# Clean Water Act Methods

## Overview of EPA's CWA Method Activities

August 2019, Adrian Hanley, U.S. EPA

# CWA Analytical Methods Program

- Many industries and municipalities are permitted to discharge pollutants under the CWA NPDES
- They use analytical methods to analyze the chemical, physical, and biological components of wastewater and other environmental samples for monitoring compliance
- CWA requires EPA, through rulemaking, to establish test procedures to measure pollutants for CWA programs
- EPA promulgates test procedures in 40 CFR Part 136



# Method Update Rules (MURs)

- Plan to propose and finalize Method Update Rules more frequently
  - Smaller rules
  - Less wait time for revisions, ATPs, corrections
- A “Routine MUR” every 1-2 years
  - Routine MURs will contain non-controversial items
  - ATPs, minor editorial updates and revisions to methods (EPA, VCSBs, etc.)
- Non-routine MURs will contain more contentious items (i.e., new methods) and be proposed separately and less frequently

# 2019 Routine MUR

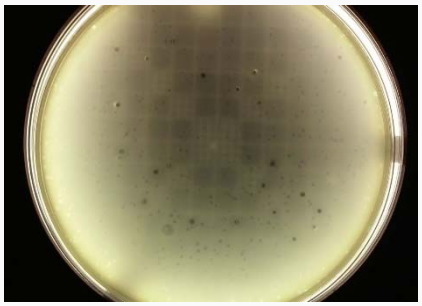
- Next routine Methods Update Rule proposal - 2019
- Will include
  - Voluntary Consensus Standard Body (VCSB) method revisions and submittals
  - Alternate Test Procedures (ATPs)
  - Corrections and clarifications

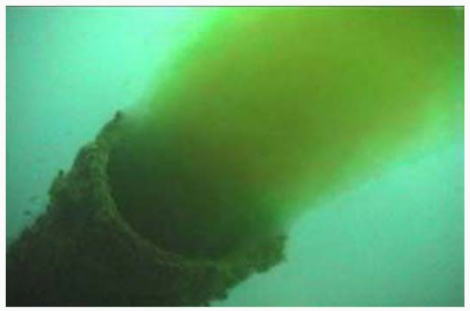
https://www.epa.gov/cwa-methods/methods-update-rule-2018

# CWA Microbiology Method Activities

- Coliphage culture methods 1642 and 1643
  - Male-specific and somatic coliphage
  - Validated in recreational waters and wastewater
  - Methods are available on the web at:

    https://www.epa.gov/cwa-methods/other-clean-water-act-test-methods-microbiological
  - Collaboratorative work with ORD is ongoing

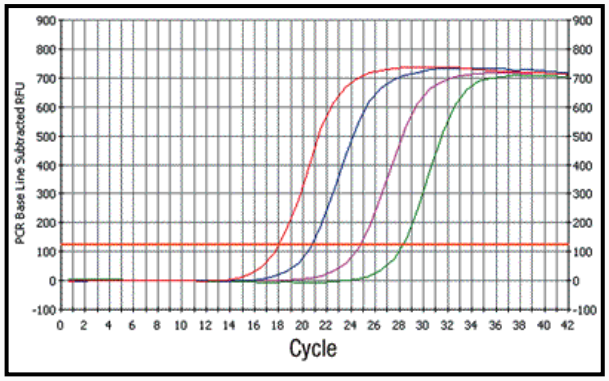


# CWA Microbiology Method Activities

- Microbial source tracking molecular methods
  - OW and ORD collaboration
  - Rapid Methods
  - Human specific targets
  - Completed multi-laboratory validation study for recreational waters (fresh and marine)

https://www.epa.gov/cwa-methods/other-clean-water-act-test-methods-microbiological

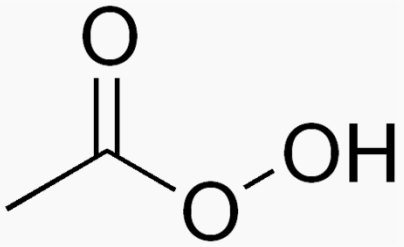



# CWA Chemistry Method Activities

- Peracetic acid and hydrogen peroxide methods
- Continuous monitoring – total residual chlorine
- PCB congener method
- ATP reviews
- Update QC Criteria for Methods 608.3, 624.1, and 625.1

# Peracetic Acid and $H_2O_2$

- Alternative antimicrobial
  - Almost no residual – unlike chlorine
  - Byproducts: hydrogen peroxide and acetic acid
  - Already in use at some POTWs
- Method must be performed onsite
  - Degrades quickly




- Currently Collaborating with the Standard Methods Joint Editorial Board
  - Multi-lab validation finished
  - Report and method drafted and reviewed by EPA

