Disinfection By-Products (DBP) and Your Water and Sewer Department

Many of you are hearing the term disinfectant by-products in our drinking water and wondering what they are talking about.

What is a disinfectant by-product? How are they formed?

Disinfectant by-products are produced at the potable drinking water plants or in distribution systems. The Ed Love Plant utilizes the industry standard chlorine to kill bacteria and microbial life in our water. This renders the water safe for consumption. The first step of the problem comes from our raw water source or Lake Tuscaloosa. Decaying plants, algae and any other organic materials that are deposited in the lake form simple organic compounds. At the plant, the step of flocculation is used to remove as much of this organic material as possible. The problem lies in that not all organic materials can be removed in the plant.

The remaining dissolved organics react with the chlorine and possibly with the fluoride to form compounds such as Total Trihalomethanes (TTHM's) and Haloacetic acids (HAA5's). The term halogen comes from chemistry and refers to the right side of the periodic table and includes chlorine, fluorine, bromine and iodine.

How does this affect me?

EPA and AMA have performed numerous tests over the years by injecting mice with these DBP's. In concentrated amounts, the by-products may be related to bladder and kidney cancer. As we all know, the mice are always injected with maximum concentrations for the worst case scenario. The levels that occur in our drinking water are far below the levels injected into research test subjects.

What is a safe level?

EPA has established guidelines for water treatment. In Stage I of the disinfectant by-products rule, the limits were set at 80 parts per billion (ppb) on Trihalomethanes and 60 ppb on Haloacetic acids. The level on Haloacetic acids formed at the plant and distribution are only 20 ppb. No Haloacetic acid has been detected in Tuscaloosa water. In the outlying areas or where the water is detained longer due to lack of use or heat, Trihalomethanes will form. So far, Tuscaloosa has been meeting the quarterly averages as set by EPA. The next phase of the DBP rule, Stage II is coming in 2012. The limits in Stage II will be 60 ppb for Trihalomethanes and 40ppb for Haloacetic Acids.

What are we doing to lower DBP's?

The Water Department has installed automatic flushers in specific locations where water is detained longer. The flushing prevents water from sitting in the lines. The water treatment plant is also lowering the chlorine level in the plant to 3.0 ppm to 2.5 ppm. EPA'S maximum limit is 4.1 ppm. This level could be reduced further if water concentrations of chlorine remain above their minimum in the distribution system's extremities. Tank management is also being used to reduce these levels. The water turnover or cycles in tanks and lines will help reduce these products.

Tuscaloosa is ahead of nearly all water utilities across the nation as the water treatment plant has been for two years developing methods to eliminate DBP's through operational strategies. Tuscaloosa along with two to three other water utilities across the U.S. are setting the bar for the rest of the nation. EPA is

learning the best techniques for eliminating DBP's. This will be shared with water utilities throughout the country to aid them in these techniques.
Tuscaloosa along with EPA continues to study and test the process for greater reductions of DBP's.

Am I in any danger?

Operating at the levels set forth by EPA for compliance is far below the levels that could possibly cause harm. Alternate treatment methods are being studied such as nano-membrane filtration and reverse osmosis that eliminate organics and thus by-products.

Why are we not changing to these forms of treatment?

Nano-filtration and reverse osmosis are extremely expensive to operate and purchase. As with most new technology, even though reverse osmosis has been around for years, the cost is always high. In the future, the cost may come down but technology will also change. We will continue studying these issues in the coming years and do what is best for Tuscaloosa and the customers.