

# **Applying for a Crown Land Tenure**

COLUMBIA						
All applications must include completed application form, general location map, local detail map, appropriate fees and attachments as indicated below.						
INFORMATION REGARDING APPLYING FOR CROWN LAND AVAILABLE AT						
PART 1 NAME(S) AND MAILING ADDRESS						
Applicant Name: FULL LEGAL NAME of Individual(s), Company or Society, Ministry or Government Agency Your File:	Are you an Agent submitting this application on behalf of your client?					
Contact Name for Company or Ministry Applicants: Joseph Sukhnandan	Agent Name & Mailing Address:					
Applicant Mailing Address: Suite 100, 1975 Springfield Road Kelowna British Columbia postal code V1Y 7V7	postal code Agent Contact Numbers:					
Applicant Contact Numbers: Phone: 250.469.8020         Daytime Phone: Fax: 250.469.8097         Applicant Email Address: Joseph. Sukhnandan@fortisbc.com	Agent Email Address:					
Is the Applicant or the Applicant's Spouse a Provincial Yes X No (FOR OFFICE USE ONLY. To address application processing for Provincial O Procedures - Applications)	Government Employee Government Employees go to the Land Procedure: Allocation					
For applications made by more than one individual: Join For your information: Joint Tenants: on the death of one tenant the interest pas Tenants in Common: on the death of one tenant the inter	t Tenants or Tenants in Common uses to surviving tenant. rest passes to the beneficiaries of the estate.					
BC Inc. #, BC Registration # or Society #: A0060155	GST Registration #:					
Age: 19 or over Yes No Canadian Citizen o	or Permanent Resident OYes ONO					
Do you hold another Crown land tenure? Yes X No If yes	s, provide File Number:					
Deviad of Projected Line:						
Two years or less X Two to five years Five to ten years Ten to thirty years More than thirty years						
Application Type:       new application       replacement application – file number         Investigative permit application       amendment application – file number						
Proposed Use/Tenure Type: (e.g. powerline right of way, gravel quarry licence): Investigative Permit						

(date/time received)	File Number:	Project Number:
	Disposition ID:	Client Number:

