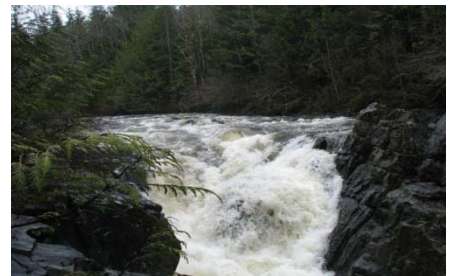




**KWAGIS POWER**



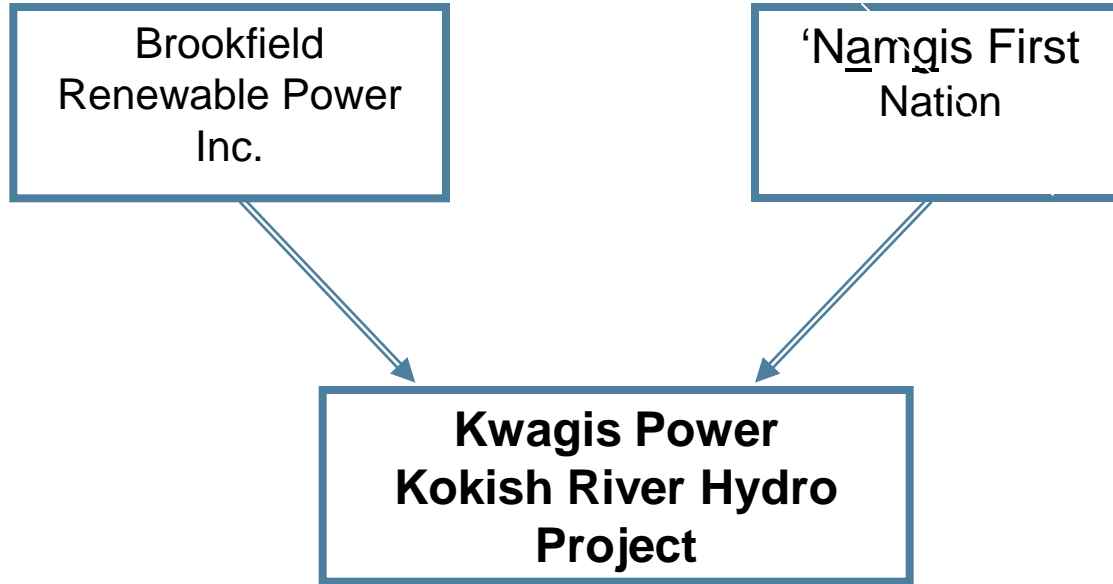
**Brookfield**  
Renewable Power



# Agenda

- ▶ Kwagis Power Limited Partnership
  - Brookfield Renewable Power Inc.
  - ‘Namgis First Nation
- ▶ Project Description
- ▶ Environmental Assessment
  - Study methods, findings, mitigation measures
- ▶ Development Schedule
- ▶ Questions and Answers

