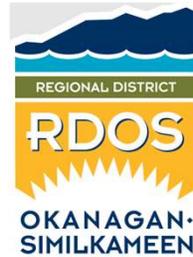




Associated
Environmental



Platinum
member



Meadow Valley Aquifer Study

Report to Environment and Infrastructure Committee
Regional District Okanagan Similkameen

Marta Green, P.Geo.; Steve Colebrook, M.Sc.; Dylan Riley, GIT

Thursday August 4, 2022 11:00 AM

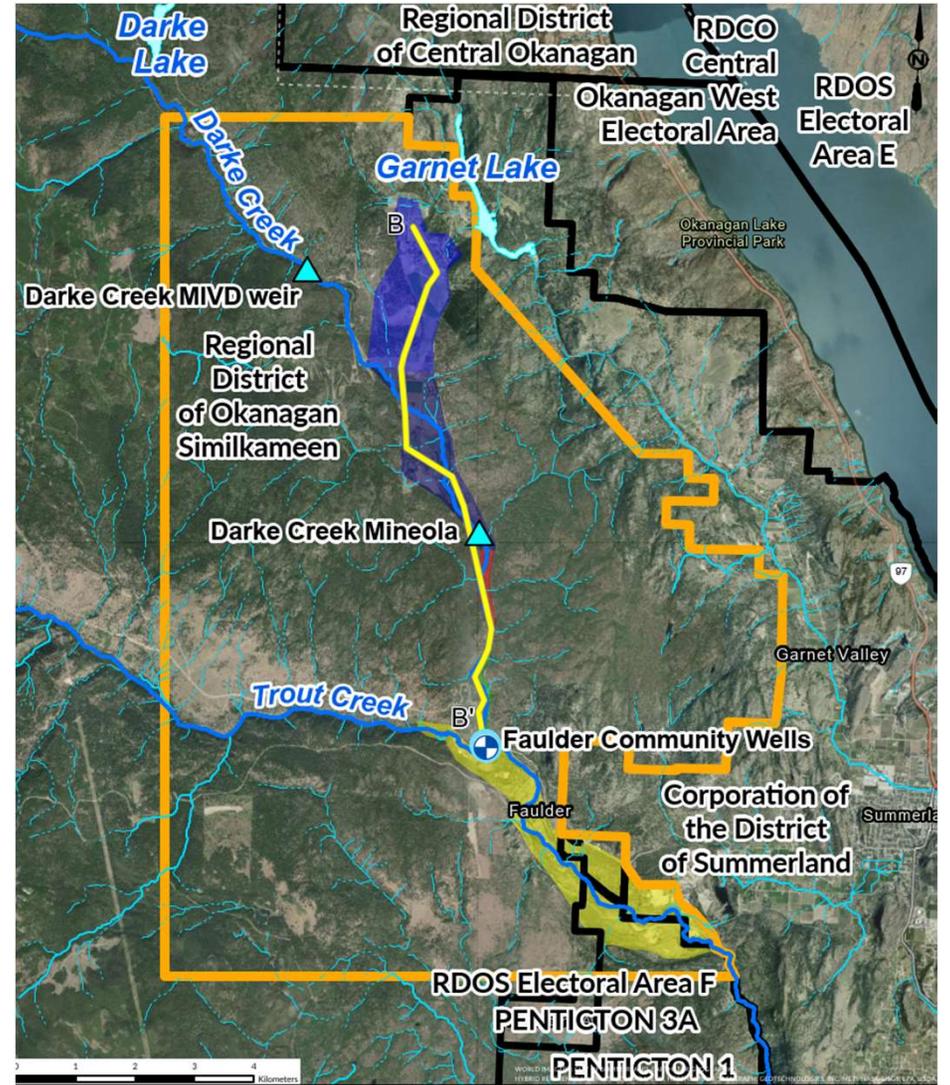
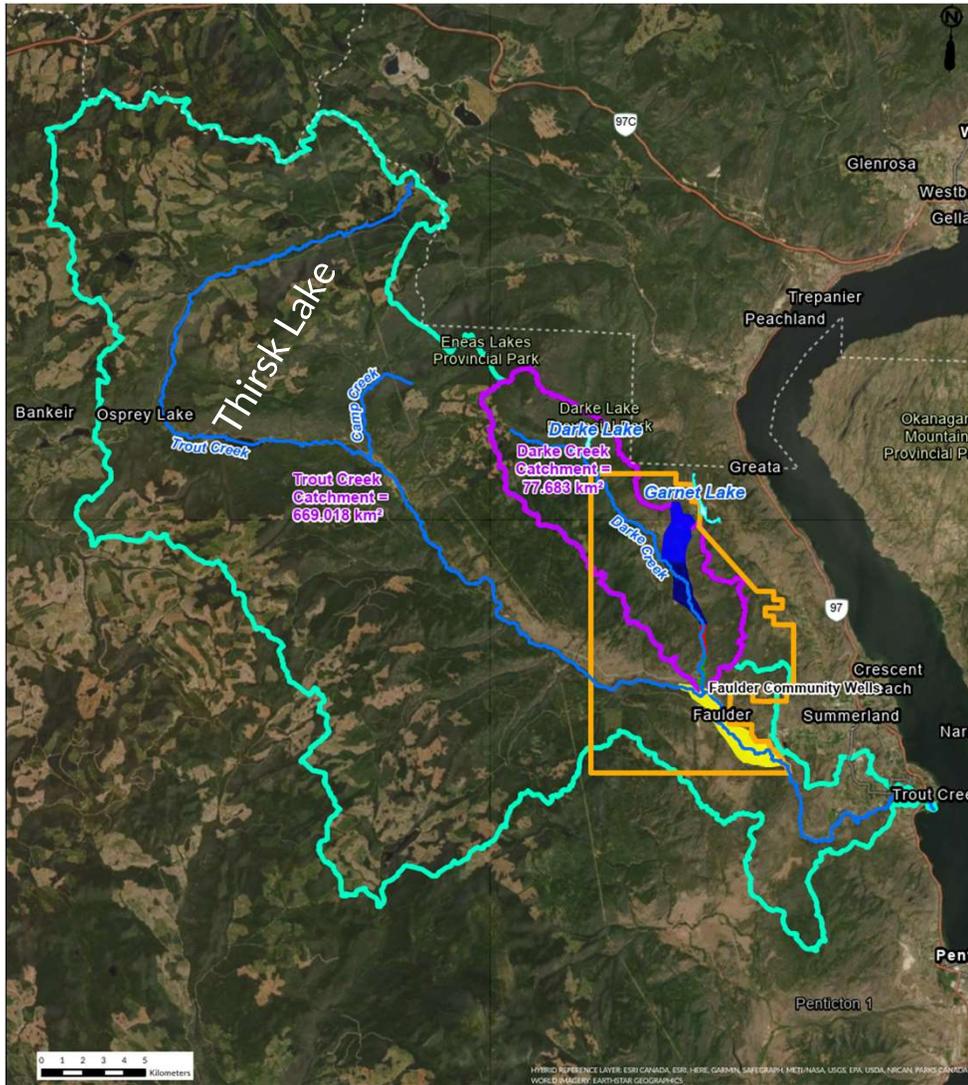
From this study, we looked to answer two questions:

