

# Elbow River Water Quality Data Report



> An east-facing view of Elbow River during a training event with the Weaselhead Glenmore Park Preservation Society

CreekWatch is a program of the non-profit RiverWatch Institute of Alberta, specializing in community-based environmental monitoring and award-winning citizen science education for thirty years. This 2024 Report shares our findings with the public, governments, and water quality professionals to collaboratively work towards the baseline monitoring and improvement of our stormwater creeks in Alberta.

This CreekWatch Report examines the state of Calgary’s Elbow River based on the water quality data collected with the assistance of community environmental monitoring groups. You can view a snapshot of data in the attached graphs generated by the RiverWatch online and responsive [graphing tool](#). Thank you to EPCOR, The City of Calgary, and the Land Stewardship Centre’s Watershed Stewardship Grant financed by Alberta Environment and Protected Areas for major funding support, and to all of our dedicated volunteers who have made this sampling season possible – we couldn’t have done it without you!

### Elbow River By-the-Numbers

	2024	2023	2022
Number of Sampling Events	18	20	9
Number of Data Points	118	118	66
Number of Sampling Hours	16.5	9	4.4

### Analysis

This 2024 report shows the same number of data points generated by CreekWatch volunteers and technicians. Based on median values, improvements were observed in dissolved oxygen, water temperature, and phosphorus levels, while many other parameters remained relatively stable.

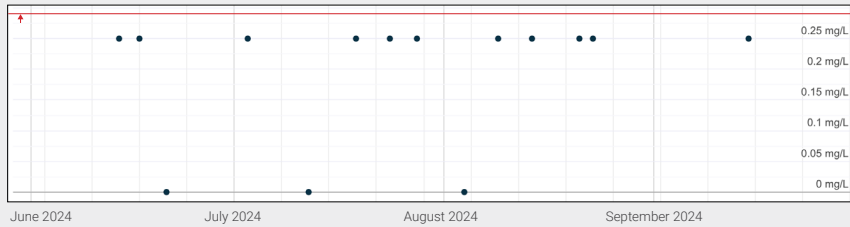
### Elbow River Water Quality Data

Parameter	Median Value		
	2024	2023	2022
Dissolved Oxygen (mg/L)	9.0	8.0	6.1
Water Temperature (°C)	14.0	16.7	11.5
Turbidity (NTU)	10	10	10
pH	7.9	7.6	7.6
Ammonia Nitrogen (mg/L)	0.25	0.25	0.25
Phosphorus (mg/L)	0.02	0	0
Chloride (mg/L)	10	15	15

NOTE: All data collected during the open water season of the specified calendar year.



## Ammonia Nitrogen (mg/L)



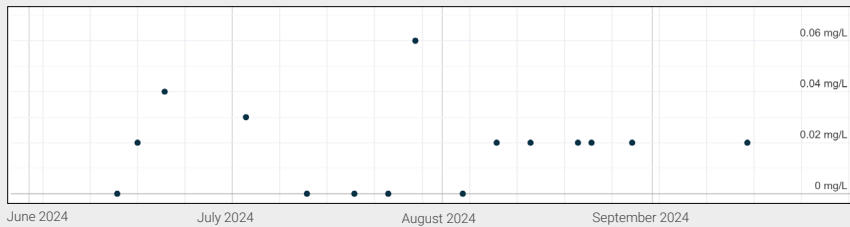
**Median 0.25**

Ammonia nitrogen concentrations are measured by dipping Hach test strips into water and noting the colour change. Red line indicates the Environmental Quality Guidelines for Alberta Surface Waters (2018) for exceedance is maximum 1.0 mg/L at pH 8.0, 10°C.

## Why monitor Ammonia Nitrogen?

Ammonia nitrogen is a familiar nutrient and pollutant in waterways, consisting of ionized ammonium ( $\text{NH}_4^+$ ) and toxic ammonia ( $\text{NH}_3$ ). It exists in water through natural processes like the nitrogen cycle and can be introduced through human activities, such as agriculture, urban runoff, wastewater discharge, and industrial emissions. Ammonia nitrogen is vital for plant growth but can harm aquatic life at elevated concentrations, causing eutrophication, oxygen depletion, and fish kills. Ammonia toxicity increases with higher water temperatures and pH levels, and prolonged exposure can be harmful to aquatic life, potentially leading to biodiversity loss.

## Phosphorus (mg/L)



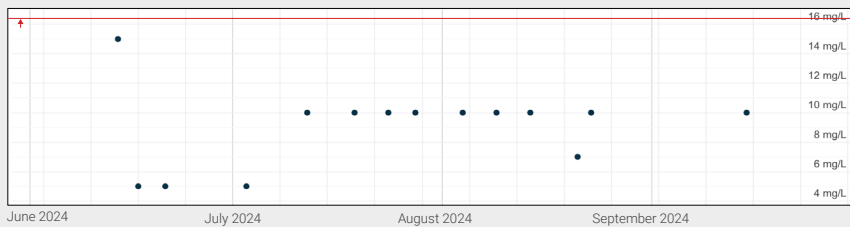
**Median 0.02**

Orthophosphate concentrations are measured with either a LaMotte 1200 Colorimeter or a Hach kit that compare a change in water colour.

## What is Phosphorus in water?

Phosphorus is a crucial component for living organisms, found in food like eggs, meat, and dairy, and moves through the biogeochemical cycle in ecosystems. It is absorbed by plants as inorganic phosphates and passed through the food web. However, excess phosphorus in waterways, often from human actions like agriculture, sewage, and stormwater runoff, can cause nutrient pollution. Increased phosphorus levels may lead to eutrophication, harmful algae blooms that deplete oxygen, and disrupt the ecosystem. Algae blooms can also release toxins and clog water treatment filters, posing environmental and human health risks.

## Chloride (mg/L)



**Median 10**

Chloride concentrations are measured using Hach kits with a drop-by-drop titration to show a change in water colour from yellow to orange. Red line indicates the Environmental Quality Guidelines for Alberta Surface Waters (2018) for exceedance is maximum 120 mg/L. Chloride results collected before July 15th, 2024 may have been corrected to account for titrant normality.

## What does Chloride measure?

Chloride is an element found in compounds like road salts. When dissolved in water, chloride ions can be measured, indicating the "saltiness" of water. It can enter waterways naturally through coastal flooding, groundwater discharge, and weathering of chloride-containing rocks or human activities like deicing, agricultural runoff, and industrial processes like fracking. High chloride concentrations can harm freshwater ecosystems, interfere with an organisms osmoregulation, and make water unsuitable for drinking or irrigation. It may also complicate water treatment plants, requiring additional infrastructure to manage salinity.

To review our data reports, visit [creekwatch.ca/creekwatch-reports](https://creekwatch.ca/creekwatch-reports)