisite surveys, we will prepare documents for Rights of Way for the penstock and intake, a Lease for the powerhouse and Licences for any other subsequent tenures required for this project, these documents will be issued for terms to coincide with the term of your Electricity Purchase Agreement;
- (j) this Agreement is subject to the Right of Way granted to BC Hydro and Power Authority as defined on plan RP4942 on file in the Vancouver Land Title Office;
- (k) this Agreement is subject to the Right of Way granted to Tyson Creek Hydro Corp. as

defined on Plan EPP10446 on file in the Vancovuer Land Title Office;

- (1) this Agreement is subject to the prior rights of A&A Trading Ltd. as holder of a Licence of Occupation on file 2407400 issued for log handling and storage purposes;
- (m) this Agreement is subject to the prior rights of Young Life as holder of a Licence of Occupation on file 2408517 issued for the purpose of guided saltwater recreation;
- this Agreement is subject to the prior rights of Veresen Energy Infrastructure Inc.. as holder of a Licence of Occupation on file 2408556 issued for the purpose of investigating a Clean Energy Project;
- this Agreement is subject to the prior rights of Altaqua Cleanergy Corp. as holder of a Licence of Occupation on file 2409882 issued for the purpose of investigating a Clean Energy Project;
- (p) this Agreement is subject to the prior rights of Altaqua Cleanergy Corp. as holder of a Licence of Occupation on file 2410190 issued for the purpose of investigating a Clean Energy Project;
- (q) this Agreement is subject to the prior rights of Western Tidal Holdings Ltd. as holder of a Licence of Occupation on file 2410825 issued for the purpose of investigating an Ocean Energy Project;
- (r) you will not remove or permit the removal of any Improvement from the Land except as expressly permitted or required under this Agreement;
- (s) any interest you may have in the Improvements ceases to exist and becomes our property upon the termination of this Agreement, except where an Improvement may be removed under paragraph 4.1(cc)(ii), (iii) or (iv) in which case any interest you may have in that Improvement ceases to exist and becomes our property if the Improvement is not removed from the Land within the time period set out in paragraph 4.1(cc)(ii) or the time period provided for in the direction or permission given under paragraph 4.1(cc)(iii); and
- (t) if, after the termination of this Agreement, we permit you to remain in possession of the Land and we accept money from you in respect of such possession, a tenancy from year to year will not be created by implication of law and you will be deemed to be a monthly occupier only subject to all of the provisions of this Agreement, except as to duration, in the absence of a written agreement to the contrary.

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ARTICLE 6 - SECURITY AND INSURANCE

- 6.1 On the Commencement Date, you will deliver to us Security in the amount of \$150,000.00 which will
 - (a) guarantee the performance of your obligations under this Agreement;
 - (b) be in the form required by us; and
 - (c) remain in effect until we certify, in writing, that you have fully performed your obligations under this Agreement.
- 6.2 Despite section 6.1, your obligations under that section are suspended for so long as you maintain in good standing other security acceptable to us to guarantee the performance of your obligations under this Agreement and all other dispositions held by you.
- 6.3 We may use the Security for the payment of any costs and expenses associated with any of your obligations under this Agreement that are not performed by you or to pay any overdue Fees and, if such event occurs, you will, within 30 days of that event, deliver further Security to us in an amount equal to the amount drawn down by us.
- 6.4 After we certify, in writing, that you have fully performed your obligations under this Agreement, we will return to you the Security maintained under section 6.1, less all amounts drawn down by us under section 6.3.
- 6.5 You acknowledge that we may, from time to time, notify you to
 - (a) change the form or amount of the Security; and
 - (b) provide and maintain another form of Security in replacement of or in addition to the Security posted by you under this Agreement;

and you will, within 60 days of receiving such notice, deliver to us written confirmation that the change has been made or the replacement or additional form of Security has been provided by you.

- 6.6 You must
 - (a) without limiting your obligations or liabilities under this Agreement, at your expense, purchase and maintain during the Term the following insurance with insurers licensed to do business in Canada:
 - (i) Commercial General Liability insurance in an amount of not less than \$5,000,000.00 inclusive per occurrence insuring against liability for personal

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injury, bodily injury (including death) and property damage, including coverage for all accidents or occurrences on the Land or the Improvements. Such policy will include cross liability, liability assumed under contract, provision to provide 30 days advance notice to us of material change or cancellation, and include us as additional insured;

- (b) ensure that all insurance required to be maintained by you under this Agreement is primary and does not require the sharing of any loss by any of our insurers;
- (c) within 10 working days of Commencement Date of this Agreement, provide to us evidence of all required insurance in the form of a completed "Province of British Columbia Certificate of Insurance";
- (d) if the required insurance policy or policies expire or are cancelled before the end of the Term of this Agreement, provide within 10 working days of the cancellation or expiration, evidence of new or renewal policy or policies of all required insurance in the form of a completed "Province of British Columbia Certificate of Insurance";
- (e) notwithstanding subsection (c) or (d) above, if requested by us, provide to us certified copies of the required insurance policies.
- 6.7 We may, acting reasonably, from time to time, require you to
 - (a) change the amount of insurance set out in subsection 6.6(a); and
 - (b) provide and maintain another type or types of insurance in replacement of or in addition to the insurance previously required to be maintained by you under this Agreement;

and you will, within 60 days of receiving such notice, cause the amounts and types to be changed and deliver to us a completed "Province of British Columbia Certificate of Insurance" for all insurance then required to be maintained by you under this Agreement.

- 6.8 You shall provide, maintain, and pay for any additional insurance which you are required by law to carry, or which you consider necessary to insure risks not otherwise covered by the insurance specified in this Agreement in your sole discretion.
- 6.9 You waive all rights of recourse against us with regard to damage to your own property.

ARTICLE 7 - ASSIGNMENT

7.1 You must not sublicense, assign, mortgage or transfer this Agreement, or permit any person to use or occupy the Land, without our prior written consent, which consent we may withhold.

7.2 Prior to considering a request for our consent under section 7.1, we may require you to meet certain conditions, including without limitation, that you provide us with a report as to the environmental condition of the Land as provided in section 4.5.

ARTICLE 8 - TERMINATION

8.1 You agree with us that

- (a) if you
 - (i) default in the payment of any money payable by you under this Agreement, or
 - (ii) fail to observe, abide by and comply with the provisions of this Agreement (other than the payment of any money payable by you under this Agreement),

and your default or failure continues for 60 days after we give written notice of the default or failure to you,

- (b) if, in our opinion, you fail to make diligent use of the Land for the purposes set out in this Agreement, and your failure continues for 60 days after we give written notice of the failure to you;
- (c) if you fail to maintain in good standing any disposition issued by us to you for the use and occupation of Crown land;
- (d) if you
 - (i) become insolvent or make an assignment for the general benefit of your creditors,
 - (ii) commit an act which entitles a person to take action under the *Bankruptcy and Insolvency Act* (Canada) or a bankruptcy petition is filed or presented against you or you consent to the filing of the petition or a decree is entered by a court of competent jurisdiction adjudging you bankrupt under any law relating to bankruptcy or insolvency, or
 - (iii) voluntarily enter into an arrangement with your creditors;
- (e) if you are a corporation,
 - (i) a receiver or receiver-manager is appointed to administer or carry on your business, or

- (ii) an order is made, a resolution passed or a petition filed for your liquidation or winding up;
- (f) if you are a society, you convert into a company in accordance with the *Society Act* without our prior written consent;
- (g) if this Agreement is taken in execution or attachment by any person; or
- (h) if we require the Land for our own use or, in our opinion, it is in the public interest to cancel this Agreement and we have given you 60 days' written notice of such requirement or opinion;

this Agreement will, at our option and with or without entry, terminate and your right to use and occupy the Land will cease.

- 8.2 If the condition complained of (other than the payment of any money payable by you under this Agreement) reasonably requires more time to cure than 60 days, you will be deemed to have complied with the remedying of it if you commence remedying or curing the condition within 60 days and diligently complete the same.
- 8.3 You agree with us that
 - (a) you will make no claim against us for compensation, in damages or otherwise, upon the lawful termination of this Agreement under section 8.1; and
 - (b) our remedies under this Article are in addition to those available to us under the *Land Act*.

ARTICLE 9 - DISPUTE RESOLUTION

- 9.1 If any dispute arises under this Agreement, the parties will make all reasonable efforts to resolve the dispute within 60 days of the dispute arising (or within such other time period agreed to by the parties) and, subject to applicable laws, provide candid and timely disclosure to each other of all relevant facts, information and documents to facilitate those efforts.
- 9.2 Subject to section 9.5, if a dispute under this Agreement cannot be resolved under section 9.1, we or you may refer the dispute to arbitration conducted by a sole arbitrator appointed pursuant to the *Commercial Arbitration Act*.
- 9.3 The cost of the arbitration referred to in section 9.2 will be shared equally by the parties and the arbitration will be governed by the laws of the Province of British Columbia.
- 9.4 The arbitration will be conducted at our offices (or the offices of our authorized representative) in Surrey, British Columbia, and if we or our authorized representative have no office in

UTILITY LICENCE

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Surrey, British Columbia, then our offices (or the offices of our authorized representative) that are closest to Surrey, British Columbia.

9.5 A dispute under this Agreement in respect of a matter within our sole discretion cannot, unless we agree, be referred to arbitration as set out in section 9.2.

ARTICLE 10 - NOTICE

10.1 Any notice required to be given by either party to the other will be deemed to be given if mailed by prepaid registered mail in Canada or delivered to the address of the other as follows:

to us

MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS 200 4723 1st Street SW Calgary, AB T2G 4Y8;

to you

NI HYDRO HOLDING CORP. 200 4723 1st Street SW Calgary, AB T2G 4Y8;

or at such other address as a party may, from time to time, direct in writing, and any such notice will be deemed to have been received if delivered, on the day of delivery, and if mailed, 7 days after the time of mailing, except in the case of mail interruption in which case actual receipt is required.

- 10.2 In order to expedite the delivery of any notice required to be given by either party to the other, a concurrent facsimile copy of any notice will, where possible, be provided to the other party but nothing in this section, and specifically the lack of delivery of a facsimile copy of any notice, will affect the deemed delivery provided in section 10.1.
- 10.3 The delivery of all money payable to us under this Agreement will be effected by hand, courier or prepaid regular mail to the address specified above, or by any other payment procedure agreed to by the parties, such deliveries to be effective on actual receipt.
ARTICLE 11 - MISCELLANEOUS

- 11.1 No provision of this Agreement will be considered to have been waived unless the waiver is in writing, and a waiver of a breach of a provision of this Agreement will not be construed as or constitute a waiver of any further or other breach of the same or any other provision of this Agreement, and a consent or approval to any act requiring consent or approval will not waive or render unnecessary the requirement to obtain consent or approval to any subsequent same or similar act.
- 11.2 No remedy conferred upon or reserved to us under this Agreement is exclusive of any other remedy in this Agreement or provided by law, but that remedy will be in addition to all other remedies in this Agreement or then existing at law, in equity or by statute.
- 11.3 The grant of a sublicence, assignment or transfer of this Agreement does not release you from your obligation to observe and perform all the provisions of this Agreement on your part to be observed and performed unless we specifically release you from such obligation in our consent to the sublicence, assignment or transfer of this Agreement.
- 11.4 This Agreement extends to, is binding upon and enures to the benefit of the parties, their heirs, executors, administrators, successors and permitted assigns.
- 11.5 If, due to a strike, lockout, labour dispute, act of God, inability to obtain labour or materials, law, ordinance, rule, regulation or order of a competent governmental authority, enemy or hostile action, civil commotion, fire or other casualty or any condition or cause beyond your reasonable control, other than normal weather conditions, you are delayed in performing any of your obligations under this Agreement, the time for the performance of that obligation will be extended by a period of time equal to the period of time of the delay so long as
 - (a) you give notice to us within 30 days of the commencement of the delay setting forth the nature of the delay and an estimated time frame for the performance of your obligation; and
 - (b) you diligently attempt to remove the delay.
- 11.6 You acknowledge and agree with us that
 - (a) this Agreement has been granted to you on the basis that you accept the Land on an "as is" basis;
 - (b) without limitation we have not made, and you have not relied upon, any representation or warranty from us as to
 - (i) the suitability of the Land for any particular use, including the use permitted by this Agreement;

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 the condition of the Land (including surface and groundwater), environmental or otherwise, including the presence of or absence of any toxic, hazardous, dangerous or potentially dangerous substances on or under the Land and the current and past uses of the Land and any surrounding land and whether or not the Land is susceptible to erosion or flooding;

- (iii) the general condition and state of all utilities or other systems on or under the Land or which serve the Land;
- (iv) the zoning of the Land and the bylaws of any government authority which relate to the development, use and occupation of the Land; and
- (v) the application of any federal or Provincial enactment or law to the Land;
- (c) you have been afforded a reasonable opportunity to inspect the Land or to carry out such other audits, investigations, tests and surveys as you consider necessary to investigate those matters set out in subsection (b) to your satisfaction before entering into this Agreement;
- (d) you waive, to the extent permitted by law, the requirement if any, for us to provide you with a "site profile" under the *Environmental Management Act* or any regulations made under that act;
- (e) we are under no obligation, express or implied, to provide financial assistance or to contribute toward the cost of servicing, creating or developing the Land or the Improvements and you are solely responsible for all costs and expenses associated with your use of the Land and the Improvements for the purposes set out in this Agreement; and
- (f) we are under no obligation to provide access or services to the Land or to maintain or improve existing access roads.
- 11.7 You agree with us that nothing in this Agreement constitutes you as our agent, joint venturer or partner or gives you any authority or power to bind us in any way.
- 11.8 This Agreement does not override or affect any powers, privileges or immunities to which you are entitled under any enactment of the Province of British Columbia.

The parties have executed this Agreement as of the date of reference of this Agreement.

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File No.: 2411641 Disposition No.: 922632

SIGNED on behalf of HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF BRITISH COLUMBIA by the minister responsible for the *Land Act*

or the minister's authorized representative

Minister responsible for the *Land Act* or the minister's authorized representative

SIGNED on behalf of **NI HYDRO HOLDING CORP.** by a duly authorized signatory

Authorized Signatory

UTILITY LICENCE

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LEGAL DESCRIPTION SCHEDULE

DISTRICT LOT 3734, AND THOSE PARTS OF DISTRICT LOTS 3735, 3736, 4592 AND 6643, TOGETHER WITH UNSURVEYED FORESHORE OR LAND COVERED BY WATER BEING PART OF THE BED OF SKOOKUMCHUCK NARROWS, GROUP 1, NEW WESTMINSTER DISTRICT CONTAINING 385.189 HECTARES, MORE OR LESS

LEGAL DESCRIPTION SCHEDULE

DISTRICT LOT 3734, AND THOSE PARTS OF DISTRICT LOTS 3735, 3736, 4592 AND 6643, TOGETHER WITH UNSURVEYED FORESHORE OR LAND COVERED BY WATER BEING PART OF THE BED OF SKOOKUMCHUCK NARROWS, GROUP 1, NEW WESTMINSTER DISTRICT, CONTAINING 385.189 HECTARES, MORE OR LESS



Scale = 1: 71,522 BCGS_MAPSHEET 92G.071

UTILITY LICENCE

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File No.: 2411641 Disposition No.: 922632

SCHEDULE A

ADDITIONAL FEES AND RENTS

"Operating Period" means the first twelve month period of the Term beginning on the Commencement Date and each successive twelve month period thereafter

"Production Report" means a report that contains

a detailed statement showing the quantity of material removed from the Quarry Land during the Operating period covered by the report, and

your Statutory Declaration in a form satisfactory to us confirming without qualification that the statement contained in the Production Report is true

"Quarry Land" means land identified as quarry, or uses included with the Land identified in the Legal Description which includes but is not limited to land identified as Borrow Pits.

"Royalty Fee" means \$1.00 per metric tonne

A Royalty Fee is payable for all aggregate material that is:

removed from Quarry Land;

used in the production of concrete; and

moved from its original position and used in another location of the Land, however,

A Royalty Fee is not payable for aggregate material that is:

- (a) used to build and maintain public roads; and
- (b) located immediately beneath the area of the intake, penstock, powerhouse;
- *(c) not used in concrete production and ultimately used in the same position (i.e. penstock bedding); and*
- (d) material that is stored passively on the Land and shown in the "Legal Description Schedule"

You will within 15 days after the end of each Operating Period deliver to us a Production Report for that Operating Period together with a payment in a sum equal to the Royalty Fee payable.

STANDARD LICENCE

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Our File: 2411644

February 1, 2016

NI Hydro Holding Corp 200 4723 1 St SW Calgary, AB T2G 4Y8

Dear NI Hydro Holding Corp:

It is my pleasure to enclose your original copy of Licence No. 242942 duly executed on behalf of the Minister which will expire on October 1, 2049.

The Licence is issued for a term of 32 years and 10 months for Run-of-River Waterpower purposes at the rental of \$44,488.82 for the first year of the term.

This licence covers that parcel or tract of land in the vicinity of Ramona Creek, Group 1, New Westminster District, containing 287.798 hectares.

Do not hesitate to contact me at 604 586-4411 or <u>maxine.davie@gov.bc.ca</u> if you have any questions or require assistance. It continues to be our pleasure to be of service.

Yours truly,

Maxue Mars

Maxine Davie Senior Portfolio Administrator

Enclosures

pc: BC Assessment Authority, North Shore/Squamish Valley Sunshine Coast Regional District

South Coast Natural Resource Region



LICENCE OF OCCUPATION

Licence No.: 242942

File No.: 2411644 Disposition No.: 922772

THIS AGREEMENT is dated for reference December 15, 2015 and is made under the Land Act.

BETWEEN:

HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF BRITISH COLUMBIA, represented by the minister responsible for the *Land Act*, Parliament Buildings, Victoria, British Columbia

(the "Province")

AND:

NI HYDRO HOLDING CORP. (Inc. No. BC0814633) 200 4723 1 St SW Calgary, AB T2G 4Y8

(the "Licensee")

The parties agree as follows:

ARTICLE 1 - INTERPRETATION

1.1 In this Agreement,

"Agreement" means this licence of occupation;

"Commencement Date" means January 1, 2016;

"disposition" has the meaning given to it in the Land Act and includes a licence of occupation;

"Fees" means the fees set out in Article 3;

"Hazardous Substances" means any substance which is hazardous to persons, property or the environment, including without limitation

(a) waste, as that term is defined in the Environmental Management Act; and

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- (b) any other hazardous, toxic or other dangerous substance, the use, transportation or release into the environment of which, is now or from time to time prohibited, controlled or regulated under any laws or by any governmental authority, applicable to, or having jurisdiction in relation to, the Land;
- "Improvements" includes anything made, constructed, erected, built, altered, repaired or added to, in, on or under the Land, and attached to it or intended to become a part of it, and also includes any clearing, excavating, digging, drilling, tunnelling, filling, grading or ditching of, in, on or under the Land;
- "Land" means that part or those parts of the Crown land either described in, or shown outlined by bold line on, the schedule attached to this Agreement entitled "Legal Description Schedule" except for those parts of the land that, on the Commencement Date, consist of highways (as defined in the *Transportation Act*);
- "Realty Taxes" means all taxes, rates, levies, duties, charges and assessments levied or charged, at any time, by any government authority having jurisdiction which relate to the Land, the Improvements or both of them and which you are liable to pay under applicable laws;
- "Security" means the security referred to in section 6.1 or 6.2, as replaced or supplemented in accordance with section 6.5;
- "Term" means the period of time set out in section 2.2;
- "we", "us" or "our" refers to the Province alone and never refers to the combination of the Province and the Licensee: that combination is referred to as "the parties"; and

"you" or "your" refers to the Licensee.

- 1.2 In this Agreement, "person" includes a corporation, partnership or party, and the personal or other legal representatives of a person to whom the context can apply according to law and wherever the singular or masculine form is used in this Agreement it will be construed as the plural or feminine or neuter form, as the case may be, and vice versa where the context or parties require.
- 1.3 The captions and headings contained in this Agreement are for convenience only and do not define or in any way limit the scope or intent of this Agreement.
- 1.4 This Agreement will be interpreted according to the laws of the Province of British Columbia.
- 1.5 Where there is a reference to an enactment of the Province of British Columbia or of Canada in this Agreement, that reference will include a reference to every amendment to it, every

UTILITY LICENCE

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regulation made under it and any subsequent enactment of like effect and, unless otherwise indicated, all enactments referred to in this Agreement are enactments of the Province of British Columbia.

