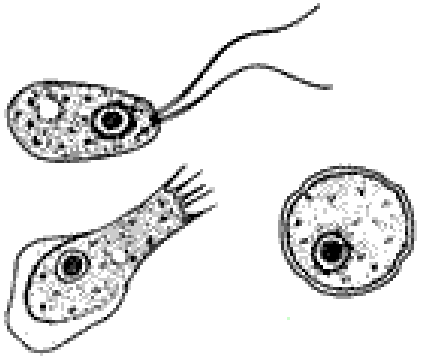
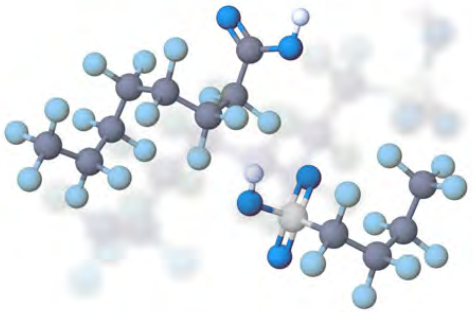




New Cyanotoxin Rules and Other Emerging Contaminants

Gregg Baird, REHS
OHA-Drinking Water Services

PUBLIC HEALTH DIVISION
Drinking Water Services

Oregon Health Authority

Presentation Overview

- New Cyanotoxins monitoring rule
- Emerging contaminants of concern

Cyanotoxin Health Advisory Levels

- Established by EPA and adopted by Oregon for total microcystins and cylindrospermopsin

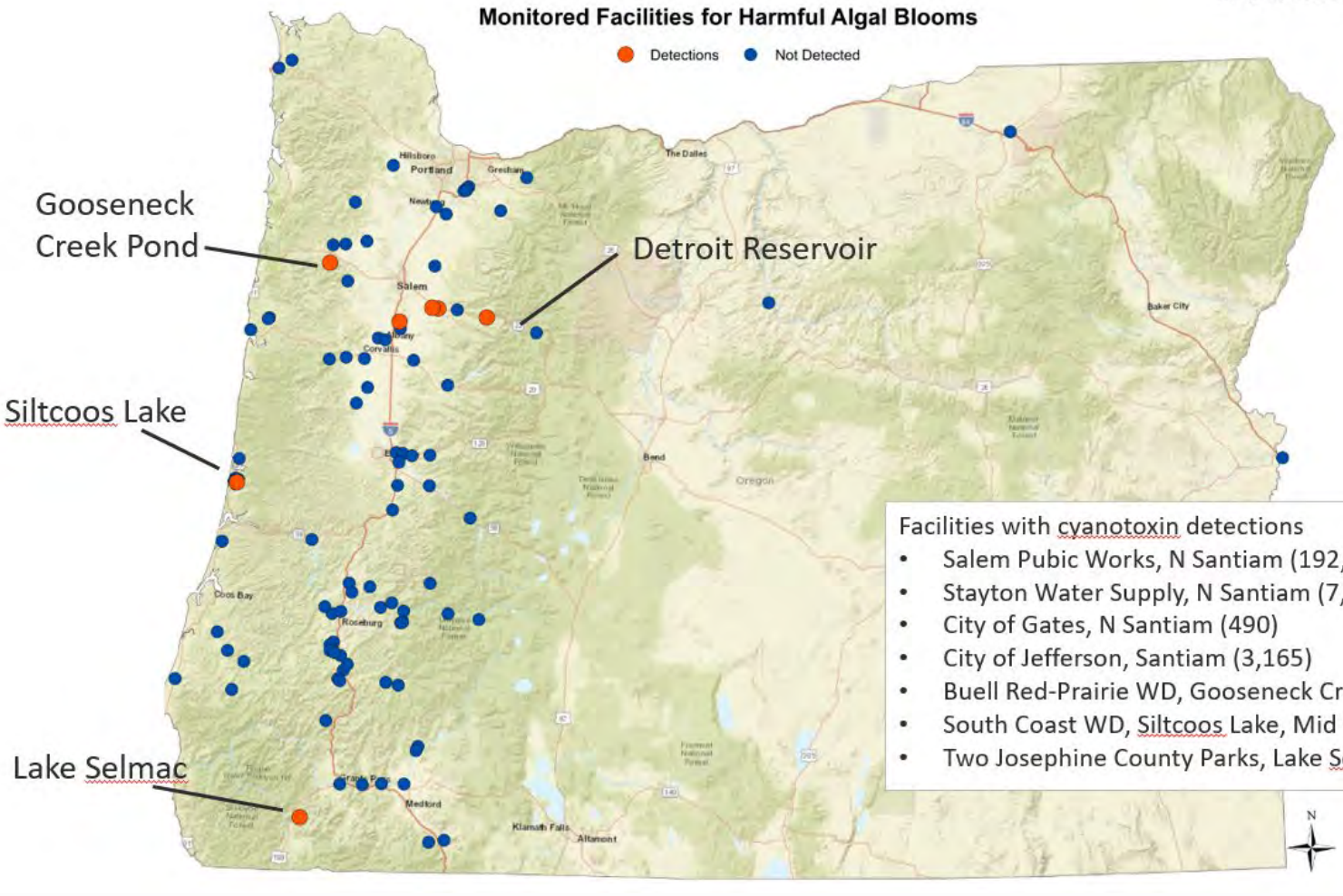
Cyanotoxin	For Vulnerable People (µg/L)	For Age 6 and Above (µg/L)
Total Microcystins	0.3	1.6
Cylindrospermopsin	0.7	3

