



# PFAS Toxicity Assessment Review

NC Secretaries' Science Advisory Board

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*PFAS Proposed  
for Standards  
Development*

1. Perfluorooctane sulfonic acid (**PFOS**)
2. Perfluorooctanoic acid (**PFOA**)
3. Hexafluoropropylene Oxide Dimer Acid (HFPO-DA; **GenX**)
4. Perfluorobutane Sulfonic Acid (**PFBS**)
5. Perfluorobutanoic Acid (**PFBA**)
6. Perfluorohexanoic Acid (**PFHxA**)
7. Perfluorononanoic acid (**PFNA**)
8. Perfluorohexanesulfonic acid (**PFHxS**)

## *Why these PFAS Compounds?*

1. All compounds have a significant literature base so health effects can be determined.
2. Literature bases for all compounds have been evaluated by a federal agency.
3. All compounds have health effects data to support development of a reference dose or cancer slope factor.
4. All compounds have been detected in NC's environmental media.

# *Toxicological Values for Standards Calculations*

## 1. Reference Dose (RfD)

An estimate of a daily exposure to the human population that is likely to be without an appreciable risk of deleterious effects during a lifetime

## 2. Cancer Slope/Potency Factor (CSF or CPF)

The cancer risk (proportion affected) per unit of dose and can be used to compare the relative potency of different chemical substances.

## 3. Bioaccumulation Factor (BAF)

*(Surface Water Standards Only)*

The amount of a chemical taken up from water plus the contribution of chemical in the diet of the organism.

# *References Dose (RfD) Sources*

1. EPA Office of Water Toxicity Assessment PFAS compounds;  
**EPA MCLs**
  - PFOS (*CSF also*)
  - PFOA (*CSF also*)
  - GenX
  - PFBS
2. EPA Integrated Risk Information System (IRIS) Assessments
  - PFBA
  - PFHxA
3. Agency for Toxic Substance and Disease Registry (ATSDR);  
**EPA MCLs**
  - PFNA
  - PFHxS

# Water Quality Standards Requirements

## Surface Water

*Pursuant to 15A NCAC 02B .0208 (a)(2)(A) and (B):*

### **RfD**

1. As published by the EPA pursuant to Section 304(a) of the Federal Water Pollution Act as amended,
2. As issued by the EPA as listed in the Integrated Risk Information System (IRIS) file, or
3. As approved by the Director after consultation with the State Health Director.

### **CPF/CSF**

1. Unacceptable health risk for cancer to be more than one case of cancer per one million people exposed ( $10^{-6}$  risk level).

## Groundwater

*The following references are used, in order of preference 15A NCAC 02L .0202 (e):*

1. EPA Integrated Risk Information System (IRIS)
2. EPA Drinking Water Health Advisories
3. Other EPA health risk assessment data
4. Other relevant, published health risk assessment data and scientifically valid peer-reviewed published toxicological data.



# *Toxicity Assessment Information*

- The toxicity assessments from EPA and CDC programs are the foundation for the National Primary Drinking Water regulation proposed by EPA.
  - Assessments are high quality scientific reports suitable for rulemaking
- The EPA has produced an IRIS Assessment Handbook for EPA staff with detailed methods for conducting assessments done by the IRIS program.
  - The IRIS Handbook was developed for use by the IRIS program and provides operating procedures for developing assessments including incorporation of systematic review, hazard identification, and dose-response methods to ensure consistency throughout the IRIS Program, which spans multiple organizational divisions and geographic locations.
  - The IRIS Assessment Handbook contains detailed methods for conducting assessments of this same rigor and scientific support as the assessments done by the IRIS program.



# *Request for SAB's Assistance*

DEQ is asking the NC SSAB to review the tables provided and determine if the toxicity assessments that have come from programs other than the IRIS program are consistent with the IRIS Handbook guidelines.

## **Charge Question:**

Are the EPA and CDC assessments adequate and of comparable quality to the EPA's IRIS assessments?

- If no, what aspect of the assessment is not of comparable quality?

## **Charge Response (draft):**

*The NC SSAB finds, regarding the eight PFAS that DEQ is proposing for water quality standards development, that the non-IRIS EPA assessments and the EPA's RfDs based on the CDC ATSDR assessments are adequate and of comparable fit-for-purpose to the EPA's IRIS assessments.*

**Motion to accept Charge Response as drafted during the meeting:** all in favor.

