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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

July 15, 2022

RE: ALERT: Public Interactive Water Features Connected to Public Water Supplies

Dear Water System Official:

The Texas Commission on Environmental Quality (TCEQ) is providing important updates to a letter sent to public water systems (PWSs) in October 2021 on how to minimize the risk of *Naegleria fowleri* (*N. fowleri*) exposure (commonly referred to as brain-eating amoeba) for a public water supply. As was stated in the October 2021 letter, there were two instances of *N. fowleri* exposure in Texas in 2020 and 2021 that resulted in the deaths of two children after the children visited public interactive water features or “splash pads.” The Texas Department of State Health Services (DSHS) regulates splash pads and TCEQ regulates public water systems that supply water to these features. Both agencies have rules concerning the minimum necessary backflow prevention devices on the supply lines into these types of water features. The U.S. Centers for Disease Control and Prevention (CDC) and DSHS have issued new guidance for the prevention of *N. fowleri* exposure in water playgrounds and decorative fountains, which is available at this website:

<https://dshs.texas.gov/poolspa/default.aspx>

The enclosed recommendations include updated information about the potential for false positive tests for chlorine residuals when systems use both free chlorine disinfection as well as some form of cyanuric acid (commonly “dichlor” and “trichlor”).

***Naegleria fowleri* Infection**

According to the CDC, most *N. fowleri* infections are associated with swimming in warm freshwater lakes and rivers. The *N. fowleri* amoeba enters the nasal cavity and travels to the brain and causes a severe brain infection called primary amoebic meningoencephalitis (PAM) which is usually fatal. You cannot get infected from swallowing water contaminated with the *N. fowleri* amoeba because it is killed by normal levels of stomach acid. Since visitors to splash pads may get water in their nasal cavities and under certain conditions a splash pad may support the growth of the amoeba, the risk of infection will exist.

Minimizing the Risks of Infection from a Splash Pad or Public Water Supply

Disinfection

The *N. fowleri* amoeba can only grow in water where little or no disinfectant (like free chlorine or chloramine) is present. Ensuring that your system maintains an adequate disinfectant residual throughout the drinking water distribution system and in the plumbing of premises is the most effective way to prevent the growth of the amoeba. Texas public water systems are required to maintain a minimum free chlorine residual of 0.2 mg/L or a minimum chloramine residual of 0.5 mg/L (measured as total chlorine) throughout their distribution systems. Systems that

maintain a chloramine residual in their distribution systems should be diligent in monitoring for potential nitrification. During nitrification events, chloramine residuals may not be adequate to be able to provide protection against pathogens like *N. fowleri*.

Cross-Contamination Events

Public water systems must take precautions to prevent a contamination hazard such as the *N. fowleri* amoeba from backflowing into the potable water distribution system. Splash pads are required to have a backflow prevention assembly or an air gap to protect the public water system. Should a backflow event occur with *N. fowleri* contaminated water entering a distribution system, continuous maintenance of an adequate disinfectant residual throughout the distribution system is crucial to inactivate or "kill" the amoeba.

The TCEQ has enclosed recommended actions that will minimize *N. fowleri* exposure and protect public water supplies that have a splash pad connected to the distribution system.

If you have questions or need additional information, please contact David Simons, P.E., of the Emergency Preparedness and Response Section by email at david.simons@tceq.texas.gov or by phone at 512-239-3154.

Sincerely,



Cari-Michel La Caille, Deputy Director
Water Supply Division
Texas Commission on Environmental Quality

Enclosure: TCEQ Recommendations for Public Water Systems with Public Interactive Water Features

To minimize the risk of *Naegleria fowleri* (*N. fowleri*) amoeba exposure, the TCEQ recommends that public water systems that have splash pads connected within their distribution systems perform the following actions:

- **Public Water Systems that only supply potable water to splash pads (do not own or operate a splash pad):**
 - Evaluate the backflow prevention devices at the connection to the splash pad.
 - Repair or replace reduced-pressure-principle backflow preventer assemblies (RPBAs) that fail a test by a licensed backflow prevention assembly tester.
 - If no backflow prevention assembly is installed, install a required health hazard device (RPBA or air gap).
 - Replace inappropriate backflow prevention devices (for example, double check valve backflow prevention assemblies and atmospheric vacuum breakers) with a required health hazard device (RPBA or air gap).
 - Test RPBAs upon installation and at least annually. [From TCEQ rules in 30 Texas Administrative Code (TAC) §290.44(h)(4)].
 - Share this letter with the owners and operators of any splash pads connected to your system to inform them of the risks from *N. fowleri*.
- **Public Water Systems that own or operate a splash pad (and other owners and operators of splash pads):**
 - Evaluate the backflow prevention devices at the connection to the splash pad.
 - Repair or replace RPBAs that fail a test by a licensed backflow prevention assembly tester.
 - If no backflow prevention assembly is installed, install a required health hazard device (RPBA or air gap).
 - Replace inappropriate backflow prevention devices (for example, double check valve backflow prevention assemblies and atmospheric vacuum breakers) with a required health hazard device (RPBA or air gap).
 - Test RPBAs upon installation and at least annually. [From TCEQ rules in 30 TAC §290.44(h)(4)].
 - Please see the operation, maintenance, and record keeping practices of the splash pad for compliance with Department of State Health Services (DSHS) rules in 25 TAC Chapter 265, Subchapter M.
 - If you operate a splash pad that is supplied with potable water containing a monochloramine/combined chlorine residual:
 - DSHS’s rules for splash pads require that these facilities be operated with a free chlorine or bromine disinfectant residual (unless the splash pad is operated as a pass-through facility without recirculation of water).
 - If you intend to establish free chlorine disinfectant residuals within the splash pad, be certain that you are not actually operating the facility with a monochloramine/combined chlorine residual. Monochloramine interferes with free chlorine test methods that use DPD reagent and can cause false positive free chlorine test results. The potable water must be breakpoint chlorinated by adding enough chlorine to eliminate the nitrogen containing compounds like monochloramine so that a free chlorine residual can exist.

TCEQ Recommendations for Public Water Systems with Public Interactive Water Features or “Splash Pads” June 2022

To confirm that water in the splash pad has a free chlorine residual, test a sample for free chlorine, total chlorine, monochloramine, and free available ammonia. (The supplying public water system must have this testing equipment.) When monochloramine and free available ammonia residuals are essentially zero (typically 0.05 mg/L or less) and the total chlorine and free chlorine residuals are nearly the same, the water has an actual free chlorine residual. Any additional free chlorine added to the water will remain in free chlorine form.

- If some form of cyanuric acid (commonly “dichlor” and “trichlor”) is used in conjunction with chlorine in a splashpad, it is important to be aware that cyanuric acid binds up the chlorine. This binding leaves only a small amount of free available chlorine to act as a disinfectant, because chlorine combined with cyanuric acid may not be an effective disinfectant. The standard test for free chlorine, using DPD reagent, will falsely measure the cyanuric acid-bound chlorine as free available chlorine. The splash pad operator may measure an apparent free chlorine residual of 2.0 ppm or higher due to the false positive caused by cyanuric acid-bound chlorine and be unaware that the actual free available chlorine residual is too low to prevent conditions that could allow the establishment of *N. fowleri*. Although the use of cyanuric acid in outdoor pools is a widespread practice, in a public pool the operators can see when algae or cloudiness starts to form, indicating the same low disinfectant conditions that could allow *N. fowleri* to establish and multiply. Public pool operators can “shock” a pool when these conditions occur. In contrast, a splash pad operator may only see thin water sprays and shallow water on the ground, which is unlikely to visibly show the start of algae growth in the splash pad water storage tanks. As a preventative measure, splash pad operators should visually check the water in a vault for algae or cloudiness to recognize low disinfectant conditions and treat as appropriate when those conditions are observed.