

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

GRAVES COUNTY WATER DISTRICT'S)	
UNACCOUNTED-FOR WATER LOSS)	CASE NO.
REDUCTION PLAN, SURCHARGE, AND)	2019-00347
MONITORING)	

NOTICE OF FILING

Graves County Water District (“Graves District”) files with the Public Service Commission (“the Commission”) the attached report on the progress of its water loss detection and repair program for the period from October 1, 2019 to September 30, 2020 as required by the Commission’s Order of September 30, 2019 in Case No. 2018-00429.

Dated: January 4, 2021

Respectfully submitted,

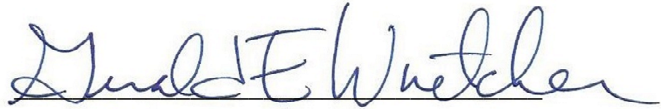


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CERTIFICATE OF SERVICE

In accordance with 807 KAR 5:001, Section 8, I certify that Graves County Water District's electronic filing of this document is a true and accurate copy of the same document being filed in paper medium; that the electronic filing was transmitted to the Public Service Commission on January 4, 2021; that there are currently no parties that the Public Service Commission has excused from participation by electronic means in this proceeding; and that within 30 days following the end of the state of emergency announced in Executive Order 2020-215 this Notice in paper medium will be delivered to the Public Service Commission.

A handwritten signature in blue ink, appearing to read "Gerald E. Wuetcher". The signature is fluid and cursive, with a large initial "G" and "W".

Gerald E. Wuetcher

**ANNUAL PROGRESS REPORT OF GRAVES COUNTY
WATER DISTRICT'S WATER LOSS DETECTION AND REPAIR PROGRAM**

On September 30, 2019, the Public Service Commission (“Commission”) in Case No. 2018-00429¹ authorized Graves County Water District (“Graves District”) to collect a monthly surcharge of \$5.00 per customer for service rendered on and after October 1, 2019 and continuing for 72 months or until the total amount of the surcharge assessed equaled \$1,721,600, whichever occurred first, subject to certain conditions. These conditions included the submission of a yearly report containing a schedule of the estimated and actual progress of Graves District’s water loss detection and repair program and the estimated and actual expenditures made with surcharge proceeds.² The Public Service Commission indicated that this yearly report will be used to evaluate the need for prospective adjustments to the water loss detection and repair program and the authorized surcharge.

This report addresses Graves District’s water loss and detection program for the period from October 1, 2019 to September 30, 2020 (“Review Period”). It compares the results of the program’s first year to the assumptions and estimates contained in Graves District’s program proposal. As it noted in its proposal, the accuracy of the original cost estimates and the program’s results cannot be gauged until the program has operated for a minimum of two years.³ Moreover, the first year of the program faced several challenges, including the initial startup of the program and operating in a global pandemic. Accordingly, no adjustments in the surcharge amount or other program features should be made at this time.

¹ *Application of Graves County Water District for An Alternative Rate Adjustment*, Case No. 2018-00429 (Ky. PSC Sep. 30, 2019).

² *Id.* at 14.

³ Case No. 2018-00429, Supplemental Proposal of Graves County Water District for a Water Loss Detection and Repair Surcharge at 5 (filed Aug. 19, 2019).

Program Implementation

In its Order of September 30, 2019, the Commission directed Graves District to submit a comprehensive unaccounted-for water loss reduction plan that established priorities and a time schedule for eliminating each source of unaccounted-for water loss and provides a detailed spending plan for the surcharge proceeds.⁴ On December 20, 2019, Graves District submitted its comprehensive plan.⁵ Appendix A to this report provides a comparison of the proposed program implementation with actual implementation.

