

Alternative Water Supply Concept

Presentation to the
City of Parkville

March 16th 2015

...Trevor Wicks ...

March 2015

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The City of Parksville depends on both groundwater and surface water to supply a population of just under 12,000 people.

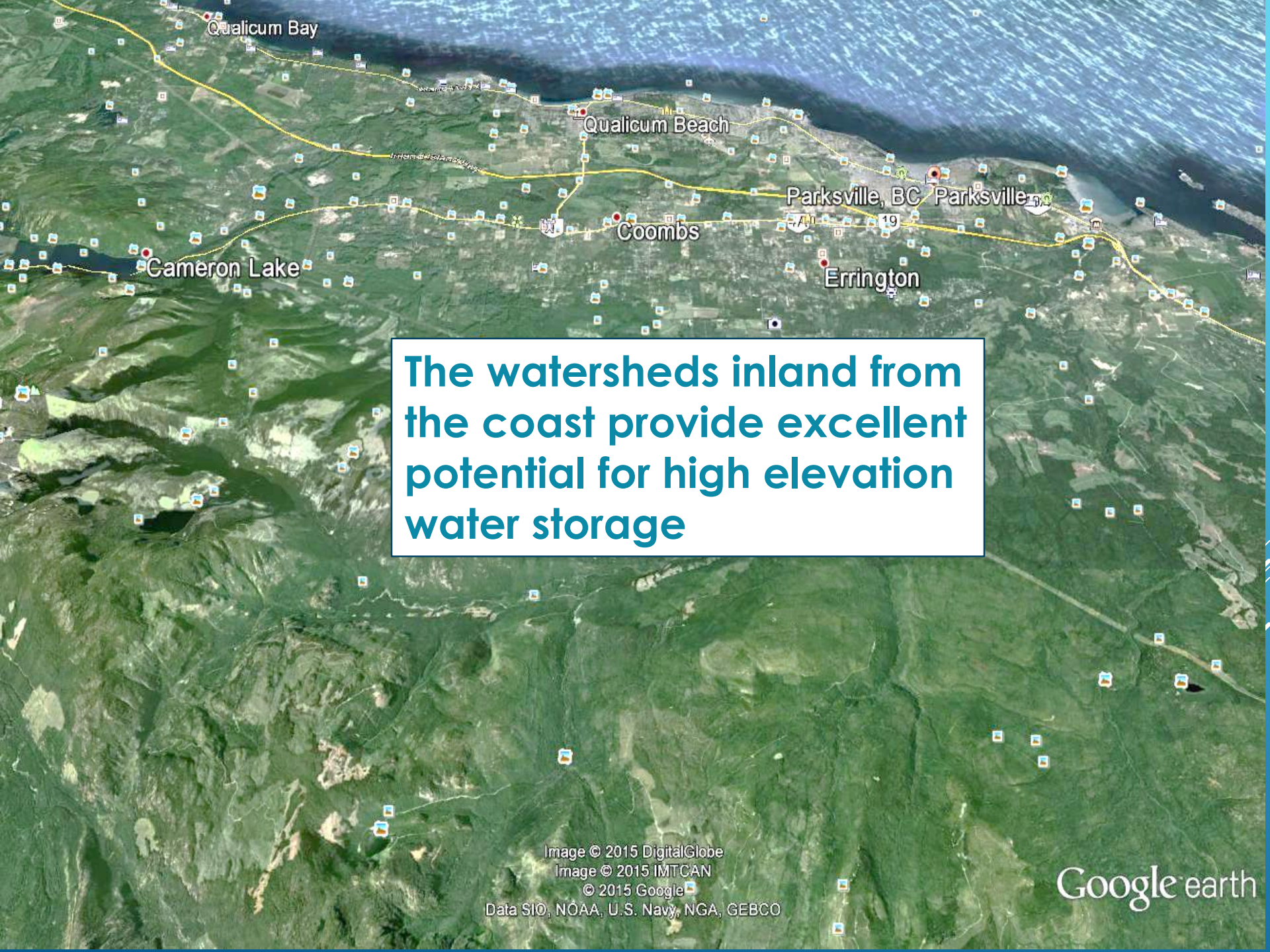
The present well field aquifer is under stress, and groundwater levels have dropped 11 meters within the past 25 years. The continued decline indicates that extraction at the current rates is unsustainable. The lowering groundwater levels also increase the risks to human health from contaminating land uses in the groundwater recharge areas.

