2022 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 2022, CFPUA once again met or exceeded the many state and federal standards for drinking water.

Next year, 2023's report will look somewhat different. That's because at the start of 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. This year's report lists water quality results for the Sweeney and Richardson systems separately, while future reports will reflect the system combination.

I encourage you to read more about the Sweeney-Richardson system combination on page 10 of this report.

This is also the last report that will include results from before the completion of CFPUA's Sweeney Treatment Enhancements Project. In October 2022, we brought new deep-bed, granular activated carbon (GAC) filters online at the Sweeney Water Treatment Plant, which produces about 80 percent of the water CFPUA provides to customers. Since then, these filters have been reducing per- and polyfluoroalkyl substances (PFAS) in treated drinking water to at or near non-detectable levels.

This report includes PFAS sampling results for January through December 2022, including several months prior to the new filters coming online. To see more current PFAS results from the Sweeney Plant, visit our website at CFPUA.org/Sweeney. You may also read more about the filters themselves on page 11 of this report.

For CFPUA and our customers, 2022 was a momentous year, and we look forward to continuing to provide you clearly better water in the years to come. We 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/2022WaterQuality

To receive a printed copy of this report, please email:
Communications@cfpua.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 three 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 interesting 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 the Richardson and Sweeney water systems. The consolidated system will operate as CFPUA/Wilmington system PWS ID# 04-65-010. Future Drinking Water Quality Reports will reflect this change. Monterey Heights continues to operate as a separate water system.*

See page 10 of this report for more information.

New Hanover County

Richardson Water System

(CFPUA/NHC system PWS ID# 04-65-232): CFPUA's second-largest system, which distributes water in northern New Hanover County in areas including Murrayville, Northchase, Porters Neck, and parts of Castle Hayne and Ogden. Water is provided via the Richardson Water Treatment Plant using groundwater sourced from the Castle Hayne and PeeDee aquifers.

Sweeney Water System

(CFPUA/Wilmington system PWS ID# 04-65-010): CFPUA's largest system, which distributes water within the City of Wilmington, parts of the Ogden area, 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. Water is provided via the Sweeney Water Treatment Plant using source water from the Cape Fear River.

Monterey Heights Water System

(CFPUA/Monterey Heights system PWS ID# 04-65-137): CFPUA's smallest system, which distributes water 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 differs from our two other drinking water systems in that it 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 corrossion 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.

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. The Richardson and Monterey Heights water systems also undergo 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.

