MORE CREEK HYDROELECTRIC PROJECT

Project Description (Federal)

Alaska Hydro Corporation

Project Description

To Initiate the Environmental Assessment Process

Photo Credit: Jay P. Kawatski

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REVISION TRACKING TABLE

Ref. No.	Revision	Date
1	Draft Submitted to CEAA	February 18, 2016
2	Draft Submitted to CEAA	August 5, 2016
3	Draft Submitted to CEAA	September 8, 2016
4	Submitted to CEAA	September 14, 2016
5	Corrections Submitted to CEAA	September 21, 2016

EXECUTIVE SUMMARY

General Information and Contacts

Alaska Hydro Corporation (AHC) proposes to develop the More Creek Hydroelectric Project (the Project) as a 75 MW hydroelectric project with reservoir storage. The proposed reservoir storage would inundate (flood) an area of approximately 2104 ha extending 20 km upstream from the Project intake and create a reservoir with a total surface area of 2680 ha. AHC is a renewable green energy company and has a registered office in North Vancouver. The company is listed on the Toronto Stock Exchange as (TSX:AKH).

Category	**Details**
Name of Project:	More Creek Hydroelectric Project
Name of Corporation:	Alaska Hydro Corporation
Address:	2633 Carnation Street, North Vancouver, BC V7H 1H6
President and Chief Executive Officer:	Cliff Grandison
Principle Contact:	Cliff Grandison (address same as above)

Principle Contact for Purposes of Project Description for the More Creek Hydroelectric Project	
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Company Website	http://www.alaskahydro.com/
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Project Location

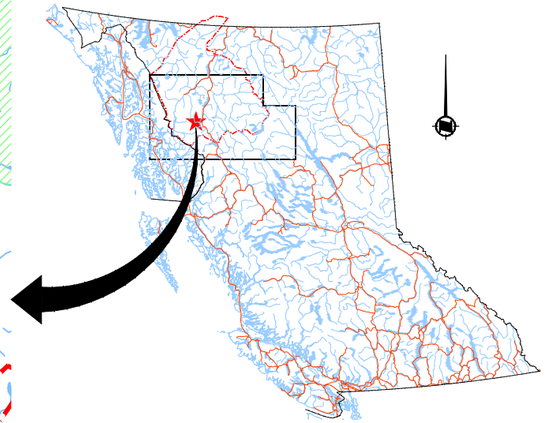
The Project is located at N57 º01'51" latitude and W130 º 22'28"W longitude (at powerhouse), which is approximately 985 km northwest of Vancouver, 130 km north of the town of Stewart in northwestern British Columbia and 95 km east from the border of British Columbia and Alaska (Figure 1). The Project Layout is shown in Figure 2 and the general arrangement of works is shown in Figure 3. The Project is located entirely over provincial Crown land within the Kitimat-Stikine Regional District.

The Project is being proposed to achieve several key objectives: provide British Columbia electricity consumers with a long-term, reliable, cost effective supply of renewable electricity; provide benefits to First Nations; stimulate economic resource development in the region consistent with defined land management resource objectives (LRMP, 2000); and contribute to achieving British Columbia's goals set out in the *Clean Energy Act* and *Green House Gas Reductions Target Act*.

The proposed Project would assist BC Hydro in meeting future energy demands and/or supply local resource sectors with a clean, renewable, on-demand source of energy. One distinct advantage to the proposed Project is that it would help meet the demands of energy peaking in the Province; whereby, the reservoir/storage capacity of the Project would allow Project operations to increase or decrease to match energy consumer demands.

The purpose of this document is to provide a conceptual Project development plan to the BC Environmental Assessment Office (BC EAO) and the Canadian Environmental Assessment Agency (CEAA) such that these agencies have sufficient information to make a determination on whether provincial and/or federal environmental assessments are required.

DEASE LAKE 9
Dease Lake
TATCHO CREEK 11
TATL'AH 13
SALMON CREEK 3
CLASSY CREEK 8
UPPER TAHLTAN 4
HIUSTA'S MEADOW 2
TAHLTAN 10
TAHLTAN 1
GUHTHE TAH 12
Telegraph Creek
STIKINE RIVER 7
TELEGRAPH CREEK 6A
TELEGRAPH CREEK 6
KLUACHON LAKE 1
ISKUT 6
Stikine River
MOUNT EDZIZA PARK
TODAGIN SOUTH SLOPE PARK
KINASKAN LAKE PARK
STIKINE RIVER PARK
DENETIAH PARK
DUNE ZA KEYIH PARK [A.K.A. FROG-GATAGA PARK]
PITMAN RIVER PROTECTED AREA
GLADYS LAKE ECOLOGICAL RESERVE
CHUKACHIDA PROTECTED AREA
SPATSIZI PLATEAU WILDERNESS PARK
FINLAY RUSSEL PARK
FORT WARE 1
Fort Ware
SUCKER LAKE 2
FINLAY - RUSSEL PROTECTED AREA
ISKUT RIVER HOT SPRINGS PARK
SPATSIZI HEADWATERS PARK
PROJECT LOCATION
BOB QUINN SUBSTATION
GREAT GLACIER PARK
NINGUNSAW PARK
TATLATUI PARK
Iskut River
CRAIG HEADWATERS PROTECTED AREA
37
CANADA
USA
ALASKA
LAVA FORKS PARK
BORDER LAKE PARK
TAHLTAN TRADITIONAL TERRITORY (APPROXIMATE)
DAMDOCHAX PROTECTED AREA
SUSTUT PROTECTED AREA
SUSTUT PARK
BEAR RIVER 3
KLEWADUSKA 6
BEAR LAKE 4
TSUPMEET 5
BEAR LAKE 1B
TSAYTUT ISLAND 1C
BEAR GLACIER PARK
MEZIADIN LAKE PARK
Stewart



BRITISH COLUMBIA
NTS

SOURCE:

BASEMAP GENERATED FROM CANVEC 1:1,000,000. FIRST NATIONS RESERVES AND PARKS LAYERS FROM DATA BC.

0 20 40 60 80 100 km

LEGEND

- TAHLTAN TRADITIONAL TERRITORY (APPROX.)
- FIRST NATIONS RESERVE
- PARK / PROTECTED AREA

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MORE CREEK HYDROELECTRIC PROJECT
LOCATION PLAN

DATE	JUL 16	PROJ.	E6348
DWN.	KV/DGC	DWG.	FIGURE 1

LAND TENURE APPLICATION AREA

EXISTING NATIONAL HYDRO NETWORK (NHN) WATERBODY, SURFACE AREA = 576 HA

NORMAL MAXIMUM OPERATING LEVEL EL. 498m SURFACE AREA = 2680 HA

GALORE CREEK MINE ROAD (SEE NOTE 3)

END OF FOREST SERVICE ROAD

GALORE CREEK MINE ROAD (SEE NOTE 3)

PROPOSED INTAKE

MORE CREEK HYDROELECTRIC PROJECT, SEE FIGURE 3

PROPOSED POWERHOUSE

PROPOSED TRANSMISSION LINE TO INTERCONNECTION POINT

PROPOSED INTERCONNECTION POINT

BOB QUINN SUBSTATION

MORE CREEK

CREEK

ISKUT FSR

37

AIRSTRIP

BOB QUINN LAKE

NOTES:

1. WATERCOURSES AND LAKES FROM BMGS, ILMB, CANADIAN HYDRO NETWORK 1.0–CL4–NC4; SOURCE DATA = BC–TRIM; SOURCE SCALE = 1:20,000
2. ADDITIONAL BASEMAP LAYERS DOWNLOADED FROM THE BC DATA DISTRIBUTION SERVICE.
3. GALORE CREEK MINE ROAD APPROXIMATED FROM GOOGLE EARTH.
4. COORDINATE SYSTEM = UTM ZONE 9, NAD 83

0 2 4 6 8 km

LEGEND

- ROAD (DIGITAL ROAD ATLAS)
- ROAD (FOREST SERVICE)
- TRAIL
- ROAD (ESTIMATED, SEE NOTE 3)
- GLACIER

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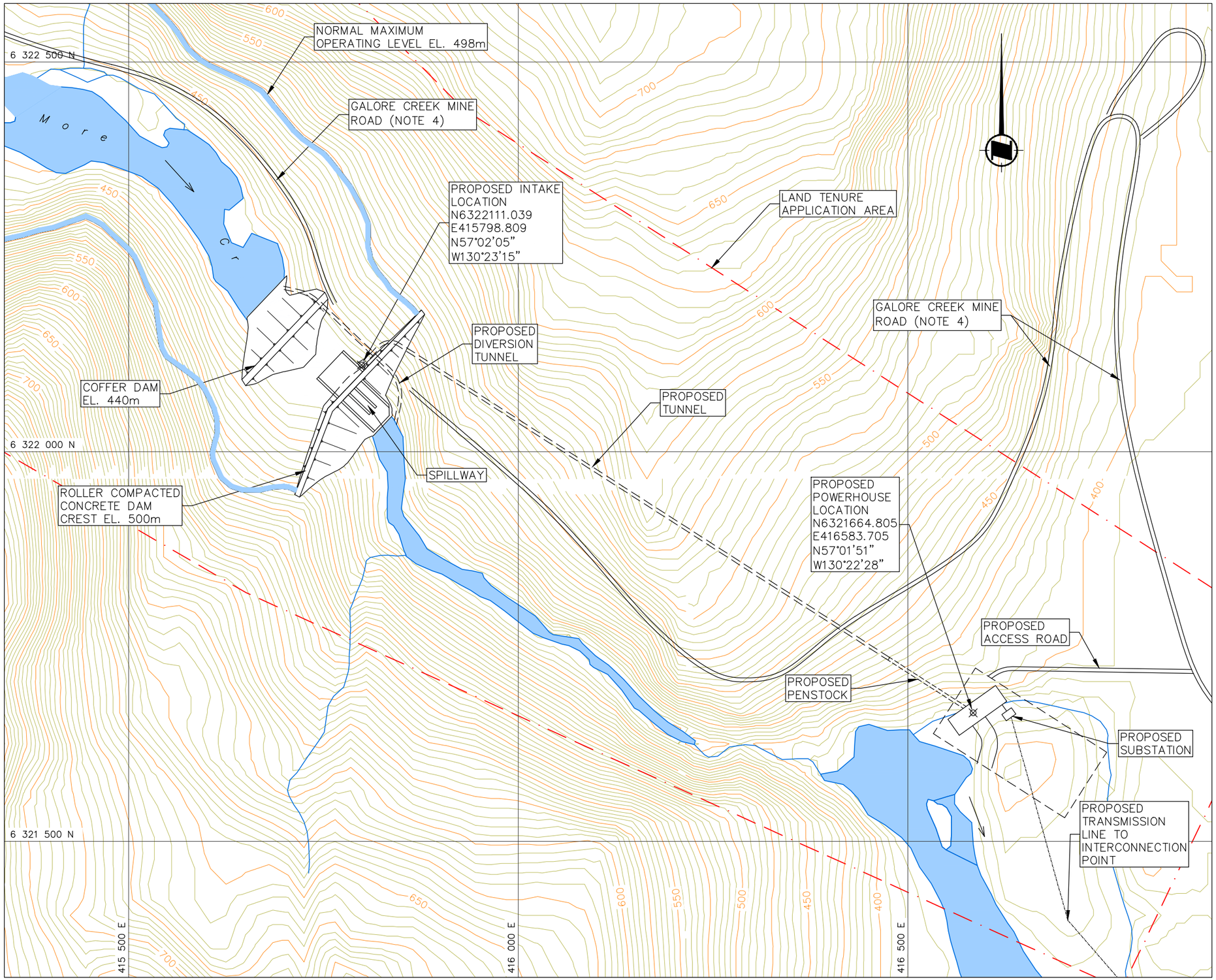
MORE CREEK HYDROELECTRIC PROJECT
PROJECT LAYOUT

DATE	JUL 16	PROJ.	E6348
DWN.	KV/DGC	DWG.	FIGURE 2



NOTES

1. CONTOURS FROM BMGS, ILMB, CANADIAN DIGITAL ELEVATION DATA, GEOBASE 1.0; SOURCE DATA = BC–TRIM; SOURCE SCALE = 1:20,000; CONTOUR INTERVAL SHOWN = 10m
2. WATERCOURSES AND LAKES FROM BMGS, ILMB, CANADIAN HYDRO NETWORK 1.0–CL4–NC4; SOURCE DATA = BC–TRIM; SOURCE SCALE = 1:20,000.
3. ADDITIONAL BASEMAP LAYERS DOWNLOADED FROM THE BC DATA DISTRIBUTION SERVICE.
4. GALORE CREEK MINE ROAD APPROXIMATED FROM GOOGLE EARTH.
5. COORDINATE SYSTEM = UTM ZONE 9, NAD 83

0 100 200 300 400m

SCALE

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MORE CREEK HYDROELECTRIC PROJECT

GENERAL ARRANGEMENT

DATE JUL 15	PROJ. E6348
DWN. DGC	DWG. FIGURE 3

Regulatory Framework

The Project constitutes a reviewable project pursuant to Part 4 of the Reviewable Project Regulation (B.C. Reg. 370/02) as the proposed Project is a new hydroelectric power plant facility with a rated nameplate capacity of 50 MW or more of electricity.

The Project is considered a "designated project" in accordance with the *Canadian Environmental Assessment Act* 2012, Regulations Designating Physical Activities Schedule 4 which states the following "the construction, operation, decommissioning and abandonment of a new dam or dyke that would result in the creation of a reservoir with a surface area that would exceed the annual mean surface area of a natural water body by 1,500 ha or more". The Project reservoir is anticipated to inundate an area of approximately 2,104 ha.

Water Resources and Use

The More Creek Hydroelectric Project submitted a water licence application on August 15, 2014 for the diversion of 80 m^3/s from More Creek and the flooding of 2,104ha for development of a water storage reservoir for power generation. AHC has reviewed water interests on More Creek and in the vicinity of the Project. There are no other water licences or water licence applications on More Creek based on a web query search conducted on January 18, 2016. However, there are three existing water licence applications on tributaries that discharge directly into More Creek (Table 1). There is potential for the Project to impact one of the three water licence applications listed in Table 1.

Table 1. Potential Water Use in the Vicinity of the Project

Water Licence No.	Creek Name	Purpose	Quantity	Proponent	Priority Date
Z125233	ZZ Creek (83182)	Power-General	2.8 m^3/s	Northern Hydro Limited	2009/08/28
Z125227	ZZ Creek (83164)	Power-General	1.0 m^3/s	Northern Hydro Limited	2009/08/28
Z125232	ZZ Creek (83198)	Power-General	2.85 m^3/s	Northern Hydro Limited	2009/08/28

The confluence of More Creek and the Iskut River is approximately 1.5 km downstream of the More Creek Project Powerhouse. On the Iskut River and on tributaries to the Iskut River there are three operating water power hydroelectric plants (Table 2). Preliminary estimates indicate that the More Creek Hydroelectric Project may facilitate a potential gain of 148 GWh of additional energy generation at the hydroelectric facility located on the Iskut River (C128205) as a result of co-ordinated water management.

Table 2. Existing Water Power Infrastructure in the Vicinity of the Project

Water Licence No.	Creek Name	Purpose	Quantity	Proponent
C128967	Volcano Creek	Power-General	9.9 m^3/s	Altagas Renewable Energy Inc.
C128205	Iskut River	Power-General	156 m^3/s	Coast Mountain Hydro Corp.
C130660	Iskut River	Power-General	96 m^3/s	Coast Mountain Hydro Corp.
C130640	McLymont Creek	Power-General	30 m^3/s	Altagas Renewable Energy Inc.
C130640	McLymont Creek	Storage-Power	61, 600m^3/year	Altagas Renewable Energy Inc.

Land Use

All components associated with the Project are located on British Columbia Crown Land. The Proponent has made applications for an Investigative Licence (IUL) and water licence for Power – General. An IUL was granted on May 14, 2015 (Land File: 6408748). The IUL is for a total area of 4,794 ha. It is anticipated that the area for the investigative use licence may be reduced during subsequent phases of Project development as Project design details become refined. The Project is located within the Cassiar-Iskut-Stikine Land and Resource Management zone based on the Cassiar-Iskut-Stikine Land and Resource Management Plan (LRMP, 2000). An overview of the land use and interests in the vicinity and overlapping the Project area was conducted and are summarized in Table 3 to Table 5.

Mineral titles overlapping the Project provide a holder with sub-surface rights only. AHC will contact and consult with all mineral title holders whose tenures are overlapped by the Project. Table 3 provides a list of mineral tenures that overlap the proposed Project.

Table 3. Mineral Interests/Staking overlapping the Project area

Tenure Type Description	Tenure #ID	Purpose/ Description	Requestor
Mineral and Placer	328865	Flooding	BC Hydro & Power Authority
Mineral and Placer	385933 328489	Hydro Project	Water Stewardship Division (MOE)
Mineral Claims	508337 508338 508124 408606 545725	Mineral	Galore Creek Mining Corporation
Mineral Claims	511113 692583	Mineral	Carl Alexander, Van Einsiedel
Mineral Claims	501812 518112 501927 502756	Mineral	Rimfire Minerals Corporation

No tree farm licences (TFL) have been identified over the Project area. Historically, no forest tenures have been issued in the Cassiar Timber Supply Area (TSA) in which, the Project is situated. Timber harvesting has typically been conducted under short term timber sales (LRMP, 2000). A list of active forest cut block holders in the vicinity of the Project is provided in Table 4.

Table 4. Cut Blocks Overlapping the Project Area

File ID	Cut Block ID	Purpose	Holder
A64561	49-1 2 7 42		Cassiar Forest Corporation
L47464	1	Road Access & Mine Site	Galore Creek Mining Corporation

L49671	1	Clearing Zone	Highway 37 Power Corporation

AHC endeavors to consult with all parties with interests over the Crown Land that is overlapped by the Project. A summary of these interests is provided in Table 5. This table of active Crown Land interests will be updated as additional interest holders are identified.

Table 5. Active Crown Land Interests over the Project area

Crown Land Interest in the Project Area	Number of Active Interests
Forest Service Roads (Cassiar Forest Corp)	1
Guide Outfitter Certificate	1
Bob Quinn Substation	1
Northwest Transmission Line	1
Highway 37	1
Mineral/Placer/Coal Reserve	5
Trapline Areas (501701, 501714, 501723)	3
Water Licence Applications	3
Total Active Interests	**16**

Project Description

The Project is a hydroelectric facility that will include reservoir storage over an area of approximately 2,680 ha of the More Creek drainage area basin (Figure 2). The nameplate capacity of the hydroelectric facility is anticipated to be 75 MW with an average annual energy output of 348 GW-hr. The maximum Project water diversion from More Creek will be 80 m^3/s. The footprint of the Project area for water power investigation is approximately 4,795 ha. The Project components and physical activities include the following:

- Access Roads
- Intake
- Dam
- Reservoir
- Power Tunnel and Penstock
- Powerhouse and Generation Facilities
- Staging and Spoil Areas
- Transmission Lines
- Reservoir Filling and Penstock Diversion
- Excavation and Clearing Procedures
- Concrete Works
- Work Camps
- Rock blasting

The hydroelectric operation will be based on conventional technology whereby water is diverted from the reservoir at the intake dam through the power tunnel/ penstock to the turbines at the powerhouse facility. At the turbines, the hydraulic energy is converted to mechanical energy and a generator will convert the

mechanical energy to electrical energy. The Project powerhouse facility will house three vertical axis Francis type turbines. The diverted water will then be discharged through the tailrace back into More Creek. Electricity generated at the facility will be transmitted to the Bob Quinn substation via a 13 km transmission line.

Table 6. Preliminary Project Parameters

Power Output:	75 MW
Energy Output:	348 GWh/yr
Max Diverted Flow:	80 m^3/s
Gross Head:	118 m
Dam Crest elevation	498 m AMSL
Minimum Lake elevation	468 m AMSL
Access Roads	~1 km of newly constructed access
Powerhouse (tailrace elevation):	~380 m AMSL
Power Tunnel:	5.5 m x 5.5 m and 1000 m long
Penstock	150 m length
Powerhouse	35 m x 75 m
Diversion Tunnel during construction	12 m x 12 m, and 200 m long
Powerline Length/ Voltage:	13 km/ 287 kV
Intake Structures:	Dam/ spillway/ integral chute/ intake
Dam	Max height at center: 85 m
Dam crest	290 m in length; 4-5 m wide
Work Camp	150 m x 75 m
Gravel pit or quarry	400 m x 400 m
Staging areas	100m x 200m
Intake Structures:	Dam/ spillway/ intake

Access

Access to the Project site will be via 11.5 km of existing access road of which, approximately, the first 5 km is a forestry road that intersects Highway 37 just north of Devil Creek. The remaining access road was constructed by Galore Creek Mining Corp for the Galore Creek Project. It is anticipated that approximately 1 km of newly constructed access roads will be needed to access the powerhouse and intake from the existing Galore Creek access road. The road will be most extensively used during construction and will be used periodically during operations for maintenance and operations.

Project Activities and Phases

AHC plans to submit a Project application for the Environmental Assessment Certificate and Environmental Impact Statement to the BC EAO and CEAA, respectively, in Q4 of 2017. It is anticipated that Project construction would commence by Q2 of 2018 and the commercial operation date would be in Q1 2020. The plant is expected to operate for upwards of 100 years. An overview of the main Project milestones for the BC EAO and CEAA (the Agency) environmental assessment process are provided in the table below.

Main Project Milestones include:		**Target Date**
BC EAO	**CEAA**	
Submission of Project Description to BC EAO	Submission of Project Description to CEAA	Q3 2016
20 day Public comment period	20 day Public comment period	Q3 2016
Section 10 order issued by BC EAO under the *Environmental Assessment Act* (EAA) issued	Agency (CEAA) issues Notice of Determination	Q3 2016
Procedural order under section 11 of EAA issued by BE EAO		Q4 2016
BC EAO issues the Application Information Requirements following Public Comment Period	Agency (CEAA) issues Notice of Commencement	Q4 2016***
	Public comment period on draft Environmental Impact Statement (EIS) Guidelines	Q1 2017***
	Agency (CEAA) issues final EIS Guidelines to Proponent	Q1 2017
Application Prepared and Submitted to BC EAO	Public comment period on EIS Guidelines	Q1 2017**
	EIS submitted to Agency (CEAA)	Q1 2018**
Application Evaluated by BC EAO for Completeness	Public comment period on draft EA report	Q1 2018**
Application Review Phase and Public Comment Period	Agency (CEAA) issues EA report	Q3 2018**
Environmental Assessment Certificate (EAC) issued	Environmental Assessment Decision Statement issued by the Agency (CEAA)	Q4 2018**
Concurrent provincial and federal permit approvals		Q4 2018**

**The target dates provided within the above table are conservative estimates. The Main Project milestones outlined may occur at an earlier date than the date provided in the above table.

*** The period between Environmental Assessment commencement by the Agency (CEAA) (i.e. issuance of Notice of Commencement) and the EA Decision Statement issued by the Agency provides the government

with 365 days for review (excluding periods where the Proponent is required to follow-up on issues that may be identified).

The phases of the More Creek Project includes and will occur in the following order: development and permitting, construction phase I, construction phase II, commissioning and de-mobilization, site restoration, operations and decommissioning. The table below lists each phase of the Project, the target date for each phase, and the associated activities with each phase of the Project.

Main Project Milestones include:	**Target Dates**	**Activities**
Development and Permitting	Q1 2016 – Q2 2018	Conduct baseline data assessments for aquatic resources, terrestrial resources, hydrological resources, archaeological resources, and traditional use studies. Make submission to the BC EAO and CEAA as part of their respective environmental assessment processes. Engage with First Nation and public stakeholders with interests over the Project area.
Construction Phase I	Q3 2018**	Site preparation and mobilization - Clearing and logging works - Setting up work camps and related services (i.e. sewage treatment) - Access road construction - Grubbing, stripping, and excavation activities for the powerhouse site - Gravel pit and Quarry construction
Construction Phase II		Project infrastructure construction and placement - Assemble concrete plant - Blasting for the diversion tunnel and placement of penstock - Placement of cofferdam - Placement of roller compact concrete for dam body and concrete for intake structure - Installation of powerhouse foundation, steel frame, and mechanical items - Transmission line construction and substation upgrades
Commissioning and De-mobilization	Q4 2019**	- Installation of turbines and generators at the powerhouse and their controls - Take-down of work camp and concrete plant and construction equipment - Plant commissioning and testing
Site Restoration		- Re-vegetation of construction areas that are not required for permanent operations - Reservoir filling at approved rates (it is estimated that filling the reservoir will take 6-7 months) - Final plant commissioning
Operations	Q1 2020**-Q1 2120	- In-service date of first Project phase - Commercial Operation Date of Project facility - Operation of Project facility:

	- Maintenance of Project facility: i.e. access road grading/ dust suppression/ snow ploughing or de-icing, periodic clearing along transmission line corridor, concrete spot repairs, and mechanical equipment maintenance (i.e. fluid changes) - Facility Monitoring: i.e. long-term environmental operations monitoring plans (e.g. water quality, flow monitoring) - Periodic systems testing
Decommissioning and Abandonment	- There are no current plans for the decommissioning and abandonment of the facilities and infrastructure related to the proposed Project. No decommissioning or abandonment phases are scheduled at this time. It is anticipated that rehabilitation efforts to extend the facility life span will be considered following the life span of the facilities' equipment and components.

**The target dates provided within the above table are conservative estimates. The Main Project milestones outlined may occur at an earlier date than the date provided in the above table.

*** The period between Environmental Assessment commencement by the Agency (CEAA) (i.e. issuance of Notice of Commencement) and the EA Decision Statement issued by the Agency provides the government with 365 days for review (excluding periods where the Proponent is required to follow-up on issues that may be identified).

Waste Management

It is anticipated that minimal waste streams will be generated by the Project (waste streams may include waste rock, air emissions, domestic/ industrial waste); however, any waste streams generated will be actively managed. The majority of waste streams generated will be during the construction phase of the Project and may include woody debris, acid rock generation, air emissions from fuel combustion by actively hauling vehicles and other work vehicles, vehicle maintenance, dust emissions from actively hauling vehicles and the use of explosives, industrial waste resulting from construction materials and processes, and domestic wastes generated by working crews and operators.

The Project has the potential for acid rock generation; however, rigorous rock testing for this potential will be conducted throughout Project construction. Acid rock management systems including appropriate stockpiling procedures and disposal procedures will be implemented throughout the life of the Project.

Waste management systems will separate industrial and domestic wastes. Where appropriate, reduce, reuse or recycle strategies will be implemented to mitigate waste disposal requirements. The Project will use permitted landfills for waste disposal and appropriate waste collection areas for recyclables and hazardous waste products and sewage effluent. All waste management systems will incorporate best management practices to prevent spills, fire, and wildlife attraction issues.

Regional Setting

The proposed More Creek Hydroelectric Project is located within the Kitimat-Stikine Regional District. The population in the Kitimat-Stikine Regional District was estimated at 37,361 in 2011[3]. Nearly 21,251, residents live within five incorporated municipalities in this district. The closest municipalities to the Project area include Stewart, approximately 87 km to the south, and New Hazelton, approximately 260 km to the southeast. Stewart has a population of approximately 494 and New Hazelton has a population of approximately 666 as of 2011[3].

The Project is within the Cassiar-Iskut-Stikine Land and Resource Management zone based on the Cassiar-Iskut-Stikine Land and Resource Management Plan (LRMP). The LRMP identified the key sectors within the LRMP area as the following: mining, tourism, retail and construction. However, forestry, fishing and agriculture were also identified at a much smaller scale. The economic sectors that the Project overlaps with predominantly include mining and hydroelectric development. The economy of the LRMP is heavily reliant on the natural resource industry and public administration sectors. The Alaska boarder is approximately 95km away from the vicinity of the Project.

Provincial Parks in the region include Mount Edziza Provincial Park located approximately 30 km to the north, Kinaskan Lake Provincial Park located approximately 49 km to the northeast, and Ningunsaw Provincial Park located approximately 22 km to the southeast of the proposed Project. There are no federal lands located within the Project area. The nearest National Park is the Gwaii Haanas National Park Reserve and Haida Heritage Site located approximately 450 km from the Project site.

The Project area is within a region of British Columbia that is characterized as having small scattered communities typically located along highway infrastructure. No permanent, seasonal or temporary residences have been identified as occurring in the Project area based on a preliminary desktop overview using IMAP BC and Frontcounter BC's Discovery tool. It is anticipated that during consultation with Project stakeholders any residences present within the Project area, used for permanent, seasonal or

temporary uses, will be identified. The nearest community to the Project is Iskut which is located approximately 90 km away.

The Project is within the asserted traditional territory of the Tahltan. The asserted traditional territory of the Tahltan is located along the Alaskan/Canadian border and includes part of the Yukon Territory encompassing about 93,500 km^2. The main reserves of the Tahltan First Nation are located at Telegraph Creek which is home to about 400 residents, of which approximately 350 are of Tahltan ancestry.[1] Dease Lake is another local community located about 50 km north of the Stikine River and is the junction to Telegraph Creek; the present population numbers at Dease Lake are approximately 475 of which approximately 45% are Tahltan.[1] A list of some of the nearest aboriginal reserves to the More Creek Hydroelectric Project site are provided below. Aboriginal reserves listed below and marked with an "*" are occupied, unmarked reserves are either unoccupied or no data is available.

Iskut 6*	Guhthe Tah 12*	Salmon Creek 3	Upper Tahltan 4
Kluachon Lake 1	Telegraph Creek 6*	Telegraph Creek 6A*	Tahltan Forks 5
Stikine River 7	Classy Creek 8	Tahltan 1	Hiusta's Meadow 2
Tahltan 10			

*Occupied as per http://www.city-data.com/canada/British-Columbia-Index.html

Iskut 6 and Kluachon Lake 1 Reserves are the closest to the Project area and are located approximately 90 km north northeast from the Project site.

The Project area has been the subject of numerous environmental studies since the 1970s. BC Hydro conducted investigations over the Project area in the late 1970s and early 1980s as well as a site downstream on the Iskut River to determine the feasibility of a hydroelectric project of a similar design to that being proposed herein. BC Hydro conducted studies on fish and fish habitat, wildlife, vegetation, geomorphology, geotechnical studies, archaeology, and hydrology studies. The Proponent anticipates reviewing these studies and including their data in the overall assessment of the Project, where appropriate.

In addition, environmental studies have been conducted in the vicinity and/or over portions of the Project area for the development of the Galore Creek Mine. The Galore Creek Mine has investigated the environmental considerations for their proposed mine access road which traverses along the northern shore of More Creek. The Proponent anticipates reviewing these studies as part of their environmental assessment over the Project area, where appropriate.

Environmental Studies over the Project Area

There are a number of past, active, and future designated projects under CEAA 2012 that are located in the northwestern region of British Columbia. A list of some of the designated projects in the vicinity of the Project and located in northwestern British Columbia are provided in Table 7.

Table 7. History of CEAA projects in region of the More Creek Hydroelectric Project

Past Projects	Existing Projects
Eskay Creek Mine	Forrest Kerr Hydroelectric Project
	Northwest Transmission Line
	Red Chris Mine
	Galore Creek Mine

[1] http://www.tahltan.ca/nation/territory/ Accessed: July 14, 2015

	McLymont Creek Hydroelectric Project
	Schaft Creek Mine
	Volcano Creek Hydroelectric Project

Environmental studies conducted for other designated projects in the vicinity of the More Creek Hydroelectric Project will be reviewed by AHC, as applicable, in the compilation of baseline data and the overall analysis of cumulative impacts on resource development and extraction in the region.

Existing Environment

The Project area is located at the intersection between the Stikine Plateau, the Skeena Mountains, and the Coast Mountains where the western physiographic system meets the interior system. The majority of the Project area is located within the Interior Cedar-Hemlock wet-cold biogeoclimatic zone and the rest of the Project is located within the Engelmann Spruce-Subalpine Fir undifferentiated biogeoclimatic zone. The Project's settings and infrastructure do not encroach on any Provincial or National Park boundaries.

Regionally important plant species, including those on the provincial red and blue lists and those protected under the federal *Species at Risk Act* (SARA), that may be located within the Project area, as defined by the Skeena Stikine Forest District, include, but are not limited to those provided in Table 8 (Ecosystem Explorer BC MOE, 2015).

