December 5, 2023

ALISHA KALE
OSCEOLA WATER WORKS
PO BOX 515
OSCEOLA IA 50213

Subject: Osceola Water Works Sanitary Survey
Public Water Supply ID # IA2038038

Dear Ms. Kale and Board of Trustees,

Enclosed is the report of the recent sanitary survey of the public water supply referenced above.

No significant or minor deficiencies were identified during this survey. However, several requirements, recommendations, and reminders are summarized at the end. We believe that you will find the report self-explanatory and strongly encourage you to take action on the minor deficiencies, requirements, and recommendations.

You may contact Emma Huston (515-901-5642 or emma.huston@dnr.iowa.gov) or this office with any questions or comments.

The cooperation and assistance of Brandon Patterson and Cory Gallup in completing this survey was appreciated.

Sincerely,

Ted Petersen
Supervisor, Field Office #5

c: Water Supply Operations (w/encl. via email: pwsrecords@dnr.iowa.gov)
Brandon Patterson (w/encl. via email)
Cory Gallup (w/encl. via email)

PUBLIC WATER SUPPLY INFORMATION			
SYSTEM	**NAME:** OSCEOLA WATER WORKS		**PWS CLASSIFICATION:** Community
	ADDRESS: OSCEOLA WATER BOARD OF TRUSTEES, PO BOX 515 208 W JEFFERSON ST, OSCEOLA, IA, 50213		**PHONE:** 641-342-1435
	RESPONSIBLE AUTHORITY/OWNER: OSCEOLA WATER BOARD OF TRUSTEES		
	ADDRESS: OSCEOLA WATER BOARD OF TRUSTEES, PO BOX 515 208 W JEFFERSON ST, OSCEOLA, IA, 50213		**PHONE:** 641-342-1435
	TREATMENT GRADE: WT3	**DISTRIBUTION GRADE:** WD2	**WATER USE PERMIT #:** 142-R7

SOURCE/ENTRY POINT	SDWIS NAME:	DESCRIPTION/PHYSICAL LOCATION:
	S/EP FROM WEST LAKE	TAP AT LAB SINK

RESPONSIBLE OPERATOR(S)	NAME:	WT GRADE:	WD GRADE:	CERTIFICATION #:
	BRANDON PATTERSON	WT3	WD3	6949
	CORY GALLUP	WT2	WD2	11677

SURVEY INFORMATION				
SURVEY	**DATE THIS SURVEY:** 11/20/2023	**DATE LAST SURVEY:** 12/22/2020		**PURPOSE:** Routine Sanitary Survey
PERSON INTERVIEWED	**NAME:** Brandon Patterson Cory Gallup		**TITLE:** Water Supt Shift operator	
CONSUMPTION	**Period Reviewed:** November 2022 - October 2023	**AVERAGE DAILY USE (MGD):** 1.163	**MAXIMUM DAILY USE (MGD):** 1.818	**PE @100 GPCD:** 11,629
POPULATION SERVED	**TOTAL NUMBER OF SERVICE CONNECTIONS:** 2166		**POPULATION OUTSIDE CORPORATE LIMITS:** 88	
	CENSUS POPULATION: 6036		**TOTAL POPULATION SERVED*:** 6124	
	MILES OF PIPE: N/A			

*equals census pop. + population outside corp. limits(2.5 X # of service connections or actual pop.)