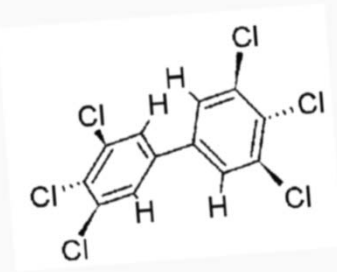
# Continuous Monitoring

- Total residual chlorine pilot study
- Based on EPA Drinking Water Method 334.0
- Recruited POTWs to generate side-by-side data for monitors and an onsite lab
- Multiple utilities gathering side by side data from continuous monitoring instruments and on-site labs

# PCB Congener Method

- Method goals:
  - Identifies and quantifies PCB contamination using individual congeners
  - Improves sensitivity over Method 608, less sensitive to typical laboratory background
  - Implementable at a typical mid-sized full-service environmental laboratory
- Single-laboratory validation completed
- Multi-laboratory validation underway

# PCB Congener Method cont.




- Quantification
  - 29 carbon-13 isotope dilution standards
  - Calibration of 48 congeners
  - Other 161 congeners quantified indirectly
- Matrices
  - Wastewater by LLE and SPE
  - Soxhlet extraction for biosolids, sediment, and fish tissue
- Single Lab Sensitivity (MDL)
  - Aqueous mostly part per trillion level (mono highest)
  - Solid matrices ~100 ppt, fish tissue 2 ppb and lower

# PCB Multi-Lab Study

- Completed QAPP and Study Plan
- Current Efforts:
  - Mixed standards distributed
  - Test validation matrices received
  - 8 paid laboratories and 4 volunteer laboratories participating
  - Testing underway
- See presentation on Friday for more information!

# 608.3, 624.1, 625.1 QC Criteria Update

- TNI, ACIL, APHL, and WEF have volunteered to provide data to update QC criteria
  - Initial calibration, MDLs, calibration verification, ongoing precision and recovery, surrogate recover, MS/MSDs
- Secondary Data Collection
  - Use existing data anonymously
  - Volunteer laboratories
    - Perform NPDES compliance monitoring
    - Have an SOP and formal quality system
  - Coordinate with laboratory associations
- First draft of study plan reviewed by EPA

# ATP Reviews

- Alternate test procedures (ATPs) for nationwide use are submitted to EPA HQ for review
  - Codified at 40 CFR 136.4 and 136.5
- Protocols for EPA review of alternate test procedures and new methods are available at:

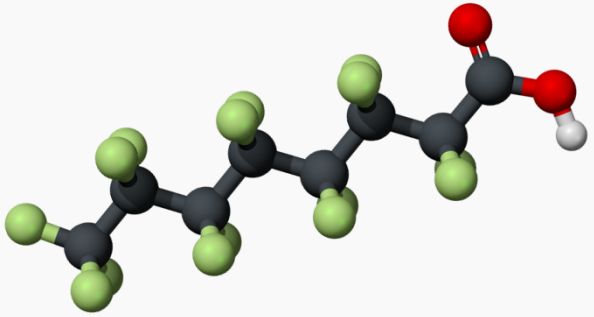
https://www.epa.gov/cwa-methods/alternate-test-procedures

# Anticipated Projects

- PFAS Methods
  - Developing new analytical methods is one of the initiatives in the *EPA's Per- and Polyfluoroalkyl Substances (PFAS) Action Plan* (https://www.epa.gov/pfas/epas-pfas-action-plan)
  - Multiple efforts planned
- Total nitrogen method

# PFAS Methods

- DOD Collaboration on solid phase extraction isotope dilution method
  - Based off of a method originally developed by SGS AXYS
  - DOD is managing the study
  - EPA OW and OLEM are providing review
  - Currently drafting single laboratory validation study plan and assessing available data
  - Plan to test many matrices



# PFAS Methods (cont.)

- Total organic fluorine by combustion ion chromatography (CIC)
  - Detects any organofluorines (including PFAS)
  - Cannot differentiate between types of organofluorine (e.g., PFAS vs. fluorinated pesticides or pharmaceuticals)
  - Naturally occurring organofluorine compounds are very rare and are only known to exist as a byproduct of volcanic processes
    - (Gribble, Gordon W. "Naturally occurring organofluorines." The Handbook of Environmental Chemistry, 2002)
  - Literature shows the sensitivity is mostly driven by the ability of solid phase media to remove inorganic fluorine
  - Currently drafting the single laboratory validation study plan

# Total Nitrogen

- Total Nitrogen
  - High-Temperature Catalytic Combustion and Chemiluminescence Detection
  - EPA reviewing multi-laboratory data provided by Shimadzu
  - ASTM has drafted a method (D8083-16)
  - EPA may contract additional laboratory work if the current data is not sufficient
  - Still in the planning stages

# Contact Information

**For more information or additional feedback, please contact:**

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