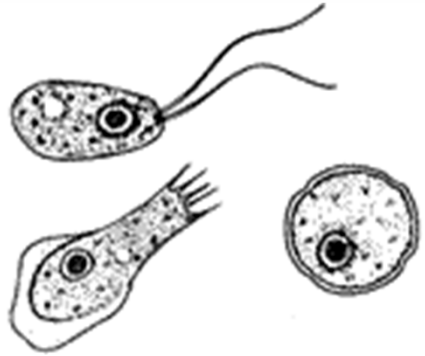

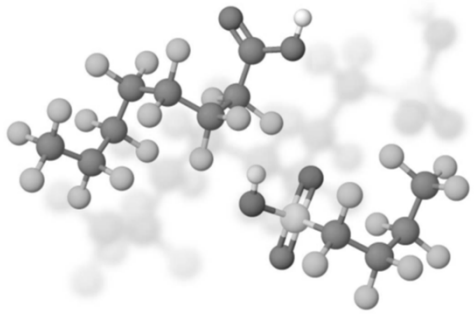

Health Advisories in Drinking Water

Gregg Baird, REHS
OHA-Drinking Water Services

PUBLIC HEALTH DIVISION
Drinking Water Services

Oregon Health Authority

Overview

- What are health advisories?
- Health advisory levels vs. MCLs
- Oregon's approach to health advisories
- Examples of contaminants seen in Oregon that have health advisories
- Issues/challenges with health advisories

What are Health Advisories?

- Info on contaminants that can cause human health effects & are known/anticipated to occur in drinking water
- Technical guidance to states on health effects, analytical methodologies, and treatment technologies
- Based on non-cancer health effects for different durations of exposure (1-day, 10-day, and Lifetime)
  - No adverse health effects expected at or below that level if the water is consumed for that duration
- Non-regulatory/non-enforceable

- Not all unregulated contaminants have HAs (and some regulated contaminants have HAs!)

HALs vs. MCLs

HALs	MCLs
Non-regulatory/non-enforceable	Regulatory/enforceable
Health-based levels	Consider other factors (feasibility of treatment, cost)
Based on duration of exposure (1-day, 10-day, or lifetime)	Duration not specified (it's either under or over the MCL)
Can be targeted to different populations (bottle-fed infants, vulnerable populations)	Generally not targeted (NO3 is one exception)
No requirement to treat or correct	If exceeded, required to correct (install treatment, inactivate source)
Targeted population advised not to drink	Public notice required and sometimes temporary protective measures (boil water notice)

