

# Gledhow Beck and Lake

## A Citizen Science Report on Water Quality in the Gledhow Valley

Report Summary June 2025

Friends of Gledhow Valley Woods

### The Friends of Gledhow Valley Woods and Citizen Science

The Friends of Gledhow Valley Woods have long campaigned to improve the environmental state of Gledhow Beck and Lake. Water Pollution continues to damage biodiversity and undermine the value of this much-loved green space for the local community. This summary sets out our findings for the period September 2023 to December 2024.

In September 2023, the Friends of Gledhow Valley Woods decided to establish a citizen science project to monitor, record and report concerns on the state of water quality in Gledhow Beck and Lake. We have recruited and trained **32 local residents as citizen scientists** to undertake this regular monitoring.

**Our work is supported by collaborations with water@leeds, the University of York's Department of Environment and Geography and Water Rangers – [waterrangers.com](https://www.waterrangers.com)**



### What are the sources of pollution in Gledhow Beck and Lake?

#### Sewage Overflows

Four combined sewer overflows (CSOs) discharged untreated sewage into Gledhow Beck for 396.15 hours in 2024 (408 hours in 2023)

#### Misconnected Plumbing

Wastewater from homes wrongly enters surface drains and flows untreated into the Beck and Lake via incorrectly plumbed appliances. At least three misconnection sites have been confirmed.

#### Road Runoff

Rainwater washes oil, heavy metals, tyre particles, and microplastics from roads into the Beck and Lake through unmonitored outfalls. Leeds City Council's practice of discharging the contents of road gulleys into Gledhow Beck makes this problem worse.

### Our key findings

Citizen Scientists conducted monthly water chemistry sampling, kick testing, and bacterial assessments. Accompanied by data collected from academics on pharmaceuticals and sediment contamination. The results suggest serious concerns:

- **E. coli levels in Gledhow Lake regularly exceed bathing water safety standards.**
- **Aquatic invertebrate diversity is lower than in other North Leeds Becks and the Lower Aire catchment as a whole, with very few clean-water indicator species, suggesting poor water quality.**
- **High conductivity levels may indicate an excess of dissolved substances, which can stress aquatic life.**
- **Nitrate concentrations are elevated at several sites, which can promote algal growth, which can reduce oxygen levels and biodiversity.**



- **Pharmaceutical contamination, including the 'forever chemical' perfluorooctanoic acid, was found in both the Beck and the Lake.**
- **A previous study of Gledhow Lake in 2018 reported high concentrations of metals and nutrients, along with low oxygen levels, suggesting a vulnerable ecological condition.**
- **Sewer debris can be seen along the entire length of Gledhow Beck. This has a negative impact on the community's enjoyment of Gledhow Valley Woods.**

## What we measure and why

What?	Why?
Temperature	Raised temperatures affect aquatic metabolic rates and reduce oxygen levels, increasing stress and fatalities.
Dissolved Oxygen	Crucial for aquatic life. Low levels can lead to hypoxia (low oxygen) or anoxia (absence of oxygen), causing fish kills. Levels drop with high temperature or nutrient overload.
Electrical Conductivity	Conductivity indicates the amount of dissolved ions. High readings suggest pollution from road runoff, nutrients or industrial inputs.
Nutrients	Nutrients are elements essential for aquatic organisms' survival and growth. Natural sources include rock weathering and decomposition. Rises can indicate pollution from manure, fertilisers, wastewater from sewage treatment works, septic tanks and CSOs.  Excessive levels of phosphorus and nitrogen cause eutrophication and health issues.
E. coli	Indicates recent faecal contamination, commonly from sewage or agriculture. High levels pose health risks for recreational users.
Kick Sampling	Measures aquatic invertebrate diversity. The absence of sensitive species indicates pollution; presence suggests good ecological health.
Pharmaceuticals	Detects traces of human medications and industrial compounds. Their presence reflects sewage contamination and chemical persistence in the environment.

## Pharmaceuticals found in Gledhow Beck

Pharmaceuticals enter the Lake and Beck from the four Combined Sewer Overflows in the Gledhow Valley. These adversely impact on aquatic life.

*With thanks to the University of York.*

### **Carbamazepine**

(Epilepsy medication)

### **Caffeine**

(Stimulant - commonly consumed)

### **Cetirizine**

(Antihistamine medication)

### **Fexofenadine**

(Hay fever medication)

### **Gabapentin**

(Epilepsy medication)

### **Metformin**

(Diabetes medication)

### **Perfluorooctanoic Acid**

(Industrial Surfactant)

### **Cotinine**

(Attention deficit disorder medication)

### **Furosemide**

(Blood pressure medication)

### **Irbesartan**

(Blood pressure medication)

### **Lorsartan**

(Blood pressure medication)

### **Nicotine**

Stimulant (tobacco -related)

### **Temazepam**

(Sleep medication)



## What needs to change?

The Friends of Gledhow Valley Woods want to see immediate and sustained action from Yorkshire Water, regulators, elected representatives, and the local community. Without intervention, the pollution will continue to undo the environmental progress achieved through years of volunteer-led conservation work.

## What action can you take?

• Join our team of Citizen Scientists  
[infofgvvcitizenscience@gmail.com](mailto:infofgvvcitizenscience@gmail.com)

• Sign our petition: <https://chnng.it/whPPC8Kv5x>

• Write to your local councillor and MP  
<https://www.gov.uk/find-your-local-councillors/leeds>  
Or, email: [fabian.hamilton.mp@parliament.uk](mailto:fabian.hamilton.mp@parliament.uk)

• Donate to our campaign  
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