



REGIONAL
DISTRICT
OF NANAIMO

REGIONAL GROUNDWATER LEVEL ANALYSIS: PRE-SUMMER 2026

RECOMMENDATION

That the Board receive the report “Regional Groundwater Level Analysis: Pre-Summer 2026” for information.

BACKGROUND

Groundwater is essential to communities in our region, with over 40% of residents relying on groundwater for their water supply. This includes water service areas operated by the Regional District of Nanaimo (RDN), District of Lantzville, City of Parksville and Town of Qualicum Beach. Four improvement districts also source groundwater for their waterworks systems, including Deep Bay Improvement District, Bowser Waterworks, Qualicum Bay Horne Lake Waterworks and North Cedar Improvement District. Additionally, Snaw-naw-as First Nation and Stz’uminus First Nation operate water supply systems that rely on groundwater from regional aquifers. EPCOR is a private water system that provides groundwater for residents in French Creek. In addition to serviced water areas, over 4800 residents in the RDN source their drinking water from private domestic wells or small water systems.

The RDN Drinking Water and Watershed Protection (DWWP) program monitors groundwater levels in aquifers across the region, through the RDN Volunteer Observation Well Network, to understand water availability and assess trends over time. This supplements the monitoring done by the Province via the Provincial Observation Wells within the region.

Since 2020, the RDN DWWP program has completed an annual regional analysis of groundwater levels to support water conservation decisions for the summer period ahead and provide an update on longer-term and seasonal trends observed in the aquifers within our region. This reporting has been supported by consulting professional hydrogeologists from Waterline Resources Inc (2020 and 2021) and GW Solutions Inc (2022, 2023, 2024, 2025 and 2026).

The historical trend analysis includes 62 wells – 30 RDN Volunteer Observation Wells (VOW) and 32 Provincial Groundwater Observation Network wells (OW) – which monitor 13 surficial (sand and gravel) aquifers and 9 bedrock aquifers. The historical analysis considers all available data between 2013-2026.

This 2026 seasonal analysis includes 62 wells that have current data available at time of reporting. This years’ reporting covers all 22 of the region’s mapped aquifers that are monitored and provides a snapshot of where groundwater levels are at in comparison to previous years data at the time of reporting.

Provincial OW sites include active sites with real time data where data is posted live via telemetry, as such some 2026 data included in this report is live data and has not yet been validated by the province at the time of reporting.

SUMMARY

Seasonal Conditions and Longer-Term Trends

Of the 22 aquifers that have 2026 monitoring data: 1 is much above normal range; 5 are within normal range; 5 are below the normal range, while 11 are reporting much below normal levels. As referenced in the graphs that illustrate the seasonal levels (see Appendix C), much below normal indicates levels between the zero to 10th percentile, below normal is the 10th to 25th percentile, normal is 25th to 75th percentile, above normal, is 75th to 90th percentile, and much above normal is 90th to 100th percentile. This is in the context of a drier than average winter and a low snowpack accumulation, followed by hotter than average spring. The variability across aquifers illustrates the complex nature of groundwater in our region and how different conditions exist in different locations. These trends are influenced by the physical attributes of the aquifers (bedrock or sand and gravel; confined or unconfined), the level of demand and pumping, the distribution and volume of precipitation received, among other factors.

Seasonally **much above normal** range with increasing historic trend:

- Aquifer 212 – Oceanside – bedrock

Seasonally **within normal range** with increasing historic trend:

- Aquifer 216 – Parksville – surficial
- Aquifer 167 – Millstone Valley – surficial
- Aquifer 1098 – Nanoose – surficial
- Aquifer 165 – South Wellington – bedrock

Seasonally **within normal range** with stable or decreasing historic trend:

- Aquifer 161 – Upper Cassidy – surficial (2 monitoring wells reporting: 1 stable, 1 moderate decline)

Seasonally **below normal** with variable historic trend:

- Aquifer 214 – Nanoose – bedrock (5 monitoring wells reporting: 3 increasing, 1 stable, 1 large decline)
- Aquifer 220 – Errington – bedrock (2 monitoring wells reporting: 1 increasing, 1 large decline)
- Aquifer 162 – Cedar Yellowpoint – bedrock (8 monitoring wells reporting: 4 increasing, 2 stable, 1 moderate decline, 1 large decline)
- Aquifer 709 – Gabriola Island – bedrock (6 monitoring wells reporting: 1 increasing, 3 stable, 2 moderate decline)

Seasonally **below normal** with historic stable or decreasing trend:

- Aquifer 215 – Lantzville – surficial (3 monitoring wells reporting: 2 stable, 1 large decline)

Seasonally **much below normal** with increasing historic trend:

- Aquifer 213 – Upper Lantzville – bedrock

Seasonally **much below normal** with stable historic trend:

- Aquifer 664 – Little Qualicum – surficial
- Aquifer 217 – Qualicum Beach – surficial

- Aquifer 163 – Cedar – surficial
- Aquifer 1250 – French Creek – surficial

Seasonally **much below normal** with stable or decreasing historic trend:

- Aquifer 218 – Nanoose Peninsula – bedrock (3 monitoring wells reporting: 1 stable, 1 moderate decline, 1 large decline)
- Aquifer 416 – Deep Bay – surficial (2 monitoring wells reporting: 1 stable, 1 moderate decline)
- Aquifer 160 – Lower Cassidy – surficial (2 monitoring wells reporting: 1 stable, 1 moderate decline)
- Aquifer 662 – Big Qualicum – surficial (3 monitoring wells reporting: 1 stable, 2 moderate decline)

Seasonally **much below normal** with variable historic trend:

- Aquifer 219 – Nanoose – surficial (4 monitoring wells reporting: 1 increasing, 2 stable, 1 moderate decline)

Seasonally **much below normal** with decreasing historic trend:

- Aquifer 211 – Benson Meadows – bedrock

Application

This information provides a snapshot of groundwater conditions in the region heading into the summer months. The seasonal conditions observed in spring, as reported in this memo, can provide an early indication of where heightened water conservation measures may be needed through the summer. Watching weather patterns over July and August and how that translates into community water demand and / or low streamflow, will further inform water service providers and well owners across the region.

Water purveyors have implemented the annual outdoor water conservation framework to promote water use reduction. This year’s groundwater reporting will be shared with municipal, improvement district, and small water system staff to provide an outlook for groundwater conditions this coming summer and support their management considerations and communications to customers.

The primary measures to respond to potential groundwater shortages include water conservation (efficient irrigation, rainwater harvesting, soil improvements, efficient appliances) and eliminating leaks. Understanding the seasonal conditions of a well or aquifer in relation to longer-term groundwater level trends offers important context and can help prioritize policy solutions for areas that are regularly under more water stress due to aquifer characteristics, climate impacts and localized demand. Where trends indicate declining levels over time, as well as below average seasonal levels, it points not only to the need for increased water conservation measures going into the summer period but also to the longer-term need to encourage groundwater recharge across the landscape, supplement water storage, and practice water efficiency year-round. Increasing trends and above average seasonal levels may help to indicate where water management actions are having a positive effect.

Data Tables and Graphs

The updated figures, data tables and hydrographs attached to this report include the following:

- *Figure 1 – Groundwater Monitoring Well Locations* illustrates the extent of the monitoring well network and the location of underlying aquifers across the region and indicates if a site is part of the provincial or regional monitoring program.

- *Appendix A – Summary of Groundwater Observation Well Data* provides a detailed table that reports the historical and seasonal groundwater level trend per mapped aquifer, based on either Provincial or RDN observation wells with available data at time of reporting. It also notes which community water service areas, if any, are associated with which aquifer and lists the total number of registered wells correlated to each mapped aquifer to get a sense of the density of private wells relying on the aquifer outside the serviced areas. [Note that this number of private wells is not exhaustive as, a) there are also many registered wells that are uncorrelated to an aquifer but fall within the spatial extent of the aquifer and, b) there are many unregistered wells that are not accounted for].
- *Appendix B – Historical Groundwater Level Trend Results* provides a table with the long-term groundwater level trend results calculations and hydrographs for each observation well used for this reporting, showing the dataset available 2013-2026 for level fluctuations over time. They include a black trend line that indicates the slope of change over the time of the available dataset.
- *Appendix C – Seasonal Groundwater Level Trend Results* provides hydrographs for each observation well that has updated data since the last report in 2025. These charts plot each year of data against the months of the year to see inter-annual variation compared with the average across the data record to 2013. Seasonal groundwater level charts compare current year conditions (black line) to the long-term median (grey line), using data from active volunteer wells that has been cleaned to reflect non-pumping (static) levels. Shaded areas show the historical range of groundwater levels for each date, expressed as percentiles based on all available years of data (typically 10 or more). The middle range (25th to 75th percentile, shown in green) represents typical conditions, while values above the 75th percentile indicate higher-than-normal levels and those below the 25th percentile indicate lower-than-normal levels.

FINANCIAL IMPLICATIONS

This report has no financial implications.

STRATEGIC PLAN ALIGNMENT

Water Security - Understand our water resources and their risks, to manage our water resources effectively and sustainably.

REVIEWED BY:

- N. Viau, Manager, Water Services
- M. Walters, Acting Chief Administrative Officer

ATTACHMENTS

1. Figure 1 – Groundwater Monitoring Well Locations 2026
2. Appendix A – Summary of Groundwater Monitoring Well Data 2026
3. Appendix B – Historical Groundwater Level Results 2013 – 2026
4. Appendix C – Seasonal Groundwater Level Results 2026