LESSON LEARNED: Protecting Environmental Health by Regulating PFAS as a Class/Classes

Photographs for Testimony by Laura Olah, Executive Director
Citizens for Safe Water Around Badger (CSWAB)

Stakeholder Meeting – Drinking Water PFAS MCLs
10:00 am – 1:00 pm September 23, 2020
Hosted by Wisconsin DNR

EPA
United States
Environmental Protection
Agency

Technical Fact Sheet – Dinitrotoluene (DNT)

November 2017

TECHNICAL FACT SHEET – DNT

At a Glance

- Nitroaromatic explosive that exists as six isomers: 2,4- and 2,6-DNT are the most common forms.
- Not naturally found in the environment.
- Used as an intermediate in the production of ammunition, polyurethane polymers, dyes, plasticizers and automobile

Introduction

This fact sheet, developed by the U.S. Environmental Protection Agency (EPA) Federal Facilities Restoration and Reuse Office (FFRRO), provides a summary of dinitrotoluene (DNT), including physical and chemical properties; environmental and health impacts; existing federal and state guidelines; detection and treatment methods; and additional sources of information. This fact sheet is intended for use by site managers and field personnel who may address DNT contamination at cleanup sites or in drinking water supplies.

The widespread use of DNT in manufacturing munitions, polyurethane foams, and other chemical products has contributed to extensive soil and groundwater contamination. DNT can be transported in surface water or groundwater because of its moderate solubility and relatively low volatility,

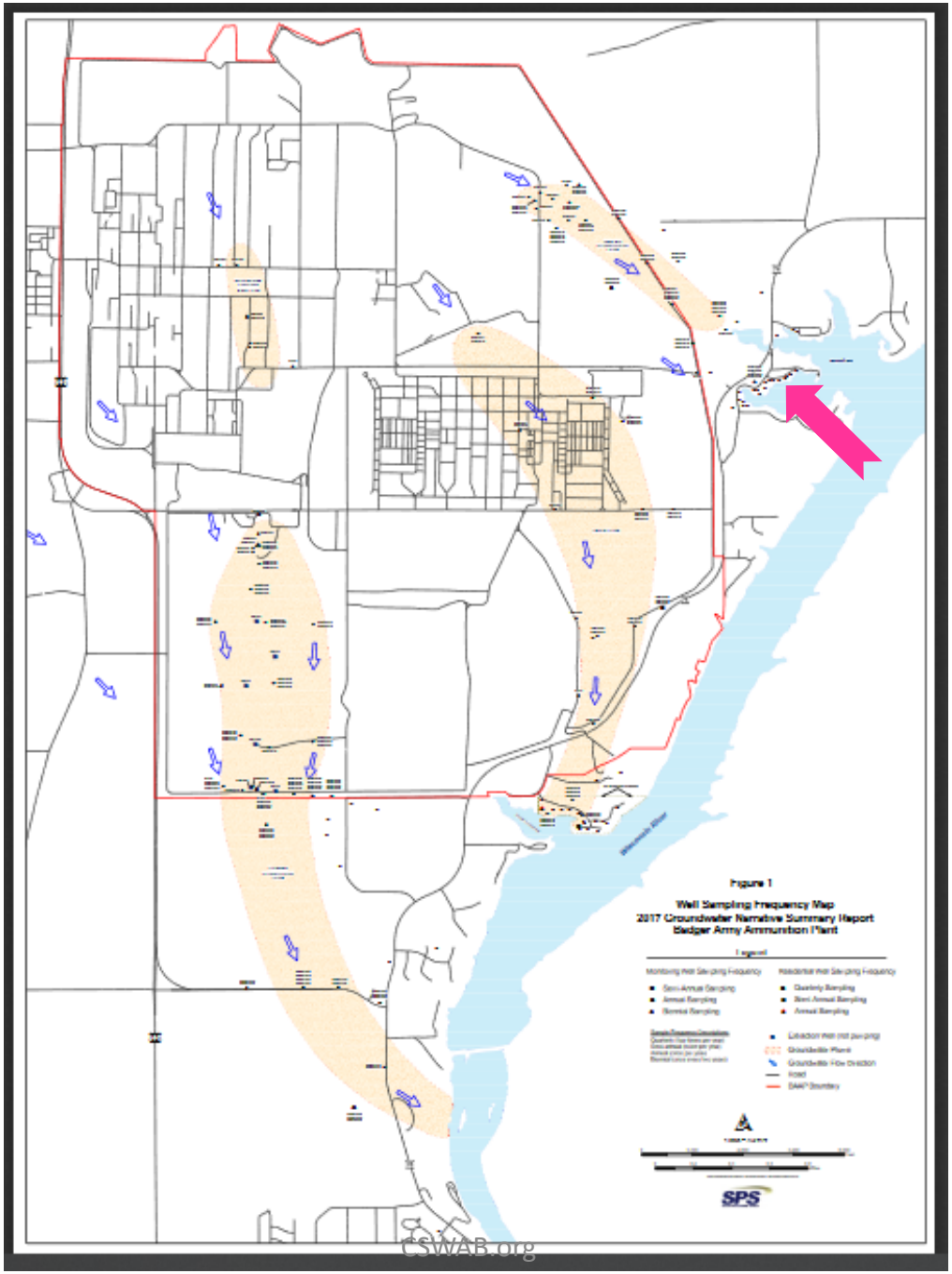
Figure 1
Well Sampling Frequency Map
2017 Groundwater Narrative Summary Report
Badger Army Ammunition Plant
Legend
SPS

