

# What does the Recent Designation of PFAS as a CERCLA Hazardous Substance Mean for Landfills in Florida?

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# Outline

- PFAS chemistry
- History of EPA PFAS initiatives
- PFAS in landfills
  - Update from 2024
- CERCLA Hazardous Substances
- “Enforcement Discretion”
- PFAS emissions routes and impacts
- Preparation

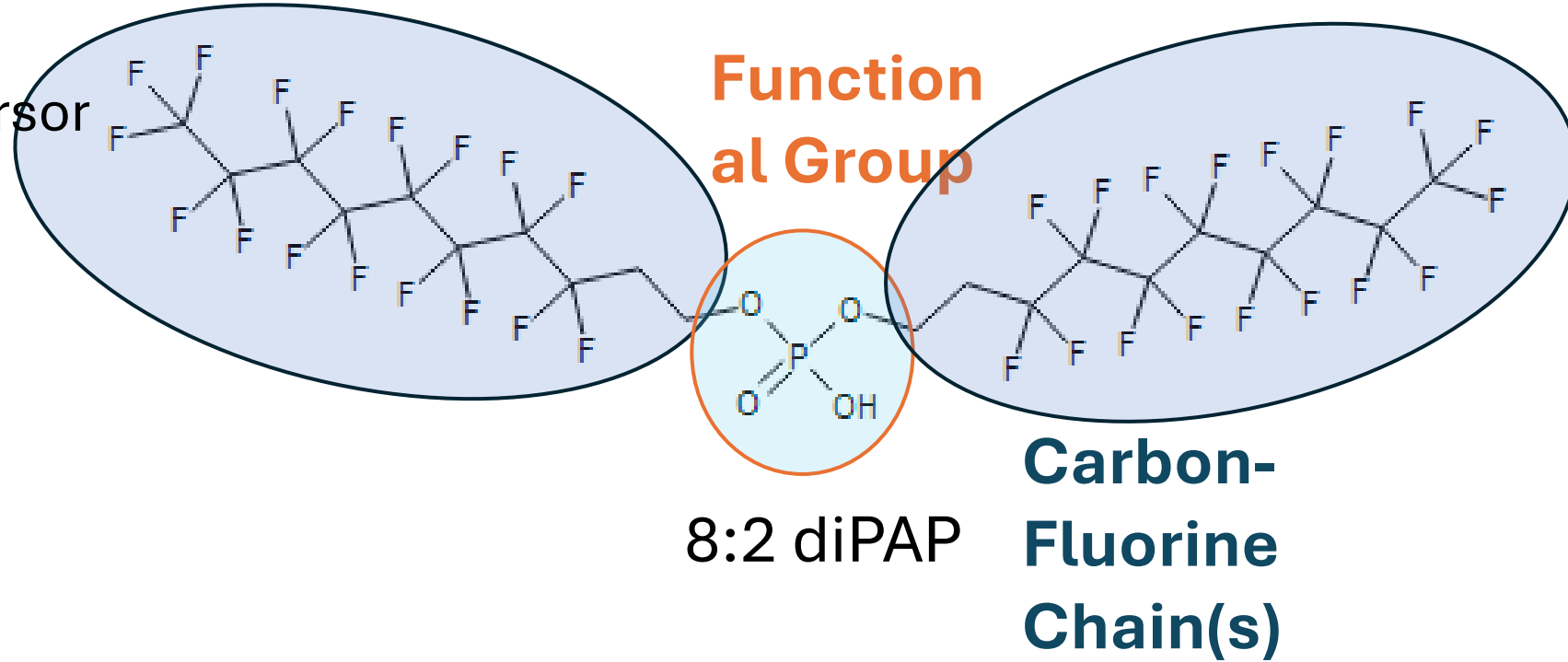


# Introduction

- PFAS Basics

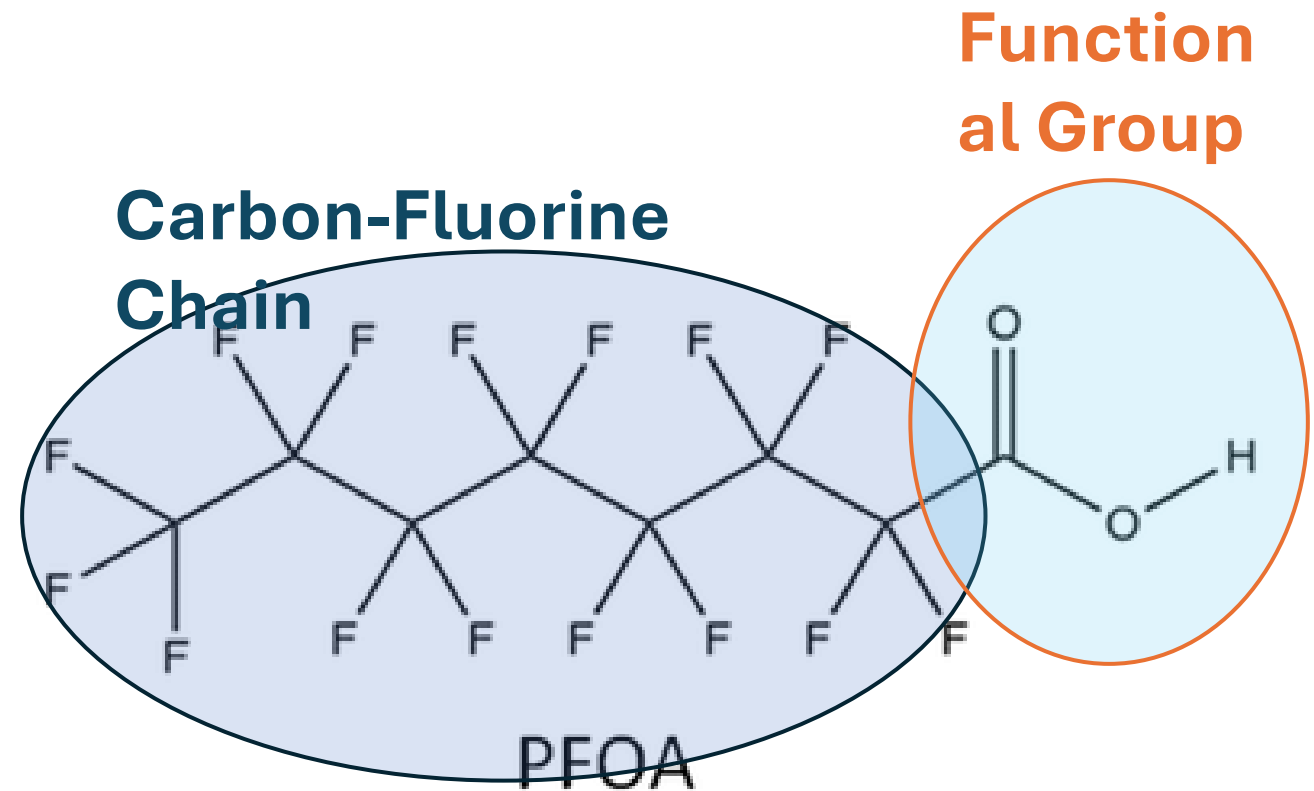
