

2023

Drinking Water Quality Report



Cape Fear
Public Utility Authority



A Message from the Executive Director

Every year, Cape Fear Public Utility Authority is required to produce this Drinking Water Quality Report, also known as the Consumer Confidence Report. It outlines how CFPUA meets regulatory requirements for drinking water to protect public health and provide the highest-quality product to our customers. Consider this our water report card. I am proud to share that in 2023, CFPUA once again met or exceeded the many state and federal standards for drinking water.

This is the first report reflecting results from the consolidated CFPUA-Wilmington Water System, which serves more than 90 percent of CFPUA’s customers. In January 2023, CFPUA completed a project to combine its two largest water distribution systems: the Sweeney Water System, which sources water from the Cape Fear River, and the Richardson Water System, which sources water from the Castle Hayne and Pee Dee aquifers.

Most customers in this newly consolidated system continue to receive water from the same source and CFPUA water treatment plant that they always have. Combining the systems significantly simplified operations and will increase overall system reliability during events like droughts or system maintenance.

This is also the first report reflecting a full year of operating deep-bed, granular activated carbon (GAC) filters at our Sweeney Water Treatment Plant. CFPUA undertook this project to address the per- and polyfluoroalkyl substances (PFAS) contaminating the Sweeney Plant’s source water: the Cape Fear River.

As you will see from the results, these filters continue to perform exceptionally well, consistently reducing PFAS concentrations in treated drinking water far below standards proposed by U.S. Environmental Protection Agency (EPA) for six compounds, including GenX. I encourage you to read more on page 11 of this report.

As a result of EPA’s proposal to establish legally enforceable levels of PFAS in drinking water, thousands of U.S. drinking water providers are preparing for or contemplating upgrades to their own treatment facilities to address PFAS. Throughout much of 2023 we were proud to welcome hundreds of legislators, state and federal regulators, researchers, and environmental advocates from across the nation to tour the Sweeney Plant and see firsthand how CFPUA *already* has addressed PFAS contamination in the Cape Fear River. Many across the nation now admire the accomplishments of our community and seek to emulate our successes.

I hope you find this report useful and encourage you to share it with your friends and neighbors.

Kenneth Waldroup, P.E.



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Share this Report

This report contains information on drinking water that may be of interest to your family, friends, and others you know in our community.

To share a digital copy of this report, use the following link:

www.CFPUA.org/2023WaterQuality

To receive a printed copy of this report, please email:

Communications@cfpu.org. You may also contact us on our social media accounts to ask for a copy of this report.



En Español

Para obtener una copia del informe en Español sobre los resultados más recientes de la calidad del agua publicado por el Cape Fear Public Utility Authority, **llame al 910-332-6550**.

Your Drinking Water System

This report includes drinking water quality results for CFPUA's two water distribution systems*.

Results from this testing period found that our drinking water continues to meet or exceed federal and state regulatory standards. These standards are designed to protect public health and the taste and appearance of drinking water.

Cape Fear Public Utility Authority is required by the Environmental Protection Agency to produce an Annual Water Quality Report for its customers. However, this report goes beyond basic requirements and provides you with valuable information on the water systems that serve your home, workplace, and the places you visit for entertainment and community services. We hope you find it informative and educational.

If you have any questions about this report or concerning your water, please contact **CFPUA's Water Treatment Division at 910-332-6739**.

We want our valued customers to be informed about their water utility. If you want to learn more, consider attending an **Authority Board Meeting on the second Wednesday of each month at 9 a.m. in Room 138 of the New Hanover County Government Center Complex**.

**A note about CFPUA's drinking water systems: In January 2023, CFPUA completed consolidation of its Richardson and Sweeney water systems. These were formerly separate systems served by the Richardson Water Treatment Plant and the Sweeney Water Treatment Plant, respectively. The consolidated system receives water from both threatment plants and is now known as the CFPUA-Wilmington system, PWS ID# 04-65-010.*

Monterey Heights continues to operate as a separate water system.



New Hanover County

CFPUA-Wilmington Water System
(CFPUA/Wilmington system PWS ID# 04-65-010): CFPUA's main water system, which distributes water within the City of Wilmington, Murrayville, Northchase, Porters Neck, Castle Hayne, Ogden, Monkey Junction/Independence Boulevard (including Pine Valley, Echo Farms, Barclay, Crosswinds, and Lake Brewster), Kings Grant, Tarin Woods, River Lights, U.S. 421, and Wrightsboro.

This system relies on two water treatment plants: the 44-million gallons per day (MGD) capacity Sweeney Water Treatment Plant, which sources water from the Cape Fear River, and the 7 MGD Richardson Water Treatment Plant, which sources groundwater from the Castle Hayne and PeeDee aquifers.

Monterey Heights Water System
(CFPUA/Monterey Heights system PWS ID# 04-65-137): Distributes water to approximately 5 percent of CFPUA customers in southern New Hanover County in areas including Monterey Heights, Woodlake, Laurel Ridge, Sentry Oaks, and Veterans Park. Groundwater is sourced from the Castle Hayne aquifer and distributed by a series of wells. This system does not rely on a centralized water treatment plant.

Protecting Your Water

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791).

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Cape Fear Public Utility Authority is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking.