- Health effects include upset stomach, diarrhea, vomiting, as well as long-term liver or kidney damage

Temporary Cyanotoxin Monitoring Results – July to Oct 2018

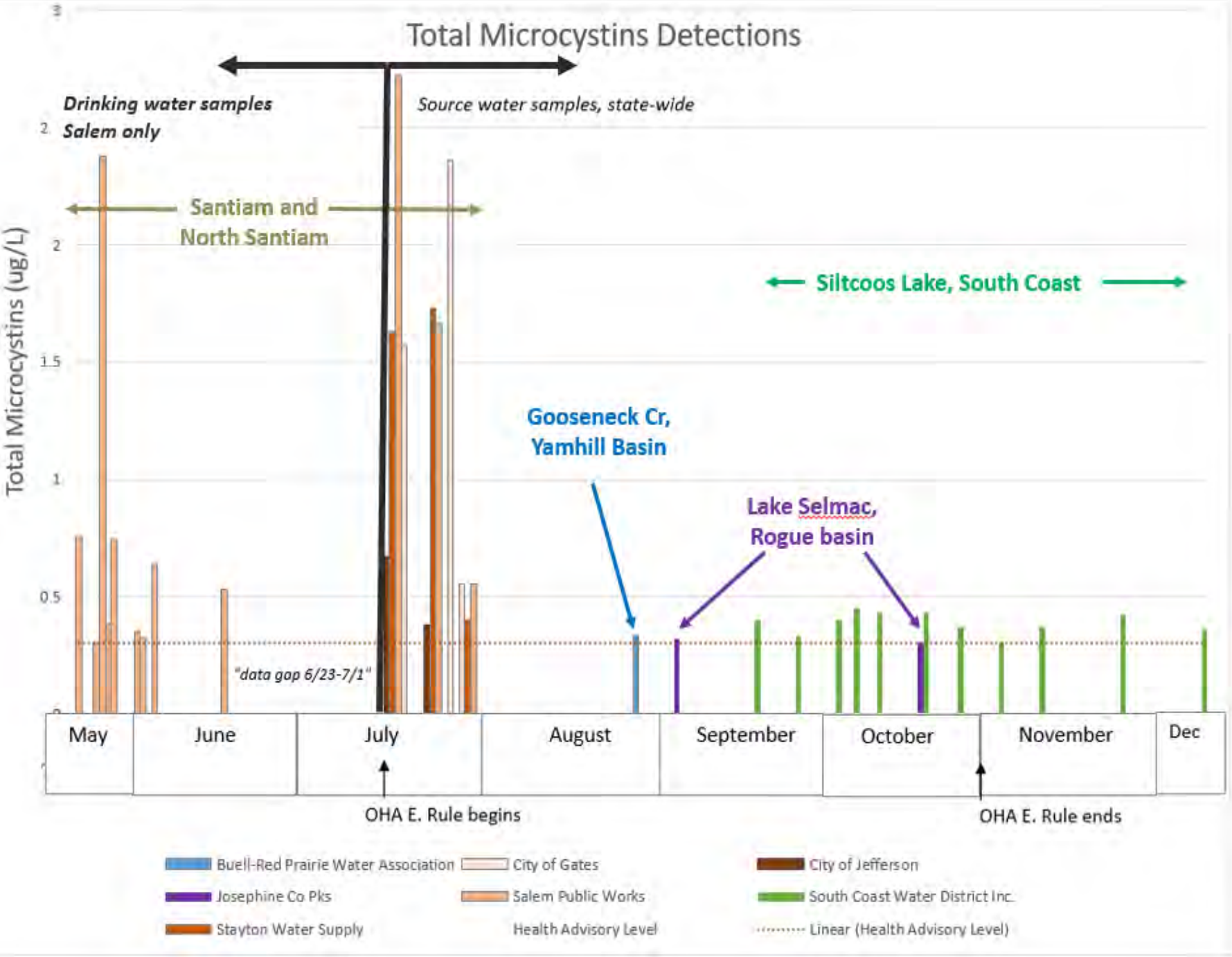
- 8 systems (4 sources) detected total microcystins
- Other than Salem, 17 samples found Microcystins in source
- 1 system detected cylindrospermopsin in source
- **No detections at any entry point (finished water) samples**

