Revising Harmful Algal Bloom Advisory Protocols and Assessment Methods
Discussion Outline

1. Should UDOH and UDEQ revise the Guidance for Local Health Departments to incorporate EPA’s recommended toxin thresholds for microcystin and cylindrospermopsin?

2. Should UDOH and UDEQ revise the Guidance for Local Health Departments threshold advisories (e.g., swimming closure between 20,000-100,000 cells/mL and/or 4-20 µg/L microcystin)?

3. Should public health advisories be altered in cases where high cyanobacteria cell densities are observed but relatively low toxin concentrations are observed?

4. Should DWQ revise the 303(d) Assessment Methodology for the 2018 Integrated Report to incorporate the toxin thresholds identified in EPA’s draft guidance?

5. Do WQHAP members have comments on EPA’s draft guidelines for recreational thresholds for microcystins and cylindrospermopsin that DWQ should consider in preparing comments to EPA?
1. Should UDOH and UDEQ revise the Guidance for Local Health Departments to incorporate EPA’s recommended toxin thresholds for microcystin and cylindrospermopsin?
# UDEQ/UDOH Guidelines for HABs

<table>
<thead>
<tr>
<th>Toxin Producing Blue-green algae Cell Density (cells/mL)</th>
<th>Microcystin Concentrations (µg/L)</th>
<th>Anatoxin-A¹ (µg/L)</th>
<th>Chlorophyll <em>a</em> (µg/L)</th>
<th>Health Risks</th>
<th>Action Recommended</th>
<th>Relative Probability of Acute Health Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20,000</td>
<td>&lt;4</td>
<td>&lt;20</td>
<td>&lt;10</td>
<td>Negligible</td>
<td>None</td>
<td>Low</td>
</tr>
<tr>
<td>20,000–100,000</td>
<td>4–20</td>
<td>NA</td>
<td>10–50</td>
<td>Short-term effects e.g. skin irritation, gastrointestinal illness</td>
<td>Issue caution advisory; Post CAUTION sign; Weekly sampling recommended</td>
<td>Low to Moderate</td>
</tr>
<tr>
<td>100,000 – 10,000,00 or Reports of animal illnesses or death</td>
<td>20–2,000</td>
<td>NA</td>
<td>50–5,000</td>
<td>As above for low risk, and potential for long-term illness</td>
<td>Issue warning advisory; Post WARNING sign; Weekly sampling recommended</td>
<td>Moderate to High</td>
</tr>
<tr>
<td>&gt;10,000,000 or Visible scum layer or Reports of human illness</td>
<td>&gt;2,000</td>
<td>&gt;20</td>
<td>&gt;5,000</td>
<td>As above for moderate risk, and potential for acute poisoning</td>
<td>Issue Danger Advisory; Post DANGER sign; Weekly sampling recommended</td>
<td>High</td>
</tr>
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</table>


NA = None available
## Draft EPA Recreational Criteria or Swimming Advisory Recommendations for Microcystins and Cylindrospermopsins

<table>
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<tr>
<th>Application of Recommended Values</th>
<th>Microcystins</th>
<th>Cylindrospermopsin</th>
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<tr>
<td></td>
<td>Magnitude (µg/L)</td>
<td>Frequency</td>
</tr>
<tr>
<td>Swimming Advisory</td>
<td></td>
<td>Not to be exceeded</td>
</tr>
<tr>
<td>Recreational Water Quality Criteria</td>
<td>4</td>
<td>No more than 10 percent of days</td>
</tr>
</tbody>
</table>
2. Should UDOH and UDEQ revise the Guidance for Local Health Departments threshold advisories (e.g., swimming closure between 20,000-100,000 cells/mL and/or 4-20 µg/L microcystin)?
HAB Decision-making Algorithm

- **Tier I**: Water changing to bright green or scum accumulations?
  - No: No Action
  - Yes: LHD posts CAUTION sign
    - Water samples taken
    - Weekly sampling until bloom dissipation
    - Bloom dissipates, remove sign
    - Blue-green algae count < 100,000
  - No: Blue-green algae count < 100,000

- **Tier II**: Blue-green algae count > 100,000 or animal illness?
  - Yes: LHD posts WARNING sign
    - Takes site-specific actions
    - Weekly sampling
  - No: Return to Tier II at LHD discretion

