Discolored Water Discussion

1/16/2018 City of Excelsior
City Council Work Session

Background

- Over the course of the past 6 months, staff has been tracking water quality complaints
- Complaints consist mainly of discoloration and aesthetic issues
- When complaints are received, staff reaches out to the homeowner with water quality issues and schedules an appointment.
- Staff tests the water following the appointment and provides the homeowner with the results.
- The water quality issues typically have higher levels of iron and sometimes manganese
- When staff is able, flushing of the watermains is done to reduce water age and bring in fresh water to the affected homeowners
- Flushing would seemingly clear up the water for a few days, but the discoloration would return
- The water quality issues were more heavily concentrated in the Academy/Glencoe/Pleasant area and Hidden Lane

2017 Street and Utility Project

- Complaints began in the summer of 2017 and coincided with the street and utility improvement project
- Watermain was replaced at Second Street, Third Street and Mill Street
- Water was turned on and off frequently
- Changes in directional flow creates disruptions and allows sediment to break loose from the walls of older pipe
- Installing new pipe also changes the hydrology and flow of the water within the system
- Disruptions can continue until the system equalizes

Age of Water Mains and Water Services

Year Water Mains Installed	Age of Water Mains	Percentage in System
1920-1929	90-100 years old	3.8%
1930-1939	80-90 years old	22.1%
1940-1949	70-80 years old	2.1%
1950-1959	60-70 years old	6.1%
1960-1969	50-60 years old	10.9%
1970-1979	40-50 years old	4.8%
1980-1989	30-40 years old	27.3%
1990-1999	20-30 years old	7.8%
2000-2009	10-20 years old	1.3%
2010-2017	0-10 years old	13.8%

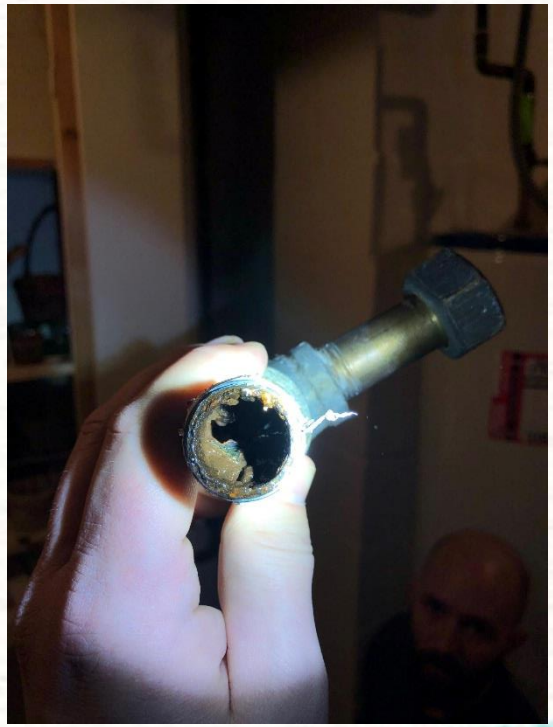
Age of Watermains

Age of Water Mains

- Approximately 45% of the system is 50+ years of age
- Watermain is mainly cast iron piping
- Cast iron piping is subject to deterioration both inside and out
- The production process has not changed and levels of iron and manganese are very low in the water leaving the treatment facility
- Once the water leaves the facility, it is subject to the aged piping within the distribution system
- This impacts the quality of water

Age of Water Services

- Piping within the home can also be an issue
- Original water services and plumbing are most likely galvanized steel



Increased Water Age

- Water is typically best when used frequently and doesn't sit in the pipes for an extended period of time
- Water that sits in the pipe longer becomes lower quality
- Glencoe/Academy/Pleasant neighborhood's water age has most likely increased
- The apartment complex demolished for Water's Senior Living used 200,000-300,000 gallons per quarter; approximately 3,000 gallons per day
- Increased water age and less turnover causes the water to be subject to the deterioration and sediment built up in the pipe
- This results in lower water quality

Dead-Ends

- Hidden Lane and Maclynn Road also began to have issues in late July in conjunction with last summer's project
- The project may have changed the directional flow and disrupted the system
- This most likely caused sediment to be broken loose from the pipes and settle out in the dead-ends of the system
- The City flushed over a dozen times in this area once we received complaints
- Low water usage could also be a factor; water age increases with mains that are oversized
- Automatic flushing system could be an option for dead-end areas to reduce water age and increase water turnover

Changes in the Water Aquifer

- Water moves below ground and the quality can be affected by factors unknown
- City consulted with Tonka Water and were given recommendations in regard to testing
- Public Works has begun to test for ammonia- which can affect chlorine residual within the system and cause discoloration
- The City will monitor and consult with Tonka Water to further define if any processes need to be changed once more data is collected
- The consultation with Tonka Water gave Public Works great feedback on how to better the treatment of our water

WSB Proposal

- WSB and Associates provided a proposal for a water quality study
- The proposal would be two-fold. The first part of the proposal would be the creation of a unidirectional flushing program
- The second part would be a qualitative water analysis. Testing would be done before and after flushing and provide recommendations for enhanced water treatment methods. This includes the treatment process itself and whether treatment needs to be changed or modified to better address the water quality

Future Pavement Management Plan Projects

- With modified maintenance practices and implementation of revisions to Plant operations, aged watermain throughout the system will continue to be an issue
- Capital improvement projects for infrastructure replacement or rehabilitation may be influenced by watermain repair and maintenance costs, both in dollars and use of resources, such as Public Works staff response
- A $16M draft preliminary Capital Improvement Plan (CIP) has been prepared for consideration and financial analysis
- Next steps would be to perform a financial analysis and decide on a schedule to consider finalization of the CIP. The CIP is a planning and guidance document, which can be modified by City Council as needed.

Discussions and Questions – Staff Direction Needed

- Feedback on WSB Water Quality proposal
- Feedback on proposed future CIP improvements