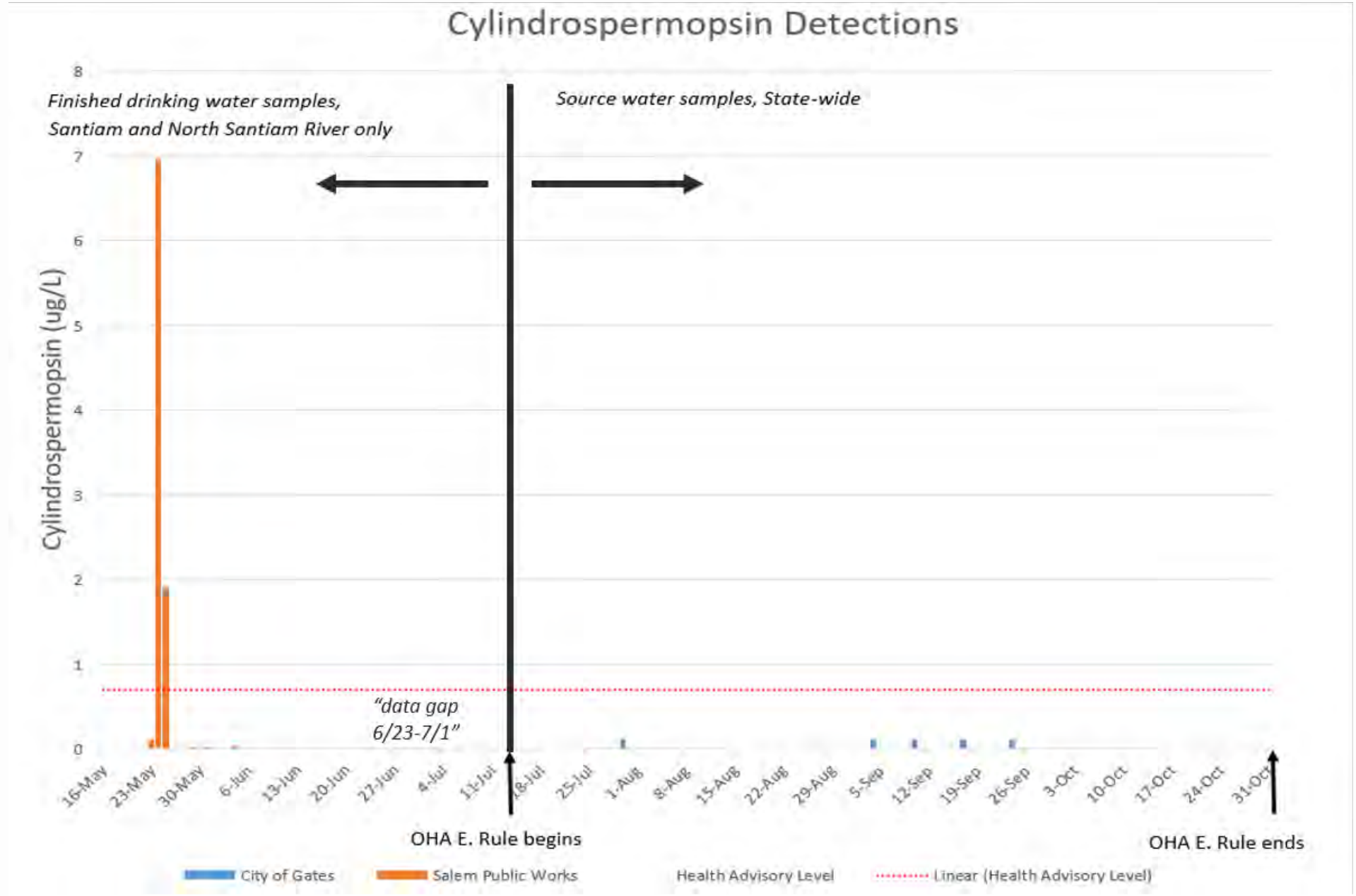
Map by Lesley Merrick, DEQ Lab, January 2019