- **Tier III**: Blue-green algae count > 10,000,000; or thick scum mats; or human illness?
  - Yes: LHD posts DANGER sign
    - Lake closed
    - Weekly sampling
## Current Tier I Advisory

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<tr>
<th>Toxin Producing Blue-green algae Cell Density (cells/mL)</th>
<th>Microcystin Concentrations (µg/L)</th>
<th>Health Risks</th>
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<td>20,000-100,000</td>
<td>4-20</td>
<td>Short-term effects; e.g. skin irritation, gastrointestinal illness</td>
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**CAUTION**

**TOXIC ALGAE MAY BE PRESENT**

Lake may be unsafe for people and pets

- Do not swim or water ski in areas of scum. No nadie o pratique el esquí acuático en áreas con espuma o veredas.
- Do not drink the lake water. No tome el agua del lago.
- Keep pets and livestock away. Mantenga alejados las mascotas y el ganado.
- Clean fish well and discard guts. Limpie bien el pescado y deseche las tripas.
- Avoid areas of scum when boating. Evite las áreas con espuma o veredas cuando ande en lancha.

Call your doctor or veterinarian if you or your animals have sudden or unexplained sickness or signs of poisoning. Learn more: hab.saltlakecity.gov

Report new algae blooms to the Department of Environmental Quality:
(801) 536-4123

Call your local health department:
Utah Poison Control Center
(800) 222-1222

Division of Water Quality
# Current Tier II Advisory

<table>
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<tr>
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<th>Microcystin Concentrations (µg/L)</th>
<th>Health Risks</th>
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## Microcystin Concentrations

- **100,000-10,000,000**: 20-2,000 µg/L
- **As above for low risk, and potential for long-term illness**

### WARNING

**TOXIC ALGAE PRESENT**

Lake unsafe for people and pets

Until further notice:
- **Do not swim or water ski**
- **Do not drink the lake water.**
- **Keep pets and livestock away.**
- **Clean fish well and discard guts.**
- **Avoid areas of scum when boating.**

Evite las áreas con espuma o verrugas cuando ande en lancha.

**Date Posted:**

Call your doctor or veterinarian if you or your animals have sudden or unexplained sickness or signs of poisoning. Learn more: Utah Poison Control Center (800) 222-1222.

Report new algae blooms to the Department of Environmental Quality: 801-530-4129.

Division of Water Quality
3. Should public health advisories be altered in cases where high cyanobacteria cell densities are observed but relatively low toxin concentrations are observed?
Utah Poison Control Center

676 Reported Cases (As of November 1)

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<tr>
<th>Exposure Type</th>
<th>Percentage</th>
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<td>Human Exposure (533)</td>
<td>79%</td>
<td>Recreated in or exposed to Utah Lake Water</td>
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<tr>
<td>Animal Exposure (34)</td>
<td>5%</td>
<td>14 dogs (8 UT Co., 5 SL Co., 1 WY)</td>
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<tr>
<td>Information only (109)</td>
<td>16%</td>
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32% of cases are symptomatic

Symptoms Reported:
GI: diarrhea, nausea, vomiting, and abdominal pain
Skin: rash and irritation
Neuro: headache, dizziness, drowsiness
Ocular: irritation
EPA Acknowledgment of Toxin Indicator Limitations

- "Cyanobacterial cells cause allergenicity and irritation in animal, independent of whether the cyanobacterial cells produce toxin."
- "These [studies] support that there is no relationship between cyanotoxin content and the allergenic effect of cyanobacteria."
- "Overall, these studies provide evidence of significant associations between cyanobacterial cell exposure and human health effects even in the absence of cyanotoxins."
4. Should DWQ revise the 303(d) Assessment Methodology for the 2018 Integrated Report to incorporate the toxin thresholds identified in EPA’s draft guidance?
Lake Assessment Guidance

Recreational Use Support

Beneficial Use Supported:
  • The beneficial use is supported if cyanobacteria cell counts <20,000 cells/mL.

Beneficial Use Not Supported:
  • The beneficial use is not supported if the cyanobacteria cell count exceeds 100,000 cells/mL for more than one sampling event or other narrative indicators (e.g., phycocyanin, chlorophyll-a, HAB beach warnings, suggest recreational uses are not being attained).

Insufficient Data and Information:
  • The waterbody will be categorized 3A if there is one exceedance >20,000 cells/mL. These waterbodies will be prioritized for further evaluation with respective public health managing partners such as the State Health Department and State Parks Departments.
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QUESTIONS