United States Environmental Protection Agency

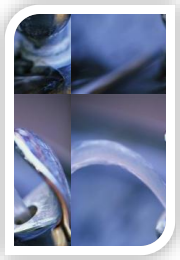
Public Webinar:

Revisions to the Unregulated Contaminant Monitoring Rule (UCMR 4) Meeting Presentations

Held January 13, 2016
USEPA, Office of Ground Water and Drinking Water

Office of Water (MLK 140) EPA 815-R-16-001 January 2016

Revisions to the Unregulated Contaminant Monitoring Rule (UCMR 4) for Public Water Systems



Public Webinar

January 13, 2016

Meeting starts at 1:00 p.m. E.T.

USEPA

Office of Ground Water and Drinking Water

WELCOME

Gregory J. Carroll, USEPA

General Meeting Information

- Purpose
  - Review of EPA's proposed rule and discussion with the public
- Webinar lines are muted to minimize background noise
  - 10 minute break at approximately 2:30 p.m.
- Public questions and discussion at the end of the webinar

Agenda

1:00	Introduction	(15 minutes)
1:15	Proposed UCMR 4	(30 minutes)
1:45	UCMR 4 Sampling Design	(30 minutes)
2:15	UCMR 4 Reporting	(15 minutes)
2:30	Break	(10 minutes)
2:40	UCMR 4 Laboratory Approval Process & MRLs	(20 minutes)
3:00	Submitting Public Comments	(5 minutes)
3:05	Statements from Webinar Participants, Q&A and Discussion	(100 minutes)
4:45	Closing Remarks	(5 minutes)

Introduction

Brenda Parris, USEPA

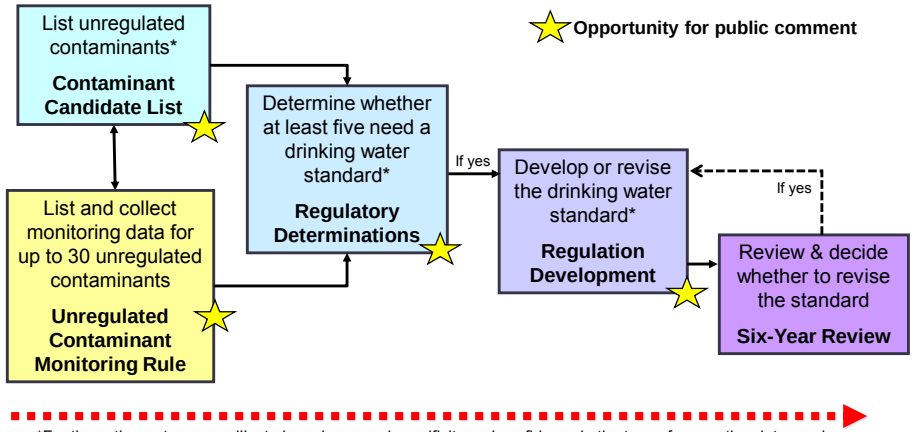
UCMR 4 Introduction Overview

- Regulatory background for UCMR
  - Safe Drinking Water Act (SDWA) authority
  - Relationship to:
    - Candidate Contaminant List (CCL)
    - **Unregulated Contaminant Monitoring Rule (UCMR)**
    - Regulatory Determination
    - Six-Year Review
- UCMR
  - Objectives
  - Approach
  - Implementation

SDWA

- Passed in 1974, SDWA authorized EPA to set enforceable health standards for contaminants in drinking water
  - National Primary Drinking Water Regulations (NPDWRs)
- 1996 SDWA amendments changed the process of developing and reviewing NPDWRs
  - CCL
  - UCMR
  - Regulatory Determination
  - Six-Year Review

General Flow of SDWA Regulatory Processes



*For these three stages, we like to have increased specificity and confidence in the type of supporting data used (e.g. health and occurrence). SDWA requires that we used best available data to make our decisions.

CCL

- List of priority unregulated contaminants
  - Chemicals and microbes
  - Published every five years
  - Known or anticipated to occur in public water systems (PWSs)
  - May require regulation under SDWA

Draft CCL 4

- Published February 4, 2015
- Carried forward the final list of CCL 3 contaminants (multi-step process evaluating ~7,500 contaminants)
- Requested and evaluated contaminant nominations from the public
- Evaluated any new data from previous negative regulatory determinations

In establishing the proposed list of contaminants for UCMR 4, EPA started with this priority set of contaminants, which includes 100 chemicals or chemical groups and 12 microbes

UCMR

- SDWA section 1445(a)(2), as amended in 1996, redesigned the UCMR Program; requirements included:
  - Issue list of no more than 30 unregulated contaminants, once every 5 years
  - Require PWSs serving population >10,000 people as well as a nationally representative sample of PWSs serving ≤10,000 people to monitor
  - Store analytical results in the National Drinking Water Contaminant Occurrence Database (NCOD)
  - Direct implementation – EPA manages program in partnership with states
  - EPA funds testing/analytical costs for small PWSs

UCMR History

- UCMR 1 (2001-2005, 26 contaminants)
- UCMR 2 (2007-2011, 25 contaminants)
- UCMR 3 (2012-2016, 30 contaminants)
  - Monitoring concluded in 2015
    - Data review will occur in 2016
- UCMR 4 (2017-2021, 30 contaminants)
  - Proposed in the FR on December 11, 2015
  - Final publication anticipated in late 2016/early 2017

National occurrence data publically available:
http://www.epa.gov/dwucmr/occurrence-data-unregulated-contaminant-monitoring-rule

Objective of UCMR Program

- Collect national occurrence data for suspected drinking water contaminants that do not have health-based standards set under the SDWA
  - Drinking water occurrence information is used to support future regulatory actions to protect public health
  - Public will benefit from information about whether or not unregulated contaminants are present in their drinking water

UCMR Approach

- UCMR established a 3-tiered approach for monitoring
  - Assessment Monitoring (List 1)
  - Screening Survey (List 2)
  - Pre-Screen Testing (List 3)
- Based on:
  - Availability and complexity of analytical methods
  - Laboratory capacity
  - Sampling frequency
  - Relevant universe of PWSs
  - Other considerations (e.g., cost/burden)

Typical UCMR System Applicability

	System Type	Systems Serving > 10,000	Systems Serving ≤ 10,000
Assessment Monitoring (List 1 Contaminants)	CWS[1] & NTNCWS[2]	All systems (~4,200)	800 randomly selected systems
Screening Survey (List 2 Contaminants)	CWS & NTNCWS	All systems (~410) serving more than 100,000, and ~320 randomly selected systems serving 10,001 to 100,000	480 randomly selected systems
Pre-Screen Testing (List 3 Contaminants)	May be conducted by a limited number of PWSs		