Is there enough groundwater supply, now and into the future while considering growth and climate change, to support:



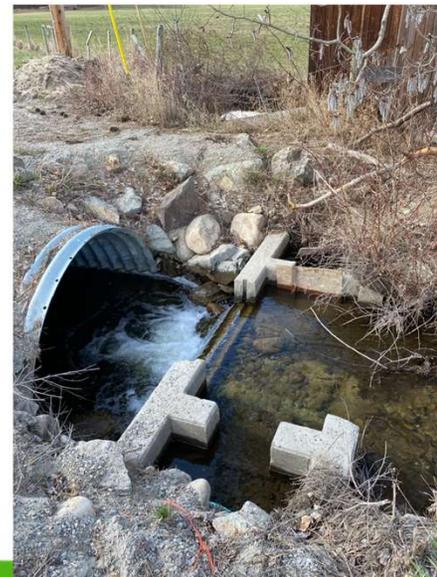
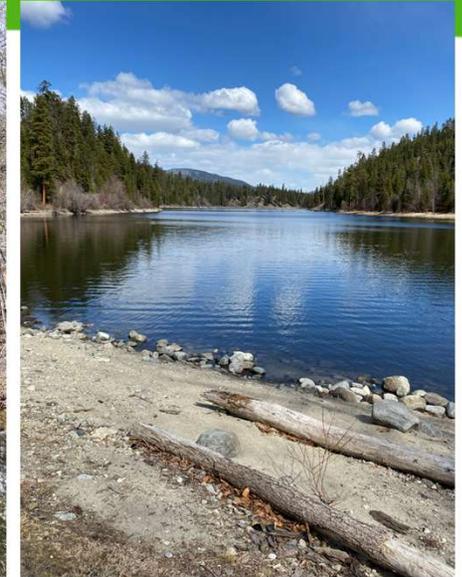
1. The Faulder Community Water Service Area?

2. Other areas of Aquifer #299 (within Electoral Area F) that rely on private water wells and Meadow Valley Irrigation District?



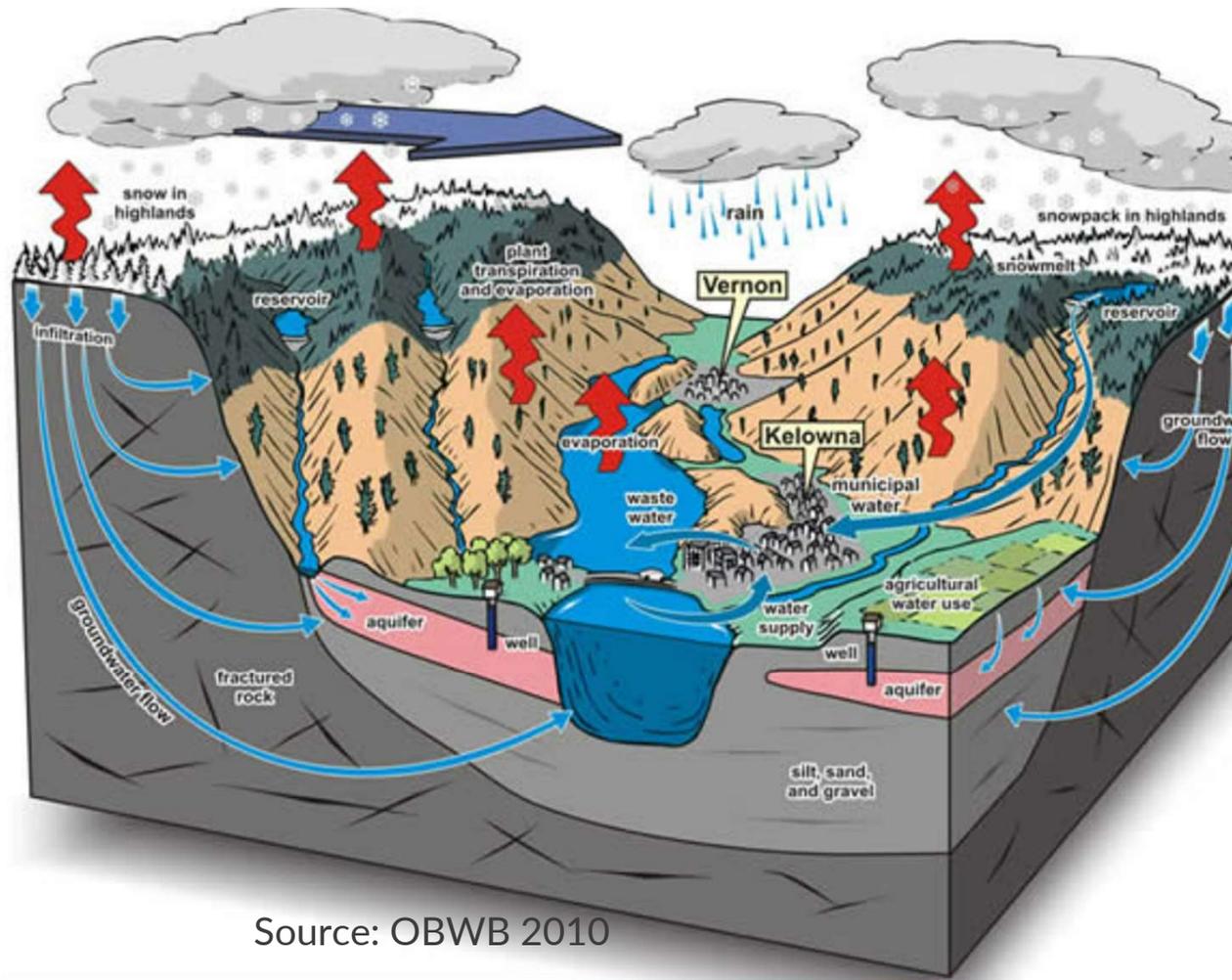
Work Completed

- Reviewed background information
- Visited the study area, and interviewed residents
- Collected three water levels and installed two dataloggers
- Drew cross sections, synthesized Darke Creek flow data
- Completed water demand model with future climate scenarios



