

ACWA 2022 Annual Meeting

Wisconsin PFAS Surface Water Quality Criteria Rule

Adrian Stocks

Wisconsin DNR Water Quality Bureau Director

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Monitoring Efforts - Surface Waters/Fish Tissue

- Paired fish tissue and surface water samples
- 2019
 - Targeted waterbodies
 - Higher-resolution follow-up at areas with elevated PFAS
- 2020 + 2021
 - Expanded to all long-term trend sites
 - 44 Rivers
 - Drain 80% of state's area



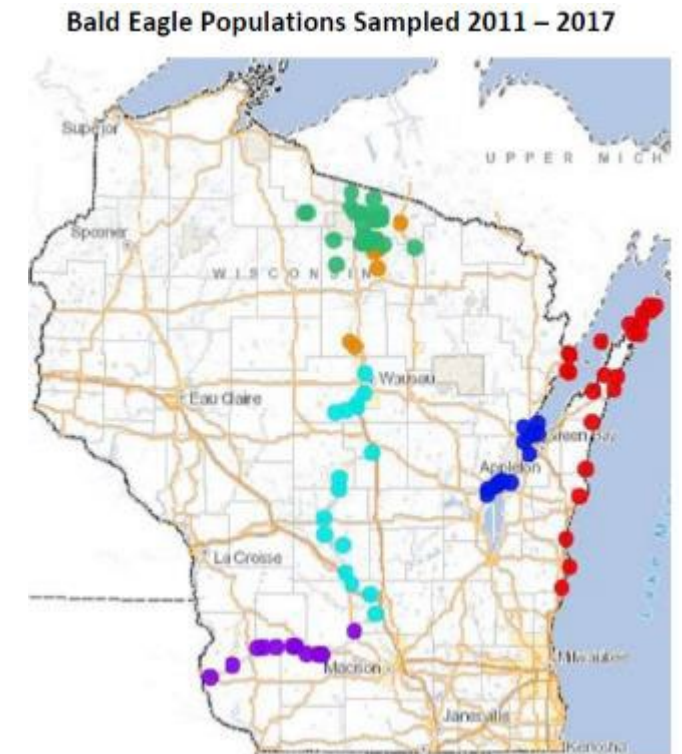
Monitoring Efforts - Surface Water (2020)

- 44 Rivers, 80% of state's drainage area
- Highest water column samples
 - PFOS: 4.33 ng/L (WI River at Biron)
 - PFOA: 12.7 ng/L (WI River at Merrill)



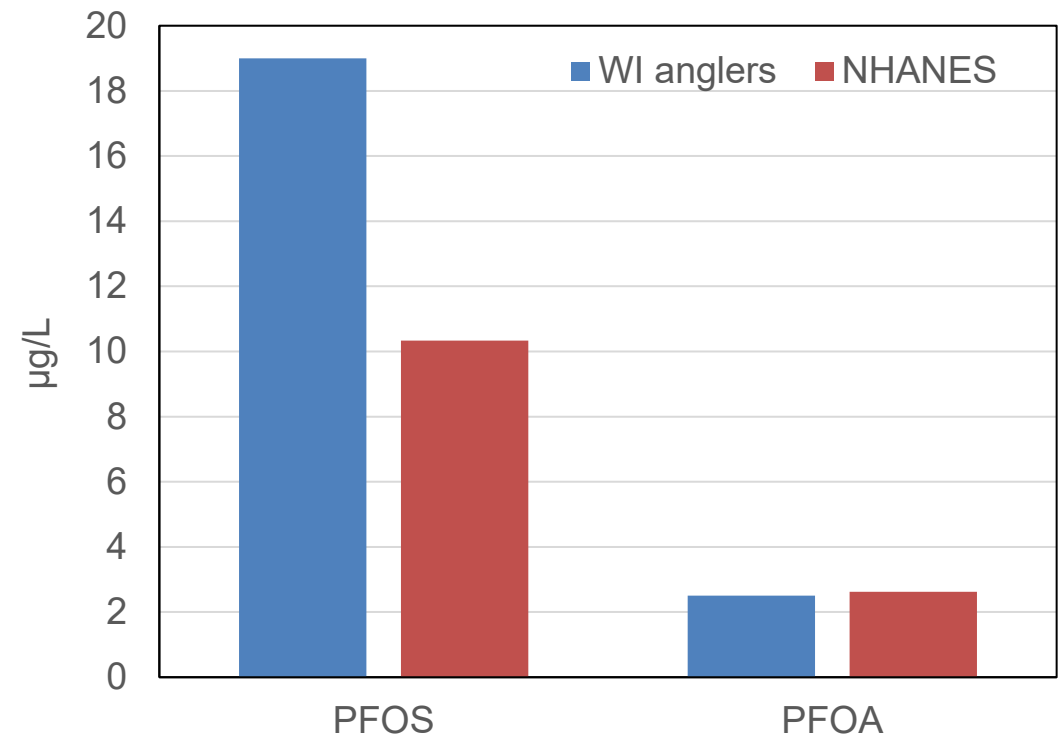
Monitoring Efforts - Bald Eagles

- WDNR Statewide Biosentinel Program (2011-2017)
 - Sampled in 6 regions, measured total PFAS
 - Highest concentrations ($>600 \mu\text{g PFAS/L (ppb)}$) in Middle & Lower Wisconsin River
 - Lowest concentrations in Northern Highlands