[1]Community Water System
[2]Non-transient Non-community Water System

EPA Implementation Roles

- Review, track and determine PWS applicability and monitoring progress
- Coordinate Laboratory Approval Program
- Provide technical support for Regions, states, PWSs and laboratories
- Coordinate outreach
- Assist and support Regional compliance efforts

EPA Implementation Roles

- Small PWS support:
  - EPA funds small system testing including kits, sample analysis and shipping
  - Manages sample kit distribution
  - Maintains lab and implementation contracts to support UCMR
  - Responsible for data review
- Large and small PWS support:
  - Safe Drinking Water Accession and Review System (SDWARS) reporting system and users
  - Prepares data for NCOD

States' Role in the UCMR 4 Program

- State participation is voluntary
- EPA has established Partnership Agreements (PAs) under previous UCMRs and will continue to do so for UCMR 4
  - States, tribes and territories help EPA implement the UCMR program; help to ensure high data quality
  - Review and revise State Monitoring Plans (SMPs)
  - Update system information to preload into SDWARS
  - Review and approve proposed Ground Water Representative Monitoring Plans (GWRMPs)
  - Compliance assistance
  - Notification and instructions for systems

Regulatory Determination

- Determine which contaminants may have an adverse effect on human health
- Determine if a contaminant occurs in drinking water at a frequency and at levels of public health concern
- Meaningful opportunity for health risk reduction
- Made every five years
- Determinations for at least five contaminants from the CCL
- UCMR helps provide the necessary data

Six-Year Review

- Reviews existing NPDWRs and determines if a revision is appropriate
  - Includes the re-evaluation of exposure to regulated contaminants based on their health effects and occurrence in drinking water
- Any revisions to existing NPDWRs must maintain protection or provide for greater health protection
- Made every six years

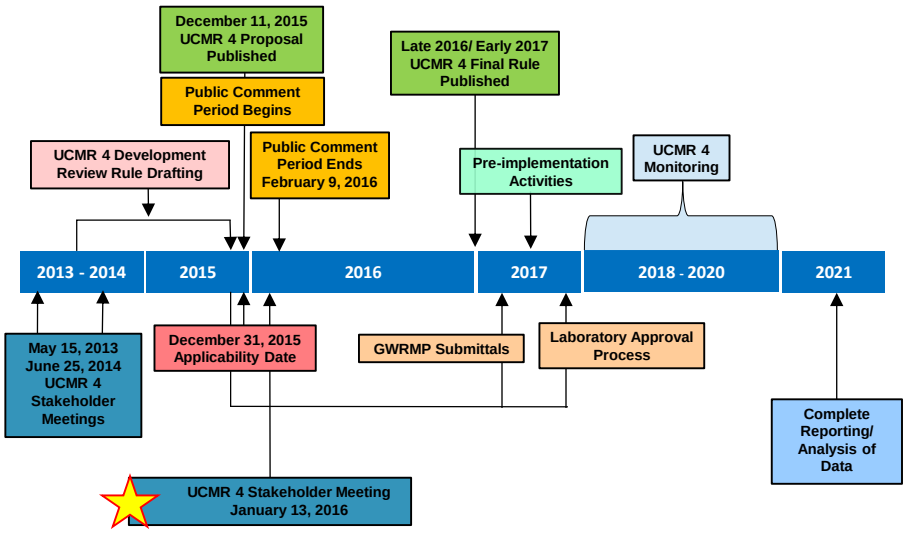
Proposed UCMR 4

Melissa Simic, USEPA

Proposed UCMR 4 - Overview

- Timeline
- Notable proposed changes from UCMR 3
- Contaminant selection process
- Proposed contaminants and analytical methods
- Estimated costs

UCMR 4 Timeline



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Notable Proposed Changes

- Analytes
- Applicability
- Monitoring time frame
- Sampling frequency
- Sampling locations
- Reporting requirements

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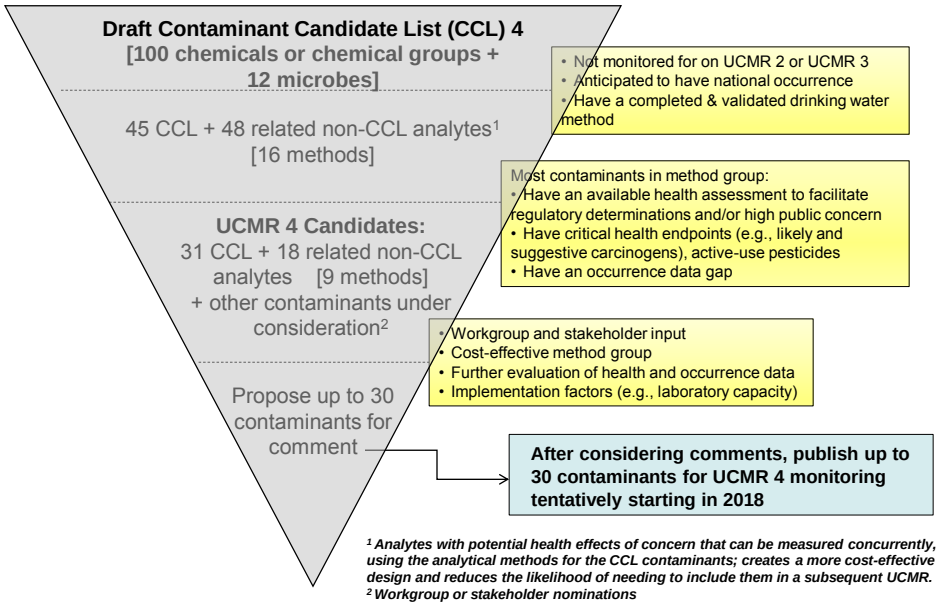
UCMR 4 Candidate Contaminants – Information Compendium

- Provides the initial list of contaminants that EPA considered
- Outlines the contaminant prioritization process
- Indicates the reason a contaminant was not included on the proposed list
- Provides supporting information for each of the proposed contaminants

UCMR 4 Candidate Contaminants – Information Compendium

- Primary source for the information is the CCL program
  - Reviewed and evaluated other publically available data sources
- Generally includes five sections:
  - Background & Use
  - Health Effects
  - Production & Release
  - Occurrence in Water
  - Persistence & Mobility
- The document is located in the docket

UCMR 4 Prioritization Process



[1] Analytes with potential health effects of concern that can be measured concurrently, using the analytical methods for the CCL contaminants; creates a more cost-effective design and reduces the likelihood of needing to include them in a subsequent UCMR.
[2] Workgroup or stakeholder nominations

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Proposed UCMR 4 Analytes

ADDA ELISA	
"total microcystins"	
EPA Method 544 (SPE LC/MS/MS)	
microcystin-LA	microcystin-RR
microcystin-LF	microcystin-YR
microcystin-LR	nodularin
microcystin-LY	
EPA Method 545 (LC/ECI-MS/MS)	
anatoxin-a	cylindrospermopsin
EPA Method 200.8 (ICP-MS) or alternate SM or ASTM	
germanium	manganese

EPA invites public comment on the following contaminants that were considered by the workgroup but not included in the proposed list: ***Legionella pneumophila*** and ***Mycobacterium avium***, **ammonia**, and the pesticides **vinclozolin**, **hexazinone** and **disulfoton**.