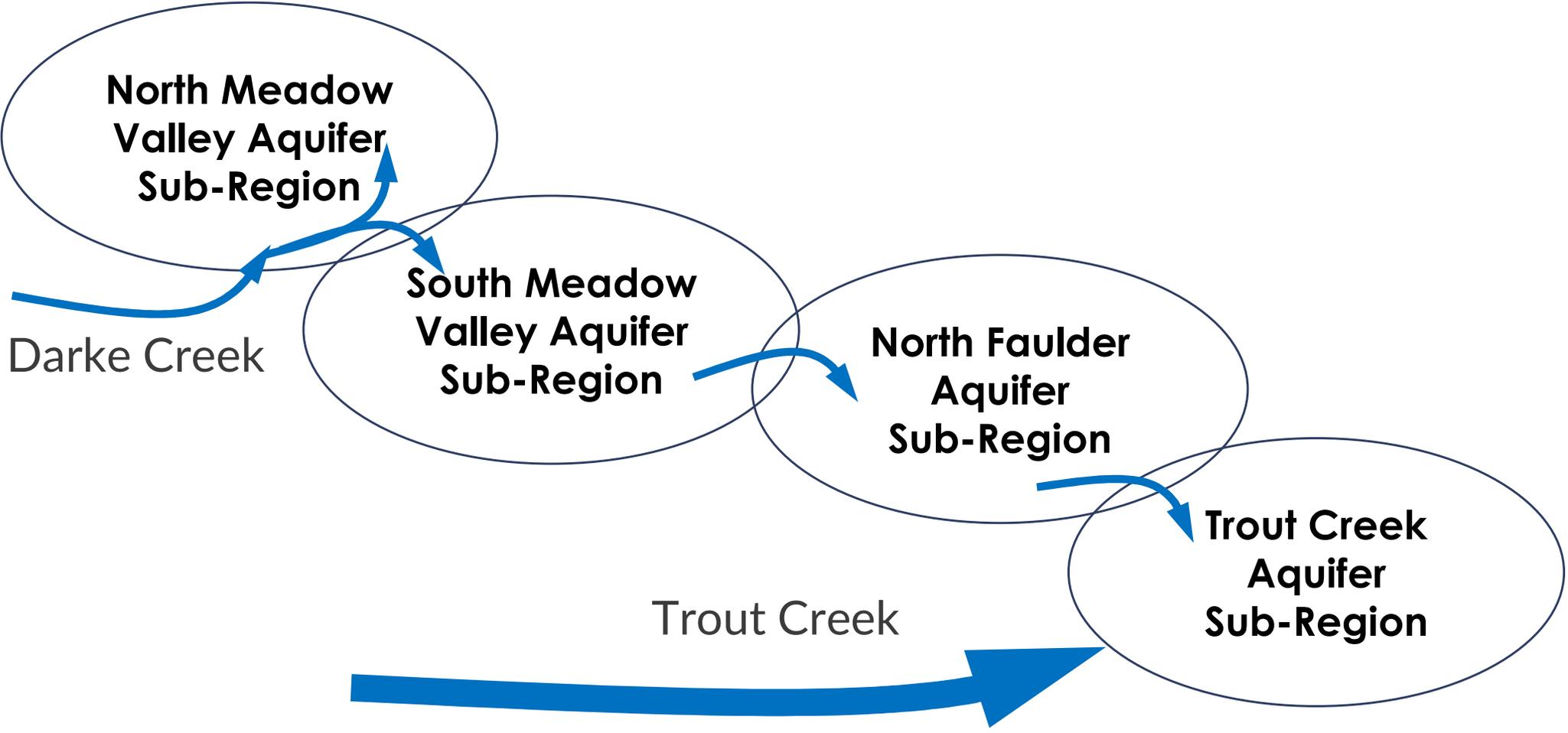
Groundwater Hydrogeology Concepts

- Part of the Water Cycle
- Recharged by infiltrating rain and snowmelt
- Exists in spaces between sand grains or in bedrock fractures
- Slow moving
- Ultimately discharging back to surface water bodies
- Losing stream: type that loses water as it flows downstream by infiltration