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PART 2. PURPOSE, LOCATION, AREA					
PLEASE SELECT APPROPRIATE PROPOSED LAND USE					
Proposed Land Use Program Area	New Application Fees (including GST)	Program Specific Requirements Website			
Aggregates & Quarry	\$1,050.00	for.gov.bc.ca/Land_Tenures/tenure_programs/programs/aggregates/index.html			
Agriculture – Intensive	\$ 262.50	for.gov.bc.ca/Land Tenures/tenure programs/programs/agriculturein/index.html			
Agriculture - Extensive	\$ 262.50	for.gov.bc.ca/Land Tenures/tenure programs/programs/agricultureex/index.html			
Airport – private	*\$50 per hour process time	Contact FrontCounter BC			
Alpine Skiing	Type 1 (minor) \$1,050.00 Type 2 (major) contact <u>FrontCounter BC</u>	resort_development/how_process_works/tenure_permits/allocation_by_proposal.htm			
Aquaculture – Fin fish	\$5,171.25	for.gov.bc.ca/Land Tenures/tenure programs/programs/aquaculture/index.html			
Aquaculture – Shellfish	\$1,260.00	for.gov.bc.ca/Land Tenures/tenure programs/programs/aquaculture/index.html			
Clean Energy -	Investigative licence\$525.00	http://www.env.gov.bc.ca/wsd/water_rights/waterpower/index.html			
Wind Power	Investigative Permit\$525.00	http://www.for.gov.bc.ca/land_tenures/tenure_programs/programs/windpower/index.html			
Ocean Energy	Wind Meteorological tower \$525.00	http://www.for.gov.bc.ca/land_tenures/tenure_programs/programs/oceanenergy/index.html			
Commercial - General	\$ 262.50	for gov bc call and Tenures/tenure programs/programs/generalcommercial/index.html			
Commercial - Film	\$525.00	for.gov.bc.ca/Land Tenures/tenure programs/programs/film/index.html			
Adventure Tourism	Non-Motorized \$262.50 Motorized \$3,465.00	for.gov.bc.ca/Land Tenures/tenure programs/programs/adventure tourism/index.html			
Communication Site	\$1,050.00	for.gov.bc.ca/Land Tenures/tenure programs/programs/communicationsites/index.html			
Community/ Institutional	\$ 262.50	for.gov.bc.ca/Land Tenures/tenure programs/programs/community/index.html			
Federal Reserves	\$3,465.00	Federal Government Only – Contact FrontCounter BC			
Ferry Terminals	*\$50 per hour process time				
General Industrial	\$ 525.00	for.gov.bc.ca/Land_Tenures/tenure_programs/programs/generalindustrial/index.html			
Golf Course	\$3,465.00	for.gov.bc.ca/Land Tenures/tenure programs/programs/golfcourses/index.html			
Grazing	\$ 262.50	for.gov.bc.ca/hra/Legislation/grazing.htm			
Head Lease	\$50 per hour process time	Contact FrontCounter BC			
Log Handling	\$1,050.00	for.gov.bc.ca/Land Tenures/tenure programs/programs/loghandling/index.html			
Marina	\$ 525.00	for.gov.bc.ca/Land Tenures/tenure programs/programs/marinas/index.html			
Mining	\$ 525.00	for.gov.bc.ca/Land Tenures/tenure programs/programs/mining/index.html			
Oil and Gas	\$ 525.00	for.gov.bc.ca/Land_Tenures/tenure_programs/programs/oil_gas/index.html			
Private Moorage	\$ 262.50	for.gov.bc.ca/Land Tenures/tenure programs/programs/privatemoorage/index.html			
Provincial Reserves		For Provincial Government Ministries Only			
Utilities (Linear Use)	Less than 25 Km \$1,050.00 More than 25 Km *\$50 per hour Access to single lot \$262.50	for.gov.bc.ca/Land Tenures/tenure programs/programs/utilities/index.html			
Residential	\$ 262.50	for.gov.bc.ca/Land Tenures/tenure_programs/programs/residential/index.html			
Roadways – Public	\$ 262.50	for.gov.bc.ca/Land Tenures/tenure_programs/programs/roadways/index.html			
Roadways – Industrial	\$1,050.00	for.gov.bc.ca/Land Tenures/tenure programs/programs/roadways/index.html			
Note: Investigative Permits (available for all program areas): \$525.00 (including GST) Replacement Application Fees: 50% of above fee or \$210.00 (including GST), as a minimum. Amendment Fees: Contact FrontCounter BC					

\* To be paid at a later date

#### PART 2 (continued)

**General Location** of Crown land (i.e. distance from nearest community, Indian Reserve or significant geographic location such as a lake or mountain; location on a named road; etc.): 15km south of Princeton

Please provide a shape file if available.

Area in Hectares: 750 OR length (km/m): \_\_\_\_\_ width (km/m): \_\_\_\_\_

#### PART 3. LEGAL DESCRIPTION OR BOUNDARY DESCRIPTION

**If surveyed, give legal description**: as provided by the local Land Title Office (e.g., Lot 1 of Section 31, Township 12 W6M Kamloops Division of Yale District Plan 18411). A legal description is found in the Certificate of Title (CofT). A copy of the CofT must be attached to the application. A copy of your Registered Survey Plan, if available, will confirm the dimensions of the place of use.

If unsurveyed: enter description of unsurveyed Crown land and description of boundaries. <u>Please see attached "Overview of Application Area" (two plan drawings)</u> <u>and "Proposed Location of Works" (one plan drawing)</u>

#### Instructions to Describe Unsurveyed Crown Land

• The point of commencement, for unsurveyed parcels, should be described in terms of an existing survey post (e.g., 18 metres west of the S.E. corner of the parcel) or a readily identifiable geographic feature (e.g., a prominent point of land or intersection

of two roads) to enable accurate location of the parcel.