Table 8. Regionally important, provincially and federally listed plant species with the potential to occur in the Project area

Scientific Name	Common Name	Status					CF Priority
		Provincial	BC List	COSEWIC	SARA	Global	
Andreaea rupestris var. papillosa		S1(2011)	Red			G5TNR	2
Botrychium ascendens	Unswept moonwort	S3(2015)	Blue			G3(2011)	1
Botrychium crenulatum	Dainty moonwort	S2S3 (2015)	Blue			G3(2011)	2
Carex krausei	Krause's sedge	S2S3(2015)	Blue			G4(1994)	3
Carex lenticularis	Lakeshore sedge	S3(2011)	Blue			G5T5(1988)	
Draba lactea	Milky draba	S3(2015)	Blue			G5(2012)	3
Epilobium hornemannii ssp. behringianum	Hornemann's willowherb	S2S3(2000)	Blue			G5T4(1994)	3
Festuca minutiflora	Little fescue	S3(2015)	Blue			G5(1993)	3
Geum rossii var. rossii	Ross' avens	S2S3(2008)	Blue			G5T5(1994)	3
Hygrohypnum alpinum		S3(2015)	Blue			G4G5(2007)	3
Juncus albescens	Whitish rush	S3(2015)	Blue			G5(1989)	
Lescuraea saxicola		S3(2015)	Blue			G4G5(1991)	2
Nephroma occultum	Cryptic paw	S2S3(2007)	Blue	SC(2006)	1-SC(2007)	G4(2007)	2
Pedicularis parviflora ssp. parviflora	Small-flowered lousewort	S2(2015)	Red			G4T4(1994)	4
Plantago eriopoda	Alkali plantain	S3(2008)	Blue			G5(1996)	4
Pohlia elongata		S3(2015)	Blue			G4G5(1991)	3
Polemonium boreale	Northern Jacob's ladder	S3(2015)	Blue			G5(1989)	3
Ranunculus pedatifidus ssp. affinis	Birdfoot buttercup	S3(2015)	Blue			G5T5(1991)	3
Rumex arcticus	Arctic dock	S3(2015)	Blue			G5(1991)	4
Silene drummondii var. drummondii	Drummond's campion	S3?(2015)	Blue			G5T5(1997)	4
Ulota curvifolia		S3(2015)	Blue			G3G5(1991)	2
Warnstorfia tundrae		S2(2015)	Red			GU(2000)	2

Wildlife specific objectives over the Project area have been developed by the Cassiar Iskut-Stikine Land and Resource Management Plan (2000). A large portion of the Project site is located within high value Grizzly Bear and Marten habitat. There is a lesser portion of the Project site that is located in high value Moose habitat. For all three of these species there are specific management objectives identified by the LRMP. There is a proposed Wildlife Habitat Area (WHA) for Grizzly Bears (WHA ID 247345) in the vicinity of the Project area. No other wildlife habitat areas have been identified over the Project site.

Based on the breeding bird atlas of British Columbia (accessed December 21, 2015), there is the potential for 144 bird species to occur in the Project area. Of these bird species 112 would be protected under the federal *Migratory Bird Convention Act* (1994). Regionally important wildlife species, including those on the provincial red and blue lists and those protected under the federal *Species at Risk Act* (SARA), that are located within the Skeena Stikine Forest District include, but are not limited to those listed in Table 9 (BC Ecosystems Explorer MOE, 2015)

Table 9. Regionally important, provincially and federally listed animal species within the Skeena Stikine Forest District including species with the potential to occur in the Project area (blue).

Scientific Name	Common Name	Status					CF Priority
		BC List	Provincial	COSEWIC	SARA	Global	
Mammal Species							
Alces alces	Moose	Yellow	S5(2015)			G5(2006)	6
Gulo gulo	Wolverine		S3(2015)	SC(2014)		G4(2005)	2
Gulo gulo luscus	Wolverine, *luscus* subspecies	Blue	S3(2010	SC(2014)		G4T4(1996)	2
Marmota caligata	Hoary Marmot	Yellow	S5(2015)			G5(1996)	5
Martes americana	Marten	Yellow	S5?(2015)			G5(2015)	
Myotis lucifugus	Little Brown Myotis	Yellow	S4(2015)	E(2013)	1-E(2014)	G3(2012)	5
Ochotona collaris	Collared Pika	Blue	S3S4(2015)	SC(2011)		G5(2015)	2
Odocoileus hemionus	Mule Deer	Yellow	S5(2015)			G5(1996)	6
Oreamnos americanus	Mountain Goat	Blue	S3(2015)			G5(1996)	1
Pekania pennanti	Fisher	Blue	S3(2015)			G5(2005)	2
Rangifer tarandus	Caribou		S3?(2015)			G5(2006)	2
Rangifer tarandus pop. 15	Caribou (northern mountain population)	Blue	S3(2010)	E/SC(2014)	1-T/SC(2005)	G5T4T5(2013)	2
Tamiasciurus hudsonicus	Red Squirrel	Yellow	S5(2015)			G5(2016)	5
Ursus americanus	Black Bear	Yellow	S5(2015)	NAR(1999)		G5(2003)	6
Ursus arctos	Grizzly Bear	Blue	S3?(2015)	SC(2002)		G4(20000	2
Herptile Species							
Ambystoma macrodactylum	Long-toed Salamander	Yellow	S4S5(2010)	NAR(2006)		G5(2015)	4
Anaxyrus boreas	Western Toad	Blue	S3S4(2010)	SC(2012)	1-SC(2005)	G4(2008)	2
Rana luteiventris	Columbia Spotted Frog	Yellow	S4(2010)	NAR(2000)		G4(2008)	2
Gastropod Species							
Lymnaea atkaensis	Frigid Lymnaea	Blue	S3S5(2015)			G4G5(2006)	4
Insect Species							
Boloria epithore sigridae	Western Meadown Fritillary, sigridae subspecies	Blue	S2S4(2013)			G5T3(2001)	3
Polites draco	Draco Skipper	Blue	S3(2013)			G5(2016)	4
Somatochlora kennedyi	Kennedy's Emerald	Blue	S3S4(2015)			G5(2015)	4
Bird Species							
Accipiter gentilis laingi	Northern Goshawk	Red	S2B(2010)	T(2013)	1-T (2003)	G5T2(2008)	1
Aegolius acadicus	Saw-whet Owl	Yellow	S5B,S5N (2009)			G5(1996)	5
Aquila chrysaetos	Golden Eagle	Yellow	S4S5B(2015)	NAR(1996)		G5(2011)	4

Asio flammeus	Short-eared owl	Blue	S3B,S2N(2015)	SC(2008)	1-SC(2012)	G5(2008)	2
Bombycilla garrulus	Bohemian Waxwing*	Yellow	S5B(2015)			G5(1996)	6
Bubo virginianus	Great Horned Owl	Yellow	S5(2015)			G5(1996)	6
Chordeiles minor	Common Nighthawk	Yellow	S4B(2015)	T(2007)	1-T(2010)	G5(2009)	2
Cinclus mexicanus	American Dipper*	Yellow	S4 (2015)			G5(1996)	5
Coccothraustes vespertinus	Evening Grosbeak*	Yellow	S5(2015)			G5(1996)	2
Contopus cooperi	Olive-sided Flycatcher*	Blue	S3S4B(2015)	T(2007)	1-T (2010)	G4(2008)	2
Contopus sordidulus	Western Wood-Pewee*	Yellow	S5B(2015)			G5(2009)	2
Cyanocitta stelleri	Steller's Jay	Yellow	S5(2015)			G5(1996)	5
Dryocopus pileatus	Pileated Woodpecker*	Yellow	S5(2015)			G5(1996)	4
Empidonax hammondii	Hammond's Flycatcher*	Yellow	S5B(2015)			G5(1999)	5
Euphagus carolinus	Rusty Blackbird	Blue	S3S4B(2015)	SC(2006)	1-SC(2009)	G4(2008)	2
Falcipennis Canadensis	Spruce Grouse	Yellow	S5(2015)			G591996)	6
Falco peregrinus	Peregrine Falcon		S3B(2015)	SC(2007)		G4(2000)	2
Falco rusticolus	Gryfalcon	Blue	S3S4B(2015)	NAR(1987)		G5(1996)	4
Glaucidicum gnoma	Northern Pygmy-Owl	Yellow	S4B(2015)			G4G5(2009)	3
Hirundo rustica	Barn Swallow	Blue	S3S4B(2015)	T(2011)		G5(1996)	2
Histrionicus histrionicus	Harlequin Duck*	Yellow	S4B,S3N(2015)			G4(1996)	1
Ixoreus naevius	Varied Thrush*	Yellow	S5B(2015)			G5(1996)	5
Junco hyemalis	Dark-eyed Junco*	Yellow	S5B(2015)			G5(2009)	5
Loxia curvirostra	Red Crossbill*	Yellow	S5(2015)			G5(1996)	2
Loxia leucoptera	White-winged Crossbill*	Yellow	S5B(2015)			G5(1996)	5
Myadestes townsendi	Townsend's Solitaire*	Yellow	S5B(2015)			G5(2009)	2
Oreothlypis celata	Orange-crowned Warbler*	Yellow	S5B(2015)			G5(2009)	5
Perisoreus canadensis	Gray Jay	Yellow	S5B(2015)			G5(1996)	6
Phalaropus lobatus	Red-necked Phalarope	Blue	S3S4B(2015)	SC(2014)		G4G5(2005)	2
Picoides arcticus	Black-Backed woodpecker*	Yellow	S4S5B(2015)			G5(1996)	6
Picoides dorsalis	Three-toed Woodpecker*	Yellow	S5B (2015)			G5(2003)	6
Picoides pubescens	Downy Woodpecker*	Yellow	S5B(2015)			G5(1996)	5
Picoides villosus	Hairy Woodpecker *	Yellow	S5B(2015)			G5(1996)	5
Pinicola enucleator	Pine Grosbeak*	Yellow	S5B(2015)			G5(1996)	5
Piranga ludoviciana	Western Tanager*	Yellow	S5B(2015)			G5(1996)	6
Poecile atricapillus	Black-capped Chickadee*	Yellow	S5B(2015)			G5(1996)	6
Poecile gambeli	Mountain Chickadee*	Yellow	S5B(2015)			G5(1996)	6
Regulus satrapa	Golden-crowned Kinglet*	Yellow	S5B(2015)			G5(1999)	5
Selasphorus rufus	Rufous Hummingbird *	Yellow	S4S5B(2015)			G5(2015)	2
Setophaga coronate	Yellow-Rumped Warbler*	Yellow	S5B(2015)			G5(1996)	5
Setophaga townsendi	Townsend's Warbler *	Yellow	S5B(2015)			G5(2008)	5

Sitta canadensis	Red-breasted Nuthatch*	Yellow	S5B(2015)			G5(1996)	5
Spinus pinus	Pine Siskin*	Yellow	S5B(2015)			G5(1996)	2
Wilsonia pusilla	Wilson's Warbler	Yellow	S5B(2015)			G5(2009)	2

*****Migratory bird species protected under the Migratory Bird Convention Act, 1994; COSEWIC= Committee on the Status of Endangered Wildlife in Canada; CF=Conservation Frame work. B.C. Conservation Data Centre. 2016. BC Species and Ecosystems Explorer. B.C. Minist. of Environ. Victoria, B.C. Available: http://a100.gov.bc.ca/pub/eswp/ (accessed May 25, 2016).

The More Creek drainage flows into the Iskut River which subsequently flows into the Stikine River. The Stikine-Iskut River system is known to have twenty (20) fish species which include both catadromous/anadromous and freshwater resident species. Anadromous and catadromous fish species are excluded from the More Creek drainage due to a number of documented fish migration barriers along the Iskut River. Therefore, the fish species that inhabit the More Creek drainage are all freshwater resident fish. A cursory overview of potential fish species inhabiting More Creek is provided in Table 10. The fisheries inventory assessment conducted for the Project will confirm the presence and absence of the fish species with potential to occur within the Project area.

Table 10. Regionally important, provincially and federally listed fish species including fish species with the potential to occur in More Creek (blue).

Scientific Name	Common Name	BC List	Provincial	COSEWIC	Global	CF Priority
Catostomus catostomus	Longnose Sucker	Yellow	S5(2010)		G5(2015)	6
Cottus asper	Prickly Sculpin	Yellow	S5(2010)		G5(2015)	5
Gasterosteus aculeatus	Threespine Stickleback	Yellow	S5(2010)		G5(2012)	6
Cottus cognatus	Slimy Sculpin	Yellow	S5(2010)		G5(2015)	6
Lampetra tridentata	Pacific Lamprey	Yellow	S5(2010)		G4(2012)	6
Lota lota	Burbot	Yellow	S4(2004)		G5(2015)	2
Mylocheilus caurinus	Peamouth	Yellow	S5(2010)		G5(2016)	5
Oncorhynchus mykiss	Rainbow Trout	Yellow	S5(2004)		G5(2008)	6
Prosopium williamsoni	Mountain Whitefish	Yellow	S5(2010)		G5(1996)	6
Salvelinus malma	Dolly Varden char	Yellow	S4(2011)		G5(2000)	2
Salvelinus namaycush	Lake trout	Yellow	S4(2004)		G5(2015)	2
Salvelinus confluentus	Bull trout*	Blue	S3S4(2011)	E(2002)	G4(2011)	2
Oncorhynchus clarkia clarkii	Cutthroat Trout*, clarkia subspecies	Blue	S3S4(2004)		G4T4(1997)	2

* Fish species in More Creek; COSEWIC= Committee on the Status of Endangered Wildlife in Canada; CF=Conservation Frame work. B.C. Conservation Data Centre. 2016. B.C. Conservation Data Centre. 2016. BC Species and Ecosystems Explorer. B.C. Ministry. of Environ. Victoria, B.C. Available: http://a100.gov.bc.ca/pub/eswp/ (accessed May 25, 2016).

Potential Environmental Effects

AHC will conduct a complete review of existing studies over the Project area in coordination with multi-year environmental studies over the Project area, where required, to assess the baseline environmental resources including wildlife and fisheries inventories and to analyze potential Project effects on these resources. The impacts to the environment from the pre-development and the environmental investigation phase of the Project are anticipated to be negligible. Impacts to the land from surveys and field studies are expected to be limited to periodic vehicle and foot access which has the potential to cause minor disturbance to the surrounding wildlife. This disturbance would be infrequent, temporary, and reversible in scope.

Potential environmental effects from the Project will be largely associated with the construction phase of the Project and with the development of the water storage reservoir.

During the construction phase of the Project there are potential environmental impacts that may result from:

- Greenhouse gas emissions from the operation of equipment and vehicles on site, and flooded vegetation to create the water storage reservoir.
- Concrete pouring near water courses
- Sedimentation
- Fugitive dust generation from vehicle access to site and movement on site and blasting activities.
- The production of solid nonhazardous construction wastes.
- Machinery and equipment use at the Project site during plant construction and operation has the potential for fuel and/or chemical spills to the soil.
- There is potential for acid rock generation at the site during rock excavation and blasting activities.
- During the Project construction phase, the impacts to wildlife resources may result from noise generation during site construction, disturbance due to site access, and alteration to the landscape for installment of Project infrastructure. Impacts resulting from construction noise will be temporary and reversible. However, noise and physical disturbance to habitat has the potential to result in wildlife avoidance of the Project area. Impacts resulting from infrastructure intrusion on natural habitats will be permanent and irreversible.

The creation of the 2,680 ha water storage-reservoir has the following potential environmental impacts:

- Effects on geology, terrain, and soils may create slope instability and shoreline erosion; alter the underlying soil composition and cause soil disturbance. Soil compaction and altered drainage patterns from Project construction may cause additional soil disturbance.
- Emission of greenhouse gases from the storage reservoir.
- Potential for dust generation.
- Permanent loss of vegetation in the 2,104 ha area that is flooded which will include permanent losses to vegetation communities, potential loses to rare plant communities and rare plant species, and in particular loses to those plant communities associated with low lying riverine areas.
- Surface water flows of More Creek will be impacted by flow regulation at the dam.
- The predicted annual change in surface flows in the Stikine River at the Alaska Boarder is 0%, however, monthly surface flows are predicted to range from an increase of 13% to a decrease of 2%.
- The Project will impact sediment movement both upstream and downstream of the proposed intake.
- The most significant effects of the Project on wildlife and migratory birds will result from the creation of the storage reservoir which is anticipated to flood approximately 2,104 ha of existing wildlife habitat. This flooded area represents permanent alteration of habitat.
- This flooded reservoir may destroy important riparian and terrestrial area used by breeding bird populations.
- Creation of the storage reservoir will displace local wildlife populations and will alter the habitat ranges of wildlife species in the vicinity of the Project area.

Migratory birds are potentially at risk during their breeding season from April to June/July. Impacts to migratory bird breeding season will be mitigated by minimizing vegetation clearing and grubbing activities during this sensitive window, where possible. Sensitive wildlife windows will be identified and included in the final Project Application; where possible, AHC will adhere to the sensitive wildlife timing windows during construction.

The development of the Project access road and transmission line also has the potential to fragment wildlife habitat. Moreover, the human-wildlife interface will increase as a result of Project operations and human access to the Project site. Disturbance to wildlife species as a result of increased human activity in the may also result in wildlife avoidance of the surrounding Project area. The creation of motorized access to the site may increase wildlife vulnerability to hunting.

Noise generated during Project operations at the powerhouse is anticipated to be minor and of a comparable level to the sound created by the natural More Creek drainage. Disturbance to wildlife from noise generated at the Project powerhouse is anticipated to be negligible.

The Project may impact fish and fish habitat during the construction and operation phases. During the construction phase works conducted near the water have the potential to increase sedimentation to the creek, spill toxic materials into the creek, and alter flow regimes for the installation of the intake weir. These impacts will be mitigated through the implementation of best management practices and the development of a construction environmental management plan which shall be adhered to throughout construction.

During operations a number of potential impacts to fish and fish habitat may result from the development of the proposed Project. The intake weir will permanently block fish from moving upstream and downstream of it. Flows in the diversion reach of the Project will be reduced as a result of the flow diversion for energy generation. In addition, the creation of the storage-reservoir will permanently flood existing tributary habitat and areas of off-channel fish habitat upstream of the intake. Changes to More Creek's hydrology and geomorphology have the potential to impact fish and fish habitat as they will alter the sedimentation, hydrology and temperature regimes in More Creek. Consequently, fish life history requirements and life history timing may be impacted.

The storage-reservoir will flood existing vegetation which may increase methyl-mercury production in resident fish populations. The dam spillway also has the potential to create elevated dissolved gas levels in More Creek. Furthermore, tributary and off-channel habitat will also be flooded by the creation of the storage-reservoir.

The diversion reach of the Project will have reduced stream flows. Fish habitat within this reach may be reduced as a result of reduced flows. Less flow may also alter the temperature regime of this section of More Creek and therefore, impact fish life history processes and productivity in this area. Stage changes that result from flow discharge at the tailrace may also have the potential to strand fish unless an adequate operational ramping rate is implemented.

It is anticipated that any emissions generated by the Project during development will be entirely offset by the Project during operations when clean, renewable energy will be produced. Where possible, potential Project impacts identified through the terrestrial wildlife and fisheries assessments will be addressed through:

- The development of comprehensive mitigation measures for all phases of the Project
- Changes to Project timing, design and infrastructure placement
- The offsetting of impacts via compensation activities

Where possible, mitigation measures will be implemented into the Project design to reduce impacts to fish and fish habitat, terrestrial habitat and wildlife. During Project construction best management practices will be adhered to and a construction environmental management plan will be developed and implemented with specific parameters defined for working near water. Fish screens at the Project intake and a potential fish passageway will be considered for the Project design. A minimum instream flow release will be

implemented during Project operations to maintain fish and fish habitat within the diversion reach of the Project. The Project will also develop suitable ramping rates to ensure that changes in flow stage-levels will not strand fish downstream of the Project.

Potential Socio-Economic Effects

AHC is in the preliminary phase of evaluating the socio-economic effects of the proposed Project. The Project will provide a positive economic stimulus to the surrounding community during all phases. During the construction phase it is expected that the most significant economic stimulus will be created. Current estimates expect the construction phase to take approximately two years. Over this period approximately 290 person years (PY) of employment is expected to be created. The Project is expected to create 16 full time operating jobs. It is anticipated that immediate benefits to First Nation and local communities will include the creation of construction and operating jobs in addition to numerous skilled training opportunities. Furthermore, indirect positive economic impacts are anticipated for the region where development support resources are sourced.

The Project is anticipated to be a capital investment of $275 million excluding the cost of permitting and site studies. In the long term, a reliable and inexpensive source of clean energy may increase the attractiveness of the area to other potential business development.

Potential social effects from the Project may include impacts to the existing land use (LRMP), pressure on existing resources within the region during the construction phase, and impacts to traditional purposes associated with the area overlapped by the Project. The traditional uses in the Project area including country food harvesting activities (fishing, hunting, and berry-picking) will be impacted by the creation of the storage reservoir.

AHC will conduct an assessment specific to impacts to the baseline social conditions of the Project area. Of particular focus will be how the Project will alter the existing land use of the area as prescribed by the LRMP, how service demands of the Project may impact the surrounding region, and how traditional use activities including hunting, fishing, and gathering will be impacted by the Project footprint and Project activities.

Potential Effects on Human Health

AHC anticipates commencing discussions and evaluation of the Project effects on public and First Nations' health following the submission of the Project Description to CEAA. The objective of AHC is to provide a full evaluation of the Project's effects on public and First Nation's health in the Project Application.

Potential health effects associated with the Project include air quality impacts, contamination of country foods, impacts to drinking and recreational water quality and noise effects. Air quality impacts are anticipated to be most significant during the construction phase when activities have the potential to generate sulphur oxides, nitrogen oxides, particulate matter, and volatile organic compounds. During operation air quality impacts are anticipated to be nominal. Contamination of country foods may be caused by the potential for methylmercury bioaccumulation as a result of the creation of the water storage reservoir. There may be potential for methylmercury bioaccumulation processes to occur as a result of water reservoir creation and this can result in a human health concern when fish populations are used for consumption. AHC will evaluate the potential methyl mercury production from flooded soils and the potential for

bioaccumulation of methyl mercury through the food chain. Drinking and Recreational water quality impacts are expected to be nominal through the implementation of best management practices and water quality monitoring plans; however, equipment use and concrete works have potential to impact water quality. Noise effects will be most substantial during Project construction and will be associated with blasting activities and equipment use on site. Noise generated during construction will be temporary and intermittent; noise generated during operations is anticipated to be nominal.

Potential Effects on Heritage Values

AHC is in the preliminary stages of evaluating the Project's effects on physical and cultural heritage in the area. It is anticipated that the effects on physical and cultural heritage will be evaluated based on published reports that document the rich cultural heritage and history of the Project area and through direct consultation with Aboriginal groups whose traditional territory is overlapped by the Project.

First Nations and Métis

A list of the First Nations and Métis with traditional territory over the Project area are provided in the Table 12. This list was developed in coordination with Frontcounter BC. AHC anticipates that the complete list of First Nations and Métis with interests in the Project area will be confirmed during the CEAA Project Description review.

Table 12. Aboriginal Groups that may be interested in or potentially affected by the Project

Aboriginal Groups					
Organization	**Contact Name**	**Mailing Address**	**Phone**	**Fax**	**Email**
Tahltan Indian Band	Chief and Council	PO BOX 46 Telegraph Creek, BC V0J 2W0	250-235-3244	250-235-3244	info@tahltan.ca
Iskut Band	Chief and Council	PO Box 30 Iskut, BC V0J 1K0	250-234-3331	250-234-3200	iskutfirstnations@yahoo.ca
Tahltan Central Government	Chief and Council	Box 69 Tatl'ah (Dease Lake, BC) V0C 1L0	250-771-3274	250-771-3020	http://tahltan.org/contact/
Métis Nation BC		Unit #103 – 5668 192nd Street, Surrey, BC V3S 2V7	604-557-5851	778-571-9402	lshaw@mnbc.ca

Potential Effects on the First Nations and the Métis

Preliminary discussions with First Nations have indicated that the flooded area from the Project may impact traditional use in the area including use of the land for berry picking, mushroom picking, and hunting. As part of the consultation plan conducted for the Project with the First Nations a Traditional Use Study will be conducted to fully assess and mitigate, where possible, impacts to traditional use activities from the development of the Project.

AHC will complete a thorough investigation of potential Project effects on First Nation and Métis health, socio-economic conditions, cultural heritage, and traditional use during the development of the Environmental Impact Statement to be submitted for the Project. The assessment of these effects will be conducted in consultation with aboriginal groups impacted by the Project.

The development of the Project is anticipated to create economic stimulus in the region. During construction and operation there will be a number of employment opportunities created. The Project will also generate tax revenue for the region. However, the influx of workers in the area has the potential to put a strain on services of nearby communities and nearby infrastructure, particularly during the construction phase when demands will be greatest. Development of the Project will increase access to the More Creek valley. This has the potential to impact country food harvesting and traditional uses in the More Creek valley. Furthermore, development of the storage reservoir for the Project will flood 2,680 ha of land. This flooded area would impact hunting and country food harvesting activities in that area. The flooded area also has the potential to cause methylmercury bioaccumulation which could become a health impact for country foods harvested for consumption.

Consultation with First Nations and the Métis Nation BC

AHC initiated contact with the Tahltan Central Council in Q2 of 2016 and provided the Tahltan Central Council with preliminary Project information. AHC anticipates providing formal Project notification during Q4 2016 to the First Nations and Métis Nation BC whose traditional territory overlaps the Project area. AHC is committed to ongoing consultation with First Nations and Métis Nation BC throughout all phases of Project development, construction and operations. The objective of the consultation process is to inform the First Nations and Métis Nation BC about all Project aspects, to achieve an understanding of the archeological valued environmental components and traditional use over the land, to identify issues and concerns about the Project and to address and/or mitigate those issues or concerns as best possible.

AHC has prepared a preliminary First Nation and Métis Nation BC consultation plan. Detailed documentation of consultation will be undertaken throughout the consultation process to ensure that any concerns and issues identified are fully understood and addressed as best possible. It is anticipated that the consultation process will include in person meetings with First Nation and Métis Nation BC leadership and communities, distribution of information regarding Project details and achieved milestones, inclusion of First Nation and Métis Nation BC in environmental studies over the land, careful tracking and recording of all identified issues and concerns, and the development of mitigation measures in correspondence with First Nations and Métis Nation BC to address those identified issues and concerns as best possible.

A summary of the proposed consultation activity schedule to be conducted by AHC is provided in Table 13.

Table 13. More Creek Hydroelectric Project anticipated Aboriginal Group Consultation Schedule

Activity	Anticipated Schedule
Notification with Project Description	Q3 2016
Follow-up on initial Notification via phone call and meeting requests	Q4 2016
Meeting	Q1 2017
Site Visits	Q2 2017
Provide Project Status Update Notification and follow-up on any issues/ comments/ concerns identified during previous consultation	Q3 2017

First Nation Participation in Environmental Studies	Q3 2016 – 2017
Ongoing Consultation to understand First Nation interest in the land including traditional and contemporary use and impacts to that use from the Project	Q1-Q4 2017
Provide Project updates through mail-out and/or email and/or preferred communication methods identified by First Nation	Q1 2017- Q1 2018
Meeting to discuss Environmental Study outcomes	Q3 2017
Open House for Project	Q4 2016- Q1 2017

Government Agency, and Local Government Consultations

Throughout the Project Application and Environmental Assessment process AHC anticipates meeting with federal, provincial, and local government agencies as part of a coordinated review of the Project. It is anticipated that the BC Environmental Assessment Office (BC EAO) and Canadian Environmental Assessment Agency (CEAA) will establish a Working Group to coordinate the review of the Project with all relevant stakeholders and interested parties. AHC will attend meetings with the Working Group to provide pertinent Project details as they relate to work plans, environmental studies, Project design, environmental considerations, mitigation measures, and other details that may be requested by the agencies. AHC has initiated preliminary consultation with the BC EAO, BC Ministry of Forests, Lands, and Natural Resource Operations (MFLNRO), and CEAA to discuss the Project.

Public Consultation

The Project is in its preliminary development stages. At this time, AHC is in the process of identifying all key stakeholders and Aboriginal Groups with interests over the Project area. No consultations with any stakeholders has commenced to date. It is anticipated that formal notification of the Project and consultation will commence with all identified interest groups in 2016. Throughout the EA process the Proponent anticipates holding open houses and engaging in consultation outreach activities with all public stakeholders in the Project area. A preliminary list of communities identified for consultation so far is provided below:

- Communities within the Kitimat-Stikine Regional District;
- Stewart;
- New Hazelton;
- Town of Iskut;
- Town of Dease Lake;
- Town of Telegraph Creek;
- Mineral claims stakeholders including Galore Creek Mining Corporation, Carl Alexander, Van Einsiedel, and Rimfire Minerals Corporation;
- Mineral placer stakeholders including BC Hydro Power Authority and Ministry of Environment Water Stewardship Division;
- Cassiar Forest Corporation;
- Skeena Timber Sales Manager;;
- Highway 37 Power Corporation;
- Northern Hydro Limited;
- Active Guide Outfitter Area held by Heidi Gutfrucht (Object ID 230) located over the Project area; and,

- Galore Creek Mining Corp. co-owned by NovaGold Resource Inc. and Teck Resources Limited.
- AltaGas

Authorizations, Permits, and Licenses

AHC will make concurrent applications to the BC EAO for provincial permits under the BC EAO Concurrent Approvals Regulation. The BC EAO submissions would be reviewed by provincial regulatory agencies concurrently with the federal review of the Application by CEAA for an Environmental Assessment Decision.

The Project requires an approved Environmental Assessment Certificate from BC EAO prior to issuance of its provincial permits. Concurrent provincial permit applications for the Project will be coordinated through the Major Projects Office of the Ministry of Forests, Lands and Natural Resource Operations (MFLNRO). Provincial approvals under the following legislation are anticipated for the Project: *BC Environmental Assessment Act* (2002), *BC Land Act* (1996), *BC Water Act* (1996), and *BC Forest and Range Practices Act* (2002).

Similarly, the Project will require a finalized Environmental Assessment Decision Statement prior to issuance of federal approvals. Federal approvals under the following legislation may be required for the Project: *Fisheries Act* (1985), *Navigable Water Protection Act* (1985), and *Canadian Environmental Assessment Act* (2012).

AHC will meet with the provincial and federal agencies prior to the final Application submissions to verify that all permitting requirements for the Project are considered.

FIGURES AND DRAWINGS

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ABBREVIATIONS AND ACRONYMS

AIA	Archaeological Impact Assessment
AHC	Alaska Hydro Corporation
AMSL	Above Mean Sea Level
BCEAO	British Columbia Environmental Assessment Office
BCH	British Columbia Power and Authority
CEAA	Canadian Environmental Assessment Agency
CEAA 2012	*Canadian Environmental Assessment Act 2012*
CEMP	Construction Environmental Management Plan
CF Priority	Conservation Framework Priority
CH_4	methane
CO	Carbon monoxide
CO_2	Carbon Dioxide
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DFO	Fisheries and Oceans Canada
EAO	British Columbia Environmental Assessment Office
EIS	Environmental Impact Statement
ESSFwv	Engelmann Subalpine Spruce wet very cold
FISS	Fish Inventory Summary System
GHG	Greenhouse gases
HCH	Humid Continental Highlands
HUT	Humid Temperate
HVAC	Heating, ventilation and air conditioning
ICHvc	Interior Cedar Hemlock very wet cold
IUL	Investigative Licence
LRMP	Land Resource Management Plan
LU	Landscape Unit
MAD	Mean Annual Discharge
MFLNRO	British Columbia Ministry of Forests, Lands and Natural Resource Operations
MOE	British Columbia Ministry of Environment
NO_x	Nitrogen oxides
NWPA	*Navigable Waters Protection Act*
OGMA	Old Growth Management Area
OPPR	Operations Parameters and Procedures Report
POI	Point of Interconnection
PM_{10}	Particulate Matter 10 um
$PM_{2.5}$	Particulate Matter 2.5 um
PMF	Probable Maximum Flood
Project Application	Environmental Impact Statement (under CEAA 2012); the Application under BCEAO
PY	Person Years
Q1, Q2, Q3, Q4	First Quarter, Second Quarter, Third Quarter, Fourth Quarter
RAB	Resource Analysis Branch
ROW	Right of Way
SARA	*Species at Risk Act*
SBI	Sub-boreal Interior
SKM	Skeena Mountains
SO_x	Sulphur oxides
TDG	Total Dissolved Gasses
TNDC	Tahltan Native Development Corporation
TRS	Total reduced sulphur
UWR	Ungulate Winter Range
VOCx	Volatile organic compounds
WHA	Wildlife Habitat Area
WSC	Water Survey of Canada

UNITS

^oC	degrees Celsius
cm	centimetre(s)
GWh	gigawatt hour
ha	hectare(s)
km	kilometre(s)
km^2	square kilometre(s)
kV	killivolt
m	metre(s)
m^3/s	cubic metre(s) per second
mm	millimetre(s)
MVA	megavolt amperes
MW	megawatt
t/km^2	tonnes per square kilometre
um	micro metre(s)
yr	year

GENERAL INFORMATION AND CONTACT(S)

1.1 Nature of Project

The More Creek Hydroelectric Project (the "Project") is a reservoir storage hydroelectric project proposed for More Creek in northwestern British Columbia, with an estimated generating capacity of 75 MW. The dam intake will be located approximately 2.5 kilometres (km) upstream from More Creek's confluence with the Iskut River. The Project is located approximately 130 km north of the Town of Stewart. The reservoir created by the dam will extend approximately 20 km upstream.

The Project will generate approximately 348 gigawatt hour (GWh). The annual generation of the plant represents enough power for approximately 31,600 homes in British Columbia (based on BC Hydro average household customer use). According to the BC Ministry of Energy and Mines, most of the world must rely on combustion processes using fossil fuels to produce electricity; however, these processes contribute to substantial greenhouse gas emissions and air quality concerns. Advantages to hydroelectric energy production include that it is renewable and has a minimal carbon footprint, hydroelectricity rates in British Columbia are unaffected by global markets because BC has a cost-based regulation of rates, and the low-cost electricity provided gives BC a competitive advantage in electricity-intensive industries (BC Ministry of Energy and Mines).

In November 2007 the *Greenhouse Gas Reduction Targets Act* set aggressive legislated targets for reducing greenhouse gas (GHG) emissions including reducing GHG emissions by a minimum 33% below 2007 levels by 2020 and a further emission-reduction target of 80% below 2007 levels by 2050. Furthermore, legislation in the *Clean Energy Act* sets the objective for at least 93% of the electricity generated in British Columbia to come from clean or renewable resources.