Monitoring Efforts - Anglers

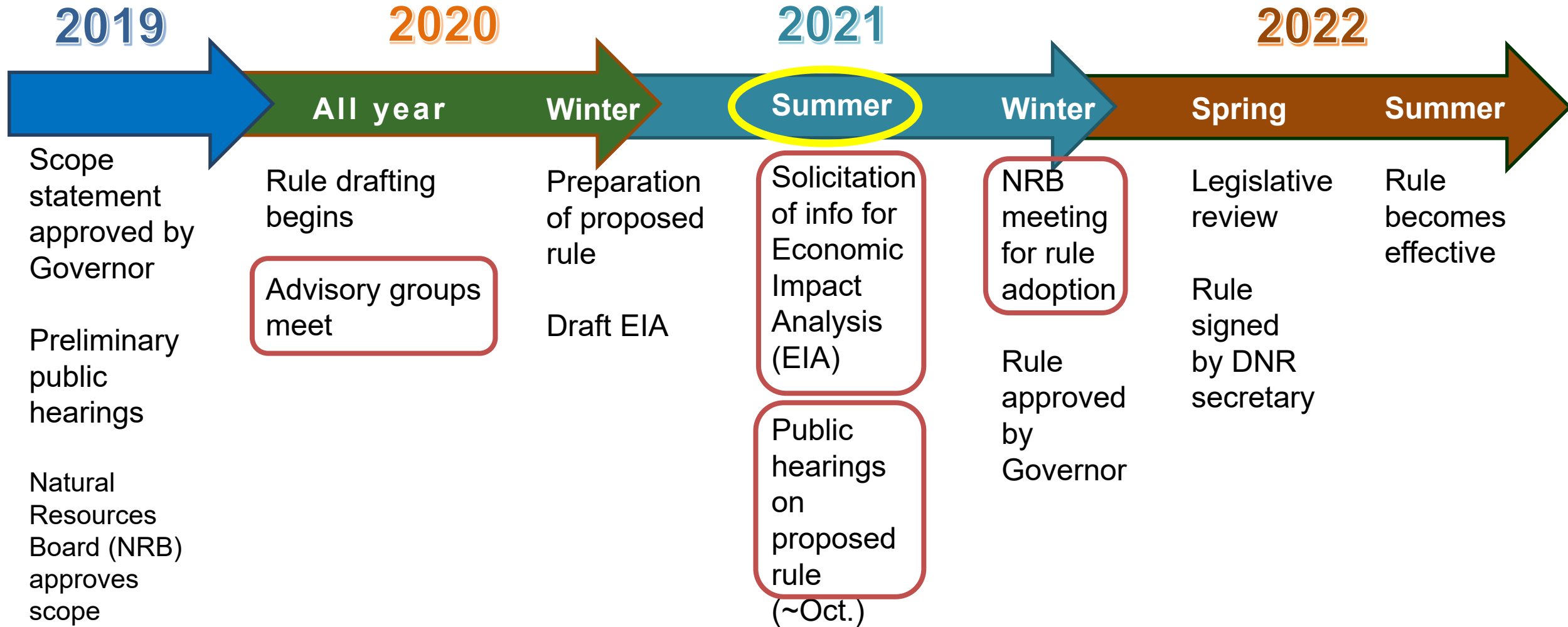
- 2012-13 DHS biomonitoring study of older male anglers
 - PFOS in all samples, median 19 $\mu\text{g/L}$ (ppb)
 - PFOA in >97% of samples, median 2.5 $\mu\text{g/L}$ (ppb)
 - PFOS in WI anglers > PFOS in comparable population surveyed in National Health and Nutrition Examination Survey



Water Quality Standards rule

- Define existing narrative standards with numeric public health significance thresholds for PFOS, PFOA (NR 102, 105)
- Establish WPDES permit requirements for wastewater discharges of PFOS, PFOA to surface waters of the state (NR 106)
- Add specifications for preservation, holding time of samples to be analyzed for PFAS (NR 219)