Facilities with cyanotoxin detections

- Salem Pubic Works, N Santiam (192,000))
- Stayton Water Supply, N Santiam (7,830)
- City of Gates, N Santiam (490)
- City of Jefferson, Santiam (3,165)
- Buell Red-Prairie WD, Gooseneck Cr Pond, Yamhill basin (976)
- South Coast WD, Siltcoos Lake, Mid Coast basin (200)
- Two Josephine County Parks, Lake Selmac, Illinois basin (50)

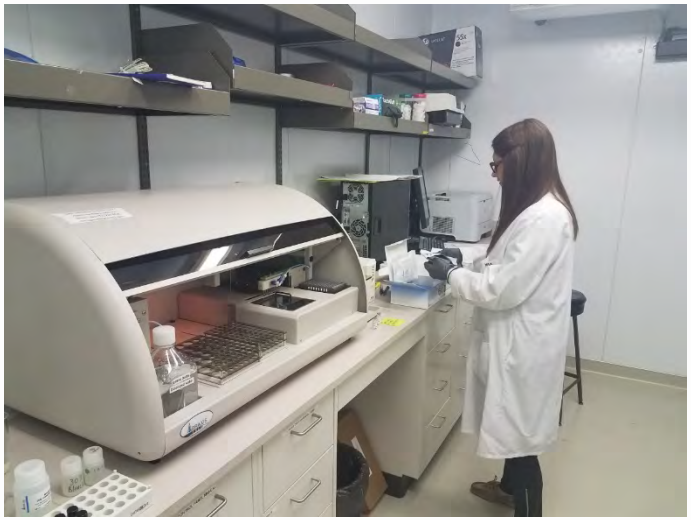

Total Microcystins Detections
Drinking water samples
Salem only
Source water samples, state-wide
Santiam and
North Santiam
Siltcoos Lake, South Coast
Gooseneck Cr,
Yamhill Basin
Lake Selmac,
Rogue basin
Total Microcystins (ug/L)
3
2
2
1.5
1
0.5
"data gap 6/23-7/1"
May
June
July
August
September
October
November
Dec
OHA E. Rule begins
OHA E. Rule ends
Buell-Red Prairie Water Association
City of Gates
City of Jefferson
Josephine Co Pks
Salem Public Works
South Coast Water District Inc.
Stayton Water Supply
Health Advisory Level
Linear (Health Advisory Level)


Cylindrospermopsin Detections
Finished drinking water samples,
Santiam and North Santiam River only
Source water samples, State-wide
Cylindrospermopsin (ug/L)
8
7
6
5
4
3
2
1
0
"data gap
6/23-7/1"
16-May
23-May
30-May
6-Jun
13-Jun
20-Jun
27-Jun
4-Jul
11-Jul
18-Jul
25-Jul
1-Aug
8-Aug
15-Aug
22-Aug
29-Aug
5-Sep
12-Sep
19-Sep
26-Sep
3-Oct
10-Oct
17-Oct
24-Oct
31-Oct
OHA E. Rule begins
OHA E. Rule ends
City of Gates
Salem Public Works
Health Advisory Level
Linear (Health Advisory Level)