Hydroelectric power generation is and will continue to be an integral renewable energy alternative to conventional fossil fuel energy generation and will help British Columbia meet its clean energy objectives, GHG reduction goals, and provide a sustainable energy resource for future energy demands. The following main components are a part of the Project:

- A spillway and intake (i.e. headworks) will form the main dam structure on More Creek. The coordinates of this structure are N57º02'05" and W130º23'15". The combined length of the headworks is approximately 300 m.
- The water storage reservoir will extend approximately 20 km upstream of the Project intake and will have an estimated total surface area of 2680 ha. It is expected that there will be flooding of portions of upwards of 22 surrounding tributaries including portions of the existing Galore Creek mine road, which was not completed and ends part way through the reservoir.
- A tailrace and powerhouse which is located at N57º01'51" and W130º22'28". The tailrace will be approximately 50 m long and the powerhouse will have a footprint of approximately 2625 m^2.

Additional elements including access roads and a transmission line will also be required for the Project and are discussed in further details in Sections 2.1.3 and 2.1.9, respectively.

1.2 Proponent Information

The Project is being developed by the Alaska Hydro Corporation ("AHC"). AHC has multiple years of experience in energy and mining projects in British Columbia. AHC was incorporated in British Columbia on October 16, 2006. It is a Vancouver based renewable green energy company (BC Incorporation Number: BC 07771846). Additional details on AHC are provided in Table 1.

Table 1. Proponent Information

Category	Details
Name of Corporation:	Alaska Hydro Corporation
Address:	2633 Carnation Street, North Vancouver, BC V7H 1H6
President and Chief Executive Officer:	Cliff Grandison
Principle Contact:	Cliff Grandison
Principle Contact for Purposes of Project Description for the More Creek Hydroelectric Project	
Name and Title:	Cliff Grandison, President
Email Address:	grandiso@telus.net
Contact:	**Ph.** (604) 929-3691 **Fax.** (604) 929-4996
Company Website	http://www.alaskahydro.com/
Agent:	Lily Kotzeva, Sigma Engineering Ltd (604.688.8271 ext 388; lkotzeva@synex.com)

1.3 Consultation Undertaken

AHC has initiated contact and/or anticipates initiating contact to introduce the Project with the Project stakeholders listed below. AHC plans to commence the consultation process by providing each stakeholder with notification of the Project which will include a Project Description and overview maps.

Regional District, Municipalities and Towns

- Kitimat-Stikine Regional District
  Address: 300 – 4545 Lazelle Avenue Terrace, B.C. V8G 4E1
  Phone #: (250) 615-6100
  Email: info@rdks.bc.ca

- Municipal District of Stewart
  Address: PO Box 460 705 Brightwell Street Stewart, BC V0T 1W0
  Phone #: (250) 636-2251

- Municipal District of Kitimat
  Address: 270 City Centre Kitimat, BC, v8C 2H7

Phone #: (250) 632-8900
Email: feedback@kitimat.ca

- Municipal District of New Hazelton
  Address: PO Box 340, New Hazelton, BC V0J 2J0
  Phone #: (250) 842-6077
  Email: info@newhazelton.ca

- Town of Iskut
- Town of Dease Lake
- Town of Telegraph Creek

Aboriginal Groups

- Tahltan Band
  Address: PO Box 46 Telegraph Creek, BC V0J 2W0
  Phone #: (250) 235-3151
  Email: info@tahltan.ca

- Iskut Band
  Address: Box 30 Iskut, BC V0J 1K0
  Phone #: (250) 234-3331
  Email: info@iskut.org

- Métis Nation BC
  Address: Unit #103 – 5668 192nd Street Surrey, BC V3S 2V7
  Phone #: (604) 557-5851

Interest Groups

- Galore Creek Mining Corp.
  Address: Suite 3300 –550 Burrard Street Vancouver, BC V6C 0B3
  Phone #: (877) 717-4262
  Email: info@gcmc.ca

- Northern Hydro Ltd.
  Address: PO Box 556 Pemberton, BC V0N 2L0
  Website: http://www.rppc.ca/

- Cassiar Forest Corporation
- Water Stewardship Division (MOE)
- Mineral Claims Interests
- Active Guide Outfitters
- Landowners and occupants in nearby proximity to the Project
- BC Hydro
- AltaGas

1.4 Regulatory Requirements of Other Jurisdictions

The Project will require approvals and compliance from provincial and regional authorities in addition to the *Canadian Environmental Assessment Act* 2012 (CEAA 2012). The Project will be required to complete an Environmental Impact Statement (EIS) under CEAA 2012 and an Application under the *British Columbia Environmental Assessment Act* as regulated by the British Columbia Environmental Assessment Office (BC EAO). Provincial approvals will also be required from the Ministry of Forests, Lands, and Natural Resource Operations (MFLNRO) which include adjudication of a water licence and land tenure. The Kitimat-Stikine Regional District will require the Project to make application for the necessary development permits during Project construction. A list of the offices and contact information for each of the regulatory jurisdictions is provided below.

Regulatory Jurisdiction	Contact Person	Phone Number	Address	Email
CEAA	Andrea Raska– Project Manager	604-666-9162	410 – 701 West Georgia St. Vancouver, BC V7Y 1C6	Andrea.Raska@ceaa-acee.gc.ca
BCEAO	Monica Perry – Executive Project Director	(250) 387-1543	1st Floor, 836 Yates Street, Victoria, BC V8W 9H8	Gerry.Hamblin@gov.bc.ca
MFLNRO	Kelly Storey – Portfolio Administrator	(250) 847-7331	1st Floor – Alfred Avenue, PO Box 5000 Smithers, BC V0J 2N0	Kelly.Storey@gov.bc.ca
Kitimat-Stikine Regional District	TBD	(250) 615-6100	300 – 4545 Lazelle Avenue Terrace, BC V8G 4E1	info.rdks.bc.ca

1.5 Environmental Studies Conducted in Project Area

In support of the adjudication of the Project's environmental assessment process the Project will complete baseline and impact assessments which will include studies pertaining to: air, fish/aquatic resources, terrain, vegetation, wildlife, water quality, surface water flows, sediments and reservoir sedimentation, ice formation, and geo-hazard. Section 5 provides additional details on these environmental studies.

Numerous environmental studies have previously been conducted in the vicinity of the Project area and will contribute to the environmental assessment and review, and will be used to inform the baseline studies with respect to providing applicable information and selecting valued ecosystem components. During the period over the late 1970's and early 1980's BC Hydro evaluated the development of a large dam at the same location as the proposed Project. The Proponent anticipates using the BC Hydro study archives comprehensively in the planning development phase of the Project.

Previous environmental assessments and reports conducted in the vicinity of the Project area that will be reviewed for Project consideration include, but are not limited to, the following:

- Anweiler, G.G., and D.A. Blood. 1982. An Overview Impact Assessment of Proposed Stikine-Iskut Access and Exploration Programs on Wildlife. Draft report prepared for B.C. Hydro and Power Authority by Blood and Associates.

- Aquatic Environments Ltd. 1983. Fisheries studies for proposed dams in the Stikine and Iskut Rivers. Prepared for BC Hydro & Power Authority.

- BC Hydro. 1984b. Stikine-Iskut Development-Iskut Canyon & More Creek Projects Design Study Phase 1. BC Hydro Interim Report No. H1674, August 1984.

- Blood, D.A. 1982. Potential Impacts of Stikine-Iskut Hydroelectric Projects on Bears. Prepared for B.C. Hydro and Power Authority.

- Blood, D.A. and G.G. Anweiler. 1982. Stikine-Iskut Hydroelectric Projects, Supplementary Wildlife Studies. Prepared for B.C. Hydro and Power Authority.

- Bruce, I. 2006. Plant Site Design Feasibility Geotechnical Report. Prepared for Novagold Resources Inc.

- Clague, J.J. 1981. Late Quaternary Geology and Geochronology of British Columbia, Part 2: Summary and Discussion of Radiocarbon-Dated Quaternary History, GSC Paper 80-35, 41 p.

- Clague, J.J. 1985. Deglaciation of Prince Rupert – Kitimat area, British Columbia. Canadian Journal of Earth Sciences 22: 256-265.

- Clement. 1992. Biophysical habitat units of the lower Stikine and Iskut Drainages. Expanded legend for MELP, Smithers.

- Gorman, W. 1982. Habitat Utilization by Ungulates and Other Wildlife in the Proposed Reservoir Areas on the Stikine and Iskut Rivers. Prepared for B.C. Hydro and Power Authority.

- Irvine, J. 1978 (revised draft). Preliminary field observations for the proposed Site B Dam in the Iskut River. Memo for Environmental Resources Division, BC Hydro & Power Authority.

- Jang, L. and T. Webber. 1996. State of Water Quality of Iskut River below Johnson River, 1980-1994. Environment Canada and the BC Ministry of Environment, Lands and Parks.

- Jones, M.L. and P. T.P. Tsui. 1979. Fisheries investigations in the vicinity of proposed hydroelectric reservoirs on the Stikine and Iskut Rivers in the Northwestern British Columbia. Report prepared by Aquatic Environments Limited, Calgar, for British Columbia Hydro and Power Authority.

- Land Use Coordination Office. 2000. Cassiar Iskut-Stikine Land and Resource Management Plan. Ministry of Sustainable Resource Use, Government of B.C.

- McCart, P. and G. Walder. 1982. Fish populations associated with proposed hydroelectric dams on the Stikine and Iskut rivers – Volume I: Baseline Studies. Report prepared by Aquatic Environments Limited, Calgary, for British Columbia Hydro and Power Authority.

- McCart, P.J., D.W. Mayhood, M.L. Jones and G.J. Glova. 1979. Stikine-Iskut fisheries studies 1979. Stikine-Iskut fisheries studies 1979. Report prepared by P. McCart Biological Consultants Ltd., Nanaimo, for British Columbia Hydro & Power Authority.

- Ministry of Forests. 1988. Biogeoclimatic zones of British Columbia. Map.

- NDM. 1998. Evaluation of Impacts Related to Gravel Removal from the Iskut River. Report prepared by Norecol Dames & Moore, with Jemmett Associates as sub-contractor, for International Skyline Gold Corp.

- Northern Natural Resource Services Ltd. 1979 (Draft). Stikine-Iskut Aquatic ecological studies, 1978. Downstream sections. Prepared for British Columbia Hydro & Power Authority, January, 1979.

- Penner, D.F., and P. Jalkotzy. 1982. Studies on Furbearing Mammals in the Stikine-Iskut River Drainages, British Columbia. Prepared for B.C. Hydro and Power Authority.

- Rescan Environmental Services Ltd. and Rescan Tahltan Environmental Consultants. 2006. Galore Creek Project Interior Grizzly Bear Cumulative Effects Assessment. Prepared for NovaGold Canada Inc.

- Resource Analysis Branch. 1975. Biophysical mapping of the Iskut River and tributaries. Draft mapping at 1:50,000 scale. Resource Analysis Branch (RAB) of Ministry of Environment.

- Talisman Land Resource Consultants. 1982. Stikine/Iskut Hydroelectric Development Wildlife Habitat Mapping Study. Prepared for B.C. Hydro and Power Authority.

2. PROJECT INFORMATION

2.1 General Description, Context and Objectives

2.1.1 Project Context and Objectives

The Project is being proposed to achieve several key objectives: provide British Columbia electricity consumers with a long-term, reliable, cost effective supply of renewable electricity; stimulate economic resource development in the region consistent with defined land management resource objectives (LRMP, 2000); and contribute to achieving British Columbia's goals set out in the *Clean Energy Act* and *Green House Gas Reductions Target Act*.

Approximately 86% of British Columbia electricity generation and supply in the 2012 Forecasted Five-year average is generated by hydro power. BC Hydro forecasts that the Province's electricity needs will grow by 20 to 40 percent over the next 20 years and BC Hydro is committed to achieving energy self-sufficiency i.e. meeting energy demands through domestic sources of power through securing new supplies of clean energy and building new transmission and distribution infrastructure.

The proposed Project would assist BC Hydro in meeting future energy demands and/or supply local resource sectors with a clean, renewable, on-demand source of energy. The energy supply provided by the Project would be cost-effective for the end-user. One distinct advantage to the proposed Project is that it would help meet the demands of energy peaking in the Province; whereby, the reservoir/storage capacity of the Project would allow Project operations to increase or decrease to match energy consumer demands.

The Project will provide the following benefits to British Columbians:

- Generate 348 GWh per year of electricity;
- Supply a renewable source of electricity that will displace approximately 336,986.4 metric tonnes of CO_2 emissions per year created by coal generation or 192,577.2 metric tonnes of CO_2 emissions per year created by Natural gas generation;
- Provide a consistent and reliable source of renewable electricity throughout the year;
- Provide a cost effective source of renewable electricity; and
- Support regional and provincial economic development.

2.1.2 General Description of Project Components

This is an independent Project which is not being developed in conjunction with any other Project. The Project is a described physical activity under Schedule 4- Regulation Designating Physical Activities of the *CEAA* 2012. Schedule 4 defines a described physical activity as "the construction, operation, decommissioning and abandonment of a new dam or dyke that would result in the creation of a reservoir with a surface area that would exceed the annual mean surface area of a natural water body by 1,500 ha or more". The mean annual surface area of More Creek is 576 ha. The reservoir for the Project is anticipated to inundate an area of approximately 2,680 ha, exceeding the mean annual surface area of More Creek by 2104 ha.

The Project will have a capacity of 75 MW, and will be designed to create the approximately 2,680 ha of reservoir storage on More Creek. The Proponent has applied for a water licence on More Creek for Power – General (Application Number: 6001458). The Project will consist of access roads, a dam, diversion structure, intake, water storage reservoir, spillway, power tunnel and penstock, powerhouse containing three turbines and a fenced switchyard, tailrace, transmission line, and laydown and spoil areas all located on unsurveyed Crown Land (Land File: 6408748). Preliminary Project parameters and design details are summarized in Table 2 and are described in greater detail in the following sections.

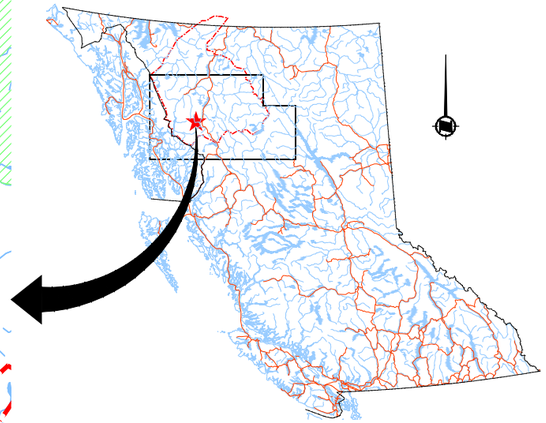
Table 2. Preliminary Project Parameters

Power Output:	75 MW
Energy Output:	348 GWh/yr
Max Diverted Flow:	80 m^3/s
Gross Head:	118 m
Dam Crest elevation	498 m AMSL
Minimum Lake elevation	468 m AMSL
Access Roads	~1 km of newly constructed access
Powerhouse (tailrace elevation):	~380 m AMSL
Power Tunnel:	5.5 m x 5.5 m and 1000 m long
Penstock	150 m length
Powerhouse	35 m x 75 m
Diversion Tunnel during construction	12 m x 12 m, and 200 m long
Powerline Length/ Voltage:	13 km/ 287 kV
Intake Structures:	Dam/ spillway/ integral chute/ intake
Dam	Max height at center: 85 m
Dam crest	290 m in length; 4-5 m wide
Work Camp	150 m x 75 m
Gravel pit or quarry	400 m x 400 m
Staging areas	100m x 200m
Intake Structures:	Dam/ spillway/ intake

The Project engineering is currently at the prefeasibility level. Additional Project design considerations include fish passage at the intake. The final Project design will consider principal visual and aesthetic issues including: location, size, and shape of each component and its visual quality. Please note that at this preliminary stage in Project development all dimensions and levels

provided are conceptual and subject to change as new information is collected and more detailed design is completed. Figure 1 shows the Project location.

DEASE LAKE 9
Dease Lake
TATCHO CREEK 11
TATL'AH 13
SALMON CREEK 3
CLASSY CREEK 8
UPPER TAHLTAN 4
HIUSTA'S MEADOW 2
TAHLTAN 10
TAHLTAN 1
GUHTHE TAH 12
Telegraph Creek
STIKINE RIVER 7
TELEGRAPH CREEK 6A
TELEGRAPH CREEK 6
KLUACHON LAKE 1
ISKUT 6
Stikine River
MOUNT EDZIZA PARK
TODAGIN SOUTH SLOPE PARK
KINASKAN LAKE PARK
STIKINE RIVER PARK
DENETIAH PARK
DUNE ZA KEYIH PARK [A.K.A. FROG-GATAGA PARK]
PITMAN RIVER PROTECTED AREA
GLADYS LAKE ECOLOGICAL RESERVE
CHUKACHIDA PROTECTED AREA
SPATSIZI PLATEAU WILDERNESS PARK
FINLAY RUSSEL PARK
FORT WARE 1
Fort Ware
SUCKER LAKE 2
FINLAY - RUSSEL PROTECTED AREA
ISKUT RIVER HOT SPRINGS PARK
SPATSIZI HEADWATERS PARK
PROJECT LOCATION
BOB QUINN SUBSTATION
GREAT GLACIER PARK
NINGUNSAW PARK
TATLATUI PARK
Iskut River
CRAIG HEADWATERS PROTECTED AREA
37
CANADA
USA
ALASKA
LAVA FORKS PARK
BORDER LAKE PARK
TAHLTAN TRADITIONAL TERRITORY (APPROXIMATE)
DAMDOCHAX PROTECTED AREA
SUSTUT PROTECTED AREA
SUSTUT PARK
BEAR RIVER 3
KLEWADUSKA 6
BEAR LAKE 4
TSUPMEET 5
BEAR LAKE 1B
TSAYTUT ISLAND 1C
BEAR GLACIER PARK
MEZIADIN LAKE PARK
Stewart



BRITISH COLUMBIA
NTS

SOURCE:

BASEMAP GENERATED FROM CANVEC 1:1,000,000. FIRST NATIONS RESERVES AND PARKS LAYERS FROM DATA BC.

0 20 40 60 80 100 km

LEGEND

- TAHLTAN TRADITIONAL TERRITORY (APPROX.)
- FIRST NATIONS RESERVE
- PARK / PROTECTED AREA

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MORE CREEK HYDROELECTRIC PROJECT
LOCATION PLAN

DATE	JUL 16	PROJ.	E6348
DWN.	KV/DGC	DWG.	FIGURE 1

Project Permitting Requirements

Concurrent permitting will be sought for the following Provincial licences and tenures prior to Project construction:

Pre-Construction Permitting	
Legislation	**Permit/Licence/Tenure**
BC Environmental Assessment Act	Environmental Assessment Certificate
Canadian Environmental Assessment Act 2012	Environmental Assessment Decision Statement
BC Water Act (only issued once the Environmental Assessment Certificate is approved)	Conditional Water Licence
BC Land Act	General Area Licence of Occupation
MFLNRO/ Cassiar Forest Corporation/ *BC Forest and Range Practices Act*	Road Use Permit
Construction Permitting	
BC Mine Act	Quarry/Gravel Permits
BC Forest and Range Practices Act	Road Works Permits Road Use Permits Licence to Cut Burning permits

Provincial and local permits and approvals will be required for construction. These permits will be sought once construction is ready to begin. A summary list of the required permits and approvals for each component of the Project is provided in Table 3.

Table 3. Summary of required permits and Approvals for Project Construction Activities

Dam, Reservoir, and Intake	
Activity	**Anticipated Permit**
Clearing and logging	Licence to Cut under the *BC Forest Act*
Construction of a temporary diversion channel	Conditional Water Licence under *BC Water Act* (British Columbia Dam Safety Regulation)
Rock and fill material	Quarry/Gravel permits under the BC Mines Act
Excavation of foundation for dam and intake	Conditional Water Licence under *BC Water Act*
Formwork and Concrete pouring for dam and intake	General Area Licence under the *BC Land Act*
Installation of trash racks, screens, gates, valves	Conditional Water Licence under *BC Water Act*
Use of rip rap to limit and control scour and erosion	Authorization under Section 35(2) of the *Fisheries Act*
Penstock/Tunnel	
Activity	**Anticipated Permit**
Excavation of trenches	Conditional Water Licence under *BC Water Act*
Placement of bedding material and drain rock	Conditional Water Licence under BC Water Act
Placement and interconnection of pipe sections	Conditional Water Licence under BC Water Act
Backfilling of trenches	General Area Licence of Occupation under the *BC Land Act*
Tunnelling Activities	Quarry/Gravel permits under the BC Mines Act
Removal and stockpiling of tunnelling materials	
Powerhouse and Switchyard	
Activity	**Anticipated Permit**
Clearing and logging	Licence to Cut under the *BC Forest Act*
Excavation of foundation for powerhouse	Conditional Water Licence under *BC Water Act*
Formwork and Concrete pouring	Conditional Water Licence under *BC Water Act*
Construction of walls, roof, and fencing	General Area Licence of Occupation under the *BC Land Act*
Installation of turbines, generators and associated equipment	Conditional Water Licence under *BC Water Act*

Construction of tailrace structure	Approvals under Section 5.1 of the NWPA Authorization under Section 35(2) of the *Fisheries Act*
Access Roads	
Activity	**Anticipated Permit**
Clearing and logging	Licence to Cut under the *BC Forest Act*
Grading of surface materials	Conditional Water Licence under *BC Water Act*
Compaction of surface materials	Conditional Water Licence under *BC Water Act*
Installation of ditches and culverts	General Area Licence of Occupation under the *BC Land Act*
Rock and fill material	Quarry/Gravel permits under the BC Mines Act
Bridge construction	Statutory Right of Way under the *BC Land Act* Approvals under Section 5.1 of the NWPA Authorization under Section 35(2) of the *Fisheries Act*
Transmission Line	
Activity	**Anticipated Permit**
Clearing and logging	Licence to Cut under the *BC Forest Act*
Flagging and marking of right of way	General Area Licence of Occupation under the *BC Land Act*
Installation of wood poles	General Area Licence of Occupation under the *BC Land Act*
Installation of 287 kV line	Approvals under Section 5.1 of the NWPA
Staging and Storage	
Activity	**Anticipated Permit**
Clearing and logging	Licence to Cut under the *BC Forest Act*
Preparation of gravel staging areas	Quarry/Gravel permits under the BC Mines Act
Construction of temporary project management offices	Road Works Permits under the *BC Forest and Range Practices Act*
Construction of temporary construction camps	Road Use Permits under the *BC Forest and Range Practices Act* Authorizations under the *Health Act*

Prior to the Project facility being brought online, a reservoir filling and ramping-up procedure will be in place such that reservoir filling and tailrace discharge (once reservoir has been filled) is gradual and impacts to the surrounding land base and downstream of the dam are minimized. The rate at which reservoir filling and tailrace discharge occurs will be formulated and approved through consultation with various Provincial and Federal fisheries, wildlife agencies and other applicable agencies, as required.

During the operations phase of the Project there will be the following general maintenance requirements:

- cleaning trash racks of accumulated debris
- trimming right of way under power line
- road maintenance (grading of the road, ditch cleaning)

Anticipated permits associated with ongoing operations and maintenance activities include:

- Conditional Water Licence under the *BC Water Act*
- General Area Licence of Occupation under the *BC Land Act*
- Lease (Powerhouse site) under the BC *Land Act*
- Statutory Right of Way under the *BC Land Act*

2.1.3 Access Roads

Access to the Project site will be via 11.5 km of existing access road of which, approximately, the first 5 km is a forestry road that intersects Highway 37 just north of Devil Creek. The remaining access road was constructed by Galore Creek Mining Corp for the Galore Creek Project. It is anticipated that approximately 1 km of newly constructed access roads will be needed to access the powerhouse and intake from the existing Galore Creek access road. The road will be most extensively used during construction and will be used periodically during operations for maintenance and operations.

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LAND TENURE APPLICATION AREA

EXISTING NATIONAL HYDRO NETWORK (NHN) WATERBODY, SURFACE AREA = 576 HA

NORMAL MAXIMUM OPERATING LEVEL EL. 498m SURFACE AREA = 2680 HA

GALORE CREEK MINE ROAD (SEE NOTE 3)

END OF FOREST SERVICE ROAD

GALORE CREEK MINE ROAD (SEE NOTE 3)

PROPOSED INTAKE

MORE CREEK HYDROELECTRIC PROJECT, SEE FIGURE 3

PROPOSED POWERHOUSE

PROPOSED TRANSMISSION LINE TO INTERCONNECTION POINT

PROPOSED INTERCONNECTION POINT

BOB QUINN SUBSTATION

MORE CREEK

CREEK

ISKUT FSR

37

AIRSTRIP

BOB QUINN LAKE

NOTES:

1. WATERCOURSES AND LAKES FROM BMGS, ILMB, CANADIAN HYDRO NETWORK 1.0–CL4–NC4; SOURCE DATA = BC–TRIM; SOURCE SCALE = 1:20,000
2. ADDITIONAL BASEMAP LAYERS DOWNLOADED FROM THE BC DATA DISTRIBUTION SERVICE.
3. GALORE CREEK MINE ROAD APPROXIMATED FROM GOOGLE EARTH.
4. COORDINATE SYSTEM = UTM ZONE 9, NAD 83

0 2 4 6 8 km

LEGEND

- ROAD (DIGITAL ROAD ATLAS)
- ROAD (FOREST SERVICE)
- TRAIL
- ROAD (ESTIMATED, SEE NOTE 3)
- GLACIER

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MORE CREEK HYDROELECTRIC PROJECT
PROJECT LAYOUT

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DWN.	KV/DGC	DWG.	FIGURE 2

2.1.4 Intake, Dam and Reservoir

Intake. The proposed intake location is approximately 2.5 km upstream of More Creek's confluence with the Iskut River. The design flow at the intake is expected to be approximately 80 m^3/s. The design flow for power generation will be directed through the intake to the power tunnel. The intake design will include a gated concrete structure with conventional trashracks and fish screening will be installed as required. The approximate dimensions of the intake structure will be 30 m by 20 m. The approximate dimensions of the gated concrete structure will be 30 m by 20 m.

Reservoir. The elevation at the reservoir during full operating levels will be at 498 m above mean sea level (AMSL). From the dam, the reservoir will extend approximately 20 km upstream and inundate approximately 2104 ha, creating a reservoir with a total surface area of 2,680 ha. The creation of the reservoir will flood portions of the Galore Creek mine road. The maximum depth of the reservoir will be approximately 80 m. Mapping of the estimated inundated area is provided in **Figure 2.**

At full operating levels, the reservoir will store approximately 58% of the mean annual run-off from the More Creek basin at the dam site and provide a live storage of approximately 640 million m^3 of water. Water that is not stored will flow directly through the Project plant or be spilled over the dam. During the investigative phase of Project development, the Proponent anticipates installing water level and temperature gauges at multiple locations on More Creek including the intake site, the powerhouse site, downstream of the powerhouse site, and at appropriate More Creek tributary input sites. The reservoir is anticipated to inundate portions of tributaries that discharge into More Creek. During the baseline studies and environmental study review for the Project, the lateral and longitudinal extent of flooding will be confirmed through mapping and field surveys.

Dam. The dam and intake structure for the Project will be located on the east bank at the entrance to the More Creek Canyon. The crest length of the dam will be approximately 290 m and has an approximate crest width of 4-5 m. The 85 m high gravity structure dam will be constructed from roller compacted concrete (RCC) and will be founded on rock on both abutments and its foundation. The dam structure will include a conventional reinforced concrete spillway. All design features of the dam will be constructed to seismic and flood standards for the expected "High" downstream consequence assessment typically used for moderate-sized dams.

Spillway. A gated overflow type spillway will be designed with redundancy in gates for the estimated flood passage. The spillway design capacity will be approximately 2,500 m^3/s and the routed inflow design flood for passage through the spillway will be approximately 1,580 m^3/s. Spill from the dam will discharge down the front face of the dam via the spillway. There is no low level release facility currently proposed for the dam.

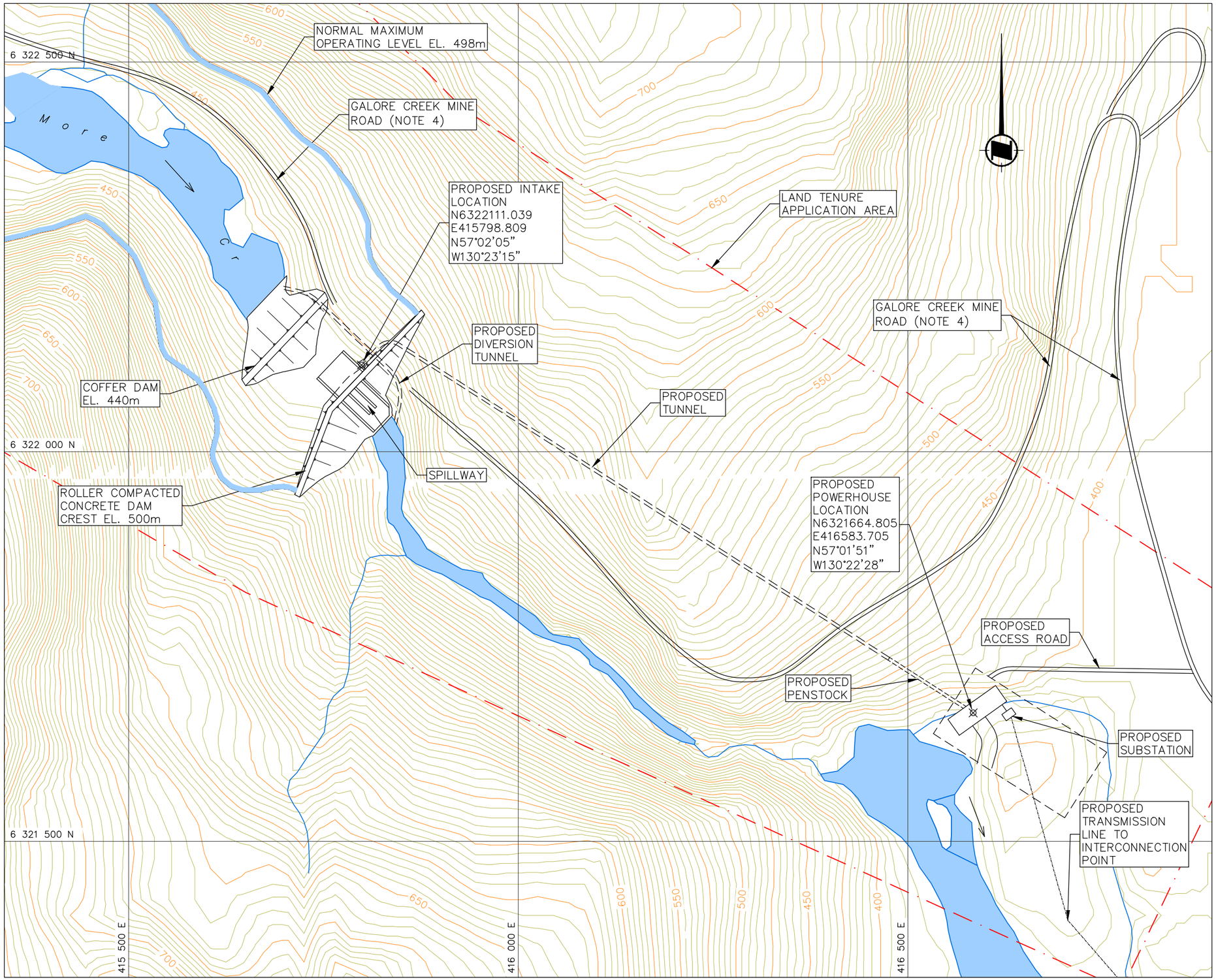
The spillway will be located at the intake on the right bank side of More Creek. More Creek flow in excess of flows that are directed into the power tunnel for power generation and flows that comprise reservoir storage will be discharged through the spillway. The spillway will discharge excess flows back to More Creek. The spillway structure is anticipated to consist of 3 spillway bays resulting in a total length of approximately 135 m. Spillway flows will be controlled using radial gates.

The spillway structure will be designed to the probable maximum flood (PMF) which approximates discharge levels of 1,580 m^3/s. Therefore, the spillway configuration will be designed to a capacity

of 2,500 m^3/s when the reservoir is at its normal maximum operating level of 498 m AMSL. The conceptual layout of the intake and dam is provided in Figure 3.

Bathymetric Data: Defining the Natural Waterway and the extent of the Reservoir Boundaries

The Proponent will conduct a review of the existing reporting (i.e. BC Hydro archives) and if required, conduct a bathymetric survey to determine the bed elevation and verify the distance upstream that will be impacted by reservoir inundation. This analysis will be conducted using the reservoir water level to determine maximum depths and widths along the More Creek valley. The analysis will include measures for bed elevation, surveyed water level, intake water level, maximum depth, and top widths as the reservoir extends upstream of the dam. At this stage in the preliminary analysis it is anticipated that the reservoir will extend approximately 20 km upstream from the intake, create a maximum depth of 80 m, and average widths of approximately 1.45 km.



