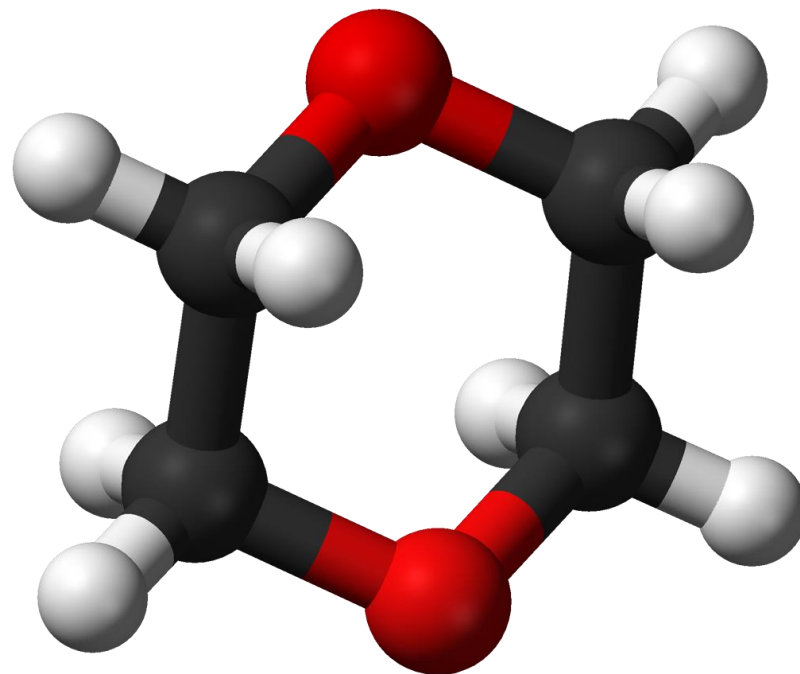


1,4-Dioxane Update

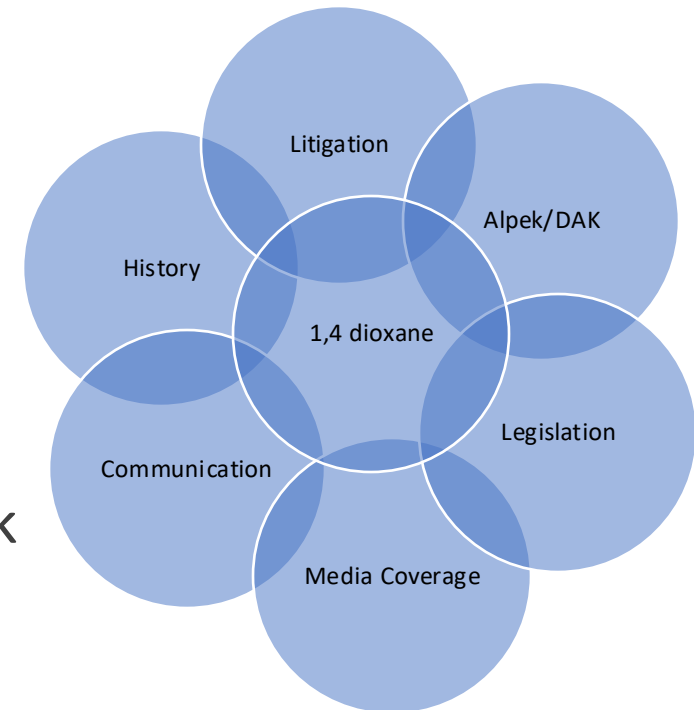
CFPUA Board Meeting

November 12, 2024



Agenda

- ▶ What is 1,4-dioxane?
- ▶ History of contamination in North Carolina and Cape Fear River
- ▶ CFPUA communication and media coverage
- ▶ History of regulatory and legislative actions
- ▶ Quick Overview: City of Asheboro et al. v. NCDEQ
- ▶ Alpek Polyester (formerly DAK Americas) Cedar Creek Site in Fayetteville
- ▶ Potential treatment options and costs
- ▶ Next steps: Petition for Emergency Rulemaking



What is 1,4-Dioxane?