- 1.6 If any section of this Agreement, or any part of a section, is found to be illegal or unenforceable, that section or part of a section, as the case may be, will be considered separate and severable and the remainder of this Agreement will not be affected and this Agreement will be enforceable to the fullest extent permitted by law.
- 1.7 Each schedule to this Agreement is an integral part of this Agreement as if set out at length in the body of this Agreement.
- 1.8 This Agreement constitutes the entire agreement between the parties and no understanding or agreement, oral or otherwise, exists between the parties with respect to the subject matter of this Agreement except as expressly set out in this Agreement and this Agreement may not be modified except by subsequent agreement in writing between the parties.
- 1.9 Each party will, upon the request of the other, do or cause to be done all lawful acts necessary for the performance of the provisions of this Agreement.
- 1.10 Any liabilities or obligations of either party arising, or to be performed, before or as a result of the termination of this Agreement, and which have not been satisfied or remain unperformed at the termination of this Agreement, any indemnity and any release in our favour and any other provision which specifically states that it will survive the termination of this Agreement, shall survive and not be affected by the expiration of the Term or the termination of this Agreement.
- 1.11 Time is of the essence of this Agreement.
- 1.12 Wherever this Agreement provides that an action may be taken, a consent or approval must be obtained or a determination must be made, then you or we, as the case may be, will act reasonably in taking such action, deciding whether to provide such consent or approval or making such determination; but where this Agreement states that you or we have sole discretion to take an action, provide a consent or approval or make a determination, there will be no requirement to show reasonableness or to act reasonably in taking that action, providing that consent or approval or making that determination.
- 1.13 Any requirement under this Agreement for us to act reasonably shall not require us to act in a manner that is contrary to or inconsistent with any legislation, regulations, Treasury Board directives or other enactments or any policy, directive, executive direction or other such guideline of general application.

UTILITY LICENCE

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ARTICLE 2 - GRANT AND TERM

- 2.1 On the terms and conditions of this Agreement, we grant you, your employees, agents and contractors a licence to occupy the Land only for the purposes of constructing, erecting, stringing or otherwise installing, operating, maintaining, removing and replacing the Improvements necessary for the transmission of electric energy and for telecommunications equipment necessary for your transmission of electric energy; and you acknowledge this licence of occupation does not grant you exclusive use and occupancy of the Land.
- 2.2 The term of this Agreement commences on the Commencement Date and terminates on the 32 year 10 month anniversary of that date, or such earlier date provided for in this Agreement. We reserve the right to terminate this Agreement in certain circumstances as expressly provided in this Agreement.

ARTICLE 3 - FEES

- 3.1 You will pay to us
 - (a) for the first year of the Term, Fees of \$44,488.82, payable in advance on the Commencement Date; and
 - (b) for each year during the remainder of the Term, the Fees either determined by us under section 3.2 or established under section 3.3, payable in advance on each anniversary of the Commencement Date.
- 3.2 We will, not later than 15 days before each anniversary of the Commencement Date during the Term, give written notice to you specifying in our sole discretion the Fees payable by you under subsection 3.1(b) for the subsequent year of the Term and we will establish such Fees in accordance with our policies applicable to your use of the Land under this Agreement.
- 3.3 If we do not give notice to you under section 3.2, the Fees payable by you under subsection 3.1(b) for the year for which notice was not given will be the same as the Fees payable by you for the preceding year of the Term.

ARTICLE 4 - COVENANTS

4.1 You must

- (a) pay, when due,
 - (i) the Fees to us at the address set out in Article 10,

UTILITY LICENCE

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- (ii) the Realty Taxes, and
- (iii) all charges for electricity, gas, water and other utilities supplied to the Land for use by you or on your behalf or with your permission;
- (b) deliver to us, immediately upon demand, receipts or other evidence of the payment of Realty Taxes and all other money required to be paid by you under this Agreement;
- (c) observe, abide by and comply with
 - all applicable laws, bylaws, orders, directions, ordinances and regulations of any government authority having jurisdiction in any way affecting your use or occupation of the Land or the Improvements including without limitation all laws, bylaws, orders, directions, ordinances and regulations relating in any way to Hazardous Substances, the environment and human health and safety, and
 - (ii) the provisions of this Agreement;
- (d) in respect of the use of the Land by you or by any person who enters upon or uses the Land as a result of your use of the Land under this Agreement, keep the Land and the Improvements in a safe, clean and sanitary condition satisfactory to us, and at our written request, rectify any failure to comply with such a covenant by making the Land and the Improvements safe, clean and sanitary;
- (e) not commit any wilful or voluntary waste, spoil or destruction on the Land or do anything on the Land that may be or become a nuisance to an owner or occupier of land in the vicinity of the Land;
- (f) use and occupy the Land only in accordance with and for the purposes set out in section 2.1;
- (g) not construct, place, anchor, secure or affix any Improvement in, on, or to the Land or otherwise use the Land in a manner that will interfere with any person's riparian right of access over the Land and you acknowledge and agree that the granting of this Agreement and our approval of the Improvements under this Agreement, whether through our approval of a Management Plan (where applicable) or otherwise, do not:
 - (i) constitute a representation or determination that such Improvements will not give rise to any infringement of any riparian right of access that may exist over the Land; or
 - (ii) abrogate or authorize any infringement of any riparian right of access that may exist over the Land;

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and you remain responsible for ensuring that you will not cause any infringement of any such riparian right of access;

- (h) pay all accounts and expenses as they become due for work performed on or materials supplied to the Land at your request, on your behalf or with your permission, except for money that you are required to hold back under the *Builders Lien Act*;
- (i) if any claim of lien over the Land is made under the Builders Lien Act for work performed on or materials supplied to the Land at your request, on your behalf or with your permission, immediately take all steps necessary to have the lien discharged, unless the claim of lien is being contested in good faith by you and you have taken the steps necessary to ensure that the claim of lien will not subject the Land or any interest of yours under this Agreement to sale or forfeiture;
- (j) not cut or remove timber on or from the Land without being granted the right under the *Forest Act* to harvest Crown timber on the Land;
- (k) obtain our prior written consent, which consent may be unreasonably withheld, before permitting any other person to use the Land or the Improvements (including without limitation, any copper, coaxial, fibre optic or similar material or device) for any telecommunications purpose;
- obtain our prior written consent, which consent may be unreasonably withheld, before using the Land or the Improvements for any telecommunications purpose other than a telecommunications purpose which is necessary for your operation of the Improvements;
- (m) if any soil is disturbed by you as a result of your construction or maintenance of the Improvements, at your expense, restore the surface of the Land to a condition satisfactory to us;
- (n) permit the free and unrestricted use by the general public of the banks of Ramona Creek for recreational and fishing purposes;
- (o) deliver to us a survey of the constructed transmission line, on the Land, prepared by a British Columbia Land Surveyor, in a form satisfactory to us, not later than 30 days prior to the expiration of this Agreement;
- (p) not conduct any activities, or install any Improvements on the Land until you are in receipt of a "Leave to Commence Construction" or express written consent from from the Assistant Regional Water Manager;
- (q) adhere to the conditions contained in the Environmental Assessment Certificate No.

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Licence	File No.: 2411644
	Disposition No.: 922772

E13-04 Table of Conditions dated November 25, 2013, and subsequent revisions thereto, held on file by us;

- submit to us a copy of any approved revisions to the Environmental Assessment Certificate Table of Conditions, dated November 25, 2013, within thirty (30) days of approval;
- (s) adhere to the conditions contained in the "request for exemption from general wildlife measures" letter dated April 23, 2014, and subsequent revisions thereto, held on file by us;
- submit to us a copy of any approved revisions to the "request for exemption from general wildlife measures" letter dated April 23, 2014, within thirty (30) days of their approval;
- have a qualified professional (coast) design any access roads and bridges to the standards as outlined in the Ministry of Forests and Range Engineering Manual and applicable legislation;
- (v) upon completion of construction of the access roads and bridges, submit to us a qualified professional's report, similar to an 'As Built Certificate' signed and sealed by a qualified professional, stating that the construction conforms to the standards and legislation;
- (w) prior to beginning construction leading onto any public highway, obtain an access permit from the District Engineer, Ministry of Transportation and Infrastructure for the Highways District in which the Land is situated;
- (x) not construct access roads to a width exceeding 20 metres plus 3 metres for cuts and fill without our prior written consent;
- (y) deactivate access roads, in accordance with the standards outlined in the Ministry of Forests and Range Engineering Manual and applicable legislation, and to the satisfaction of the District Manager, Sunshine Coast Forest District, should some or all of the access roads no longer be required, or upon termination of this Agreement;
- (z) take all reasonable precautions to avoid disturbing or damaging any archaeological material found on or under the Land and, upon discovering any archaeological material on or under the Land, you must immediately notify the ministry responsible for administering the *Heritage Conservation Act*;
- (aa) permit us, or our authorized representatives, to enter on the Land at any time to inspect the Land and the Improvements, including without limitation to test and remove soil, groundwater and other materials and substances, where the inspection may be necessary

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or advisable for us to determine whether or not you have complied with your obligations under this Agreement with respect to Hazardous Substances, provided that we take reasonable steps to minimize any disruption of your operations;

(bb) indemnify and save us and our servants, employees and agents harmless against all claims, actions, causes of action, losses, damages, costs and liabilities, including fees of solicitors and other professional advisors, arising out of one or more of the following:

- (i) any breach, violation or non-performance of a provision of this Agreement,
- (ii) any conflict between your use of the Land under this Agreement and the lawful use of the Land by any other person, and
- (iii) any personal injury, bodily injury (including death) or property damage occurring or happening on or off the Land by virtue of your entry upon, use or occupation of the Land,

and the amount of all such losses, damages, costs and liabilities will be payable to us immediately upon demand; and

- (cc) on the termination of this Agreement,
 - (i) peaceably quit and deliver to us possession of the Land and, subject to paragraphs (ii), (iii) and (iv), the Improvements in a safe, clean and sanitary condition,
 - (ii) within 30 days, remove from the Land any Improvement you want to remove, if the Improvement was placed on or made to the Land by you, is in the nature of a tenant's fixture normally removable by tenants and is not part of a building (other than as a tenant's fixture) or part of the Land and you are not in default of this Agreement,
 - (iii) not remove any Improvement from the Land if you are in default of this Agreement, unless we direct or permit you to do so under paragraph (iv),
 - (iv) remove from the Land any Improvement that we, in writing, direct or permit you to remove, other than any Improvement permitted to be placed on or made to the Land under another disposition, and
 - (v) restore the surface of the Land as nearly as may reasonably be possible, to the condition that the Land was in at the time it originally began to be used for the purposes described in this Agreement, but if you are not directed or permitted to remove an Improvement under paragraph (iii), this paragraph will not apply to that part of the surface of the Land on which that Improvement is located,

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and all of your right, interest and estate in the Land will be absolutely forfeited to us, and to the extent necessary, this covenant will survive the termination of this Agreement.

- 4.2 You will not permit any person who enters upon or uses the Land as a result of your use of the Land under this Agreement to do anything you are restricted from doing under this Article.
- 4.3 You must not use all or any part of the Land
 - (a) for the storage or disposal of any Hazardous Substances; or
 - (b) in any other manner whatsoever which causes or contributes to any Hazardous Substances being added or released on, to or under the Land or into the environment from the Land;

unless

- (c) such storage, disposal, release or other use does not result in your breach of any other provision of this Agreement, including without limitation, your obligation to comply with all laws relating in any way to Hazardous Substances, the environment and human health and safety; and
- (d) we have given our prior written approval to such storage, disposal, release or other use and for certainty any such consent operates only as a consent for the purposes of this section and does not bind, limit, or otherwise affect any other governmental authority from whom any consent, permit or approval may be required.
- 4.4 Despite any other provision of this Agreement you must:
 - (a) on the expiry or earlier termination of this Agreement; and
 - (b) at any time if we request and if you are in breach of your obligations under this Agreement relating to Hazardous Substances;

promptly remove from the Land all Hazardous Substances stored, or disposed of, on the Land, or which have otherwise been added or released on, to or under the Land:

- (c) by you; or
- (d) as a result of the use of the Land under this Agreement;

save and except only to the extent that we have given a prior written approval expressly allowing specified Hazardous Substances to remain on the Land following the expiry of the

UTILITY LICENCE

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Term.

- 4.5 We may from time to time
 - (a) in the event of the expiry or earlier termination of this Agreement;
 - (b) as a condition of our consideration of any request for consent to an assignment of this Agreement; or
 - (c) if we have a reasonable basis for believing that you are in breach of your obligations under this Agreement relating to Hazardous Substances;

provide you with a written request to investigate the environmental condition of the Land and upon any such request you must promptly obtain, at your cost, and provide us with, a report from a qualified and independent professional who has been approved by us, as to the environmental condition of the Land, the scope of which must be satisfactory to us and which may include all such tests and investigations that such professional may consider to be necessary or advisable to determine whether or not you have complied with your obligations under this Agreement with respect to Hazardous Substances.

- 4.6 You must at our request from time to time, but not more frequently than annually, provide us with your certificate (and if you are a corporation such certificate must be given by a senior officer) certifying that you are in compliance with all of your obligations under this Agreement pertaining to Hazardous Substances, and that no adverse environmental occurrences have taken place on the Land, other than as disclosed in writing to us.
- 4.7 We will not do anything on the Land that will interfere materially with the Improvements or your use of the Improvements, or that creates a public hazard.

ARTICLE 5 - LIMITATIONS

- 5.1 You agree with us that
 - (a) in addition to the other reservations and exceptions expressly provided in this Agreement this Agreement is subject to the exceptions and reservations of interests, rights, privileges and titles referred to in section 50 of the *Land Act*;
 - (b) other persons may hold or acquire rights to use the Land in accordance with enactments other than the Land Act or the Ministry of Lands, Parks and Housing Act, including rights held or acquired under the Coal Act, Forest Act, Geothermal Resources Act, Mineral Tenure Act, Petroleum and Natural Gas Act, Range Act, Water Act or Wildlife Act (or any prior or subsequent enactment of the Province of British Columbia of like effect); such rights may exist as of the Commencement Date and may be granted or

UTILITY LICENCE

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acquired subsequent to the Commencement Date and may affect your use of the Land;

(c) other persons may hold or acquire interests in or over the Land granted under the Land Act or the Ministry of Lands, Parks and Housing Act; such interests may exist as of the Commencement Date; following the Commencement Date we may grant such interests (including fee simple interests, leases, statutory rights of way and licences); you acknowledge that your use of the Land may be affected by such interests and the area or boundaries of the Land may change as a result of the granting of such interests;

- (d) you have no right to compensation from us and you release us from all claims, actions, causes of action, suits, debts and demands that you now have or may at any time in the future have against us arising out of any conflict between your use of the Land under this Agreement and any use of, or impact on the Land arising from the exercise, or operation of the interests, rights, privileges and titles described in subsections (a), (b), and (c);
- this Agreement does not limit any right to notice, compensation or any other benefit that you may be entitled to from time to time under the enactments described in subsection (b), or any other applicable enactment;
- (f) you will not commence or maintain proceedings under section 65 of the Land Act in respect of any interference with your use of the Land as permitted under this Agreement that arises as a result of the lawful exercise or operation of the interests, rights, privileges and titles described in subsections (a), (b) and (c);
- (g) you will not without our prior written consent, which consent may be unreasonably withheld, permit any other person to use the Land or the Improvements (including, without limitation, any copper, coaxial, fibre optic or similar material or device) for any telecommunications purpose;
- (h) you will not without our prior written consent, which consent may be unreasonably withheld, use the Land or the Improvements for any telecommunications purpose other than a telecommunications purpose which is necessary for your operation of the Improvements;
- upon completion of construction and the requisite surveys, we will prepare documents for Rights of Way for the penstock and intake, a Lease for the powerhouse and Licences for any other subsequent tenures required for this project, these documents will be issued for terms to coincide with the term of your Electricity Purchase Agreement;
- (j) this Agreement is subject to the Right of Way granted to Tyson Creek Hydro Corp. as defined on Plan EPP10446 on file in the Vancovuer Land Title Office;
- (k) this Agreement is subject to the prior rights of NI Hydro Holding Corp. as holder of a

UTILITY LICENCE

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Licence	File No.: 2411644
	Disposition No.: 922772

General Area Licence of Occupation on file 2409412, issued for Clean Energy Project purposes;

- this Agreement is subject to the prior rights of NI Hydro Holding Corp. as holder of a General Area Licence of Occupation on file 2409421, issued for Clean Energy Project purposes;
- (m) this Agreement is subject to the prior rights of NI Hydro Holding Corp. as holder of a General Area Licence of Occupation on file 2409711, issued for Clean Energy Project purposes;
- this Agreement is subject to the prior rights of Tyson Creek Hydro Corp. as holder of a Licence of Occupation on file 2409556 issued for construction material and equipment staging area purposes;
- (o) you will not remove or permit the removal of any Improvement from the Land except as expressly permitted or required under this Agreement;
- (p) any interest you may have in the Improvements ceases to exist and becomes our property upon the termination of this Agreement, except where an Improvement may be removed under paragraph 4.1(cc)(ii), (iii) or (iv) in which case any interest you may have in that Improvement ceases to exist and becomes our property if the Improvement is not removed from the Land within the time period set out in paragraph 4.1(cc)(ii) or the time period provided for in the direction or permission given under paragraph 4.1(cc)(iii); and
- (q) if, after the termination of this Agreement, we permit you to remain in possession of the Land and we accept money from you in respect of such possession, a tenancy from year to year will not be created by implication of law and you will be deemed to be a monthly occupier only subject to all of the provisions of this Agreement, except as to duration, in the absence of a written agreement to the contrary.

ARTICLE 6 - SECURITY AND INSURANCE

- 6.1 On the Commencement Date, you will deliver to us Security in the amount of \$150,000.00 which will
 - (a) guarantee the performance of your obligations under this Agreement;
 - (b) be in the form required by us; and
 - (c) remain in effect until we certify, in writing, that you have fully performed your obligations under this Agreement.

UTILITY LICENCE

Licence	File No.: 2411644
	Disposition No.: 922772

- 6.2 Despite section 6.1, your obligations under that section are suspended for so long as you maintain in good standing other security acceptable to us to guarantee the performance of your obligations under this Agreement and all other dispositions held by you.
- 6.3 We may use the Security for the payment of any costs and expenses associated with any of your obligations under this Agreement that are not performed by you or to pay any overdue Fees and, if such event occurs, you will, within 30 days of that event, deliver further Security to us in an amount equal to the amount drawn down by us.
- 6.4 After we certify, in writing, that you have fully performed your obligations under this Agreement, we will return to you the Security maintained under section 6.1, less all amounts drawn down by us under section 6.3.
- 6.5 You acknowledge that we may, from time to time, notify you to
 - (a) change the form or amount of the Security; and
 - (b) provide and maintain another form of Security in replacement of or in addition to the Security posted by you under this Agreement;

and you will, within 60 days of receiving such notice, deliver to us written confirmation that the change has been made or the replacement or additional form of Security has been provided by you.

- 6.6 You must
 - (a) without limiting your obligations or liabilities under this Agreement, at your expense, purchase and maintain during the Term the following insurance with insurers licensed to do business in Canada:
 - Commercial General Liability insurance in an amount of not less than \$5,000,000.00 inclusive per occurrence insuring against liability for personal injury, bodily injury (including death) and property damage, including coverage for all accidents or occurrences on the Land or the Improvements. Such policy will include cross liability, liability assumed under contract, provision to provide 30 days advance notice to us of material change or cancellation, and include us as additional insured;
 - (b) ensure that all insurance required to be maintained by you under this Agreement is primary and does not require the sharing of any loss by any of our insurers;
 - (c) within 10 working days of Commencement Date of this Agreement, provide to us evidence of all required insurance in the form of a completed "Province of British

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Columbia Certificate of Insurance";

- (d) if the required insurance policy or policies expire or are cancelled before the end of the Term of this Agreement, provide within 10 working days of the cancellation or expiration, evidence of new or renewal policy or policies of all required insurance in the form of a completed "Province of British Columbia Certificate of Insurance";
- (e) notwithstanding subsection (c) or (d) above, if requested by us, provide to us certified copies of the required insurance policies.
- 6.7 We may, acting reasonably, from time to time, require you to
 - (a) change the amount of insurance set out in subsection 6.6(a); and
 - (b) provide and maintain another type or types of insurance in replacement of or in addition to the insurance previously required to be maintained by you under this Agreement;

and you will, within 60 days of receiving such notice, cause the amounts and types to be changed and deliver to us a completed "Province of British Columbia Certificate of Insurance" for all insurance then required to be maintained by you under this Agreement.