NOTES

1. CONTOURS FROM BMGS, ILMB, CANADIAN DIGITAL ELEVATION DATA, GEOBASE 1.0; SOURCE DATA = BC–TRIM; SOURCE SCALE = 1:20,000; CONTOUR INTERVAL SHOWN = 10m
2. WATERCOURSES AND LAKES FROM BMGS, ILMB, CANADIAN HYDRO NETWORK 1.0–CL4–NC4; SOURCE DATA = BC–TRIM; SOURCE SCALE = 1:20,000.
3. ADDITIONAL BASEMAP LAYERS DOWNLOADED FROM THE BC DATA DISTRIBUTION SERVICE.
4. GALORE CREEK MINE ROAD APPROXIMATED FROM GOOGLE EARTH.
5. COORDINATE SYSTEM = UTM ZONE 9, NAD 83

0 100 200 300 400m

SCALE

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MORE CREEK HYDROELECTRIC PROJECT

GENERAL ARRANGEMENT

DATE JUL 15	PROJ. E6348
DWN. DGC	DWG. FIGURE 3

2.1.5 Construction Diversion

A cofferdam and diversion tunnel will be required to divert all creek flow around the dam during the entire duration of dam construction. The cofferdam will be at an elevation of approximately 440 m AMSL. The cofferdam and diversion tunnel will be designed for a flow of 800 m^3/s which represents a moderate flood flow condition. Following construction, the upstream cofferdams will be submerged by the reservoir and downstream cofferdams will be removed at the completion of dam construction.

2.1.6 Power Tunnel and Penstock

The tunnel, penstock route and overall Project layout (excluding the storage reservoir) are shown in **Figure 3.** Flows for Project generation will be diverted from the dam into the intake and directed from the intake into a 1000 m long, 5.5 m diameter power tunnel excavated into rock. In the upstream section of the power tunnel it will be predominately unlined. The downstream section of the power tunnel will be lined with steel pipe and connect to a short section of steel penstock (approximately 150 m) and branch manifold to direct flows to the generating units of the powerhouse. At the powerhouse, valves will be installed to allow for the isolation of each generating unit from flow, as may be required.

2.1.7 Powerhouse and Generation Facilities

The powerhouse will be located on the left bank of More Creek. It will be constructed above-ground and consist of structural steel, corrugated steel and aluminum sheeting. The powerhouse foundation will be constructed of reinforced concrete located at an elevation of approximately 380 m AMSL. The powerhouse dimensions will be roughly 75 m long by 35 m wide and 10 m high. Three vertical axis Francis type turbines coupled with salient pole electric generators will be housed in the powerhouse. Each turbine will have a rated output of approximately 25 MW, with generators rated at approximately 25 MVA. The main floor will house the control switchgear. Draft tubes will convey the discharging water from the Francis turbines into the tailrace channel. The Francis turbines will be submerged under several meters of water during operation; therefore, vertical steel bulkhead gates will be installed at the downstream end of each draft tube for isolating each of the three draft tubes from the tailrace. A switchyard will be located adjacent to the powerhouse site. The switchyard will include the transformer, air blast circuit breakers, relays and steel anchorage structure for a transmission line terminal. The transformer will be installed outdoors in a fenced 25 m by 15 m area. As additional information becomes available, the exact location and area required for the generation facility will be updated.

2.1.8 Staging and Spoil Areas

A staging area, approximately 100 m by 200 m in size, will be located adjacent to the powerhouse site for use during construction. Spoil areas will be determined as the Project design advances and more accurate volume estimates become available.

2.1.9 Transmission Lines

A transmission line will interconnect the powerhouse to the Bob Quinn Substation, subject to BC Hydro review. The transmission line will be approximately 13 km long, 287 kV, and will consist of wood pole structures with three conductors. The transmission line will follow a southern routing before connecting to the Bob Quinn Substation.

The transmission line route selected will be an overland crossing. The portion of the transmission line which is located on Crown Land is included in the Crown Land application (Land File: 6408748). The total area for the transmission line application is 215.3 ha. The area of the lands application may be decreased as the design details are finalized. It is anticipated that the transmission line right-of-way will be approximately 50 m wide. The proposed transmission line corridor is shown in Figure 2.

2.1.10 Design for Fish Considerations

A fish passage facility may be required at the Project intake. Fish passage facility parameters would be determined and designed following the identification of critical fish species that require fish passage. The type of fish passage facility installed at the Project intake will be determined through consultation with Provincial agencies and Fisheries and Oceans Canada (DFO) following the identification of these key fish parameters (i.e. species and life history requirements). Considerations for minimum instream flow release for fish and fish habitat within the Project diversion reach will also be reviewed.

2.2 Project Activities

The estimated capital cost of construction for the Project is $275,000,000. It is anticipated that the Project will create approximately 290 person years (PY) worth of jobs during construction (calculation based on construction camp costs per person days). The Project is expected to create 16 full time operating jobs. It is anticipated that energy generated by the Project will be sold to BC Hydro and/or other users.

2.2.1 Pre-Construction and Timelines

All of the baseline environmental inventory studies, archaeological studies, report review and assessments are anticipated to be completed by July 2018. An estimate of the Project development timeline is provided in Table 4.

Table 4. Project Development Timeline

Main Project Milestones include:		**Target Date**
BC EAO	**CEAA**	
Submission of Project Description to BC EAO	Submission of Project Description to CEAA	Q3 2016
20 day Public comment period	20 day Public comment period	Q3 2016
Section 10 order issued by BC EAO under the *Environmental Assessment Act* (EAA) issued	Agency (CEAA) issues Notice of Determination	Q3 2016
Procedural order under section 11 of EAA issued by BE EAO		Q4 2016
BC EAO issues the Application Information Requirements following Public Comment Period	Agency (CEAA) issues Notice of Commencement	Q4 2016***
	Public comment period on draft Environmental Impact Statement (EIS) Guidelines	Q1 2017***
	Agency (CEAA) issues final EIS Guidelines to Proponent	Q1 2017
Application Prepared and Submitted to BC EAO	Public comment period on EIS Guidelines	Q1 2017**
	EIS submitted to Agency (CEAA)	Q1 2018**
Application Evaluated by BC EAO for Completeness	Public comment period on draft EA report	Q1 2018**
Application Review Phase and Public Comment Period	Agency (CEAA) issues EA report	Q3 2018**
Environmental Assessment Certificate (EAC) issued	Environmental Assessment Decision Statement issued by the Agency (CEAA)	Q4 2018**
Concurrent provincial and federal permit approvals		Q4 2018**

**The target dates provided within the above table are conservative estimates. The Main Project milestones outlined may occur at an earlier date than the date provided in the above table.

*** The period between Environmental Assessment commencement by the Agency (CEAA) (i.e. issuance of Notice of Commencement) and the EA Decision Statement issued by the Agency provides the government with 365 days for review (excluding periods where the Proponent is required to follow-up on issues that may be identified).

2.2.2 Construction

Pending Environmental Assessment certification, construction could commence by July 2018 and would be anticipated to take place over the following 18 month period. During Application submissions a detailed construction schedule will be prepared and will include considerations for potential environmental constraints such as sensitive timing windows to mitigate Project impacts to aquatic and terrestrial wildlife species. A preliminary timeline estimate for Project construction is provided in Table 5.

Table 5. Preliminary Project Construction and Operations Schedule

Main Project Milestones include:	Target Date
Initiate project construction	Q3 2018**
Project Commissioning	Q4 2019**
In-service date of first Project phase	Q1 2020**
Commercial Operation Date of Project facility	Q1 2020**
Operation and maintenance of Project facility	Q1 2020** – Q1 2120

Construction of the proposed facility is scheduled to take place over approximately 18 months from 2018 to 2020. At this preliminary stage it is anticipated that approximately forty (40) construction vehicles will be travelling to the Project site on average each day. A detailed construction schedule will be prepared as part of the Project application process and will take into consideration potential environmental constraints.

Details of the construction process will be refined during the Project feasibility study; however, it is expected the construction of the Project will include the activities outlined below:

Site Preparation and Mobilization (2018)

- Clearing and logging of Project footprint including reservoir, dam, roads, powerhouse and transmission line
  - Trees will be removed from Project footprint. Where not required, topsoil and vegetation will remain.
- Construction of the Project work camp
  - Camp will include sewage treatment or sewage will be trucked off site
- Construction of access roads
  - Vegetation and topsoil will be removed from road footprint
- Grubbing and stripping of dam and powerhouse site
  - Vegetation and topsoil will be removed from footprint
- Excavation of powerhouse site
  - Soil and potentially rock excavation will be required. Location of spoil areas is yet to be determined.
- Construction of gravel pit for roller compacted concrete aggregate

- Further site investigation will determine the location of the pit. Settling ponds will be constructed to control sediment where necessary

Construction Phase (2019)

- Assembly of concrete plant
- Blasting of diversion tunnel
  - The location of muck spoil area is yet to be determined
- Placement of cofferdam
  - Once the cofferdam is completed, More Creek will be diverted into the Diversion Tunnel and around the dam construction area
- Placement of RCC for dam body
  - RCC will be trucked to site from the concrete plant
- Placement of concrete for intake structure
- Installation of radial gates and intake mechanical items
- Blasting of power tunnel
  - The location of muck spoil area is yet to be determined
- Placement of penstock
- Construction of powerhouse foundation and steel structure
- Construction of transmission line to Bob Quinn Substation
- Construction of substation at powerhouse, and upgrades at Bob Quinn Substation

Commissioning and De-mobilization (2019-2020)

- Installation of turbines and generators
- Installation of powerhouse controls and power equipment
- De-mobilization of work camp, concrete plant and construction equipment

Site restoration of Project footprint (2020)

- Restoration will include stabilization, contouring and reseeding
- Filling of reservoir
  - The diversion tunnel will be sealed and the reservoir will be filled while maintaining a minimum downstream flow release
- Final commissioning of the plant

2.2.3 Operations

Commercial operation of the Project is anticipated to occur by March 2020 following the commissioning phase of permitting. It is anticipated that the commissioning phase of the Project will take place over 3 months. During the commissioning period reservoir filling, instream flow

verification, and ramping rate monitoring will be assessed to ensure operations compliance with regulatory requirements are achieved.

The Project will operate as a reservoir storage facility. It will operate with a normal operating full supply level (FSL) of about 498 m AMSL and this level is anticipated to range between 468 m and 498 m during operations. At a full supply level the reservoir will have a total volume of about 920 million m^3 of water and a total live volume of 640 million m^3 of water. The Project will be evaluated for its capacity to operate in a manner that may accommodate peak energy demands. This evaluation will require ongoing consultation and discussion with BC Hydro.

Flow from the reservoir storage will be directed into the power tunnel from the Project intake. From the power tunnel flows will enter the penstock and be directed into the powerhouse for electricity generation at the plant turbines. The maximum diversion for power generation at the plant turbines is estimated to be 80 m^3/s. It is anticipated that a minimum instream flow release of 10% of the mean annual discharge (MAD) may be required for release at the plant spillway to maintain downstream fish habitat and hydraulic connectivity in More Creek. The minimum instream flow release will be prioritized over flows used for plant operations, if required. Flows discharged from the turbines are released into the Project tailrace where they are released back to More Creek upstream of its confluence with the Iskut River. During the filling of the storage reservoir a filling protocol will be designed and implemented to mitigate changes to the existing flow patterns downstream of More Creek.

As part of the final application a draft operations parameters and procedures report (OPPR) will be prepared. Included within the report will be the monitoring requirements for the More Creek flows and water levels. Additionally, facility monitoring, routine maintenance, and periodic systems testing will be outlined within the report and the activities outlined will be conducted throughout the lifespan of the facility. Routine maintenance of the facility is anticipated to include the following:

- Access road grading, dust suppression, and snow ploughing and/or de-icing;
- Periodic clearing along the transmission line corridor;
- Mechanical equipment maintenance (e.g. fluid changes); and,
- Concrete spot repairs.

The plant operating system will be designed for both remote access and on-site operation. A permanent operator will be present at the facility at all times during operations. It is anticipated that on average approximately two to three (2-3) vehicles will travel to the plant each day during operations.

2.2.4 Decommissioning

The lifespan of reservoir projects is expected to be upwards of 100 years; however, with careful maintenance and upgrading, other facilities have demonstrated working capacities of beyond 100 years. Consequently, there are no current plans for the decommissioning and abandonment of the facilities and infrastructure related to the proposed Project. No decommissioning or abandonment phases are scheduled at this time. It is anticipated that rehabilitation efforts to extend the facility life span will be considered following the life span of the facilities' equipment and components. However, the decision to rehabilitate the facility will be dependent on a number of financial and

economic factors at that time. A Conceptual Decommissioning Plan will be prepared as part of the Project Application (Environmental Impact Statement under CEAA 2012; Application to BCEAO) process, if required.

2.3 Emissions, Discharges and Waste

The Project is not expected to produce significant volumes of waste. The greatest volume of waste production will be generated during the construction phase of the Project. During operations, the volume of waste generation will be nominal and limited to domestic garbage, waste materials generated by the plant operator and the generation of minor volumes of waste materials that may result from plant maintenance activities. During all phases of the Project all waste products generated will be trucked off of site in a timely manner for disposal at an appropriate waste management facility. The waste management strategy at the plant will aim to implement "reduce, reuse, and recycle" practices with the objective to minimize waste production throughout all phases of plant development, construction and operation.

2.3.1 Atmospheric Emissions

It is anticipated that the atmospheric emissions caused by the Project will be most significant during the construction phase of the Project and from the creation of a reservoir. During Project construction the release of gaseous emissions may result from the use of mechanized equipment, heavy duty machinery and portable generators. Periodic air emissions may also result from blasting activities potentially associated with the intake, power tunnel, and powerhouse construction.

The use of explosives for blasting activities will be sourced from an approved off-site location. Storage of explosives on site will be in accordance with Natural Resources Canada requirements and industry standards. All transport of explosives will be in compliance with Transport Canada rules and regulations. There is potential for dust generation at the Project site as a result of vehicle access to the site and mechanized equipment operating during construction at the site.

Greenhouse gas generation will result through natural decaying processes from the inundation of the 2,104 ha of existing vegetation and organic matter. Prior to flooding, merchantable timber will be logged and removed along with woody debris.

It is estimated that over its 102 (includes 2 years of construction) year life span the Project will produce an average of 14,404 tonnes of CO_2e/ year. This estimate is based on the calculated "likely scenario" estimates (43, 567 tonnes of CO_2e/ year) for the Site C Project by BC Hydro. The Project is in relative general proximity to the Site C Project. The likely scenario estimates of the Site C Project assumes that approximately 30% of vegetation is left remaining following logging and clearing activities, it further treats merchantable timber and buried biomass as stored carbon. The estimate for the More Creek Project takes into account a smaller flood area of 2,104 ha compared to a flood area of 6,345 for Site C and 2 years of construction compared to 8 years of construction for the Site C Project. Baseline estimates of CO_2e/ year in the vicinity of the Site C Project are estimated to be 5,700 tonnes of CO_2e/ year due to agricultural activities in the area. It is likely that baseline CO_2e/ year for the More Creek Project would be lower since there are no agricultural or industrial activities within the vicinity of the Project.

It is anticipated that during Project operations there will be no gaseous emissions. An HVAC system will be installed in the Project powerhouse for air ventilation. Air ventilated from the powerhouse is not expected to release any gaseous emissions to the environment. Back-up diesel generators will be available at the Project powerhouse for use during power outages and/or emergencies. The use of the back-up diesel generators is expected to be short-lived and infrequent; however, during these periods minor air emissions resulting from fuel-combustion will result.

A list of potential atmospheric contaminants that may occur during the construction and operations phases of the Project include:

- Greenhouse gas emissions (e.g. CO, CO2, NOx, SOx) – from the operation of equipment and vehicles on site, flooded vegetation to create the water storage reservoir
- Particulate Matter (PM2.5, PM5) – dust generation from vehicle access to site and movement on site, blasting activities

Criteria air contaminant potentially associated with the Project include:

- Sulphur Oxides (SOx)
- Nitrogen Oxides (NOx)
- Particulate Matter
- Volatile Organic Compounds – use of fuel for equipment onsite and the potential for spills
- Carbon Monoxide (CO) – from equipment used on site

2.3.2 Liquid Discharges

Industrial Liquids

Fuels, hydraulic fluids, and lubricants will be required on site during Project construction to operate equipment on site. Operating equipment condition will meet best management standards to ensure fuel accidents and spills are prevented. Fuel storage on site will only be permitted in designated fuel storage areas that are designed with fuel containment capacity of a sufficient volume to contain all potential fuel spill events. Fueling of equipment on site will also only be permitted in designated areas that are a minimum distance of 30 m away from natural drainages. Additional fuel containment and fuel spill management plan details will be included as part of the construction environmental management plan ("CEMP") developed for the Project. Best fuel management practices will be detailed in the CEMP to ensure fuel management implementation and mitigation measures minimize the risk of accidental fuel spills. In addition, the CEMP will outline fuel containment strategies and protocol to be implemented in the event a fuel spills occur. The CEMP will be provided as part of the final Application submission for the Project.

During plant operations it is anticipated that minimal fuel volumes will be stored on site. Some of the plant equipment at the powerhouse site will require fuel including hydraulic fluids and lubricants. Moreover, back-up diesel generators stored on-site will also require a fuel source to be stored at the powerhouse site. Therefore, as part of the long-term operations of the plant a spill prevention and response plan will be developed and included in the Project's OPPR. A preliminary draft OPPR will be submitted as part of the final Application submission. Details of the fuel management plan will include fuel storage protocols, best management practices for the handling of fuels and industrial liquids, and will also include a description of how the industrial liquids are to be used. The plant powerhouse and substation sites will include design specific parameters and

contain sufficient spill containment equipment and materials on site to prevent accidental spills from being discharged to the environment.

All waste fluids generated by the Project will be managed and/or disposed of in compliance with all regulatory requirements. It is anticipated that waste fluids will have designated storage containers with sufficient containment to mitigate risk of spills. The storage containers holding waste fluids will be transported to a designated disposal facility for final disposal.

Water Management during Construction

Stormwater management during Project construction will be incorporated into the construction design. It is anticipated that control and/or settling ponds will be implemented on site, as appropriate, to manage site water run-off and to prevent sedimentation to More Creek and its surrounding drainages. A comprehensive stormwater management plan will be provided in the Project CEMP. The stormwater management plan will include details regarding control/settling pond design, location, and water quality monitoring. At the powerhouse site, where there are minor volumes of fuel being stored, there will be spill containment systems in place to prevent fuel or other industrial liquids from entering the More Creek system in the event of an accidental spill.

Sewage

During operation, the powerhouse site will have a washroom and sink associated with the facility and during construction, the Project will have a camp with washroom facilities. The human waste generated on site during construction and/or operation will either be contained and transported off-site to a designated sewage treatment plant or treated using an appropriately designed sewage treatment system located on site.

2.3.3 Waste Disposal

During all phases of the Project the objective to reduce, reuse and recycle will be implemented. Where this objective is not met and wastes for disposal are generated, these wastes will be disposed of in a manner that is in accordance with regulatory requirements.

The Project may produce solid nonhazardous construction wastes and where possible these waste products will be recycled. Waste products that cannot be reused or recycled will be transported to an appropriate waste disposal facility for disposal (i.e. landfill). All industrial liquids used during Project construction and operation i.e. fuels and chemicals will have designated and clearly defined containment areas equipped with sufficient spill containment materials. Disposal of industrial liquids from the Project site will be in compliance with regulatory requirements.

3. PROJECT LOCATION

3.1 Description of Project Location and Site Plan

3.1.1 Project Coordinates

More Creek is located approximately 130 km north of the town of Stewart in northwestern British Columbia. The Project is located approximately 95 km east from the coastal border of Alaska. The intake for the Project will be located at approximately N57º02'05" and W130º23'15" and the powerhouse will be located at approximately N57º01'51" and W130º22'28". The proposed point of interconnection (POI) of the transmission line will be located at approximately N56º56'22" and W130º16'11".

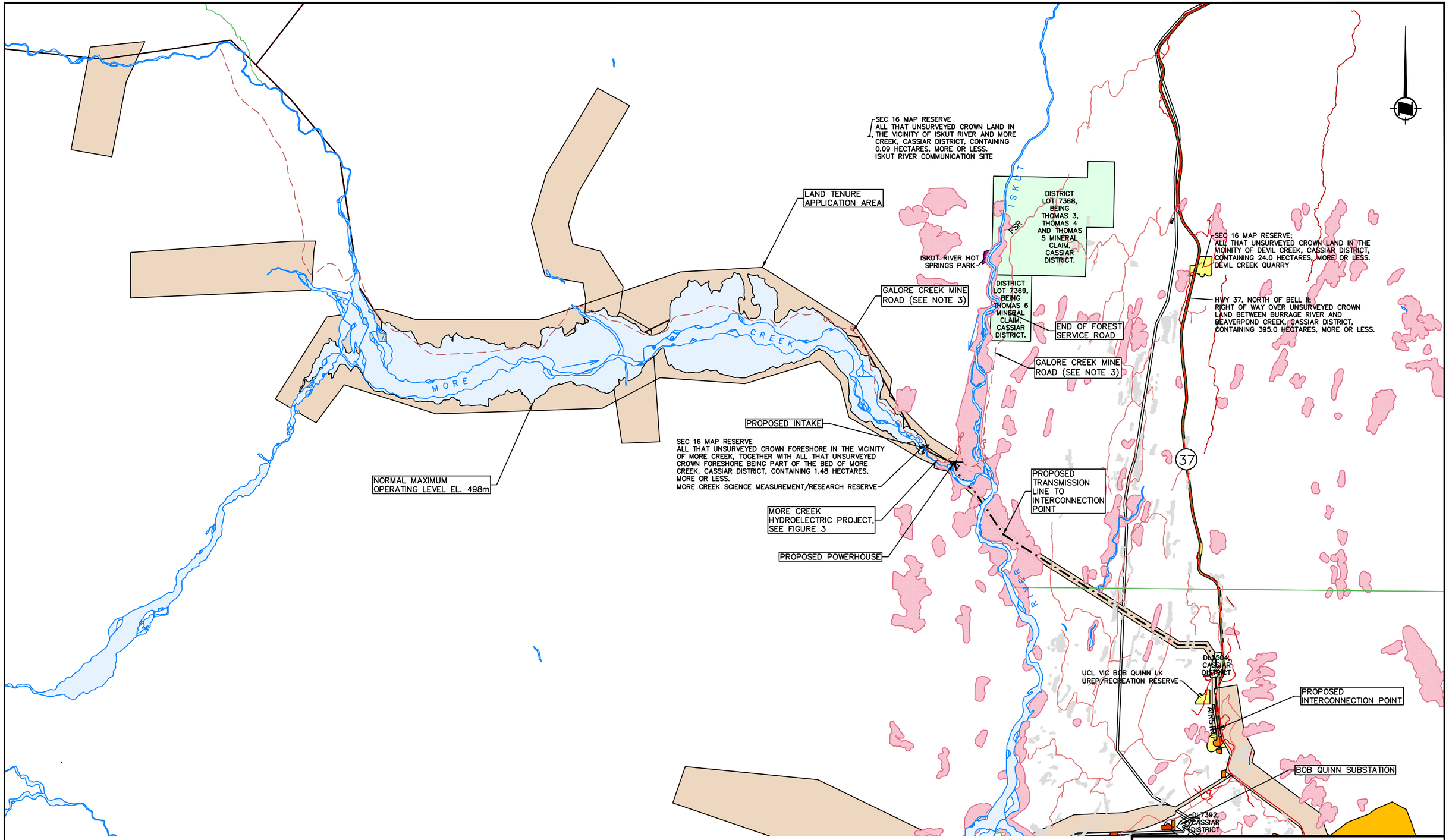
3.1.2 Site Plan

The Project will be located over eight (8) reaches of the mainstem of More Creek according to a preliminary desktop overview using MOE imap BC (accessed May 22, 2015). Figure 1 shows an overview of the Project area. The intake weir will extend across More Creek in a naturally confined area at the entrance to the More Creek canyon. The reservoir created by the intake weir will flood 2,680 ha of the U-shaped valley of More Creek including portions of its tributary drainages and portions of the Galore Creek mine road. The power tunnel and penstock will traverse along the left-bank side of More Creek before reaching the Project powerhouse located on More Creek's left bank. It is anticipated that the new road construction required for powerhouse and intake access will be in coordination with existing industry plans for the region. The new construction of a 13 km long 287 kV, three phase transmission line will connect the Project with the existing BC Hydro transmission line at the Bob Quinn Substation. It is anticipated that the powerline will cross the Iskut River and several other smaller drainages before interconnecting near Highway 37.

3.1.3 Project Maps

Figure 4, Figure 5 and Figure 6 have been developed for the Project Description to illustrate some of the following Project location details:

- Existing Infrastructure and Land Use;
- Nearby communities;
- Land ownership; and,
- Environmental sensitive areas
- Surrounding More Creek drainage;
- Hydrometric Stations



NOTES:

1. WATERCOURSES AND LAKES FROM BMGS, ILMB, CANADIAN HYDRO NETWORK 1.0–CL4–NC4; SOURCE DATA = BC–TRIM; SOURCE SCALE = 1:20,000
2. ADDITIONAL BASEMAP LAYERS DOWNLOADED FROM THE BC DATA DISTRIBUTION SERVICE.
3. GLORE CREEK MINE ROAD APPROXIMATED FROM GOOGLE EARTH.
4. CO–ORDINATE SYSTEM: UTM ZONE 9, NAD 83.

0 2 4 6 8 km

CROWN LICENCE:
- COMMUNICATIONS
- HYDRO
- INDUSTRIAL
- QUARRY
- RECREATION
- TRANSPORTATION
- TRAPPING BOUNDARY
- WIND

- FOREST RESERVE
- PROVINCIAL PARK
- PROPOSED WILDLIFE HABITAT – GRIZZLY

TANTALUS:
- SURVEY PARCELS
- LAND RIGHT–OF–WAY

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LAND USE & ENVIRONMENTALLY SENSITIVE AREAS

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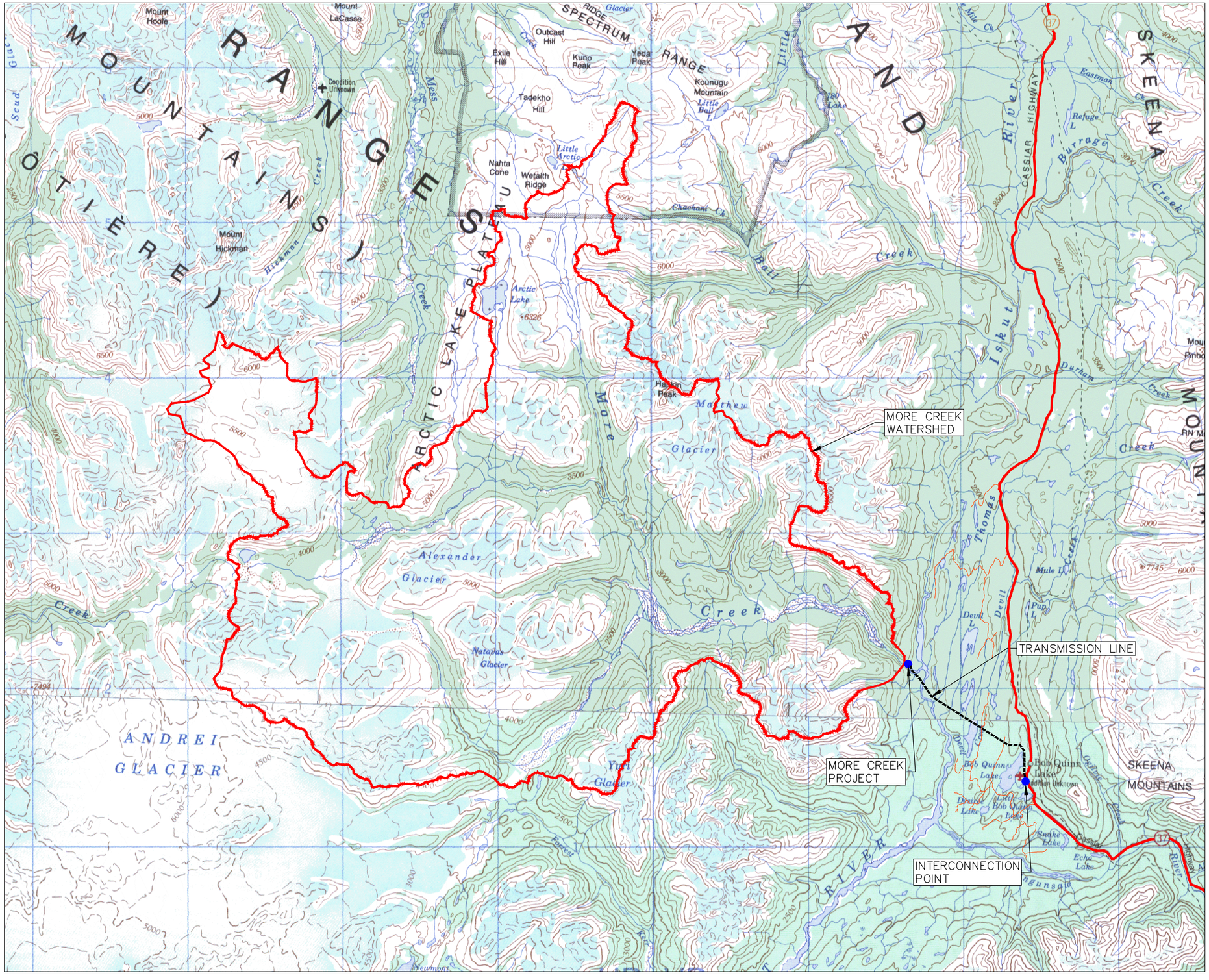

NOTES

1. BASE MAP FROM NTS 104B ISKUT RIVER & 104G TELEGRAPH CREEK, ORIGINAL SCALE 1:250,000
2. COORDINATE SYSTEM = UTM ZONE 9, NAD 83

0 5 10 15 20km

SCALE

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WATERSHED BOUNDARIES

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Dease Lake

08CD001

08CE001

Stikine River

08CG003

08CG005

PROJECT LOCATION

BOB QUINN SUBSTATION

Iskut River

08CF003

08CG001

08CG007

08CG004

CANADA

USA

ALASKA

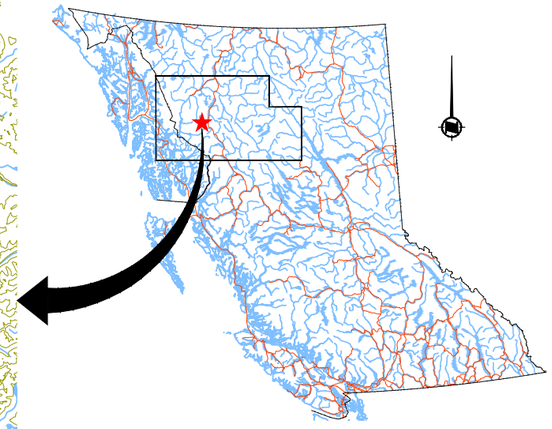
2000

1000

37

08DA005

Stewart



SOURCE:

BASEMAP GENERATED FROM CANVEC 1:1,000,000 DATA SET. HYDROMETRIC STATIONS, RUN-OFF ISOLINE AND DRAINAGE AREA LAYERS FROM DATA BC.

0 20 40 60 80 100 km

LEGEND

- WATER SURVEY OF CANADA HYDROMETRIC GAUGE LOCATION
- ANNUAL UNIT RUN-OFF ISOLINE – mm ($m^3/s/km^2$)
- CONTOURS (500m INTERVAL)
- MORE CREEK DRAINAGE AREA
- ISKUT RIVER DRAINAGE AREA

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MORE CREEK HYDROELECTRIC PROJECT
HYDROMETRIC STATIONS & RUN-OFF ISOLINES

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Waterbodies and Fishing Areas

There are numerous unnamed tributaries (upwards of 22 unnamed tributaries according to MOE imap accessed November 26, 2015) that drain into More Creek upstream of the proposed Project. Many of the tributaries draining into More Creek are first-third order headwater streams. More Creek has a natural mean annual surface area of 576 ha, the proposed reservoir for the Project will inundate 2104 ha impacting the unnamed tributaries. The use of these areas for First Nation and recreational fishing has not yet been determined. There are no known roads or other existing infrastructure in place for access to these areas except the Galore Creek road which extends into the proposed reservoir.

Existing Infrastructure

There is no known existing infrastructure located within the reservoir, intake, power-tunnel/penstock, powerhouse, and access road portions of the Project site. However, the alignment of the transmission line for the Project crosses three active forest roads: Block 49 100 Road (IDR18074) operated under a road permit of the Cassiar Forest Corporation and Forest Service Roads 1000 and 1400 (ID8975; Client: Timber Sales Manager Skeena).

Major infrastructure located nearby the Project includes: the Northwest Transmission Line located approximately 6 km east of the Project powerhouse, Highway 37 located approximately 7 km east of the Project powerhouse and the Bob Quinn Substation located approximately 13km east of the Project powerhouse.

More Creek is a tributary to the Iskut River with the proposed Project intake located approximately 2.5 km upstream from More Creek's confluence with the Iskut River. The Iskut River and its drainages have three existing conditional water licences located downstream of the Iskut River confluence with More Creek (Table 6). Volcano Creek is a tributary to the Iskut River and discharges upstream of the confluence of the Iskut River with Forrest Kerr Creek. The conditional water licence on Volcano Creek (C128967) has its point of diversion located approximately 38 km southwest of the More Creek Hydroelectric Project. The Volcano Creek Hydroelectric Project has a run-of-river configuration and a nameplate capacity of 16 MW.

McLymont Creek is a tributary to the Iskut River and discharges downstream of the confluence of the Iskut River with Forest Kerr Creek. The conditional water licence on McLymont Creek (C130640) has its point of diversion located approximately 43 km southwest of the More Creek Hydroelectric Project (downstream along the Iskut River). The McLymont Creek Hydroelectric Project has a run-of-river configuration and a nameplate capacity of 66 MW.

