

POOL CHEMISTRY BASICS FOR THE NORTH FORT BEND WATER AUTHORITY

Pool owners may be surprised to learn that one of the most important components of pool maintenance is knowing where your water comes from and how your water is disinfected (or treated) before it flows out of your tap.

WHERE DOES MY WATER COME FROM?

The North Fort Bend Water Authority (NFBWA) was created by the Texas Legislature to combat the effects of subsidence in the northern Fort Bend County region, as required by the Fort Bend Subsidence District (FBSD). The NFBWA provides a supply of surface water to most of the Municipal Utility Districts (MUDs) and cities within its boundaries in order to reduce ground water pumpage and related subsidence issues. [Click here](#) to see if your MUD receives surface water from the NFBWA.

What's subsidence and why should I care?

Subsidence is the gradual sinking of the land's surface caused by pumping our precious ground water resources faster than they are replenished. Subsidence changes drainage patterns and causes flooding. [Click here](#) to learn more about subsidence and steps you can take to help prevent it.

What's a MUD?

Municipal Utility Districts (MUDs) are special districts created to finance infrastructure for developments. MUDs provide water and wastewater utility services to residents within their boundaries, and ensure the supply, distribution, and quality of the water that comes out of your tap. [Click here](#) to figure out which MUD serves your water supply and whether your MUD currently receives surface water from the NFBWA.

Potable water in the Houston and Katy areas comes from either ground water wells or surface water sources. Because surface water plants are located near surface water supply sources, there are currently only three surface water supply plants that serve most of the Houston and Katy areas. Water is distributed from the surface water supply plants through large water pipelines to the NFBWA. [Click here](#) to learn more about the impressive infrastructure that supplies your area with surface water.

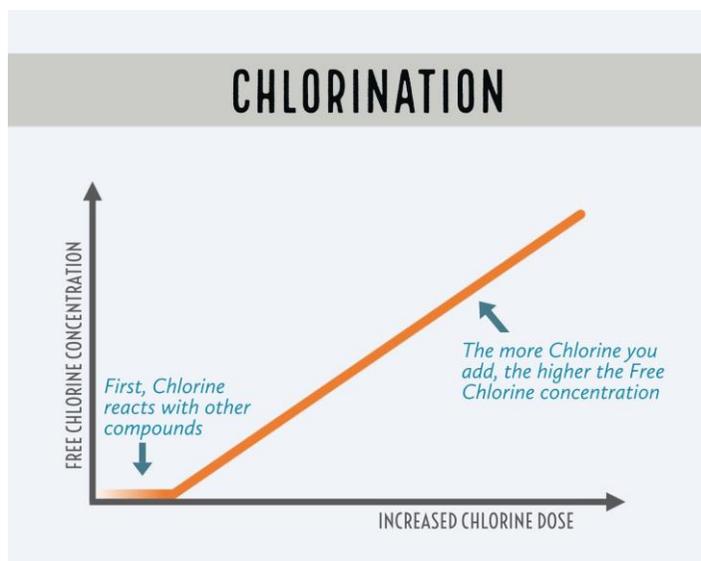
HOW IS MY WATER TREATED?

Chlorine is commonly used in water disinfection and is the most well-known disinfectant, especially among pool owners. Chlorination is a relatively simple process that involves adding chlorine in the form of chlorine gas, bleach (sodium hypochlorite), or calcium hypochlorite to water for disinfection. The below shows a simplified version of chlorination chemistry.

However, not all water is treated with just chlorine!

In fact, all surface water and some ground water in Fort Bend County are treated with chlorine compounds called chloramines. More specifically, the chloramine used by the NFBWA is called monochloramine.

Monochloramine is formed when chlorine is mixed with ammonia. Monochloramine is a powerful disinfectant and is ideal for water traveling through long distribution networks, like the Surface Water Supply Project. [Click here](#) to figure out which MUD serves your water supply and whether your MUD currently receives chloramine-treated surface water, from the NFBWA. If you have additional questions about how your water is treated, please contact your MUD operator.