SURVEY INFORMATION		
ASSESSMENTS	**SOURCE CLASSIFICATION:** Surface water	**ORGANIC CHEMICAL PHYSICAL VULNERABILITY (SW/IGW SYSTEMS ONLY):** Yes
	ORGANIC CHEMICAL VULNERABILITY (GW SYSTEMS ONLY): N/A	**ORGANIC PHYSICAL VULNERABILITY (GW SYSTEMS ONLY):** N/A

AUTHENTICATION		
INSPECTOR	**NAME/TITLE:** Emma Huston, Environmental Specialist Emma Huston Digitally signed by Emma Huston Date: 2023.12.05 10:33:47 -06'00'	**DATE:** 12/5/2023
REVIEWER	**NAME/TITLE:** Janet Gastineau, Environmental Specialist Senior	**DATE:** 12/5/2023

General Description

SOURCE: Raw water is withdrawn from West Lake Reservoir which is fed by Squaw Creek and is located northwest of town. The reservoir has a surface area of approximately 306 acres at normal pool with a storage volume of 3,800-4,200 acre-feet. The drainage area consists of approximately 6,350 acres of primarily agricultural land. There are two raw water intakes, one at 12' and one at 16' (was formerly 20' before it was raised) below normal pool, that flow by gravity through two separate transmission lines that come together into one line into the treatment plant.

TREATMENT: The treatment plant was upgraded in approximately 2003 and has a capacity of 3 MGD. The upgrades are essentially duplicate treatment units to the existing treatment plant. Treatment begins with the addition of ferric sulfate (primary coagulant) at a rapid mix in the raw water line for the newer side of the treatment plant and no rapid mix on the other, original side. Chlorine dioxide and a cationic polymer (coagulant aid) are injected at the two upflow clarifiers that run in parallel. Sodium permanganate is also added. Water is then filtered through 8-dual media gravity filters containing 1' sand and 2.5' granular activated carbon (GAC). Three filters are in service on each treatment train with one in standby for when the next filter in use is backwashed. Filter effluent enters a clear well for each treatment train before being pumped to a common header leading to the contact time chamber within the ground storage reservoir. The chlorine injection point was relocated in 2020 to the common header to the contact time chamber. Caustic soda is added after the contact time chamber and before the ground storage reservoir (GSR) for pH adjustment. Ammonium sulfate is added after the contact chamber within the GSR to convert to chloramines in order to reduce the potential production for disinfection byproducts in the distribution system. Fluoride is added after the GSR. There is a two-cell lagoon west of the water treatment plant for process wastewater and an emergency power generator is located on the south side of the treatment plant for full operation of the plant and various pumps.

STORAGE: Plant storage includes a 60,000-gallon clear well on the original side, an 80,000 gallon clear well on the new side, and a 1.5 million gallon, baffled ground storage reservoir. There are three transfer pumps from each clear well to the ground storage reservoir and three high service pumps to pump water from the GSR to the distribution system. Two elevated storage tanks serve the distribution system, a 0.3 MG tank in the center of town and a 0.5 MG tank located in the industrial park on the west side of town. The EST on the east side of town is owned and operated by Southern Iowa Rural Water Association (SIRWA).

1. Sources

- Source capacity continues to be an issue for this system as lake levels in West Lake remain low due to persistent drought conditions. Recommended Standards for Water Works 3.0 and 3.1.1 requires an adequate quantity of water to be available to meet the maximum projected water demand of the service area. In addition, there is no emergency connection from another water source to provide additional water to the system. Conservation measures are in place and several options for adding capacity in the short-term, including pumping water from a nearby private lake and rerouting a portion of the City's wastewater final effluent to the West Lake watershed to increase lake volume, are being considered. Planning for the construction of a new reservoir to provide redundancy has been an ongoing and challenging effort for several years.

- A Source Water Protection Plan for West Lake was approved by the Iowa DNR in November 2021.

- The system has two intakes in West Lake; however, due to the low lake levels, the system is planning to switch to the lower intake December 6, 2023. This lower intake was raised 4 feet in November 2023. Historically, there have been elevated manganese levels present in water drawn from the lower intake. The system has never before used the lower intake during winter months but is working with Chem-Sult to make any necessary adjustments to the treatment process.

- As previously described, there was recently a significant amount of work done on the intakes; however, there has not previously been routine inspections or maintenance of the intakes. The system should

periodically perform maintenance on the intake structure. Removal of debris and inspection of intake screen integrity prevents damage to piping valves and pumps. This is particularly important after significant rain events and during winter if there is a possibility of ice buildup or anytime zebra mussels, etc., are a problem.

