



# Water Supply and Environmental Crisis

Baynes Lake, Elko and Kikomun Creek Provincial Park

Presentation By:

- Stan Doehle
- David Hunt
- John Hodgins



# Why We are Here

- We have a major water crisis facing our communities
- 7 Sinkholes in the head pond of Elko Dam feed our watershed
  - 20,000 GPM of Elk River water is introduced into our watershed from these sinkholes
  - A head pond level of 917 meters is required to wet the sink holes
- Personal 20-year history working on this issue
- At some point, a berm was built by BC Hydro or East Kootenay Power blocking the river from accessing the sink holes
- In 2009, BC Hydro assisted in the removal of a small portion of the berm
  - Returned water to the sink holes and the aquifer and restored the community water supply
  - This alone proves that water in the sink holes flows into the surrounding area
- In 2016, BC Hydro de-commissioned the Elko Dam
  - Starting in 2017, for the first time, the sinkholes have continuously not been wetted at all
  - Since then there has been a 7-foot vertical drop in water level in area lakes and ponds
  - 2+ feet per year and dropping!
  - Impacting all lakes, wells and wildlife in the area, including those in Kikomun Creek Provincial Park

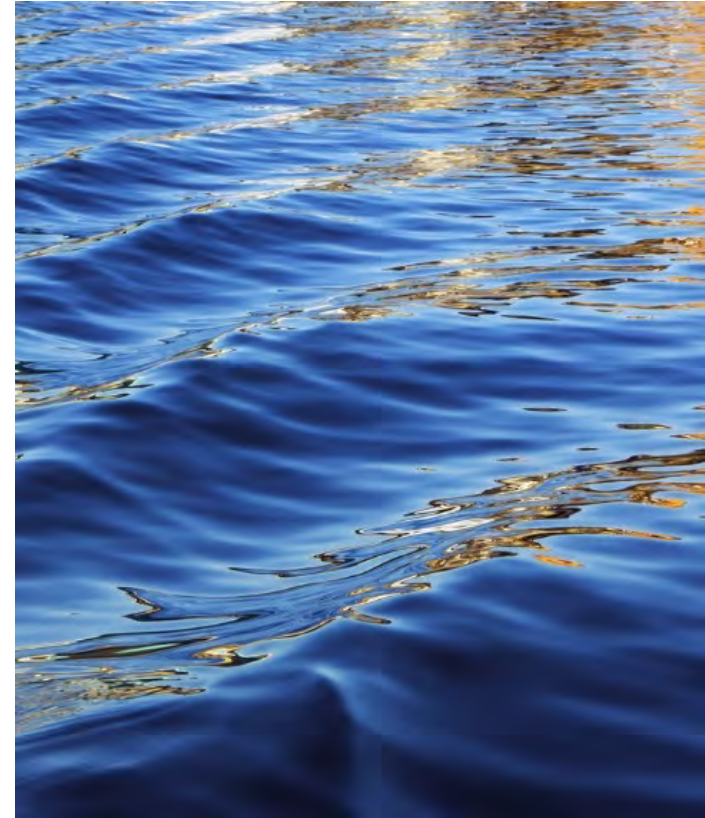
# We need your support!

- There are three possible solutions for BC Hydro, or the Ministry of the Environment.
  1. Operate the dam at the 917 level to return water to the aquifer to restore the community water supply
  2. The second option would be to sculpt out the back channel as defined in the side channel monitoring study by BC Hydro. This would be a permanent solution.
  3. Another truly permanent solution to this 40-year-old issue would be to place the river back against the hill side of Elko, where the river originally flowed.
- Either restoring the river, or sculpting the Head Pond, would permanently wet the sinkhole area and the Elko dam would no longer have an adverse impact on our community water supply.
- We respectfully ask the Provincial Ministries to support the communities of Elko and Baynes Lake by restoring the water to the sink hole area, for the protection of the environment and the restoration of our community water shed.



# Photos Showing Impact

David Hunt, an area resident, will take us through some photos to give you a better sense of this water crisis





# Prior to Elko Dam, Natural Levels for Baynes Lake

Adolph Lumber Mill - Circa 1909



Adolph Lumber Mill – Circa 1910



- These are the Pre-Dam water levels at Baynes Lake
- They clearly show that Baynes Lake was naturally a full, Kettle Lake, year after year



# Sink Holes and Head Pond



This is the Head Pond and Sinkholes on the western bank of the Elk River, at Elko, currently deprived of water. They connect to the Aquifer and when 'wetted', or filled with water, they provide the source water to our area (20,000 GPM)."