Rulemaking Process and Timeline



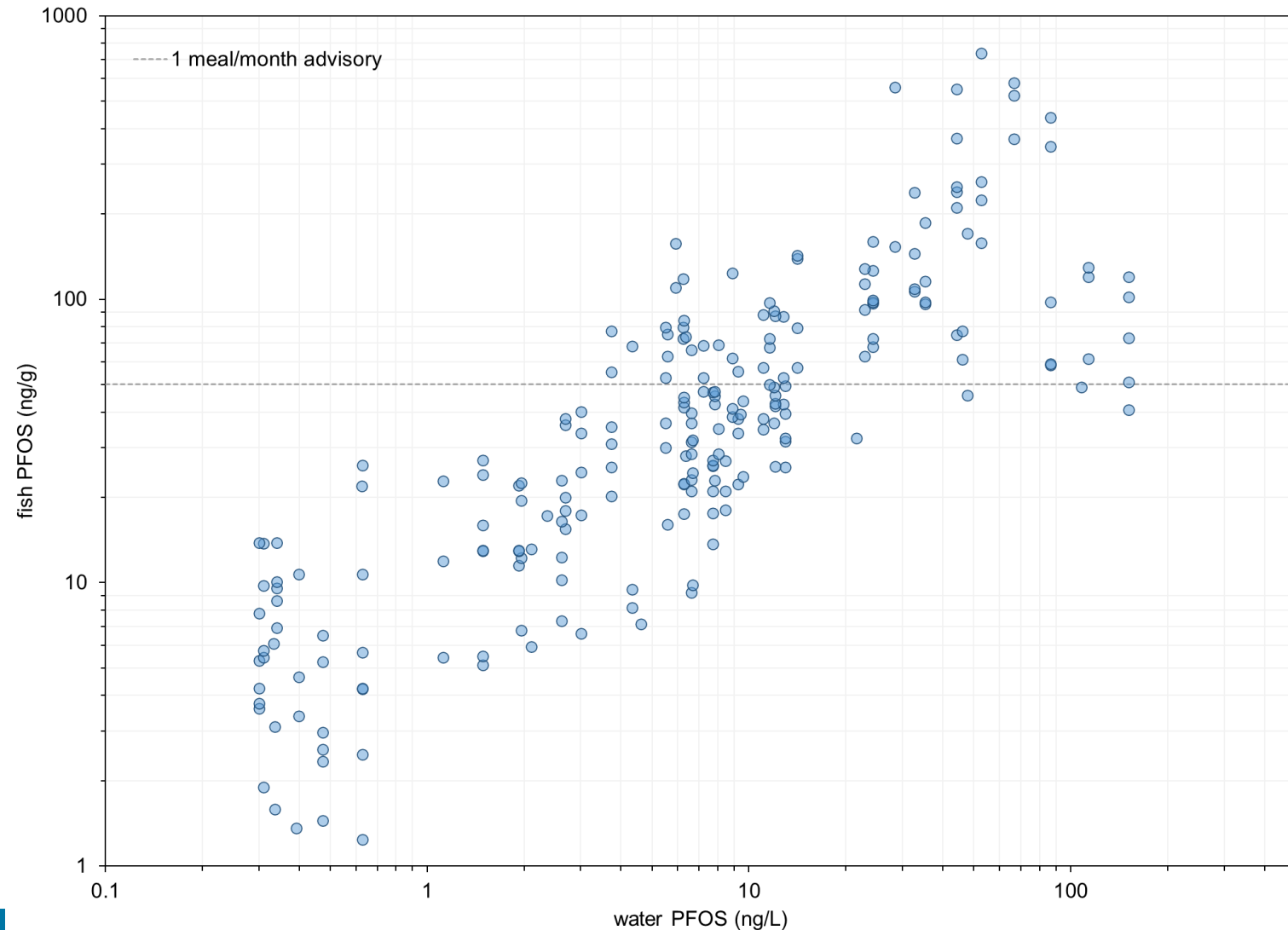
PFAS Water Quality Standards



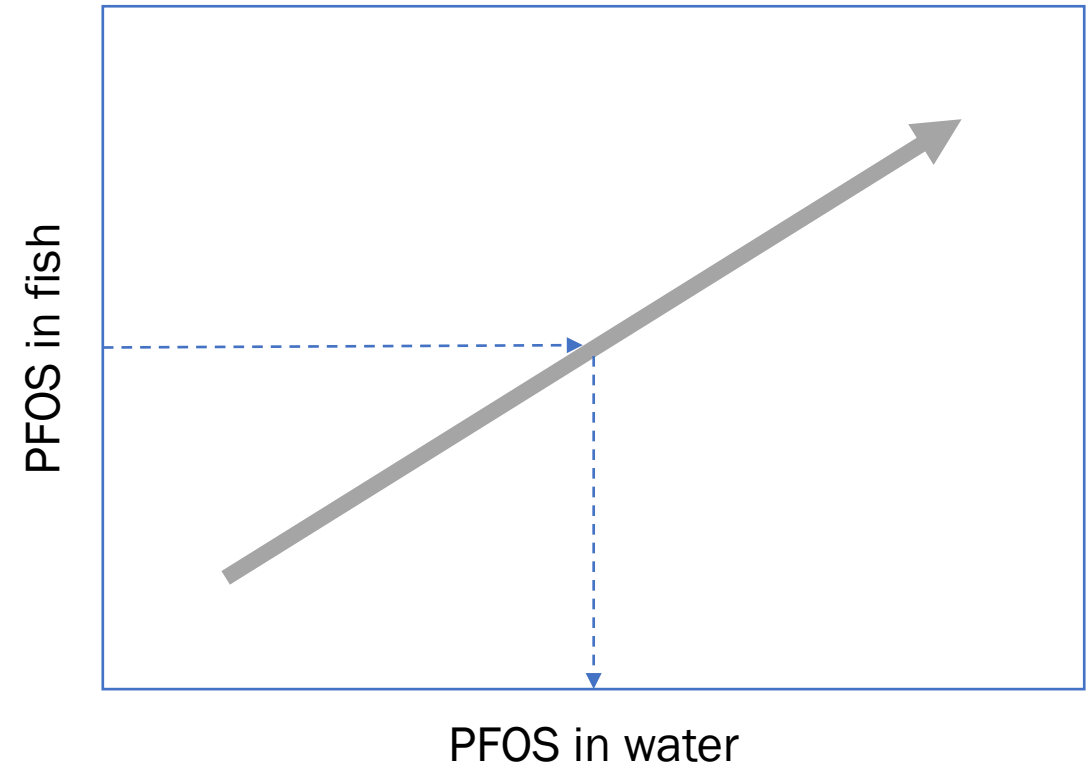
PFOS Water Quality Standard

PFOS = 8 ng/L

Prevents issuance of 1 meal/month fish consumption advisory



- **PFOS** proposed threshold = 8 ng/L (ppt)
- Protect people's exposure through fish consumption

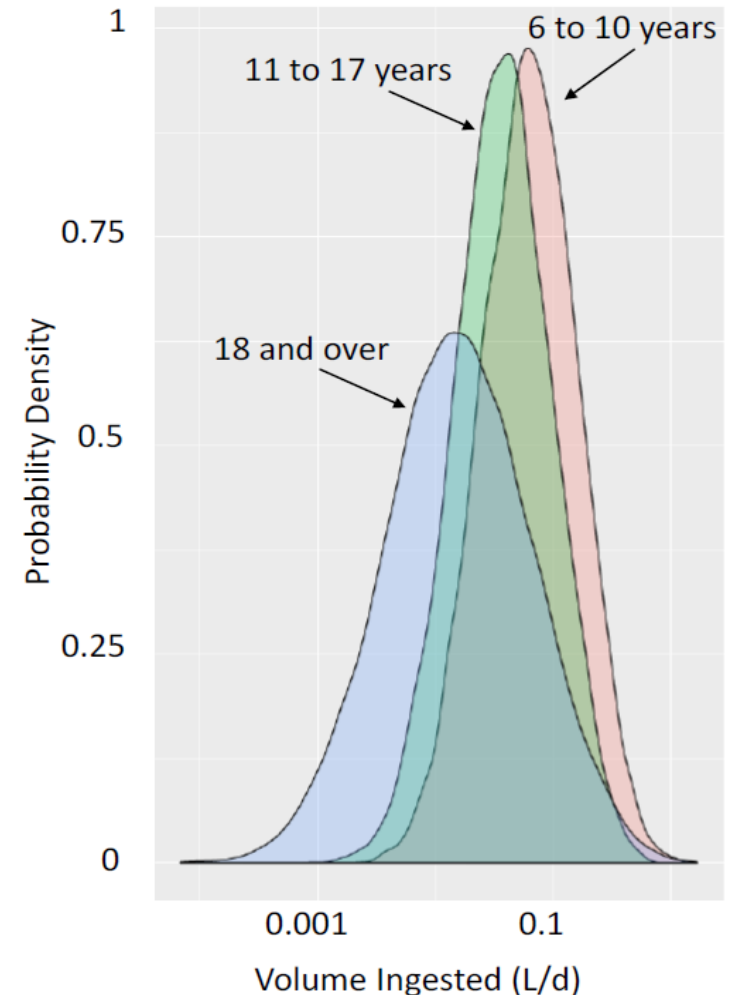


DNR chose a level of PFOS in fish tissue, and set standard at the corresponding PFOS water level- (1 meal/month)