# Kwagis Power

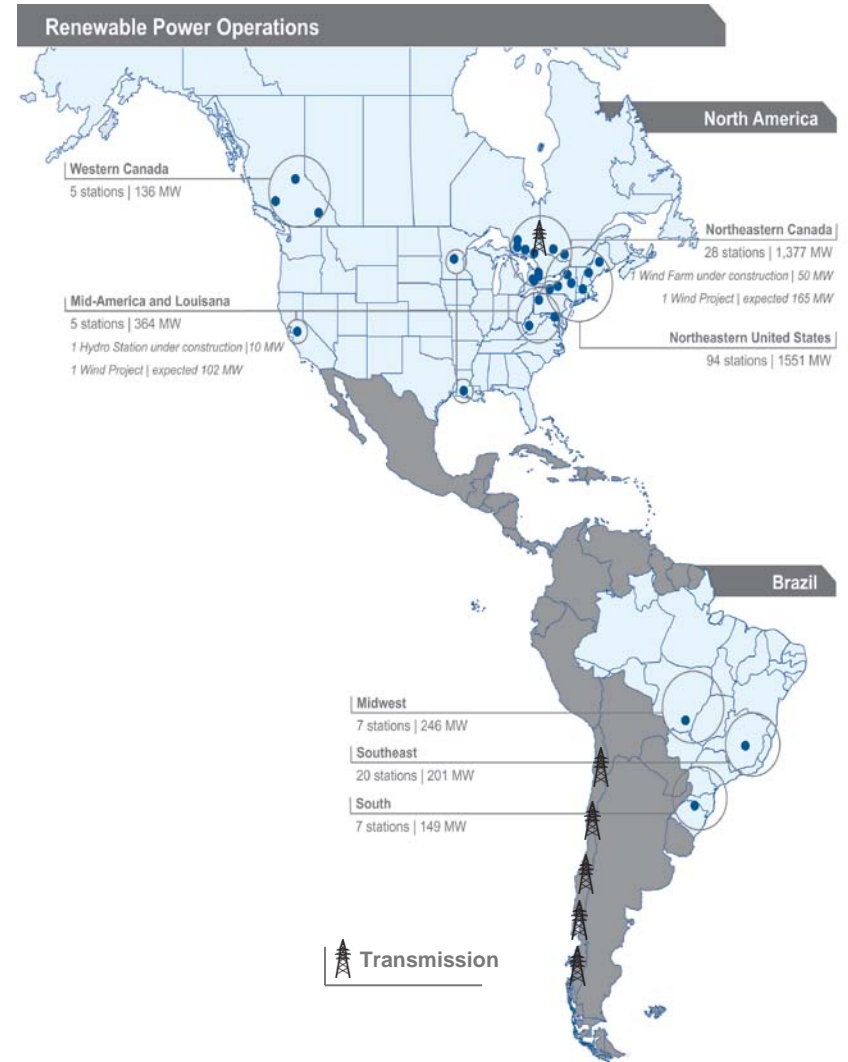




# Brookfield Renewable Power

Unique hydroelectric focus - one of the world's largest privately-held hydro portfolios

- ▶ ~ \$16 billion in assets under management
- ▶ 3 countries: Canada, United States and Brazil
  - Operating in 3 Provinces and 9 States
- ▶ 4,200 MW total installed capacity
- ▶ 166 hydro generating stations, including 1 pumped storage plant, 2 wind farm, and 2 gas plants
- ▶ 65 river systems
- ▶ ~1,100 employees