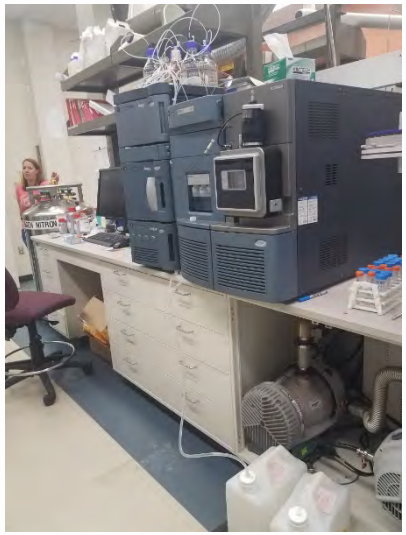
Permanent cyanotoxin monitoring rules 2019 – Susceptible systems

- 58 PWS currently meet the rule criteria for conducting routine monitoring (“susceptible source”)

- List of susceptible systems posted on our website. Subject to change.



ELISA: Enzyme Linked Immunosorbent Assay



LC MS/MS: Liquid Chromatography with tandem mass spectrometry

Monitoring requirements

- Raw water sampling every 2 weeks
- If >= 0.3 ug/L, sample at raw and EP weekly
- If detected at EP, sample daily
- If > HAL*, confirmation asap
- If confirmed > HAL, issue advisory

*HAL = Health Advisory Level

Purchasing water systems

- No routine sampling required
- If seller has an initial sample over the HAL at their entry point, they must notify purchasers within 24 hours (heads up)
- If confirmation sample is also over the HAL at the seller's EP, they must notify purchasers within 8 hrs (joint advisory issued)

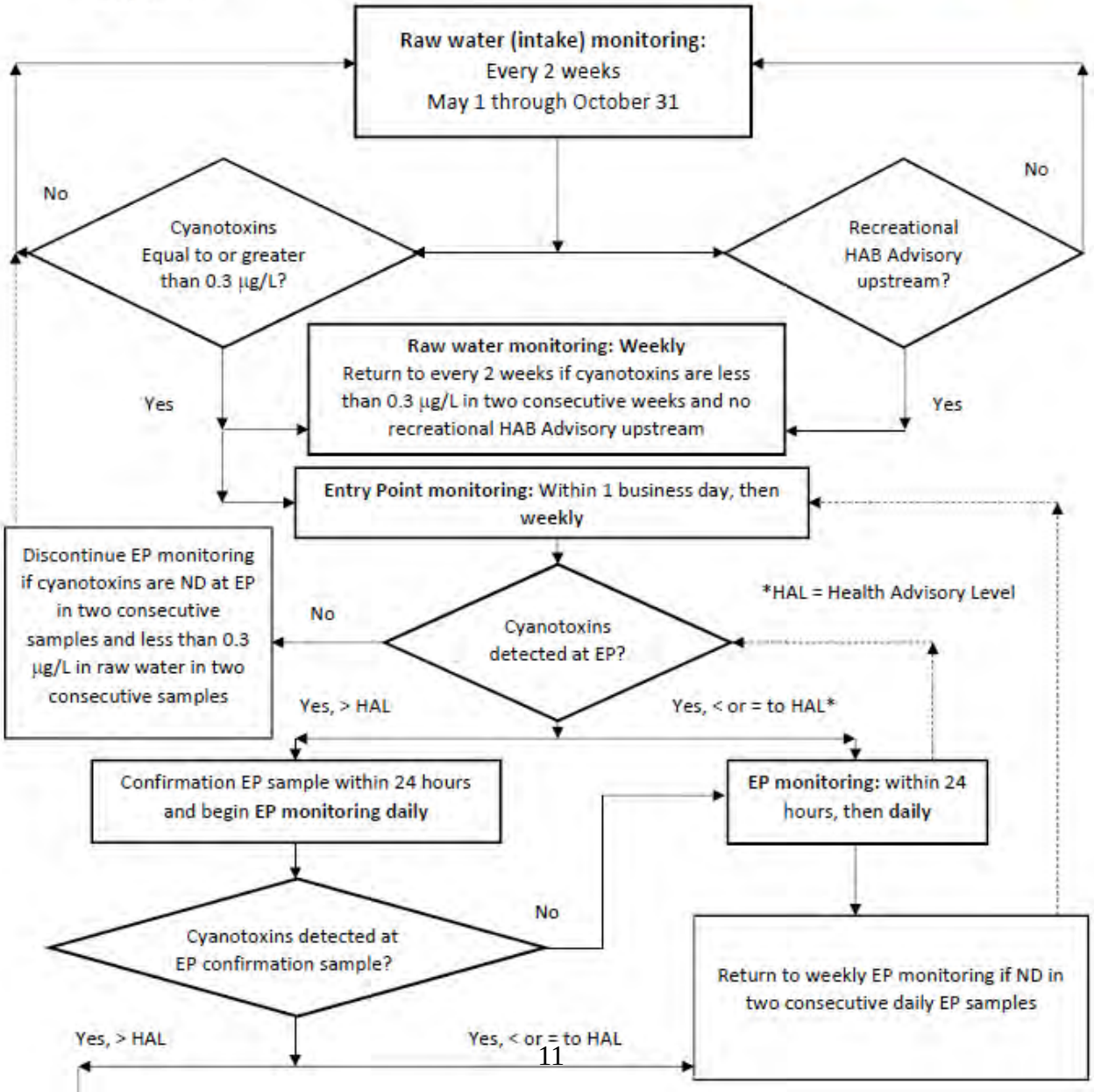
  * Advisory may be lifted at purchasing systems when two consecutive sample rounds at representative locations are < or = HAL