PFOA Water Quality Standard

PFOA = 20 ng/L in drinking water sources
Protects against daily ingestion

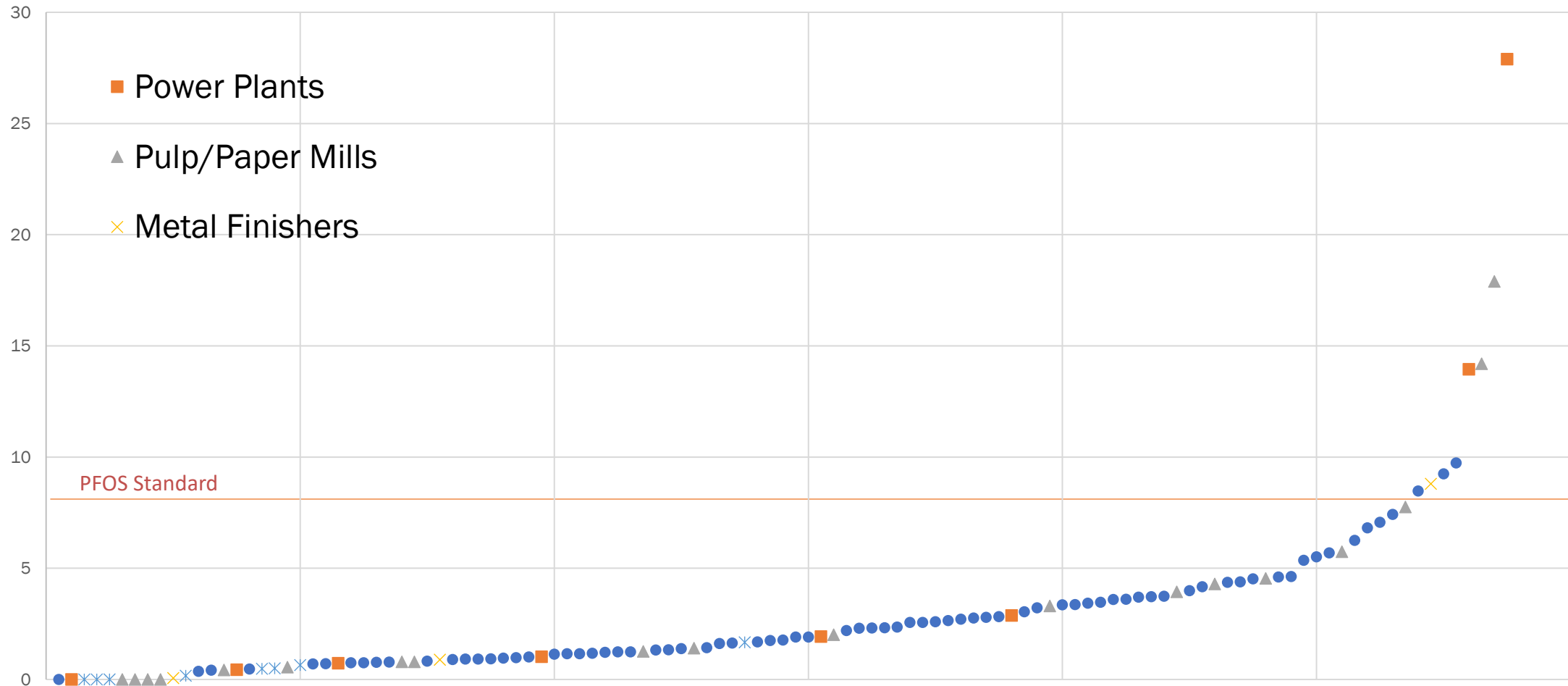
95 ng/L in all other waters
Protects against incidental
ingestion by children during
recreation



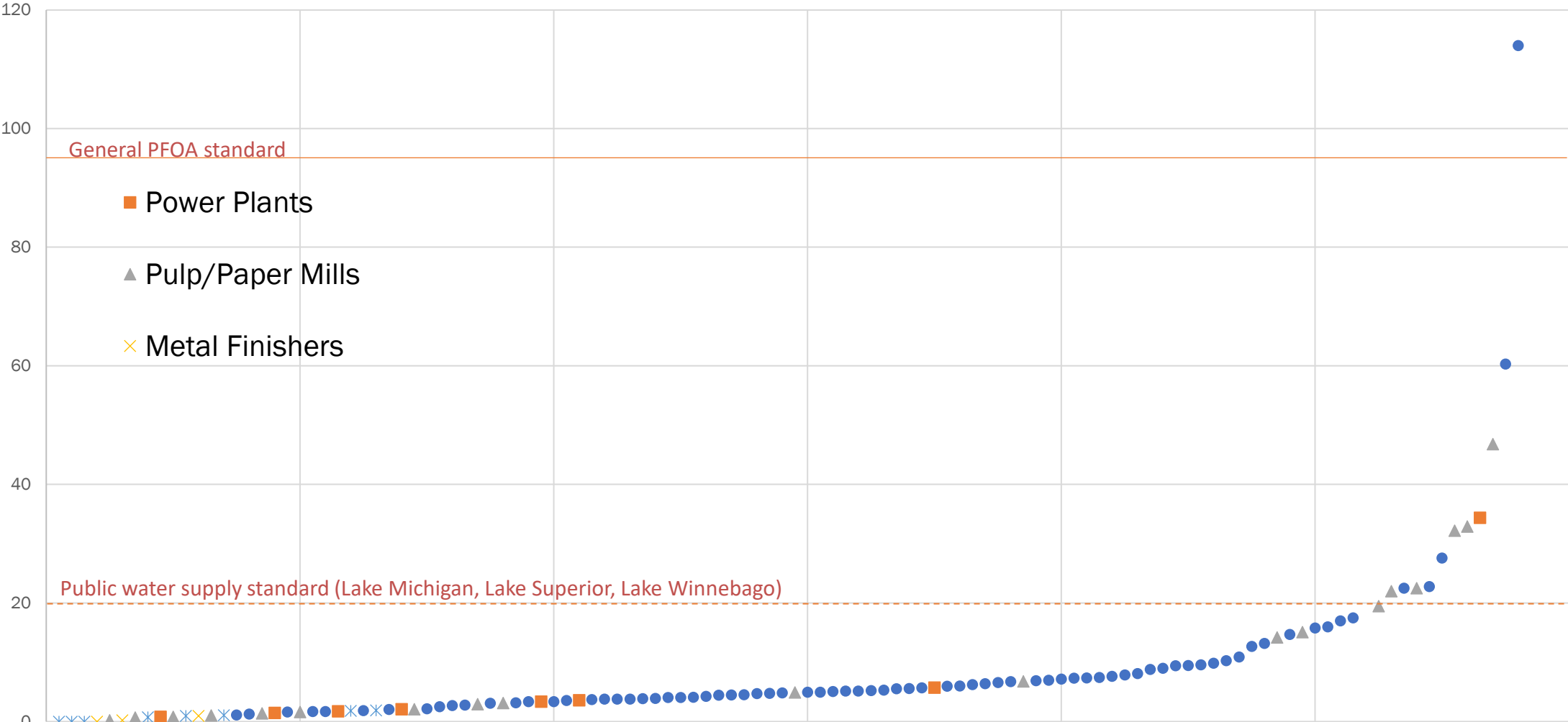
Wastewater Sampling (2020-2021)

