

## 2020 SOURCE WATER RISK AND RESILIENCY PLAN

### Introduction

In 2014, North Carolina House Bill 894: An Act to Improve Source Water Protection was signed into law. The law was passed after large river spills in West Virginia and North Carolina affected source waters for nearby drinking water systems. The law was written to include all public water suppliers that rely on surface waters, affecting small and large utilities alike.

The concept of the law is simple but important: It requires water utilities to open communication lines with upstream dischargers and industries, and to build protocol for staff at the water plants should a spill occur. In a contamination event, the time that might be saved by giving an upstream discharger a direct number to call or by training staff on proper protocol could make a significant difference in building an effective response.

At Cape Fear Public Utility Authority (CFPUA), plans to address contamination events are critical to the resiliency of our daily operations. Our intake is the last on the Cape Fear River, downstream of hundreds of dischargers, industrial areas, and municipalities. Our largest water distribution system — which serves the local hospital, university, and all of the downtown district — relies on the river to produce an average of 16 million gallons of drinking water per day. In short: Our community and our economy depend on the Cape Fear River.

In preparing this plan, CFPUA staff posed hypothetical worst-case scenarios and ensured CFPUA had protocol to respond. The process also highlighted the legislation's limitations. As a public water supplier, CFPUA is unable to enforce this law — the potential contaminant sources (PCSs) identified are not required by law to communicate with us. Additionally, while the law is designed to address acute contamination events, it does little to encourage public water suppliers to prepare for chronic challenges to source water protection like emerging contaminants and the impacts of climate change.

The plan that follows is the result of months of effort from staff across the organization: plant operators, emergency response staff, and experts in environmental management and geographic information systems (GIS). Staff has identified, and attempted to contact, over 150 PCSs that have the potential to impact CFPUA source water and ensured that protocol is in place to address these scenarios. Finally, the plan outlines additional source water threats that CFPUA is preparing for and partnerships the organization hopes to build to increase overall watershed resilience.

In 2018, America's Water Infrastructure Act was signed into law. This federal law requires community drinking water systems of a certain size to review their emergency response plans every five years. CFPUA intends to use this plan as evidence of that review and, as a result, this plan is intended to be a living document.

In addition, this plan will be revised as additional threats to our source waters are identified or when the status of previously identified PCSs changes. Updated versions of the plan will be posted to the CFPUA website and shared internally with staff in the water treatment and water quality divisions.

## Threats to Source Water

The Cape Fear River crosses eastern North Carolina for approximately 200 miles and meets the Atlantic Ocean in Southport, NC. Throughout its course, the river supplies water for a variety of municipal, industrial, and agricultural practices, bolstering its economic importance, but also increasing its vulnerability to pollution.

Staff has identified three categories of potential threats to CFPUA source waters: Acute Threats (Accidents and Malevolent Events); Acute Threats (Natural Events); and Chronic Threats. Each category requires different planning and response strategies, and most threats will necessitate coordination throughout the watershed to address them properly.

### Acute Threats – Accidents and Malevolent Events

Acute Accidents and Malevolent Events are the kind of threats that spurred House Bill 894's development. These threats are typified by events such as train derailments and major industrial spills into the Cape Fear River. These events may last anywhere from a few hours to a few days.

To prepare for and respond to these events, CFPUA:

- Monitors water quality at the intake
- Has the option of closing the intake until the contamination passes
- Can implement emergency conservation protocol
- Can optimize use of storage tanks and system interconnects

### Acute Threats – Natural Events

Acute Natural Events are contamination events caused by short-term changes in the environment. These threats vary widely and can range from severe algal blooms to heavy precipitation events and flash droughts that degrade water quality.

To prepare for and respond to these events, CFPUA:

- Monitors water quality at the intake
- Monitors environmental indicators across the state
- Maintains emergency conservation protocol
- Is increasing the resiliency of its infrastructure
- Uses advanced treatment techniques at the Sweeney Water Treatment Plant

### Chronic Threats

The Cape Fear River, and similar waterways, are impacted by long-term problems that can degrade water quality or impact water quantity. These problems often occur over long periods of time, making them difficult to monitor and respond to. Chronic threats faced by CFPUA are issues such as: emerging contaminants and unregulated runoff; the impacts of climate change; and the potential for Inter Basin Transfers upstream of our intake. To view CFPUA sampling results visit our [Emerging Contaminants](#) and [Drinking Water Quality](#) pages.