EPA Method 525.3 (SPE GC/MS)	
alpha-hexachlorocyclohexane	profenofos
chlorpyrifos	tebuconazole
dimethipin	total permethrin (cis- & trans-)
ethoprop	tribufos
oxyfluorfen	
EPA Method 552.3 (GC/ECD) or 557 (IC/ECI-MS/MS)	
HAA5 (regulated)	HAA9
HAA6Br	
EPA Method 541 (GC/MS)	
1-butanol	2-propen-1-ol
2-methoxyethanol	
EPA Method 530 (GC/MS)	
butylated hydroxyanisole	quinolone
o-toluidine	

Cyanotoxins

EPA Method 544 (LC/MS/MS[1])			
Analyte	**EPA Health Advisory (HA)[2]**	**Critical Health Effect**	**Occurrence**
microcystin-LR	1.6 µg/L (ten-day HA for school-age children and adults); 0.3 µg/L (ten-day HA for bottle-fed infants and young children)	Liver effects	Microcystins in water supplies: 77 samples from 33 water supplies; Range of detects = <0.15 - 0.36 µg/L (Haddix et al., 2007)
microcystin-LA			
microcystin-LF			
microcystin-LY			
microcystin-RR			
microcystin-YR			
nodularin	Not available	Liver toxicity	Not available

[1]Liquid Chromatography/Tandem Mass Spectrometry
[2]Total microcystins will also be measured by ADDA ELISA; EPA HA applies

Cyanotoxins

EPA Method 545 (LC/ESI-MS/MS[1])			
Analyte	**EPA Health Advisory (HA)**	**Critical Health Effect**	**Occurrence**
anatoxin-a	Not available	Targets nervous system	Florida Waters (Burns 2008), drinking water max = 8.46 µg/L
cylindrospermopsin	3 µg/L (ten-day HA for school-age children through adults); 0.7 µg/L (ten-day HA for bottle-fed infants and young children)	Increased relative kidney weight and decreased urinary protein	Florida Waters (Burns 2008), drinking water range of detects = 8-97 µg/L

[1]*Liquid Chromatography Electrospray Ionization-Tandem Mass Spectrometry*

Metals

EPA Method 200.8[1] (ICP-MS[2])			
Analyte	**Health Reference Level (HRL)**	**Critical Health Effect**	**Occurrence**
germanium	7.44 µg/L[3]	Kidney, ureter, bladder-changes in tubules	NIRS[4] drinking water range of detects = 26-230 µg/L; detected in 4 out of 989 samples
manganese	300 µg/L	Central nervous system effects	NIRS drinking water median = 11.96 µg/L; detected in 672 out of 989 samples

[1]Metals can also be measured by alternate Standard Methods (SM) 3125 or SM 3125-09 or ASTM International D5673-10
[2]Inductively Coupled Plasma-Mass Spectrometry
[3]Based on OW's evaluation of the dose information in the critical study, the HRL should be about ten times larger (i.e., 0.744 to 7.44 µg/L)
[4]National Inorganics and Radionuclides Survey, 1984-1986

Pesticides

EPA Method 525.3 (SPE GC/MS[1])			
Analyte	**Health Reference Level (HRL)**	**Critical Health Effect**	**Occurrence**
alpha-hexachlorocyclohexane	0.006 µg/L	Cancer	NAWQA[2] ambient water median = 0.011 µg/L; detected in 21 out of 7,119 samples
chlorpyrifos	Not available	Significant plasma and RBC cholinesterase inhibition	PDP[3] drinking water = not detected in the 13 sites sampled
dimethipin	153 µg/L	Kidney, lungs, duodenum, liver, glandular stomach, heart, aortic artery, and testes toxicity; decreased body weight gain	TRI[4] = 87 pounds released in 1 state in 2010

[1]Solid Phase Extraction and Capillary Column Gas Chromatography-Mass Spectrometry
[2]USGS, National Water-Quality Assessment Program (NAWQA)
[3]Pesticide Data Program (PDP)
[4]Toxic Release Inventory (TRI)

Pesticides

EPA Method 525.3 (SPE GC/MS)			
Analyte	**Health Reference Level (HRL)**	**Critical Health Effect**	**Occurrence**
ethoprop	1.25 µg/L	Cancer	PDP drinking water = not detected in the 13 sites sampled
oxyfluorfen	210 µg/L[5]	Liver toxicity	PDP drinking water = not detected in the 13 sites sampled
profenofos	0.35 µg/L	Plasma and RBC cholinesterase (ChE) inhibition	PDP drinking water = not detected in the 13 sites sampled

[5]Human Health Benchmark for Pesticides

Pesticides

EPA Method 525.3 (SPE GC/MS)			
Analyte	**Health Reference Level (HRL)**	**Critical Health Effect**	**Occurrence**
tebuconazole	210 µg/L	Decreased body weights, absolute brain weights, brain measurements and motor activity in offspring	PDP drinking water median detect = 0.01 µg/L; detected at 4 out of 13 sites
total permethrin (cis- & trans-)	3.65 µg/L	Cancer	California Drinking Water Monitoring Data = not detected in the 35 PWSs sampled
tribufos	7 µg/L	Plasma cholinesterase (ChE) inhibition	PDP drinking water = not detected in the 13 sites sampled

Haloacetic Acids (HAAs)

EPA Method 552.3 (GC-ECD)[1] or EPA Method 557 (IC-ESI-MS/MS)[2]

Analyte	MCLG[3]	Health Effects	Occurrence[4] (Median conc. and # detections)	HAA6Br Group	HAA5 Group	HAA9 Group
bromochloroacetic acid (BCAA)	Not available	Clear evidence of carcinogenicity (NTP 2009); Reproductive effects	3.3 µg/L; 263 of 291 systems	HAA6Br		HAA9
bromodichloroacetic acid (BDCAA)	Not available	Clear evidence of carcinogenicity (NTP 2014)	3.2 µg/L; 90 of 102 systems			
chlorodibromoacetic acid (CDBAA)	Not available		3.2 µg/L; 66 of 101 systems			
tribromoacetic acid (TBAA)	Not available		5 µg/L; 15 of 98 systems			
monobromoacetic acid (MBAA)	Not available		1.5 µg/L; 124 of 291 systems		HAA5 Group MCL[5] = 60 µg/L	
dibromoacetic acid (DBAA)	Not available	Clear evidence of carcinogenicity in mice (NTP 2007)	2.3 µg/L; 202 of 291 systems			
dichloroacetic acid (DCAA)	0 µg/L	Cancer	11 µg/L; 272 of 291 systems			
monochloroacetic acid (MCAA)	70 µg/L	Decreased body, liver, kidney and spleen weights	3 µg/L; 215 of 290 systems			
trichloroacetic acid (TCAA)	20 µg/L	Liver changes	9.7 µg/L; 259 of 291 systems			