If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at www.epa.gov/safewater/lead.

Across the nation, rivers, lakes, streams, ponds, reservoirs, springs, and wells are sources of drinking water (both tap and bottled). As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up contaminants resulting from animal or human activity. Contaminants that may be present in source water include:

- 💧 **Microbial Contaminants**, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, or wildlife.
- 💧 **Inorganic Contaminants**, such as salts and metals, which can be naturally occurring or may result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- 💧 **Pesticides and Herbicides**, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- 💧 **Organic Chemical Contaminants**, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production and may also come from gas stations, urban stormwater runoff, and septic systems.
- 💧 **Radioactive Contaminants**, which can be naturally occurring or may be the result of oil and gas production and mining activities.

To ensure that tap water is safe to drink, EPA prescribes regulations that limit the amounts of certain contaminants in water provided by public water systems. FDA regulations establish limits for substances in bottled water to provide protection for public health.



Lead and Home Plumbing

Lead in drinking water has been a concern in the water and wastewater industries for decades. The primary sources of lead in drinking water are corrosion in drinking water pipes and household plumbing and appliances maintained by homeowners.

In 1991, the EPA introduced the Lead and Copper Rule (LCR) to ensure public water suppliers manage lead and copper in drinking water. Public water suppliers have several tools to make sure they are meeting the requirements of this rule. EPA recently revised its LCR, which you can learn more about on page 10 of this report.

To effectively monitor and manage lead and copper in drinking water, public water suppliers often implement corrosion-control measures. CFPUA staff regularly test lead and copper levels in homes and businesses across the service area, and operators introduce orthophosphate into the water systems to line pipes and add more protection.

CFPUA’s corrosion-control program has successfully managed the threat of lead in our drinking water. However, we cannot control the variety of materials used in internal plumbing components—the private parts of water systems that are owned and maintained by home and business owners.

In older areas of New Hanover County, homes may rely on aging plumbing systems that have not been updated to meet newer standards. When internal plumbing components contain lead, residents and customers are more likely to be exposed to these metals as they leach into drinking water from faucets and other plumbing materials.

Reducing Lead Exposure at Home

- **Use only cold water for drinking, cooking, and making baby formula (boiling water does not remove lead from water).**
- **Regularly clean your faucet’s screen (also known as an aerator).**
- **Before use, flush your pipes by running your tap.**
- **Contact CFPUA to learn more about sources of lead and removing lead service lines.**



Water Disinfection and Health Effects

Disinfecting source water is a critical part of any water treatment process. Chlorine and other disinfectants eliminate water-borne pathogens such as Giardia, Cryptosporidium, E. coli, bacteria, and viruses. These microbial pathogens are known to cause gastrointestinal illnesses and other health issues. Because these pathogens are found in the Cape Fear River, the water source for the Sweeney Water Treatment Plant, CFPUA uses UV technology, ozonation, and chlorine to disinfect your water prior to its distribution. Water distributed from the Richardson Plant, which is a low pressure reverse-osmosis membrane treatment plant, and the Monterey Heights system also undergoes chlorine disinfection.

Chlorine treatment has proven to be a transformative achievement in public health. Introduced as the solution to the 1850 cholera epidemic in London, chlorine became a widely used water disinfectant by the 1900s. Chlorine was first used in the United States as a major water disinfectant in 1908 in Jersey City, New Jersey. By 1995, 64% of all community water systems in the country used chlorine to disinfect water.

Unfortunately, chlorine and other disinfectants may cause problems once in the distribution system. They can react with naturally occurring compounds in water to form byproducts such as Trihalomethanes (THM), Haloacetic acids (HAA), Chlorite, and Bromate. According to the EPA, some disinfection byproducts are “suspected to cause bladder cancer and reproductive effects in humans.” To ensure that public water suppliers such as CFPUA provide clean drinking water, the U.S. Environmental Protection Agency (EPA) developed the Stage 2 Disinfection Byproduct rule.

CFPUA developed a plan to not only meet but surpass state and federal regulations. As part of the plan, 5 tank mixers and 17 floating aeration systems have been installed at the Sweeney Plant as well as elevated storage tanks within the Sweeney System. These systems reduce the disinfection byproducts already formed by spraying fine, uniform particles of water into the air. This process allows these volatile compounds to escape into the atmosphere and be removed from customers’ water.

CFPUA also practices routine water system flushing. This helps maintain water pressure and pipe integrity and minimizes the formation of disinfection byproducts. During flushing, water is forced through pipes and out of fire hydrants at a high velocity, removing accumulated mineral sediment until the water is clear. Because disinfection byproducts are more easily formed at high temperatures, CFPUA conducts increased flushing during the summer months. CFPUA conducts sampling to confirm that these protocols effectively reduce disinfection byproducts and ensure compliance with state and federal requirements.

Lead Service Line Inventory

By October 2024, the U.S. Environmental Protection Agency requires every American water system to have completed an inventory of water service lines across its service area. This is to comply with the EPA’s revised Lead and Copper Rule, ensuring that any lead pipes are eliminated from water systems.

The target of the inventory is lead service lines (LSLs). A service line is the pipe that connects a private property to the public water system, meaning part of the pipe is owned by CFPUA, and part is owned by the private property owner. The new Lead and Copper Rule requires water utilities survey both the public and private sides.

