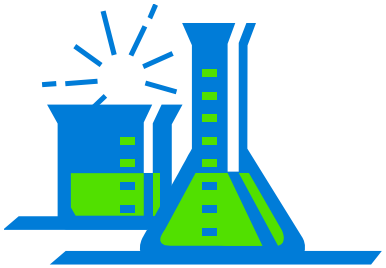
Unregulated Contaminant Monitoring Rule 3

January 1, 2013 – December 31, 2015

(January 9, 2013 – 12/16/2016)

Unregulated Contaminant Monitoring Rule 4

January 1, 2018 – December 31, 2020



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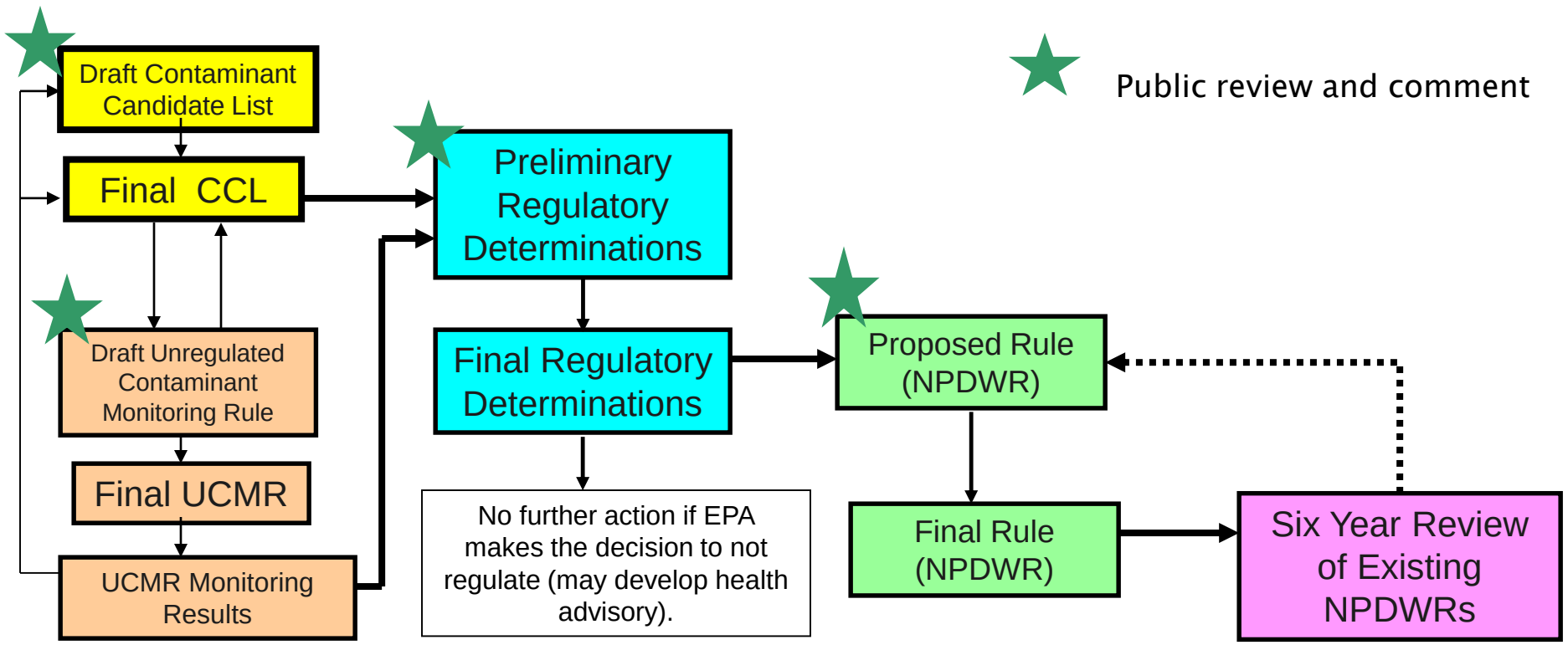
NJ Drinking Water Quality Institute, March 27, 2017

UCMR:
Unregulated Contaminant Monitoring Rule

- U.S. Environmental Protection Agency
  - New list of up to 30 unregulated contaminants every 5 years
    - 2013–2015, 2018–2020

- To provide baseline occurrence data
  - Drinking water contaminants that do not have health – based standards under the SDWA
  - USEPA can combine with toxicological research to make decisions about potential future drinking water regulations

General Flow of Federal Safe Drinking Water Act Regulatory Processes



At each stage, need increased specificity and confidence in the type of supporting data used (e.g. health, occurrence, treatment).

