

# **PUBLIC BATHING PLACES (BEACHES)**

## **OPERATOR HANDBOOK**

**Summit County Public Health**  
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# Summit County Public Health

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Dear Bathing Beach Operators,

Bathing beaches are great places to have fun, be active, or just relax. As the summer season approaches, it is the perfect time to start thinking about health and safety issues at your property.

Waters used for recreational purposes are subject to a variety of environmental influences, which can affect the health and/or safety of individuals using those waters. Inadequate environmental controls can contribute to the spread of communicable diseases and/or cause injuries.

Summit County Public Health's (SCPH) Recreation Programs operate under the Environmental Health Division. This unit inspects resident and day camps, RV parks, public beaches and public swimming pools.

The goals of this program are to reduce the potential for the spread of communicable diseases, lower the risk of injuries and assure that these facilities are maintained in compliance with applicable laws and rules. These goals are achieved through inspections of the beaches as well as through education.

SCPH would like to take this opportunity to provide you with this resource binder as we continue to develop the educational piece of our program. It focuses on the role of beach operators and public health officials in preventing outbreaks of illnesses, drowning, injuries, etc.

This binder includes a number of handouts and items that may be beneficial to you and your employees. Our resources web page - found here: <https://www.scph.org/pools-campgrounds-resident-camps/beaches> - has many informative handouts, brochures, and links.

If you have any questions, please feel free to contact your inspector directly or any member of the SCPH Recreation Safety Team at 330-926-5600.

We are hopeful that you will maintain this binder in a clean and safe place where it is easily accessible for your reference. We included a plastic sleeve folder in the back of the binder to store copies of your beach license, life guard certifications, etc. As the regulations and recommendations change, your inspector will bring updated documents and information for your binder during their routine inspections.

If you have questions, or, suggestions on the use of the binder please feel free to contact me at (330) 812-3977, or, [dmasters@schd.org](mailto:dmasters@schd.org).

Sincerely,

Desaree Masters, REHS  
EH Supervisor  
Environmental Health Division  
Summit County Public Health



## REASONS TO CLOSE A BATHING BEACH

The licensee of a public bathing place (bathing beach) shall maintain the beach, its components, appurtenant facilities and the surrounding area in a safe, clean and sanitary condition, and in good repair.

Critical operational items. The operator of a bathing beach or portion thereof shall close the bathing beach when an imminent health hazard is present, including but not limited to the following:

- 1) Inclement weather.
- 2) When a lifeguard is not provided as is required.
- 3) When a recreational waterborne illness is linked to a beach.
- 4) When bacteriological standards are exceeded. E.coli levels exceeding 235 colony forming units (cfu) per 100 milliliters of beach water tested.
- 5) When cyanotoxin thresholds for recreational waters is exceeded. See State of Ohio Harmful Algal Bloom Response Strategy for Recreational Waters.

**Table 2 — Numeric Thresholds for Cyanotoxins in Recreational Water.**

| Threshold (µg/L)       | Microcystins* | Anatoxin-a | Cylindrospermopsin | Saxitoxins* |
|------------------------|---------------|------------|--------------------|-------------|
| Recreational           | 8             | 8          | 15                 | 0.8         |
| Public Health Advisory |               |            |                    |             |

\*Microcystins and saxitoxin thresholds are intended to be applied to total concentrations of all reported congeners, variants, or analogs of those cyanotoxins.

- 6) When there is an electrical hazard.



## **FREQUENTLY ASKED QUESTIONS BEACH WATER MONITORING**

Beach water can become polluted from many sources including, but not limited to, sanitary sewer, storm sewer, and combined sewer overflows; urban, rural, and agricultural runoff; malfunctioning septic tanks and aeration systems; industrial wastes, boating wastes, human and animal wastes. Natural pools, reservoirs, lakes or parts of such are not generally recommended for public bathing places and such bathing places are used at the operator's risk.

### **What are the risks of swimming in polluted water?**

The most common illness associated with swimming in, and ingesting polluted water is gastroenteritis. Typical symptoms include nausea, vomiting, abdominal cramps, fever, headache, and diarrhea. Other illnesses associated with swimming in such waters include shigellosis, cryptosporidiosis, and giardiasis, as well as eye, ear, nose, and throat infections.

### **What can I do to protect my family and myself?**

Do not swim if you are sick or if you have a weakened immune system. Do not swim near storm drains or other visible discharge pipes. Do not swallow the water – try to keep your face and head out of the water. Always shower after swimming.

**After a heavy rainfall, wait 24 hours before going swimming.**

### **What can I do to help keep the beaches clean?**

Conserve water. Excess water use at home means more water that has to be processed by sewage treatment plants. This can lead to sewer overflows and raw sewage discharges into beach areas.

Dispose of animal waste properly. When exercising your pet, collect and properly dispose of its waste. This helps to reduce the amount of animal waste that may be washed into the beach area from storm water runoff.

Use natural substances to fertilize lawns and gardens. Use compost made from natural products instead of chemical fertilizer. Minimize the use of pesticides and herbicides whenever possible.

Maintain private septic systems. Keep your septic tank or aeration system in good working order. Have it pumped and serviced in accordance with the manufacturer's recommendations. This will help prevent leaking and inadvertent discharge of treated or untreated sewage into the storm sewer – and ultimately into the beach area.

Properly dispose of marine and recreational boating wastes. Empty sewage holding tanks and portable toilet waste in proper onshore sanitary facilities. Perform regular service on boat engines, to minimize discharge of gasoline and motor oil.

Do not throw trash into the water.

### **I have heard that water samples can be taken at bathing beaches, what are the acceptable standards?**

Acceptability of bathing beach waters is based on the single, most recent sample collected, the Summit County Health District recommends against swimming if E. coli levels exceed 235 colony-forming units (cfu) per 100 milliliters of beach water tested.

If E. coli bacteria levels exceed 235 cfu, ODH and Summit County recommend the posting of signs to inform beach users of conditions that may make it unsafe for some to swim. The signs should read: "Water Quality Advisory – Bacterial levels here currently exceed state standards. Children, the elderly and those in ill health are advised not to swim."

Gastroenteritis is the most common illness associated with swimming in polluted water. Symptoms include nausea, vomiting, cramps, fever, headache and diarrhea. Swimmers can reduce their chances of getting sick by steering clear of visible discharge pipes; keeping their head and face out of the water; not swallowing the water; showering after swimming; and waiting 24 hours after a heavy rainfall before swimming.

Should you have any questions regarding the acceptability of the water at the bathing beaches in your community, please do not hesitate to contact us at 330-926-5600.



## **OHIO DEPARTMENT OF HEALTH BEACH SAFETY FAQs**

Beach water can become polluted from many sources including, but not limited to, sanitary sewer, storm sewer, and combined sewer overflows; urban, rural, and agricultural runoff; malfunctioning septic tanks and aeration systems; industrial wastes, boating wastes, human and animal wastes.

### **How do I know when it is safe to swim at the beach?**

When the bacteria or cyanotoxin levels at a monitored beach are abnormally high, the beach operator erects warning signs to alert you to the potentially hazardous conditions. If you don't see the warning signs, it's probably safe to go into the water.

If a sign is erected it means that the level of bacteria or cyanotoxins in the water are currently higher than the maximum standard that is used for evaluating beaches. If you are already sick, or if your immune system is weakened, your risk of becoming ill is greater if you swim.

### **What kinds of illnesses could I get from swimming in contaminated water?**

Most swimming-related illnesses are minor. They require little or no treatment and have no long-term health effects. The most common illness associated with swimming in polluted water is gastroenteritis with the following symptoms: nausea, vomiting, headache, stomachache, fever and diarrhea. Other illnesses associated with swimming include eye, ear, nose, and throat infections.

### **If I get sick after swimming, what should I do?**

If you think you became sick from swimming at the beach, you should consult your doctor. You should also tell the beach operator or your local health district. That way, the water can be tested again and the beach area can be assessed for potential contamination sources.

### **How can I get information about a beach before I go?**

You can call the beach operator to learn about current beach conditions. You can also check the Ohio Department of Health website at: [www.odh.ohio.gov/healthybeaches](http://www.odh.ohio.gov/healthybeaches)



## **SWIMMER'S ITCH**

### **What is swimmer's itch?**

Swimmer's itch, also called cercarial dermatitis, appears as a skin rash caused by an allergic reaction to certain microscopic parasites that infect some birds and mammals. These parasites are released from infected snails into fresh and salt water (such as lakes, ponds, and oceans). While the parasite's preferred host is the specific bird or mammal, if the parasite comes into contact with a swimmer, it burrows into the skin causing an allergic reaction and rash. Swimmer's itch is found throughout the world and is more frequent during summer months.

### **How does water become infested with the parasite?**

The adult parasite lives in the blood of infected animals such as ducks, geese, gulls, swans, and certain mammals such as muskrats and raccoons. The parasites produce eggs that are passed in the feces of infected birds or mammals.

If the eggs land in or are washed into the water, the eggs hatch, releasing small, free-swimming microscopic larvae. These larvae swim in the water in search of a certain species of aquatic snail.

If the larvae find one of these snails, they infect the snail, multiply and undergo further development. Infected snails release a different type of microscopic larvae (or cercariae, hence the name cercarial dermatitis) into the water. This larval form then swims about searching for a suitable host (bird, muskrat) to continue the lifecycle. Although humans are not suitable hosts, the microscopic larvae burrow into the swimmer's skin, and may cause an allergic reaction and rash. Because these larvae cannot develop inside a human, they soon die.

### **What are the signs and symptoms of swimmer's itch?**

Symptoms of swimmer's itch may include:

- tingling, burning, or itching of the skin
- small reddish pimples
- small blisters

Within minutes to days after swimming in contaminated water, you may experience tingling, burning, or itching of the skin. Small reddish pimples appear within twelve

hours. Pimples may develop into small blisters. Scratching the areas may result in secondary bacterial infections. Itching may last up to a week or more, but will gradually go away.

Because swimmer's itch is caused by an allergic reaction to infection, the more often you swim or wade in contaminated water, the more likely you are to develop more serious symptoms. The greater the number of exposures to contaminated water, the more intense and immediate symptoms of swimmer's itch will be.

Be aware that swimmer's itch is not the only rash that may occur after swimming in fresh or salt water.

### **Do I need to see my health care provider for treatment?**

Most cases of swimmer's itch do not require medical attention. If you have a rash, you may try the following for relief:

- Use corticosteroid cream
- Apply cool compresses to the affected areas
- Bathe in Epsom salts or baking soda
- Soak in colloidal oatmeal baths
- Apply baking soda paste to the rash (made by stirring water into baking soda until it reaches a paste-like consistency)
- Use an anti-itch lotion

Though difficult, try not to scratch. Scratching may cause the rash to become infected. If itching is severe, your health care provider may suggest prescription-strength lotions or creams to lessen your symptoms.

### **Can swimmer's itch be spread from person-to-person?**

Swimmer's itch is not contagious and cannot be spread from one person to another.

### **Who is at risk for swimmer's itch?**

Anyone who swims or wades in infested water may be at risk. Larvae are more likely to be present in shallow water by the shoreline. Children are most often affected because they tend to swim, wade, and play in the shallow water more than adults. Also, they are less likely to towel dry themselves when leaving the water.

## Once an outbreak of swimmer's itch has occurred in water, will the water always be unsafe?

No. Many factors must be present for swimmer's itch to become a problem in water. Since these factors change (sometimes within a swim season), swimmer's itch will not always be a problem. However, there is no way to know how long water may be unsafe. Larvae generally survive for 24 hours once they are released from the snail. However, an infected snail will continue to produce cercariae throughout the remainder of its life. For future snails to become infected, migratory birds or mammals in the area must also be infected so the lifecycle can continue.

## Is it safe to swim in my swimming pool?

Yes. As long as your swimming pool is well maintained and chlorinated, there is no risk of swimmer's itch. The appropriate snails must be present in order for swimmer's itch to occur.

## What can be done to reduce the risk of swimmer's itch?

To reduce the likelihood of developing swimmer's itch

- Do not swim in areas where swimmer's itch is a known problem or where signs have been posted warning of unsafe water.
- Do not swim near or wade in marshy areas where snails are commonly found.
- Towel dry or shower immediately after leaving the water.
- Do not attract birds (e.g., by feeding them) to areas where people are swimming.
- Encourage health officials to post signs on shorelines where swimmer's itch is a current problem.

# Swimming and Ear Infections



Swimmer's ear (also known as otitis externa) is a bacterial infection typically caused by water that stayed in the outer ear canal for a long period of time, providing a moist environment for bacteria to grow. Anyone can get swimmer's ear, but it is most often seen in children. Swimmer's ear cannot be spread from one person to another.

Swimmer's ear is not the same as a middle ear infection, which is common in children.

## Signs and symptoms

- Pain when the outer ear is tugged or when pressure is put on the part of the outer ear that sticks out in front of the ear canal (tragus)
- Itchiness inside the ear
- Drainage from the ear
- Redness and swelling in the ear

## Preventing swimmer's ear

- Keep ears as dry as possible.
  - » Use a bathing cap, ear plugs, or custom-fitted swim molds when swimming.
- Dry ears thoroughly after swimming or showering.
  - » Use a towel to dry ears well.
  - » Tilt head back and forth so that each ear faces down to allow water to escape the ear canal.
  - » Pull earlobe in different directions when ear faces down to help water drain out.
  - » If there is still water in the ear, consider using a hair dryer to move air within the ear canal.
    - Put the hair dryer on the lowest heat and speed/fan setting.
    - Hold the hair dryer several inches from ear.
- DON'T put objects in ear canal (including cotton-tip swabs, pencils, paperclips, or keys).
- DON'T try to remove ear wax. Ear wax helps protect the ear canal from infection.
  - » If you think the ear canal could be blocked by ear wax, check with your healthcare provider.
- Check with your healthcare provider about using ear-drying drops after swimming.
  - » **DON'T use these drops if you have ear tubes, punctured ear drums, swimmer's ear, or ear drainage.**

## Treating swimmer's ear

- Check with your healthcare provider if you have ear pain or drainage from the ear.
- Swimmer's ear can be treated with antibiotic ear drops.



U.S. Department of  
Health and Human Services  
Centers for Disease  
Control and Prevention

<https://www.cdc.gov/healthywater/swimming/swimmers/rwi/ear-infections.html>



## RECREATIONAL WATER ILLNESSES (RWI'S)

Recreational Water Illnesses, or RWI's, are diseases caused by germs that are spread through contaminated water such as pools, hot tubs, splash pads, lakes, rivers, oceans, etc. RWI's can be especially risky for people with compromised immune systems.

### **TO PREVENT A RWI INFECTION, SWIMMERS SHOULD:**

- Keep water out of your mouth while swimming. Most RWI's occur after accidentally ingesting contaminated water.
- Thoroughly wash your hands after swimming and before eating or drinking.
- Dry your ears after you swim.
- Do not swim if you have diarrhea to prevent others from becoming ill.

### **TYPES OF RWI'S:**

#### **CRYPTOSPORIDIOSIS "CRYPTO"**

**WHAT IS IT?** Cryptosporidiosis, or "Crypto", is an illness caused by a single-celled parasite called *Cryptosporidium* and is one of the most common causes of waterborne disease in humans in the United States.

**HOW DO YOU BECOME INFECTED?** Infection occurs after swallowing water or food that is contaminated with the parasite or by touching your mouth with contaminated hands or objects.

**SYMPTOMS** include watery diarrhea, stomach cramping/pain, nausea, vomiting, low-grade fever, loss of appetite, dehydration, and weight loss. Symptoms usually appear around one week after infection and last 1-2 weeks.



## GIARDIASIS

**WHAT IS IT?** Giardiasis is an illness caused by a single-celled parasite called *Giardia*.

Giardiasis is another one of the most common causes of waterborne disease in the United States.

**HOW DO YOU BECOME INFECTED?** The most common way people become sick with the *Giardia* parasite is by swallowing contaminated drinking or recreational water. It can also spread from person to person, through animals, or through contaminated food or objects.

**SYMPTOMS** usually appear 1-2 weeks after infection and may include diarrhea, abdominal cramps, gas, nausea, weight loss, and dehydration. Symptoms last 2-6 weeks or longer.

## SHIGELLOSIS

**WHAT IS IT?** Shigellosis is an illness caused by *Shigella* bacteria.

**HOW DO YOU BECOME INFECTED?** Infection occurs after swallowing contaminated water or food or by putting something in your mouth that is contaminated with the bacteria.

**SYMPTOMS** begin shortly after infection (1-2 days) and may include diarrhea (sometimes bloody), fever, nausea, and stomach cramps. Symptoms typically last for about a week.



## ESCHERICHIA COLI (E. COLI)

**WHAT IS IT?** A group of bacteria called *Escherichia coli* (*E. Coli* for short) causes illness.

**HOW DO YOU BECOME INFECTED?** Infection occurs after eating contaminated food or drinking contaminated water. Elevated *E. Coli* levels in water is usually caused by sewage overflows, failing sewage systems, polluted storm water, or agricultural runoff.

**SYMPTOMS** appear 1 to 10 days after exposure and may include severe stomach cramps, diarrhea (often bloody), vomiting, and fever. Serious complications from the illness can occur, however most people recover within 5 to 7 days.

## NAEGLERIA FOWLERI

**WHAT IS IT?** *Naegleria fowleri* is a rare disease caused by a single-celled living organism commonly occurred to as the "brain-eating ameba". The organism is naturally occurring in soil and warm freshwater such as rivers, lakes, etc.

**HOW DO YOU BECOME INFECTED?** *Naegleria fowleri* can infect people when water containing the organism enters the body through the nose and travels to the brain where it destroys tissue. Infection cannot occur after ingesting contaminated water.

**SYMPTOMS** appear 1-9 days after nasal exposure and include severe frontal headache, fever, nausea, vomiting, stiff neck, seizures, altered mental status, hallucinations, and coma. The disease is generally fatal.

**IF YOU THINK YOU MAY BE ILL WITH A RECREATIONAL WATER ILLNESS, CONTACT YOUR HEALTHCARE PROVIDER.**



## **BEACH GUARD**

The Beach Guard system allows local beach managers to post real-time beach monitoring and notification data online, and allows the public to view beach advisories that might be in place.

Water samples are collected by Summit County Public Health at licensed bathing beaches and the results are reported using this system. If the sample results are greater than the recreational standard of 235 colony forming units of E. coli bacteria, the operator is instructed to post an advisory to warn swimmers of the risk of illness associated with water contact. The advisory remains posted until a follow up sample result is below the recreational standard.

<https://publicapps.odh.ohio.gov/beachguardpublic/>

### **What do the different advisories mean?**



#### **Bacteria Contamination Advisory**

Posted when the level of bad bacteria in the water has reached unsafe levels and could make you sick. Children, the elderly and those in ill health or weakened immune systems are advised not to swim.



#### **Recreational Public Health Advisory**

Avoid all contact with the water. Algal toxins have been found at unsafe levels. Swimming and wading are not recommended. Keep pets away. For more information go to [www.ohioalgaefinfo.com](http://www.ohioalgaefinfo.com) or call 1-866-644-6224

## What are the beach water standards?

Recommendations issued by the Ohio Department of Health for posting advisory signs at beach areas are based upon the E. coli bacteria content of water samples collected at each beach.

Evaluation of water sample results is based on the single sample maximum standard adopted by the United States Environmental Protection Agency in 2004 for the evaluation of fresh water beaches. The single sample maximum standard allows beach managers to react more quickly to short-term changes in water quality, thus providing a greater level of protection for the bathing public.

**The single sample maximum for E. coli bacteria content is 235 colony forming units (cfu) per 100mL of water tested.**

## What should be included in a bathing beach advisory sign?

1. If the criterion for E. coli bacteria is exceeded, a recommendation will be made for posting the beach with signs that advise against swimming due to high bacteria levels.
2. Suggested language for posting a beach includes: Water Quality Advisory - Bacterial levels here currently exceed state standards. Children, the elderly and those in ill health are advised not to swim.
3. Advisory signs should be of sufficient size to be easily read and posted in a conspicuous location to be easily seen, preferably near all commonly used entrances and at other places of congregation at the beach (e.g., rest rooms, changing areas, lifeguard stations, etc.)
4. Signs should be readily available at all times in the event a posting is suggested or required.

## How do I know when it is safe to swim at the beach?

When the bacteria and/or cyanotoxin sample results are above the threshold, the beach operator erects advisory signs to alert you to the potentially hazardous conditions. These results can be found on the [BeachGuard webpage](#) where you can also sign up to receive an alert when there is a change in the advisory status.

## I saw an advisory sign at my beach. What does it mean?

There are two types of advisory signs that could be posted at the beach. One type of advisory is for bacterial contamination and the other is for cyanotoxins. The sign means that the water sample result is currently higher than the threshold that is used for evaluating beaches. If you are already sick, or if your immune system is weakened, your risk of becoming ill is greater if you swim when these advisories are

in place.

## What kinds of illnesses could I get from swimming in contaminated water?

The most common illness associated with swimming in polluted water is gastroenteritis with the following symptoms: nausea, vomiting, headache, stomachache, fever and diarrhea. Other illnesses associated with swimming include eye, ear, nose, and throat infections. Cyanotoxin exposure could result in skin rashes and may impact neurological and liver function.

## If I get sick after swimming, what should I do?

If you become sick after swimming at the beach, you should consult your doctor. You should also tell the beach operator or your local health district. That way, the water can be tested again and the beach area can be assessed for potential contamination sources.

## What are the sampling procedures for collecting composite cyanotoxins samples?

**A Guide to Collecting Grab and Composite Cyanotoxin Samples** - created by the Ohio Environmental Protection Agency (OEPA)

- This [video](#) demonstrates cyanotoxin sample collection procedures at beaches for both grab and composite samples.