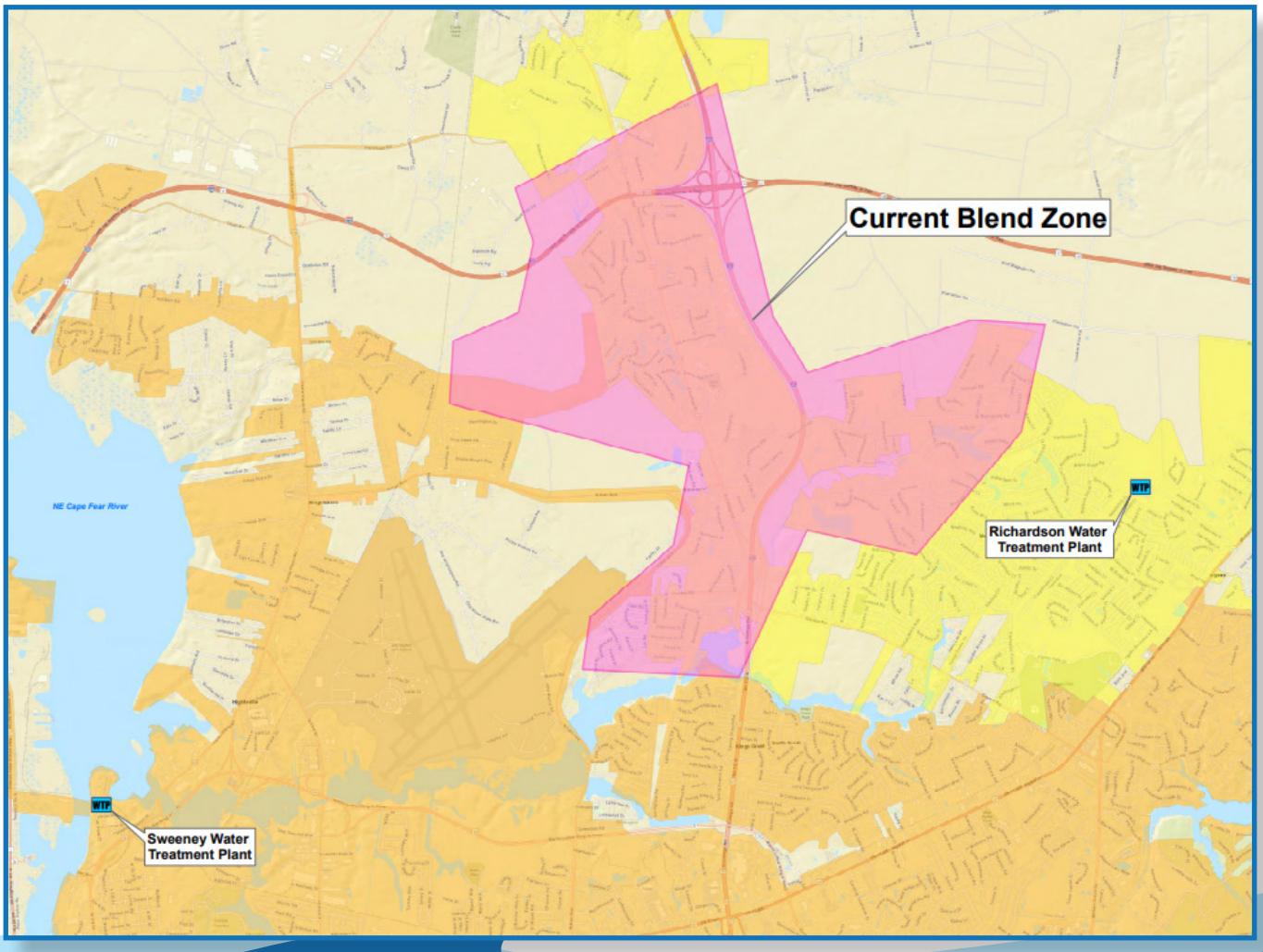
A Tale of Two Systems

When CFPUA was created in 2007-08, one of the organization's first major projects was completing our community's newest water treatment plant. The Nanofiltration Water Treatment Plant (known today as the Richardson Water Treatment Plant), was a project started by New Hanover County but handed off to CFPUA upon its formation.

In 2009, staff cut the ribbon on the state-of-the-art plant, which sourced groundwater from the Castle Hayne and Pee Dee aquifers and served customers in the fast-growing Ogden, Porters Neck, and Murrayville areas. Over the years, the plant's capacity has been expanded from 6 million gallons per day (MGD) to 7 MGD and had its primary water treatment technology upgraded from nanofiltration to low-pressure reverse osmosis.

The Richardson System has always had interconnections available to CFPUA's much larger Sweeney System. These interconnections were installed to allow the Sweeney System to supplement Richardson's in the event of a major drought, water line break, or other event that could affect the supply of water. Over the years, however, these interconnections rarely required long-term activation.

Water quality differences like mineral content or water hardness between the Sweeney and Richardson distribution systems has always been an area for compatibility improvements. From 2017 on, CFPUA also was grap-



pling with the issue of PFAS contamination in the Sweeney water supply. While Richardson's nanofiltration filters, and later its reverse-osmosis filters, were able to remove PFAS, the Sweeney Plant lacked technologies to effectively treat for PFAS, despite being one of the state's most sophisticated water treatment plants.

CFPUA's Water Treatment and Environmental Management staff has worked diligently in recent years to get water treatment characteristics compatible across the Sweeney and Richardson systems. In 2022, new granular activated carbon filters to remove PFAS compounds came online at the Sweeney Plant.

After months of testing in partnership with the N.C. Department of Environmental Quality, CFPUA received approval to consolidate the systems. In January 2023, specific interconnections were opened, and the consolidation was complete.