[1]Gas Chromatography with Electron Capture Detection
[2]Ion Chromatography Electrospray Ionization Tandem Mass Spectrometry
[3]MCLGs established under the Stage 1 and Stage 2 DBPRs
[4]Disinfection By-product Information Collection Rule (DBP ICR) (1997-1998)
[5]The HAA5 group is currently regulated in drinking water at a MCL of 60 µg/L per Stage 1 and Stage 2 DBPRs

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Alcohols

EPA Method 541 (GC/MS[1])			
Analyte	**Health Reference Level (HRL)**	**Critical Health Effect**	**Usage**
1-butanol	700 µg/L	Abnormally diminished activity in the body/organs; inability to control muscles	TRI[2] = 11,093,815 pounds released in 47 states in 2010
2-propen-1-ol	35 µg/L	Impaired kidney function and increased relative liver, spleen and kidney weights	TRI = 445,833 pounds released in 13 states in 2010
2-methoxyethanol	21 µg/L	Reproductive effects	TRI = 23,240 pounds released in 16 states in 2010

[1]Gas Chromatography-Mass Spectrometry
[2]Toxic Release Inventory (TRI)

Semivolatile Organic Chemicals

EPA Method 530 (GC/MS)			
Analyte	**Health Reference Level (HRL)**	**Critical Health Effect**	**Usage**
butylated hydroxyanisole	0.581 µg/L	Changes in liver weight	NREC[2] Median = 0.1 µg/L; detected at 2 out of 85 sites
o-toluidine	0.194 µg/L	Cancer	TRI[3] = 6,623 pounds released in 1 state in 2010
quinoline	0.01 µg/L	Cancer	TRI = 15,789 pounds released in 9 states in 2010

[1]Gas Chromatography-Mass Spectrometry
[2]USGS, National Reconnaissance of Emerging Contaminants (NREC) Surface Water Data, 1999-2004
[3]Toxic Release Inventory (TRI)

Additional Contaminants and Indicators Considered for UCMR 4

- ***Legionella pneumophila*** (on CCL 4)
  - Method was not ready at the time of proposal
  - Thought to be largely a premise plumbing issue
  - Health effects:
    - Legionnaire's Disease and Pontiac Fever
  - 52 reported waterborne disease outbreaks affecting 225 people between 1990 and 2010 (CDC MMWR)
  - OW Draft (October 2015) - Technologies for *Legionella* Control: Scientific Literature Review:
    - http://www.epa.gov/sites/production/files/2015-10/documents/drafttechlegionellaoct2015.pdf

Additional Contaminants and Indicators Considered for UCMR 4

- ***Mycobacterium avium*** (on CCL 4)
  - Method was not ready at the time of proposal
  - Health effects:
    - Pulmonary disease, lymphadenitis, post-traumatic wound infection
  - No reported outbreaks between 1990 and 2008 (CDC MMWR)

Additional Contaminants and Indicators Considered for UCMR 4

- **Ammonia**
  - May be oxidized to nitrite and nitrate (contaminants of greater toxicological concern) via nitrification
    - Nitrite/Nitrate are regulated in drinking water: MCLG/MCL 1,000 and 10,000 µg/L respectively based on methemoglobinemia
  - The NPDWR for nitrite and nitrate requires compliance monitoring at each entry point to the distribution system (EPTDS)
    - Limited research indicates that nitrification downstream of EPTDS (i.e., in distribution system) may lead to higher nitrite and/or nitrate exposure (especially for PWSs using chloramine disinfection)
    - Measuring ammonia at entry point could serve as a surrogate for nitrification potential

Additional Contaminants and Indicators Considered for UCMR 4

- Three pesticides in method 525.3 were identified as lower priority based on data evaluation:
  - **Disulfoton:** Production cancelled 2009; non-cancer endpoint; not detected in 2,300 samples from 295 systems (UCMR 1 SS 2001-2003); not persistent to moderately persistent in the environment; very regionalized usage
  - **Hexazinone:** Not on CCL 4; non-cancer endpoint; not detected in 221 samples (PMP, 1999); moderately persistent to persistent in the environment
  - **Vinclozolin:** No current usage; non-cancer endpoint; was being phased out in 2004; persistent in the environment

Proposed Contaminants

- EPA invites comments on:
  - The proposed contaminants and their associated methods
  - The six additional contaminants considered for UCMR 4, but not included on the proposed list
  - Additional contaminants that may not have been considered for UCMR 4
  - ***Suggestions for which contaminant(s) to remove if others are added***
  - Additional consensus analytical methods for the proposed contaminants

UCMR 4 Cost Estimates

Average Annual Cost per Respondent (2017-2021)			
	Labor	Non-labor (methods & shipping)	Labor plus Non-labor
Small systems	$100	$0	$100
Large systems	$410	$3,630	$4,040
Very large systems	$750	$9,780	$10,530
States	$8,990	$0	$8,990
EPA	$815,240	$3,864,860	$4,680,100

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UCMR 4 Cost Estimates

Respondent	Avg. Annual Cost All Respondents (2017-2021)
Small systems (25-10,000), including labor only (non-labor costs paid for by EPA)	$0.16 m
Large systems (10,001-100,000), including labor and non-labor costs	$15.7 m
Very large systems (100,001 and greater), including labor and non-labor costs	$4.3 m
States, including labor costs related to implementation coordination	$0.50 m
EPA, including labor for implementation, non-labor for small system testing	$4.7 m
AVERAGE ANNUAL NATIONAL TOTAL	**$25.3 m**

*Note that totals may not equal the sum of components due to rounding.
*EPA assumes that one-third of the systems would monitor during each of the three monitoring years.

