EDMONSON COUNTY WATER DISTRICT

UNACCOUNTED-FOR WATER LOSS REDUCTION & PREVENTION PROGRAM

1. Purpose
   a. The Edmonson County Water District has exceeded the KY Public Service Commission's recommended unaccounted for water loss of fifteen percent (15 %). The goal of the Edmonson County Water District Water Loss Detection and Prevention Program is to assist in monitoring and reducing the unaccounted-for water loss in a manner that will be most economical to the Edmonson County Water District.

2. System Overview
   a. The Edmonson County Water District (ECWD) has two Water Treatment Plants (WTP's) Brownsville WTP & Wax WTP, which together provides retail water sales to approximately eleven thousand (11,000) residential customers and to two (2) wholesale customers, the City of Brownsville and Green River Valley Water District. The distribution system is split into two systems, the Brownsville system and the Wax system. The Wax and Brownsville system are independent of each other, but in times of emergency and high demand one system can supplement the other system if needed. The Wax system utilizes five (5) booster pumping stations, one (1) control valve, and nine (9) storage tanks to furnish water to the distribution system. The Wax system has five 8 individual pressure zones. The Brownsville system utilizes three (3) booster pumping stations, three (3) control valves, and nine (9) storage tanks to furnish water to the distribution system. The Brownsville system has six (6) individual pressure zones. There are approximately seven hundred (700) miles of water mains in the distribution systems, ranging in sizes from two inch (2") to sixteen inch (16"), with various types of pipes. Approximately ninety-five percent (95 %) of the pipe material is PVC and the majority of the remaining five percent (5%) is asbestos cement (AC). There are approximately thirteen-thousand, five hundred (13,500) service lines including the eleven-thousand (11,000) active customers and approximately twenty-five hundred (2,500) vacant accounts. Most service lines are polyethylene (PE) plastic tubing material with less than one percent (1%) being copper service tubing.

   b. Both systems have areas that have transient customers which make it difficult to factor demand in the system on a consistent basis due to not knowing exactly how many customers are using water at any one particular time. These areas are mainly vacation and weekend homes in the Nolin River Lake area. There are multiple areas where the system has been upgraded by installing larger lines paralleling the older smaller lines, and tying the two (2) lines together, therefor utilizing both lines – making leak detection more difficult.

3. Detection & Prevention Procedures
   a. Water Treatment Plant personnel will monitor tank levels for any noticeable change or abnormalities in tank levels and calculate tank losses after midnight daily, and report calculations to distribution personnel.
   b. Water treatment plant personnel shall report any changes immediately to distribution personnel, that in their opinion, could be cause for water loss.
   c. Water treatment plant personnel and the distribution personnel shall compare gallons sold and gallons produced monthly. Keep a record of all plant use, flushing, fire dept. use, other usage, tank losses, line breaks, line leaks, excavation damages, theft and other losses.
   d. Utilizing information collected in (c) fill out the monthly water loss report per Water District policy and governing entities. The water loss reports will be given to the Manager for review and shall be reported to the Board of Commissioners.
   e. All leaks that are reported to the customer service staff, shall be reported to the distribution supervisor and a workorder shall be prepared. All reported leaks shall be investigated. When a leak is determined, distribution personnel will notify KY811 for utility locates. All leaks will be repaired as timely and efficiently as possible. Distribution Personnel shall make decisions when investigating leaks to determine the severity and course of action taken to repair the leak. All emergencies shall be fixed as soon as possible.
   f. The Water District will dedicate two full time employees for leak detection.
   g. Distribution personnel will be attentive to any possible leaks while doing routine work and investigate. When a leak is determined, a work order is to be prepared and notify KY811 for utility locates. All leaks will be repaired as timely and efficiently as possible.
   h. When the need arises distribution personnel will schedule leak detection during hours of low usage. This scheduling will also be coordinated with treatment plant personnel.
   i. Distribution personnel will do inspection of tanks, pump stations, valve, hydrants, meters and parts of the system per the inspection policy of the Water District and governing entities.
   j. Billing Clerks will review meter readings each month, watching for variances (high, low, and no usage). Billing Clerks will check to verify that meters are read in the proper time frame and read as close to the same day of each month as possible.
   k. Meters will be tested and/or changed out according to the Water Districts meter test program.
   l. Treatment plant meters and four-inch (4") meters will be tested annually or more often if a problem arises.
   m. Flow meters that are installed shall be checked daily to check for any variance in flows. Leak detection meters, that are installed at tank sites, shall be utilized to

determine flow in tank zones after midnight and the customer counts are to be used to determine the demand factor for that zone. The portable flow meter will be used to divide the system in to smaller zones, and calculations using customer data shall be used to determine demand factors to help determine whether there is a leak or usage. When there is determined to be a leak in an area, a visual search shall be made of the area. When a leak cannot be located because it is not surfacing, valves, sound loggers, microphone listening leak detectors and portable flow meters will be utilized to find leaks. The Water District will continue to install permanent flow meters at needed sites as funding becomes available.

n. Water used for flushing will be estimated as accurately as possible and recorded on the work order and flushing report logging the time and date.
o. When a leak is repaired, loss shall be estimated as accurately as possible and recorded on the work order and leak report, logging the time and date.
p. After a leak has been repaired, it will be re-checked in two (2) days to ensure that it was correctly repaired and has not started leaking again.
q. Repaired leaks will be recorded and logged on the system map to help determine leak prone areas and assist determinations for the Capital Improvement Plan. Sections will be replaced as required if the cost is more feasible than repairing. Service lines will be replaced after the second leak or sooner if deemed necessary.
r. The Water District has requested help for leak detection from the KY Rural Water Association (KRWA) to train personnel in leak detection and will continue to use their expertise.
s. It is objective of the Edmonson County Water to utilize this program moving forward, and to reach the goal of reducing the unaccounted-for water loss to twenty percent (20%) in the next 18 months.

4. Future Possibilities
   a. The Water District will continue investigating new technologies and methodologies, such as satellite imagery, to enhance the future success of the ECWD Water Loss Detection and Prevention Program.

This Water Loss Detection and Prevention Program is hereby adopted in written form this 24th day of May, 2022.

Jimmy Mills, Chairman

Barry Rich, Secretary-Treasurer