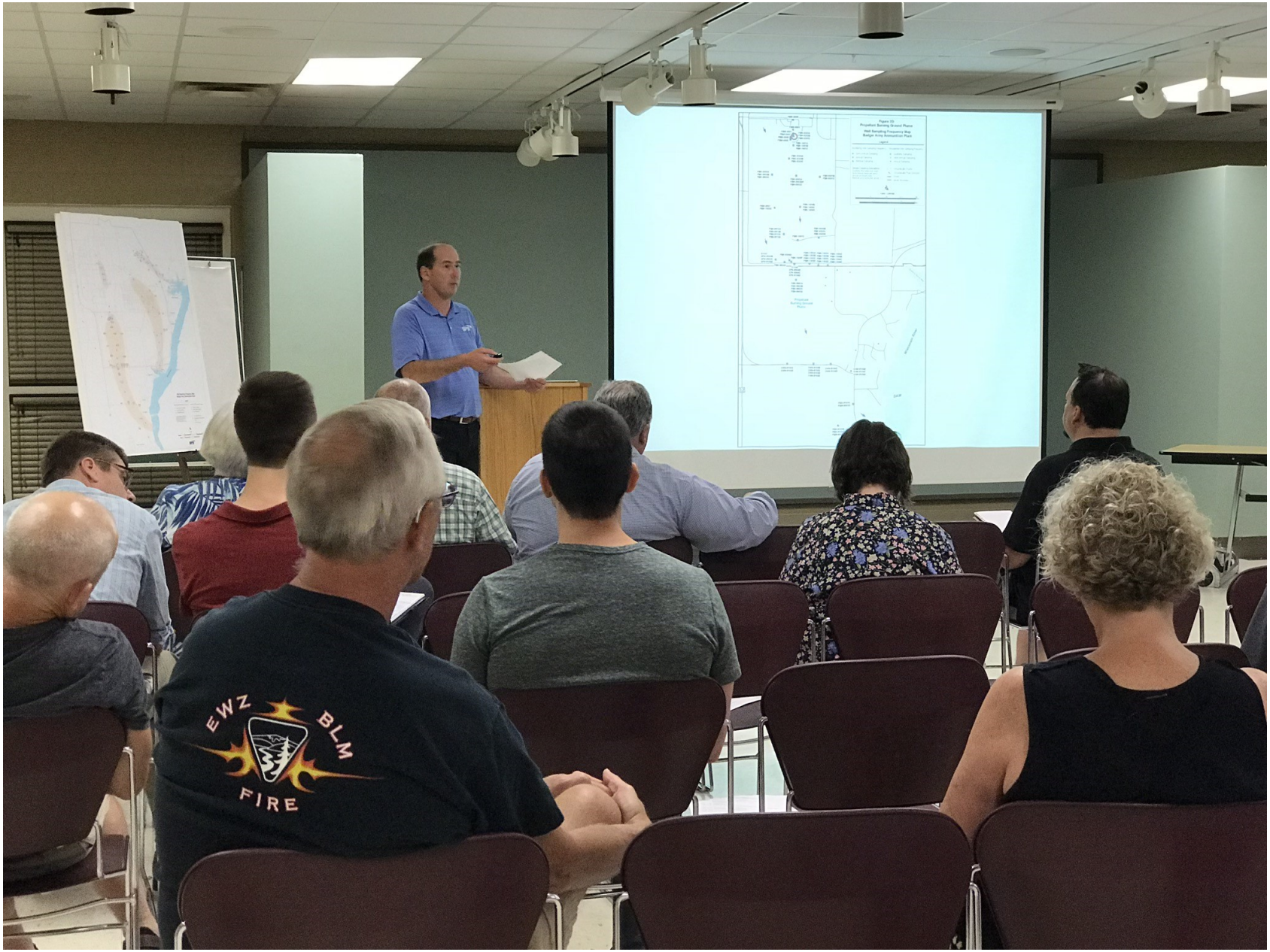
EWZ
BLM
FIRE


Photo by Eagle-Herald

LAND-APPLIED BIOSOLIDS - PRIVATE DRINKING WATER WELL SAMPLING RESULTS - MARINETTE AND OCONTO COUNTIES, WISCONSIN - APRIL 20, 2020

NOTE: PRELIMINARY DATA IS PRESENTED BELOW. DATA VALIDATION ON RESULTS IS PENDING.