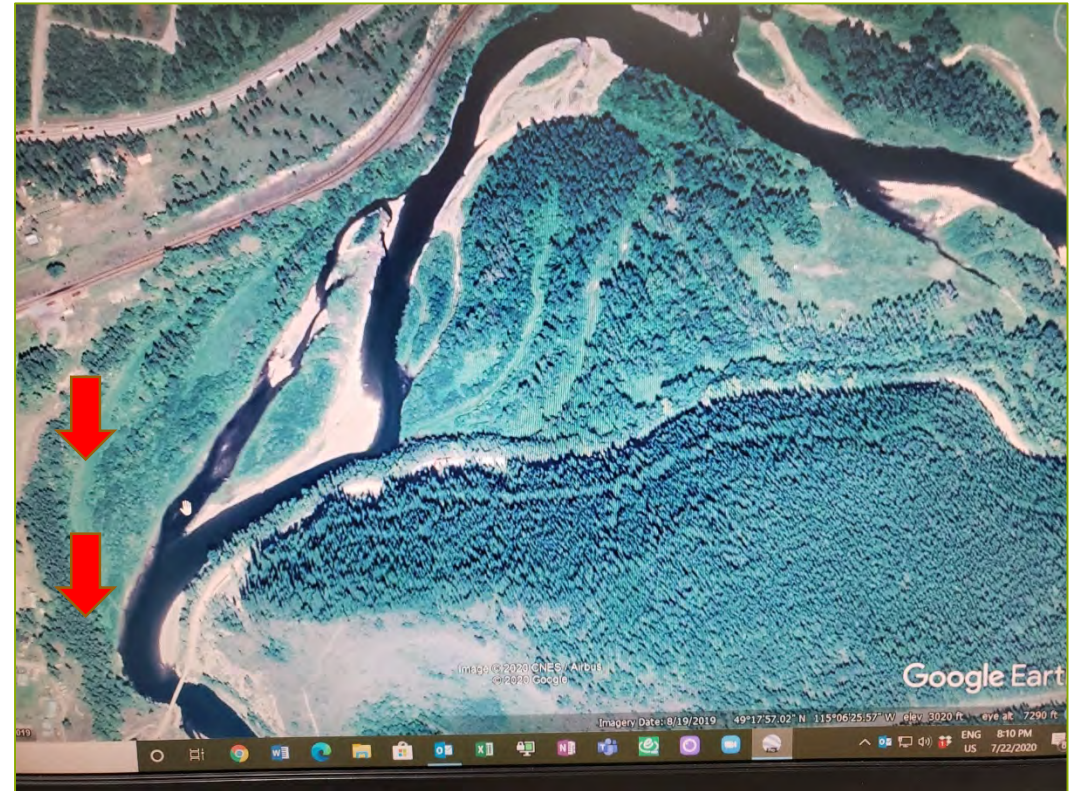


# Elko Dam and Google Earth of Elk River

Since 1924, the Dam Operator has controlled the water level in the Elk River and, consequently, the access to the Aquifer and the source water for the Baynes Lake area



This overhead photo of the Elk River shows the historic path of the river, with the Sinkholes on the left





# Wetted Sink Holes



In 2009, the Comptroller of Water ordered BC Hydro to maintain the 917 level that is required to keep full pool in the Head Pond and deliver water to the Sinkholes. This produced consistent, healthy water levels for 7 years.





# After 3 Years Without “Wetting” (Water)

The 2016 decommissioning of the Elko Dam has now starved the sink holes of source water to the Aquifer, resulting in 3 years of declining water levels and a 7 ft. vertical drop in the surrounding lakes and ponds. It has also resulted in compromised water wells and severe habitat destruction.

(Note the island structure that has now been exposed in the middle of Baynes Lake)

Baynes Lake - 2017



Baynes Lake - 2020



7-foot vertical drop





# After 3 Years Without “Wetting” (Water)

We are at record low water levels at a time when all other SE BC lakes, and rivers, are at record highs.

Baynes Lake - 2017



Baynes Lake - 2020





# After 3 Years Without “Wetting” (Water)

Clearly, we need our source water restored immediately!

