COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF:

ELECTRONIC APPLICATION OF KENTUCKY-AMERICAN WATER COMPANY FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR INSTALLATION OF ADVANCED METERING INFRASTRUCTURE	)))))	**CASE NO. 2025-00240**

APPLICATION

Pursuant to KRS 278.020(1) and 807 KAR 5:001, Section 15(2), Kentucky American Water ("KAW") requests a CPCN to deploy Advanced Metering Infrastructure ("AMI") throughout its service territory. As support for this request, KAW is providing as attached Exhibit A its comprehensive AMI Plan which includes a cost-benefit analysis of AMI deployment in KAW's service territory. In support of this filing, KAW states as follows:

1. KAW is a corporation organized and existing under the laws of the Commonwealth of Kentucky with its principal office and place of business at 2300 Richmond Road, Lexington, Kentucky 40502. KAW can be contacted by e-mail via the e-mail addresses of its counsel set forth below. KAW was incorporated on February 27, 1882, and attests that it is currently in good standing in the Commonwealth of Kentucky.

2. KAW is a wholly-owned subsidiary of American Water Works Company, Inc. ("AWW") and is engaged in the distribution and sale of water in its Central Division, consisting of Bourbon, Clark, Fayette, Harrison, Jessamine, Nicholas, Scott, and Woodford Counties and its Northern Division, consisting of Gallatin, Owen and Grant Counties. It currently owns, operates and maintains potable water production, treatment, storage, transmission and distribution systems for the purpose of furnishing potable water for residential, commercial, industrial and

governmental users in its service territory. KAW is also engaged in the collection and treatment of wastewater in Bourbon, Clark, Owen, and Franklin Counties.

3. Facts Relied Upon to Show that the Project is Required by Public Convenience or Necessity. 807 KAR 5:001, Section 15(2)(a). See Exhibit A, generally. Exhibit A comprehensively identifies the facts upon which KAW relies showing that AMI is required by public convenience and necessity. It shows all of the metering options KAW considered for its future meter needs and concludes that AMI is the best solution to meet those needs and is the most economically beneficial to customers in the long term. KAW proposes to install AMI-capable metering equipment only when metering equipment is already necessary due to meter failure or in the ordinary course of business through length-of-service ("LOS") replacements. In sum, implementing AMI will benefit customers and improve operational efficiency. As further explained in the Direct Testimony of Krista Citron, the cost-benefit analysis in Exhibit A supports the deployment of AMI.

4. Copies of Required Permits. 807 KAR 5:001, Section 15(2)(b). KAW is not aware of any permits or franchises it must seek for the AMI meter deployment.

5. A Full Description of the Proposed Route, Manner of Construction, and Impacted Utilities. 807 KAR 5:001, Section 15(2)(c). See Exhibit A, Appendix A, Figures 26-28 for maps depicting the proposed locations and deployment timeframes. KAW plans to deploy AMI at all premises in its service territory and will do so by changing out its meters as part of its normal meter changeout process. The deployment will not compete with the facilities of any other utility.

6. Three Copies of Maps of Suitable Scale Showing the Location of the Project. 807 KAR 5:001, Section 15(2)(d)(1). See Exhibit A, Appendix A, Figures 26-28 for maps depicting the proposed locations and deployment timeframes.

7. Plans and Specifications and Drawings of the Project. 807 KAR 5:001, Section 15(2)(d)(2). See Exhibit A, Appendix B for specifications of the selected AMI technology KAW proposes deploying.

8. The Manner in Which KAW Plans to Finance the Project. 807 KAR 5:001, Section 15(2)(e). KAW will fund the AMI project in the ordinary course of business, using the same mix of debt and equity it uses to fund the remainder of its capital investment program.

9. Estimated Annual Cost of Operation. 807 KAR 5:001, Section 15(2)(f). See Exhibit A, Figure 25 for the annual cost of operation for each year of the first 20 years of AMI deployment.

10. Plans, Specifications, Plats, and Reports Sealed by a Professional Engineer. KRS 322.340. See the cover page of Exhibit A which is signed and sealed by an engineered registered in Kentucky. Appendix B to Exhibit A shows the specifications of the selected metering equipment.

11. Direct Testimony. The attached Direct Testimony of Robert Burton (President of KAW), Krista Citron (Senior Manager, Operational Performance for American Water Works Service Company, Inc.), and Justin Sensabaugh (Senior Manager of Operations for KAW) is provided in further support of KAW's Application in this matter.

WHEREFORE, KAW respectfully requests the Commission approve the requested CPCN for deployment of AMI in its entire service territory.

Respectfully submitted,

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BY: ______________________________

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CERTIFICATE

In accordance with the Commission's Order of July 22, 2021 in Case No. 2020-00085 (Electronic Emergency Docket Related to the Novel Coronavirus COVID-19), this is to certify that the electronic filing has been transmitted to the Commission on July 11, 2025; and that there are currently no parties in this proceeding that the Commission has excused from participation by electronic means.

STOLL KEENON OGDEN PLLC

By______________________________

Attorneys for Kentucky-American Water Company

EXHIBIT A

ADVANCED METER INFRASTRUCTURE PLAN

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KENTUCKY-AMERICAN WATER COMPANY

ADVANCED METERING INFRASTRUCTURE PLAN

Executive Summary

Kentucky-American Water Company ("Company" or "KAWC") is seeking a certificate of public convenience and necessity ("CPCN") to deploy advanced metering infrastructure ("AMI") cellular meter reading devices throughout its service territory because it is the right thing to do for its customers.

There is a demonstrated need.[1] KAWC will install AMI-capable metering equipment only when metering equipment replacement is already necessary – either at the time the existing meter must be replaced due to meter failure or in the normal course through length of service ("LOS") replacements. AMI will allow the Company to provide the level of service customers have come to expect from KAWC, and other utilities in Kentucky.

There is no wasteful duplication. Because AMI will replace existing meters no longer deemed appropriate to provide service to customers, their installation will not constitute wasteful duplication as it does not create "excess capacity over need" and it is neither an "excessive investment relative to productivity or efficiency" nor an "unnecessary multiplicity of physical properties."[2] Instead, replacing those meters in the normal course of operations is required for the continued provision of water service to KAWC's customers.

There has been a thorough evaluation of alternatives, and the Company continues to believe that AMI is the appropriate meter solution for its customers.[3] American Water Works Service Company, Inc. ("Service Company") completed both a metering request for information ("RFI") and a request for proposals ("RFP") process to evaluate metering options enterprise-wide, including for the benefit of KAWC and its customers.

A cost benefit analysis ("CBA") has been completed. Over the course of the first two replacement cycles, using AMI vs. AMR technology is expected to cost $27-33M in capital and produce $29M in quantitative benefits. When annual capital related expenses are netted against annual operating expense benefits, AMI is the least cost solution in the long term. AMI also provides both customer and operational benefits beyond those which can be quantified in the CBA and should not be discounted. When examining the underlying net present value by AMR and AMI, based on average pricing, the result between the two technologies is $3.6mm over 20 years, or approximately $180k per year. For context, this is just over $1.29 per customer per year (roughly $0.11 per month for an average residential bill).

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[1] "[A] determination of public convenience and necessity requires both a finding of the need for a new service system or facility from the standpoint of service requirements, and an absence of wasteful duplication resulting from the construction of the new system or facility." *Kentucky Utilities Co. v. Pub. Serv. Comm'n*, 252 S.W. 2d 885, 890 (Ky. 1952).

[2] *Kentucky Utilities Co.*, 252 S.W. 2d at 890.

[3] While the Kentucky Public Service Commission ("Commission") previously rejected the Company's application for a CPCN for AMI, the Company believes that AMI continues to be the right solution for its customers and this AMI Plan will demonstrate why it is appropriate to approve the CPCN at this time. *See In re Electronic Application of Kentucky-American Water Company for an Adjustment of Rates, A certificate of Public Convenience and Necessity for Installation of Advanced Metering Infrastructure, Approval of Regulatory and Accounting Treatments, and Tariff Revisions*, Kentucky Public Ser'v Comm'n Case No. 2023-00191 (Order of April 9, 2024).

This Exhibit is offered to demonstrate to the Commission that the requirements for a CPCN to transition to AMI have been met and the processes to be utilized to move forward with AMI deployment.

Summary of the Plan

The Company replaces water meters on an LOS schedule unless the meter fails prior to that time and requires replacement. The LOS varies depending on the size of the meters, but for most residential meters LOS is approximately ten years.[4] As KAWC continues to replace aging meters over the next decade, the Company proposes to begin replacing AMR meters that have reached the end of their LOS with cellular AMI technology in its normal, scheduled, periodic replacement of its existing AMR equipment throughout its service territory. Importantly, unlike some other earlier proposed AMI deployments in the Commonwealth, KAWC is not proposing to accelerate the replacement of its entire meter reading system regardless of its age or condition. Rather, KAWC will transition to AMI technology for meter reading equipment as it completes meter and endpoint replacements in the normal course of business.

The Company's transition to AMI will provide both operational benefits and efficiencies as well as enhanced customer service to customers. The transition to an AMI program will enable strategic and permanent improvements in safety, customer experience, operational efficiencies, and environmental benefits. The Company looks forward to leveraging AMI to empower customers with timely consumption data to enable smart water use choices, enhance customer communication regarding customer water consumption patterns and unusually high-water use, and improve water system operations and management. Implementation of AMI will allow KAWC to realign its business processes and redeploy personnel previously focused on meter reading to other work, as discussed below. To best take advantage of these benefits and efficiencies, it is important that the Company begin deploying AMI as soon as possible because each time an outdated AMR meter is installed at a customer's premises, it places that customer approximately ten years away from being able to take advantage of the benefits of the AMI technology currently enjoyed by other water customers across the Commonwealth of Kentucky.

[4] Other meter sizes have varying LOS schedules as more fully detailed in Figure 3, below.

Overview of AMI Technology

AMI is not a single technology or piece of equipment, but rather an integration of many technologies that will provide KAWC an intelligent connection with its customers. AMI technology creates a network between customer meters and a utility's information system, with data capable of flowing bi-directionally, facilitating automated meter readings and the capture of interval consumption data.

As depicted below, a key difference between an AMI system and an AMR system is in the frequency with which customer meters are read. AMI technology automates meter readings so readings can occur multiple times per day rather than once a month. Because of the frequency of readings, AMI provides customers the ability to view water consumption data within 48 hours of use, and depending on how they are accessing the data, a Customer Service Organization ("CSO") representative can access consumption data in as few as 6 hours. More timely access to this data enables more timely detection of leaks and meter malfunctions.

Components of AMI Technology

There are three primary components to an AMI system – meters, communication modules, and collectors and headend systems. A brief description of each component is provided below:

- ### Meters

AMI uses water meters that include technologies integrated into the meter register. How a specific meter functions to measure the amount of water going through the meter can vary depending on the metering application and the preferred technology of the utility. However, independent of the type of measurement technology used, the meters include technologies that provide backwards flow indicators, tamper alerts and no flow alerts, but as technologies change more alerts will likely be available in the future.

- ### Communication Modules/Endpoints

Communication modules or "endpoints" go by several industry terms, but most are specific to a vendor's technology and marketing literature. Essentially, endpoints are two-way radios that are physically attached to the meter that send and receive data from the headend system. The endpoint communicates with the meter, recording readings, and can communicate data as frequently as 15-minute intervals. Inbound communication functionality of the endpoint allows the device to execute command signals sent from the utility back-office systems. This is useful when upgrading endpoint firmware versions or executing on-demand functionality. The two most dominant technologies used across vendor platforms are a fixed-network based system, and a cellular-network based system (described below).

- ### Collectors and Headend Systems

In an AMI fixed-network system, data is transmitted from the meter's endpoint to a network data collector ("collector"), which is typically mounted on an elevated structure. A single collector can collect data from upwards of 10,000 meters, with each meter reporting one read every 15 minutes, but the number of collectors required to support an AMI fixed-network system can be impacted by the size and topography of the utility's service territory. Typically, the number of collectors needed is determined by conducting a propagation study performed by the vendor of the AMI equipment. This propagation study takes into account signal strength and the acceptable range of endpoints reporting to any collector. Topography and permanent structures can all have a negative effect on signal strength. A cloud-based "Headend System" can aggregate vast amounts of reads from multiple collectors deployed regionally.

In an AMI cellular system, collectors are not required and data travels from the endpoints directly to the headend system. In this case, the network is operated by cellular network providers like AT&T or Verizon. A utility's meter data management system then aggregates meter reads from the headend system/vendor platforms and will normalize and act as the key interface between meter reading and a utility's business transactional systems, such as billing.

As noted above, there are two types of AMI systems:

- **Fixed-Network System** – With fixed-network systems, meter reading is accomplished by endpoints installed on each meter. The endpoints collect real-time water use readings from the meter and transmit them via radio signals to collectors that are owned by the utility. The collectors are physically installed throughout the service area. The collectors relay the collected data to a central location, where the data is organized within a vendor's headend system, then transferred to the utility. Fixed-network systems require the utility to purchase, build and maintain the infrastructure to support the data collection process.

- **Cellular-Network Systems** – With cellular-network systems, cellular endpoints are installed on each meter to transmit the meter data via an existing cellular infrastructure to a central location, where the data is organized within a vendor's headend system, then transferred to the utility. Cellular networks do not require the use of collectors, so unlike a fixed-network system, no new infrastructure needs to be purchased, built or maintained by the utility to support the data collection process in the field.

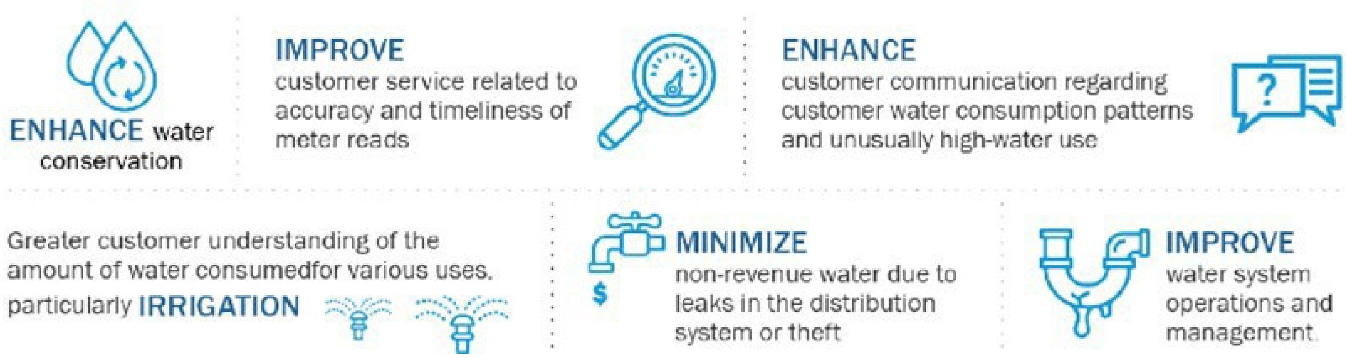
Cellular AMI as the Preferred AMI Technology

The key differentiator of a cellular-network system is the ability to leverage an existing communications network that regularly updates its technology without increased capital costs. Cellular networks are regularly updated to keep up with the latest technologies and provide greater coverage, reliability and security than fixed-network systems. A fixed-network system requires that a utility maintain and periodically update the system, leading to increased and ongoing capital costs. A cellular-network system also provides the following advantages over a fixed-network system:

- gaps in coverage are addressed by the cellular provider;
- ability to leverage robust security programs and cellular connectivity;
- access to the same disaster recovery systems used by emergency services;
- limited ongoing maintenance related to security reviews, hardware refreshers and changes in technology; and
- protections from liabilities related to the physical structure, such as damage caused by storms, security patches, and equipment failures.