Location	Sample Date	PFOA	PFOS	PFBS	PFHpA	PFHxS	PFNA	PFDA	PFDoA	PFHxA	PFTeA	PFTrIA	PFUnA	NEtFOSAA	NMeFOSAA	PFBA	PFPeA	PFHxDA	PFODA	PFPeS	PFHpS	PFNS	PFDS	PFDoS	FOSA	NEtFOSA	NMeFOSA	NMeFOSE	NEtFOSE	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	DONA	GenX	F-53B Major	F-53B Minor
BWS-001	3/2/2020	< 1.7	< 1.7	< 1.7	**0.53 J**	< 1.7 UB	< 1.7	< 1.7	< 1.7	**1.1 J**	< 1.7	< 1.7	< 1.7	< 17	< 17	**0.66 J**	**1.5 J**	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7 UB	< 1.7	< 1.7	< 3.3	< 1.7	< 17	< 17	< 17	**0.20 J**	< 1.7	< 3.3	< 1.7	< 1.7
BWS-002	3/2/2020	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 17	< 17	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 2.3 UB	< 1.7	< 1.7	< 3.4	< 1.7	< 17	< 17	< 17	< 1.7	< 1.7	< 3.4	< 1.7	< 1.7
BWS-003	3/2/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 18	< 18	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	**7.0**	< 1.8	< 1.8	< 3.6	< 1.8	< 18	< 18	< 18	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8
BWS-003 DUP	3/2/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 18	< 18	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	**9.9**	< 1.8	< 1.8	< 3.6	< 1.8	< 18	< 18	< 18	**0.17 J**	< 1.8	< 3.6	< 1.8	< 1.8
BWS-004	3/2/2020	**3.4**	**3.9**	< 1.8	**1.0 J**	< 1.8 UB	< 1.8	< 1.8	< 1.8	**0.63 J**	< 1.8	< 1.8	< 1.8	< 18	< 18	**0.46 J**	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	**4.5**	< 1.8	< 1.8	**1.2 J**	< 1.8	< 18	< 18	< 18	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8
BWS-005	3/2/2020	**1.3 J**	< 1.7	**2.7**	**1.6 J**	< 1.7 UB	< 1.7	< 1.7	< 1.7	**57**	< 1.7 UJ	< 1.7	< 1.7	< 17	< 17	**21**	**110**	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	**3.0**	< 1.7	< 1.7	< 3.4	< 1.7	< 17	< 17	< 17	< 1.7	< 1.7	< 3.4	< 1.7	< 1.7
BWS-006	3/2/2020	**1.1 J**	**2.3 JN**	**0.80 J**	**0.34 J**	< 1.7 UB	< 1.7	< 1.7	< 1.7	**0.59 J**	< 1.7	< 1.7	< 1.7	< 17	< 17	**1.3 J**	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	**5.8**	< 1.7	< 1.7	< 3.4	< 1.7	< 17	< 17	< 17	< 1.7	< 1.7	< 3.4	< 1.7	< 1.7
BWS-007	3/2/2020	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6 UB	< 1.6	< 1.6	< 1.6	< 1.6	**0.29 J**	< 1.6	< 1.6	< 16	< 16	**0.85 J**	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	**6.3**	< 1.6	< 1.6	< 3.2	< 1.6	< 16	< 16	< 16	**0.16 J**	< 1.6	< 3.2	< 1.6	< 1.6
BWS-008	3/2/2020	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9 UB	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 19	< 19	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	**7.9**	< 1.9	< 1.9	< 3.8	< 1.9	< 19	< 19	< 19	**0.18 J**	< 1.9	< 3.8	< 1.9	< 1.9
BWS-009	3/2/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 18	< 18	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 3.5	< 1.8	< 18	< 18	< 18	< 1.8	< 1.8	< 3.5	< 1.8	< 1.8
BWS-010	3/3/2020	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 17	< 17	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	**4.1**	< 1.7	< 1.7	< 3.4	< 1.7	< 17	< 17	< 17	< 1.7	< 1.7	< 3.4	< 1.7	< 1.7
BWS-010 DUP	3/3/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 18	< 18	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	**6.1**	< 1.8	< 1.8	< 3.6	< 1.8	< 18	< 18	< 18	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8