- Terminal vs precursor
- Class
- Chain length

## Carbon-Fluorine Chain(s)



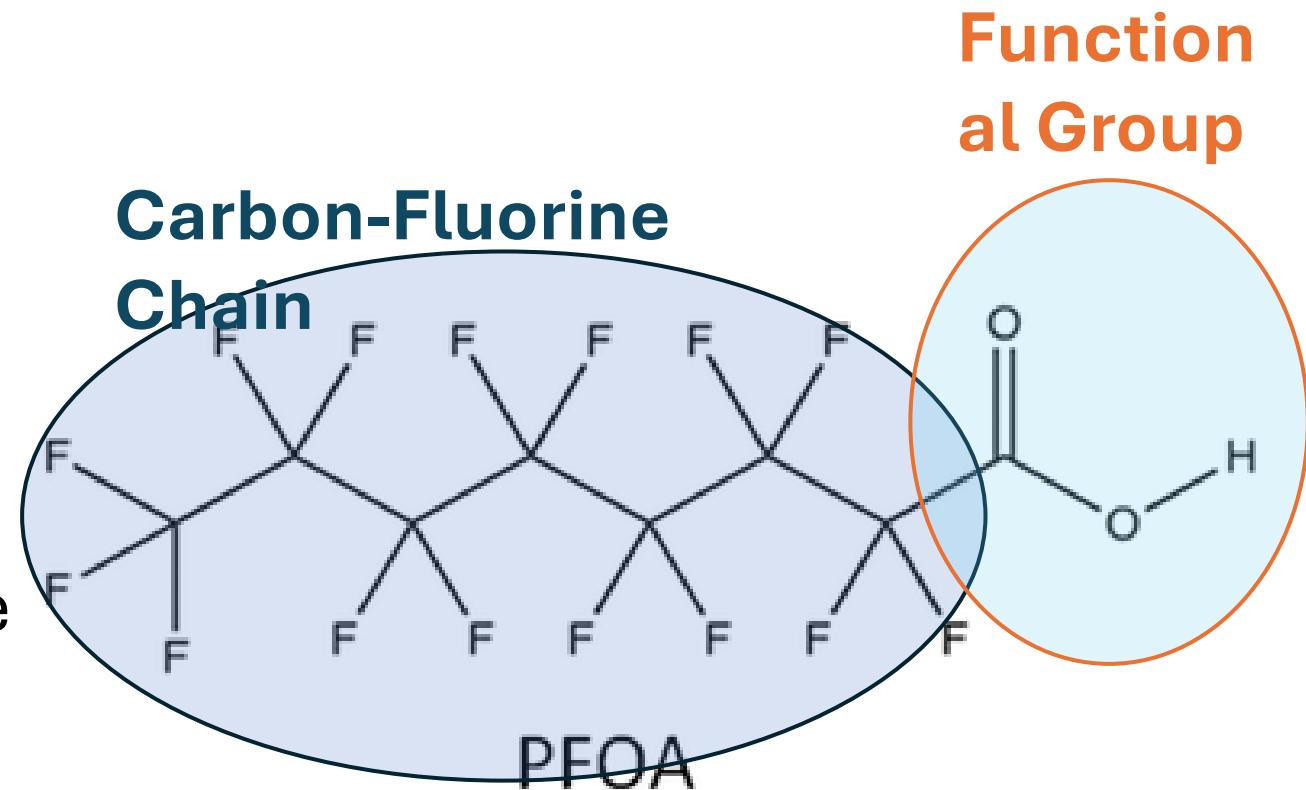
# Introduction

- PFAS Basics
  - Terminal vs precursor
  - Class
  - Chain length



# Introduction

- PFAS Basics
  - Terminal vs precursor
  - Class
  - Chain length
- Reported concentrations of “total PFAS” vary based on the number of PFAS included and inherent leachate variability
  - Analytical capabilities are rapidly expanding: water, soil, and air matrices