Benefits of AMI Technology

The principal objectives for considering transitioning to an AMI system include improving the effectiveness of Company operations and customer service, meeting customers' expectations, as well as increased water conservation. A critical pathway to changing customers' water use behaviors is informing customers about their water in a way that empowers them to make changes.



The implementation of an AMI system can achieve great benefits for the customer and utility operations.

Key Operational and Customer Service Benefits of AMI include, but are not limited to:

- ✓ Safety Improvement: Having employees in the field reading meters creates an exposure to potential injuries and accidents due to potentially unsafe environments, inclement weather, and exposure to vehicular traffic, animals, and the like. Being able to read meters remotely through AMI reduces this potential risk, both for injuries to our employees and injuries and damage to third parties.

- ✓ Customer Service: The implementation of AMI will enhance the Company's existing efforts to increase billing accuracy and reduce the likelihood of estimated bills (e.g., due to weather events, or temporary obstructions of endpoint signals) by automatically providing timely, frequent, accurate reads through the network. In addition, manual re-reads will be reduced through access to real time meter data. AMI technology would also improve the customer experience by identifying issues early and allowing customers to address potential issues on their end in a timely manner, likely reducing the number of high bill complaints and leak adjustments as a result and generally avoiding customer frustration associated with such challenges.

- ✓ Increased Water Conservation: For customers, understanding the scale of individual water use activities can be difficult, especially when provided with only monthly billing statements. This limited insight creates barriers for customers trying to identify inefficiencies or excessive use in their behavior. By providing customers with more granular water usage data (daily, hourly, etc.), customers are empowered to understand and make changes in their habits and behaviors.

- ✓ Affordability: With more timely and consistent visibility into water usage, customers with AMI can proactively take steps to control their water bills. Not only can customers control their everyday water usage behaviors, but they can also use access to timely data to help avoid high water bills. AMI can assist customers with identifying leaks in a more timely manner, which can save customers significant money.

- ✓ Operational Efficiency: AMI data can be used to uncover irregularities that may signal a leak, meter issues, or tampering or water theft. By doing so, the Company can more timely address those issues to further improve its meter reading and bill accuracy, as well as leak detection and non-revenue water reduction efforts. In addition, as AMI technology is deployed, KAWC anticipates reductions in service orders associated with estimated bills and move-in/move-outs that will free up some of the work currently performed by field service representative ("FSRs"). Further, as AMI is deployed, the need to do drive by periodic meter reading will decline and be nearly eliminated altogether upon full deployment, ultimately allowing for the redeployment of meter reading resources to higher value work as well.

- ✓ Customers' Expectations: Today, people live in a world dominated by speed and access to information. For example, if you want to check your checking account balance and transfer funds to your savings account, you can do so immediately using an app on your phone or by logging into your bank account via the internet. If you want to pay your utility bill again, you can quickly do so by logging into your account or calling the utility directly to make payment. Quick access to information is now an expectation, and information related to water service should not be an exception. AMI will enable KAWC to provide its customers with timely access to their water usage, which in turn allows customers to make informed decisions about their service.

- ✓ Redeployment of Resources: While some of the above benefits present opportunities for labor-related efficiencies, these efficiencies are not necessarily anticipated to result in a workforce reduction. Rather, AMI presents an opportunity for KAWC to have affected labor resources refocus their efforts on other high value work, such as achieving meter reading and other service order targets in the near term, accommodating the demands of a growing customer base in the long term, and on a continual basis, seeking operational and customer service improvements.

- ✓ AMI Paves the Way for Future Technological Improvements: Deploying AMI meters allows for the future expansion of features that can be offered to the customers as technology advances, such as real-time customer alerts.

What Does AMI Technology Look Like for Our Customers?

Once AMI is installed for a customer, the frequency of meter readings will increase dramatically. Instead of one reading per month, there can be up to 96 readings per day. With more frequent meters reads more information is available to our customers, our CSOs, and FSRs. For example, leak detection would be available on a near immediate basis instead of after a monthly read and customer service efforts can be proactive instead of reactive if high consumption is observed. In short, the additional information that flows from more frequent meter readings will offer a vastly enhanced user experience for KAWC customers.

The following three figures show what a KAWC customer can see presently using AMR technology and also what a customer with AMI technology sees when logging into their MyWater account.[5] For example, current KAWC customers who log into the Company portal to see their usages only see limited information. Figure 1 below is an example that shows a customer's monthly usage.

Figure 1

However, a customer with an AMI meter will see far more detailed information. The following example shows that a customer with AMI has access to much more detailed information which can timely inform customers' water usage behaviors.

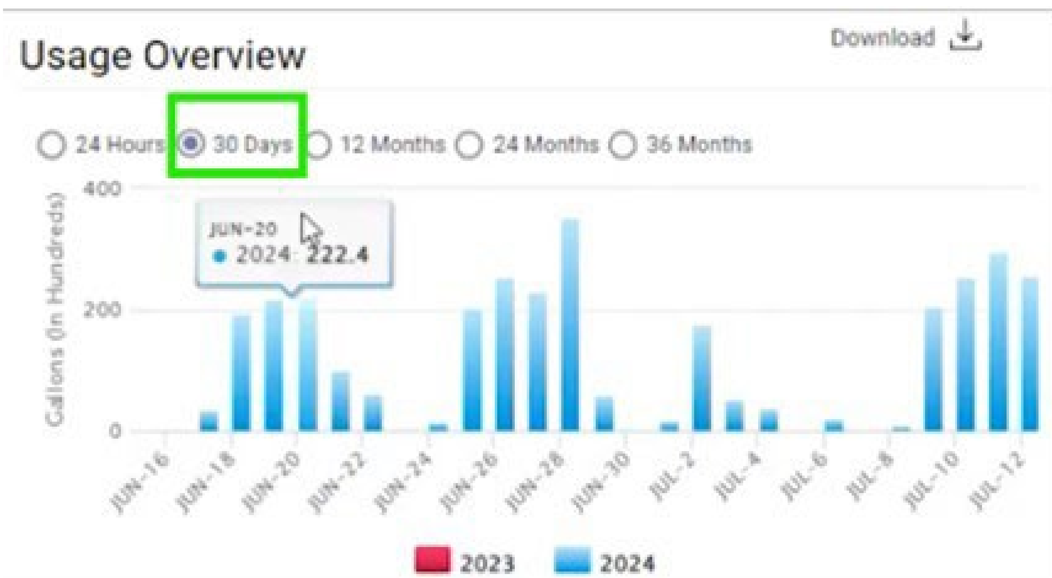
[5] These examples are actual customer accounts with KAWC or, in the examples with AMI data, from another American Water affiliate where AMI technology is already deployed. Any identifying information for the customers has been removed.

Figure 2

A customer with an AMI meter has access to their water usage down to the hour for the most recent twenty-four hours and down to the day for the most recent month.

The following image shows the daily usage for a customer over the last 30 days.

Figure 3



AMI technology makes monitoring water usage far more accurate because of the availability of more precise data.

Real World Examples[6] of Enhanced Customer Service Made Possible via AMI Technology

The above enumerated features and advances in technology translate into real world improvements in customer experience that is only available because of the additional water usage detail AMI provides. In other words, AMI metering directly supports improved customer service and customer experience.

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[6] These are examples of actual customer interactions from American Water affiliates where AMI is already deployed. Any identifying information for the customers has been removed.

What follows below are examples of actual customer service interactions that took place in the American Water footprint where the presence of AMI meters and the additional data AMI provided[7] allowed for rapid resolution of customer concerns.

Customer 1 was concerned about high bills. Their landlord, who ultimately fixed the customer's pipe, told them that there had been no leak. However, AMI data showed a periodic leak that significantly expanded over two months and was resolved the day the landlord fixed the pipe. In the following figure, each row is a day, and each column is an hour. The highest usage is red, and the lowest usage is green.