The City of Parksville would be prudent to investigate options for alternative water supplies as a contingency or back up plan.

The region has the potential to supply sustainable, high quality water, with very low operational costs.

The presentation to council will provide an overview of how this type of system could be developed.

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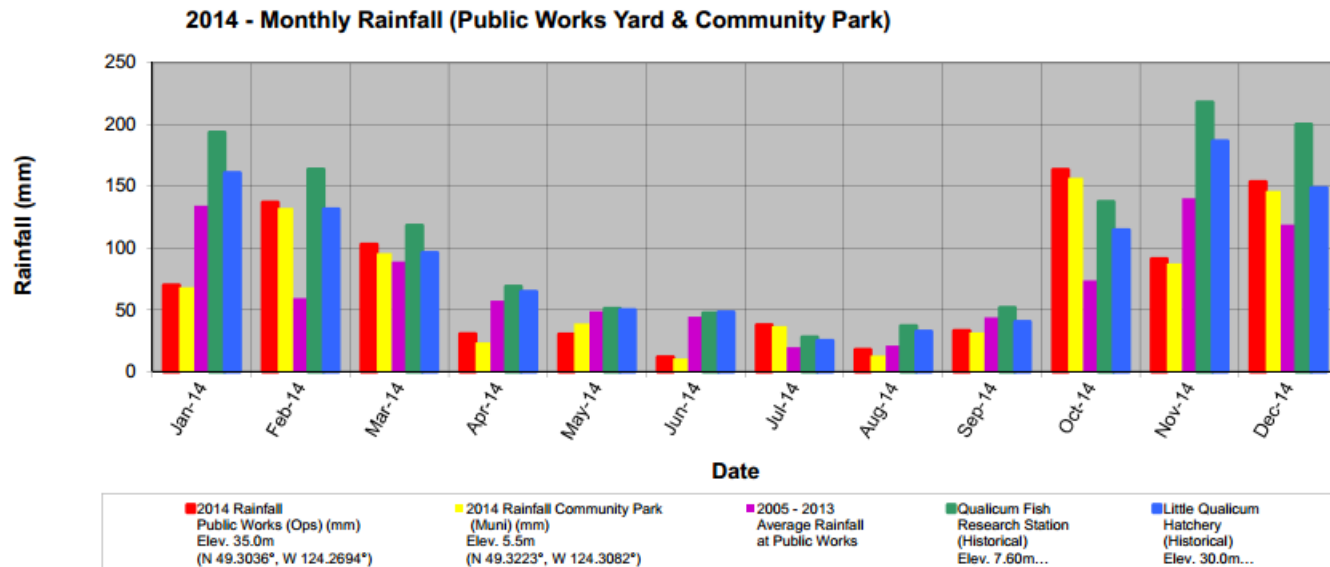