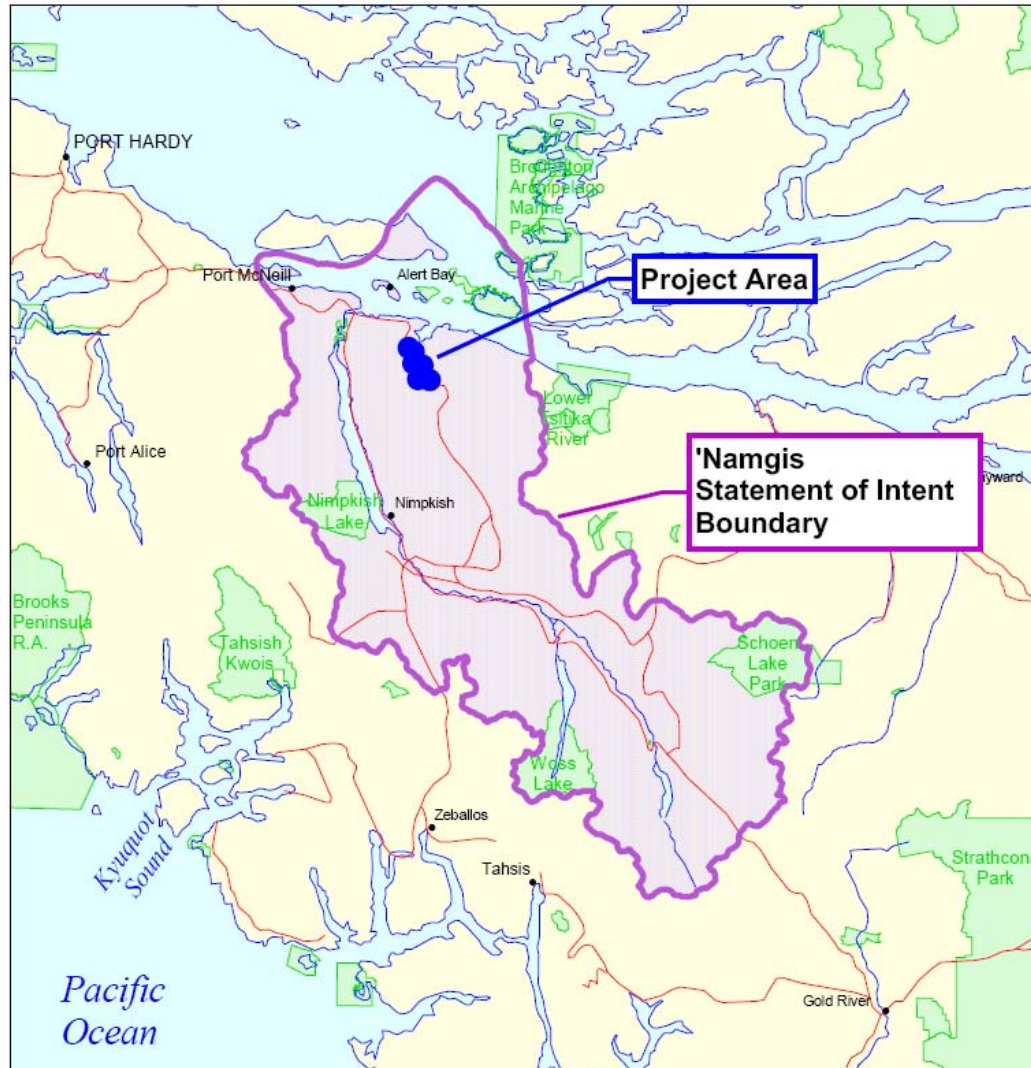


# Brookfield Renewable Power's Objectives

## Investing for the long term

- ▶ Responsible owner and operator of renewable energy assets;
- ▶ Manage reliable resources on a sustainable basis;
- ▶ Expand our renewable power platform through acquisition and new build, backed by long term contracts;
- ▶ Invest in long-term assets;
- ▶ Apply discipline to financial and project management;
- ▶ Align interests with local stakeholders and First Nations; and
- ▶ Dedicated to sustainable development of renewable energy.

# 'Namgis First Nation Traditional Territory



**KWAGIS POWER**

**Brookfield**  
Renewable Power



# ‘Namgis First Nation

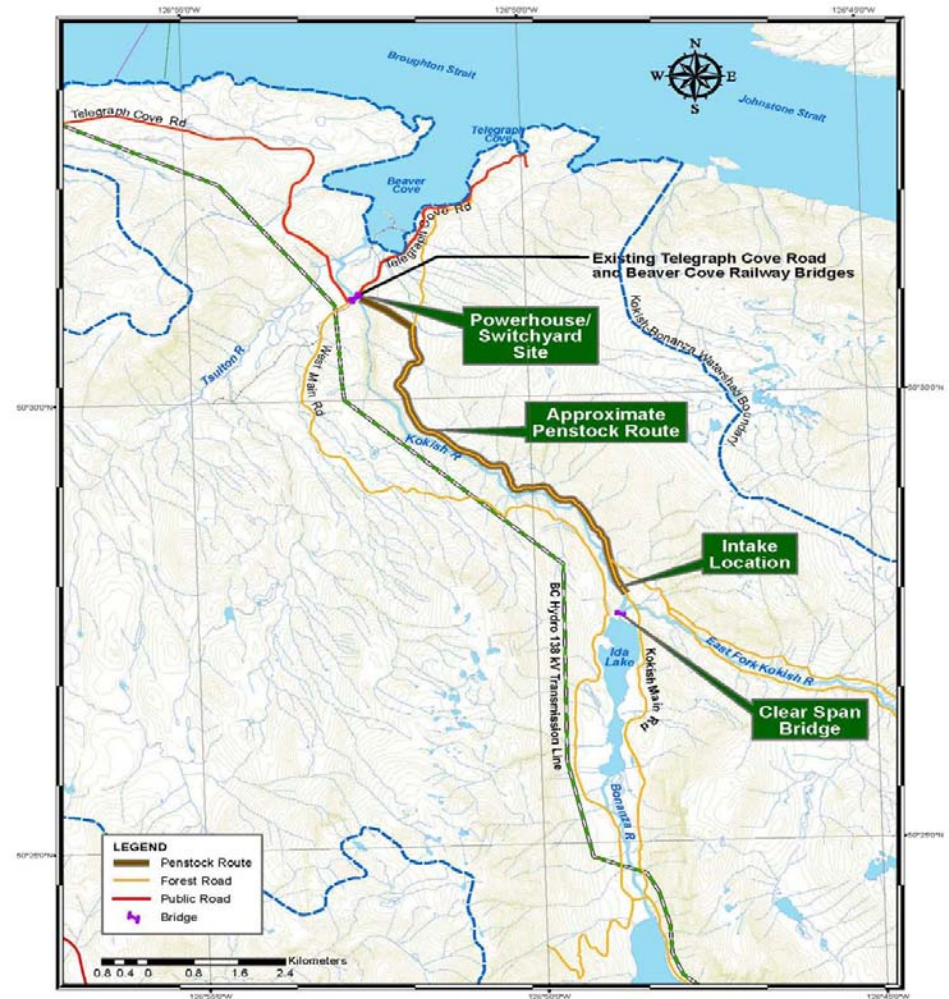
- ▶ Committed to long term sustainable economic development;
- ▶ Committed to stewardship of the environmental resources within our Traditional Territory;
- ▶ Want to work with partners that share these values;
- ▶ Proud of our association with Brookfield;
- ▶ Participated in many of the EA studies: fisheries, TEK, Archeology; and
- ▶ Equity Partner in the Project, plus signed Benefits Agreement.