CFPUA launched its LSL inventory in 2020, much earlier than required by regulators. Phase 1 of the survey covered 10,500 properties in downtown Wilmington and Sunset Park, the oldest parts of CFPUA’s service area and therefore the most likely to have LSLs. While that phase of the survey found zero LSLs, crews did locate some galvanized pipes, an older style of service line that has a higher chance of having a “gooseneck” fitting – a curved attachment connecting parts of the pipe – made of lead. Out of an abundance of caution, CFPUA is replacing all of these galvanized lines.

That 2020 head-start and the data we gained from Phase 1 of the inventory has allowed CFPUA to capitalize on funding assistance opportunities for our LSL program. In 2023, the State Division of Water Infrastructure awarded CFPUA \$4,161,150 in combined grants and loans for the next steps of our LSL inventory and replacement program. Funding came from the Bipartisan Infrastructure Law and will help us keep program costs low, saving money for our customers.

Of the 30 communities statewide that received funding assistance, CFPUA’s award was the largest.

CFPUA is currently working with our contractor to plan the remaining phases of the LSL inventory. Once the data is in, results of the survey will be published at CFPUA.org.

To learn more about the EPA’s Lead and Copper Rule, visit epa.gov/dwreginfo/lead-and-copper-rule.

Year One of Sweeney’s GAC Filters

The first full year of operating Granular Activated Carbon (GAC) filters at CFPUA’s Sweeney Water Treatment Plant is on the books, and the numbers show the filters are exceeding proposed regulations on PFAS.

CFPUA brought the GAC filters online in October 2022, significantly enhancing the Sweeney Plant’s ability to treat drinking water for PFAS compounds. Since then, the filters have consistently removed PFAS to at or near non-detectable levels, including the six compounds in EPA’s first proposed regulation for PFAS: GenX, PFOS, PFOA, PFNA, PFBS, and PFHxS.

CFPUA’s PFAS sampling does show some compounds periodically breaking through the filters. These “ultra-short-chain” PFAS, so named because of the small number of carbon chains in their molecules, are among the hardest to treat. Little to no health information exists for these ultra-short-chain PFAS, which include PFPrA and PFMOAA.

In 2023, CFPUA asked the N.C. Department of Environmental Quality to prioritize research of these PFAS. We also began exchanging GAC media in our filters more frequently, removing old media and sending it offsite to be cleaned. These more frequent exchanges have resulted in higher PFAS removal rates, but increased the filters’ yearly operating costs by about \$1 million.

We are also working with the N.C. Collaboratory and others to investigate the potential of other treatment media that could be used at Sweeney, along with the GAC, to provide additional treatment benefits for these harder-to-treat PFAS.

CFPUA continues to publish the latest PFAS sampling results on our website at [CFPUA.org/Results](https://www.cfpua.org/Results).



Crews removing GAC media from a filter at CFPUA’s Sweeney Water Treatment Plant in 2023.

Glossary of Drinking Water Terms

Action Level (AL) - The concentration of a contaminant that, if exceeded, triggers treatment or other requirements that a water system must follow.

Level 1 Assessment - A Level 1 assessment is a study of the water system to identify potential problems and determine (if possible) why total coliform bacteria have been found in our water system.

Locational Running Annual Average (LRAA) - The average of sample analytical results for samples taken at a particular monitoring location during the previous four calendar quarters under the Stage 2 Disinfectants and Disinfection Byproducts Rule.

Maximum Contaminant Level (MCL) - The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

Maximum Contaminant Level Goal (MCLG) - The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Maximum Residual Disinfection Level (MRDL) - The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfection Level Goal (MRDLG) - The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Million Fibers per Liter (MFL) - Million fibers per liter is a measure of the presence of asbestos fibers that are longer than 10 micrometers.

Nephelometric Turbidity Unit (NTU) - Nephelometric turbidity unit is a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

Not-Applicable (N/A) - Information not applicable/not required for that particular water system or for that particular rule.

Non-Detects (ND) - Laboratory analysis indicates that the contaminant is not present at the level of detection set for the particular methodology used.

Parts per million (ppm) or Milligrams per liter (mg/L) - One part per million corresponds to one minute in two years or a single penny in \$10,000.

Parts per billion (ppb) or Micrograms per liter (ug/L) - One part per billion corresponds to one minute in 2,000 years, or a single penny in \$10,000,000.

Parts per trillion (ppt) or Nanograms per

liter (ng/L) - One part per trillion corresponds to one minute in 2,000,000 years, or a single penny in \$10,000,000,000.

Parts per quadrillion (ppq) or Picograms per liter (picograms/L) - One part per quadrillion corresponds to one minute in 2,000,000,000 years or one penny in \$10,000,000,000,000.

Picocuries per liter (pCi/L) - Picocuries per liter is a measure of the radioactivity in water.

Secondary Maximum Contaminant Level (SMCL) - The highest level of a contaminant that is allowed in drinking water under the EPA's National Secondary Drinking Water Regulations. These non-mandatory regulations provide standards for aesthetic considerations in water, such as taste, color, and odor. These contaminants are not considered to present a risk to human health.

Treatment Technique (TT) - A required process intended to reduce the level of a contaminant in drinking water.