UCMR3 System Applicability

Assessment Monitoring (List 1 Contaminants) = 21 contaminants		
System Type	Systems serving >10,000	Systems serving ≤10,000
CWS & NTNCWS	All systems (4200) NJ = 160	800 randomly selected systems NJ = 15
TNCWS	No requirements	No requirements

NJ = 175 systems

Screening Survey (List 2 Contaminants) = 7 contaminants		
System Type	Systems serving >10,000	Systems serving ≤10,000
CWS & NTNCWS	All systems (410) serving more than 100,000, and 320 randomly selected systems serving 10,001 to 100,000 NJ = 21	480 randomly selected systems NJ = 6
TNCWS	No requirements	No requirements

NJ = 27 systems

Pre-Screen Testing (List 3 Contaminants): viruses = 2 contaminants		
System Type	Systems serving >1,000	Systems serving ≤1,000
CWS, TNCWS & NTNCWS	No requirements	800 randomly selected systems NJ = 3

NJ = 3 systems

NJ =160 systems

NJ =24 systems

UCMR Data: 2016 Release 1,048,576 samples nationwide

- 36,991 NJ samples – 184 systems
  - **PWS > 10,000: 160 systems; 34,738 samples**
  - PWS< 10,000: 21 systems, 2253 samples
    - [Very small systems for micro: 3 systems, 33 samples]
- Monitoring type
  - **Assessment: monitoring: 34,824 samples**
  - Screening survey: 2134
  - Prescreening survey: 33
- Facility type
  - **GW = 25,405 samples (143 systems)**
  - SW = 9530 samples (86 systems)
  - Mixed =1860 samples (52 systems)
  - GUDI = 196 samples (2 systems)

UCMR Data: 2016 Release

- 36,991 samples analyzed in New Jersey
  - **15,758 first samples**
  - 15,328 second
  - 3021 third
  - 2884 fourth
- Sample locations
  - **Entry point = 32,882**
  - Maximum residence time = 4109
- Collection year
  - 2013 = 11,652
  - **2014 = 13,718**
  - 2015 = 11,398
  - 2016 = 223

UCMR Data

- MRLs lower than in previous UCMRs, more detections than in past UCMRs
- Reference concentrations posted for most contaminants
  - http://water.epa.gov/lawsregs/rulesregs/sdwa/ucmr/ucmr3/upload/UCMR3_FactSheet_List1.pdf
  - DrinkTap.org
  - NJ specific “reference concentrations”

Assessment Monitoring: List 1

- Volatile Organic Compounds (7)
  - 174 systems; 1433 samples of each analyte
  - **1,2,3-Trichloropropane**
  - 1,3-Butadiene*
  - Chloromethane (Methyl chloride)
  - 1,1-Dichloroethane
  - Bromomethane (methyl bromide)*
  - Chlorodifluoromethane (HCFC-22)
  - Bromochloromethane (Halon 1011)
    - USEPA Method 524.3

*Not detected in NJ

Assessment Monitoring: List 1 VOCs – cont.

- 1,2,3 – Trichloropropane
  - DWQI Recommended MCL (2009) = 0.03 ug/L
  - MRL = 0.03 ug/L
  - 2/174 systems > MRL

- 1,1-Dichloroethane
  - NJ MCL = 50 ug/L
  - EPA ref. conc. = 6/600 ug/L (10^{-6}/10^{-4})
  - MRL = 0.03 ug/L
  - 27/174 systems > MRL

Assessment Monitoring: List 1

- Synthetic Organic Compounds (1)
  - 174 systems; 1433 samples of each analyte
  - **1,4-dioxane**
    - Detected in 341/1433 samples in NJ (24%)
    - PQL modified 11/25/2015; Interim Specific Ground Water Quality Criteria (ISGWQC) became the Groundwater Standard = 0.4 ug/L
    - 27/174 systems > Groundwater Standard = 16% of systems that sampled
    - DEP issued letters to these systems: monitoring
    - EPA Method 522; MRL = 0.07 ug/L

Assessment Monitoring: List 1

- Oxyhalide Anion (1)
  - 174 systems; 1997 samples
  - **Chlorate**
    - Detected in 1506/1997 samples (75%)
    - Detected above EPA ref. conc. (210 ug/L) in 15% of samples; 47% of systems
    - EPA 300.1, ASTM D6581-08, Standard Methods 4110D (1997)

Assessment Monitoring: List 1

- Metals (6)
  - 175 systems; approx. 2028 samples/metal
  - **Vanadium** (2 systems> RC; 2nd samples low)
  - Molybdenum
  - **Cobalt** (1 system > RC; 2nd low)
  - **Strontium**
  - Chromium
  - Hexavalent chromium
    - EPA 200.8 Rev 5.4, EPA 218.7

Assessment Monitoring: List 1 Metals – cont.