# Kokish River Project Layout

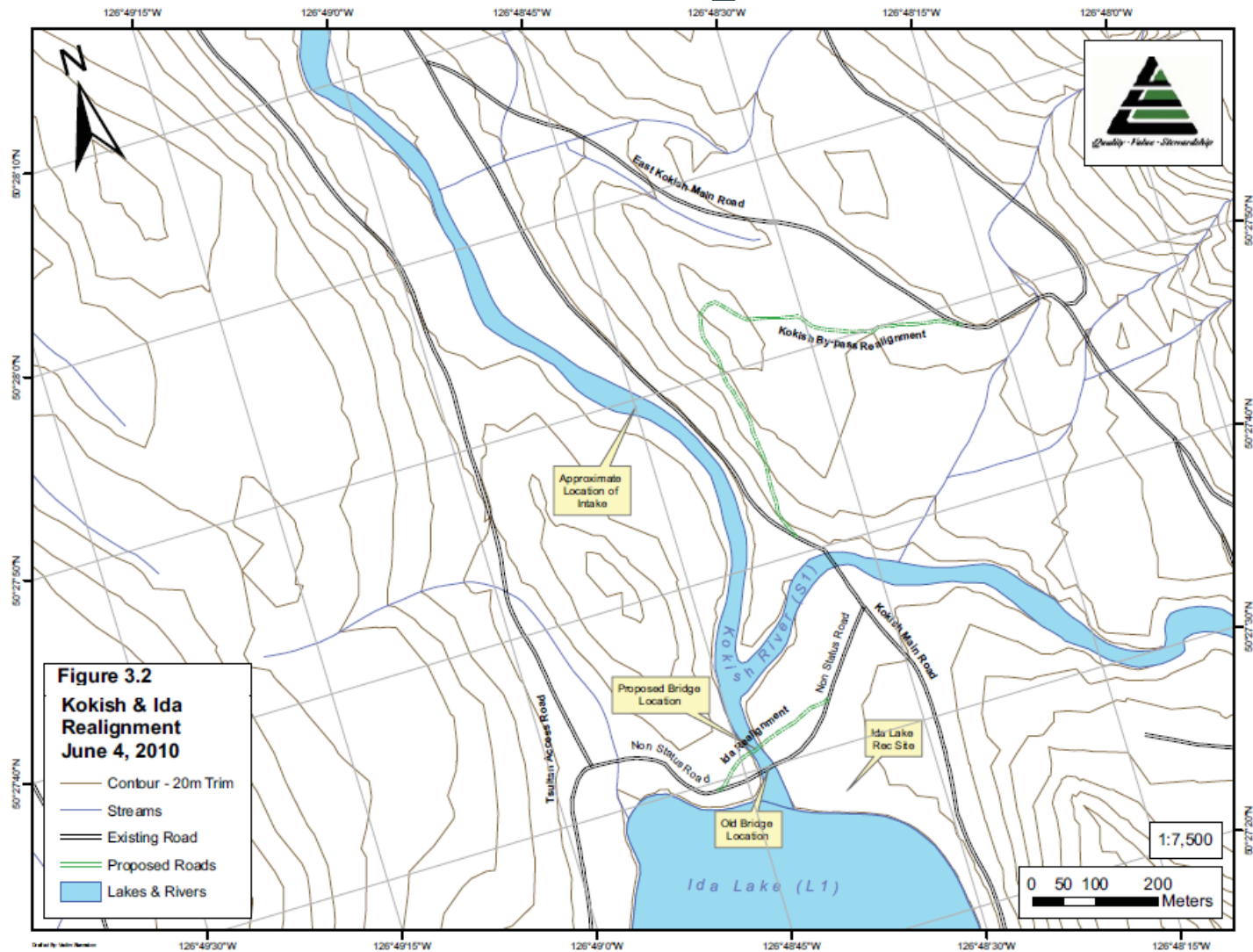
## Main Project Components

- ▶ Clear span bridge across Bonanza Creek
- ▶ Intake below confluence, above 11.3 km falls
- ▶ 9,200 m buried penstock, 7,000 m beside or in Kokish Main Road
- ▶ Powerhouse downstream of Telegraph Cove Road Bridge
- ▶ Short 138 kV power line to BC Hydro grid, less than 1 km
- ▶ Interconnection beside Sea Soil plant





