



PFAS

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Important Messages

- PFAS are widely used chemicals.
- They stay in the body for a long time.
- A variety of health risks are associated with high-level exposure.
- Levels at Well 15 are considered low.
- Department of Health Services will recommend a groundwater standard this year for two PFAS.
- Well 15 is off as we wait for that recommendation.
- Follow existing fish advisories for local waterways to reduce potential exposures to PFAS.

Key Questions

- What are PFAS chemicals?
- How much water do I get from Well 15?
- How do levels at the well compare to current regulations and guidelines?
- Where are PFAS at Well 15 coming from?
- What are the next steps for Well 15 and beyond?

What are PFAS?

Per- and polyfluoroalkyl substances (PFAS)

- A group of man-made chemicals made to repel water, oil, and grease
- Commonly used for manufacturing purposes, including firefighting foam



PFAS Exposure

- Drinking water and soil from industrial areas with frequent PFAS manufacture, disposal, or use
- Indoor air or dust from consumer products treated with PFAS to resist stains
- Surface water or groundwater receiving run-off or seepage from areas where firefighting foam was often used
- Fish from contaminated bodies of water
- Grease resistant food packaging and paper products

Potential Human Health Impacts

- Scientists are still learning about the health effects that various PFAS can have on the body.
- Some, but not all, studies in humans with PFAS exposure have shown that certain PFAS may:
 - Affect growth, learning, and behavior of infants and older children
 - Lower a person's chance of getting pregnant
 - Interfere with the body's natural hormones
 - Increase cholesterol levels
 - Affect the immune system
 - Increase the risk of cancer

EPA Health Advisory Level

- Provides a margin of safety
- Focused on fetuses and breastfed infants
- Based on body weight, contribution of exposure from drinking water, drinking water intake and calculated reference dose
- 70 parts per trillion [PFOS, PFOA, or combined]
- PFOA + PFOS at Well 15 is 10-12 ppt

ATSDR Minimum Risk Levels (MRLs)

What are MRLs?

- An estimate of daily human exposure (or dose) expressed in mg/kg/day.
- MRLs are screening tools and not intended as a drinking water guidance.
- MRLs are not regulatory or action levels for the ATSDR
- Not directly comparable with US EPA Health Advisory (HA) levels

ATSDR Minimum Risk Levels (MRLs)

How can MRLs be used?

- Basic drinking water intake and body weight estimates can be used to convert to drinking water concentrations.
- MRLs and conversions available for 4 common PFAS compounds:
 - PFOS – 52 ppt (adult) and 14 ppt (children)
 - PFOA – 78 ppt (adult) and 21 ppt (children)
 - PFHxS – 517 ppt (adult) and 140 ppt (child)
 - PFNA – 78 ppt (adult) and 21 ppt (child)

ATSDR Minimum Risk Levels (MRLs)

What if my drinking water levels are higher?

- In Madison Well 15:
 - PFOA, PFOS, and PFHxS levels do not exceed ATSDR MRLs
 - PFNA is not detected
- Exposure to levels higher to an MRL does not mean health problems will occur but signals that a closer look at the site may be needed.

Drinking Water Guidance in Other States

State	Type	PFOA	PFOS	PFHxS	PFNA	Additional information
California	Drinking Water	14 ppt	13 ppt	-	-	Water quality value adopted from guidance issued by New Jersey
Colorado		70 ppt	70 ppt	-	70 ppt	70 ppt based on the sum of PFOA, PFOS, and PFHpA levels
Connecticut		70 ppt	70 ppt	70 ppt	70 ppt	70 ppt based on the sum of PFOA, PFOS, PFNA, PFHxS, PFHpA
Massachusetts		70 ppt	70 ppt	70 ppt	70 ppt	70 ppt based on the sum of PFOA, PFOS, PFNA, PFHxS, PFHpA
Minnesota		35 ppt	27 ppt	27 ppt	-	
New Hampshire		70 ppt	38 ppt	85 ppt	23 ppt	A total of 70 ppt from the sum of PFOA and PFOS would also be non-compliance
New Jersey		14 ppt	13 ppt	-	13 ppt	
North Carolina		70 ppt	70 ppt	-	-	NC follows US EPA PFOA/PFOS guidance. Gen X compounds are also regulated at a concentration of 140 ppt
Vermont		20 ppt	20 ppt	20 ppt	20 ppt	20 ppt based on the sum of PFOA, PFOS, PFNA, PFHxS, PFHpA

Why Are These Different?