Source: OBWB 2010

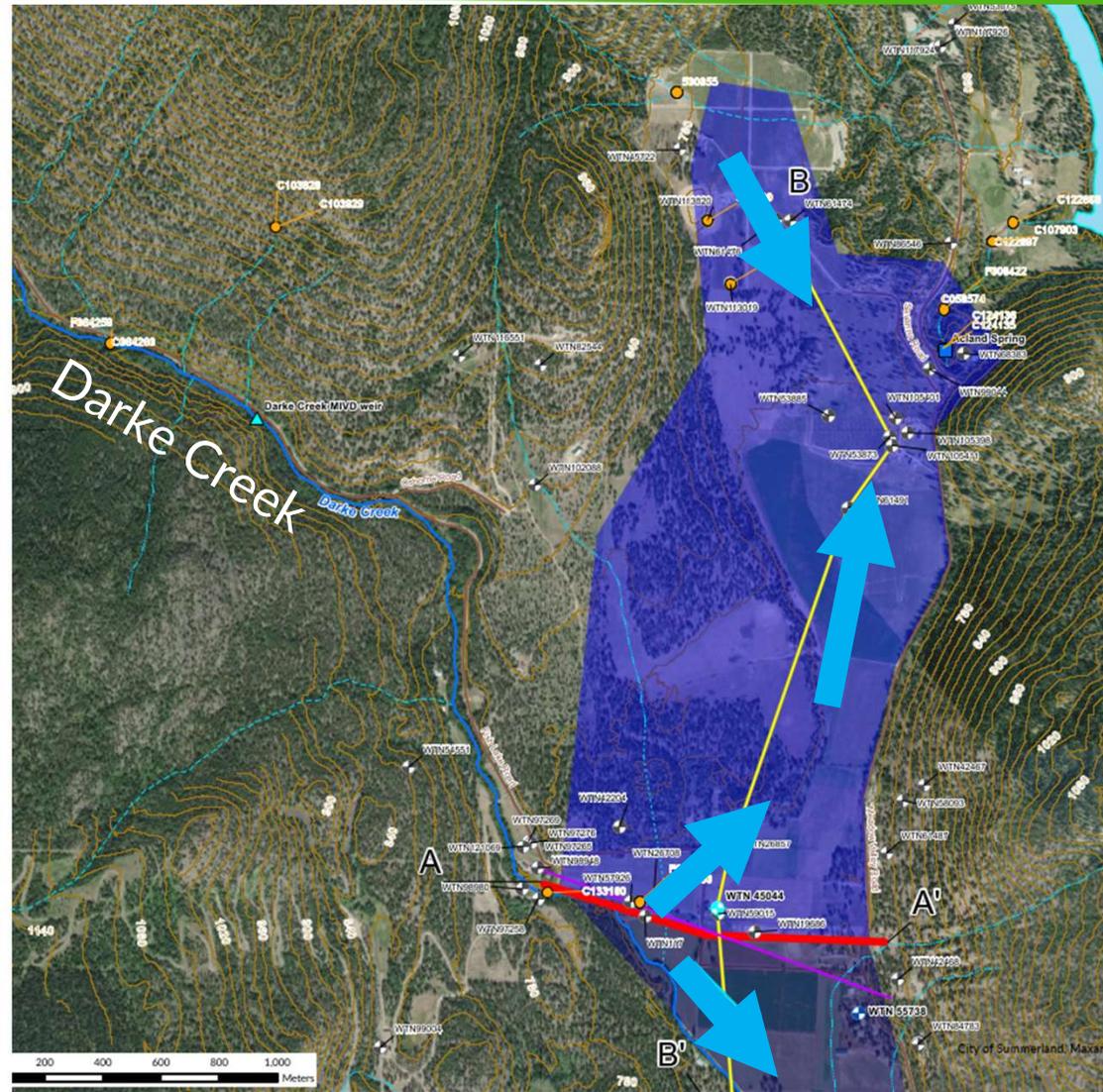
Conceptual Model of Groundwater Flow



North Meadow Valley Aquifer Sub-Region

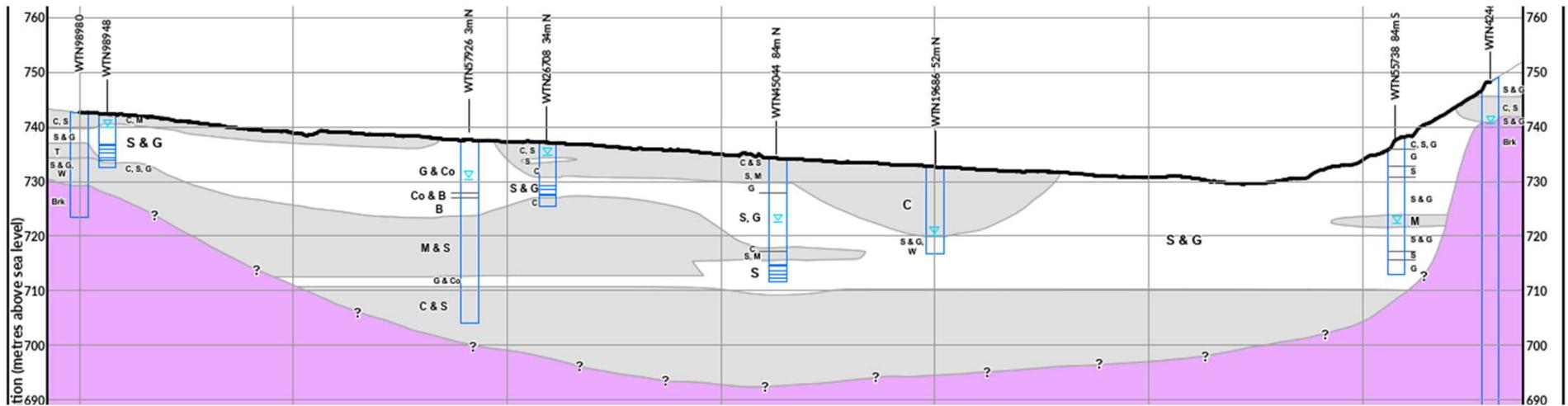
Likely fully allocated in dry years

- Recharge from Darke Creek (losing stream reaches)
- Groundwater divide at Fish Lake Road
- Groundwater flow is radial and then to North, discharging to Acland Spring (and possible Garnet Lake)