• Boundary lines of the area must be, as much as possible, astronomically true north, south, east and west so that a rectangular lot is formed.

• Where the topographic features of the area do not allow for rectangular boundary lines running true north, south, east and west, then boundaries will be permitted in other directions as long as they do not interfere with the orderly survey of other surrounding land.

• The side lines of small parcels fronting on lakes, rivers, tidal waters and on certain surveyed highways shall, where possible, be parallel to each other and perpendicular to the general trend of the features on which the small parcel fronts.

• The sidelines for unsurveyed foreshore shall, as a general rule, be laid out at right angles to the general trend of the shore. This may be varied to suit special conditions, but encroachment on the foreshore fronting adjoining lands shall be avoided. The outside or waterward boundary shall be a straight line or series of straight lines joining the outer ends of the side boundaries. On narrow bodies of water the outside boundary shall not normally extend beyond the near edge of the navigable channel.

1 hectare = 2.471 acres 1 metre = 3.281 feet 100 metres x 100 metres = 10,000 square metres or 1 hectare

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PART 4. APPLICATION CERTIFICATION				
All applications must be complete. Incomplete applications will be returned to applicant. Please refer to the specific program requirements (e.g., Aggregates, Commercial, Residential) for information that must be submitted with this application.				
All of the following must be attached to or enclosed with this application f	form:			
<b>Fees</b> (in the amount indicated in Part 2) to <b>Minister of Finance</b> (check attached or pay in person with debit card or cash)	que or credit card authorization form			
General Location Map(s) at a scale of 1:50,000 to 1:250,000 indicat area under application and the location of access roads, watercourse	ing general location of the sand other major landmarks.			
Detailed Site Map(s) outlining in detail the area under application, she the application area including the dimensions (in metre) and area (ha), including	nowing the exact perimeter boundaries of cluding watercourses, district lots etc.			
X Program Specific Requirements (i.e. communication site, agricultur Program specific requirements can be confirmed at http://www.for.gov.bc.ca/Land Tenures/crown land application informat	re, industrial, aquaculture). tion/program_areas.html			
<u>PLEASE NOTE</u> : Additional items may be required (e.g. Advertising, Security Deposit, Proof Of Insurance, Letter Of Consent) Please consult Program Policies or contact FrontCounter BC for further information. Some items may have additional associated costs or require additional processing time.				
Applicant or Agent signature(s): Bauy Teny, Vice President Finance & CFO Date: May 7, 2013 FORTIS INC.				

#### PLEASE RETAIN A COPY OF THIS APPLICATION FOR YOUR RECORDS - APPLICATIONS ARE NOT TRANSFERABLE -

**NOTE**: The information you provide will be subject to the Freedom of Information and Protection of Privacy Act. If you have any questions regarding the treatment of your personal information, please contact the Manager, Privacy, Information Access and Records Management.

The submission of this form does not in any manner convey any rights to use or occupy Crown land.



# Government of British Columbia

Natural Resources Program Delivery

Services are delivered through Government's FrontCounterBC initiative which is the responsibility of the Ministry of Forests, Lands and Natural Resource Operations offices listed below and at <a href="http://www.frontcounterbc.gov.bc.ca/contact/">http://www.frontcounterbc.gov.bc.ca/contact/</a>

Call FrontCounter BC toll free at: **1-877-855-3222** Call from outside North America at: **++1-604-586-4400** 