- 6.8 You shall provide, maintain, and pay for any additional insurance which you are required by law to carry, or which you consider necessary to insure risks not otherwise covered by the insurance specified in this Agreement in your sole discretion.
- 6.9 You waive all rights of recourse against us with regard to damage to your own property.

ARTICLE 7 - ASSIGNMENT

- 7.1 You must not sublicense, assign, mortgage or transfer this Agreement, or permit any person to use or occupy the Land, without our prior written consent, which consent we may withhold.
- 7.2 Prior to considering a request for our consent under section 7.1, we may require you to meet certain conditions, including without limitation, that you provide us with a report as to the environmental condition of the Land as provided in section 4.5.

ARTICLE 8 - TERMINATION

- 8.1 You agree with us that
 - (a) if you

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- (i) default in the payment of any money payable by you under this Agreement, or
- (ii) fail to observe, abide by and comply with the provisions of this Agreement (other than the payment of any money payable by you under this Agreement),

and your default or failure continues for 60 days after we give written notice of the default or failure to you,

- (b) if, in our opinion, you fail to make diligent use of the Land for the purposes set out in this Agreement, and your failure continues for 60 days after we give written notice of the failure to you;
- (c) if you
 - (i) become insolvent or make an assignment for the general benefit of your creditors,
 - (ii) commit an act which entitles a person to take action under the *Bankruptcy and Insolvency Act* (Canada) or a bankruptcy petition is filed or presented against you or you consent to the filing of the petition or a decree is entered by a court of competent jurisdiction adjudging you bankrupt under any law relating to bankruptcy or insolvency, or
 - (iii) voluntarily enter into an arrangement with your creditors;
- (d) if you are a corporation,
 - (i) a receiver or receiver-manager is appointed to administer or carry on your business, or
 - (ii) an order is made, a resolution passed or a petition filed for your liquidation or winding up;
- (e) if you are a society, you convert into a company in accordance with the *Society Act* without our prior written consent;
- (f) if this Agreement is taken in execution or attachment by any person; or
- (g) if we require the Land for our own use or, in our opinion, it is in the public interest to cancel this Agreement and we have given you 60 days' written notice of such requirement or opinion;

this Agreement will, at our option and with or without entry, terminate and your right to use and occupy the Land will cease.

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- 8.2 If the condition complained of (other than the payment of any money payable by you under this Agreement) reasonably requires more time to cure than 60 days, you will be deemed to have complied with the remedying of it if you commence remedying or curing the condition within 60 days and diligently complete the same.
- 8.3 You agree with us that
 - (a) you will make no claim against us for compensation, in damages or otherwise, upon the lawful termination of this Agreement under section 8.1; and
 - (b) our remedies under this Article are in addition to those available to us under the Land Act.

ARTICLE 9 - DISPUTE RESOLUTION

- 9.1 If any dispute arises under this Agreement, the parties will make all reasonable efforts to resolve the dispute within 60 days of the dispute arising (or within such other time period agreed to by the parties) and, subject to applicable laws, provide candid and timely disclosure to each other of all relevant facts, information and documents to facilitate those efforts.
- 9.2 Subject to section 9.5, if a dispute under this Agreement cannot be resolved under section 9.1, we or you may refer the dispute to arbitration conducted by a sole arbitrator appointed pursuant to the *Commercial Arbitration Act*.
- 9.3 The cost of the arbitration referred to in section 9.2 will be shared equally by the parties and the arbitration will be governed by the laws of the Province of British Columbia.
- 9.4 The arbitration will be conducted at our offices (or the offices of our authorized representative) in Surrey, British Columbia, and if we or our authorized representative have no office in Surrey, British Columbia, then our offices (or the offices of our authorized representative) that are closest to Surrey, British Columbia.
- 9.5 A dispute under this Agreement in respect of a matter within our sole discretion cannot, unless we agree, be referred to arbitration as set out in section 9.2.

ARTICLE 10 - NOTICE

10.1 Any notice required to be given by either party to the other will be deemed to be given if mailed by prepaid registered mail in Canada or delivered to the address of the other as follows:

to us

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MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS 200-10428 153 St Surrey, BC V3R 1E1;

to you

NI HYDRO HOLDING CORP. 200 4723 1 St SW Calgary, AB T2G 4Y8;

or at such other address as a party may, from time to time, direct in writing, and any such notice will be deemed to have been received if delivered, on the day of delivery, and if mailed, 7 days after the time of mailing, except in the case of mail interruption in which case actual receipt is required.

- 10.2 In order to expedite the delivery of any notice required to be given by either party to the other, a concurrent facsimile copy of any notice will, where possible, be provided to the other party but nothing in this section, and specifically the lack of delivery of a facsimile copy of any notice, will affect the deemed delivery provided in section 10.1.
- 10.3 The delivery of all money payable to us under this Agreement will be effected by hand, courier or prepaid regular mail to the address specified above, or by any other payment procedure agreed to by the parties, such deliveries to be effective on actual receipt.

ARTICLE 11 - MISCELLANEOUS

- 11.1 No provision of this Agreement will be considered to have been waived unless the waiver is in writing, and a waiver of a breach of a provision of this Agreement will not be construed as or constitute a waiver of any further or other breach of the same or any other provision of this Agreement, and a consent or approval to any act requiring consent or approval will not waive or render unnecessary the requirement to obtain consent or approval to any subsequent same or similar act.
- 11.2 No remedy conferred upon or reserved to us under this Agreement is exclusive of any other remedy in this Agreement or provided by law, but that remedy will be in addition to all other remedies in this Agreement or then existing at law, in equity or by statute.
- 11.3 The grant of a sublicence, assignment or transfer of this Agreement does not release you from your obligation to observe and perform all the provisions of this Agreement on your part to be observed and performed unless we specifically release you from such obligation in our consent

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to the sublicence, assignment or transfer of this Agreement.

- 11.4 This Agreement extends to, is binding upon and enures to the benefit of the parties, their heirs, executors, administrators, successors and permitted assigns.
- 11.5 If, due to a strike, lockout, labour dispute, act of God, inability to obtain labour or materials, law, ordinance, rule, regulation or order of a competent governmental authority, enemy or hostile action, civil commotion, fire or other casualty or any condition or cause beyond your reasonable control, other than normal weather conditions, you are delayed in performing any of your obligations under this Agreement, the time for the performance of that obligation will be extended by a period of time equal to the period of time of the delay so long as
 - (a) you give notice to us within 30 days of the commencement of the delay setting forth the nature of the delay and an estimated time frame for the performance of your obligation; and
 - (b) you diligently attempt to remove the delay.
- 11.6 You acknowledge and agree with us that
 - (a) this Agreement has been granted to you on the basis that you accept the Land on an "as is" basis;
 - (b) without limitation we have not made, and you have not relied upon, any representation or warranty from us as to
 - (i) the suitability of the Land for any particular use, including the use permitted by this Agreement;
 - the condition of the Land (including surface and groundwater), environmental or otherwise, including the presence of or absence of any toxic, hazardous, dangerous or potentially dangerous substances on or under the Land and the current and past uses of the Land and any surrounding land and whether or not the Land is susceptible to erosion or flooding;
 - (iii) the general condition and state of all utilities or other systems on or under the Land or which serve the Land;
 - (iv) the zoning of the Land and the bylaws of any government authority which relate to the development, use and occupation of the Land; and
 - (v) the application of any federal or Provincial enactment or law to the Land;
 - (c) you have been afforded a reasonable opportunity to inspect the Land or to carry out

UTILITY LICENCE

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such other audits, investigations, tests and surveys as you consider necessary to investigate those matters set out in subsection (b) to your satisfaction before entering into this Agreement;

- (d) you waive, to the extent permitted by law, the requirement if any, for us to provide you with a "site profile" under the *Environmental Management Act* or any regulations made under that act;
- (e) we are under no obligation, express or implied, to provide financial assistance or to contribute toward the cost of servicing, creating or developing the Land or the Improvements and you are solely responsible for all costs and expenses associated with your use of the Land and the Improvements for the purposes set out in this Agreement; and
- (f) we are under no obligation to provide access or services to the Land or to maintain or improve existing access roads.
- 11.7 You agree with us that nothing in this Agreement constitutes you as our agent, joint venturer or partner or gives you any authority or power to bind us in any way.
- 11.8 This Agreement does not override or affect any powers, privileges or immunities to which you are entitled under any enactment of the Province of British Columbia.

The parties have executed this Agreement as of the date of reference of this Agreement.

SIGNED on behalf of HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF BRITISH COLUMBIA by the minister responsible for the *Land Act* or the minister's authorized representative

Minister responsible for the Land Act or the minister's authorized representative

UTILITY LICENCE

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File No.: 2411644 Disposition No.: 922772

SIGNED on behalf of **NI HYDRO HOLDING CORP.** by a duly authorized signatory

hull.

Authorized Signatory

Sheri Wise Vice President, Controller

242942

File No.: 2411644 Disposition No.: 922772

LEGAL DESCRIPTION SCHEDULE

THAT PARCEL OR TRACT OF LAND IN THE VICINITY DISTRICT LOT 6468 AND UNSURVEYED FORESHORE OR LAND COVERED BY WATER BEING PART OF THE BED OF RAMONA CREEK, ALL WITHIN GROUP 1, NEW WESTMINSTER DISTRICT



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242942

File No.: 2411644 Disposition No.: 922772

SCHEDULE A

ADDITIONAL FEES AND RENTS

"Operating Period" means the first twelve month period of the Term beginning on the Commencement Date and each successive twelve month period thereafter

"Production Report" means a report that contains

a detailed statement showing the quantity of material removed from the Quarry Land during the Operating period covered by the report, and

your Statutory Declaration in a form satisfactory to us confirming without qualification that the statement contained in the Production Report is true

"Quarry Land" means land identified as quarry, or uses included with the Land identified in the Legal Description which includes but is not limited to land identified as Borrow Pits.

"Royalty Fee" means \$1.00 per metric tonne

A Royalty Fee is payable for all aggregate material that is:

removed from Quarry Land;

used in the production of concrete; and

moved from its original position and used in another location of the Land, however,

A Royalty Fee is not payable for aggregate material that is:

- (a) used to build and maintain public roads; and
- (b) located immediately beneath the area of the intake, penstock, powerhouse;
- (c) not used in concrete production and ultimately used in the same position (i.e. penstock bedding); and
- (d) material that is stored passively on the Land and shown in the "Legal Description Schedule"

You will within 15 days after the end of each Operating Period deliver to us a Production Report for that Operating Period together with a payment in a sum equal to the Royalty Fee payable.

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Page a) of a)



February 15, 2016

Approval File: 2004088

NI Hydro Holding Corp. 440 - 233 - 1 Street West North Vancouver, BC, V7M 1B3

Attention: Isabelle Deguise

Re: Application for approval to make changes in and about Ramona Creek, Barbie Creek, Clemens Creek, Tributaries and Unnamed Creeks

Your November 2015 Section 9 Approval application has been granted, Schedule A of the Approval lists the stream crossings you may construct, remove, or maintain under this authorization.

The term of this approval is 5-years, this term is to provide sufficient time to address and resolve any issues of the work done under this authorization.

Construction activities in the Ramona Creek watershed are subjects to those listed in the Table of Conditions of Environment Assessment Certificate E13-04, or as amended.

You may wish to inform the water licensees of the Narrows Inlet Project website, and that they can receive updates via email, by registering at:

http://www.bluearthrenewables.com/portfolio/narrows-inlet-hydro-project/

A portion of the access road is located on private property, and adjacent to private property. The holder of this Approval is advised that the location of property lines and legal survey posts may need to be found prior to undertaking construction activities.

An approval for the proposed changes in and about Ramona Creek, Barbie Creek, Clemens Creek, Tributaries and Unnamed Creeks has been granted, subject to the conditions noted on the attached Approval document 2004088.

Please be advised that applications for an approval can take up to 140 days to process. To improve our ability to review your application in a timely manner, please consider submitting information outlined in the South Coast Approval Guidelines available at:

http://www.env.gov.bc.ca/wsd/water_rights/licence_application/section9/approval_application_guida nce_water_act_sec-9-south_coast_feb-2013.pdf.

If you have any questions or concerns please contact the Water Information Technician at 604-586-4400.

Yours truly,

Remko Rosenboom, M.Sc., A.Ag. Regional Water Manager

Enclosure

pc: Sara Barker, Hedberg Associates Shishalh (Sechelt) First Nations Brian & Scilla Anderson Jensen Power LTD Peter Schober Stephen Richards Elizabeth & Dando Raap-Wolski Timothy & Jennifer Dolden Patricia Pieper Murray Smith

JD /BGS



Water Act

APPROVAL

WATER ACT - Subsection 9(1), Clauses (a), (b) and (c) (Changes in and about a stream)

NI Hydro Holding Corp.

is hereby authorized to make changes in and about a stream as follows:

- (a) The name of the stream is Ramona Creek, Barbie Creek, Clemens Creek, Tributaries and Unnamed Creeks, herein referred to as "the stream".
- (b) The changes to be made in and about the stream are:

Removal, construction and maintenance of bridges, stream culverts, and cross drain culverts for the access road to the Ramona Creek area, and over Ramona Creek, Barbie Creek, Clemens Creek and on Unnamed Tributaries or Creeks, to access the proposed Ramona Creek and proposed Ramona Lake waterpower projects, within that parcel or tract of land in the vicinity of District Lot 6468, together with unsurveyed foreshore or land covered by water, Group 1, New Westminster District held under Crown Land File 2409421.

- (c) This Approval does not authorize entry on privately held land or Crown land.
- (d) This Approval does not constitute authority of any other agency. The holder of this Approval shall have the necessary permits from other agencies concerned prior to the commencement of the works authorized herein.
- (e) The holder of this Approval must have permits or other written consent from any affected right-of-way holders before commencing work that could affect utilities or other structures within the right-of-ways.
- (f) This Approval does not authorize the alteration or removal of any works held under a water licence.
- (g) The holder of this Approval shall take reasonable care to avoid damaging any land, works, trees, or other property and shall make full compensation to the owners for any damage or loss resulting from the exercise of rights granted hereunder.
- (h) The work authorized shall be completed on or before December 31, 2021, and the holder of this Approval shall advise Surface Water Authorizations by email to:

WaterActReferrals.LowerMainland@gov.bc.ca, when the changes have been completed.

- (i) A copy of this Approval (and associated plans/drawings listed on this Approval) must be available for inspection, upon request, at any location where the authorized changes in and about a stream are being undertaken.
- (j) Ramona Creek, Barbie Creek and Clemens Creek supplies water to licensees located downstream of these proposed stream crossings, therefore, extra care must be taken to ensure that no unnecessary siltation or disturbance occurs.
- (k) The holder of this Approval shall locate the licensed works on Barbie Creek and on Clemens Creek, as to ensure accurate information is used to prepare plans. Permission to enter onto private land must be obtained from the respective landowners.
- (I) The holder of this Approval shall delineate the location of Barbie Creek and Clemens Creek, 30-metres or so, upstream and downstream of the access road, in order to define the work areas and the no-go areas. The holder of this Approval shall not use meters of definable banks or the presence of an alluvial streambed for delineating the stream location, as the stream may have poorly defined stream banks, or be sub-surface in places, i.e. non-alluvial streambed.
- (m) The holder of this Approval should maintain the natural surface and sub-surface drainage patterns of Barbie Creek and Clemens Creek, unless moving the water to another area is necessary to avoid unstable or sensitive soils.
- (n) The holder of this Approval shall maintain the flow split between Barbie Creek and Clemens Creek, this flow split is located between the Barbie Creek Upper Bridge and the Barbie Creek Lower Bridge. The flow split between Barbie Creek and Clemens Creek shall be maintained to the satisfaction of the Regional Water Manager.
- (o) Work in the stream channel shall occur:

(1) During the period of August 1 to September 15, so that the fisheries interests are protected; or

(2) Outside of the reduced risk window (as stated above) in order to accommodate the project schedule, subject to the following:

(i) The Environmental Monitor shall provide advice to the holder of this Approval on the timing of the work based on: the nature of the works, environmental values (including fish, amphibians, wildlife, any listed species present), water quality, channel stability, weather conditions, water levels, and any other relevant factors); and

(ii) The Environmental Monitor shall also provide additional construction mitigation advice to the holder of this Approval, and daily or full-time supervision of all work in or near the stream; and (iii) Work must be timed and planned appropriately, the stream must be completely dry or have marginal flows for the duration of the construction activities; and

(iv) The advice of the Environmental Monitor on construction timing (as per (i) above) and mitigation measures (as per (ii) above), as well as the timing of work and the presence of the Environmental Monitor, must be documented in writing. This documentation must be retained for at least 2 years following construction, and if requested by this office, provided for our review.

- (p) All works shall comply with plans in the November 6, 2015 application, prepared by Hedberg Associates, and the works authorized are those stream crossing listed on Schedule A of this Approval.
- (q) The works shall be designed and installed so as not to restrict fish passage and/or lead to fish stranding.
- (r) Equipment and machinery used in or near the stream channel must be in good operating condition and free of leaks, excess oil and grease.
- (s) Care shall be exercised during all phases of the work to prevent the release of silt, sediment, sediment-laden water, raw concrete, concrete leachate or any deleterious substances.
- (t) All excavated material and debris shall be removed from the site or placed in a stable area above the high water mark of the stream and mitigative measures to protect the excavated material and debris from erosion and reintroduction into the watercourse shall be used, such as, but not limited to, covering the material with erosion blankets or seeding and planting with native vegetation.
- (u) The holder of this Approval shall implement sediment control plans (SCP) during construction, and the SCP are to be maintained until exposed slopes have stabilized.
- (v) All temporary works (including a ford, stream crossing, flow bypass) shall be removed on completion of the project, and the stream channel restored to its natural condition.
- (w) A spill containment kit or drip tray must be readily accessible on-site and no equipment or machinery refueling shall take place within 10 meters of any watercourse.
- (x) If dewatering or isolation of flow will be conducted, and the stream is known or suspected to contain fish and/or amphibians, the holder of this Approval will designate an appropriately qualified environmental professional to salvage any fish and amphibians present, prior to commencement of work in the stream channel. It is the responsibility of the holder of this Approval to obtain any permits needed prior to the salvage.
- (y) The holder of this Approval shall retain a qualified Environmental Monitor to supervise all in-stream works authorized under this Approval. In the event of an environmental incident or non-compliance with any of the terms or conditions of this Approval, the

Environmental Monitor shall notify the Assistant Regional Water Manager (604-586-4400), within 24 hours.

- (z) The Environmental Monitor is hereby granted authority to stop the work authorized under this Approval if deemed necessary by the Environmental Monitor to address risks to the environment.
- (aa) Archeological sites (both recorded and unrecorded) are protected under the Heritage Conservation Act and must not be altered or damaged without a permit from the Archeology Branch. The holder of this Approval must advise everyone who will be involved in ground-disturbance and construction that if archeological materials are encountered, activities must be halted and the Archeology Branch contacted at 250-953-3334 for direction.
- (bb) The holder of this Approval must provide a brief post-construction report within 60 days of completion of the works.

That report shall include a signed statement from the Environmental Monitor summarizing: the in-stream works undertaken, the timing of those works, the total instream area directly affected, the frequency of monitoring; whether or not they observed or were otherwise aware of any non-compliance with the terms and conditions of this Approval; and a description of any environmental incidents, non-compliance or other difficulties, and how these were addressed and reported. The report shall be provided as a hard copy addressed to James Davies, Regional Hydrologist, labelled with the file number of this Approval.