Connecting these systems has significantly simplified CFPUA operations and will help ensure a consistent supply during events such as droughts or system maintenance, all while providing customers the same high-quality, water they expect. Some customers in an area known as the "blending zone" *(see the map to the left)* may be receiving some combination of Sweeney and Richardson water, but most customers are still receiving water from the same plant source that served them prior to 2023.

This year's Drinking Water Quality Report covers the operating period before the systems were connected, so it reflects results from the formerly separate Sweeney and Richardson systems. Results from the newly combined CFPUA/Wilmington system (PWS ID# 04-65-010) will be reflected in 2023's report.

New Sweeney Filters Online

New filters to remove GenX and other PFAS from drinking water came online in October 2022. These deep-bed, granular activated carbon (GAC) filters are removing PFAS to at or near non-detectable levels.

Visit **CFPUA.org/Sweeney** to learn more about the project, and check out some highlights below:

Sweeney GAC Filters, By the Numbers

- 8 deep-bed filters
- Capacity to treat 44 MGD (million gallons of water per day)
- Nearly 3,000,000 combined pounds of GAC between all filters
- Filters have a combined volume of an Olympic-sized swimming pool
- $43 million construction cost
- GAC will be replaced approximately every 200-300 days, allowing filters to continue removing as much PFAS as possible from drinking water

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.

2022 Drinking Water Quality Results – PWS ID# 04-65-010, Sweeney 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, 2022. 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	2022	N/A	N/A	N/A	TT*	Naturally present in the environment
E. coli	Microbiological Contaminants in Distribution System	Number of Positive/Present Samples	0	2022	NO	N/A	0	**	Human and animal fecal waste
Fluoride (ppm)	Inorganic Contaminants	Highest Compliance Result	0.63	2020 2021 2022	NO	0.1 – 0.63	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)	0.23	2022	NO	ND – 1.7	0	10	Byproduct of drinking water disinfection
Chlorine (ppm)	Disinfection Residuals Summary	Highest Running Annual Average	1.18	2022	NO	0.20 – 2.70	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	0.24	2022	NO[1]	Soil Runoff
Turbidity (NTU)	Lowest Monthly Percent of Sample Meeting Limits	100%	2022	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	0.150	2020	0	1.3	1.3	Corrosion of household plumbing systems; erosion of natural deposits
Lead (ppb)	90th percentile	< 3	2020	0	0	15	Corrosion of household plumbing systems; erosion of natural deposits

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	1.7	2022	NO	69% – > 86%	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		2022	NO	0.6 – 43.2	80	
B02		2022	NO	0.6 – 38.4	80	
B03		2022	NO	2.3 – 41.1	80	
B04		2022	NO	3.4 – 44.3	80	
B05		2022	NO	3.3 – 43.3	80	
B06		2022	NO	2.4 – 50.5	80	
B07	44.1	2022	NO	6.9 – 65.4	80	
B08		2022	NO	1.3 – 45.5	80	
HAA5 (ppb)						Byproduct of drinking water disinfection
B01		2022	NO	ND – 10.7	60	
B02		2022	NO	ND – 9.5	60	
B03		2022	NO	ND – 8.3	60	
B04		2022	NO	ND – 9.7	60	
B05		2022	NO	ND – 8.1	60	
B06		2022	NO	ND – 10.8	60	
B07	14.7	2022	NO	ND – 12.5	60	
B08		2022	NO	ND – 8.9	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	0.53	2020 2021 2022	ND – 0.53	0.3 mg/L
Manganese (ppm)	Highest Compliance Result	0.017	2020 2021 2022	ND – 0.017	0.05 mg/L
pH (standard units)	Highest Compliance Result	8.1	2020 2021 2022	6.9 – 8.1	6.5 to 8.5
Sodium (ppm)	Highest Compliance Result	37	2020 2021 2022	12 – 37	N/A
Sulfate (ppm)	Highest Compliance Result	46	2020 2021 2022	ND – 46	250 mg/L

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.

1,4-Dioxane

1,4-Dioxane is a likely human carcinogen, according to the U.S. EPA, and has been found in 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)	2022	0.75	0.17 – 2.10	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

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.