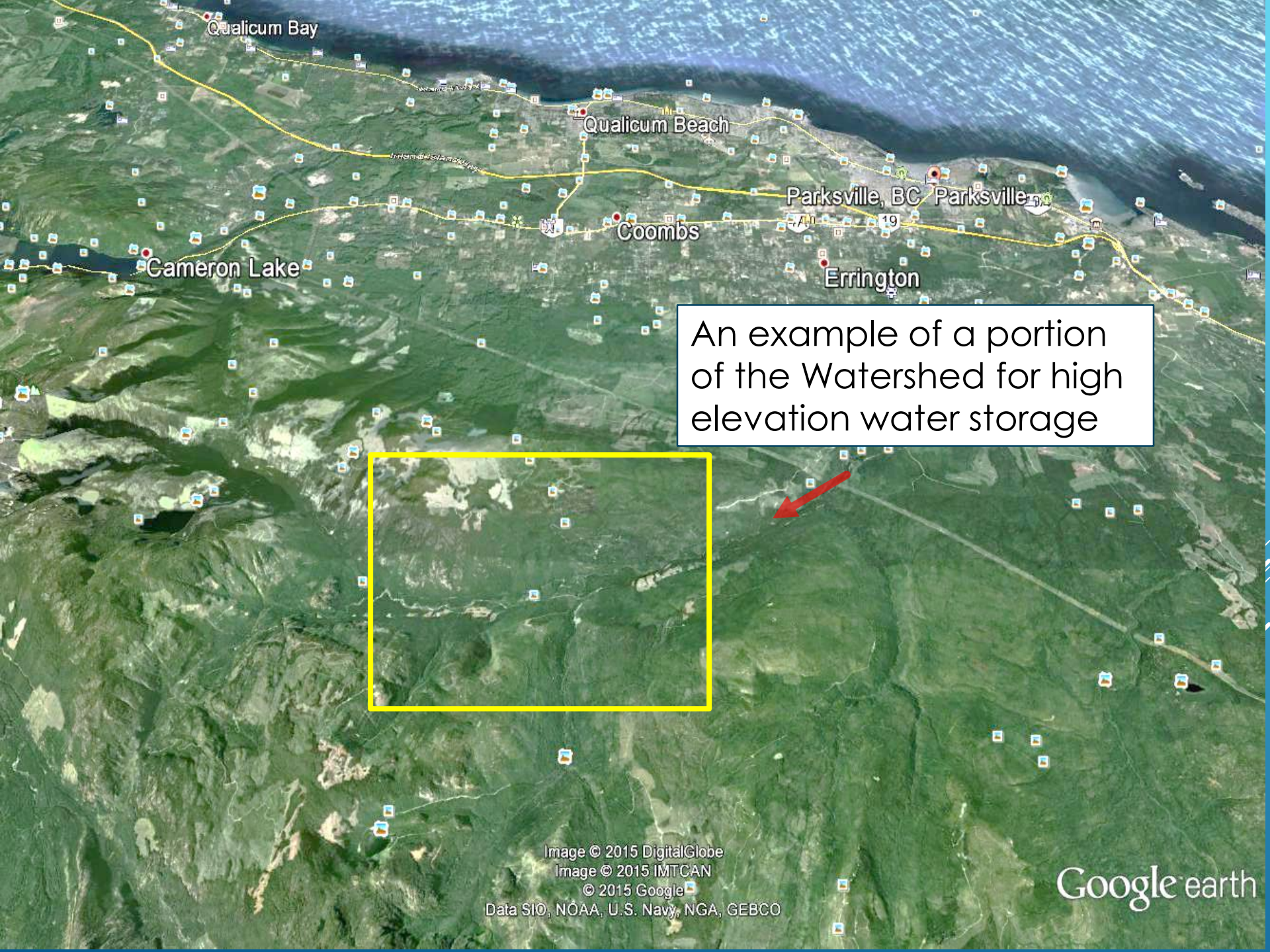
The watersheds inland from the coast provide excellent potential for high elevation water storage

Storing high quality water at high elevation has many benefits

1. Water is relatively clean
2. Minimal contamination risk
3. Provides ecological and fisheries benefits
4. Eliminates the need for summer extraction from the river
5. Reduces storm flooding
6. Will flow downhill for free
7. Very low operational costs
8. Can generate electric power
9. Can supply many different areas

High flow diversion and storage of water would occur in late fall, winter and in spring and early summer during storm events.





An example of a portion
of the Watershed for high
elevation water storage

A satellite image of a mountainous region, likely the Englishman River watershed. The terrain is rugged with deep valleys and ridges. The vegetation is primarily green, indicating forest cover, with some brownish patches that could be cleared land or different types of vegetation. A network of roads or trails is visible, winding through the landscape. In the upper left, there's a large, light-colored area that might be a snowfield or a large clearing. The overall scene is a high-altitude or mountainous environment.