Figure 4

Sum of Gallons	Hour																							
Date	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Grand Total
Wednesday, November 13, 2024	10.2	0.0																							10.2
Tuesday, November 12, 2024	8.3	0.0	0.0	0.0	0.0	1.3	12.9	1.1	24.5	26.7	22.4	21.3	15.2	12.0	1.3	0.0	0.0	0.0	14.0	0.2	0.0	0.0	5.7	1.7	168.6
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Wednesday, June 19, 2024	0.0	0.0	0.0	0.0	3.5	1.4	13.3	1.6	2.2	1.9	17.6	15.6	10.3	10.8	0.0	9.6	17.1	1.8	0.3	0.0	0.0	0.0	21.4	5.9	134.1
Tuesday, June 18, 2024	4.6	0.0	0.0	0.0	0.0	0.0	16.2	0.9	0.0	4.2	30.6	33.1	21.2	11.5	12.2	16.8	4.6	0.3	6.6	3.8	0.0	3.2	0.6	8.2	178.3
Monday, June 17, 2024	16.8	0.8	0.0	0.0	0.0	0.0	19.4	4.2	0.0	0.0	10.1	30.1	15.6	4.6	13.9	21.9	12.9	7.4	25.1	8.4	0.0	4.8	3.1	6.8	206.0
Sunday, June 16, 2024	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	3.8	0.0	3.3	17.3	27.7	10.9	0.8	2.3	11.3	39.5	0.0	16.2	2.4	1.7	0.1	0.5	139.7
Saturday, June 15, 2024	1.3	0.0	0.0	0.0	0.0	0.0	3.4	0.0	2.5	1.3	1.4	28.2	20.8	13.3	13.2	0.0	4.8	15.8	17.2	0.3	14.2	8.3	4.1	0.0	150.0
Friday, June 14, 2024	270.5	269.2	267.3	266.9	268.6	267.4	272.9	266.6	267.4	273.1	265.6	292.4	250.2	9.5	26.4	22.4	4.9	6.6	1.3	7.7	0.0	0.2	5.4	5.7	3,588.1
Thursday, June 13, 2024	268.9	269.2	269.3	272.8	269.6	269.4	281.9	265.6	268.1	281.8	288.1	305.4	289.7	303.7	281.8	280.6	294.9	285.2	270.2	269.5	271.7	272.7	272.2	271.6	6,673.8
Wednesday, June 12, 2024	292.9	276.1	275.9	270.7	270.9	273.6	278.5	266.0	277.8	275.7	276.2	308.6	287.4	279.5	280.2	287.3	280.1	284.0	270.5	271.9	276.5	270.3	284.5	269.9	6,680.1
Tuesday, June 11, 2024	287.8	267.5	273.2	271.0	271.6	275.5	284.9	275.5	272.2	346.6	288.0	289.1	287.4	273.5	277.2	273.0	270.1	272.0	266.2	264.4	269.3	268.4	269.5	281.3	6,675.0
Monday, June 10, 2024	292.8	272.9	264.9	264.2	269.0	277.3	274.9	277.3	264.4	279.5	301.0	292.1	305.6	291.1	273.9	273.8	268.5	273.3	275.9	268.3	272.8	272.1	269.0	278.2	6,652.8
Sunday, June 9, 2024	285.2	268.0	271.5	273.9	271.1	273.9	274.7	274.4	274.1	274.4	290.2	308.8	279.3	269.1	268.1	268.5	274.8	274.3	286.5	262.1	263.1	273.5	271.2	291.6	6,622.2
Saturday, June 8, 2024	281.2	269.4	272.2	269.3	269.4	270.5	267.9	294.0	294.0	272.1	271.4	272.3	285.7	277.5	287.8	270.5	282.2	273.7	273.1	271.1	273.4	271.2	264.8	279.5	6,614.0
Friday, June 7, 2024	18.7	8.1	1.9	0.0	0.0	224.1	280.5	267.2	264.6	270.9	288.7	289.4	292.1	295.0	300.8	289.7	282.1	275.9	277.4	275.4	268.5	268.1	288.2	289.8	5,317.0
Thursday, June 6, 2024	282.8	270.1	272.0	272.1	271.5	271.2	276.2	265.7	268.5	289.0	317.1	278.4	290.4	291.5	33.9	4.4	0.1	0.1	7.3	0.4	0.1	2.0	0.2	14.9	3,979.9
Wednesday, June 5, 2024	299.4	70.1	0.0	0.0	0.0	0.0	185.8	304.1	290.5	273.0	273.1	267.1	272.5	276.4	275.3	281.5	272.8	272.0	269.3	267.3	266.0	267.8	276.7	267.1	5,228.1
Tuesday, June 4, 2024	15.8	1.8	0.0	0.0	0.0	2.4	18.2	1.6	0.0	34.1	46.8	13.8	64.2	286.6	279.8	272.3	272.3	272.1	273.5	268.8	269.8	271.6	270.3	286.6	3,222.4
Monday, June 3, 2024	292.1	279.3	268.4	269.8	269.4	266.8	278.2	267.7	275.3	307.1	301.8	65.9	1.4	0.0	0.0	0.0	1.9	2.9	0.0	2.1	0.1	0.1	0.1	9.1	3,159.4
Sunday, June 2, 2024	23.6	0.4	0.1	2.8	9.9	274.4	271.2	270.7	266.8	278.3	319.1	293.7	299.2	305.4	286.6	284.0	280.5	288.9	271.8	273.8	270.8	270.6	277.0	274.1	5,398.6
Saturday, June 1, 2024	280.7	272.6	271.7	273.9	273.0	269.2	272.0	266.3	310.6	280.1	265.7	257.7	269.7	279.0	273.8	273.3	173.8	2.0	15.1	11.8	0.4	0.1	0.1	20.4	4,612.7
Friday, May 31, 2024	121.8	262.2	262.6	263.6	263.6	263.8	284.8	224.1	48.4	174.4	277.0	270.5	273.7	270.6	281.7	290.2	288.3	295.3	292.4	273.3	273.4	269.0	271.6	270.8	6,067.1
Thursday, May 30, 2024	18.2	0.0	0.0	0.0	0.0	0.0	3.2	235.2	287.5	266.7	267.1	292.8	60.5	26.7	23.7	273.9	267.2	276.6	275.3	21.9	5.4	0.1	21.2	21.7	2,644.8
Wednesday, May 29, 2024	285.9	271.3	272.1	266.4	262.6	264.6	268.1	265.3	289.6	277.4	192.3	13.3	19.3	102.8	274.2	271.1	272.4	151.3	0.1	0.1	0.2	0.1	9.8	1.7	4,032.0
Tuesday, May 28, 2024	289.1	271.5	273.8	272.2	266.0	269.4	80.1	3.0	44.7	207.9	286.6	287.8	285.6	267.4	273.5	274.4	277.9	266.1	264.3	264.2	275.8	270.1	270.1	277.6	5,819.3
Monday, May 27, 2024	272.5	277.8	270.9	266.8	266.3	268.0	273.0	273.1	269.2	292.0	320.7	312.3	278.5	271.3	289.9	274.1	274.0	271.0	271.5	275.5	273.6	273.9	268.0	281.8	6,665.6
Sunday, May 26, 2024	290.8	268.7	268.7	272.5	271.4	193.4	0.0	0.0	0.1	2.0	158.9	76.8	276.2	282.8	271.8	271.6	272.6	274.5	275.3	272.3	280.8	276.3	273.6	271.1	5,102.3
Saturday, May 25, 2024	268.9	264.0	268.2	267.2	265.5	266.9	268.0	270.2	62.3	6.7	0.0	3.7	269.6	271.8	274.5	283.7	282.3	296.1	275.2	274.5	268.5	265.4	263.2	284.0	5,520.6
Friday, May 24, 2024	275.1	241.2	0.1	0.1	1.9	210.3	273.4	267.8	47.1	12.7	0.3	215.8	123.1	0.0	0.0	0.3	25.5	9.6	19.2	266.8	279.0	273.0	274.9	288.7	3,105.9
Thursday, May 23, 2024	286.1	266.2	269.4	270.9	270.8	269.4	275.0	270.5	290.8	286.8	281.6	286.2	291.3	275.6	276.4	273.0	277.0	297.8	295.8	278.5	287.1	275.0	276.9	266.2	6,694.3
Wednesday, May 22, 2024	286.3	266.4	265.1	265.3	267.5	268.1	267.6	280.8	310.9	273.6	264.3	261.3	262.3	265.8	266.1	266.0	265.5	265.4	268.9	264.9	286.2	270.1	268.5	282.0	6,508.8
Tuesday, May 21, 2024	21.4	0.0	0.0	0.0	0.0	2.2	17.4	55.4	95.8	271.6	266.8	270.3	271.1	271.8	270.0	266.5	268.5	267.0	271.3	271.1	269.9	271.4	270.4	270.5	4,240.4
Monday, May 20, 2024	276.8	272.9	269.1	268.3	270.0	267.3	264.1	252.5	59.7	20.0	0.1	0.1	0.1	0.1	2.6	0.1	0.1	2.9	0.1	0.2	0.1	19.5	7.7	4.7	2,259.0
Sunday, May 19, 2024	288.3	269.8	270.3	267.7	268.2	268.0	266.2	265.3	264.0	281.0	287.3	309.0	280.2	273.3	282.4	285.4	271.2	291.4	277.8	279.8	269.7	268.3	271.2	270.6	6,626.2
Saturday, May 18, 2024	0.1	7.0	0.0	0.0	2.1	0.0	0.1	9.8	198.2	278.3	281.0	297.5	294.8	267.4	267.4	268.8	272.8	272.7	272.7	270.3	274.0	268.4	268.6	273.4	4,345.5
Friday, May 17, 2024	16.8	1.3	0.1	0.1	0.1	0.1	85.1	263.4	146.4	19.8	17.5	35.7	7.0	0.0	0.0	211.5	271.1	101.7	0.2	0.2	4.6	1.5	7.0	0.0	1,191.1
Thursday, May 16, 2024	280.5	266.2	269.8	275.3	268.5	268.1	280.8	267.3	289.9	277.3	278.2	284.5	150.1	9.6	84.3	269.5	272.1	278.0	277.9	273.2	270.3	268.4	272.3	75.9	5,808.0
Wednesday, May 15, 2024	290.9	274.0	268.7	269.1	269.8	271.6	275.2	262.3	63.7	26.1	6.1	277.9	293.5	276.5	272.6	271.4	271.8	271.2	270.1	274.3	274.5	269.2	268.6	267.8	5,837.0
Tuesday, May 14, 2024	31.3	10.7	0.0	2.5	0.0	0.0	13.2	2.0	26.6	40.2	65.8	280.0	276.0	274.9	269.3	266.0	266.6	266.0	276.9	270.5	267.7	267.2	270.0	275.4	3,719.0
Monday, May 13, 2024	292.3	263.5	263.1	263.6	261.9	131.5	12.1	0.2	24.6	48.9	17.4	21.2	291.1	24.3	2.6	0.0	0.0	2.2	0.2	3.1	0.1	0.2	3.0	18.3	1,945.4
Sunday, May 12, 2024	233.0	282.4	269.1	266.3	268.6	269.2	269.6	270.8	270.8	241.7	48.5	45.2	121.4	271.8	273.2	272.0	273.3	265.1	273.7	264.1	260.9	262.1	273.1	269.9	5,815.9
Saturday, May 11, 2024	296.7	270.3	268.2	262.5	263.3	262.0	273.1	273.6	268.1	264.8	113.9	27.5	181.5	185.9	8.5	11.8	0.9	20.3	5.9	0.4	0.5	0.5	0.3	5.8	3,266.3
Friday, May 10, 2024	98.5	262.4	268.8	270.5	271.2	270.5	270.0	262.9	272.1	297.8	292.1	282.5	101.5	22.2	47.0	1.2	12.5	6.7	6.9	2.5	0.0	0.0	39.8	276.1	3,635.8
Thursday, May 9, 2024	275.3	268.0	265.0	266.3	266.1	272.1	274.3	261.2	282.6	269.8	283.7	275.9	293.1	291.7	182.7	0.1	0.1	12.2	31.4	272.1	137.8	0.4	279.5	98.3	4,839.6
Wednesday, May 8, 2024	298.0	280.6	269.5	269.1	269.0	268.5	275.5	202.7	162.4	304.4	288.7	305.1	129.4	101.8	273.5	279.0	269.2	266.2	266.0	270.8	270.0	280.5	289.6	272.0	6,161.6
Tuesday, May 7, 2024	268.3	164.1	5.8	0.0	0.1	1.8	15.3	0.4	247.6	287.6	286.8	292.7	295.1	296.7	282.2	276.0	273.1	273.3	274.3	268.7	273.9	272.7	270.1	279.9	4,906.2
Monday, May 6, 2024	287.3	282.1	274.5	276.3	275.7	270.7	280.5	261.9	288.8	98.4	18.4	21.8	17.9	18.9	187.5	276.4	279.1	274.6	267.4	270.0	271.4	278.3	270.1	271.5	5,319.5
Sunday, May 5, 2024	281.7	267.5	266.7	267.6	267.5	269.2	267.7	266.0	262.1	285.0	298.9	307.2	287.4	281.3	288.3	283.2	266.1	269.7	268.7	271.6	268.5	267.8	275.3	273.9	6,608.7
Saturday, May 4, 2024	20.0	1.6	0.0	0.0	3.8	37.9	266.4	271.6	284.0	297.0	277.3	264.3	280.6	282.1	283.7	274.7	273.6	277.3	269.2	270.0	268.5	269.6	269.4	270.5	5,012.9
Friday, May 3, 2024	141.0	197.1	0.0	0.0	3.4	0.0	10.8	163.3	85.4	3.6	9.9	0.0	0.0	0.1	0.0	0.0	0.0	1.9	0.0	1.9	2.5	0.1	0.0	13.9	635.3
Thursday, May 2, 2024	25.8	0.0	0.0	0.0	0.0	0.0	1.9	10.7	37.1	55.6	16.9	28.1	2.2	0.0	0.0	0.0	0.0	0.1	2.7	6.1	10.1	0.0	2.1	2.3	201.6
Wednesday, May 1, 2024	23.4	15.0	0.0	0.0	0.0	0.0	189.3	120.3	30.6	9.9	30.1	19.3	0.1	0.1	0.1	0.1	0.1	0.3	12.1	16.4	7.2	0.9	16.3	9.3	500.8
Tuesday, April 30, 2024	15.9	20.7	0.0	5.3	0.0	0.0	11.4	0.5	53.6	18.2	18.8	6.7	0.0	0.0	0.0	0.0	0.0	1.9	0.0	4.6	7.5	2.0	8.1	6.2	181.3
Monday, April 29, 2024	15.4	0.0	0.0	0.0	0.0	0.0	10.0	2.2	25.0	25.6	16.1	15.5	0.0	2.2	6.6	0.0	0.0	2.1	2.9	0.1	0.1	0.0	12.3	20.8	156.9
Sunday, April 28, 2024	281.6	266.0	266.7	267.1	263.7	261.9	265.8	229.0	81.8	3.9	0.1	4.1	29.9	8.9	0.2	21.6	0.4	0.2	3.4	2.0	15.4	6.9	16.1	10.5	2,307.3
Saturday, April 27, 2024	286.9	270.0	265.6	271.6	264.4	268.3	268.5	265.3	262.6	266.6	273.8	309.2	58.6	24.0	12.8	19.1	18.1	29.3	13.6	1.0	2.4	1.9	0.1	135.0	3,588.7
Friday, April 26, 2024	11.4	2.1	0.0	0.0	0.0	0.0	12.7	3.7	26.5	213.3	259.2	287.7	316.3	287.3	282.9	140.7	2.0	0.1	2.8	0.2	5.6	3.2	0.2	201.3	2,059.1
Thursday, April 25, 2024	13.7	0.1	0.1	0.1	0.1	0.1	0.1	0.1	135.8	309.6	283.0	259.3	4.3	0.0	0.0	3.0	0.0	0.8	20.3	10.5	0.1	0.1	0.1	11.1	1,052.3
Wednesday, April 24, 2024	280.0	272.2	265.6	266.1	266.9	268.3	276.1	262.6	283.6	35.6	16.7	36.8	35.5	39.2	2.4	0.0	0.0	3.6	0.1	0.2	1.9	0.2	2.5	20.7	2,636.8
Tuesday, April 23, 2024	12.5	15.7	0.0	0.0	0.0	21.9	16.1	0.1	25.3	30.9	36.8	22.3	27.1	135.7	269.6	272.0	268.9	280.8	266.8	268.6	269.7	267.5	284.3	268.3	3,060.7
Monday, April 22, 2024	9.9	31.7	0.0	0.0	0.0	0.0	13.8	6.8	20.3	9.0	31.2	20.2	23.8	18.7	17.8	1.4	3.0	1.9	3.5	1.8	5.4	0.0	0.1	1.9	222.3
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Tuesday, September 19, 2023	2.5	0.0	0.0	0.0	3.5	0.0	16.5	5.8	14.4	8.4	11.1	19.5	10.3	20.6	2.8	0.0	0.0	23.3	0.0	0.0	0.0	0.0	5.9	7.7	152.4
Monday, September 18, 2023	10.8	0.0	0.0	0.0	0.0	0.0	16.9	4.6	38.9	10.0	0.0	2.5	28.3	3.8	0.0	0.0	0.0	16.3	0.4	1.7	0.3	2.5	8.2	19.0	164.2
Sunday, September 17, 2023	31.5	4.0	1.5	0.0	0.0	0.0	0.0	0.0	1.4	7.3	23.2	47.4	280.8	271.6	265.6	269.7	275.0	272.6	294.7	20.6	30.1	8.3	1.4	5.3	2,111.7
Saturday, September 16, 2023	263.2	265.0	266.9	267.7	268.2	265.3	281.5	204.6	0.0	9.9	29.0	32.0	21.5	35.6	7.2	3.0	1.5	3.9	0.1	0.1	0.0	1.4	1.4	2.9	2,231.8
Friday, September 15, 2023	7.2	0.9	0.7	0.8	1.2	1.4	20.5	6.2	34.8	8.5	5.8	30.4	2.6	0.0	6.6	1.1	1.4	7.6	8.1	173.0	298.5	251.2	85.7	267.9	1,222.4
Thursday, September 14, 2023	0.3	0.2	0.1	0.1	0.2	0.2	17.5	4.5	64.4	18.1	7.3	29.5	3.9	3.9	3.1	95.8	21.0	34.4	26.5	35.4	2.5	5.3	15.2	1.5	390.8
Wednesday, September 13, 2023	13.3	16.9	0.0	0.0	0.0	0.0	5.6	5.0	24.9	19.7	16.8	16.6	31.9	20.9	0.1	9.1	0.2	35.3	12.2	21.9	61.5	1.9	4.3	1.4	319.2
Tuesday, September 12, 2023	24.3	11.5	11.5	11.3	11.0	10.9	17.0	13.7	15.9	5.5	0.4	1.3	14.3	29.9	2.2	1.5	0.1	0.3	3.2	0.2	0.2	1.7	3.4	8.9	200.3
Monday, September 11, 2023	27.8	12.5	12.1	12.5	11.5	13.5	26.1	7.5	21.3	4.7	25.1	29.5	13.4	20.6	1.7	1.2	0.0	27.1	7.2	7.0	8.5	6.9	12.2	15.6	325.5
Sunday, September 10, 2023	21.9	2.0	0.1	0.1	0.1	0.1	15.6	4.3	3.1	13.4	32.6	32.6	7.1	0.5	3.2	0.4	0.3	3.2	2.3	0.6	0.5	0.3	2.1	25.4	171.8
Saturday, September 9, 2023	18.9	9.4	0.1	0.0	0.0	0.0	4.0	0.0	0.0	4.5	15.2	24.0	23.2	20.3	7.2	7.9	4.6	42.0	44.7	3.0	1.4	2.2	2.8	19.0	254.3

Customer 2 is a large account that presented with a leak underground. Before the installation of AMI, the leak would not have been detected until after the account billed in the customary billing cycle. However, using AMI data, the company was able to see the high usage and quickly repaired the leak. The first Print screen below includes the high usage from Neptune 360. The second print screen shows the usage before and after the leak was fixed.

Figure 5

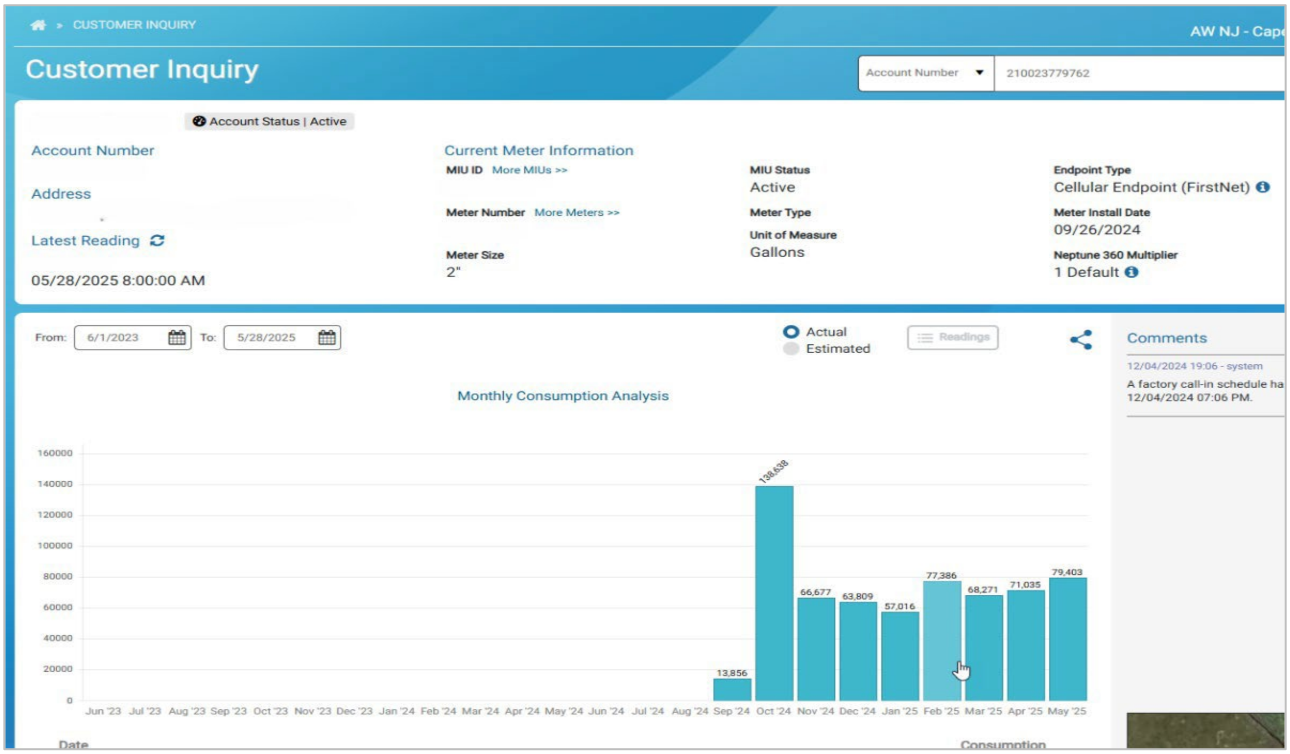
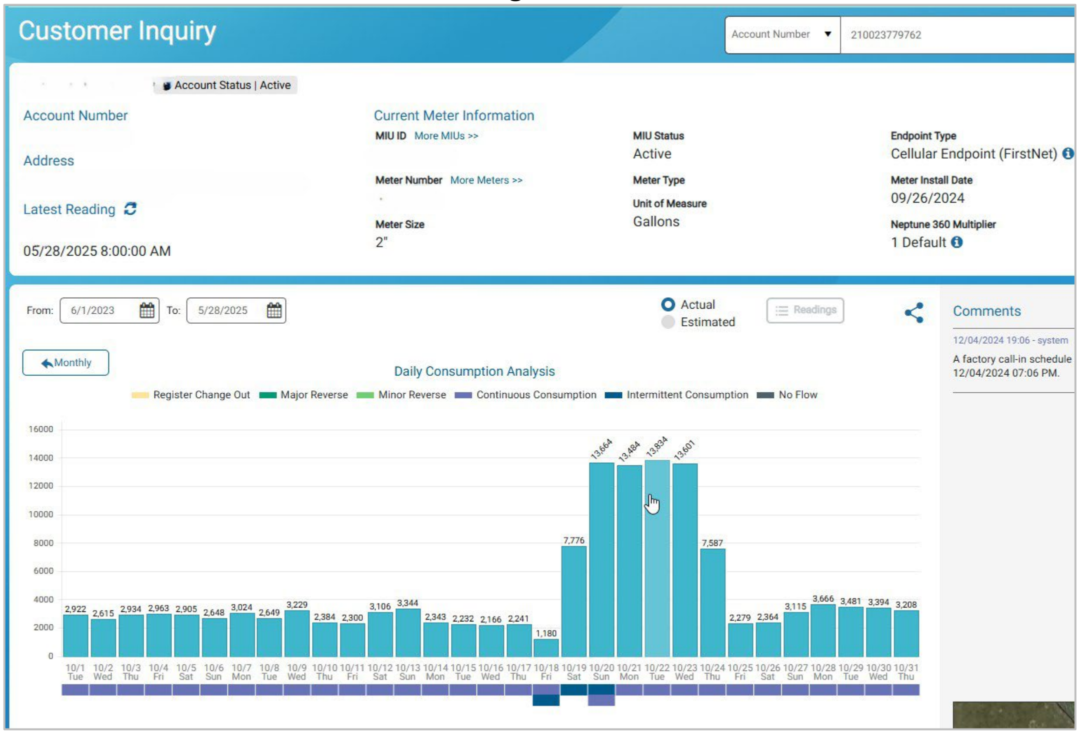