- To help with development of the EIA
- 123 Facilities
 - 78 Municipalities
 - 45 Industries
- QA/QC Checks
 - Duplicates
 - Field Blanks
 - Comparability Checks

Monitoring Efforts - PFOS in Effluent



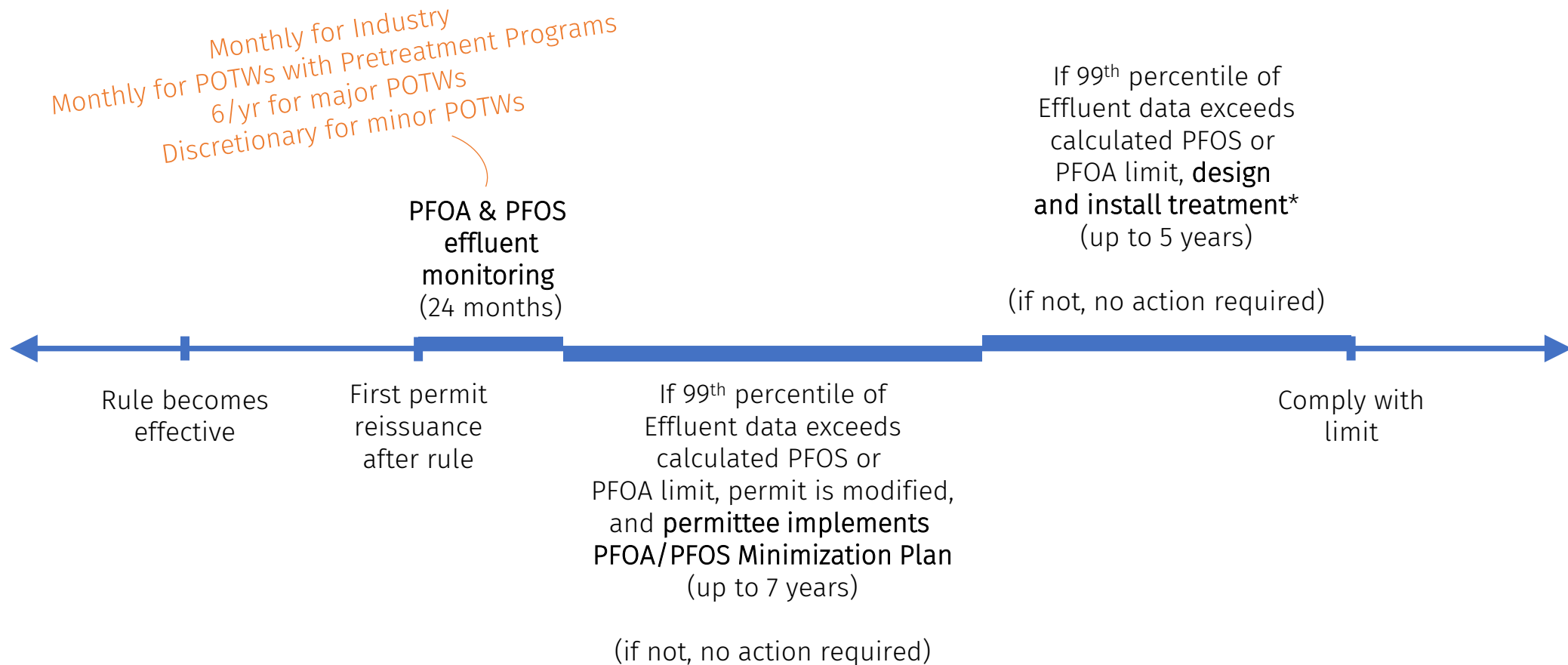
Monitoring Efforts - PFOA in Effluent



Implementation focuses on source reduction

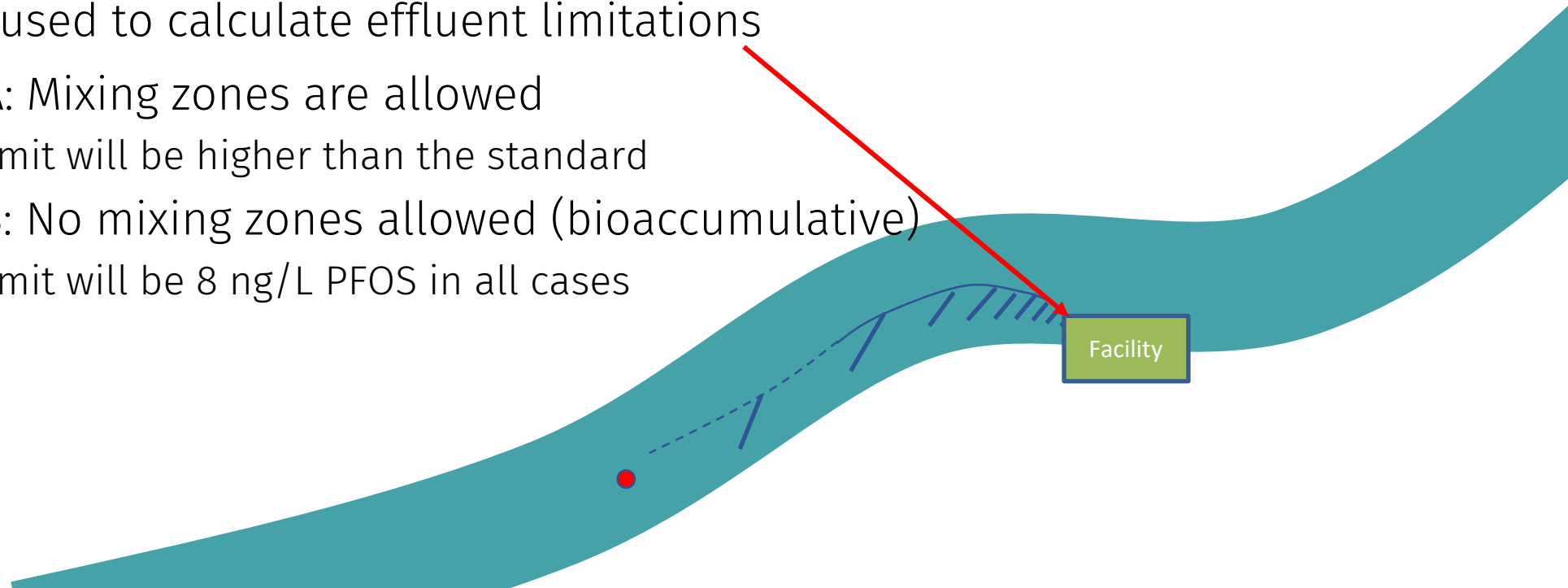
- 2 years of monitoring to determine need for limit
- 7 years of source reduction
- Experience shows this to be effective approach for difficult pollutants (e.g. Mercury)