The conditional water licences on the Iskut River (C128205 and C130660) are for the Forrest Kerr Hydroelectric facility. This facility has a run-of-river configuration and has a nameplate capacity of 195 MW. The More Creek Hydroelectric Project is located approximately 37 km northeast and upstream of the Forrest Kerr facility. Preliminary estimates indicate that the More Creek Hydroelectric Project may facilitate a potential gain of 148 GWh of additional energy generation at the Forrest Kerr facility as a result of co-ordinated water management.

Table 6. Existing Water Power Infrastructure

Water Licence No.	Creek Name	Purpose	Quantity	Proponent
C128967	Volcano Creek	Power-General	9.9 m^3/s	Altagas Renewable Energy Inc.
C128205	Iskut River	Power-General	156 m^3/s	Coast Mountain Hydro Corp.
C130660	Iskut River	Power-General	96 m^3/s	Coast Mountain Hydro Corp.
C130640	McLymont Creek	Power-General	30 m^3/s	Altagas Renewable Energy Inc.
C130640	McLymont Creek	Storage-Power	61, 600m^3/year	Altagas Renewable Energy Inc.

Land Use

All components associated with the Project are located on British Columbia Crown Land. The Proponent has made applications for an Investigative Licence (IUL) and water licence for Power – General. An IUL was granted on May 14, 2015 (Land File: 6408748). The IUL if for a total area of 4,794 ha. This area will be reduced during the detailed design phase of the Project. A water licence under the *Water Act* was applied for on August 15, 2014 (Water Licence No. 6001458).

The Project is within the Cassiar-Iskut-Stikine Land and Resource Management zone based on the Cassiar-Iskut-Stikine Land and Resource Management Plan (LRMP, 2000). The LRMP identified key sectors within the LRMP area as the following: mining, tourism, retail and construction. However, forestry, fishing and agriculture were also identified at a much smaller scale. The economic sectors that the Project overlaps with predominantly include mining and hydroelectric development. The Project will aim to meet the objectives outlined within the Cassiar-Iskut Stikine Land and Resource Management Plan.

The LRMP indicates that the economic profile of the land management area is based primarily on natural resources and public administration. There is a high abundance of high quality natural resources in the area; however, economic development is hampered by limited infrastructure, long distance to markets, the long, cold winters and the small scattered population of the area (LRMP, 2000). Existing land use in the Project area and surrounding areas is largely linked to resource extraction, renewable energy generation and exploration activities associated with the development of these industries.

The surrounding Project area has historically been rich in mineral resources and there are a number of existing mineral resource extraction exploration activities in place. The Iskut-Stikine area is one of the richest and most active mineral exploration regions in the Province (LRMP, 2000). A list of mineral claims that overlap the Project area are provided in Table 7.

Table 7. Mineral Interests/Staking overlapping the Project Area

Tenure Type Description	Tenure #ID	Purpose/ Description	Requestor
Mineral and Placer	328865	Flooding	BC Hydro & Power Authority
Mineral and Placer	385933 328489	Hydro Project	Water Stewardship Division (MOE)
Mineral Claims	508337	Mineral	Galore Creek Mining Corporation

	508338 508124 408606 545725		
Mineral Claims	511113 692583	Mineral	Carl Alexander, Van Einsiedel
Mineral Claims	501812 518112 501927 502756	Mineral	Rimfire Minerals Corporation

No tree farm licences (TFL) have been identified over the Project area. Historically, no forest tenures have been issued in the Cassiar Timber Supply Area (TSA) in which, the Project is situated. Timber harvesting has typically been conducted under short term timber sales (LRMP, 2000). A list of the active forest cut blocks identified overlapping the land tenure area of the Project is provided in Table 8.

Table 8. Cut Blocks Overlapping the Project Land Tenure Area

File ID	Cut Block ID	Purpose	Holder
A64561	49-1 2 7 42		Cassiar Forest Corporation
L47464	1	Road Access & Mine Site	Galore Creek Mining Corporation
L49671	1	Clearing Zone	Highway 37 Power Corporation

Recreational land use that overlaps the Project area includes an active guide outfitter area held by Heidi Gutfrucht (Guiding Certificate # 600502; Object ID 230). There is also an overlapping licence of occupation for guided mountaineering/rock climbing commercial recreation in the Project area (Land File # 6406985).

There are no known Aboriginal communities or settlements in the Project area. However, traditional use of the land will require further consideration. The nearest known Aboriginal settlement communities in proximity to the Project are: Dease Lake and Telegraph Creek approximately 160 km and 110 km away from the Project site, respectively. Iskut, a smaller settlement area is located approximately 90 km away from the Project site.

The Project is within the asserted traditional territory of the Tahltan. The asserted traditional territory of the Tahltan is located along the Alaskan/Canadian border and includes part of the Yukon Territory encompassing about 93,500 km^2. The main reserves of the Tahltan First Nation are located at Telegraph Creek which is home to about 400 residents, of which approximately 350 are of Tahltan ancestry.[2] Dease Lake is another local community located about 50 km north of the Stikine River and is the junction to Telegraph Creek; the present population numbers at Dease Lake

[2] http://www.tahltan.ca/nation/territory/ Accessed: July 14, 2015

are approximately 475 of which approximately 45% are Tahltan.[1] A list of some of the nearest aboriginal reserves to the More Creek Hydroelectric Project site are provided below. Aboriginal reserves listed below and marked with an "*" are occupied, unmarked reserves are either unoccupied or no data is available.

Iskut 6*	Guhthe Tah 12*	Salmon Creek 3	Upper Tahltan 4
Kluachon Lake 1	Telegraph Creek 6*	Telegraph Creek 6A*	Tahltan Forks 5
Stikine River 7	Classy Creek 8	Tahltan 1	Hiusta's Meadow 2
Tahltan 10			

*Occupied as per http://www.city-data.com/canada/British-Columbia-Index.html

Iskut 6 and Kluachon Lake 1 Reserves are the closest to the Project area and are located approximately 90 km north northeast from the Project site.

The proposed More Creek Hydroelectric Project is located within the Kitimat-Stikine Regional District. The population in the Kitimat-Stikine Regional District was estimated at 37,361 in 2011[3]. Nearly 21,251, residents live within five incorporated municipalities in this district. The closest municipalities to the Project area include Stewart, approximately 87 km to the south, and New Hazelton, approximately 260 km to the southeast. As of 2011, Stewart had a population of approximately 494 and New Hazelton had a population of approximately 666[2].

Environmentally Sensitive Areas

The Project's settings and infrastructure do not encroach on any Provincial or National Park boundaries. The nearest Provincial parks to the Project area are Iskut Hot Springs Provincial Park located approximately 38km northeast, Mount Edziza Provincial Park located approximately 30 km northwest of the Project and Ningunsaw Provincial Park located approximately 20 km southeast of the Project.

The Cassiar Iskut-Stikine Land and Resource Management Plan (2000) has identified several area-specific management objectives over the Project area. A large portion of the Project site is located within high value Grizzly Bear and Marten habitat. There is a lesser portion of the Project site that is located in high value Moose habitat. For all three of these species there are specific management objectives identified by the LRMP.

There is a proposed Wildlife Habitat Area (WHA) for Grizzly Bears (WHA ID 247345) in the vicinity of the Project area. No other wildlife habitat areas have been identified over the Project site.

The Proponent is committed to ongoing consultation with representatives from MFLNRO, DFO, MOE, and Project stakeholders with the objective to minimize the impact of development to environmentally sensitive areas overlapped by the Project.

[3] http://www.bcstats.gov.bc.ca/StatisticsBySubject/Census/OpenData.aspx Accessed: July 13, 2015

3.1.4 Photographs

The following photographs near the Project site were sourced by the Proponent from Appendix G of the Galore Creek Power Supply Pre-Feasibility North Route Study.

Downstream near Road Km 18-Photo 1

Downstream near Road Km 44-Photo 2

Downstream near Road Km 54-Photo 3

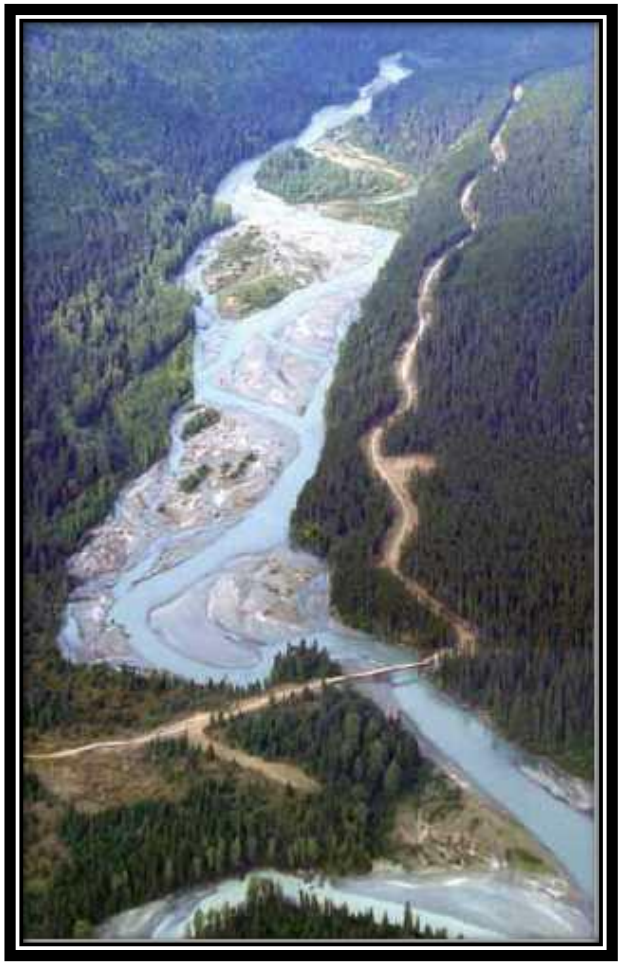
Downstream Panoramic view near Road km 56-Photo 4

Upstream near Road Km 52-Photo 5

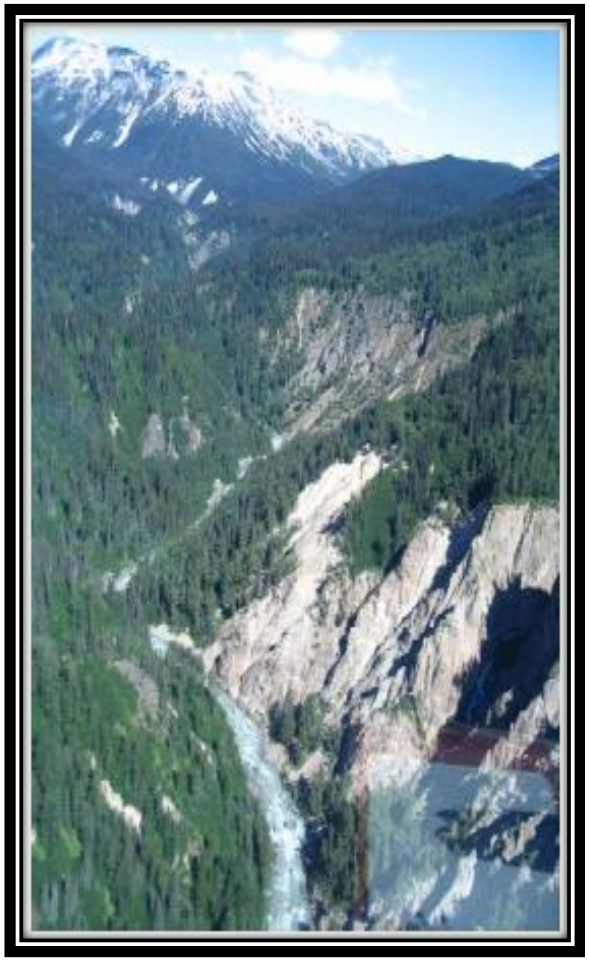
Upstream near Road Km 23-Photo 6

Just upstream of More Creek canyon-Photo 7

Looking south-west near Road Km 58 Photo 8



The Iskit River Bridge at the confluence of More Creek and the Iskit River



Upper More Creek looking upstream

Photograph: Mouth of More Creek, Jay P Kawatski

Site visits are anticipated to occur following the submission of the Project Description. During the site visits additional photo documentation of the site area will take place.

3.1.5 Proximity of the Project

The Project is not located on any federal lands. The nearest National Park is the Gwaii Haanas National Park Reserve and Haida Heritage Site located approximately 450 km from the Project site. Locations of First Nation communities and settlement areas are described under Land Use. The Project is located approximately 95 km east from the border of Alaska.

The Project area is within a region of British Columbia that is characterized as having small scattered communities typically located along highway infrastructure. No permanent, seasonal or temporary residences have been identified as occurring in the Project area based on a preliminary desktop overview. It is anticipated that during consultation with Project stakeholders any residences present within the Project area, used for permanent, seasonal or temporary uses, will be identified. The nearest communities to the Project are Bell II, approximately 60 km away, and Iskut approximately 90 km away.

3.2 Land and Water Use

3.2.1 Zoning Designations

The Project area is located outside of all municipal boundaries; therefore, zoning designations for the Project area will be established by the regional district. The Project is entirely located within the Kitimat-Stikine Regional District Electoral Area D. The Project Area is outside of the zoning boundary of the Kitimat-Stikine Regional District and therefore, classified as un-zoned. Under the "un-zoned" classification it is anticipated that no rezoning will be required for the Project.

3.2.2 Land Use and Legal Land Descriptions

The local study area of the Project, as defined by the IUL (4794.173 ha), is located entirely over Crown Land for both surface and subsurface ownership. The Crown in the right of British Columbia owns More Creek, including the beds and shores. No surface or subsurface Federal Lands have been identified within this area. No private lands overlap the Project area.

The legal description of the land as written in the IUL is as follows: all that unsurveyed Crown Land in the vicinity of More Creek, Cassiar District, containing 4,578.877 hectares, more or less and all that unsurveyed Crown Land in the vicinity of More Creek, Cassiar District, containing 215.296 hectares, more or less.

No tree farm licences, conservancies, federal or provincial parks or recreational sites have been identified over the Project area based on a desktop overview. A desktop overview was conducted using imapBC to identify the active interests over the proposed Project area (See Table 9). At this preliminary stage in Project development no permanent, seasonal or temporary residences have been identified over the Project area.

Table 9. Active Crown Land Interests over the Project area

Crown Land Interest in the Project Area	Number of Active Interests
Forest Service Roads (Cassiar Forest Corp)	1
Guide Outfitter Certificate	1
Bob Quinn Substation	1
Northwest Transmission Line	1
Highway 37	1
Mineral/Placer/Coal Reserve	5
Trapline Areas (501701, 501714, 501723)	3
Water Licence Applications	3
Total Active Interests	**16**

Road use in the Project area will include use of Forestry Roads maintained and operated by the Cassiar Forest Corp. Use of all forestry roads and any required upgrades will be discussed during consultation with the appropriate forest road permit holder and the Ministry of Forests, Lands, and Natural Resource Operations (MFLNRO), as appropriate. Highway 37 is located approximately 7 km east of the proposed Project.

3.2.3 Water Use

Based on a web query search conducted on November 26, 2015 there are no other water licences on More Creek. However, there are three water licence applications on tributaries that discharge directly into More Creek in the vicinity of the Project. A list of these water licence applications are provided in Table 10.

Table 10. Potential Water Use in the Vicinity of the Project

Water Licence No.	Creek Name	Purpose	Quantity	Proponent	Priority Date
Z125233	ZZ Creek (83182)	Power-General	2.8 m^3/s	Northern Hydro Limited	2009/08/28
Z125227	ZZ Creek (83164)	Power-General	1.0 m^3/s	Northern Hydro Limited	2009/08/28
Z125232	ZZ Creek (83198)	Power-General	2.85 m^3/s	Northern Hydro Limited	2009/08/28

It is anticipated that the More Creek Project will bring critical infrastructure closer towards the proposed Northern Hydro Limited projects listed in the table above, which may improve development feasibility of these sites. There may be a conflict with water licence application (Z125227) as a result of the More Creek Hydroelectric Project development. However, it is not expected that the other two listed water licence applications will be affected. Additional assessments and consultation with Northern Hydro Limited will be coordinated by the Proponent.

3.2.4 Relevant Planning Documents used for Consultation Purposes

The relevant planning documents that will direct the development of the Project will include those identified by the Regional District and specific to the zoning designation and requirements of the Project area. In addition, the Cassiar Iskut-Stikine Land Resource Management Plan will also guide the direction of consultation and development of the Project. As discussed in Section 3.1.3 "Land Use", the majority of the Project area is located within the General Management Zone; however, area-specific management will be implemented for special interest and high value resources such as Grizzly Bears that are identified in the LRMP (2000).

3.2.5 Use of Traditional Lands for Project Development

Based on early engagement and documented historical knowledge of the Project area it is likely that the traditional lands in the Project area are those of the Tahltan First Nation and Métis Nation BC. The Proponent has commenced early consultation with the Tahltan First Nation and has begun preliminary discussions regarding their traditional use of the land surrounding More Creek. The Proponent commits to ongoing consultation with the Tahltan First Nation and Métis Nation BC and anticipates these consultation efforts to include meetings and open houses that allow the aboriginal groups to share their traditional history. The objective of First Nation consultation will be to fully understand the potential impacts of the Project to the First Nation's traditional use and/or other values of the land. The Proponent will make requests for the Tahltan First Nation and Métis Nation BC to partake in the environmental studies conducted for the Project.

It is the ongoing commitment of the Proponent to work with First Nations to understand their traditional use in the area and the potential impacts of the Project to their traditional use.

The Project will inundate an area of approximately 2,104 ha of land overlapped by the Tahltan First Nation traditional territory. AHC's preliminary understanding of traditional use over the proposed Project area includes activities for hunting, berry-picking and mushroom picking. These activities would be impacted by the creation of the storage-reservoir. The storage reservoir created by the Project will preclude the use of the formerly terrestrial area for traditional uses. The construction of Project access roads has the potential to increase public access to the area which could enhance traditional use in the area.

Based on preliminary desktop review of traditional use, the past use of the Project area is hypothesized to have been relatively light and the area is not anticipated to represent an intensive traditional use activity zone. Country food harvesting activities associated with berry-picking, mushroom picking, and hunting may be impacted by the road access created by the Project which would facilitate increased access to the area. Increased access to the Project area may increase the pressure on country food resources and/or increase traditional use activities in the Project area. The reservoir created by the Project may impact the country food harvesting activities by flooding potential country food harvest zones and altering/ removing wildlife habitat previously used for hunting activities. Furthermore, the Project has the potential to fragment wildlife habitat and disturb existing wildlife habitat which could result in wildlife avoidance of the Project area. Any wildlife avoidance of the Project area would negatively impact the hunting activities associated with the Project area. Previous records have demonstrated archaeological sites tended to be within the subalpine zone, where travel routes are more accessible, consequently, the impact to traditional use caused by reservoir flooding for the Project in the lower valleys may be less significant.

Traditional use of fishing resources by First Nations in the region were typically focused around fish sites on the Stikine River and its major tributaries. However, freshwater fisheries resources are present in More Creek. The More Creek morphology will be substantially altered by the reservoir created by the Project and this will change the fish habitat composition upstream of the Project intake. The Proponent will consult with First Nations to determine how the altered stream morphology may impact traditional use related to fisheries activities in More Creek.

4. FEDERAL INVOLVEMENT

4.1 Federal Financial Support

The Project development, construction, and operation will be financed privately. There is no known or anticipated financial support expected from the federal government at this time.

4.2 Use of Federal Lands for the Project

No portion of the Project will be situated over federal lands or interests. The Project will be located entirely on British Columbia Crown Land.

4.3 Federal Regulatory Requirements

The proposed Project may trigger a Canadian Environmental Assessment Agency (CEAA) review according to the *CEAA* 2012, Regulations Designating Physical Activities Schedule 4 which states the following "the construction, operation, decommissioning and abandonment of a new dam or dyke that would result in the creation of a reservoir with a surface area that would exceed the annual mean surface area of a natural water body by 1,500 ha or more". The Project reservoir is anticipated to inundate an area of approximately 2,680 ha. Consequently, the Proponent is submitting a Project Description to CEAA for review to determine whether an environmental assessment completed by CEAA will be required.

Additional federal regulatory permits that may be required include an authorization under the *Navigable Waters Protection Act* and an authorization may be required under the *Fisheries Act*, should serious harm to fish be unavoidable during Project development. Following further consultation and investigative studies these permit requirements will be confirmed. A list of the preliminary federal regulatory requirements that may be required for the Project are summarized in Table 11.

Table 11. Preliminary Federal Regulatory Requirements

Act, Regulation, Code of Practice or Guideline	Regulatory Body
Canadian Environmental Assessment Act, SC 2012, c.19, s.52	Canadian Environmental Assessment Agency
Fisheries Act, RSC 1985, c.F-14	Fisheries and Oceans Canada
Navigation Protection Act, RSC 1985, c.N-22	Transport Canada

As Project design and environmental studies are completed the final permitting requirements for the Project will be defined and outlined in the final submission of the Project Application.

5. ENVIRONMENTAL EFFECTS

The objective of this section of the Project Description is to identify potential impacts to the environment that may result from development, construction and operation of the Project. The potential environmental effects outlined herein are based on preliminary information and desktop review of existing historical data. Once the Project has completed its environmental studies a complete analysis and verification of the environmental effects caused by the Project will be conducted. The environmental studies and environmental effects analysis will be included as part of the final Application submissions for the Project.

5.1 Physical and Biological Setting

5.1.1 Air Quality, Noise and Climate

Air Quality

The Cassiar Iskut-Stikine LRMP identified clean air as one of the competitive advantages to the region (LRMP, 2000). The nearest ambient air monitoring sites in the vicinity of the Project are identified in Table 12. The Telegraph Creek ambient air quality site is located approximately 72 km northwest from the Project site and has approximately 17 years of air quality data for PM_{10}. In addition, a number of environmental air monitoring stations have been established under air permits for industrial activity in the region (see Table 13).

Table 12 . Ambient Air Sites

Monitoring location ID	Client Location ID	Location Purpose Code	Location Type Code	Office Code	Description	Date Est.	Monitoring Location Name	Object ID	Distance from Project
E233102	56	1	01	60	Teom at Tahltan School for Emergency Forest Fire Readings	7/24/1998	Telegraph Creek	18493	~72 km NW
E302530	49	3	01	60	Road use land clearing	6/16/2015	Brucejack Mine: Fugitive Dust sources at Wildfire Camp	34930	~78 km SE

Table 13. Air Permit Monitoring Sites

Monitoring ID	Client Location ID	Discharge Media Code	Location Purpose Code	Location Type Code	Office Code	Description	Est.	Name	Object ID	Distance from Project
E265902	49	4	3	29	60	Auxiliary fuel fired refuse incinerator located north of Bob Quinn Lake on km 3 of Devil's Creek FSR	3/15/2007	Galore Creek – Bob Quinn/Sus Camp Incinerator – PA - 18297	22630	~10 km NE
E216073	49	4	3	29	60		7/24/1991	PR9072 BCBC Bob Quinn Incinerator	9925	~10 km SE
E267362	49	4	3	29	60	Round Lake Camp (Hooh Camp) is located at km 74.5 along the proposed Galore Creek Mine access road north of Bob Quinn Lake BC. (Mineral Tenure 516452)	6/27/2007	Galore Creek Mine Camp Incinerator 18357	24309	~42 km W
E267363	49	4	3	29	60	Located at km 89 on the proposed Galore Creek Mine Access Road, north of Bob Quinn Lake. Mineral Tenure 516441	6/27/2007	Galore Creek Mine Camp Incinerator 18358	24310	~52 km W
E284437	49	4	3	29	60	Construction camp incinerator for Forrest Kerr hydroelectric project, located near confluence of Iskut River and Forrest	12/9/2010	Incinerator Forrest Kerr 105259	30368	~ 40 km SW

Monitoring ID	Client Location ID	Discharge Media Code	Location Purpose Code	Location Type Code	Office Code	Description	Est.	Name	Object ID	Distance from Project
						Kerr Creek approx.. 95 km northwest of Stewart BC				
E222213	49	4	3	29	60	Auxiliary fueled incinerator for mine camp that closed in 2008. Incinerator still used for remaining maintenance staff. When >100 people no authorization needed	10/26/1995	Incinerator- Eskay Creek Mine PR-12977	13874	~42 km S
E296239	49	4	3	29	60	Controlled air, double chambered, refuse incinerator for incineration of putrescible waste	1/22/2014	KSM Camp 6 (Treaty Saddle Camp) – MSW Incineration	34726	~49 km S
E296270	49	4	3	29	60	Controlled air, double chambered, refuse incinerator for incineration of putrescible waste	1/23/2014	KSM Camp 22 (Treaty Operating) – MSW Incinerator	34912	~48 km SE
E296251	49	4	3	29	60	Controlled air, double chambered, refuse incinerator for incineration of putrescible waste	1/23/2014	KSM Camp 5 (Treaty Plan) – MSW Incinerator	34043	~48 km SE

Noise

The Project area is situated over lands generally classified as rural. It is anticipated that noise generated in this rural area will largely result from natural occurrences from wildlife and geomorphological processes. However, anthropogenic noise generation in the area may be associated with the nearby Highway 37 and other resource industry developments in the area including the Galore Creek Mine and investigative works associated with run-of-river developments on tributaries to More Creek.

Climate

The majority of the Project area is located within the Sub-boreal Interior Ecoprovince and the Northern Skeena Mountains Ecosection. This ecosection is dominated by the Interior Cedar Hemlock very wet cold (ICHvc) biogeoclimatic zone with higher elevation areas being a part of the Engelmann Spruce Subalpine Fir – wet very cold biogeoclimatic zone (ESSFwv). The majority of the Project area is located within the Interior Cedar-Hemlock wet-cold biogeoclimatic zone the rest of the Project is located within the Engelmann Spruce-Subalpine Fir undifferentiated biogeoclimatic zone. Generally, the ICHvc has an interior, continental climate dominated by easterly moving air masses that produce cool wet winters and warm dry summers (Ketcheson et al., 1991). The ICHvc is characterized by "devil's club" zonal associations, Roche spruce, feathermosses, and subalpine fir (Ketcheson et al., 1991). The ESSFwv has a relatively cold, moist, and snowy continental climate with short cool growing seasons and long cold winters (Coupe et al., 1991). Engelmann spruce and subalpine fir are the dominant climax tree species in the ESSFwv (Coupe et al., 1991). The Project area climate classification is summarized in Table 14.

Table 14. Climate Classification of Project Area

Climate Classification	Project Area
Ecodivision	Humid Continental Highlands (HCH)
Ecodomain	Humid temperate (HUT)
Ecoprovince	Sub-boreal Interior (SBI)
Ecoregion	Skeena Mountains (SKM)
Ecosection	Northern Skeena Mountains

The Canadian Climate Normal stations located in closest proximity to the Project are Stewart A located approximately 125 km south of the Project and Dease Lake located approximately 160 km north from the Project. However, Stewart A represents a wetter and warmer climate as it is located closer to the coast and at a lower elevation. Dease Lake represents a drier and cooler climate as it is located further north and into the interior of the Province. These stations are anticipated to be most representative of the Project area climate. The data from these two Canadian Climate Normal stations are provided in Figure 7 and Figure 8. The Stewart A station is located at an elevation of 7.30 m AMSL. The Dease Lake station is located at an elevation of 808.60 m AMSL.

Potential Project Effects on Air Quality, Noise and Climate

Common air contaminants criteria has been identified by British Columbia air quality objectives and includes carbon monoxide (CO); nitrogen oxides (NOx); sulphur oxides (SOx); total reduced sulphur (TRS); volatile organic compounds (VOCs); Ammonia and particulates with PM_{10} and $PM_{2.5}$ size breakdowns. It is the objective of the Project to ensure that all Project phases will be in compliance with the air quality objectives set out by the Province.

Air quality could be impacted by the Project during the construction phase as a result of the emissions from trucks and heavy machinery and dust generation from machinery movement on site and potential blasting activities. It is anticipated that impacts to air quality during Project operations will be negligible as hydroelectric power generation has no emissions. However, localized traffic in the area may result in minor increases to air emissions.

Noise generated by the Project will be most significant during the construction phase when construction related activities generate noise and vehicle traffic is greatest. During Project operations noise levels will be minimal. No noise generation is anticipated at the Project intake except for the noise created by water cascading into More Creek at the spillway. At the Project powerhouse the electrical equipment will create a slight humming noise; however, it is anticipated that the noise created from the naturally cascading water in More Creek and the nearby Iskut River will be louder. During operations vehicle access to the site also has potential to generate noise. Noise generated from vehicle access will be minor, short-lived and intermittent.

Impacts to the climate caused by the Project will be via the emission of greenhouse gases from construction and reservoir emissions. There may be methane emissions that are created by the decaying organic material in the storage reservoir. It is anticipated that any emissions generated by the Project during development will be entirely offset by the Project during operations when clean, renewable energy will be produced.

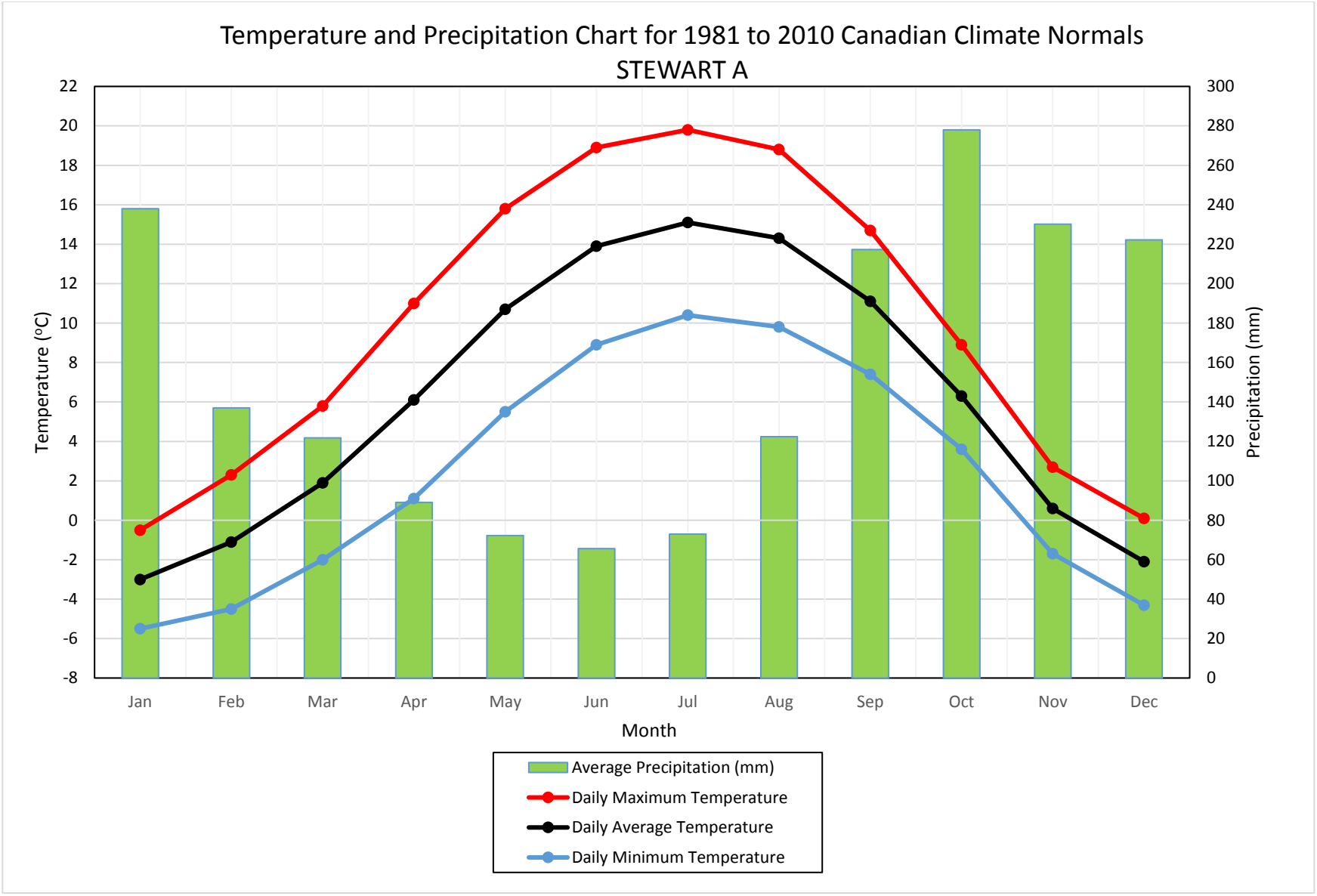


Figure 7. Temperature and Precipitation Chart for 1981 to 2010 Canadian Climate Normals STEWART A

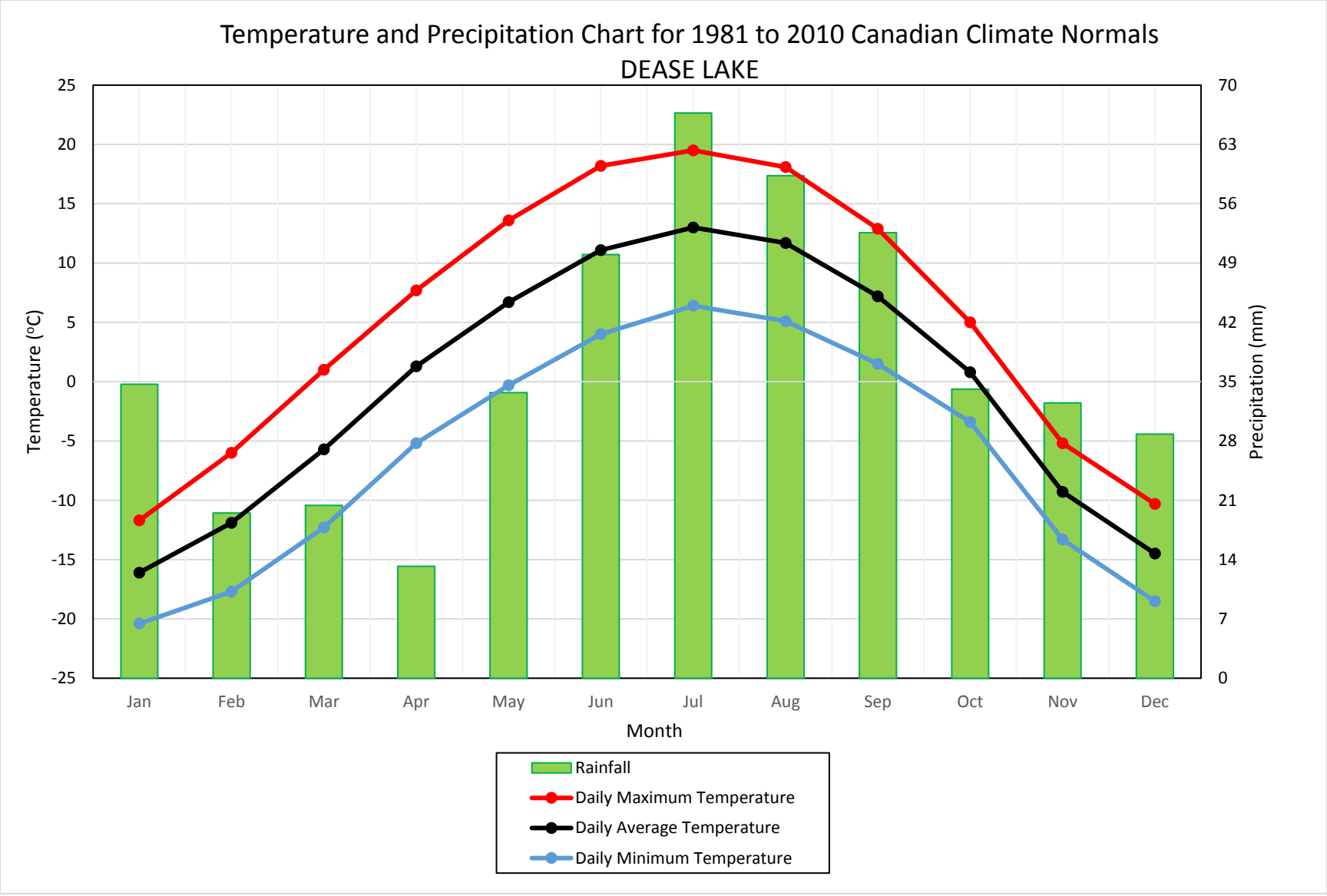


Figure 8. Temperature and Precipitation Chart for 1981 to 2010 Canadian Climate Normals DEASE LAKE

5.1.2 Geology, Terrain and Soils

Geology

The Project area lies along the margin of the Intermontane and Coast belts and is underlain by rocks of the Stikine terrane (Stikinia) which is the largest arc terrane in the Canadian Cordillera. The geology of the More Creek area is characterized by quaternary sediments including glacial deposits, colluvium and alluvium in its flood plain area and the upper Triassic Stuhini Group outside of the flood plain area (Alldrick, et al., 2004). Upper Triassic Stuhini Group rocks in the More Creek area comprise a thick package of predominantly volcanic arc derived sediments, limestones and intercalated intermediate to mafic volcanic rocks (Logan et al., 1991).