Rémko Rosenboom, M.Sc., A.Ag. Regional Water Manager

Approval File: 2004088	Date Issued:	February 15, 2016	Approval No.: 2004088
Precinct: 29D - Jervis			

APPENDIX C. LIST OF EPPS TO BE PROVIDED BY THE CONTRACTOR

Required EPPs	Timing of Delivery	
Acid Rock Drainage Management	Prior to construction	
Air Quality Protection and Dust Control	Prior to construction	
Amphibian and Amphibian Habitat Protection	Prior to construction	
Archaeological Resources and Cultural Use Sites	Prior to construction	
Bear-Human Conflict Management Plan	Prior to construction	
Blast Management	Prior to construction	
Communication Strategy	Prior to construction	
Compensation Design and Restoration Requirements	In advance of compensation construction	
Contaminated Waste Management Plan	Prior to construction	
Construction Health and Safety Management	Prior to construction	
Construction Waste Management Plan	Prior to construction	
Debris Management	Prior to construction	
Emergency Preparedness and Response Procedures	Prior to construction	
Environmental Monitoring	Prior to construction	
Erosion Control, Sediment and Drainage Management	Prior to construction	
Fire Preparedness	Prior to construction	
Fish and Fish Habitat Protection	Prior to construction	
Hazardous Materials Management	Prior to construction	
In Stream Works and Riparian Crossing Construction	Prior to construction	
Invasive Species Management	Prior to construction	
Long term Site Access Management	Prior to construction	
Mountain Goat Management	Prior to construction	
Monitoring and Management	Prior to construction	
Nesting and Migratory Bird Protection	Prior to construction	
Site Revegetation and Reclamation Requirements	Prior to construction	


Required EPPs	Timing of Delivery
Soil and Groundwater Protection	Prior to construction
Solid Waste Management Plan	Prior to construction
Spill and Spill Response Management	Prior to construction
Surface Water Quality Protection Plan	Prior to construction
Vegetation Management and Site Restoration	Prior to construction
Visual Quality Protection	Prior to construction
Wildlife and Wildlife Habitat Protection	Prior to construction



APPENDIX D. EA TABLE OF CONDITIONS



Schedule B Table of Conditions: Narrows Inlet Hydro Project

SCHEDULE B

TABLE OF CONDITIONS

Interpretation

In this Schedule:

(a) The phrase "to the satisfaction of" means, where it is used in relation to a document, that the Holder must provide a document, or any amendment to the document, to the reviewing entity referenced in the condition. That entity may: reject the document, or amendment, and require the Holder to resubmit it; or require the Holder to make changes to the document, or the amendment. If no such requirement is communicated to the Holder by the entity, the Holder need not obtain further approval of the document.

(b) Columns 3 to 6 (Timing, Application Section/Supporting Documents, Provincial Compliance Agencies, Subject), in the table below are for convenience of reference only, and do not form a part of the condition.

(c) The term "Qualified Professional" (QP) means a person who has training, experience and expertise in a discipline relevant to the field of practice set out in the condition, and who is registered with the appropriate professional organization in British Columbia, is acting under that organization's code of ethics and is subject to disciplinary action by that organization.

No.	Condition	Timing	Application Section or Supporting	Provincial Compliance Agencies	Subject
1	 Prior to vegetation clearing, the Holder must: (a) identify high suitability goshawk habitat by using habitat suitability models following Inventory Methods for Raptors (Resource Inventory committee, 2001) and by using a qualified professional (QP); (b) undertake goshawk nest surveys in all identified high quality habitat using a QP; (c) maintain an area of undisturbed forest surrounding all active and alternate nest sites within an identified breeding area determined by the Ministry of Forests, Lands and Natural Resource Operations (FLNR); and (d) implement suitable habitat replacement for any high suitability goshawk habitat that is proposed to be cleared, prior to undertaking clearing of or construction to the satisfaction of FLNR. The Holder may not conduct harvesting of trees during nesting season in the area referred to in paragraph (c). 	Pre-Construction Construction	Application Volume I, Sections 2.4.1.2, 6.6.4.1.5, 6.7.4.1.5, 6.8.4.1.4, 6.9.4.1.4, 6.10.4.1.4, 6.11.4.1.3, 6.14.4.1.4, 6.15.4.1.3, 11.3.5, 12.3.5, 13.3.5, 14.3.5, 15.3.5, 16.3.5, 17.3.4 and 18.3.3.5	EAO FLNR	Northern Goshawk Monitoring
2	Prior to starting construction on the Ramona Lake component, the Holder must:	Pre-Construction Construction	Application Volume I, Sections 6.9.4.1.2, 6.10.4.1.2 and 14.3.4	EAO FLNR	Wildlife Monitoring

No.	Condition	Timing	Application Section or	Provincial Compliance	Subject
			Supporting	Agencies	
			Documents		
	(a) determine the habitat for aquatic breeding				
	salamanders using a QP;				
	(b) evaluate the risk of egg-mass stranding resulting				
	from lake drawdown during the period from				
	egg-laying to hatching for that area using a QP;				
	(c) submit a report to FLNR documenting habitat				
	quantity and quality for salamanders, and				
	drawdown and lake sursharger				
	(d) submit a report to ELNP documenting risk of				
	(d) Submit a report to FLNK documenting fisk of				
	impacts from project operations: and				
	(e) develop and implement a compensation plan for				
	the loss of high quality habitat for aquatic				
	breeding salamanders, and for impacts from				
	egg-mass mortality. The plan, including any				
	proposed changes, must be prepared and				
	implemented to the satisfaction of FLNR.				
3	Prior to commencing construction of the Lower	Pre-Construction	Application Volume I,	EAO	Wildlife
	Ramona components, the Holder must provide to	Construction	Sections 6.10.5, 14.4		Monitoring
	EAO a Marine Sensitivity Blasting Management Plan		and 22.2.8		
	for the Lower Ramona area focussed on marine				
	organisms that are sensitive to blasting hoise and		Ecosystem Dynamics		
	disruption in Narrows met.		Marino Issues		
	The plan must follow the guidelines in the Holder's		Responses) dated		
	Fcosystem Dynamics Inc. letter report (Marine		September 26, 2013		
	Issues Responses) dated September 26, 2013.		50ptember 20, 2010		

Supporting Agencies	
Documents	
The plan, including any proposed changes, must be prepared and implemented to the satisfaction of EAO.	
4 The Holder must retain the services of an Independent Environmental Monitor (IEM), with demonstrated experience and knowledge of environmental monitoring for construction projects in BC, commencing three months prior to construction, throughout the construction and decommissioning phases. Pre-Construction Decommissioning N/A EAO Mcc The IEM must monitoring for construction and decommissioning phases. Decommissioning N/A EAO FLNR Co The IEM must monitor compliance with the Construction Environmental Management Plan (CEMP) plans in Condition 11. The IEM must also review, evaluate and report to the Holder the effects of Project activities and effectiveness of the mitigation measures specified in the plans, and compliance with the conditions with the EA Certificate and other regulatory permits, approvals and authorizations that apply. If during monitoring, the IEM observes that mitigation measures are ineffective; the IEM must make recommendations for further mitigation measures to be implemented. The Holder must, in writing, permit the IEM to halt work if environmental monitoring indicates that there is a current or imminent impact to the environment that has not been approved as part of the Certified Proiet Description (CPD) or other regulatory	Monitoring and Compliance Enforcement

No.	Condition	Timing	Application Section or Supporting	Provincial Compliance Agencies	Subject
			Documents	U	
	permits, approvals or authorizations that apply. The IEM must document the mitigation measures that have been implemented and their effectiveness and provide summary recommendations to EAO and FLNR and interested First Nations (<i>shíshálh</i> Nation), on an annual basis during the construction and decommissioning phases of the Project.				
5	 The Holder must: (a) act in accordance with the BC Hydro document entitled: <i>Approved Work Practices for Routine Electrical Cable Maintenance in Freshwater and Marine Coastal Areas</i> in the Interconnection area of Sechelt Inlet as specified in the CPD; and (b) lay cable only within the period Dec. 1 – Feb. 15, unless written authorization is provided by the Department of Fisheries and Oceans (DFO). 	Construction	Application Volume I, Sections 2.3.6 and 2.4.2.6 BC Hydro document entitled: Approved Work Practices for Routine Electrical Cable Maintenance in Freshwater and Marine Coastal Areas	EAO	Marine Fauna
6	 The Holder must communicate information to the public on the status of the Project in order to provide public awareness of ongoing activities and construction schedules and to ensure general safety in and surrounding the Project area. The Holder must set up a public web site and notify the general public of the existence of the website through advertisements in local newspapers. The Holder must post the following to the website: construction schedule and list of activities during construction and the locations; 	Pre-Construction Construction Operations Decommissioning	Application Volume I, Sections 19.2.3, 19.2.4, 19.2.5 and 19.2.6	EAO	Information Management

No.	Condition	Timing	Application Section or Supporting	Provincial Compliance Agencies	Subject
	 final plans required under the CEMP; and results of studies conducted prior to and during construction. The Holder must also communicate in writing with the Narrows Inlet Users Group regarding timing of activities related to the construction of the powerhouse, transmission line and other infrastructure in the Lower Ramona Creek area. If, for safety reasons, road or trail access must be restricted during the construction phase, the Holder must provide written notice to Ramona Creek and Doriston property owners and the Narrows Inlet Users Group. Notification must be provided on the public web site and placed at entry/exit points to all roads and trails that are to be restricted no less than 14 days in advance of access restriction.		Documents		
7	The Holder must develop and maintain access to a protected File Transfer Protocol (FTP) site or equivalent protected medium containing all Project reports and documents identified in the Table of Conditions and allow access to FLNR, EAO, DFO and other parties as required by EAO. The FTP site must be in place prior to commencing construction and remain during operations through to decommissioning.	Pre-Construction Construction Operations Decommissioning	N/A	EAO FLNR	Water Quality Monitoring
8	The Holder must conduct a study to determine:	Pre-Construction	Section FID1 of Supplemental report	EAO FLNR	Water Quality Monitoring

No.	Condition	Timing	Application Section or	Provincial Compliance	Subject
			Supporting	Agencies	
			Documents		
	(a) whether elevated methyl mercury (MeHg) levels		submitted July 2013		
	relative to background are found in				
	sediment/soils surrounding Ramona Lake				
	(including organic soils in the northern tributary				
	to Ramona Lake in areas that will be flooded);				
	(b) the potential MeHg pathways into Ramona				
	(c) whether flooding of Personal ake could load to				
	(c) whether hooding of Kalifolia Lake could lead to				
	the release of meng into Kantona Lake.				
	The study must be conducted by a laboratory with				
	capacity to do sediment and soil analysis. The				
	interpretation of results with respect to pathways				
	and consequences for Ramona Lake must be				
	conducted by a QP.				
	Prior to commencing construction of the Ramona				
	Lake component of the Project, the Holder must				
	submit the study to FLNR, EAO and the shishalh				
	Nation unless they provide written notice to the				
	Holder that this is unnecessary.				
	If the study concludes that:				
	in the study concludes that.				
	• there are elevated MeHg levels in the				
	sediments and soil that would be flooded;				
	 there are potential pathways for MeHg to 				
	enter Ramona Lake; and				
	 flooding could lead to mercury 				
	concentrations in Ramona Lake higher than				
	those set out in Health Canada Standards for				

No.	Condition	Timing	Application Section or	Provincial Compliance	Subject
			Supporting	Agencies	
	Courselieus Durishin a Western Quality		Documents		
	Canadian Drinking Water Quality,				
	Then the Holder must not construct the weir or				
	flood Ramona Lake.				
9	The Holder must: (a) conduct two radar surveys (one horizontal and	Pre-Construction Construction	Application Volume I, Sections 11.3.5.5 and 15.3.5.5	EAO FLNR	Wildlife Mitigation
	one vertical) with associated audio visual surveys, conducted by a QP, at the head of Narrows Inlet. Survey methods must be				
l	conducted according to Inventory Methods for Marbled Murrelet Radar Surveys (Resource Inventory Committee (2006)) or as set out in the				
	Nesting and Migratory Bird Protection Plan in the CEMP as required in Condition 11;				
	(b) prepare a report by a QP using the results from these surveys with recommendations for mitigation requirements, including design				
	diverters and monitoring of effectiveness of mitigation; and				
	(c) implement recommendations from (b) above to the satisfaction of FLNR.				
10	Following the completion of construction, a QP retained by the Holder must review all temporary	Post Construction	Application Volume I, Sections 2.7 and 14.3.6	EAO FLNR	Temporary Road Deactivation
	access roads and bridges, and all roads within 500 m				
	of Goat Winter Range, and recommend the				
	appropriate level of deactivation. The QP must consult with active logging companies in the area				

No.	Condition	Timing	Application Section or Supporting	Provincial Compliance Agencies	Subject
	 before making his or her recommendation. The QP must then prepare and implement site specific deactivation plans to the satisfaction of FLNR. The QP must oversee the deactivation, and provide FLNR with an opinion report confirming if the deactivation has been completed in accordance with the plans. 		Documents		
11.1	The Holder must minimize construction impacts by developing, submitting and adhering to a CEMP as detailed in Volume 1: section 22.2 of the Holder's Application for an EA Certificate. The CEMP, and any amendments to it, must be prepared and implemented to the satisfaction of EAO and FLNR. The Holder must provide this draft CEMP to <i>shishálh</i> Nation for review a minimum of 90 days prior to the planned commencement of construction. The Holder must provide the updated CEMP to EAO, FLNR, and shishalh Nation within 30 days of the commencement of construction. The Holder must implement the CEMP and adhere to the requirements of all component plans.	Pre-Construction Construction	Application Volume I, Section 22.2 and Volume II, Appendix 16	EAO FLNR	Construction Environmental Management Plan

No.	Condition	Timing	Application Section or	Provincial Compliance	Subject
			Supporting	Agencies	
			Documents		
11.2	The CEMP must include the requirement that, prior to	Pre-Construction	Application Volume I,	EAO	Construction
	starting construction in any area, a QP must complete	Construction	Section 22.2 and	FLNR	Environmental
	surveys using methodology (i.e. survey design		Volume II, Appendix 16		Management Plan
	including but not limited to considerations for				
	seasonal and weather conditions, and localized				
	conditions), as determined by the QP, and approved				
	by FLNR, to detect the following species (should they				
	occur) within the area proposed for construction:				
	• Oregon forest snail and Pacific sideband snail:				
	 Red legged frog and western toad: and 				
	 Bare plants and ecosystem as identified from 				
	Species at Risk Act, and red and blue listed				
	species.				
	If these species and ecosystems are found within an				
	area of the project footprint that would be subject to				
	clearing or other disturbances, the QP will indicate				
	which mitigation measures outlined in the				
	environmental protection plans, as part of the CEMP,				
	will be implemented. The results of the surveys and				
	applied actions will be reported in the weekly IEM				
	reports. If the actions identified by the QP require				
	localized project redesign or were not previously				
	Identified in the CEIVIP, then approval from FLINR WIII				
	be required prior to implementation.				
	The shishalb Nation must be provided with conies of				
	draft and final plans				
	uran and final plans.				
12	The Holder must submit an Operational Parameters	Prior to Operation	Application Volume I,	EAO	Operational

No.	Condition	Timing	Application Section or	Provincial Compliance	Subject
			Supporting	Agencies	
			Documents		
	and Procedures report (OPPR) and an Operational		Section 22.3	FLNR	Parameters and
	Environmental Monitoring Plan (OEMP) considering				Operational
	each Project hydroelectric component as listed in the				Environmental
	CPD, Table of Contents, to EAO and FLNR, at least				Monitoring plan
	30 days prior to commissioning. The plans included				
	within the OPPR and OEMP must:				
	 be specific to the Project component(s); 				
	• adhere to the FLNRO "Operating Parameters				
	and Procedures Template [DRAFT] 2013", and				
	the DFO guidelines, "Long term Aquatic				
	Monitoring Protocols for New and Upgraded				
	Hydroelectric Projects, 2013", or as replaced				
	or amended from time to time; and				
	 be developed and implemented to the 				
	satisfaction of EAO and FLNR.				
	The OPPR must include a requirement to measure				
	instream flows every 15 minutes throughout				
	Operations. The OPPR must also document mitigation				
	measures to be followed during routine maintenance				
	activities, and to minimize environmental effects				
	associated with the operation of the Project (including				
	those arising from malfunctions and accidents).				
	The Holder must provide the draft OPPR and OEMP to				
	FLNR and shishalh Nation for review a minimum of				
	30 days prior to the commencement of				
	commissioning, unless written notice is provided to				

No.	Condition	Timing	Application Section or	Provincial Compliance	Subject
			Supporting Documents	Agencies	
	the Holder advising that this provision is unnecessary.				
	The Holder must provide the updated OPPR and OEMP to EAO, FLNR, and shishalh Nation a minimum of 30 days prior to the commencement of operations unless written notice is provided to the Holder advising that this provision is unnecessary.				
13	 Prior to the start of construction the Holder must complete and implement a Noise and Sensory Disturbance Management Plan as described in Volume 1: section 22.2.8 of the Holder's Application for an EA Certificate. The Holder must ensure that sound levels at the Lower Ramona powerhouse do not exceed BC Oil and Gas Commission guidance for permissible sound levels in rural areas¹ by incorporating the following noise abatement mitigation in the design of the powerhouse as determined by a QP: acoustical louvres on the powerhouse; double curtain wall on the tailrace; ventilation to allow doors to be closed; partial underground embedment of the powerhouse; and constructing tailrace orientation away from private preparties 	Pre-Construction Construction Operations	Application Volume I, Section 10.1	EAO	Noise Mitigation
14	private properties. The Holder may only draw down Ramona Lake in	Operations	Application Volume I,	EAO	Water Quality

¹ The Oil and Gas Commission's *British Columbia Noise Control Best Practices Guideline* (March 2009).