2023 Drinking Water Quality Results – PWS ID# 04-65-010, CFPUA-Wilmington Water System

We routinely monitor for over 150 contaminants in your drinking water according to Federal and State laws. The tables below list all the drinking water contaminants that we detected in the last round of sampling for each particular contaminant group. The presence of contaminants does not necessarily indicate that water poses a health risk. Unless otherwise noted, the data presented in this table is from testing done January 1 through December 31, 2023. The EPA and the State allow us to monitor for certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. Some of the data, though representative of the water quality, is more than one year old.

Microbiological | Inorganic Contaminants | Other Disinfection Byproducts | Disinfection Residuals Summary

Contaminant (units)	Contaminant Type	Reporting Basis	Your Water	Sample Date	MCL/ MRDL Violation	Range Low - High	MCLG/ MRDLG	MCL/ MRDL	Likely Source of Contamination
Total Coliform Bacteria	Microbiological Contaminants in the Distribution System	N/A	N/A	2023	N/A	N/A	N/A	TT*	Naturally present in the environment
E. coli	Microbiological Contaminants in Distribution System	Number of Positive/Present Samples	1	2023	NO	N/A	0	**	Human and animal fecal waste
Fluoride (ppm)	Inorganic Contaminants	Highest Compliance Result	0.65	2021 2022 2023	NO	0.1 – 0.65	4	4	Erosion of natural deposits; water additive that promotes strong teeth; discharge from fertilizers and aluminum factories
Bromate (ppb)	Other Disinfection Byproducts	Highest Quarterly Running Annual Average (RAA)	0.39	2023	NO	ND – 4.70	0	10	Byproduct of drinking water disinfection
Chlorine (ppm)	Disinfection Residuals Summary	Highest Running Annual Average	1.06	2023	NO	0.44 – 1.87	4	4	Water additive used to control microbes

*If a system collecting 40 or more samples per month finds greater than 5% of monthly samples are positive in one month, an assessment is required.

**Routine and repeat samples are total coliform-positive and either is *E. coli*-positive or system fails to take repeat samples following *E. coli*-positive routine sample or system fails to analyze total coliform-positive repeat sample for *E. coli*. If either an original routine sample and/or its repeat sample(s) are *E. coli* positive, a Tier 1 violation exists.

Turbidity

Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indicator of the effectiveness of our filtration system. The turbidity rule requires that 95% or more of the monthly samples must be less than or equal to 0.3 NTU.

Contaminant (units)	Reporting Basis	Your Water	Sample Date	TT Violation	Likely Source of Contamination
Turbidity (NTU)	Highest Single Measurement	0.1	2023	NO ¹	Soil Runoff
Turbidity (NTU)	Lowest Monthly Percent of Sample Meeting Limits	100%	2023	NO ²	Soil Runoff

¹ TT Violation if: Turbidity > 1 NTU.

² TT Violation if: Less than 95% of monthly turbidity measurements are < 0.3 NTU.

Lead & Copper

Contaminant (units)	Reporting Basis	Your Water	Sample Date	# Sites Above AL	MCLG	Action Level	Likely Source of Contamination
Copper (ppm)	90th percentile	0.220	2023	0	1.3	1.3	Corrosion of household plumbing systems; erosion of natural deposits
Lead (ppb)	90th percentile	< 3	2023	0	0	15	Corrosion of household plumbing systems; erosion of natural deposits

Nitrate/Nitrite Contaminants

Contaminant (units)	Sample Date	MCL Violaion	Your Water	Range Low - High	MCLG	MCL	Likely Source of Contamination
Nitrate (as Nitrogen) (ppm)	2023	NO	1.32	ND - 1.32	10	10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits

Water Characteristics Contaminants

Secondary Substances, required by the NC Public Water Supply Section, are substances that affect the taste, odor, and/or color of drinking water. These aesthetic substances normally do not have any health effects and normally do not affect the safety of your water.

Contaminant (units)	Reporting Basis	Your Water	Sample Date	Range Low - High	SMCL
Iron (ppm)	Highest Compliance Result	0.67	2021 2022 2023	ND – 0.67	0.3 mg/L
Manganese (ppm)	Highest Compliance Result	0.023	2021 2022 2023	ND – 0.023	0.05 mg/L
pH (standard units)	Highest Compliance Result	7.6	2021 2022 2023	7.3 – 7.6	6.5 to 8.5
Sodium (ppm)	Highest Compliance Result	37	2021 2022 2023	8.5 – 37	N/A
Sulfate (ppm)	Highest Compliance Result	37	2021 2022 2023	ND – 37	250 mg/L

Total Organic Carbon

Contaminant (units)	Contaminant Type	Reporting Basis	Your Water	Sample Date	TT Violation	Range Low - High	Compliance Method	Likely Source of Contamination
Total Organic Carbon [TOC Treated] (removal ratio)	Disinfection Byproduct Precursors – TOC	RAA Removal Ratio	1.67	2023	NO	100%	Step 1	Naturally present in environment

Disinfection Byproduct Compliance

Some people who drink water containing trihalomethanes (TTHM) in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer. Some people who drink water containing haloacetic acids (HAA5) in excess of the MCL over many years may have an increased risk of getting cancer.