For other samples - To assure consistency in collecting samples for analysis, the following procedures are used:

1. Specific sites (or the same locations) should be designated for collecting samples during the bathing season.
2. Collectors should sample where the water is about three (3) feet deep, in an area of the beach generally used for swimming.
3. The sample bottle should be inverted. With a sweeping motion, the sample should be collected from about one (1) foot below the water surface.
4. Every precaution should be taken to minimize sediment or debris in the sample. In cases where debris or sediment is present throughout the sample, this information should be noted on the laboratory form.
5. The collector should complete the laboratory form, noting such items as water temperature and clarity, and general weather conditions as indicated.

Additional information can be found on the Ohio Department of Health's website at <https://odh.ohio.gov/know-our-programs/bathing-beach-monitoring/welcome>

## CHAPTER 902

### Public Bathing Places

- 902.01 Public bathing place defined.
- 902.02 Operation and maintenance; permit required.
- 902.03 Terms and conditions of operation.
- 902.99 Penalty.

#### CROSS REFERENCES

Division of Water - see ORC 1521  
Exemption from liability to recreational users - see ORC 1533.181  
Watercraft - see ORC 1547 & 1548  
Communicable disease - see ORC 3707.04 et seq.  
Obstruction of waterways - see ORC 5589.06 & 5589.99  
Primary drinking water - see OAC 3745-81-01 through 3745-81-89  
General provisions - see EHC 100  
Bathing beach fees - see EHC 101  
Semipublic sewage disposal system fees - see EHC 101  
Swimming pools, spas and special use pools - see EHC 901

**EHC** Environmental Health Code      **ORC** Ohio Revised Code      **OAC** Ohio Administrative Code

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#### **902.01 PUBLIC BATHING PLACE DEFINED.**

As used in this chapter, "public bathing place" means and includes impounding reservoirs, basins, ponds, lakes, creeks, rivers and other similar bodies of water used collectively by numbers of persons for swimming or recreative bathing, together with the surrounding area, buildings, equipment and appurtenances pertaining to such bathing places, with the exception of bathing places in connection with single-family residences intended only for the use of nonpaying residents or their guests, and which are also prominently posted with a sign stating the following:

**"WARNING, NO LIFEGUARD. MINORS NOT PERMITTED WITHOUT AN ACCOMPANYING ADULT. ALL OTHERS SWIM AT THEIR OWN RISK."**

*(Resolution 15-85 adopted 2/12/85; Resolution 17-91 adopted 1/24/91; Resolution 011-19 adopted 04/11/2019)*

#### **902.02 OPERATION AND MAINTENANCE; PERMIT REQUIRED.**

No person shall operate or maintain a public bathing place until a permit therefore has been obtained from the Health Commissioner. Such permit shall be for the calendar year and shall be renewable on May 31 of each year, or not less than ten days before the bathing beach is made available for swimming.

*(Res. 113. Adopted 1-28-63; Res. 17-91. Adopted 1-24-91; Resolution 011-19 adopted 04/11/2019)*

**902.03 TERMS AND CONDITIONS OF OPERATION.**

- (a) No person shall operate or maintain a public bathing place, other than a swimming pool operated in accordance with Section 901, or any building, equipment or appurtenance pertaining thereto, except by written consent of the Health Department. The terms, conditions and expiration date shall be set forth in the written authorization. Failure to comply with such terms, conditions and expiration date shall constitute a violation of this section.
- (b) The person responsible for the operation of a public bathing place shall provide adequate personnel and facilities to insure compliance with all health, sanitation and safety rules as may be required by the Health Department. Placards listing such rules shall be posted in conspicuous places and shall be enforced.
- (c) Natural pools, reservoirs, lakes or parts of such are not generally recommended for public bathing places and such bathing places are used at the operator's risk.
- (d) Terms and conditions for the operation of public bathing places within the Summit County Combined General Health District shall be as follows:

**(1) Health and safety.****A. Swimming areas.**

- 1. Swimming areas must be clearly marked with conspicuous buoys or poles spaced not more than 100 feet apart and separated from no-diving areas by the use of a lifeline placed at the four-foot mark.
- 2. Bottoms shall be free from holes, steep slopes and sharp objects, and in parts less than five-feet deep shall have a bottom of sand, gravel, stone or other acceptable material to eliminate any unusually turbid (muddy) condition of the bathing water under normal use conditions.
- 3. Water depths in diving areas shall conform to standards outlined in Chapter 3701-31 of the Ohio Administrative Code.
- 4. The minimum safety equipment at each lifeguard station shall include one ring buoy at least eighteen inches in diameter, attached to at least forty feet of rope, and one rescue tube or rescue buoy. This equipment shall be available at all occupied lifeguard stations.
- 5. All swimming areas shall have a fully equipped backboard with a proper fitting extrication collar, sand bags (or equivalent), blanket and ties, or straps, available at all times.
- 6. All bathing areas shall maintain fully stocked first-aid kit containing, as a minimum, the contents of a twenty-four unit kit as recommended by the American Red Cross, or equivalent, as approved by the Board of Health.
- 7. All equipment and appurtenances shall be maintained in good repair at all times.
- 8. Health and safety rules shall be established by the operator of a bathing area, and these rules shall be posted conspicuously along the bathing area shoreline.
- 9. A telephone, with a posted list of emergency numbers, shall be readily available at all bathing places.
- 10. Night swimming shall only be permitted where adequate artificial lighting is available.
- 11. Any person suspected of having an infectious or communicable disease shall not be permitted to use the swimming area. Any person who has been refused entry to a swimming area under this section may be granted such entry upon presentation of a written statement from a physician that the condition is not infectious or communicable.

**B. Beach areas.**

1. The beach area shall be kept free of litter, dead fish, broken glass, sharp objects or any other hazardous materials.
2. Refuse containers shall be provided in sufficient numbers to assure that litter or hazardous materials do not accumulate on the beach area.

**C. Bathhouse areas.**

1. Bathhouses, where provided, shall be constructed in accordance with all applicable State and local building codes and shall contain the required number of fixtures (showers, sinks, toilets, urinals, drinking fountains, etc.).
2. Bathhouses and their appurtenances shall be maintained in good repair and shall be kept thoroughly clean and free from any accumulation of filth, garbage, rubbish or other waste.
3. Disposal of sewage and liquid wastes shall be in a public sanitary sewerage system or by another method approved by the Ohio Environmental Protection Agency.
4. All sewage and liquid waste collection systems shall be maintained in a safe and sanitary manner so as not to create a health hazard or nuisance.
5. All water supply systems shall meet the standards of the Ohio Environmental Protection Agency.
6. All drinking water supplies shall be of adequate quantity and potable quality and the water supply system and equipment shall be maintained in a safe and sanitary manner so as not to create a health hazard.

**(2) Lifeguards**

A. Qualifications. The term "qualified lifeguard" shall mean an individual possessing as minimum qualifications all of the following:

1. Must be sixteen years of age or older;
2. Must be physically and mentally capable of performing the duties of a lifeguard;
3. Must be trained in first-aid and artificial respiration;
4. Must have completed a water safety and rescue course such as offered by the American Red Cross.

**B. Requirements at bathing areas.**

1. One or more qualified lifeguards for each 300 linear feet of occupied bathing area shoreline shall be on duty at all times during open hours.
2. A lifeguard shall be considered on duty when he or she is occupying an elevated lifeguard chair situated so as to provide the lifeguard with a clear, unobstructed field of vision of his or her respective territory observation.
3. All water surface areas being used by bathers shall be within the field of vision of a qualified, on-duty, lifeguard.
4. Where there are one or more lifeguards on duty occupying an elevated lifeguard chair, a walking guard on the shore may also be considered on-duty if he or she is maintaining surveillance for any particular area.

5. Where diving or sliding in deep water is permitted, a separate, qualified lifeguard shall be on duty and situated so that he or she has a clear, unobstructed field of vision of the diving and/or sliding area.
6. When deep water swimming, outside of diving areas and removed from shore lines and elevated lifeguard stations, is permitted, at least one rescue boat, or rescue board, shall be provided and manned with a qualified lifeguard.

**(3) Water quality.**

A. Bacteriological standards.

1. Periodic sampling of bathing beach waters at bathing areas within the Health District may be required, to determine the bacteriological quality of the water.
2. The acceptability of bathing beach waters shall be based on the following bacteriological criteria: the fecal coliform count (either MPN or MF count) shall not exceed 200 per 100 milliliters as a monthly geometric mean based on not less than five samples per month, nor shall it exceed 400 per 100 milliliters in more than ten percent of all samples taken during the month.

**(4) Responsibility of beach owner/operator.**

A. Owners/operators. Each bathing area shall be under the supervision of a competent operator or attendant, who shall be responsible for maintaining the bathing area and all its appurtenances in a safe and sanitary manner.

B. Records.

1. The owner/operator shall be responsible for maintaining a personnel file of each qualified lifeguard under his or her supervision. The personnel file shall include the following:
  - a. Record of physical examination (if so required);
  - b. Record of pre-employment skill test (if so required);
  - c. Record of in-service training (if so required); and
  - d. Record of American Red Cross or equivalent water safety, life-saving, first-aid, CPR, rescue, etc., courses and certificates of successful completion of said courses.
2. Each bathing area shall maintain at all times a complete record of all accidents, inquiries or rescues and of all cases where first-aid treatment was provided by a qualified lifeguard. These records shall be available to Summit County Health Department personnel and appropriate local law enforcement authorities upon request.

**(5) Inspections.**

It shall be the duty of the Health Department to inspect each bathing area at least once each season and to record inspections on a form prescribed by the Department. Said inspections shall be made to determine compliance with the terms and conditions set forth in this chapter and, for that purpose, personnel of the Health Department shall be granted entry thereto at any reasonable time.

(6) **Variances.**

The Board of Health may grant a variance from the requirements of this subsection (d) if such variance will not be contrary to the public interest, where a person shows that, because of practical differences or other special conditions, their strict application will cause unusual and unnecessary hardship. However, no variance shall be granted that will defeat the spirit and general intent of this section or be otherwise contrary to the public interest.

*(Resolution 113 adopted 1/28/63; Resolution 16-85 adopted 2/12/85; and Resolution 17-91 adopted 1/24/91; Resolution 011-19 adopted 04/11/2019)*

**902.99 PENALTY.**

Whoever violates or fails to comply with any of the provisions of this Environmental Health Code shall be in violation of ORC 3707.48, 3709.20, 3709.21 or 3709.22, and subject to penalties provided in ORC 3707.99 and 3709.99.

*(Resolution 011-19 adopted 04/11/2019)*



## **WATER DEPTHS IN DIVING AREAS**

The licensee of a public bathing place (bathing beach) shall comply with Environmental Health Code (EHC) Chapter 902.

EHC 902.03(d)(1)(A)(3) states, "Water depths in diving areas shall conform to standards outlined in Chapter 3701-31 of the Ohio Administrative Code."

### **OAC 3701-31**

#### 3701-31-04(B)(6)(bb)(ii)

The required water depths beneath recreational diving boards shall be maintained as follows:

- a) Not less than five feet on either side for diving boards one meter or less in height; or
- b) Not less than seven feet on either side for diving boards three meters in height.

#### 3701-31-05.1(L)

Starting platforms/blocks. Starting blocks shall be appropriately designed for their intended purpose. Water depth. The water depth shall be at least five feet at a point one foot from the end wall to at least four feet at a point five inches from the end wall.

### **Recommendations:**

#### 3701-31-05.1(V)

Slides. All slides at a public swimming pool shall be installed in the following manner as applicable:

(1) Required water depths for slides:

- a) Kiddee slides shall only be installed in wading pools.

- b) Playground slides shall only be installed in the shallow areas of a public swimming pool.
- c) Recreational slides may be installed to enter into various depths of water as per manufacturer's specifications.
- d) The depth of water beneath a water slide that enters the public swimming pool within two inches of the water level shall not exceed forty-eight inches.
- e) The depth of water beneath a water slide that terminates more than two inches above the water level shall not be less than sixty inches.
- f) A speed slide shall be designed for high velocity that will terminate in a straight run out for deceleration and exit as per manufacturer's specifications.

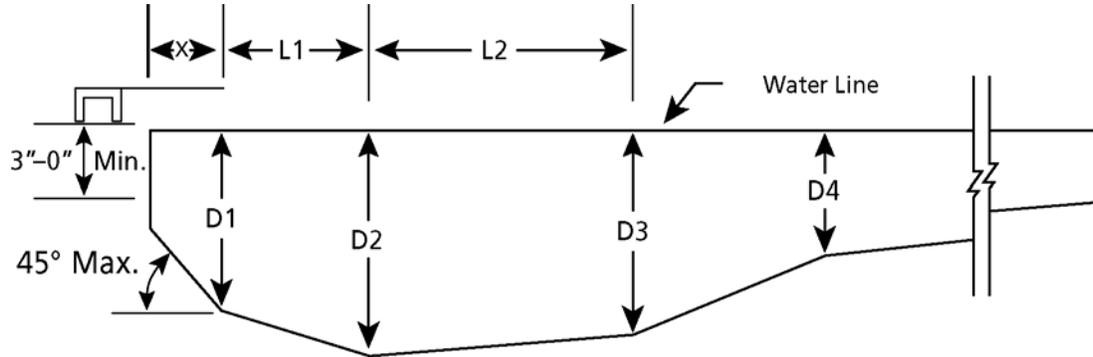
(2) The following requirements apply to all slides:

- a) All slides, except those attached to play features, shall have visually designated splash down areas.
- b) All slides shall have a ladder or steps within the area for egress.
- c) Handrails shall be provided at slides more than one meter above the deck level.
- d) Platforms more than one meter above the water level shall be protected with side barriers at least forty-eight inches high. Pickets or spindles shall offer a gap less than four inches.
- e) All water slides shall have a switch easily accessible to immediately shut-down the slide pump.

[Appendix B](#)

**CHART A**

(This drawing does not show the shallow portion of the pool)



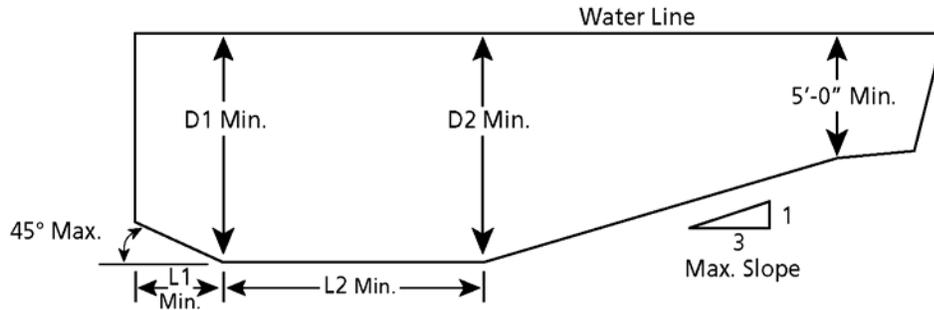
[-Table A-](#)

| <u>Max board ht. over water</u> | <u>Max diving board length</u> | <u>Min board overhang (x)</u> | <u>D1</u> | <u>D2</u> | D3    | D4   | L1   | <u>L2</u> |
|---------------------------------|--------------------------------|-------------------------------|-----------|-----------|-------|------|------|-----------|
| deck Level                      | 8'                             | 24"                           | 7'0"      | 8'6"      | 7'6"  | 5'0" | 5'0" | 10'0"     |
| 26"                             | 10'                            | 2'6"                          | 7'6"      | 8'6"      | 8'0"  | 5'0" | 5'0" | 10'0"     |
| 30"                             | 12'                            | 3'0"                          | 8'0"      | 9'0"      | 8'0"  | 5'0" | 5'0" | 10'0"     |
| 1-Meter                         | 16'                            | 4'0"                          | 8'6"      | 9'0"      | 8'0"  | 5'0" | 5'0" | 11'5"     |
| 3-Meter                         | 16'                            | 4'0"                          | 8'6"      | 11'0"     | 10'0" | 5'0" | 5'0" | 11'5"     |

Note: A deck level board is one-half meter (nineteen inches) or less above water level. A longer board may be used on a lower stand if the water depth meets or exceeds the requirements for the longer board. Diving hopper side and end slopes shall not exceed forty-five degrees.

**CHART B**

(This drawing does not show the shallow portion of the pool)



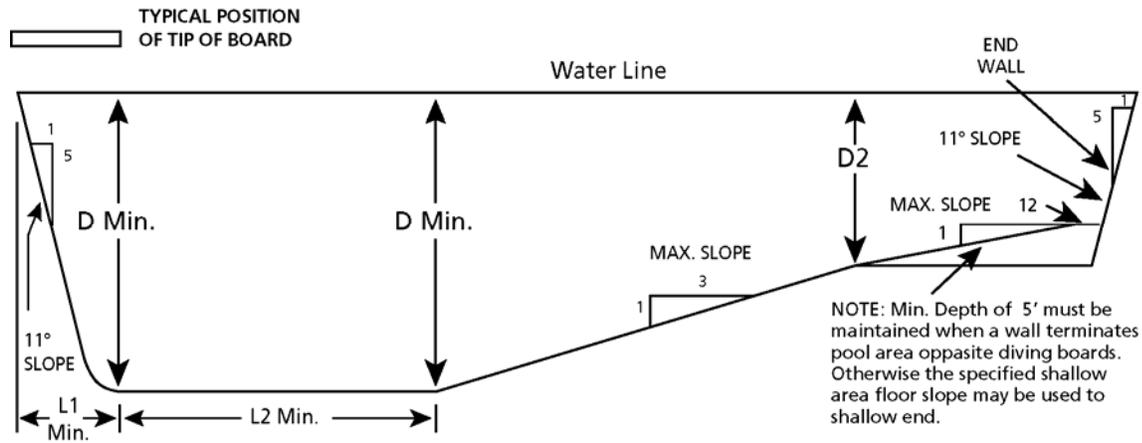
-Table B-

| <u>Max board ht. over water</u> | <u>Max diving board length</u> | <u>Min board overhang (L1)</u> | <u>D1</u>    | <u>D2</u>    | <u>L2</u>    |
|---------------------------------|--------------------------------|--------------------------------|--------------|--------------|--------------|
| <u>19" or less</u>              | <u>8' min. only</u>            | <u>2'6"</u>                    | <u>7'6"</u>  | <u>8'6"</u>  | <u>10'0"</u> |
| <u>26"</u>                      | <u>10'</u>                     | <u>2'6"</u>                    | <u>7'6"</u>  | <u>8'6"</u>  | <u>10'0"</u> |
| <u>30"</u>                      | <u>12'</u>                     | <u>3'0"</u>                    | <u>8'0"</u>  | <u>9'0"</u>  | <u>10'0"</u> |
| <u>1-Meter</u>                  | <u>16'</u>                     | <u>4'0"</u>                    | <u>8'6"</u>  | <u>10'0"</u> | <u>10'0"</u> |
| <u>3-Meter</u>                  | <u>16'</u>                     | <u>6'0"</u>                    | <u>11'0"</u> | <u>12'0"</u> | <u>12'0"</u> |

Note: A longer board may be used on a lower stand if the water depth meets or exceeds the requirements for the longer board. Diving hopper side and end slopes shall not exceed forty-five degrees.

**CHART C**

(This drawing does not show the shallow portion of the pool)



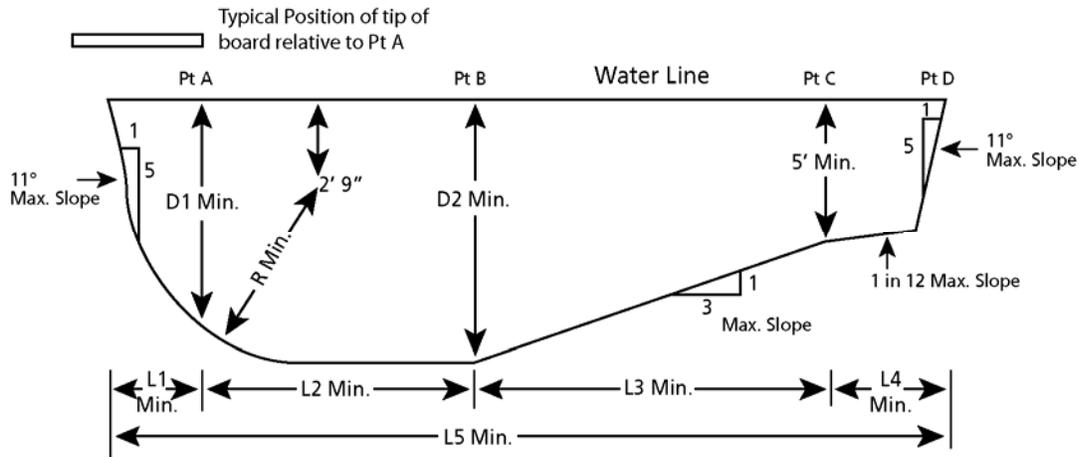
| <u>Max. board ht. over water</u> | <u>Max. diving board length</u> | <u>D1</u>    | <u>L1</u>   | <u>L2</u>    | <u>Pool Width</u> |
|----------------------------------|---------------------------------|--------------|-------------|--------------|-------------------|
| <u>26" (2/3 meter)</u>           | <u>10'</u>                      | <u>8'6"</u>  | <u>2'6"</u> | <u>10'0"</u> | <u>20'0"</u>      |
| <u>30" (3/4 meter)</u>           | <u>12'</u>                      | <u>9'0"</u>  | <u>3'0"</u> | <u>10'0"</u> | <u>20'0"</u>      |
| <u>1 Meter</u>                   | <u>16'</u>                      | <u>10'0"</u> | <u>4'0"</u> | <u>12'0"</u> | <u>20'0"</u>      |
| <u>3 Meter</u>                   | <u>16'</u>                      | <u>12'0"</u> | <u>6'0"</u> | <u>12'0"</u> | <u>24'0"</u>      |

Placement of boards shall observe the following minimum dimensions. With multiple board installations, minimum pool widths must be increased accordingly.

|                                             |              |
|---------------------------------------------|--------------|
| <u>1 Meter (or less) Board to pool side</u> | <u>10'0"</u> |
| <u>3 Meter Board to pool side</u>           | <u>12'0"</u> |
| <u>Distance between adjacent boards</u>     | <u>10'0"</u> |

**CHART D**

(This drawing does not show the shallow portion of the pool)



| Max. diving board length | Max. board ht. over water | D1    | D2    | R    | L1   | L2    | L3    | L4   | L5    | Min.  | Width of Pool at: | of    |
|--------------------------|---------------------------|-------|-------|------|------|-------|-------|------|-------|-------|-------------------|-------|
|                          |                           |       |       |      |      |       |       |      |       | Pt. A | Pt. B             | Pt. C |
| 16'                      | 1 meter                   | 8'6"  | 10'0" | 7'0" | 4'0" | 10'0" | 15'0" | 2'0" | 31'0" | 20'0" | 22'0"             | 22'0" |
| 16'                      | 3 meter                   | 11'0" | 12'0" | 8'6" | 6'0" | 10'6" | 21'0" | 0    | 37'6" | 22'0" | 24'0"             | 24'0" |

Note: L4 is a minimum dimension to allow sufficient length opposite the board. This may of course be lengthened to form the shallow portion of the pool. L2, L3 and L4 combined represent the minimum distance from the tip of board to pool wall opposite diving equipment.

