

How to Read a Lab Report

DRINKING WATER PROTECTION | WATER POLICY CENTER

Lab reports have a lot of highly technical information, making them challenging to read. This document is intended to help you read your lab report and understand your water test results.

- In most cases, the key results are on the first few pages of the lab report. The test results will be listed for each contaminant, along with their units of measurement.
- Some contaminants may have [guidance values or standards](https://www.health.state.mn.us/communities/environment/risk/guidance/gw/index.html) (<https://www.health.state.mn.us/communities/environment/risk/guidance/gw/index.html>) for drinking water. You can compare test results with these or other values as relevant.
- If you have any questions, you can refer to the resources listed below or contact the Minnesota Department of Health for assistance.

Key terms and definitions

Sampling point: The location at which the sample was taken.

Analyte: The specific chemical or contaminant that was tested.

Reporting Limit: The lowest level that the lab can detect the contaminant with certainty about the level in the sample.

Result: The final measurement or value of the test performed. Results may show levels (or “concentrations”) of contaminants in water samples. Results may also show whether the contaminant is above or below the reporting limit.

Results of “<” mean that the contaminant tested was below the reporting limit and is considered a non-detect.

Units: Type of measurement, usually concentration of the contaminant in water. Common units used are parts per billion (ppb), parts per trillion (ppt), milligrams per Liter (mg/L), nanograms per Liter (ng/L) and micrograms per Liter (µg/L). Results can be converted into other units. For example, 3 ng/L is equal to 0.003 µg/L. Additionally, ppb are equal to ug/L and ppt are equal to ng/L.

Method: The method indicates a standard testing procedure that is used to determine a result.

Qualifiers: Qualifiers describe an irregularity or issue with the result.

The most common qualifier we see is a “J-Flag”, which indicates the contaminant was detected below the reporting limit. This means that we know the contaminant was present in the sample at a low level, but we do not know the exact numerical value.

Matrix: The type of water tested. Usually drinking water, groundwater, or surface water.

Duplicate: A second sample that is identical to the first sample, taken for quality assurance.

Field blank: A sample of water which, prior to use, is known to be free of contaminants. This sample is then handled in the same manner as others taken at the sampling location. This sample is used for the purpose of detecting onsite contamination in sample handling or collection.

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MDH Sample Number: 22D0869-01									
Location ID: D01		Collect Date: 04/13/22		Field Residual Chlorine Result: None					
Sampling Point: field blank		Collect Time: 11:30		Field Fluoride Result: None					
Field Number: FB1220001		Matrix: Drinking Water		Field pH Result: None					
Field PO4 Result: None									
Results were produced by the Minnesota Department of Health, except where noted.									
PFAS in Water 533									
Analyte	Result	Reporting Limit	Units	Batch	Prepared	Analyzed	Init.	Method	Qualifiers
11-Chloroicosafuoro-3-oxaundecane (11Cl-PF3OUdS)	<	5.1	ng/L	B2D0878	04/25/22 09:32	04/26/22 01:17	APM	EPA 533	

This is the header of our standard lab reports from the Public Health Laboratory. Highlighted in the red boxes are the most relevant and useful information for understanding your testing results.

Frequently asked questions

My report is very long—which pages contain my results?

In most cases, the results you should pay attention to are on the first few pages of the lab report. For example, results with the header describing which chemicals were tested for, such as “PFAS in Water 533” are the ones you should focus on.

You can disregard results titled “Batch #,” “Blank,” “LCS,” or “Matrix Spike.”

What is a “Matrix Spike” and what does it mean for my results?

This is a quality control measure. A matrix spike is used to determine if the sample itself (water, sediment, or soil), is directly interfering with the test. The results listed in the matrix spike section are not indicative of the results in your water sample.

Additional resources

For more information on the different methods used to test for contaminants in drinking water, you can visit the Environmental Protection Agency’s website, [Methods Approved to Analyze Drinking Water Samples to Ensure Compliance with Regulations](https://www.epa.gov/dwanalyticalmethods) (<https://www.epa.gov/dwanalyticalmethods>).

Drinking water testing for the Minnesota Department of Health (MDH) is often completed through the MDH Public Health Laboratory (PHL). For questions related to general laboratory testing, please visit [The Public Health Laboratory](https://www.health.state.mn.us/about/org/phl/topics/index.html) (<https://www.health.state.mn.us/about/org/phl/topics/index.html>) website.

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Drinking Water Protection Section
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www.health.state.mn.us

Minnesota Department of Health
Water Policy Center
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