Implementation of the proposed plan is generally proceeding according to schedule. At Graves District's request, through Mayfield Electric and Water System ("Mayfield"), hired in December 2019 a person whose primary assignment will be leak detection.⁶ Although it originally proposed to have two persons assigned to leak detection who would each work 20 hours per week in that assignment, Graves District determined that having one person whose sole duty was leak detection would be more effective and would ensure a greater level of expertise. (Other Mayfield employees will continue to perform leak detection assignments when necessary.) In January 2020, Graves District entered into a lease agreement for a hydro-excavator truck. In May 2020 it purchased a Mikron 3 listening device to better locate leaks. It, however, did not purchase 20 noise logger devices and related equipment as originally proposed. Mayfield agreed to purchase the devices and to share the equipment with Graves District at no cost.

Beginning in February 2020, installation of additional magnetic water meters at specific locations throughout its distribution system to establish district metered areas ("DMAs") began.

⁴ Order of Sept. 30, 2019 at 12.

⁵ A detailed spending plan for the surcharge proceeds had been contained in the surcharge proposed submitted in Case No. 2018-00429 on August 19, 2019.

⁶ Graves District contracts with Mayfield for all operation and maintenance services. Mayfield performs these services in consultation with Graves District's Board of Commissioners.

As described in Graves District's proposal, water usage for each DMA is metered with a meter connected to Mayfield's Automated Meter Infrastructure ("AMI"). Mayfield monitors water usage within each zone and can quickly identify excessive water usage in a DMA. Once excessive water usage is identified, leak sensors are deployed in the DMA. These sensors significantly narrow the area in which the leak may be located. The leak detection specialist can then pinpoint the exact leak location and a work crew can be deployed to repair the leak.

In its proposal, Graves District proposed to create 35 DMAs by the end of the second year of the program. As of September 30, 2020, 19 DMAs existed. Currently there are 23 DMAs. Graves District expects to have as many as 53 DMAs in operation by the end of the program's second year. With a greater number of DMAs, water leaks can be detected earlier, and the volume of lost water can be reduced. In addition to the savings from lower water losses, reducing the area to search for a leak through the creation of additional DMAs will also result in lower water loss detection expense since fewer manhours will be spent searching for a leak.

Mayfield, on Graves District's behalf, is currently integrating the new equipment into its AMI infrastructure. The real-time information is being used to assign the leak specialist and other Mayfield employees to locate and repair leaks on Graves District's system. Graves District is continuing to review predictive analysis software with plans to purchase such software in the third or fourth year of the program.

Surcharge Revenue

During the Review Period, Graves District collected \$240,030 in surcharge revenues. Revenues from the surcharge represent only ten months of actual billing and collection. The surcharge first appeared on customers bills in November 2019. Graves District received its first revenues from the surcharge December 2019.

In its proposal, Graves District calculated surcharge revenue assuming 4,781 customers and expected annual revenues from the surcharge of \$286,860. As shown in Table 1 below, Graves District’s customer base exceeded that level. Based upon customer levels as of September 30, 2020, Graves District now estimates annual surcharge revenue of \$290,040 and expects the District to reach the total authorized amount in 71 months, one month earlier than originally estimated. The last month that the surcharge will be billed will likely be September 2025.

Table 1		
Month Collected	Customers Billed	Surcharge Revenue
December 2019	4,779	\$23,890
January 2020	4,813	\$24,065
February 2020	4,794	\$23,970
March 2020	4,796	\$23,980
April 2020	4,793	\$23,965
May 2020	4,774	\$23,870
June 2020	4,783	\$23,915
July 2020	4,816	\$24,080
August 2020	4,825	\$24,125
September 2020	4,834	\$24,170

Overall Expenditures

Table 2 reflects expenditure in the Review Period and proposed expenditures in the program’s second year. It also shows the total amount estimated for each category as set forth in Graves District’s proposal. The text below and Appendix B to this report provide additional details regarding the actual and budgeted amounts.

