PFAS: The CFPUA Experience

Cape Fear Public Utility Authority

May 9, 2025

Introduction to CFPUA

- Serve approximately 200,000 people in Wilmington and New Hanover County
- Annually deliver 7 billion gallons of water
- Annually collect 6.6 billion gallons of wastewater
- Average water production: 19.2 million gallons per day

2017: Five-year Odyssey Begins

Thursday, June 8, 2017 @starnewsonline

WILMINGTON, N.C.

StarNews

SPECIAL REPORT: TOXIC TAP WATER

Toxin taints CFPUA drinking water

From plant to pipes

Researchers have found chemicals made at the Fayetteville Works plant and used to make Teflon in the pipes of CFPUA's water system.

Wilmington StarNews front page, June 8, 2017

- Sparked crisis of confidence in safety of drinking water
- Communitywide call for steps to address contamination
- Legal action against Chemours and DuPont (ongoing)
- CFPUA staff directed to identify and implement effective treatment solution as promptly as possible

PFAS Solution Timeline

Find GenX PFAS

June 2017

Study & Pilot Test

Aug 2017

Design

Oct 2018

Construct

Nov 2019

Online

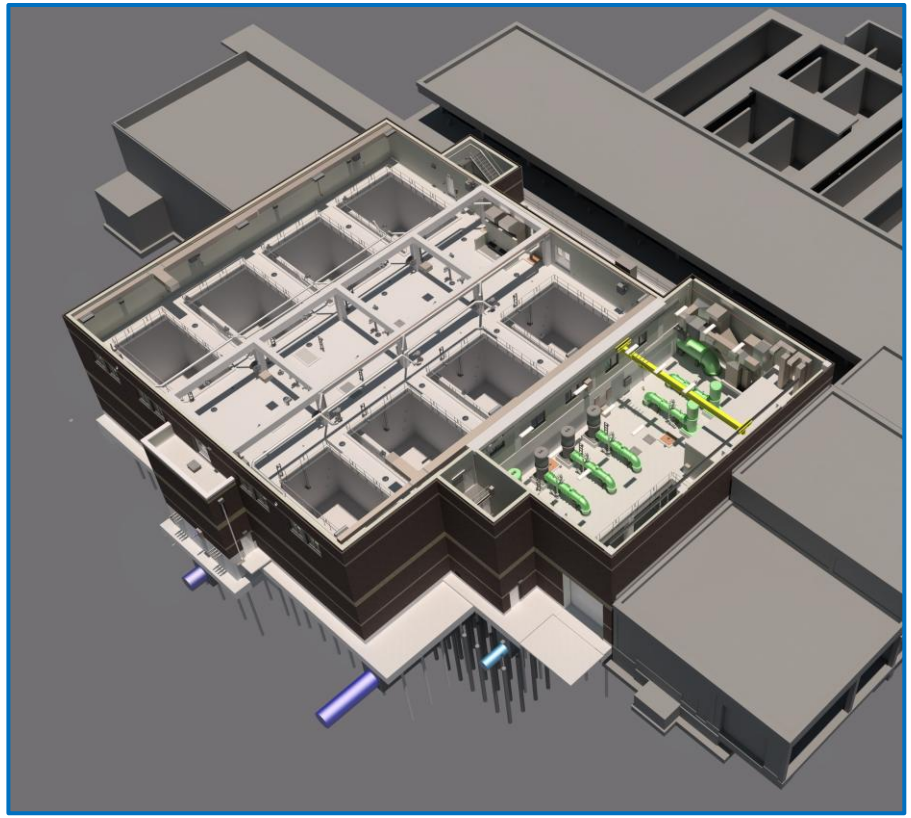
Oct 2022

Sweeney Water Treatment Plant

1. Raw Water Ozonation
2. Superpulsators
3. Intermediate Ozonation
4. Biofiltration with GAC
5. **Deep Bed GAC Contactors**
6. UV Disinfection
7. Finished Chemical Addition
8. Clear wells
9. High-Service Pump Station
10. Backwash and Residuals Handling

