

Understanding Lab Results

Some questions have been received at JAC regarding how to read laboratory test results and the meaning of a “J” flag for a reported concentration. This document explains some basics of the reporting and interpretation of lab results.

Here is an example lab result for PFOA and PFOS:

Analyte	Results	RL	DL	Units	DF	Flag/Qual
Perfluorooctanoic acid (PFOA)	1.9	2.0	0.46	ng/L	1	J
Perfluorooctanesulfonic acid (PFOS)	20	2.0	0.63	ng/L	1	
TOTAL PFOS + PFOA	21.9J					

The laboratory data table headings are:

- Results: The actual detected concentration.
- RL*: The reporting limit, which is the smallest concentration (or amount) of the analyte that can be reported by the laboratory.
- DL*: The detection limit (also called the Method Detection Limit, or MDL) is the smallest concentration of an analyte that can be measured and reported with 99-percent confidence that the concentration is greater than zero.
- Units: The concentration units that the results are being reported in. In this case ng/L or parts per trillion (ppt).
- DF: The dilution factor used in the analysis (1 indicates no dilution was required to analyze the sample).
- Flag/Qual: Coded flags that indicate if QA/QC criteria are not met.
- J: This flag indicates that the analyte was estimated in the analysis because it was between the RL and DL. The laboratory in August 2023 included additional J qualifiers. J+ represents a high-biased estimated concentration and J- represents a low biased estimated concentration. It is important to recognize that J values represent a very small account of estimation and make very little difference in understanding a result. In other words, J values represent a concentration found below the current testing technology threshold of 4 parts per trillion. * Note that RL and DL are not fixed numbers, and can vary by analyte, sample, and test date.

In the example above, PFOA was detected at 1.9 ng/L but was flagged with a J. It is estimated at 1.9 because it is below the RL of 2.0 mg/L but above the 0.46 ng/L DL. PFOS was detected at 20 ng/L and is not flagged because it is above the RL of 2.0 ng/L. If the Results column has an ND reported, then that indicates the analyte was not detected (i.e., below the DL).

All values J and actual were used in the average concentrations. The statement indicated that J values less than 0.95 (which is our default detection limit used for ND samples) were not included in the concentration averages. For this particular figure, all the data was used.