**CARBON:**

Carbon itself is not a dangerous chemical in our drinking water, its main function is to absorb tastes and odors. The clusters that were tested in this data were the Verde River, the CAP Canal, SRP, Tempe Cluster, and the Chandler Cluster.

There are a few factors that are used to test carbon levels:

* Total Organic Carbon (TOC), which is the amount of carbon found in organic compound and is a non-specific indicator of water quality. Most lakes and rivers have around 2-10 mg/L, however normal levels should not go over 25 mg/L.

TOC is important for reading water quality before treatment. It comes from decaying Natural Organic Matter (NOM), as well as synthetic sources. So it basically tells you the amount of natural organic matter in the water source.

This important because the water treatment plants treat water chloride containing disinfectants. When raw water is chlorinated, active chlorine compounds react with natural organic matter and produce disinfection by products. Per studies, we have determined that higher levels of natural organice matter in source water during the disinfection process increases the amount of carcinogens in the processed drinking water.

Here you can see the TOC levels for the most part stayed under 10 mg/L, which is the average for lakes and rivers, and we only went over the 25 mg/L one time in 2002.

* Dissolved Organic Carbon (DOC), which covers a fraction of what total organic carbon can pass through a filter. Too much DOC in water can lead to an increase in bacteria growth. A safe level of DOC is 5 mg/L or less.
* Ultraviolet Absorbance (UVA). This is a water quality test parameter that uses UV rays to see the amount of carbon per centimeter (cm-1). While there isn’t a certain amount that levels need to be, the less amount of carbon per centimeter, the better.
* Specific Ultraviolet Absorbance (SUVA). It is the absorbance of UV light in a water sample at a specified wavelength and is normalized for DOC concentration. A normal level for SUVA is 2 L/mg-m or less. High levels of SUVA can also cause an increase in humic matter, which can create Disinfections By Product (DBPs).

From the data that is shown, there were a couple of years in the early 2000s where the levels of all four measurement tools went much higher than it should. Because of this, bacteria levels were more than likely higher than they should have been, along with an increase in humic matter. Fortunately, we have seen a good consistent level for each measurement tool in the last 10 years of data.

**FIELD MEASUREMENTS**

pH levels are an important indicator on how safe our drinking water is and is something that many people do not pay attention to on a regular basis. While pure water has a pH level of 7, drinking water should have a pH level between 6 and 8.5.

When the pH level is high in water, it can have a baking soda taste. It will leave a residue on your plumbing fixtures, can be difficult to heat, and can cause problems with lathering soap. Fortunately, a high level of pH does not cause any health issues. When the pH level is low in water, it can have a bitter taste, and may cause corrosion on plumbing fixtures. There is a higher chance of the water being contaminated with pollutants, which can be very unsafe to drink.

When the temperature rises in water, the pH level has a tendency to drop. From the data that was pulled, we were able to see that the pH levels remained consistent, even when the temperature of the water rose.

Looking at the data for all of the collection times per year for all of the reservoirs and canals, there were a couple of years in the early 2000s where the pH levels were significantly lower than they should be. From this data, we can conclude that in that timeframe, the water from these areas were not at a safe level for consumption. That being said, the pH levels went back to a normal level shortly after and remained at a safe level for the next five to ten years.