No.		Condition	Timing	Application Section or	Provincial Compliance	Subject
			_	Supporting	Agencies	
				Documents		
	accordanc	ce with the following conditions:		Sections 2.5.2.4 and	FLNR	
				14.2.2		
	(a) the m	aximum daily drawdown is less than or				
	equal	to 1 m/day;				
	(b) subje	ct to paragraph (c), lake drawdown must				
	be co	nducted in order to allow lake levels to be				
	at the	e following levels during the listed year of				
	opera	tions:				
	Year	Drawdown Level				
	1	(i) above 1361 m above sea level				
		(masl) on October 1st; and				
		(ii) not less than 1353 masl for the				
		remainder of that year.				
	2	A maximum lake drawdown of 16 m				
		from the natural lake level which is to				
		be determined in year 1.				
	(c) in yea	ars 3 and following, no incremental lake				
	drawo	down may be conducted unless approved				
	by FLI	NR and the maximum drawdown for				
	Ramo	na Lake must not exceed 45 m; and				
	(d) the H	older must not draw down Ramona Lake if				
	at any	r time the total suspended solids (TSS)				
	value	s measured at the outlet monitoring points				
	specif	ied below in Condition 15 exceed site-				
	specif	ic water quality guidelines for freshwater				
	aquat	ic life (BC Water Quality Guidelines).				
15	The Holde	er must develop and implement a water	Prior to Operations	Application Volume I,	EAO	Water Quality
	quality an	id lake level monitoring program at	Operations	Sections 2.5.2.4 and	FLNR	
	Ramona L	ake to the satisfaction of FLNR. All		14.2.2		
	monitorin	ng instrumentation associated with this				
	program r	must be installed and be operational prior				

No.	Condition	Timing	Application Section or	Provincial Compliance	Subject
			Supporting	Agencies	
			Documents		
	to the start of operations. The water quality				
	parameters must include temperature, TSS and				
	nutrients. The monitoring program must include the				
	following:				
	 at least one water quality monitoring station 				
	at the Upper Ramona tailrace, and one				
	station at the Ramona Lake outlet;				
	 the frequency and location of temperature 				
	and nutrient monitoring must be determined				
	by a QP;				
	 at least one lake level monitoring station in 				
	Ramona Lake at the Lake pump/intake				
	structure;				
	 a minimum turbidity monitoring frequency of event 20 minutes; 				
	every so minutes,				
	 a minimum take level monitoring frequency of event 1 hour; and 				
	• turbidity trigger levels at which operational				
	responses (to be specified by ELNR) and				
	supplemental TSS sampling are carried out				
	supplemental iso sumpling are carried out.				
	The Holder must maintain a website, accessible to				
	FLNR staff, showing turbidity and lake level data.				
	The data must be posted to the website within				
	24 hours of collection.				
16	Unless otherwise authorized by FLNR, the Holder	Pre-Construction	Application Volume I,	EAO	Fish Mitigation
	must design and construct the pumping system for	Construction	Section 2.5.2.4	FLNR	
	Ramona Lake based on contingencies described in	Operations			
	the letter of November 14, 2013, from the Holder to		Letter dated		
	EAO to maintain IFR flows in Ramona Creek.		November 14, 2013,		

No.	Condition	Timing	Application Section or	Provincial Compliance	Subject
			Supporting	Agencies	
			Documents		
			from the Holder to		
			EAO		
47	The Usedan second	Duianta Onematiana	A sulication Maluses 1	540	
17	The Holder must:	Prior to Operations	Application volume I,	EAU	Fish Mitigation
	(a) develop and implement a fish habitat		Sections 11.2 and	FLINK	
	compensation plan (plan) for the Chickwat		volume II, Appendix 59		
	Creek facility to the satisfaction of DFO and				
	FLNK;				
	(b) provide FLINK and EAU with copies of the plan;				
	and (c) provide any proposed changes to the plan to				
	(c) provide any proposed changes to the plan to				
	must be implemented to the satisfaction of				
	DEC and ELNB. Provide any proposed changes				
	to the plan to DEO and ELNR for review				
	Changes to the plan must be implemented to				
	the satisfaction of DFO and FLNR.				
18	The Holder must ensure that the tailraces that are	Pre-Construction	N/A	EAO	Fish Mitigation
	part of the Project prevent fish access or fish	Construction		FLNR	
	stranding during low water levels.	Operations			
19	The Holder must adhere to Fisheries and Oceans	Prior to Operations	Application Volume I,	EAO	Fish Mitigation
	Canada Flow Ramping Study: Study of Flow Ramping	Operations	Sections 2.5.2.1,	FLNR	
	Rates for Hydropower Developments, Knight Piesold,		2.5.2.4 and 2.5.2.5.		
	2005, unless otherwise authorized by FNLR.				
			Fisheries and Oceans		
			Canada Flow Ramping		
			Study: Study of Flow		
			nyuropower Dovelopments Knight		
			Developments, knight		

No.	Condition	Timing	Application Section or	Provincial Compliance	Subject
			Supporting	Agencies	
			Documents		
			Piesold, 2005		
20	During Project operations, the Holder must maintain	Operations	Application Volume I,	EAO	Fish Mitigation
	at least the following IFRs and diversion rates during		Sections 2.5.2.1,	FLNR	
	the periods specified below, as measured below the		2.5.2.4 and 2.5.2.5		
	point of diversion:				
	Chickwat Creek:				
	IFR: 0.61CMS from April 1 to July 31				
	0.44 CMS Oct 17 to Nov 17				
	0.32 CMS for the rest of the year				
	Maximum Rate of Diversion: 7.1 CMS				
	Upper Ramona Creek:				
	IFR: 0.03 CMS				
	Maximum Rate of Diversion: 2.0 CMS				
	Lower Ramona Creek:				
	IFR: 0.12 CMS				
	Maximum Rate of Diversion: 3.7 CMS				
	The Holder must cease diverting water (in the case				
	of Chickwat Creek) or pumping water (in the case of				
	upper and lower Ramona Creeks) if it is unable to				
	maintain the minimum IFR. If minimum IFR is not				
	maintained, the Holder must report this to DFO,				
	FLNR and EAO within 24 hours.				
	The Holder must not divert water at a rate greater				
	The holder must not ulvert water at a fale greater				

No.	Condition	Timing	Application Section or	Provincial Compliance	Subject
			Documents	Agencies	
	than the maximum rate of diversion set out above during operations and commissioning. If the Holder diverts water greater than the maximum rate, the Holder must advise DFO and FLNR within 24 hours of the diversion and mitigate effects as required by EAO, DFO or FLNR.				
21	The Holder must construct and monitor the effectiveness of a fish passage structure at the Chickwat Intake, to ensure upstream and downstream fish passage. The fish passage structure must allow the upstream and downstream movement of adult Dolly Varden char.	Pre-Construction Operations	Application Volume I, Sections 11.2 and Section 24, Table 24-1	EAO FLNR	Fish Mitigation
22	 The Holder must design and implement a study (Before-After Control-Impact Study) (BACI) for coastal tailed frog (CTF) in Ramona Creek. This study, intended to measure any effects post-construction, must be designed and conducted by a QP and be consistent with the recommended methods of general program design outlined in Appendix A of the "Guidelines for the Collection and Analysis of Fish and Fish Habitat Data for the Purpose of Assessing Impacts from Small Hydropower Projects in British Columbia" or as may be replaced or amended from time to time. This study must follow the study design and methods outlined in the Upper and Lower Ramona OEMP. The program must include the following: BACI design; power analysis which meets the specified statistical criteria in Appendix A of the "Guidelines 	Pre-Construction Construction Operations	Application Volume I, Sections 11.3.4, 14.3.4, 15.3.4, 16.3.4 and 17.3.3	EAO FLNR	Wildlife Monitoring

No.	Condition	Timing	Application Section or	Provincial Compliance	Subject
			Supporting	Agencies	
			Documents		
	for the Collection and Analysis of Fish and Fish				
	from Small Undergrouper Draights in DC ² , or on more				
	from Small Hydropower Projects in BC , or as may				
	be replaced or amended from time to time;				
	estimates of habitat variables causing any				
	observed changes to tadpole population;				
	a minimum of one year of baseline monitoring prior to one year of baseline monitoring				
	five years of past construction in Ramona Creek and				
	Pamona Crock:				
	• CTE surveys to be completed within 30m of				
	diversion reaches in Ramona Creek:				
	 identification of stream reaches where the Project 				
	may impact CTE:				
	 collection and transplanting of CTE to undisturbed 				
	habitat in potential impact areas prior to				
	disturbance: and				
	 measures to avoid or mitigate any confirmed 				
	statistically significant impacts of the Project on				
	CTF populations or habitat.				
	The Holder must implement the mitigation measures				
	identified in the program to the satisfaction of FLNR.				
23	Prior to commencing construction, the Proponent	Pre-Construction	Section WSS1 of	EAO	Wildlife
	must enter into a contribution agreement with	Construction	Supplemental report	FLNR	Monitoring and
	FLNR, in the amount of \$75,000 distributed over	Operations	submitted June 7, 2013		Mitigation
	5 years, to support a provincial regional grizzly bear				-
	monitoring program to assess grizzly bear habitat				
	use and movement in the Tzoonie River Valley. Once				

No.	Condition	Timing	Application Section or Supporting Documents	Provincial Compliance Agencies	Subject
	complete, the results of the monitoring program, including identified mitigations, such as road closures, must be incorporated into an updated version of the project Human-Bear Conflict Management Plan specified as a requirement of the OEMP under Condition 11. The updated Human- Bear Conflict Management Plan must be provided to the <i>shishálh</i> Nation unless they advise the Holder in writing that this is unnecessary.				
24	 Prior to the operation of the Chickwat Creek powerhouse, the Holder must do one of the following two things with respect to the anadromous Reach in Chickwat Creek as identified in the "Analysis of the Effects of Upstream Pumping of IFR – Chickwat Creek" (Ecofish, July, 2013): 1. provide compensation as per DFO compensation guidelines²; 2. initiate the pumping proposal of 4 cms from the tailrace to the location set out in the report entitled "Analysis of the Effect of Upstream Pumping of IFR - Chickwat Creek" (Ecofish, July, 2013). 	Prior to Operations	Section FID2 and FID3 of Supplemental report submitted May 16, 2013 and July 4, 2013	EAO FLNR	Fish Mitigation
	The implementation of either 1 or 2 must be to the satisfaction of FLNR or DFO.				

² DFO Guide: An Application Guide to Submitting an Application for Authorization under Paragraph 35(2)(b) of the *Fisheries Act* - see guide for submitting an "offsetting plan".

No.	Condition	Timing	Application Section or	Provincial Compliance	Subject
			Supporting	Agencies	
			Documents		
25	 The Holder must design and implement a study using a QP to assess the effects of low stream flows affecting stream connectivity on macro invertebrate survival in Ramona and Chickwat Creeks by doing the following: determine sites in Ramona and Chickwat Creeks sensitive to low flow effects on macroinvertebrate habitat; monitor these sensitive sites for loss of macroinvertebrate habitat at low flow conditions created when intake and powerhouse systems are tested during start up conditions; if there is a potential for loss of macroinvertebrate habitat created under low flow conditions, the Holder must note the locations and flows and extent of invertebrate losses predicted and report these to FLNR; if effects are noted, the Holder must increase flows to reduce effects on macroinvertebrate habitat or provide compensation as required by the OPPR; and the Holder must prepare and implement an adaptive management plan, including any proposed changes, to the satisfaction of FLNR and EAO to address seasonal effects of low flow augmentation and/or compensation 	Prior to Operations	Documents Section FID6 of Supplemental report submitted June 10, 2013	EAO FLNR	Fish Monitoring and Mitigation

No.	Condition	Timing	Application Section or	Provincial Compliance	Subject
			Supporting	Agencies	
			Documents		
26	(a) At least one year prior to the end of Project	Decommissioning			Decommissioning
	operations, the Holder must submit a				Plan
	Decommissioning and Abandonment Plan to				
	EAO and FLNR for review;				
	(b) the plan must identify how each Project				
	component will be assessed to determine which				
	components should be removed to sustain				
	natural aquatic and terrestrial ecosystem				
	(c) the Plan must include details about the type and				
	(c) the Plan must include details about the type and ovtent of decommissioning required for the				
	following components:				
	 full or partial removal of instream works 				
	associated with the intake and tailrace.				
	 full or partial removal of salvageable 				
	components, equipment and materials from				
	the intake, powerhouse, switchvard and				
	ancillary facilities;				
	 permanent closure of the penstock at all 				
	access points;				
	 full or partial removal of above ground 				
	transmission lines;				
	 full or partial removal of submerged 				
	transmission line;				
	 closure of all private access roads; and 				
	 reclamation of all disturbed areas where such 				
	activities are consistent with paragraph (a).				
	A draft plan, and any proposed changes, must be				
	forwarded to EAO, identified federal and provincial				
	agencies and shíshálh Nation for review and				

No.	Condition	Timing	Application Section or Supporting Documents	Provincial Compliance Agencies	Subject
	comment. The Holder must prepare and implement the Decommissioning and Abandonment Plan to the satisfaction of EAO and FLNR.				

APPENDIX E. SCOPE OF INFORMATION AND REPORTS OF THE IE FROM THE GUIDE FOR INDEPENDENT POWER PROJECT



Scope of Work for Independent Engineer (IE) and delegates

Scope of Information and Reports by the Independent Engineer (IE)

A. Preamble

[**Name**] (the "Licensee") is proceeding with the construction of the [**Name**] Waterpower Project (the "Project"). The Project, located on [name of stream], is authorized by Conditional Water Licence [**Number**] (the "Licence"), which forms part of this document. The works of the Project are described under clause (h) of the licence.

The Licensee is required under clause (i) 1) of the Licence to retain an Independent Engineer (IE) who will provide information and reports under the direction of the Engineer under the Water Act (the "Engineer") regarding the design and construction of the works. The Licensee is also required to retain an Independent Environmental Monitor (IEM) as set out in the Licence.

The information and reports to be provided by the IE to the Engineer under the Water Act, and the IE's relationship with the Licensee, Design Engineer, Construction Engineer and IEM are described in this document.

B. Regulation of the Construction of Works

The Engineer has the power to regulate the construction of works, which regulation may consider the following:

- 1) The criteria for the design and construction of works to protect the public and the environment.
- The criteria for the operation of the works to protect the interests of licensees, riparian owners and owners of land adjacent to the works, and protect the environment from adverse effects.
- 3) The construction activities that may adversely affect the public, the environment and the interests of licensees, riparian owners and owners of land adjacent to the works.

If the Engineer has determined that the construction of works may be hazardous to the public and the environment, or the interests of licensees, riparian owners and owners of land adjacent to the works may be adversely affected, the Engineer may issue an order that directs the Licensee to change the manner in which the works are constructed to remove the hazard and adverse effect.

C. Information and Reports

The Licensee is required under clause (i) of the Licence to submit to the Engineer the following:

- a) plans that show the general arrangement of the works;
- b) criteria for the design of the works;
- c) criteria for the operation of the works;
- d) a schedule for the construction of the works;
- e) an Construction Environmental Management Plan (CEMP) for the management and mitigation of construction impacts.

The Licensee is also required under clause (j) to ensure that the design drawings for the works to be constructed are signed and sealed by a professional engineer registered in the province of British Columbia (the "Design Engineer").

These submissions by the licensee are the basis for the regulation of the construction of the works.

The IE is directed to review the submissions and provide the Engineer with reports as follows:

- Compare the plans showing the general arrangement of the works to the works described by the Licence and describe any differences.
- 2) Assess the criteria for the design of the works to determine if works constructed to these criteria will be a hazard to the public and the environment.
- Assess the criteria for the operation of the works to determine if works operated to these criteria will protect the interests of licensees, riparian owners and owners of land adjacent to the works, and protect the environment from adverse impacts.
- 4) Assess the schedule for the construction of the works to determine if there are any practical matters in relation to the conditions in the Licence and the EMP; and the interests of the public, licensees, riparian owners and owners of land adjacent to the works that the Engineer should consider in the regulation of the works.
- 5) Assess the design drawings for the construction of the works to determine if they are in accordance with the criteria for the design and operation of the works, and they are signed and sealed by the Design Engineer.
- 6) Assess the schedule for the construction of the works and the design drawings for the construction of the works to determine the frequency of the submission by the Licensee of the reports on the progress of construction.
- 7) Review the reports submitted by the Licensee on the progress of the construction of the works to determine if any of the construction activities should be adjusted to reduce the future hazard posed by the works on the public and the environment.
- 8) Summarize any outstanding matters that would make the works a hazard to the public and the environment when the Licensee submits a schedule for testing the works.

The IE will prepare a recommendation report for the Engineer on the review of items 1) to 4) above for the issuance of Leaves to Commence Construction (LTCC).

The IE will prepare a recommendation report for the Engineer, copy to the Licensee, Design Engineer and the Construction Engineer, on the review of items 5) and 6) if the actual construction of a particular component of the project may proceed.

The IE will prepare construction progress and inspection reports as specified in Section G, below.

The Engineer may also direct the IE to provide additional information and reports as may be required for the regulation of the construction of the works.

The IE will discuss and clarify with the Design Engineer and the Construction Engineer any matters that may need further action. If the IE is unable to resolve such matters, the IE must immediately notify the Engineer. The Engineer will contact the Licensee, and resolve the matter.

The IE will prepare IE Completion Report for the Engineer summarizing how the IE fulfilled the roles and responsibilities described in this document. This report should include an overview of all outstanding action items for the licensee or its contractors and any recommendations to the Engineer regarding these items or the project in general.

D. Delegation of Duties of the IE

When the IE is unable to personally inspect or monitor the construction activities, the person who has the same authority as the IE to personally inspect and monitor the construction activities is:

Name 1

E. Independent Environmental Monitor (IEM)

The Licensee is required to retain a person (the "Independent Environmental Monitor") to observe and report on the activities of constructing the works in relation to the requirements under the environmental management plan (the "EMP"). The IE will be provided a copy of the report by the IEM.

The IE will review the reports by the IEM and advise the Engineer in a written report if the construction activities are adversely affecting the environment and the interests of licensees, riparian owners and owners of land adjacent to the works.

The IE and the IEM will communicate with each other during the construction of the works to coordinate their activities, discuss and consider environmental matters prior to issuances of Leaves, initiative and undertake incident management and response activities, implement mitigative measures, and provide information to the Engineer for proper regulation of the construction of the works, when appropriate or required.

F. Leave to Commence Construction (LTCC)

The Licensee may divide the construction of the works into phases. Before the Engineer grants LTCC of any phase of the works, the Engineer must be satisfied that the Licensee has met the requirements under clause (i) of the licence.

The IE will provide the Engineer with information and reports as set out in Section C above for each phase in the construction of the works. The information and reports are to be provided in a timely manner in accordance with the schedule for the construction of the works.

Based on information submitted by the IE, the Engineer may issue a leave to commence construction for a particular phase of the project, subject to the IE reviewing design drawings and giving consent for construction to proceed.

Unless otherwise agreed upon during the project inception and scoping meeting the IE has to issue at least one or multiple LTCC for the following components of the construction of the project:

- Clearing and grubbing
- Bulk excavation
- Headpond filling
- Penstock cleaning and flushing
- Penstock loading
- Construction of civil works (typically separate for intake, penstock and powerhouse)
- Intake Diversion Phase 1
- Intake Diversion Phase 2
- Headpond filling
- Commissioning Generating Equipment

The IE will approve all changes related to the LTCC approved design of the project, except if they are related to:

- The water elevation of the headpond
- Frequency of magnitude of spill
- The location of the IFR-delivery
- A significant change in design of the tailrace
- A significant change in design of the intake structure
- Change in the intake location over 10 m
- Change in the tailrace location over 10 m
- Change in the penstock and powerhouse location over 50 m

G. Undertaking and Monitoring of Construction

The IE will review the design drawings for the construction of the works, and prepare a report as set out in Section C before giving consent that construction may be undertaken. The IE will identify in the report to the Engineer the components within each phase of the construction of the works that are critical for regulating the construction of the works to protect the public and the environment, and the interests of licensees, riparian owners and owners of land adjacent to the works, and protect the environment from adverse effects. A cover letter, with a copy to the Licensee, Design Engineer and the Construction Engineer, would make recommendation ("Leave") if construction of that particular component of works may be undertaken, and this would be sufficient for the Construction Engineer to proceed with construction.

The Construction Engineer may not proceed with construction of works, without prior Leave for that component of the works. When having reasonable grounds, the IE may refuse to issue a Leave for any reason, including but not limited to where proposed works are inconsistent with plans, the water licence, the CEMP, environmental legislation (e.g., the Water Act), where required approvals or permits have not been issued, or where those works may pose a risk to public health, safety, property or the environment. Further, the IE may refuse to issue a Leave if not satisfied with environmental monitoring (as undertaken by the IEM) or prior responses of the Construction Engineer or their contractors to requested actions to mitigate environmental impacts from previous incidents or minimize the potential for future environmental impacts.

It is expected that in reviewing a request for a Leave, the IE has discussed outstanding issues or things with the person responsible for the activity or providing the information, and there has been an opportunity to provide the information or to conduct the activity.

If the IE refuses to issue a Leave, the Engineer and Licensee must be notified immediately. A refusal must be in writing and given to the person who is responsible for providing the information or conducting an activity, as well as to the Licensee. A written refusal should name the things, the extent to which the things must cease or be improved to, a date if the things are time-sensitive, that are needed to extinguish the refusal.

The IE will schedule site inspections, at a minimum monthly frequency, when and where appropriate, to verify that the conditions for the construction of the critical components are in accordance with the construction plans, and provide the Engineer with monthly reports on the outcome of the inspection(s) and construction progress.

The IE is expected to be at site at least once a month unless otherwise agreed upon by the Engineer and upon recommendation of the IE.

The IE is expected to submit a monthly progress report to the Engineer unless otherwise agreed upon by the Engineer.

The IE is responsible for the adequate reporting of incidents (e.g. deficiencies, noncompliance) with any of the relevant legislation or the Water Licence to the Engineer and for the adequate reporting of these incidents by the contractors to the IE. The Independent Engineer is responsible for the oversight that corrective measures are implemented by the contractor.

The IE is responsible for the adequate submission of monitoring reports by the Licensee during the construction and commissioning of the project.

H. Authority to Stop Construction Activities

The IE will have the authority to stop construction activities, where and when those activities are in non-compliance with: the CEMP, the Water Licence, plans, Leaves, or environmental legislation (e.g., the Water Act), or when those activities pose a significant threat or adverse impact to public health, safety, property, or the environment.

A stop construction activities issued by the IE must be in writing and given to the person who is responsible for the construction activities, as well as to the Licensee. A stop construction activities must specify the particular activities found in non-compliance.

A written stop construction activities should describe the extent the activities must cease or be improved to, a date if the activities are time-sensitive, and the things that are needed to extinguish the stop.

With the agreement of the IE or the Engineer under the Water Act, stop construction activities may proceed if the IEM is available or on-site, and the non-compliance can be address through the resolution procedures specified in the IEM Scope of Work.