Note: placement of boards shall observe the following minimum dimensions. With multiple board installations minimum pool widths must be increased accordingly:

|                                                    |     |
|----------------------------------------------------|-----|
| 3 Meter Board to Pool Side                         | 11' |
| 1 Meter Board or Deck Level Board to 3 Meter Board | 10' |
| 3 Meter to another 3 Meter Board                   | 10' |



Department of Health  
Environmental Protection Agency  
Department of Natural Resources

# State of Ohio Harmful Algal Bloom Response Strategy for Recreational Waters



August 2020

Mike DeWine, Governor

Jon Husted, Lt. Governor

Laurie A. Stevenson, Director — Ohio Environmental Protection Agency

Mary Mertz, Director — Ohio Department of Natural Resources

Lance Himes, Interim Director — Ohio Department of Health

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## Ohio Harmful Algal Bloom Response Strategy for Recreational Waters 2020

By signature, the undersigned certify that they have provided comments on, or reviewed the 2020 Ohio Harmful Algal Bloom Response Strategy for Recreational Waters:



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Laurie A. Stevenson, Director, Ohio Environmental Agency



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Mary Mertz, Director, Ohio Department of Natural Resources



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Lance Himes, Interim Director, Ohio Department of Health

## **Acknowledgements**

We acknowledge the close working relationship between the Ohio Environmental Protection Agency, the Ohio Department of Natural Resources, and the Ohio Department of Health in addressing Harmful Algal Bloom (HAB) issues in Ohio and in developing this unified state response strategy for recreational waters.

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## 1. Introduction

### 1.1 Purpose

The purpose of the *Ohio Harmful Algal Bloom Response Strategy for Recreational Waters* is to provide a unified statewide approach to addressing harmful algal blooms (HABs) in Ohio recreational waters and to protect people from cyanotoxins produced by cyanobacteria. The Strategy identifies numeric thresholds to be used in making advisory decisions. Sampling will target those cyanotoxins that may be present at or above the threshold criteria established by the State of Ohio.

The focus of the Ohio Harmful Algal Bloom Response Strategy for Recreational Waters is on publicly owned, recreational lakes with public beaches and boat ramps, although these practices can apply to any recreational water body. The State of Ohio will post advisories at state park lake beaches and signage at boat ramps. On state park lakes jointly managed by the Ohio Department of Natural Resources (ODNR) and the U.S. Army Corps of Engineers (USACE), sampling and public notification will be coordinated according to the interagency agreement (see Appendix I). Local agencies and entities responsible for other recreational waters are encouraged to follow the State Strategy for posting advisories for consistency in communicating risk to the public. To assist local beach managers and public health departments, a Local HAB Response Guide was developed this year and is included with this state response strategy as Appendix A.

The State will conduct sampling at state park beaches in response to the presence of cyanobacterial blooms. Harmful algal blooms can also impact recreational activities that occur in the open waters of lakes and rivers (such as boating and jet skiing). However, the potential exposure to cyanotoxins at much greater at beaches (e.g., full emersion swimming, larger number of children), therefore the State is focusing on monitoring and advisories on those higher risk waters. Increased education and outreach will be conducted to address and minimize the public's exposure to harmful algal blooms in the open waters. This includes posting of caution signage at boat ramps in conjunction with posting advisories at beaches.

A separate procedure for responding to harmful algal blooms on sources of drinking water, the Ohio Environmental Protection Agency's (Ohio EPA) *Public Water System Harmful Algal Bloom Response Strategy*, is available online at: [epa.ohio.gov/ddagw/HAB](https://epa.ohio.gov/ddagw/HAB). Guidance on the health effects of exposure to cyanotoxins and testing private drinking water sources for the presence of cyanotoxins and treatment options is available from the Ohio Department of Health (ODH) at <https://odh.ohio.gov/wps/portal/gov/odh/know-our-programs/private-water-systems-program/Resources-and-Education/>.

### 1.2 Agency Roles and Responsibilities

The following are the responsibilities of each of the three state agencies that developed this Strategy:

#### *Ohio Department of Natural Resources (ODNR):*

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- Monitor state park lakes for HAB development.
- Visually inspect state park beaches in response to bloom reports.
- Sample state park beaches for cyanotoxins if a bloom is visually evident at or near the beach.
- Post advisories and caution signs when necessary at state park beaches and boat ramps.
- Provide outreach to the public about HABs.
- Coordinate with the U.S. Army Corps of Engineers on jointly managed lakes.
- Create advisory signage templates in PDF format.

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### Ohio Department of Health (ODH):

- Evaluate illness reports, support local health district investigations, classify reports according to existing case definitions and report case results to the One Health Harmful Algal Bloom System (OHHABS).
- Determine advisory thresholds in consultation with ODNR and Ohio EPA.
- Advise the public about private lake HAB issues.
- Provide information to the public about HAB safety and health effects.
- Provide one website for posting recreational HAB advisories to the public through the BeachGuard application.
- Forward information on bloom reports and NOAA satellite imagery to local health districts.
- Coordinate with local health districts when responding to a potential HAB and post advisories when necessary, including sampling on public beaches not located at state parks.
- Communicate with Ohio EPA and ODNR as described in the communication protocol when advisories will be posted by local health districts.
- Review National Oceanic and Atmospheric Administration (NOAA) satellite imagery to evaluate HAB risks in open waters.

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### Ohio Environmental Protection Agency (Ohio EPA):

- Monitor NOAA satellite imagery and other information to identify bloom formation and share with ODH and ODNR.
- Use various screening tools to assist in determining the presence of a cyanobacteria and cyanotoxins.
- Collect and review Algal Bloom Reports, maintain in a database, and forward as appropriate for response.
- Maintain a database of state-reported HAB data.
- Maintain the [ohioalgaefinfo.com](http://ohioalgaefinfo.com) website.
- Provide HAB sample collection guidance for private lakes and other private water bodies and refer them to the Ohio State University (OSU) Extension, local health districts or ODH for additional assistance.
- Assist with sampling at public lakes as needed.
- Assist in determining the presence of a cyanobacteria bloom by microscopic review to determine genera.
- Sample for cyanotoxins and phytoplankton as part of the Inland Lakes Monitoring Program.
- Provide HAB sampling protocols and train others in sample collection.
- Provide outreach to the public about HABs.

The following table outlines the roles and responsibilities for sampling and posting advisories at various recreational water bodies.

**Table 1 — State and Local Agency Roles and Responsibilities.**

|                                                          | Type of Waterbody                         | Sampling or Observations of Blooms                | Post Advisories                                  |
|----------------------------------------------------------|-------------------------------------------|---------------------------------------------------|--------------------------------------------------|
| <b>Beaches and Primary Contact Recreation Areas</b>      | State Park                                | ODNR, Local Health Districts                      | ODNR                                             |
|                                                          | Other Public Beaches and Recreation Areas | Local Beach Manager or Local Health District*     | Local Beach Manager or Local Health Districts    |
|                                                          | Private Beaches and Recreation Areas      | Property Owner                                    | Property Owner                                   |
|                                                          | US Army Corps of Engineers (USACE) lake   | USACE coordinates with ODNR, Local Beach Manager* | USACE coordinates with ODNR, Local Beach Manager |
| <b>Rivers with Primary Contact Recreation Activities</b> | Rivers- Private access                    | Property Owner                                    | Property Owner                                   |
|                                                          | Ohio River                                | ORSANCO*                                          | Local govt./Ohio EPA                             |
|                                                          | Rivers – public access                    | Local Health Districts/<br>Ohio EPA               | Local Health Districts                           |

\*Ohio EPA may be able to provide sampling assistance if the local health district or Ohio River Valley Sanitation Commission (ORSANCO) is unable to respond.

HABs reported in non-public (private) waters may be referred to the Ohio State University Extension Office or local health departments for assistance. Owners and managers of private beaches, lakes, and ponds can use the sampling guidance provided in Appendix A to collect samples. Samples can be sent to labs listed in Appendix E for cyanotoxin analysis.

### 1.3. Cyanobacteria

Cyanobacteria are organisms that are found in all bodies of water. Under favorable conditions (nutrient availability, light, and heat) cyanobacteria can multiply and create an algal bloom becoming visible to the naked eye. These algal blooms generally occur in eutrophic or hypereutrophic water bodies. Eutrophication is most often the result of an elevated supply of nutrients, particularly nitrogen and phosphorus, to surface waters that results in enhanced production of primary producers, particularly phytoplankton and aquatic plants (Prepas and Charette 2003).

Cyanobacteria can cause problems in recreational waters. Large algal blooms can cause decreased dissolved oxygen concentrations resulting in fish kills. Many cyanobacteria also produce taste and odor compounds that affect the taste of fish. The foul smell produced by some cyanobacteria is a nuisance to those living around or recreating on the water.

### 1.4 Cyanobacterial Blooms

Cyanobacterial blooms vary in species composition and cyanotoxin production over time and within a water body. The distributions of cyanobacteria populations are affected by weather and lake conditions, hydrology, lake morphology, and the type of cyanobacteria. The cyanobacteria can be distributed evenly throughout a lake, or irregularly distributed because of currents and/or prevailing winds. Hydrologic changes because of heavy rains, or the discharge from a stream resulting in currents, can significantly affect cyanobacteria population distributions. Areas like shallow bays, coves, sites directly affected by nutrient-rich inflows, or structures that affect flow (e.g. dikes, piers, or intake towers) can significantly affect population growth rates and cyanobacteria distribution.

Cyanobacteria can be found at the water surface (scums), at a particular depth (e.g. *Planktothrix rubescens*), or can occur throughout the water column (e.g. *Planktothrix spp.*, *Cylindrospermopsis spp.*). Strong winds, rainfall, currents, and lake turnover can all mix a surface algal bloom throughout the water column. Winds can also concentrate a surface algal bloom in calm leeward (downwind) areas such as a bay, cove, beach, or inlet. Some cyanobacteria are also capable of buoyancy regulation, and during calm non-mixed conditions can move vertically throughout the water column based on light and nutrient availability. These various factors, that can move a visible surface algal bloom below the surface or to a different portion of the lake, are important to understand because the absence of a surface algal bloom does not necessarily indicate an algal bloom is not present. If it is noticed that a surface algal bloom has dissipated, the bloom may not have senesced (died), but could have just moved to another area of the lake or mixed below the lake surface within the water column. In addition, some cyanobacteria cannot form surface scums, so surface accumulations should not be relied on as the only indicator that an algal bloom is present.

Color is not necessarily a good way to distinguish cyanobacteria from green algae or suspended sediment. Cyanobacteria can appear in many colors that include brown and green. *Cylindrospermopsis spp.* blooms are generally brown and appear like suspended sediment. Other blooms are green and are mistaken for green algae. It is important for lake managers to be familiar with their lake so they can notice changes in the normal appearance outside bloom season. The best way to know for sure if cyanobacteria are present is through processed satellite imagery, microscopic examination, or use of other cyanobacteria screening tools (e.g. molecular methods, cyanotoxin field test kits).

## 1.5 Cyanotoxins

Cyanobacteria can produce a variety of cyanotoxins which can cause illness and death in humans and animals. These cyanotoxins include liver toxins, nerve toxins, and skin toxins. Some of the more common cyanotoxins detected in Ohio waters include microcystins and saxitoxin. Cylindrospermopsin and anatoxin-a have also been detected, but much less frequently. Cyanotoxins can be found within cyanobacteria cells or released from the dying cells into the water. Sudden die-off of an algal bloom can release cyanotoxins to the water all at once in great concentration (when using an algaecide) or gradually when some cells die while others grow during the lifecycle of a bloom. Cyanotoxin production is strain-specific, and many of these organisms can produce one or several different types of cyanotoxins. These cyanotoxins are colorless, odorless, and tasteless, and persist in the water after an algal bloom is gone. Cyanotoxins may be degraded by bacterial action and sunlight over time.

## 2. Cyanotoxin Toxicity Thresholds

### 2.1 Introduction

This section provides guidelines for public recreational water managers responding to HABs and their potential to adversely impact human health. Included in this strategy are cyanotoxin thresholds protective of human health by incidental ingestion in recreational waters; a framework to be used in issuing HAB advisories; and language for signage to use when posting affected water bodies.

These guidelines were recommended by a committee that included representatives from Ohio EPA, ODH and ODNR and were adopted by the Directors of those state departments. These guidelines are reviewed and updated annually. This strategy supersedes previous versions of this document. The science of HABs and their related cyanotoxins is evolving, and this strategy may require updating with the issuance of new toxicity information or national HAB guidance or policy.

## 2.2 Health Impacts from Exposure to Cyanotoxins

Many of the health symptoms associated with exposure to cyanotoxins can mimic other illnesses and diseases and therefore may not be readily recognized by the medical community or the public. Some of these symptoms include nausea, skin rashes, gastrointestinal distress, disorientation, numbness and fatigue. These symptoms can occur more quickly and severely in dogs and other animals. Increasing the level of awareness through education within the medical and veterinary community, general public and government agencies is strongly recommended in order to determine the public health impact of these cyanotoxins. ODH has developed information for physicians, known as “Screen for Green” that provides a diagnostic flowchart to assess probable patient exposure to cyanotoxins and treatment options. Similar information is available for veterinarians including diagnosis and treatment actions when an animal illness is suspected. Information for physicians, veterinarians and health effects of exposure to cyanotoxins can be found at [odh.ohio.gov/wps/portal/gov/odh/know-our-programs/harmful-algal-blooms/welcome/](https://odh.ohio.gov/wps/portal/gov/odh/know-our-programs/harmful-algal-blooms/welcome/).

Cyanotoxins can affect liver and brain function. Many of the cyanobacteria produce toxins that can cause skin irritation. Due to the potency of these toxins and no known antidote, the State of Ohio is taking a conservative approach with human exposure to these toxins when setting recreational water thresholds.

Reports of suspected human or animal illnesses should be reported to the local health district of residence. Local health districts will collect illness report information and work with ODH on reviewing these reports and next steps. Should ODH determine that an outbreak has occurred, then a Recreational Public Health Advisory, as described in Section 4.4, may be posted even when toxin levels are below advisory thresholds.

## 2.3 Cyanotoxin Thresholds for Recreational Waters

Numerous risk assessment frameworks, exposure assumptions, and toxicity values from state, national, and primary literature sources were considered prior to developing the cyanotoxin thresholds. The following thresholds were established based on the best scientific information, guidance, and public policy available at the time, and are based on incidental ingestion only (Table 2).

While protective of human exposures based on current information, the thresholds given here may or may not be protective of animals such as dogs or livestock. The United States Environmental Protection Agency (U.S. EPA) issued final recommended recreational swimming advisories for two cyanotoxins, microcystins and cylindrospermopsin in June 2019 which were subsequently adopted by the State of Ohio in this document.

For a toxicity review of various cyanotoxins, exposure assumptions and threshold calculations, see Appendix D.

**Table 2 — Numeric Thresholds for Cyanotoxins in Recreational Water.**

| Threshold (µg/L)                       | Microcystins* | Anatoxin-a | Cylindrospermopsin | Saxitoxins* |
|----------------------------------------|---------------|------------|--------------------|-------------|
| Recreational<br>Public Health Advisory | 8             | 8          | 15                 | 0.8         |

\*Microcystins and saxitoxin thresholds are intended to be applied to total concentrations of all reported congeners, variants, or analogs of those cyanotoxins.

### 3. HAB Identification and Reporting

This section describes how to recognize a potential HAB, how to report a HAB, what to sample for, and how information is shared.

#### 3.1 Observation

The initial observation of a possible HAB involves identifying the presence of color and/or scum in surface water. Frequent, close monitoring of the algal bloom's location(s) is recommended, especially in recreational waters. The color can vary from brown (looks like suspended sediment), green, blue-green, white, black, purple or red. (See Photo Gallery of Ohio HABs at [ohioalgaefinfo.com](http://ohioalgaefinfo.com)).

The State will use remotely sensed imagery collected and processed by the National Oceanic and Atmospheric Administration (NOAA) or the National Aeronautical and Space Administration (NASA) to assist in identifying the location of HABs in Lake Erie, inland state park lakes, and portions of the Ohio River. For state recreation managers, the imagery is used as a tool to assist in visual confirmation of algal bloom presence. These remote sensing tools can provide information on lakes or rivers that are at least 300 meters wide. A processed image can detect HABs approximately 1-2 feet below the surface when the human eye cannot. It can also detect algal blooms in turbid waters when the blooms can be difficult to visually identify. Hyperspectral imaging by airplane may also be used during times of increased cloud cover to supplement the satellite images. NOAA prepares a bi-weekly bulletin depicting satellite images of HABs, predicted algal bloom densities and wind directions for Lake Erie. More information on the NOAA HAB detection and monitoring program for Lake Erie can be found at the Great Lakes Environmental Research Lab website at [glerl.noaa.gov](http://glerl.noaa.gov). Beginning in May 2017, a similar satellite product became available for inland lakes in Ohio. Ohio EPA reviews the near daily images for any cyanobacteria detections, generates maps of cyanobacteria detections for individual lakes, and shares a summary of current cyanobacteria detections and lake maps with ODNR and ODH. A multi-agency project, Cyanobacteria Assessment Network (CyAN), is responsible for using satellites to identify cyanobacteria blooms across the contiguous United States and will publicly share satellite data through an Android mobile application (in development) and EnviroAtlas. More information on the CyAN project can be found at the U.S. EPA website at [epa.gov/water-research/cyanobacteria-assessment-network-cyan](http://epa.gov/water-research/cyanobacteria-assessment-network-cyan).

Ohio EPA conducts ambient HAB sampling at inland lakes and Lake Erie as part of their inland lakes and nearshore Lake Erie monitoring programs. Public water systems routinely monitor for HABs on their source waters and provide that data to Ohio EPA. When HABs are detected on inland lakes or nearshore Lake Erie areas near public beaches, that data will be provided to ODNR and ODH for follow-up. USACE, Ohio Lake Management Society (OLMS), and other organizations also conduct HAB sampling and provide that information to Ohio EPA. When these data indicate a HAB may be present on a lake, the information will be forwarded to ODNR and ODH for potential follow-up.

### 3.2 Reporting

Individuals that observe HABs are encouraged to complete an Algal Bloom Report Form on the [ohioalgaefinfo.com](http://ohioalgaefinfo.com) website that is accessible as a webform to directly locate the bloom location and include digital photos. Alternatively, a paper form is available (included in Appendix F) and may be submitted through e-mail along with digital photos to Ohio EPA's HAB mailbox ([HABMailbox@epa.ohio.gov](mailto:HABMailbox@epa.ohio.gov)). All Algal Bloom Reports and HAB data (cyanotoxin and phytoplankton data, and photographs) will be entered into a repository maintained by Ohio EPA. Cyanotoxin data will be posted on [ohioalgaefinfo.com](http://ohioalgaefinfo.com).

Algal bloom observers are encouraged to submit digital photographs with the Algal Bloom Report for algal bloom evaluation. Close-up (within 24 inches) and landscape photographs showing the extent and location of the algal bloom are helpful. Bloom reports at state park beaches will be forwarded to the state park beach manager for response. In response to reports of potential HABs on non-state park beaches, Ohio EPA will evaluate the report and share with local water managers and ODH, who will notify local health districts. Ohio EPA will provide sampling guidance to managers of private water bodies.

Coordination of response to blooms reported in non-state park beaches may be referred to the OSU Extension Office or local health districts for assistance. Owners of private beaches or ponds can use the sampling guidance provided in Appendix B to collect samples. Samples can be sent to labs listed in Appendix E for cyanotoxin analysis.

