



Interpreting PFAS Laboratory Reports

Contaminated Sites Program

Reading lab data reports can be confusing. This fact sheet is designed to help you better understand per- and poly-fluoroalkyl substances (PFAS) lab results and how they compare to regulatory standards. Terminology may vary between laboratories.

Reading the Results of Your Lab Report

Lab reports typically have several sections, including: 1) the cover page, 2) definitions/glossary, 3) the case narrative, 4) the client sample results, and 5) laboratory quality assurance/quality control (QA/QC) practices.

In the client sample results section, you will find the test performed by the lab, the results, and notes on any problems. These notes are called “qualifiers.” Most labs use a standard set of qualifiers, which are defined and discussed on page 2 of this fact sheet. The example below shows the result for two PFAS as reported in the “Client Sample Results” section of the lab report.

Example table showing test results and what the notation means

Analyte	Result	Qualifier	RL	MDL	Units
Perfluorooctanoic Acid (PFOA)	7.5		1.7	0.21	ng/L
Perfluorooctanesulfonic Acid (PFOS)	ND <1.7		1.7	0.14	ng/L
Notes: RL = reporting limit MDL = method detection limit ng/L = nanograms per liter					

ND = the contaminant was not detected

If a contaminant is not found in a sample, the “result” column in the laboratory report will show “ND” - and results are generally shown as less than the reporting limit (RL).

ND means the chemical is not present in the sample at a high enough level for the laboratory equipment to detect.

RL = Reporting Limit

The reporting limit is the lowest concentration of the substance tested that can be reported reliably under normal laboratory conditions. This is sometimes also referred to as the limit of quantitation or “LOQ.”

MDL = Method Detection Limit

Each laboratory method has the ability to detect chemicals down to a certain amount, known as the MDL or “method detection limit.” Anything below the MDL can’t be detected by the lab’s test equipment.

In the example above, PFOA was detected at 7.5 parts per trillion or nanograms per liter (ng/L) and PFOS was not detected (ND), meaning PFOS was not present in the sample above the MDL. **It may be that PFOS was not present at all in the sample, or it could have been present but at a very low amount, less than 0.14 ng/L.**



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Data Qualifiers - “J” or “B” next to the result

All lab information is reviewed by a chemist to ensure it meets specific quality standards. Sometimes “qualifiers” are applied to a sample result to note problems or irregularities that may have occurred during testing. Most labs use a standard set of these codes. The most common qualifiers found in PFAS lab reports are “B” and “J” qualifiers.

Example table with data qualifier

Analyte	Result	Qualifier	RL	MDL	Units
Perfluorooctanoic Acid (PFOA)	2.1	B	1.7	0.21	ng/L
Perfluorooctanesulfonic Acid (PFOS)	0.5	J	1.7	0.22	ng/L

Notes:
RL = reporting limit
MDL = method detection limit
ng/L = nanograms per liter (equal to parts per trillion)

“J” qualifier - used to note the reported amount is considered estimated
The “J” qualifier is used whenever the measured amount is lower than the reporting limit (RL) but above the method detection limit (MDL).

“B” qualifier - means the chemical was found in both the sample and a “blank.”
When chemicals are found in both the blank and the test sample, the reported value is qualified with a “B” to show the uncertainty in the source of the contamination. In the example above, PFOA was detected in the sample at a concentration of 2.1 ng/L but it was also detected in the blank, so it is uncertain whether the contamination was present in the water from the test area or whether it was introduced by the laboratory or elsewhere.

What’s a blank?

A blank is a sample container filled with distilled water from outside the test area. A blank should be non-detect for all chemicals, but because PFAS are commonly found in the environment, low-level detections of PFAS can occur in a blank. **If a chemical is detected in both the sample and the blank, it is unclear if the amount reported is from the test area or another source.**

How to calculate the sum of PFAS

In April 2019, DEC set protective levels (“action levels”) for two PFAS. DEC uses the action levels to decide when a different water supply or water treatment is needed to protect human health. DEC’s action levels for PFAS are currently based on the sum of two PFAS (PFOS+PFOA).

The sum of the PFAS is calculated by adding the amounts of the substances together. This is a straightforward calculation when all PFAS are detected in a sample. However, if one of these substances is below the level of detection (i.e., reported as “ND”), then a value equal to twice the Method Detection Limit (MDL) is used in the place of the “ND” in the sum. Twice the MDL is a more reliable estimate of the potential maximum concentration (highest amount) in a sample reported as “ND” than the MDL. This calculation is used for safety reasons to ensure that the risk is not underestimated.



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The sum of the PFAS is noted as being a “maximum concentration” (highest amount) if any of the substances are not detected (“ND”) in the sample, because the actual amount could be any below this maximum. This can be best illustrated by example, as shown in the table below.

- In this example, the sum of the PFAS is shown as 2.9 B‡ ng/L.
- The actual amount of PFAS may be 2.9 ng/L, or it may be less than this value.
 - The amount of PFOS, which was not detected in the sample, may range anywhere from zero (not present) to the values used in the adding process.
 - The amount of PFOA, which was detected in a blank sample, may range anywhere from zero (i.e., all of the PFOA is a result of blank contamination) to the value used in the calculation.

PFAS	RL	Reported Value (ng/L)	MDL	Value Used in Summation (ng/L)
PFOA	1.7	2.1 B	0.16	2.1 (could be from test area or other contamination)
PFOS	1.7	ND <1.7	0.4	0.8 (2 x MDL)
Sum of PFAS				2.9 B‡

Notes:

‡ - Maximum concentration, the sum of the PFAS includes one or more result that is not detected greater than the MDL.

B - PFAS compound was found in the blank and sample.

For More Information

Contact the DEC Contaminated Sites Program for further assistance.

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