



KDHE's HAB Response Plan

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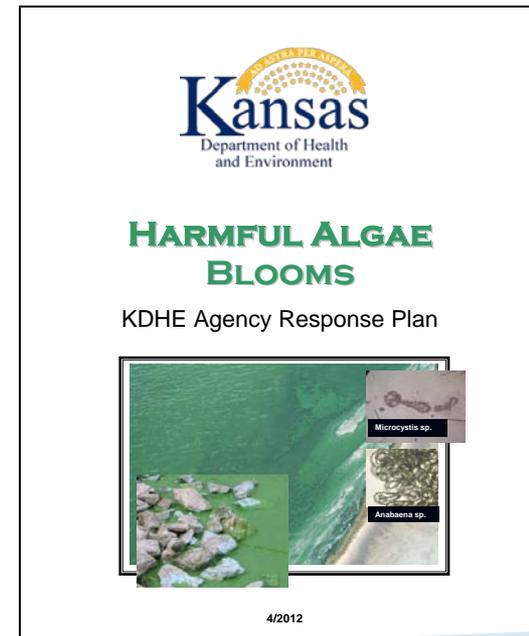
Kansas Department of Health and Environment

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KDHE HAB Response Procedures

In 2010, KDHE established a response policy and plan in responding to Cyanobacterial blooms for the protection of public health, pets and livestock in public waters.



KDHE Policy Updates

After reviewing the 2011 HAB season:

Change the Microcystin toxin level from 2 to 4 $\mu\text{g}/\text{L}$ to set Advisory level

To lift a health advisory, levels are now at 4 $\mu\text{g}/\text{L}$ rather than non-detect.

KDHE HAB Response Plan

- The plan outlines the implementation of the interaction, responsibilities and activities of KDHE, and
- KDHE's coordination with other stakeholders to responding to HAB concerns in a rapid and effective manner.

Public or Private Water Bodies

- ▶ **Public Water Bodies** – those waters that are referred to as reservoirs, community lakes, state fishing lakes and/or are waters managed or owned by federal, state, county or municipal authorities and all privately owned lakes that serve as public drinking water supplies or that are open to the general public for primary or secondary contact recreation.

Public or Private Water Bodies

- ▶ **Private Water Bodies** – Any freshwater reservoir or pond that is both located on and completely bordered by land under common private ownership (or not accessible to the general public).
- ▶ Will be referred to the Kansas State Veterinary Diagnostic Laboratory

Public Health Protection Levels

Based on the findings of these analyses, KDHE may issue one of two levels of public health protection notifications or none at all:

“Public Health Advisory”

Or

“Public Health Warning”

Public Health Protection Levels

- ▶ “Public Health Advisory” – notifies the public that hazard conditions exist and encourages limiting exposure to the water.
- ▶ Microcystin toxin levels $> 4 \mu\text{g/L}$ $< 20 \mu\text{g/L}$ or
- ▶ Cyanobacterial cell counts $> 20,000 < 100,000$ cells/mL.



Public Health Protection Levels

- ▶ “Public Health Warning” – notifies the public that conditions are unsafe for human or animal exposures. That public access to the water should be restricted or prohibited.
- ▶ Microtoxin levels $\geq 20 \mu\text{g/L}$
- ▶ Cyanobacterial cell counts $\geq 100,000$ cells/mL.



KDHE Response Procedure

- A response will include, but is not limited to:
 - Request for site investigation and sampling
 - Analysis
 - Interpretation of analytical results – Non–Issue, Advisory, Warning
 - Notification of results to Lake Managers
 - Notification of “Advisories” to the Public – Public Messages, Web sites, Lake postings
 - Water bodies are posted
 - Repeat if required



KDHE Collection/Sampling Locations

Sampling will be performed **only** at public water bodies and only at locations that are identified as most frequently used **MAJOR** points of public access.

- Swimming beaches
- Boat Ramps
- Public drinking water intakes
- Marinas
- Boat Docks
- Other areas that are designated for public access.