Doehle Kettle Pond - 2017



Doehle Kettle Pond - 2020





# Environmental and Wildlife Impact

This crisis has also produced an environmental disaster and habitat destruction for the endangered Western Painted Turtle, and a diverse Fish and Waterfowl population. It has had the identical impact on the water levels in Kikomun Creek Provincial Park, including Surveyors Lake and connecting water channels seen here.

We believe the water level dynamics between 2009 – 2020 prove the correlation between the Elk River Sinkholes and the area community water supply.

## Surveyors Lake – Kikomun Provincial Park



Endangered Western Painted Turtle

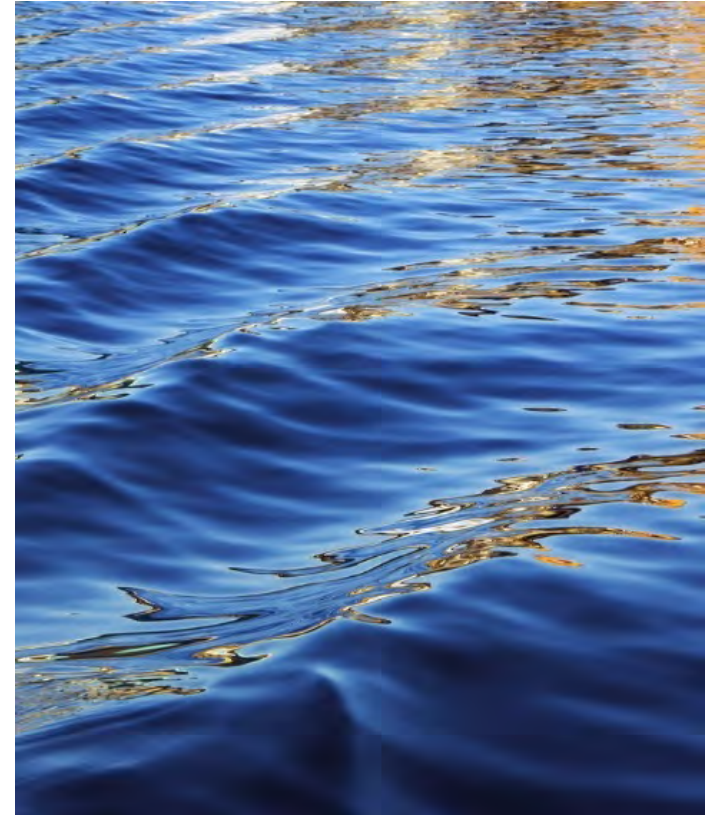






# Supporting Geological Evidence

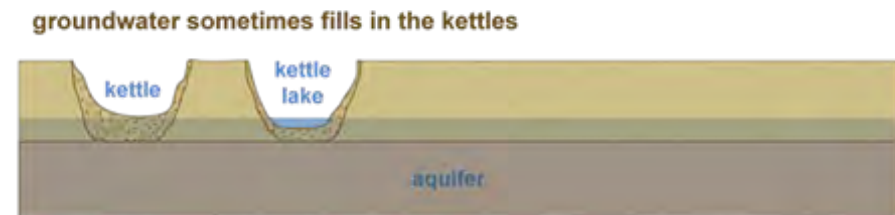
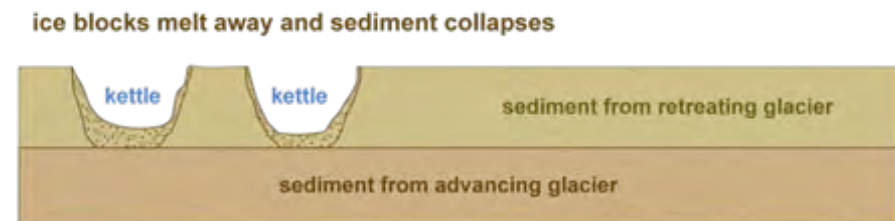
John Hodgins, a Geologist with 43 years of experience, will present his geological findings on the Elko Aquifer that runs from the Elk River through Elko, to Baynes Lake, and to Kikomun Creek Provincial Park