North Meadow Valley Aquifer Sub-Region

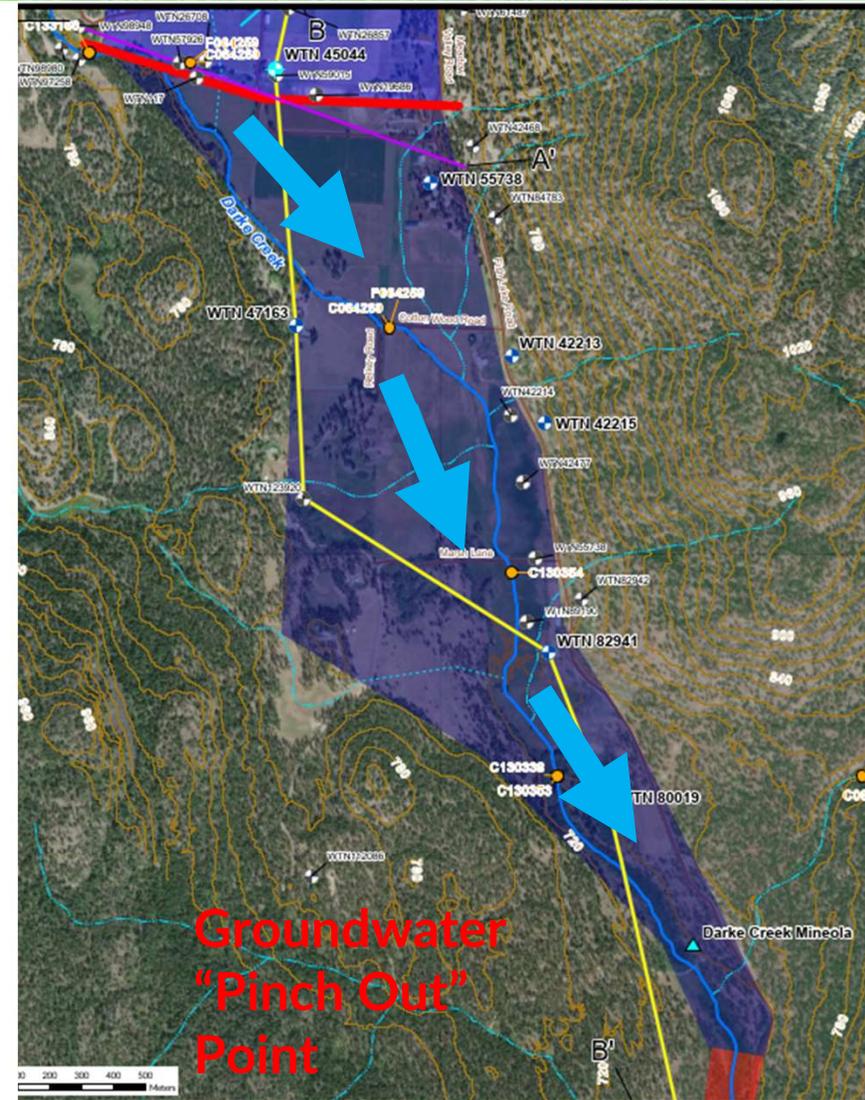
Likely fully allocated in dry years



- Aquifer is thin at about 10m thick
- Low water levels in Darke Creek and wells in some years
- Impacts to others in sub-region
- Likely no impact to other sub-regions

South Meadow Valley Aquifer Sub-Region Likely fully allocated in dry years

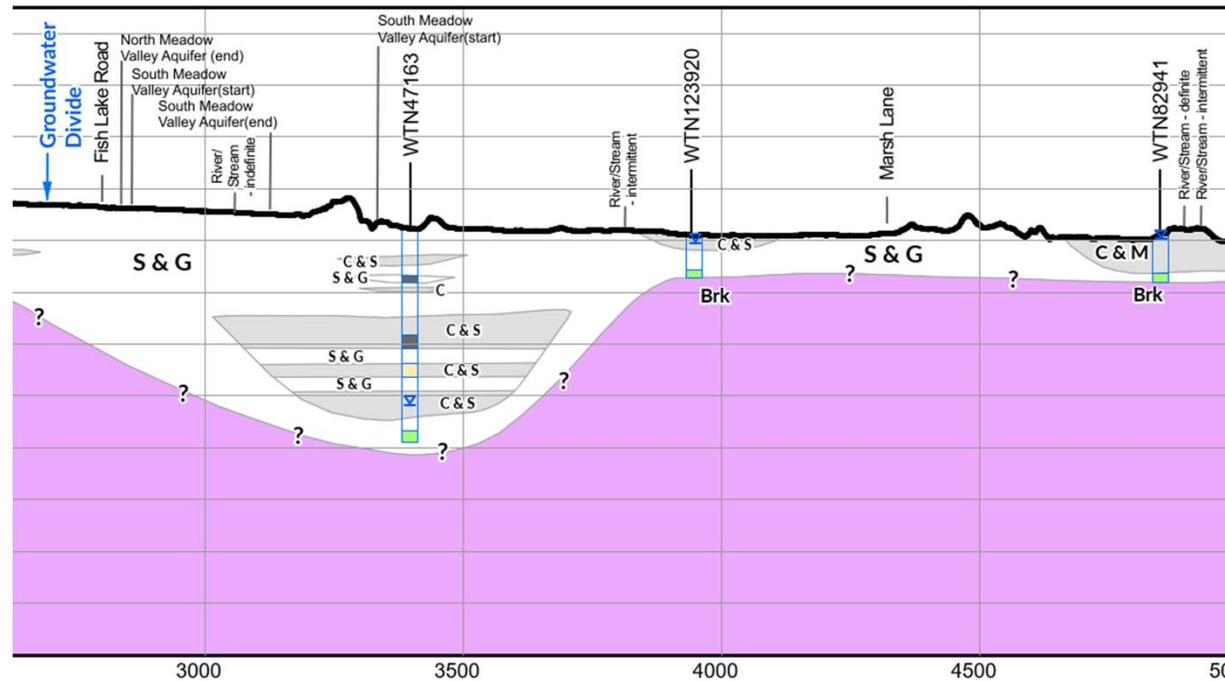
- Also recharged from Darke Creek.
- Groundwater divide at Fish Lake Road
- Groundwater flow is radial and then south to North Faulder Aquifer in wet years.
- In dry years, no groundwater flow to North Faulder



