Oregon Department of Environmental Quality
Toxic Air Contaminant Review and Update Rulemaking

Perfluorodecanoic acid (PFDA) ATSAC Feedback Organizer

Background

In June 2025, DEQ and OHA requested written responses from members of the Air Toxics Science Advisory Committee (ATSAC) in response to a question regarding the proposed TRV for perfluorodecanoic acid (PFDA). The purpose of this document is to compile ATSAC member feedback during DEQ's TAC Review and Update Rulemaking.

DEQ and OHA Email to ATSAC

"We did run across one more question about one of our proposed TRVs where "DEQ in consultation with ATSAC" is the authoritative source. The currently proposed chronic noncancer TRV for perfluorodecanoic acid (PFDA) (CASRN 335-76-2) comes from the Texas Commission on Environmental Quality (TCEQ) unmodified and is 0.053 µg/m3 (see last table of "Document 4: TRVs Where DEQ is the Authoritative Source" page 32. TCEQ derived this value by a simple route to route extrapolation from their own 2023 oral reference dose for the same compound. They employed the simple route to route formula:

$$Oral\ RfD\ in \frac{mg}{kg \cdot day} \times \frac{70\ kg\ body\ weight}{20 m^3/day} = RfC\ in\ mg/m^3$$

DEQ and OHA would like to apply the same route to route extrapolation equation to the more recent, 2024 IRIS oral RfD for PFDA instead of the TCEQ oral RfD that the agencies proposed to you in previous meetings. This change would bring our TRV closer to our Authoritative Sources listed in rule. The final value would be:

$$2 \times 10^{-9} \frac{mg}{kg \cdot day} \times \frac{70\ kg\ body\ weight}{20 m^3/day} = 7 \times 10^{-9} \frac{mg}{m^3} = \mathbf{7 \times 10^{-6}\ \frac{\mu g}{m^3}}$$

Do you agree with or have concerns about this proposed update?"

ATSAC members' written responses were submitted to OHA in June 2025 and compiled into this document.

ATSAC Member Written Responses

John Budroe, PhD

A tabular summary of the information used by US EPA IRIS (2024) and TCEQ (2023) to develop RfDs for perfluorodecanoic acid (PFDA) is listed below:

Agency	TCEQ	US EPA IRIS
Critical studies	Kawashima et al. (1995)	Grandjean et al. (2012), Budtz-Jørgensen and Grandjean (2018), Wikström et al. (2020)
Sex, species	male rats	male, female human children
Exposure duration	subacute	chronic
Endpoint	increased liver weight	decreased immune system response, decreased body weight
Cumulative uncertainty factor	81000	30
RfD	1.5×10^{-5} mg/kg-day	2×10^{-9} mg/kg-day

The information above indicates:

1) *IRIS used newer studies than TCEQ to develop a PFDA RfD. Although these studies were available to TCEQ, they were not discussed in the 2023 document.*
2) *IRIS used human data to develop a PFDA RfD; TCEQ used animal data for the same purpose. The use of human data instead of animal data for chemical risk assessment where possible is generally preferred.*
3) *The exposure duration of the critical studies used to develop the IRIS RfD (chronic) were more appropriate compared to the exposure duration of the study used to develop the TCEQ PFDA RfD (subacute).*
4) *The IRIS PFDA RfD was developed using an endpoint (decreased immune system response) observed in a sensitive subpopulation (children).*
5) *The TCEQ PFDA RfD cumulative uncertainty factor is far greater than 3000 (the maximum used by OEHHA and IRIS), and is over three orders of magnitude greater than the IRIS PFDA RfD cumulative uncertainty factor.*
6) *The IRIS PFDA RfD is substantially more health protective than the TCEQ PFDA RfD.*

On the basis of this information, I agree with the proposal by OHA and DEQ to change from using the TCEQ PFDA RfD to the IRIS PFDA RfD as the basis for developing a PFDA TRV via route-to-route extrapolation.

Daisy Dong, PhD

I agree with the use of 2024 IRIS oral RfD to do route-to-route extrapolation for PFDA TRV.

John Stanek, PhD

I agree with the use of the updated IRIS value for calculating a TRV for PFDA.

Susan Tilton, PhD

I don't have any concerns with the use of the IRIS PFDA RfD for route-to-route extrapolation.

John Vandenberg, PhD

I reviewed the IRIS (2024) and TCEQ (2023) documents on PFDA and summaries of critical studies.

From my review I see that although the TCEQ document is dated 2023 it does not appear that several critical studies cited by IRIS (2024) were considered.

The newer studies include recent results in ~1500 infants (Wikstrom et al, 2020 - abstract attached below) plus studies showing effects in children (Grandjean et al. (2012); BudtzJørgensen and Grandjean, 2018) and the resulting RfD based on effects in infants and children is much lower than that derived by TCEQ.

Based on the consideration of more recently published studies I conclude that the IRIS (2024) document should be used as the authoritative source for TRV derivation.

Please note that the Wikstrom et al study included similar results for several PFAS that may affect other TRVs.

I agree with the proposal by OHA and DEQ to use route-to-route extrapolation to derive an RfC from the IRIS (2024) RfD for PFDA.

Title
Maternal serum levels of perfluoroalkyl substances in early pregnancy and offspring birth weight
Author(s)
Wikström, S; Lin, PI; Lindh, CH; Shu, H; Bornehag, CG
Year
2020
DOI
10.1038/s41390-019-0720-1
Abstract
BACKGROUND: Perfluoroalkyl substances (PFASs) are widespread, bioaccumulating, and persistent and show placental transfer. Emerging research indicates associations between prenatal exposure and low birth weight. The aim of this study was to assess the associations between first trimester exposure to PFASs and birth weight (BW) in the Swedish Environmental, Longitudinal, Mother and child, Asthma and allergy (SELMA) study and examine whether associations differ between girls and boys.
METHODS: Eight PFASs were analyzed in maternal serum (median: 10 weeks of pregnancy). Associations between prenatal PFAS exposure and birth outcomes with BW, BW for gestational age, and birth small for gestational age (SGA) were assessed in 1533 infants, adjusted for potential confounders and stratified by sex.
RESULTS: Increased maternal perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), perfluorononanoic acid (PFNA), perfluorodecanoic acid (PFDA), and perfluoroundecanoic acid (PFUnDA) were associated with lower BW, lower BW for gestational age, and SGA birth. Associations were significant only in girls, where prenatal exposure in the upper quartile was associated with a 93-142-g lower BW when compared with that of the lowest quartile exposure. The associations were not mediated by effects on gestational age.
CONCLUSIONS: We found associations between prenatal exposure for five different PFASs and birth weight, with more pronounced associations in girls than in boys.

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