Cyanotoxin Monitoring Requirements

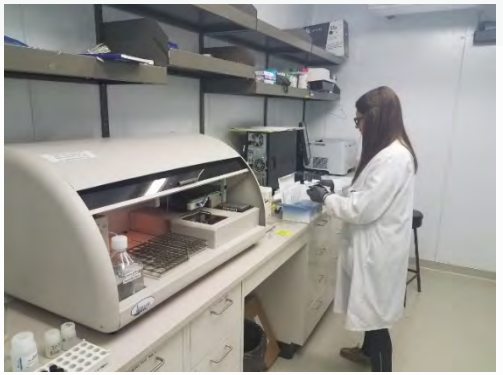
For Sources Determined to be Susceptible

Oregon Health Authority

May 2019



Analytical methods



- Samples must be analyzed by an accredited lab or the DEQ lab
- Total microcystins: EPA method 546 for total microcystins (ELISA)
- Cylindrospermopsin:
  - DEQ Analytical Method for Determination of Cylindrospermopsin in Raw and Finished Water by ELISA
  - EPA method 545 (LC MS/MS) if detected through ELISA in finished drinking water

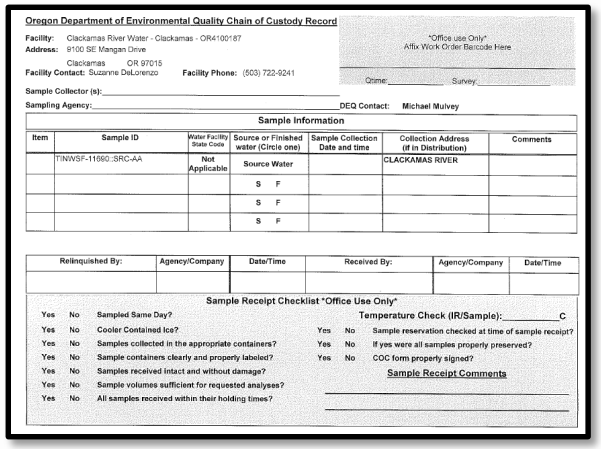
Public Notification

- Health Advisory if confirmed > HAL
  - PWS and any purchasers
  - Press release
  - If advisory is delayed with OHA approval (rare), PWS must issue press release stating results but no advisory
- Must publish EP detections in annual CCR
- To lift advisory:
  - 2 daily samples at EP < or = HAL and
  - Distribution samples < or = HAL for 2 days

Oregon Health Authority

Reporting

- PWS must ensure labs analyze and report results > HAL within 2 business days
- Treated water samples > HAL must be reported to OHA & purchasers within 24 hrs
- Confirmation samples > HAL must be reported to OHA & purchasers within 8 hrs
- Report results to lift an advisory to OHA within one business day
- Report all other results to OHA by 10th of following month



