

# **INFRASTRUCTURE IMPROVEMENT PLAN**

**WHITLEY COUNTY WATER DISTRICT #1  
19 S HIGHWAY 25W  
WILLIAMSBURG, KY 40769**

*Prepared by*

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## **TABLE OF CONTENTS**

<b>1.0 INTRODUCTION .....</b>	<b>3</b>
Purpose and Background.....	3
General Facility Information.....	3
<b>2.0 WATER LOSS PREVENTION AND LEAK DETECTION PROGRAM .....</b>	<b>5</b>
Implementation .....	5
Anticipated Timeline .....	5
<b>3.0 PROPOSED IMPROVEMENTS PROJECT.....</b>	<b>6</b>
Description.....	6
Need for Project .....	6
Cost Estimate.....	6
Anticipated Funding .....	6
Anticipated Timeline .....	7

## **ATTACHMENTS**

Attachment A – Water System Maps

Attachment B – Water Loss Prevention and Leak Detection Program

## **1.0 Introduction**

### **Purpose and Background**

The primary purpose of this document is to layout a succinct plan of action with a goal of reducing the Whitley County Water District #1's (WCWD) water loss to an acceptable level below the industry standard of 15%. It is also intended to fulfill item 9.a. in the KY Public Service Commission final order in Case No. 2022-00321 which requires WCWD to file with the Commission "a qualified infrastructure improvement plan".

WCWD's distribution system started with a number of small private community water systems and privately funded and installed extensions that were not installed and maintained in accordance with today's standards and have been prone to excessive leakage. WCWD has obtained funding over the last twenty years to replace and interconnect most of these areas, but some remain in service and are contributing to an unacceptable water loss. In 2020 WCWD put together a proposed capital improvements project aimed at addressing the remaining major areas of concern, but to date has been unsuccessful in obtaining acceptable funding for the project.

In April 2021 WCWD made a purchase water adjustment rate filing (Case No. 2021-00157) with the Commission and in its final order approving the rate adjustment the Commission required WCWD to file an application for an adjustment in base rates. In October 2022 WCWD filed an Alternative Rate Filing application for a rate adjustment pursuant to 807 KAR 5:076 (Case No. 2022-00321). Due to WCWD's unacceptably high unaccounted for water loss, in its final order under that case the Commission authorized WCWD to assess a monthly Water Loss Reduction Surcharge of \$2.76 per meter per month for 48 months, or until \$570,282 has been assessed, whichever comes first, to fund its unaccounted-for water loss reduction efforts. In 2022 the unaccounted for water loss was 36.7% with 30.3% being from line leaks and in 2021 it was 34.2% with 28.3% being from line leaks.

### **General Facility Information**

#### **Facilities**

WCWD purchases water from the City of Corbin via two master meters on the north end of the distribution system, the City of Williamsburg via nine master meters around the periphery of the City's distribution system and McCreary County Water District via one master meter on the west side of Whitley County. WCWD once purchased water from the City of Jellico via two master meters on the south end of the system but ceased purchasing water via them a few years ago due to the high cost of the water plus the unreliability of the source and its

frequent poor quality. In total there are approximately 579 miles of transmission mains varying in size from 2" to 12", four booster pump stations and four storage tanks in the distribution system. The system serves approximately 3,850 customer services.

Hydraulic model maps of the system is included herein in Attachment

## **2.0 Water Loss Prevention and Leak Detection Program**

As part of the filing in Case No. 202-00321 WCWD developed and submitted a Water Loss Prevention and Leak Detection Program outlining processes and procedures that can be conducted on a routine basis to identify and repair water line leaks, identify and monitor un-metered water usage and reduce the overall water loss in the system. A copy of this plan is included herein as Attachment B.

### **Implementation**

The Routine Procedures portion of plan, i.e., Communications, Master Meter reading and recording, Data Analysis, etc., which do not require capital expenditures have already been implemented as have the Leak Detection Procedures.

The less expensive capital improvement items, i.e. internal master meters, portable flow meter, additional by-pass meters, and gate valve replacement will be undertaken and prioritized in that order as funding from the surcharge accumulates.

The most expensive item in the plan, Replacement of Older Transmission Mains, will require major capital funding is addressed further in 3.0 Proposed Improvements Project below.

### **Anticipated Timeline**

With approximately 3,850 active meters, WCWD should be collecting approximately \$10,000 each month from the surcharge. With surcharge collection starting in April 2023, the following schedule of installation of the less expensive capital improvement items is anticipated (subject to change based on results:

Five Internal Master Meters – two in the north portion of the system, one in the east portion and two in the southern portion – by October 1, 2023.