# Baynes-Surveyor Kettle Lake Formation

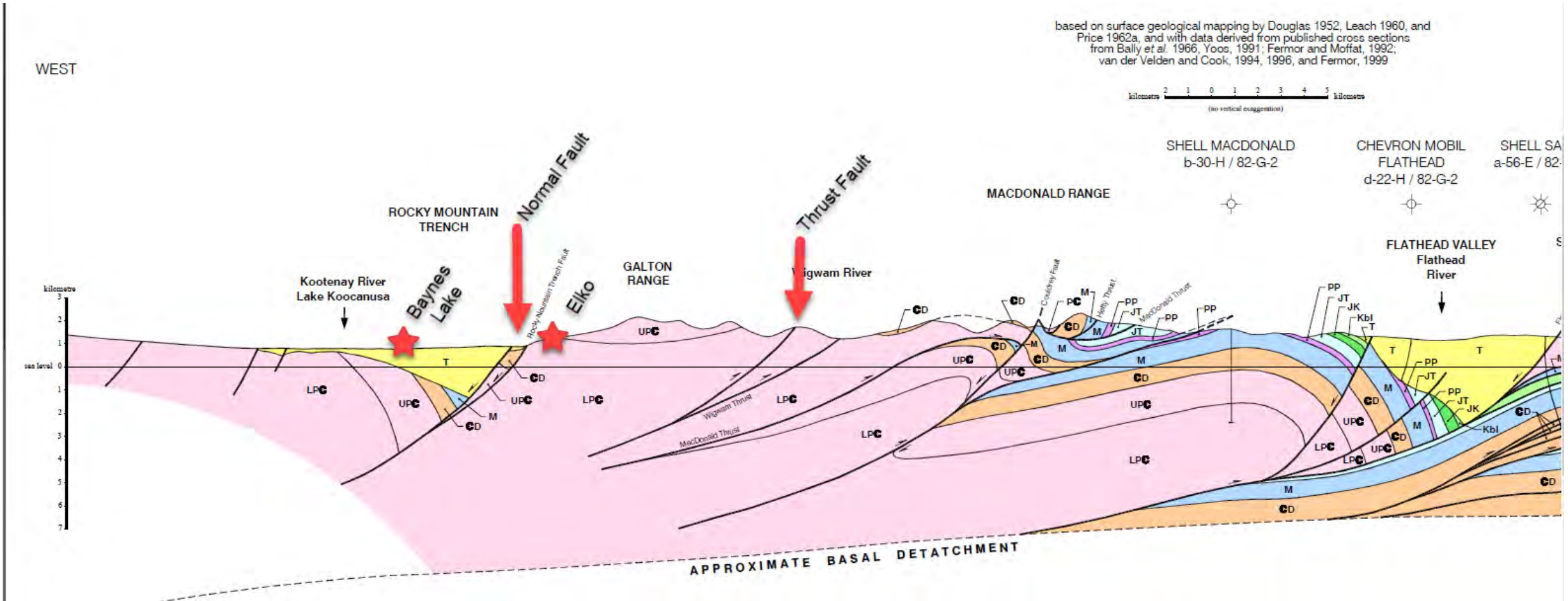
- No surface exit at Baynes lake
- Surveyor lake system has a surface exit into the Koocanusa