POOL CHEMISTRY FOR WATER TREATED WITH CHLORAMINES

Chloramination is a much more complicated process than chlorination. Have you ever noticed that after adding chlorine to your pool, the free chlorine concentration doesn't change? No, you didn't read your test wrong! You are simply witnessing a well-established chemical process involving converting chloraminated water to chlorinated water.

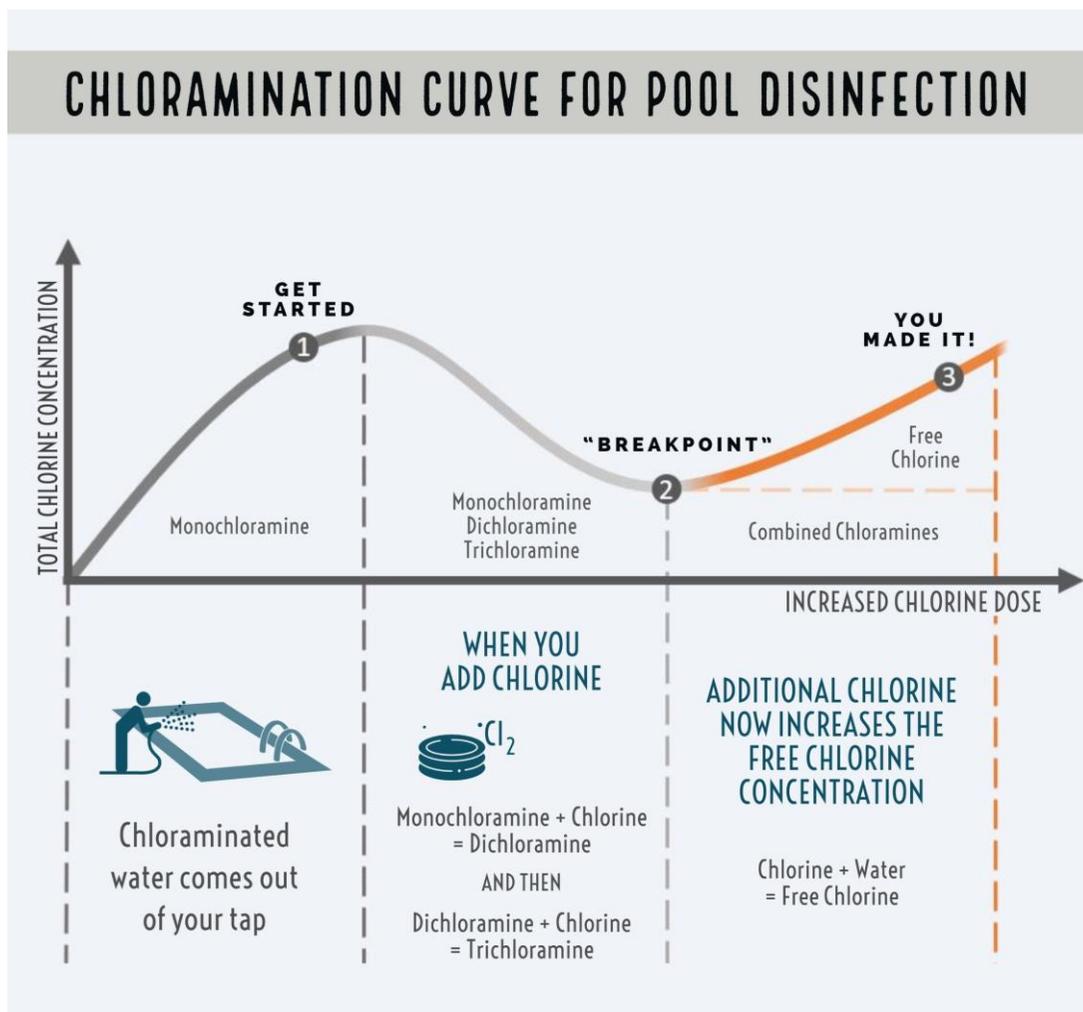
Before we get into the chemistry, let's review a few key terms you may hear mentioned at your local pool supply store.

