Lake Jackson Water System: Questions and Answers

Oct. 6, 2020

Drinking Water Quality

Is my water safe to drink now that the Boil Water Notice has been lifted?

Yes. When the Boil Water Notice is rescinded, residents can drink tap water, but should continue to take proper precautions against *Naegleria fowleri* infection by preventing the water from going up their nose or sniffing water into their nose. According to the Centers for Disease Control and Prevention (CDC), people cannot be infected with *Naegleria fowleri* by consuming drinking water. The *Naegleria fowleri* ameba does not cause an infection if it is in water that a person drinks, because the ameba is killed by normal levels of stomach acid. However, individuals can become infected with *Naegleria fowleri* when water contaminated with the ameba enters the body through the nasal passages. Once the ameba enters the nasal passages, they can travel to the brain where they may cause Primary Amebic Meningoencephalitis (PAM).

What steps has TCEQ taken to ensure that Lake Jackson's drinking water is safe?

On Friday, Sept. 25, in coordination with TCEQ, the City of Lake Jackson issued a Do Not Use Warning. The Do Not Use Warning was rescinded on Saturday, Sept. 26, and replaced with a Boil Water Notice.

TCEQ has maintained a presence onsite with City of Lake Jackson staff to provide both technical and operational assistance. Agency personnel are assisting the City in a thorough flushing of its water distribution system to ensure disinfectant residuals are consistently maintained above regulatory minimums in each water storage tank and throughout the system.

A disinfectant residual is the minimum level of disinfectant—as required by TCEQ—to remain in the water to prevent pathogens from growing in plumbing.

In addition, TCEQ is helping the City develop a cross-connection evaluation plan to ensure the safety of the public water supply. A cross-connection is any temporary or permanent connection between the potable (i.e., drinking) water system and another source containing non-potable water or other substances that could contaminate drinking water if a backflow condition occurs. Backflow is unwanted flow of water in the reverse direction.

While the Boil Water Notice has been lifted, the City of Lake Jackson remains under a special precaution notice regarding *Naegleria fowleri.* Residents can drink the tap water but should continue to take proper precautions against *Naegleria fowleri* infection by avoiding getting water up into their noses.

The City will be required to establish a minimum free chlorine residual of 1.0 milligrams per liter (mg/L) or greater throughout its distribution system. Once this is achieved, the City will be required to maintain a minimum 1.0 mg/L free chlorine residual at all points throughout the system for at least 60 days.

Should I be concerned if my water smells and/or tastes different than before? How long will this last?

Properly conducted free chlorine conversions can often cause the water to have a different taste and/or odor than when using chloramine for disinfection. Customers will likely be able to notice the difference, but there are no effects on health associated with the change in taste/odor. Once the water system has returned to using chloramine as the disinfectant, the taste/odor of the water will return to normal.

Why was the *Do Not Use Order* rescinded, and the *Boil Water Notice* issued?

- TCEQ investigators determined that 14 of the 54 locations tested throughout the distribution system failed to meet TCEQ's minimum disinfectant residual requirements. Agency rules require public water systems that do not meet minimum disinfectant residual levels to issue a Boil Water Notice.
- On Sept. 26, TCEQ worked with city officials to enact a city-wide Boil Water Notice, which was issued because disinfectant levels were below the regulatory minimum. In conjunction with the Boil Water Notice, the Do Not Use Water Advisory was rescinded.
- In addition to notifying consumers to boil water prior to consumption, the Boil Water Notice also included precautionary measures provided by the CDC to help reduce the risk of *Naegleria fowleri* by limiting the amount of water going into the nasal cavity.

We consumed Lake Jackson drinking water before this problem was discovered and the Boil Water Notice was issued. How do we know we weren't infected?

According to the CDC, people cannot be infected with *Naegleria fowleri* by consuming drinking water. The *Naegleria fowleri* ameba does not cause an infection if it is in water that a person drinks because the ameba is killed by normal levels of stomach acid. However, individuals can become infected with *Naegleria fowleri* when water contaminated with the ameba enters the body through the nasal passages. Once ameba enter the nasal passages, they can travel to the brain where they may cause Primary Amebic Meningoencephalitis (PAM). For information on symptoms of *Naegleria fowleri*, visit the CDC website.

Public Safety

What symptoms should people watch for?

For information on symptoms of *Naegleria fowleri*, visit the CDC website.

How was *Naegleria fowleri* able to enter the system?

TCEQ is working with local health officials and the City of Lake Jackson, along with officials with the Texas State Department of Health Services and the CDC to determine how the ameba entered the public water system.

How can I prevent an incident like this from happening in my city? Would chlorine residuals at normal levels kill *Naegleria fowleri*?