Portable flow meter by November 1, 2023.

Additional By-pass meters December 1, 2023 through June 1, 2024.

Gate valve replacement July 1, 2024 through April 1, 2027.

### 3.0 Proposed Improvements project

#### Description

The project will replace old deteriorated often undersized lines in 11 areas of the existing distribution system, extend water service to five unserved areas, extend a transmission main from the City of Williamsburg system to the District's existing distribution system along KY 92 West and install a pressure reducing valve station to reduce the pressures along KY 26 and side roads from Rockholds to Williamsburg. The project will include the installation of approximately 800 linear feet (LF) of 8-inch, 30,350 LF of 6-inch, 35,200 LF of 4-inch and 15,370 LF of 3-inch waterline, one booster pump station, one master meter, one pressure reducing station, and appurtenances such as leak detection (by-pass) meters, gate valves, meters service tubing, etc.

#### Need for Project

The lines planned for replacement are significant contributors to WCWD's unacceptably high-water loss. The transmission main will allow WCWD to replace wholesale water currently being purchased from the McCreary County Water District with wholesale water from the City of Williamsburg at less than half the rate. It is also anticipated that it will reduce the amount of water that has to be flushed in the area to keep the chlorine residual acceptable. The addition of the pressure reducing valve south of Rockholds will permit water to be feed into the area from the Corbin when needed at the same pressure as is normally experience in the area when it is being fed from Williamsburg. Extension into the unserved areas will provide the residents of those areas with a safe potable water source.

#### Cost Estimate

Administrative	\$ 35,000
Legal Expenses	\$ 25,000
Land, Appraisals, Easements	\$ 20,000
Planning	\$ 20,000
Engineering and Inspection	\$ 394,000
Construction	\$3,301,000
Contingency	\$ 330,000
Total	\$4,125,000

#### Anticipated Funding

USDA Rural Development	\$ 3,315,000
KIA Cleaner Water Grants	\$ 810,000

**Anticipated Timeline**

Funding Application Submittal	February 1, 2024
Funding Approval	May 1, 2024
Design and Permitting	October 1, 2024
Construction Start	January 1, 2025
Completion of Construction	January 1, 2026

**ATTACHMENT A**  
**WATER SYSTEM MAPS**



**ATTACHMENT B**

**WATER LOSS PREVENTION AND LEAK DETECTION PROGRAM**

# Whitley County Water District

## WATER LOSS PREVENTION AND LEAK DETECTION PROGRAM

The Whitley County Water District has a distribution system that was originally comprised of a number of community water systems. Over the years, management has obtained funding to replace the aging water pipes in the small communities and combine them hydraulically where geographically feasible. Currently, the Water District purchases water from the City of Corbin via two master meters, the City of Williamsburg via nine master meters and McCreary County Water District via one master meter. In total there are approximately 579 miles of transmission mains, over 3800 customer services, 4 pumping stations and 4 storage tanks. Water loss has been a continuing problem for the Water District partially due to abnormally high water pressures in parts of the distribution system. However, the Water District is committed to allocating a sufficient amount of resources to identify and correct water loss, thus improving its operating efficiencies.

The following plan outlines processes and procedures that the Whitley County Water District will conduct on a routine basis (both in a reactive and proactive mode) to identify and repair water line leaks, identify and monitor un-metered water usage and reduce its overall water loss.

### 1. ROUTINE PROCEDURES (Daily/Weekly/Monthly):

- A. COMMUNICATIONS: Monthly meetings to address the status of water loss by personnel from the office, distribution department and board members are planned to assure a unified team effort to minimize water loss.
- B. MASTER METERS: Read & record all master meter readings throughout the distribution system at approximately the same time each day:
  - Wholesale Master Meters
    1. Corbin #1 on Highway 26
    2. Corbin #2 off of Highway 26
    3. Highway 25 W from City of Williamsburg on U.S. 25 (3-point)
    4. Highway 92 East from City of Williamsburg off U.S. 25
    5. Bank from City of Williamsburg on U.S. 25
    6. Briar Creek from City of Williamsburg
    7. Adkins from City of Williamsburg (Savoy I)
    8. Tackett Creek from City of Williamsburg (Savoy II)
    9. Savoy Road from City of Williamsburg (Savoy III)
    10. George Hayes Road from City of Williamsburg (Savoy IV)
    11. Under-Pass  $\frac{3}{4}$  meter from City of Williamsburg (Old George Hayes)
    12. Highway 92 West from McCreary County Water District