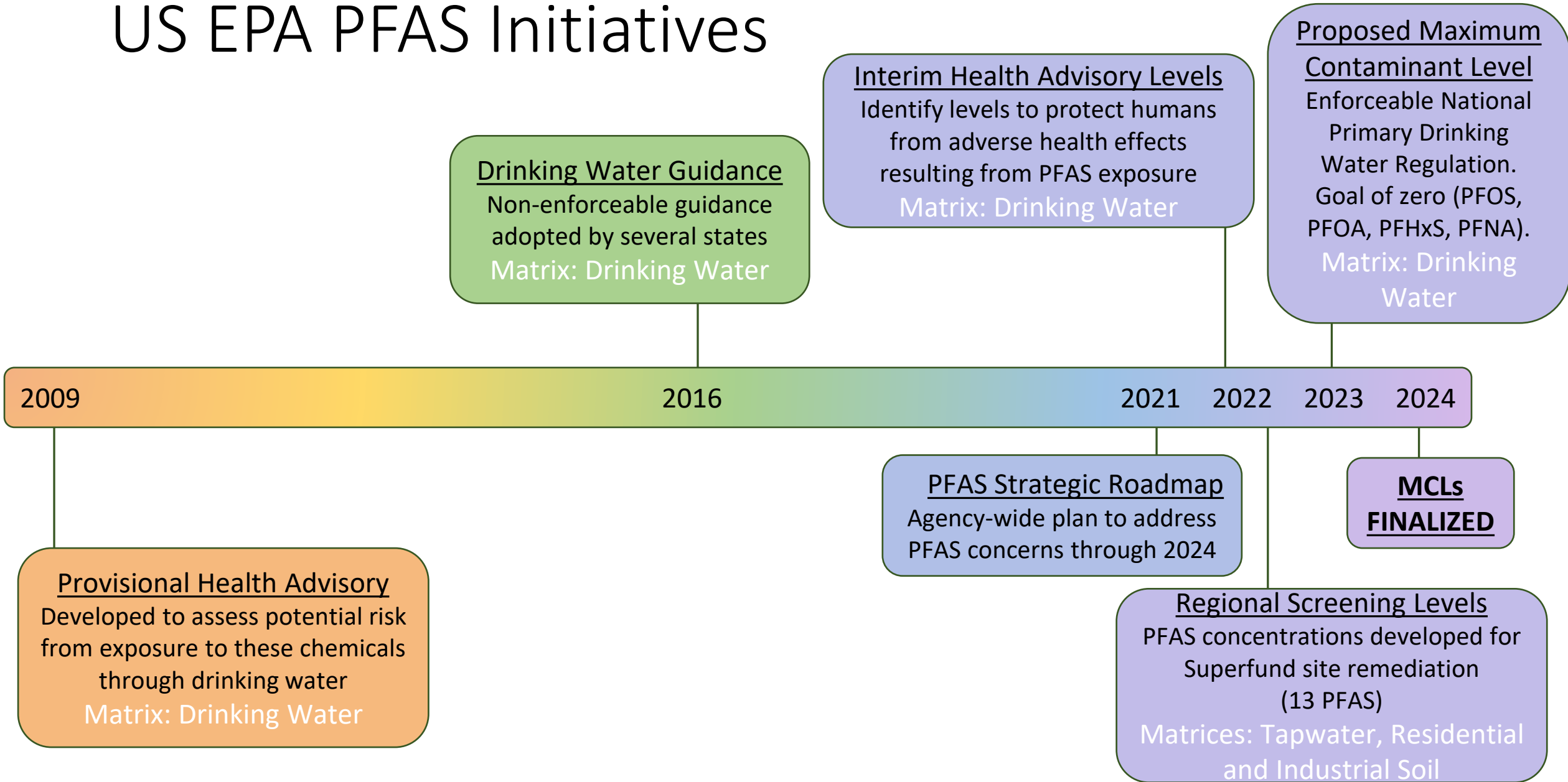


# PFAS Treatment

- Evolving
- Separation vs. destruction
- Safest place for PFAS right now?
- Volume reduction
- Tradition treatment vs. PFAS