Chemicals	CASRN Number	Standards			Status HA Document	Health Advisories						Cancer Descriptor
						10-kg Child						
		Status Reg.	MCLG (mg/L)	MCL (mg/L)		One-day (mg/L)	Ten-day (mg/L)	RfD (mg/kg/day)	DWEL (mg/L)	Life-time (mg/L)	mg/L at 10^{-4} Cancer Risk	
INORGANICS												
Ammonia	7664-41-7	-	-	-	D '92	-	-	-	-	30	-	D
Antimony	7440-36-0	F	0.006	0.006	F '92	0.01	0.01	0.0004	0.01	0.006	-	D
Arsenic	7440-38-2	F	zero	0.01	-	-	-	**0.0003**	0.01	-	**0.002**	A
Asbestos (fibers/l >10Fm length)	1332-21-4	F	7 MFL[1]	7 MFL	-	-	-	-	-	-	700-MFL	A[2]
Barium	7440-39-3	F	2	2	D '93	0.7	0.7	**0.2**	7	-	-	N
Beryllium	7440-41-7	F	0.004	0.004	F '92	30	30	**0.002**	0.07	-	-	-
Boron	7440-42-8	-	-	-	F '08	3	3	**0.2**	7	6	-	I
Bromate	7789-38-0	F	zero	0.01	D '98	0.2	-	**0.004**	0.14	-	0.005	B2
Cadmium	7440-43-9	F	0.005	0.005	F '87	0.04	0.04	0.0005	0.02	0.005	-	D
Chloramine[3]	10599-90-3	F	4[4]	4[4]	D '95	-	-	0.1	3.5	3.0	-	-
Chlorine	7782-50-5	F	4[4]	4[4]	D '95	3	3	0.1	5	4	-	D
Chlorine dioxide	10049-04-4	F	0.8[4]	0.8[4]	D '98	0.8	0.8	0.03	1	0.8	-	D
Chlorite	7758-19-2	F	0.8	1	D '98	0.8	0.8	0.03	1	0.8	-	D
Chromium (total)	7440-47-3	F	0.1	0.1	F '87	1	1	**0.003**[5]	0.1	-	-	D
Copper (at tap)	7440-50-8	F	1.3	TT[6]	D '98	-	-	-	-	-	-	D
Cyanide	143-33-9	F	0.2	0.2	F '87	0.2	0.2	**0.0006**[7]	-	-	-	I
Fluoride	7681-49-4	F	4	4	-	-[8]	-	**0.06**[9]	-	-	-	-
Lead (at tap)	7439-92-1	F	zero	TT[6]	-	-	-	-	-	-	-	B2
Manganese	7439-96-5	-	-	-	F"04	1	1	0.14[10]	1.6	0.3	-	D
Mercury (inorganic)	7487-94-7	F	0.002	0.002	F '87	0.002	0.002	**0.0003**	0.01	0.002	-	D
Molybdenum	7439-98-7	-	-	-	D '93	0.08	0.08	0.005	0.2	0.04	-	D
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Boron	7440-42-8	-	-	-	F '08	3	3	**0.2**	7	6	-	I
Bromate	7789-38-0	F	zero	0.01	D '98	0.2	-	**0.004**	0.14	-	0.005	B2
Cadmium	7440-43-9	F	0.005	0.005	F '87	0.04	0.04	0.0005	0.02	0.005	-	D
Chloramine[3]	10599-90-3	F	4[4]	4[4]	D '95	-	-	0.1	3.5	3.0	-	-
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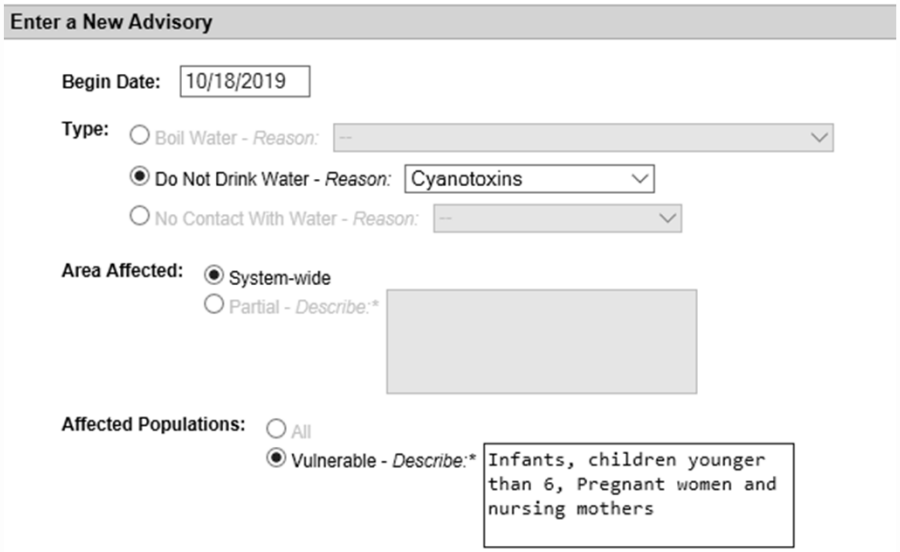
Oregon's approach to HALs

- We use and apply the EPA health advisories
- Although non-regulatory and non-enforceable, DWS expects public water systems to notify their customers if a HAL is exceeded
  - For cyanotoxins, public notice is <u>required</u> in Oregon

- If a PWS issues an advisory, we enter in Data Online under "Water Advisories"



Contaminants with HALs in Oregon

- Cyanotoxins
- Manganese
- PFAS
- Arsenic

Cyanotoxins HALs

- EPA health advisories that Oregon decided to regulate (regulatory/enforceable standards in Oregon but not nationally)

Cyanotoxin	For Vulnerable People (ug/L or ppb)	For Anyone (ug/L or ppb)
Total Microcystins	0.3	1.6
Cylindrospermopsin	0.7	3

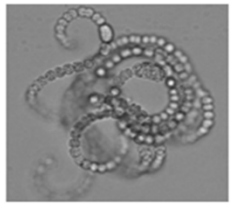
- Only SW PWSs susceptible to cyanotoxins required to monitor
- 10-day health advisory but our rules require public notice if cyanotoxins confirmed in finished water regardless of duration

Web resources: healthoregon.org/dwcyanotoxins

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

- Rules for Cyanotoxin Monitoring for Public Water Systems
- List of Susceptible Sources required to monitor for cyanotoxins - *April 23, 2019, subject to change*
- Cyanotoxin Monitoring Flowchart
- Cyanotoxin Rules Fact Sheet
- 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