### 3.3 Screening and Cyanotoxin Analysis

Ohio EPA has developed a standard sampling protocol that can be used when sampling HABs (Appendix B). The protocol is used to collect samples at state park beaches during the primary recreational season from Memorial Day to Labor Day and as deemed necessary outside of the primary recreational season when conditions warrant the need for continued testing. At Ohio State Park beaches, if the park managers observe a potential HAB at the beach, the standard protocol is to collect a composite cyanotoxin sample and submit for microcystin analysis. The Ohio EPA protocol can be found in Appendix B. An instructional video (*HABs - A Guide to Collecting Grab and Composite Cyanotoxin Samples*) is available online at <https://youtu.be/B2yLi1Bp0CY>.

Cyanobacterial screening may include: phytoplankton identification (qualitative identification of genera and/or species present); cell quantification (cell counts or biovolume); phytopigment quantification (e.g. chlorophyll a or phycocyanin from sensors or analytical methods, reported in relative fluorescence units or cell density); molecular (qPCR) assessment of cyanobacteria genes or cyanotoxin-production genes; and rapid assessment field tests for cyanotoxins.

If screening is not conducted prior to cyanotoxin analysis, water managers are recommended to at least sample for microcystins, since they are the most commonly occurring cyanotoxin in Ohio. If phytoplankton identification or molecular screening shows an abundance of cyanobacteria capable of producing other cyanotoxins, additional analysis for those cyanotoxins (such as cylindrospermopsin, anatoxin-a, and saxitoxins) is recommended.

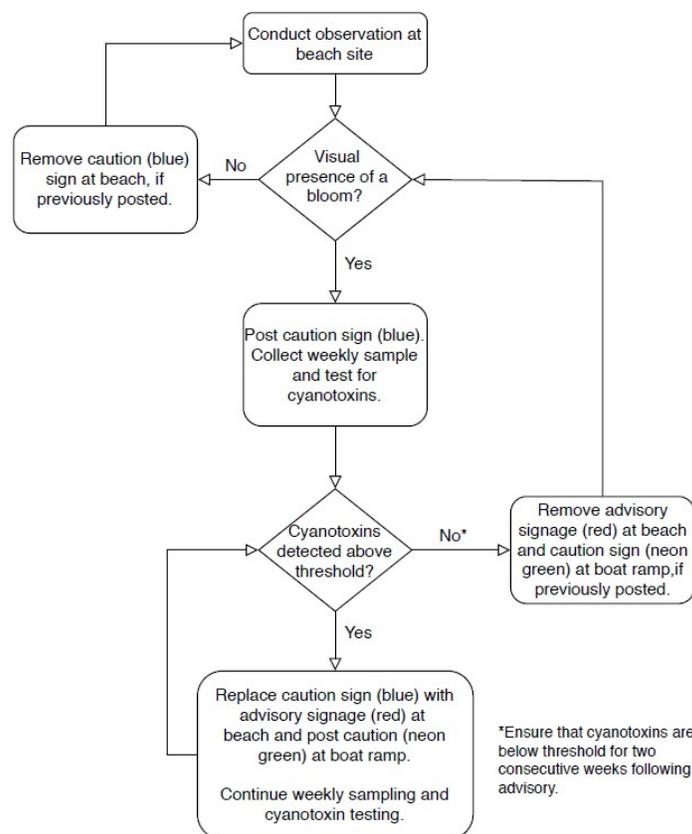
### 3.4 Information Sharing and Data Management

All recreational advisories occurring at state park beaches will be posted by ODNR on the BeachGuard website at [odh.ohio.gov/healthybeaches](http://odh.ohio.gov/healthybeaches). If a water manager posts an advisory on a non-state park public beach or boat ramp, they are encouraged to share that information with their local health district, who should then post the advisory on the BeachGuard website. The [ohioalgaefinfo.com](http://ohioalgaefinfo.com) website has been developed as the State’s primary site for HAB information. The website includes access for advisory notifications, reported recreational water quality data and information, links to the NOAA bulletin and related satellite imagery, the ability to report algal blooms, factsheets and general HAB information.

## 4. Harmful Algal Bloom Advisories

### 4.1 Advisory Postings

Public advisories are necessary to inform the public of the health risks associated with exposure to water that contains cyanotoxins. The State of Ohio will issue a recreational caution and a recreational public health an advisory for recreational waters based upon the available evidence as described below. The State will only be responsible for posting advisories at state park beaches and caution signage at boat ramps. For state park beaches, advisory posting removal will be based upon two consecutive samples taken at least one week apart with cyanotoxin levels below threshold levels. Caution signage removal will depend on where the sign is posted, as detailed below. It is recommended that other public and private recreational water managers post (and remove) advisories at beaches and access points according to this strategy to ensure consistency in messaging (see Table 1). PDF versions of the sign templates are available at [ohioalgaefinfo.com](http://ohioalgaefinfo.com) for use by local health districts, other managing agencies responsible for public beaches, and private beach managers to help ensure consistent messaging across the state. A flow-diagram outlining the posting strategy is provided below:



## 4.2 General Signage

The general informational sign has been posted for recreational waters at public state park beaches and boat ramps. For non-state park beaches with a history of HAB occurrence or upon visual confirmation of a HAB at a beach, posting of the informational sign is recommended:

**Have fun on the water, but know that blue-green algae are in many Ohio lakes. Their toxins may be, too.**

**Be alert! Avoid water that:**

- looks like spilled paint
- has surface scums, mats, or films
- is discolored or has colored streaks
- has green globs floating below the surface

**Avoid swallowing lake water.**

**For more information go to [ohioalgaefinfo.com](http://ohioalgaefinfo.com)  
or call 1-866-644-6224**



## 4.3 Recreational Caution

A Recreational Caution will be issued at a public state park beach when an algal bloom is visually confirmed. A Recreational Caution will be issued with an BLUE sign (with black lettering) posted with the following language:

**CAUTION**

**A possible algal bloom may be at the beach.**

**<FACILITY NAME> has tested the water.**

**Lab results pending.**

**For more information go to [ohioalgaefinfo.com](http://ohioalgaefinfo.com)  
or call 1-866-644-6224**



Once a Caution sign is posted, sampling for cyanotoxins occurs according to standard procedures (Appendix B). If cyanotoxins are detected above the recreational threshold; the Caution sign will be replaced with a Recreational Public Health Advisory. The Caution sign may be removed after algal bloom is gone.

## 4.4 Recreational Public Health Advisory

A Recreational Public Health Advisory will be issued at a public state park beach when cyanotoxin levels are equal to or exceed a recreational threshold. A Recreational Public Health Advisory will be issued with a RED sign (with white lettering) posted with the following language:

**DANGER**

**Avoid all contact with the water.**

**Algal toxins have been found at unsafe levels.**

**Swimming and wading are not recommended.**

**Keep pets away.**

**For more information go to [ohioalgaefinfo.com](http://ohioalgaefinfo.com)  
or call 1-866-644-6224**



A Recreational Public Health Advisory will remain until cyanotoxin levels have decreased to below recreational thresholds. The Advisory (and Boat Ramp Caution) may be removed after two consecutive samples taken at least one week apart indicate cyanotoxin concentrations are below recreational thresholds. If the bloom is still visually present, the Recreational Caution sign shall be reposted.

#### 4.5 Boat Ramp Caution

A Boat Ramp Caution sign will be issued and removed at a public state park boat ramps in conjunction with a Recreational Public Health Advisory (4.4 above). A Boat Ramp Caution will be issued with a SAFETY GREEN sign (with black lettering) posted with the following language:

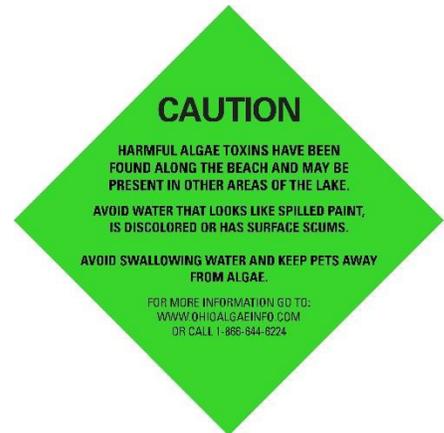
##### **CAUTION**

**Harmful algae toxins have been found along the beach and may be present in other areas of the lake.**

**Avoid water that looks like spilled paint, is discolored, or has surface scums.**

**Avoid swallowing water and keep pets away from algae.**

**For more information go to [ohioalgaefinfo.com](http://ohioalgaefinfo.com) or call 1-866-644-6224**



### 5. Harmful Algal Bloom Public Awareness and Education

Ohio EPA, ODNR and ODH work together to educate the general public about harmful algal blooms in publicly owned recreational waters with public beaches and/or boat ramps. This education includes where harmful algal blooms have been detected, their type and water sample testing levels; potential health risks of coming into contact with them; and any public health advisories that have been issued for contaminated recreational waters (see Section 4 “Harmful Algal Bloom Advisories”).

Here are the primary ways the agencies educate the general public about harmful algal blooms:

- All three agencies offer extensive harmful algal blooms information and resources on their websites, which can be accessed at
  - [ohioalgaefinfo.com](http://ohioalgaefinfo.com)
  - <https://odh.ohio.gov/wps/portal/gov/odh/know-our-programs/harmful-algal-blooms/welcome-to-habs>
  - [ohiodnr.gov/wps/portal/gov/odnr-core/divisions/parks-wc/div-parks/div-parks-wc](http://ohiodnr.gov/wps/portal/gov/odnr-core/divisions/parks-wc/div-parks/div-parks-wc)
- Posting of signage on state park beaches and boat ramps (see Section 4 - Harmful Algal Bloom Advisories).
- When ODNR issues a “Recreational Public Health Advisory” or a “Recreational Caution” for state park beaches signage is posted and the information is listed on the [odh.ohio.gov/healthybeaches](http://odh.ohio.gov/healthybeaches) website’s HAB Advisory Map.
- For state park beaches under a “Recreational Public Health Advisory” updated water sample test results are posted periodically on the [odh.ohio.gov/healthybeaches](http://odh.ohio.gov/healthybeaches) website’s HAB Advisory Map.

## 6. Glossary and Acronyms

**Algal toxin (cyanotoxin):** A toxin produced by cyanobacteria.

**Anatoxin-a:** A nerve toxin produced by a number of cyanobacteria.

**Beach:** Area along the shore that is a designated swimming area and is managed for public use.

**BeachGuard:** Website ([odh.ohio.gov/healthybeaches](http://odh.ohio.gov/healthybeaches)) on which water quality data and recreational advisories for public beaches are listed and mapped. Bacterial advisories for recreational waters (E. coli and HAB) are listed and mapped on this site.

**Biovolume:** Measured and derived by associating the phytoplankton with similar geometric forms and determining the volume of these by measuring the linear dimensions required for its calculation under the microscope (Vadrucci et al. 2007).

**Blue-green algae (cyanobacteria):** Photosynthesizing bacteria, (see definition below).

**Cyanobacteria (blue-green algae):** Photosynthesizing bacteria which may produce cyanotoxins that can cause sickness and possibly death in exposed populations of humans and animals. Cyanobacteria can be present as unicellular, colonial, or filamentous organisms. Some have the ability to fix nitrogen and/or regulate their buoyancy.

**Cyanotoxin (algal toxin):** Toxin produced by cyanobacteria. These cyanotoxins include liver toxins, nerve toxins and skin toxins.

**Cylindrospermopsin:** A liver toxin produced by a number of cyanobacteria.

**ELISA (Enzyme Linked Immunoassay):** A rapid assessment method commonly used to detect microcystins, cylindrospermopsin, and saxitoxin.

**Eutrophic:** A body of water rich in mineral and organic nutrients that promote a proliferation of algae and aquatic plants, resulting in a reduction of dissolved oxygen.

**HAB (Harmful Algal Bloom):** A visually identified concentration of cyanobacteria that discolors the water, or a cell count greater than 4,000 cells/ml of cyanobacteria genera capable of cyanotoxin production (Shambaugh and Brines, 2003) Accumulations of cyanobacteria cells may be present at the water surface, at a defined depth, or throughout the water column.

**Hypereutrophic:** A body of water extremely rich in nutrients and minerals.

**Microcystins:** A common type of cyanotoxin that is toxic to the liver. There are more than 80 congeners (forms) of this cyanotoxin. Microcystin-LR is one of the most toxic congener.

**Photic zone:** The uppermost layer in a body of water into which light penetrates in sufficient amounts to influence living organisms, especially those organisms like cyanobacteria that require light for photosynthesis.

**Primary recreational contact:** Waters that, during the recreation season, are suitable for one or more full-body contact recreation activities such as, but not limited to, wading, swimming, boating, water skiing, canoeing, kayaking, and scuba diving.

**Public lake:** A lake managed by a political subdivision of the State of Ohio.

**Recreational area:** Water area where swimming, wading, diving, jet skiing, water skiing, tubing, wakeboarding, windsurfing, kite boarding or any other in-water activity may occur that is likely to result in immersion or ingestion of water.

**Saxitoxin:** A nerve toxin produced by a number of cyanobacteria.

**Scum:** A cyanobacteria algal bloom that has a dense surface accumulation of cyanobacteria cells.

**Water column:** A vertical expanse of water from the surface of a river or lake to the bottom sediments.

### **Acronyms**

**DES:** Division of Environmental Services, Ohio EPA Laboratory

**NASA:** National Aeronautics and Space Administration

**NOAA:** National Oceanic and Atmospheric Administration

**ODH:** Ohio Department of Health

**ODNR:** Ohio Department of Natural Resources

**Ohio EPA:** Ohio Environmental Protection Agency

**ORSANCO:** Ohio River Valley Water Sanitation Commission

**USACE:** United States Army Corps of Engineers

**U.S. EPA:** United States Environmental Protection Agency

## **Appendix A – Local HAB Response Guide**

Since 2011, the State of Ohio has maintained the Harmful Algal Blooms Response Strategy for Recreational Waters. As Ohio's HAB response continues to evolve, the role and responsibility of local beach managers and local health districts has increased due to greater awareness of HABs, increased monitoring by public water systems. Additionally, the role and responsibility of local health districts was clarified in a recent opinion by Ohio Attorney Mike DeWine, Opinion 2017-009. Pursuant to R.C. 3709.11, the health commissioner of a general health district shall inform the public of the presence of a harmful algal bloom in a river when the HAB constitutes a public health matter and has implied authority to test, or obtain testing, for HABs within or abutting the boundaries of the general health district that is accessible by the public and may inform the public of the results when it is necessary to protect the public health from a public nuisance.

The state of Ohio recommends that local health districts and beach managers follow the HAB identification and posting steps described in Section 3 and the posting of HAB advisories as described in Section 4 to help ensure consistency with messaging posting and advisory language to the public statewide. This response guide summarizes key pieces of the State's Response Strategy relevant for local HAB response and provides a quick reference tool.

### ***How to identify a harmful algal bloom?***

Potential HABs may be reported directly to local health districts or beach managers by the public or park staff, submitted as a bloom report to Ohio EPA, observed on satellite imagery and reported by Ohio EPA, ODH or another entity. Upon notification of a bloom it is important to get a visual observation to confirm the report and determine if additional monitoring steps are needed. Some types of algae are often mistaken as cyanobacteria and not all cyanobacteria produce toxins. During the site visit, it is helpful to take photos, collect an initial water sample for algae identification, and potentially grab a water sample for toxin analysis if the bloom appears to be a HAB.

### ***How to determine if a bloom is toxic and post advisories?***

If a bloom is suspected to be cyanobacteria, it is recommended to collect a water sample at the beach or recreational water and either conduct a phytoplankton identification to determine the type of cyanobacteria present, or analyze for the water sample for the most common toxins, including microcystin, cylindrospermopsin, anatoxin-a and saxitoxin. See the Sampling and Safety Materials in Appendix B. If the phytoplankton identification determines that cyanobacteria are present that produce certain toxins (see Table 1), then ask the laboratory to test for those specific toxins. Post the blue sign while sampling results are pending. Consider posting recreational health advisories and caution signs on the state beach advisory webpage, BeachGuard.

### ***How many samples should be collected and what is the process?***

It depends on the size or type of recreational area, sampler access or resources. If it is a large beach and the bloom is only impacting a small portion, it may be helpful to sample multiple areas. Multiple grab samples from several locations can be collected and mixed together for a single composite sample. The transect procedure described in the Strategy, Appendix B provides a way to representatively sample the beach recreation zone and is preferred. However, if only a single grab sample can be collected from the bloom that is also acceptable. Regardless, it is important to document when, where and how the sample was collected. Photos of current conditions during sample collection are also very helpful.

### *How to interpret the results?*

Cyanotoxin results should be compared to Numeric Thresholds for Cyanotoxins in the 2020 Harmful Algal Blooms Response Strategy for Recreational Waters (Section 2.3, Table 2). If the results exceed the Recreational Health Advisory level, it is recommended to post the recreational advisory (red) sign immediately and plan to conduct weekly samples until the levels drop below the threshold for two consecutive weeks and the bloom is gone. If cyanotoxins are detected but below the threshold, you should continue to conduct visual inspections of the water and if conditions worsen collect additional samples. If a bloom is visually observed it is recommended that the caution (blue) sign be posted and remain until the bloom is gone, as long as toxins are not detected at or above a recreational threshold.

### *When can the Recreational Health Advisory be removed?*

Once you have posted a Recreational Health Advisory, weekly monitoring is recommended until the levels drop below the Recreational Health Advisory level for two consecutive weeks and the bloom is gone. If cyanotoxin concentrations drop below the Recreational Health Advisory level for two weeks and the bloom is gone, you can remove the recreational advisory (red) sign. If a bloom reappears, repost the blue Caution sign and resample for cyanotoxins. If at anytime during the weekly testing of a visually confirmed bloom shows cyanotoxin results above the Recreational Health Advisory level, the recreational advisory (red) sign should be reposted.

### *Reports of Illness*

Individuals who are concerned that they may be experiencing HABs illness symptoms after exposure to contaminated water should contact their healthcare provider and their local health district. Healthcare providers may follow the “screen for green” tool and obtain more information on diagnosing a HAB illness at [odh.ohio.gov/wps/portal/gov/odh/know-our-programs/harmful-algal-blooms/Information-for-Physicians/](https://odh.ohio.gov/wps/portal/gov/odh/know-our-programs/harmful-algal-blooms/Information-for-Physicians/). Healthcare providers who rule out other potential causes of the symptoms and suspect or confirm a HABs illness are advised to contact their local health district. Local health districts should complete forms for reports of human illnesses associated with either recreational or public water supply exposure to HABs toxins, and then fax completed forms to the ODH Bureau of Environmental Health and Radiation Protection secure fax: (614) 466-4556.

Pet and livestock owners who are concerned that their animal may be experiencing HABs illness symptoms after exposure to contaminated water should contact their veterinarian and the local health district. Veterinarians can use the diagnostic and treatment tools provided at [odh.ohio.gov/wps/portal/gov/odh/know-our-programs/harmful-algal-blooms/Information-for-Veterinarians/](https://odh.ohio.gov/wps/portal/gov/odh/know-our-programs/harmful-algal-blooms/Information-for-Veterinarians/). Veterinarians who rule out other potential causes of the symptoms and suspect or confirm a HABs illness, should complete an animal illness report form and fax it to the ODH Bureau of Environmental Health and Radiation Protection secure fax: (614) 466-4556.

Links to forms and other public health information is available online at [odh.ohio.gov/wps/portal/gov/odh/know-our-programs/harmful-algal-blooms/welcome-to-habs](https://odh.ohio.gov/wps/portal/gov/odh/know-our-programs/harmful-algal-blooms/welcome-to-habs).

### *Media and Outreach Materials*

Communicating to the public during a HAB event can be challenging and it is important to provide consistent advice and messaging. ODH and Ohio EPA can provide technical and outreach assistance and encourage development of draft materials prior to an event. Informational brochures and other materials are available at [ohioalgaefinfo.com](https://ohioalgaefinfo.com). Information on health effects of exposure to cyanotoxins, and information for healthcare providers and veterinarians can be found at [odh.ohio.gov/wps/portal/gov/odh/know-our-programs/harmful-algal-blooms/welcome/](https://odh.ohio.gov/wps/portal/gov/odh/know-our-programs/harmful-algal-blooms/welcome/)

### ***Pre-season Recommendations***

- Determine staff responsible for responding to HABs.
- Review the State Response Strategy and contact Ohio EPA’s Emerging Contaminants Section if you have any questions or would like to set up a HAB response training event.
- Contact a laboratory that provides phytoplankton identification and/or algal toxin analysis and verify prices, hours of operation, sample containers, sample preservation procedures. Be sure to inquire about weekend availability. Prepare a “grab and go” sampling kit (cooler, gloves, containers, lab paperwork and contact information) and make sure responding staff are aware of safety and sampling procedures.
- If there are waters with previous HAB problems or recreational advisories, consider posting white information signs at the start of the recreational season.
- Contact the ODH Recreation Program to set up an account to post HAB advisories on BeachGuard.

### ***Who do I contact for assistance?***

For information on health effects of HABs and reporting HAB human and animal illnesses, please contact ODH at (614) 728-9452. For information on posting advisories on BeachGuard, please contact ODH at (614) 644-7464 or toll free at 1-866-OHIO BCH (1-866-644-6224). For guidance on monitoring and general HAB questions, please contact Ohio EPA Emerging Contaminants Section at (614) 644-2752. A detailed list of contacts is provided in Appendix H of the Strategy.

## **Appendix B – Sampling and Safety Materials**

This sampling protocol is designed to be responsive to Algal Bloom Reports in recreational waters so that public health may be protected. It is applicable to collections by anyone who wishes to characterize phytoplankton and cyanotoxins in Ohio waters.