Differences from US EPA of 70 ppt

- The current guidance's from other states range from 13 to 70 ppt
- Differences due to varying approaches during risk assessment process for calculation:
 - Different reference dose (RfD)
 - Choice of sensitive population and toxicological endpoint
 - Drinking water exposure assumptions
 - Technical and capacity considerations
 - Social, political, and/or economic pressures

Reduce exposure

- Avoid eating contaminated fish.
- Some products may still contain PFAS (Teflon)
- Dust household surfaces regularly. (Infants and young children)
- PFAS exposure through garden vegetables is not likely to be a significant source of exposure
- Showering, washing dishes, swimming in water that contains PFAS should not increase exposure

Breastfeeding

- **The advantages of breastfeeding continue to greatly outweigh the potential risks in nearly every circumstance**
- **Based on current science, the benefits of breastfeeding appear to outweigh the risks for infants exposed to PFAS in breast milk.**

PFAS



www.publichealthmdc.com/pfas

 **Public Health**
MADISON & DANE COUNTY

Healthy people. Healthy places.

Objectives










- Show the general service area for Well 15
- Summarize PFAS monitoring and results
- Compare Well 15 PFAS results to current federal and state regulations
- Provide a brief overview of the known contamination at Truax

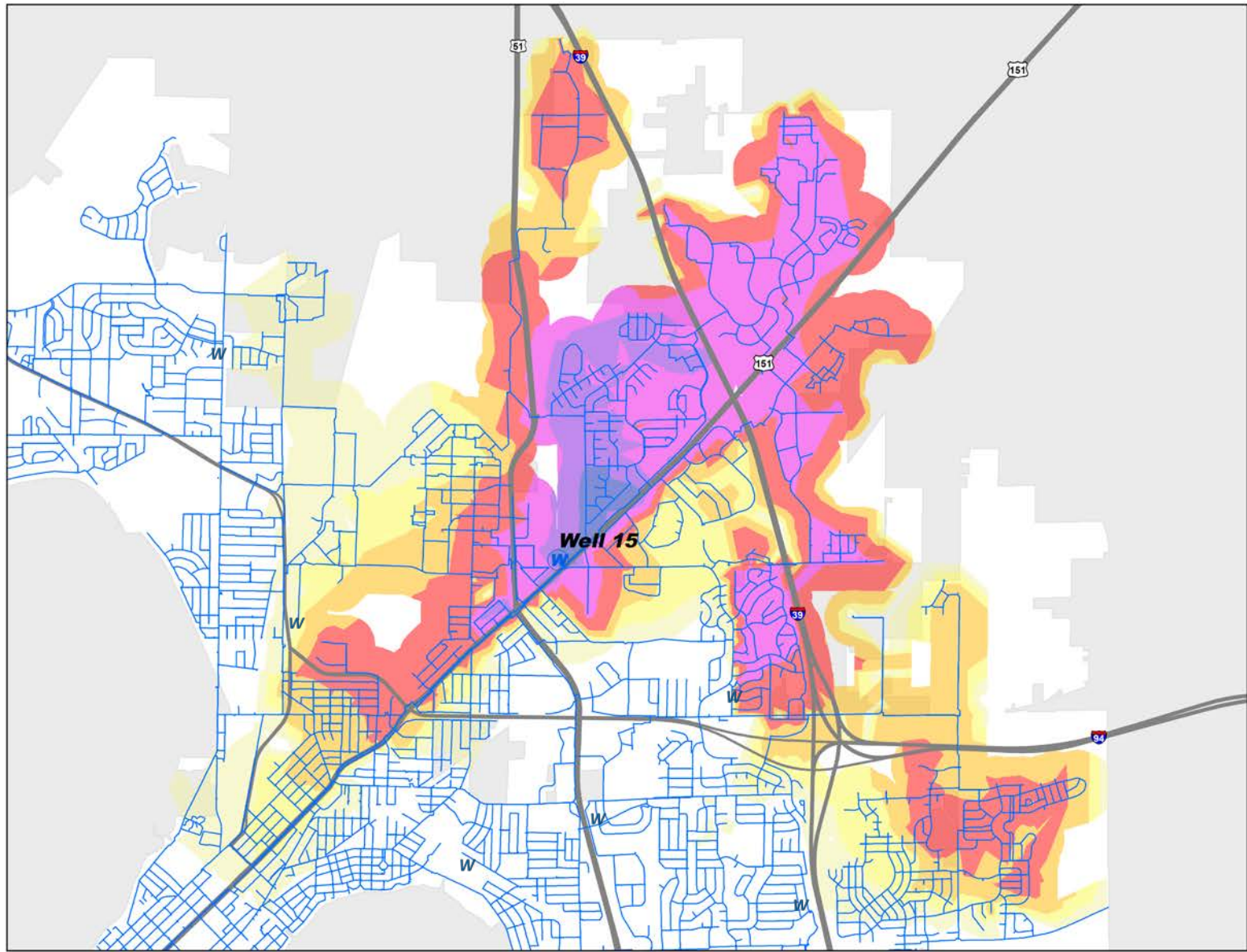
WELL 15 SERVICE AREA

Well 15
Influence Zone
2/19/2019



Legend

-  Unit Well
-  Water Main
- Well Source %**
-  80 - 100
-  60 - 80
-  40 - 60
-  20 - 40
-  10 - 20
-  5 - 10
-  1 - 5



Disclaimer: The City of Madison makes no representation about the accuracy or completeness of these records and in no event shall the City be liable for any damages whatsoever resulting from the use of these records.
The information provided is based on computer simulations of 2017 operating conditions. This information will be updated every three to five years, or as necessary, to reflect general changes in operating conditions, such as the development of new water sources and the abandonment of older ones.

PFAS MONITORING

Well 15 PFAS Results

Results in parts per trillion or ng/L

2/4/2019

Perfluorosulfonic Acids (PFSAs)

Abbreviation

Perfluorobutane sulfonic acid	PFBS	2.7 – 3.4
Perfluoropentane sulfonic acid	PFPeS	2.4 – 3.2
Perfluorohexane sulfonic acid	PFHxS	20
Perfluoroheptane sulfonic acid	PFHpS	0.29
Perfluorooctane sulfonic acid	PFOS	5.1 – 5.9

Perfluorocarboxylic Acids (PFCAs)

Abbreviation

Perfluorobutanoic acid	PFBA	2.4 – 3.0
Perfluoropentanoic acid	PFPeA	4.4 – 5.6
Perfluorohexanoic acid	PFHxA	6.2
Perfluoroheptanoic acid	PFHpA	2.0 – 2.4
Perfluorooctanoic acid	PFOA	5.7 – 6.1