BWS-011	3/3/2020	**0.82 J**	< 1.9 UB	< 1.9	< 1.9	< 1.9 UB	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 19	< 19	< 1.9 UB	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	**8.5**	< 1.9	< 1.9	< 3.7	< 1.9	< 19	< 19	< 19	< 1.9	< 1.9	< 3.7	**1.2 J**	< 1.9
BWS-012	3/3/2020	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 17	< 17	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	**6.6**	< 1.7	< 1.7	< 3.4	< 1.7	< 17	< 17	< 17	< 1.7	< 1.7	< 3.4	< 1.7	< 1.7
BWS-013	3/3/2020	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 17	< 17	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	**7.6**	< 1.7	< 1.7	< 3.4	< 1.7	< 17	< 17	< 17	< 1.7	< 1.7	< 3.4	< 1.7	< 1.7
BWS-014	3/3/2020	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 17	< 17	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	**4.1**	< 1.7	< 1.7	< 3.5	< 1.7	< 17	< 17	< 17	< 1.7	< 1.7	< 3.5	< 1.7	< 1.7
BWS-015	3/3/2020	< 1.8	< 1.8	< 1.8	**0.42 J**	< 1.8 UB	< 1.8	< 1.8	< 1.8	**0.59 J**	< 1.8	< 1.8	< 1.8	< 18	< 18	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	**3.5**	< 1.8	< 1.8	< 3.7	< 1.8	< 18	< 18	< 18	< 1.8	< 1.8	< 3.7	< 1.8	< 1.8
BWS-015A	3/3/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 18	< 18	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	**4.9**	< 1.8	< 1.8	< 3.6	< 1.8	< 18	< 18	< 18	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8
BWS-015B	3/3/2020	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 17	< 17	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	**6.1**	< 1.7	< 1.7	< 3.4	< 1.7	< 17	< 17	< 17	< 1.7	< 1.7	< 3.4	< 1.7	< 1.7
BWS-017	3/3/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 18	< 18	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	**2.6**	< 1.8	< 1.8	< 3.6	< 1.8	< 18	< 18	< 18	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8
BWS-018	3/3/2020	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6 UB	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 16	< 16	< 1.6 UB	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	**3.2**	< 1.6	< 1.6	< 3.3	< 1.6	< 16	< 16	< 16	< 1.6	< 1.6	< 3.3	< 1.6	< 1.6
BWS-019	3/3/2020	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 17	< 17	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	**3.5**	< 1.7	< 1.7	< 3.4	< 1.7	< 17	< 17	< 17	< 1.7	< 1.7	< 3.4	< 1.7	< 1.7
BWS-020	3/3/2020	< 1.6	< 1.6 UB	**0.41 J**	**0.21 J**	< 1.6 UB	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 16	< 16	< 1.6 UB	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	**3.1**	< 1.6	< 1.6	< 3.3	< 1.6	< 16	< 16	< 16	< 1.6	< 1.6	< 3.3	< 1.6	< 1.6
BWS-021	3/3/2020	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 17	< 17	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	**2.4**	< 1.7	< 1.7	< 3.3	< 1.7	< 17	< 17	< 17	< 1.7	< 1.7	< 3.3	< 1.7	< 1.7
BWS-022	3/3/2020	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6 UB	< 1.6	< 1.6	< 1.6	**0.49 J**	< 1.6	< 1.6	< 1.6	< 16	< 16	< 1.6 UB	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.9 UB	< 1.6	< 1.6	< 3.3	< 1.6	< 16	< 16	< 16	< 1.6	< 1.6	< 3.3	< 1.6	< 1.6
BWS-023	3/3/2020	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 17	< 17	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	**2.6**	< 1.7	< 1.7	< 3.3	< 1.7	< 17	< 17	< 17	< 1.7	< 1.7	< 3.3	< 1.7	< 1.7