- Optimizing Toxin Removal - All surface water systems can take steps at their treatment plants to increase the removal efficiency of cyanotoxins.
- EPA Water Treatment Optimization for Cyanotoxins
- American Water Works Association CyanoTOX Spreadsheet for Cyanotoxin Removal Rate Calculation

Manganese (Mn)

- Essential nutrient needed to stay healthy
- Nervous system / reproductive effects observed in animals after high oral doses

1 & 10-day HAL (mg/L or ppm)	Lifetime HAL (mg/L or ppm)
1	0.3*

*Considered acute for bottle-fed infants (10-day HAL)

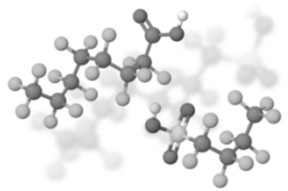
- Several historical Mn detects > HALs in Oregon

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

Manganese DWS activities

- Send letter to PWSs with historical Mn detections over HALs informing them of HAL and recommend testing
- Develop Mn fact sheet
- Develop Mn PN advisory template
- Track UCMR4 Mn results (through 2020)

Per- and poly-fluorinated alkyl substances (PFAS)



- Group of 4,000+ man-made chemicals
- Used in many consumer stain & water-repellent products
- Component of fire-fighting foams

	Lifetime HAL (ng/L or ppt)
PFOA	70*
PFAS	70*

*individually or combined

- Although a lifetime HAL, most states are recommending consumers use and alternate source of water & PWS install tx or change sources

LTH DIVISION
r Services

Authority

PFAS DWS activities

- Track available PFAS test results (Air Natl Guard, Army)
- Cross-agency coordination on PFAS issues (DEQ, EPA)
- Map potential PFAS contamination sites, proximity to PWSs, assess risk
- Create OHA fact sheet on PFAS
- Provide technical support to PWSs on PFAS (sampling protocol)

Arsenic

- No EPA health advisory level for arsenic
- Oregon has set an acute “health advisory” level for arsenic:

	Short-term exposure (2 weeks or less)
Arsenic	35 ppb

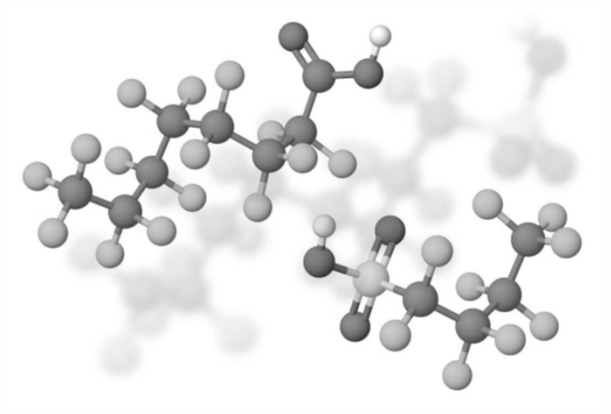
- Do not drink for young children, especially infants
- Tier 1 public notice template on our website

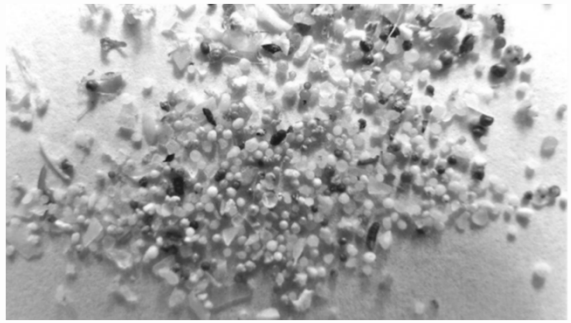
Issues/challenges with health advisories

- Confusion around 1-day, 10-day, Lifetime health advisory levels

- In the absence of EPA health advisories, states setting their own
  - Example: PFAS other than PFOA and PFOS
  - Levels can differ from state to state

Questions?





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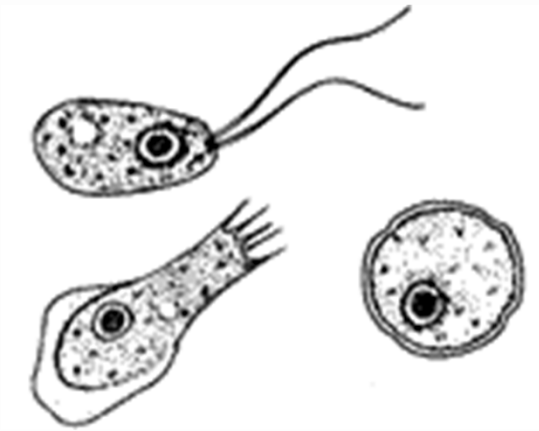

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