South Meadow Valley Aquifer Sub-Region

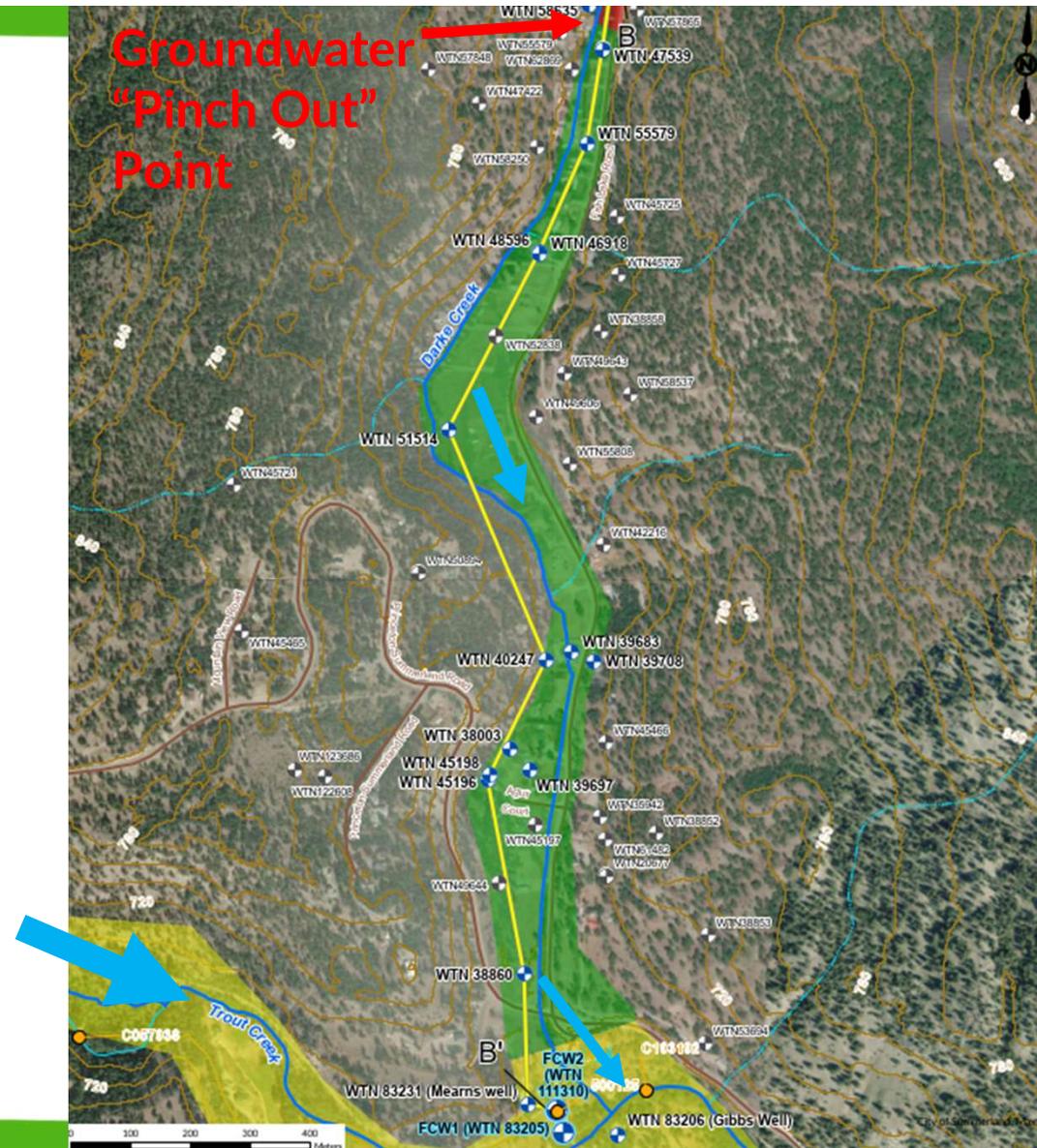
Likely fully allocated in dry years

- Aquifer is thin and short, with wells installed to bedrock.
- Low levels in Darke Creek and groundwater wells in dry years
- Impacts other users in sub-region and those in North Faulder

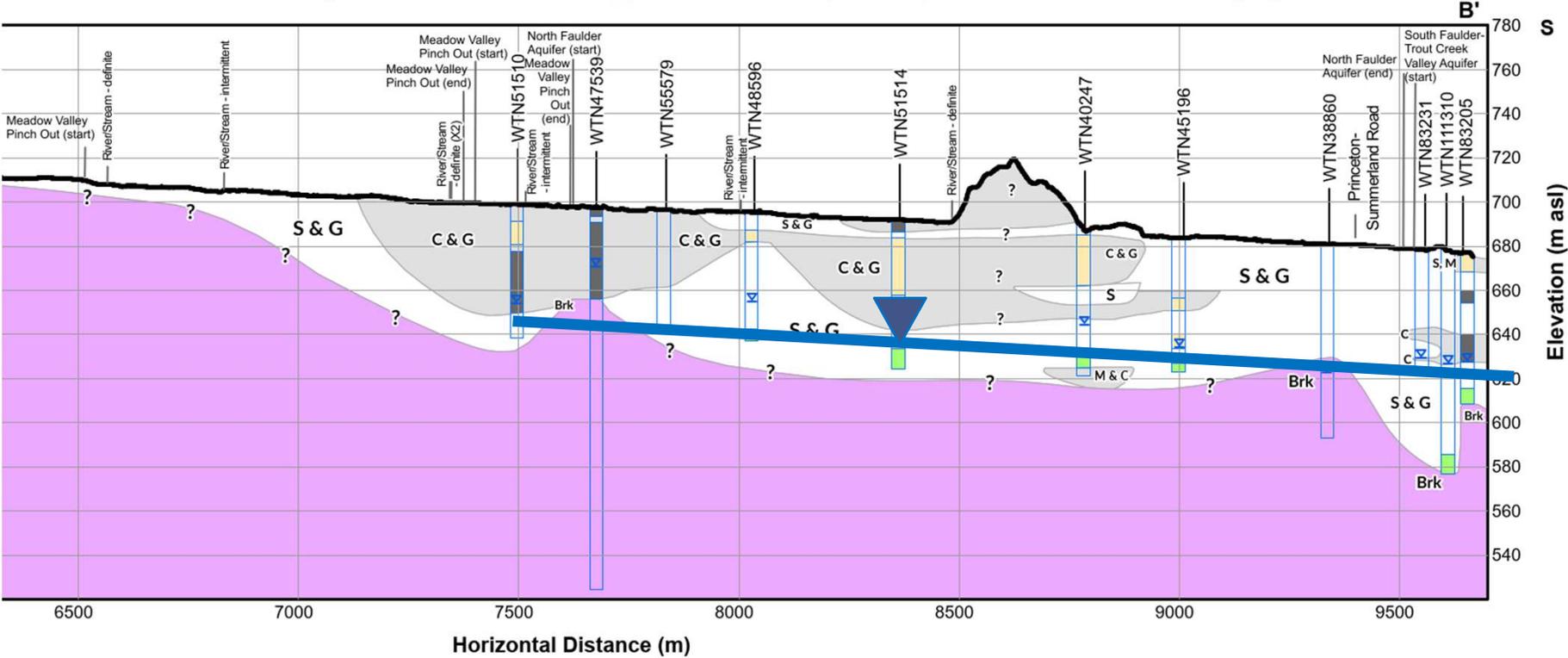


North Faulder Aquifer Sub-Region Likely fully allocated in dry years

- Recharges from Darke Creek after “Groundwater Pinch-Out” point
- Additional input via groundwater flow from South Meadow Aquifer during wet years only.
- Groundwater flows south towards Trout Creek Aquifer.