Higher reaches of the Englishman River watershed
with elevations between 250 meters and 350 meters

Image © 2015 DigitalGlobe
Image © 2015 IMTCAN
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Google earth

Channel overflow structure on the side of the main stream

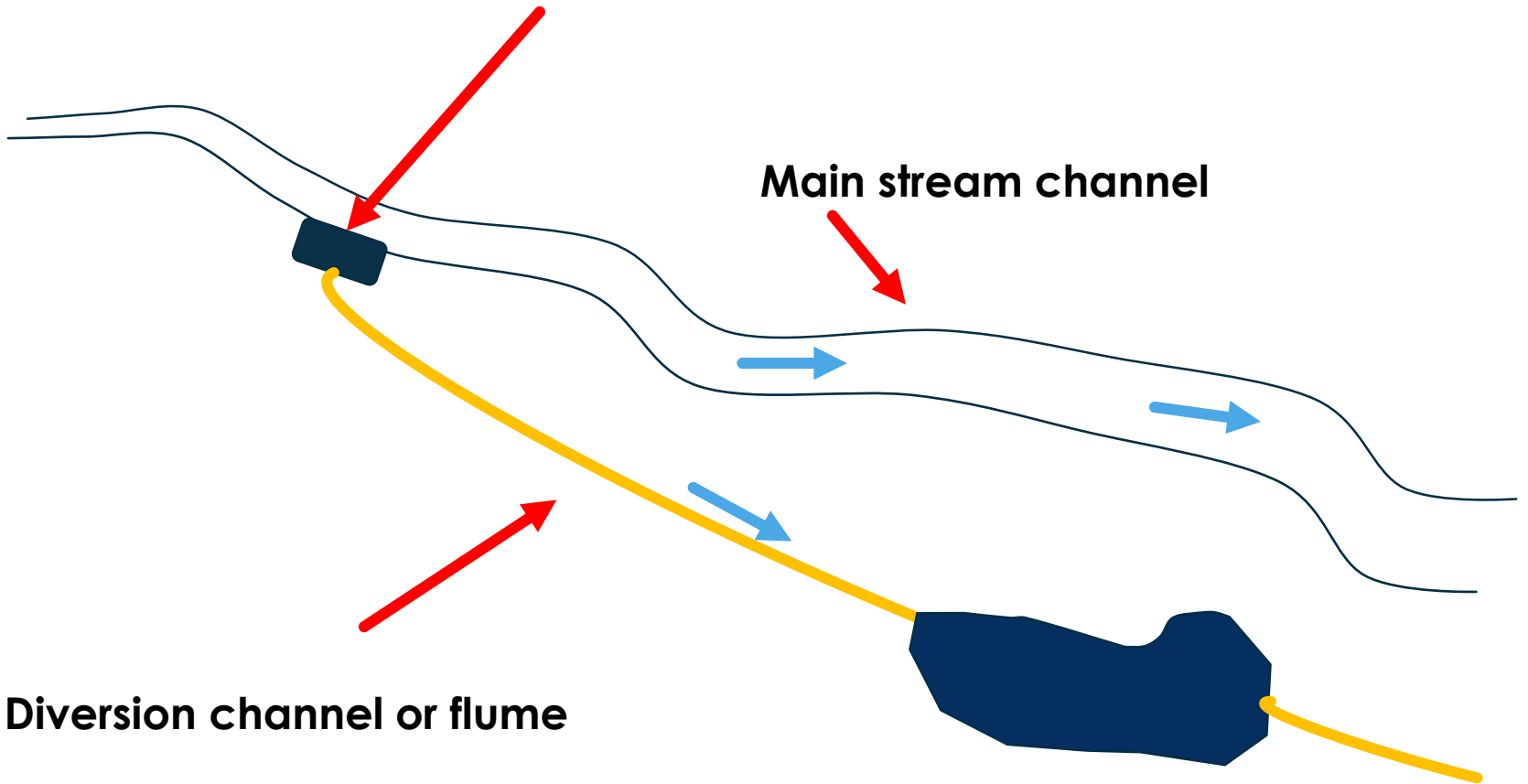
The existing creek or river channel would not be directly impacted