Of greatest importance in managing *Naegleria fowleri* is maintaining a disinfectant residual throughout the entire drinking water distribution system. Scientific literature suggests that a targeted continuous

0.2 mg/L free chlorine residual or 0.5 mg/L chloramine residual (measured as total chlorine) throughout the distribution system is a reasonable target for *Naegleria fowleri* control. Public water system officials should consider increasing disinfectant levels above TCEQ's minimum requirements if they have concerns about biofilm or tank sediment in the system.

How did this happen if TCEQ has rules in place to protect against it?

TCEQ is committed to minimizing risks from drinking water contaminants by ensuring compliance monitoring. Determinations for formal enforcement are identified on a weekly basis. For more information about TCEQ's role and the steps the agency has undertaken to protect public health and safety, refer to TCEQ's City of Lake Jackson, Texas, Incident webpage.

How frequently does this happen?

According to the CDC, most *Naegleria fowleri* infections are associated with swimming in warm freshwater lakes and rivers. However, very rarely, *Naegleria fowleri* has caused deaths associated with tap or faucet water going up the nose. *Naegleria fowleri* can grow in water tanks and pipes, especially where little or no disinfectant is present. It can also grow in the pipes and water heaters of homes and buildings. *Naegleria fowleri* infections have been reported when people put their heads underwater, rinse their sinuses through the nose, and cleanse their noses during religious practices using contaminated tap or faucet water.

People cannot be infected with *Naegleria fowleri* by consuming drinking water because the ameba is killed by normal levels of stomach acid. For more information, visit **Texas Department of State Health Services website**.

Are people who drink well water at risk from the *Naegleria fowleri*?

Customers within the Brazosport Water Authority service area, including the City of Lake Jackson, who use private wells for water service – and are not physically connected to the public water supply – are not impacted.

Where will water that is flushed out of the system as part of the chlorine conversion go?

Questions regarding the City of Lake Jackson's plans for the water being flushed out of the system should be referred to the City of Lake Jackson public water system.

Were residents of Lake Jackson and other people who consume drinking water from the Brazosport Water Authority at risk?

After extensive conversations with local officials, TCEQ determined that the Brazosport Water Authority's disinfection residuals were at adequate levels to ensure the water was safe to drink, with the exception of the City of Lake Jackson, which at that time stayed on the Do Not Use order. Since the BWA system had an adequate disinfectant residual, there was no safety issue for BWA's distribution system or other communities in the region.

Who regulates interactive water features such as splash pads and fountains in Texas, and is the interactive water feature in Lake Jackson currently in compliance with the regulations?

The Texas Department of State Health Services regulates splash pads and interactive water features/fountains in Texas. For more information, see Title 25, Texas Administrative Code Chapter 265, Subchapter M (Interactive Water Features and Fountains).

What is the City of Lake Jackson's compliance history?

The City of Lake Jackson draws groundwater from 11 wells and purchases treated surface water from the Brazosport Water Authority.

TCEQ records from Sept. 1, 2010, to Sept. 26, 2020, indicate Lake Jackson was issued one Notice of Violation for allegedly failing to maintain its wells and related components in a watertight condition. The City submitted documentation showing the leak was repaired, and the alleged violation was resolved on May 1, 2019. During that same time period, the TCEQ conducted five investigations, two in response to complaints, and three scheduled compliance investigations.

On Sept. 26, 2020, TCEQ documented low chloramine residuals (measured as total chlorine) in the distribution system, and based on the low residuals, TCEQ required the City to issue a Boil Water Notice.

As of that same date, based on TCEQ Water Supply Division compliance data, the City was meeting the regulatory standard for all the other primary drinking water standards.

Regulatory Requirements for Water Quality

Why is drinking water disinfected?

Disinfection of drinking water is critical to protecting consumers from disease-causing microorganisms, called pathogens, including bacteria or viruses. Disinfectants are very effective at inactivating pathogens and providing benefits to public health. For additional information on the importance of disinfecting drinking water, please see the Centers for Disease Control.

Who regulates drinking water for safety in Texas?

Under Texas Health and Safety Code Chapter 341, Subchapter C, TCEQ regulates public water systems in Texas to ensure the safety of public drinking water supplies. TCEQ regulations on public water systems are in Title 30, Texas Administrative Code Chapter 290 (Public Drinking Water). TCEQ oversees more than 7,000 public water systems that provide drinking water to approximately 29,000,000 Texans.

A public water system must be approved by TCEQ for compliance with the rules for water treatment, quality, source approval, disinfection, pressure maintenance, distribution, storage, and capacity. Please refer to TCEQ's City of Lake Jackson, Texas, Incident webpage for more information.

What are the drinking water disinfection requirements in Texas?

Public water systems are required to disinfect water prior to it entering the distribution system that carries it through pipes for delivery to consumers. Public water systems in Texas are also required to maintain a minimum amount of residual disinfectant (0.2 mg/L free chlorine residual or 0.5 mg/L chloramine measured as total chlorine) throughout the distribution system to minimize the presence of harmful microorganisms. Treatment prior to distribution may use a number of different disinfectants, but a public water system is required to maintain a residual disinfectant level using either chlorine or chloramine in the distribution system.

