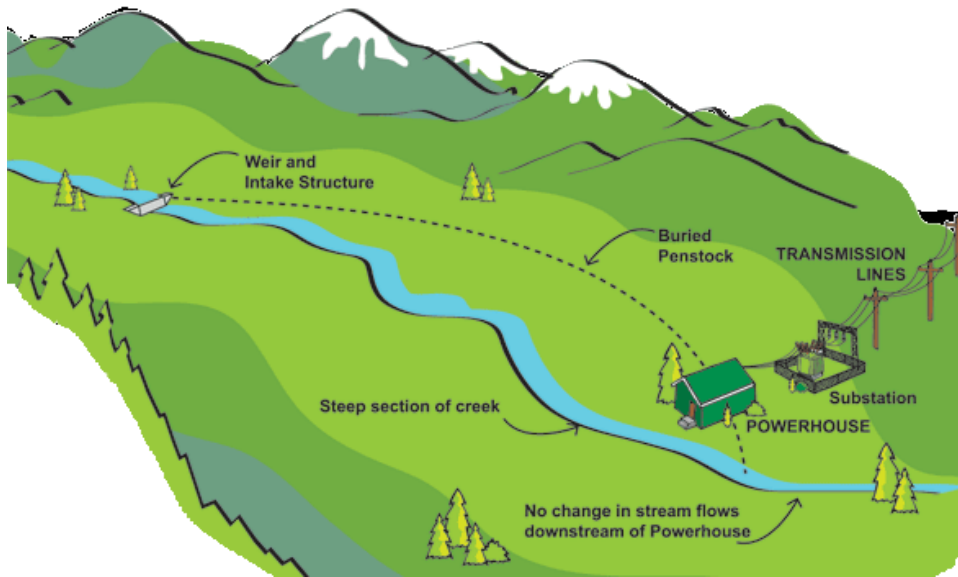


The Project:

- **The Corporation of the Village of Slocan submitted a waterpower project application on Springer Creek in May 2010**
- **Engineering & Environmental studies were performed on the project site to determine project economics and environmental attributes**
- **In 2015, the water license application is under active review by Front Counter BC.**
- **The proposed project configuration is based on the results of these studies:**
 - **800 kW run-of-river hydro**
 - **3100 MWh avg annual production**
 - **Max flow diversion = $0.8 \text{ m}^3/\text{sec}$**
 - **Elevation drop = 130 metres**
 - **Penstock pipe - 610mm diameter**
 - **800 m long**
 - **HDPE & Steel pipe**



What is Run-of-river hydro?



Run of river hydropower is a type of waterpower generation that has been used throughout the world for over 100 years.

A portion of a stream's flow is diverted into a pipe that drops in elevation. The drop creates increased pressure that is used to spin a turbine and generate

electricity. Once the water leaves the turbine, it is returned to the original stream.

Run-of-river power typically involves a small weir structure on a creek and does not store water. Flows upstream and downstream of the project are unaltered.

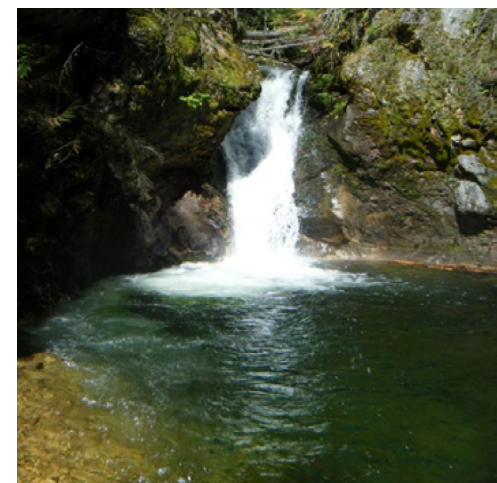
Significant environmental and engineering studies are performed to determine the level of allowable flow diversion.

How is the Diversion Flow Determined?

