



Cowichan Valley Regional District

Acknowledgment

We would like to recognize that we are on the unceded territories of the Quw'utsun, Malahat, Ts'uubaa-asatx, Halalt, Penelakut, Stz'uminus, Lyackson, Tsawout & Lyackson Nations, whose people have walked gently here for thousands of years.

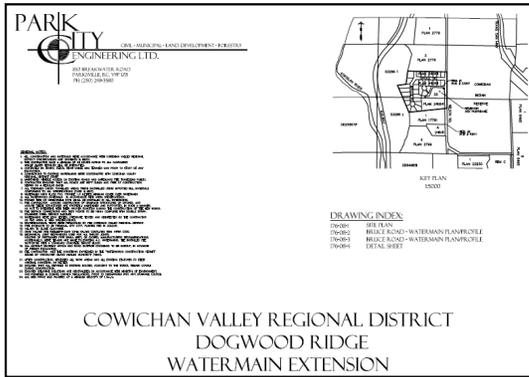


Dogwood Water System



COWICHAN VALLEY REGIONAL DISTRICT

175 Ingram Street Duncan, BC V9L 1N8 Phone: 250 746 2500



Partial watermain upgrade

New Reservoir



New treatment building, pipeworks, high flow pump, chemical pumps, back up generator, flow meters

Past Projects

Funded through:

- Canada-BC Municipal Rural Infrastructure grant funding \$266,666
- Community Works Fund \$136,952 (2010/2011)
- Community Works Fund \$69,161 (2014), \$52,693 (2015) and \$3,384 (2019 and 2022)
- \$92,496 loan in 2011 for 25-year term (matures in 2036). Remaining debt is \$59,845 – annual payback is \$3,901 (\$2,519 principal, \$1,382 interest at current rates)



Dogwood Water System

Updated Infrastructure

- Water treatment building
- Reservoir (227,000L)
- Water meters replaced as needed
- Interconnection point already installed for possible connection to the City of Duncan water system
- Fire pump and hydrant for fire protection
- Back up power for BC Hydro outages

SCADA (supervisory control and data acquisition)

- for 24-hour monitoring of critical equipment (high/low chlorine, high/low reservoir levels, pump fail, high and low pressure)
- On-call CVRD Utilities Operator available 24/7 to respond to emergency alarms

Annual Water Testing

Weekly Bacteriological Testing

- Weekly - one sample taken from one of two sampling locations located throughout the distribution system
- Sample locations are alternated each week
- Samples are tested by Island Health Authority and results are available on the Island Health website

Quarterly Manganese Testing

- Testing is done quarterly from within the distribution system (one sample is taken from before the first user)
- Sample results are available on the CVRD website

Annual Testing

- Full Spectrum analysis based on the Canadian Drinking Water Guidelines
- Sampling of the source and distribution is alternated each year



Copyright <https://www.thomassci.com/scientific-supplies/Sterile-Water-Sample-Bottles>

Contact CVRD Utilities for results

Concerns with Dogwood Water System

Low water supply from the two existing wells during the dry summer months



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Manganese in the SOURCE water is above the Maximum Allowable limit



