



October 5, 2023

Subject: 2023 Audit of Private Fire Service Report

Dear Board of Trustees:

On May 22, 2023, KWD issued a “Do Not Drink” order to all customers because of a backflow event introducing firefighting foam into the distribution system. Since then, staff has worked diligently to understand the causes of the backflow, and corrective actions needed, as well as auditing all fire service accounts to identify the risks of this type of event occurring again.

The attached report summarizes the findings of the audit, corrective action taken, and corrective action still needed. The audit identified two other locations (out of 196 fire service systems) with the same vulnerabilities as the site of the May 22, 2023, backflow event. While 68 fire services need modification to meet KWD’s current standards, we have been able to definitively determine KWD does not have a systemic unprotected cross-connection issue.

KWD staff demonstrated dedication throughout this challenging period. Their commitment to ensuring the delivery of high-quality water to our customers is a testament to their passion and exceptional professionalism. We are fortunate to have such a talented and resilient team.

Our customers have shown patience and understanding during this inconvenient period. Providing safe drinking water is an essential service, and we are grateful for the trust our customers place in us. Their support and feedback have been inspiring us to continuously improve and enhance our services. As always, we remain committed to providing the safest and highest quality water possible.

The local fire departments have been extremely supportive in our efforts to safeguard our drinking water supply. We have kept regular communication with them, sharing the progress of our inspections. Their partnership and expertise are crucial to ensuring the safety and resilience of our water system.

This backflow event has not only tested our response preparedness but has also provided us with an opportunity for learning and improvement. While this event did expose weaknesses in our processes, we will apply the lessons we have learned and make the necessary changes to enhance our operational procedures and to improve backflow prevention in our system.

In closing, we thank you for your continued leadership, support, and trust in our organization. We look forward to continuing our mission of providing high quality water to our customers and communities for the protection of public health and safety.

Sincerely,

Benjamin LaPlante

Benny LaPlante, Service Manager

Ec. Roger Crouse, General Manager

Kennebec Water District
2023 Audit of Private Fire Service Compliance Report
October 5, 2023

Introduction

Because of a May 2023 distribution system contamination event from an unprotected fire service connection, Kennebec Water District (KWD) staff conducted an audit of all fire services. This report summarizes KWD's effort to understand the cause of the contamination, risks of future contamination, and steps needed to protect our water quality. The goal of the audit, and subsequent corrective actions, is to protect public health and safety by ensuring properties with fire protection systems comply with KWD backflow prevention requirements.

Backflow prevention is a critical aspect of drinking water systems to prevent the unwanted reversal of water flow from a non-potable (non-drinkable) water supply, into a potable (drinkable) water supply. Backflow can be caused by internal plumbing pressure exceeding distribution system water pressure (back-pressure) or when there is a loss in pressure in the distribution system (back-siphonage). Backflow can be prevented with the use of backflow prevention devices which contain check-valves that allow water to flow in one direction only. The backflow prevention devices needed for fire suppression systems are required to be tested initially, and at least annually, by a certified tester, to ensure proper functionality. Results are reported to the water system by the testers and tracked for compliance.

Do Not Drink Order

On May 22, 2023, a Do Not Drink Order was issued for the entire KWD water system due to the presence of firefighting foam in the water. The foam was introduced into the water system when the Waterville Fire Department was fighting a fire at 60 Elm Street in Waterville. The fire department pumped water and foam into the building's fire system at a pressure exceeding the water pressure provided by KWD resulting in a "back pressure" event. Unfortunately, there was no backflow prevention device installed on the fire service. Consequently, foam and water flowed into KWD's distribution system.

Because of the contamination in the system, KWD staff was uncertain about the safety of the drinking water and subsequently issued a "Do Not Drink" order for the entire water system.

After the contamination was flushed out of the system, and testing demonstrated the water was again safe to drink, KWD staff began evaluating the cause of the event and developing a plan to audit the fire service connections throughout the system.

Cross Connection Control Policy

A Cross-Connection Control Policy is a documented set of procedures and requirements established to protect a water supply from contamination due to backflow. Prior to the May 22, 2023, event, KWD's policy had the following unrecognized exemption for services installed prior to June 30, 1987.

Sprinkler policy: Fire services or life safety systems installed or modified after June 30, 1987 having fire department connections must be protected by at least an approved double check device.

KWD updated the Cross-Connection Control Policy in July 2023 removing this exemption, thus requiring all fire services to be protected with a testable backflow prevention device regardless of the installation date.

Two years prior to the May 2023 event, KWD made improvements to the internal process of reviewing new services and existing service renovations. This process allows staff to collaborate on information and requirements for each of these services, ensuring that they are not activated until all critical requirements, including backflow prevention, have been met.

Auditing Fire Service Accounts and Connections

To understand the extent of the risk to the distribution through fire service connections, KWD staff conducted an audit of fire service accounts and connections through a review of existing records, meeting with fire departments, and an on-site inspection of each fire service connection.