- ▶ A synthetic industrial chemical used in many products, including paint strippers, dyes, and varnishes
- ▶ Also a byproduct in the manufacture of polyethylene terephthalate (PET) plastic
- ▶ Classified by the EPA as “likely to be carcinogenic to humans”
 - ▶ Long-term exposure may cause kidney and liver damage
- ▶ No federal MCL for 1,4-dioxane
 - ▶ EPA lifetime exposure health advisory: 0.35 ppb in drinking water = 1-in-1 million risk of cancer; 35 ppb = 1-in-10,000 risk of cancer
 - ▶ State guidelines range from 0.25 ppb (New Hampshire) to 1 ppb (California)

Source: [EPA](#)



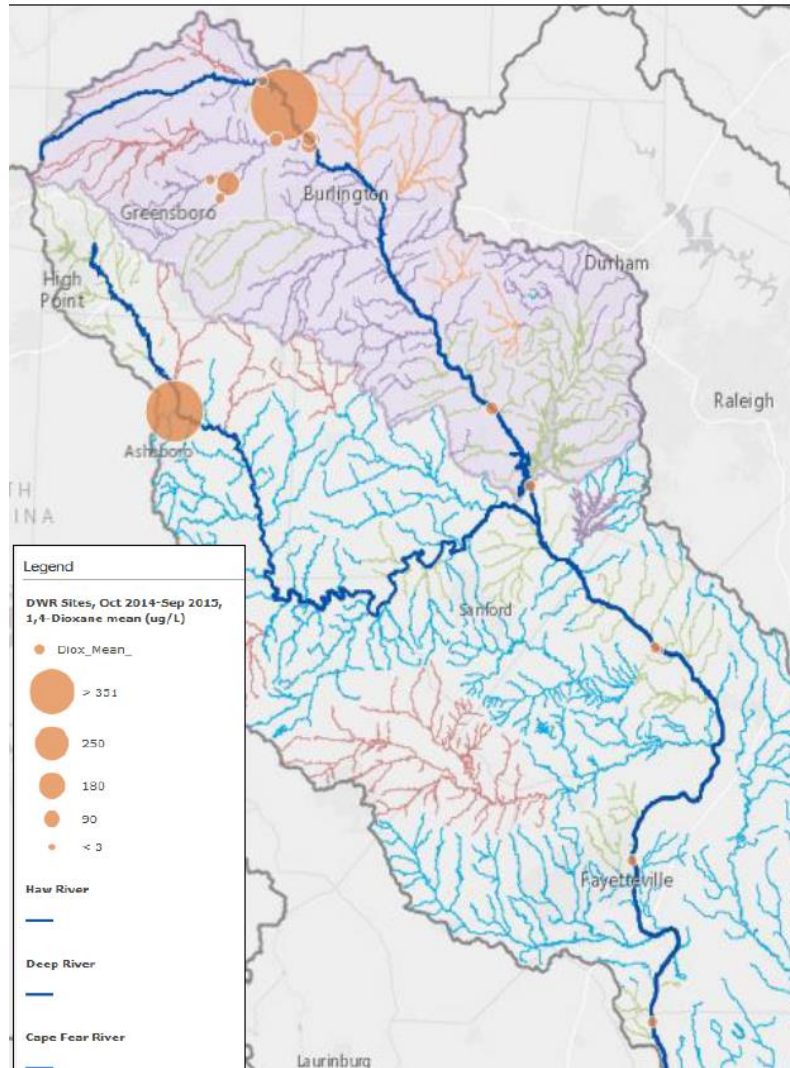
1,4-Dioxane in the Cape Fear River: UCMR3

- ▶ EPA's Unregulated Contaminant Monitoring Rule (UCMR3) collects data every 5 years for contaminants that may present in PWSs that are not regulated by National Primary Drinking Water Regulations but may warrant regulation.
- ▶ Round 3 (UCMR3) contaminant list, with sampling in 2013-14, included 1,4-dioxane. Results showed:
 - ▶ North Carolina had nation's third-highest concentration of 1,4-dioxane
 - ▶ North Carolina had fourth-highest number of water systems impacted by 1,4-dioxane
 - ▶ The Cape Fear River Basin was the state's most-impacted region.

