



CENTRALIZED TREATMENT OPTIONS AND CHALLENGES

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THE CAPE FEAR PUBLIC UTILITY AUTHORITY



- ▶ Established July 1, 2008
- ▶ Self supporting agency
- ▶ Merged water/wastewater utilities of New Hanover County and the City of Wilmington
- ▶ Approximately 68,000 accounts serving over 200,000 customers


CFPUA manages four separate water systems:

- ▶ City of Wilmington, NC
 - Centralized drinking water since the 1900s.
- ▶ New Hanover County, NC
 - Fragmented well systems until Nanofiltration Plant in 2009

 PWS #04-65-010
Sweeney Water Treatment Plant

 PWS #04-65-232
Nano Filtration Plant

 PWS #04-65-191
Monterey Heights

 PWS #04-65-137
US 421 System



WATER SOURCES



Surface Water
Source: Cape Fear River



Ground Water
Source: Pee Dee & Castle Hayne Aquifers

CFPUA SWEENEY WATER TREATMENT PLANT



- ▶ Sweeney WTP Advanced Treatment Process
 - Ozonation
 - Enhanced Coagulation (SuperPulsator Clarifiers)
 - Biological Filtration
 - UV Disinfection
 - Finished Water Aeration (Project Completion – Summer 2016)
 - Elevated Storage Tank Aeration (Completion – Spring 2016)

SWEENEY UPGRADE 2012



SWEENEY: IMPROVEMENTS TO DRINKING WATER

- ▶ Overall Water Quality Improvements
 - Ozonation
 - Enhanced Coagulation (SuperPulsator Clarifiers)
 - Biological Filtration
 - UV Disinfection
 - Finished Water Aeration (Project Completion – Summer 2016)
 - Elevated Storage Tank Aeration (Completion – Spring 2016)
- ▶ Designed for 21st Century Challenges

<ul style="list-style-type: none"> • Trihalomethanes (THM) • Haloacetic Acids (HAA) • Algae / Algal Toxins 	<ul style="list-style-type: none"> • UCMR-3, 4, 5 • EDCs / PCPs • Perfluorinated Compounds
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SWEENEY: PROCESS CHALLENGES

- ▶ Source Water Quality
 - Not in complete control – “run of the river”
 - Highly variable
- ▶ Capital / Maintenance Costs
 - Plant upgrades
 - System / instrumentation maintenance
- ▶ Security Concerns
 - SCADA security & cyber security
 - Plant site, critical process & chemicals
- ▶ Future regulated contaminants
 - Advanced treatment strategies necessary
 - Plant monitoring / lab testing costs
 - Increased focus on distribution system attenuation & monitoring