To prepare for and respond to these events, CFPUA:

- Participates in watershed-wide groups and partnerships
- Keeps up with the latest research on treatment techniques, environmental change, and federal and state regulations
- Comments on potential permitting changes that may impact our operations
- Increases resiliency of infrastructure and systems

## Emergency Response Plans

In the event CFPUA needs to respond quickly to river contamination, staff would refer to one of the below Incident Action Plans (IAP) or Standard Operating Protocols (SOP):

### Public Information and Policy Procedure:

- Directs internal communication procedures for customer notifications as required by Public Notification Rule

### Critical Customer Call List:

- Lists contact information for CFPUA customers that service vulnerable populations (hospice and nursing homes), are critical to community resiliency (fire departments), or demand large volumes of water to sustain their operations (UNCW)

### Water System Contamination:

- Contains three IAPs depending on whether the contamination is possible, credible, or has been confirmed

### Water Supply Interruption:

- Referred to if interruptions have occurred due to longer-term events such as drought or acute loss of one source

### Water Emergency Advisory Stages:

- Outlines the stages of CFPUA water conservation protocol to be implemented depending on CFPUA operating conditions such as drought advisories and water conditions

### Water Emergency Management Plan:

- Action plan for complying with the CFPUA Emergency Water Conservation Ordinance

### Algal Blooms:

- Outlines monitoring guidelines and responses to algal blooms of varying severity

### 2018 Water System Interconnects Map:

- Identifies locations of interconnects to help redistribute water throughout all three of CFPUA's water systems to maintain water supply during a shortage or other event.

The plans and protocols discussed above include EPA-approved strategies from documents such as the Environmental Protection Agency's (EPA) "Effective Risk and Crisis Communication during Water Security Emergencies," and "Critical Information Policies for Water Utilities," which helps utilities identify and manage potentially sensitive information.

### Closing the Intake

CFPUA uses two intakes near Lock and Dam #1 in the Cape Fear River: The Lower Cape Fear Water & Sewer Authority intake and CFPUA's Kings Bluff Pump Station. In the event of an emergency, both can be closed remotely from the Sweeney Water Treatment Plant until the contamination passes. Both can also be closed manually at several points, including from the main intake valve at the Sweeney Plant. Another option would

be to divert, isolate, or blow-off water at various points along the transmission line before a contamination reaches the Sweeney Plant. If CFPUA had to close an intake, the following would occur:

- Treatment processes would cease at the Sweeney Plant
- Total clear well capacity would be utilized until empty
- All interconnects would open
- CFPUA's two groundwater systems would produce at full capacity

CFPUA water systems could sustain themselves for approximately 36 to 48 hours with a 10 percent margin of error. During this time, mandatory water conservation measures would be enacted to help retain maximum water supply during the event. Detailed conservation procedures and implementation triggers are outlined in the CFPUA Water Emergency Management Plan.

## Communications

All public notices and media communications regarding a contamination incident will be conducted by the Public Information Officer (PIO) or a designated staff member. Utility staff has produced pre-formatted media releases and distribution lists for multiple incident types, ensuring that the public is adequately informed through multiple channels. Information sharing partnerships exist with local radio stations, news outlets, and government agencies. Additionally, information regarding a spill and any contaminant properties will be made available on the CFPUA website (<https://www.cfpua.org/>) and accessible through social media. CFPUA also may partner with New Hanover County Emergency Management to use the county's automated telephone notification system to distribute advisories, as well as recording information for use on the CFPUA Customer Information Line.

After initial notifications have been released, designated personnel will monitor social media outlets for information requests. Additional updates will be provided as the situation progresses via media outlets and the utility website. Samples are taken frequently during contamination events to monitor contaminant concentrations, providing data to support decisions-making strategies.

In the event of a continuous or especially lengthy spill, or low storage levels at the start of the incident response, updates may also be provided addressing water supply levels. The tone of messages encouraging water conservation will change according to the severity of a water supply threat.

## Methodology

According to the Safe Drinking Water Act Amendments of 1996, all states must establish a Source Water Assessment Program (SWAP) and provide public water systems with findings that could impact their source waters. North Carolina House Bill 894 recommends identifying the SWRRP's area of outreach by using the geographic radius surrounding the raw water intake provided by the North Carolina Division of Water Resources (now North Carolina Department of Environmental Quality) SWAP Report.

CFPUA's SWAP report identified four PCSs within a 10-mile radius that could threaten our source water with acute contamination. However, given our current understanding of the distance contaminants can travel and the public concern around chronic threats to drinking water like Per- and Polyfluoroalkyl Substances (PFAS), we decided to shape the area of outreach in our SWRRP to include contaminant sources up to Fayetteville, North Carolina. This extended the area of outreach to approximately 45 miles upstream of CFPUA's raw water intake. The extended outreach area and PCSs are shown in a series of maps in Appendix C.

Additionally, in 2019, new language in America's Water Infrastructure Act was adopted by the North Carolina Department of Environmental Quality. As a result, water systems were asked to include all *known*

contaminant sources that affect their raw water. In response, staff added nine additional NPDES Wastewater Treatment Facility sites where sampling has indicated their discharge affects the raw water at CFPUA’s intake. These PCSs are outside of the Source Water Risk and Resiliency Area (SWRRPA) and extend up to 160 miles above of CFPUA’s raw water intake (see Appendix C to view maps).