BWS-024	3/3/2020	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 17	< 17	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	**3.2**	< 1.7	< 1.7	< 3.4	< 1.7	< 17	< 17	< 17	< 1.7	< 1.7	< 3.4	< 1.7	< 1.7
BWS-025	3/3/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 18	< 18	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 3.5	< 1.8	< 18	< 18	< 18	< 1.8	< 1.8	< 3.5	< 1.8	< 1.8
BWS-026	3/3/2020	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 17	< 17	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	**3.2**	< 1.7	< 1.7	< 3.4	< 1.7	< 17	< 17	< 17	< 1.7	< 1.7	< 3.4	< 1.7	< 1.7
BWS-027	3/4/2020	< 1.8	< 1.8	**1.2 J**	**3.7**	< 1.8	< 1.8	< 1.8	< 1.8	**59**	< 1.8	< 1.8	< 1.8	< 18	< 18	**21**	**110**	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.6	< 1.8	< 18	< 18	< 18	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8
BWS-028	3/4/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 18	< 18	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.5	< 1.8	< 18	< 18	< 18	< 1.8	< 1.8	< 3.5	< 1.8	< 1.8
BWS-029	3/4/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 18	< 18	**0.51 J**	**0.80 J**	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.6	< 1.8	< 18	< 18	< 18	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8
BWS-029 DUP	3/4/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 18	< 18	**0.47 J**	**0.75 J**	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.7	< 1.8	< 18	< 18	< 18	< 1.8	< 1.8	< 3.7	< 1.8	< 1.8
BWS-030	3/4/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	**0.58 J**	< 1.8	< 1.8	< 1.8	< 18	< 18	**1.6 J**	**2.1**	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	**0.64 J**	< 1.8	< 1.8	< 3.5	< 1.8	< 18	< 18	< 18	< 1.8	< 1.8	< 3.5	< 1.8	< 1.8
BWS-031	3/4/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 18	< 18	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.6	< 1.8	< 18	< 18	< 18	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8
BWS-032	3/4/2020	**3.5**	**22**	**1.4 J**	**0.87 J**	**3.9**	< 1.8	< 1.8	< 1.8	**1.0 J**	< 1.8	< 1.8	< 1.8	< 18	< 18	**2.3**	**0.87 J**	< 1.8	< 1.8	**0.51 J**	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.6	< 1.8	< 18	< 18	< 18	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8
BWS-033	3/4/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 18	< 18	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.6	< 1.8	< 18	< 18	< 18	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8
BWS-034	3/4/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 18	< 18	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	**0.72 J**	< 1.8	< 1.8	< 3.5	< 1.8	< 18	< 18	< 18	< 1.8	< 1.8	< 3.5	< 1.8	< 1.8
BWS-035	3/5/2020	< 1.8	< 1.8	**1.1 J**	**2.5**	< 1.8 UB	< 1.8	< 1.8	< 1.8	**12**	< 1.8	< 1.8	< 1.8	< 18	< 18	**4.9**	**21**	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	**2.6**	< 1.8	< 1.8	< 3.7	< 1.8	< 18	< 18	< 18	< 1.8	< 1.8	< 3.7	< 1.8	< 1.8
BWS-036	3/5/2020	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 17	< 17	< 1.7	< 1.7	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	**9.1**	< 1.7	< 1.7	< 3.4	< 1.7	< 17	< 17	< 17	< 1.7	< 1.7	< 3.4	< 1.7	< 1.7
BWS-037	3/5/2020	**1100**	**56 JN**	**18**	**510**	**45**	**2.4**	< 1.7	< 1.7	**1100**	< 1.7	< 1.7	< 1.7	< 17	< 17	**280**	**1300**	< 1.7 UB	< 1.7	**3.7**	**6.2**	< 1.7	< 1.7	< 1.7	**9.0**	< 1.7	< 1.7	< 3.5	< 1.7	< 17	**1.8 J**	< 17	< 1.7	< 1.7	< 3.5	< 1.7	< 1.7