## Safety Precautions

Safety must come first when sampling for cyanotoxins. Gloves should be worn when sampling HABs (shoulder length if collecting samples at depth). Chest waders should also be worn if collecting a cyanotoxin sample when wading off the shore to protect skin from contact with cyanotoxins. A personal floatation device should be worn if entering the water to collect a sample or sampling from a boat. Avoid inhaling spray or getting spray in eyes from boats, wind, or irrigation water from areas with harmful algal blooms. Consider wearing an N95 mask to prevent inhalation of spray if conditions promote formation of water droplets (high wind, fast moving boat).

Do not ingest or allow the water to come in contact with the skin. Always wash hands with clean, fresh water after sampling and do not touch hands to mouth, eyes, open cuts or other exposed areas of the body before washing. All equipment, gloves, and waders should be rinsed with clean (tap or bottled) water (not lake water) after a sampling event.

## Sample Collection at Beaches

The following materials are needed for collecting samples at beaches: Clean PETG (polyethylene terephthalate) plastic or glass sample container(s), clean bucket, long handled spoon or stir rod, waders, floatation device, and shoulder length waterproof gloves.

The goal of beach sampling is to determine the average, representative, total microcystins concentration at the beach and determine if an advisory is necessary to help protect public health. To determine the average total microcystins concentration, samples will be collected along three beach transects, equally spaced along the beach, at ankle, knee, and hip depths (adapted from USGS, 2008). A composite sample should be collected using the following approach:

1. Label a clean sample container with the official beach name (includes lake name), current date and time.
2. Divide beach into three equally spaced transects. Try to use the same transect locations each time you sample that beach.
3. Go to first transect location and slowly wade into the water, perpendicular to the shoreline, to ankle depth. Samplers should walk slowly as not to stir bottom sediments and avoid collecting suspended sediment that may be kicked up. At ankle depth, lower the clean sample container to wrist depth (approximately 15 cm below water surface), fill the container with water, and then dump the container into a clean sampling bucket. Next, slowly wade to knee depth water, lower the same sample container to elbow depth (approximately 30 centimeters below water surface), fill the container with water, and dump the water in the bucket (combine with the previously collected sample). Slowly walk to hip depth, lower the same sample container to elbow depth and fill with water, and dump that sample into the bucket (combine with previously collected sample). Wade back to shore.
4. Repeat step 3 at the second and third transects, using the same sample container and bucket, taking care not to slosh the water collected along previously transects out of the sample bucket.

5. Mix the water in the bucket using a clean spoon or rod, fill the sample container with the mixed sample (3/4 full), and tightly cap the sample container. This is the composite sample you will submit to the laboratory for total microcystins analysis (see Appendix E for list of labs certified in Ohio EPA Method 701.0). This sample represents average conditions at the beach. If the ODNR HAB coordinator instructs you to also collect a sample for saxitoxins analysis, fill a pre-preserved 40 ml glass vial to the top of the vial (do not overfill or underfill). If the ODNR HAB coordinator also instructs you to collect a sample for phytoplankton identification, fill a third sample container and follow the preservation instructions provided by the HAB coordinator.
6. Immediately transfer the sample(s) to a dark cooler on wet ice or ice packs after sample collection. The sample(s) must be kept in the dark and on ice to preserve any cyanotoxin that may be present. If a microcystins sample will not arrive for processing at the laboratory within 5 days, the sample must be frozen in a standard freezer until it is analyzed by the lab. Ensure enough head space in the container to allow for expansion of the water when frozen to avoid breaking the bottle (3/4 full is typically fine). If a saxitoxins vial must be frozen, invert the vial three times, uncap and discard 1/3 of the sample volume, recap, and freeze the vial laying down to avoid container breakage during freezing. If a phytoplankton identification sample is collected, it should not be frozen.
7. If samples are being shipped to a lab, they must be shipped overnight (next day morning delivery) on ice to ensure the sample arrives chilled at the lab. If samples arrive to the lab warm, the lab must qualify the sample results as estimated, and may refuse to analyze the sample.

To clean sampling equipment between sampling sites (if sampling multiple beaches in one day), rinse equipment (waders, bucket, stir spoon) at least three times in water from the beach you are currently sampling, at a location away from any of your sampling transects.

**The procedure for collecting both discrete grab and composite beach samples is demonstrated in an Ohio EPA training video, available on Ohio EPA's HAB website: <https://youtu.be/B2yLi1Bp0CY>.**

Local beach managers may not have the supplies available to conduct composite sampling. In that case, a single grab sample from the densest part of the bloom will typically provide a worst case cyanotoxin concentration. If a scum is present, a scum sample can be collected from the scum-water surface interface. If the cause of the bloom is not known, the beach manager may collect a phytoplankton identification or molecular sample first or may sample for cyanotoxins directly. General sample collection and preservation instructions for each type of sample collection are provided below. The state recommends contacting the lab that will be analyzing the samples for further instructions.

**Phytoplankton Sample Collection.** Phytoplankton samples can be collected to determine the cause of the bloom. If cyanobacteria are present, the manager should use Table A1 at the end of this Appendix to determine if the bloom is capable of producing cyanotoxins, and which cyanotoxins should be analyzed.

The sampler should contact the lab that will be analyzing the samples for further instructions on containers, sample volume, and preservation guidance. Ideally, samples should be preserved at the time of collection with Lugol's iodine solution at a ratio of 1:100. To achieve a 1:100 ratio add approximately 1 ml of Lugol's solution per 100 ml of sample. Final preserved sample color should be similar to that of weak tea. Samples should be kept on wet ice and in the dark during transport. Ship for overnight delivery to the laboratory. If samples are shipped immediately after collection on wet ice, sample preservation with Lugol's iodine may not be necessary (consult lab conducting analysis). Do not freeze the phytoplankton sample - doing so will make identification difficult.

If the location of the bloom is evident (i.e. at the surface or just below the surface), collect a grab sample from the densest part of a bloom. If collecting a scum, collect a grab sample from the scum-water surface interface. Do not collect the portion of the scum that is above the water surface, as these are often dead cells that may no longer be readily identified. If the bloom is not at a distinct location, but diffuse throughout the water column, consider using a composite sampler that includes a collection for a range of depths. If you suspect the presence of benthic cyanobacteria, you can collect a sample near the lake bottom.

**Molecular (qPCR) HAB Testing.** Molecular testing methods are emerging as a new screening tool for HAB identification. Molecular testing can identify the presence of cyanobacteria in a water sample (16S gene) and the presence of toxin-production genes (microcystins- *mcyE* gene, cylindrospermopsin- *cyrA* gene, and saxitoxin- *sxtA* gene). These methods continue to evolve, with additional analysis options becoming available. These methods are unique in that they can distinguish between strains of cyanobacteria that are capable of toxin-production from those that are not (this is not possible with microscopic phytoplankton identification). However, this method cannot distinguish between live and dead cells, nor does the presence of a cyanotoxin gene equate to cyanotoxin being present in the water. The manager should contact the lab for sample collection guidance, but generally only 50 ml of water is needed and a preservative is not necessary. Samples must be shipped overnight on ice. The lab conducting the analysis will be able to provide further sampling instructions. A list of Ohio EPA certified cyanotoxin screening (qPCR) labs is included in Appendix E.

**Cyanotoxin Sample Collection.** The sampler should contact the lab conducting the analysis prior to sample collection, for guidance on proper sampling container, sample volume, and any required sample preservation. If a microcystins sample will be analyzed using the Ohio EPA Microcystins-ADDA ELISA method, collect at least 100 ml of sample in a glass or PETG plastic container. No sample preservative is required with this method. If the laboratory is using an alternate analysis method, the required sample volume, container type, and preservation may be different. Saxitoxins sampling may require the use of a pre-preserved sample vial.

Immediately after sample collection, transfer the sample to a dark cooler on wet ice or ice packs. The sample must be kept in the dark and cool to preserve any cyanotoxins that may be present. If a sample will not arrive for processing at the laboratory within 5 days, the sample must be frozen in a standard freezer until it is processed. Ensure enough head space in the container to allow for expansion of the water when frozen to avoid breaking the bottle.

Total cyanotoxins should be determined for recreational water sample analysis. Total cyanotoxins include both extracellular cyanotoxins, which are located outside the cyanobacteria cell wall, and intracellular cyanotoxins, which are located inside the cell wall.

If there are multiple beaches on a single lake with cyanobacteria blooms, consider sampling all beaches in the same manner as stated above, differentiating each sample location by an alternate location name. When you move to a new beach location to set up new transects, rinse the collection bucket and stirring rod three times with lake water at each location. Rinse away from the transect sampling points so as not to cross contaminate or mix the water where samples will be collected. Use a new, glass, PETG plastic, or other laboratory approved container for each different beach sampled. Make sure each sample location is identified by latitude/longitude or at least marked on a map and provided to the laboratory and kept for your records.

**Table B1. Cyanobacteria and Their Associated Cyanotoxins**

| Cyanobacterial Genera                                          | Hepatotoxins       |              | Neurotoxins |            |
|----------------------------------------------------------------|--------------------|--------------|-------------|------------|
|                                                                | CYLINDROSPERMOPSIN | MICROCYSTINS | ANATOXIN    | SAXITOXINS |
| <i>Anabaena (Dolichospermum)</i>                               | X                  | X            | X           | X          |
| <i>Anabaenopsis</i>                                            |                    | X            |             |            |
| <i>Aphanizomenon (Cuspidothrix)</i>                            | X                  | X            | X           | X          |
| <i>Aphanocapsa</i>                                             |                    | X            |             |            |
| <i>Arthrospira</i>                                             |                    | X            | X           |            |
| <i>Chrysochlorum</i>                                           | X                  |              |             |            |
| <i>Cylindrospermum</i>                                         | X                  |              | X           | X          |
| <i>Fischerella</i>                                             |                    | X            |             |            |
| <i>Gloeotrichia</i>                                            |                    | X            |             |            |
| <i>Leptolyngbya (Plectonema)</i>                               |                    | X            |             |            |
| <i>Limnothrix</i>                                              |                    | X            |             |            |
| <i>Lyngbya (Microseira)</i>                                    | X                  | X            |             | X          |
| <i>Merismopedia</i>                                            |                    | X            |             |            |
| <i>Microcystis</i>                                             |                    | X            |             |            |
| <i>Nostoc</i>                                                  |                    | X            |             | X          |
| <i>Oscillatoria (Planktothrix)</i>                             | X                  | X            | X           | X          |
| <i>Phormidium (Anagnostidinema, Geitlerinema, Microcoleus)</i> |                    | X            | X           | X          |
| <i>Pseudanabaena</i>                                           |                    | X            |             |            |
| <i>Raphidiopsis (Cylindrospermopsis)</i>                       | X                  |              | X           | X          |
| <i>Scytonema</i>                                               |                    | X            |             |            |
| <i>Snowella</i>                                                |                    | X            |             |            |
| <i>Synechococcus</i>                                           |                    | X            |             |            |
| <i>Synechocystis</i>                                           |                    | X            |             |            |
| <i>Umezakia</i>                                                | X                  |              |             |            |
| <i>Woronichinia</i>                                            |                    | X            | X           |            |

Information adapted from Jennifer Graham (USGS) with cyanotoxin production documented by Bernard et al., 2017; Chapman and Foss, 2019; Huang and Zimba, 2019.

## **Appendix C – Events Shaping Ohio’s HAB Strategy**

Formal lake monitoring in Ohio ceased in the mid-1990s when federal funding for the Clean Lakes Program ended. In 2007, Ohio EPA participated in the National Lakes Survey which included sampling for the cyanotoxin, microcystins. This initiated the new Ohio EPA Inland Lakes Sampling Program which formally commenced in 2008.

In 2008, because of developing awareness of cyanotoxins reported in other states, Ohio EPA Division of Surface Water formed a Harmful Algal Bloom Focus Group consisting of representatives from state and federal agencies and universities. The purpose of this group was to develop a network to benchmark on HAB issues and to develop an initiative to address HABs in Ohio.

In April 2009, the results of the 2007 National Lake Survey were released, showing that more than 36% of the randomly selected 19 Ohio lakes sampled had detectable levels of microcystins. This percentage was higher than the national average. The highest concentration of microcystins detected in Ohio was at Grand Lake St. Marys. Ohio EPA sampled the water at Grand Lake St. Marys during May 2009 and determined that the microcystins level was four times higher than the World Health Organization's criterion established for recreational exposure. A water quality advisory was posted. That advisory remained in place for the entire 2009 recreational season due to persistent, high concentrations of microcystins.

In 2010, Ohio EPA, ODNR and ODH developed a three-tiered advisory system. The highest level of advisory was posted at Grand Lake St. Marys and at Cutler Lake in Blue Rock State Park where swimming, boating and fishing were discouraged. The City of Celina has continued to test their finished water. There has not been a single detection of microcystins in their finished waters since testing began in May 2009.

Also, in 2010, Ohio EPA conducted limited testing of finished water supplies along the Lake Erie Western Basin and in several inland lakes. Akron had low levels of microcystins detected in their finished water. Ohio EPA followed up with additional testing to ensure that the water supply was safe. Western Basin Lake Erie beaches were also tested; the Maumee Bay State Park Beach had microcystins levels over 25 times higher than the World Health Organization's benchmark criterion for recreational waters.

Multiple meetings were held in 2010 between Ohio EPA, ODNR and ODH and with numerous groups around Grand Lake St. Marys. A consultant hired by U.S. EPA developed recommendations for addressing nutrient cycling in the lake and nutrient input from the watershed, which was recognized as causing the HABs. Two in-lake pilot projects were conducted in the fall of 2010 to collect data and address HAB issues. The State initiated in-lake treatment in the summer of 2011 to immediately address HAB growth. In addition, ODNR designated the watershed as "distressed," and adopted rules to mitigate nutrient loading in that watershed.

Based on the State's experiences in 2009-2010, a formal Strategy was developed in June 2011 that:

- Established commonly accepted terminology;
- Developed consistent sampling methodology;
- Reviewed cyanotoxin thresholds; and
- Revised the advisory protocol.

The 2012 revisions to the Strategy include:

- Addition of a beach managers guide which is intended to be a pull-out quick reference that outlines the sample collection and advisory posting process;
- Removal of the public water supply guidance so this document can focus only on recreational waters;
- Discussion of the use of satellite imagery for tracking HABs;
- Clarification of agency roles; and
- Streamlining of the Strategy document by placing some of the details in the appendices.

The 2014 revisions to the Strategy include:

- Updates to agency administrators and contacts;
- Clarification of the protocol for posting the white general information sign;
- Removal of the Fish Consumption and Cyanotoxins Section;
- Revisions to the satellite discussion;
- Removal of guidance for in-lake sampling;
- Updates to the Ohio State Parks beach list;
- Updates to contact information; and
- Addition of an agreement between Ohio and the U.S. Army Corps of Engineers for HAB coordination and response on jointly managed lakes.

The 2015 revisions to the Strategy include:

- Updates to the contact names and phone numbers-ODH, DDAGW;
- Changes to collection containers;
- Changes to cyanotoxin processing; and
- Changes to cyanotoxin holding times.

The 2016 revisions to the Strategy include:

- Revisions to the state agency roles and responsibilities;
- Modification of the advisory terminology and signage;
- Movement of the sampling protocol and safety precautions to an appendix;
- Movement of the Beach Manager's Guide, the outreach protocols, illness report protocols and case definitions to standard operating procedures; and
- General updates to the technical content of the document.

The Strategy was not revised in 2017, 2018, and 2019.

The 2020 revisions to the Strategy include:

- Revised cyanotoxin thresholds based on new U.S. EPA guidance;
- Updated Section 4 to reflect new signage and posting strategy;
- Added new Appendix A that summarizes local response;
- Updated Appendix B to simplify sampling procedures; and
- General updates to the technical content of the document.

**Appendix D –  
Toxicity Review, Exposure Assumptions,  
and Threshold Calculations**

## Toxicity Review

Toxicity values for microcystins, anatoxin-a, cylindrospermopsin, and saxitoxins were selected by an interagency committee for the establishment of cyanotoxin thresholds in recreational waters. The toxicity values for the specific cyanotoxins are referred to as reference doses (RfDs), which are intended to represent a “safe” dose for humans, below which no toxic effect is to be expected. The values are expressed in milligrams per kilogram body weight per day (mg/kg-day). Safety factors are included between 3 and 1000, depending on the number, variety, and quality of the available studies. The values are derived to account for varying lengths of exposure to the cyanotoxins, including an acute exposure, which can be as short as one day, a short-term exposure, a subchronic exposure, and a chronic (or lifetime) exposure. Not all cyanotoxins have all four exposure lengths assessed, depending on the cyanotoxin-specific data available specific to the cyanotoxin.

The other exposure factors used in the calculations of the threshold concentrations in recreational waters has been updated according to the U.S. EPA’s *Recommended Human Health Recreational Ambient Water Quality Criteria or Swimming Advisories for Microcystins and Cylindrospermopsin* (2019). The updated incidental ingestion rate (IR) used to establish the threshold values was calculated using a combined distribution analysis of available data on liters of ingestion per hour and number of hours spent in the water per day. The 90th percentile for children six to 10 years old is 0.21 L/day incidental ingestion while recreating in fresh water (U.S. EPA, 2019) and is a conservative estimate of incidental ingestion for the most sensitive population. The updated mean body weight (BW) for a child ages 6 – 10 was also used for the BW exposure factor and is 31.8 kg. The calculation used in developing all thresholds is:

$$\text{Recreational Water Threshold } (\mu\text{g/L}) = \frac{\text{RfD} \times \text{BW}}{\text{IR}} \times \text{CF}$$

Where:

RfD = cyanotoxin-specific Reference Dose (mg/kg-day)

BW = Body Weight = 31.8 kg

IR = Incidental Ingestion Rate = 0.21 L/day

CF = Conversion Factor = 1000  $\mu\text{g}/\text{mg}$

### Anatoxin-a

U.S. EPA’s *Health Effects Support Document for the Cyanobacteria Toxin Anatoxin-A* from 2015 was used as the basis for the anatoxin-a thresholds presented here. In summary, 7-week drinking water study in rats reported the no observed adverse effect level (NOAEL) in the study was 0.05 mg/kg-day and the lowest observed adverse effect level (LOAEL) was 0.5 mg/kg-day based on an increase in white blood cell counts over the first 5 weeks of the study. However, U.S. EPA noted that the toxicological significance of this effect is not clear. A second short term oral toxicity study reported mortality end points at two dose levels, 0.5 and 2.5 mg/kg-day, that were unexplained by the authors. Therefore; the uncertainty in the biological significance of these effects and the deficiencies in the database for anatoxin-a, U.S. EPA concluded it was not appropriate to establish a toxicity value based on these studies.

Because of the need to take regulatory action, Ohio is setting a subchronic RfD based on the 7-week drinking water rat study discussed in the U.S. EPA Health Effects Support Document because it represents the best available toxicity information for anatoxin-a. The RfD is 0.00005 mg/kg-day, based on the NOAEL of 0.05 and an uncertainty factor of 1000. The uncertainty factor includes a factor of 10 for rat to human variability, 10 for variability among humans, and 10 for database deficiencies, including limitations within the study used as the basis for the RfD, lack of reproductive studies, and lack of toxicity testing in a second species. The resulting anatoxin-a threshold in recreational waters is 8  $\mu\text{g}/\text{L}$ .

## Cylindrospermopsin

U.S. EPA's *Recommended Human Health Recreational Ambient Water Quality Criteria or Swimming Advisories for Microcystins and Cylindrospermopsin* (2019) was used as the basis for the cylindrospermopsin threshold presented here. The RfD is 0.0001 mg/kg-day based on a NOAEL of 0.03 mg/kg-day on increased kidney weight identified at the LOAEL of 0.06 mg/kg-day from an 11-week mouse study. The RfD incorporates an uncertainty factor of 300, including a factor of 10 for mouse to human variability, 10 for variability among humans, and 3 for database deficiencies. The resulting cylindrospermopsin threshold in recreational waters is 15 µg/L.

## Microcystins

U.S. EPA's *Recommended Human Health Recreational Ambient Water Quality Criteria or Swimming Advisories for Microcystins and Cylindrospermopsin* (2019) was used as the basis for the subchronic microcystins RfD of 0.00005 mg/kg-day. It was derived from a 13-week mouse study that identified a lowest-observed-adverse-effect-level (LOAEL) of 50 µg/kg/day based on liver pathology, and includes an uncertainty factor of 1000, which includes a factor of 10 for mouse to human variability, 10 for variability among humans, and 3 for LOAEL to no-observed-adverse-effect-level (NOAEL) extrapolation, and 3 for uncertainties in the database. The resulting microcystins threshold in recreational waters is 8 µg/L.

## Saxitoxin

To develop a saxitoxin guideline, the committee reviewed various sources. Information in the *Report of the Joint FAO/IOC/WHO ad hoc Expert Consultation on Biotoxins in Bivalve Mollusks* (2004) was identified as a critical report for saxitoxin exposure. The expert consultant reviewed several case series for about 60 individuals, ages 3 to 72, and covering some 20 incidents of poisoning between 1970 and 1990. Based on these data, 2.0 µg STXeq/kg was established as a provisional LOAEL. By applying an uncertainty factor of 3 for the conversion of the LOAEL to an acute reference dose (ARfD) for saxitoxins of 0.0007 mg/kg-day was presented.

The *European Food Safety Authority (EFSA) Marine Biotoxins in Shellfish – Saxitoxin Group: Scientific Opinion of the Panel on Contaminants in the Food Chain* (2009) was also reviewed as a critical report for saxitoxin. This EFSA scientific panel calculated a LOAEL from 500 documented reports on exposure in humans to be in the region of 1.5 µg STXs/kg. They also incorporated an uncertainty factor of 3 to convert the LOAEL to a NOAEL of 0.5 µg STXs/kg. No additional uncertainty factor was included, and the resulting ARfD for saxitoxin was 0.0005 mg/kg-day. Both sources made the same conclusion that no additional uncertainty factor for variation among humans was necessary, because the data set covered a wide variety of affected consumers, including sensitive individuals (FAO/IOC/WHO, 2004; EFSA, 2009).