Overflow diversion weir

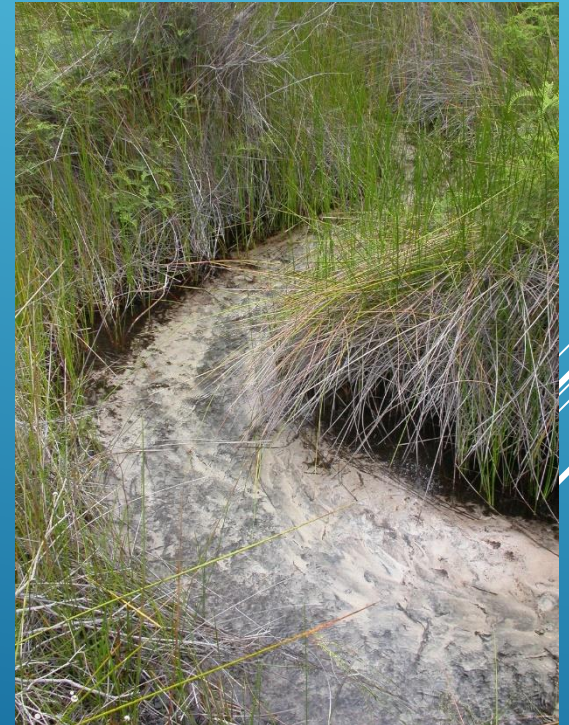
Main stream channel

Diversion channel or flume





The diversion channels carry water to fill constructed storage ponds / lakes





The ponds /lakes are constructed into the natural topography and are interconnected with naturalised streams and/or wetlands







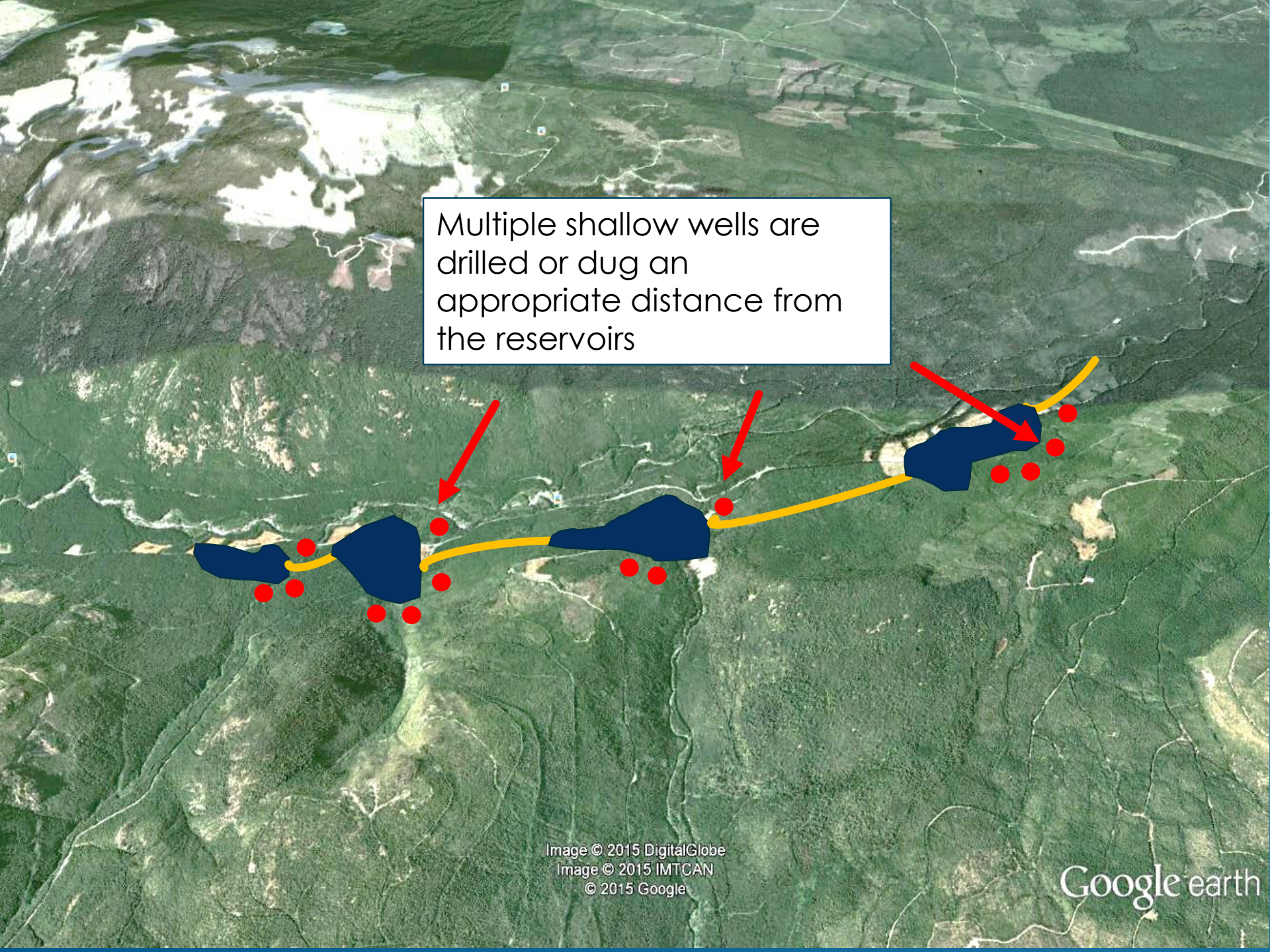
The ponds/lakes can be vegetated with indigenous plants and trees.