Sources: [EPA](#), [NCDEQ](#)

UCMR3 DATA - ENTRY POINT	
Date	1,4 – dioxane
12/5/13	4.68 µg/L
3/11/14	ND
3/25/14 ¹	-
6/9/14	0.52 µg/L
9/8/14	0.38 µg/L
Average	1.4 µg/L
Range	ND - 4.68

1,4-Dioxane in the Cape Fear River: N.C. studies

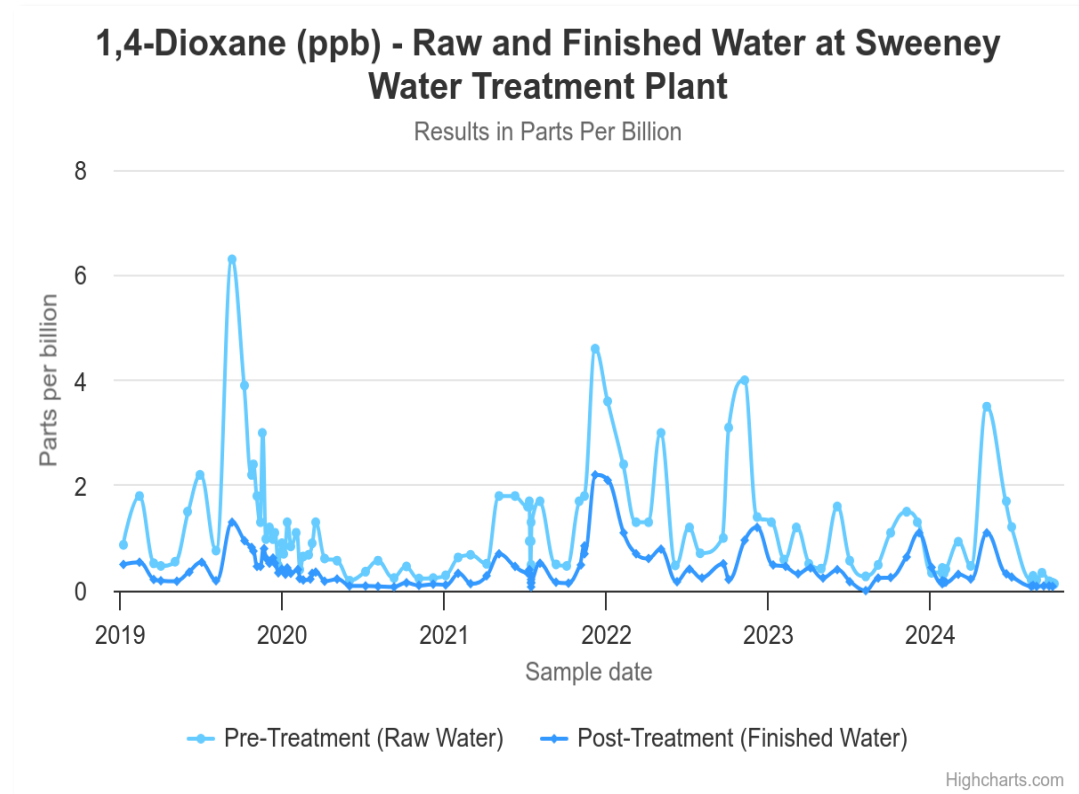


- ▶ 2014: Following the UCMR3 results, NCDEQ (then NCDENR) collaborated with Dr. Detlef Knappe of N.C. State to sample the Cape Fear River Basin and try to pinpoint sources of 1,4-dioxane contamination.
- ▶ Four “hot spots” were identified, with maximum ambient 1,4-dioxane concentrations ranging from 171-1,030 ppb and mean concentrations ranging from 42.6 - 350.5 ppb.
- ▶ Three of these hot spots were downstream of wastewater treatment plants in Asheboro, Greensboro, and Reidsville.

Source: [NCDEQ](https://www.ncdeq.org/)

CFPUA's Transparency and Advocacy

- ▶ CFPUA has published information about 1,4-dioxane levels since as early as 2015, when results from UCMR3 appeared in our [2014 Consumer Confidence Report](#).
- ▶ Results in raw and finished water have been published on CFPUA.org since 2018.
- ▶ Advocacy and public statements include:
 - ▶ [CFPUA Asks NCDEQ to Take Action on 1,4 Dioxane](#) (2018 news release)
 - ▶ [CFPUA responding to elevated 1,4-dioxane levels in Cape Fear River near Greensboro](#) (2021 news release)
 - ▶ [UPDATE: 1,4-dioxane levels below detection limits in initial CFPUA water monitoring](#) (2021 news release)