Figure 6



Customer 3 hidden leak causing a flood. The company was able to use AMI data to find out which meter in a bank of multiple meters was leaking and flooding a local street. This event took place after hours and during an active rainstorm, so the FSR's were not able to determine which of the meters in that bank of meters was leaking. The AMI usage data was able to identify the leaking meter, preventing further flooding.

Customer 4 was concerned about high bills and thought the scope of their lawn watering didn't correspond with the consumption billed. Hourly reads showed ~1000 gallons per hour were consumed between 2am and 6am each day on Mondays, Wednesday, and Fridays. With this knowledge regarding their water consumption, the customer was empowered to make informed, economic choices about how often and how long to run their irrigation system.

Figure 7

1																										
2																										
3	**Sum of Consumption**	**Ho**																								
4	**Date**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**Grand Total**
77	Tuesday, September 3, 2024	2.5	0	0	0	0	0	0.1	0	0.8	5.1	1.8	6.7	8.4	30.2	3.3	5.3	3.3	16.2	6.2	13.5	11.8	0.3	2	0	117.5
78	Monday, September 2, 2024	0	0	0	2.8	0	0	0	0.9	5.7	47	2.2	1.1	8.9	3.2	0.2	0	2.1	1.4	0.4	1.5	1.8	2.4	19.1	0	100.7
79	Sunday, September 1, 2024	0	0.1	0	0	0	0	3	3.2	3.1	2.7	0.4	3.8	1	1.7	0.4	0.9	21.4	36.2	5.3	1.5	20.6	20.3	6.8	0.1	132.5
80	Saturday, August 31, 2024	0	0	2.9	0	0.1	0	0	1.1	3	10.8	1.5	1.9	3.8	2.5	1.6	2.1	11.2	1.5	0	0.1	0	0	4.2	0	48.3
81	Friday, August 30, 2024	0.1	2.5	829.6	960.4	862.6	765.6	474.3	2.7	4.8	4.7	34.3	2.2	2.8	2.8	1.9	3.3	0	0.4	19.2	3.6	1.2	22	0	0.1	4001.1
82	Thursday, August 29, 2024	0	0	0.1	0	0	0	4.3	2.6	0.3	4.7	0.2	0.1	0.1	24.6	5.2	6.5	13	24.5	3.1	0.4	1.6	19.8	0	0.3	111.4
83	Wednesday, August 28, 2024	0	0	833	956.3	867.5	768.3	488.2	0	9.8	0	0.1	0.1	0.1	0.1	0.2	0.1	18.4	2.2	2.8	23.8	13	0.3	0	1.8	3986.1
84	Tuesday, August 27, 2024	0.4	0	0.1	0	0	732.7	272.8	5.2	3.1	22.7	26	4.7	7.8	3	1.9	4.4	1.4	22.6	25.7	0	39.9	14.5	0	2.5	1191.4
85	Monday, August 26, 2024	0	0	839.7	961.6	867.9	777.7	487.3	2.9	1.9	23.2	4.8	2.1	2.2	2.1	0.1	3.7	0.2	0.1	0.1	0.2	4.9	17.5	0.2	0.2	4000.6
86	Sunday, August 25, 2024	0	0	0.1	0	0	0.1	2.2	3	0	2.3	0.1	7.5	25.2	0.2	1.6	35.3	5.4	15.7	0.2	0	34.8	20.6	0.2	0.2	154.7
87	Saturday, August 24, 2024	0	0	0.1	0	0	710	266.6	0	3.6	0	3.6	1.7	0.3	3.3	6.2	1	3.4	0.2	0.5	1.6	29.3	23.9	0.1	1.8	1057.2
88	Friday, August 23, 2024	0.1	0.1	826	962.4	867.9	768	488.7	0.4	10.1	3.7	9.1	3.6	0.1	1.6	1.8	3.1	0.2	2.7	2.6	35.3	7.3	2	0	1.4	3998.2
89	Thursday, August 22, 2024	0	1.7	0	0	0	0.1	0	5.7	3.1	0	0	0	0	13.7	4.2	0.2	3.3	0.2	3	3.5	0.7	12.5	0	1.9	53.8
90	Wednesday, August 21, 2024	0	0	814.7	939	845.6	763.1	466.3	0	5.4	0.1	5.9	0	5.2	0.4	3.3	1.8	2	1.5	1.8	24.2	20.3	2.4	0.3	0	3903.3
91	Tuesday, August 20, 2024	0	1.5	0.1	0	0	744.6	278.6	1.7	2.2	3	1.6	1.3	3.9	4.8	1.8	1.9	12.1	5.5	7.6	1.9	25.5	13.9	1.6	2.5	1117.6
92	Monday, August 19, 2024	0	0	841.3	966.1	873.8	762.9	458.1	3.6	6.8	1.7	9.2	0.1	3.2	1.7	0.1	3.6	15.4	4.5	1.9	7.3	32.1	1.4	2	1.5	3998.3
93	Sunday, August 18, 2024	1.8	0	0.1	0	0	4	2.9	0	5.7	2.4	1.4	0.2	0.1	2.1	0.2	2.6	1.9	12.3	176.5	111.7	24.7	0.7	2.2	0	353.5
94	Saturday, August 17, 2024	0.1	0	0.1	0	2.8	0	0	0	1.3	26.1	27.8	6.1	22.4	6.7	0.1	0.8	0.4	25.6	3.2	5.6	6	2.7	0.7	0	138.5
95	Friday, August 16, 2024	0	0	0.1	0	0	3.1	0	0	0.9	8.1	5.3	0.5	1.7	6.1	0.1	0.4	0.4	0.1	30.8	7.6	19.2	4.5	2.7	2.2	93.8
96	Thursday, August 15, 2024	2.3	0.1	0	0	0.1	0	1.3	5.6	2.1	0.1	0.2	0.1	0.7	1.9	0.1	0.1	0.1	0	0.9	0.1	12.3	14.1	3.7	0	45.9
97	Wednesday, August 14, 2024	2.4	0.1	0	0	0	2.7	0.1	1.1	3	2.8	2	29.5	2.2	4.9	0.3	1.6	0.1	0	1.9	2.5	12.8	6.5	11.5	0	88
98	Tuesday, August 13, 2024	2.3	0	0	0	0	0.1	2.7	1	5	0.4	1.9	3.7	0	0.1	0.1	3.5	36.5	32	1	1.5	23.3	0.6	0.4	2.4	118.5
99	Monday, August 12, 2024	0	0	0	0	0	0	0	0	3969	6.5	4.6	2	2.3	2.9	3.6	1.9	2	0	2.3	0.1	26.2	39.5	8.8	0	4071.3
100	Sunday, August 11, 2024	4.2	2.1	0	0	0	2	0	0.1	1.3	3.2	3.6	1.7	1.5	3.8	0.1	2.1	0	0	0	0	0	0	0	0	25.7
101	Saturday, August 10, 2024	0.1	0	0	0	0	697.8	289.3	0	1.5	4.9	1.8	0.1	2	3.1	1.9	0.2	0	0.2	0.4	0	0.1	21.7	0.1	0	1025.2
102	Friday, August 9, 2024	0	0.1	818.2	958.1	862.1	780.7	486	0	51.9	0	20.6	46	4.2	5.7	23.7	23.3	10.3	0.5	0	0.1	1.3	2.2	0.3	1.4	4096.7
103	Thursday, August 8, 2024	0	0	0	0	0	0	0	0	0	0.1	0	2	1.5	0.1	0.1	23	64.4	44.2	2	6.1	14.4	0.7	0	2.2	160.8

Sheet2 Sheet1 +

Ready Accessibility: Investigate Average: Monday, October 24, 1904 Count: 26 Sum: Tuesday, April 8, 2025 Display Settings

Customer 5 fire line leak: As part of a fire service project, the KAWC team was performing audits on known fire service leaks. To assist in completing that project, the Company put AMI on several larger customers who wanted to be able to track real-time water usages. In July of 2023, KAWC noticed a large increase of water usage on a fire detector check meter at a local hospital and then met with the hospital's maintenance team to assist with the location and source of the leak. While investigating, AMI was able to pinpoint the exact time the leak started. The hospital maintenance team used that information to check work order records and found that at the time the leak began, a boring crew had been installing underground conduit and had hit the bottom of the fire service main, causing a leak. AMI was able to reduce the leak time and gave the hospital maintenance team vital information to determine a possible cause of the leak.

Customer 6 was certain they were being billed for more consumption than a two-person household could generate, especially given that the residents worked outside the home. Hourly AMI data showed the consumption was driven by routine irrigation between 5am and 7 am, primarily on Tuesdays, Thursdays, and Saturdays. See consumption data highlighted in red.

Figure 8

Date	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Grand Total
Wednesday, July 27, 2022	0	0	0	0	0	0	0	0	0	0	0	0	0	37	0	0	0	0	0	0	0	37	0	0	75
Tuesday, July 26, 2022	0	0	0	0	0	0	0	37	0	0	0	0	0	0	0	0	0	0	37	0	0	0	37	0	112
Monday, July 25, 2022	150	0	37	0	0	0	0	0	0	0	37	0	0	0	0	0	0	0	37	0	0	0	0	0	262
Sunday, July 24, 2022	0	0	0	0	449	561	150	0	0	0	0	37	187	37	0	0	0	0	37	0	0	0	0	0	1,459
Saturday, July 23, 2022	0	0	0	0	0	636	486	0	0	0	37	0	0	37	0	0	0	112	0	0	0	0	37	0	1,346
Friday, July 22, 2022	0	0	0	0	0	0	0	37	0	0	37	37	37	0	0	0	0	187	37	0	0	37	0	0	411
Thursday, July 21, 2022	0	37	112	0	0	636	262	0	0	0	37	0	0	0	0	0	0	37	0	0	0	0	0	0	1,122
Wednesday, July 20, 2022	0	0	0	0	0	0	0	0	0	0	0	37	0	0	0	0	0	0	0	37	0	0	0	0	75
Tuesday, July 19, 2022	0	0	0	0	0	636	262	37	0	0	0	0	0	0	0	0	0	0	37	0	0	0	0	37	1,010
Monday, July 18, 2022	0	0	0	0	0	0	0	0	37	0	0	0	0	0	0	0	0	37	0	0	0	0	0	37	112
Sunday, July 17, 2022	0	0	0	0	0	0	0	0	0	37	0	0	0	0	0	0	37	0	0	0	37	0	0	0	112
Saturday, July 16, 2022	0	0	0	0	0	636	262	0	0	0	37	112	37	75	0	0	0	37	0	0	0	0	0	0	1,197
Friday, July 15, 2022	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	0	0	37	0	0	37	0	0	112
Thursday, July 14, 2022	0	0	0	0	0	636	299	0	0	0	112	0	0	0	0	0	0	150	0	0	0	0	0	37	1,234
Wednesday, July 13, 2022	0	0	0	0	0	0	0	0	0	150	0	0	0	0	0	0	0	0	37	0	0	0	0	0	187
Tuesday, July 12, 2022	0	0	0	0	0	673	262	0	0	37	0	0	0	0	0	0	37	0	0	37	0	0	0	0	1,047
Monday, July 11, 2022	0	0	75	0	0	0	0	37	0	0	0	0	37	0	0	0	0	0	0	0	0	0	0	0	150
Sunday, July 10, 2022	0	0	0	0	0	0	0	0	0	0	0	37	0	0	0	0	0	0	0	37	37	37	0	0	150
Saturday, July 9, 2022	0	0	0	0	0	636	262	0	0	37	0	37	37	37	0	0	0	0	37	0	0	0	0	0	1,085
Friday, July 8, 2022	0	0	0	0	0	0	0	0	0	37	0	0	0	0	0	0	0	0	0	0	0	0	37	0	75
Thursday, July 7, 2022	0	0	0	0	0	636	262	0	0	0	0	0	37	0	0	0	0	0	0	0	37	112	0	0	1,085
Wednesday, July 6, 2022	0	0	0	0	0	0	0	0	112	37	0	37	37	0	0	0	0	0	37	0	0	37	0	0	299
Tuesday, July 5, 2022	0	0	0	0	0	598	187	0	150	636	150	0	0	37	0	0	0	0	37	0	0	0	0	0	1,795
Monday, July 4, 2022	37	0	0	0	0	0	0	0	0	0	0	37	0	75	0	0	0	0	37	0	0	0	0	112	299
Sunday, July 3, 2022	0	0	0	0	0	0	0	0	0	0	0	0	37	0	0	0	0	0	0	0	0	0	0	0	37
Saturday, July 2, 2022	0	0	0	0	0	636	150	0	0	0	0	75	0	0	0	0	37	75	0	0	0	0	37	0	1,010
Friday, July 1, 2022	0	0	0	112	0	0	0	0	37	37	0	0	37	0	112	37	0	0	37	0	0	0	0	0	411
Thursday, June 30, 2022	0	0	0	0	0	636	150	0	150	0	0	0	0	0	0	0	0	37	0	0	0	0	0	0	972
Wednesday, June 29, 2022	150	0	0	0	0	0	0	0	37	37	0	0	0	0	0	37	0	0	0	0	37	0	0	0	299
Tuesday, June 28, 2022	0	0	0	0	0	636	187	0	0	0	0	0	37	0	0	0	0	0	0	0	0	0	0	0	860
Monday, June 27, 2022	0	0	0	0	0	0	0	0	37	0	0	0	0	0	0	0	37	0	0	112	0	0	0	0	187
Sunday, June 26, 2022	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	0	0	0	37	0	0	37	112
Saturday, June 25, 2022	0	0	0	0	0	598	187	0	0	112	0	37	37	0	75	37	0	0	0	0	37	0	0	0	1,122
Friday, June 24, 2022	0	0	0	0	0	0	0	37	0	150	37	0	0	0	0	0	0	37	0	0	0	0	0	37	299
Thursday, June 23, 2022	0	0	0	0	0	636	150	0	37	0	75	0	37	0	0	0	0	37	0	0	0	0	0	0	972
Wednesday, June 22, 2022	0	0	0	0	0	0	0	37	150	0	0	0	0	0	37	0	0	0	0	37	0	0	0	0	262
Tuesday, June 21, 2022	0	0	0	0	0	636	187	0	0	0	0	0	0	75	75	0	0	0	37	0	0	0	0	0	1,010
Monday, June 20, 2022	0	0	0	0	0	0	0	0	0	0	0	0	0	0	150	0	0	37	0	0	0	187	75	0	449
Sunday, June 19, 2022	0	0	0	0	0	0	0	561	262	0	0	0	37	0	37	75	37	0	0	0	0	0	0	0	1,010
Saturday, June 18, 2022	0	0	0	0	0	0	112	37	37	0	0	37	0	37	0	0	37	0	0	0	0	0	0	0	299
Friday, June 17, 2022	0	0	0	0	0	0	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	0	0	75
Thursday, June 16, 2022	0	0	0	0	0	673	150	0	0	0	0	0	0	0	0	37	112	75	0	0	37	0	0	0	1,085
Wednesday, June 15, 2022	0	0	0	0	0	0	0	37	0	0	0	37	0	0	0	0	0	0	112	0	112	0	0	0	299
Tuesday, June 14, 2022	0	0	0	0	0	636	187	0	75	0	0	0	0	0	0	150	0	0	0	0	0	0	0	0	1,047

