AGENDA
CITY OF LARAMIE, WYOMING
CITY COUNCIL SPECIAL MEETING AND WORK SESSION
CITY HALL
SEPTEMBER 13, 2016 6:00 pm

City Council Meetings are open to the public. Requests for accommodations from persons with disabilities must be made to the City Manager's Office 24 hours in advance of a meeting.

1. SPECIAL MEETING

1.A. Adjournment

2. WORKSESSION

2.A. Public Comments

2.B. WORK SESSION: Fluoridation of Drinking Water [Smith, PW Dir]

Documents:

Coversheet Fluoridation.pdf
CDC Memo Attachment B.pdf

2.C. WORK SESSION: Wyoming Business Council Sponsored Trip to the National Main Street Conference Update.

2.D. City Council Updates/Council Comments

2.E. Agenda Review

2.F. Public Comments

CITY OF LARAMIE COUNCIL WORK SESSION September 13, 2016

LARAMIE 1868	**Agenda Item:** Discussion Item **Title: Fluoridation of Drinking Water**

Recommended Council MOTION:

Discussion item only, no action necessary.

Administrative or Policy Goal:

Community Water Fluoridation - *the controlled addition of a fluoride compound to a public water supply to achieve a concentration optimal for dental caries prevention.*

Background:

At City Council's request, staff has reviewed our current practices with regard to the addition of fluoride to the City's drinking water (fluoridation). As is typical with discussions on this topic there are pros and cons to the policy to fluoridate; however, we have tried to focus more on the technical aspects of the issue as it relates to water treatment and tried not to express an opinion concerning the public health effects of the practice.

The United States Environmental Protection Agency (USEPA) and the United States Department of Health and Human Services Centers for Disease Control and Prevention (CDC) both recommend the addition of fluoride to drinking water, but do not require the practice. Attached as Attachment A to this cover sheet is a statement from the CDC concerning the practice of fluoridation, it also cites numerous sources the reader can utilize in researching this topic.

Current City Practice

We currently fluoridate to a level of 0.7 mg/l which is the recommended national standard. To reach the level of 0.7 mg/l we dose approximately 0.5 mg/l fluoride solution to account for naturally occurring fluoride levels resident in the source water. Fluoride is ubiquitous in the environment and therefore likely to be present to some extent in all water sources. For example, sea water contains approximately 1.2 mg/l of fluoride while the concentration present in source water is often equal to the amount of fluoride in rainfall, which is typically 0.1 to 0.2 mg/l. We have found this to be the case with our source water.

The City currently fluoridates water to the target level of 0.7 mg/l through the addition of sodium fluorosilicate in solution. Our practices are consistent with American Water Works Association (AWWA) standards as provided in the Manual of Water Supply Practices M4, Water Fluoridation Principals and Practices. Attachment B provides an estimate of the average annual cost of fluoridation.

The following information is included to provide some additional background on our current practice.

- Feeding fluoride is less than pleasant and is difficult to manage. The product (sodium fluorosilicate) comes in 50 pound bags that require a lot of handling. The fluoride feed equipment demands more tending and repairs than most other similar equipment.
- Sodium fluorosilicate is difficult and dangerous to handle. The compound is toxic by inhalation, ingestion, and via skin contact. Bags are often broken in shipment and when handling, dust of the product is often spread, increasing the risk of inhalation.
- Sodium fluorosilicate is a toxic compound that can be used to poison a water system when used in high doses and EPA and Homeland Security requires that it, and feed equipment, be secured.
- As mentioned above, the fluoride feed equipment is constantly breaking down due to the nature of the product. Sodium fluorosilicate is corrosive, abrasive and difficult to dissolve into solution which wears the equipment out quickly.
- We dose at 0.5 ppm (mg/l) to allow for variations in the source water levels.
- Temporary interruptions of dosing are necessary to deal with problems.
- Fluoridation process and coagulation process often interfere with each other making residual management impossible at times.
- Sodium fluorosilicate is becoming more difficult to purchase and the product from China comes of questionable quality.
- Having fluoride in the system provides useful tracer information for management of the water quality in the distribution system.
- Having fluoride in the system has proved useful in assessing potential main line leaks.

In spite of the issues related to the handling of sodium fluorosilicate, as a staff, we support fluoride addition as long as the community supports and wants this service. However, our position would change if any of the following were to occur:

- The quality of the sodium fluorosilicate becomes suspect due to supply issues.
- The feed equipment becomes unreliable.
- We can't safely handle the product.
- EPA or CDC change their position on fluoridation.
- The community changes its position and no longer supports fluoridation.