BWS-038	3/5/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	**0.34 J**	< 1.8	< 1.8	< 18	< 18	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 2.2 UB	< 1.8	< 1.8	< 3.6	< 1.8	< 18	< 18	< 18	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8
BWS-039	3/5/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 18	< 18	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 20	< 20	< 20	< 40	< 20	< 18	< 18	< 18	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8
BWS-040A	3/5/2020	< 1.7	< 1.7	< 1.7	**1.5 J**	< 1.7 UB	< 1.7	< 1.7	< 1.7	**7.7**	< 1.7	< 1.7	< 1.7	< 17	< 17	**1.3 J**	**9.7**	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7 UB	< 1.7	< 1.7	< 3.5	< 1.7	< 17	**21**	< 17	< 1.7	< 1.7	< 3.5	< 1.7	< 1.7
BWS-040B	3/5/2020	**0.77 J**	< 1.7	< 1.7	**3.5**	< 1.7 UB	< 1.7	< 1.7	< 1.7	**27**	< 1.7	< 1.7	< 1.7	< 17	< 17	**9.0**	**44**	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	**8.9**	< 1.7	< 1.7	< 3.5	< 1.7	< 17	**13 J**	< 17	< 1.7	< 1.7	< 3.5	< 1.7	< 1.7
BWS-041	3/5/2020	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 17	< 17	< 1.7	< 1.7	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7 UB	< 1.7	< 1.7	< 3.4	< 1.7	< 17	< 17	< 17	< 1.7	< 1.7	< 3.4	< 1.7	< 1.7
BWS-042	3/5/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	**0.62 J**	< 1.8	**0.64 J**	< 1.8	< 1.8	< 18	< 18	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	**3.1**	< 1.8	< 1.8	< 3.7	< 1.8	< 18	< 18	< 18	**0.20 J**	< 1.8	< 3.7	< 1.8	< 1.8
BWS-042 DUP	3/5/2020	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 17	< 17	< 1.7	< 1.7	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	**5.0**	< 1.7	< 1.7	< 3.4	< 1.7	< 17	< 17	< 17	< 1.7	< 1.7	< 3.4	< 1.7	< 1.7
BWS-043	3/6/2020	< 1.7	< 1.7 UB	< 1.7	< 1.7	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 17	< 17	< 1.7	< 1.7	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7 UB	< 1.7	< 1.7	< 3.5	< 1.7	< 17	< 17	< 17	< 1.7	< 1.7	< 3.5	< 1.7	< 1.7
BWS-044	3/6/2020	**0.83 J**	< 1.7	**0.66 J**	< 1.7	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 17	< 17	**3.0**	**0.72 J**	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	**3.5**	< 1.7	< 1.7	< 3.4	< 1.7	< 17	< 17	< 17	< 1.7	< 1.7	< 3.4	< 1.7	< 1.7
BWS-045	3/6/2020	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9 UB	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 19	< 19	< 1.9	< 1.9	< 1.9 UB	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	**4.2**	< 1.9	< 1.9	< 3.8	< 1.9	< 19	< 19	< 19	< 1.9	< 1.9	< 3.8	< 1.9	< 1.9
BWS-046	3/6/2020	< 1.8	< 1.8	**0.23 J**	**0.47 J**	< 1.8 UB	< 1.8	< 1.8	< 1.8	**7.6**	**0.40 J**	< 1.8	< 1.8	< 18	< 18	**3.3**	**15**	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 3.6	< 1.8	< 18	< 18	< 18	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8
BWS-047	3/9/2020	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9 UB	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 19	< 19	< 1.9	< 1.9	< 1.9 UB	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9 UB	< 1.9	< 1.9	< 3.7	< 1.9	< 19	< 19	< 19	< 1.9	< 1.9	< 3.7	< 1.9	< 1.9
BWS-048	3/9/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 18	< 18	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 3.6	< 1.8	< 18	< 18	< 18	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8