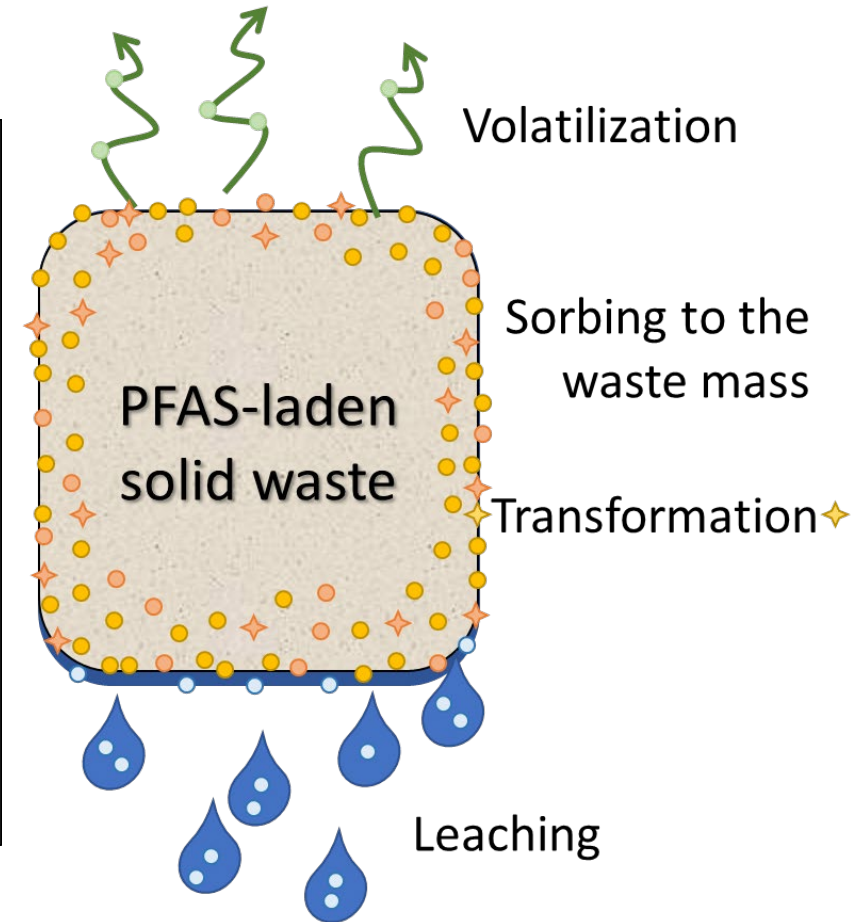
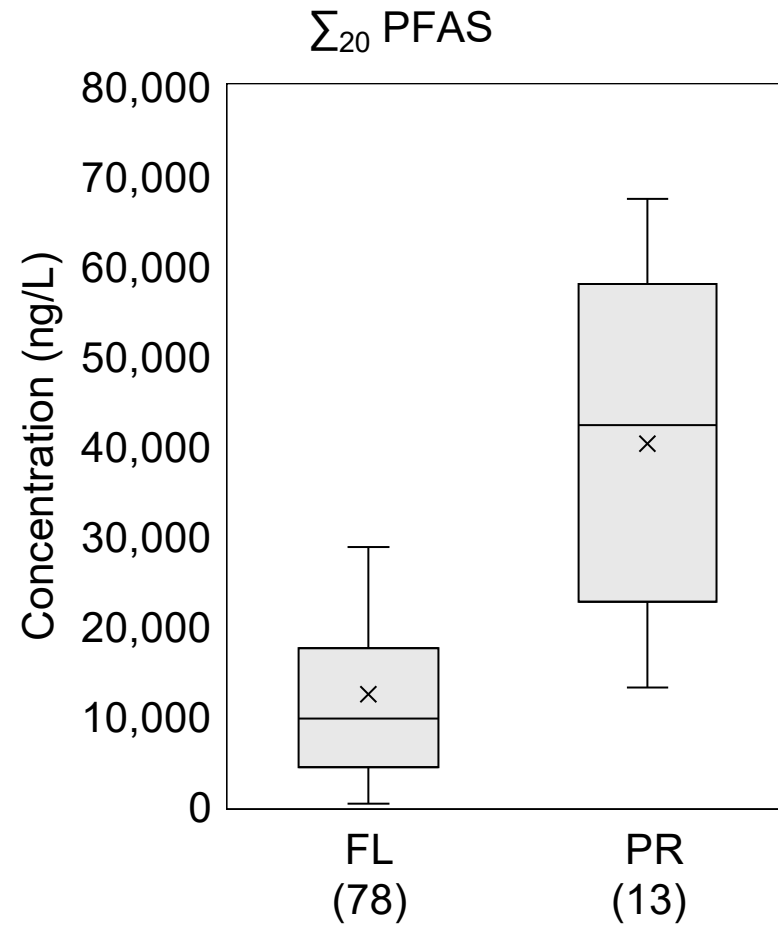