Oregon Department of Environmental Quality Chain of Custody Record

Facility: Clackamas River Water - Clackamas - OR4100187
Address: 8100 SE Mangan Drive
Clackamas OR 97015
Facility Contact: Suzanne DeLorenzo Facility Phone: (503) 722-9241

Office use Only
Affix Work Order Barcode Here

Crime: Survey:

Sample Collector (s):
Sampling Agency: DEQ Contact: Michael Mulvey

Sample Information

Item	Sample ID	Water Facility State Code	Source or Finished water (Circle one)	Sample Collection Date and time	Collection Address (if in Distribution)	Comments
	TINWSF-11660::SRC-AA	Not Applicable	Source Water		CLACKAMAS RIVER	
			S F			
			S F			
			S F			

Relinquished By:	Agency/Company	Date/Time	Received By:	Agency/Company	Date/Time

Sample Receipt Checklist *Office Use Only*

Temperature Check (IR/Sample): C

Yes No Sampled Same Day?
Yes No Cooler Contained Ice?
Yes No Samples collected in the appropriate containers?
Yes No Sample containers clearly and properly labeled?
Yes No Samples received intact and without damage?
Yes No Sample volumes sufficient for requested analyses?
Yes No All samples received within their holding times?

Yes No Sample reservation checked at time of sample receipt?
Yes No If yes were all samples properly preserved?
Yes No COC form properly signed?

Sample Receipt Comments

PUBLIC HEALTH DIVISION
Drinking Water Services

Funding

- The Oregon Legislature approved funding for analysis by the DEQ lab through June 30, 2019
- Continued funding has been requested in the 2019 legislature (House Bill 3326)
- Private labs can also be accredited to analyze for cyanotoxins

Web resources: healthoregon.org/DWP

Cyanotoxin Resources for Drinking Water

Drinking Water Services

Water System Operations

Surface Water Treatment

Capacity Development

Public Notice Resources & Templates

Fact Sheets & Best Management Practices

Water System Surveys & Outstanding Performance

Circuit Rider Program

Pipeline Newsletter

Contact Us

Rules for Cyanotoxin Monitoring in Drinking Water

Oregon Health Authority has developed permanent rules that require drinking water systems in the state using certain surface water sources, such as those prone to harmful algae blooms, to routinely test for cyanotoxins that these blooms produce, and notify the public about the test results.

These rules are effective starting December 27, 2018 and replace temporary administrative rules adopted for cyanotoxin monitoring and testing that were effective July 1, 2018 through December 27, 2018.

OHA is encouraging water systems not subject to the cyanotoxin monitoring rules that serve surface water and have had algae issues in the past to voluntarily test for cyanotoxins and notify the public about the results.

Rules Resources

- Permanent Rules for Cyanotoxin Monitoring at Public Water Systems (final)
- Cyanotoxin Monitoring Flowchart
- Cyanotoxin Sampling DEQ & OHA Presentation from 4/22/19 (webinar recording from 5/2/19).

Recommended Reading

- EPA Recommendations for Public Water Systems to Manage Cyanotoxins in Drinking Water
- EPA Fact Sheet on Cyanobacteria and Cyanotoxins - Information for Drinking Water Systems
- EPA Drinking Water Cyanotoxin Risk Communications Tool Box
- EPA Cyanotoxin Management Plan Template and Example Plans

Treatment Information

- EPA Water Treatment Optimization for Cyanotoxins
- American Water Works Association CyanoTOX Spreadsheet for Cyanotoxin Removal Rate Calculation

What you can do now:

- Understand monitoring requirements, including if detections are found
- Consider contracting with DEQ or other accredited lab for additional sampling
- Evaluate treatment optimization steps if needed
- Update contact lists (internal, purchasers, state)
- Know where to get public notice templates and resources
- Determine representative distribution sampling sites

Emerging contaminants (ECs)

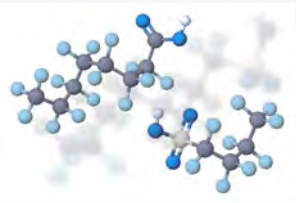
- Contaminants in drinking water that are not regulated under the Safe Drinking Water Act (SDWA)
- May or may not have Health Advisory Levels (HALs)
- Human health effects may or may not be well understood
- Examples of ECs in the news a lot lately: PFAS, cyanotoxins