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)	2022	2.11	ND – 11.1	See note above.
PFOS (ppt)	2022	1.06	ND – 3.57	See note above.
PFOA (ppt)	2022	1.22	ND – 4.15	See note above.
PMPA	2022	2.48	ND – 10.7	None
PFUdA	2022	0.005	ND – 0.189	None
N-methylperfluoro-1-octanesulfonamidoacetic acid	2022	0.004	ND – 0.152	None
Byproduct 4 (BP4); R-PSDA	2022	2.24	ND – 18.6	None
Byproduct 5 (BP5); Hydrolyzed PSDA	2022	1.52	ND – 16.3	None
Byproduct 6 (BP6); R-PSDCA	2022	0.349	ND – 12.9	None
R-EVE	2022	1.72	ND – 6.39	None
PEPA	2022	0.507	ND – 2.69	None
PFPeA	2022	3.38	ND – 16.1	None
PFPeS	2022	0.168	ND – 1.15	None
6:2 FTS	2022	0.011	ND – 0.172	None
FBSA	2022	0.017	ND – 0.256	None
PFHxA	2022	2.43	ND – 9.93	None
PFDA	2022	0.023	ND – 0.211	None

Contaminant (units)	Sample Date	Your Water Average	Range Low - High	Health Information
PFHxS	2022	0.741	ND – 2.88	See note above.
PFBA	2022	2.39	ND – 9.08	None
PFBS	2022	1.30	ND – 5.69	See note above.
PFHpA	2022	0.920	ND – 3.75	None
PFHpS	2022	0.006	ND – 0.140	None
PFNA	2022	0.070	ND – 0.386	See note above.
PFMPA	2022	0.001	ND – 0.041	None
PFO2HxA	2022	2.23	ND – 12.4	None
PFO3OA	2022	0.236	ND – 2.67	None
PPF Acid	2022	8.17	ND – 25.3	None
PFMOAA	2022	8.5	ND – 30.1	None
Hydro-EVE Acid	2022	0.007	ND – 0.264	None
NVHOS	2022	0.981	ND – 5.09	None

Additional Water Characteristics Contaminants

Contaminant (units)	Sample Date	Your Water Average	Range Low - High
Hardness (ppm)	2022	28	21 - 32
Alkalinity (ppm)	2022	23	15 - 28
Conductivity (umhos/cm)	2022	189	145 - 239
Total Dissolved Solids (ppm)	2022	125	95 - 158
Ortho Phosphate (ppm)	2022	1.22	0.92 – 1.41
Total Phosphate (ppm)	2022	1.28	1.10 – 1.74
Chlorate (ppb)	2022	33.5	17 - 50
Perchlorate (ppb)	2022	0.049	ND – 0.087

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

The complete SWAP Assessment report for the Sweeney 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 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.

Kings Bluff, near Lock & Dam 1 in Bladen County, is the site of the main intakes serving the Sweeney Water Treatment Plant.

2022 Drinking Water Quality Results – PWS ID# 04-65-232, Richardson 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, 2022. 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	2022	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	2022	NO	N/A	0	**	Human and animal fecal waste
Barium (ppm)	Inorganic Contaminants	Highest Compliance Result	0.0094	2020 2021 2022	NO	ND – 0.0094	2	2	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Chromium (ppb)	Inorganic Contaminants	Highest Compliance Result	1.8	2020 2021 2022	NO	ND – 1.8	100	100	Discharge from steel and pulp mills; erosion of natural deposits
Fluoride (ppm)	Inorganic Contaminants	Highest Compliance Result	0.60	2020 2021 2022	NO	ND – 0.60	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	0.22	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	1.24	2022	NO	0.41 – 1.87	4	4	Water additive used to control microbes

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	36.5	2022	NO	36.5	80	
B02		2022	NO	35.3	80	
HAA5 (ppb)						Byproduct of drinking water disinfection
B01	20.5	2022	NO	20.5	60	
B02		2022	NO	14.6	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	0.41	2020 2021 2022	ND – 0.41	0.3 mg/L
Manganese (ppm)	Highest Compliance Result	0.021	2020 2021 2022	ND – 0.021	0.05 mg/L
pH (standard units)	Highest Compliance Result	7.5	2020 2021 2022	7.3 – 7.5	6.5 to 8.5
Sodium (ppm)	Highest Compliance Result	32	2020 2021 2022	8.5 – 32	N/A
Sulfate (ppm)	Highest Compliance Result	16	2020 2021 2022	ND – 16	250 mg/L