Combined PFOA + PFOS**

11 - 12

** EPA Health Advisory Level for PFOA & PFOS: 70 ppt

Well 15 Comparison to Federal and State Guidelines

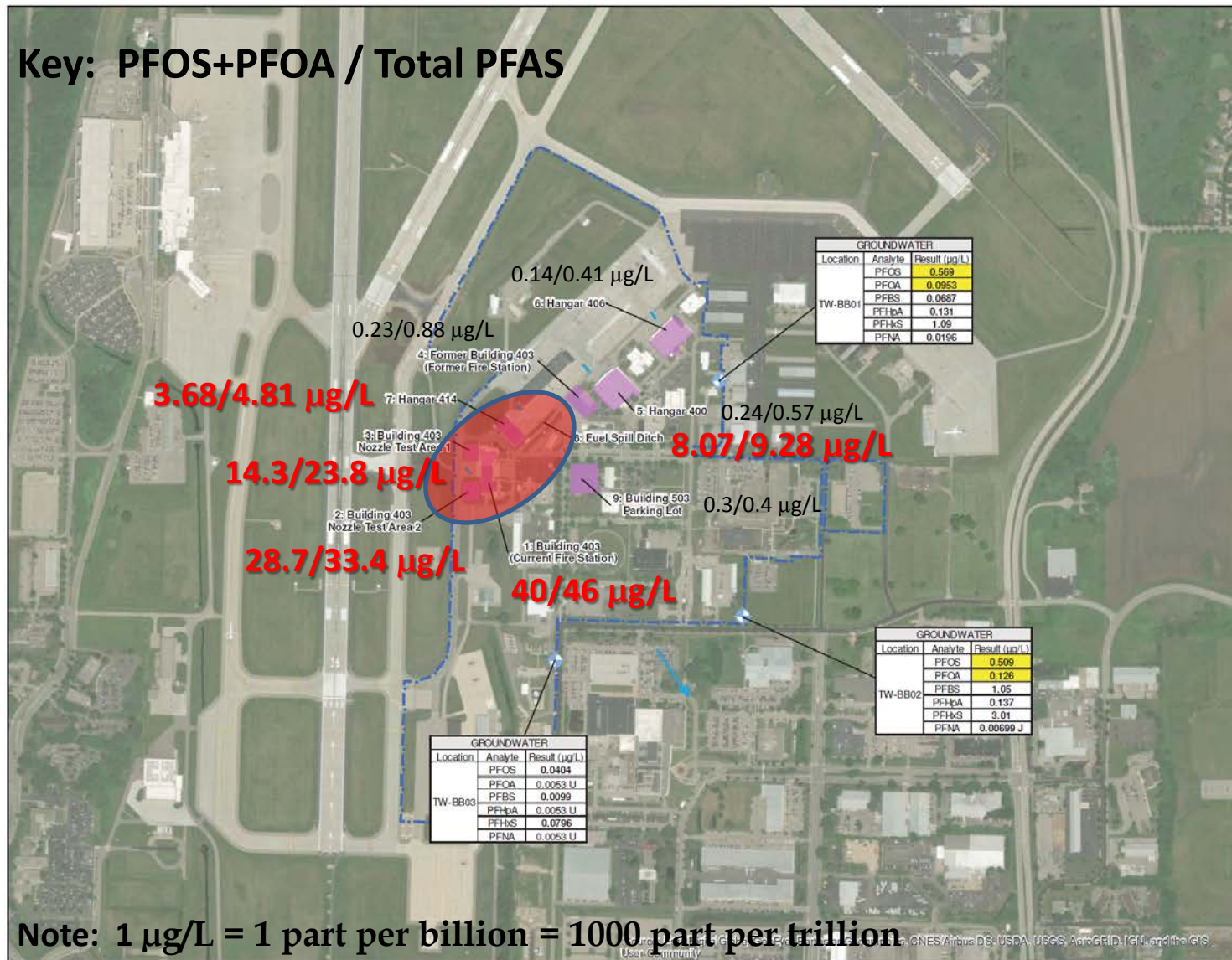
Units in parts per trillion, ppt	INDIVIDUAL PFAS COMPOUNDS							
	PFOA	PFOS	PFHxS	PFHpA	PFNA	PFBA	PFBS	Gen-X
Well 15 (max)	6.1	5.9	21	2.4	<2	3.0	3.4	<5
New Jersey	14	13			13			
California	14	13						
Draft ATSDR	21	14	140		21			
Minnesota	35	27	27			7000	2000	
New Hampshire	70	38	85		23			
North Carolina								140
Units in parts per trillion, ppt	SUMMED TOTAL PFAS (5/2)							
	PFOA	PFOS	PFHxS	PFHpA	PFNA	PFBA	PFBS	Gen-X
Well 15 (max)	34					3.0	3.4	<5
Vermont	20							
Alaska	70						2000	
Connecticut	70							
Massachusetts	70						2000	
Well 15 (max)	12							
Maine	70							
Michigan	70							
New Hampshire	70							
Rhode Island	70							

Sources: www.asdwa.org/pfas/ Accessed 1/18/19
pfas-1.itrcweb.org Accessed 3/6/19

PROBABLE SOURCE OF PFAS

Truax Field – Air National Guard Base

Key: PFOS+PFOA / Total PFAS



Note: 1 µg/L = 1 part per billion = 1000 part per trillion

BASE BOUNDARY ANALYTICAL RESULTS

Truax Field Air National Guard Base
Madison, Wisconsin

Legend

- Temporary Monitoring Well
- Installation Area (approximate)
- Potential AFFF PFOS/PFOA PRL (approximate)
- Assumed Groundwater Flow

Notes & Sources

Notes:
 AFFF = aqueous film forming foam