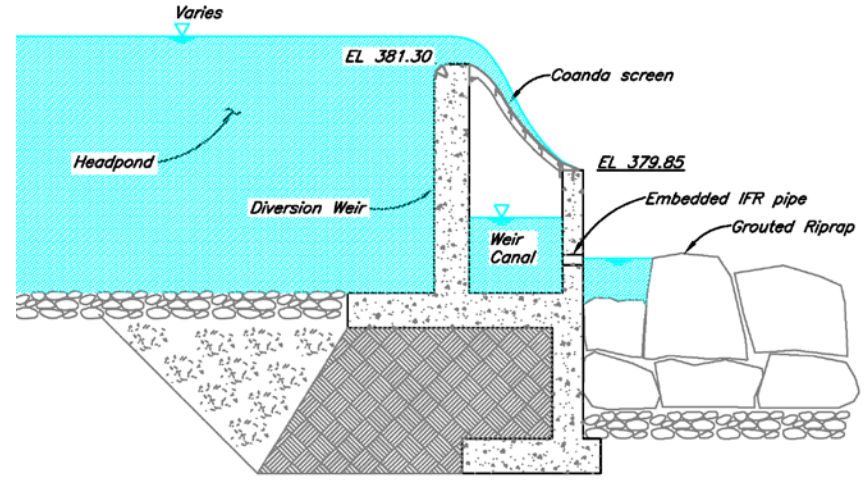
# Kokish River Roads and Bridge





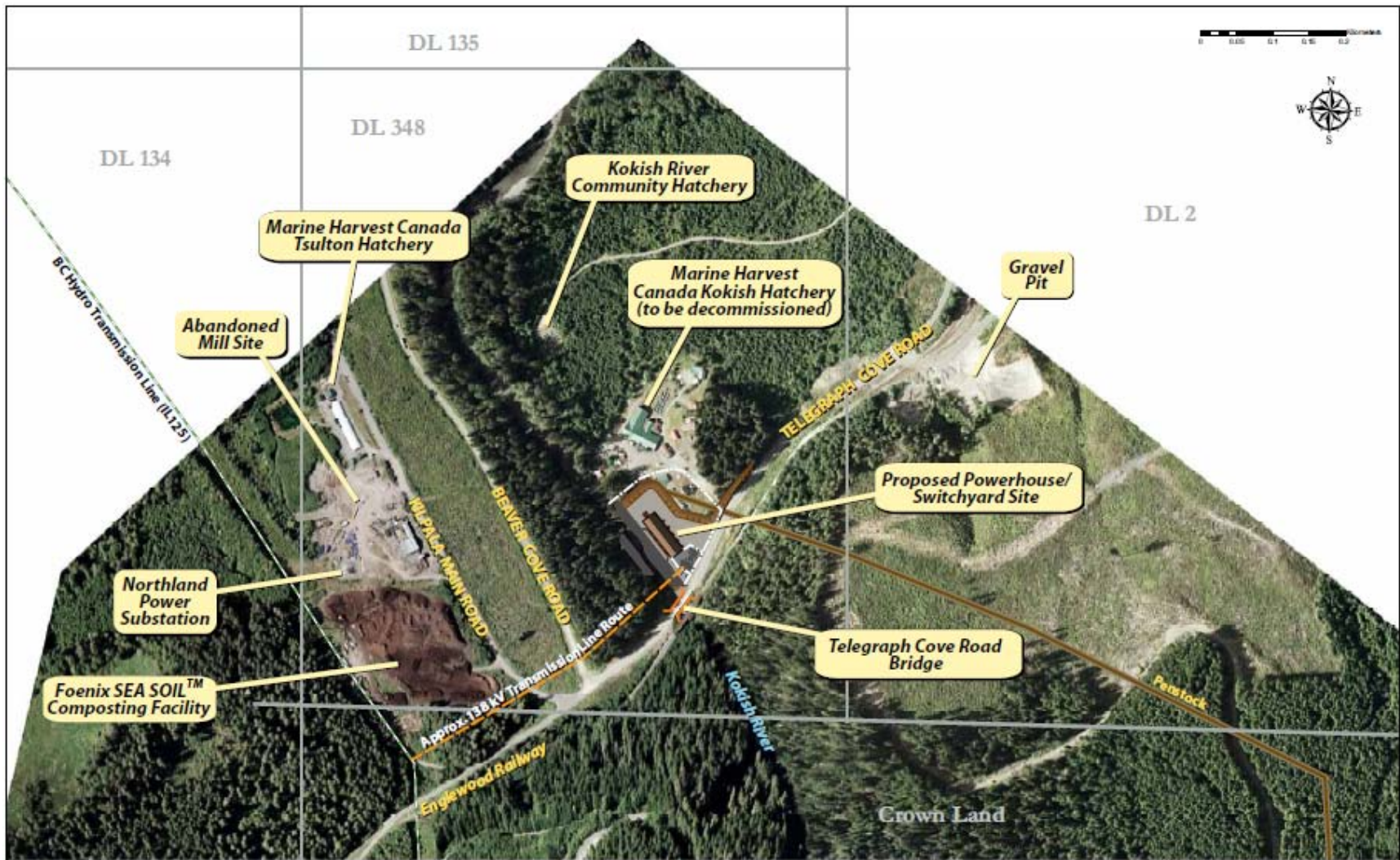
# Kokish River Coanda Intake

- ▶ Water flows through wedge wire screen into intake
- ▶ Debris screened out and passes downstream
- ▶ Fish ladder to be incorporated into design
- ▶ Several in use in BC