National, State, and Local Media Coverage

- ▶ Media coverage of 1,4-dioxane contamination in the Cape Fear River preceded the June 2017 article on GenX. For example, in 2016, articles in the [Washington Post](#) and the [North Carolina Health News](#) website featured Knappe's monitoring in the Cape Fear River basin.
- ▶ Local media has consistently covered CFPUA's statements on upstream discharges and advocacy. Examples include:
 - ▶ WECT (2017): [CFPUA hopes to partner with researchers to study other contaminants in water](#)
 - ▶ Port City Daily (2019): [After 1,4-Dioxane spike, CFPUA asks state environmental agency for assistance](#)



NCDEQ's actions related to 1,4-dioxane

- ▶ **November 2016 - October 2017:** DWR secures funding for lab instrumentation capable of analyzing 1,4-dioxane and develops analytical method.
- ▶ **2017:** DEQ requires a number of dischargers, including Asheboro and Greensboro and Dak Americas Cedar Creek Site to monitor for 1,4-dioxane in their permitted discharges.
- ▶ **2019:** DWR notifies 28 POTWs with pretreatment programs (April) and 18 permitted industrial dischargers (October) in the Cape Fear River Basin the State is requiring a 3-month screening of wastewater for certain emerging compounds, including 1,4 dioxane and PFAS.
- ▶ **November 2019:** NCDEQ issues NOVs to the cities of Greensboro and Reidsville after data they submitted showed levels of 1,4-dioxane in their wastewater of 975.5 ppb and 367 ppb, respectively.
- ▶ **March 2021:** N.C. Environmental Management Commission approves Special Order of Consent (SOC) with City of Greensboro to reduce concentrations of 1,4-dioxane in discharges from the T.Z. Osborne WWTP. The SOC also requires Greensboro to notify downstream PWSs when it detects elevated 1,4-dioxane levels in discharges.

Source: [NCDEQ](#)

City of Asheboro et al. v. NCDEQ

- ▶ The cities of Asheboro, Greensboro, and Reidsville filed a contested case in the N.C. Office of Administrative Hearings challenging NCDEQ's authority to: (1) include 1,4-dioxane effluent limits and conditions contained in the City of Asheboro's NPDES renewal permit; and (2) enforce 1,4-dioxane limits and conditions against Greensboro and Reidsville.
 - ▶ Focused on NCDEQ's authority to use a "narrative standard," used to limit specific pollutants with no established numeric criteria.
- ▶ On September 12, 2024, Chief Administrative Law Judge van der Vaart ruled in favor of the Petitioners, holding:
 - ▶ NCDEQ exceeded its authority by using a narrative standard that included limits that were not approved through the rulemaking process; and
 - ▶ The limits within NPDES permits for the cities of Asheboro, Greensboro, and Reidsville were void and unenforceable.
- ▶ On October 12, 2024, NCDEQ filed Petition for Judicial Review with Wake County Superior Court.
- ▶ This ruling may impact current and future NPDES permits, limiting NCDEQ's ability to use narrative standards and enforce any permits that use narrative standards.
- ▶ A separate case pending before the U.S. Supreme Court, *City and County of San Francisco v. U.S. Environmental Protection Agency*, questions EPA's use of narrative standards. NCDEQ is delegated its authority from the EPA.

Alpek Polyester (formerly Dak Americas)

- ▶ 2023: Alpek Polyester takes over Dak Americas plant at 3216 Cedar Creek Road in Fayetteville. Manufactures PET resin and RPET flakes
- ▶ March 2023: DEQ issues draft discharge permit, based on application submitted by DAK in 2022.
 - ▶ Permit application projects 45% increase in process wastewater discharge, from .320 MGD in 2021 to .464 MGD in 2026
 - ▶ Requires monthly monitoring for 1,4-dioxane
 - ▶ Fact Sheet lists 1,4-dioxane among parameters that did not receive a limit because “they did not demonstrate reasonable potential to exceed applicable water quality standards/criteria and the maximum predicted concentration was <50% of the allowable concentration”