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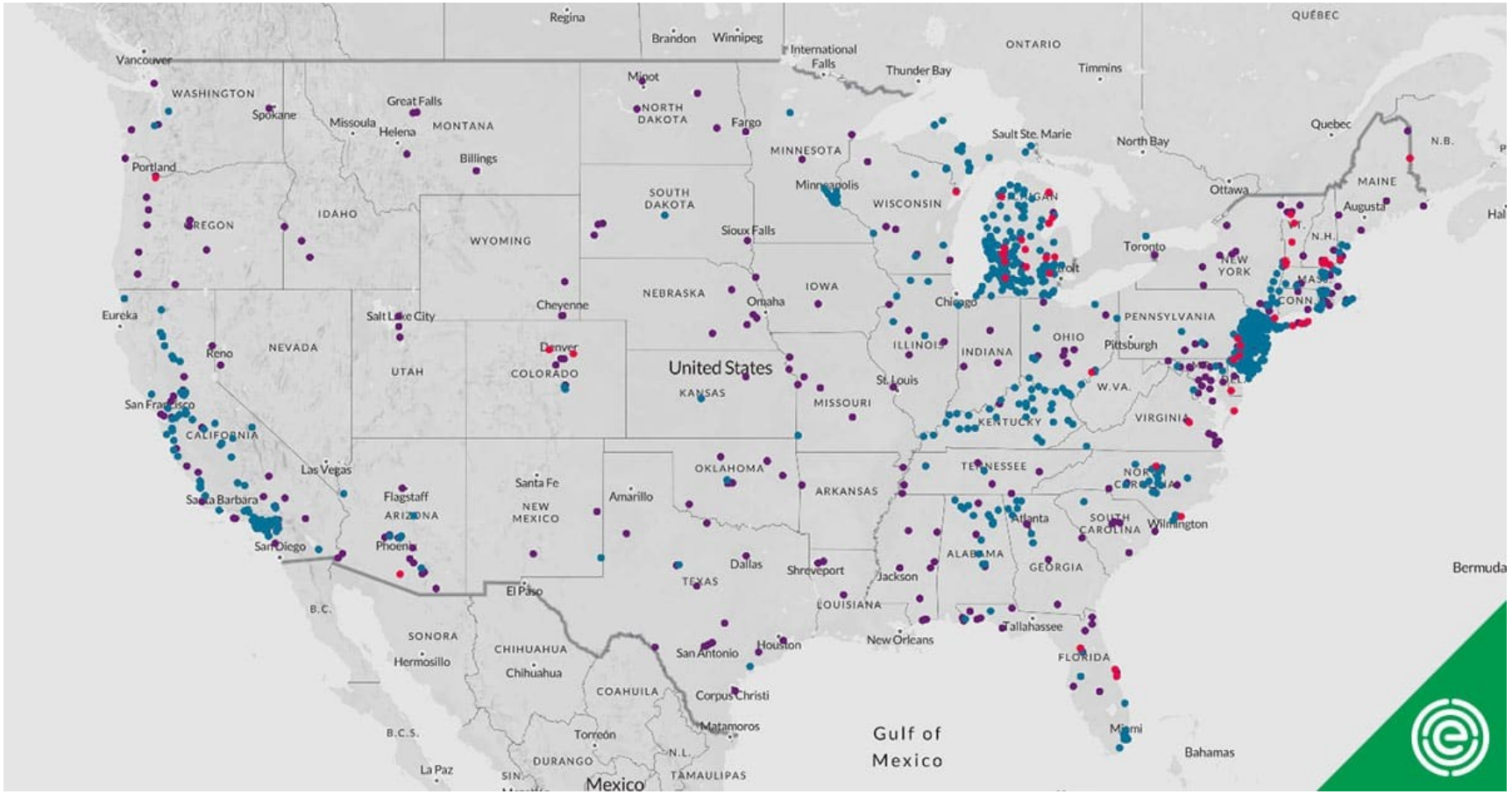
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Global Perspective

Scientific Basis for Managing PFAS as a Chemical Class

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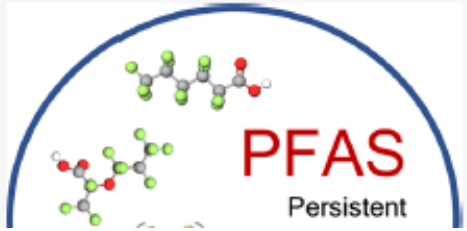
ABSTRACT: This commentary presents a scientific basis for managing as one chemical class the thousands of chemicals known as PFAS (per- and polyfluoroalkyl substances). The class includes perfluoroalkyl acids, perfluoroalkylether acids, and their precursors; fluoropolymers and perfluoropolyethers; and other PFAS. The basis for the class approach is presented in relation to their physicochemical, environmental, and toxicological properties. Specifically, the high persistence, accumulation potential, and/or hazards (known and



PFAS chemicals pass from mother to fetus throughout pregnancy


Angie Wheeler/Offset