2. Treatment

- It is recommended that Standard Operating Procedures (SOP) be written and reviewed periodically for coagulant addition.

- The system routinely consults with Chem-Sult about chemical adjustments and modifications. This includes jar testing. However, Osceola Water Works staff are not trained or experienced with jar testing themselves. The system operators expressed interest in learning how to conduct jar testing using the equipment they have in the treatment plant. Jar testing is recommended to determine the optimal chemical application rates and it is recommended that operators learn how to use this equipment. Contact a representative of the Iowa DNR's Area Wide Optimization team for more information on jar testing at 515-805-4523.

- The piping and chemical feed lines in the plant were well labeled; however, some of the piping in the basement was in need of painting. Painting of the piping should be conducted to maintain integrity and sanitary appearance. Mr. Patterson mentioned that plant maintenance is planned within the next few years, which would likely include rehabilitation of the clarifiers and filters and painting of piping in the plant.

- There is a total of eight filters with six in use at any given time. The granular activated carbon (GAC) on each filter is replaced annually. However, there are reportedly some issues with dead spots on the filter beds and underdrain issues.

- Unusually high ammonia levels have recently been measured in the source water (currently ranging from 1.68 to 2.34 mg/L). In response, the system has switched to disinfecting with free chlorine.

- Ammonia is not currently being added and free chlorine is being used for disinfection; however, the system typically chloraminates. Systems that add ammonia should have a Monitoring Plan with Alert and Action Levels. A template for the system's use is enclosed.

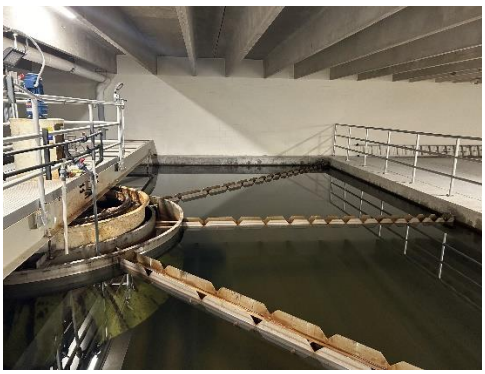
- Humid/damp conditions are reportedly an issued in the water treatment plant basement. A new dehumidifier was just purchased by the system but not yet installed. Dehumidification should be provided in areas where excess moisture could cause hazards for operator safety, or damage to equipment.

- Fluorosilicic acid is stored in an isolated area of the basement and within secondary containment but is not in a separate room. Consideration shall be given to providing a separate room for fluorosilicic acid storage and feed. [Recommended Standards for Water Works 5.4.7]

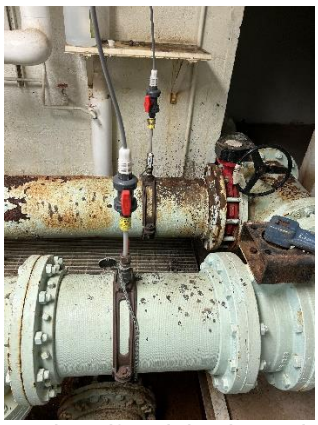
- Recommended Standards for Water Works 5.1.11.c recommends that the day tank for the chemical solution should not contain more than a 30-hour (pump time) supply of solution.

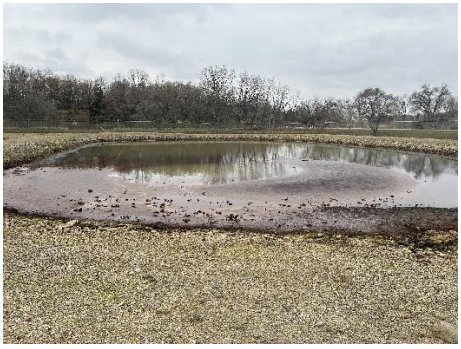
- A chlorine gas detector was added to the chlorine gas room in May 2023. There is also an automatic shutoff in the event of a leak.