- Strontium
  - Detected in 2013/2019 samples (>99%)
  - NJ Groundwater standard = 2000 ug/L
  - 11/2019 samples and 5/175 systems > NJ Groundwater standard

- DEP notified one system

Assessment Monitoring: List 1 Metals – cont.

- Chromium
  - MCL = 100 ug/L
  - Detected in 132/175 systems (75%)
  - 961/2023 samples (48%)
  - Range of detections: 0.2–58 ug/L

- Hexavalent chromium
  - Detected in 157/174 systems (90%)
  - 1428/2028 samples (70%)
  - Range of detections: 0.03–3.8 ug/L

Assessment Monitoring: List 1

- Perfluorinated Compounds (6)
  - 175 systems; 1461 samples
  - perfluorooctane sulfonate (PFOS)
  - **perfluorooctanoic acid (PFOA)**
  - **perfluorononanoic acid (PFNA)**
  - perfluorohexane sulfonic acid (PFHxS)
  - perfluoroheptanoic acid (PFHpA)
  - perfluorobutane sulfonic acid (PFBS)*

* Not detected in NJ

- EPA 537 Rev 1.1

Assessment Monitoring: List 1 Perfluorinated Compounds (cont.)

- PFOA
  - EPA MRL = 0.020 ug/L or 20 ng/L
  - Detected in 87/1461 samples (6%); 18/175 systems (11%)
  - EPA Draft HA = 70 ng/L (combined PFOA+ PFOS)
    - 1 sample PFOA above 70 ug/L; 6 systems PFOA+PFOS>70 ug/L
  - DEP Draft Guidance (2007) = 40 ng/L
    - 13 samples, 7 systems
  - DWQI Draft HB recommendation (2016)= 14 ng/L
    - 87 samples, 19 systems

Assessment Monitoring: List 1 Perfluorinated Compounds (cont.)

- PFOS
  - EPA MRL = 0.040 ug/L or 40 ng/L
  - Detected in 12/1461 samples (0.8%); 6/175 systems > MRL (3%)
  - EPA Draft HA = 70 ng/L (combined PFOA+ PFOS)
    - 1 PFOS sample > 70

Assessment Monitoring: List 1 Perfluorinated Compounds (cont.)

- PFNA
  - EPA MRL = 0.020 ug/L or 20 ng/L
  - Detected in 7/1461 samples (0.5%); 4/175 systems (2%)

  - No EPA Reference concentration
  - Groundwater standard = 0.01 ug/L
  - DWQI MCL recommendation (2015)= 13 ng/L
    - 7 samples, 4 systems

Screening Survey: List 2

- Hormones (7)
  - 28 systems; 2122 samples
  - 17-β-estradiol*
  - 17-α-ethynylestradiol (ethinyl estradiol)*
  - 16-α-hydroxyestradiol (estriol)*
  - Equilin*
  - Estrone*
  - Testosterone: I sample in 2013; 3 other samples ND
  - 4-androstene-3,17-dione: 1 sample in 2015, 3 other samples ND

*Not detected in NJ

- USEPA Method 539

Pre-Screening Testing: List 3

- List 3 Contaminants
  - Enteroviruses*
  - Noroviruses*
  - USEPA Method 1615, developed by USEPA and USGS
    - Aerobic spores
    - Enterococcus
    - Enterovirus (cell culture)
    - Enterovirus (RT-qPCR)
    - E. coli
    - Male specific phage
    - Norovirus GIA
    - Norovirus GIB
    - Norovirus GII
    - Somatic phage
    - Total coliform