# Kokish River Powerhouse Location





# Kokish Hydroelectric Project Benefits

## Benefits of the Project include:

- ▶ Provides a long-term, sustainable economic activity for region and the 'Namgis First Nation partner on their traditional territory that fits well with cultural and societal values;
- ▶ Assists the province and BC Hydro in reaching their electricity self-sufficiency goals by providing an additional source of clean, renewable energy;
- ▶ Provides revenue to the Province and RDMW in the form of water rent and municipal taxes;
- ▶ Reinforces the electrical system of the northern portion of Vancouver Island; and
- ▶ Utilizes the extensive road network and existing infrastructure in order to minimize the Project's environmental footprint.



# Kokish River Environmental Assessment

Field studies commenced in 2004 and have involved numerous specialists, including many of the best in BC.

To date, \$3 million has been invested in environmental studies.

Field studies carried out on:

- ▶ Surface Hydrology
- ▶ Wildlife, Wildlife Habitat and Vegetation
- ▶ Air Quality
- ▶ First Nations Traditional and Current Use
- ▶ Archeology
- ▶ Noise
- ▶ Others

Focus on:

- ▶ Fisheries and Aquatic Habitat (including hydrology)
- ▶ Navigation
- ▶ First Nations and stakeholder consultation



# Kwagis Power Consultation Activities

## Keeping the public informed

Open communications, information exchange, and community engagement activities are essential elements in the project's development process. Issues identified during these activities will enable Kwagis Power to plan, design, build and operate a successful Project.

Pre-Application stage consultation activities included notification and information sharing through:

- news releases,
- Project bulletins,
- Project website,
- open houses,
- distribution of feedback forms, and
- meetings with stakeholders.



# Kwagis Power Hydrology/Fisheries

## Studies Undertaken include:

- ▶ Flow gauging since 2005, good correlation with WSC long term flow data on the Tsitika;
- ▶ Fisheries studies since 2004;
- ▶ Snorkel surveys, fin clipping, radio tagging, electro shocking;
- ▶ Surveyed 20 transects, 4-7 different flow over 2 years; and
- ▶ Modelled using PHABSIM.