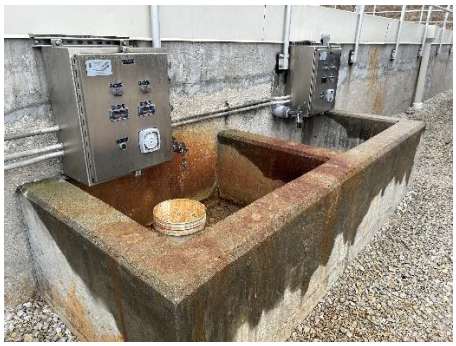
- The system was issued NPDES Permit #2038003 in 2020. At the time of the survey, equipment was staged on site for sludge removal and subsequent land application. There was no remaining freeboard on either lagoon. In the east lagoon, there was so much sludge that it was higher than the water level (see photo below). Lagoons used for the removal of chemical sludge, backwash, or regeneration water must be maintained in good condition and such that their integrity is not compromised.

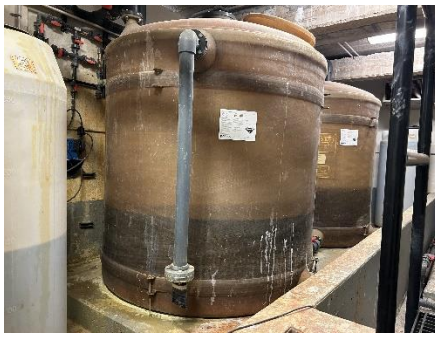

Clarifier on the newer side of the plant.


Fluorosilicic acid bulk and day tanks. Piping and chemical feed lines are clearly labeled.


Ferric sulfate injection point. Piping in need of painting.


East lagoon full of sludge.


Chemical offloading area with secondary containment and labels outside of the water treatment plant.


Chemical bulk and day tanks in the basement. The bulk tanks are too large to remove from the basement and are filled via chemical offloading previously pictured.

3. Distribution System

- Nitrite monitoring in the distribution system was assigned in the Water Supply Operation Permit and must be conducted according to a written Nitrite Monitoring Sampling Plan. Nitrite monitoring locations must be selected based on conditions within the distribution system that present the greatest risk for nitrification to occur. Consider areas of the distribution system with decreased flow, higher HPC (your lab can run these), increased temperature, and increased customer complaints. Age of pipe can also be a factor as older pipe may have a greater disinfectant demand that can result in nitrification. Reductions in pH and alkalinity can also be a symptom of nitrification; chloramine residuals decay more slowly at pH values above 8.5. Please develop a Nitrite Monitoring Sampling Plan and make it available during sanitary surveys.

- There shall be no connection between the distribution system and any pipes, pumps, hydrants, or tanks whereby unsafe water or other contaminating materials may be discharged or drawn into the distribution system. It is recommended that the system conduct annual inspections to identify cross-connections within the distribution system. The EPA's Cross-Connection Control Manual (available via the internet) may be helpful in establishing an inspection program. [Recommended Standards for Water Works 8.10.1]

- The minimum size of water main which provides for fire protection and serving fire hydrants shall be six-inch diameter. The minimum size of water main in the distribution system where fire protection is not to be provided should be a minimum of three inch diameter. When fire protection is provided, it should be limited to segments of the distribution system that are served with adequately sized piping between the point of use and the treatment plant and in accordance with the requirements of the State Insurance Services Office. [Recommended Standards for Water Works 8.2.2 and 8.2.3]