## KETTLE FORMATION





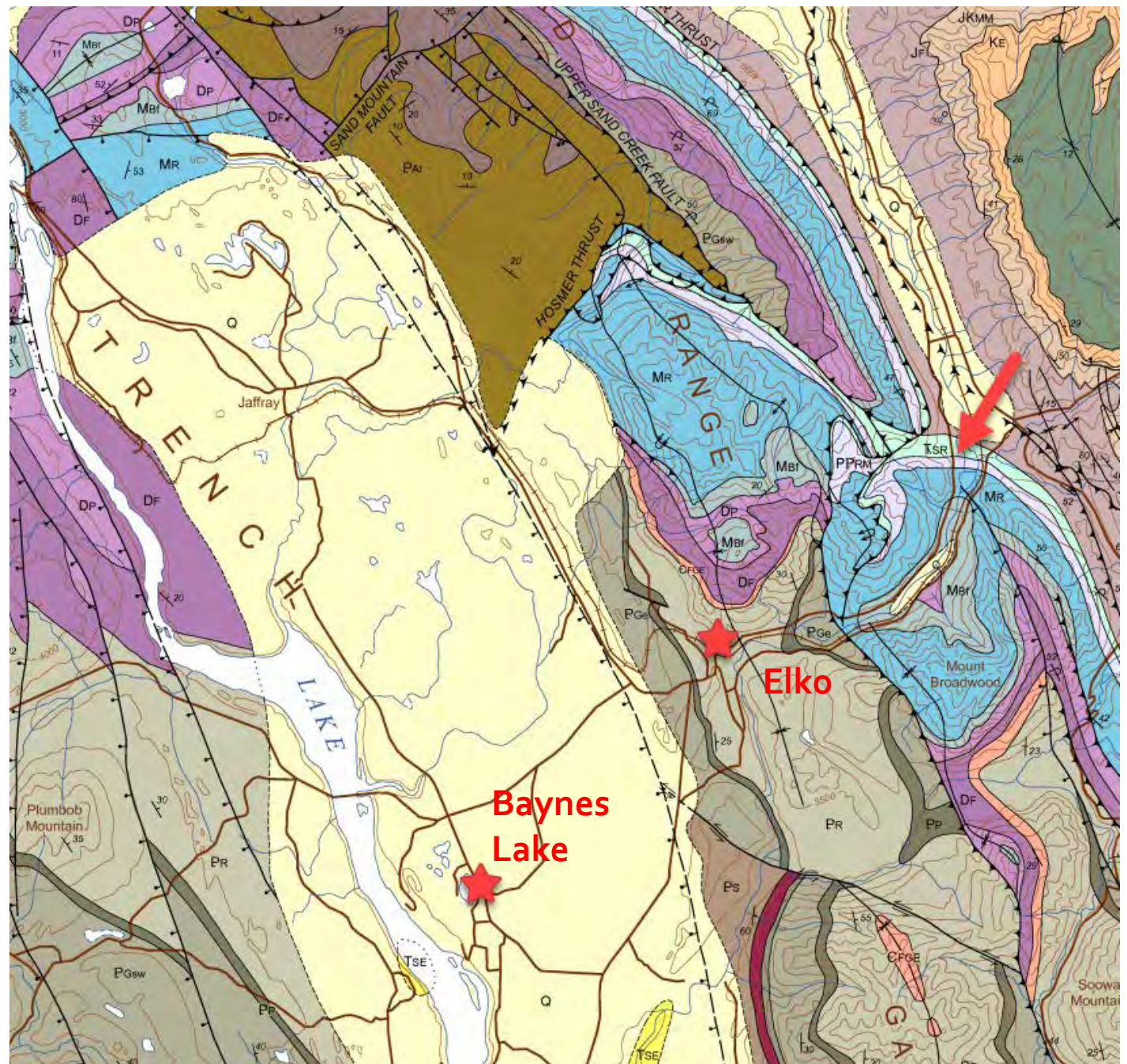
# Regional Geological Setting



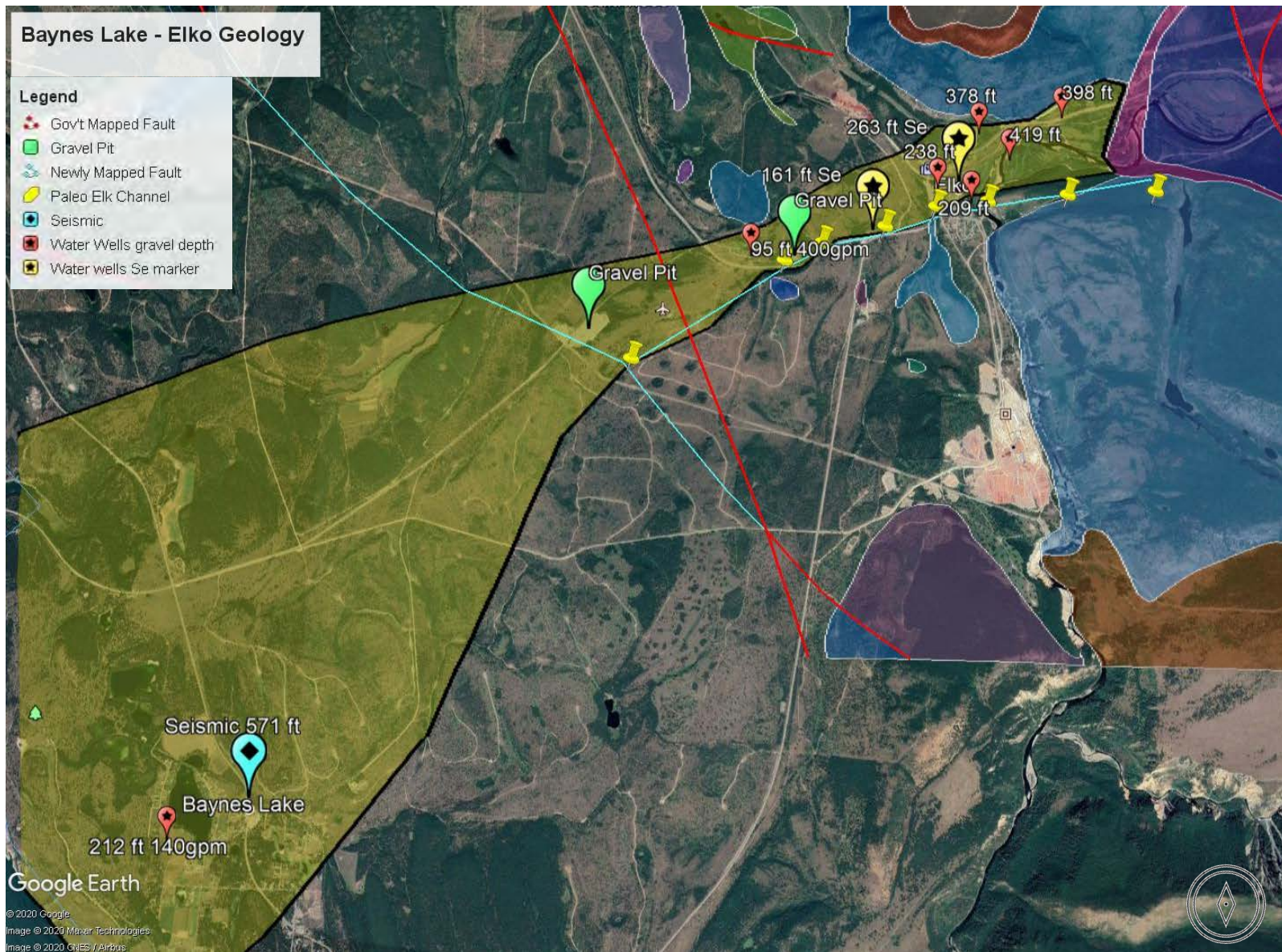


# Regional Geological Setting

- Normal fault and thrust fault patterns create structural grain in the Rocky Mountain Trench and adjacent Rocky Mountains (NW-SE trends)
- Red arrow denotes break in structural grain (NE-SW), result of transpressional wrench faulting.