Manganese

- Essential nutrient needed to stay healthy
- Nervous system and reproductive effects observed in animals after high oral doses
- 1 & 10 day HAL for adults and children older than 6 months = 1 mg/L (1000 µg/L).
- Lifetime HAL = 0.3 mg/L (300 µg/L)
  - 10 day HAL of 0.3 mg/L recommended for bottle-fed infants.
- Several historical & UCMR Mn detects > HALs in Oregon

Photo credit: Alchemist-hp (talk) (www.pse-mendelejew.de) - Own work, FAL, https://commons.wikimedia.org/w/index.php?curid=11930318

Per- and poly-fluorinated alkyl substances (PFAS)



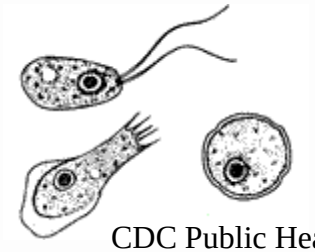
- Group of 4,000+ man-made chemicals including PFOA & PFOS
- Used in many consumer stain & water-repellent products
- Component in fire-fighting foams
- EPA lifetime HAL for PFOS & PFOA = 70 parts per trillion (PPT) individually or combined
- 6 PFAS (including PFOS and PFOA) monitored under UCMR3. In Oregon 65 PWSs monitored, no detections
- 4 known PFAS contamination sites in OR

Legionella

- Bacteria that causes Legionnaire's disease via inhalation
- #1 cause of waterborne disease outbreaks in the US (per CDC 7,458 cases reported in 2017)
- Legionella introduced after treatment (main breaks?) can enter distribution system and under right conditions multiply (warm water, low chlorine residual)
- Large buildings with lots of plumbing most susceptible
- Building owners that add treatment for Legionella may become regulated PWSs under the SDWA

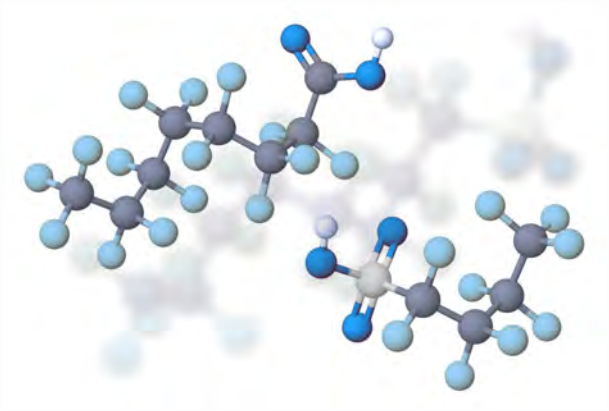
Naegleria fowleri

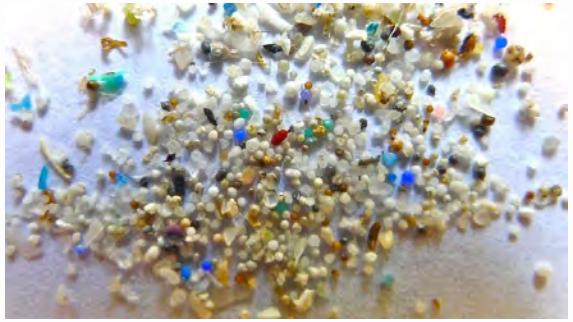
- NF is an ameba commonly found in warm freshwater and soil
- Infects people when ameba enters the nose and travels to the brain where it destroys tissue (usually fatal)
- Most infections associated with swimming/diving in lakes and rivers
- Very rarely deaths associated with irrigating sinuses with contaminated tap water
- **Cannot** be infected by drinking water contaminated with NF
- NF can grow in storage tanks, hot water heaters, distribution pipes and premise plumbing, esp. where little or no disinfectant is present
- NF confirmed in two Louisiana PWSs in 2013 (3 associated deaths). As result, state issued emergency rule requiring minimum disinfectant residual level (0.5 ppm) and increased residual monitoring



CDC Public Health Image Library

Questions?





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