Additional Research

As you might expect, there is considerable information available on this topic. When performing research it is easy to find information in support of, or in opposition to the practice of fluoridation. Many research papers suggest there is strong evidence that water fluoridation reduces tooth decay; many research papers also suggest the risks of fluoridation outweigh any potential benefit and may actually cause adverse effects.

The primary detrimental, or adverse effect of fluoridation is dental fluorosis. There is evidence that suggests fluoridation causes dental fluorosis, most of which is mild and not usually of aesthetic concern. Fluoride's adverse effects depend on total fluoride dosage from all sources. At the commonly recommended dosage, the only clear adverse effect is dental fluorosis, which can alter the appearance of children's teeth during tooth development; this is mostly mild and is unlikely to represent any real effect on aesthetic appearance or on public health.

Recommended Practice

In April 2015, recommended fluoride levels in the United States were changed to 0.7 ppm from the previous standard level of 0.7–1.2 ppm to reduce the risk of dental fluorosis. In the US, mild or very mild dental fluorosis has been reported in 20% of the population, moderate fluorosis in 2% and severe fluorosis in less than 1%. As mentioned above, we dose at 0.5 ppm with a goal of achieving a total level of 0.7 ppm, the recommended level. The additional fluoride (above 0.5 ppm) is naturally occurring in our water sources, so even if we did not add fluoride we would still have fluoride in our drinking water (0.1 to 0.3 ppm).

Regulatory Considerations

Fluoridation of public water supplies is not mandated by the USEPA or any other federal agency in the United States. The 1974 Safe Drinking Water Act (SDWA) specified that no national primary drinking water regulation can require the addition of any substance for preventive health benefits not related to drinking water contamination. This prohibition inherently established fluoridation as a decision to be made by each individual state or local municipality.

States Requiring Fluoridation

State	Year Mandated
Connecticut	1965
Kentucky	1966
Illinois	1967
Minnesota	1967
Ohio	1969
South Dakota	1969
Georgia	1973
Nebraska	1973, 2008
California	1995
Delaware	1998
Nevada	1999
Louisiana	2008
Arkansas	2011

Note: Washington, D.C. and Puerto Rico also require fluoridation

Attachment B

Estimated Annual Expense

This estimate of annual fluoridation expenses is based upon a review of the past 4 years of expenses and produced an average annual value for each of the following categories. The average annual amount of water treated is 17 million gallons.

Chemicals	$16,500
Power	$7,805
Time	$20,280
Equipment	$13,000
Repair & Maintenance	$2,962
Total	$60,547

Notes:

1) Over the past 4 years we have been plagued with fluoride supply problems and at times have been unable to get product. The value for chemicals is adjusted to reflect a steady supply.
2) Power is based on run hours at 27 amp load.
3) The cost of the water is not assigned because it is pumped back into the system after the solution is made. It does impact the size of the pumps we use and the power consumption.
4) Man hours are estimated to be 338 hours per year @ $60/hour.
5) Equipment is based on $65,000 replacement cost with a 20 year life cycle. There are 4 feeders in the system.

DEPARTMENT OF HEALTH & HUMAN SERVICES Public Health Service

Centers for Disease Control
and Prevention (CDC)
Atlanta, GA 30341-3724

June 8, 2015

STATEMENT ON THE EVIDENCE SUPPORTING THE SAFETY AND EFFECTIVENESS OF COMMUNITY WATER FLUORIDATION

On behalf of the Centers for Disease Control and Prevention (CDC), I am pleased to provide a statement on the evidence regarding the safety and benefits of community water fluoridation. For the record, this statement is not testimony for or against any specific legislative proposal.

Good oral health is an important part of good overall health and an essential part of our everyday lives. Diet, sleep, psychological status, social interaction, school, and work are all affected by impaired oral health. Over the past several decades, there have been major improvements in the nation's oral health that have benefitted most Americans.[1]

However, profound disparities in oral health status remain for some population subgroups, such as the poor, the elderly, and many members of racial and ethnic minority groups.[1] Tooth decay is one of the most common chronic diseases among American children with 1 of 4 children living below the federal poverty level experiencing untreated tooth decay.[2] Untreated decay can cause pain, school absences, difficulty concentrating, and poor appearance—all contributing to decreased quality of life and ability to succeed.[3]

Tooth decay and its complications are preventable, and several preventive and early treatment options are safe, effective, and economical. The CDC leads national efforts to improve oral health by using proven strategies such as community water fluoridation and school-based dental sealant programs that prevent oral diseases.