City / Town	Location	Mailing Address	Phone	Fax
100 Mile				
House	300 S Cariboo Highway	Box 129, 100 Mile House VOK 2E0	250 395-7800	250 395-7810
Burns Lake	185 W Highway 16	Box 999, Burns Lake VOJ 1E0	250-692-2200	250-692-7461
Campbell River	370 S Dogwood Street	370 S Dogwood Street, Campbell River V9W 6Y7	250-286-9300	250-286-9490
Castlegar	845 Columbia Avenue	845 Columbia Avenue, Castelgar V1N 1H3	250-365-8600	250-365-8568
Chilliwack	46360 Airport Road	46360 Airport Road, Chilliwack V2P 1A5	604-702-5700	604-702-5711
		Box 4501 RR#2(687 Yellowhead South Highway 5),		
Clearwater	687 Yellowhead South Highway	Clearwater VOE 1N0	250-587-6700	250-587-6790
Cranbrook	1902 Theatre Road	1902 Theatre Road, Cranbrook V1C 7G1	250-426-1766	250-426-1767
Dawson Creek	9000 17th Street	9000-17th St Dawson Creek, V1G 1A5	250-784-1200	250-784-0143
		RR 1 Mile 301 6100 Alaska Hwy Fort Nelson VOC		
Fort Nelson	6100 Alaska Highway	1R0	250-774-5511	250-774-3704
Fort St. James	2537 Stones Bay Road	Box 100, Fort St. James VOJ 1P0	250-996-5200	250-996-5290
Fort St. John	Suite 100, 10003 110th Ave	Suite 100, 10003 110th Ave, Fort St. John V1J 6M7	250-787-3415	250-261-2084
Kamloops	441 Columbia Street	441 Columbia Street, Kamloops V2C 2T3	250-828-4131	250-828-4442

City / Town	Location	Mailing Address	Phone	Fax
Mackenzie	#1 Cicada Road	Box 2260, Mackenzie VOJ 2C0	250-997-2200	250-997-2236
Merritt	3840 Airport Road V1K 1M5 (off of Hwy 5A)	Box 4400 Station Main, Merritt V1K 1B8 (different PC correct)	250-378-8400	250-378-8481
Nanaimo	Suite 142, 2080 Labieux Road	Suite 142, 2080 Labieux Road, Nanaimo V9T 6J9	250-751-7220	250-751-7224
Port Alberni	4885 Cherry Creek Road	4885 Cherry Creek Road, Port Alberni V9Y 8E9	250-731-3000	250-731-3010
Port McNeil	2217 Mine Road Place	Box 7000, Port McNeil VON 2R0	250-956-5000	250-956-5079
Powell River	7077 Duncan Street	7077 Duncan Street, Powell River V8A 1W1	604-485-0700	604-485-0799
Prince George	1044-5th Avenue	1044-5th Avenue, Prince George V2L 5G4	250-565-6779	250-565-6941
Haida Gwaii	1229 Oceanview Drive	Box 39, Haida Gwaii V0T 1S0	250-559-6200	250-559-8342
Quesnel	322 Johnston Avenue	322 Johnston Avenue, Quesnel V2J 6B5	250-992-4400	250-992-4403
Revelstoke	1761 Big Eddy Road	Box 9158 RPO#3, Revelstoke VOE 3KO	250-837-7611	250-837-7626
Squamish	Suite 101 - 42000 Loggers Lane	Suite 101 - 42000 Loggers Lane, Squamish V8B 0H3	604-898-2100	604-898-2191
Smithers	1st Floor, 3726 Alfred Avenue	Bag 5000, Smithers VOJ 2N0	250-847-7356	250-847-7556
Surrey	Suite 200-10428 153rd Street	Suite 200-10428 153rd Street, Surrey V3R 1E1	604-586-4400	604-586-4434
Terrace	Suite 200-5220 Keith Avenue	Suite 200-5220 Keith Avenue, Terrace V8G 1L1	250-638-5100	250-638-5176
Vanderhoof	1522 Highway 16 East	Box 190, Vanderhoof VOJ 3A0	250-567-6363	250-567-6370
Vernon	2501-14 Avenue	2501-14 Avenue, Vernon V1T 8H2	250-558-1700	250-549-5485
Williams Lake	120 - 640 Borland Street	120 - 640 Borland Street, Williams Lake V2G 4T1	250-398-4574	250-398-4836





Data has been developed using the most current available information, but errors or ommissions may exist. Please forward any questions or ommissions to the FortiSEC coronate Mapping Group. Data source: http://goto.Example.com/fi Page 8

1:250,000

1-866-4FORTIS http://www.fortisbc.com





**Overview of Proposed Application Area** 



# **Section A: Project Overview**

# **Project and Purpose**

The proposed Similkameen Hydroelectric Project is a 45-65 MW hydroelectric project on the Similkameen River approximately 15 km south of the town of Princeton. The proposed project will incorporate a dam and large storage reservoir. See the attached map "Overview of Application Area" for the project's location.