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UCMR 4 Sampling Design

Brenda Parris, USEPA

UCMR 4 Sampling Design Overview

- System applicability
- Sampling frequency and timing
- Revised sampling locations
  - Phased sample-analysis for microcystins
  - Haloacetic acid (HAA) groups
  - Source water sampling
- Representative sampling
- Schedules

System Applicability: National Sample Assessment Monitoring Design (List 1)

System Size (# of people served)	10 Cyanotoxins	20 Additional Chemicals	Total # of Systems per Size Category
Small systems[1] (25 – 10,000)	800 randomly selected SW or GWUDI systems	800 randomly selected SW, GWUDI and GW systems	1,600
Large systems[2] (10,001 and over)	All SW or GWUDI systems (1,987)	All SW, GWUDI and GW systems (4,292)	4,292
TOTAL	**2,787**	**5,092**	**5,892**

[1] Total for small systems is additive because these systems would only be selected for one component of UCMR 4 sampling (10 cyanotoxins or 20 additional chemicals). EPA would pay for all analytical costs associated with monitoring at small systems.
[2] Large system counts are approximate. The number of large systems is not additive. All SW and GWUDI systems would monitor for cyanotoxins; those same systems would also monitor for the 20 additional List 1 chemicals, as would the large GW systems.

Sampling Frequency and Timing

- Sample collection time frame
  - March through November
  - Exclude December, January and February
    - Except for re-sampling events, as needed
- Better reflect the times of year when contaminants are more likely to occur in drinking water (e.g., cyanotoxins and pesticides)
- Monitoring will take place over a three-year period (2018-2020)

Sampling Frequency and Timing

Contaminant Type	Water Source Type	Time Frame	Frequency
List 1 Contaminants - Cyanotoxins	SW or GWUDI	March – November	You must monitor twice a month for four consecutive months (total of eight sampling events). Sample events must occur two weeks apart.
List 1 Contaminants – Additional Chemicals	SW or GWUDI	March – November	You must monitor four times during your 12-month monitoring period. Sample events must occur two months apart. (Example: If your first sampling event is in March, the second monitoring must occur during May, the third during July, and the fourth during September).
	GW	March – November	You must monitor two times during your 12-month monitoring period. Sample events must occur six months apart. (Example: If your first monitoring is in March, the second monitoring must occur during September. If your first monitoring is in November, the second monitoring must occur in May).

Sampling Locations - Overview

- **Microcystins**
  - Phased sample analysis
    - PWSs will collect all required samples but not all samples may need to be analyzed
  - "Total microcystins" (ADDA ELISA) at source water intake and EPTDS
  - Method 544 (specific microcystin congeners) at the EPTDS
  - Temperature and pH at source water intake (concurrently)
- **Haloacetic Acid Groups**
  - Stage 2 Disinfection Byproduct Rule (DBPR) locations and/or distribution system maximum residence time (DSMRT)
  - Source water intake [bromide and total organic carbon (TOC)] concurrently
- **Remaining UCMR 4 contaminants**
  - EPTDS sampling

Phased Sample-Analysis for Microcystins

PWSs (SW and GWUDI) must collect all required samples for each sampling event (source water intake and EPTDS samples) but all samples may not need to be analyzed.

Source water intake samples analyzed for total microcystins by ADDA ELISA (PWS will also take pH and temperature measurements)

0.3 µg/L (the reporting limit for total microcystins)

ELISA result <0.3 µg/L

ELISA result ≥0.3 µg/L

ELISA analysis of the EPTDS sample would be the first step for consecutive systems (purchase 100% of their water)

Source water result would be reported to EPA. Other collected samples (for ELISA and 544) from the EPTDS would not be analyzed for that sampling event

Source water result would be reported to EPA. The EPTDS sample would then be analyzed by ELISA

EPTDS ELISA result <0.3 µg/L

EPTDS ELISA result ≥0.3 µg/L

EPTDS result would be reported to EPA and the 544 sample would not be analyzed for this particular sampling event

EPTDS result would be reported to EPA and the other microcystin sample collected at the EPTDS would be analyzed using Method 544 to identify particular microcystin congeners

Sampling Location	Samples Collected
Source water intake	ADDA ELISA, pH and temperature
Entry point to the distribution system (EPTDS)	ADDA ELISA, EPA Method 544 and 545

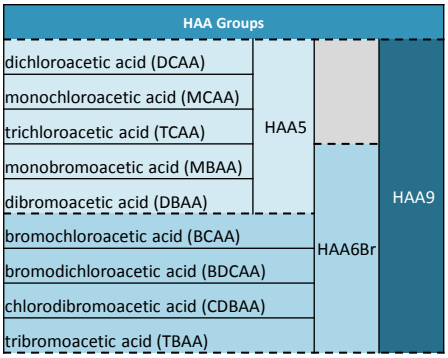
*Method 544 (identifies six specific congeners) is not a confirmation check of the ADDA ELISA result (provides a 'total' of 80-100 congeners)

Sampling Locations – HAA Groups

- If subject to Stage 2 DBPR:
  - Collect distribution system samples at the locations identified under that rule
- If not subject to Stage 2 DBPR:
  - Collect samples at a location that represents the DSMRT
    - DSMRT is an active point (i.e., location that currently provides water to customers) in the distribution system where water has been in the system longest relative to the EPTDS

Sampling Locations – HAA Groups

- UCMR 4 HAA samples and HAA5 Stage 2 DBPR compliance samples can be collected at the same time
  - Must use a UCMR 4 approved laboratory and EPA Method 552.3 or 557
- PWSs report HAA results to EPA for three groups (HAA5, HAA6Br and HAA9)
  - Labs also report individual HAA analyte data for QC purposes
- Better understand co-occurrence between regulated and unregulated disinfection byproducts



Source Water Sampling

- Applies to microcystin (i.e., ADDA ELISA, pH and temperature) and HAA (i.e., bromide and TOC) monitoring
- Untreated water entering the water treatment plant
  - A location prior to any treatment
- Systems subject to:
  - The Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR)
    - Use the source water sampling site(s) under that rule
  - Stage 1 DBPR (remain unchanged under Stage 2 DBPR)
    - Use TOC source water sampling site(s)
- Systems with two different source water sampling locations for LT2/Stage 1 DBPR
  - Use sample point that best represents the definition of source water sample location(s) for UCMR

Representative Sampling

- Large GW systems with multiple EPTDSs can sample at representative sampling locations rather than at each EPTDS if prior approval is received
  - Representative sampling plans approved under prior UCMRs will be recognized for UCMR 4
  - These systems **must** submit a copy of the documentation from their state or EPA that approved their representative sampling locations

Representative Sampling

- New GW representative monitoring plans must be submitted for review by the state or EPA within 120 days from publication of the final rule
- Approved representative locations must be loaded into the SDWARS by December 31, 2017

Schedules

- Large system schedules
  - EPA initially drafts schedule
  - Partnered state has opportunity to review and modify
  - PWS has opportunity to review and modify
    - Systems must NOT modify their schedules to avoid a suspected vulnerable period
- Small system schedules
  - EPA initially drafts schedule
  - Partnered state has opportunity to review and modify