- C. **RECORDING READINGS:** All master meter readings shall be recorded in log books or on spreadsheets. Record readings of both registers on compound meters.
- D. **CONSISTENT METER READING SCHEDULES:** Establish a schedule wherein all customer meters are read at approximately the same time each month to ensure that any inconsistencies are identified and potential service line problems are identified and corrected.
- E. **FIELD PERSONNEL RESPONSIBILITIES:** All distribution personnel (meter readers, service techs, etc.) shall immediately report to their supervisor any identified water leaks, tank overflows, telemetry problems, or other concerns that are presently, or could, result in water leaks or loss. A work order will be generated by the supervisor to address the problem immediately or at the earliest possible time, given the urgency of the problem.
- F. **OFFICE PERSONNEL RESPONSIBILITIES:** All office personnel shall immediately report any customer reported leaks, tank overflows, pressure problems, or other issues to the field supervisor. The office personnel will generate a work order and coordinate with the field supervisor to make a determination as to whether a field crew needs to be dispatched immediately or later, based on the urgency of the problem.
- G. **RECORDING DATA:** Daily and monthly records (via computer data bases, manual logs, or spreadsheets) shall be maintained by appropriate supervisory personnel to record and analyze the following information:
- Daily and weekly master meter readings
  - Pump station run times
  - Estimated water losses from line breaks, tank overflows, hydrant usage, etc.
  - Metered customer water sales by route
  - Other un-metered water usage
- H. **DATA ANALYSIS:** Water purchased and usage data obtained and recorded shall be evaluated and analyzed on a daily/weekly/monthly basis to determine:
- Water production and purchase amounts
  - Metered usage
  - Known un-metered usage
  - Known losses from line breaks, etc.
  - Water loss by distribution zone
- I. **FOCUS ON DISTRIBUTION SYSTEM ZONES:** The Water District's present system has twelve separate zones as determined by the above master meters.
- Master meter readings will be entered into an Excel spreadsheet daily to identify excessive usage that may indicate a water line break.
  - Monthly water loss reports will be compiled for each of the twelve zones.
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- Data analysis will be focused on water usage and loss in each of these major zones in order to prioritize leak detection efforts based on potential water loss in each area.
- J. **METER TESTING AND REPLACEMENT:** Pursuant to PSC regulations, customer meters will be tested and/or replaced on a periodic schedule to ensure that they are registering water accurately.
- Meters are to be tested as follow:
    1. Larger meters (master meters and customer meters 4" and larger) shall be tested on an annual basis.
    2. All 3" meters will be tested every two years.
    3. All 2" meters will be tested every three years.
    4. All 1" and ¾" meters will be tested or replaced new every ten years.
  - All meters will be replaced as warranted.

## **2. LEAK DETECTION PROCEDURES**

- A. **DISTRICT PERSONNEL:** On a routine basis (weekly or bi-weekly, as routine system operations permit), District personnel will be assigned to leak detection shifts after hours (typically 11:00 PM to 3:00 AM). Customer usage is minimal at this time and allows field personnel to go valve to valve (and often meter to meter) with listening devices and detect abnormal flows. Personnel will perform leak detection in those areas with the highest known water loss, based on routine data collection and analysis.
- B. **OUTSIDE CONSULTANTS:** Outside consultants will be utilized as circumstances and funding dictate. The Water District has routinely utilized the services of Kentucky Rural Water (specifically Danny Stinson) in this process and has also utilized the services of Kenvirons, Inc. for leak detection.

## **3. CAPITAL IMPROVEMENTS**

As funding permits, the District will prioritize and acquire/install the following:

- A. **INTERNAL MASTER METERS:** Additional master meters for subsections of the system will be prioritized and acquired in order to more accurately monitor water usage and identify water loss throughout the system.
- B. **BY-PASS METERS:** As funding permits, additional by-pass meters will be installed to further isolate smaller portions of the distribution system in order to more accurately identify and correct water loss problems in specific areas of the system.
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- C. FLOW METER: One of the most important tools in detecting water usage and loss is a portable flow meter. As funds are available, the Water District will purchase one of these units.
- D. GATE VALVES: All gate valves will be exercised as recommended in the Kentucky Division of Water Regulations. Valves which fail to operate properly will be replaced as funding permits.
- E. MAPS: The Water District will maintain updated distribution system maps. Accurate maps depicting line size and location are vital to leak detection.
- F. REPLACEMENT OF OLDER TRANSMISSION MAINS: As noted above, much of the distribution system has been replaced as the original community systems were merged hydraulically. As funding permits, new projects to replace remaining older pipes in the distribution system will be developed.