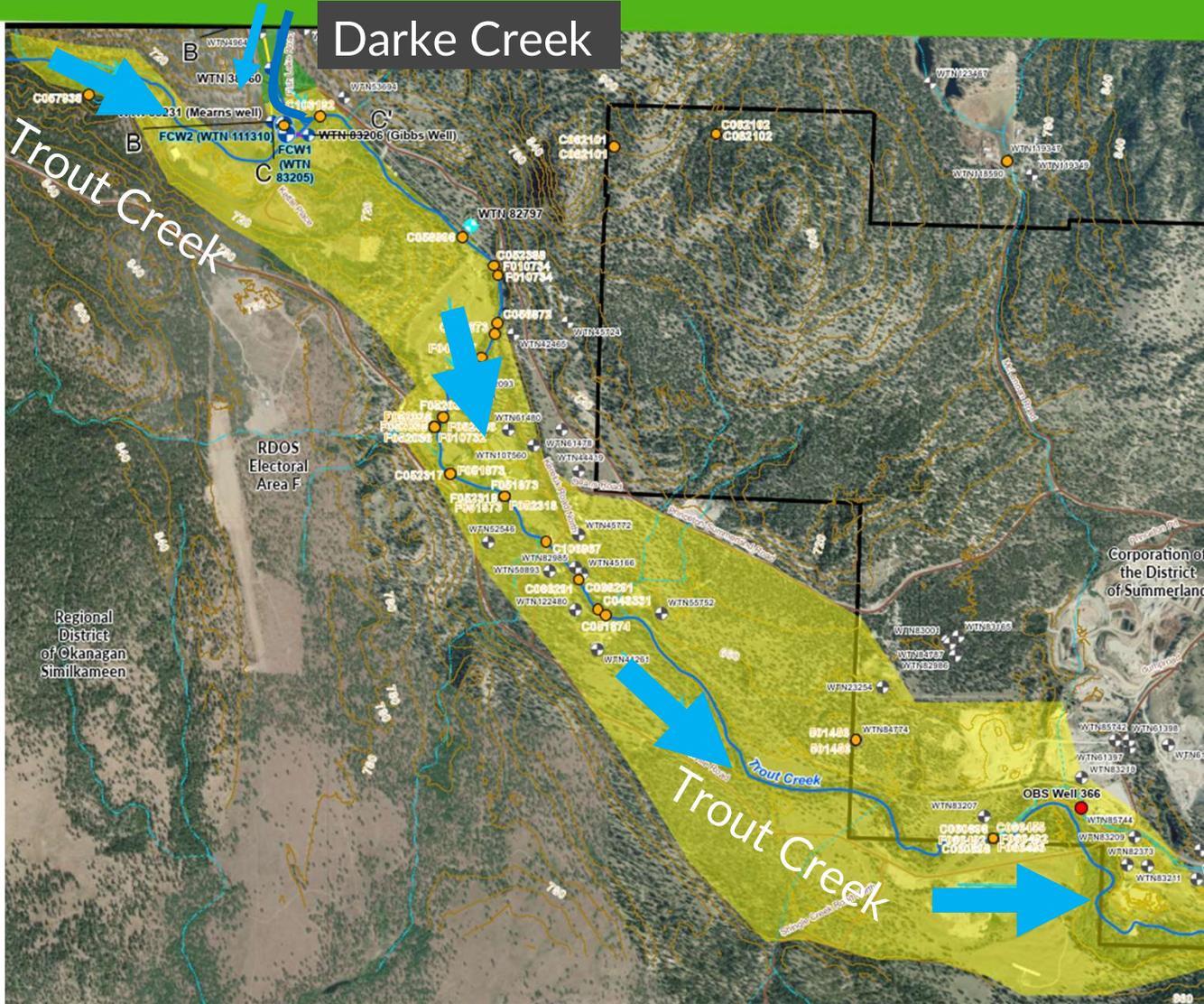
North Faulder Aquifer Sub-Region: Likely fully allocated in dry years