Routine Replacement Approach

Under the proposed plan, KAWC will transition to AMI when necessary to do so – either at the time the existing meter must be replaced due to meter failure or in the normal course through LOS replacements. *There is no replacement acceleration proposed by the Company.* Replacing LOS or failed meters in the normal course of operations is required for the continued provision of water service to KAWC's customers.

KAWC's Current Metering Infrastructure

The Company has approximately 143,720 meters and endpoints in service as of March 2025. As shown in Figure 9 below, the vast majority of these are smaller than 2". Additionally, more than 99% of these are "outside" set meters.

Figure 9

Meter Size	Count	% of Total
5/8"	134,977	93.9%
1"	5,430	3.8%
1.5"	254	0.2%
2"	2,839	2.0%
3"	35	0.0%
4"	103	0.1%
6"	54	0.0%
8"	28	0.0%
Total	**143,720**	**100.0%**
2" and smaller total	**143,500**	**99.8%**

Almost all KAWC's meters are equipped with AMR endpoints. AMR endpoints enable automated meter reading when the Company's personnel bring a data receiver within proximity of the endpoint, typically by driving by with a receiver-equipped vehicle. The exception is approximately 257 meters which are equipped with Badger cellular AMI endpoints, two examples are mentioned below. These endpoints were installed to provide enhanced customer service capabilities to major accounts.

Prior to 2017, the AMR endpoints were generally hardwired to the installed meters, making the meter and endpoint particularly difficult to separate and resplice successfully. Approximately 42,631 of the Company's 143,720 meters were installed prior to 2017. Additionally, a portion of the meters installed since 2017 were integrated units, where the AMR endpoint and meter are "all-in-one" and not at all separable. The AMR endpoints generally have antennas that protrude through the Company's current cast iron meter pit lids. However, approximately 20,000 of KAWC's 5/8-inch meters are Hersey / Mueller brand meters with AMR endpoints that sit below the meter pit lids.

As noted above, Toyota Motor Manufacturing Kentucky and the University of Kentucky are two major accounts that both expressed a demonstrated interest that the Company install AMI technology. In the case of Toyota, the significant use of water is a concern that it wants to be able to control in order to control, to the extent it can, the cost of production of Toyota vehicles in its Kentucky plant. The University of Kentucky, as one might imagine, also has significant water usage and was likewise very interested in being able to monitor usage on a more granular level in order to control, to the extent it could, its costs, and ultimately the cost to students attending that university. Additionally, with the University of Kentucky's many closed campus streets, the Company trucks are prevented from conducting drive-by AMR readings.

Obsolescence and Wasteful Duplication

The AMR technology currently deployed is obsolete from a customer experience perspective in the Commonwealth of Kentucky, and each meter the Company replaces because that meter has reached the end of its LOS is obsolete from a useful life perspective. In other words, the Company replaces meters and endpoints when the meter's LOS expires, unless the meter or endpoint fail prior to that point in time. Should the Commission not approve a transition to AMI technology, the meters and endpoints at issue will still require replacement. The Company proposes replacing those obsolete meters in the normal course of business as they reach the end of their useful lives with AMI meters that offer a far better customer experience, serviceability, and diagnostic capabilities. Importantly, the Company does not plan to accelerate the removal of AMR meters in order to replace them with AMI meters. Instead, the AMI meters will only be installed at the end of the existing AMR meters' LOS, or in the event that the existing meter is damaged or fails and therefore needs to be replaced in order to continue serving the customer. In other words, the Company does not plan to strand any assets, and there is no wasteful duplication. This is a differentiating factor between KAWC's CPCN application and many of the AMI applications evaluated by the Kentucky Public Service Commission previously.[8]

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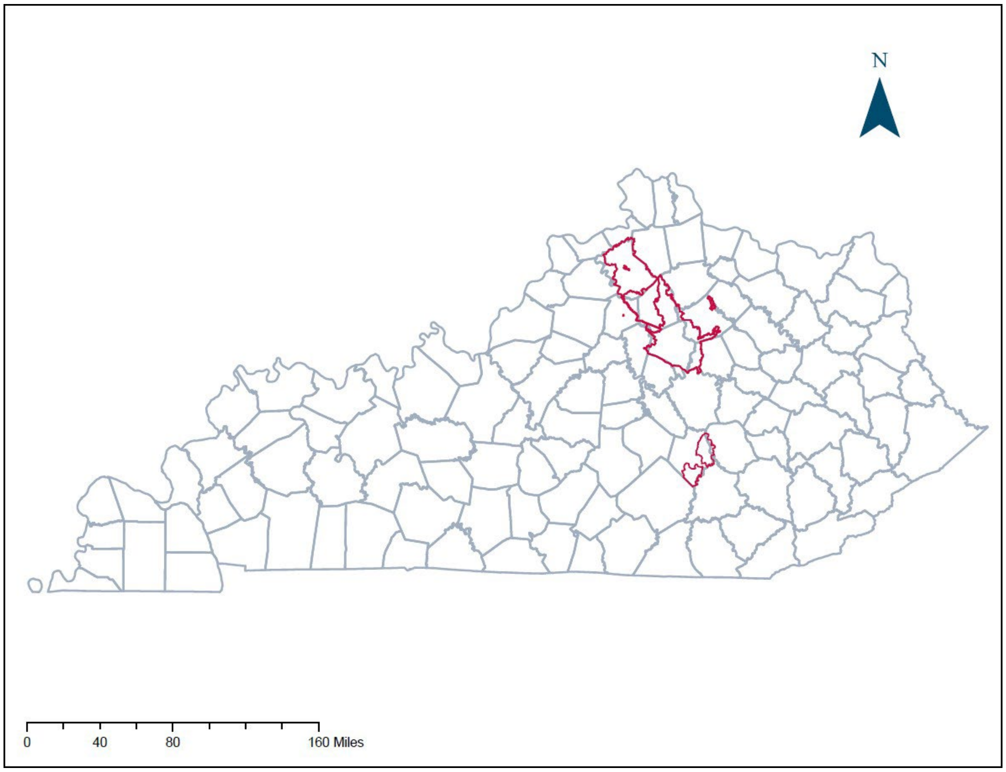
[8] *Cf. Application of Shelby Energy Cooperative, Inc. for a Certificate of Public Convenience and Necessity for its 2010-2014 Construction Work Plan*, Case No. 2010-00244, Order at 5 (Ky. PSC Aug. 3, 2011) ("the premature replacement of existing meters clearly constitutes a duplication of facilities, and this can only be determined to be a non-wasteful duplication after a full investigation of all the facts by the Commission.").

As noted above, AMI metering technology has already been deployed around Kentucky. The maps that follow indicate KAWC's service area in Kentucky, and the areas where water service is provided by other utilities that offer AMI to their customers. It is fair to say that KAWC's customers are surrounded by utilities that offer the benefits of AMI technology.

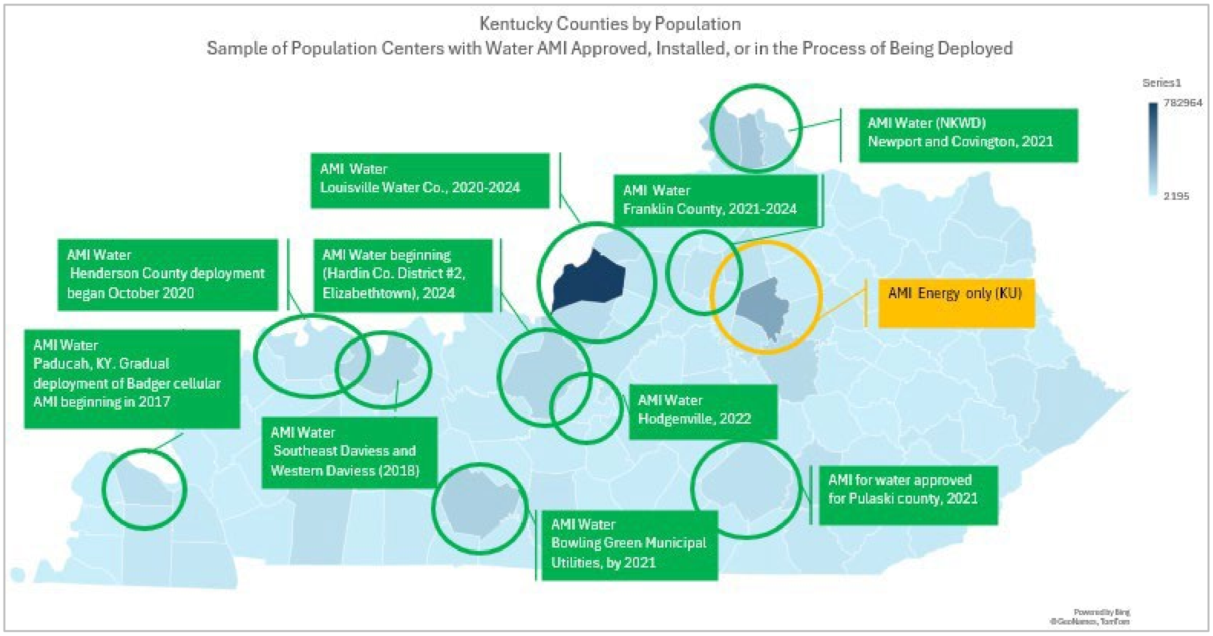
Kentucky-American Water Service Area (indicated in red)

Figure 10



Utilities Surrounding the KAWC Service Area Presently Offering AMI

Figure 11[9]



KAWC's Scheduled Periodic Meter Replacement Program

Background and Upcoming Schedule

As discussed above, KAWC follows a periodic meter replacement program, as part of its normal course of business, to renew aging meters and endpoints. The schedule is in part informed by meter testing regulations found in 807 KAR 5:066 Section 16(1). Since late 2011, the schedule has also been informed by the deviation granted in Case No. 2009-00253, permitting the Company to keep its 5/8-inch meters in service for 15 years without testing for accuracy.[10] To respond to these regulations and operate efficiently, KAWC has varying practices for meter testing and replacement depending on the frequency of required testing, as well as the size and cost of the meters. These are shown in Figure 12 below.

[9] North to South: **Northern Kentucky (Covington, Newport):** [9] https://psc.ky.gov/pscscf/2021%20Cases/2021-00095//20210922_PSC_ORDER.pdf; **Greater Louisville:** https://louisvillewater.com/news/advanced-metering-installations-reach-halfway-point/ (2023), https://louisvillewater.com/news/ami-update-reaching-new-milestones/; **Franklin County**: https://fpb.cc/ami; **Greater Lexington/KU** : https://experience.arcgis.com/experience/1659773d752048b5a2c99f518d449328**;** **Henderson**: https://www.hkywater.org/DocumentCenter/View/104/HWU-Strategic-Plan-for-Capital-Spending-Water---Wastewater---Stormwater-PDF; **Western Davies**: https://psc.ky.gov/pscscf/2017%20Cases/2017-00459//20180227_PSC_ORDER.pdf; **Southeast Davies**: https://psc.ky.gov/pscscf/2017%20Cases/2017-00458//20180227_PSC_ORDER.pdf; **Elizabethtown**: https://www.hcwd2.org/wp-content/uploads/2024/07/June-Minutes-2024.pdf; **Hodgenville**: https://usgwater.com/wp-content/uploads/2024/03/CS_Metering_Hodgenville_KY_USG_2023.pdf**;** **Paducah**: https://www.pwwky.com/eyeonwater/; **Bowling Green**: https://www.bgmu.com/customer-care/advanced-meters/#when-will-my-advanced-meter-be-installed-and-who-will-install-my-meter; **Pulaski County (Southeastern Water):** https://psc.ky.gov/pscscf/2021%20Cases/2021-00222/20210812_PSC_ORDER.pdf

Figure 12 – KAWC Practices for Scheduled Meter Testing and Replacement

Meter Size	2025 Price of Meter Material Alone (Confidential)[11]	Frequency of Required Testing	KAWC Operational Practice for Scheduled Testing and Replacement
3” and larger	[redacted]	1-2 years	KAWC tests and maintains the meters in the field and conducts meter and endpoint replacements on a case-by-case basis.
1.5” – 2”	[redacted]	4 years	KAWC replaces the meters when testing is required, tests the removed product in the lab, and will reuse these meters and their endpoints if they pass testing and are in good working order.
1”	[redacted]	10 years	KAWC replaces the meters and their endpoints as they reach their testing limit.
5/8”	[redacted]	10 years (or up to 15 years per approved deviation)	KAWC replaces the meters and their endpoints as they reach their testing limit.

[10] *In the Matter of Kentucky-American Water Company’s Request for Permission to Deviate from 807 KAR 5:066, Section 16(1)*, Case No. 2009-00253, Order October 5, 2011.

[11] Prices are estimates based on currently available data.

[12] Figures are approximate. Larger meters vary substantially in price depending on functionality and purpose.