Wells are in located within the Koksilah Watershed



Copyright: <https://maps.gov.bc.ca/ess/hm/imap4m/>



Aquifer 197 Facts

Size: 48.6 km²

Water Demand

941 Wells

14 Community Water Systems

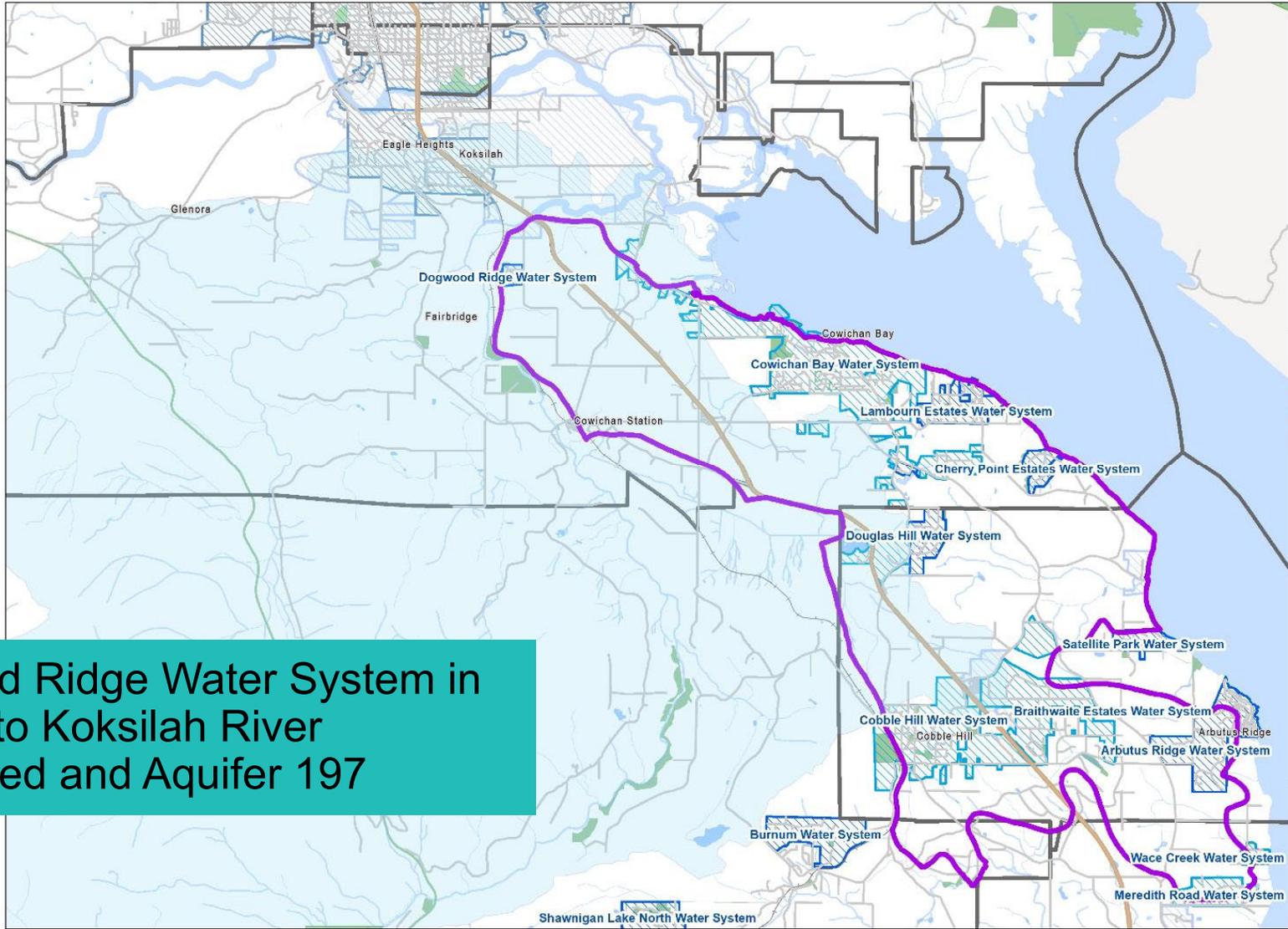
- CVRD - Cherry Point, Dogwood Ridge, Satellite Park, Arbutus Ridge, Douglas Hill, Lambourn Estates
- Improvement Districts – Wace Creek, Meredith Road, Braithwaite Estates, Cobble Hill, Cowichan Bay
- Private – Millar's, Vanland, Garnett Creek

Aquifer 197 extends from the Koksilah River south along the coast as far as Mill Bay.

The northern portion of the aquifer underlies the lower end of the Koksilah River watershed.

Likely hydraulic connections between the aquifer and the river

- Groundwater may supplement surface flows at certain times of the year
- Surface flows may recharge groundwater at other times



This map is compiled from various sources for internal use and is designed for reference purposes only. The Regional District does not warrant the accuracy. All persons making use of this compilation are advised that amendments have been considered for convenience purposes only and that boundaries are representational.

The original Bylaws should be consulted for all purposes of interpretation and application of the Bylaws.

Printed: December 1, 2023

- Legend
- Koksilah River Watershed
 - Aquifer 197
 - Local Government Boundary
 - CVRD Water Systems
 - Improvement District Water Systems
 - Private Water Systems



Scale: 1:50,000

Dogwood Ridge Water System in relation to Koksilah River Watershed and Aquifer 197