Disinfection Byproduct	Your Water (LRAA)	Date Sampled	MCL Violation	Range Low - High	MCL	Likely Source of Contamination
TTHM (ppb)						Byproduct of drinking water disinfection
B01		2023	NO	3.5 - 13.2	80	
B02		2023	NO	3.0 - 13.4	80	
B03		2023	NO	3.3 - 18.9	80	
B04		2023	NO	3.3 - 15.2	80	
B05		2023	NO	2.9 - 15.8	80	
B06		2023	NO	3.8 - 15.5	80	
B07	31.4*	2023	NO	11.7 - 20.6	80	
B08		2023	NO	3.1 - 14.4	80	
HAA5 (ppb)						Byproduct of drinking water disinfection
B01		2023	NO	ND - 3.0	60	
B02		2023	NO	ND - 2.8	60	
B03		2023	NO	ND - 3.7	60	
B04		2023	NO	ND - 2.5	60	
B05		2023	NO	ND - 3.7	60	
B06		2023	NO	ND - 3.2	60	
B07	5.6*	2023	NO	ND - 3.9	60	
B08		2023	NO	ND - 2.8	60	

*The values under “Your Water (LRAA)” are locational running annual averages. The “Range, Low - High” values represent the lowest and highest individual results at each site sampled in the system. The LRAA values are higher than the “Range, Low – High” values because the LRAA reflects data collected prior to the start-up of the Sweeney GAC facility in 2022, which has resulted in lower disinfection byproducts throughout the system.

Radiological Contaminants

Contaminant (units)	Sample Date		MCL Violation (Y/N)	Your Water	Range Low - High	MCLG	MCL	Likely Source of Contamination
Combined radium (pCi/L)	2016	2020	NO	1.43	ND – 1.43	0	4	Erosion of natural deposits
	2017	2021						
	2019	2023						

Unregulated Contaminants

The purpose of unregulated contaminant monitoring is to assist EPA in determining the occurrence of unregulated contaminants in drinking water and whether future regulations are warranted.

Per- and Polyfluoroalkyl Substances (PFAS) Contaminants, Sweeney and Richardson Water Treatment Plants

PFAS are found in a wide range of consumer products such as cookware, pizza boxes, and stain repellants. Most people have been exposed to PFAS. Certain PFAS can accumulate and stay in the human body for long periods of time. There is evidence that exposure to PFAS can lead to adverse health outcomes in humans.

Several different methods can be used to determine Per- and Polyfluorinated Alkyl Substances (PFAS) levels in water. Each method targets a different list of PFAS compounds and has different quality control requirements, resulting in varying levels of accuracy.

NOTE: In March 2023, the U.S. Environmental Protection Agency (EPA), proposed a National Primary Drinking Water Regulation (NPDWR) for six PFAS compounds. As of the time of this report, the regulation has not been finalized. Visit www.epa.gov/PFAS for more information.

Contaminant (units)	Sample Date	Your Water Average	Range Low - High	Health Information
GenX (ppt)	2023	0.745	ND - 2.81	See note above.
PMPA (ppt)	2023	3.84	ND - 8.82	None
R-EVE (ppt)	2023	0.022	ND - 1.39	None
PEPA (ppt)	2023	0.058	ND - 1.28	None
PFPeA (ppt)	2023	2.24	ND - 6.90	None
6:2 FTS (ppt)	2023	0.142	ND - 9.08	None
PFHxA (ppt)	2023	0.863	ND - 3.27	None
PFBA (ppt)	2023	3.17	ND - 9.08	None
PFBS (ppt)	2023	0.210	ND - 1.26	See note above.
PFHpA (ppt)	2023	0.009	ND - 0.571	None
PFO2HxA (ppt)	2023	0.500	ND - 3.90	None
PFPrA (ppt)	2023	16.4	ND - 46.4	None
PFMOAA (ppt)	2023	8.45	ND - 20.7	None

1,4-Dioxane

1,4-Dioxane is a likely human carcinogen, according to the U.S. EPA, and has been found in surface and groundwater at sites throughout the United States. The physical and chemical properties and behavior of 1,4-dioxane create challenges for its characterization and treatment. It is highly mobile and does not readily biodegrade in the environment.

Contaminant (units)	Sample Date	Your Water Average	Range Low - High	Health Information
1,4-Dioxane (ppb)	2023	0.4	ND – 1.10	EPA established a 1-day health advisory of 4000 ppb and a 10-day health advisory of 400 ppb for a 10-kg child and a lifetime health advisory of 200 ppb in drinking water

UCMR5 – EPA’s Fifth Unregulated Contaminant Monitoring Rule

Contaminant (units)	Sample Date	Your Water Average	Range Low - High	Health Information
PFPeA (ppt)	2023	4.40	ND – 4.40	None
PFEESA (ppt)	2023	ND	ND	None
GenX (ppt)	2023	ND	ND	See note on page 17.
NFDHA (ppt)	2023	ND	ND	None
PFOS (ppt)	2023	ND	ND	See note on page 17.
PFUnA (ppt)	2023	ND	ND	None
PFPeS (ppt)	2023	ND	ND	None
6:2 FTS (ppt)	2023	ND	ND	None
PFHxA (ppt)	2023	ND	ND	None
PFODoA (ppt)	2023	ND	ND	None
PFOA (ppt)	2023	ND	ND	See note on page 17.
PFDA (ppt)	2023	ND	ND	None
PFHxS (ppt)	2023	ND	ND	See note on page 17.
PFBA (ppt)	2023	ND	ND	None
PFBS (ppt)	2023	ND	ND	See note on page 17.
PFHpA (ppt)	2023	ND	ND	None
PFHPpS (ppt)	2023	ND	ND	None