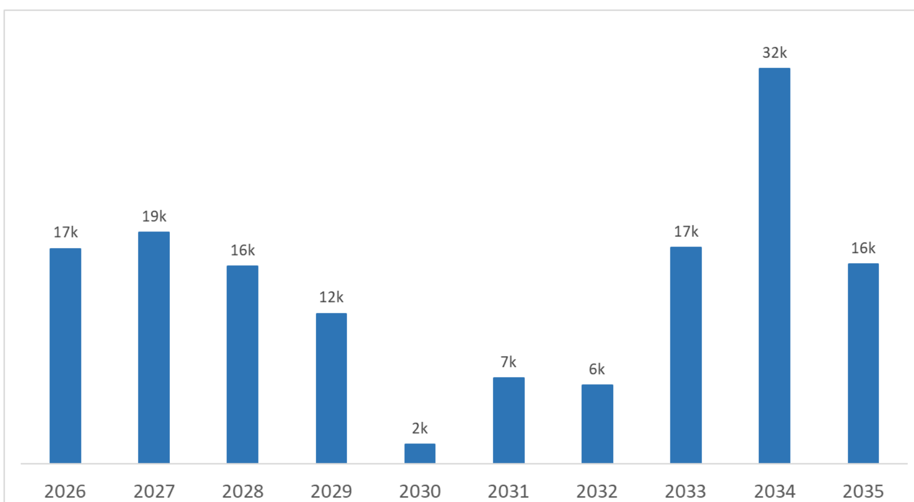
In an effort to optimize efficiency, KAWC had been targeting replacement of 5/8-inch meters and their hardwired endpoints based on a 15-year maximum field life, at least since the deviation was granted in Case No. 2009-00253. However, since that time, KAWC has observed an increase in meter reading challenges and an increase in corresponding unscheduled meter and endpoint replacements, triggered by equipment that was no longer performing well. As part of the Company's efforts to address and prevent meter reading challenges, KAWC moved back to a 10-year target for 5/8-inch meter and endpoint replacement.

For at least the meters installed prior to 2017, as well as for any integrated all-in-one units, the endpoint generally can't be replaced on a different cycle than the meter, due to the hardwired or embedded nature of the endpoint. For newer products, the meter and endpoint are typically attached by a plug, allowing the meter and endpoint to be more easily separated. The Company has found it important to keep the brand of the meter and endpoint aligned, and most efficient to keep the replacement of both units on the same cycle. However, with some of the more modern meters, there is at least the practical possibility in the future of changing only the meter or the endpoint if it would be efficient to do so.

As of May 2025, KAWC assesses that more than 34,000 of its 5/8-inch meters are now at or past the 10-year mark. KAWC has developed a plan to replace these meters, along with other meters coming due for replacement, over the next three years. The planned schedule would include replacing approximately 17,000 in 2026, 18,500 in 2027, and 16,000 in 2028. KAWC will target replacing the remaining 5/8-inch meter stock as the existing meters reach year 10. For meters other than 5/8-inch meters, KAWC will continue to test and replace in accordance with the schedule shown in Figure 12.

Figure 13, below, shows the quantity of 2" and smaller meters planned for periodic scheduled replacement over the next 10 years.[13]

Figure 13 - Upcoming Forecast for 2" and Smaller Meter Replacements, in 000s

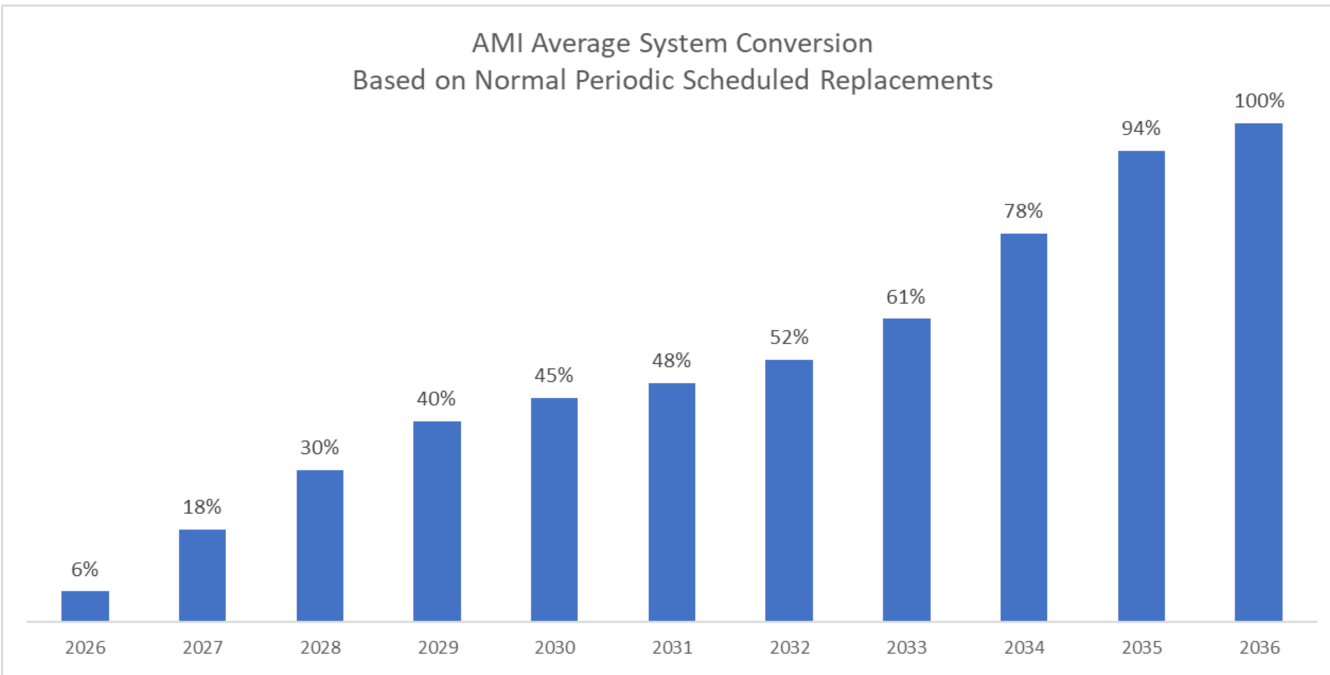


[13] For purposes of a simplified presentation, 1.5-inch and 2-inch meters are shown as replaced at the 4-year mark. However, these meters and endpoints may in fact be reused if they are found to be in good working order, as noted in Figure 3.

*Meters/endpoints replaced by thousands per year over the next 10 years.

In addition to replacing meters and endpoints, other parts are also sometimes replaced at this time as needed. One upcoming example is meter pit lids. The 20,000 5/8-inch Mueller meters with hardwired endpoints do not have holes in the lids for antennas. If these meters were replaced with AMR technology, new lids would be required for the antennas. Likewise, regardless of current brand, if KAWC installs AMI endpoints as it completes meter replacements, new composite lids will be installed on all meters, to replace the current cast iron lids. Composite lids are transparent to radio and cellular signals, reduce battery usage, and optimize coverage. The resulting pace of transition to AMI would look approximately as shown below in Figure 14:

Figure 14



Geographic Distribution

Because the Company's scheduled meter replacement program is based on length of service, and not location, the distribution of meter replacements over time is scattered geographically.

Some benefits of AMI will not be sensitive to this geographic distribution and will happen gradually throughout the 10-year meter replacement schedule as the number of AMI meters/endpoints increases. For example, each AMI meter installed will increase the number of customers who have access to timely usage data. Likewise, the Company will have increasing access to timely data to enhance customer service and increase work force efficiency as fewer resources are consumed for meter reading-related field service work.

Some benefits, however, will be sensitive to the geographic dispersion of meter replacements. While some benefits (such as usage visibility and leak detection) will be immediate for customers who receive an AMI meter, KAWC expects that monthly meter reading benefits may not fully begin until the system is nearly completely converted to AMI, sometime between 2035 and 2036.

The appendix to this exhibit features maps to help visualize the geographic dispersion of the periodic meter replacement program. Figure 26, shown in Appendix A, represents meter replacements by year of completion. Note the distribution of colors across the geography. Likewise, Figures 27-28 (Appendix A) illustrate the anticipated transition to AMI technology under a scheduled meter replacement approach and show a snapshot of AMI saturation in 2026 to 2030, 2031 to 2034.

Other Potential Replacements

In addition to scheduled periodic meter replacement, the Company also sometimes replaces meters and endpoints off-cycle, when metering equipment is no longer performing well, thus unexpectedly reaching the end of its useful life. The Company would use the same AMI enabled equipment and technology for these replacements as it would for the scheduled periodic program.

Metering Technology & Selection

Technology Considerations & Selections

As the Company considered the potential transition to AMI, KAWC focused its evaluation on the difference between AMR and cellular based AMI. Upon consideration of the potential of ongoing and increasing capital costs associated with building out and maintaining a fixed-network, without any corresponding benefit beyond what AMI Cellular technology provides, KAWC quickly rejected both a fixed-network AMI approach as well as a hybrid fixed and cellular AMI approach as a potential option for replacing its existing meter reading system. AMI cellular technology also provides the added benefits of being routinely updated to keep up with the latest technologies, provides greater coverage and security over fixed-network systems. AMI cellular technology also protects KAWC from liabilities related to damage to the physical structures caused by storms, security patches vulnerabilities, and/or equipment failures.

Alternative 1: Continuing with AMR Technology

As KAWC currently uses AMR technology, this alternative consists of replacing KAWC's existing AMR equipment with new AMR equipment. Under this alternative, KAWC would replace all existing meters and endpoints with new AMR meters and endpoints over the course of the next 10 years and replace approximately 6,790 meter pit lids in 2025. As this alternative essentially maintains the status quo, customers would not gain the incremental benefits discussed above for another decade. Under this alternative, KAWC has identified two preferred vendors through the meter selection process discussed below that provide the AMR components necessary to replace the existing AMR system with new AMR components.[14]

[14] The other vendors initially considered only offered end points. As functionality is best when the meter and endpoint is from the same vendor, KAWC determined to move forward with evaluating the functions and costs of the two vendors that could provide both meters and endpoints.

Alternative 2: Deploying AMI Cellular Technology

This alternative consists of replacing KAWC's existing AMR equipment with new AMI equipment. Under this alternative, KAWC would replace all existing meters and endpoints with new AMI meters, lids, and endpoints over the course of the next 10 years. Through the meter selection process discussed below, KAWC identified two preferred vendors that provide both meters and AMI cellular components.

Alternative Selected

KAWC prepared a cost benefit analysis comparing cellular AMI with existing technology/AMR, which is discussed below in the Cost Benefit Analysis section. Given the extensive operational and customer service benefits made available through the implementation of AMI, the fact the CBA demonstrates that AMI is the least cost solution in the long term, and that customers of other large water utilities are already receiving the enhanced service AMI provides, the Company continues to believe that deploying AMI is the right metering solution for the business and customers. Absent additional investment, continuing to install AMR technology would block KAWC customers from the enhanced benefits and service AMI offers for approximately ten more years.

Meter Selection Process

In mid-2024, and continuing through the second quarter of 2025, American Water's Service Company pursued an RFI and an RFP to identify and survey suppliers currently in the market that could meet the meter needs of American Water across its footprint. The goal of the RFI was to identify potential vendors whose products, capabilities, features, capacity, and services would be a good fit for American Water's customers, and the RFP was designed to identify and award business to a strategic partner or partners within the metering domain to provide meters moving forward. In addition, demonstrating diligence, validating vendor capacity, and refreshing pricing, contractual terms and product offerings for both metering and AMI technology (hardware, communication network, software, integration capabilities) were priorities.

American Water began the process with an RFI to validate which vendors could meet American Water's minimum criteria for RFP participation and ensure due diligence was followed. Twelve vendors received the RFI. Three vendors were disqualified due to their non-response to the RFI. Then the RFI results were compared against American Water's minimum established criteria, which were focused on a vendor's ability to meet American Water's purchasing quantities, product needs, provide a current cellular solution, provide a back-up cellular solution, scale across American Water's territory, and respond to the latest integration and security requirements. Two vendors were selected to move forward to the RFP process because they could meet all American Water's minimum requirements, and they were both selected as providers.

American Water proceeded with an RFP with the goals of securing optimum enterprise-wide pricing, delivery and support terms as well as validating technical capabilities that will lead to reduced field visits, improved customer satisfaction and reduced complexity. Following rigorous review, American Water selected both RFP vendors and is currently entering into modernized contracts with both vendors with improved terms and service level agreements.

Cost Benefit Analysis ("CBA")

KAWC analyzed the costs and benefits of the various potential meter reading technologies and associated meter, endpoint, and lid replacements. Costs and benefits were measured for the life of the metering equipment--at least ten years of operations for each meter replaced over a ten-year period, for a total of twenty years evaluated. The time period is adequate to observe the impacts of an entire cycle of investment and to realize the benefit of initial lid investments, A customer-based view of the costs and benefits was compared for potential technology solutions in both nominal dollars by year as well as in net present value.

When examining the underlying net present value by AMR and AMI, based on average pricing, the result between the two technologies is $3.6mm over 20 years, or approximately $180k per year. For context, this is just over $1.29 per customer per year (roughly $0.11 per month for an average residential bill).

Because this is a long-term analysis and because pricing differences between direct competitors might diminish over the long term, KAWC not only evaluated each brand of AMI and AMR product but also looked at the average cost of AMI and AMR for both brands. Averaging avoids locking in price differences as a constant in the Cost Benefit Analysis and also reflects the fact that KAWC is not requesting approval of a specific project or specific product, but rather a long-term shift in metering technology. The company will continue to evaluate suppliers as it deploys metering infrastructure for the long term.

Scenarios Modeled for Cost and Benefit

The potential investment scenarios modeled include the following:

1) **"AMI"**- This scenario considers replacement of meters 2" and smaller, as they come due for testing (but no more than once in a 10-year period). Cellular AMI endpoints would be installed, along with ultrasonic and nutating disc meters for sizes 1.5" and above and nutating disc meters for 5/8" - 1" meters. New composite meter pit lids would be installed for all affected meter pits.
2) **" AMR" or "Existing Tech"**[15]- This scenario considers replacement of meters 2" and smaller, as they come due for testing (but no more than once in a 10-year period). AMR endpoints would be installed, along with ultrasonic and nutating disc meters for sizes 1.5" and above and nutating disc meters for 5/8" - 1" meters. New composite meter pit lids would be installed in instances where Mueller / Hersey meters are being replaced (approximately 20k meters).

Cost Drivers

The quantities of meters and endpoints to be replaced by year is shown below in Figure 15 and the quantity of lids to be replaced is shown in Figure 16, by year and technology type. The quantities shown below for meters, endpoints and lids were used to prepare the cost / benefit scenarios.

[15] In the "Existing Tech" scenario 2, equipment was replaced with like. For 99% plus of the 2" and smaller meters, this means replacing AMR with AMR. For the 257 2" and smaller meters with an existing AMI endpoints, however, the like replacement was AMI, and this immaterial nuance exists in the model.