The purpose of the project is twofold.

First, power generated through the installed turbines will be used to serve load within the FortisBC Electricity Service Area, providing a source of clean and renewable energy for the customers of FortisBC. The storage reservoir will provide a higher capacity and increased firm energy, which is essential for the utility to reliably serve its load.

Second, the storage reservoir upstream of Princeton provides numerous downstream benefits to communities both in Canada and downstream in the United States as well as potential biological benefit to fish species in the lower Similkameen. Downstream benefits include potential flood attenuation for downstream communities; increased late summer flows in the lower Similkameen for agricultural irrigation; and flow shaping and resulting higher capacities for downstream hydroelectric projects.

The project would create a reservoir with a surface area of approximately 750 hectares. It would have two principal purposes: the impoundment of water for the generation of hydroelectricity, and buffering water flows on the Similkameen River for flood control purposes.

# Location, Size, Main Features

The project site is approximately located at UTM coordinates 678290 E, 5468510 N (Zone 10U), roughly 15 km upstream of Princeton on the Similkameen River. The site is adjacent to Copper Mountain Mining. The project would feature a 175-200 m high roller-compacted concrete ("RCC") dam with crest length 350-477 m. That dam would be constructed using approximately 1.6-2,000,000 m<sup>3</sup> of RCC, which would require a 230 m long, up to 3.6 m diameter diversion tunnel during construction. Once operational, up to 45 m<sup>3</sup>/s of water would be diverted into an 801 m long power conduit. The resulting head (varying between 140-170 m, depending on reservoir level) would be used to drive two Francis turbines. The project is estimated to generate 213-233

GWh of energy annually. Once complete, the dam would create a reservoir with a surface area of approximately 750 hectares, with its water elevation ranging from a minimum of approximately 895 m (minimum operating level) to a maximum of approximately 936.5 m (peak flood level). The final range will be determined as part of an optimization process.

See the attached figure "Proposed Location of Works" for a proposed site layout. Table A provides a project summary and significant design features:

Project Title:	Similkameen River Hydro Project	
Project Location:	Princeton, BC	
Connection Point to Grid:	The preferred location is to tap onto the BC Hydro system at the existing mine site, as this is the closest connection.	
Water Source:	Similkameen River	
Project Operation:	Seasonal Storage Hydro	
Rated Capacity of Plant	45-65 MW	
Design Flow:	45 m <sup>3</sup> /s	
Gross Head (mean annual):	140-170 m	
Dam:	Roller Compacted Concrete (RCC) with ungated spillway incorporated in dam.	
Reservoir:	Maximum storage as FSL: 412 million m <sup>3</sup> . Live storage: 167 million m <sup>3</sup> .	
Water Conveyance System:	Headrace tunnel / pressure shaft / high pressure tunnel 2.2 to 2.5 m diameter.	
Powerhouse:	Surface powerhouse at toe of dam. Concrete substructure with structural steel, metal clad superstructure and steel roof, housing the generating equipment, switch-gear, and protection and control equipment.	
Turbines:	Two vertical axis Francis turbines, at a rated speed of 514 rpm.	
Generators:	Two direct Coupled Synchronous generators at 13.8 kV.	
Access:	Road access off of Highway 3 16 km south of Princeton then private road to dam site.	

Table A – Similkameen Project Details

#### Access Plans

Access to the project site will be by road off of BC Highway 3 16km south of Princeton. A network of existing on-site roads will allow access to dam and powerhouse sites.

The attached figure "Overview of Application Area" shows Highway 3 in relation to the application area.

#### **Construction Schedule**

It is estimated that development of this project will require approximately 6, with construction occupying 2.5 years (with the dam itself being the limiting factor). Figure A shows an estimate of the dates that match this timeline.