I. Testing the Operation

The IE will monitor the testing of the operation of the works to determine if the operation poses a hazard to the public and the environment, and submit to the Engineer a report on the outcome of the monitoring.

J. Acceptance

By signing this document the IEM accepts all roles and responsibilities as descripted in this document until his IEM Completion Report has been approved by the Engineer.

By signing this document the IE declares that he or his delegates are and will not get any direct or indirect financial interest in the companies involved in the project, including the holder of the Water licence, it's lenders or insurers, it's contractors and subcontractors or any other company associated with this project.

The roles and responsibilities of the IE as set out above are acceptable to:

lennder McCash

Date: January 4, 2016

Name: _____ Independent Engineer

AND .

The Licensee agrees to retain the Independent Engineer to provide the roles and responsibilities as set out above.

Isabelle Degwise Name: <u>Negwise</u> Licensee NI Hydro Holding Grp

Date: Jan. 4/16

Appendix A - Contact List

Engineer under the Water Act

Name: Position Title: Office Phone Number: Mobile or Alternate Phone Number: Mailing Address:

Independent Engineer (IE)

Name: Jennifer McCash, P.Eng. Position Title: Independent Engineer Company: JEM Energy Ltd. Office Phone Number: 604-581-4750 Mobile or Alternate Phone Number: 604-551-0211 Mailing Address: jemenergy@telus.net

Independent Engineer - Delegated

Name: George Steeves, P.Eng. Position Title: Independent Engineer Delegate Company: True North Energy Office Phone Number: 647-788-6028 Mobile or Alternate Phone Number: 416-452-4715 Mailing Address: <u>gsteeves@ameresco.com</u>

Design Engineer

Name: Position Title: Company: Office Phone Number: 7 Mobile or Alternate Phone Number: Mailing Address:

Construction Engineer

Name: Position Title: Company: Office Phone Number: Mobile or Alternate Phone Number: Mailing Address:

APPENDIX F. SCOPE OF INFORMATION AND REPORTS OF THE IEM FROM THE GUIDE FOR INDEPENDENT POWER PROJECT



Scope of Work for Independent Environmental Monitor (IEM) and delegates
Appendix F Guide for Waterpower Projects Scope of Information and Reports by the Independent Environmental Monitor (IEM)

A. Preamble

[**Name**] (the "Licensee") is proceeding with the construction of the [**Name**] Waterpower Project (the "Project"). The Project, located on [name of stream], is authorized by Conditional Water Licence [**Number**] (the "Licence"), which forms part of this document. The works of the Project are described under clause (h) of the licence.

The Licensee is required under clause (i) 3) of the Licence to prepare an environmental management plan for the management and mitigation of construction impacts (the "CEMP"), which plan is to be to the satisfaction of the Engineer under the Water Act (the "Engineer").

The Licensee is required under clause (i) 2) of the Licence to retain a person with professional qualifications (the "Independent Environmental Monitor") who will monitor environmental impacts from the construction of works. The monitor will also provide information and reports under the direction of the Engineer on compliance of the construction with the CEMP. The Licensee is also required to retain an Independent Engineer (IE) as set out in the Licence.

The CEMP are the provisions that meet the collective requirements of (list the provincial and federal agencies that contributed to the development of the CEMP) and the Engineer to mitigate the effects of the construction activities.

The information and reports by the Independent Environmental Monitor (IEM) will be provided to (list the provincial and federal agencies that contributed to the development of the CEMP) and the Engineer. Each agency will take action on the information and reports provided by the IEM in accordance with the jurisdiction of the agency.

B. Regulation of the Construction of Works

The Engineer has the power to regulate the construction of works, which regulation may consider the construction activities that may adversely affect the public, the environment and the interests of licensees, riparian owners and owners of land adjacent to the works.

If the Engineer has determined that the construction activities may be hazardous to the interests of licensees, riparian owners and owners of land adjacent to the works and the environment, the Engineer may issue an order that directs the Licensee to change the manner in which the works are constructed to remove the hazardous condition.

C. Information and Reports

The IEM is responsible for observing the methods of construction and preparing information and reports on the compliance of the construction activities with the CEMP.

The IEM is expected to be at site during all activities authorized in the Leave to Commence Construction (LTCC) or Leave to Commence Diversion (LTCD) unless otherwise agreed upon by the Engineer upon recommendation of the IEM.

The IEM has to submit a progress report on a weekly basis to the Engineer unless otherwise agreed upon by the Engineer at the time of issuance of the LTCC or at a later date upon recommendation of the IEM.

The IEM is responsible for the adequate reporting of deficiencies and non-compliance with any of the relevant legislation, including the Water Licence, to the Engineer and for the adequate reporting of these incidents by the contractors to the IEM. The IEM is responsible for the oversight that corrective measures are implemented by the contractor.

The information and the reports to be provided by the IEM to (list the provincial and federal agencies that contributed to the development of the CEMP) and the Engineer and must include the following:

1. Review the CEMP and develop a work plan that sets out the following:

- The frequency of inspecting the construction activities.
- The manner in which notice is to be given to the parties for a construction activity that is not in compliance with the CEMP.
- A process for escalating enforcement of compliance of construction activities with the CEMP.
- The format and frequency for the preparation of reports on the compliance of the construction activities with the CEMP.
- 2. Reports on meetings with the Licensee and the Construction Engineer to develop a strategy to communicate to the workers on the construction site the following:
 - the requirements of the CEMP,
 - the potential environmental impacts, and
 - the authority of the IEM.
- 3. Reports on matters that arise during the construction and testing of the works that are not described in the CEMP. If cannot be resolved by discussion with the licensee and the Construction Engineer, obtain direction from the Engineer and (list the provincial and federal agencies that contributed to the development of the CEMP) for the mitigation of these matters.
- 4. Provide any other information or advice required by the Engineer and (list the provincial and federal agencies that contributed to the development of the CEMP) that is required to ensure that the construction and commissioning of the works is in accordance with the CEMP.
- 5. An IEM Completion Report summarizing how the IEM fulfilled the roles and responsibilities described in this document. This report should include an overview of all outstanding action items for the licensee or its contractors and any recommendations to the Engineer regarding these items or the environmental monitoring for the project in general.

D. Independent Engineer (IE)

The Licensee is required under clause (i) 1) of the Licence to retain an IE who will provide information and reports under the direction of the Engineer regarding the design and construction of the works.

The IE and the IEM will communicate with each other during the construction of the works to coordinate their activities to provide information to the Engineer for proper regulation of the construction of the works.

E. Delegation of Duties of the IEM

When the IEM is unable to personally observe and report on the construction activities, the persons who have the same authority as the IEM to observe and report on construction activities are:

1. Name 1

2. Name 2

F. Testing the Operation

When the Licensee submits a schedule for testing the operation of the works, the IEM will inspect the site and report to (list the provincial and federal agencies that contributed to the development of the CEMP) and the Engineer on any matters that would make the works a hazard to the public and the environment.

The IEM will observe the testing of the operation of the works to determine if the operation poses a hazard to the public and the environment, and submit to the Engineer a report on the outcome of the monitoring.

G. Authority to Stop Construction Activities

The plan prepared by the IEM for escalating the enforcement of compliance of construction activities with the CEMP includes a provision that the IEM may direct the Construction Engineer to stop a construction activity.

The authority of the IEM to stop a construction activity pertains only to those matters under the jurisdiction of (list the provincial and federal agencies that contributed to the development of the CEMP).

An order to stop a construction activity that affects the interests of licensees, riparian owners and owners of land adjacent to the works may only be given by the Engineer.

G.1 Resolution Procedures for Deficiencies/NonCompliance and Stop Work

During construction the IEM will help identify and resolve potential issues and deficiencies through effective communication with the Construction Manager, Prime Contractor, and appropriate regulatory agencies. With respect to instances involving the identification of deficiencies in contravention of the approved CEMP such as in-adequate spill protection available on-site, the IEM will direct the Contractor and/or Construction Manager (or designate) to rectify the noted deficiency before problems evolve.

With respect to prescribed mitigative measures to be followed by the Contractor, the IEM will note that immediate action is to be taken to correct the non-functioning measures.

The IEM shall identify any activities which may cause negative environmental impacts that are different and/or at a greater level of intensity (magnitude) than anticipated, and/or which may be in contravention with the approved CEMP or applicable environmental regulations. In such instances, the IEM will advise the Construction Manager and Prime Contractor that changes or modifications to the Contractor's method(s) of operation are recommended to reduce those impacts.

The Construction Manager will direct the Contractor to resolve the issue as expeditiously as possible.

If the recommended changes/modifications are not carried out and the construction activities continue to adversely affect the environment, the IEM may suspend the specific construction activity which is causing the adverse effect, and document the suspension of work. In such instances, the IEM shall advise the Construction Manager, Prime Contractor, IE, and applicable regulatory agencies of the work stoppage.

All environmental emergencies and incidents will be reported immediately and managed in a rapid, safe and effective manner.

When warranted, the IEM will report on the magnitude of impacts such as spills or other environmental incidents, and the likelihood that the incident could recur, or is occurring on an ongoing basis, using **Table 1** below.

Table 1: Criteria to be used to Assess and Report on the Severity of Environmental Incidents

		Likelihood of Repeat/Ongoing Occurrence						
		High Medium		Low				
Magnitude of Impact	High	Immediate Stop Work Order & FLNRO Notification within 24 hours. Event noted in IEM report, mitigative measures by proponent & follow-up by IEM required.	FLNRO Notification within 24 hours. Event noted in IEM report, mitigative measures by proponent & follow-up by IEM required.	Event noted in IEM report, proponent obligated to complete mitigative measures; follow-up by IEM required.				
	Medium	FLNRO Notification within 24 hours. Event noted in IEM report, mitigative measures by proponent & follow-up by IEM required.	Event noted in IEM report, proponent obligated to complete mitigative measures; follow-up by IEM required.	Event noted in IEM report.				
	Low	Event noted in IEM report, proponent obligated to complete mitigative measures; follow-up by IEM required.	Event noted in IEM report.	Event noted in IEM report.				

FLNRO means Ministry of Forests, Lands, and Natural Resource Operations, and includes legislation managed by the Ministry of Environment.

H. Acceptance

By signing this document the IEM accepts all roles and responsibilities as descripted in this document until his IEM Completion Report has been approved by the Engineer.

By signing this document the IEM declares that he or his delegates are and will not get any direct or indirect financial interest in the companies involved in the project, including the holder of the Water licence, it's lenders or insurers, it's contractors and subcontractors or any other company associated with this project. The roles and responsibilities of the IEM as set out above is acceptable to:

J. Alex Sarturi

Date: Jan 4/16

Name: _______ Independent Environmental Monitor

And

The Licensee agrees to retain the Independent Environmental Monitor to provide the roles and responsibilities as set out above.

Isabelle Deguise Name: <u>Deguise</u> Licensee NI Hydro Holding Corp.

Date: Jan. 4/16

Appendix A - Contact List

Engineer under the Water Act

Name: Position Title: Office Phone Number: Mobile or Alternate Phone Number: Mailing Address:

Independent Engineer (IE)

Name: Jennifer McCash, P.Eng. Position Title: Independent Engineer Company: JEM Energy Ltd. Office Phone Number: 604-581-4750 Mobile or Alternate Phone Number: 604-551-0211 Mailing Address: jemenergy@telus.net

Independent Engineer - Delegated

Name: George Steeves, P.Eng. Position Title: Independent Engineer Delegate Company: True North Energy Office Phone Number: 647-788-6028 Mobile or Alternate Phone Number: 416-452-4715 Mailing Address: <u>gsteeves@ameresco.com</u>

Design Engineer

Name: Position Title: Company: Office Phone Number: 7 Mobile or Alternate Phone Number: Mailing Address:

Construction Engineer

Name: Position Title: Company: Office Phone Number: Mobile or Alternate Phone Number: Mailing Address:

APPENDIX G. ENVIRONMENTAL MONITORING REPORT TEMPLATE



APPENDIX G

Environmental Monitoring Report Template

Environmental Monitoring Template

Name of Company:

Environmental Monitoring Report Number: Year- #####

Project Title:

Reporting Period: [Daily report / Weekly report / Monthly report]

Date: [*Month/Day/Year*]

Conditional Water Licence Number:

Licensee:

Ministry Water File Number:

Contact Information:

Owner: [Name and Phone Number]

Project Manager: [Name and Phone Number]

Contractor(s): [Name and Phone Number]

Environmental Monitor(s): [Name, Phone Number and Cell Number]

Independent Engineer (if applicable):

Independent Environmental Monitor (if applicable):

Weather: [General description of weather during the reporting period including temperature, precipitation amounts, and severe weather events.]

Table 1Weather tracking table

Day	Date	Site Visit (Y/N)	Min to Max Temperature* (⁰C)	Precipitation* (mm)	Severe Weather Experienced
Day of the Week	Month/Day/ Year				Description of Severe Weather Event (e.g. heavy rainfall, blizzard, damaging winds)

Construction Activities: [Description of construction activities which took place during the reporting period (e.g. backfilling, installations, excavations, blasting, etc.)]

Commissioning Activities: [Description of construction activities which took place during the reporting period]

Environmental Activities: [Description of environmental activities which took place during the reporting period. This section will describe the Environmental Monitor(s) tasks throughout the reporting period including meetings, site-visits, observations, notes, recommendations, and incidents. A detailed monitoring summary and environmental incidents/issues summary will be provided in **Table 2** and **Table 3**.]

Meetings and Key Communications: [Description of meetings with the Environmental Monitor(s). Meeting subject, date, and potential issues will be documented in this section.

Wildlife Observations: [Brief description of wildlife observations during reporting period. Include the observer's name, species observed, location, and if possible, the behaviour.]

Comments and Upcoming Works: [Briefly describe upcoming work for the next reporting period.]

Table 2 Environmental Monitoring Summary

Date	Environmental Monitor	Monitoring Activities	Data Collection
Month\Day\Year	Name, Designation (IE, IEM).	Location, type of monitoring, duration.	Water Quality, Air Quality, Noise Level, etc.

Table 3 Incident Summary: Environmental Concerns, Actions and Recommendations

Report	Incident Number	Project Component	Environmental Concerns	Mitigation Action Recommended/Taken	Further Action Required	Complete Y/N?
Provide Report # (reference # at beginning of report)	Provide an up-to- date Incident #.	Excavation, Blasting, Concrete works, etc.	Description of impacts to the environment.	Description of mitigative action and commitments. Including recommendations from the IE and IEM.	Development of workplans, updating Environmental Management Plans, and updating CEMP if applicable.	lf No, provide reason(s).

Site Photos:

Photo 1 [must include date and time]					
Caption [must include direction of view and location]					
Photo 2 [must include date and time]					
Caption [must include direction of view and location]					

Report prepared by (name and designation):

Signature_____ Date_____

Report reviewed by (name and designation):

APPENDIX H. CEMP CHECKLIST



APPENDIX H

CEMP Checklist

CEMP Checklist

Section	Section Title	Section Completed		If incomplete, reason or mitigating	
NO.		Yes	No	Tactor	
1.1	Cover Page				
1.2	Document Approval				
1.3	Revision Tracking Tables				
2.1	Purpose of CEMP				
2.2	Document Organization				
2.3	Distribution and Doc. Control				
2.4	Change Mgt. and Approval				
3.1	Owner				
3.2	Project Description				
3.3	Land				
3.3.1	Commitments to Other Land Users				
3.4	Zoning				
3.5	First Nations Interests				
3.6	Water Requirements				
3.7	Weather and Climate				
3.8	Fire Management				
3.9	Environmental Setting				

Section	Section Title	Section Completed		If incomplete, reason or mitigating	
NO.		Yes	No	factor	
3.9.1	Aquatic Environment				
3.9.2	Geophysical Environment				
3.9.3	Terrestrial Vegetation and Wildlife				
3.9.4	Heritage Resources				
3.10	Construction Schedule				
3.10.1	Timing Windows				
4.1	Corp. Env. Statement/Commitment				
4.2	Summary of Applicable Legislation				
5.1	Pre-Construction Commitments				
6.1	Permits, Licences and Approvals				
6.2	First Nations Agreements				
6.3	Roles and Responsibilities				
6.3.2	Independent Engineer				
6.3.2.1	Scope of Service for IE & Delegates				
6.3.3	Independent Environmental Monitor				
6.3.3.1	Scope of Service for IEM & Delegates				
6.4	Environmental Monitoring Programs				
6.5	Reporting				
6.5.1	IE and IEM				

Section	Section Title	Section Completed		If incomplete, reason or mitigating
NO.		Yes	No	factor
6.5.2	Environmental Incidents			
6.6.1	Environmental Orientation Training			
6.6.2	Pre-Activity Meetings			
6.6.3	Daily Meetings (Tailgate, toolbox, etc.)			
7.0	Environmental Management			
7.1	Access and Traffic Management			
7.2	Air Quality and Dust Control			
7.3	Noise Control			
7.4	Excavation and Borrowing			
7.4.1	Blast Management			
7.4.2	Metal Leaching and Acid Rock			
7.5	Erosion, Sediment and Drainage			
7.6	Care of Water			
7.7	Waste Management			
7.7.1	Solid Waste Mgt. Reduction			
7.7.2	Liquid Waste Management			
7.8	Hazardous Material Management			
7.9	Fuel Storage, Handling and Emergency Spill Response			

Section	Section Title	Section Completed		If incomplete, reason or mitigating
NO.		Yes	No	Tactor
7.10	Concrete Production, Handling and Wastage			
7.11	Emergency Preparedness & Resp.			
7.11.1	Accidents and Malfunction			
7.11.2	Storms and Severe Weather			
7.11.3	Avalanche Control			
7.11.4	Landslide Safety			
7.12	Fire Preparedness			
7.13	Heritage, Cultural & Arch. Sites			
7.14	Fish & Fish Habitat Protection			
7.14.1	Fish Salvage			
7.15	Wildlife Management			
7.15.1	Habitat Mitigation/Compensation			
7.15.2	Human/Wildlife Interaction Mgt.			
7.16	Vegetation Mgt. and Reclamation			
7.16.1	Vegetation Clearing			
7.16.2	Invasive Plant Management			
7.16.3	Site Reclamation & Landscape Rest.			
8.1	Wildlife VC Species			

Section	Section Title	Section Completed		If incomplete, reason or mitigating
NO.		Yes	No	factor
8.2	Wildlife Mgt. Best Practice Guidelines and Regulatory Requirements			
8.2.1	Amphibians			
8.2.2	Birds			
8.2.3	Mammals			
8.2.4	Invertebrates			
8.2.4.1	Molluscs			
8.2.4.2	Insects			
8.3	Regulatory Requirements for Mgt. of Designated Wildlife Habitat			
8.4	Mitigation Effectiveness Assessment			
8.5	Adaptive Management			
9.1	Commissioning Plan			
9.2	Ramping Rate Study			
10.0	Key Contacts			

APPENDIX I. SELECT WATER QUALITY GUIDELINES (CRITERIA) FOR THE PROTECTION OF AQUATIC LIFE



Construction activities proposed for this project have the potential to impact a number of water quality parameters. Construction and vegetation removal may cause erosion and increase runoff, thereby resulting in increased sediment transport. This can potentially increase Turbidity and Total Suspended Solids (TSS) in receiving waters. Concrete work also has the potential of altering pH in receiving environments. The various modifications proposed to the landscape may also create dust management issues which could influence turbidity and/or TSS. The operation of machinery may introduce chemicals such as oils and greases. Given these activities, a minimum of five water quality parameters may be analyzed throughout the course of the work: turbidity (as a surrogate for TSS in mg/L, although TSS may also be measured as needed), pH, as well as hydrocarbons, oils and greases. Construction activity, environmental risk, and incidents will determine the frequency at which each parameter is monitored.

Water quality compliance will be assessed in relation to the Canadian Water Quality Guidelines for the Protection of Aquatic Life developed by the Canadian Council of Ministers of the Environment (CCME) (CCREM, 1987; CEQG, 2011). Where federal guidelines have not been formalized, parameters will be assessed in relation to Provincial Water Quality Guidelines for the Protection of Aquatic Life (BC MOE, 2011; MELP, 1997). Select water quality criteria are summarized in Table 1.