When discussing a saxitoxin threshold for recreational waters in Ohio, the committee decided to use 0.5 µg STXs/kg as an estimated NOAEL (EFSA, 2009) and further apply uncertainty factors to calculate an ARfD. The committee agreed to apply an uncertainty factor of 100 which includes 10 for a lack of chronic, developmental, and reproductive studies and 10 for variability among humans. The resulting ARfD for use in calculating a saxitoxin threshold is 0.00005 mg/kg-day. The resulting threshold for saxitoxin in recreational waters is 0.8 µg/L.

## **Appendix E – Laboratories Used by the State of Ohio**

The most up to date list of laboratories than are certified/accepted to perform analyses can be found at:  
[\*epa.ohio.gov/Portals/28/documents/labcert/Combined-Lab-List.pdf\*](https://epa.ohio.gov/Portals/28/documents/labcert/Combined-Lab-List.pdf)

There are other laboratories that may perform cyanotoxin and phytoplankton analysis. Any laboratory selected must use the protocol outlined in the Strategy or other method approved by Ohio EPA.

## Appendix F – Forms\*

Use the Algal Bloom Report Form to submit reports of an algal bloom and/or when submitting phytoplankton and/or cyanotoxin samples to a laboratory for analysis by e-mail to

***[HABMailbox@epa.ohio.gov](mailto:HABMailbox@epa.ohio.gov)***.

The Algal Bloom Report Form and webform version are accessible at:

***<https://survey123.arcgis.com/share/ac459f1f0b344bfa93c0486b028fba6>***

\*Cyanotoxin sample submission should be coordinated with the laboratory where the samples will be submitted.

| <b>Algal Bloom Report Form</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                  |        |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--|
| <p>Please provide information about the potential blue-green algae bloom observed. Information can be entered into this electronic form and saved on your computer using Word or Adobe Reader (version 9+).</p> <p><b>Please save and email a completed copy of this form to <a href="mailto:HABmailbox@epa.ohio.gov">HABmailbox@epa.ohio.gov</a>.</b></p> <p>You are encouraged to include digital photographs as additional email attachments (close-up, and landscape showing extent and location of algal bloom).</p> <p>If possible, consider including an image from an online mapping application such as Google, Bing or Yahoo Maps, with a marker at the bloom location. For more information go to the <a href="http://ohioalgaefinfo.com">ohioalgaefinfo.com</a> website.</p> |                                                                                                                                                                                                                  |        |  |
| <b>Algal bloom Location:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                  |        |  |
| Water body:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Date bloom observed:    /    /                                                                                                                                                                                   |        |  |
| County (optional):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Drinking water source? Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/>                                                                                                 |        |  |
| Publicly Owned Lake? Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Attached map with algal bloom location noted (e.g. Google Map image)? Yes <input type="checkbox"/> No <input type="checkbox"/> Digital photos attached? Yes <input type="checkbox"/> No <input type="checkbox"/> |        |  |
| <b>Report Completed By:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                  |        |  |
| Name:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Organization:                                                                                                                                                                                                    |        |  |
| Title:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Phone: (    )    -    ext.                                                                                                                                                                                       | Email: |  |
| <b>Algal Bloom Description and Sampling Information:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                  |        |  |
| Please describe the location of the algal bloom in the water body (e.g. center of lake, at the boat dock, at the beach):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                  |        |  |
| Do you notice any colors in the water                      Yes <input type="checkbox"/> No <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                  |        |  |
| Please check any colors you see, or describe the color(s) below:                      Green <input type="checkbox"/> Blue <input type="checkbox"/> Red <input type="checkbox"/> Rust <input type="checkbox"/> Brown <input type="checkbox"/> Milky White <input type="checkbox"/> Purple <input type="checkbox"/> Black <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                  |        |  |
| Please estimate the size (sq. feet) or the extent of algal bloom:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                  |        |  |
| Can you see a surface scum (an accumulation at the surface) or algae floating near the watersurface?<br>Algae floating at the surface can look like grass clippings, green cottage cheese curds, or spilled paint.    Yes <input type="checkbox"/> No <input type="checkbox"/> Uncertain <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                  |        |  |
| Is the algal bloom near a public beach? If yes, please specify the beach name or location below.                      Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                  |        |  |
| Is the algal bloom near a drinking water intake? (Specify water system name if known)                      Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                  |        |  |
| Were samples taken? Yes <input type="checkbox"/> No <input type="checkbox"/><br>If yes, what type of samples; when and where were they collected; and where were they sent for analysis?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                  |        |  |
| Do you know if other water quality information is available? (Specify what data is available and where)                      Yes <input type="checkbox"/> No <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                  |        |  |

## **Appendix G – Ohio State Park Beaches**

## OHIO STATE PARK BEACHES

### LAKE ERIE BEACHES

| County       | State Park                 | Beach  | Latitude      | Longitude     | Acres of Water |
|--------------|----------------------------|--------|---------------|---------------|----------------|
| Ashtabula    | Geneva State Park          |        | 41°51'25.58"N | 80°58'39.85"W |                |
| Lake         | Headlands State Pk. (East) |        | 41°45'24.38"N | 81°17'24.35"W |                |
|              | Headlands State Pk. (West) |        |               |               |                |
| Erie         | Kelleys Island St. Pk.     |        | 41°36'55.32"N | 82°42'17.15"W |                |
| Ottawa       | Catawba Island St. Pk.     |        | 41°34'25.45"N | 82°51'27.09"W |                |
|              | East Harbor State Park     |        | 41°33'32.35"N | 82°48'15.52"W |                |
|              | South Bass Island St. Pk.  |        | 41°38'31.97"N | 82°50'14.05"W |                |
| Toledo/Lucas | Maumee Bay St. Pk.         | Erie   | 41°41'8.73"N  | 83°22'37.05"W |                |
|              |                            | Inland | 41°41'0.40"N  | 83°22'38.03"W |                |

### INLAND BEACHES

| County    | State Park   | Beach         | Latitude      | Longitude     | Acres of Water |
|-----------|--------------|---------------|---------------|---------------|----------------|
| Delaware  | Alum Creek   | Main          | 40°11'25.21"N | 82°58'14.43"W | 3,387          |
|           |              | Camp          | 40°14'8.59"N  | 82°58'39.94"W |                |
| Belmont   | Barkcamp     |               | 40° 2'14.78"N | 81° 0'37.98"W | 117            |
| Muskingum | Blue Rock    |               | 82°58'39.94"W | 81°50'56.87"W | 15             |
| Clark     | Buck Creek   | Main          | 39°56'57.79"N | 83°44'7.61"W  | 2,120          |
|           |              | Camp          | 39°58'1.20"N  | 83°43'47.55"W |                |
| Fairfield | Buckeye Lake | Crystal Beach | 39°55'56.71"N | 82°28'37.68"W | 3,173          |
|           |              | Fairfield     | 39°55'19.34"N | 82°28'14.67"W |                |
|           |              | Lake Brooks   | 39°54'5.31"N  | 82°30'59.82"W |                |
| Morgan    | Burr Oak     | Main          | 39°32'7.30"N  | 82° 2'11.11"W | 664            |
|           |              | Lodge         | 39°31'49.79"N | 82° 2'10.59"W |                |
| Warren    | Caesar Creek | North         | 39°32'13.27"N | 83°59'8.52"W  | 2,830          |
|           |              | South         | 39°29'16.67"N | 84° 3'25.91"W |                |
| Clinton   | Cowan Lake   | Main (S)      | 39°22'54.20"N | 83°53'58.69"W | 700            |
|           |              | Camp (N)      | 39°23'23.90"N | 83°53'59.40"W |                |
| Fayette   | Deer Creek   |               | 39°37'9.62"N  | 83°13'42.78"W | 1,277          |
| Delaware  | Delaware     |               | 40°22'17.88"N | 83° 3'29.47"W | 1,330          |
| Muskingum | Dillon       | Boaters       | 40° 0'54.60"N | 82° 7'8.84"W  | 1,560          |
|           |              | Swimmers      | 40° 0'59.25"N | 82° 7'9.91"W  |                |
| Clermont  | East Fork    | Main          | 39° 1'10.38"N | 84° 8'3.23"W  | 2,610          |
|           |              | Camp          | 39° 1'20.58"N | 84° 5'39.47"W |                |
| Lorraine  | Findlay      |               | 41° 8'6.45"N  | 82°12'51.82"W | 93             |
| Meigs     | Forked Run   |               | 39° 5'39.05"N | 81°46'29.84"W | 102            |

| INLAND BEACHES |                  |                  |               |               |                |
|----------------|------------------|------------------|---------------|---------------|----------------|
| County         | State Park       | Beach            | Latitude      | Longitude     | Acres of Water |
| Auglaize       | Grn Lk St. Marys | Main East        | 40°32'30.02"N | 84°25'19.02"W | 13,500         |
|                |                  | Main West        | 40°32'33.62"N | 84°25'34.44"W |                |
|                |                  | Camp             | 40°32'42.00"N | 84°26'25.53"W |                |
| Columbiana     | Guilford Lake    | Main             | 40°48'10.70"N | 80°52'58.49"W | 396            |
|                |                  | Camp             | 40°48'20.45"N | 80°52'37.65"W |                |
| Fulton         | Harrison Lake    |                  | 41°38'23.31"N | 84°21'41.83"W | 105            |
| Preble         | Hueston Woods    |                  | 39°34'30.51"N | 84°45'20.13"W | 625            |
| Logan          | Indian Lake      | Fox Island       | 40°28'34.79"N | 83°52'54.61"W | 5,800          |
|                |                  | Camp             | 40°30'34.95"N | 83°53'46.68"W |                |
|                |                  | Oldfield         | 40°30'0.97"N  | 83°54'41.77"W |                |
| Jackson        | Jackson Lake     |                  | 38°54'6.59"N  | 82°35'39.13"W | 242            |
| Jefferson      | Jefferson Lake   |                  | 40°27'48.54"N | 80°48'0.31"W  | 17             |
| Champaign      | Kiser Lake       |                  | 40°11'4.78"N  | 83°57'5.05"W  | 396            |
| Vinton         | Lake Alma        | #1-West          | 39° 8'54.01"N | 82°30'52.50"W | 60             |
|                |                  | #2-East          | 39° 8'54.46"N | 82°30'45.62"W |                |
| Vinton         | Lake Hope        |                  | 39°19'13.88"N | 82°21'21.99"W | 120            |
| Athens         | Lake Logan       |                  | 39°32'30.25"N | 82°28'15.66"W | 400            |
| Shelby         | Lake Loramie     |                  | 40°21'39.87"N | 84°21'25.85"W | 1,655          |
| Trumbull       | Lake Milton      |                  | 41° 7'20.62"N | 80°58'45.10"W | 1,685          |
| Pike           | Lake White       |                  | 39° 5'58.49"N | 83° 1'9.89"W  | 337            |
| Madison        | Madison Lake     | (Deer Creek)     | 39°52'10.39"N | 83°22'27.45"W | 106            |
| Trumbull       | Mosquito         |                  | 41°18'10.67"N | 80°45'44.16"W | 7,850          |
| Ross           | Paint Creek      |                  | 39°14'20.80"N | 83°22'15.98"W | 1,190          |
| Pike           | Pike Lake        |                  | 39° 9'42.15"N | 83°13'11.36"W | 13             |
| Summit         | Portage Lakes    | Main             | 40°58'9.32"N  | 81°32'45.53"W | 2,034          |
|                |                  | Camp             | 40°56'19.89"N | 81°31'17.44"W |                |
| Geauga         | Punderson        |                  | 41°27'18.14"N | 81°12'33.80"W | 150            |
| Ashtabula      | Pymatuning       | Main             | 41°36'19.16"N | 80°32'10.09"W | 14,000         |
|                |                  | Camp             | 41°32'50.72"N | 80°31'35.98"W |                |
|                |                  | Cabins           | 41°34'41.98"N | 80°31'57.07"W |                |
| Highland       | Rocky Fork       | North            | 39°11'32.19"N | 83°28'35.12"W | 2,080          |
|                |                  | South            | 39°10'57.47"N | 83°28'33.99"W |                |
| Guernsey       | Salt Fork        | Main             | 40° 5'9.25"N  | 81°29'36.65"W | 2,952          |
|                |                  | Camp             | 40° 4'27.22"N | 81°29'55.52"W |                |
|                |                  | Cabins           | 40° 6'30.32"N | 81°32'12.79"W |                |
| Ross           | Scioto Trail     |                  | 39°13'48.59"N | 82°57'13.29"W | 30             |
| Scioto         | Shawnee          | Turkey Crk-Lodge | 38°44'17.62"N | 83°11'52.24"W | 68             |
|                |                  | Roosevelt-Camp   | 38°43'37.62"N | 83°10'39.45"W |                |
| Clermont       | Stonelick        |                  | 39°13'16.51"N | 84° 4'39.47"W | 200            |
| Athens         | Strouds Run      |                  | 39°20'58.37"N | 82° 2'15.31"W | 161            |
| Vinton         | Tar Hollow       | Main             | 39°23'4.35"N  | 82°45'5.23"W  | 15             |
|                |                  | Camp             | 39°23'18.34"N | 82°45'0.88"W  |                |
| Portage        | West Branch      |                  | 41° 8'16.57"N | 81° 6'13.70"W | 2,650          |
| Noble          | Wolf Run         |                  | 39°48'2.22"N  | 81°31'18.16"W | 220            |

## **Appendix H – 2020 HAB Contacts**

## Report HABs – Ohio EPA

Ohio EPA - Division of Drinking and Ground Waters  
Emerging Contaminants Section  
[HABmailbox@epa.ohio.gov](mailto:HABmailbox@epa.ohio.gov)

Ruth Briland, Ohio EPA HAB Specialist [ruth.briland@epa.ohio.gov](mailto:ruth.briland@epa.ohio.gov)  
Emilie Eskridge Ohio EPA Section Supervisor [emilie.eskridge@epa.ohio.gov](mailto:emilie.eskridge@epa.ohio.gov)  
Marissa Ganzfried, Ohio EPA HAB Compliance [marissa.ganzfried@epa.ohio.gov](mailto:marissa.ganzfried@epa.ohio.gov)  
Colin White, Section Manager [colin.white@epa.ohio.gov](mailto:colin.white@epa.ohio.gov)

50 W. Town St., Suite 700  
P.O. Box 1049  
Columbus, OH 43215  
Office (614) 644-2752  
Fax (614) 644-2909

Ohio EPA DES  
Kristen Sowards, DES Sample Coordinator  
8955 East Main Street  
Reynoldsburg, OH 43068  
Office (614) 644-4243

## Report HABs - State Park Lakes

Natalie Pirvu [natalie.pirvu@dnr.state.oh.us](mailto:natalie.pirvu@dnr.state.oh.us)  
DNR HAB Coordinator  
2045 Morse Road C-4  
Columbus OH 43229  
Office (614) 265-6466

## Report HABs – Ohio River

Greg Youngstrom [Gregy@orsanco.org](mailto:Gregy@orsanco.org)  
ORSANCO  
5735 Kellogg Ave.  
Cincinnati, OH 45228  
Office (513) 231-7719  
Fax (513) 231-7761

## Report HABs - Private Lakes

Local Health Districts  
See Managing Harmful Algal Blooms in Private Ponds Fact Sheet  
[ohioalgaefinfo.com](http://ohioalgaefinfo.com)  
Also see sampling methodology and laboratory information in this document.

## Advisory Notifications on BeachGuard

ODH  
Bureau of Environmental Health and Radiation Protection, Recreation Program  
Mary Shaffer  
Office (614) 466-1390 or (614) 466-6736  
[Mary.Shaffer@odh.ohio.gov](mailto:Mary.Shaffer@odh.ohio.gov)

Gene Phillips  
Chief, Bureau of Environmental Health and Radiation Protection  
Office (614) 466-1390  
[Gene.Phillips@odh.ohio.gov](mailto:Gene.Phillips@odh.ohio.gov)

## Health Effects of HAB Exposures and Reporting of Human and Animal Illness Reports

ODH, Bureau of Environmental Health and Radiation Protection  
Bryce Kerr (614) 728-4160  
Danielle Kohan (614) 387-5703

A listing of local health departments can be found at: <https://odh.ohio.gov/wps/portal/gov/odh/find-local-health-districts>

## **Appendix I – Ohio/U.S. Army Corps of Engineers Agreement and Points of Contact**

## Cooperation Between Ohio And The U.S. Army Corps of Engineers To Address HABS In Ohio

### Introduction

Since 2009 three agencies for the State of Ohio have worked collaboratively to develop a Statewide Response Strategy for responding to Harmful Algal Blooms (HABS) observed in recreational lakes in Ohio. The response strategy is based on relative risk assessment for recreational users. Risk is high for recreational users in calm, shallow areas where prolonged, whole-body contact with water containing HABS and the cyanotoxins they can produce is found and where a high likelihood of ingestion is present. Open water recreation is a lower risk when compared with swimming at a beach.

The Ohio response strategy focuses on swimming beaches as the areas where the risk is the greatest for a threat to human health. The strategy includes monitoring for cyanotoxins and provides a framework for decision making about health advisory communication at beaches and at other locations around an affected lake.

Ohio is committed to the continued operation under the statewide strategy. Local, municipal and other agencies are all encouraged to follow this strategy when HABS are observed in recreational waters. In support of this effort to have all agencies follow the same protocol, the State of Ohio and the U.S. Army Corps of Engineers will work cooperatively as follows:

### For USACE Projects Co-Located with ODNR

- If a bloom in the open lake is observed by USACE, that information will be communicated to the park staff and reported to the Ohio EPA
- If a HAB is observed, ODNR will sample and monitor according to the Ohio Statewide Response Strategy for HABS in Recreational Waters.
- When a cyanotoxin threshold is exceeded at a beach, the appropriate advisory will be posted only at beaches.
- White general information signs will remain posted at all major access points to the water according to the sign plan for each location.
- Any data from routine open water samples collected by USACE will be used to build the body of knowledge about HABS.

### For USACE Projects Not Co-Located with ODNR

- If a HAB is observed and the USACE or other third party co-located at the project sample and monitor, they will do so in accordance with the Ohio Statewide Response Strategy for HABS in Recreational Waters.
- Analytical results will be shared with state and local agencies in order for those agencies to determine what action, if any, is called for in accordance with the statewide strategy.
- Samples may be submitted to Ohio EPA's lab for analysis and for long term data housing.

**U.S. Army Corps of Engineers District POCs and Reservoir Park Managers  
at Projects Co-owned with ODNR**

**Louisville District POC:**

Jade Young  
[Jade.L.Young@usace.army.mil](mailto:Jade.L.Young@usace.army.mil)  
(502) 315-7439

Jennifer Thomason  
[Jennifer.C.Thomason@usace.army.mil](mailto:Jennifer.C.Thomason@usace.army.mil)  
(502) 315-3217

Zac Wolf  
[Zachary.L.Wolf@usace.army.mil](mailto:Zachary.L.Wolf@usace.army.mil)  
(502) 315-6312

**Louisville District Reservoir Park Managers:**

Area Operations Manager (Miami River Region)  
Jay Vanhoose  
[Jay.J.Vanhoose@usace.army.mil](mailto:Jay.J.Vanhoose@usace.army.mil)  
(513) 897-1050

Caesar Creek Lake  
Jim O'Boyle  
[James.F.O'Boyle@usace.army.mil](mailto:James.F.O'Boyle@usace.army.mil)  
(513) 897-1050

C.J Brown Reservoir (Buck Creek State Park)  
Matthew Palmer  
[Matthew.H.Palmer@usace.army.mil](mailto:Matthew.H.Palmer@usace.army.mil)  
(937) 325-2411

William H. Harsha Lake (East Fork Lake State Park)  
Dave Johnstone  
[David.L.Johnstone@usace.army.mil](mailto:David.L.Johnstone@usace.army.mil)  
(513) 797-6081

**Huntington District POC:**

Thad Tuggle  
[Thaddaeus.S.Tuggle@usace.army.mil](mailto:Thaddaeus.S.Tuggle@usace.army.mil)  
(304) 812-3887

**Huntington District Reservoir Park Managers:**

Alum Creek Lake  
Sylvia Chelf  
(740) 548-6151

Delaware Lake  
Greg Feustel  
(740) 363-4011

Deer Creek Lake  
Bonnie Maki

(740) 869-2243

Dillon Lake  
Will Rutter  
(740) 454-2225

Tom Jenkins Dam (Burr Oak State Park)  
Will Rutter  
(740) 454-2225

Paint Creek Lake  
T.J. Milnes  
(937) 365-1470

**Pittsburgh District POC:**

Rose Reilly  
Rosemary.J.Reilly@usace.army.mil  
(412) 395-7357

**Pittsburgh District Reservoir Park Managers:**

Mosquito Creek Lake  
Bill Spring  
(330) 637-1961

Michael J. Kirwan Lake (West Branch State Park)  
Doug Krider  
(330) 358-2622

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## Bloom Report Form

Please provide information about the potential blue-green algae bloom observed. Information can be entered into this electronic form and saved on your computer using Word or Adobe Reader (version 9+).

**Please save and email a completed copy of this form to [HABmailbox@epa.ohio.gov](mailto:HABmailbox@epa.ohio.gov).**

You are encouraged to include digital photographs as additional email attachments (close-up, and landscape showing extent and location of bloom).