# US EPA PFAS Initiatives



# PFAS in Landfills

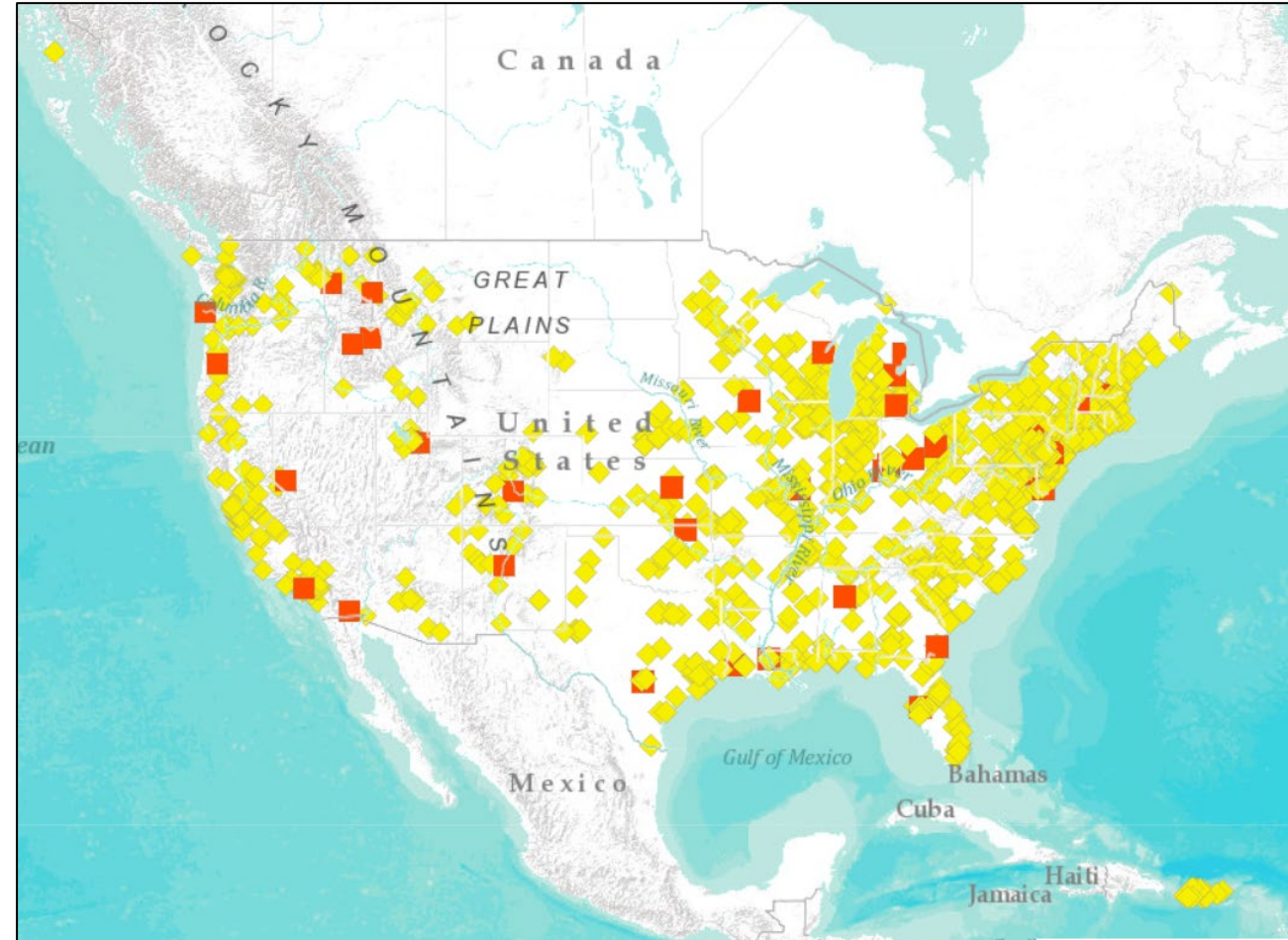
- Recent data, trends
  - Partitioning and transformation
- PFAS sources
  - FTOHs
  - Ultra-short chain
- PFAS emissions
  - Leachate
  - **Gas**





# What is CERCLA?

- The Comprehensive Environmental Response, Compensation, and Liability Act (aka Superfund)
- Hazardous waste cleanup
  - Response, enforcement
  - Identify responsible parties
  - Recover costs
- Hazardous Substance Superfund
- Standard response sequence
- Cleanup standards



# Hazardous Substances

- CERCLA list of hazardous substances
  - CWA, CAA, RCRA lists, +
  - 40 CFR part 302.4
  - List and reportable quantities
  - ~800 substances
- PFOA and PFOS (legacy PFAS) added in 2024
- Reportable quantity: 1 lb
  - 86 million gallons of leachate
- “PFAS Enforcement Discretion” memorandum
  - Focus on manufacturing and industrial PFAS generators
  - MSW exemption
    - Residential, small business, and non-profit generators



# CERCLA and MSW

- Historically, household waste, biosolids excluded
  - Interim policy since 1989
- MSW landfills and industrial waste
  - Data
  - NC Example
- Unlined landfills
  - CERCLA enforcement at Sub C landfills
  - Sub C -> Hazardous Waste