Many of the retention areas will receive inflow from surrounding land

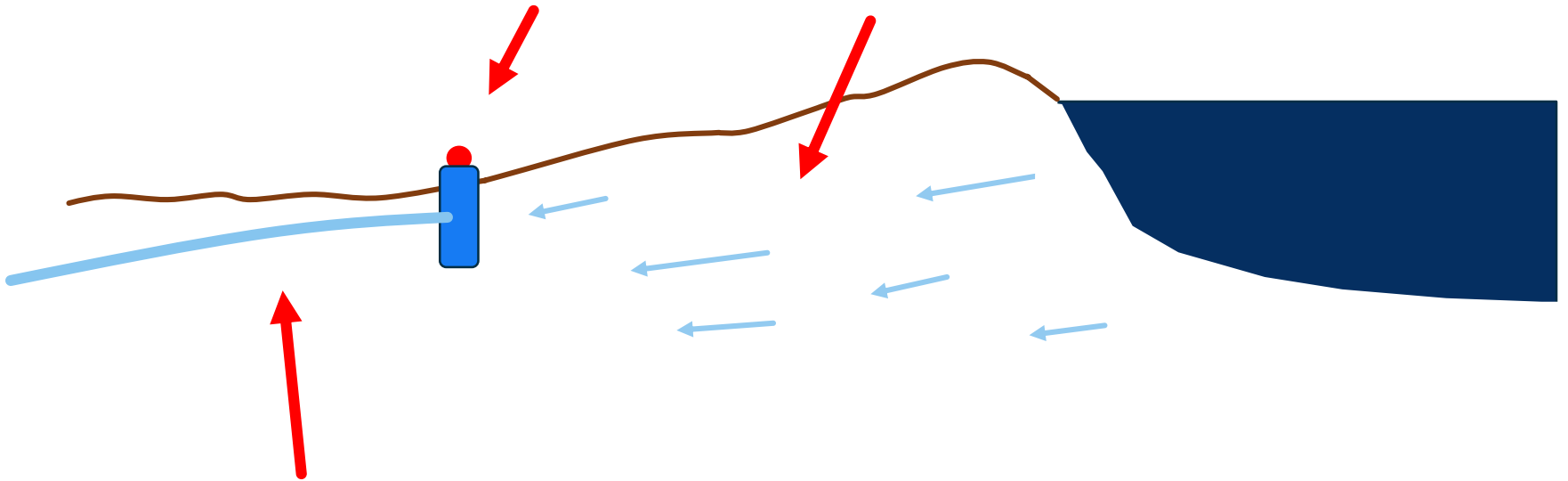


Overflow structures allow the fresh water to fill the ponds and the surplus to flow back to the stream