Contaminant (units)	Sample Date	Your Water Average	Range Low - High	Health Information
PFNA (ppt)	2023	ND	ND	See note on page 17.
PFMPA (ppt)	2023	ND	ND	None
8:2 FTS (ppt)	2023	ND	ND	None
9CI-PF3ONS (ppt)	2023	ND	ND	None
4:2 FTS (ppt)	2023	ND	ND	None
11CI-PF3OudS (ppt)	2023	ND	ND	None
PFMBA (ppt)	2023	ND	ND	None
ADONA (ppt)	2023	ND	ND	None
NMeFOSAA (ppt)	2023	ND	ND	None
NEtFOSAA (ppt)	2023	ND	ND	None
PFTA (ppt)	2023	ND	ND	None
PFTrDA (ppt)	2023	ND	ND	None
Lithium (ppb)	2023	ND	ND	Potential adverse impacts to renal and neurological systems.

Additional Water Characteristics Contaminants

Contaminant (units)	Sample Date	Your Water Average	Range Low - High
Hardness (ppm)	2023	42	21 - 58
Alkalinity (ppm)	2023	41	20 -61
Conductivity (umhos/cm)	2023	173	71 - 293
Total Dissolved Solids (ppm)	2023	103	47 -155
Ortho Phosphate (ppm)	2023	1.17	0.89 - 1.44
Total Phosphate (ppm)	2023	1.43	1.04 - 1.87
Chlorate (ppb)	2023	23.5	17 - 30
Perchlorate (ppb)	2023	0.044	ND - 0.120
Chloride (ppm)	2023	9.3	4.8 - 20

Per- and Polyfluoroalkyl Substances (PFAS) Contaminants, Emergency Wells

CFPUA maintains numerous emergency groundwater wells that can supplement the water system during events such as droughts, system maintenance, or major leaks caused by damage to infrastructure. These wells do not continuously feed water to the drinking water system. The results in the chart below are for emergency ground-water wells that were activated to the system during 2023.

Contaminant (units)	Sample Date	Your Water Average	Range Low - High	Health Information
GenX (ppt)	2023	0.456	ND - 3.77	See note on page 17.
PFOA (ppt)	2023	0.477	ND - 1.72	See note on page 17.
PFOS (ppt)	2023	0.561	ND - 2.21	See note on page 17.
PMPA (ppt)	2023	0.686	ND - 5.19	None
R-PSDA (ppt)	2023	0.126	ND - 2.26	None
PFPeA (ppt)	2023	0.473	ND - 1.70	None
PFHxA (ppt)	2023	0.418	ND - 1.71	None
PFHxS (ppt)	2023	0.372	ND - 1.55	See note on page 17.
PFBA (ppt)	2023	0.368	ND - 1.83	None
PFBS (ppt)	2023	0.204	ND - 1.30	See note on page 17.
PFHpA (ppt)	2023	0.169	ND - 0.955	None
PFO2HxA (ppt)	2023	3.88	ND - 28.6	None
PFO3OA (ppt)	2023	0.990	ND - 8.61	None
PFO4DA (ppt)	2023	0.071	ND - 1.27	None
PFPrA (ppt)	2023	1.22	ND - 14.4	None
PFMOAA (ppt)	2023	13.4	ND - 101	None
NVHOS (ppt)	2023	0.319	ND - 2.94	None

Source Water Assessment Program (SWAP)

As part of the Source Water Assessment Program (SWAP), the North Carolina Department of Environmental Quality's Public Water Supply Section conducted assessments for all drinking water sources across North Carolina. The purpose of the assessments was to determine the susceptibility of each drinking water source (well or surface water intake) to Potential Contaminant Sources (PCSs). The results of the assessment are available in SWAP Assessment Reports that include maps, background information, and a relative susceptibility rating of Higher, Moderate, or Lower.

The relative susceptibility rating of each source for the Sweeney Water System was determined by combining the contaminant rating (number and location of PCSs within the assessment area) and the inherent vulnerability rating (i.e., characteristics or existing conditions of the well or watershed and its delineated assessment area). The assessment findings are summarized in the table below:

Source Name	Susceptibility Rating	SWAP Report Date
Cape Fear River Kings Bluff	Moderate	2020
Lower Cape Fear Water and Sewer Authority Kings Bluff	Moderate	2020
Well 31: Queens Point	Moderate	2020
Well 34: Sea Spray	Higher	2020
Well 38: Fox Croft	Moderate	2020
Well 34: Masonboro Forest	Lower	2020
Well 44: Sea Pines	Lower	2020
Well 45: Beacon Woods	Lower	2020
Well 15: Elkmont	Moderate	2020
Well 19: Marsh Oaks	Moderate	2020
Well 20: Old Marsh Oaks	Higher	2020
Well 28: M	Higher	2020
Well 4: White Road	Moderate	2020
Well A: Castle Hayne	Higher	2020
Well A: PeeDee	Higher	2020
Well B: Castle Hayne	Higher	2020
Well B: PeeDee	Higher	2020