The Project area is located at the intersection between the Stikine Plateau, the Skeena Mountains, and the Coast Mountains where the western physiographic system meets the interior system. The secondary physiographic rank of the Project area includes the Tahltan Highlands (part of the Stikine Plateau) to the north and the Boundary ranges (part of the Coast Mountains) to the south. The majority of the Project area is within the Coast Mountain boundary range. The Boundary Ranges are the steep, rugged, northernmost portion of the Coast Mountains. The Coast Mountains extend from Washington to the Yukon border and form a 50-80 km wide band (Fenger and Kowall, 1992). The bedrock within the Boundary ranges consists of intrusive, igneous, acidic rocks such as granodiorite, quartz monzonite, and quartz diorite and basic metamorphic or volcanic rocks (i.e. schist, gneiss, and andesite) (Fenger and Kowall, 1992). Many geological processes have shaped the rock formations in the area including glaciation and glacial recession, fluvial activity, volcanic activity, and cold weather processes.

The generalized bedrock geology of the Project area is undifferentiated sedimentary and volcanic rocks along the eastern portion of the Project area, volcanic rocks such as basalt, andesite, rhyolite, trachyte, cinders, and ash along the western-most portion of the Project area, and plutonic rocks such as granodiorite, quartz diorite, quartz monzonite, syenite, monzonite, diorite, felsite, and feldspar porphyry in the More Creek headwaters area (Fenger and Kowall, 1992). Mapping conducted by Alldrick et al., 2004 indicates that the More Creek valley includes rock formations of dacite, massive, aphyric flows to well-bedded tuff, and volcanic conglomerate on the western portion of the Project area and volcanic sandstone, thick-bedded pale green, angular limestone clasts, enhedral plagioclase grains and finely interbedded black to grey siltstone to the east. The rocks underlying the dam site are composed of metavolcanics (andesites) and very fine-grained felsites; the andesite rocks are exposed as a sequence of north-south parallel trending bands lying across the More Creek Valley (BC Hydro, 1984).

The distribution of surficial materials in the Project area is caused by a combination of ice (glaciers) and moraine processes at the More Creek headwaters, moraine and rock processes along the surrounding valley slopes of the More Creek canyon, and fluvial processes in the More Creek floodplain (Fenger and Kowall, 1992).

BC Hydro conducted preliminary geotechnical work in 1971 and from 1979 to 1983 during which regional geological mapping and detailed geological mapping at the proposed dam site were conducted in addition to reservoir shoreline studies (BC Hydro reports GEO 18-82 and H 1681; BC Hydro, 1984). During investigative studies conducted by BC Hydro it was determined that the rock forming the abutments at the Project dam site will provide suitable foundation for either an embankment or arch dam (BC Hydro reports GEO 18-82 and H 1681; BC Hydro, 1984). BC Hydro

also noted that underground excavation conditions were expected to be good and that concrete linings would not be considered structurally necessary in any sections of the tunnel, instead, shotcrete and rock reinforcement could be used where faults or other soft rocks intersect the tunnel (BC Hydro reports GEO 18-82 and H 1681; BC Hydro, 1984).

AHC will review all relevant geological and geotechnical reports that have been conducted over the Project area as part of the Project's geotechnical assessment. Based on AHC's preliminary review of the available data it is anticipated that additional studies at the More Creek Canyon area will be required to verify the nature and quality of the abutment rock across the proposed dam axis, and nature of shear zones and competency of bedrock in the vicinity of the powerhouse.

Terrain

The Project intake is located within a canyon section of More Creek where the U-shaped valley, formed through glaciation processes, naturally narrows. The More Creek channel has a low-gradient slope ranging between 0.2-2.1% (IMAP BC; accessed May 2015). On either side of the More Creek channel are steep slopes that form the U-shaped valley and may have moderate erosion and slope instability risk. More Creek discharges directly into the Iskut River.

Soils

The soils of the More Creek valley are regosols at low valley elevations and transition into humo-ferric podzols at higher elevations in the valley. The highest elevations of the surrounding Project area are composed of ice, rock and regosol (Fenger and Kowall, 1992). Regosols are young, unweathered soils with poorly developed soil horizons and are typically derived from annual or periodic fluvial deposits. These type of soils regularly receive new surface deposits during the snowmelt. Humo-Ferric Podzols are deeply weathered soils with a dark organic enriched surface layer. Humo-Ferric soils have a B horizon with less than 5% organic carbon and are more extensive at lower elevations (Fenger and Kowall, 1992).

The Cassiar Iskut-Stikine LRMP (2000) has identified agricultural operations in the area as limited due to the short growing season and distance to larger markets. It is anticipated that the steep valley slopes and active More Creek floodplain will preclude agricultural development in the Project area. The ESSF biogeoclimatic zone has a very low capability for agricultural use because of its adverse climate and topography; livestock grazing during the brief summer season in the biogeoclimatic zone is the only significant agricultural use and is limited to wetlands and forest openings (Coupe et al., 1991).

Potential Project Effects on Geology, Terrain and Soils

Project effects on geology, terrain, and soils are primarily associated with the creation of the 2,680 ha water storage-reservoir. The following potential effects from the Project on geology, terrain and soils are identified:

- Installation of Project infrastructure and creation of the storage-reservoir may create slope instability and shoreline erosion. Project design will require the flooding for a reservoir area which will also alter the underlying soil composition.
- Machinery and equipment use at the Project site during plant construction and operation has the potential for fuel and/or chemical spills to the soil.
- Project construction may result in soil disturbance. Soil compaction and altered drainage patterns from Project construction may cause additional soil disturbance.
- There is potential for acid rock generation at the site during rock excavation and blasting activities.

5.1.3 Vegetation

The Project is located across two biogeoclimatic zones including the Interior Cedar Hemlock very wet cold (ICHvc) at lower elevations and the Engelmann Spruce Subalpine Fir – wet very cold biogeoclimatic zone (ESSFwv) at higher elevations. Important valued ecosystem components associated with vegetation in the Project area may include riparian areas, rare plant communities, and rare plant species.

In the ICHvc zone the dominant climax tree species include the western redcedar and western hemlock in mature forests. Other tree species that are common include white spruce, Engelmann spruce, their hybrids, and subalpine fir. Extensive wetlands are infrequent in this zone due to the steeply sloping mountainous terrain characteristic of the zone. Vegetation common to the wet subzone includes *Gymnocarpium dryopteris*, *Oplopanax horridus*, *Streptopus roseus* (rosy twistedstalk), *Dryopteris expansa* (spiny wood fern), and *Mnium spp* (Ketcheson et al., 1991).

In the ESSF zone the dominant climax tree species include the Engelmann spruce and subalpine fir. Mature stands are dominated by spruce which are typically longer lived than subalpine fir. At higher elevations and in areas of greater moisture subalpine fir will frequently dominate the forest canopy. Other tree species that may occur in this zone include mountain hemlock, Amabilis fir, western white pine, Douglas-fir, western hemlock and western redcedar as well as lodgepole pine, whitebark pine, limber pine, and alpine larch in drier areas of the zone. Deciduous trees are uncommon in the ESSF. The wet cold ESSF zone has a moderately dense ericaceous shrub layer and a very productive luxuriant herbaceous layer on zonal sites. Characteristic species of these subzones are *Vaccinium ovalifolium* (oval-leafed blueberry), *Gymnocarpium dryopteris* (oak fern), *Tiarella unifoliata* (one-leafed foamflower), *Streptopus roseus* (rosy twistedstalk), and *Valeriana sitchensis* (Coupe et al., 1991).

Other regionally important plant species, including those on the provincial red and blue lists and those protected under the federal *Species at Risk Act* (SARA), that may be located within the Project area, as defined by the Skeena Stikine Forest District, include, but are not limited to those provided in Table 15.

Table 15. Regionally important, provincially and federally listed plant species with the potential to occur in the Project area

Scientific Name	Common Name	Status					CF Priority
		Provincial	BC List	COSEWIC	SARA	Global	
Andreaea rupestris var. papillosa		S1(2011)	Red			G5TNR	2
Botrychium ascendens	Unswept moonwort	S3(2015)	Blue			G3(2011)	1
Botrychium crenulatum	Dainty moonwort	S2S3 (2015)	Blue			G3(2011)	2
Carex krausei	Krause's sedge	S2S3(2015)	Blue			G4(1994)	3
Carex lenticularis	Lakeshore sedge	S3(2011)	Blue			G5T5(1988)	
Draba lactea	Milky draba	S3(2015)	Blue			G5(2012)	3
Epilobium hornemannii ssp. behringianum	Hornemann's willowherb	S2S3(2000)	Blue			G5T4(1994)	3
Festuca minutiflora	Little fescue	S3(2015)	Blue			G5(1993)	3
Geum rossii var. rossii	Ross' avens	S2S3(2008)	Blue			G5T5(1994)	3
Hygrohypnum alpinum		S3(2015)	Blue			G4G5(2007)	3
Juncus albescens	Whitish rush	S3(2015)	Blue			G5(1989)	
Lescuraea saxicola		S3(2015)	Blue			G4G5(1991)	2
Nephroma occultum	Cryptic paw	S2S3(2007)	Blue	SC(2006)	1-SC(2007)	G4(2007)	2
Pedicularis parviflora ssp. parviflora	Small-flowered lousewort	S2(2015)	Red			G4T4(1994)	4
Plantago eriopoda	Alkali plantain	S3(2008)	Blue			G5(1996)	4
Pohlia elongata		S3(2015)	Blue			G4G5(1991)	3
Polemonium boreale	Northern Jacob's ladder	S3(2015)	Blue			G5(1989)	3
Ranunculus pedatifidus ssp. affinis	Birdfoot buttercup	S3(2015)	Blue			G5T5(1991)	3
Rumex arcticus	Arctic dock	S3(2015)	Blue			G5(1991)	4
Silene drummondii var. drummondii	Drummond's campion	S3?(2015)	Blue			G5T5(1997)	4
Ulota curvifolia		S3(2015)	Blue			G3G5(1991)	2
Warnstorfia tundrae		S2(2015)	Red			GU(2000)	2

Potential Project Effects on Vegetation

The most significant impacts to vegetation will be caused by the creation of the reservoir-storage area. The flooding of approximately 2,104 ha is proposed for the Project water reservoir-storage. This will result in the permanent loss of vegetation in the 2,104 ha area that is flooded and will include permanent losses to vegetation communities and potentially rare plant communities and rare plant species. During the development phase of the Project the vegetative communities will be identified and mapped to assess the scope of impacts to these valued ecosystem components. Riparian and wetland communities in the Project area will also be identified and mapped. An assessment of the impact to riparian and wetland communities will be conducted. The Project will also result in the loss of bottom land riverine forest located in the More Creek valley. Flooding of the land will cause existing organic matter from vegetation and soils to rot and this process will result in the emission of methane (CH_4) and carbon dioxide (CO_2) to the atmosphere. The most significant emissions caused by decaying vegetation will occur directly following reservoir filling. The emissions from vegetation that decays as a result of flooding will contribute to greenhouse gas pollution.

5.1.4 Water

Ice Processes

It is anticipated that under natural conditions, More Creek freezing processes commence in late November. However, warm air masses that arrive periodically from the coast result in breaks in ice forming processes. It is expected that ice formed over the winter begins to break up and melt in mid to late March. Variability in ice forming processes on More Creek will depend on winter severity each year.

Ice formation is caused by frazil ice growth in the center of the stream when waters have become supercooled. Frazil ice particles accumulate together to form small flocs. The accumulation of small flocs form large flocs and ice pans and eventually, solid ice cover at the water surface. Frazil ice formation may cause the appearance of anchor ice on objects of high thermal conductivity during the early portion of frazil formation. Ice formation may also take place from shore ice growth along the border of the stream as well (Carlson, 1981).

Ice breakup in the spring results from increasing air temperatures and solar radiation and causes ice ablation (Carlson, 1981). Ice jams may form in constrictions, such as the More Creek canyon, if stream flows rise rapidly during ice breakup causing large sheets of ice to break-up and be transported with the flow.

Potential Effects of the Project on Ice Processes

Development of the Project would result in delays to ice forming processes in More Creek. It would be expected that the More Creek reservoir would become ice covered by mid-December and that ice thickness would vary according to winter severity each year.

The Project will impact the transport of ice past the intake. The reservoir-storage upstream of the Project intake may be ice-covered through much of the winter. During active frazil ice formation,

when particles remain small enough to move with the stream flow, frazil ice and anchor ice may develop at the Project intake. During ice breakup in the spring there is anticipated to be minimal potential for the breakup of large ice sheets to cause ice jams at the Project intake. BC Hydro observations of ice conditions in More Creek indicated that they should not pose a problem during diversion because a narrow constriction in river channel upstream of the intake will prevent large sheets of ice from entering the canyon.

Surface Water Flows

More Creek originates in the Coast Mountains of northwestern BC and flows eastward to its confluence with the Iskut River. The Iskut River flows 210 km from Zechtoo Mountain, north of Iskut, to discharge into the Stikine River; the drainage area is 9,380 km^2. The Stikine River flows an additional 11 km from the Iskut River confluence before it reaches the Alaskan border. The Stikine River discharges into the Eastern Passage off of the coast of Alaska.

There is one existing run of river hydroelectric Project on the Iskut River – the Forrest Kerr Hydroelectric Project (See Table 6); however, there are other hydroelectric projects located on tributaries that drain directly into the Iskut River. There are no hydroelectric projects operating on More Creek or its tributary drainages; however, there are four water power applications on tributaries to More Creek.

The More Creek drainage basin has a discontinued WSC gauge (08CG005) which has a record of 19 complete years of historical flow data at the mouth of More Creek over the period from 1971-1995. BC Hydro collected natural stage data in 1982 from three staff gauges in More Creek; two located upstream of the proposed Project intake and on gauge located downstream of the intake. The data from the WSC 08CG005 gauge and potentially, existing BC Hydro gauging data, will be used to conduct the hydrological analysis on More Creek.

Table 17 provides a list of the inactive WSC gauges in the vicinity of More Creek. The inactive WSC gauge sites provide detailed flow data on the Iskut River upstream and downstream of its confluence with More Creek. A map of all the WSC gauge sites listed in Table 16 and Table 17 is provided in Figure 6.

Table 16. Summary of Active WSC flow monitoring stations nearest to More Creek

Station	Station Name	Drainage Area (km^2)	Years of data	Start Year	Coordinates
08DA005	Surprise Creek	218	49	1967	56°6'33" N 129°28'38" W
08CG001	Iskut River (below Johnson River)	9500	57	1959	56° 44' 03" N 131° 40' 08" W
08CE001	Stikine River (at Telegraph Creek)	29000	62	1954	57°54'0" N 131°9'34" W
08CD001	Tuya River (near Telegraph Creek)	3550	59	1956	58°4'20" N 130°49'35" W

Table 17. Summary of Discontinued WSC flow monitoring station nearest to More Creek

Station	Station Name	Drainage Area (km^2)	Years of data	Start Year	End Year	Coordinates
08CG005	More Creek	844	24	1971	1995	57°2'27" N 130°24'5" W
08CG007	Iskut River above Forrest Kerr Creek	6290	5	1981	1985	56° 44' 30" N 130° 36' 50" W
08CG004	Iskut River above Snippaker Creek	7230	30	1966	1995	56° 41' 55" N 130° 52' 23" W
08CG003	Iskut River at Outlet of Kinaskan Lake	1250	35	1964	1998	57° 31' 50" N 130° 10' 45" W

The drainage area of More Creek is 844 km^2 (**Figure 5**). More Creek has mean annual discharge (MAD) of approximately 49.5 m^3/s based on the 19 year complete flow record from WSC station 08CG005 (which is located near the mouth of More Creek) developed and monitored by the Water Survey Branch of Canada from 1974 to 1994. The mean annual surface area of More Creek is 576 ha. Mean Monthly Flows before the Project and after the Project are provided in Table 18 and are based on the above mentioned gauge and period of record. The average monthly discharge for More Creek before and after the Project is shown in **Figure 9** and includes the reservoir water level.

Table 18. Mean Monthly Inflows Before and After the Project

Month	Mean Monthly Flow m^3/s Before	Mean Monthly Flow m^3/s After
January	7	55
February	6	17
March	6	10
April	11	12
May	50	38
June	115	37
July	140	50
August	111	69
September	68	86
October	48	74
November	17	72
December	9	80
Mean Annual Flow	**50**	**50**

The design flow for the Project is 80 m^3/s and it was selected to fully develop the potential of the site. The estimated average annual generation is 345 GWh/year (using a minimum instream flow release of 10%, subject to review by government agencies).

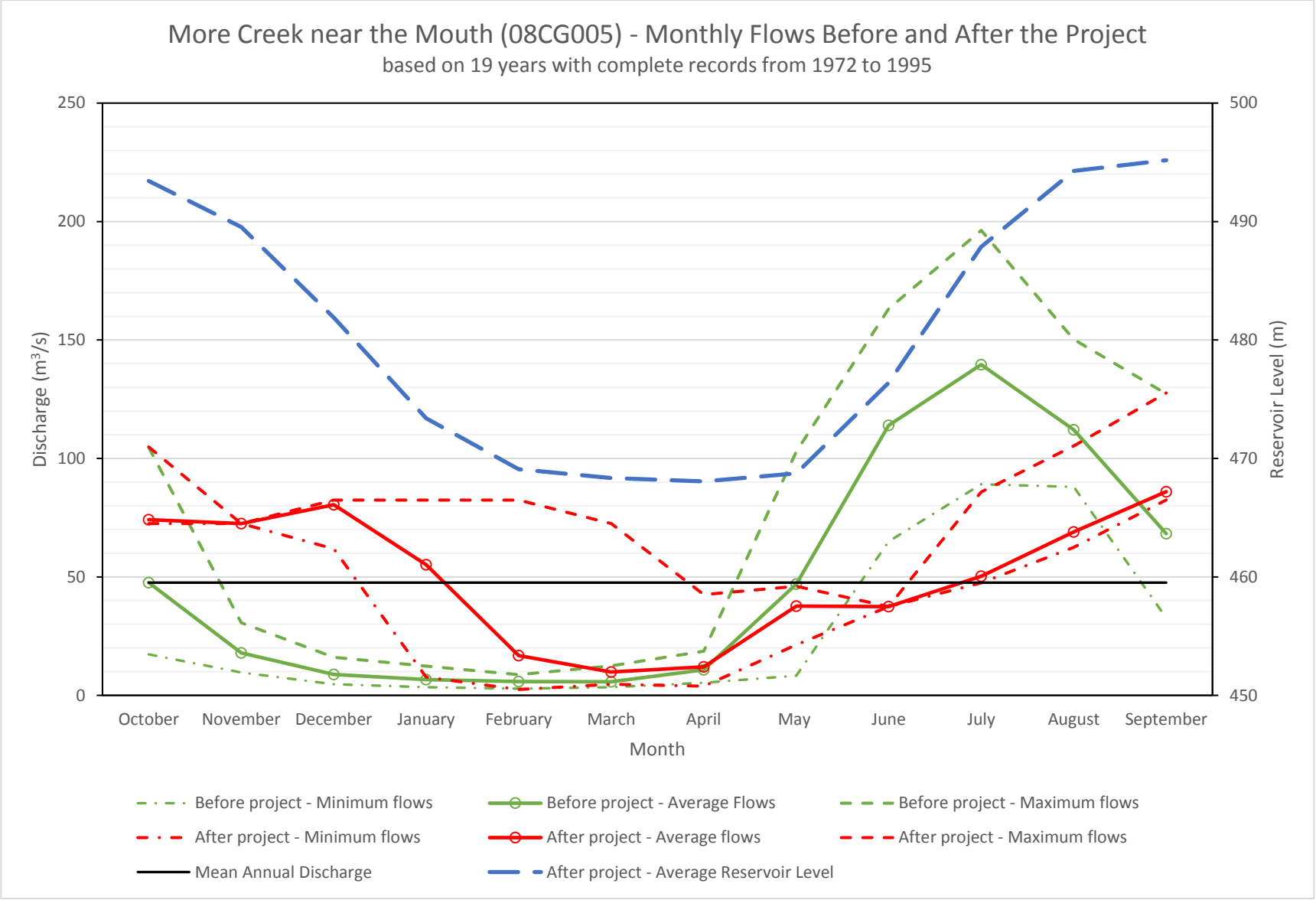


Figure 9. More Creek Average Monthly Discharge WSC (08CG005) gauge data

Potential Effects of the Project on Surface Water Flows

A significant impact on surface water flows caused by Project development will result from flow regulation. Flow regulation will change the natural flow regime on More Creek and subsequently, the natural flow regime downstream of More Creek along the Iskut River. Natural flows during the spring and summer melt period will be in excess of flows required for plant operation; consequently, these excess flows will be stored in the plant reservoir. Meanwhile, during the winter when More Creek natural flows are less than required to operate the plant at maximum capacity the water stored in the reservoir will be released to enhance plant generation.

The natural flow regime on More Creek will be adjusted by plant operations resulting in reduced flows from the natural baseline during the spring/summer and increased flows from the natural baseline in the winter months. More Creek will experience much reduced flow within its diversion reach located directly downstream of the intake to the tailrace flow discharge site. It is anticipated that the diversion reach flows will be maintained at a minimum of 10% of mean annual discharge (MAD) year-round during plant operations.

There will be an impact to surface water flows during reservoir filling of the Project. Reservoir filling will be conducted over an appropriate length of time to mitigate the impacts of reduced flow release downstream of the More Creek intake. The reservoir headpond volume is anticipated to be 900,000,000 m^3. The MAD on More Creek is estimated at 49.5 m^3/s based on an analysis using WSC 08CG005. The reservoir filling time will be evaluated to achieve the objective of mitigating significant upstream and downstream impacts and reservoir filling will be a onetime occurrence.

The creation of the plant reservoir will significantly alter the upstream surface water morphology by flooding approximately 20 km upstream of the Project intake. The water depth at the Project intake will increase. The reservoir storage capacity will result in approximately 133 days of stored flow for operations at maximum output. A flow transition zone will be created between the backwater of the flooded area and More Creek at the upstream extent of the reservoir.

AHC will conduct an assessment of the impacts from upstream and downstream surface water flow changes that will result from the Project. Upstream surface water flow assessments will include evaluation of the change in water levels and flow rates. Downstream surface water flow assessments will identify impacts to surface water levels in the Project diversion reach and the impacts to surface water levels and flows downstream of the Project tailrace. It is anticipated that the regulation of flows on More Creek will enhance generation for the downstream run-of-river project on the Iskut River (the Forrest Kerr plant).

Sedimentation and Morphology

Background to Physical Setting

The More Creek headwaters originate from glacial meltwaters from the Stikine Plateau to the north and from the Coastal Mountains to the south. More Creek represents the border between these two physiographic regions. The Coast Mountains are a major mountain range in the Pacific Coast Ranges of western North America and extend from southwestern Yukon through the Alaska Panhandle and the majority of the Coast of British Columbia south to the Fraser River.

The Boundary Ranges of the Coast Mountains are heavily glaciated. The high mountain peaks are the result of well-developed cirque glaciation. Peaks and ridges below approximately 6,500 feet are rounded and subdued by the effects of ice-sheet erosion (Holland, 1976). U-shaped valley profiles are predominant in this region as a result of glacial activity resulting in steepened valley walls and truncated spurs (Holland, 1976). Antecedent rivers flow throughout this region (incised before Pleistocene) and served as the main drainage pathways for the westward flow of glacial ice. The flow of ice resulted in the regions characteristic over-deepened valleys and many hanging valleys in addition, to cirque erosion processes which carved out many of the mountain peaks and ridges in the region (Holland, 1976).

The Stikine Plateau is located in northern British Columbia and lies east of the Boundary Ranges of the Coast Mountains and west of the Cassiar Mountains. The Stikine Plateau drains a large area of dissected plateau country. The Tahltan Highland of the Stikine Plateau is a transition zone between plateaus and the Boundary Ranges of the Coast Mountains (Holland, 1976). The Tahltan Highlands landscape along the Coast Mountains boundary is shaped by volcanic activity from Mount Edziza and intense glaciation during the Pleistocene (Holland, 1976).

More Creek drains an 844 km^2 area before discharging into the Iskut River, which is a significant tributary to the Stikine River (drainage area of Stikine River: 52,000 km^2). The landscape of More Creek is heavily influenced by previous volcanic and glacial activity.

Sedimentation processes of More Creek have previously been studied by BC Hydro (BC Hydro, 1984). BC Hydro's findings indicate that sediment yield of More Creek is relatively heavy; it was documented that the area above More Creek yields ~ 800 t/km^2 of sediment annually. AHC will review all available sedimentation reports completed by BC Hydro as part of their assessment of sedimentation processes on More Creek, impact of the Project on natural sedimentation patterns, and the potential impact of sedimentation patterns on Project operations.

Channel Morphology

More Creek flows through a U-shaped valley before entering into the More Creek canyon located approximately 1.5 km upstream of More Creek's confluence with the Iskut River. The More Creek canyon is a narrow, steep-walled bedrock canyon approximately 1 km long. More Creek is actively down-cutting through the canyon bedrock. The More Creek canyon abruptly discharges into a broad alluvium filled river channel at its terminus.

The More Creek reservoir will be approximately 20 km in length and will be located within a wide, flat-bottomed valley with a floor of granular deposits and steep bedrock walls. According to BC Hydro studies, along the abutments flanking the dam site the soil cover is generally shallow; however, talus up to 5 m in depth occurs locally (BC Hydro, 1984). The diversion reach of More Creek is located within a steep-walled well-incised canyon. The Project will discharge flows from the powerhouse tailrace into the broad alluvium filled channel upstream of More Creek's confluence with the Iskut River.

Potential Project Effects on Sedimentation and Channel Morphology

The Project will impact sediment movement both upstream and downstream of the proposed intake. More Creek serves as a conduit for the movement of significant volumes of sediments from upstream tributaries to the Iskut River. The movement of these materials contribute to the active down-cutting processes in the More Creek bed-rock canyon.

Upstream Effects

According to existing BC Hydro studies, the reservoir impoundment created by the Project will flood much of the talus and the toes of the slides in weak sediments along the More Creek valley walls. This has the potential to result in renewed and accelerated slide activity in the More Creek valley. Additional geotechnical and structural geology information will be collected in the upstream Project area to identify and assess the geotechnical and/or geomorphological hazards.

The Project intake will block the flow of large sediment movement through the More Creek canyon. It is anticipated that larger sediment will settle and accumulate upstream of the intake with finer sediment moving into reservoir. The Proponent will conduct an analysis of reservoir filling issues using existing data collected by BC Hydro reports and the design parameters proposed for the Project. This analysis will identify predicted reservoir filling rates based on sedimentation rates and predicted instream flows.

Downstream Effects

The Project intake will block the movement of large sediment from flowing downstream into the More Creek canyon and thereafter, into the Iskut River. In the Project diversion reach, downstream of the intake and upstream of the Project tailrace, aggradation processes may be reduced as a result of reduced flow in the diversion reach and blocked debris and large sediments at the intake. The Project tailrace will return diverted flows from More Creek at the intake back into More Creek just before its confluence with the Iskut River. Flows discharged back to More Creek at the tailrace are not expected to carry larger sediments, that otherwise would be carried under natural flow conditions, and consequently, reduced aggradation processes may result downstream of the Project tailrace in More Creek and thereafter in the Iskut River. There is some potential for reduced aggradation processes to occur in the Iskut River as a result of blocked sediment at the Project intake; however, the magnitude of this impact has not been quantified. The impacts of the Project on aggradation and/or degradation processes downstream of the Project tailrace have not been quantified.

Initially, sedimentation at the Project intake will reduce the sediment load downstream of the Project intake. The Proponent will conduct sedimentation analysis to assess the downstream impacts of reduced sedimentation that may result from the development and operation of the Project.

It is anticipated that sedimentation processes and rates will be unaffected in the Iskut River. The drainage area of the Iskut River where More Creek discharges into is 3,808 km^2. BC Hydro studies indicate that More Creek has higher rates of sedimentation relative to the Iskut River at More

Creek's confluence. Further sedimentation analysis will determine the extent to which sedimentation will be affected by Project operations.

5.1.5 Water and Sediment Quality

Environment Setting

Water quality is important for the health and productivity of fish and fish habitat in the More Creek system. During baseline studies conducted for the Project water quality parameters will be measured to assess the baseline water quality of the Project site and to evaluate potential impacts of the Project on baseline water quality.

The Proponent will complete a water quality monitoring program during the Project's development phase. Monitoring sites for water quality will be located upstream of the proposed reservoir, in the proposed reservoir, in the diversion reach (where accessible), and downstream of the powerhouse site. Water quality parameters that will be measured include temperature, pH, alkalinity, turbidity, total suspended solids, dissolved oxygen, specific conductance, metals (i.e. methylmercury) and nutrients such as nitrogen and phosphorus.

The water quality assessment for the Project will include a review of previous studies conducted by BC Hydro on More Creek, a review of available provincial data, and the baseline water quality monitoring program. Previous studies on nearby drainages, including the Iskut River drainage, indicate that the sediment (suspended matter and bedload) yield is heavy on More Creek. BC Hydro (1984) reported that the area above the More Creek Project yields approximately 800 t/km^2 annually, which is approximately 14% higher than the average for the entire Iskut River basin. BC Hydro (1984) went on to report that the estimated annual sediment load at the More Creek Project site is 0.7×10^6 t.

The government of Canada water office has collected daily sediment load data along two sediment monitoring stations on the Iskut River: one station is located on the Iskut River above Snippaker Creek (08CG004) approximately 65 km downstream of the Project and the other station is located on the Iskut River below Johnson River (08CG001) approximately 115 km downstream of the Project. The sediment load data is summarized in Table 19 and Table 20. Based on the regional sediment load data provided in Table 19 and Table 20, the highest sediment yields occur in late spring-early summer.