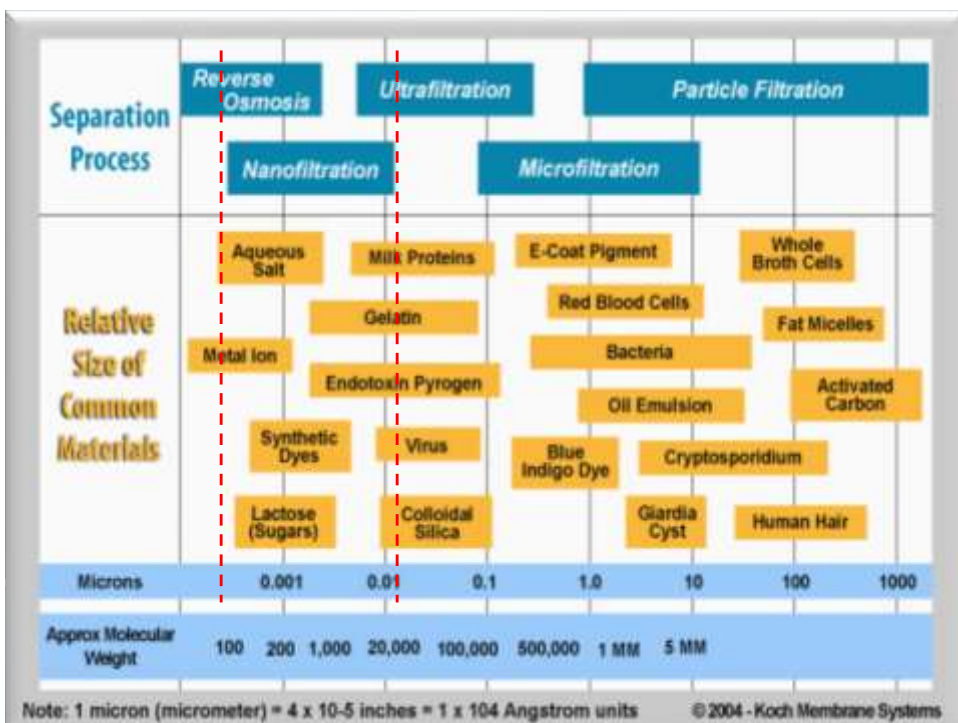


CFPUA NANOFILTRATION COMPLEX





- ▶ Advanced Membrane Technology
 - Nano-filtration membrane
- ▶ 25 Groundwater Wells
- ▶ Source Aquifers
 - Castle Hayne
 - Pee Dee
- ▶ 6.0 MGD Capacity
- ▶ Two 1.0 MG Clearwells



NANO: IMPROVEMENTS TO DRINKING WATER

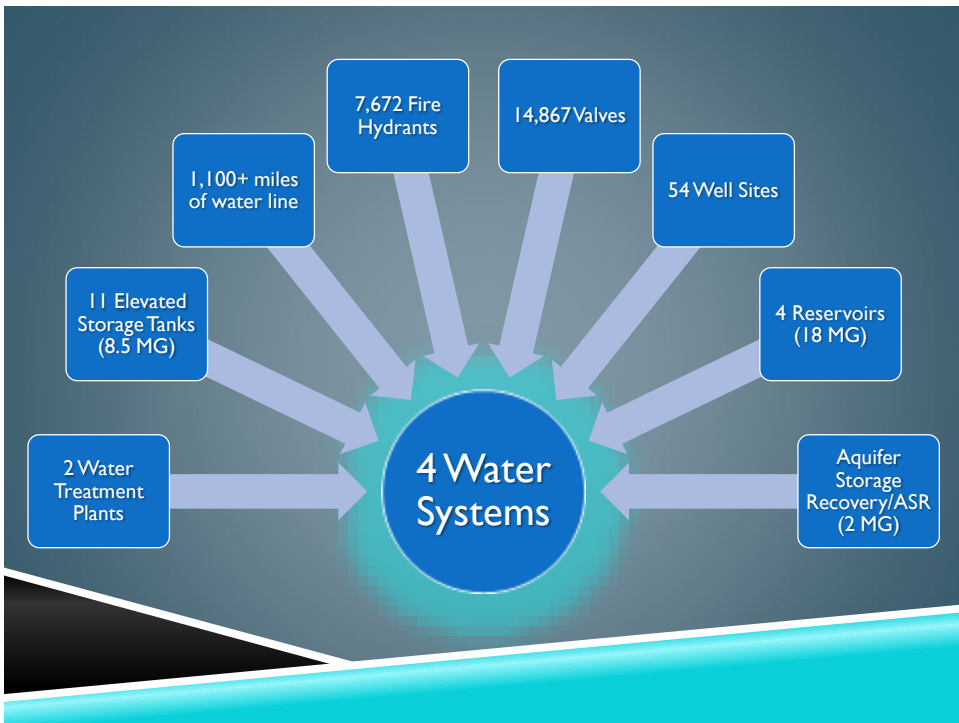
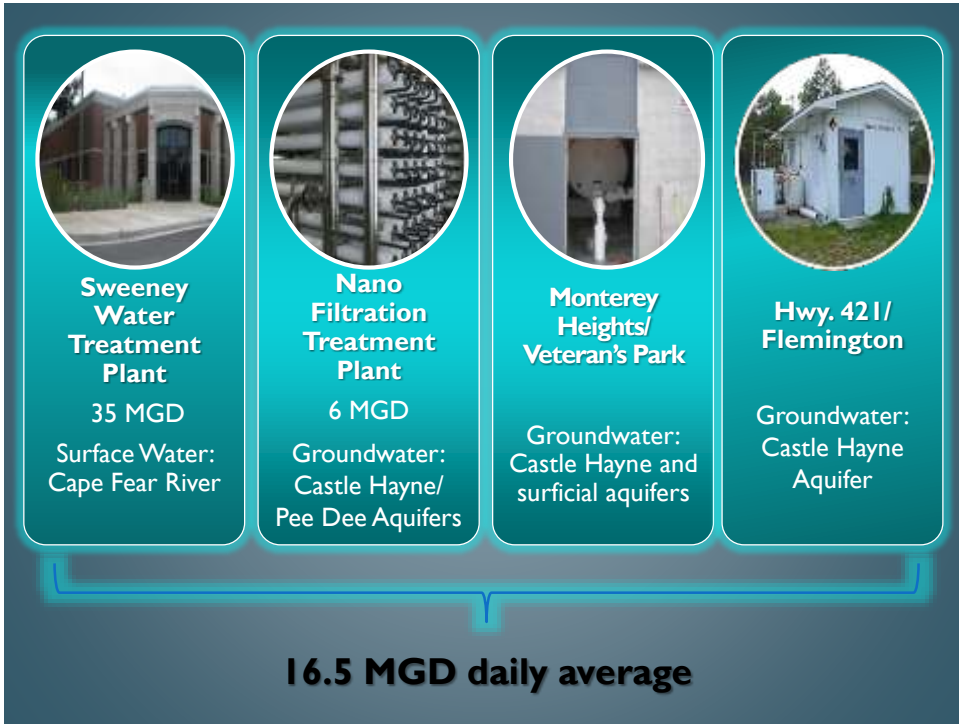
- ▶ Overall Water Quality Improvements
 - Reduction in hardness – discontinue use of home softeners for customers
 - Organics and Inorganics removal
 - Removal of small amount of chlorides (upgrade to RO possible)
 - Reduction in iron & manganese and the occurrence of discolored water
 - Improved taste & odor
 - Addition of blended polyphosphate for corrosion control to prohibit plumbing corrosion
- ▶ Future System Integration:
 - Emergency support for overall system
 - Source of high quality blend water