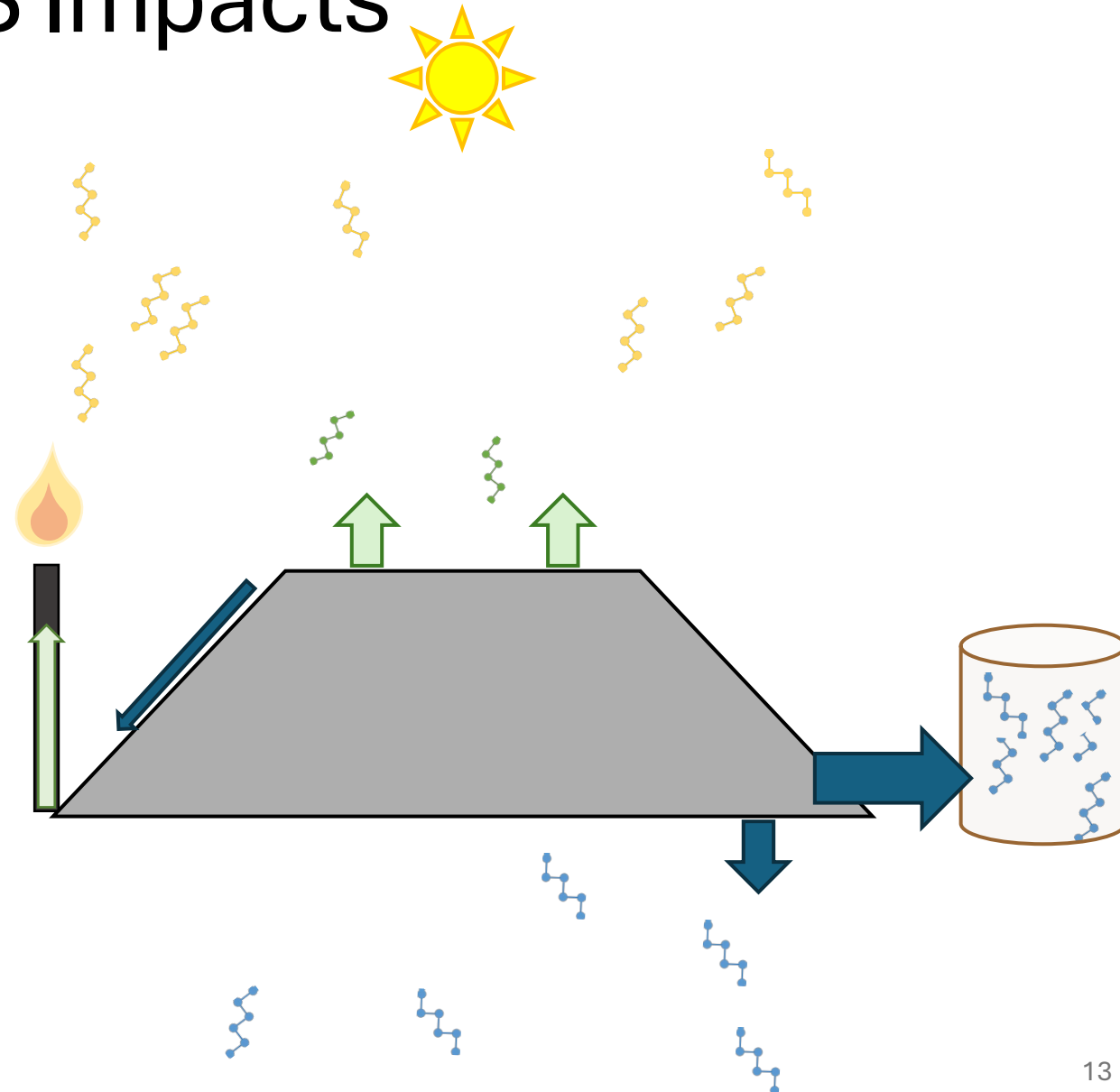
# Other “Hazardous” Classifications

- CERCLA Hazardous Substance
- RCRA Hazardous Constituent
  - Corrective action process
  - Cause a waste to be a hazardous waste
- RCRA Hazardous Waste
  - Listed
  - Characteristic
  - PFAS leaching limitations



# Evaluating Landfill PFAS Impacts

- Tracing back to PFAS sources
  - Soil
  - Groundwater
  - Surface water
- Possible emission routes
  - Liner leaks
  - Leachate storage and on-site management
  - Stormwater
  - Fugitive gas emissions
  - Gas flares
- Transformation