A project's Diversion Flow is determined from a balance of information collected from numerous environmental, engineering and financial studies. These include:

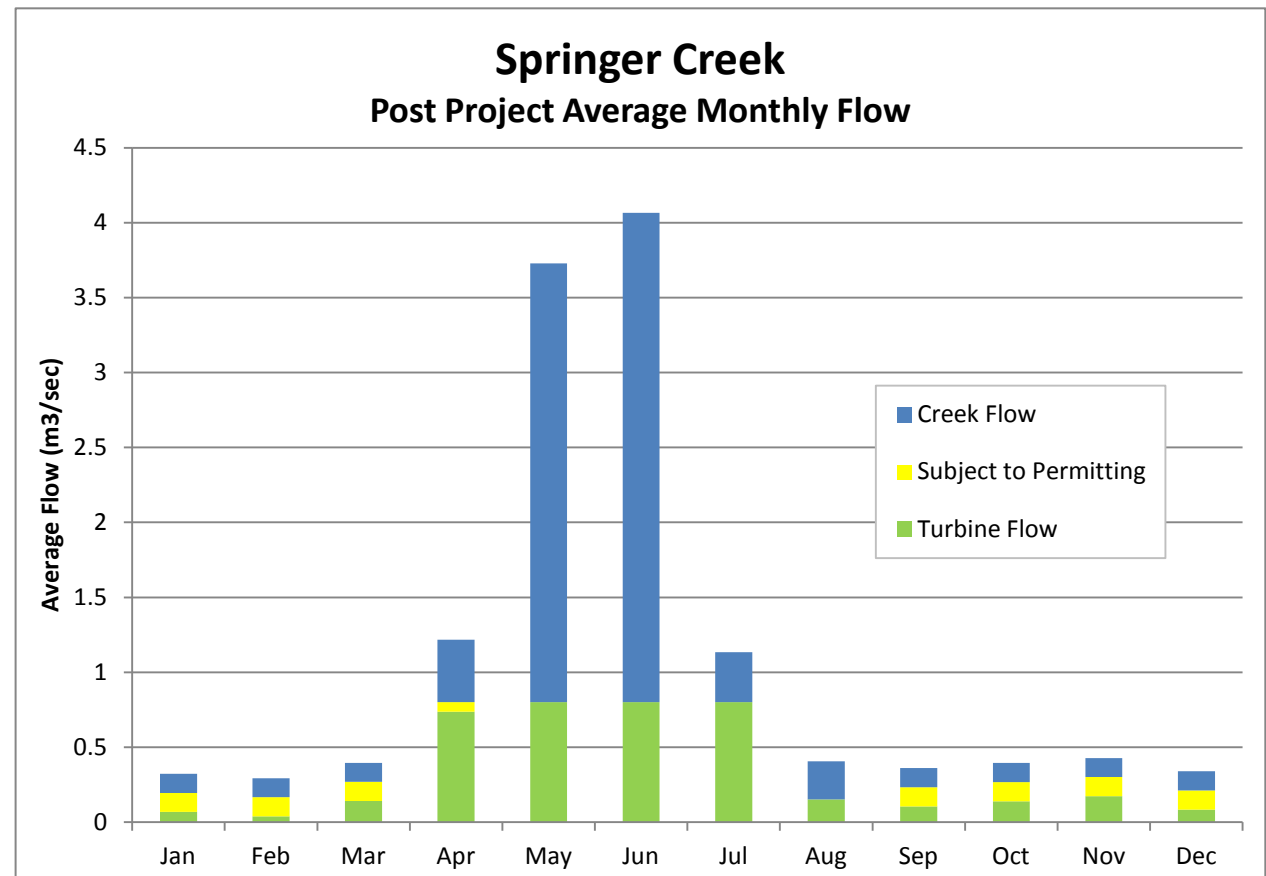
- Historic range of water flows and relative magnitude of extremes**
- Species, quantity and location of fish present**
- Quantity and quality of fish habitat**
- Biological productivity of invertebrates and periphyton**
- Seasonal variability of water quality (chemistry, turbidity, temp & oxygen)**

Minimum flow recommendations are developed by scientists based on the combined results of these studies. The recommendation is reviewed and ratified by Provincial & Federal agencies.