Source Name	Susceptibility Rating	SWAP Report Date
Well C: Castle Hayne	Moderate	2020
Well C: PeeDee	Moderate	2020
Well F: Castle Hayne	Lower	2020
Well F: PeeDee	Lower	2020
Well G: Castle Hayne	Moderate	2020
Well G: PeeDee	Moderate	2020
Well H: Castle Hayne	Moderate	2020
Well H: PeeDee	Moderate	2020
Well I: Castle Hayne	Lower	2020
Well I: PeeDee	Lower	2020
Well J: Castle Hayne	Lower	2020
Well J: PeeDee	Lower	2020
Well K: Castle Hayne	Moderate	2020
Well K: PeeDee	Moderate	2020
Well L: Castle Hayne	Moderate	2020
Well L: PeeDee	Moderate	2020
Well P: PeeDee	Moderate	2020
Well Q: PeeDee	Higher	2020
Well 29: N	Higher	2020
Well 30: O	Moderate	2020

The complete SWAP Assessment report for the CFPUA-Wilmington System may be viewed on the Web at: www.ncwater.org/?page=600. Note that because SWAP results and reports are periodically updated by the PWS Section, the results available on this web site may differ from the results that were available at the time this report was prepared. If you are unable to access your SWAP report on the web, you may mail a written request for a printed copy to: Source Water Assessment Program – Report Request, 1634 Mail Service Center, Raleigh, NC 27699-1634, or email requests to swap@ncdenr.gov. Please indicate the system name and number (CFPUA/Wilmington System, PWS ID# 04-65-010) and provide your name, mailing address, and phone number.

If you have any questions about the SWAP report, please contact the Source Water Assessment staff at 919-707-9098.

It is important to understand that a susceptibility rating of “higher” does not imply poor water quality, only the system’s potential to become contaminated by PCSs in the assessment area.



Sweeney Water Treatment Plant
Plant Type: Surface Water
Source: Cape Fear River
Capacity: 44 MGD



Richardson Water Treatment Plant
Plant Type: Groundwater
Source: Castle Hayne and Pee Dee Aquifers
Capacity: 7 MGD

2023 Drinking Water Quality Results – PWS ID# 04-65-137, Monterey Heights Water System

We routinely monitor for over 150 contaminants in your drinking water according to Federal and State laws. The tables below list all the drinking water contaminants that we detected in the last round of sampling for each particular contaminant group. The presence of contaminants does not necessarily indicate that water poses a health risk. Unless otherwise noted, the data presented in this table is from testing done January 1 through December 31, 2023. The EPA and the State allow us to monitor for certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. Some of the data, though representative of the water quality, is more than one year old.

Microbiological | Inorganic Contaminants

Contaminant (units)	Contaminant Type	Reporting Basis	Your Water	Sample Date	MCL Violation	Range Low - High	MCLG	MCL	Likely Source of Contamination
Total Coliform Bacteria	Microbiological Contaminants in the Distribution System	N/A	N/A	2023	N/A	N/A	N/A	TT*	Naturally present in the environment
E. coli	Microbiological Contaminants in the Distribution System	Number of Positive/Present Samples	0	2023	NO	N/A	0	**	Human and animal fecal waste
Fluoride (ppm)	Inorganic Contaminants	Highest Compliance Result	0.25	2022 2023	NO	ND – 0.25	4	4	Erosion of natural deposits; water additive that promotes strong teeth; discharge from fertilizers and aluminum factories

*If a system collecting 40 or more samples per month finds greater than 5% of monthly samples are positive in one month, an assessment is required.

**Routine and repeat samples are total coliform-positive and either is *E. coli*-positive or system fails to take repeat samples following *E. coli*-positive routine sample or system fails to analyze total coliform-positive repeat sample for *E. coli*. If either an original routine sample and/or its repeat sample(s) are *E. coli* positive, a Tier 1 violation exists.

Lead & Copper

Contaminant (units)	Reporting Basis	Your Water	Sample Date	# Sites Above AL	MCLG	Action Level	Likely Source of Contamination
Copper (ppm)	90th percentile	0.290	2022	0	1.3	1.3	Corrosion of household plumbing systems; erosion of natural deposits
Lead (ppb)	90th percentile	< 3.0	2022	0	0	15	Corrosion of household plumbing systems; erosion of natural deposits

Disinfection Residuals Summary

Contaminant (units)	Reporting Basis	Your Water	Sample Date	MRDL Violation	Range Low - High	MRDLG	MRDL	Likely Source of Contamination
Chlorine (ppm)	Highest Running Annual Average	1.10	2023	NO	0.36 – 1.82	4	4	Water additive used to control microbes

Disinfection Byproduct Compliance

Some people who drink water containing trihalomethanes (THM) in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer. Some people who drink water containing haloacetic acids (HAA5) in excess of the MCL over many years may have an increased risk of getting cancer.