Additional Water Characteristics Contaminants

Contaminant (units)	Sample Date	Your Water Average	Range Low - High
Hardness (ppm)	2022	52	40 - 78
Alkalinity (ppm)	2022	56	45 - 69
Conductivity (umhos/cm)	2022	138	108 - 166
Total Dissolved Solids (ppm)	2022	91	71 - 110
Chloride (ppm)	2022	8.5	6.9 – 9.9
Ortho Phosphate (ppm)	2022	1.15	0.46 – 1.53
Total Phosphate (ppm)	2022	1.09	0.40 – 1.47

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.

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)	2022	0.154	ND – 0.773	See note above.
PFOS (ppt)	2022	0.709	ND – 2.31	See note above.
PFOA (ppt)	2022	0.494	ND – 1.96	See note above.
PMPA (ppt)	2022	0.093	ND – 1.39	None
PFPeA (ppt)	2022	0.602	ND – 2.07	None
PFPeS (ppt)	2022	0.075	ND – 0.743	None
6:2 FTS (ppt)	2022	0.026	ND – 0.244	None
PFHxA (ppt)	2022	0.621	ND – 2.24	None
PFHxS (ppt)	2022	0.815	ND – 2.82	See note above.
PFBA (ppt)	2022	0.258	ND – 1.28	None
PFBS (ppt)	2022	0.445	ND – 1.49	See note above.
PFHpA (ppt)	2022	0.385	ND – 1.49	None
PFNA (ppt)	2022	0.007	ND – 0.112	See note above.
PFO2HxA (ppt)	2022	1.01	ND – 5.08	None
PFO3OA (ppt)	2022	0.189	ND – 1.49	None
PPF Acid (ppt)	2022	9.14	ND – 21.2	None
PFMOAA (ppt)	2022	5.52	ND – 26.0	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 Richardson 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 and continued on the following page:

Source Name	Susceptibility Rating	SWAP Report Date
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
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

Source Name	Susceptibility Rating	SWAP Report Date
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 Richardson 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 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/NHC System, PWS ID# 04-65-232) 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.

2022 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, 2022. 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	2022	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	2022	NO	N/A	0	**	Human and animal fecal waste
Fluoride (ppm)	Inorganic Contaminants	Highest Compliance Result	0.30	2020 2022	NO	ND – 0.30	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	0.95	2022	NO	0.22 – 1.76	4	4	Water additive used to control microbes

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	41.9	2022	NO	41.9	80	
B02		2022	NO	35.3	80	
HAA5 (ppb)					60	Byproduct of drinking water disinfection
B01	20.0	2022	NO	20.0	60	
B02		2022	NO	17.8	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	0.20	2020 2022	ND – 0.20	0.3 mg/L
Manganese (ppm)	Highest Compliance Result	0.031	2020 2022	ND – 0.031	0.05 mg/L
pH (standard units)	Highest Compliance Result	8.0	2020 2022	7.2 – 8.0	6.5 to 8.5
Sodium (ppm)	Highest Compliance Result	39	2020 2022	7.1 - 39	N/A

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.

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)	2022	0.167	ND – 1.37	See note above.
PFOA (ppt)	2022	0.182	ND – 0.881	See note above.
PFPeA (ppt)	2022	0.371	ND – 1.47	None
PFPeS (ppt)	2022	0.205	ND – 2.03	None
6:2 FTS (ppt)	2022	0.022	ND – 0.303	None
PFHxA (ppt)	2022	0.350	ND – 1.83	None
PFHxS (ppt)	2022	0.918	ND – 7.02	See note above.
PFBA (ppt)	2022	0.322	ND – 1.87	None
PFBS (ppt)	2022	0.604	ND – 4.98	See note above.
PFHpA (ppt)	2022	0.151	ND – 1.25	None
PFO2HxA (ppt)	2022	0.157	ND – 2.20	None
PPF Acid (ppt)	2022	1.36	ND – 6.67	None
PFMOAA (ppt)	2022	1.73	ND – 12.2	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 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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