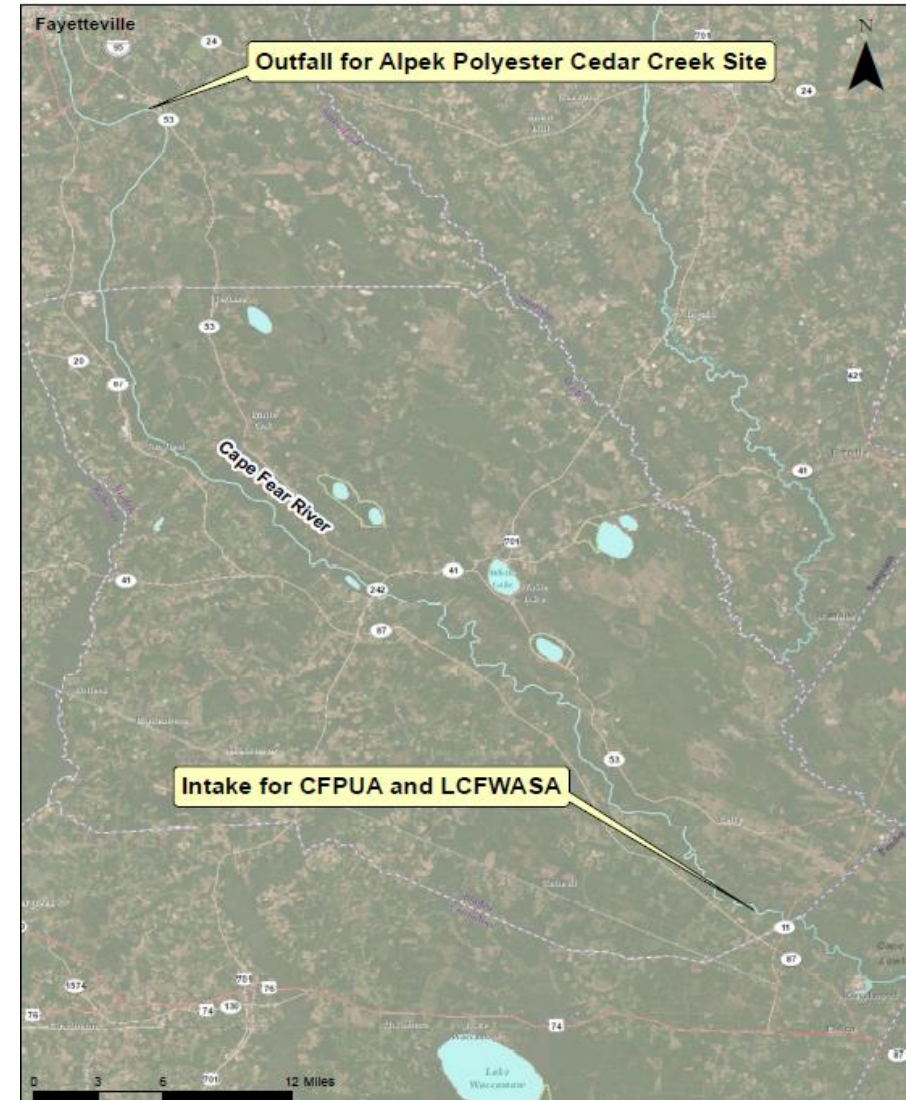
Sources: [Alpek Polyester](#), [NCDEQ](#)



Alpek Polyester (formerly Dak Americas)

- ▶ June 2023: NCDEQ emails Alpek to state the State intends to amend the company's draft NPDES permit to limit levels of 1,4-dioxane in its discharge to 2,112.1 ppb. The email asks Alpek to develop a schedule for compliance.
- ▶ December 2023: In a letter to NCDEQ, Alpek states that the average level of 1,4-dioxane in its discharge was 4,612.7 ppb and that meeting NCDEQ's limit would require a \$10 million investment in treatment, which would not be operational until 2034.
- ▶ February 2024: NCDEQ withdraws Alpek's draft NPDES permit for additional consideration. This was a response to both community concerns and regulatory considerations tied to water quality.

Source: [NCDEQ](#)



Potential Treatment Options and Costs

- ▶ **Budget consideration for additional treatment for 1,4-dioxane at Sweeney**
 - ▶ Current treatment at Sweeney to reduce 1,4-dioxane in drinking water: biological filters and ozonation
 - ▶ Additional treatment – Ultraviolet Advanced Oxidation Process (UV-AOP) – could increase removal to 95% or more
 - ▶ **UV-AOP cost estimates:** \$20 million (capital) / \$3 million (annual operating)