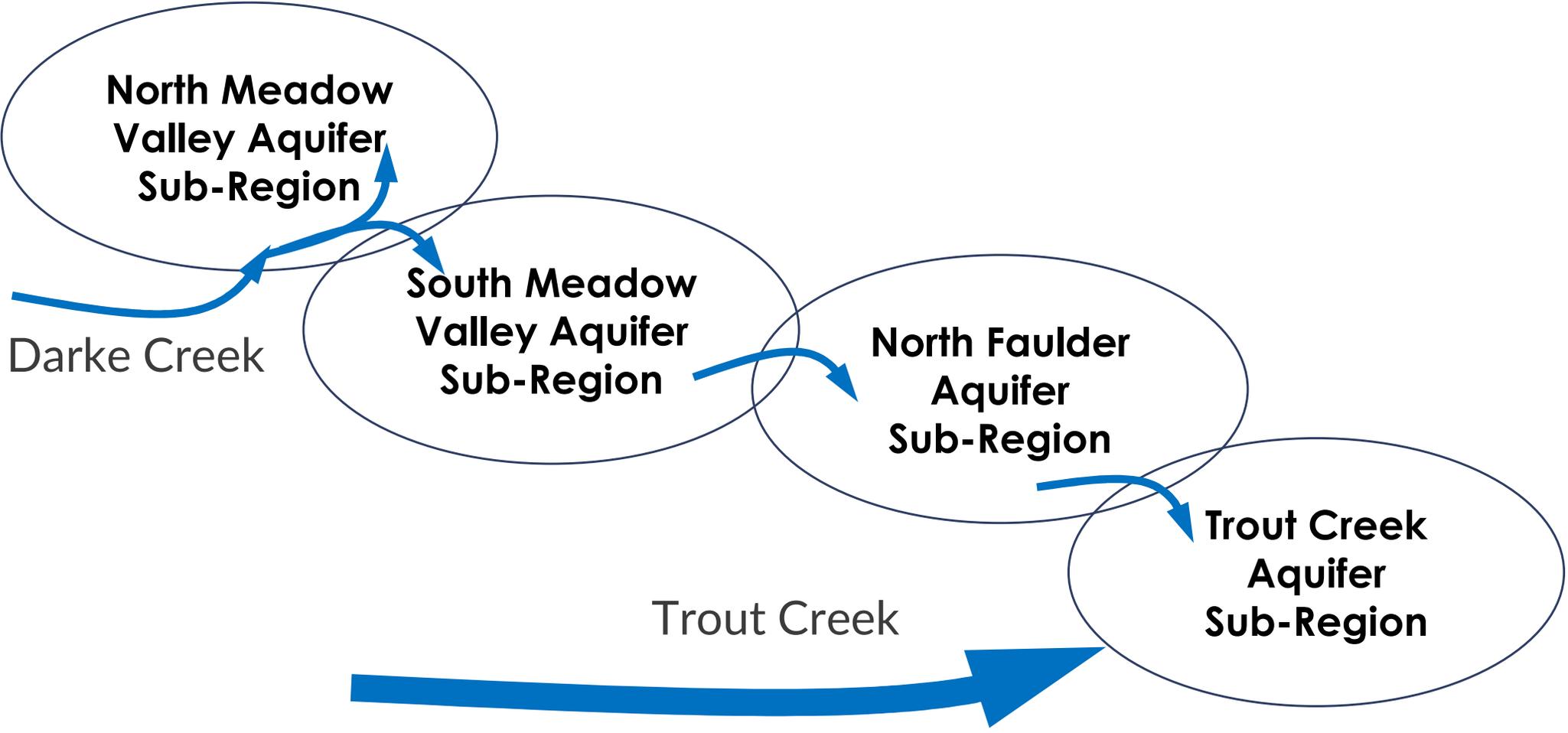
- Surficial aquifer is thin (10m), wells already screened to bottom of surficial aquifer, and many wells are screened into bedrock. Local reports of dry wells in dry years.

Trout Creek Valley Aquifer Sub-Region - Likely NOT fully allocated for individual domestic wells

- Recharge from Trout Creek losing reaches upstream of Faulder.
- Minor contribution from Meadow Valley/Darke Creek losing reaches.
- Groundwater flows southeast towards District of Summerland.

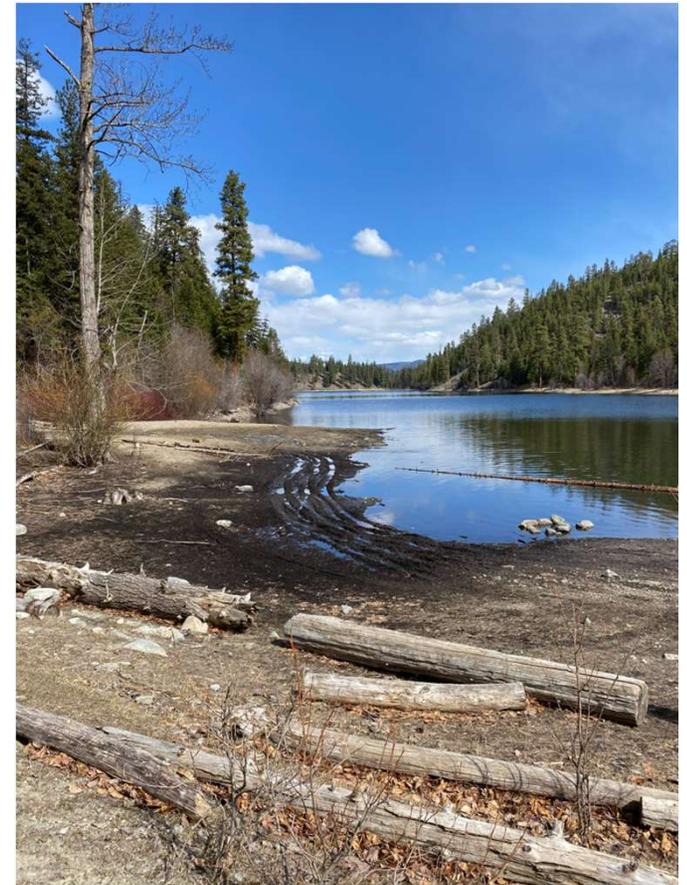


Conceptual Model of Groundwater Flow



Climate Change Considerations

- Water supply impacts
 - Annual precipitation will go up
 - More rain than snow
 - Impact to groundwater recharge unknown
- Water demand impacts
 - Longer, hotter summers
 - Will increase agricultural and outdoor domestic water demands in all Sub-Regions (up to 44% increase)



FCW1 and FCW2 - Limit to growth due to water licence volume

- Licence is based on 2000 L/p/d for 81 lots and actual meters data (56,000 m³/year)
- Equal to 500 L/p/d (Cdn average)
- Expect household sizes to increase (zoning allows accessory buildings)
- Indoor water use insignificant
- Outdoor water use can vary and can exceed existing water licence if water conservation efforts not followed.
- To increase water licence volume, need to apply for a new groundwater use licence.



Recommendations – Planning

- Limit domestic groundwater use within the Meadow Valley or North Faulder Aquifer Sub-Regions
- No need to limit domestic use in Trout Creek Aquifer Sub-Region
- Promote water conservation measures in particular in the Faulder Community Water Service Area
- Look into requirements for a new groundwater use licence application with Ministry of Forests.



Recommendations – Further Data Collection

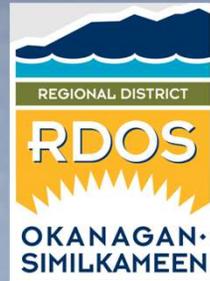
- Continue to monitor water use in FCW1 and FCW2.
- Complete additional technical studies on Trout Creek and Darke Creek
- Conduct a long-term pumping test on FCW2



Recommendations - Partnerships

- Share report with Ministry of Forests to highlight importance of losing stream reaches to Aquifer #299 recharge
- Consider starting Community Monitoring
 - For example, join Living Lakes Canada network)
 - Additional groundwater monitoring locations in South Meadow Valley and North Faulder Aquifer Sub-regions (partnership with Ministry of Forests)





Questions?

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