Contactor Design Summary

Granular Activated Carbon Contactor Design Summary	
Number of GAC Contactors	8
Design Flow Rate (each)	3,823 GPM
Type	Concrete Basin
Size (each)	22 x 38 feet
GAC Media Depth	12.5 feet
Contact Time at Design Flow	20 minutes



Contactor Construction Summary

Schedule:

- Study/Pilot testing – 12 months
- Design – 9 months
- Construction – 36 months
- Optimization – 12+ months

Construction Cost:

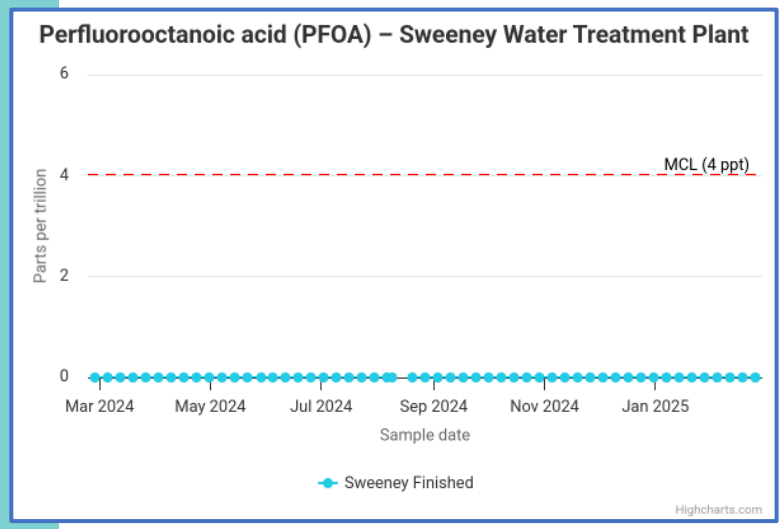
- Bid – $35,915,000 (2019)
- Final construction – $36,084,104