Table 2					
	Proposed Total	First Year Budgeted	Review Period Actual	Current Year Projected	Revised Total
Establishment of DMAs	\$383,285	\$197,118	\$109,832	\$179,792	\$ 289,624
Hydro-Excavator Truck	\$300,000	\$ 50,000	\$ 52,084	\$ 78,125	\$ 390,623
Purchase of Leak Detection Equipment	\$ 22,825	\$ 22,825	\$ 4,400	\$ 18,425	\$ 22,825
Loss Detection	\$541,710	\$ 90,285	\$ 57,936	\$ 90,675	\$ 511,311
Loss Repair (Labor & Transportation)	\$200,000	\$ 80,000	\$ 28,311	\$ 36,220	\$ 209,410
Total	\$1,447,820	\$440,228	\$252,563	\$403,237	\$1,423,793

Establishment of DMAs

During the Review Period, 19 DMAs were established. Total cost to establish these DMAs was \$100,456, which results in an average DMA installation cost of \$5,288.⁷ In its proposal, Graves District has estimated the cost of a DMA at \$10,951 or approximately \$4,663 more than the average cost to establish a DMA in the Review Period. A significant portion of this lower cost is due to lower than expected meter costs. In its proposal, Graves District estimated the average meter cost to be \$5,295. Graves District has currently been able to procure six-inch magnetic meters with encoder at a cost of \$3,949.50. Additionally, the fifteen percent contingency (or \$1,428) included in the original estimate has so far proven unnecessary. The lower cost of a DMA enables Graves District to install additional DMAs. The construction of 34 DMAs is planned for the current year at a projected cost of \$179,792.⁸

⁷ During the Review Period, Graves District purchased two meters and 10 encoders that were not installed. The cost of these meters was removed when determining the average cost of a DMA. During the review period, Mayfield purchased 27 meters for Graves District. Because of cash flow concerns, Mayfield billed the cost of these meters over a period of several months. The cost of seven meters purchased during the Review Period is not reflected in the Review Period expenses.

⁸ 34 DMAs x \$5,288 per DMA = \$179,792. These cost projections are estimates. Should costs increase, adjustments to the number of installations will be necessary.

Hydro-Excavator Truck

In its proposed, Graves District proposed to acquire a hydro-excavator truck at the estimated cost of \$300,000. Graves District subsequently entered an agreement to lease a hydro-excavator truck. The monthly lease payments on the truck are approximately \$6,510.39. Annual cost of the lease is \$78,125.

Leak Detection Equipment

In May 2020 Graves District acquired at a cost of \$4,400 a Mikron 3 listening device to locate leaks. This cost is equal to the estimated cost contained in Graves District's proposal. Graves District did not purchase 20 noise logger devices and related equipment as originally proposed. Instead it will use similar devices that Mayfield has acquired and agreed to share at no charge. Graves District plans to use the budgeted \$18,425 to purchase pressure sensors and pressure release valve monitors within the next two years.

Loss Detection

Graves District originally proposed to assign two persons to leak detection who would each work 20 hours per week in that assignment. After additional consideration, it determined having one person devote his or her entire attention to leak detection was preferable. Mayfield hired this specialist was hired in December 2019. During the review period, approximately 1,233 regular manhours and 68 overtime manhours were expended on leak detection.⁹ This included not only the leak detection specialist's time, but also that of other Mayfield employees who were occasionally tasked with leak detection assignments. The delay in hiring a leak detection specialist and problematic working conditions created by the pandemic limited the hours for leak detection.

⁹ Mayfield vehicles travelled approximately 7,854 miles in support of leak detection assignments.

Graves District expects that in the current year approximately 2,080 manhours and 13,000 miles of travel will be devoted to the leak detection mission.¹⁰

Loss Repair

In its proposal, Graves District assumed 200 leaks would be located and repaired in the first year of the program, 100 leaks would be located and repaired in the second year, and 50 leaks would be located repaired in each of the remaining four years. It estimated the costs associated with labor and materials to repair a leak at \$400.¹¹ During the Review Period, only 68 leaks were repaired at a cost of \$28,310. This resulted in an average repair cost of \$416.32 per leak. Graves District has used this cost to estimate to budget for leak repair expenses in the surcharge's remaining years. Five hundred leaks are still expected to be located and repaired over the six-year period, but the remaining 432 leaks are expected to evenly over the next five years. Eighty-seven leaks are expected to occur over each of the next five years, resulting in an annual leak repair cost of \$36,220.