### PCS Risk Rating Rubric

The SWRRPA includes a variety of PCSs that can either individually or collectively affect the quality of CFPUA raw water. To better assess these sites, and to prioritize the risk, staff created a Risk Rating Rubric designed to objectively rate the risk associated with each category of PCS. The rubric asked eight general questions that would quantify how severely a PCS could affect the King’s Bluff intake and/or CFPUA drinking water. For questions regarding the Risk Rating Rubric scoring protocol, please contact CFPUA staff at 910-332-6625.

### Data Limitations

The data used in this plan was gathered from the North Carolina Department of Environmental Quality’s GIS Website. Their data is categorized by operation type. The data was downloaded and clipped to the initial CFPUA SWRRP maps. Staff investigated each of the categories in the table below and identified the PCSs that could affect the King’s Bluff raw water intake.

PCS Categories Within SWRRPA	PCS Categories Outside of SWRRPA
Active Permitted Landfills	Brownfield Agreement Sites
Animal Operation Sites	Dry Cleaning Solvent Cleanup Sites
Hazardous Waste Sites	Federal Remediation Branch Sites
Inactive Hazard Sites	Manufactured Gas Plant Sites
NPDES Wastewater Treatment Facility Sites	Military Installations, Ranges, and Training Areas
Pre-Regulatory Landfill Sites	
Regional Underground Storage Tanks	

Table 1. The bolded categories are those identified to contain sites in our SWRRP area of impact and outreach.

NCDEQ datasets provided necessary information that helped staff assess the risk associated with individual PCSs. The data provided general clues to operations onsite and, when mapped, visualized trends and clusters of industries in geographic areas. However, the data had limitations. Some data is suspected to be out-of-date or incomplete, which in turn may affect the quality and accuracy of the risk assessment associated with each PCS. Using the data available, staff created an individual datasheet for each PCS, containing information that may be relevant in the event of a spill (see Appendix B).

### PCS Outreach and Community Feedback

Work began on the SWRRP in May 2018 and was completed as of March 1, 2020. Per SWRRP compliance requirements, staff created a comprehensive plan for communicating with all identified PCSs. Each PCS was contacted via phone, email, letter, or some combination of the three. Each letter or email was accompanied by the contact form (see Appendix D) the PCS should use in the event of a spill or discharge that could reach the Cape Fear River. In a spill event, this form provides the necessary information needed for CFPUA to make timely decisions to protect our customers.

In addition to SWRRP compliance requirements, staff will share this plan with interconnected systems and local stakeholders in a series of public meetings in 2020 (Table 2).

Interconnected Systems	Examples of Stakeholders
Wrightsville Beach	CFPUA Customers
New Hanover Regional Medical Center	Environmental Organizations
Cape Fear Memorial Hospital	City of Wilmington
Veteran’s Hospital	New Hanover County
University of North Carolina Wilmington	Lower Cape Fear Water & Sewer Authority
North Carolina State Port of Wilmington	CFPUA Staff

Table 2. Examples of interconnected systems and stakeholders

Finally, CFPUA intends to share this plan with our customers. To address the community's interest in local water quality, CFPUA has been employing new and innovative communication techniques to reach a larger portion of our customer base. These new techniques include video production, social media outreach, and engaging web content. We intend to use these same techniques to increase awareness of our 2020 Source Water Risk and Resiliency Plan.

To view the interactive web-based version of this report, please visit the Environmental Protection page on the CFPUA website at [www.cfpua.org/624/Environmental-Protection](http://www.cfpua.org/624/Environmental-Protection).

## Acknowledgements

This SWRRP took over two years to complete, and it could not have been done without the hard work and guidance of CFPUA staff and our external partners. The plan's scope extends far beyond the required SWRRP guidelines--a goal that was only achievable with the expertise and input from everyone involved.

We would like to acknowledge the work of the following departments at CFPUA for their contributions to the SWRRP:

- Communications Department
- Environmental Management Department
- Linear Assets & Project Management Department
- Public & Environmental Policy Department
- Treatment & Engineering Department

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  - Bachelor of Science in Environmental Sciences, with concentration in Conservation
- **Bennett Winslow | UNCW Department of Physics**
  - Bachelor of Arts in Physics, with a minor in Environmental Sciences
- **Lauren Whitehouse | UNCW Department of Geosciences & Undergraduate Honors College**
  - Bachelor of Arts in Geoscience, with minors in Geospatial Technology and Environmental Studies

## Appendices

### Appendix A

[Risk Assessment Rubric](#)

### Appendix B

[PCS Data Sheets](#)

### Appendix C

[Maps](#)

### Appendix D

[PCS Contact Form](#)

### Appendix E

[Acronym Definitions](#)