What is chloramine?

Chloramine is a long-lasting disinfectant added to public drinking water. Formed by combining chlorinated water with small amounts of ammonia, it is commonly used for disinfection in many public water systems throughout Texas, the United States, and countries around the world.

How often and what type of testing is required at public water systems?

Federal and state regulations have set standards for 102 contaminants for microorganisms, disinfection by-products, disinfectants, organic and inorganic chemicals, and radionuclides. All public water systems in Texas are required to monitor the levels of contaminants in treated water and to verify that each contaminant does not exceed its maximum contaminant level, disinfectant level, and/or action level.

Testing is required on a daily, weekly, monthly, quarterly, annual, 3-year, 6-year, or 9-year schedule. Schedules for drinking water compliance monitoring are based on federal and state sampling requirements, public water system type and size, and historical sample results. Additionally, public water systems must submit operating reports to TCEQ that demonstrate the effectiveness of treatment to verify the water the system provides to customers meets federal and state drinking water standards.

How are those tests applied to the City of Lake Jackson?

The City of Lake Jackson is required to monitor for coliform bacteria monthly from locations throughout their distribution system for a minimum of 30 samples per month. Along with these bacteriological samples, the City is required to analyze and report the disinfectant residual level at the time of each sample collection for the analyzing laboratory and TCEQ to accept the sample for compliance. The City is also required to take daily disinfectant residuals samples within the distribution system and submit a summary of the data to the TCEQ in their Disinfectant Level Quarterly Operating Report (DLQOR).

A full list of the City of Lake Jackson's chemical and microbiological monitoring schedules can be viewed on **Texas Drinking Water Watch**.

What are TCEQ's regulations regarding backflow prevention and cross-connection control prevention?

TCEQ is currently assisting the City of Lake Jackson in developing a plan for performing cross-connection evaluations to identify and eliminate possible sources of contamination. A cross-connection is any temporary or permanent connection between the potable (i.e., drinking) water system and another source containing non-potable water or other substances that could contaminate drinking water if a backflow event occurs. Backflow is unwanted flow of water in the reverse direction.

TCEQ's cross-connection control regulations in Title 30, Texas Administrative Code, Chapter 290 prohibit public water systems from connecting to an actual or potential contamination hazard without first protecting the potable-water supply. Learn more about cross connections on TCEQ's website.

What is free chlorine conversion?

A free chlorine conversion is proven to be more effective in killing microorganisms within the pipes of the distribution system, raising disinfectant residuals, and remedying the presence of *Naegleria fowleri*.

Upon recommendations from the CDC, TCEQ instructed the City of Lake Jackson to make a temporary change in the type of disinfectant used in the water supply.

A free chlorine conversion (also referred to as a "chlorine burn") occurs when a water system that typically uses chloramine removes ammonia (needed to form chloramine) from the treatment process and disinfects the water with only chlorine. Excess ammonia, which can accumulate in a chloramine-treated distribution system over time, is a source of food for specific types of bacteria that are harmless

to people. These bacteria can make it difficult for public water systems to maintain a disinfectant residual. The “chlorine burn” is a common practice by many public water systems throughout the country to reduce the number of these bacteria so that a satisfactory disinfectant residual can be maintained throughout the distribution system.

Chlorine conversions can be used as a preventative strategy or to stop nitrification, which can diminish water quality. Although customers may be concerned about taste and odor changes, no associated risks to health are expected during the temporary conversion.

The City will be required to establish a minimum free chlorine residual of 1.0 milligrams per liter (mg/L) or greater throughout the City’s distribution system. Once this is achieved, the City must maintain a minimum 1.0 mg/L free chlorine residual at all points throughout the system for at least 60 days.

More information on free chlorine conversions can be found in the Facts about Drinking Water Disinfection and the Free Chlorine Conversion Process informational document.

Why is my water system conducting a free chlorine conversion?

A free chlorine conversion is typically conducted for two primary reasons:

- Conversions are often conducted as a preventative maintenance measure to kill bacteria that can make the maintenance of disinfection residual problematic. A film can form in the distribution system piping that can contain bacteria that use ammonia as a food source. The bacteria in this film are harmless to people. When the water system stops adding ammonia, the bacteria starve. Therefore, a periodic conversion to free chlorine is effective for inactivating these types of bacteria in piping with biofilm by interrupting the supply of ammonia and can help prevent subsequent issues from recurring.
- In rare occasions, if the distribution system receives a moderate to excessive amount of ammonia over long periods of time, bacteria using ammonia as a food source can bloom and cause a loss of disinfectant residual. As a result, the water system may not be able to maintain the minimum required disinfectant residual in the distribution system. The conversion to free chlorine, in conjunction with increased flushing activities, assists in removing excess film from the distribution system and starves these bacteria. The chlorine conversion thus helps the system return to an environment where the disinfectant residual can be maintained.