NANO: PROCESS CHALLENGES

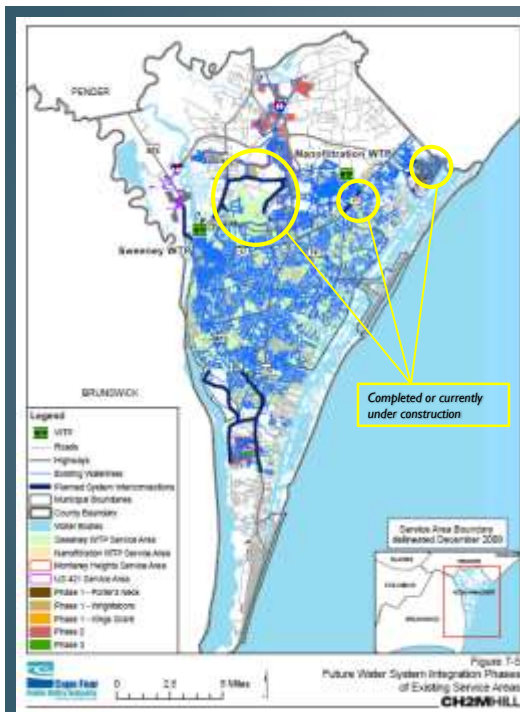
- ▶ Quality/quantity source water
- ▶ Discharge limitations/regulations
- ▶ Higher production cost of same quality
- ▶ Well site security





OPERATING FOUR SYSTEMS IS PROBLEMATIC:

- ▶ No connectivity for demand leveling/event management
- ▶ Lack of consistent water quality
- ▶ Increased Costs
 - Operations
 - Compliance challenges
 - Administrative
 - Capital Costs
 - Rate Increases



WATER SUPPLY INTEGRATION

- ▶ Emergency Interconnections
- ▶ Partial System Integration
 - System Interconnects
- ▶ Complete System Integration
 - Phase 1
 - Phase 2
 - Phase 3

System and plant expansions and upgrades are important to, centralized treatment, regional growth and to CFPUA's commitment to stewardship, sustainability, and service.