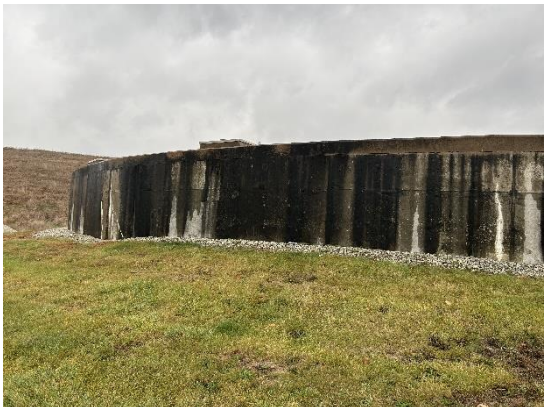
- Lead service lines and lead goose necks have been identified in the distribution system; these sources are known to be one of the major contributors to high lead levels in finished water delivered to customers. Efforts should be taken to replace these as they are discovered. The City has recently implemented a policy such that if a service line develops a leak and it is discovered that the service line is lead, then it must be replaced.

- The flushing program has been temporarily suspended due to the water shortage.

4. Finished Water Storage

- The West elevated storage tank (EST) had an exterior pressure wash in 2021 and the interior was sand blasted and painted in 2022. Roof repairs were completed on the Center EST in 2023 after both the interior and exterior were sandblasted and painted in 2020. Both towers were last inspected in 2023.

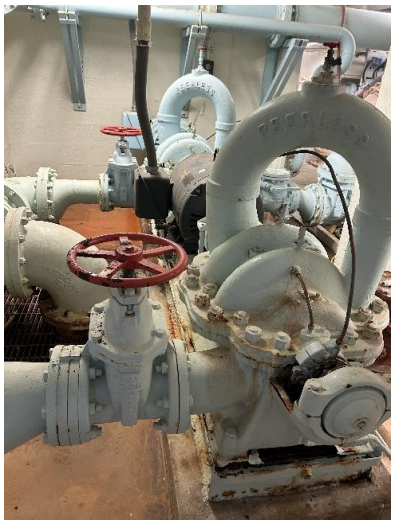
- Each manhole on a ground level or flat roof structure shall be elevated at least 24 inches above the top of the tank or covering sod, whichever is higher. [Recommended Standards for Water Works 7.0.8.2] The manholes are not 24 inches above the top of the GSR tank. The next time modifications to this water storage structure are completed, these access manholes must be brought up to this construction standard.



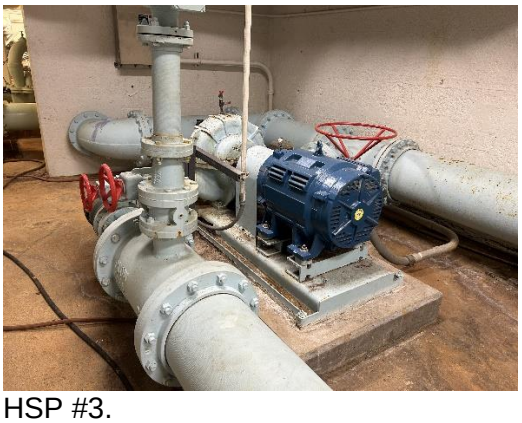
GSR just west of the water treatment plant.

5. Pumps, Pump Facilities and Controls

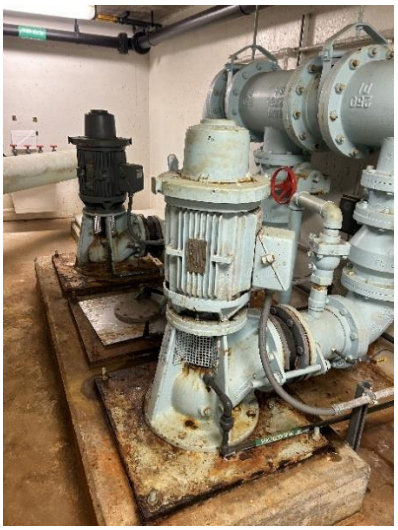
There are three transfer pumps on each side of the plant. Transfer pump #5 has been temporarily removed and is out of service until it can be replaced. Only two of the three high service pumps (HSP) were operational at the time of the inspection. HSP #1 was out of service during the previous sanitary survey as well. Replacement of this pump is planned. Variable frequency drives were added to HSPs #2 and #3 in 2020.