Multiple shallow wells are drilled or dug an appropriate distance from the reservoirs

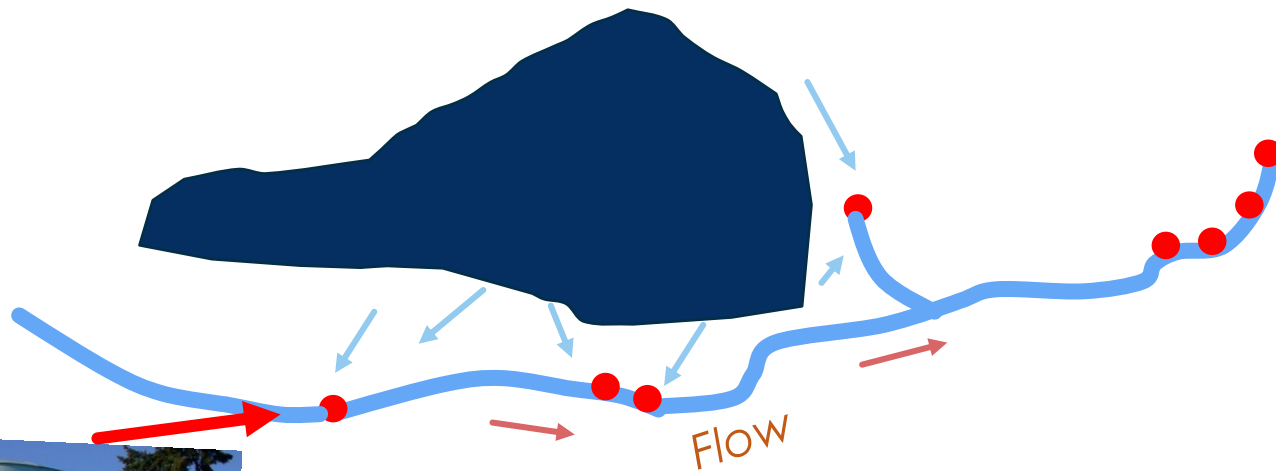


The water from the reservoirs slowly infiltrates the surrounding land and recharges the groundwater for the wells.



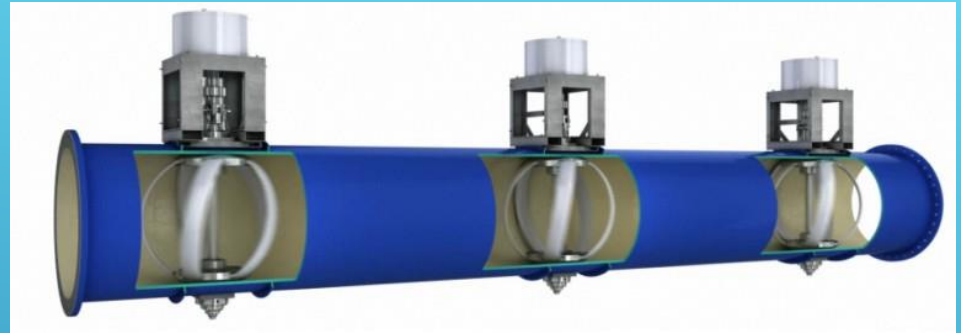
The wells are inter-connected by small diameter syphon pipes, that carry the water downhill under pressure

The multiple syphon pipes are sized for continuous flow with remotely controlled valves downhill