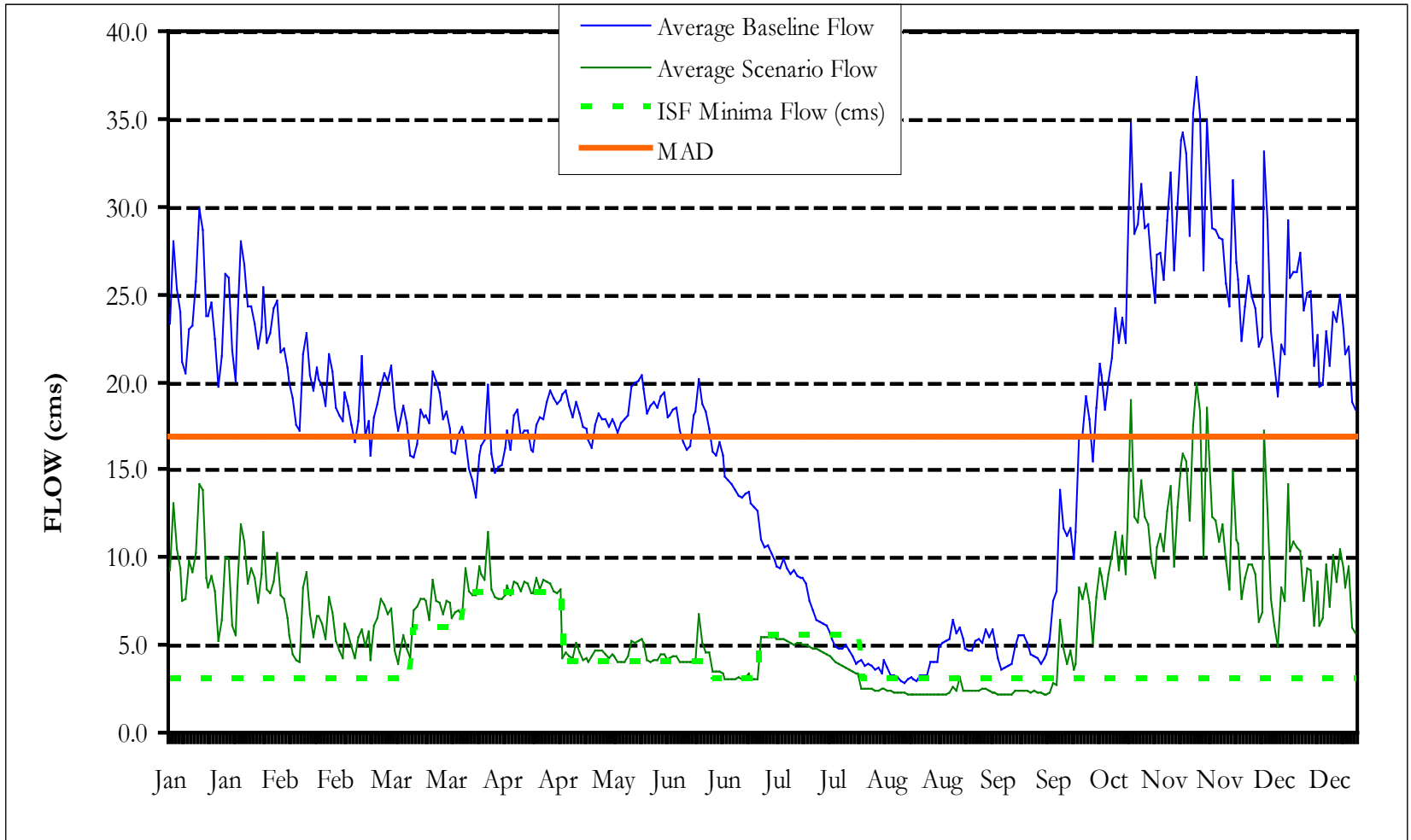


# Kokish River Fisheries Studies

## Major Findings

- ▶ Five species of Pacific Salmon, Summer and Winter Run Steelhead, Cutthroat Trout, Dolly Varden Char, Pacific Lamprey, Sculpins, Kokanee
- ▶ Different species require different conditions for different life stages
- ▶ Majority assessment effort focused on Coho Salmon and Steelhead
- ▶ Limiting factor on Steelhead and Coho capacity is low flow in summer months

# Kokish River Hydrology and IFR





# Kokish River Fisheries

## Proposed Mitigation Measures

- ▶ IFR maintains no net loss, no flow related Harmful Alteration Disruption Destruction
- ▶ Incorporate fish ladder and Coanda Screen in intake design
- ▶ Turbine 100% instantaneous flow bypass, long ramping rates
- ▶ Schedule instream works in fish windows, best management practices during construction
- ▶ Adaptive management



# Kokish River Fisheries

## Proposed Compensation Measures

- ▶ Restoration and creation of Kokish River off-channel habitat
- ▶ Modification of Barrier Falls at 11.3 km
- ▶ Debris removal
- ▶ Spawning gravel placement
- ▶ Restoration of riparian vegetation



# Kokish River Navigation

- ▶ Recreational kayaking
- ▶ Flow range of 10 – 30 m<sup>3</sup>/s for navigation, 25 m<sup>3</sup>/s optimal
- ▶ Main paddling season in spring
- ▶ IFR lower than navigation flow
- ▶ Shut down plant on four days per year in May – June to allow natural flow in river
- ▶ Provide real time flow data



# Kokish River Schedule

## Current Project Schedule

Early 2011	Final design commence
Summer 2011	Major permitting completed
Summer/Fall 2011	Construction commence
Fish Window 2012 - Fish Window 2013	Intake construction
April 2014	Commercial operation



# Kwagis Power Consultation

Kwagis Power wishes to keep First Nations, agencies and the public engaged in all aspects of the Project. We invite you to review the application at:

[http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic\\_project\\_doc\\_list\\_332\\_r\\_app.html](http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_project_doc_list_332_r_app.html)

We encourage you to provide Feedback to:

**The Environmental Assessment Office**

or

**Kwagis Power**

By mail:

Martha Anslow

Project Assessment Manager

PO Box 9426 Stn Prov Govt

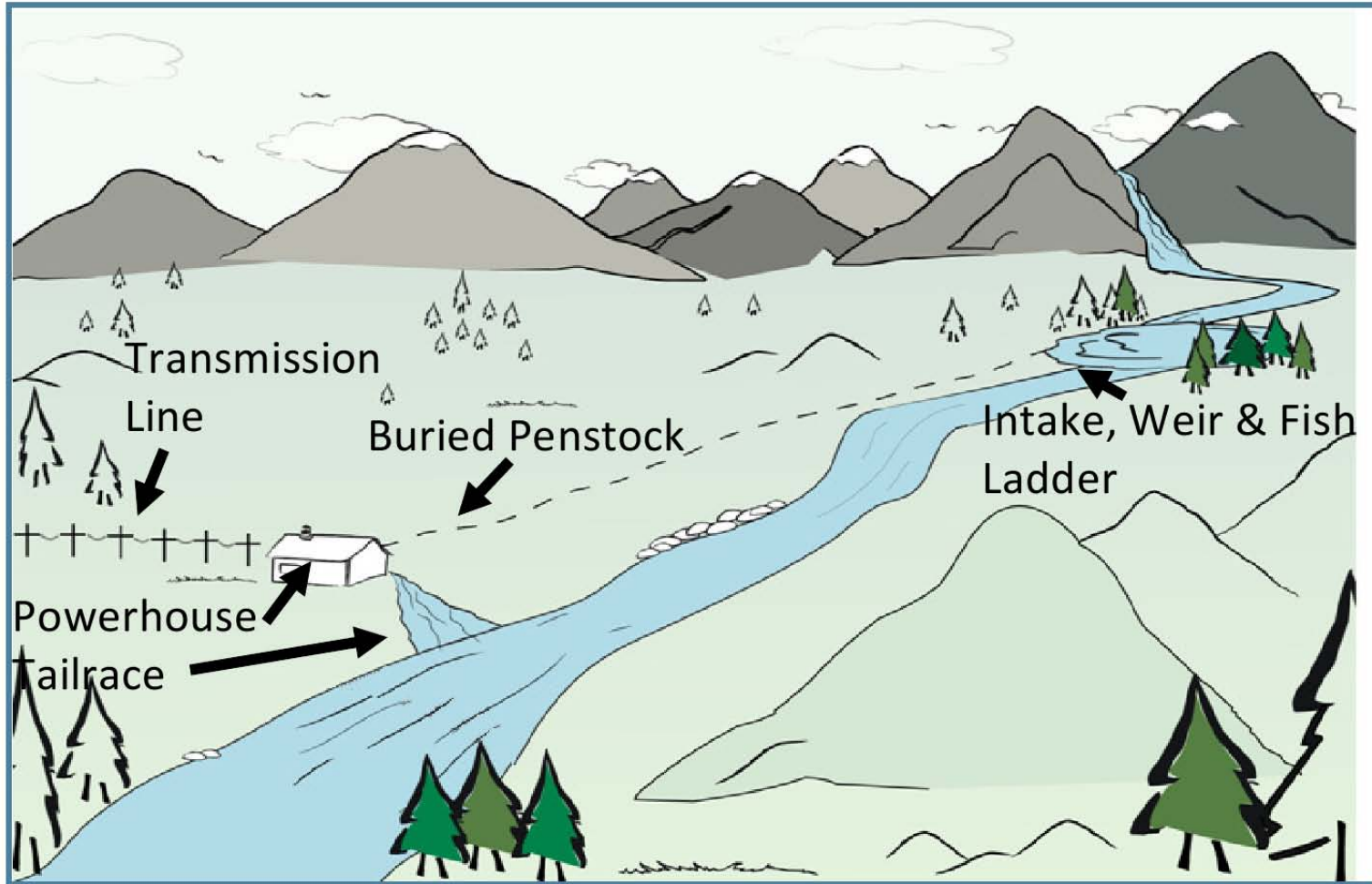
Victoria BC V8W 9V1

By fax:

Fax: 250-356-6448

By email: [Laura.Cornwell@stantec.com](mailto:Laura.Cornwell@stantec.com)

# Run-of-River Project Elements





# Kokish River Watershed



# Kokish River Proposed Instream Flow Release (IFR)

Period	Scenario Q	% Mean	Key Period and Life Stage	Rationale and source of flow level
1-Jan	3.00	18%	CO incubation	Kokish habitat data
16-Jan	3.00	18%	"	
1-Feb	3.00	18%	"	
16-Feb	3.00	18%	"	
1-Mar	3.00	18%	"	
16-Mar	6.00	35%	WSH Spawning	75% maximum, allow 2 cms local inflow
1-Apr	8.00	47%	WSH and SSH Spawning	75% maximum
16-Apr	8.00	47%	"	
1-May	4.00	24%	SH incubation	
16-May	4.00	24%	"	
1-Jun	4.00	24%	"	
16-Jun	3.00	18%	SH rearing	
1-Jul	5.60	33%	SH migration	pulsing flow of 12 cms 2 days per week for
16-Jul	5.60	33%	"	
1-Aug	3.00	18%	SH rearing	90% maximum value
16-Aug	3.00	18%	"	
1-Sep	3.00	18%	"	
16-Sep	3.00	18%	"	no allowance for chum spawning
1-Oct	3.00	18%	"	
16-Oct	3.00	18%	"	
1-Nov	3.00	18%	"	no allowance for coho spawning
16-Nov	3.00	18%	"	
1-Dec	3.00	18%	"	
16-Dec	3.00	18%	CO, DV, CM incubation	
<b>Annual</b>	<b>3.88</b>	<b>23%</b>		