Table 19. Daily Sediment Load Data for Iskut River above Snippaker Creek (08CG004)

Month	Daily Sediment Loads (Tonnes) for 1982 (drainage area: 7,230 km^2)			
	Mean	Minimum	Maximum	Total
May	4,292	141	46,600	133,043
Jun	53,817	16,900	93,300	1,614,500
Jul	39,297	13,600	110,000	1,218,200
Aug	24,703	9,200	55,300	765,800
Sep	20,921	1,740	129,000	627,640
Oct	17,497	926	205,000	542,397

Table 20. Daily Sediment Load Data for Iskut River Below Johnson River (08CG001)

Month	Daily Sediment Loads (Tonnes) for 1982 (drainage area: 9500 km^2)			
	Mean	Minimum	Maximum	Total
Jun	58,440	13,600	120,000	1,753,200
Jul	46,984	20,800	113,000	1,456,500
Aug	26,820	9,110	67,500	831,410
Sep	29,827	1,830	200,000	894,810
Oct	31,552	448	325,000	978,102

Potential Project Effects on Water and Sediment Quality

During the construction phase of the Project there is some potential for water quality to be impacted by heavy equipment, drilling and blasting, and work conducted near and in the confines of More Creek. The Proponent will minimize any potential effects on water quality by following federal and provincial guidelines for conducting work in or near waterways in addition to adhering to best management practices. Sediment laden water from work areas will be directed away from the creek for sediment retention before any water is released back into the creek. Water quality and erosion and sediment management plans will be developed as part of the Construction Environmental Management Plan for the Project.

During Project operations there may be some water quality concerns associated with an increase in total dissolved gas ("TDG") levels and changes to the stream's natural temperature regime. According to an unpublished technical paper by Sullivan et al., high spill levels produce high levels of TDG because spilled water entrains significant volumes of atmospheric gases that are forced into solution by the increased pressure at depth in the stilling basins. It is anticipated that the large storage reservoir will alter temperature regimes in More Creek both upstream and directly downstream of the Project intake.

A thorough evaluation of potential Project effects on water and sediment quality will be evaluated during the water quality monitoring program for the Project. Results of the evaluation will be included in the final Project Application.

5.1.6 Wildlife

The Project site is situated within two biogeoclimatic zones, the Engelmann Spruce (ESSFwv) and Interior Cedar Hemlock zones (ICHvc). A review of wildlife associated with the ESSFwv and wildlife ranges in British Columbia indicates that ungulates such as Moose, Mountain Goat, Caribou, and Mule Deer are distributed throughout the Project area. The Project area is potentially also a very productive zone for Grizzly Bear. The ESSFwv zone is habitat to a few reptiles and it is anticipated that only a few amphibians will inhabit the Project area including: the Western Toad, Columbia Spotted Frog, and the Long-toed Salamander. The conifer forests of the ESSFwv are important for furbearers such as Marten, Fisher, Red Squirrel, and Wolverine and for a variety of seed-eating birds including the Red Crossbill, White-winged Crossbill, and Pine Siskin (Coupe, 1991).

Bird species common in old-grown habitats of the ESSFwv and with distributions in the Project area include the Varied Thrush, Three-toed Woodpecker, Spruce Grouse, Golden-crowned Kinglet, Red-breasted Nuthatch, Mountain Chickadee, Orange-crowned Warbler, Steller's Jay, and Hammond's Flycatcher. Breeding birds commonly found in the young seral forests that may be present in the Project area include the Northern Pygmy-Owl, Northern Goshawk, Wilson's Warbler, Rufous Hummingbird, Pine Grosbeak, Western Tanager, Dark-eyed Junco, Yellow-rumped Warbler, Three-toed woodpecker, Black-backed woodpecker, and Bohemian Waxwing. Swift-flowing streams are important habitats for Harlequin Duck and American Dipper (Coupe et al., 1991); these wildlife species have the potential to be located within the Project area. Mountain Goat frequently inhabit rugged south-facing terrain on a year-round basis. Blue Grouse are also associated with the ESSFwv zone especially during winter and have distributions that extend into the Project area. Golden Eagle select south-facing cliffs for nest sites (aeries) in the ESSFwv particularly where large rodents such as the Hoary Marmot are abundant. (Coupe et al., 1991).

A portion of the Project area is also located within the ICHvc which provides productive habitat for Grizzly Bear and Black Bear. The ICHvc provides the necessary high-protein and high-energy diet for the bear's growth, in the form of lush herbaceous vegetation and abundant huckleberry and blueberry patches (Ketcheson et al., 1991). Caribou, while never very common, occur throughout much of the ICHvc in the late summer and early fall before they move up in winter to ESSFwv forests with a deeper, denser snowpack; Moose may also be scattered throughout the zone (Ketcheson et al., 1991).

Birds with the potential to occur in the Project area include: Pileated Woodpecker in those sections of the ICHvc zone with mature and old growth habitat; Black-backed three-toed Woodpecker in those habitat areas with recent disturbance and remnant snags; and other wood-boring birds such as Hairy Woodpecker and Downy Woodpecker in coniferous/deciduous forests of the Project area within the ICHvc zone (Ketcheson et al., 1991). Other bird species that have the potential to occur in the Project area (within the ICHvc zone) include Great Horned Owl, Northern Pygmy Owl, Saw-whet Owl, Gray Jay, Steller's Jay, Varied Thrush, Golden-crowned Kinglet, Bohemian Waxwing, Townsend's Warbler, and Red Crossbill as well as breeding populations of Western Wood-Pewee, Gray Jay, Black-capped Chickadee, Red-breasted Nuthatch, Yellow-rumped Warbler, Evening Grosbeak, Pine Grosbeak, Pine Siskin, and White-winged Crossbill, Olive-sided Flycatcher and Townsend's Solitaire.

The Skeena Stikine Forest District supports a range of plant and animal life including several important and/or at risk species. The Project is located within the Middle Iskut River Landscape Unit (LU; provincial ID 858). The biodiversity emphasis option in the Middle Iskut River LU is intermediate. The Middle Iskut River LU has identified the Project area and/or the vicinity of the Project area as having areas of high value habitat for moose, Mountain Goat, Grizzly Bear, and Martin (LRMP, 2000). Portions of the Project area also overlap with the Edziza-Lower Stikine Grizzly Bear Population. A list of potential species with habitat overlapped by the proposed Project are provided in Table 22 and are highlighted in blue. Regionally important animal species, including those on the provincial red and blue lists and those protected under the federal *Species at Risk Act* (SARA), that are located within the Skeena Stikine Forest District are also include, in Table 21.

Table 21. Regionally important, provincially and federally listed animal species within the Skeena Stikine Forest District including species with the potential to occur in the Project area (blue).

Scientific Name	Common Name	Status					CF Priority
		BC List	Provincial	COSEWIC	SARA	Global	
Mammal Species							
Alces alces	Moose	Yellow	S5(2015)			G5(2006)	6
Gulo gulo	Wolverine		S3(2015)	SC(2014)		G4(2005)	2
Gulo gulo luscus	Wolverine, *luscus* subspecies	Blue	S3(2010	SC(2014)		G4T4(1996)	2
Marmota caligata	Hoary Marmot	Yellow	S5(2015)			G5(1996)	5
Martes americana	Marten	Yellow	S5?(2015)			G5(2015)	
Myotis lucifugus	Little Brown Myotis	Yellow	S4(2015)	E(2013)	1-E(2014)	G3(2012)	5
Ochotona collaris	Collared Pika	Blue	S3S4(2015)	SC(2011)		G5(2015)	2
Odocoileus hemionus	Mule Deer	Yellow	S5(2015)			G5(1996)	6
Oreamnos americanus	Mountain Goat	Blue	S3(2015)			G5(1996)	1
Pekania pennanti	Fisher	Blue	S3(2015)			G5(2005)	2
Rangifer tarandus	Caribou		S3?(2015)			G5(2006)	2
Rangifer tarandus pop. 15	Caribou (northern mountain population)	Blue	S3(2010)	E/SC(2014)	1-T/SC(2005)	G5T4T5(2013)	2
Tamiasciurus hudsonicus	Red Squirrel	Yellow	S5(2015)			G5(2016)	5
Ursus americanus	Black Bear	Yellow	S5(2015)	NAR(1999)		G5(2003)	6
Ursus arctos	Grizzly Bear	Blue	S3?(2015)	SC(2002)		G4(20000	2
Herptile Species							
Ambystoma macrodactylum	Long-toed Salamander	Yellow	S4S5(2010)	NAR(2006)		G5(2015)	4
Anaxyrus boreas	Western Toad	Blue	S3S4(2010)	SC(2012)	1-SC(2005)	G4(2008)	2
Rana luteiventris	Columbia Spotted Frog	Yellow	S4(2010)	NAR(2000)		G4(2008)	2
Gastropod Species							
Lymnaea atkaensis	Frigid Lymnaea	Blue	S3S5(2015)			G4G5(2006)	4
Insect Species							
Boloria epithore sigridae	Western Meadown Fritillary, sigridae subspecies	Blue	S2S4(2013)			G5T3(2001)	3
Polites draco	Draco Skipper	Blue	S3(2013)			G5(2016)	4
Somatochlora kennedyi	Kennedy's Emerald	Blue	S3S4(2015)			G5(2015)	4
Bird Species							
Accipiter gentilis laingi	Northern Goshawk	Red	S2B(2010)	T(2013)	1-T (2003)	G5T2(2008)	1
Aegolius acadicus	Saw-whet Owl	Yellow	S5B,S5N (2009)			G5(1996)	5
Aquila chrysaetos	Golden Eagle	Yellow	S4S5B(2015)	NAR(1996)		G5(2011)	4

Asio flammeus	Short-eared Owl	Blue	S3B,S2N(2015)	SC(2008)	1-SC(2012)	G5(2008)	2
Bombycilla garrulus	Bohemian Waxwing*	Yellow	S5B(2015)			G5(1996)	6
Bubo virginianus	Great Horned Owl	Yellow	S5(2015)			G5(1996)	6
Chordeiles minor	Common Nighthawk	Yellow	S4B(2015)	T(2007)	1-T(2010)	G5(2009)	2
Cinclus mexicanus	American Dipper*	Yellow	S4 (2015)			G5(1996)	5
Coccothraustes vespertinus	Evening Grosbeak*	Yellow	S5(2015)			G5(1996)	2
Contopus cooperi	Olive-sided Flycatcher*	Blue	S3S4B(2015)	T(2007)	1-T (2010)	G4(2008)	2
Contopus sordidulus	Western Wood-Pewee*	Yellow	S5B(2015)			G5(2009)	2
Cyanocitta stelleri	Steller's Jay	Yellow	S5(2015)			G5(1996)	5
Dryocopus pileatus	Pileated Woodpecker*	Yellow	S5(2015)			G5(1996)	4
Empidonax hammondii	Hammond's Flycatcher*	Yellow	S5B(2015)			G5(1999)	5
Euphagus carolinus	Rusty Blackbird	Blue	S3S4B(2015)	SC(2006)	1-SC(2009)	G4(2008)	2
Falcipennis Canadensis	Spruce Grouse	Yellow	S5(2015)			G591996)	6
Falco peregrinus	Peregrine Falcon		S3B(2015)	SC(2007)		G4(2000)	2
Falco rusticolus	Gryfalcon	Blue	S3S4B(2015)	NAR(1987)		G5(1996)	4
Glaucidicum gnoma	Northern Pygmy-Owl	Yellow	S4B(2015)			G4G5(2009)	3
Hirundo rustica	Barn Swallow	Blue	S3S4B(2015)	T(2011)		G5(1996)	2
Histrionicus histrionicus	Harlequin Duck*	Yellow	S4B,S3N(2015)			G4(1996)	1
Ixoreus naevius	Varied Thrush*	Yellow	S5B(2015)			G5(1996)	5
Junco hyemalis	Dark-eyed Junco*	Yellow	S5B(2015)			G5(2009)	5
Loxia curvirostra	Red Crossbill*	Yellow	S5(2015)			G5(1996)	2
Loxia leucoptera	White-winged Crossbill*	Yellow	S5B(2015)			G5(1996)	5
Myadestes townsendi	Townsend's Solitaire*	Yellow	S5B(2015)			G5(2009)	2
Oreothlypis celata	Orange-crowned Warbler*	Yellow	S5B(2015)			G5(2009)	5
Perisoreus canadensis	Gray Jay	Yellow	S5B(2015)			G5(1996)	6
Phalaropus lobatus	Red-necked Phalarope	Blue	S3S4B(2015)	SC(2014)		G4G5(2005)	2
Picoides arcticus	Black-Backed woodpecker*	Yellow	S4S5B(2015)			G5(1996)	6
Picoides dorsalis	Three-toed Woodpecker*	Yellow	S5B (2015)			G5(2003)	6
Picoides pubescens	Downy Woodpecker*	Yellow	S5B(2015)			G5(1996)	5
Picoides villosus	Hairy Woodpecker *	Yellow	S5B(2015)			G5(1996)	5
Pinicola enucleator	Pine Grosbeak*	Yellow	S5B(2015)			G5(1996)	5
Piranga ludoviciana	Western Tanager*	Yellow	S5B(2015)			G5(1996)	6
Poecile atricapillus	Black-capped Chickadee*	Yellow	S5B(2015)			G5(1996)	6
Poecile gambeli	Mountain Chickadee*	Yellow	S5B(2015)			G5(1996)	6
Regulus satrapa	Golden-crowned Kinglet*	Yellow	S5B(2015)			G5(1999)	5
Selasphorus rufus	Rufous Hummingbird *	Yellow	S4S5B(2015)			G5(2015)	2
Setophaga coronate	Yellow-Rumped Warbler*	Yellow	S5B(2015)			G5(1996)	5
Setophaga townsendi	Townsend's Warbler *	Yellow	S5B(2015)			G5(2008)	5

Sitta canadensis	Red-breasted Nuthatch*	Yellow	S5B(2015)			G5(1996)	5
Spinus pinus	Pine Siskin*	Yellow	S5B(2015)			G5(1996)	2
Wilsonia pusilla	Wilson's Warbler	Yellow	S5B(2015)			G5(2009)	2

*****Migratory bird species protected under the Migratory Bird Convention Act, 1994; COSEWIC= Committee on the Status of Endangered Wildlife in Canada; CF=Conservation Frame work. B.C. Conservation Data Centre. 2016. BC Species and Ecosystems Explorer. B.C. Minist. of Environ. Victoria, B.C. Available: http://a100.gov.bc.ca/pub/eswp/ (accessed May 25, 2016).

It is anticipated that the species list will be refined following ongoing consultation activities and wildlife studies. The list will endeavor to include species of concern to the region and to First Nations. The LRMP also identifies resource objectives for Grizzly Bear habitat. The investigative studies conducted for the Project will incorporate the LRMP wildlife objectives where appropriate.

Wildlife assessments over the Project area will include information previously collected during BC Hydro assessments conducted in the early 1980s and any other relevant information collected by nearby wildlife assessments for other projects, where available. Wildlife baseline bio-inventory studies will be conducted during the investigative phase of the Project. These studies will document the species present in the Project area and will focus on provincial red and blue listed animals and plant communities, species of regional concern, and species of concern to First Nations. Wildlife and vegetation studies will also document any species protected under the federal SARA.

A preliminary overview of the Project area has not identified any proposed or legally established Wildlife Habitat Areas (WHAs), Old Growth Management Areas (OGMAs), or Ungulate Winter Ranges (UWR).

It is anticipated that during the pre-development phase of the Project assessments for the following wildlife parameters will be conducted:

- Spring raptor survey and waterfowl surveys;
- Amphibian surveys;
- Breeding bird surveys;
- Fall migration surveys;
- Winter mammal and ungulate tracking surveys;
- Additional studies and assessments, as required.

Where information required to inform the wildlife assessments is not readily available from previous studies conducted in the Project area and/or updates to the existing wildlife assessments are required, the Proponent will enlist a qualified professional to develop additional field study programs to supplement existing wildlife assessments and fill in any data gaps.

Potential Project Effects on Wildlife and Migratory Birds

The impacts from the pre-development and the environmental investigation phase of the Project are anticipated to be negligible. Impacts to the land from surveys and field studies are expected to be limited to periodic vehicle and foot access which has the potential to cause minor disturbance to the surrounding wildlife. This disturbance would be infrequent, temporary, and reversible in scope.

During the Project construction phase, the impacts to wildlife resources may result from noise generation during site construction, disturbance due to site access, and alteration to the landscape for installation of Project infrastructure. Impacts resulting from construction noise will be temporary and reversible. However, noise and physical disturbance to habitat has the potential to result in wildlife avoidance of the Project area. Impacts resulting from infrastructure intrusion on natural habitats will be permanent and irreversible. Migratory birds are potentially at risk during their breeding season from April to June/July. Impacts to migratory bird breeding season will be mitigated by minimizing vegetation clearing and grubbing activities during this sensitive window, where possible. Sensitive wildlife windows will be identified and included in the final Project

application; where possible, AHC will adhere to the sensitive wildlife timing restrictions during construction.

The most significant effects of the Project on wildlife and migratory birds will result from the creation of the storage reservoir which is anticipated to flood approximately 2,104 ha of existing wildlife habitat. In particular Harlequin duck breeding and nesting habitat may be affected by flooding tributaries to More Creek. Conversely, controlled flow regimes downstream of reservoir Projects, such as the Terzaghi Dam in the Bridge River, have led to the creation of high quality Harlequin Duck habitat as result of high aquatic insect densities[4].A bird survey conducted by Rescan in 2006 did not identify Harlequin ducks in More Creek although they are present in nearby streams. Similarly, flooding tributaries to More Creek may potentially adversely affect American dippers due to loss of habitat including the loss of foraging and nesting habitat.

This flooded area represents permanent alteration of habitat. Creation of the storage reservoir will displace local wildlife populations and will alter the habitat ranges of wildlife species in the vicinity of the Project area. The development of the Project access road and transmission line also has the potential to fragment wildlife habitat. Moreover, the human-wildlife interface will increase as a result of Project operations and human access to the Project site. Disturbance to wildlife species as a result of increased human activity in the Project area may also result in wildlife avoidance of the surrounding Project area. The creation of motorized site access to the site may increase wildlife vulnerability to hunting.

Noise generated during Project operations at the powerhouse is anticipated to be minor and of a comparable level to the sound created by the natural More Creek drainage. Disturbance to wildlife from noise generated at the Project powerhouse is anticipated to be negligible.

A review of existing wildlife studies over the Project area in addition to a wildlife baseline study, where required to fill in any information data gaps, will be conducted to fully assess the potential impacts of the Project to wildlife and migratory bird resources. This assessment will be completed and submitted as part of the Project Application.

Where possible, potential Project impacts identified through the terrestrial wildlife assessments will be addressed by either:

- The development of comprehensive mitigation measures for all phases of the Project
- Changes to Project timing, design and infrastructure placement
- The offsetting of impacts via compensation activities

5.1.7 Aquatic Resources

The aquatic resources in the Project area have been described in detail in previous BC Hydro studies and assessments conducted in the 1980s. During the pre-development phase of the Project historical data collected over the Project site will be used to assess the Project's impacts to aquatic resources and to inform any additional work that may be required during the baseline assessment. Additional baseline data collection and field programs will be conducted, as required, in order to thoroughly assess the effects of the Project on the aquatic resources in the Project area.

[4] https://www.bchydro.com/bcrp/projects/docs/bridge_river/05.W.BR.03.pdf

A preliminary desktop analysis (using IMAP MOE accessed on May 22, 2015) identified the following macro reach breaks in the area of the More Creek mainstem anticipated to be impacted by the Project (Table 22).

Table 22. Preliminary Reach Break Analysis of More Creek

Reach Number	Approximate Reach Length (m)	Approximate Average Reach Gradient (%)
1	1294	0.5
2	1840	0.2
3	3588	0.2
4	4610	0.7
5	384	2.1
6	1373	0.3
7	7899	0.3
8	2930	0.9

Resource objectives for riparian habitat are identified in the LRMP (2000). The investigative studies conducted for the Project will also incorporate these LRMP objectives where appropriate.

Benthic Productivity

Benthic productivity in an aquatic system is an important parameter for defining ecosystem health and monitoring changes within the ecosystem over time. Furthermore, benthic populations are a food supply for fish populations and therefore, an important link in the ecosystem chain. Understanding the benthic productivity of an aquatic system will provide additional information to fish population dynamics.

The benthic productivity bottleneck in More Creek is expected to be from the high sediment loading capacity of the system which results in significant scouring along the More Creek valley. Benthic invertebrate population's most productive timing window typically occurs between late spring through early fall. The benthic invertebrate productive timing likely correlates with the peak sedimentation rates in More Creek.

The Proponent will conduct a benthic monitoring program in the More Creek system to establish baseline benthic productivity conditions upstream of the Project intake, in the Project diversion reach, and downstream of the Project powerhouse, where feasible. Benthic invertebrate sampling will be in accordance with the provincial guidelines for sampling where appropriate (Beatty et al., 2006). Benthic biodiversity, abundance, and biomass will be measured as part of the monitoring program. The baseline data collected during the benthic productivity study program will be included in the Project Application. The benthic productivity baseline program developed for the Project will be incorporated into a long-term operation monitoring program for the Project to facilitate a before and after comparison and verify Project impacts to benthic productivity following Project construction.

Methylmercury

Flooding to create the storage reservoir for the Project will result in microbial breakdown of dead plants and organic soils which may subsequently result in the methylation of mercury already present in the More Creek aquatic system. Production of methyl mercury from flooded soils can result in the bioaccumulation of methyl mercury in invertebrate and fish populations. Significant bioaccumulation can result in a human health concern when fish populations are used for consumption. Consequently, the Proponent will evaluate the potential methyl mercury production from flooded soils and the potential for bioaccumulation of methyl mercury through the food chain.

The Proponent will conduct an analysis of the potential for methylmercury contamination from flooding the 2,680 ha area for the storage reservoir. Analysis will include the sampling of soil, water, benthic invertebrates, and fish for their baseline levels of total and dissolved inorganic mercury, total methylmercury, and stable isotopes (carbon/nitrogen) as appropriate for each sampling source. Samples for analysis will be collected from upstream of the proposed storage reservoir, along the proposed storage reservoir, and downstream of the Project intake.

Recent research has indicated that methylmercury bioaccumulation is often more significant downstream of storage reservoir dams (Heron 2013). The Proponent anticipates implementing a long term monitoring program during Project operations to assess the occurrence of methylmercury bioaccumulation within the water storage reservoir, downstream of the intake in the diversion reach of the Project, and downstream of the Project tailrace (if appropriate). The parameters of the long-term methylmercury bioaccumulation program will be defined in the Operations Environmental Management Plan developed for the Project and submitted with the Project Application.

Fish

The More Creek drainage flows into the Iskut River which subsequently flows into the Stikine River. The Stikine-Iskut River system is known to have twenty (20) fish species which include both catadromous/anadromous and freshwater resident species. Anadromous and catadromous fish species are excluded from the More Creek drainage due to a number of documented fish migration barriers along the Iskut River.

Therefore, the fish species that inhabit the More Creek drainage are all freshwater resident fish. Regionally important, provincially and federally listed fish species, including fish species potentially inhabiting More Creek are provided in Table 23. The fisheries inventory assessment conducted for the Project will confirm the presence and absence of the fish species with potential to occur within the Project area.

Table 23. Regionally important, provincially and federally listed fish species including fish species with the potential to occur in More Creek (blue).

Scientific Name	Common Name	BC List	Provincial	COSEWIC	Global	CF Priority
Catostomus catostomus	Longnose Sucker	Yellow	S5(2010)		G5(2015)	6
Cottus asper	Prickly Sculpin	Yellow	S5(2010)		G5(2015)	5
Gasterosteus aculeatus	Threespine Stickleback	Yellow	S5(2010)		G5(2012)	6
Cottus cognatus	Slimy Sculpin	Yellow	S5(2010)		G5(2015)	6

Lampetra tridentata	Pacific Lamprey	Yellow	S5(2010)		G4(2012)	6
Lota lota	Burbot	Yellow	S4(2004)		G5(2015)	2
Mylocheilus caurinus	Peamouth	Yellow	S5(2010)		G5(2016)	5
Oncorhynchus mykiss	Rainbow Trout	Yellow	S5(2004)		G5(2008)	6
Prosopium williamsoni	Mountain Whitefish	Yellow	S5(2010)		G5(1996)	6
Salvelinus malma	Dolly Varden char	Yellow	S4(2011)		G5(2000)	2
Salvelinus namaycush	Lake trout	Yellow	S4(2004)		G5(2015)	2
Salvelinus confluentus	Bull trout*	Blue	S3S4(2011)	E(2002)	G4(2011)	2
Oncorhynchus clarkia clarkii	Cutthroat Trout*, clarkia subspecies	Blue	S3S4(2004)		G4T4(1997)	2

* Fish species present in More Creek; COSEWIC= Committee on the Status of Endangered Wildlife in Canada; CF=Conservation Frame work. B.C. Conservation Data Centre. 2016. B.C. Conservation Data Centre. 2016. BC Species and Ecosystems Explorer. B.C. Ministry. of Environ. Victoria, B.C. Available: http://a100.gov.bc.ca/pub/eswp/ (accessed May 25, 2016).

An online search of the Ministry of Environment Fisheries Information System (FISS) shows the presence of Dolly Varden char and Bull Trout in More Creek (Watershed Code: 610-517000-00000). Mountain whitefish have been documented at the confluence between More Creek and the Iskut River. Two potential obstacles along More Creek, downstream of the proposed intake are also documented. Additional surveys will be required to confirm these preliminary findings, establish spatial and temporal habitat boundaries, and verify any potential barriers to fish movement.

The fisheries assessment completed for the Project will use information presented in existing studies over the Project area and supplement those studies with information collected as part of an independently conducted multi-year fisheries field study program. The objective of the independently conducted multi-year fisheries field study program is to fill in any data gaps of the previous studies and to collect the necessary fish data for long-term monitoring assessments during Project operations. The multi-year fisheries field study program for the Project is anticipated to commence in 2016. The fisheries assessment will document the presence/ absence, abundance, and distribution of all fish species upstream, downstream and within the Project area. During the fisheries assessment a detailed description of stream characteristics throughout the Project area will also be completed and will include documentation of fish migration barriers, macrohabitats, and mesohabitat assessments.

Species Population Structure

The following accounts of species population structure for the known fish species documented in the More Creek system is taken from McPhail, 2007.

Bull Trout are a cold water species that are rarely encountered in environments where temperatures exceed 15°C for prolonged periods of time. This fish species exhibits three common life-history patterns: fluvial; adfluvial; and stream-resident. It is anticipated that Bull Trout found in More

Creek would be representative of stream-resident populations. All Bull Trout spawn in flowing water and this is typically triggered by a drop in temperature. Bull trout spawn during the fall. Bull trout are a blue-listed species in British Columbia and therefore, are of conservation concern.

Dolly Varden char are associated with cold waters where summer temperatures rarely exceed 20ºC and temperatures are normally below 15ºC. This fish species demonstrates three common life-history forms an anadromous, stream-resident, and adfluvial form. On the eastern slope of the Coast Mountains, Dolly Varden char are typically confined to small, headwater streams. It is anticipated that Dolly Varden char in the More Creek system exhibit the stream-resident life history form. Dolly Varden char typically migrate prior to spawning (unless they are a stream resident). Spawning takes place in the fall and typically peaks in late September when water temperatures are approximately 6ºC. Dolly Varden char are abundant in British Columbia and not heavily exploited.

Mountain whitefish also exhibit three common life history forms which include: lacustrine, riverine, and adfluvial. This species spawns in either fall or early winter once temperatures have dropped below 10ºC and spawning peaks at temperatures below 6ºC. Mountain whitefish spawn in flowing water and spawning may be preceded by a migration to smaller streams. Mountain whitefish in British Columbia do not have any major conservation concerns.

All three fish species documented in the Project area are fall or winter spawners. The sediment loading capacity of the More Creek system during early fall may inhibit reproductive success of these species in More Creek.

Fish Movements

The Forrest Kerr Hydroelectric Project has thoroughly documented downstream barriers from More Creek on the Iskut River. A fish migration barrier exists at a chute located immediately below the Forrest Kerr plant's intake weir site. This chute has been identified numerous times by RAB (1975), NNRS (1979) and Beak (1991) as a 3 m high by 5 m long chute located over rock. Furthermore, the plant intake for the Forrest Kerr Hydroelectric Project represents a fish migration barrier itself. Consequently, no anadromous fish species are located in the More Creek drainage and all fish species in the vicinity of More Creek are fresh-water resident species.

An online query on British Columbia IMAP via RAB database for obstacles to fish passage on More Creek has identified two potential rock barriers located approximately 1.8 km and 2 km upstream of More Creek's confluence with the Iskut River. Additional information was unavailable for these two listed obstacles. Quantification of these obstacles and their potential to block fish migration will be quantified during the fish resources assessment conducted for the Project. The potential for velocity barriers to occur during high flows on More Creek will also be reviewed.

Potential Project Effects on Fish and Fish Habitat

The Proponent intends to prevent serious harm to fish. For certain Project components, a serious harm to fish may be unavoidable; under such cases authorizations under section 35(2) of the *Fisheries Act* will be sought. Any and all potential Project impacts identified through the aquatic baseline bioinventory assessments will be addressed by either:

- The development of comprehensive mitigation measures for all phases of the Project
- Changes to Project timing, design and infrastructure placement
- The offsetting of impacts via compensation activities

The Project may impact fish and fish habitat during the construction and operation phases. During the construction phase works conducted near the water have the potential to increase sedimentation to the creek, spill toxic materials into the creek, and alter flow regimes for the installation of the intake weir. These impacts will be mitigated through the implementation of best management practices and the development of a construction environmental management plan which shall be adhered to throughout construction.

During operations a number of potential impacts to fish and fish habitat may result from the development of the proposed Project. The intake dam will permanently block fish from moving upstream and downstream of it. The creation of the storage reservoir will alter the existing fish habitat upstream of the intake by altering the hydrology and temperature regimes through regulating stream flow, geomorphology processes by altering sedimentation regimes and ice forming processes. The plant operations whereby stream flow is stored at the storage reservoir and released with the intent of optimizing plant operation efficiencies will also alter the hydrology and temperature regime downstream of the intake. Therefore, during freshet melt excess stream flow will be stored in the storage reservoir and flows downstream of the intake will be reduced relative to pre-Project flows. Meanwhile, during winter low flow periods the water stored in the storage-reservoir will be used for generation and increased flows will be released downstream of the Project. Flows in the diversion reach of the Project will be reduced as a result of the flow diversion for energy generation. In addition, the creation of the storage-reservoir will permanently flood existing tributary habitat and areas of off-channel fish habitat.

These changes to More Creek's hydrology and geomorphology have the potential to impact fish and fish habitat as they will alter the habitat and temperature regimes in More Creek. Consequently, fish life history requirements and life history timing may be impacted. For example, a decrease in temperature typically triggers spawning for Dolly Varden char, Bull trout, and Mountain Whitefish. A shifted temperature regime has the potential to alter life history timing for spawning amongst other fish species life history phases.

5.2 Changes to Fish, Fish Habitat and Wildlife

A description of the potential impacts of the Project on fish, fish habitat, and wildlife are provided in Sections 5.2.1 to 5.2.3, respectively.

5.2.1 Fish and Fish Habitat including Marine Plants

A description of the potential Project impacts to fish and fish habitat including aquatic marine plants is provided in Section 5.1.7. Generally, the creation of the Project storage-reservoir will alter the type of fish habitat in More Creek upstream of the intake by flooding 2,680 ha of land. The storage-reservoir will alter existing habitat by changing flow regime, temperature regime, and sedimentation processes. Moreover, the storage-reservoir will flood existing vegetation which may

increase methyl-mercury production in resident fish populations. The storage-reservoir also has the potential to create elevated levels of dissolved gas in More Creek. Furthermore, tributary and off-channel habitat will also be flooded by the creation of the storage-reservoir.

Downstream of the Project tailrace, impacts related to changes in flow regime due to regulated flows will result from Project development. This has the potential to alter fish habitat and impact fish life history processes. Stage changes that result from flow discharge at the tailrace may also have the potential to strand fish unless an adequate operational ramping rate is implemented.

The diversion reach of the Project will have reduced stream flows. Fish habitat within this reach may be reduced as a result of reduced flows. Less flow may also alter the temperature regime of this section of More Creek and therefore, impact fish life history processes and productivity in this area.

Where possible, mitigation measures will be implemented into the Project design to reduce impacts to fish and fish habitat. During Project construction best management practices will be adhered to and a construction environmental management plan will be developed and implemented with specific parameters defined for working near water. Fish screens at the Project intake and a potential fish passageway will be considered for Project design. A minimum instream flow release will be implemented during Project operations to maintain fish and fish habitat within the diversion reach of the Project. The Project will also develop suitable ramping rates to ensure that changes in flow stage-levels will not strand fish downstream of the Project.

5.2.2 Migratory Birds

The Project area is located within the sub-boreal interior ecoprovince of British Columbia and within two biogeoclimatic zones: the Engelmann Spruce Subalpine Fir zone and the Interior Cedar Hemlock zone. Based on the breeding bird atlas of British Columbia (accessed December 21, 2015), there is the potential for 144 bird species to occur in the Project area. Of these bird species 112 would be protected under the federal *Migratory Bird Convention Act* (1994).

Birds, eggs and nest trees are protected by law under section 34 of the *BC Wildlife Act*. The *BC Wildlife Act* provides year-round protection to birds' nests such that it is not permitted, except as provided by regulation, to injure, molest or destroy (a) a bird or its egg (b) the nest of an eagle, perefrine falcon, gyrfalcon, osprey, heron or burrowing owl, or (c) the nest of a bird not referred to in paragraph (b) when the nest is occupied by a bird or its egg.