If possible, consider including an image from an online mapping application such as Google, Bing or Yahoo Maps, with a marker at the bloom location. For more information go to the [ohioalgaeinfo.com](http://ohioalgaeinfo.com) website.

### Bloom Location:

Water body:

Date bloom observed: / /

County (optional):

Drinking Water Source? Yes  No  Unknown

Publicly Owned Lake? Yes  No  Unknown

Attached map with bloom location noted (e.g. Google Map image)? Yes  No

Digital photos attached? Yes  No

### Report Completed By:

Name:

Organization:

Title:

Phone: ( ) - ext.

Email:

### Bloom Description and Sampling Information:

Please describe the location of the bloom in the water body ( e.g. center of lake, at the boat dock, at the beach):

Do you notice any colors in the water column? Yes  No

Please check any colors you see, or describe the color(s) below: Green  Blue  Red  Rust  Brown  Milky White  Purple  Black

Please estimate the size (sq. feet) or the extent of bloom:

Can you see a surface scum (an accumulation at the surface) or algae floating near the water surface? Algae floating at the surface can look like grass clippings, green cottage cheese curds, or spilled paint. Yes  No  Uncertain

Is the bloom near a public beach? If yes, please specify the beach name or location below. Yes  No  Unknown

Is the bloom near a drinking water intake? (Specify water system name if known) \_\_\_\_\_ Yes  No  Unknown

Were samples taken? Yes  No

If yes, what type of samples; when and where were they collected; and where were they sent for analysis?

Do you know if other water quality information is available? (Specify what data is available and where) Yes  No

***Have fun on the water, but know that blue-green algae are in many Ohio lakes. Their toxins may be, too.***

**Be Alert! Avoid water that:**

- looks like spilled paint
- has surface scums, mats or films
- is discolored or has colored streaks
- has green globs floating below the surface



**Avoid swallowing lake water.**

***For more information, visit  
ohioalgaeinfo.com  
or call 1-866-644-6224.***



# **CAUTION**

**A POSSIBLE ALGAL BLOOM MAY BE  
AT THE BEACH**

\_\_\_\_\_ **HAS TESTED THE WATER**

**LAB RESULTS PENDING**

FOR MORE INFORMATION GO TO:  
[WWW.OHIOALGAEINFO.COM](http://WWW.OHIOALGAEINFO.COM) OR  
CALL 1-866-644-6224

# **DANGER**

**AVOID ALL CONTACT WITH WATER**

**ALGAL TOXINS HAVE BEEN FOUND  
AT UNSAFE LEVELS**

**SWIMMING AND WADING ARE NOT  
RECOMMENDED  
KEEP PETS AWAY**

**FOR MORE INFORMATION GO TO:  
[WWW.OHIOALGAEINFO.COM](http://WWW.OHIOALGAEINFO.COM)  
OR CALL 1-866-644-6224**

# **CAUTION**

**HARMFUL ALGAE TOXINS HAVE BEEN  
FOUND ALONG THE BEACH AND MAY BE  
PRESENT IN OTHER AREAS OF THE LAKE**

**AVOID WATER THAT LOOKS LIKE SPILLED PAINT, IS DISCOLORED OR  
HAS SURFACE SCUMS**

**AVOID SWALLOWING WATER AND KEEP PETS  
AWAY FROM ALGAE**

**FOR MORE INFORMATION GO TO:  
[WWW.OHIOALGAEINFO.COM](http://WWW.OHIOALGAEINFO.COM)  
OR CALL 1-866-644-6224**

# Harmful Algal Blooms

## Information for Pet Owners

### What are HABs and how are they dangerous to pets?

A harmful algal bloom (HAB) occurs when cyanobacteria begin to grow quickly in a water body, creating colorful scum or "blooms". Some algal blooms are not dangerous, but a harmful algal bloom (HAB) releases dangerous toxins into the water. These toxins can pose a threat both to animals and their owners. Since pet owners often allow their animals to drink from and swim in these water bodies, pets have an increased risk of cyanotoxin exposure.

### How do pets get exposed to HABs?

Symptoms depend on the type of toxin and exposure route: dermal, ingestion or inhalation. Pet exposure to cyanotoxins typically occurs after swimming or drinking from contaminated water. Other exposures occur when animals lick their fur after swimming or by eating the surface scum on the beach. The severity of the illness depends on the amount of water and type of algal cells ingested, the animal's body size, the amount of food in the animal's stomach, and the sensitivity of the species and individual animal.



### What can I do to reduce risk of HAB-related illness in my pet?

- Use BeachGuard to track HAB advisories in Ohio: [www.publicapps.odh.ohio.gov/beachguardpublic](http://www.publicapps.odh.ohio.gov/beachguardpublic)
- Keep people, pets, and livestock out of water with blooms.
- If your pets enter the water, be sure to rinse them off with clean, fresh, HAB-free water so they do not lick algae off their fur or skin where toxins may be present.
- Do not let your pet eat algae off the beach as toxins may be present.
- Do not water lawns or gardens with water from HAB-impacted lakes or ponds.
- Follow posted water body closures announced by state agencies or local authorities.

### What are the symptoms of HAB-related illnesses?

- |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Depression</li><li>• Incoordination or weakness</li><li>• Loss of appetite</li><li>• Excessive drooling</li><li>• Muscle twitching</li><li>• Seizure</li><li>• Respiratory failure</li></ul> | <ul style="list-style-type: none"><li>• Vomiting &amp; diarrhea</li><li>• Abdominal tenderness</li><li>• Jaundice</li><li>• Dark urine</li><li>• Rashes</li><li>• Allergic reactions</li><li>• Hives</li></ul> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



### What should I do if my pet is ill from a HAB exposure?

If your pet is ill and you suspect HAB exposure, seek immediate veterinary attention. Once your pet has been cared for, contact your local health district to report the illness using the "HAB Animal Illness Report Form" using the web address provided below.

### Contact Us

Report animal illness to your local health district and the Ohio Department of Health.

Find your LHD using the web tool: [www.odh.ohio.gov/GetMyLHD](http://www.odh.ohio.gov/GetMyLHD)

Report a HAB-related illness using the form: [www.odh.ohio.gov/HABAnimalForm](http://www.odh.ohio.gov/HABAnimalForm)

**Ohio Department of Health, Bureau of Environmental Health and Radiation Protection**

**246 N High St, Columbus, Ohio 43215**

**Phone: (614) 644-1390 Email: [BEH@odh.ohio.gov](mailto:BEH@odh.ohio.gov)**



## APPROVED TRAINING ORGANIZATIONS FOR LIFEGUARDING, CPR, AND FIRST AID

| <b>LIFEGUARD</b>                      |                                                |
|---------------------------------------|------------------------------------------------|
| <b>Organization</b>                   | <b>Training Course</b>                         |
| American Red Cross                    | Lifeguard Training                             |
| YMCA                                  | YMCA Lifeguard                                 |
| Boy Scouts of America                 | BSA, Lifeguard (three years)                   |
|                                       | Aquatic Instructor BSA (three years)           |
| Ellis and Associates                  | National Pool and Waterpark Lifeguard Training |
| Starfish Aquatics                     | Lifeguard Training                             |
| NASCO- National Safety Company        | Lifeguard Training                             |
| Lifeguard-Pro.org                     | Lifeguard Training                             |
| American Aquatics and Safety Training | Lifeguard Training                             |

| <b>CPR</b>                            |                                                |
|---------------------------------------|------------------------------------------------|
| <b>Organization</b>                   | <b>Training Course</b>                         |
| American Red Cross                    | CPR for the Professional Rescue or Successor   |
| American Heart Association            | Health Care Provider (infant, child and adult) |
| National Safety Council Course        | CPR                                            |
| EMS Safety Services                   | CPR/AED for Professional Rescuers Course       |
| American Aquatics and Safety Training | CPR/AED                                        |
| Pacific Medical Training              | BLS Recertification Course                     |

| <b>FIRST AID</b>                                                           |                                        |
|----------------------------------------------------------------------------|----------------------------------------|
| <b>Organization</b>                                                        | <b>Training Course</b>                 |
| American Red Cross                                                         | Community First Aid or Successor       |
| Ohio Department of Public Safety<br>Division of Emergency Medical Services | Emergency Medical Technician - Basic   |
| EMS Safety Services                                                        | Basic First Aid for Community Rescuers |
| American Aquatics and Safety Training                                      | First Aid                              |
| Pacific Medical Training                                                   | BLS Recertification Course             |

Revised 11/13/2020



## Laboratories Certified/Accepted to Perform Analyses on Public Drinking Water

Ohio Environmental Protection Agency  
Division of Drinking and Ground Waters

August 2021

|                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Cyanotoxin and Cyanobacteria Screening:</b> | Cyanotoxin Analysis (Total Microcystins by ELISA), Cyanobacteria Screening (Determination of Cyanobacteria and Cyanotoxin Producing Genes by qPCR)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Microbiological:</b>                        | <b>Escherichia coli (E. coli) and Total Coliform:</b> MMO-MUG, Quanti-Tray, Membrane Filtration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Pesticide - SOC:</b>                        | Aldicarb, Aldicarb Sulfone, Aldicarb Sulfoxide, Carbaryl, Carbofuran, 3-Hydroxycarbofuran, Methomyl, Oxamyl (Vydate), Dalapon, Dicamba, 2,4-D, Dinoseb, Pentachlorophenol, Picloram, 2,4,5-TP (Silvex), Alachlor, Atrazine, Butachlor, Metolachlor, Metribuzin, Propachlor, Simazine, Aldrin, Chlordane (Total), Dieldrin, Endrin, Heptachlor, Heptachlor Epoxide, Hexachlorobenzene, Hexachlorocyclopentadiene, Lindane, Methoxychlor, Toxaphene, Di(2-Ethylhexyl)Phthalate, Di(2-Ethylhexyl) Adipate, Glyphosate, Endothall, Diquat, 2,3,7,8-TCDD (Dioxin), Benzo[a]Pyrene, EDB, DBCP, 1,2,3-TCP, PCBs (as Decachlorobiphenyl), Perchlorate |
| <b>Radiochemistry:</b>                         | Gross Alpha, Gross Beta, Radium-226, Radium-228, Uranium, Tritium, Iodine-131, Radioactive Cesium, Radioactive Iodine, Radioactive Strontium 89 and 90, Gamma Emitters                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Standard Chemistry:</b>                     | Alkalinity, Bromide, Chloride, Chlorine, Chlorite, Chlorine Dioxide, Cyanide, Fluoride, Hardness, Nitrate, Nitrite, Ortho Phosphate, pH, Phosphorous, Stability, Sulfate, TDS, TOC/DOC, Turbidity, UV 254                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Trace Metals:</b>                           | <b>Primary:</b> Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Thallium<br><b>Secondary:</b> Aluminum, Calcium Iron, Magnesium, Manganese, Silicon, Silver, Sodium, Zinc                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Volatile Organic Compounds:</b>             | HAAs, Regulated VOCs, TTHM, Vinyl Chloride                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Other:</b>                                  | Asbestos, Cryptosporidium, Per/Polyfluorinated Alkyl Substances (PFAS)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

**\*Please contact lab for detailed information about the analyses offered.**

**Disclaimer:**

*This information is provided for informational purposes only and should not be construed as an endorsement of a particular laboratory. Other laboratories may hold acceptance for these parameters and may not appear here for various reasons, such as not offering commercial services or pending applications. If you have questions about the acceptance status of a particular laboratory, please contact the Ohio EPA Laboratory Certification staff at [DWLabCert@epa.ohio.gov](mailto:DWLabCert@epa.ohio.gov) or (614) 644-4245.*

Laboratories Certified/Accepted to Perform Analyses on Public Drinking Water

| Laboratory                                                                                                | HABs          | Microbiological        | Chemistry                                                                           | Other           |
|-----------------------------------------------------------------------------------------------------------|---------------|------------------------|-------------------------------------------------------------------------------------|-----------------|
| Adams Water Lab, Inc.<br>912 East Tallmadge Avenue, Akron, OH 44310<br>(330) 633-3991                     |               | MMO-MUG<br>Quanti-Tray | Standard Chemistry<br>Trace Metals                                                  |                 |
| Advanced Analytics Laboratory<br>1025 Concord Avenue, Columbus, OH 43212<br>(614) 299-9922                |               |                        | Volatile Organic Compounds                                                          |                 |
| Alloway Lima Laboratory<br>1101 North Cole Street, Lima, OH 45805<br>(419) 223-1362 or (800) 436-1243     |               | MMO-MUG<br>Quanti-Tray |                                                                                     |                 |
| Alloway Marion Laboratory<br>1776 Marion-Waldo Road, Marion, OH 43302<br>(740) 389-5991 or (800) 873-2835 | ELISA<br>qPCR | MMO-MUG<br>Quanti-Tray | Standard Chemistry<br>Trace Metals<br>Volatile Organic Compounds<br>Pesticide - SOC |                 |
| Alpha Analytical, Inc. – Mansfield<br>320 Forbes Boulevard<br>Mansfield, MA 02048                         |               |                        |                                                                                     | PFAS            |
| ALS Environmental – Holland<br>3352 128 <sup>th</sup> Avenue, Holland, MI 49424<br>(616) 399-6070         |               |                        |                                                                                     | PFAS            |
| ALS Environmental - Kelso<br>1317 South 13 <sup>th</sup> Avenue, Kelso, WA 98626<br>(800) 695-7222        |               |                        |                                                                                     | PFAS            |
| ALS Laboratory Group<br>4388 Glendale-Milford Road, Cincinnati, OH 45242<br>(513) 733-5336                |               |                        | Trace Metals                                                                        | Asbestos        |
| American Analytical Laboratories, Inc.<br>840 South Main Street, Akron, OH 44311<br>(330) 535-1300        |               | MMO-MUG                | Standard Chemistry<br>Trace Metals                                                  |                 |
| Analytical Services, Inc.<br>130 Allen Brook Lane, Williston, VT 05495<br>(800) 723-4432                  |               | Quanti-Tray            |                                                                                     | Cryptosporidium |
| Aqua Pennsylvania, Inc. – Bryn Mawr<br>762 W. Lancaster Avenue<br>Bryn Mawr, PA 19010                     |               |                        | Standard Chemistry<br>Trace Metals<br>Volatile Organic Compounds                    |                 |
| Archbold Water Plant Laboratory<br>700 North Street, Archbold, OH 43502<br>(419) 445-2506                 | ELISA         |                        |                                                                                     |                 |

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| Laboratory                                                                                                             | HABs  | Microbiological        | Chemistry                                                                           | Other |
|------------------------------------------------------------------------------------------------------------------------|-------|------------------------|-------------------------------------------------------------------------------------|-------|
| Benchmark Environmental Labs, Inc.<br>4319 Indianola Avenue, Columbus, OH 43214<br>(614) 267-4588                      |       | MMO-MUG                |                                                                                     |       |
| Biosolutions, LLC<br>10180 Queens Way, Suite 6, Chagrin Falls, OH 44023<br>(440) 708-2999                              |       | MMO-MUG                | Standard Chemistry<br>Trace Metals                                                  |       |
| BoJhun Environmental Services<br>222 S. Main Street, Fostoria, OH 44830<br>(419) 436-7066                              |       | MMO-MUG<br>Quanti-Tray |                                                                                     |       |
| Brookside Laboratories, Inc.<br>200 White Mountain Drive, New Bremen, OH 45869<br>(419) 977-2766                       |       | MMO-MUG<br>Quanti-Tray | Standard Chemistry<br>Trace Metals<br>Volatile Organic Compounds<br>Pesticide - SOC |       |
| Bryan Water Plant Laboratory<br>841 East Edgerton Street, Bryan, OH 43506<br>(419) 633-6160                            |       | MMO-MUG<br>Quanti-Tray |                                                                                     |       |
| Canton City Health Department<br>420 North Market Avenue, Canton, OH 44702<br>(330) 489-3231                           |       | MMO-MUG<br>Quanti-Tray |                                                                                     |       |
| Canton Water Laboratory<br>2664 Harrisburg Road NE, Canton, OH 44705<br>(330) 489-3035                                 |       | MMO-MUG                | Standard Chemistry                                                                  |       |
| Cardinal Environmental Lab, LLC<br>2870 Salt Springs Road, Youngstown, OH 44509<br>(330) 797-8844 or (800) 523-0347    |       | MMO-MUG<br>Quanti-Tray | Standard Chemistry<br>Trace Metals<br>Volatile Organic Compounds                    |       |
| Celina Water Department Laboratory<br>714 South Sugar Street, Celina, OH 45822<br>(419) 586-2270                       | ELISA | MMO-MUG<br>Quanti-Tray |                                                                                     |       |
| CETEC Cleveland Environmental Technology, Inc.<br>5000 Euclid Avenue, Suite 311, Cleveland, OH 44103<br>(216) 361-0517 |       | MMO-MUG<br>Quanti-Tray |                                                                                     |       |
| Cincinnati Miller WTP Laboratory<br>5651 Kellogg Avenue, Cincinnati, OH 45230<br>(513) 624-5600                        |       | MMO-MUG<br>Quanti-Tray |                                                                                     |       |
| Cleveland Water Compliance Laboratory<br>1245 West 45 <sup>th</sup> Street, Cleveland, OH 44102<br>(216) 664-3171      | ELISA | MMO-MUG                |                                                                                     |       |

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| Laboratory                                                                                                         | HABs  | Microbiological                               | Chemistry                                                        | Other                   |
|--------------------------------------------------------------------------------------------------------------------|-------|-----------------------------------------------|------------------------------------------------------------------|-------------------------|
| Con-Test, A Pace Analytical Laboratory<br>39 Spruce Street, East Longmeadow, MA 01028<br>(413) 525-2332            |       |                                               |                                                                  | PFAS                    |
| Coshocton Environmental Testing, LLC<br>709 Main Street, Coshocton, OH 43812<br>(740) 622-3328 or (800) 870-6570   |       | MMO-MUG<br>Quanti-Tray                        | Standard Chemistry<br>Trace Metals<br>Volatile Organic Compounds |                         |
| CWM Environmental, Inc.<br>4450 Johnston Parkway, Suite B, Cleveland, OH 44128<br>(216) 663-0808                   |       | MMO-MUG                                       | Standard Chemistry<br>Trace Metals<br>Volatile Organic Compounds |                         |
| Dayton Central Water Quality Laboratory<br>3210 Chuck Wagner Lane, Dayton, OH 45414<br>(937) 333-6093              |       | MMO-MUG<br>Quanti-Tray<br>Membrane Filtration | Standard Chemistry<br>Trace Metals<br>Volatile Organic Compounds |                         |
| Eastern Lab Services, Ltd.<br>1035 Medina Road, Suite 500, Medina, OH 44254<br>(330) 670-7920 or (877) 357-5227    |       | MMO-MUG<br>Quanti-Tray                        |                                                                  |                         |
| Elyria Water Works Laboratory<br>3628 West Erie Avenue, Lorain, OH 44053<br>(440) 244-4310                         | ELISA |                                               |                                                                  |                         |
| EMSL Analytical, Inc.<br>200 Route 130 North, Cinnaminson, NJ 08077<br>(800) 220-3675                              |       |                                               |                                                                  | Cryptosporidium         |
| Enthalpy Analytical, LLC<br>2714 Exchange Drive, Wilmington, NC 28405<br>(910) 212-5856                            |       |                                               |                                                                  | PFAS                    |
| EnviroScience<br>5070 Stow Road, Stow, OH 44224<br>(330) 688-0111                                                  | ELISA |                                               |                                                                  |                         |
| Erie County Health Department Laboratory<br>420 Superior Street, Sandusky, OH 44870<br>(419) 626-5623              | ELISA | MMO-MUG<br>Quanti-Tray                        |                                                                  |                         |
| Eurofins CEI, Inc.<br>730 SE Maynard Road, Cary, NC 27511<br>(919) 481-1413                                        |       |                                               |                                                                  | Asbestos                |
| Eurofins Eaton Analytical, LLC<br>110 South Hill Street, South Bend, IN 46617<br>(800) 332-4345 or (574) 472-5523  |       | Quanti-Tray                                   | Radiochemistry                                                   | Cryptosporidium<br>PFAS |
| Eurofins Eaton Analytical, LLC – Monrovia<br>750 Royal Oaks Drive, Suite 100, Monrovia, CA 91016<br>(626) 386-1100 |       |                                               |                                                                  | PFAS                    |