Figure 15

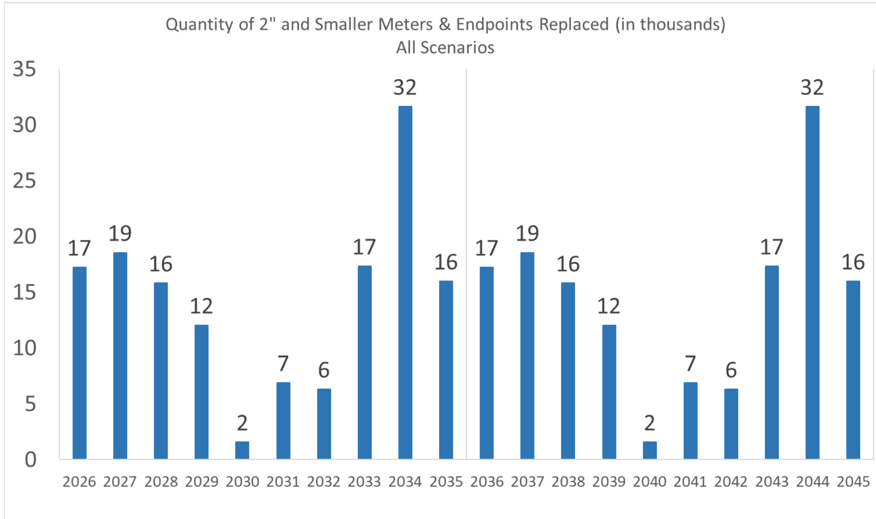
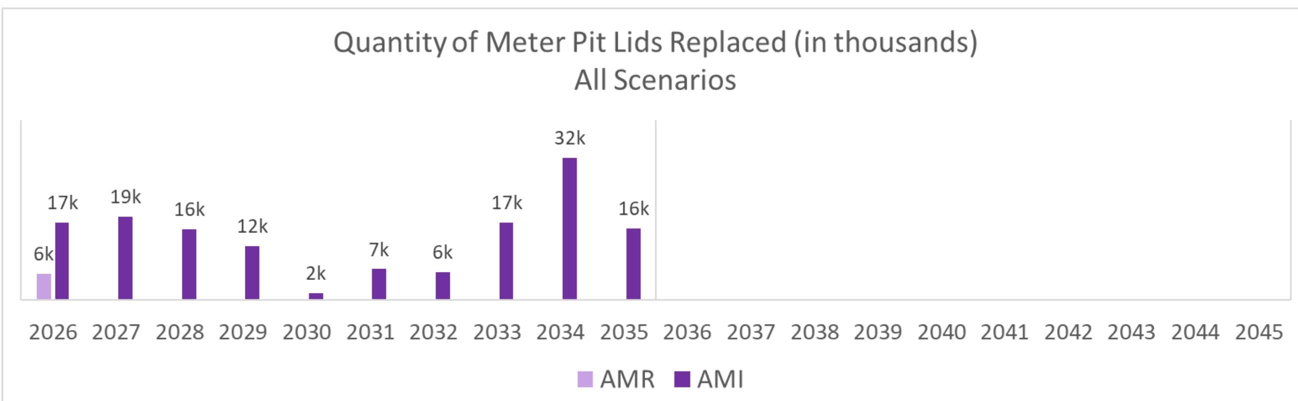


Figure 16[16]



Starting 2025 prices for materials and installation are shown below. These were increased by 2.9% annually starting in 2026. This 2.9% annual increase is equal to the ten-year CAGR for the Bureau of Labor Statistics all- goods Consumer Price Index as of 2024.[17]

[16] For the purposes of cost / benefit modeling, a conservative assumption is made that lids are replaced 1 to 1 with applicable meter replacements. In reality, many meter pits in Kentucky are dual set, meaning there are two meters in one pit. In these instances, only one lid would need to be purchased.

[17] The Series ID is CUUR0000SA0.

Figure 17 – 2025 Material and Installation Prices (CONFIDENTIAL)

Items	**Cellular AMI - Average**	**AMR - Average**	Cellular AMI - Badger	AMR - Badger	Cellular AMI - Neptune	AMR - Neptune
Installation Labor	[redacted]					
Meter						
Connected AMI Endpoint						
Items						
AMR Endpoint						
Composite Lids						

The capital expenditures associated with each scenario, based on these quantities and prices, were forecasted for the 20-year period in nominal dollars by year. The totals vary primarily due to different pricing for meters and endpoints, as well as the varying quantities of lids.

For the purpose of comparing costs and benefits over time, revenue requirement type calculations were used to reflect the cost of the capital expenditures. The annual cost recognition for each program reflects depreciation, property taxes, and pre-tax rate of return. Key capital-related cost assumptions are shown in Figure 18 below.

Figure 18

Common Assumptions for All Scenarios	
Annual inflation for meter materials[18]	2.9%
Depreciation Rate[19]	10%
Property Tax Rate	1.48% of net plant
Pre-Tax Rate of Return	Debt ratio, equity ratio and equity cost based on the approved capital structure and rate of return in Case No. 2023-00191
Uncollectible expense and utility regulatory assessment fees	0.622%

Benefit drivers

The largest and most readily measurable financial benefits of AMI (new technology) relative to AMR (existing technology) were modeled to include:

- Field service operators labor and related benefits:
  - Reduced demand for approximately 30.2k field service orders, or approximately 12.76k annual hours of meter reading related work outside of the periodic read cycle, once AMI is fully installed.
  - Benefits modeled to increase over time with increasing concentration of AMI meters.
- Meter reading labor and related benefits:
  - Eventual eliminated need for periodic meter reading labor, once AMI is fully installed.
  - Benefits modeled to begin when the system is nearly fully converted to AMI after a full 10-year normal periodic replacement cycle.
- Vehicle benefits associated with labor benefits
  - Reduced demand for vehicles and associated fuel, fleet and rate base return, corresponding to reduced field service and meter reading labor demand.

[18] 10-year CAGR for CPI all goods, as of December 2024.

[19] To avoid undue refinement, the capital investment was not broken out into the portion charged to Utility Plant in Service "UPIS" and the portion charged to Accumulated Cost of Removal "ACOR". Rather, all capital expenditure is recorded as UPIS and the depreciation reflects a 10-year life.

Key quantity and price related assumptions related to meter reading, and field service labor are shown below in Figure 19.

Figure 19

Labor Related Price and Quantity Assumptions	AMI	AMR
Meter Reading		
Meter reading full time employees (current)	7	7
Meter reading full time employees (after full replacement cycle)	0	7
Meter reading hourly wage 2024	$31.31	$31.31
Quantity of benefit recognized	Begins when AMI saturation averages 95% of system (year 11)	
Field Service Work		
FSR orders completed 2024	103,573	103,573
Reduction in FSR order demand	(30,200)	-
Field service work hourly wage 2024	$34.55	
Field Service and Meter reading overtime factor	107.7%/106.6%	
Quantity of benefit recognized	% of benefit achieved aligns with average % of AMI saturation achieved	
Common Labor Assumptions for Meter Reading and Field Service Work		
Annual union wage increase assumption (3-year CAGR for average FSR and meter reader wage changes, 2022-2024)	3.0%	
Overhead/overtime rate (benefits and payroll taxes as a % of wages)	27.5% + 3% union APP	

Key vehicle-related benefit assumptions are shown in Figure 20 below. Vehicle-related benefits were calculated in line with labor benefits, with the assumption that one vehicle is needed for a full-time equivalent quantity of labor, using 2088 hours as a basis.

Figure 20

Vehicle Related Price and Quantity Assumptions	Amount for 2024
Annual mileage & mpg for vehicle	11,437 miles / 12.2 mpg
Fuel cost per gallon (forecasted by Energy Information Administration Table 12 as of 3/5/2025 at 11:48 EST)	$3.55
Vehicle Related Price and Quantity Assumptions	Amount for 2024
Annual maintenance per light truck	$3,137
Average net book value per light truck (as of May 2025)	$33,112
Current annual depreciation per vehicle	$6,928

The benefits are recognized over time, as AMI is deployed eventually throughout the system. The twenty-year nominal totals were forecasted based on the pace of AMI deployment.

Cost Net of Benefits

When annual capital related expenses are netted against annual operating expense benefits, AMI is expected to be the most economically beneficial in the long term. Figure 21 shows the annual costs net of benefits by year on a per customer per month basis for the average pricing of AMR and AMI. Figure 22 shows the underlying costs net of benefits by year for the two meter suppliers on a per customer per month basis, separated by AMR and AMI per manufacturer.

Figure 21 (CONFIDENTIAL)

[redacted]

Figure 22 (CONFIDENTIAL)

Meter Technology Comparison
20-Year Annual Costs Net of Benefits by Year
per Customer per Month

[redacted]

The annual costs net of benefits can also be discounted to a net present value ("NPV") for the twenty-year period.[20] Please see Figure 23 below for the average pricing results of AMR and AMI on a per customer per month basis. Figure 24 details the underlying net present value by manufacturer and by AMR and AMI on a per customer per month basis. The gap between these is $3.6mm over 20 years, or approximately $180k per year. For context, this is just over $1.29 per customer per year (roughly $0.11 per month for an average residential bill). Additionally, as discussed above, these are merely the quantifiable effects of AMI. KAWC expects our customers to experience significant qualitative benefits as well related to improved customer service, water use management, high bill avoidance, and affordability. KAWC also expects its employees will be safer and better able to support customers efficiently, with fewer truck rolls.

[20] A discount factor equal to Kentucky American's requested rate of return in this case, or 7.87% is used for the purpose of calculating net present value.

Figure 23 (CONFIDENTIAL)

Meter Technology Comparison
20-Year Net Present Value of Costs Net of Benefits
per Customer per Month

[redacted]

Figure 24 (CONFIDENTIAL)

Meter Technology Comparison
20-Year Net Present Value of Costs Net of Benefits
per Customer per Month

[redacted]

KAWC is providing below the estimated forecast annual cost of operation, as well as the estimated forecast annual cost net of benefits, for each year from 2026 to 2045 in Figure 25.

Figure 25

Year of Operation	Calendar Year	Annual Cost of Operation	Annual Cost of Operation Net of Benefits
1	2026	$253,194	$203,582
2	2027	$1,493,237	$1,340,870
3	2028	$2,695,325	$2,438,392
4	2029	$3,012,941	$2,660,548
5	2030	$2,899,845	$2,491,164
6	2031	$2,636,145	$2,185,036
7	2032	$2,521,906	$2,010,647
8	2033	$2,757,081	$2,147,337
9	2034	$3,850,619	$3,048,612
10	2035	$4,890,529	$3,890,201
11	2036	$5,286,651	$3,673,812
12	2037	$5,625,765	$3,431,152
13	2038	$5,931,906	$3,676,371
14	2039	$6,054,331	$3,734,784
15	2040	$5,747,470	$3,359,460
16	2041	$5,289,902	$2,830,571
17	2042	$4,985,448	$2,453,535
18	2043	$5,036,957	$2,432,955
19	2044	$5,961,917	$3,288,408
20	2045	$6,840,952	$4,095,784

Summary of Findings

Based on all of the foregoing, the Company believes that deployment of AMI technology utilizing a cellular network is in the long-term best interest of customers. AMI provides significant benefits to customers through improved metering, operational efficiencies and enhanced customer service, among others. While many of these benefits may not be explicitly quantifiable, they still provide tangible benefits to customers. While initially slightly more costly than AMR, AMI does so while delivering a solution that is the least cost in the long term.

Unlike other AMI deployments in the state, KAWC is not planning a discreet project to accelerate the replacement of its existing metering equipment. Rather, KAWC is merely planning to transition to an updated technology for meter reading equipment as it completes meter and endpoint replacements in the normal course of business. As such, it is clear that whereby cellular AMI will be installed for normal, scheduled, periodic replacements or in instances of damaged or broken equipment, that there is a need for the investment and no wasteful duplication.

It is critical that the Company begin AMI implementation as soon as possible in order to maximize the benefits and cost effectiveness of AMI implementation, and KAWC plans to begin doing so upon approval of this Plan.

CPCN Filing Requirements

Below is a list of the CPCN specific filing requirements set forth in 807 KAR 5:001 Section 15 (2):

(a)	The facts relied upon to show that the proposed construction or extension is or will be required by public convenience or necessity.	See Exhibit A.
(b)	Copies of franchises or permits, if any, from the proper public authority for the proposed construction or extension, if not previously filed with the commission.	Not applicable. No new franchises or permits are required for the deployment of cellular AMI technology.
(c)	A full description of the proposed location, route, or routes of the proposed construction or extension, including a description of the manner in which same will be constructed, and the names of all public utilities, corporations, or persons with whom the proposed construction or extension is likely to compete.	KAWC plans to install AMI at all premises in KAWC's service territory. See Exhibit A, Appendix A, Figures 26-28, for maps depicting the proposed locations and deployment timeframes.
(d)(1)	Three (3) copies (one (1) in portable document format on electronic storage medium and two (2) in paper medium) of maps to suitable scale showing the location or route of the proposed construction or extension, as well as the location to scale of like facilities owned by others located anywhere within the map area with adequate identification as to the ownership of the other facilities.	See Exhibit A, Appendix A, Figures 26-28 for maps depicting the proposed locations and deployment timeframes.
(d)(2)	Plans and specifications and drawings of the proposed plant, equipment, and facilities.	See Appendix B for the selected metering option's equipment specification sheets.
(e)	The manner in detail in which the applicant proposes to finance the proposed construction or extension.	This construction will be funded in the ordinary course of business, using the same mix of debt and equity as utilized to fund the remainder of its capital investment program.
(f)	An estimated annual cost of operation after the proposed facilities are placed into service.	See Figure 25.
	Engineering plans, specifications, drawings, plats and reports for the proposed construction or extension prepared by a registered engineer must be signed, sealed, and dated by an engineer registered in Kentucky.	See Cover Page of Exhibit A containing the sign and seal of an engineer registered in Kentucky

Conclusion

KAWC's implementation of cellular AMI technology over the course of the next decade is in the long-term best interests of customers. The investments are needed as they replace meters at the end of their useful life or that have failed to provide reliable service to customers. They will be made as part of the normal periodic meter equipment replacement cycle, when meters and endpoints would normally be replaced anyway; thus, there will be no wasteful duplication. Further, replacing equipment with AMI as this replacement cycle goes forward will enable significant enhancements in customer service, employee safety, and operational efficiency. A thorough meter selection process was conducted and alternatives for meter reading technology were considered, with costs and benefits measured for each. Cellular AMI is the proposed solution due to both its customer service advantages as well as its favorable proposition for costs net of benefits.