HSPs #1 and #2.



HSP #3.



Transfer pump #5 removed.

6. Monitoring, Reporting and Data Verification

- Free and total chlorine residuals were measured at 208 W Jefferson St. (Osceola Water Works). Free chlorine was measured at 2.7 mg/L and total chlorine was measured at 3.3 mg/L, which is adequate.

- The primary benefit of the Drinking Water Area-wide Optimization Program (AWOP) is improved performance of drinking water treatment plants, which increases protection against waterborne disease. The Iowa DNR has adopted sedimentation and filtration optimization goals. Water systems are encouraged to formally adopt these goals to optimize the settling and filtration processes which will provide additional public health protection benefits for these key treatment barriers. Additional information regarding AWOP may be found at https://www.iowadnr.gov/environmental-protection/water-quality/water-supply-engineering/optimization-program-awop. Questions regarding AWOP should be directed to your field office or the AWOP core team at 515-725-0278.

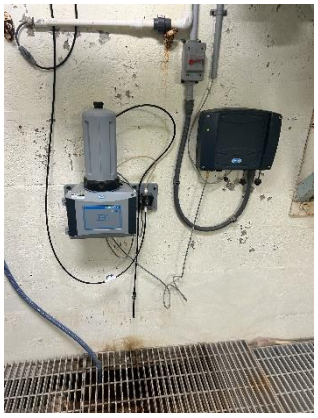
- The Iowa DNR completes the optimization assessment spreadsheet for the previous calendar year for this water system. However, it is recommended that the water system perform their own data entry to more readily assess optimization performance.

- According to the results of the 2022 optimization assessment spreadsheet, the optimization goal for individual filters is not currently being met at this facility. It is recommended that water systems optimize the filtration barrier to prevent particle breakthrough and the potential for microbes to enter the water supply. Several tools are available for water system use in optimizing surface water treatment; contact your field office or the AWOP core team at 515-725-0278 for more information.

- It is recommended that the procedures for manual operation, including a regular schedule for exercising and ensuring operator's competence with the manual override systems, be included in facility operation plans. [Recommended Standards for Water Works Policy Statement]

- During this sanitary survey lead and copper results for the last several monitoring periods were reviewed. One site on the 2021 results (217 W Jefferson) was not listed in the lead and copper sampling plan as a sampling site or alternate site. For any lead and copper monitoring site which was not sampled during previous monitoring periods, subparagraph 567 IAC 42.4(2)”a”(1)5 requires systems to submit within the first ten days following the end of each applicable monitoring period an explanation of why sampling sites have changed. Please submit the Change of Sample Site Form. Efforts must be made to ensure sample locations used during the next monitoring period in 2024 meet requirements of the Lead and Copper Rule.

- The water treatment plant only has one display screen for multiple TU5300sc’s. The screen can be moved around and the monitoring results are visible on the SCADA display screen in the office area of the plant; however, operators are not able to easily view the results of continuous turbidity monitoring while in the plant. It is recommended that additional display screens be installed.



TU5300sc with no display screen.

- A treatment technique violation was issued in April 2021 after disinfectant residuals were measured less than the minimum required concentrations (1.5 mg/L total, 0.3 mg/L free) for more than four hours. It was determined that source of the problem was the underground ammonium sulfate feed line between the water plant and the GSR. Repairs were made to address the issue and public notice was conducted.

7. Water System Management and Operations

- Osceola Water Works has enacted its water conservation policy due to the drought conditions in Clarke County and limited source capacity. Initially, voluntary conservation measures were recommended but the system has progressed through the stages of its plan as the drought has persisted. Starting in December 2023, base allocation of water for residential and commercial/industrial/institutional purposes will be restricted. Extensive public outreach has been conducted.