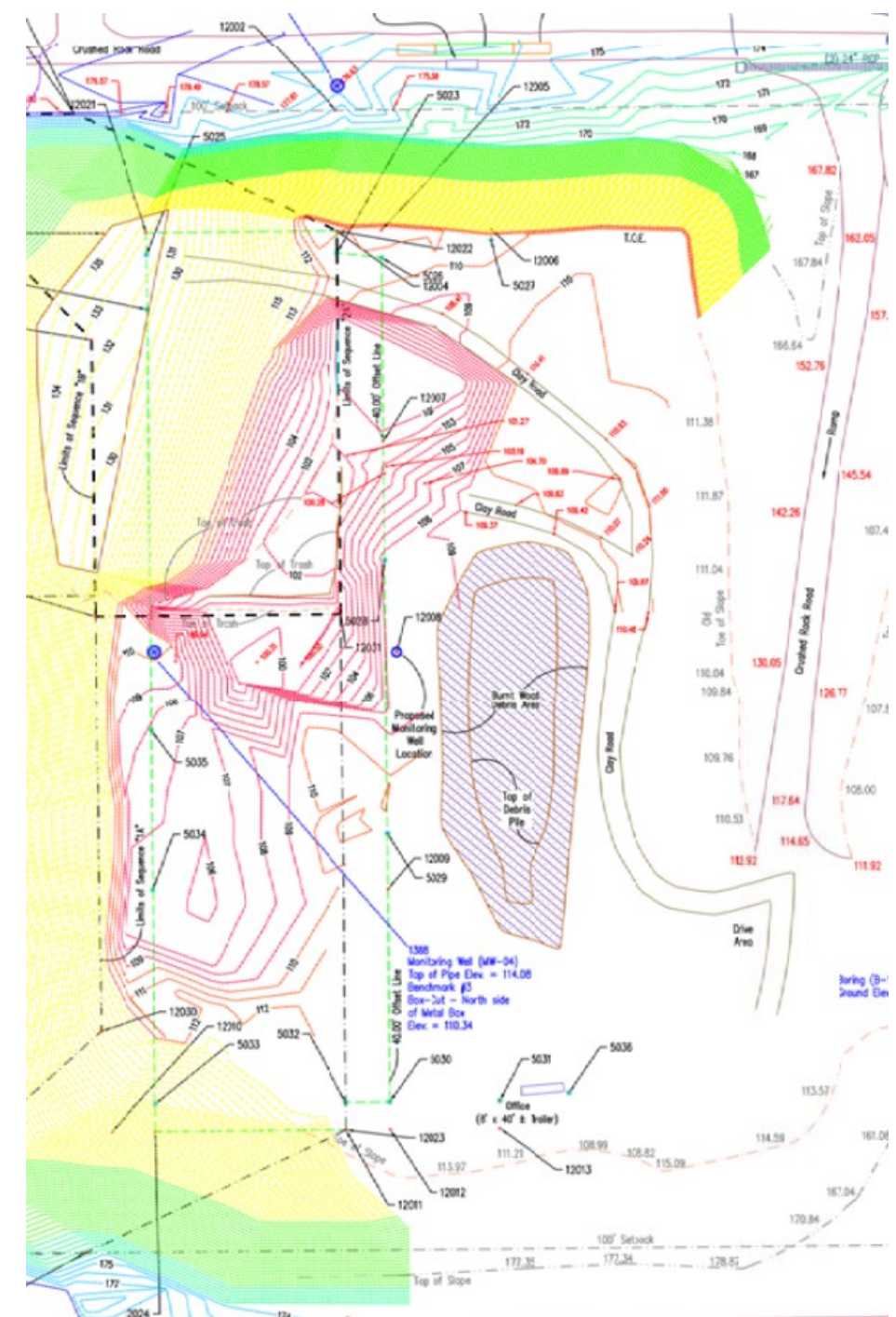
# Leachate

- Liner leaks
  - Leachate quality
    - PFAS, indicators
  - Hydrogeology
    - Porosity, gradient, conductivity
    - DAF
- Storage and on-site treatment
  - Volatile PFAS may travel
  - Aeration/evaporation
- Prepare now
  - Industrial waste generators
  - Robust background GW data
  - Accurate and up-to-date hydrogeology
  - Leachate data



# Stormwater

- Surface water
  - Runoff or landfill gas, non-landfill sources
- Prepare now
  - Accurate and up-to-date stormwater system
  - Receiving waterbodies
    - Surface water
    - Zero discharge?