The Project will flood 2,680 ha of land to create the storage-reservoir. This flooded reservoir may destroy important riparian and terrestrial area used by breeding bird populations. During the terrestrial wildlife baseline investigations for the Project existing studies will be used to quantify impacts to breeding bird populations in the Project area. A terrestrial wildlife field study will also be conducted to quantify impacts to breeding bird populations where there are data gaps in the existing studies. It is anticipated that the terrestrial wildlife field study conducted will include breeding bird surveys conducted over multiple breeding seasons.

5.2.3 Changes to Environment on Federal Lands or in another Province

The Project is not anticipated to impact any federal lands in British Columbia or any other Province. The Project is located approximately 95 km east from the border of Alaska. Greenhouse gas emissions generated by Project construction and the Project reservoir will contribute to total global greenhouse gas emissions and climate change.

Water from More Creek (drainage area: 844 km^2) flows into the Iskut River. The Iskut River flows 210 km from Zechtoo Mountain, north of Iskut, westward to discharge into the Stikine River; the Iskut River drainage area is 9,380 km^2. The Stikine River flows an additional 11 km west from the Iskut River confluence before it reaches the Alaskan border. Predicted monthly surface flow changes for the Stikine River at the Alaska Boarder during Project operations are described in Figure 10. The predicted annual change in surface flows at the Alaska Boarder is 0% however predicted monthly surface flows at the Alaska boarder range from an increase in monthly surface flows of 13% in December to a 2% decrease in monthly surface flows for the months of June and July. The months of April and May are predicted to have a 0% change in monthly surface flows.

More Creek Hydropower Project

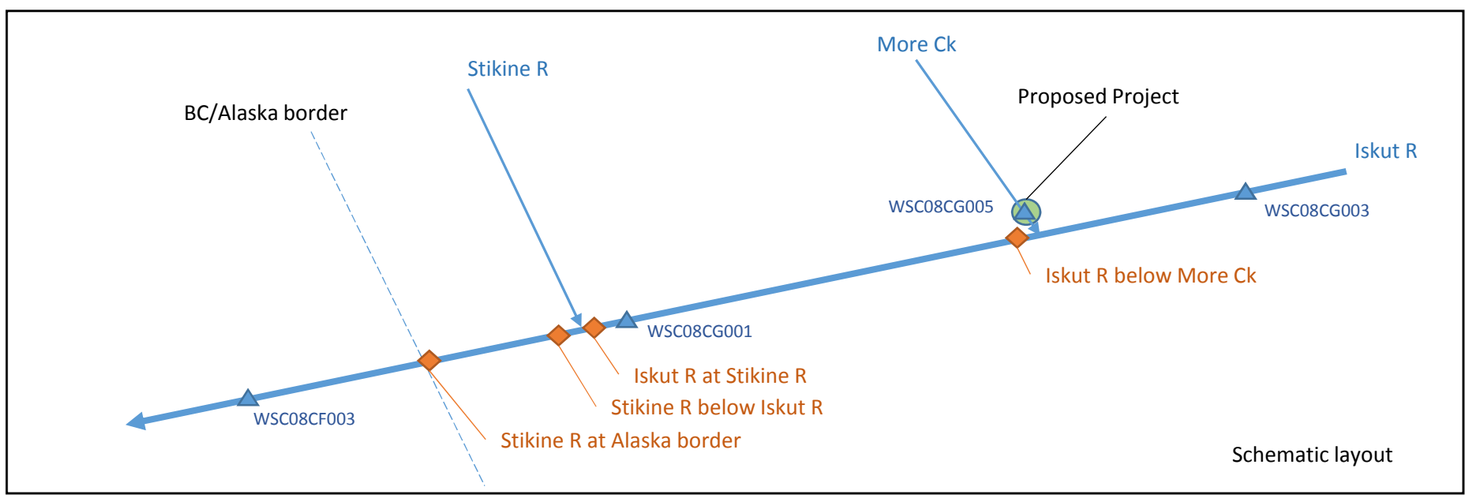
Figure 10. Mean Monthly flows Before and After the project

(all flows in m^3/s)

	More Ck near the mouth WSC08CG005			Iskut R at outlet of Kinaskan Lake WSC08CG003	Iskut R Below Johnson R WSC08CG001	Stikine R near Wrangell WSC08CF003	Iskut R below More Ck			Iskut R at Stikine R			Stikine R below Iskut R			Stikine R at Alaska border		
DA (km^2)	844			1,250	9,500	50,900	4,655			9,555			49,597			50,238 est.		
Years	1972-1995 1974-1994			1964-1996	1959-2014	1984-2013[2]												
# of years	19			29 (19 yrs used)	50 (19 yrs used)	26	19	19										
	A	B		C	D	E	F	G		H	I		J	K		L	M	
	Before	After	Difference[1]				**Before**	After	Difference	**Before**	After	Difference	**Before**	After	Difference	**Before**	After	Difference
Jan	**7**	55	685%	**5**	**83**	**296**	**25**	73	193%	**109**	157	44%	**397**	445	12%	**401**	449	12%
Feb	**6**	17	172%	**4**	**74**	**248**	**21**	32	49%	**96**	107	11%	**338**	348	3%	**341**	352	3%
Mar	**6**	10	64%	**4**	**69**	**291**	**20**	24	19%	**90**	94	4%	**373**	377	1%	**377**	381	1%
Apr	**11**	12	5%	**4**	**147**	**486**	**27**	28	2%	**176**	176	0%	**649**	650	0%	**655**	656	0%
May	**50**	38	-25%	**13**	**487**	**1982**	**99**	87	-13%	**591**	579	-2%	**2523**	2510	0%	**2548**	2535	0%
Jun	**115**	37	-68%	**45**	**940**	**3887**	**282**	204	-28%	**1233**	1155	-6%	**5020**	4942	-2%	**5069**	4991	-2%
Jul	**140**	50	-64%	**49**	**1091**	**3758**	**322**	232	-28%	**1426**	1336	-6%	**5088**	4998	-2%	**5135**	5045	-2%
Aug	**111**	69	-38%	**31**	**896**	**2952**	**227**	185	-19%	**1133**	1090	-4%	**4009**	3967	-1%	**4046**	4004	-1%
Sep	**68**	86	26%	**22**	**635**	**2343**	**149**	166	12%	**790**	808	2%	**3073**	3091	1%	**3103**	3121	1%
Oct	**48**	74	55%	**19**	**517**	**1506**	**119**	145	22%	**641**	667	4%	**2108**	2135	1%	**2127**	2154	1%
Nov	**18**	72	307%	**11**	**209**	**637**	**59**	114	92%	**270**	325	20%	**891**	946	6%	**899**	954	6%
Dec	**9**	80	795%	**7**	**105**	**427**	**34**	105	213%	**140**	212	51%	**556**	627	13%	**561**	633	13%
Annual	**50**	50	2%	**18**	**440**	**1574**	**116**	117	1%	**561**	562	0%	**2095**	2096	0%	**2115**	2116	0%

Notes:
F=A+K(4655/1250) H=F+D(9504-4655)/(9500-4655) J=H+E(49597/50900) L=J+E(42000-49597)/50238
G=B+K(4655/1250) I=G+D(9504-4655)/(9500-4655) K=I+E(49597/50900) M=K+E(42000-49597)/50238

1. (B) is based on simulation of plant operation. The small difference in the annual flow is due to storage calculations.
2. Since it is not possible to match the 19 years of WSC08CG005, the full 26 year record is used



5.3 Effects on First Nations

5.3.1 Effects on Health

AHC anticipates commencing discussions and evaluation of the Project effects on First Nations' health following the submission of the Project Description to CEAA. The objective of AHC is to provide a full evaluation of the Project's effects on First Nation's health in the Project Application.

A review of Health Canada's "Useful Information for Environmental Assessments" (2010) was used to identify potential health impacts that may be caused by the Project. These potential health impacts and their scope as it relates to the Project are described below.

Air Quality Impacts

Potential contaminants and emissions associated with the Project include the following criteria air contaminants: sulphur oxides, nitrogen oxides, particulate matter, and volatile organic compounds. Sulphur oxides and nitrogen oxides would be associated with greenhouse gas emissions that may result from decaying vegetation caused by creating reservoir storage. Volatile organic compounds release may be associated with the use of fuel for equipment and vehicles.

Dust or particulate matter generation may be caused by vehicle and machinery use on site and during Project operations. During operations dust can be generated when the reservoir is drawn down leaving areas of exposed shoreline. Potential impacts from dust include accumulation on buildings, vehicles and vegetation. Dust may also reduce visibility and be irritating to the eyes, nose and mouth of people nearby. Nuisance dust in the vicinity of the Project may potentially interfere with recreational actives.

Fine particulate matter small enough to bypass the upper respiratory system can cause adverse health effects, such as coughing, if inhaled. Young children and individuals with existing respiratory conditions are at greater risk.

The Project is located in a remote area of northwestern British Columbia and therefore, there is a large distance between potential air contaminants that may be released by the Project and a human receptor. The nearest community to the Project site is Iskut located approximately 90 km away. The majority of potential air quality impacts are associated with the construction phases of the Project. During plant operations air quality impacts are anticipated to be minimall. Mitigation measures will be implemented for the Project to ensure that air quality impacts are mitigated, where possible.

Contamination of Country Foods

Traditional use in the Project area is anticipated to include harvesting plants, hunting and fishing. There is potential for the creation of the reservoir storage for the Project to result in methylmercury generation as flooded vegetation and soils decompose. An assessment for methylmercury generation potential in the Project area will be conducted for the Project to identify baseline levels of methylmercury or precursors to methylmercury in the More Creek proposed reservoir storage area. During operations a monitoring plan for methylmercury accumulation will be implemented.

Drinking and Recreational Water Quality

The Project has the potential to impact water quality in More Creek during construction and operations. During construction best management practices will be implemented to avoid water contamination from equipment, concrete works, and site excavation activities (i.e. implementation of sediment and erosion control mechanisms). During operations the creation of a storage reservoir, altering the timing of flows into the More Creek, and reducing flows in the diversion reach of More Creek also has the potential to impact water quality. Some potential impacts to water quality from reservoir Projects include:

-Changes in flow regime

-Changes in total suspended solids

-Changes in temperature

-Changes in sediment transport with the potential to cause shoreline erosion downstream

-Super saturation of dissolved gases in the spillway and;

-Increased concentrations of methyl mercury from decaying vegetation

It is not anticipated that changes to water quality in More Creek will be a health concern. No sources of drinking water or recreational uses on More Creek have been identified. A baseline water quality assessment will be conducted in consideration of the Canadian and provincial freshwater guidelines for the protection of aquatic life. A water quality monitoring plan will be implemented during plant operations, if appropriate.

Noise Effects

Noise generated by the Project will be most significant during construction. Noise generated during the construction phase will be temporary and intermittent and associated with blasting and machinery activities. Noise generated during the operation phase of the Project will be associated with the operation of the turbines and will be nominal. Due to the limited duration and level of noise generated by the Project and the remote nature of the Project site, noise effects are not anticipated to cause a health concern.

5.3.2 Effects on Socio-economic Conditions

AHC is in the preliminary phase of evaluating the socio-economic effects of the proposed Project. The Project is situated within the Cassiar Iskut-Stikine Land Resource Management Plan area which is an area that has predominantly relied on natural resources for economic stimulus including hydroelectric and mining development. Population density within the Cassiar Iskut-Stikine LRMP area is characterized by low density communities that are isolated from major populations and governing centres. This remote region consists of small settlements of predominantly First Nation communities that are established along major road systems i.e. Highway 37. Service centres are limited in the vicinity of the Project area.

Economic Effects

It is anticipated that the Project will provide a positive economic stimulus to the surrounding community during all phases. During the construction phase it is expected that the most significant economic stimulus will be created. Current estimates expect the construction phase to take approximately two years. Over this period approximately 290 person years (PY) of employment are expected to be created. The estimated capital cost of construction for the Project is $275,000,000. Furthermore, indirect positive economic impacts are anticipated for the region where development support resources are sourced.

The types of jobs anticipated to be created during Project construction and operation are listed below.

- Carpenters (industrial and formworkers)
- Carpentry
- Cement masons/ concrete finishers
- Crane operators
- Pipefitting
- Foresters
- Heavy equipment Operators
- Instrumentation and control technicians
- Millwrights (industrial mechanics)
- Painters
- Scaffolders
- Plumbers
- Surveyors
- Underground tunnelers
- Hydrologists
- Plant Operators
- Electricians (industrial; technical instrument technicians and mechanics)
- Metal forming
- Construction supervisors and forepersons
- Other Construction trades
- Electric trades
- Construction trade helpers and labourers
- Drillers and Blasters
- Heavy duty mechanics
- HVAC technicians
- Ironworks (reinforcing and structural)
- Insulators
- Pile drivers
- Security Guard staff
- Sheet metal workers
- Truck drivers
- Environmental Consultants
- Geologists
- Engineering

The operation phase of the Project is anticipated to create 16 full-time operating jobs. In addition, periodic maintenance and clearing jobs will also be required throughout the life of plant operations. With the life-time of the plant anticipated to be upwards of 100 years – these jobs represent long-term security for local employees.

Where possible, AHC believes that the Project will provide a source of employment for First Nations and local labour groups where employment costs are competitive and quality standards are achieved. AHC will investigate the potential for participating in an Impact, Benefits Agreement with the First Nations whose traditional territory is overlapped by the Project.

Social Effects

Potential social effects from the Project may include impacts to the existing land use (LRMP), pressure on existing resources within the region during the construction phase, and impacts to traditional purposes associated with the area overlapped by the Project. The traditional uses in the Project area including country food harvesting activities (fishing, hunting, and berry-picking) will be impacted by the creation of the reservoir storage would substantially change the landscape for these traditional use activities.

AHC will conduct an assessment specific to impacts to the baseline social conditions of the Project area. Of particular focus will be how the Project will alter the existing land use of the area as prescribed by the LRMP, how service demands of the Project may impact the surrounding region, and how traditional use activities including hunting, fishing, and gathering will be impacted by the Project footprint and Project activities.

5.3.3 Effects on Physical and Cultural Heritage

AHC is in the preliminary stages of evaluating the Project's effects on physical and cultural heritage in the area. It is anticipated that the effects on physical and cultural heritage will be evaluated based on published reports that document the rich cultural heritage and history of the Project area and through direct consultation with Aboriginal groups whose traditional territory is overlapped by the Project.

A number of existing archaeological studies have been conducted over and in the vicinity of the Project area. An assessment of these reports will be conducted and any gaps in data will be used to inform the direction of any future field studies required to assess impacts from the Project, as required. Field studies over the Project area for the purpose of evaluating cultural heritage effects will be conducted in consultation with First Nations. Potential impacts of the Project on cultural and traditional use may include impacts on plant gathering such berries and mushrooms and impacts to hunting and fishing within the vicinity of the Project.

As environmental information is collected and assessments are completed for the valued ecosystem components in the Project area this information will be shared with First Nations. AHC is committed to ongoing information sharing with First Nations throughout Project investigative studies and environmental assessments. Open houses, site tours, in person meetings, and notifications requesting feedback are tools that the Proponent anticipates using to facilitate the information sharing process.

5.3.4 Effects on the Current Use of Lands and Resources for Traditional Purposes

The Project's effects on current use of the lands and resources for traditional purposes has not been fully evaluated at this stage. AHC plans to coordinate meetings with First Nations with traditional use interests over the area to gain understanding of potential effects of the Project on those traditional uses. A comprehensive evaluation of the effects of the proposed Project on the current traditional use of the lands and its resources will be completed as part of the Project Application submissions. Discussions with the Tahltan First Nation and Métis Nation BC will be conducted as part of this comprehensive evaluation.

Recent traditional studies completed in or near the Project area for other regional development projects that will be reviewed including the following:

- Rescan Environmental Services Ltd. 2009. Northwest Transmission Line Project: Tahltan Traditional Use and Knowledge Report.
- Emmons, G.T. 1911. The Tahltan Indians. In: University of Pennsylvania The Museum of Anthropological Publications Vol. IV, No. 1.
- Tahltan Nation. 2000. Stikine School District #87. School District 87 and the Tahltan Band Council.
- TTC – Tahltan Tribal Council. 1992. Traditions and Anecdotes, Collected Tales Relating to the Tahltan People. Ed. Krueger, J.K., Dease Lake, B.C.

A brief summary of some aspects of Tahltan traditional use within their traditional territory, as referenced in the studies listed above, is provided below:

> The Tahltan were traditionally a semi-sedentary nation that spent part of the year in large multifamily villages and the remainder of the year in mobile small family hunting groups (Rescan 2009; Emmons, 1911). Their fishing season extended from mid-June through early fall and generally occurred along the Stikine River and its major tributaries in areas that facilitated fishing camp establishment (Rescan 2009; Emmons, 1911). Following their fishing season the Tahltan divided up into small groups of 2-3 families and headed to hunting grounds where a camp area would be selected (Rescan 2009; Emmons, 1911). The hunting season typically took place in the spring (March 1 to May 1) and fall (October 1 to January 1) (TTC and Krueger, 1992. The preferred big game wildlife for the Tahltan included caribou, moose, bears, mountain sheep and mountain goat (School District 87, 2000). Hunting and fishing continues to represent an important traditional use within the Tahltan tradition territory.
>
> Plant and Berry gathering represent an important Tahltan traditional activity. Plants and berries contribute to a balanced diet for the Tahltan both in the past and present (School District 87, 2000). Plants that are collected include wild rhubarb, nettles, lamb's quarter, mountain sorrel, and dandelion and a variety of roots (School District 87, 2000). Berries were and continue to be a staple in the Tahltan diet and include raspberries, strawberries, low and high-bush cranberries, low, mid and high-bush blueberries, Saskatoon berries and soapberries (School District 87, 2000). Country food harvested from plants in the traditional territory represent both a source of food and medicine to the Tahltan.

Based on preliminary desktop review of traditional use country food harvesting activities associated with berry-picking, mushroom picking, and hunting may be impacted by the road access created by the Project which would facilitate increased access to the area. The reservoir created by the Project may impact the country food harvesting activities by flooding potential country food harvest zones and altering/ removing wildlife habitat previously used for hunting activities.

Culturally significant fish were reported to include (but not limited to) Dolly Varden char, bull trout, mountain whitefish, and rainbow trout (Rescan, 2009). These freshwater fisheries resources are present in the More Creek Project area. The More Creek morphology will be substantially altered by the reservoir created by the Project and this will change the fish habitat composition upstream of the Project intake. The Proponent will consult with First Nations to determine how

the altered stream morphology may impact traditional use related to fisheries activities in More Creek.

5.3.5 Historical Resources

Archaeology

The *Heritage Conservation Act* protects all archeological resources in British Columbia. The Act represents legislation for the protection and conservation of heritage in British Columbia. "In accordance with the Act (Section 13(2)), "archaeological sites may not be destroyed, excavated or altered without a permit issued by the Minister or designate" (Archaeology Branch, 1998).

An Archeological Impact Assessment (AIA) was conducted in the More Creek Valley as part of the Galore Creek Project (Rescan and RTEC, 2006; Heritage Inspection Permit 2005-269). The AIA report identified heritage sites located in open subalpine area in the More Creek Valley. Archaeological sites identified in their AIA study were generally assigned a low scientific rating. During the Galore Creek Project AIA the majority of landforms with some archaeological potential were tested along the proposed Galore Creek access ROW and they determined that there was low potential for the presence of archaeological sites in the ROW. However, Rescan and RTEC (2006) identified a number of terrain features of moderate and high archaeological potential in the More Creek Valley outside of the ROW. Previous studies have found that there is generally a lack of success in finding archaeological sites at low elevations in the forested Iskut River areas and higher success finding archaeological sites in open non-forested high elevation areas of the More Creek valley. The prehistoric inhabitants of the region may have extensively utilized higher elevation areas of the More Creek valley as a transportation corridor and for subsistence activities.

The Proponent will conduct additional archaeological assessments and/or studies to determine the archaeological potential within the Project impact zone. Every effort will be made to avoid significant cultural and heritage areas during the planning and construction of the Project. An AIA and Traditional Use Study is anticipated to be conducted, as required, and will adhere to MFLNRO's Archaeological Impact Assessment Guidelines and be in accordance with the *Heritage Conservation Act*. Local First Nations will be consulted to ensure that the location of specific heritage sites and areas of significance are preserved.

6. PROPONENT ENGAGEMENT AND CONSULTATION WITH ABORIGINAL GROUPS

6.1 Aboriginal Groups that may be interested in, or potentially affected by, the Project

A preliminary review of First Nations with the potential to be interested and/or affected by the Project has been conducted by AHC based on early discussions with Aboriginal groups and the Province of BC. A mapping review of aboriginal reserves near the Project area has also been conducted to identify potential interests. A list of Aboriginal groups that may be interested in or potentially affected by the Project was identified using the Frontcounter BC Discovery Tool for First Nation Consultation areas (accessed January 5, 2016) and early consultation with CEAA. The list of Aboriginal groups that may be interested, or potentially affected by the Project is provided in Table 24.

Table 24. Aboriginal Groups that may be interested in or potentially affected by the Project

Aboriginal Groups					
Organization	**Contact Name**	**Mailing Address**	**Phone**	**Fax**	**Email**
Tahltan Indian Band	Chief and Council	PO BOX 46 Telegraph Creek, BC V0J 2W0	250-235-3244	250-235-3244	info@tahltan.ca
Iskut Band	Chief and Council	PO Box 30 Iskut, BC V0J 1K0	250-234-3331	250-234-3200	iskutfirstnations@yahoo.ca
Tahltan Central Government	Chief and Council	Box 69 Tatl'ah (Dease Lake, BC) V0C 1L0	250-771-3274	250-771-3020	http://tahltan.org/contact/
Métis Nation BC		Unit #103 – 5668 192nd Street, Surrey, BC V3S 2V7	604-557-5851	778-571-9402	lshaw@mnbc.ca

It is anticipated that the BC EAO will confirm, in the Section 11 Order pursuant to the BCEAA, the First Nations who must be consulted for the Project and those First Nations who have been or will be invited to participate in the review of the Project.

6.2 Engagement or Consultation Activities Carried out to Date with Aboriginal Groups

AHC initiated contact with the Tahltan Central Council in Q2 of 2016 and provided the Tahltan Central Council with preliminary Project information. AHC has sought and received proposals from three archaeology firms to conduct archaeological studies. AHC has also engaged in discussions with the Tahltan Native Development Corporation (TNDC) regarding the Project and employment opportunities during the Project construction phase.

6.3 Key Comments and Concerns from Aboriginal Groups

At this preliminary stage in Project development AHC has not received any formal comments or concerns from any Aboriginal groups in regards to the proposed Project. It is anticipated that AHC will commence Project notification and discussions with Aboriginal groups in 2016. Thorough and detailed documentation of comments and concerns from Aboriginal groups will be reported throughout consultation (Section 6.4). Furthermore, AHC will respond to all Aboriginal group's comments and concerns and where possible, address the concerns identified.

Preliminary discussions with First Nations have indicated that the flooded area from the Project may impact traditional use in the area including use of the land for berry picking, mushroom picking, and hunting. As part of the consultation plan with the First Nations the Proponent anticipates conducting a Traditional Use Study to fully assess and mitigate, where possible, impacts to traditional use activities from the development of the Project.

6.4 Consultation Plan

An overview of the consultation plan for the proposed Project includes three distinct initial phases: Early Planning, Planning, and Submitting Project Application to Government. A summary of the objectives of each consultation phase is provided below. The consultation plan has been developed using the guidelines outlined in British Columbia's Guide to Involving Proponents when Consulting First Nations[5]. At this time, AHC has commenced the beginning stages of the Early Planning Phase of consultation.

As part of the Early Planning Phase AHC has identified the Aboriginal Groups in the Project area using the FrontCounter BC Discovery Tool for First Nation Consultation Areas (See Table 24). The next steps in the Early Planning Phase consultation process will be to provide the First Nations identified with information about the proposed Project including a Project Description, the scope and location of the Project (with maps), an overview of potential short and long term impacts of the Project, an overview of required Project authorizations and anticipated timelines, and an overview of anticipated benefits from the Project. The key objective of the Early Planning Phase will be to commence consultation with First Nations to determine their interests in the Project area and how the Project may impact specific Aboriginal interests. The outcomes of the Early Planning Phase are to learn about First Nation culture, history, economy, political/governance structures, and the people and how the proposed Project may impact associated Aboriginal interests. The anticipated format for consultation during the Early Planning Phase will include notifications via mail and email and telephone conversation.

During the subsequent Planning Phase the key objective for AHC is to incorporate Aboriginal interests identified into the planning of the Project. This phase will require AHC to inform the First Nation throughout the Project planning process and will require the effective communication of clear and reasonable Project timelines. Documentation of all Aboriginal group engagement processes, descriptions of specific Aboriginal interests, and potential impacts to those interests will

[5] British Columbia Guide to Involving Proponent When Consulting First Nations. http://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/consulting-with-first-nations/first-nations/involving_proponents_guide_when_consulting_with_first_nations.pdf Accessed on: January 5, 2016.

be conducted by AHC. Any changes to the Project plans and outcomes of those changes for the purposes of accommodating to Aboriginal interests will also be documented. Throughout the Planning consultation phase AHC is committed to responding to all Aboriginal group's concerns and information requests. The anticipated format for consultation during the Planning Phase will include in person meetings, open houses and site visits in addition to mail, email and telephone conversation.

During the Submitting the Project Application to Government consultation phase AHC will advise all First Nations of the Project milestones and application submission dates. In the Project Application submissions AHC will include Aboriginal interests identified during the earlier consultation phases and any impacts to those Aboriginal interests from the Project. Where appropriate, AHC will identify any measures that will be used to mitigate Project impacts to Aboriginal interests such as avoidance measures, mitigation strategies, minimizing or altering the site footprint, environmental monitoring, and any related First Nation agreements. As part of the Project Application to the government AHC will provide an engagement record of consultation which will include a description of specific Aboriginal interests and any potential impacts to those interests, a description of modifications implemented for accommodation purposes, a communication log and copies of correspondence, engagement activities and outcomes.

AHC is committed to ongoing First Nations consultation throughout the life of the Project including early development phases, construction, operation, and decommissioning. A proposed First Nation consultation schedule for the early Project development phase is provided in Table 25.

Table 25. Anticipated Aboriginal Group Consultation Schedule

Activity	Anticipated Schedule
Notification with Project Description	Q3 2016
Follow-up on initial Notification via phone call and meeting requests	Q4 2016
Meeting	Q1 2017
Site Visits	Q2 2017
Provide Project Status Update Notification and follow-up on any issues/ comments/ concerns identified during previous consultation	Q3 2017
First Nation Participation in Environmental Studies	Q3 2016 – 2017
Ongoing Consultation to understand First Nation interest in the land including traditional and contemporary use and impacts to that use from the Project	Q1-Q4 2017
Provide Project updates through mail-out and/or email and/or preferred communication methods identified by First Nation	Q1 2017- Q1 2018
Meeting to discuss Environmental Study outcomes	Q3 2017
Open House for Project	Q4 2016- Q1 2017

The First Nation consultation log developed for the Project will follow the format suggested in British Columbia's proposed Guidelines for Consulting with First Nations. The format of the First Nation consultation log is provided in Table 26.

Table 26. Proposed First Nation Engagement Communication Log

Proponent: First Nation Engagement Communication Log					
First Nation:			Provincial Contact/ Consultation Lead:		
Proponent Lead:			Location (Region/Resource District)		
Proposed Project/ Activity(ies)			Date Submitted to Province:		
Application Type(s) and File #'s (where available):					
Date	**Activity**	**Proponent Contact**	**First Nation Contact**	**Purpose**	**Notes**
yy/mm/dd	(e.g. Letter, email, phone call, meeting)				

6.5 Aboriginal Rights

Long before European settlement in North America, indigenous peoples occupied these lands and, as such, have a unique legal status. This is recognized in the Canadian legal system through the inclusion of Section 35 of the *Constitution Act*, 1982 which states "…the existing Aboriginal and treaty rights of the Aboriginal peoples of Canada are hereby recognized and affirmed" (BC Guidelines for First Nation Consultation[6]). The courts have told governments that Aboriginal rights are practices, customs or traditions integral to a distinctive culture of a First Nation and they may be historically connected to a particular area of land (BC Guidelines for First Nation Consultation). Aboriginal title is a unique interest in the land that encompasses a right to exclusive use and occupation of the land. AHC will assess the Project impacts on Aboriginal Rights of the Aboriginal groups in consultation with the Aboriginal groups as appropriate.

The Project is within the asserted traditional territory of the Tahltan. The asserted traditional territory of the Tahltan is located along the Alaskan/Canadian border and includes part of the Yukon Territory encompassing about 93,500 km^2. The main reserves of the Tahltan First Nation are located at Telegraph Creek which is home to about 400 residents, of which approximately 350 are of Tahltan ancestry.[7] Dease Lake is another local community located about 50 km north of the Stikine River and is the junction to Telegraph Creek; the present population numbers at Dease Lake are approximately 475 of which approximately 45% are Tahltan.[1]

[6] British Columbia Building Relationships with First Nations Respecting Rights and Doing Good Business. http://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/consulting-with-first-nations/first-nations/building_relationships_with_first_nations_english.pdf. Accessed January 5, 2016.
[7] http://www.tahltan.ca/nation/territory/ Accessed: July 14, 2015

6.6 Overlap of Project Area with Traditional Land Use under Aboriginal Rights

AHC will endeavor to receive specific traditional land use information or land use maps that overlap the proposed Project area. This information will be used to assess impacts to the traditional use and Aboriginal rights from the Project and will be used to inform AHC's consultation process with First Nations. It is AHC's objective to engage in meaningful consultation with the First Nations with overlapping interests in order to fully understand the geographic and temporal traditional use of the land and how such use may overlap with the Project.

7. CONSULTATION WITH THE PUBLIC AND OTHER PARTIES

AHC is concurrently submitting a Project Description to the BC EAO for their review of the proposed Project. The following record of consultation between AHC and the BC EAO has occurred to date:

Date	Form of Consultation	BC EAO Personnel	Purpose
2015.06.30	Conference-call	Andy Witt – Project Assessment Manager	To introduce the More Creek Project and commence the process of filing the Project for BC EAO review.
2016.03.14	Conference-call	Monica Perry – Executive Project Director Gerry Hamblin – Project Assessment Manager	Re-introduce the More Creek Project and commence process of filing the Project for BC EAO review.
2016.04.06	Conference-call	Monica Perry – Executive Project Director Gerry Hamblin – Project Assessment Manager	Discussed the next steps in the process including: -A substituted review -First Nation consultation

7.1 Key Comments and Concerns from Stakeholders

A preliminary overview of the Project area has identified a number of public stakeholders and other parties with interests overlapping the Project area. No private property was identified within the Project area.

A list of stakeholders that have been identified within the Project area during the preliminary overview include the following:

- Mineral claims stakeholders including Galore Creek Mining Corporation, Carl Alexander, Van Einsiedel, and Rimfire Minerals Corporation
- Mineral placer stakeholders including BC Hydro Power Authority and Ministry of Environment Water Stewardship Division
- Cassiar Forest Corporation
- Skeena Timber Sales Manager
- Altagas
- Highway 37 Power Corporation
- Northern Hydro Limited
- Kitimat-Stikine Regional District
- Active Guide Outfitter Area held by Heidi Gutfrucht (Object ID 230) located over the Project area
- Galore Creek Mining Corp.

At this preliminary stage in Project development AHC has not provided formal notification of the Project or received any formal comments or concerns from any public consultation in regards to the proposed Project. AHC will provide thorough and detailed documentation of comments and concerns from all public consultation and relevant parties identified during all consultation efforts will be documented. AHC will make best efforts to respond to and address all public comments and concerns. A record of consultation will be maintained and updated as new stakeholders are identified and additional consultation activities take place. The record of consultation will include all comments and concerns identified by stakeholders and AHC's response to each comment and/or concern received. Table 27 provides an example of the record of consultation log for stakeholders with interests in the Project that will be developed for the Project.

Table 27. Proposed Record of Consultation Log Format for Stakeholders with interest in the Project

Date	Stakeholder	Stakeholder Contact Information	Stakeholder Comments/ Concerns	AHC Response to Stakeholder Comments/ Concerns

AHC will endeavor to consult with all public stakeholders and other parties with interests overlapping the Project area. As part of the Project Application AHC will provide additional detail to characterize the land and resource use in the Project and surrounding area. AHC will conduct consultation with any additional stakeholders identified during the review of the Project Description and any other subsequent Project submissions.

7.2 Ongoing or Proposed Consultation

AHC recognizes stakeholder consultation as an ongoing process throughout all development phases of the Project. AHC endeavors to identify all stakeholders with an interest over the Project area. Feedback from stakeholders with an interest over the Project area will be used to inform Project planning, where feasible, in order to mitigate impacts from the Project on stakeholder interests. A database of all stakeholders identified will be developed for the Project and a log of engagement and consultation activities will be documented and updated throughout Project development. The following engagement and consultation activities are anticipated to be conducted to facilitate ongoing consultation with public stakeholders:

- Open houses
- Project notifications and updates
- Website updates and provision of accessible contact information
- Meetings

7.3 Consultation with Other Jurisdictions

As required, AHC will consult with additional jurisdictions regarding the proposed Project. Potential government agencies which AHC will consult with include Federal and Provincial agencies such as the Department of Fisheries and Oceans Canada, Environment Canada, Transport Canada and the Ministry of Forests Lands and Natural Resource Operations.

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