Sample Collection/Sampling Locations for Water Sources for PWS Utilities

For water sources for a Public Water Supply utility that has been determine to have a significant HAB:

- samples will be collected as close to the intake as possible if the source water is drawn directly from a lake or reservoir, or

Sample Collection/Sampling Locations for Water Sources for PWS Utilities

- outfall monitoring will be initiated if the source is a river or stream, source water is collected downstream from the impacted lake/reservoir and the outflow from that lake/reservoir comprises a significant proportion of stream flow arriving at the intake of that PWS utility as determined by mass balance curves.

Sample Collection/Sampling Locations for Water Sources for PWS Utilities

- River monitoring may also be initiated at locations above the PWS intakes to confirm the presence or absence of significant concentrations of microcystin toxins.

Initial Sampling

Initial Sampling:

- A. Number of complaints DOES NOT exceed KDHE's capacity, then a response shall be initiated as promptly as possible.
- B. Number of complaints EXCEEDS KDHE capacity, then priority response will fall under 3 classifications.

Lakes That:	Priority	Response
Support: Public Beach Public Water Supply Boating Full Body Contact Activities Confirm: Human Illness	Priority 1	Samples will be collected within the week if the HAB form was received on Monday or Tuesday. If the form was received after Tuesday, sampling will be conducted on the following Monday.
Public lakes that are publicly accessible but have no swimming beach and do not allow water skiing.	Priority 2	Considering that resources are available, samples will be collected within the week if the HAB form was received by Tuesday. If the form was received after Tuesday, sampling will be conducted on the following Monday.
Other public lakes that are largely inaccessible to the general public.	Priority 3	Will respond if capacity resources are available. Otherwise, complainant will be advised to contact their local extension office or the KS State Veterinary Diagnostic Laboratory at: Merwe KSVDL c/o Dr. Deon van der 1800 Denison Ave. Manhattan, KS 66502 785-532-4333 dmerwe@vet.ksu.edu

Processing the Re-Sampling Frequencies

- During confirmed HAB's, re-sampling frequencies of affected water bodies is directly associated with:
 - the initial sampling analytical results,
 - the water's potential for public visitation*, and
 - the lake is utilized as an Active Water Supply (AWS),
 - the lake has historic Long Term Problems (LTP)
 - the lake does not have historical problems but the HAB has lasted 4 or more weeks.

Calculating the Lake Visitation Potential

Lake Visitation Potential = Population within 30 miles × Lake Size Factor × Lake Density Factor × Public Access Factor × Contact Recreation Factor

- All water impoundments listed in the Kansas Surface Water Register have been ranked using this formula.
- Lakes have been divided into an upper 25% for visitation potential and a lower 75% for visitation potential

Processing the Re-Sampling Frequencies

A “score” is calculated using these factors, establishing the water’s re-sampling frequency.

Calculating the Final Score or Re-Sampling Frequency

Re-sampling Frequency	
0	= Weekly
1	= Weekly
2	= Bi-Weekly
3	= Bi-Weekly
4	= Monthly
≥5	= Preholiday/ Sample Season Closure
Otherwise Handle privately	

Sampling Season

- The HAB sampling season will adopt a sampling duration concurrent with the Water Quality Standards – Primary Contact Recreation, from April 1 to October 31.
- New and continued investigations will no longer be conducted after the October 31st date unless planktothrix is suspected.

Sampling Analysis

- ▶ Required analysis of:
 - Blue-green algal cell counts, and
 - Levels of microcystin toxins
 - Species, and
 - For initial sampling, nutrients, specifically nitrate, nitrite, Kjeldahl nitrogen, total phosphorous and ammonia
- ▶ Optional analysis of:
 - Percent blue-green cells
 - Estimated chlorophyll-a

Criteria for Lifting or Cancellation of HAB Advisories and Warnings

Advisories and warnings will remain in effect until:

- For Advisories: Until cyanobacteria cell counts are less than 20,000 cells/mL at all sample sites and microcystin toxin levels are less than 4 µg/L at all sample sites.

Criteria for Lifting or Cancellation of HAB Advisories and Warnings

- ▶ For Warnings: until the cyanobacterial concentrations are less than 100,000 cells/mL at all sample sites for at least one week and concentrations of microcystin toxins are less than 20 µg/L for two consecutive weeks at all sample sites.
- ▶ Bodies of water that fall below these levels and within these time periods may still not completely come off of a public health protection notification, but may be reduced to an “Advisory” level. The Public Health Advisory requirements will then need to be observed.