Water Loss Results

It is too early to draw any conclusions regarding the success of Graves District's water loss detection and repair program, but initial results appear promising. During calendar year 2019, Graves District reported an unaccounted-for water loss of 34.1 percent. Current statistics for calendar year 2020 are not yet available. During the month of November 2020, however, Graves District report an accounted-for water loss percentage of 21.2 percent. Table 3 compares the water loss for each component of Graves District's system for January 2020 and November 2020. This comparison suggests some improvement.

¹⁰ The expected cost for this work is \$90,675. Labor cost will be \$83,200 (2,080 hours x \$40 per hour). Mileage expense is estimated at \$7,475 (250 miles per week x 52 weeks x \$0.575 per mile).

¹¹ Total leak repair cost = (200 leaks x \$400) + (100 leaks x \$400) + (4 years x (50 leaks x \$400)) = \$200,000.

Table 3		
	January 2020	November 2020
Consumers	34.5	16.9
Fancy Farm	15.0	13.5
Hardeman	27.4	0.4
Hickory	46.7	20.0
Sedalia	16.5	35.1
South Graves	46.0	41.7
Total	38.3	20.8

APPENDIX A

WATER LOSS CONTROL PLAN IMPLEMENTATION SCHEDULE

Action	Original Proposal	Status
Procure Hydro-Excavator	NLT 12/01/2020	Lease Agreement Executed 01/15/2020; Hydro-Excavator in use
Hire Leak Specialist	12/01/2019	Hired 12/01/2019; Because detection activities 01/01/2020
Determine Appropriate Meters for District Meter Areas (“DMAs”)	NLT 02/01/2020	Selected Honeywell Electromagnetic Flow Meter for DMAs 02/2020; purchases began in 03/2020
Establish DMA Sites	Establish 35 DMA sites NLT 12/31/2021	Graves District plans to establish 53 DMA sites NLT 12/31/2021; 23 sites established as of 11/30/2020
Install meter equipment at DMA sites	Install metering equipment at 35 DMA sites NLT 12/31/2021	As of 11/30/2020, metering equipment established at 23 DMA sites
Install Pressure Sensors and Pressure Release Value Monitors	NLT 02/28/2023	No purchase and installation of equipment; reviewing available technology for PRV monitoring; expected purchase and installation NLT 02/28/2023
Establish Internet of Things for interface with advanced metering infrastructure (“AMI”) meters, DMAs, SCADA water tank	Establish NLT 01/01/2021	Interface established; information being received and processed
Establish workflow for DMA information to field crews	Establish NLT 01/01/2021	Information from DMA sites currently being used to determine surveillance areas for Leak Specialist
Establish infrastructure for long-term leak predictive analysis and response	Establish NLT 01/01/2023	Examining predictive analysis software but no purchase as of 11/30/2020
Systemwide monitoring established	12/01/2026	Target Date remains 12/01/2026

APPENDIX B

Total Expenditures:

Labor:	\$ 82,140.00
Materials:	106,865.99
Vehicle Expense:	9,422.00
Equipment:	6,175.00
Hydro-Excavator Truck Lease	<u>52,083.12</u>

Total: \$252,861.76

Labor (Hours:)

Activity	Regular Hours	Overtime Hours
DMA	264	59
Leak Repair	289	49
Leak Detection	1,233.5	68

Materials:

DMA Activity	\$ 91,124.21
Leak Repair	11,341.78
Leak Detection	<u>4,400.00</u>

Total: \$106,865.99

Vehicle Mileage:

DMA Activity	622.0 miles
Leak Repair	946.0 miles
Leak Detection	7,854.0 miles