- Cybersecurity is important and the Iowa DNR will remain a conduit of information between the EPA, CISA, and Iowa's local water operators and systems. The following resources are available for cybersecurity assistance: Cybersecurity & Infrastructure Security Agency's Free Cybersecurity Services and Tools webpage (https://www.cisa.gov/resources-tools/resources/free-cybersecurity-services-and-tools?utm_medium=email&utm_source=govdelivery); EPA's Cybersecurity for the Water Sector webpage (https://www.epa.gov/waterresilience/epa-cybersecurity-water-sector?utm_medium=email&utm_source=govdelivery); and EPA's Free Cybersecurity Evaluation Program, which will conduct a cybersecurity assessment for PWSs. The assessment will follow the checklist in the guidance on Evaluating Cybersecurity at Public Water Supplies which will then generate a report that will highlight gaps in cybersecurity (https://www.epa.gov/waterresilience/forms/epas-water-sector-cybersecurity-evaluation-program?utm_medium=email&utm_source=govdelivery).

- There has been some staff turnover recently, especially on the distribution side of the water system. An adequate number of sufficiently trained and knowledgeable staff must be provided to ensure the technical capacity of the water system. [567 IAC 81]

8. Operator Certification Compliance

There are no deficiencies or recommendations to report based on observations made at the time of this survey.

Summary of Significant Deficiencies

There are no significant deficiencies to report based on observations made at the time of this survey.

Summary of Minor Deficiencies

There are no minor deficiencies to report based on observations made at the time of this survey.

Summary of Requirements

1. Ensure an adequate quantity of water is available to meet the maximum projected water demand of the service area. [Recommended Standards for Water Works 3.0 and 3.1.1]

2. Maintain the lagoons used for the removal of chemical sludge, backwash, or regeneration water in good condition.

3. Develop a written nitrite sampling plan.

4. Ensure an adequate number of sufficiently trained and knowledgeable staff to ensure the technical capacity of the water system. [567 IAC 81]

Summary of Recommendations

1. Periodically inspect and perform the necessary maintenance on the intake structure.

2. Provide dehumidification in the treatment plant.

3. Ensure day tanks for the chemical solution contain no more than a 30-hour (pump time) supply of solution. [Recommended Standards for Water Works 5.1.11.c]

4. Isolate fluoride chemicals from other chemicals to prevent contamination. [Recommended Standards for Water Works 5.4.7.a]

5. Ensure water mains are sized appropriately where fire protection is provided. [Recommended Standards for Water Works 8.2.2 and 8.2.3]

6. Conduct annual inspections to identify cross-connections within the distribution system. The EPA's Cross-Connection Control Manual (available via the internet) may be helpful in establishing an inspection program. [Recommended Standards for Water Works 8.10.1]

7. Develop a written Standard Operating Procedures (SOP) for coagulant addition.

8. Develop a Monitoring Plan with Alert and Action Levels for the development of nitrification.

9. Install additional TU5300sc display screens.

10. Include procedures in the facility operation plan to regularly exercise manual override systems. [Recommended Standards for Water Works Policy Statement]

11. Adopt optimization goals for the water treatment plant.

12. Use the Optimization Assessment Software each month to more readily assess optimization performance.

13. Evaluate filtration process controls to optimize plant performance and maximize public health protection.

14. Elevate each manhole on a ground level or flat roof structure at least 24 inches above the top of the tank or covering sod, whichever is higher. [Recommended Standards for Water Works 7.0.8.2]

15. Cyber-attacks against public water systems are increasing. Implementing basic cyber hygiene practices can help your utility prevent, detect, respond, and recover from cyber incidents.

Summary of Reminders

1. Efforts should be taken to replace lead service lines and lead goose necks as they are discovered.

2. Complete the lead service line inventory and submit it to the Iowa DNR by October 16, 2024. Questions regarding the inventory may be directed to leadserviceline@IAMU.org.