Implementation Process

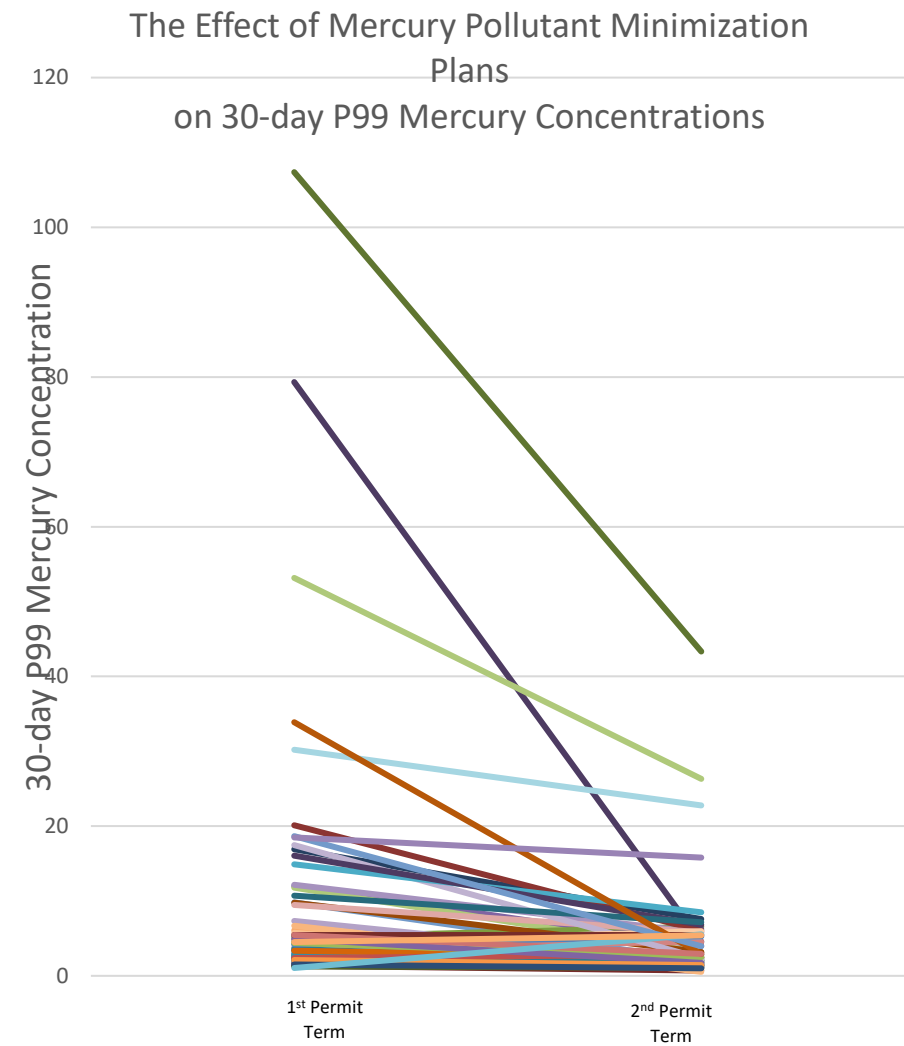


Limit Calculation

- WQS apply in waterbodies
- WQS are used to calculate effluent limitations
 - PFOA: Mixing zones are allowed
 - Limit will be higher than the standard
 - PFOS: No mixing zones allowed (bioaccumulative)
 - Limit will be 8 ng/L PFOS in all cases



Pollutant Minimization Plan Approach



PFOA/PFOS Minimization Plans



- Permittee drafts PMP and DNR reviews
- Implement PMP within 12 months of approval
- PMP shall include:
 - Documentation of previous PFAS-reduction activities
 - Proposed PFAS-reduction activities
 - Documentation/assessment framework