Sampling Design

- EPA invites comment on:
  - Monitoring time frame (March-November)
  - Cyanotoxin monitoring approach
    - Including "indicator" monitoring
  - Phased sample-analysis for microcystins
  - Balance between burden (e.g., number of PWSs, monitoring frequency) and data representativeness

UCMR 4 Reporting

Jennifer Tully, ORISE

UCMR 4 Reporting Overview

- Initial and on-going reporting requirements
- New/revised data elements
- Timing of reporting

Reporting by All Systems §141.35(b)

- EPA's electronic data reporting system (SDWARS) can be accessed:
  - http://www.epa.gov/dwucmr
- Hard copy documentation mailed:
  - UCMR Sampling Coordinator, USEPA, Technical Support Center, 26 West Martin Luther King Drive (MS 140), Cincinnati, OH 45268
- Electronic files emailed:
  - UCMR_Sampling_Coordinator@epa.gov

Large System Reporting §141.35(c)

- Contact and zip code information
  - SDWARS by December 31, 2017
- Sampling location information
  - SDWARS by December 31, 2017
  - Changes after applicability date must be submitted to (with reason) and approved by EPA's UCMR Sampling Coordinator
- Samples
  - PWSs must report all data elements specified in §141.35(e) Table 1 (e.g., disinfectant type, treatment information and disinfectant residual)
- Monitoring results
  - Entered by UCMR approved laboratory to SDWARS
  - Reviewed and submitted by PWS

Small System Reporting §141.35(d)

- If notified that system will be subject to UCMR 4:
  - Contact and zip code information
    - To SDWARS within 90 days of notification ***(new)***
  - Sampling location information
    - To SDWARS by December 31, 2017 ***(new)***
  - Samples
    - PWSs must report all data elements specified in §141.35(e) Table 1 on each sample form as appropriate (e.g., disinfectant type, treatment information and disinfectant residual)
  - Monitoring results
    - Entered by contracted laboratory to SDWARS
    - Reviewed by EPA
    - Viewed by PWS

Reporting Data Elements §141.35(e)

1. Public Water System Identification (PWSID) Code	14. Sample Identification Code
2. Public Water System Name*	15. Contaminant
3. Public Water System Facility Identification Code	16. Analytical Method Code
4. Public Water System Facility Name*	17. Extraction Batch Identification Code
5. Public Water System Facility Type*	18. Extraction Date
6. Water Source Type	19. Analysis Batch Identification Code
7. Sampling Point Identification Code	20. Analysis Date
8. Sampling Point Name*	**21. Sample Analysis Type *(more details)***
9. Sampling Point Type Code	22. Analytical Results—Sign
10. Disinfectant Type *(more details)*	23. Analytical Result—Measured Value
11. Treatment Information *(more details)*	24. Additional Value
12. Disinfectant Residual Type	25. Laboratory Identification Code
13. Sample Collection Date	26. Sample Event Code

Blue indicates new data element ***Green indicates updated data element***

*New data elements that were used in previous UCMRs but not required per rule language

Disinfectant Type - Data Element 10

- **PEMB** = permanganate (applied before SR sample location)
- **PEMA** = permanganate (applied after SR sample location)
- **HPXB** = hydrogen peroxide (applied before SR sample location)
- **HPXA** = hydrogen peroxide (applied after SR sample location)
- **CLGA** = gaseous chlorine
- **CLOF** = offsite generated hypochlorite (stored as a liquid form)
- **CLON** = onsite generated hypochlorite
- **CAGC** = chloramine (formed from gaseous chlorine)
- **CAOF** = chloramine (formed from offsite hypochlorite)
- **CAON** = chloramine (formed from onsite hypochlorite)
- **CLDB** = chlorine dioxide (applied before SR sample location)
- **CLDA** = chlorine dioxide (applied after SR sample location)
- **OZON** = ozone
- **ULVL** = ultraviolet light
- **OTHD** = all other types of disinfectant/oxidant
- **NODU** = no disinfectant/oxidant used

Treatment Information - Data Element 11

- **CON** = conventional (non-softening)
- **SCO** = softening conventional
- **RBF** = river bank filtration
- **PSD** = pre-sedimentation
- **INF** = in-line filtration
- **DFL** = direct filtration
- **PCF** = precoat filtration
- **SSF** = slow sand filtration
- **BIO** = biological filtration
- **REC** = reactor clarification (e.g., solids contact clarification, slurry recirculation clarification, Aciflo®)
- **SBC** = sludge blanket clarification (e.g., Pulsator®, Super Pulsator®, contact adsorption clarifiers, floc-blanket clarifiers)
- **ADC** = adsorption clarification (contact adsorption clarification)
- **UTR** = unfiltered treatment
- **PAC** = application of powder activated carbon
- **GAC** = granular activated carbon (not part of filters in CON, SCO, INF, DFL or SSF)
- **AIR** = air stripping (packed towers, diffused gas contactors)
- **POB** = pre-oxidation/disinfection with chlorine (applied before SR sample location)
- **POA** = pre-oxidation/disinfection with chlorine (applied after SR sample location)
- **MFL** = membrane filtration
- **IEX** = ionic exchange
- **UVT** = ultraviolet light
- **AOX** = advanced oxidation (ultraviolet light with hydrogen peroxide and/or ozone)
- **DAF** = dissolved air floatation
- **CWL** = clear well/finished water storage without aeration
- **CWA** = clear well/finished water storage with aeration
- **ADS** = aeration in distribution system (localized treatment)
- **OTH** = all other types of treatment
- **NTU** = no treatment used

Sample Analysis Type - Data Element 21

- **CF** = concentration fortified; the concentration of a known contaminant added to a field sample reported with sample analysis types LFSM, LFSMD, LFB, CCC and QCS.
- **CCC** = continuing calibration check; a calibration standard containing the contaminant, the internal standard, and surrogate analyzed to verify the existing calibration for those contaminants.
- **FS** = field sample; sample collected and submitted for analysis under this rule.
- **IS** = internal standard; a standard that measures the relative response of contaminants.
- **LFB** = laboratory fortified blank; an aliquot of reagent water fortified with known quantities of the contaminants and all preservation compounds.
- **LRB** = laboratory reagent blank; an aliquot of reagent water treated exactly as a field sample, including the addition of preservatives, internal standards, and surrogates to determine if interferences are present in the laboratory, reagents, or other equipment.
- **LFSM** = laboratory fortified sample matrix; a UCMR field sample with a known amount of the contaminant of interest and all preservation compounds added.
- **LFSMD** = laboratory fortified sample matrix duplicate; duplicate of the laboratory fortified sample matrix.
- **QCS** = quality control sample; a sample prepared with a source external to the one used for initial calibration and CCC. The QCS is used to check calibration standard integrity.
- **QH** = quality HAA; HAA sample collected and submitted for quality control purposes.
- **SUR** = surrogate standard; a standard that assesses method performance for each extraction.

