Below is a list of potential remedial action items in alignment with AWWA and as recommended by the District.

* For the Remedial Action Plan submittal, as required by the District, please select action items that the Utility plans to pursue along with a goal completion date.

If District assistance was provided, further discussion on suggested remedial action items can be found in Section 7 of the Water Audit Report.

**Preliminary Loss Control Measures**

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|  | **Category** | **Action Item Description** | **District Recommended** | **Utility****Acceptance** | **Goal Completion Date (required)** |
| **Data Validity** | **Source Meter Accuracy** | Conduct detailed annual field testing and calibration to assess the accuracy of the supply/interconnect meters in accordance with AWWA *M6 Manual of Water Supply Practices.*  |  |  |  |
| **Billed Authorized Consumption** | Conduct sample testing of customer meters by cohort to assess overall customer meter accuracy in accordance with AWWA M6  |  |  |  |
| **Customer Billing System** | Analyze the customer billing system to identify deficiencies in the data handling process resulting in apparent losses. Flowchart the data handling pathways to perform this analysis.  |  |  |  |
| Gather basic customer account demographic data, including number of meters by meter size, customer type, and consumption ranges.  |  |  |  |
| Implement written policies and procedures for activation of new billing accounts, zero read meters, and overall billing operations management. |  |  |  |
| **Unbilled Authorized Consumption** | Refine policies and procedures for various unbilled authorized usages including water main flushing; firefighting and training; stormwater, street, and sewer cleaning; and construction uses. Methods are available for better estimating water use for these purposes if metering is not feasible.  |  |  |  |
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| **Short Term Loss Control Measures (6 months to 1 year)** |
| **Category** | **Action Item Description** | **District Recommended** | **Utility****Acceptance** | **Goal Completion Date (required)** |
| **Unbilled Authorized Consumption** | Meter all flushing uses where possible. Record estimates of flushing volumes when metering is not feasible. |  |  |  |
| Track hydrant flow testing volumes either by metering or estimating by written log. |  |  |  |
| Record volumes used for stormwater, street, sewer cleaning, etc. |  |  |  |
| **Apparent Losses** | Ensure the meters are properly sized. Use the compiled list of basic customer account demographics. Look for anomalies such as small meters registering large cumulative flows or large meters registering small flows. |  |  |  |
| Ensure all valves for fire services and bypass lines on large customer meter installations are both closed and secured. |  |  |  |
| Confirm the correct meter multipliers used for large water meters and verify the absolute encoder register digits read correctly through any automatic reading equipment. |  |  |  |
| Meter accuracy testing of a sample population of the customer meters with either a calibrated test bench or by bucket testing per AWWA M6. |  |  |  |
| Accuracy testing of large meters (3-inch and larger) with low flow data gaps to quantify recoverable revenue consumption. |  |  |  |
| Ensure all customer classes are captured in reports and that the reporting queries are capturing accurate data from the billing database |  |  |  |
| **Real Losses** | Overnight flow monitoring for background leakage analysis. |  |  |  |
| Ensure prompt response time to know leaks and main breaks. |  |  |  |
| Pressure management to reduce flow rate of leaks |  |  |  |
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| **Long Term Loss Control Measures (1 year to 3 years)** |
| **Category** | **Action Item Description** | **District Recommended** | **Utility****Acceptance** | **Goal Completion Date (required)** |
| **Unbilled Authorized Consumption** | Flushing for water quality reduction  |  |  |  |
| Unidirectional Flushing (UDF) for water quality improvement |  |  |  |
| Consider shifting public works use to metered and billed consumption |  |  |  |
| **Apparent Losses** | Complete an initial third-party billing audit to confirm the validity of the systematic and reporting loss category |  |  |  |
| Annual meter survey of customer meters to directly assess the potential financial and water loss benefits of the meter replacement program |  |  |  |
| Conduct an account audit to verify that all customers are accounted in the billing system |  |  |  |
| Implement SOP for routine large meter accuracy testing. |  |  |  |
| Confirm that credit adjustments to customer billing system do not corrupt or alter true consumption volumes. Separate billed consumption from actual consumption. |  |  |  |
| **Real Losses** | Deploy a leak detection program for proactive leak repair |  |  |  |
| Establish a work order system that tracks and reduces time to repair of identified leaks  |  |  |  |
| Conduct reoccurring visual inspection of AMR/AMI customer meters, drain/clean meter boxes, etc. |  |  |  |
| Infrastructure Renewal and Replacement |  |  |  |

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Utility Representative Date