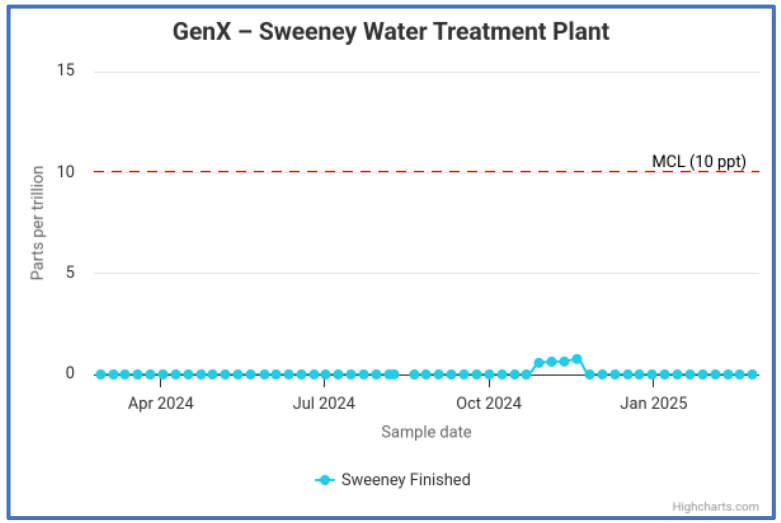
Total Project Cost: $43 million

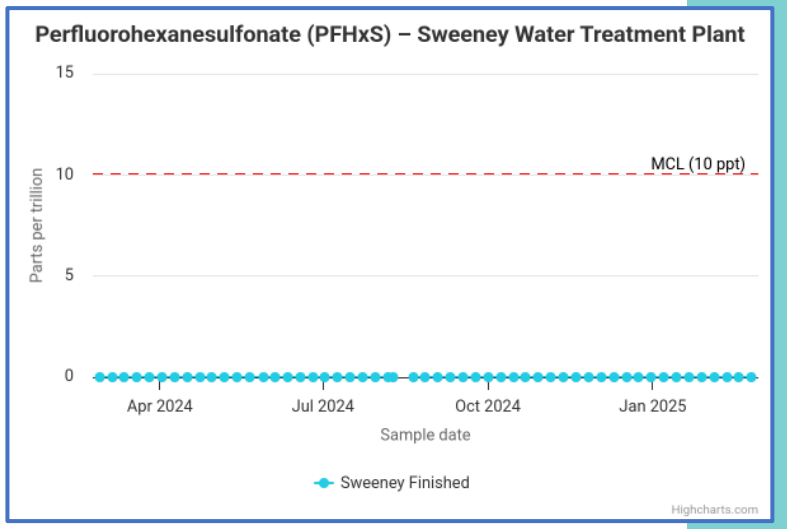
GAC Treatment Operations

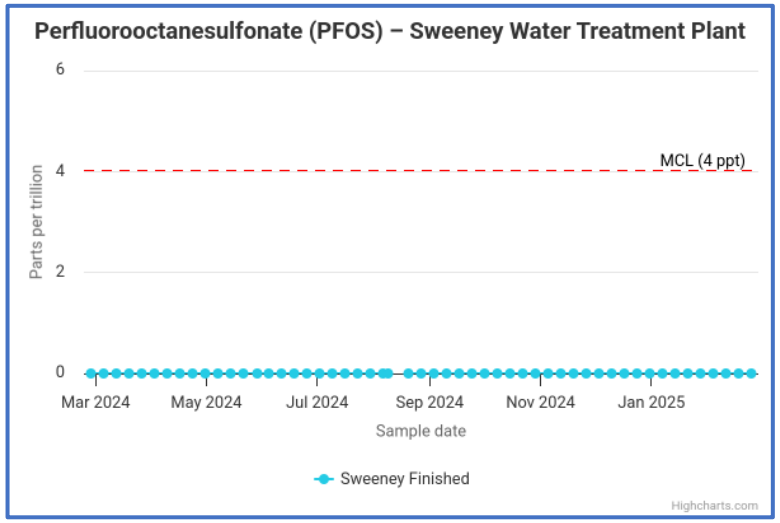
- GAC removes PFAS from water through a process called adsorption (with a “d”)
  - Water flows over the GAC and PFAS compounds cling to the surface area of GAC particles
- GAC media must be periodically regenerated to maintain high level of PFAS removal
- **Operationally 10-11 GAC media exchanges per year**
  - Carbon taken offsite by vendor for “regeneration” (PFAS destroyed by exposing GAC to extreme temperatures)
    - 60-day turnaround per filter
    - Dry GAC Media = 8 truck loads
    - Wet GAC Media = 16 truck loads

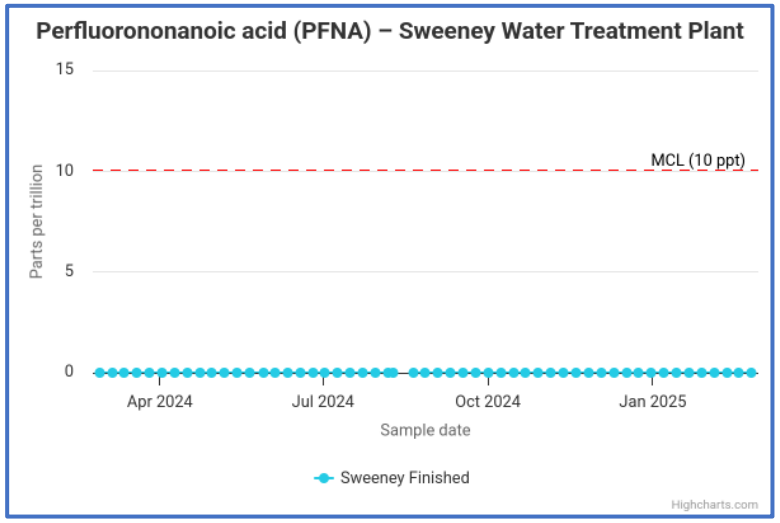
GAC Performance: PFAS MCLs and Hazard Index