Timing of Reporting Results

- Large systems
  - Laboratory posts results to SDWARS within 120 days of sample collection
  - Systems review, approve and submit to state and EPA within 60 days of laboratory's post
- Small systems
  - EPA will still manage laboratory contracts for small water systems
  - Laboratory posts results to SDWARS within 120 days of sample collection
  - Systems have the option to view data in SDWARS
  - EPA will not mail hard copy reports to systems or states

10-Minute Break

UCMR 4 Laboratory Approval Process and MRLs

Melissa Simic, USEPA

UCMR 4 Laboratory Approval Program

- Similar to the process used in UCMR 3
- Only UCMR 4 approved laboratories can analyze UCMR 4 samples collected at PWSs
  - Approval is by method and by individual location
  - A laboratory may apply for any number of UCMR 4 methods
- Laboratories need to meet:
  - UCMR 4 approval program criteria
  - Required equipment criteria
  - Laboratory performance criteria
  - Data reporting criteria

UCMR 4 Laboratory Approval Manual

- Procedures for obtaining UCMR 4 approval and procedures for revocation of approval
- Quality assurance (QA) and quality management requirements
- Initial Demonstration of Capability (IDC)
- Minimum reporting level (MRL) verification
- Quality control (QC) requirements:
  - Extraction/Analysis Batch
  - Initial calibration of analytical instruments
  - Continuing calibration checks (CCC)
  - Surrogate and internal standard
  - Laboratory reagent blanks (LRB) and laboratory fortified blanks (LFB)
  - Quality control samples (QCS)
  - Laboratory fortified sample matrix (LFSM)
- Sample handling requirements
- Uploading data to SDWARS

General Procedure

- Step 1: Request to Participate
- Step 2: Registration
- Step 3: Application Package
- Step 4: EPA Review of Application Package
- Step 5: Proficiency Testing (PT)
- Step 6: Written EPA approval

Step 1 - Request to Participate

- Submit a written request to EPA Laboratory Approval Coordinator
  - UCMR_Sampling_Coordinator@epa.gov
- EPA provides:
  - Registration material
  - Customized application package

Step 2 - Registration

- Complete registration sheet:
  - List of the UCMR 4 methods that the laboratory is seeking approval
  - Laboratory information
  - Mailing and shipping address
  - Contact information
- EPA will provide a UCMR-specific laboratory ID to each participant
- Must complete and submit the necessary registration forms within 60 days of publication of the final rule

Step 3 - Application Package

- Separate application for each method
- Application must include:
  - Proof of current drinking water laboratory certification (for select compliance monitoring methods)
  - Personnel information
  - QA information
  - Information regarding analytical equipment and sample handling procedures
  - Data submission for each method (e.g., IDC study, QC sample results, quantification reports)
  - Confirmation on reporting to SDWARS
- Must complete and submit the necessary application materials (method specific) within 120 days from publication of final rule

Step 4 - Review of Application Package

- EPA reviews application package
  - If deficiencies are identified the lab will have an opportunity to make corrective actions and submit new application information
  - If all requested information is present and acceptable, EPA will notify the laboratory that they are eligible to participate in corresponding PT studies

Step 5 - Proficiency Testing

- EPA provides method-specific PT samples
- Laboratories:
  - Analyze PT sample(s) for each analyte and method
  - If do not pass PT, may have another opportunity
- One successful PT per method
- No PT studies after monitoring begins

Step 6 – Written EPA Approval

- After successful participation in a PT study for a specific method, EPA will notify the laboratory in writing
- Before final rule is published, the laboratory will be granted a "pending approval" contingent upon:
  - Changes applied to the final rule
  - Resolution of any findings from a laboratory audit
- Granted "final approval" after promulgation of the final rule

Maintaining Approval

- Adhere to QA/QC measures in the methods, rule language and the UCMR 4 Laboratory Approval Manual
- Post occurrence data and required QC data via SDWARS within prescribed time frame
- Successfully complete audits and meet all the other stated conditions

MRLs

- MRL is an estimate of the quantitation level, achievable with a 95% confidence, by at least 75% of laboratories nationwide
- Established with data from several laboratories performing LCMRL studies
- LCMRL – The lowest true concentration for which the future recovery is predicted to fall between 50% to 150% with 99% confidence
  - Estimate of lowest concentration at which measurements of specified quality can be repeatedly made
  - Simultaneous application of precision and accuracy

MRLs

- To achieve quality across laboratories, while allowing for reasonable national laboratory capacity
- MRLs are generally established as low as is reasonable; typically lower than current HRLs and health advisories
- EPA will consider raising MRLs if there is evidence that a proposed MRL is unattainable or impractical

MRLs - Cyanotoxins

1-Contaminant	2-CAS Registry Number	3-Analytical Methods	4-Minimum Reporting Level
microcystin-LA	96180-79-9	EPA 544	0.008 µg/L
microcystin-LF	154037-70-4	EPA 544	0.006 µg/L
microcystin-LR	101043-37-2	EPA 544	0.02 µg/L
microcystin-LY	123304-10-9	EPA 544	0.009 µg/L
microcystin-RR	111755-37-4	EPA 544	0.006 µg/L
microcystin-YR	101064-48-6	EPA 544	0.02 µg/L
nodularin	118399-22-7	EPA 544	0.005 µg/L
total microcystin	N/A	ADDA ELISA	0.3 µg/L
anatoxin-a	64285-06-9	EPA 545	0.03 µg/L
cylindrospermopsin	143545-90-8	EPA 545	0.09 µg/L

MRLs – Metals

1-Contaminant	2-CAS Registry Number	3-Analytical Methods	4-Minimum Reporting Level
germanium	7440-56-4	EPA 200.8, ASTM D5673-10, SM 3125	0.3 µg/L
manganese	7439-96-5	EPA 200.8, ASTM D5673-10, SM 3125	0.4 µg/L

MRLs – Pesticides and Pesticide Byproduct

1-Contaminant	2-CAS Registry Number	3-Analytical Methods	4-Minimum Reporting Level
alpha-hexachlorocyclohexane	319-84-6	EPA 525.3	0.01 µg/L
chlorpyrifos	2921-88-2	EPA 525.3	0.03 µg/L
dimethipin	55290-64-7	EPA 525.3	0.2 µg/L
ethoprop	13194-48-4	EPA 525.3	0.03 µg/L
oxyfluorfen	42874-03-3	EPA 525.3	0.05 µg/L
profenofos	41198-08-7	EPA 525.3	0.3 µg/L
tebuconazole	107534-96-3	EPA 525.3	0.2 µg/L
total permethrin (cis- & trans-)	52645-53-1	EPA 525.3	0.04 µg/L
tribufos	78-48-8	EPA 525.3	0.07 µg/L