ID	Task Name	Duration	Start	Finish	2013	2014	2015	2016	2017	2018	2019
1	Pre-Feasibility Assessments	2.53 months	01 Apr '13	15 Jun '13	-						
2	Feasibility	12.17 months	16 Jun '13	15 Jun '14	<u>.</u>						
3	Permitting	21.3 months	16 Jun '14	15 Mar '16		6					
4	Design & Pre-Construction	12.17 months	16 Mar '16	15 Mar '17							
5	Construction	26.9 months	16 Mar '17	31 May '19					_		
6	Commissioning	1 month	01 Jun '19	30 Jun '19							-

**Figure A – Project Development Schedule** 

# **Section B: Project Description**

#### I – Background

The Similkameen Hydroelectric Project's principal offering is electric capacity and energy. One of the principal attractions of a project such as this is its ability to store water; water from the spring melt replenishes the reservoir for use during low-flow summer and winter months. This means that the facility's capacity can be treated as *firm* (meaning that it can be called on at any time), as opposed to *intermittent* resources (such as wind turbines or run-of-river hydroelectric facilities) that can only generate when their fuel source is available. Firm resources are especially valuable to electric utilities, as they assist in regulating the system and facilitating the integration of fluctuating intermittent renewable resources.

An ancillary benefit of the Similkameen project is its ability to regulate water flows and prevent flooding. The South Okanagan areas downstream of the proposed dam have historically faced challenging conditions during spring runoff which require water management authorities to manage trade-offs between the levels of various lakes and rivers. Water flows that would

otherwise cause flooding downstream can be buffered by the dam project and released during dry times of year, both preventing floods and avoiding droughts during dry summer months.

The potential markets for the electric services provided by the dam would be either FortisBC (which serves the Okanagan region) or BC Hydro (which serves the majority of British Columbia). The project is situated in close proximity to both utilities and it is expected that power can and would be sold to both.

## II – Location and Development Requirements/Impacts

## **General Location Description**

The project is located on the Similkameen River, approximately 15 km upstream from Princeton. It is situated next to the existing Copper Mountain mine site. The project would create a reservoir with a surface area of approximately 750 hectares.

The attached figure "Overview of Application Area" shows the site's location.

## **Project Justification**

In recent years British Columbia has been a net electricity importer, buying electricity from the open market. Reliance on this marketplace (i.e. trading with Alberta and Washington) exposes British Columbians to fluctuating market prices for electricity. The installation of new electrical generation, such as the Similkameen project, helps to ensure that British Columbia can meet its own electricity needs in a secure and cost-effective manner. Furthermore, the increasing introduction of intermittent renewable resources (such as wind, solar, and run-of-river hydro) places a strain on the provincial electric grid. Firm and dependable resources such as the Similkameen project provide a stabilizing influence for electric utilities that must ensure system stability.

# New Facilities/Infrastructure Proposed

The project as proposed can be generally describes as having of five main components: a dam, a power conduit, a powerhouse, a switchyard, and a transmission line. The dam would be approximately 175-200 m tall, have a crest length of 350-477 m, and require approximately 1.6-2,000,000 m<sup>3</sup> of concrete. The power conduit, of 2-2.5 m internal diameter, would convey water 801 m from the reservoir behind the dam to the powerhouse. The powerhouse would be approximately 30 m long, 11.5 m wide, and 28 m tall, and would house two or three Francis turbines and all of the maintenance equipment associated with the facility. Once generated at the

turbines, the electricity would be conveyed to a switchyard adjacent to the powerhouse, where a transformer and all associated switchgear would raise its voltage and transfer it to the facility's transmission line. The transmission line would then convey the power to a nearby point-of-interconnection (POI) with the existing power grid. Several POIs are currently under consideration. In addition to the above, short lengths of road would be required to access the various portions of the project site from Copper Mountain Mine's existing road network.

The attached figure "Proposed Location of Works" shows several of the main components of the proposed facility.