* Not detected in NJ

Summary of NJ UCMR Data

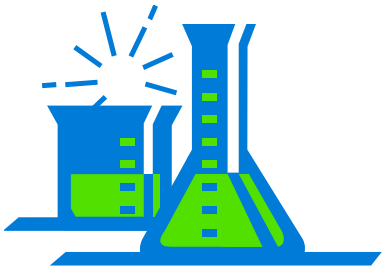
- **Not detected in UCMR3 in NJ** (10)
  - 1,3-Butadiene
  - Bromomethane
  - Perfluorobutane sulfonic acid (PFBS)
  - 17-β-estradiol
  - 17-α-ethynylestradiol (ethinyl estradiol)
  - 16-α-hydroxyestradiol (estriol)
  - Equilin
  - Estrone
  - Noroviruses
  - Enteroviruses

Summary of NJ UCMR Data

- NJ MCL (2)
  - 1,1-Dichloroethane
  - Chromium
- ISGWQC (4)
  - 1,4-Dioxane
  - PFNA
  - Strontium
  - 1,2,3-Trichloropropane
- DWQI recommendation (3)
  - PFNA
  - 1,2,3,- Trichloroethane
  - PFOA
- Under review by DWQI (1)
  - PFOS

Summary

- EPA regulatory determination
- Future UCMR4



UCMR4

- **UCMR4 Analytes: all 30 are List 1 contaminants**
  - **Monitoring 2018-2020**

  - 10 cyanotoxins
  - 2 metals
  - 8 pesticides
  - 1 pesticide manufacturing by-product
  - 3 brominated haolacetic acid groups
  - 3 alcohols
  - 3 semivolatile chemicals

https://www.epa.gov/dwucmr/fourth-unregulated-contaminant-monitoring-rule

Federal Register /Vol. 81, No. 244 / Tuesday, December 20, 2016 /92666

Exhibit 4: Timeline of UCMR 4 Activities

2017	2018	2019	2020	2021
After final rule publication: EPA/state primacy authorities (1) develop SMPs (including the nationally representative sample); (2) inform PWSs/ establish monitoring plans; and (3) continuation of laboratory approval	← **Assessment Monitoring** List 1 Contaminants → *All large systems serving more than 10,000 people; 800 small systems serving 10,000 or fewer people for cyanotoxins; 800 small systems serving 10,000 or fewer people for the 20 additional contaminants.* Reporting and analysis of data			Complete reporting and analysis of data

EXHIBIT 5—SYSTEMS TO PARTICIPATE IN UCMR 4 MONITORING

System size (number of people served)	National sample: Assessment monitoring design		Total number of systems per size category
	10 List 1 cyanotoxins	20 Additional list 1 contaminants[3]	
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 (2,725)	All SW, GWUDI and GW systems (4,292)	4,292
Total	3,525	5,092	5,892

[1]Total for small systems is additive because these systems will only be selected for one component of UCMR 4 sampling (10 cyanotoxins or 20 additional contaminants). EPA will pay for all analytical costs associated with monitoring at small systems.2

[2]Large system counts are approximate. The number of large systems is not additive. All SW and GWUDI systems will monitor for cyanotoxins; those same systems will also monitor for the 20 additional List 1 contaminants, as will the large GW systems.

[3]Water systems that are not subject to HAA5 monitoring under the D/DBPRs (§ 141.Subparts L and V) are not required to monitor for the UCMR 4 HAAs or associated indicators (TOC and bromide).

UCMR4 Analytes

10 Cyanotoxins (EPA 544, 545, 546)

- Total Microcystins (546)
- Microcystin-LR,-LA, -LY, -RR, -LF, -YR
- Nodularin
- Cylindrospermopsin
- Anatoxin-a

2 metals (EPA 200.8)

- Germanium
- Manganese

- 8 pesticides, 1 pesticide manufacturing (EPA 525.3)
  - *alpha*-Hexachlorocyclohexane
  - Chlorpyrifos
  - Dimethipin
  - Ethoprop
  - Oxyfluorfen
  - Profenofos
  - Tebuconazoletotal
  - Total Permethrin (cis- & trans-)
  - Tribufos

UCMR4 Analytes contd.

- 3 brominated haloacetic acid groups (EPA 552.3, EPA 557)
  - HAA5
  - HAA6br
  - HAA9
- 3 alcohols (EPA 541)
  - 1-Butanol
  - 2-Methoxyethanol
  - 2-Propen-1-ol
- 3 semivolatile chemicals (EPA 530)
  - Butylated hydroxyanisole
  - o-Toluidine
  - Quinoline

- https://www.epa.gov/dwucmr/fourth-unregulated-contaminant-monitoring-rule

- Questions?