Example PMP Actions: Addressing ongoing PFAS sources

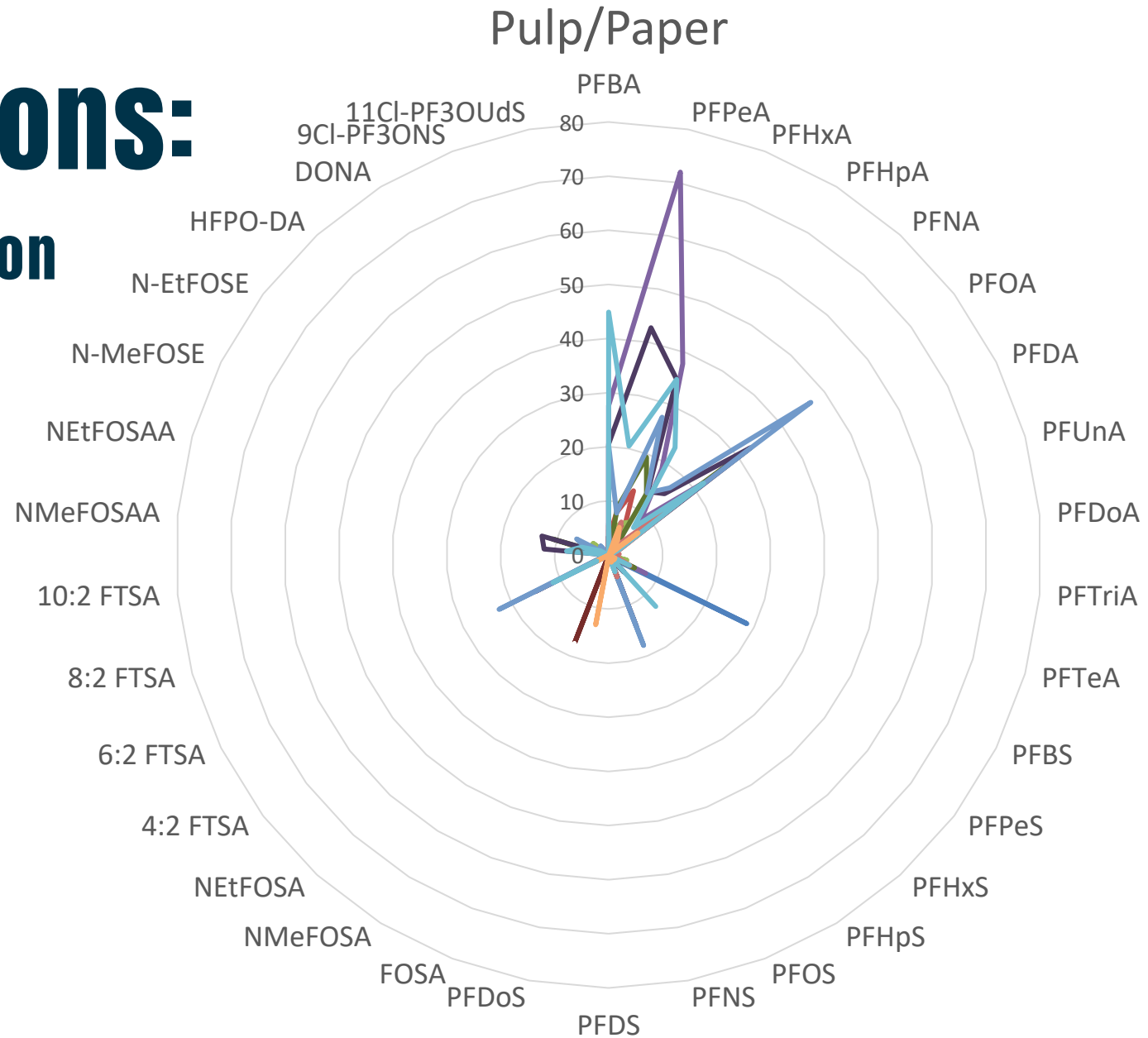
- Expectations – similar to Hg PMPs
- POTWs: Address SIUs and commercial sources
- Industries: Sampling to establish mass balance
 - Source water
 - Raw materials
 - Chemical additives
- End intentional use of PFOS, PFOA, and precursors
- Screen new additives by environmental staff at facilities
- If essential materials contain PFOS, PFOA, or precursors, search for alternative suppliers and/or monitor additives' PFAS concentrations



Example PMP Actions:

Addressing legacy contamination

- Review historic PFAS usage and locations
- PFAS fingerprinting analysis
- Sampling throughout sewers or wastewater lines to target source of legacy contamination
- Clean, line, or replace pipes/tanks