CFPUA's Next Steps

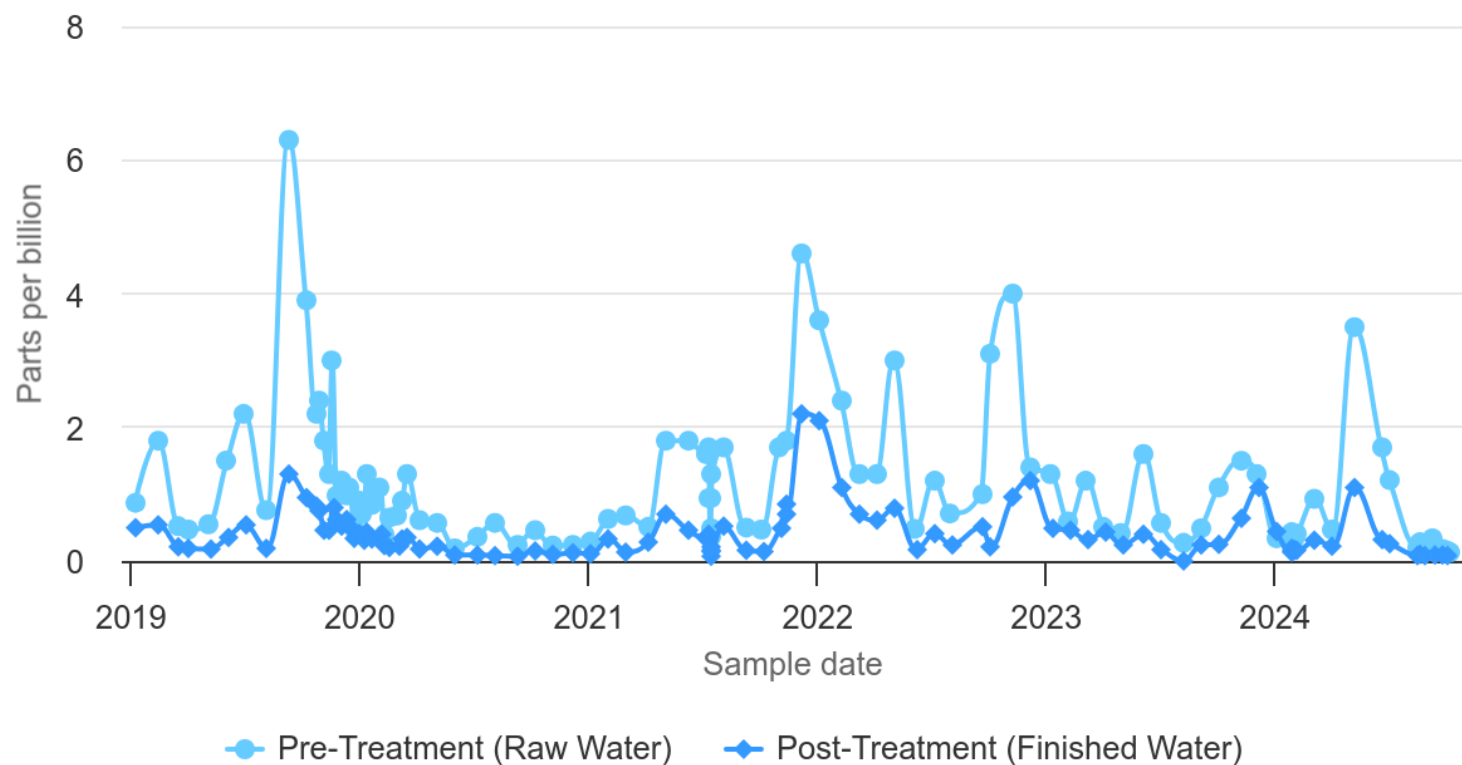
▶ **Petition EMC for Emergency Rulemaking**

- ▶ Request an emergency rule that will require 1,4-dioxane minimization plans from certain NPDES permit holders
- ▶ Would apply to any NPDES discharges with:
 - ▶ A permitted average daily flow greater than 100,000 gallons per day and an effluent with a 1,4-dioxane concentration exceeding 35 µg/L;
 - ▶ Whose discharge, in combination with other sources, results in a 1,4-dioxane concentration above 0.35 µg/L at a Downstream Drinking Water Intake as determined by both grab and composite sampling
- ▶ NPDES holders must submit quarterly progress reports to NC DEQ, detailing reductions achieved, updated effluent concentrations, and any modifications to the Minimization Plan as needed to ensure compliance with an 80% reduction target.

Questions?

1,4-Dioxane (ppb) - Raw and Finished Water at Sweeney Water Treatment Plant

Results in Parts Per Billion



Highcharts.com