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| Laboratory                                                                                                        | HABs  | Microbiological        | Chemistry                                                        | Other    |
|-------------------------------------------------------------------------------------------------------------------|-------|------------------------|------------------------------------------------------------------|----------|
| Eurofins TestAmerica Sacramento<br>880 Riverside Parkway, Sacramento, CA 95605<br>(916) 374-4308                  |       |                        |                                                                  | PFAS     |
| Geauga County Department of Water Resources<br>470 Center Street, Building 3, Chardon, OH 44024<br>(440) 285-2603 |       | MMO-MUG<br>Quanti-Tray | Standard Chemistry                                               |          |
| Greene County Sanitary Engineering Laboratory<br>422 Factory Road, Beavercreek, OH 45434-6214<br>(937) 562-7450   |       | MMO-MUG                | Standard Chemistry                                               |          |
| Holmes Laboratory, Inc.<br>3559 U.S. Highway 62, Millersburg, OH 44654<br>(330) 893-2933                          |       | MMO-MUG<br>Quanti-Tray |                                                                  |          |
| Industrial Fluid Management, Inc.<br>2926 U.S. Highway 6, McClure, OH 43534<br>(419) 748-7438                     |       | MMO-MUG                |                                                                  |          |
| International Asbestos Testing Lab<br>9000 Commerce Parkway, Suite B, Mt. Laurel, NJ 08054<br>(856) 231-9449      |       |                        |                                                                  | Asbestos |
| Jackson County Water Company Laboratory<br>124 West Huron Street, Jackson, OH 45640<br>(740) 288-4815             |       | MMO-MUG                |                                                                  |          |
| Jones & Henry Laboratories<br>2567 Tracy Road, Northwood, OH 43619<br>(419) 666-0411                              |       |                        | Standard Chemistry<br>Trace Metals<br>Volatile Organic Compounds |          |
| Lake County West Subdistrict Laboratory<br>38265 Aquarius Parkway, Willoughby, OH 44094<br>(440) 918-3420         | ELISA |                        |                                                                  |          |
| Leetonia WTP Laboratory<br>1 Saint Peter's Street, Leetonia, OH 44431<br>(330) 427-8087                           |       | MMO-MUG<br>Quanti-Tray |                                                                  |          |
| Logan County Health District Laboratory<br>310 South Main Street, Bellefontaine, OH 43311<br>(937) 592-9040       |       | MMO-MUG<br>Quanti-Tray |                                                                  |          |
| Mahoning County Board of Health<br>50 Westchester Drive, Youngstown, OH 44515<br>(330) 270-2855                   |       | MMO-MUG<br>Quanti-Tray | Standard Chemistry<br>Trace Metals                               |          |

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| Laboratory                                                                                                                       | HABs          | Microbiological                               | Chemistry                                                                           | Other           |
|----------------------------------------------------------------------------------------------------------------------------------|---------------|-----------------------------------------------|-------------------------------------------------------------------------------------|-----------------|
| MASI Laboratory<br>7940 Memorial Drive, Plain City, OH 43064<br>(614) 873-4654                                                   | ELISA<br>qPCR | MMO-MUG<br>Quanti-Tray<br>Membrane Filtration | Standard Chemistry<br>Trace Metals<br>Volatile Organic Compounds<br>Pesticide - SOC |                 |
| Microbac Laboratories, Inc. – Marietta Division<br>158 Starlight Drive<br>Marietta, OH 45750<br>(740) 373-4071                   |               |                                               | Lead & Copper                                                                       | PFAS            |
| Montgomery County Environmental<br>4257 Dryden Road, Dayton, OH 45439<br>(937) 781-3016                                          |               | MMO-MUG<br>Quanti-Tray                        | Standard Chemistry<br>Trace Metals                                                  |                 |
| NEORSD Analytical Services<br>4747 East 49th Street, Cuyahoga Heights, OH 44125<br>(216) 641-6000                                | ELISA<br>qPCR | MMO-MUG<br>Quanti-Tray                        | Standard Chemistry<br>Trace Metals                                                  |                 |
| Ohio Department of Agriculture Consumer Protection Laboratory<br>8995 East Main Street, Reynoldsburg, OH 43068<br>(614) 728-6230 |               | MMO-MUG                                       |                                                                                     |                 |
| Pace Analytical Services, LLC - Dayton<br>25 Holiday Drive, Englewood, OH 45322<br>(800) 723-5227                                |               | MMO-MUG<br>Quanti-Tray                        | Standard Chemistry<br>Trace Metals<br>Volatile Organic Compounds<br>Pesticide - SOC |                 |
| Pace Analytical Service, LLC – Gulf Coast<br>7979 Innovation Park Drive<br>Baton Rouge, LA 70769-7402<br>(225) 769-4900          |               |                                               |                                                                                     | PFAS            |
| Pace Analytical Services, LLC - Madisonville<br>825 Industrial Road, Madisonville, KY 42431<br>(270) 821-7375                    |               |                                               |                                                                                     | Cryptosporidium |
| Pace Analytical Services, LLC – Minneapolis<br>1700 Elm Street SE, Suite 200, Minneapolis, MN 55414<br>(612) 607-6352            |               |                                               | Pesticide - SOC                                                                     |                 |
| Pace Analytical Services, LLC – Ormond Beach<br>8 East Tower Circle, Ormond Beach, FL 32174<br>(386) 672-5668                    |               |                                               |                                                                                     | PFAS            |
| Pace Analytical Services, LLC - Pittsburgh<br>1638 Roseytown Road, Suites 2,3 and 4, Greensburg, PA 15601<br>(724) 850-5600      |               |                                               | Radiochemistry                                                                      |                 |

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| Laboratory                                                                                                          | HABs  | Microbiological        | Chemistry                                                                                             | Other           |
|---------------------------------------------------------------------------------------------------------------------|-------|------------------------|-------------------------------------------------------------------------------------------------------|-----------------|
| Pace Analytical Services, LLC – West Columbia<br>106 Vantage Point Drive, West Columbia, SC 29172<br>(803) 227-2702 |       |                        |                                                                                                       | PFAS            |
| Perry Environmental Laboratory<br>552 West Broadway Street, New Lexington, OH 43764<br>(740) 343-7078               |       | MMO-MUG<br>Quanti-Tray |                                                                                                       |                 |
| Q Laboratories<br>1911 Radcliff Drive, Cincinnati, OH 45204<br>(513) 471-1300                                       |       | MMO-MUG                |                                                                                                       |                 |
| Ream & Haager Laboratories, Inc.<br>179 West Broadway Street, Dover, OH 44622<br>(330) 343-3711                     |       | MMO-MUG<br>Quanti-Tray | Standard Chemistry<br>Trace Metals<br>Volatile Organic Compounds                                      |                 |
| Scientific Methods, Inc.<br>12441 Beckley Street, Granger, IN 46530<br>(574) 277-4078                               |       | Quanti-Tray            |                                                                                                       | Cryptosporidium |
| SGS North America Inc. - Orlando<br>4405 Vineland Road, Suite C-15, Orlando, FL 32811<br>(407) 425-6700             |       |                        |                                                                                                       | PFAS            |
| SGS North America Inc. – Wilmington<br>5500 Business Drive, Wilmington, NC 28405<br>(910) 350-1903                  |       |                        |                                                                                                       | PFAS            |
| Summit Environmental Technologies, Inc.<br>3310 Win Street, Cuyahoga Falls, OH 44223<br>(330) 253-8211              |       |                        | Standard Chemistry<br>Trace Metals<br>Volatile Organic Compounds<br>Pesticide – SOC<br>Radiochemistry |                 |
| Superior Laboratories<br>1075 Amity Road, Galloway, OH 43119<br>(614) 870-6826                                      |       | MMO-MUG<br>Quanti-Tray |                                                                                                       |                 |
| The Ohio State University Stone Laboratory<br>878 Bayview Drive, Put-in-Bay, OH 43456<br>(419) 285-1845             | ELISA |                        |                                                                                                       |                 |
| Twin City Water Plant Laboratory<br>4194 Indian Hill Road, Uhrichsville, OH 44683<br>(740) 922-2082                 |       | MMO-MUG                |                                                                                                       |                 |
| Vista Analytical Laboratory<br>1104 Windfield Way<br>El Dorado Hills, CA 95762<br>(916) 673-1520                    |       |                        |                                                                                                       | PFAS            |

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| Laboratory                                                                              | HABs  | Microbiological | Chemistry | Other |
|-----------------------------------------------------------------------------------------|-------|-----------------|-----------|-------|
| Willard Water Plant Laboratory<br>540 Central Ave., Willard, OH 44890<br>(419) 933-4001 | ELISA |                 |           |       |

## Appendix A – Bathing Beach Inspection Form

### Bathing Beach Inspection Checklist

|                                                                                                                                                                                                                                                                                                                                                                                               | (✓)<br>Y | (✓)<br>N | (✓)<br>N/A | (✓)<br>N/O |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|------------|------------|
| <ul style="list-style-type: none"> <li>Bathing beach has a current permit.</li> </ul>                                                                                                                                                                                                                                                                                                         |          |          |            |            |
| <b>Health and Safety in Swimming Areas</b>                                                                                                                                                                                                                                                                                                                                                    |          |          |            |            |
| <ul style="list-style-type: none"> <li>Swimming areas are clearly marked with conspicuous buoys or poles spaced not more than one hundred (100) feet apart and separated from no-diving areas by the use of a lifeline placed at the four foot mark.</li> </ul>                                                                                                                               |          |          |            |            |
| <ul style="list-style-type: none"> <li>Bottoms shall be free from holes, steep slopes and sharp objects, and in parts less than five-feet deep shall have a bottom of sand, gravel, stone or other acceptable material to eliminate any unusually turbid (muddy) condition of the bathing water under normal use conditions.</li> </ul>                                                       |          |          |            |            |
| <ul style="list-style-type: none"> <li>Water depths in diving areas shall conform to standards outlined in Chapter 3701-31 of the Ohio Administrative Code. (See Diving Requirements)</li> </ul>                                                                                                                                                                                              |          |          |            |            |
| <ul style="list-style-type: none"> <li>The minimum safety equipment at each lifeguard station shall include one ring buoy at least eighteen (18) inches in diameter, attached to at least forty feet (40) of rope, and one rescue tube or rescue buoy. This equipment shall be available at all occupied lifeguard stations.</li> </ul>                                                       |          |          |            |            |
| <ul style="list-style-type: none"> <li>All swimming areas shall have a fully equipped backboard with a proper fitting extrication collar, sand bags (or equivalent), blanket and ties, or straps, available at all times.</li> </ul>                                                                                                                                                          |          |          |            |            |
| <ul style="list-style-type: none"> <li>All bathing areas shall maintain fully stocked first-aid kit containing, as a minimum, the contents of a twenty-four (24) unit kit as recommended by the American Red Cross, or equivalent, as approved by the Board of Health.</li> </ul>                                                                                                             |          |          |            |            |
| <ul style="list-style-type: none"> <li>All equipment and appurtenances shall be maintained in good repair at all times.</li> </ul>                                                                                                                                                                                                                                                            |          |          |            |            |
| <ul style="list-style-type: none"> <li>Health and safety rules shall be established by the operator of a bathing area, and these rules shall be posted conspicuously along the bathing area shoreline.</li> </ul>                                                                                                                                                                             |          |          |            |            |
| <ul style="list-style-type: none"> <li>A telephone, with a posted list of emergency numbers, shall be readily available at all bathing places.</li> </ul>                                                                                                                                                                                                                                     |          |          |            |            |
| <ul style="list-style-type: none"> <li>Night swimming shall only be permitted where adequate artificial lighting is available.</li> </ul>                                                                                                                                                                                                                                                     |          |          |            |            |
| <ul style="list-style-type: none"> <li>Any person suspected of having an infectious or communicable disease shall not be permitted to use the swimming area. Any person who has been refused entry to a swimming area under this section may be granted such entry upon presentation of a written statement from a physician that the condition is not infectious or communicable.</li> </ul> |          |          |            |            |

| <b>Health and Safety in Beach Areas</b>                                                                                                                                                                                                                                                                  |  |  |  |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|
| • The beach area shall be kept free of litter, dead fish, broken glass, sharp objects or any other hazardous materials.                                                                                                                                                                                  |  |  |  |  |
| • Refuse containers shall be provided in sufficient numbers to assure that litter or hazardous materials do not accumulate on the beach area.                                                                                                                                                            |  |  |  |  |
| <b>Health and Safety in Bathhouse Areas</b>                                                                                                                                                                                                                                                              |  |  |  |  |
| • Bathhouses, where provided, shall be constructed in accordance with all applicable state and local building codes and shall contain the required number of fixtures (showers, sinks, toilets, urinals, drinking fountains, etc.).                                                                      |  |  |  |  |
| • Bathhouses and their appurtenances shall be maintained in good repair and shall be kept thoroughly clean and free from any accumulation of filth, garbage, rubbish or other waste.                                                                                                                     |  |  |  |  |
| • Disposal of sewage and liquid wastes shall be in a public sanitary sewerage system or by another method approved by the Ohio Environmental Protection Agency.                                                                                                                                          |  |  |  |  |
| • All sewage and liquid waste collection systems shall be maintained in a safe and sanitary manner so as not to create a health hazard or nuisance.                                                                                                                                                      |  |  |  |  |
| • All water supply systems shall meet the standards of the Ohio Environmental Protection Agency (OEPA). If well water is used, a copy of the current License to Operate (LTO) from OEPA must be submitted with the application, otherwise provide a recent water bill (account numbers may be redacted). |  |  |  |  |
| • All drinking water supplies shall be of adequate quantity and potable quality and the water supply system and equipment shall be maintained in a safe and sanitary manner so as to not create a health hazard.                                                                                         |  |  |  |  |
| <b>Lifeguard Qualifications</b>                                                                                                                                                                                                                                                                          |  |  |  |  |
| • Must be sixteen (16) years of age or older                                                                                                                                                                                                                                                             |  |  |  |  |
| • Must be physically and mentally capable of performing the duties of a lifeguard                                                                                                                                                                                                                        |  |  |  |  |
| • Must be trained in first-aid and artificial respiration                                                                                                                                                                                                                                                |  |  |  |  |
| • Must have completed a water safety and rescue course such as offered by the American Red Cross                                                                                                                                                                                                         |  |  |  |  |
| <b>Lifeguard Requirements at Bathing Areas</b>                                                                                                                                                                                                                                                           |  |  |  |  |
| • One or more qualified lifeguards for each three hundred (300) linear feet of occupied bathing area shoreline shall be on duty at all times during open hours.                                                                                                                                          |  |  |  |  |
| • A lifeguard shall be considered on duty when he or she is occupying an elevated lifeguard chair situated so as to provide the lifeguard with a                                                                                                                                                         |  |  |  |  |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|
| clear, unobstructed field of vision of his or her respective territory observation.                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |
| <ul style="list-style-type: none"> <li>All water surface areas being used by bathers shall be within the field of vision of a qualified, on-duty, lifeguard.</li> </ul>                                                                                                                                                                                                                                                                                                                                                 |  |  |  |  |
| <ul style="list-style-type: none"> <li>Where there are one or more lifeguards on duty occupying an elevated lifeguard chair, a walking guard on the shore may also be considered on-duty if he or she is maintaining surveillance for any particular area</li> </ul>                                                                                                                                                                                                                                                    |  |  |  |  |
| <ul style="list-style-type: none"> <li>Where diving or sliding in deep water is permitted, a separate, qualified lifeguard shall be on duty and situated so that he or she has a clear, unobstructed field of vision of the diving and/or sliding area.</li> </ul>                                                                                                                                                                                                                                                      |  |  |  |  |
| <ul style="list-style-type: none"> <li>When deep water swimming, outside of diving areas and removed from shore lines and elevated lifeguard stations, is permitted, at least one rescue boat, or rescue board, shall be provided and manned with a qualified lifeguard.</li> </ul>                                                                                                                                                                                                                                     |  |  |  |  |
| <b>Water Quality (Bacteriological Standards)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |
| <ul style="list-style-type: none"> <li>Periodic sampling of bathing beach waters at bathing areas within the Health District may be required, to determine the bacteriological quality of the water.</li> </ul>                                                                                                                                                                                                                                                                                                         |  |  |  |  |
| <ul style="list-style-type: none"> <li>The acceptability of bathing beach waters shall be based on the following bacteriological criteria: the fecal coliform count (either MPN or MF count) shall not exceed 200 per 100 milliliters as a monthly geometric mean based on not less than five samples per month, nor shall it exceed 400 per 100 milliliters in more than ten percent of all samples taken during the month.</li> </ul>                                                                                 |  |  |  |  |
| <b>Records</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |  |  |
| <ul style="list-style-type: none"> <li>Personnel file of each qualified lifeguard including: <ul style="list-style-type: none"> <li>Record of physical examination (if so required);</li> <li>Record of pre-employment skill test (if so required);</li> <li>Record of in-service training (if so required); and</li> <li>Record of American Red Cross or equivalent water safety, life-saving, first-aid, CPR, rescue, etc., courses and certificates of successful completion of said courses.</li> </ul> </li> </ul> |  |  |  |  |
| <ul style="list-style-type: none"> <li>Each bathing area shall maintain at all times a complete record of all accidents, inquiries or rescues and of all cases where first-aid treatment was provided by a qualified lifeguard. These records shall be available to Summit County Health Department personnel and appropriate local law enforcement authorities upon request.</li> </ul>                                                                                                                                |  |  |  |  |



## Ohio EPA Bloom Report Form

- Shall be completed and submitted if you see surface scum or something that looks like blue-green algae.

The image shows a thumbnail of the Ohio EPA Bloom Report Form. It is a structured form with several sections:
 

- Header:** "Bloom Report Form" with a brief description of its purpose.
- Reporting Information:** Fields for Name, Date, Location, and Time.
- Observation Details:** Fields for Description, Color, and other characteristics.
- Reporting Agency:** A dropdown menu to select the reporting agency.
- Reporting Officer:** Fields for Name and Title.
- Remarks:** A large text area for additional notes.
- Footer:** Contact information for the Ohio Department of Public Safety, Bureau of Environmental Services.

## Beach Regulations

- Health and safety rules shall be established by the operator of a bathing area, and these rules shall be posted conspicuously along the bathing area shoreline.
- Example signage of rules that shall be posted at bathing beaches.

The image shows a "NOTICE BEACH REGULATIONS" sign. It features a blue header with the text "NOTICE BEACH REGULATIONS" in white. Below the header is a list of regulations:
 

- The beach water is not suitable for drinking, except overlying beach areas.
- Admission to the beach may be refused to all persons having any contagious illness, infectious conditions such as scabies, heavy ringworm, foot infections, skin lesions, conjunctivitis, boils, chertosis, warts, inflamed eyes, ear discharges, or any other condition which has the appearance of being infectious. Persons with visible sores, cuts, abrasions, insect bites, and band-aids, must be accompanied by a responsible person 18 years of age or older unless a physician's certificate is presented. A person under the influence of alcohol or other intoxicating beverages shall not be permitted in the beach area.
- Littering is prohibited. No smoking, no food, drink, gum or tobacco is allowed in the water. Glass containers are prohibited throughout the beach area.
- All children who are not toilet trained should wear tight fitting rubber or plastic pants. No one should swim alone.
- Persons under the age of 6 should be accompanied by a responsible person 18 years of age or older unless a physician's certificate is presented.
- Personal conduct within the beach area shall be such that safety is not jeopardized.
- Swimming in shallow water is not permitted.
- Caution shall be exercised in the use of diving facilities.
- Swimming is prohibited after sunset or before sunrise, or when lightning is present, including a 30-minute period after the last lightning's occurrence.
- No pets are permitted in the beach area.
- Feeding of wildlife or other animals that encourage their presence is prohibited.
- Patrons are encouraged to protect themselves from sun exposure.

 At the bottom of the sign, there is contact information for the Franklin County Public Health Department:
 

Franklin County Public Health | 1001 West Main Street, Salem, OH 44483 | Phone 330-526-5800  
 Fax 330-526-6434 | TDD/Fax 330-526-6000 | www.ohio.gov

# NOTICE



# BEACH REGULATIONS

- The beach water is not suitable for drinking. Avoid swallowing beach water.
- Admission to the beach may be refused to all persons having any contagious disease, infectious conditions such as colds, fever, ringworm, foot infections, skin lesions, carbuncles, boils, diarrhea, vomiting, inflamed eyes, ear discharges, or any other condition which has the appearance of being infectious. Persons with excessive sunburn, abrasions which have not healed, corn plasters, bunion pads, adhesive tape, rubber bandages, or other bandages of any kind may also be refused admittance. A person under the influence of alcohol or exhibiting erratic behavior shall not be permitted in the beach area.
- Littering is prohibited. In addition, no food, drink, gum or tobacco is allowed in the water. Glass containers are prohibited throughout the beach area.
- All children who are not toilet-trained should wear tight fitting rubber or plastic pants.
- No one should swim alone.
- Persons under the age of 16 should be accompanied by a responsible person 16 years of age or older unless a lifeguard is present.
- Personal conduct within the beach must be such that safety is not jeopardized.
- Diving in shallow water is not permitted.
- Caution shall be exercised in the use of diving facilities.
- Swimming is prohibited after sunset or before sunrise, or when lightning is present, including a 30- minute period after the last lightning is observed.
- No pets are permitted in the beach area.
- Feeding of wildlife or other actions that encourage their presence is prohibited.
- Patrons are encouraged to protect themselves from sun exposure.

Summit County Public Health | 1867 West Market Street, Akron, OH 44313 | Phone 330-926-5600

Fax 330-926-6436 | Toll-Free 1-877-687-0002 | [www.scphoh.org](http://www.scphoh.org)



# **ATTENTION BEACH PATRONS !**

**A WATER QUALITY ADVISORY HAS BEEN ISSUED FOR THIS BEACH BECAUSE BACTERIA LEVELS CURRENTLY EXCEED STATE STANDARDS**

***Summit County Public Health asks that the following individuals refrain from swimming:***

- ***Children,***
- ***Elderly,***
- ***Anyone who is ill***
- ***Anyone who has a weakened immune system***

Beach water can become polluted from many sources including, but not limited to, sanitary sewer, storm sewer, and combined sewer overflows; urban, rural, and agricultural runoff; malfunctioning septic tanks and aeration systems; industrial wastes, boating wastes, human and animal wastes.

The most common illness associated with swimming in, and ingesting polluted water is gastroenteritis. Typical symptoms include nausea, vomiting, abdominal cramps, fever, headache, and diarrhea. Other illnesses associated with swimming in such waters include shigellosis, cryptosporidiosis, and Giardiasis, as well as eye, ear, nose, and throat infections.

Do not swim if you are sick or if you have a weakened immune system. Do not swim near storm drains or other visible discharge pipes. Do not swallow the water – try to keep your face and head out of the water. Always shower after swimming. After a heavy rainfall, wait 24 hours before going swimming.



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