Throughout this project, water quality samples will be collected in a well-mixed environment within receiving waters. Compliance with the water quality criteria will be monitored in receiving waters, at sampling stations immediately adjacent to the work sites. Background samples will be collected at least 50 m upstream or downstream of worksites. When applicable, all background samples will be collected daily prior to the start of the work, and will be collected on a daily basis during work in ESAs.

Due to the sensitive nature of fish habitat, while construction is ongoing, it will be critical that discharges from construction areas and sediment detention areas meet a high level of water quality at all times. Under all circumstances, DFO requires compliance with Subsection 36(3) of the Canada Fisheries Act (which prohibits the deposition of deleterious substances at the fish bearing point of any stream). These guidelines will be applied in receiving waters on a real-time basis through in situ monitoring of receiving water quality.

All measurement procedures shall be conducted as stated in the "Ambient Fresh Water and Effluent Sampling Manual" (MELP, 1997) and/or the BC Biological Field Sampling Manual (MWLAP, 2003), as determined based on sample types as well as specific project needs.

Parameter Criterion	Value	Flow period	Mean Detectable Limit	Source
Temperature	Optimum range for rearing coho = 9 to 16 °C, for Dolly Varden = 8 to 16 °C. Maximum change of +/- 1 °C beyond optimum range for coho, and max. +/- 1 oC change over 1 hour.		0.1 °C	MOE, 2011
Dissolved Oxygen	Optimum value for all life stages (excluding buried embryo/alevin) is a 30 day mean of 8 mg/L based on 5 evenly space samples. The instantaneous minimum level to be maintained at all times is 5 mg/L.		0.1 mg/L	MOE, 2011
рН	Between 6.5 and 9.0 pH units.		0.1 pH Unit	CEQG, 2011
Turbidity increase limits (Marine Environments)	Max. increase of 25 NTU at any time and for short term exposure.		2 NTU	CEQG, 2011
Turbidity increase limits (Freshwater)	Max. increase of 8 NTU when background is \leq 8 NTU for a short term exposure (24 hours).	clear flow period	2 NTU	CEQG, 2011
	Mean increase of 2 NTU when background is ≤ 8 NTU for a longer term exposure (30 days).	clear flow period		
	Max. increase of 8 NTU at any one time when background is between 8 and 80 NTU.	high flow or turbid period		
	Max. increase of 10% of background when background is > 80 NTU.	high flow or turbid period		
Suspended solids increase limits (Freshwater)	Max. increase of 25 mg/L when background is \leq 25 mg/L for a short term exposure (24 hours).	clear flow period	1 mg/L	CEQG, 2011
	Mean increase of 5 mg/L when background is ≤ 25 mg/L for a longer term exposure (30 days).	clear flow period		
	Max. increase of 25 mg/L at any time when background is between 25 and 250 mg/L.	high flow or turbid period		
	Max. increase of 10% of background when background is > 250 mg/L	high flow or turbid period		
Oils and greases	22 mg/L The surface water should be virtually free of petroleum, animal or vegetable oils (see Nagpal <i>et</i> <i>al.</i> 2001)		2 mg/L	MOE, 2011
	No CCME guideline for Oil and greases (only constituents like BTEXS, PAH, etc.)	n/a		CEQG, 2011

Table 1. Summary of Water Quality Criteria for this project.

APPENDIX J. PROJECT ARCHAEOLOGICAL RESOURCES AND CULTURAL SITES MONITORING AND MANAGEMENT PLAN





shíshálh Nation Rights & Title Department

5555 Sunshine Coast Hwy., Sechelt, British Columbia VoN 3Ao Tel: 604.740.5600

Shíshálh Archaeological Resources and Cultural Use Sites Monitoring and Management Plan for BluEarth Renewables Inc.

Developed for: Narrows Inlet Hydroelectric Project

Management Summary

The original location(s) and spatial extent of the proposed infrastructure has changed considerably since Merchant's study (2009-2011) resulting in the need for archaeological assessment of the revised development locations. Since the completion of Merchant's study, new archaeological sites were identified in the Project area including human remains (Kenzie Jessome, personal communication, 2015). As a result, all subsurface activities related to the construction of infrastructure associated with the Project will require archaeological monitoring by the *shishálh* Nation. Items of archaeological significance that may occur in the Project area include: lithic scatters, shell midden, fire altered rock, hearths, petroglyphs, pictographs, petroforms, culturally modified trees, arbolglyphs, rock cairns, wet sites, abandoned canoes, storage pits, mortuary internments, post-holes, residential architecture, resource collection and/or processing sites, etc. A brief description of the most common discoveries in the Narrows Inlet area is offered at the end of this document.

Areas of high archaeological potential are determined by several biogeographic and cultural criteria. Flat and easily habitable terrain, access to freshwater, and access to marine resources are all biogeographic criteria which increase the archaeological potential of an area. Areas of increased archaeological can also be determined by their proximity to previously recorded archaeological sites, association with oral history or ethnographic records, and/or proximity to parcels of designated First Nation land (Figure 1). For the purposes of this development, areas of increased archaeological potential include:

- The entire coastline of the head of Narrows Inlet and surrounding lands;
- All Sechelt Band Land (SBL) parcels and surrounding lands including SBL 6, SBL 6A, SBL 7, SBL 8, and SBL 9; and
- Areas of development with naturally flat terrain and/or areas of development in proximity to freshwater resources including all developments along the Chickwat Creek valley north of Narrows Inlet, all developments along Ramona Creek, and the shoreline of Ramona Lake.

To mitigate potential impacts to archaeological resources, archaeological surface surveys will be conducted by a professionally trained archaeologist at all development locations that require the disturbance of subsurface sediments. The results of these surface surveys will determine the level of archaeological mitigation required, if any, to proceed with excavations at each development. Recommendations will vary depending on the results of each surface survey. Generally, it is recommended that any area known to contain previously recorded archaeological resources, or any area that's has been determined to be high in archaeological potential, be avoided with a 50 m buffer if possible. When avoidance is not possible, mitigation strategies specific to the development will be recommended. For example, areas of moderate archaeological potential may be subject to monitoring and sediment screening by a trained archaeological professional during all excavation activities. Areas of high archaeological potential or areas of previously recorded archaeological resources may be subject to more thorough and systematic testing such as subsurface testing (auger testing, shovel testing, evaluative units) to determine the physical extent of identified archaeological resources or confirm that no archaeological concerns are present within that specific development footprint. Mitigation strategies may contain any combination of the methods mentioned above, in addition to any additional unmentioned methods which may best suit the results of each surface survey.



Figure 1. Development map of Narrows Inlet displaying areas of raised archaeological potential in relation to the development footprint of the Narrows Inlet Hydroelectric Project.

Guidelines for Managing Archaeological Discoveries Occurring During Construction Activities

Project activities such as new road construction, road maintenance (installation of culverts, ditches, bridges, etc.), other hydro operations that involve the excavation, movement, or disturbance of soils (such as in-take, penstock and powerhouse developments), and the flooding and/or drawdown of water have the potential to expose, damage and/or destroy archaeological materials. As a result, specific steps must be undertaken to lessen the impacts to or potential loss of archaeological resources. All archaeological sites within British Columbia are automatically protected under the Heritage Conservation Act (HCA) (MFLNRO, 1996). Any alterations to known and/or as-yet unrecorded archaeological remains¹ require permits issued by the British Columbia Archaeology Branch, Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) and, a *shishálh* Heritage Inspection Permit from the *shishálh* Nation Rights and Title Department is required for any projects within *shishálh* Territory. A sHIP permit has been acquired on behalf of BluEarth Renewables Inc. by In Situ Consulting (sHIP 2016.001) and a Heritage Inspection Permit has been applied for by In Situ Consulting for the duration of the project (BC HIP Application number 16A0027).

Pre-Monitoring Basic Archaeological Training

All contractors and on-site staff shall receive an initial Archaeological Training Orientation prepared by the Proponent and *shishálh* Nation archaeologist (Kenzie Jessome, BA., BA., MA.). The orientation session is designed specifically for the Narrows Inlet portion of the project and identified areas of raised archaeological concern. It is designed to provide basic training in the identification of archaeological sediments, and to train staff in the specific protocols to be followed if archaeological sediments or artifacts are unearthed during the project when an archaeological monitor is not on site. This orientation will outline the responsibility and need for awareness related to potential items of archaeological significance. Orientation will be provided to all new contractors and staff that will be exposed to subsurface excavations or blasting work in the Project area.

What to do if you suspect archaeological remains have been encountered?

If it is suspected that archaeological remains have been exposed/disturbed during any land-altering activities, work in the area of discovery must cease immediately. The *shishálh* Nation's archaeologist, Kenzie Jessome, will need to conduct a site visit to determine the current condition of the site and record the new site. This will enable the archaeologist to determine the extent and nature of the discovery and make appropriate recommendations on how to best mitigate impacts the site. Discussions with the *shishálh* Nation Chief and Council, BluEarth Renewables Inc., and In Situ Consulting will determine the next steps to proceed with development in the area. If site avoidance is deemed impossible, an intensive archaeological study will be required prior to proceeding with any development activity. The immediate action that should be taken upon discovery of suspected archaeological remains is as follows:

¹ Archaeological remains are not limited to artifacts or other moveable objects. Features including but not limited to the following, such as fire-hearths, storage pits, rock cairns, house floors and post-holes are all considered archaeological remains and are protected by the HCA.



1. If archaeological remains are thought to be discovered, all work must stop immediately and the site should be safely secured by marking an exclusion zone with snow fencing or flagging and installing a sturdy barrier fence.

2. Contact the *shishálh* Nation Project Archaeological Monitor who will implement necessary slope stabilization, drainage, erosion and sediment control measures to protect the discovery. The monitor will also contact the Project Archaeologist (K. Jessome) to determine best steps to protect archaeological deposits: Monitors and archaeologists can be reached at In Situ Consulting by phone at 1.604.349.2355 or email at contact@insituconsulting.ca.

3. The Project Archaeologist will provide guidance regarding how to proceed with development activities. The IEM and Licensee will be notified by the archaeologist and conversations with all concerned parties will determine the next steps.

Archaeological Site Management Options

Should the Archaeologist confirm the discovery is archaeological in nature; there are several management options. As an Inspection Permit under the Heritage Conservation Act has been applied for (Application #16A0027), there will be three management options available:



1. Site avoidance. If the boundaries of the archaeological site have been identified and delineated, the best management option is to redesign the proposed development to avoid the site (if feasible).

2. Mitigative work. If it is not feasible to avoid the archaeological site, systematic data collection prior to any further development will be undertaken by the Archaeologist. This is typically the most expensive and time-consuming management option.

3. Site protection. It may be possible to protect the site through the installation of physical barriers during the time of construction to protect the site from further disturbance. Various site-specific protective measures are possible in consultation with the *shíshálh* Nation's archaeologist.

Procedures for Identified Human Remains

In the event of the discovery of human remains the *shishálh* Nation, BluEarth Renewables Inc., and the Archaeology Branch must be contacted immediately. Discussions with these concerned parties will determine how (and if) further detailed cultural or scientific procedures are to be employed to ensure the respectful handling and responsible deposition of the remains. The *shishálh* Nation has specific cultural and scientific protocols regarding the treatment of archaeological human remains. These protocols are available at the *shishálh* Nation Rights and Title office and will be implemented immediately upon the discovery of human remains.

Expected Types of Archaeological Materials within the Project Area:

Culturally Modified Trees

Although much of the project area has been previously subject to industrial scale timber extraction over the past century, there are unrecorded Culturally Modified Trees (CMTs) located within *shishálh* Territory. A CMT is any living or dead tree that displays evidence of ancient aboriginal forestry extraction or use. CMTs can be composed of a bark strip scar, pitch extraction mark, plank removal, test holes, or arbolglyphs among many others site types. A CMT can occur in any species of tree, but the most commonly discovered CMT species in *shishálh* Territory include western red cedar, yellow cedar, and Douglas fir.



Image source: Stryd, Arnoud H.,1997 Culturally Modified Trees of British Columbia: A Handbook for the Identification and Recording of Culturally Modified Trees, British Columbia Ministry of Forests.

Artifact Scatters

The most common form of artifact scatters are lithic scatters. These scatters typically consist of fragments of stone produced during the manufacture and maintenance of stone tools. An archaeological lithic can be identified as small- to large-sized pieces of thin, sharp stone with obvious chips or stress ridges along its ventral face and a bulb of percussion at the point of contact where struck by a hammer stone. Parallel striations and intentional pecking marks may also be observed. Altered bone, antler, and teeth are often found in association with lithic scatters and can be identified by common indicators including obvious shaping, striations, incisions and unnatural perforations. Slate and basalt materials are mostly commonly utilized by ancient shishálh Peoples in the study area (and project location).

Slate Knives



Image Source: Archaeological Impact Assessment of DjSc-1, Shelter Point, Texada Island BC – Public Copy, Permit 2013-0162, Prepared by Colleen Parsley, Aquilla Consulting, Oct 2013

Shell Middens

Shell middens are produced through the collection, processing, and deposition of shellfish and as a result of the myriad of material waste producing activities that occur throughout daily life. They can be identified as layers of fragmented or whole shellfish shells mixed with other strata that appear as darker or burned layers (i.e. soil, sand, clay and hearth features, etc.). Middens often contain artifacts commonly employed in the harvesting and processing of shellfish such as flaked stone knives, hammer stones, bone or antler fishhooks, and other tools. Due to the increased preservative qualities of the calcium-rich and alkaline matrix found in archaeological middens, artifacts are often extremely well preserved in this context. Due to their increased qualities of preservation, articulated and disarticulated human remains are frequently discovered within shell middens.



Image Source: In Situ Consulting Inc., 2015

Fire-altered Rock and Hearths

Fire-altered rocks (FAR) are stones (usually coarse grained or vesicular) of moderate-to large size that have been fractured due to the rapid heating and cooling that occurs in the course of cooking, heating and the processing of food or the manufacture of wood products (canoes, boxes, etc.). Cultural features including hearths and cultural depressions are often associated with FAR. These can often be identified as concentrations of roughly fractured and blackened rocks, surrounding a matrix of layered and reddened/dark soil matrices.



Image source: In Situ Consulting Inc., 2014

Human Remains and Burials

Archaeological human remains primarily consist of the preserved skeletal elements of the human body, with very few exceptions (see section on Wet Sites below). The natural acidic nature of local soils typically breakdown bone within fifty (50) years of internment, however the alkaline matrix of shell midden deposits can preserve bone for a longer period of time. Burials may be marked by features such as stone cairns (anthropogenically piled stones) or pictographs (see section on Rock Art below). It is imperative that human remains are treated with respect and in accordance to the *shishálh* Nation's protocol for the handling of human remains. If the human remains are suspected to be non-archaeological in nature, involvement by the local RCMP detachment and Coroner's Office will be sought.



Image source: In Situ Consulting Inc., 2015

Wet Sites

Wet sites are produced when a high water table, poor drainage, or natural features/landforms create water-logged environments such as bogs or swamps. Wet sites are unique in that their anaerobic environment drastically delays the decay of organic materials such as plant fibers and soft tissue. Woven baskets, textiles, wooden artifacts, and even flesh can be preserved at wet sites even long after they would have decayed in a non-waterlogged environment.



Image source: Qwugwes Wet Site Basketry and Cordage–Draft Final Report 4-1-13, Edited by Dale R. Croes, P.I., South Puget Sound Community College, With Rhonda Foster and Larry Ross, Squaxin Island Tribe, Cultural Resources Department

Rock Art

Rock art in *shishálh* Territory takes on two primary forms: pictographs and petroglyphs. Pictographs are illustrations drawn onto a rock surface with a pigmented substance (red ochre, charcoal, chalk, etc.). Some of these pigments create a chemical reaction with the surface of the rock and produce a long-lasting chemical stain. Pictographs which produce a chemical stain will retain their form on the rock's surface longer than other pigments which may be washed away with rain or weathering. Pictographs can range in subject matter from simple geometric shapes such as lines and circles to complex illustrations such as zoomorphic figures or human-animal transformations. Petroglyphs are created when a design is carved in relief or counter-relief onto a rock face. Similar to pictographs, the subject matter of petroglyphs can range from simple to complex and may range in size from portable stones to larger fixed stone features.



Image source: In Situ Consulting Inc., 2015



Image source: shishálh Nation, tems swiya Museum

References Reviewed:

1996 MLFNRO, Archeology Branch, Heritage Conservation Act, R.S.B.C. 1996, c 187, Queen's Printer, Victoria, BC

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APPENDIX K. KEY LANDSCAPES SURROUNDING THE PROJECT AREA








APPENDIX L. WILDFLIE SPECIES IN THE MINISTRY OF FOREST, LANDS, AND NATURAL RESOURCE OPERATIONS – SOUTH COAST (REGION 2)



Appendix B - 1 -

WILDLIFE SPECIES IN THE SOUTH COAST REGION (REGION 2)

Scientific Name	Riverine or Riparian?	English Name	COSEWIC	BC List	ldentified Wildlife	Prov Wildlife Act	GOERT	МВСА	SARA	Class (English)	Origin	CF – Highest Priority	CF – Priority Goal 1	CF – Priority Goal 2	CF – Priority Goal 3	CDC Maps
Anaxyrus boreas		Western Toad	SC (Nov 2012)	Blue					1-SC (Jan 2005)	amphibians	Native	2	3	2	4	Y
Ascaphus truei		Coastal Tailed Frog	SC (Nov 2011)	Blue	Y (May 2004)				1-SC (Jun 2003)	amphibians	Native	1	4	1	2	Y
Dicamptodon tenebrosus		Coastal Giant Salamander	T (Nov 2000)	Red	Y (May 2004)				1-T (Jun 2003)	amphibians	Native	1	5	6	1	Y
Rana aurora		Northern Red-legged Frog	SC (Nov 2004)	Blue	Y (May 2004)				1-SC (Jan 2005)	amphibians	Native	1	3	1	2	Y
Rana pretiosa		Oregon Spotted Frog	E (May 2011)	Red					1-E (Jun 2003)	amphibians	Native	1	1	6	1	Y
Accipiter gentilis laingi		Northern Goshawk, <i>laingi</i> subspecies	T (Apr 2013)	Red	Y (May 2004)				1-T (Jun 2003)	birds	Native	1	1	6	1	Y
Ardea herodias fannini		Great Blue Heron, fannini subspecies	SC (Mar 2008)	Blue	Y (May 2004)		Y		1-SC (Feb 2010)	birds	Native	1	3	6	1	Y
Asio flammeus		Short-eared Owl	SC (Mar 2008)	Blue	Y (May 2004)		Y		1-SC (Jul 2012)	birds	Native	2	6	2	3	Y
Botaurus lentiginosus		American Bittern		Blue				Y		birds	Native	2	5	2	3	Y
Brachyramphus marmoratus		Marbled Murrelet	T (May 2012)	Blue	Y (May 2004)			Y	1-T (Jun 2003)	birds	Native	1	1	1	2	Y
Buteo lagopus		Rough-legged Hawk	NAR (May 1995)	Blue						birds	Native	2	6	6	2	Ν
Butorides virescens		Green Heron		Blue				Y		birds	Native	4	6	6	4	Y
Chordeiles minor		Common Nighthawk	T (Apr 2007)	Yellow				Y	1-T (Feb 2010)	birds	Native	2	6	2	4	Ν
Cinclus mexicanus		American Dipper		Yellow				Y		birds	Native	5	5	6	6	Ν
Cypseloides niger		Black Swift	C (Jul 2011)	Yellow				Y		birds	Native	2	4	2	4	Ν
Dendragapus fuliginosus		Sooty Grouse		Blue						birds	Native	2	5	2	3	Ν
Falco peregrinus		Peregrine Falcon	SC (Apr 2007)	No Status						birds	Native	2	5	2	3	N
Falco peregrinus anatum		Peregrine Falcon, anatum subspecies	SC (Apr 2007)	Red			Y		1-SC (Jun 2012)	birds	Native	2	5	6	2	Y
Grus canadensis		Sandhill Crane	NAR (May 1979)	Yellow	Y (Jun 2006)			Y		birds	Native	5	6	6	5	Ν
Hirundo rustica		Barn Swallow	T (May 2011)	Blue				Y		birds	Native	2	6	2	3	Ν
Histrionicus histrionicus		Harlequin Duck		Yellow				Y		birds	Native	1	4	1	3	W
Hydroprogne caspia		Caspian Tern	NAR (May 1999)	Blue				Y		birds	Native	2	4	2	3	W
Megascops kennicottii		Western Screech-Owl	T (May 2012)	No Status					1	birds	Native	2	6	2	4	N
Megascops kennicottii kennicottii		Western Screech-Owl, kennicottii subspecies	T (May 2012)	Blue			Y		1-SC (Jan 2005)	birds	Native	1	3	1	2	Y
Nycticorax nycticorax		Black-crowned Night- heron		Red				Y		birds	Native	3	6	6	3	Y
Patagioenas fasciata		Band-tailed Pigeon	SC (Nov 2008)	Blue			Y	Y	1-SC (Feb 2011)	birds	Native	2	5	2	3	W
Phalacrocorax auritus		Double-crested Cormorant	NAR (May 1978)	Blue						birds	Native	2	6	2	3	Y
Progne subis		Purple Martin		Blue			Y	Y		birds	Native	3	6	6	3	Y
Strix occidentalis		Spotted Owl	E (Mar 2008)	Red	Y (May 2004)				1-E (Jun 2003)	birds	Native	2	5	6	2	Y