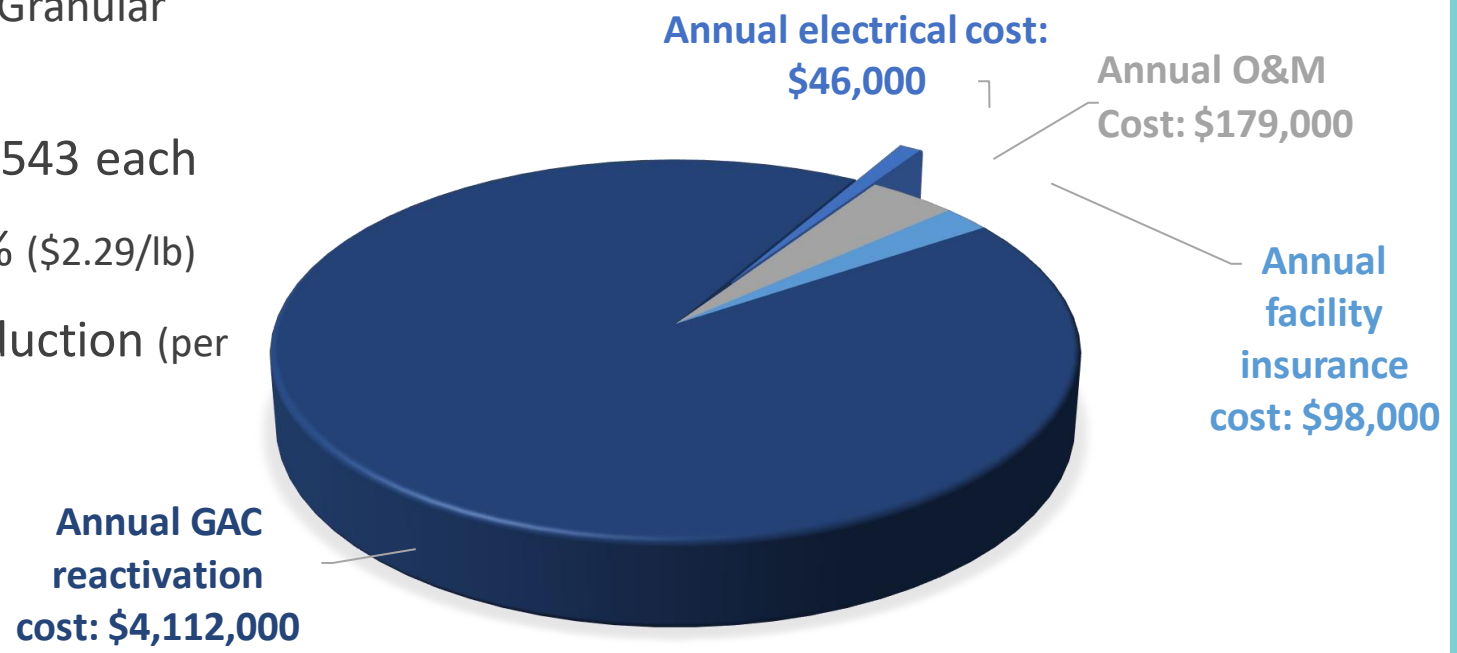






GAC Operating Costs – By the Numbers

- The operating cost for the new Granular Activated Carbon facility
  - Reactivation Cost $395,543 each
  - Virgin Makeup up to 15% ($2.29/lb)
  - Transportation Price Deduction (per qualifying contactor)



GAC Operation and Maintenance Costs	Actual Cost
Annual electrical cost	$46,000
Annual O&M cost (labor/other)	$179,000
Annual facility insurance cost	$98,000
Annual GAC reactivation cost	$4,112,000
TOTAL	**$4,435,000**

Key Takeaways

- Design for operational flexibility
- Choose your trigger carefully: Account for public expectations and regulatory expectations, but recognize cost impacts
- Recognize the scale: 8 (dry) to 16 (wet) truckloads per basin
- Impact to average customer's bill: $5.88/month or $70.56/year
- Have a robust PFAS monitoring and communications plan

Questions?