## **Roads and Road Use**

BC Highway 3 would provide the principal access to the site. To reach the project site itself from the highway, existing roads put in place by the Copper Mountain Mine would be used, except for minimal sections of new road that would need to be constructed on the construction site itself. It is expected that these roads can and would be used year-round.

The attached figure "Overview of Application Area" shows Highway 3 in relation to the application area.

#### **General Adjacent Land Use**

Directly adjacent to the dam and powerhouse is the Copper Mountain Mine. The mine owners have been consulted and are receptive to the idea of the project. Upstream users that would be affected by the reservoir include several private landowners, rangeland management agreements, forestry licenses, and an outfitting/hunting guide operation. It is expected that the impacts on these users can be mitigated in a mutually beneficial fashion.

The attached figure "Overview of the Proposed Application Area" shows adjacent land use parcels.

# **Other Development Impacts**

The principal impact of this project is the creation of a reservoir upstream of the dam. The effect of this reservoir on terrestrial and aquatic ecosystems and species will be the principal focus of environmental and impact studies prior to project execution.

#### <u>III – Utilities</u>

Detailed planning on utility connections has not yet taken place; however the following are estimations that are appropriate for the current phase of development.

Telecommunications connections are critical to the operation of a dam, and thus will be necessary for this project. It is expected that the project will be able to branch off of the existing connection at the Copper Mountain mine site.

The dam would normally supply its own electricity, however in the event of a shutdown of the electrical generating equipment an outside source of power is required. The same connection to the electric grid that is normally used to supply power can also be used to draw power in these circumstances.

During construction, it is expected that "pump and treat" chemical toilets (portable toilets) would be used. For long-term plant operations it is unlikely that a connection to an existing sewage system would be undertaken. It is more likely that the facility will use either a septic system or continue to use portable toilets.

It is unlikely that a domestic water connection will be pursued. For industrial purposes water from the reservoir can be used, however drinking water supplies for staff will need to be provided by other means.

# SECTION C: Project Description/Investigative Schedule

Valued Component	Activity	Brief Description of Activity	Time period	Potential im
Geophysical Environment	Field truthing of maps and existing data. Possible soil sampling	<ul> <li>A literature review and gap analysis of existing information will be conducted.</li> <li>Field-truthing of this information and sampling may be required including: <ul> <li>Soil sampling and characterization for purposes of erosion control and reclamation.</li> <li>Identification of natural hazards including slope stability, avalanche potential.</li> <li>Identification of geological features</li> <li>Field truthing may be conducted on foot or by helicopter.</li> </ul> </li> </ul>	Summers of 2013 and 2014	Minor impact - Some disturbance where so taken. Walking over land is lo
Fisheries Resources	Confirmation of fish habitat.	<ul> <li>A literature review and gap analysis of existing fisheries information will be conducted. Field-truthing of this information and sampling may be required including the following possible studies:</li> <li>1. Headwaters - Identification, coding and characterization of all waterbodies, reaches and lakes with a potential fish passage connection; fish production potential, lake depth, water quality including dissolved oxygen, pH, temperature, Secchi depth (literature review and field confirmation if needed)</li> <li>2. River main stem - Determine channel morphology, locate and identify obstructions, describe riparian area properties and map habitat locations. May include the following field studies: <ul> <li>a. Confirmation of fish rearing and overwintering habitat, spawning and incubation habitat and riparian habitat.</li> <li>b. Confirmation of fish migratory habitat and patterns (including falls, cascade, and riffle mesohabitats that pose seasonal or permanent obstacles or barriers to upstream fish movement);</li> </ul> </li> </ul>	Summers of 2013 and 2014	Walking over land is lo
Fisheries Resources	Presence of fish and invertebrates.	<ul> <li>A literature review and gap analysis of existing fisheries information will be conducted. Field-truthing of this information and sampling may be required including the following possible studies:</li> <li>1. Fish presence and movement patterns; Presence of listed aquatic species. May include the following fish sampling studies if deemed necessary: <ul> <li>a. electro fishing</li> <li>b. fish tagging</li> <li>c. catch and release netting or trapping</li> </ul> </li> <li>2. Benthic Invertebrates including sampling</li> </ul>	Summer 2013-Summer 2015.	Fish permits may be r sample fish. Water samples taken invertebrate analysis.
Hydrogeology flow and quality	Assessment of groundwater flow and quality.	<ul> <li>A literature review and gap analysis of existing hydrogeological information will be conducted. Sampling may be required including the following possible studies:</li> <li>Well drilling for groundwater monitoring</li> </ul>	Summer 2013-Summer 2015.	Low impact at locatio well(s) may be drilled improvements are red may be more.
Surface Water Quality	Assessment of water quality.	<ul> <li>A literature review and gap analysis of existing water quality information will be conducted. Sampling may be required including the following possible studies:</li> <li>Baseline water quality encompassing pH, alkalinity, specific conductivity,</li> </ul>	Summer 2013-Summer 2015.	Low impact. Access to or existing trails.