1. File review – Using data in KWD’s billing and backflow tracking systems, KWD staff generated a complete list of all fire private service accounts and the associated backflow prevention information. One hundred and ninety-one private fire accounts were identified. Twelve accounts were related to hydrant only private fire services. These “private” fire hydrants are located outside of the public road rights-of-way. After removing these “hydrant only” accounts, there were 179 accounts needing onsite inspections.
Through KWD’s backflow preventor tracking database, staff estimated that 84 private fire service accounts were submitting results of annual backflow prevention device testing to KWD (well short of the 179 know accounts).
2. Meetings with fire departments- Meetings were held with local fire departments to share information about fire service accounts, understand firefighting practices, discuss upcoming inspections of services, and plan ongoing communication. Fire departments were eager to partner with KWD in this effort to understand and reduce cross-connection risks. Regular updates of onsite inspections were provided to the fire departments.
3. Onsite inspections- To ensure an accurate understanding of all private fire service connections, an onsite inspection of each account was conducted. Some accounts had more than one fire service system and four new accounts/systems were identified through the inspection process. Consequently, staff from KWD’s Service Department inspected a total of 196 fire protection systems. Based upon these inspections, fire service systems were categorized in one of the following categories:

- Fully Protected – Locations where a testable backflow prevention device is installed on the water service.
- Partially Protected – Locations where a non-testable backflow prevention device is installed on the water service.
- Unprotected – Locations having no backflow prevention device installed.

Inspection Summary

KWD employees inspected 196 fire protection systems. Local fire departments were provided with results throughout the project. KWD customers were very understanding and gracious to our need for accessing their premises to complete these inspections. The inspections revealed the following findings:

Type of Fire Service System	Total Number
Fully Protected: Testable backflow prevention in place.	126*
Partially Protected: Non-testable backflow prevention device in place.	68
Unprotected: No backflow prevention in place.	2

* The fire service connection at 60 Elm Street has been modified and fully protected since May 28, 2023, and is included in the “Fully Protected” count.

Corrective Actions

Unprotected services have been prioritized as these connections pose the highest risk to the system. Fortunately, there were only three unprotected connections in our system. The fire department was notified so they may attempt to use alternative methods of firefighting to minimize the potential of contaminating the water system through back-pressure. The following is a summary of the three services.

- Property #1: 60 Elm Street in Waterville, where the backflow event occurred, is now protected with a testable backflow prevention device. This installation occurred on May 28, 2023.
- Property #2: The owner and maintenance personnel of this facility have been notified of the high-risk situation. Per KWD requirements, they are currently working with a contractor for the installation of a testable backflow prevention device. The installation is anticipated by October 31, 2023.
- Property #3: This property is vacant, and the fire system service line valve has been closed.

Partially Protected services, those with non-testable backflow prevention devices, are considered medium-risk connections. Without testable backflow prevention devices, there is no way to verify the device is working properly. Starting in October 2023, KWD will notify customers with partially protected services of the requirement for installation of a testable backflow prevention device. Customers must confirm receipt of the notification and submit plumbing upgrade plans, including the estimated installation date, for KWD review and approval within two months. Customers will be given nine months to complete the work, including inspection by KWD staff.

Fully protected services are low-risk connections and will be monitored regularly as part of KWD's Cross-Connection Control Policy. These services are protected with testable backflow prevention devices that are tested initially and at least annually by a trained and certified tester. Testers submit results to Aqua Backflow (KWD's third-party vendor) for compliance tracking.

Through our inspections, we identified 35 fully protected services which had not been submitting annual backflow prevention device testing reports. We have notified the testing companies of the missing reports and will be tracking annual testing compliance. We also identified several data tracking issues associated with accounts with multiple backflow devices.

Inspection efforts also revealed billing errors including several active fire services not receiving quarterly billing and two services that were being overbilled. These billing errors have all been rectified.

As already noted, process improvements implemented in 2021 require review of new and renovated services by KWD staff, ensuring that services are not activated until all requirements are met. We are committed to protecting the water system, our customers, and addressing billing discrepancies to provide accurate billing.

Conclusion

The backflow event of May 22, 2023, revealed a vulnerability in KWD's effort to consistently protect public health. While most of the fire services are appropriately protected, through the completion of the audit of fire services, KWD has been able to accurately assess the risks and identify needed corrective actions. Only one unprotected fire service remains, and the owner of that property is actively working to install proper backflow prevention by the end of October 2023.

Sixty-eight fire services were determined to be partially protected. KWD will be working with these property owners to have their backflow prevention devices properly upgraded over the next nine to 12 months.

Through the audit, several billing errors were identified which have been fully addressed.

KWD's internal process for reviewing new or upgraded services was enhanced more than two years ago to ensure the services are fully in compliance with all of KWD's requirements. KWD's ongoing review of backflow prevention device testing results will ensure fire services remain in compliance with KWD's cross-connection control policy.

Sincere thanks go to our staff, customers, communities, and local partners for their help, patience, and understanding. Ensuring the safety and protection of the water system is vital to KWD's mission. The ongoing diligence of KWD's staff, and continued partnerships with local municipalities and fire departments will help KWD continue to provide high quality water to our customers and communities for the protection of public health and safety.