ASTORIA PUBLIC WORKS
WATER SYSTEM
FACTS ABOUT THE USE OF CHLORINE IN DRINKING WATER

What is chlorination?
Chlorination is the process of adding chlorine to drinking water to kill parasites, bacteria, and viruses. Different processes can be used to achieve safe levels of chlorine in drinking water. Using or drinking water with small amounts of chlorine does not cause harmful health effects and provides protection against waterborne disease outbreaks.

Are there any health issues associated with chlorine?
Your water provider, the City, monitors water quality regularly to provide you with safe drinking water. Some people are more sensitive than others to chemicals and changes in their environment. Individuals who have health concerns should seek medical advice from their healthcare provider before contacting their local health department..

Does chlorine affect patients during dialysis?
During dialysis, large amounts of water are used to clean waste products out of a patient's blood. Dialysis centers must treat the water to remove all chemical disinfectants, including chlorine and chloramine, before the water can be used for dialysis. Home dialysis users should consult the machine manufacturer for instructions on how to properly treat their water before use.

What are safe levels of chlorine in drinking water?
Chlorine levels up to 4 milligrams per liter (mg/L or 4 parts per million (ppm)) are considered safe in drinking water. At this level, harmful health effects are unlikely to occur.

Will chlorine affect my water's taste or smell?
Chlorinated water can taste and smell different than untreated water. Some people like the taste and smell of chlorinated water, and others do not. Taste and smell problems may arise depending upon the water quality and amount of chlorine in the water.

Specifics for the City of Astoria:
We use chlorine gas at our treatment plant at the Astoria Headworks. The gas is combined with water to form a chlorine solution. The solution is like a very weak solution of chlorine bleach. The solution is then added to our water supply to disinfect it. We typically add about 2.0 mg/L (parts per million) to the water. To help visualize this amount, one part per million is the equivalent of 1 inch in 16 miles. Once added to the water, the chlorine starts to interact with organisms, organic compounds, and some acids that are present in the water. We refer to this as **chlorine demand**. As the chlorine interacts, it neutralizes and becomes less effective. That is why we add more chlorine than is absolutely necessary. We want to make sure we always have chlorine that can inactivate germs and pathogens in our water. The chorine that remains in the water that is still active is called **chlorine residual.** We are required to maintain a detectable amount of chlorine residual in the drinking water throughout the entire system.

Sometimes, there are substances in the water that warrant the addition of more chlorine than usual. In particular, during the fall, when new rains begin to wash organic matter, that has collected on the ground over the summer, into our water supply, the amount of chlorine needed to sustain a level to make the water safe increases. The need to increase the chlorine is compounded by additional organic matter falling into our water sources in the form of leaves. The organic compounds from the leaves contain acids (tannic acids) and lignin which increases the demand for chlorine. This demand increase means we have to add more chlorine. Our chlorine addition may be 50% more than we normally add.

During these times, it is not uncommon for the water delivered to a homeowner's tap to have a faint chlorine smell due to the extra added chlorine.

After leaving the City Headworks, water travels to town via the transmission line into the City's storage reservoirs. The reservoirs hold enough water to supply the City for a few days. During this holding time, chlorine will continue to react with compounds in the water further reducing its efficacy. So as the water leaves the reservoirs, we may need to add more chlorine to the water. At the reservoirs this is accomplished using a "tablet feeder." It is essentially a machine that mixes water and solid calcium chlorite tablets to make a chlorine solution. The addition of chlorine at the reservoirs accounts for only about 10% of our overall chlorination efforts.

The end goal of the chlorination of the water is that there will always be chlorine at the customer's tap water that is still available to inactivate harmful pathogens.

We hope this information helps.

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