Proposed Springer Creek Water Usage

- **The post project flows will vary with time of year to mimic the natural flow variation**
- **Winter minimum instream flow thresholds are within historic variability**
- **A proportion of the flow is subject to permitting review and may vary**
- **Specialized high flow releases will also be performed in summer to ensure proper sediment transport and riparian habitat management**



Springer Creek Aquatic & Terrestrial Habitat

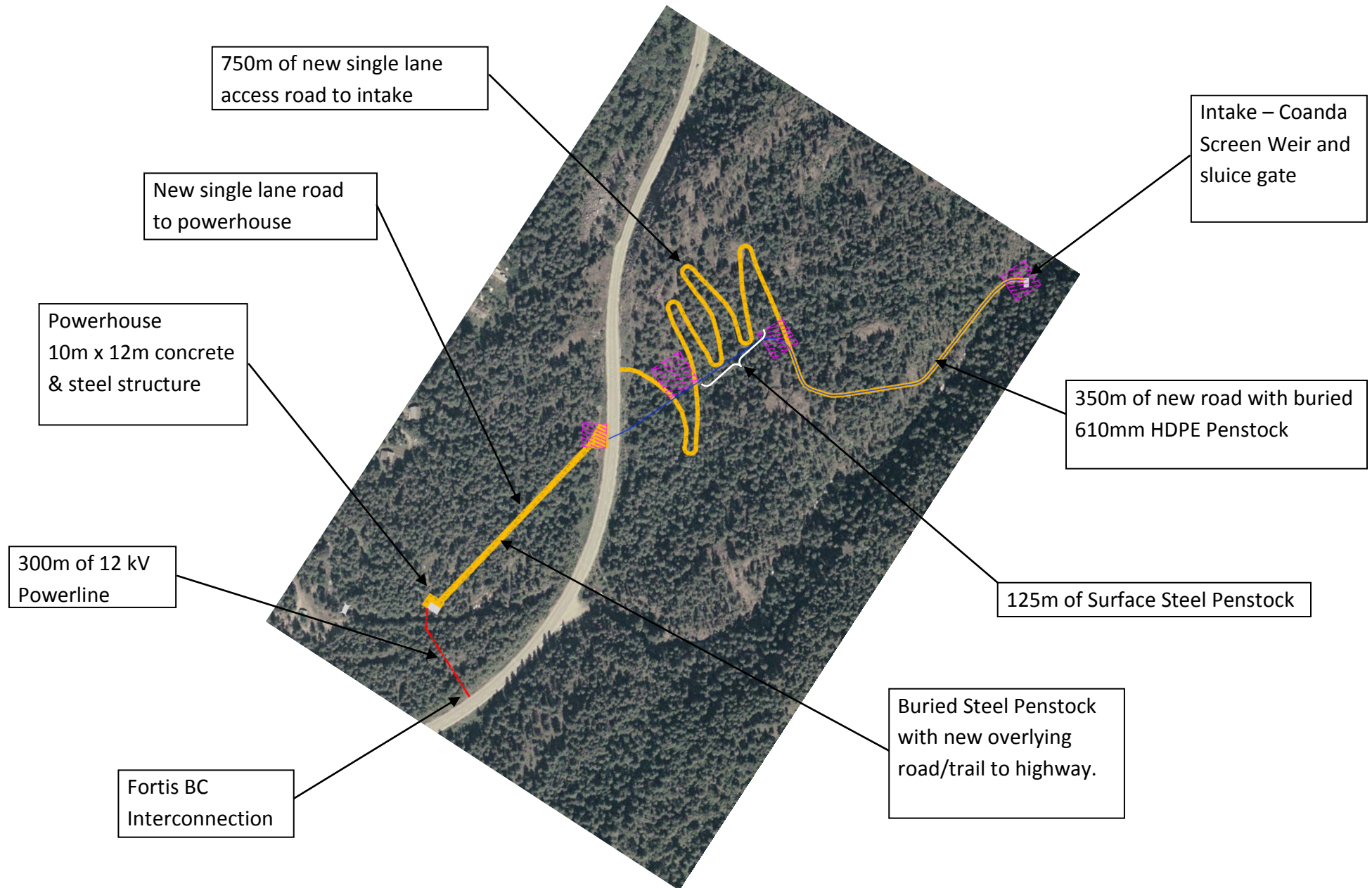
To assess the habitat within the Creek and the surrounding area, several studies were performed to develop an understanding of how the project may influence terrestrial and aquatic features. These studies including; vegetation inventory, general wildlife, winter tracking, bird surveys and species at risk.