Total Chlorine refers to everything in the water that is combined with chlorine, including free chlorine, monochloramine, dichloramine, and trichloramine.

Free Chlorine is the residual disinfectant in the water formed when chlorine reacts with water. This is just like simple chlorination. Your pool should ideally have a concentration of Free Chlorine between 1 and 4 milligrams per liter or parts per million.



Before the chlorine that you add to your pool can turn into free chlorine, it first goes through several reactions. That means that the Total Chlorine concentration must first decrease before the Free Chlorine concentration can increase. The following graph explains how the Total Chlorine concentration changes as you add more chlorine to water that is treated with chloramines.



PRACTICAL TIPS TO ADJUST THE DISINFECTANT CONCENTRATION IN YOUR POOL

Every time that chloraminated water mixes with the chlorinated water that is already in your pool, the same reactions discussed in the “Pool Chemistry for Chloraminated Water” section take place to convert the new chloraminated water to chlorinated water. This process will use the free chlorine that is present in your pool, meaning that the free chlorine concentration in your pool will decrease at a faster rate than would be expected by simple dilution alone.

The most efficient way to boost chlorine in your pool is adding liquid bleach or powder calcium hypochlorite directly to the pool. Chlorine tabs or pucks can also be added through an inline chlorinator. Chlorine tabs and pucks typically include stabilizers, like cyanuric acid, to protect free chlorine from degradation caused by ultraviolet (UV) rays.

Relying on the stabilizer in chlorine tabs or pucks to maintain the cyanuric acid levels when you have to chlorinate your pool at higher levels due to chloramines may result in too much cyanuric acid in the water. This can trigger “chlorine lock” which is when the cyanuric acid protects the free chlorine too much and renders it useless, causing low chlorine readings even when you’ve just added chlorine. If you receive chloraminated water, the best way to maintain the cyanuric acid level is to use a chlorine source that does not have cyanuric acid and then add cyanuric acid to your pool separately. A cyanuric acid concentration around 20 to 30 milligrams per liter or parts per million is ideal to protect free chlorine.

If you have a water softener for your home, turn it off before filling your pool. While most ground water in the Fort Bend County area has a high mineral content, commonly referred to as “hard water”, surface water does not have a high mineral content. A water softener may remove too much of the mineral content in surface water and throw off the total hardness of your pool water which can damage pool plaster. Let’s run through a couple of scenarios that will help make maintaining your pool free chlorine concentrations a breeze.

Scenario 1: No Free Chlorine in Your Pool

You test your pool water for free chlorine and the results show no free chlorine residual in the water. No free chlorine just means that your water is somewhere to the left of the “Breakpoint” on the Chloramination Curve for Pool Disinfection graph. If you have a Total Chlorine testing kit, test the Total Chlorine concentration to get a better idea of where you are at on the Chloramination Curve. To get to your ideal free chlorine concentration, you’ll need to add chlorine to get past the “Breakpoint” before the free chlorine concentration starts to increase.

Scenario 2: High Free Chlorine in Your Pool

You test your pool water for free chlorine and the results show very high free chlorine residual in the water. Add a fresh supply of chloraminated water to the pool to dilute the concentration of free chlorine in the pool. Remember, diluting your pool with chloraminated water will use up free chlorine at a much quicker rate than dilution with untreated water alone due to the reactions that must take place in chloramination chemistry. Allow the water to mix (this would be a great time to clean the sides of the pool and/or run your pump) before retesting.

NEED MORE HELP?

Take a sample of your pool water to a local pool supply store for additional testing beyond the normal pool maintenance kit. They will be able to help you adjust the chemical levels of your pool.

KEEP IN TOUCH

Follow us on Facebook for more information on water supply, water conservation, and water reclamation in the North Fort Bend Water Authority! Feel free to reach out with any other questions you may have about the NFBWA by filling out our [contact form](#).