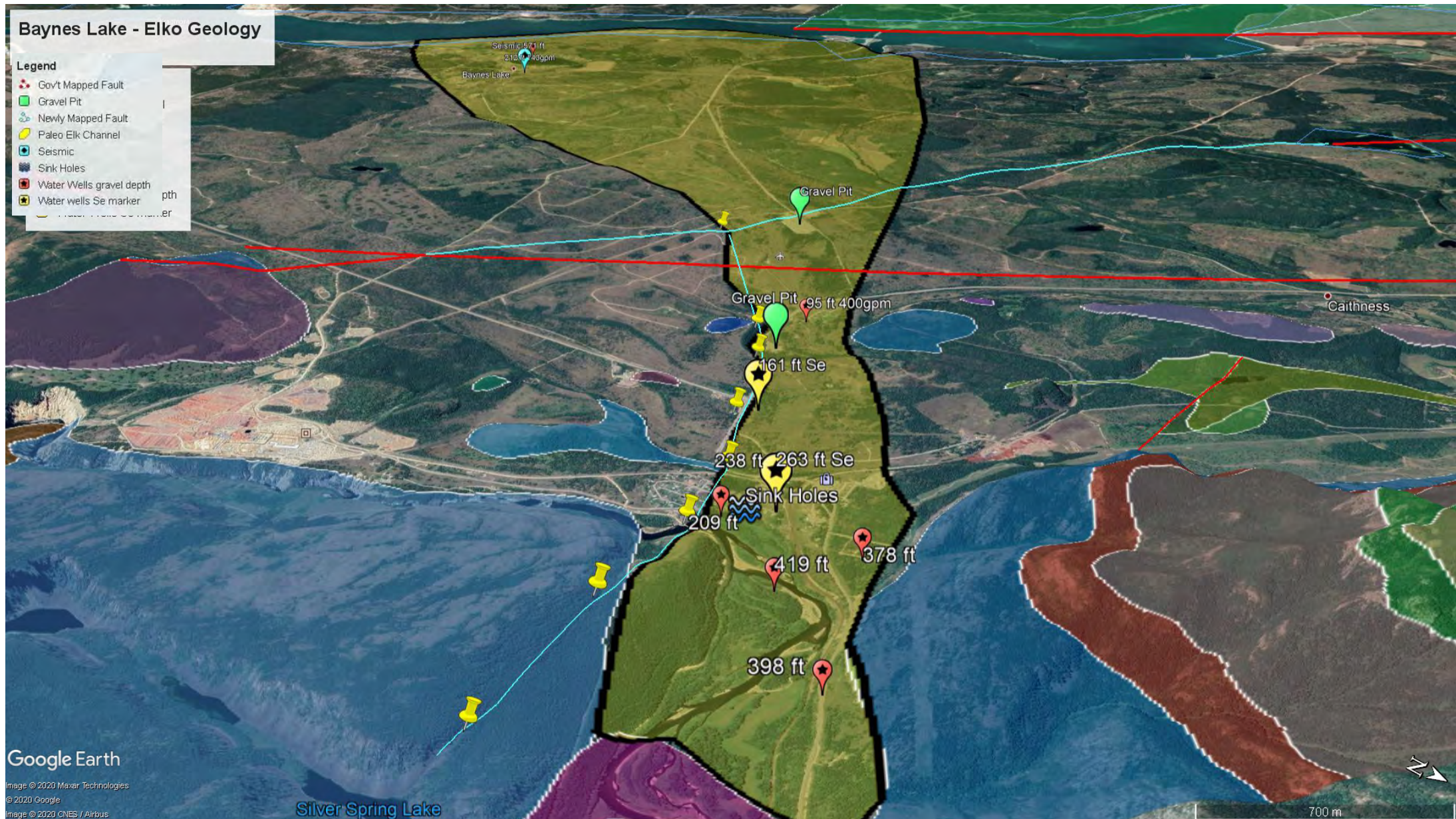


## 2020 Baynes Lake/Elko Area Geological Interpretation

- Water well data, outcrop mapping, thick gravel sediments and Se (Selenium) signatures support Elk River water flowed NE-SW towards Baynes Lake.