Based on the environmental studies, Springer Creek was found to have:

- Only Rainbow Trout within the project section**
- Numerous fish barriers both within and downstream of the project section; limiting upstream migration**
- Water, benthic invertebrate and periphyton sampling indicate that Springer Creek is a relatively low productivity stream, with limited nutrients; likely due to the predominance of bedrock**



Project General Arrangement



Springer Creek Coanda Intake

Present Intake Site:



Artist's Conception:



Penstock

- To minimize impact and better accommodate the rocky narrow canyon at the intake, the upper 300m of the penstock will use more flexible HDPE pipe which will be constructed within the access road fill
- The above ground penstock section will be steel pipe constructed in a narrow corridor on pedestals using a highline system
- The lower buried section from above the highway to the powerhouse will be steel pipe buried in a trench or within a raised fill
- The steel sections will be constructed using ring clamps to minimize equipment requirements and construction time



Public Recreation

- The Project will not impact the canyon trail usage**
- Some access control is required within the project construction zone to ensure safety**
- A new trail would be created along the lower penstock route linking the Village park/campsite to the highway and canyon trail**
- Fish habitat and population abundance will be maintained, ensuring continued usage for any recreational fishing**



Project Benefits

- **Village as project developer is in excellent position to receive outside funding: injecting grant money into the region and economy**
- **Slocan hydro project is unique using BC Hydro Standing Offer Program through a third party FortisBC connection.**
- **Secure Micro-Hydro project revenue and long term financial stability for the Village**
- **Project revenue to fund Village amenities**
- **Opportunity for creek restoration**
- **Recreation trails**
- **Monitoring of Springer Creek water quality & flows**
- **Construction jobs**
- **Long term employment**
- **Development of Green Energy industry**



Project Financing

Project Construction Cost 2016:	\$3,400,000
Annual Gross Average Revenues (from 2017)	\$250,000
Average Project Net Revenue (dependent on financing terms, includes debt repayment, costs & operations/management)	\$100,000
Fundraising (Grants: i.e., Build Canada Fund, SIBAC, CBT)	\$2,100,000
Remaining funds to be combination of reserves/loan:	\$1,300,000

Sample MFA loan terms:

Amount: \$500k-\$1.3m; 5-20 yr term;
annual payment \$36k-\$262k



Project Next Steps

- **Receive approval for Provisional Water License and Development approval through Ministry of Forests, Lands and Natural Resource Operations.**
- **Apply to BC Hydro for Standing Offer Program.**
- **Perform reviews, if desired, to assess environmental and engineering factors for alternate project configuration/alternate road access.**
- **If changes to proposal desired, apply for any amendments to the development application through MFLNRO**
- **Upon approval from BC Hydro and final development permit approval, issue RFP for final design, tender and construction**
- **Construction**
- **Hydro Operation**