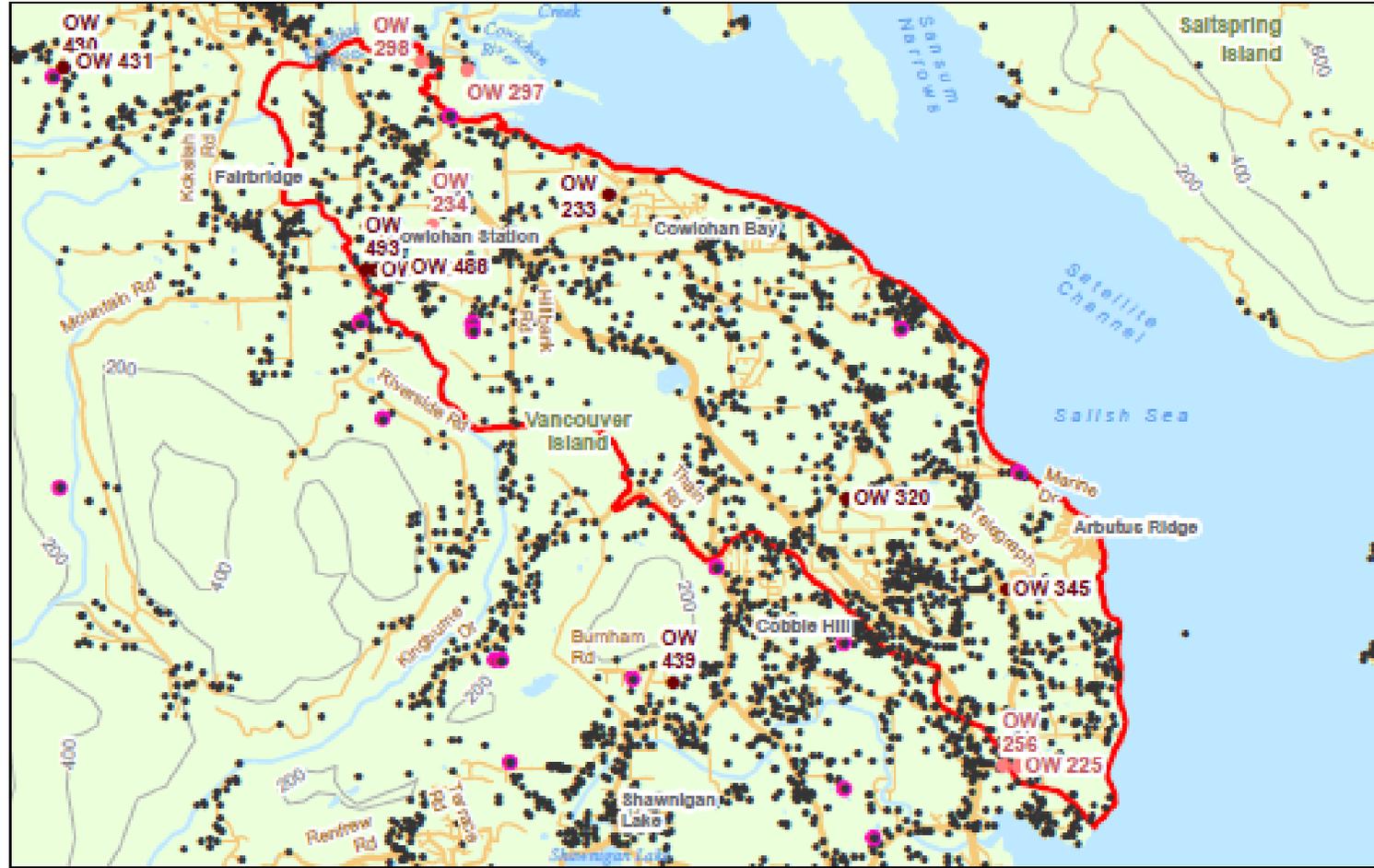


Aquifer 197 Wells



Legend

- Registered Water Well - Artesian
- Registered Water Well
- Active Observation Well
- Inactive Observation Well
- Aquifer Boundary



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Climate Change and Water Supply

Climate Projections for the Cowichan Valley

- Warmer, wetter winters – more rain in the fall, winter & spring
- Hotter, drier summers – less rain in the summer, longer dry spells, higher temperatures

Groundwater Budget

- Aquifer 197 is typically in a deficit 6-8 months of the year, recharges is remaining 4-6 months
- Increased winter rainfall may mean more aquifer recharge during the winter
- Little is known about capacity for aquifer recharge and the need for increased water storage during droughts



Manganese

Distribution water is sampled quarterly (Jan, April, July, Oct) from two sample locations. One sample is taken from before the first user and one sample is taken at the end of the system

Manganese test results are available on the CVRD website:

<https://www.cvr.ca/2699/Dogwood-Ridge-Water-System>

<i>Sampling Date</i>	<i>UNITS</i>	<i>MAC</i>	<i>AO</i>	<i>Total Mn-Distribution</i>	<i>Sampling Location:</i>
June 5, 2013	mg/L	0.12	0.02	0.043	S1-2628 Bruce Rd
February 16, 2015	mg/L	0.12	0.02	0.0907	S1-2628 Bruce Rd
February 22, 2017	mg/L	0.12	0.02	0.0381	S1-2628 Bruce Rd
March 2, 2021	mg/L	0.12	0.02	0.1050	S1-2628 Bruce Rd
January 17, 2023	mg/L	0.12	0.02	0.101	S2-tap on distribution inside TB
January 17, 2023	mg/L	0.12	0.02	0.0644	S1-2628 Bruce Rd
April 11, 2023	mg/L	0.12	0.02	0.0646	S2-tap on distribution inside TB
July 20, 2023	mg/L	0.12	0.02	0.0606	S2-tap on distribution inside TB
October 17, 2023	mg/L	0.12	0.02	0.0663	S2-tap on distribution inside TB
October 30, 2023	mg/L	0.12	0.02	0.0491	S1-2628 Bruce Rd

MAC = Maximum Allowable Concentration
AO = Aesthetic Objective



Manganese

- Island Health has reviewed CVRD's monitoring plan and have stated if the manganese level in the distribution system goes above the Maximum Allowable Concentration that treatment will likely be required

What if treatment is required?

- Cost. A similar system that was installed in 2022 at another CVRD water system cost approximately \$220,000
- Backwash water disposal. The system needs to be backwashed at least once a week. The backwash water cannot be released into the environment without pre-treatment
- Backwashing requires water to clean the media filters putting additional strain on the supply wells.



An example of a manganese treatment system

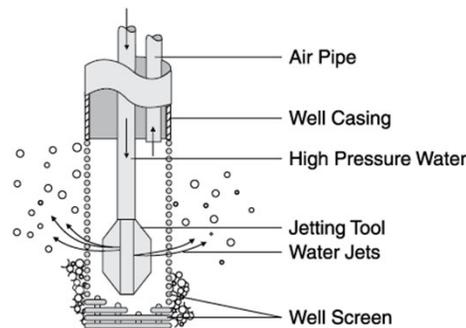


Backwash water during cleaning of the media filters



Water Hauling for 2023 and Well Rehabilitation

- Cost of water hauling - \$4250.00 paid through the Ministry of Emergency Management and Climate Readiness
- Cannot be relied on for future years



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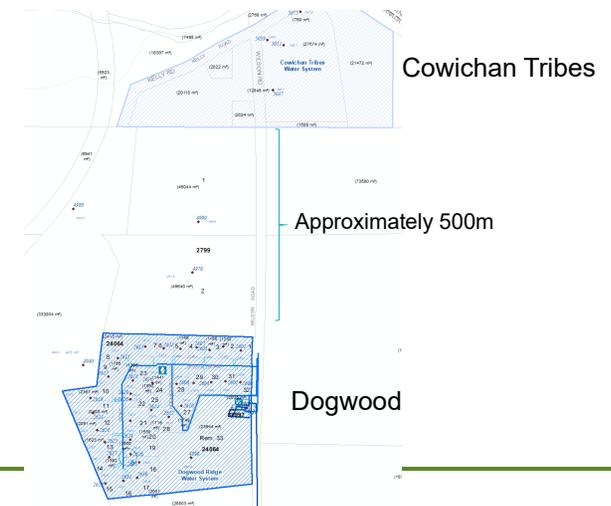
Well Rehabilitation

- Fine sand in the aquifer has a tendency to plug the well screens over time
- The wells need to be rehabilitated regularly to clean the screens to optimize well yields
- Drillwell has been engaged to perform a mechanical cleaning of the screens. This work will be completed in the coming weeks.



Connection to the City of Duncan Water System

- Your Area E Director, Alison Nicholson, has committed \$15,000 of Community Works Funds towards a preliminary engineering study for connection to the City of Duncan water system
- CVRD staff have met with City of Duncan staff and Cowichan Tribes staff to discuss the connection and both parties are supportive of the idea.
- Next step is to engage an engineering consultant to complete an assessment of the cost to connect to the City of Duncan water system
- Costs are currently unknown
- Most of the existing infrastructure will likely not be used but we won't know for sure until the feasibility study is complete.
- City of Duncan water source is of excellent quality



A low-angle photograph of a dense forest canopy, showing various green leaves and branches against a clear blue sky. The image is oriented vertically, with the top of the trees at the bottom of the frame.

Thank you!

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Contact Us

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