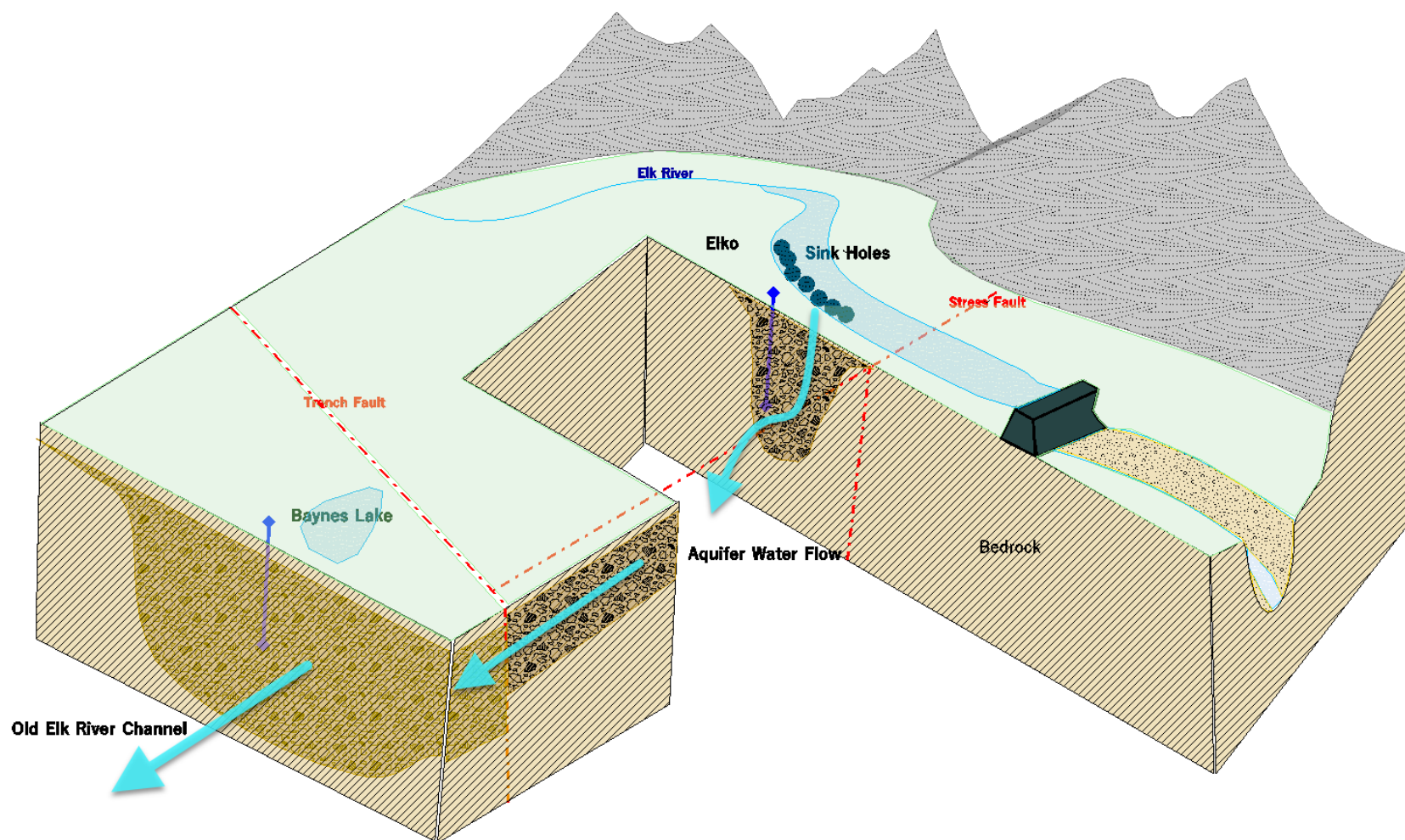


# Paleo Channel view looking SW from Elko





# Schematic of Elko - Baynes Lake relationship



# Geological Summary

- New geological mapping incorporating outcrop studies, lineament analysis, and water borehole examination, indicate a previously unmapped fault system related to wrenching between the Lizard Ranges and the Galton Ranges of the Western Rocky Mountains
- This fault exerts strong control on the configuration of the paleo Elk River system drainage
- The drainage of the Elk River controls where the fluvial sands and gravels were deposited, creating the aquifer that runs from the Elk River, under the town of Elko, and on to Baynes Lake
- Sink holes at the base of the Elko glacial deposits act as a recharge point for the aquifer from the current Elk River Dam head pond area
- The Selenium signature of the water wells of the town of Elko and the 3&93 Dairy Bar provide evidence that these wells are sourced from the Elk River
- Photographic evidence (circa 1909/1910) supports that prior to the 1924 construction of the Dam, the aquifer was adequately, naturally recharged to supply sufficient water to fill Baynes Lake and Kikomun Creek Provincial Park lakes
- These naturally occurring water levels have supported a very biodiverse Holocene ecosystem





# In Summary

Stan Doehle will wrap up



# Summary

- We believe that the **historical correlation** between the level and path of the Elk River and the water levels in our surrounding lakes and ponds and water wells, **combined with the geological evidence**, prove that the Elko Head Pond and Sinkholes are the source water for the aquifer that runs through Elko, Baynes Lake and Kikomun Creek Provincial Park.
- We are asking the Provincial Government to support the communities of Baynes Lake, Elko, and Kikomun Creek Provincial Park by ordering BC Hydro to **restore our community water supply** and **avoid an environmental disaster**.
- In the **short term**, we would ask that the Ministers order BC Hydro to **maintain the Dam at the required 917m** level to **immediately** restore water to the Elk River Head Pond, Sinkholes and Aquifer.
- As a **longer term, permanent solution**, we would ask, **the Ministers to order**, BC Hydro to **restore the river to its natural course**, by removing the man-made berm, and re-contouring the Head Pond, in order to allow the Sinkholes and aquifer to receive their natural, continuous source water from the Elk River. **This will ensure a permanent solution to our Community Water Supply and Environmental Crisis.**
- One final comment. One of the area residents created a Change.Org page, 2 weeks ago, to gauge the level of concern in the greater public.
- To-date, 1375 people have registered their **serious concern** regarding the water levels in the area.
  - <https://www.change.org/p/bc-ministry-of-environment-climate-change-restore-the-community-water-source-629d5d37-7a75-4026-9309-gfa6b8bd2993>





Thank you for your time

Any questions?

