

## NORTH MARSHALL WATER DISTRICT WATER LOSS STRATEGY

North Marshall has or is in the process of implementing the following to address the excessive system water loss:

1. Either replace or test the customer meters remaining in the system due for testing under PSC regulations. Accurate metering is essential for water loss computations. *The district has replaced approximately 3,200 residential meters and is in the process of testing the remaining 5/8" X 3/4" residential meters in the system. The district has recently completed 75% or more of the testing for larger meters and is working to complete this work in the next couple of months.*
2. Replace or calibrate all plant and production meters. *This work is being completed with the testing outlined above.*
3. Improve accounting for non-metered water use. Work with our local fire departments to improve their record keeping, improving the way we are tracking system flushing and improving our measurements of use within our treatment plants and distribution system when we have main breaks. *We have created forms that are in our cloud-based asset management system to track our water used in our flushing program and to quantify the amount of loss associated with main breaks. We are working with fire departments to improve reporting.*
4. Develop and measure water use in zoned areas. Water loss will be calculated on a zoned basis. Trending will be initiated by tracking water sales versus water pumped into metered zones. The data points will be used to prioritize leak detection study areas. *We are working on a strategy to implement this measure. Funds will have to be budgeted to address the expense associated with the installation of zoned meters.*
5. Recover District's monitoring meters previously installed in zoned areas. Prepare for monitoring during low water use periods to identify and prioritize areas with leaks. *A number of these meters have been recovered and are being identified in our asset management system.*
6. Clean valve boxes and operate all valves. Further isolation of areas by valving off a portion of the system will be used to further isolate problem areas during off period monitoring. *This program was initiated early this year and is currently in stand-by until fall when we anticipate our corrective maintenance needs will subside.*
7. Continuously monitor SCADA system tank elevation reports daily to verify proper cycling and absence of overflows. Incorporate alarm level for high water in tank reaching or exceeding the overflow elevation. *This has been implemented.*
8. Check, inspect and document all inactive meter settings in asset management data set. *Need to implement*

9. Perform night-time observation of monitoring meters identifying zones with potential leaks being careful to log observations in asset management database. *Plan to implement in the fall.*
10. Use monitoring and zoned metering data to prioritize area for further identifying the location of leaks. Visual inspection and acoustic listening devices will be used to further identify leak sources. Map sources when found. *In progress.*
11. Prepare work orders and repair leaks when discovered. *Individual work orders are prepared and are kept open until repairs are made.*
12. Use asset management database to prioritize main replacement and service line replacement along areas with repair a significant repair history. Include deteriorated areas in recommended 10-year capital plan for adjustment. *This has been implemented and incorporated into current plan approved by the Board.*
13. Populate asset management database with data for infrastructure that is replaced. *This has been implemented.*
14. Incorporate water loss reporting and implementation plan progress in staff meetings to communicate success and shifting priorities. *This has been implemented.*

#### Program Effectiveness

The effectiveness of the program will be tracked by our work order system and monitoring billing cycle water loss reports. We anticipate that through implementation of the program we can reduce our water loss to a range somewhere between 15% to 20% within the initial year. Much of the water mains and service lines within the District are beyond their useful life. The system is prone to numerous leaks due to cracked pipe or service tubing. The deterioration of the pipe line materials is noticeable and the plastic pipe in particular is brittle and subject to cracking associated with laying conditions or transient pressures.

*The initial year of implementation of this plan led to an estimated 8% reduction in water loss. A good portion of the improvement was related to improvements in the metering program. The district has an AMR system. Many of the electronic registers were not functioning properly due to dead batteries. The failures occurred simultaneously over a period of a year or so. The district is working to sink funds in a reserve account to be used to replace the registers on an interval that is predictable from previous experience.*

*During 2022, the district completed a major construction project. This project replaced many of the mains that had a history of breaks and leaks. However, it was difficult to log the construction water used for the project. The district is working on procedures to improve the measurement of water used for construction and testing.*

*Water data is being analyzed for seasonal trends. The district suspects we do have some theft of water associated with agriculture practices and filling of pools. The district will continue to work on improvements to reduce water loss.*