An Effective Intervention

Community water fluoridation is "the controlled addition of a fluoride compound to a public water supply to achieve a concentration optimal for dental caries prevention."[1] The process of adding fluoride to public water systems in the United States began in 1945 in Grand Rapids, Michigan. Soon after, dramatic declines in dental caries were noted among school children in Grand Rapids compared with school children from surrounding areas. Since then, community water fluoridation has been adopted by communities across the country, providing the cornerstone of caries prevention in the United States.[1] In 2012, more than 210 million people, or 74.6% of the U.S. population served by public water supplies, drank water with optimal fluoride levels to prevent tooth decay.[4]

Water fluoridation is beneficial for reducing and controlling tooth decay and promoting oral health across the lifespan. Evidence shows that water fluoridation prevents tooth decay by providing frequent and consistent contact with low levels of fluoride, ultimately reducing tooth decay by 25% in children and adults.[5-8] Additional evidence shows that schoolchildren living in communities

where water is fluoridated have, on average, 2.25 fewer decayed teeth compared to similar children not living in fluoridated communities.[9]

The safety and benefits of fluoride are well documented and have been reviewed comprehensively by several scientific and public health organizations. The U.S. Public Health Service; the United Kingdom's National Institute for Health Research, Centre for Reviews and Dissemination, at the University of York; and the National Health and Medical Research Council, Australia have all conducted scientific reviews by expert panels and concluded that community water fluoridation is a safe and effective way to promote good oral health and prevent decay.[10-12] The U.S. Community Preventive Services Task Force, on the basis of systematic reviews of scientific literature, issued a strong recommendation in 2001 and again in 2013, for community water fluoridation for the prevention and control of tooth decay.[9,13]

A Cost-saving Intervention

Although other fluoride-containing products such as toothpaste, mouth rinses, and dietary supplements are available and contribute to the prevention and control of dental caries, community water fluoridation has been identified as the most cost-effective method of delivering fluoride to all members of the community regardless of age, educational attainment, or income level.[14,15] Analyses have also shown that water fluoridation provides additional benefits across the lifespan beyond what is gained from using other fluoride-containing products.[8,11,16]

By preventing tooth decay, community water fluoridation has been shown to save money, both for families and the health care system.[7,17] The return on investment (ROI) for community water fluoridation varies with size of the community, increasing as community size increases, but, as noted by the U.S. Community Preventive Services Task Force, community water fluoridation is cost-saving even for small communities.[17,18] The estimated annual ROI for community water fluoridation, including productivity losses, ranged from $4.32 in small communities of 5,000 people or less, to $27.41 in large communities of 20,000 or more people.[7] The estimated ROI for community water fluoridation excluding productivity losses was $3.24 in small communities and $20.52 in large communities.[19]

A study of a community water fluoridation program in Colorado used an economic model to compare the program costs associated with community water fluoridation with treatment savings achieved through reduced tooth decay. The analysis, which included 172 public water systems, each serving populations of 1,000 individuals or more, found that 1 year of exposure to fluoridated water yielded an average savings of $60 per person when the lifetime costs of maintaining a restoration were included.[20] Analyses of Medicaid claims data in 3 other states (Louisiana, New York, and Texas), have also found that children living in fluoridated communities have lower caries related treatment costs than do similar children living in non-fluoridated communities; the difference in annual per child treatment costs ranged from $28 to $67.[21-23]

A Safe Intervention

Expert panels consisting of scientists from the United States and other countries, with expertise in various health and scientific disciplines, have considered the available evidence in peer-reviewed literature and have not found convincing scientific evidence linking community water fluoridation with any potential adverse health effect or systemic disorder such as an increased risk for cancer,

Down syndrome, heart disease, osteoporosis and bone fracture, immune disorders, low intelligence, renal disorders, Alzheimer disease, or allergic reactions.[9,11]

Documented risks of community water fluoridation are limited to dental fluorosis, a change in dental enamel that is cosmetic in its most common form. Changes range from barely visible lacy white markings in milder cases to pitting of the teeth in the rare, severe form. In the United States, most dental fluorosis seen today is of the mildest form, affecting neither aesthetics nor dental function.[24] Fluorosis can occur when young children—typically less than 8 years of age, whose permanent teeth are still forming under the gums—take in fluoride from any source.[9,11] Recommendations provided by the U.S. Public Health Service for the optimal level of fluoride in public water systems take into account levels of water consumption as well as the availability of other fluoride products.[25]

Conclusion

In the seminal report, *Oral Health in America: A Report of the Surgeon General*, Surgeon General David Satcher observed a "'silent epidemic' of dental and oral diseases […] with those suffering the most found among the poor of all ages."[1] The report affirms that community water fluoridation is "an inexpensive means of improving oral health that benefits all residents of a community, young and old, rich and poor alike." Because of its contribution to the dramatic decline in tooth decay over the past 70 years, CDC named community water fluoridation 1 of 10 great public health achievements of the 20th century.[14]

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