

NJ DWQI Testing Subcommittee

Report on the Development of a Practical Quantitation Level (PQL) for Perfluorooctanesulfonic Acid (PFOS) in Drinking Water

Testing Subcommittee Members

Tina Fan, Ph.D., Chair

Bahman Parsa, Ph.D. Retired Chair

Sandra Krietzman

Daniel Salvito, Ph.D.

Dave Pranitis, Ph.D.

USGS NJ Water Science Center

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Technical Support

Linda Bonnette

Robert Lee Lippincott, Ph.D.

Collin D. Riker

Background

The Testing subcommittee reviewed analytical information from 19 laboratories performing PFOS analysis. In considering sources of PFOS data, the following criteria were established by the Testing Subcommittee.

1. Laboratories that analyzed water samples for PFOS for NJDEP PFAS studies (2006 and 2009) and as requested by water systems
2. Laboratories that are certified for the analysis of PFOS in drinking water by the NJDEP Office of Quality Assurance
3. National Laboratories that obtained US Environmental Protection Agency (EPA) approval to analyze six PFAS under the Unregulated Contaminant Monitoring Rule 3 (UCMR3) program, that report PFOS lower than the required UCMR3 minimum reporting level (MRL) of 40 ng/L using either method EPA 537 or proprietary method.

Bootstrap Estimate of a Confidence Interval of a Mean Generated Using the Inter-laboratory Quantifiable Levels¹

Quantifiable Levels	Lower Confidence Limit (ng/L)	Mean (ng/L)	Upper Confidence Limit (ng/L) ⁴	Confidence Level Range	Number of Randomly Selected Values
MDLs ²	0.6	0.8	1.1	95%	2000
Reporting limits ³	3.5	5.0	6.6	95%	2000
Low calibration standards	2.6	3.4	4.2	95%	2000

¹**Bootstrap Estimate of a Confidence Interval of the Mean** is an statistical technique that has been used most recently by the USEPA and is applied to generate a normal distribution and associated 95 % upper and lower confidence intervals from the skewed mean (not median) values for the inter-laboratory MDLs and RLs.

²**Method Detection Limit (MDL)** is a measurement used by a laboratory to determine specific minimum detection capabilities for a particular method.

³**Reporting Limit (RL)** is the minimum concentration by which an analyte is reliably quantitated by an individual laboratory.

⁴**The upper confidence limit** of the mean MDL x 5 = 1.1 ng/L x 5 = **5.5 ng/L**

Recommendation for PFOS Practical Quantitation Level (PQL)*

The Testing Subcommittee is recommending a PQL of **4.2 ng/L** based on the bootstrap analysis of the low calibration standards from laboratories currently performing PFOS analyses.

1. The low calibration standards rather than reporting limits are more indicative of the ability of labs to quantitate at low levels;
2. The UCL of the estimate of the mean using the bootstrap means that laboratories can meet the value 95% of the time.

***Practical Quantitation Level (PQL)** is the minimum concentration for which an analyte can be reliably quantitated within an acceptable limit of uncertainty.

Comments on PQL

From Delaware Riverkeeper Network

“We support the recommendations and findings made by Dr. Oliaei and Cambridge Environmental Consulting in this technical analysis regarding a Practical Quantitation Level (PQL) for PFOA. We support Cambridge Environmental Consulting’s concurrence with the DWQI Testing Subcommittee’s analysis that determined a PQL on the basis of multiplication of the method detection limit by a factor of 5, resulting in a PQL of 4.2 ng/L for PFOS. The PQL of 4.2 ng/L is below the MCL of 5 ng/L that Cambridge Environmental Consultants recommends as more protective.”

From :Cambridge Environmental Consulting

“We concur with the Subcommittee’s analysis that determined a PQL of 4.2 ng/L for PFOS. This PQL concentration is below the proposed MCL of 13 ng/L, and below the 5 ng/L that we assert is more protective.”

Thank you!