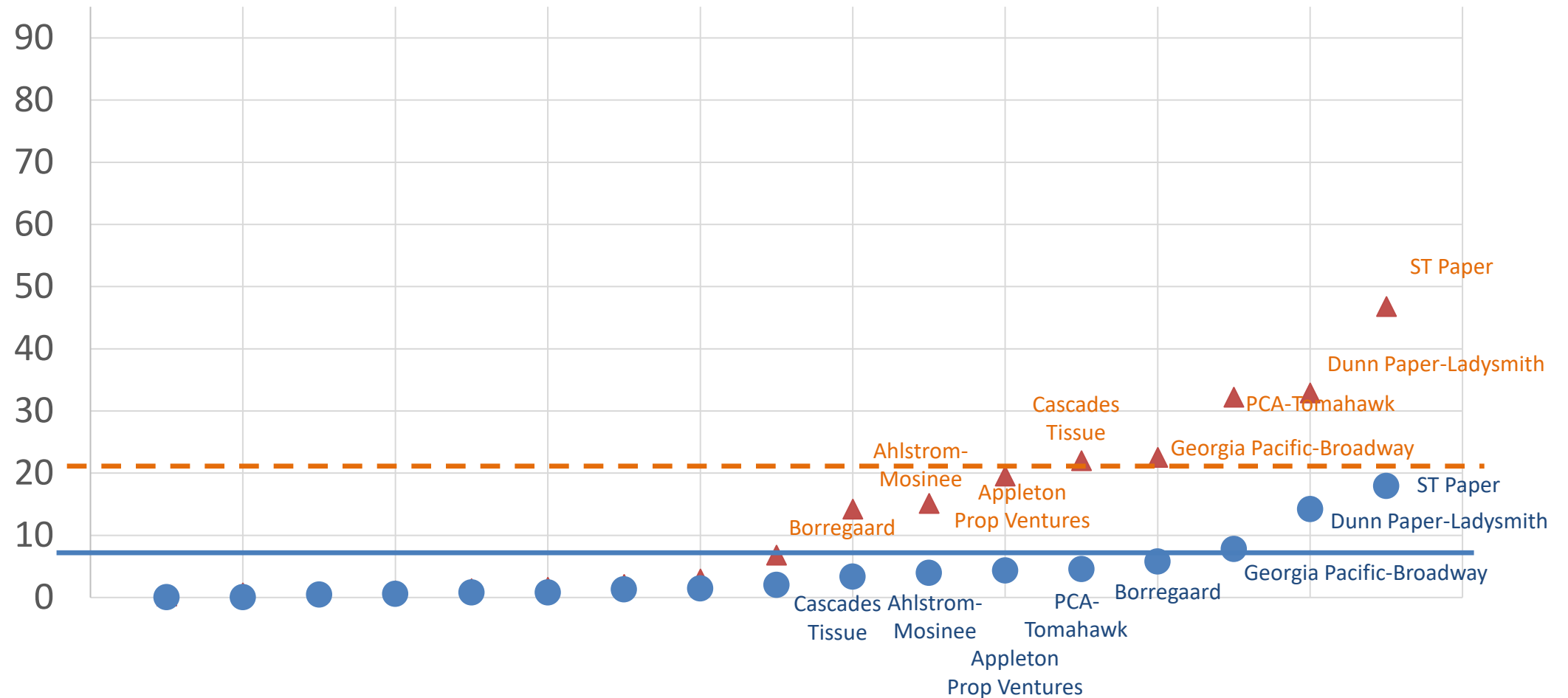


Annual Reports

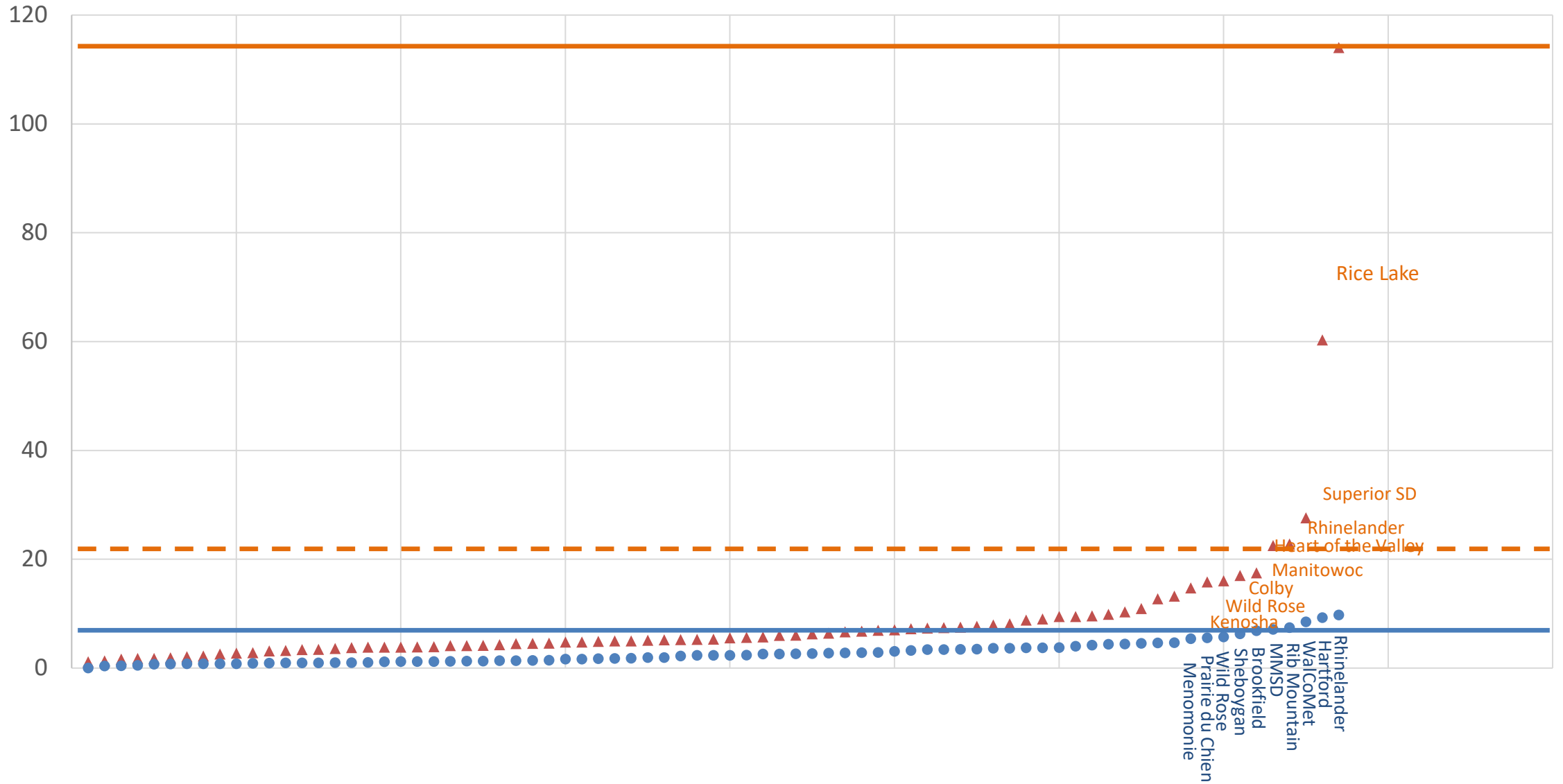
- Effluent trend analysis
- Summary of activities performed
- Assessment of efficacy of activities
- Barriers to plan's effectiveness and any proposed changes



Pulp & Paper Mill PFOA (orange) and PFOS (blue) Effluent Concentrations



POTW PFOA (orange) and PFOS (blue) Effluent Concentrations



Takeaways for Other Industries

- ✈️ • Airport runoff is extremely high in PFOS/PFOA (100s-1000s ng/L)
- 2 power plants' process wastewater streams had PFOS above standard
- 🏭 • Fox Energy Center (seeking alternative water supply), NextEra Point Beach (decommissioning)
 - Due to concentration in cooling towers or filter backwash?
- 🧪 • 1/3 direct discharging metal finishers (Briggs & Stratton) exceeded PFOS standard (8.8 ng/L)
- 🧪 • Chemical manufacturing, meat processing, medical equipment, plastic molder, hardwood/veneer industries sampled were all below standards (very limited sample sizes)
- 🧀 • Cheesemakers and food processors denied DNR access for sampling (except one)
- 💧 • Dewatering of contaminated groundwater will be an area of focus

QUESTIONS

DNR.WI.GOV



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"WILD WISCONSIN:
OFF THE RECORD"

POTW Takeaways

- Only 3/77 POTWs sampled had PFOS concentrations exceeding proposed standard
- Only 2/77 POTWs exceeded proposed PFOA standard in their waterbody
- After correcting actual results to expected 99th percentile values,
 - ~3.6% of POTWs are expected to need to implement PMPs (23/639)
 - ~0% of POTWs without SIUs (0/521)
 - ~18% of POTWs with SIUs (17/92)
 - ~23% of POTWs with authorized pretreatment programs (Q>5 MGD) (6/26)

Pulp/Paper Takeaways

- Only 2/20 mills sampled had PFOS concentrations exceeding proposed standard
- 0/20 mills exceeded proposed PFOA standard in their waterbody
 - 2 have PWS downstream
- After correcting actual results to expected 99th percentile values,
 - ~15% of direct discharging mills are expected to need to implement PMPs
- 9 mills discharge to sanitary sewers for POTWs that are expected to need to implement PMPs