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o river by foot	

		total suspended solids, turbidity, dissolved oxygen, total gas pressure, nutrients (nitrate, nitrite, ammonia, orthophosphate, and total phosphate), and water temperature;		
Hydrology	Assessment water flow	<ul> <li>A literature review and gap analysis of existing hydrological information will be conducted. Sampling may be required including the following possible studies:</li> <li>A hydrologic analysis on the stream segment immediately below the point of diversion (proposed tailrace area).</li> </ul>	Summer 2013-Summer 2015.	Low impact to install equipment. If access improvements are required, impact could be more.
Terrestrial Wildlife	Field truthing of terrestrial wildlife usage of study area.	<ul> <li>A literature review and gap analysis of existing terrestrial habitat and wildlife use information will be conducted. Field truthing may be required including the following possible studies: <ul> <li>Ungulate and large mammal survey including pellet, tracks and winter track surveys</li> <li>Avifauna including migratory and nesting bird survey</li> <li>Herptile, Chiropterids (bat) and cliff dweller survey</li> <li>Sensitive/listed species survey</li> </ul> </li> </ul>	Summer 2013-Summer 2015.	Low impact – foot access or existing accesses will be used.
Terrestrial Vegetation	Field truthing of terrestrial vegetation and rare ecological communities.	<ul> <li>A literature review and gap analysis of existing terrestrial vegetation information will be conducted. Field truthing may be required including the following possible studies:</li> <li>Rare plants; and</li> <li>Rare ecological communities.</li> </ul>	Summer 2013-Summer 2015.	Low impact – foot access or existing accesses will be used.
Timber Resources	Field truthing of potentially affected timber resources.	A literature review and gap analysis of existing forest resource information will be conducted. Field truthing may be required to assess the potential effects of the Project on timber resources upstream of the proposed dam.	Summer 2013-Summer 2015.	Low impact – foot access or existing accesses will be used.
Heritage Resources	Assessment of archeological areas or heritage sites	<ul> <li>A literature review and gap analysis of existing heritage and archeological information will be conducted. Field truthing may be required including the following possible studies:</li> <li>Preliminary Archeological Overview</li> <li>Archeological Impact Assessment if required</li> </ul>	Summer 2013-Summer 2015.	Impact will vary depending on results of Archeological Overview. If surveying is required then surface and subsurface studies may be conducted resulting in some minor ground disturbance.
Technical geological review	Assessment of the riverbed foundation strength	Review of the soil and rock characteristics just beneath the subsurface. Test pits will be dug and size limited to 5m long x 2m wide x 3 m deep. Small area around test pits will be cleared of vegetation.	Fall 2013, spring 2014 and summer 2014.	Impact is likely to be limited to few small test pits. All pits will be hand dug. If drilling equipment used, oil spill kit will be on site. Holes will be covered once investigation completed.
Surveying and Mapping	Establishing points on the ground	Ground control surveys to accurately determine elevations. Survey lines will be required and typically some lines 1-2 m wide by 200-500 m long	Summer to Fall 2013.	Low impact - foot access or existing accesses will be used. Remove vegetation from sight lines required.