Disinfection Byproduct	Your Water (LRAA)	Date Sampled	MCL Violation	Range Low - High	MCL	Likely Source of Contamination
THM (ppb)						Byproduct of drinking water disinfection
B01	71.9	2023	NO	71.9	80	
B02		2023	NO	43.7	80	
HAA5 (ppb)					60	Byproduct of drinking water disinfection
B01	34	2023	NO	34	60	
B02		2023	NO	29	60	

Water Characteristics Contaminants

Secondary Substances, required by the NC Public Water Supply Section, are substances that affect the taste, odor, and/or color of drinking water. These aesthetic substances normally do not have any health effects and normally do not affect the safety of your water.

Contaminant (units)	Reporting Basis	Your Water	Sample Date	Range Low - High	SMCL
Iron (ppm)	Highest Compliance Result	0.120	2022 2023	ND – 0.120	0.3 mg/L
Manganese (ppm)	Highest Compliance Result	0.029	2022 2023	ND – 0.029	0.05 mg/L
pH (standard units)	Highest Compliance Result	8.0	2022 2023	7.4 – 8.0	6.5 to 8.5
Sodium (ppm)	Highest Compliance Result	100	2022 2023	7.3 - 100	N/A

Radiological Contaminants

Contaminant (units)	Sample Date	MCL Violation (Y/N)	Your Water	Range Low - High	MCLG	MCL	Likely Source of Contamination
Alpha emitters (pCi/L) (Gross Alpha Excluding Radon and Uranium)	2018 2019 2020 2021 2022 2023	NO	6.29	ND – 6.29	0	15	Erosion of natural deposits

Unregulated Contaminants

The purpose of unregulated contaminant monitoring is to assist EPA in determining the occurrence of unregulated contaminants in drinking water and whether future regulations are warranted.

Per- and Polyfluoroalkyl Substances (PFAS)

PFAS are found in a wide range of consumer products such as cookware, pizza boxes, and stain repellants. Most people have been exposed to PFAS. Certain PFAS can accumulate and stay in the human body for long periods of time. There is evidence that exposure to PFAS can lead to adverse health outcomes in humans.

Several different methods can be used to determine Per- and Polyfluorinated Alkyl Substances (PFAS) levels in water. Each method targets a different list of PFAS compounds and has different quality control requirements, resulting in varying levels of accuracy.

NOTE: In March 2023, the U.S. Environmental Protection Agency (EPA), proposed a National Primary Drinking Water Regulation (NPDWR) for six PFAS compounds. As of the time of this report, the regulation has not been finalized. Visit www.epa.gov/PFAS for more information.

Contaminant (units)	Sample Date	Your Water Average	Range Low - High	Health Information
PFOS (ppt)	2023	0.115	ND- 0.910	See note above.
PFOA (ppt)	2023	0.378	ND - 1.27	See note above.
PFPeA (ppt)	2023	0.384	ND - 1.28	None
PFPeS (ppt)	2023	0.207	ND - 1.72	None
PFHxA (ppt)	2023	0.306	ND - 1.17	None
PFHxS (ppt)	2023	0.951	ND - 6.76	See note above.
PFBA (ppt)	2023	0.329	ND - 1.60	None
PFBS (ppt)	2023	0.637	ND - 3.68	See note above.
PFHpA (ppt)	2023	0.097	ND - 0.690	None
PFO2HxA (ppt)	2023	0.361	ND - 2.68	None
PFPrA (ppt)	2023	0.600	ND - 8.35	None
PFMOAA (ppt)	2023	2.470	ND - 12.5	None

Additional Water Characteristics Contaminants

Contaminant (units)	Sample Date	Your Water Average	Range Low - High
Hardness (ppm)	2023	76	23 - 130
Alkalinity (ppm)	2023	79	21 - 245
Conductivity (umhos/cm)	2023	220	171 - 585
Ortho Phosphate (ppm)	2023	1.06	0.80 - 2.11

Source Water Assessment Program (SWAP)

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The relative susceptibility rating of each source for the Monterey Heights Water System was determined by combining the contaminant rating (number and location of PCSs within the assessment area) and the inherent vulnerability rating (i.e., characteristics or existing conditions of the well or watershed and its delineated assessment area). The assessment findings are summarized in the table below:

Source Name	Susceptibility Rating	SWAP Report Date
Hillside	Moderate	2020
Lords Creek	Lower	2020
Well # 1	Higher	2020
Well # 2	Moderate	2020
Well # 3	Moderate	2020

The complete SWAP Assessment report for Monterey Heights Water System may be viewed on the Web at: www.ncwater.org/?page=600. Note that because SWAP results and reports are periodically updated by the PWS Section, the results available on this web site may differ from the results that were available at the time this CCR was prepared. If you are unable to access your SWAP report on the web, you may mail a written request for a printed copy to: Source Water Assessment Program – Report Request, 1634 Mail Service Center, Raleigh, NC 27699-1634, or email requests to swap@ncdenr.gov. Please indicate the system name and number (CFPUA/Monterey Heights System, PWS ID# 04-65-137) and provide your name, mailing address, and phone number. If you have any questions about the SWAP report, please contact the Source Water Assessment staff at 919-707-9098.

It is important to understand that a susceptibility rating of “higher” does not imply poor water quality, only the system’s potential to become contaminated by PCSs in the assessment area.



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