MRLs – Haloacetic Acids

1-Contaminant	2-CAS Registry Number	3-Analytical Methods	4-Minimum Reporting Level
bromochloroacetic acid (BCAA)	5589-96-8	EPA 552.3 or EPA 557	0.3 µg/L
bromodichloroacetic acid (BDCAA)	71133-14-7	EPA 552.3 or EPA 557	0.5 µg/L
chlorodibromoacetic acid (CDBAA)	5278-95-5	EPA 552.3 or EPA 557	0.3 µg/L
tribromoacetic acid (TBAA)	75-96-7	EPA 552.3 or EPA 557	2.0 µg/L
monobromoacetic acid (MBAA)	79-08-3	EPA 552.3 or EPA 557	0.3 µg/L
dibromoacetic acid (DBAA)	631-64-1	EPA 552.3 or EPA 557	0.3 µg/L
dichloroacetic acid (DCAA)	79-43-6	EPA 552.3 or EPA 557	0.2 µg/L
monochloroacetic acid (MCAA)	79-11-8	EPA 552.3 or EPA 557	2.0 µg/L
trichloroacetic acid (TCAA)	76-03-9	EPA 552.3 or EPA 557	0.5 µg/L

* Register for TOC and bromide

MRLs – Alcohols

1-Contaminant	2-CAS Registry Number	3-Analytical Methods	4-Minimum Reporting Level
1-butanol	71-36-3	EPA 541	2.0 µg/L
2-methoxyethanol	109-86-4	EPA 541	0.4 µg/L
2-propen-1-ol	107-18-6	EPA 541	0.5 µg/L

MRLs – Semivolatile Organics

1-Contaminant	2-CAS Registry Number	3-Analytical Methods	4-Minimum Reporting Level
butylated hydroxyanisole	25013-16-5	EPA 530	0.03 µg/L
o-toluidine	95-53-4	EPA 530	0.007 µg/L
quinoline	91-22-5	EPA 530	0.02 µg/L

Submitting Public Comments

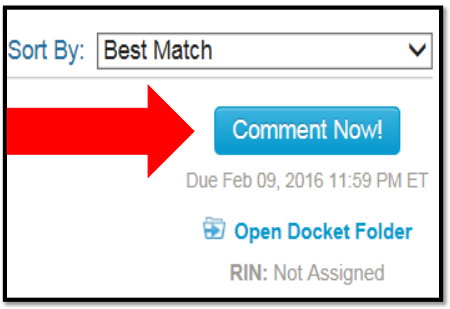
Brenda Parris, USEPA

Comment Process/Accessing Docket

- Go to http://www.regulations.gov
- Enter Docket ID EPA-HQ-OW-2015-0218
- Click Search button

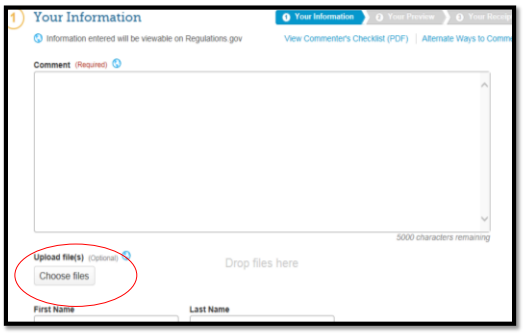
Comment Process/Accessing Docket

- The UCMR 4 docket should pop up on the next screen
- Click on the Comment Now button on right hand side of the screen



Comment Process/Accessing Docket

- Enter comment and all required information on next screen
- Upload a document by clicking on the Choose files button
- Click on the Continue button at the bottom of the page to preview your comment



Comment Process/Accessing Docket

- Once submitted, comments cannot be edited or removed
- Do not electronically submit any information you consider to be CBI
- Multimedia submissions (audio, video, etc.) must be accompanied by a written comment
  - Written comment is considered the official comment and should include discussion of all points you wish to make
- EPA public comment policy is at: http://www.epa.gov/dockets/commenting-epa-dockets

Statements from Webinar Participants

Name	Organization
Lynn Thorp	Clean Water Action
Steve Via	AWWA
Paul Monroy	Babcock Laboratories, Inc.
Amanda Foss	GreenWater Lab
Andrew Eaton	Eurofins Eaton Analytical
Charmaigne Cortesio	Arizona Public Service
Cynthia Andrews-Tate	Long Beach Water Department
Heide Bell	City of O'Fallon
Kasi Clay	City of Grand Prairie
Robert Holmes	Akron Water Supply
Dave Dunaway	ADEQ
Judy Schmidt	City of Arvada
Danielle Bonham	City of Vallejo
Zach Brown	City of Sterling
Theresa Lutz	MDWID
Jeff Martin	City of Evanston
Steven Prazak	City of Bend Utility Department
Melissa Simoncini	Concord Public Works
Doug Sims	Auburn Water System
John Allen	BCWID#1

Closing Remarks

- Further information:
  - Brenda D. Parris: parris.brenda@epa.gov
  - Melissa Simic: simic.melissa@epa.gov
  - Safe Drinking Water Hotline: http://www.epa.gov/your-drinking-water/safe-drinking-water-hotline
  - Meeting materials were sent to all registered participants
  - If you did not receive a copy, please email UCMRwebinar@cadmusgroup.com and we will send you a copy

Additional Information

Acronyms

Abbreviations and Acronyms	
ADDA	(2S, 3S, 8S, 9S, 4E, 6E)-3-amino-9-methoxy-2,6,8-trimethyl-10-phenyl-4, 6-decadienoic acid
DSMRT	Distribution System Maximum Residence Time
ELISA	Enzyme-linked Immunosorbent Assay
EPTDS	Entry Point to the Distribution System
GW	Ground Water
GWRMP	Ground Water Representative Monitoring Plan
GWUDI	Ground Water Under the Direct Influence of Surface Water
HAA5	Dibromoacetic Acid, Dichloroacetic Acid, Monobromoacetic Acid, Monochloroacetic Acid, Trichloroacetic Acid
HAA6Br	Bromochloroacetic Acid, Bromodichloroacetic Acid, Dibromoacetic Acid, Dibromochloroacetic Acid, Monobromoacetic Acid, Tribromoacetic Acid
HRL	Health Reference Level

Acronyms

Abbreviations and Acronyms	
IDC	Initial Demonstration of Capability
LCMRL	Lowest Concentration Minimum Reporting Level
MRL	Minimum Reporting Level
PA	Partnership Agreement
PT	Proficiency Testing
SDWARS	Safe Drinking Water Accession and Review System
SDWIS/Fed	Federal Safe Drinking Water Information System
SMP	State Monitoring Plan
SW	Surface Water
TOC	Total Organic Carbon