 PRL = potential release location
 PFC = perfluorinated compounds
 PFOS = Perfluorooctanesulfonic acid
 PFOA = Perfluorooctanoic acid
 PFBS = Perfluorobutanesulfonic acid
 PFHpA = Perfluorohexanoic acid
 PFHxS = Perfluorohexanesulfonic acid
 PFNA = Perfluorononanoic acid

BOLD text indicates a detection
YELLOW highlighted cells indicate 0.07 µg/L Health Advisory Exceedance.

* Field duplicate value exceeded primary sample

Sources: Potential AFFF PFC PRLs and Installation Area datalayers obtained from Figure 2 of the Final Perfluorinated Compounds Preliminary Assessment Site Visit Report prepared by BB&E and dated February 2016.



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FIGURE

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NEXT STEPS

Next Steps – One Year

- WDNR – Fish tissue sampling and analysis
 - Revise fish consumption advisory(?)
- Soil and groundwater testing – Truax / Airport
- Water/sediment testing – Starkweather Creek
- Wait for DNR/DHS interim guidance for PFOA and PFOS (groundwater standard)
- Continue testing Madison drinking water wells

Next Steps – Long Term

- Characterize extent of known contamination
- Evaluate treatment alternatives
- Clean up sources

QUESTIONS?

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www.cityofmadison.com/water/water-quality/water-quality-testing/perfluorinated-compounds