

USE OF MONOCHLORAMINES IN THE Mt. VERNON PUBLIC WATER SUPPLY

Presently, the City of Mt. Vernon uses a measurement of free chlorine residual as a form of measurement of the primary disinfection agent. In the form of a publication mailed to City of Mt. Vernon water customers, the proposed use of monochloramines as the primary means of disinfection was announced. Free chlorine and monochloramine are both chlorine compounds.

The reason for this proposed change is for two primary reasons:

Taste and odor complaints related to free chlorine

The inability to maintain the required concentration of disinfection residual in certain parts of the Mt. Vernon distribution system

In a letter from the Iowa Department of Natural Resources dated June 12, 2006, this concern was cited and a plan of action correcting this deficiency was called for. After research addressing our current water properties, the use of monochloramines for use as our primary disinfection agent was chosen because of the following reasons:

It is a more stable disinfection agent therefore it is hoped it will maintain the required concentrations throughout the distribution system

The taste and odor of this disinfection agent is not as noticeable as free chlorine

Due to ammonia naturally occurring in our groundwater from the Silurian aquifer, the formation of monochloramines is presently occurring in the distribution system.

The other practical alternative to using the combined residual method of measurement would be to increase the amount of chlorine injected into the distribution system. The amount of chlorine needed to provide the required free residual required by IDNR would be about double what we are adding now. This would require additional polyphosphate needed to provide adequate corrosion protection for the distribution system.

In order to achieve the residual disinfectant concentration required by the IDNR, the City would either need to inject additional Chlorine to provide free residual disinfection or increase the ammonia concentration to provide combined residual protection. It is the opinion of City staff that the additional ammonia would provide an adequate stable disinfectant resulting in lower concentrations of chemical additives and providing a product that less aggressive to our, and our customers' distribution systems, at a lower cost.

A plan of action and construction permit application was sent to the Department of Natural Resources for review and approval. A construction permit has been issued from the Department of Natural Resources. The necessary equipment has been delivered and installed.

The use of the new equipment and chemicals has not started.

The American Water Works Association reports that approximately 40% of U.S. utilities currently use chloramines in their distribution system. Although the City of Mt. Vernon is not proposing the use of monochloramines for this reason specifically, many communities are either using, or proposing to use monochloramines because the use of chloramines leads to the cessation of particular disinfection byproducts, which are associated with free chlorine. Some of these disinfection byproducts (DPD) are regulated while others may be regulated in the future.

Some of the communities in the area that currently use monochloramines as their primary disinfectant are listed below:

**SOME LOCAL COMMUNITIES PRESENTLY USING MONOCHLORAMINES
AS A PRIMARY DISINFECTANT**

Cedar Rapids
Keokuk
Davenport
Bettendorf
Leclair
Rathbun Regional Water
Lowden
Stanwood
East Moline

BY THE NUMBERS

These are the proposed theoretical dosages needed to maintain the disinfectant residuals required by IDNR for the two methods considered:

	Present	Proposed Monochloramine	Free Chlorine
Chlorine	2 mg/L	2 mg/L	4 mg/L
Ammonia	0 mg/L	.3 mg/L	0 mg/L
Polyphosphate	0 mg/L	2 mg/L	3 mg/L

These are the proposed costs associated with the theoretical dosages needed to maintain the disinfectant residuals required by IDNR for the two methods considered:

Estimated Cost/Day	Present	Proposed Monochloramine	Free Chlorine
Chlorine	\$5.00	\$5.00	\$10.00
Ammonia	\$0.00	\$2.67	\$ 0.00
Polyphosphate	<u>\$0.00</u>	<u>\$14.00</u>	<u>\$21.00</u>
	\$5.00/Day	\$21.67/Day	\$31.00/Day

1) Is the City of Mount Vernon Water Department planning on going forward with the use of chloramine as stated in the mailing?

At this point all the equipment is installed and chemicals delivered. We are intending to start, upon council approval.

2) Does the city have adequate proof / documentation to refute the claims from the website mentioned above?

The City relies on the expertise of the EPA and Department of Natural Resources for approved disinfection practices. If the Iowa Department of Natural resources felt that the public health was adversely affected by the use of this practice, a permit would not have been granted In Mt. Vernon, or any other community that uses this method.

3) Does the city have proof / documentation regarding the safety of the use of chloramine as a disinfectant in water supplies, especially as compared to the use of chlorine--for immediate, mid and long term use?

Monochloramines as a primary disinfectant has been in use since the early 1900's. At this point American Water Works Association estimates that 40% of water utilities use chloramines in their distribution system.

Many of the issues itemized on the website associated with chloramines are also associated with chlorine.

4) Was this brought before the public prior to the mailing? If so, in what venue? If not, why not?

The disinfection/water quality program was initiated earlier this year. The proposal was approved by City Council during a public meeting in August. Progress reports have been updated monthly. The Mt. Vernon Sun has reported updates on the progress and proposed implementation.