Scientific Name	Riverine or Riparian?	English Name	COSEWIC	BC List	ldentified Wildlife	Prov Wildlife Act	GOERT	MBCA	SARA	Class (English)	Origin	CF – Highest Priority	CF – Priority Goal 1	CF – Priority Goal 2	CF – Priority Goal 3	CDC Maps
Tyto alba		Barn Owl	T (Nov 2010)	Blue			Y		1-SC (Jun 2003)	birds	Native	2	6	2	3	Y
Ostrea conchaphila		Olympia Oyster	SC (May 2011)	Blue					1-SC (Jun 2003)	bivalves	Native	4	5	4	4	N
Sphaerium patella		Rocky Mountain Fingernailclam		Red						bivalves	Native	2	6	6	2	Y
Allogona townsendiana		Oregon Forestsnail	E (Apr 2013)	Red					1-E (Jan 2005)	gastropods	Native	1	4	6	1	Y
Carychium occidentale		Western Thorn		Blue						gastropods	Native	2	3	6	2	Y
Cryptomastix devia		Puget Oregonian	XT (Apr 2013)	Red					1-X (Jan 2005)	gastropods	Native	1	4	6	1	Y
Fossaria parva		Pygmy Fossaria		Blue						gastropods	Native	2	6	2	3	W
Haliotis kamtschatkana		Northern Abalone	T (May 2000)	Red					1-T (Jun 2003)	gastropods	Native	2	3	6	2	Y
Monadenia fidelis		Pacific Sideband		Blue						gastropods	Native	2	4	2	3	W
Nearctula sp. 1		Threaded Vertigo	SC (Apr 2010)	Red					1-SC (Jul 2012)	gastropods	Native	2	4	6	2	Y
Physa acuta		Pewter Physa		Red						gastropods	Native	2	4	6	2	Y
Pristiloma arcticum		Northern Tightcoil		Blue						gastropods	Native	4	4	4	4	W
Pristiloma johnsoni		Broadwhorl Tightcoil		Blue						gastropods	Native	2	2	6	2	Y
Prophysaon vanattae		Scarletback Taildropper		Blue						gastropods	Native	4	4	4	4	W
Zonitoides nitidus		Black Gloss		Blue						gastropods	Native	2	6	2	3	W
Argia emma		Emma's Dancer		Blue						insects	Native	4	6	6	4	Y
Argia vivida		Vivid Dancer	C (Jul 2011)	Red						insects	Native	2	6	6	2	Y
Callophrys eryphon sheltonensis		Western Pine Elfin, sheltonensis subspecies		Blue						insects	Native	4	5	4	4	Y
Callophrys johnsoni		Johnson's Hairstreak		Red	Y (Jun 2006)					insects	Native	2	2	6	2	Y
Cercyonis pegala incana		Common Wood-nymph, incana subspecies		Red			Y			insects	Native	2	3	6	2	Y
Chlosyne hoffmanni		Hoffman's Checkerspot		Red						insects	Native	3	5	6	3	Y
Danaus plexippus		Monarch	SC (Apr 2010)	Blue					1-SC (Jun 2003)	insects	Native	2	6	2	3	Y
Epargyreus clarus		Silver-spotted Skipper		Blue						insects	Native	4	6	4	4	Y
Epargyreus clarus californicus		Silver-spotted Skipper, californicus subspecies		Red						insects	Native					Y
Epitheca canis		Beaverpond Baskettail		Blue						insects	Native	4	6	6	4	Y
Erynnis propertius		Propertius Duskywing		Red			Y			insects	Native	2	4	6	2	Y
Erythemis collocata		Western Pondhawk		Blue			Y			insects	Native	2	6	2	3	Y
Euphyes vestris		Dun Skipper	T (Apr 2013)	Red			Y		1-T (Jun 2003)	insects	Native	2	4	2	3	Y
Hesperia colorado oregonia		Western Branded Skipper, <i>oregonia</i> subspecies	E (Nov 2013)	Red			Y			insects	Native	2	3	6	2	Y
Macromia magnifica		Western River Cruiser		Blue						insects	Native	2	6	2	3	Y
Octogomphus specularis		Grappletail		Red						insects	Native	2	5	6	2	Y

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MFLNRO CEMP Waterpower Template

Scientific Name	Riverine or Riparian? English Name	COSEWIC	BC List	Identified Wildlife	Prov Wildlife Act	GOERT	MBCA	SARA	Class (English)	Origin	CF – Highest Priority	CF – Priority Goal 1	CF – Priority Goal 2	CF – Priority Goal 3	CDC Maps
Omus audouini	Audouin's Night-stalking Tiger Beetle	T (Nov 2013)	Red						insects	Native	1	5	6	1	Y
Pachydiplax longipennis	Blue Dasher		Blue			Y			insects	Native	4	6	4	4	Y
Papilio indra	Indra Swallowtail		Red						insects	Native	1	6	6	1	Y
Parnassius clodius claudianus	Clodius Parnassian, claudianus subspecies		Blue						insects	Native	6	6	6	6	Y
Parnassius clodius pseudogallatinus	Clodius Parnassian, pseudogallatinus supspecies		Blue						insects	Native	4	4	4	5	Y
Polites sonora	Sonora Skipper	SC (Apr 2006)	Red	Y (Jun 2006)				1-SC (Dec 2007)	insects	Native	1	3	6	1	Y
Speyeria zerene bremnerii	Zerene Fritillary, bremnerii subspecies		Red			Y			insects	Native	2	2	6	2	Y
Sympetrum vicinum	Autumn Meadowhawk		Blue			Y			insects	Native	4	6	6	4	Y
Tanypteryx hageni	Black Petaltail		Blue						insects	Native	4	4	6	4	Y
Aplodontia rufa	Mountain Beaver	SC (May 2012)	No Status					1-SC (Jun 2003)	mammals	Native	4	6	4	5	N
Canis latrans	Coyote		Yellow						mammals	Native	6	6	6	6	Ν
Cervus elaphus roosevelti	Roosevelt Elk		Blue			Y			mammals	Native	2	3	2	3	Y
Corynorhinus townsendii	Townsend's Big-eared Bat		Blue			Y			mammals	Native	2	5	2	3	Y
Eumetopias jubatus	Steller Sea Lion	SC (Nov 2013)	Blue					1-SC (Jul 2005)	mammals	Native	2	2	6	3	Y
Gulo gulo	Wolverine	SC (May 2003)	No Status						mammals	Native	2	3	2	3	Ν
Gulo gulo luscus	Wolverine, <i>luscus</i> subspecies	SC (May 2003)	Blue	Y (May 2004)					mammals	Native	2	3	2	3	Ν
Lasiurus borealis	Eastern Red Bat		Red						mammals	Native					Y
Lepus americanus washingtonii	Snowshoe Hare, washingtonii subspecies		Red						mammals	Native	1	4	6	1	Y
Lynx rufus	Bobcat		Yellow						mammals	Native	4	6	6	4	Ν
Mustela frenata altifrontalis	Long-tailed weasel, altifrontalis subspecies		Red						mammals	Native	Not Assessed	Not Assesse d	Not Assesse d	Not Assesse d	W
Myodes gapperi occidentalis	Southern Red-backed Vole, <i>occidentalis</i> subspecies		Red						mammals	Native	1	4	6	1	Y
Myotis keenii	Keen's Myotis	DD (Nov 2003)	Blue	Y (May 2004)				3 (Mar 2005)	mammals	Native	1	1	6	1	Y
Myotis lucifugus	Little Brown Myotis	E (Nov 2013)	Yellow						mammals	Native	5	6	6	5	Ν
Oreamnos americanus	Mountain Goat		Yellow						mammals	Native	1	4	1	3	Ν
Pekania pennanti	Fisher		Blue	Y (Jun 2006)					mammals	Native	2	4	6	2	Ν
Puma concolor	Cougar		Yellow						mammals	Native	4	4	6	5	N

mammals

mammals

1-E (Jan 2005)

1-E (Jun 2003)

Native

Native

1

1

6

5

6

6

1

1

Υ

Υ

MFLNRO CEMP Waterpower Template

Sorex bendirii

Scapanus townsendii

Townsend's Mole

Pacific Water Shrew

Red

Red

Y (May 2004)

E (May 2003)

E (Apr 2006)

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Scientific Name	Riverine or	English Name	COSEWIC	BC	Identified	Prov Wildlife	GOERT	MBCA	SARA	Class	Origin	CF – Highest	CF – Priority	CF – Priority	CF – Priority	CDC
	Riparian?	English Hume	COCLINC	List	Wildlife	Act	COLIN	MEGA	CARA	(English)	ongin	Priority	Goal 1	Goal 2	Goal 3	Maps
Sorex rohweri		Olympic Shrew		Red						mammals	Native	1	3	6	1	Y
Sorex trowbridgii		Trowbridge's Shrew		Blue						mammals	Native	2	6	2	3	Y
Ursus arctos		Grizzly Bear	SC (May 2002)	Blue	Y (May 2004)					mammals	Native	2	3	2	3	Ν
Acipenser medirostris		Green Sturgeon	SC (Nov 2013)	Red					1-SC (Aug 2006)	ray-finned fishes	Native	2	4	6	2	N
Acipenser transmontanus		White Sturgeon	E (Nov 2003)	No Status					1-E (Aug 2006)	ray-finned fishes	Native	2	4	6	2	N
Acipenser transmontanus pop. 4		White Sturgeon (Lower Fraser River population)	T (Nov 2012)	Red						ray-finned fishes	Native	1	1	6	2	Y
Catostomus platyrhynchus		Mountain Sucker	SC (Nov 2010)	Blue						ray-finned fishes	Native	2	5	6	2	Y
Catostomus sp. 4		Salish Sucker	T (Nov 2012)	Red					1-E (Jan 2005)	ray-finned fishes	Native	1	1	6	1	Y
Cottus sp. 2		Cultus Pygmy Sculpin	T (Apr 2010)	Red					1-T (Jun 2003)	ray-finned fishes	Native	1	1	6	1	Y
Couesius plumbeus		Lake Chub	DD	Yellow						ray-finned fishes	Native	6	6	6	6	N
Gasterosteus aculeatus		Threespine Stickleback	SC (May 1983)	Yellow						ray-finned fishes	Native	6	6	6	6	N
Gasterosteus sp. 16		Vananda Creek Limnetic Stickleback	E (Apr 2010)	Red	Y (May 2004)				1-E (Jun 2003)	ray-finned fishes	Native	1	1	6	1	Y
Gasterosteus sp. 17		Vananda Creek Benthic Stickleback	E (Apr 2010)	Red	Y (May 2004)				1-E (Jun 2003)	ray-finned fishes	Native	1	1	6	1	Y
Gasterosteus sp. 4		Paxton Lake Limnetic Stickleback	E (Apr 2010)	Red					1-E (Jun 2003)	ray-finned fishes	Native	1	1	6	1	Y
Gasterosteus sp. 5		Paxton Lake Benthic Stickleback	E (Apr 2010)	Red					1-E (Jun 2003)	ray-finned fishes	Native	1	1	6	1	Y
Oncorhynchus clarkii clarkii		Cutthroat Trout, <i>clarkii</i> subspecies		Blue						ray-finned fishes	Native	2	4	2	3	Ν
Oncorhynchus kisutch		Coho Salmon	E (May 2002)	Yellow						ray-finned fishes	Native	2	4	2	4	Ν
Oncorhynchus nerka		Sockeye Salmon	E (May 2003)	Yellow						ray-finned fishes	Native	2	4	2	4	Ν
Oncorhynchus tshawytscha		Chinook Salmon	T (Apr 2006)	Yellow						ray-finned fishes	Native	2	4	2	4	Ν
Rhinichthys cataractae - Chehalis lineage		Nooksack Dace	E (Apr 2007)	Red					1-E (Jun 2003)	ray-finned fishes	Native	1	2	6	1	Y
Salmo salar		Atlantic Salmon		Exotic					1	ray-finned fishes	Exotic	6	6	6	6	Ν
Salvelinus confluentus		Bull Trout	SC (Nov 2012)	Blue	Y (Jun 2006)					ray-finned fishes	Native	2	2	2	3	W
Spirinchus sp. 1		Pygmy Longfin Smelt	DD (Nov 2004)	Red						ray-finned fishes	Native	1	1	6	2	Y

Appendix B

DRAFT August 2014

MFLNRO CEMP Waterpower Template

MFLNRO CEMP Waterpower Template						Appendiz - 5 -	кВ								DRAFT A	ugust 2014
Scientific Name	Riverine or Riparian?	English Name	COSEWIC	BC List	ldentified Wildlife	Prov Wildlife Act	GOERT	MBCA	SARA	Class (English)	Origin	CF – Highest Priority	CF – Priority Goal 1	CF – Priority Goal 2	CF – Priority Goal 3	CDC Maps
Thaleichthys pacificus		Eulachon	E/T (May 2011)	Blue						ray-finned fishes	Native	2	5	6	2	Y
Charina bottae		Northern Rubber Boa	SC (May 2003)	Yellow					1-SC (Jan 2005)	reptiles	Native	1	5	1	3	Ν
Contia tenuis		Sharp-tailed Snake	E (Nov 2009)	Red			Y		1-E (Jun 2003)	reptiles	Native	1	4	6	1	Y
Pituophis catenifer		Gopher Snake		No Status					1	reptiles	Native	2	6	6	2	N
Pituophis catenifer catenifer		Gopher Snake, catenifer subspecies	XT (May 2012)	Red			Y		1-X (Jan 2005)	reptiles	Native	6	6	6	6	Y
Actinemys marmorata		Western Pond Turtle	XT (May 2012)	Red					1-X (Jan 2005)	turtles	Native	2	5	6	2	Y
Chrysemys picta		Painted Turtle	E/SC (Apr 2006)	No Status					1	turtles	Native	2	6	2	3	Ν
Chrysemys picta pop. 1		Painted Turtle - Pacific Coast Population	E (Apr 2006)	Red					1-E (Dec 2007)	turtles	Native	2	4	6	2	Y

APPENDIX M. ENVIRONMENTAL SENSITIVE AREAS AND WILDLIFE VC SPECIES MAPS





Path: M:\Projects-Active\1132 Narrows Inlet Hydro Project\MXD\Fisheries\FishBearingModel\1132_CHK_FishBearingModel_2015Jun11_CA.mxd



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Figure 6-16 Project Layout, Local Study Area Configuration and Constrained Areas



Figure 6-52 Mammal Observations in the Chickwat Creek LAA



Figure 6-53 Roosevelt Elk Winter Feeding Habitat for the Project Area; the Chickwat Creek LAA is delineated in Red



Figure 6-54 Roosevelt Elk Winter Security Habitat in the Project Area; the Chickwat Creek LAA is delineated in Red



Figure 6-55 Deer Winter Range for Narrows Landscape Unit



Figure 6-57 Grizzly Bear Spring Feeding Habitat Suitability Mapping for the Project Area; the Chickwat Creek LAA is delineated in red



Figure 6-58 Grizzly Bear Summer Feeding Habitat Suitability Mapping for the Project Area; the Chickwat Creek LAA is delineated in red



Figure 6-59 Grizzly Bear Fall Feeding Habitat Suitability Mapping for the Project Area; the Chickwat Creek LAA is delineated in red



Figure 6-60 Potential Grizzly Bear Movement Corridors in the Vicinity of the Project Area, including the Chickwat Creek LAA



Figure 6-83 Potentially Suitable Denning Habitat for Wolverine Around SS Lake; the Ramona and CC High Elevation Lakes are also Identified.



Figure 6-47 Marbled Murrelet Habitat Suitability Mapping for the Project Area; the Chickwat Creek LAA is Delineated in Red



Figure 6-50 Western Screech-Owl Habitat Suitability Mapping for the Project Area; the Chickwat Creek LAA is delineated in Red



Figure 6-51 Tree-Roosting Bat Habitat Suitability Mapping for the Project Area; the Chickwat Creek LAA is delineated in Red



Figure 6-155 Seasonal Distribution of Reported Sightings of Cetaceans in the Strait of Georgia Region. (Source: BC Cetacean Sightings Network)



Figure 6-52 Mammal Observations in the Chickwat Creek LAA



Figure 6-40 Terrestrial Invertebrate Surveys Conducted in the Chickwat Creek Project Component LAA for the Narrows Inlet Hydro Project.



Figure 6-62 Distribution of Plant Community Site-Associations in the Chickwat Project Component LAA Based on TEM. (A legend for the site series map codes is provided in Appendix L of the baseline report)



Figure 6-119 Mammal Observations in the Ramona Creek Project Component Area


Figure 6-115 Terrestrial Invertebrate Surveys Conducted in the Ramona Creek Upper and Lower Project Components



Figure 6-120 Distribution of plant community site-associations in the Ramona Creek Project Component area based on TEM. (A legend for the site series map codes is provided in Appendix L of the baseline report).



Figure 6-156 Stream Reach Surveyed for Coastal Tailed Frog in the Earle Creek Project Area in 2010



Figure 6-143 Mammal Observations in the Lower Tzoonie River Valley



Figure 6-172. Terrestrial Invertebrate Surveys Conducted on the Sechelt Peninsula within the Interconnection Project Component



Figure 6-164 Grizzly Bear Spring Feeding Habitat Suitability Mapping for Sechelt Peninsula and the Earle Creek area within the Interconnection LAA



Figure 6-165 Grizzly Bear Summer Feeding Habitat Suitability Mapping for Sechelt Peninsula and the Earle Creek area within the Interconnection LAA



Figure 6-166 Grizzly Bear fall vegetation feeding habitat suitability mapping for Sechelt Peninsula and the Earle Creek area within the Interconnection LAA



Figure 6-162 Roosevelt Elk Winter Feeding Habitat Suitability Mapping for the Transmission Line Interconnection LAA; the Earle Creek Area Includes the Transmission Line East of Skookumchuk Narrows



Figure 6-163 Roosevelt Elk Winter Security Habitat Suitability Mapping for the Transmission Line Interconnection LAA; the Earle Creek Area Includes the Transmission Line East of Skookumchuk Narrows



Figure 6-157 Avian Surveys Conducted in the Transmission Line Interconnection Project Component LAA; the Earle Creek Area Includes the Transmission Line East of the Skookumchuk Narrows



Figure 6-158 Marbled Murrelet Nesting Habitat Suitability Mapping for the Transmission Line Interconnection LAA; the Earle Creek Area Includes the Transmission Line East of the Skookumchuk Narrows



Figure 6-159 Northern Goshawk breeding Habitat Suitability Mapping for the Transmission Line Interconnection LAA; the Earle Creek Area Includes the Transmission Line East of Skookumchuk Narrows



Figure 6-160 Western Screech-owl living habitat suitability mapping for the Transmission Line Interconnection LAA; the Earle Creek area includes the transmission line east of Skookumchuk Narrows



Figure 6-161 Tree-roosting Bat Habitat Suitability Mapping for the Transmission Line Interconnection LAA: the Earle Creek Area Includes the Transmission Line West of Skookumchuk Narrows



Figure 6-168 Distribution of Plant Community Site-Associations in the Sechelt Peninsula and Earle Creek Areas of the Transmission Line Interconnection LAA Based on TEM. (A legend for the site series map codes is provided in Appendix L of the baseline report)