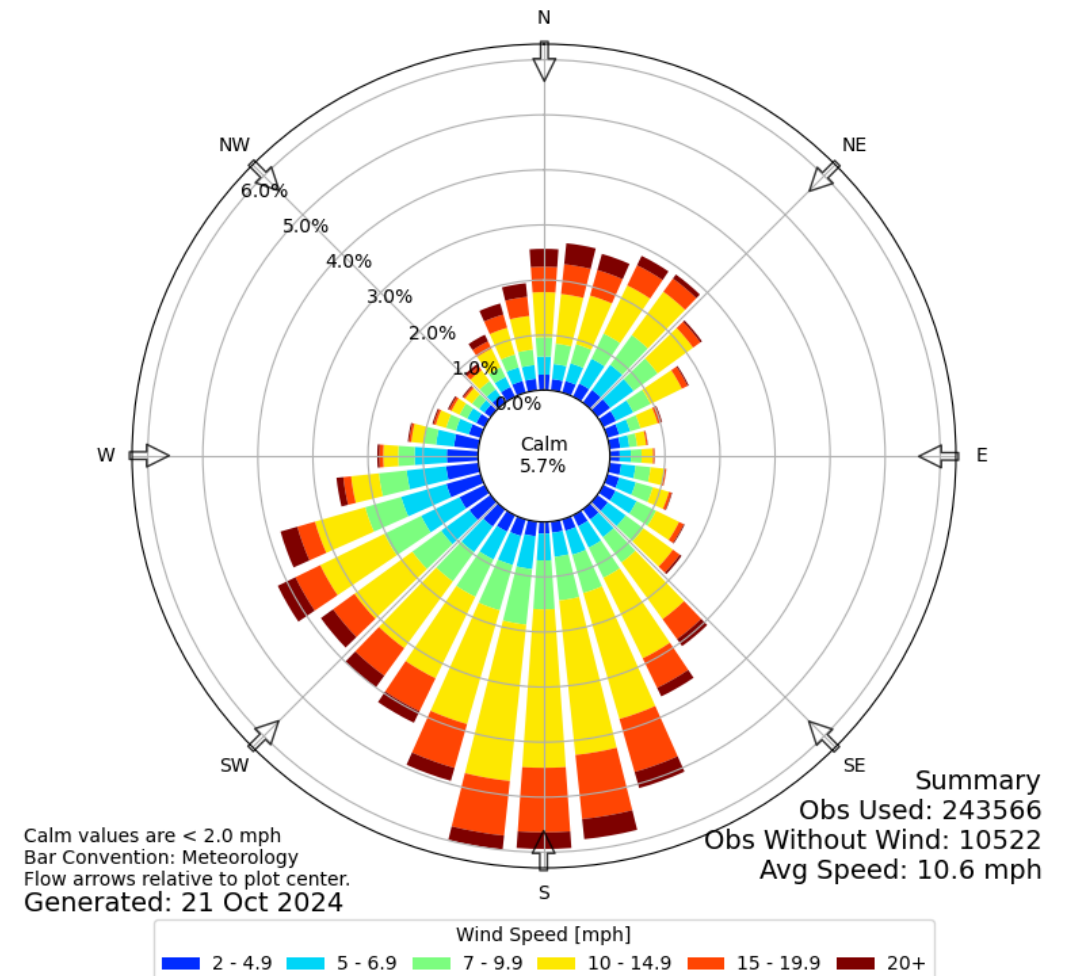


# Landfill Gas

- Travel distance
- Transformation and deposition
- Soil and groundwater
  - Strata
  - Indicators - metalloids
- Prepare now
  - Wind and weather data



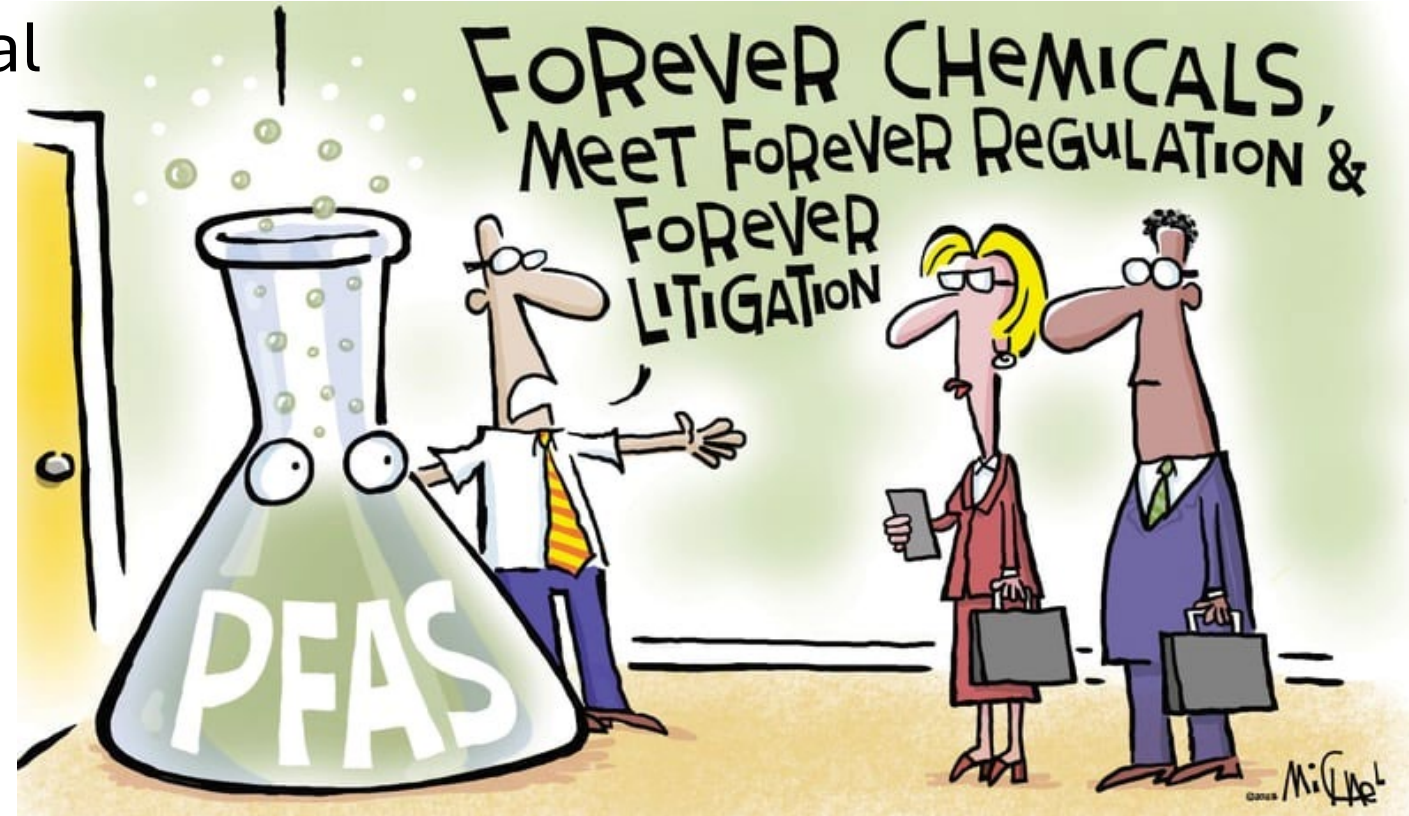
Windrose Plot for [BGD] BORGER/HUTCHINSON  
Obs Between: 01 Jul 1996 02:51 AM - 21 Oct 2024 01:51 AM America/Chicago





# Summary

- Long history of PFAS disposal
- Likelihood of more PFAS regulation
- CERCLA memorandum
  - Tradition of MSW exclusion
  - Not codified
- PFAS emissions pathways



# Prepare Now

- Site
  - Hydrogeology
  - Topography
  - Stormwater flow
  - Weather data
- Background – 7 measurements
- Leachate and gas data



# Thank you

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