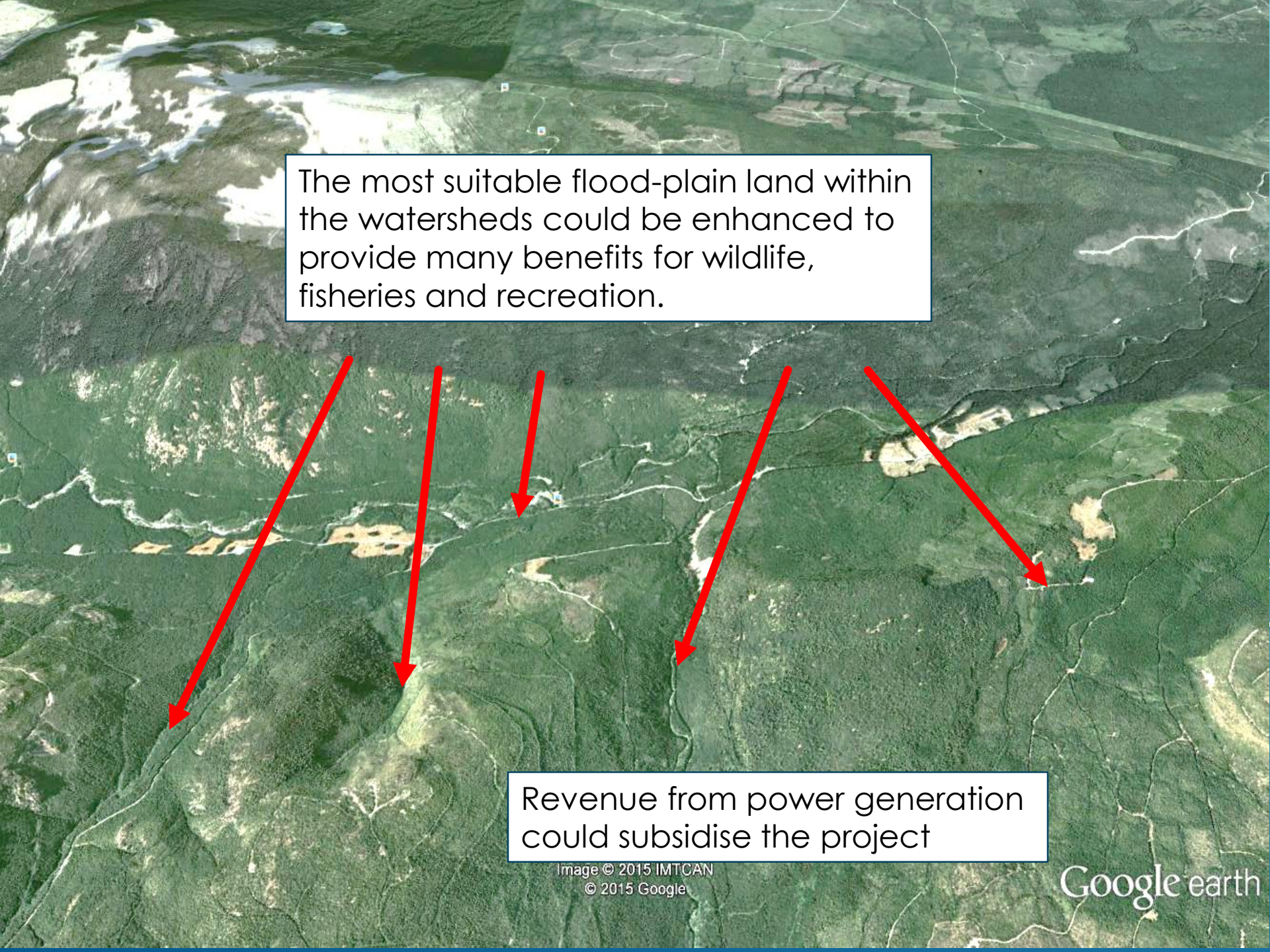
A reservoir of 'head water' is maintained by pumps powered by in-line turbine generators

Micro hydro in-line turbines could be installed anywhere in the downhill, pressure side of the supply system.





An advantage of multiple, small diameter, high pressure gravity lines, is that the source to delivery has many available options.

An aerial photograph of a river valley. The river flows from the top left towards the bottom right. The surrounding land is a mix of green forest and lighter brown/tan areas, likely floodplains or agricultural land. Five red arrows point from various locations in the valley towards the river, indicating specific areas of interest.

The most suitable flood-plain land within the watersheds could be enhanced to provide many benefits for wildlife, fisheries and recreation.

Revenue from power generation could subsidise the project







I request that the Council of City of Parksville initiate discussion about a back-up plan as the groundwater supplies are becoming contaminated, and insufficient.

Thank You

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