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Show Notes Episode 49 – PFOA/PFAS Revisited

This is an update on what we have learned since our previous podcast (April 2020)- Episode 7, Using GAC to Treat PFOA & PFAS. There are many more subspecies -PFOA, PFOS, PFHA-S, PFDA, PFAS and GenX. North Carolina is a hotbed of GenX.

The EPA has proposed a limit of four parts per trillion for PFOA and PFAS. The proposed limit for GenX (HFPO-AD) 1.0 (unitless)

<https://www.epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas>.

Compound	Proposed MCLG	Proposed MCL (enforceable levels)
PFOA	Zero	4.0 parts per trillion (also expressed as ng/L)
PFOS	Zero	4.0 ppt
PFNA	1.0 (unitless) Hazard Index	1.0 (unitless) Hazard Index
PFHxS		
PFBS		
HFPO-DA (commonly referred to as GenX Chemicals)		

PFAS_PFOA contaminants are found in clothing, footwear, carpets, food packaging, anything that’s waterproof, cookware, cosmetics, rinse-aids. It is an extensive list.

There are three treatment options - granular activated carbon, anion ion exchange resin and reverse osmosis (RO).

We have little information about distillation but believe this process does remove PFAS contaminants. The PFAS contaminants remain in the boiling water, not the steam which is condensed purified water. **Note – simply boiling water does not remove PFAS. The boiling point is much higher.**

Challenges

- Four parts per trillion is it treatable? How do we measure that? What labs can even measure that low?
- What are the ramifications for municipalities?



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The effects of PFAS are being studied by institutions. There is a correlation between Cape Fear alligators and autoimmune disorders in humans. [Alligator Study](#)

Testing

Be prepared prior to site visit.

- No new clothes, washed cotton, no fabric softener, nothing water resistant, waterproof, or stain treated. No footwear with Gore-Tex or cosmetics.
- Use only laboratory approved bottles and containers. Bottles and caps should be HDPE, High Density Polyethylene, and - or polypropylene material.
- Your field equipment should not contain Teflon®, no tubing. (Teflon® Tape is safe to use for plumbing.)
- No waterproof field books, no plastic clipboards, binders, or spiral notebooks or Post It Notes.
- Do not hold for more than 14 days, 28 days at room temperature, keep it 50° F (10° C). Temperature at the lab must be stored below 42.8°F, (6° C) but not frozen.
- [ResinTech Instructions](#)

Using Granular Activated Carbon (GAC)

- State regulators have accepted activated carbon.
- Coconut shell is not our (Urbans Aqua) first choice.
- There are a lot of studies which indicate that the coconut shell has difficulty removing the short chain material, like those in the GenX family. Short chain chemicals are in the PFAS family.
- New Jersey did a flip flop and said we now recommend activated carbon over IX resin without considering the species of PFOA, and people are putting in coconut shell carbon with reckless abandon.
 - Fire foam is in the PFOS family and can adsorbed by coal based and coconut shell carbon.
- We use coconut base carbon for reduction of taste, odor and disinfection byproducts.
- Coal base high quality agglomerated carbon is the carbon of choice for PFAS-PFOA reduction. Acid washing the carbon reduces the naturally occurring minerals found in carbon – arsenic, iron, antimony. Choose NSF certified carbon.
- Lignite base carbon made from softer brown coal is approved by some states. It is an expensive alternative. Lignite carbon has a larger pore structure.
- Depending on the manufacturer GAC offers cradle to grave accountability. Carbon can be thermally reactivated and destroyed. There is a chain of custody and certificate of destruction.



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Using Reverse Osmosis (RO)

- RO is highly effective. Unfortunately, the concentrated waste stream going down the drain includes PFAS contamination.
 - Very practical for drinking water at the tap. Apartments, condominiums, etc.
 - Whole house RO treatment can be wasteful, costly, and complicated.

Using Anion Resin

- Anion resin can reduce PFAS, PFOA contaminants.
 - The system is non-regenerable.
 - Has a smaller footprint than carbon.
 - Can be more cost effective despite the initial higher equipment cost.
 - A full water analysis is required due to competing ions, pretreatment may be required as a result. (Not unlike other anion exchange systems.)
 - pH may be depressed at start-up but will gradually come back to neutral.
 - Disposal – need to contact local waste companies for instructions; once the contaminants are on the resin, they will stick but it is up to the waste companies to determine handling.

Anion Resin (IX) vs GAC

- Empty bed contact time GAC – 10 minutes vs 2-5 minutes for anion.
 - Smaller footprint – ideal for commercial applications.
 - Depending on the pre-treatment requirements, the cost per gallon treated is lower for IX systems.
 - Disposal of IX resins can be challenging.

Avoiding Unintended Consequences of Exchange Tank Business

It can be good business to supply portable exchange tanks to your customers. Containment of all wastewaters, even tank wash-down water, is imperative.

- Have a tank dumping station at your place of business.
- Never allow water from the job site to seep into the sewer.
- Use a tank dumping station and secondary super sack containment pallet to store wet super sacks prior to disposal.
- Review “Treating for PFAS Slides” (below) for more details.



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Extra Information

[What are PFAS's](#)

[Treating for PFAS Slides EWQA, 2023](#)

[Empty Bed Contact Time Calculator](#)

[Testing Procedures](#)

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