Appendix A

Figure 26 – Meter Replacements by Year of Completion

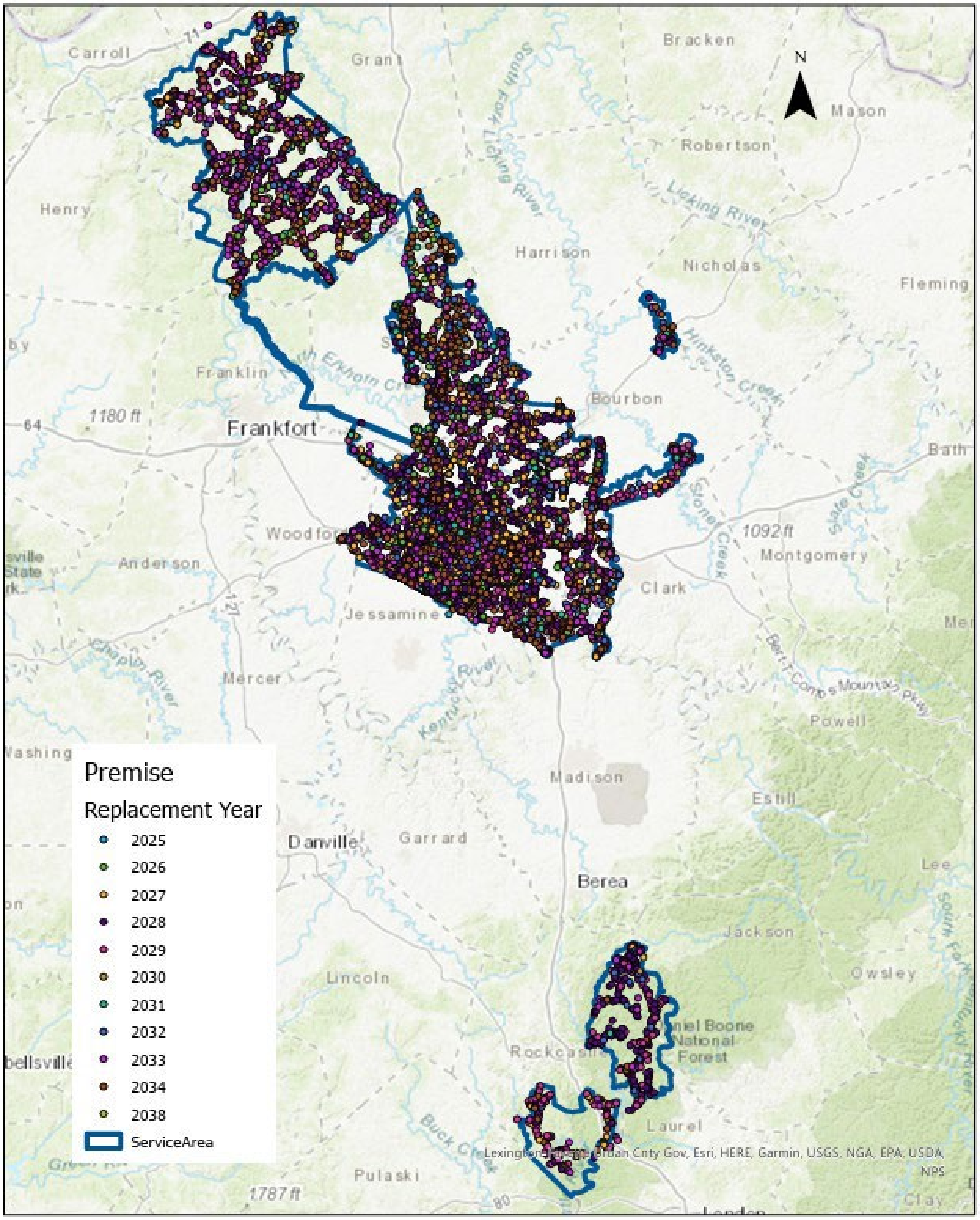


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Figure 27 – May 2025 (248 premises)

Meter Replacements: Annual Completion Over a 5-Year Period

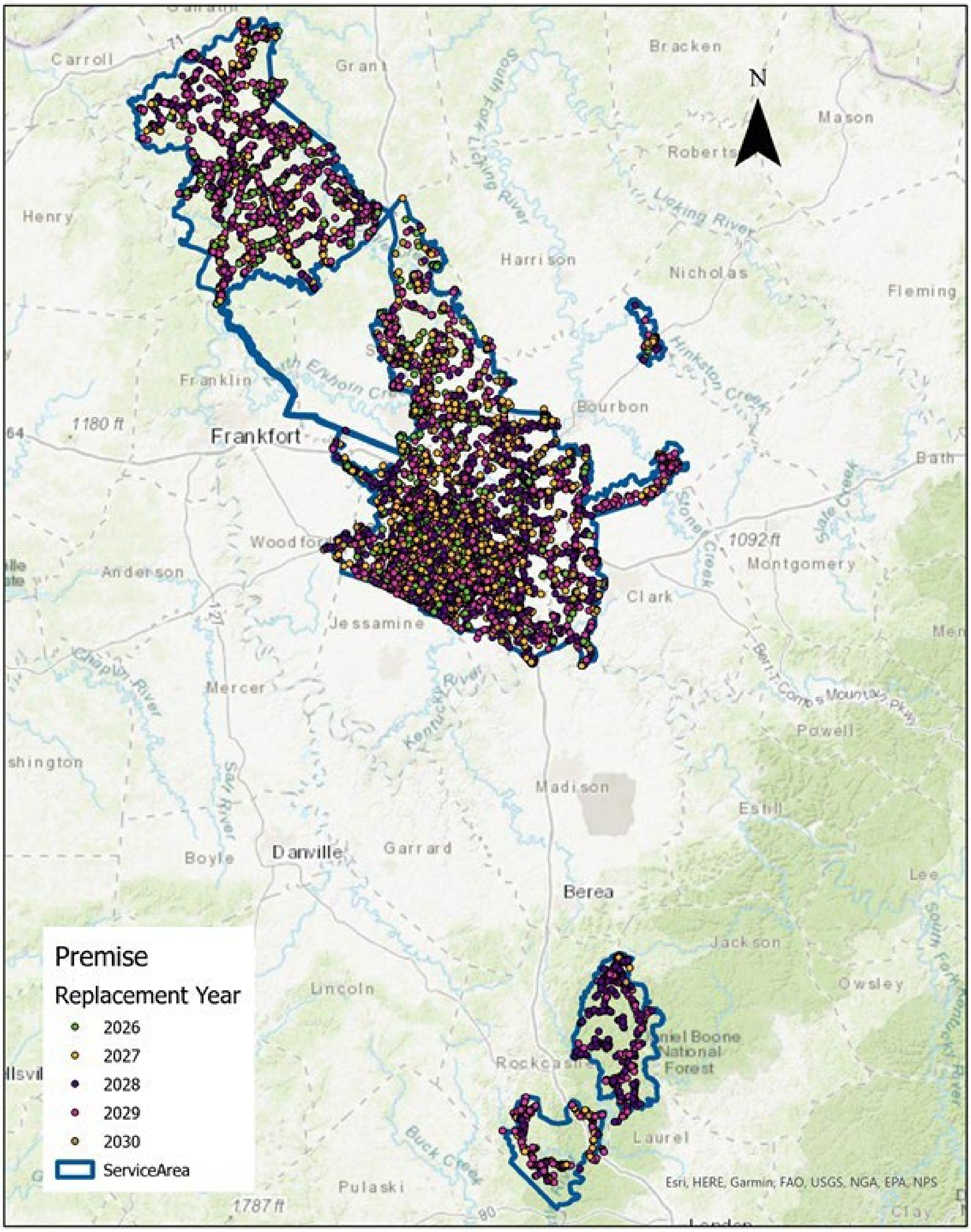
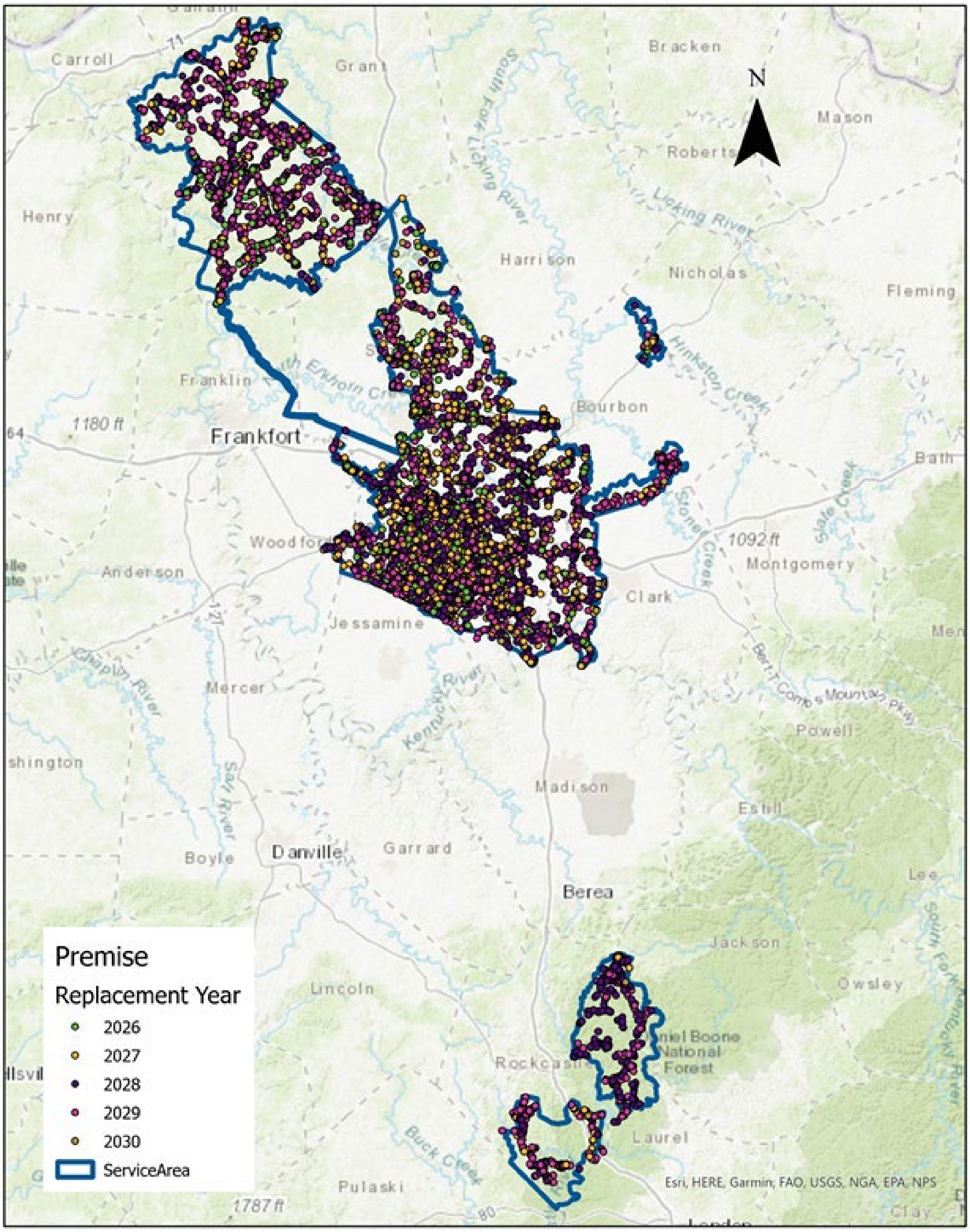


Figure 28 – End of 2034 (~81k premises)

Meter Replacements: Annual Completion Over a 5-Year Period



Appendix B

E-Series®
Ultrasonic Flow Meters

E-Series® Ultrasonic Meter

Cold Water Stainless Steel Meter, 1-1/2 and 2 inch

DESCRIPTION

The E-Series® Ultrasonic meter uses solid-state technology in a compact, totally encapsulated, weatherproof, and UV-resistant housing, suitable for residential and commercial applications. Electronic metering provides information—such as rate of flow and reverse flow indication—and data not typically available through traditional, mechanical meters and registers. Electronic metering eliminates measurement errors due to sand, suspended particles and pressure fluctuations.

The Ultrasonic 1-1/2 and 2 inch meters feature:

- Minimum extended low-flow rate lower than typical positive displacement meters.
- Simplified one-piece electronic meter and register that are integral to the meter body and virtually maintenance free.
- Sealed, non-removable, tamper-protected meter and register.
- Easy-to-read, 9-digit LCD display presents consumption, rate of flow, reverse-flow indication, and alarms (empty pipe, temperature, exceeding max flow, sensor error, reverse flow, suspected leak, 30 day no usage, end of life).
- High resolution industry standard ASCII encoder protocol sends alarms and data to ORION® Cellular endpoints and BEACON® SaaS* suite to establish a smart water solution.

The Ultrasonic meter is available with an in-line connector for easy connection and installation to AMR/AMI endpoints. It is also available with a flying lead for field splice connection.

* Software as a Service

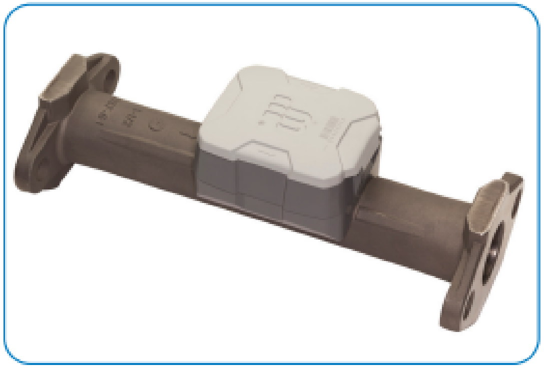
APPLICATIONS

Use the Ultrasonic meter for measuring potable cold water in residential, commercial and industrial services. The meter is also ideal for non-potable, reclaimed irrigation water applications or less than optimum water conditions where small particles exist.

E-Series Ultrasonic meters meet and exceed ANSI/AWWA C715 standards. The meters comply with the lead-free provisions of the Safe Drinking Water Act, are certified to NSF/ANSI/CAN Standards 61 and 372 and carry the NSF-61 mark on the housing.

OPERATION & PERFORMANCE

As water flows into the measuring tube, ultrasonic signals are sent consecutively in forward and reverse directions of flow. Velocity is then determined by measuring the time difference between the measurement in the forward and reverse directions. Total volume is calculated from the measured flow velocity using water temperature and pipe diameter. The LCD display shows total volume and alarm conditions and can toggle to display rate of flow.



In the normal temperature range of 45…122° F (7…50° C), the Ultrasonic "new meter" consumption measurement is accurate to:

- ±1.5% over the normal flow range
- ±3.0% from the extended low flow range to the minimum flow value

CONSTRUCTION

E-Series Ultrasonic meters feature a stainless steel, lead-free meter housing, an engineered polymer and stainless steel metering insert, a meter-control circuit board with associated wiring, LCD, and battery. Wetted elements are limited to the pressure vessel, the polymer/stainless steel metering insert and the transducers. The electronic components are housed and fully potted within a molded, engineered polymer enclosure, which is permanently attached to the meter housing. The transducers extend through the stainless steel housing and are sealed by O-rings.

The metering insert holds the stainless steel ultrasonic reflectors in the center of the flow area, enabling turbulence-free water flow through the tube and around the ultrasonic signal reflectors. The metering insert's patented design virtually eliminates chemical buildup on the reflectors, ensuring long-term metering accuracy.

METER INSTALLATION

The meter is completely submersible and can be installed using horizontal or vertical piping, with flow in the up direction. The meter will not measure flow when an "empty pipe" condition is experienced. An empty pipe is defined as a condition that occurs when the flow sensors are not fully submerged.

SPECIFICATIONS

E-Series Ultrasonic Meter Size	**1-1/2 in. (40 mm)**	**2 in. (50 mm)**
Normal Test Flow Limits	1.25…100 gpm (0.28…22.7 m^3/hr)	1.5…160 gpm (0.34…36.3 m^3/hr)
Minimum Test Flow Limits	0.40 gpm (0.09 m^3/hr)	0.50 gpm (0.11 m^3/hr)
Safe Maximum Operating Condition (SMOC)	100 gpm (22.7 m^3/hr)	160 gpm (36.3 m^3/hr)
Typical Pressure Loss	3.8 psi (0.26 bar)	5.2 psi (0.36 bar)
Reverse Flow – Maximum Rate	12 gpm (2.73 m^3/hr)	18 gpm (4.09 m^3/hr)
Operating Performance	In the normal temperature range of 45…122° F (7…50° C), new meter consumption measurement is accurate to: • ±1.5% over the normal flow range • ±3.0% from the extended low flow range to the minimum flow value	
Storage Temperature	– 40…140° F (– 40…60° C)	
Maximum Ambient Storage (Storage for One Hour)	150° F (66° C)	
Measured-Fluid Temperature Range	34…140° F (1…60° C)	
Humidity	0…100% condensing; meter is capable of operating in fully submerged environments	
Maximum Operating Pressure of Meter Housing	175 psi (12 bar)	
Register Type	Straight reading, permanently sealed electronic LCD; digits are 0.28 in. (7 mm) high	
Register Display	• Consumption (up to nine digits) • Rate of flow • Alarms (empty pipe, temperature, exceeding max flow, sensor error, reverse flow, suspected leak, 30 day no usage, end of life) • Unit of measure factory programmed for gallons, cubic feet and cubic meters	
Register Capacity	• 100,000,000 gallons • 10,000,000 cubic feet • 1,000,000 cubic meters	
Totalization Display Resolution	• Gallons: 0.X • Cubic feet: 0.XX • Cubic meters: 0.XXX	
Battery	3.6-volt lithium thionyl chloride; battery is fully encapsulated within the register housing and is not replaceable; 20-year battery life	

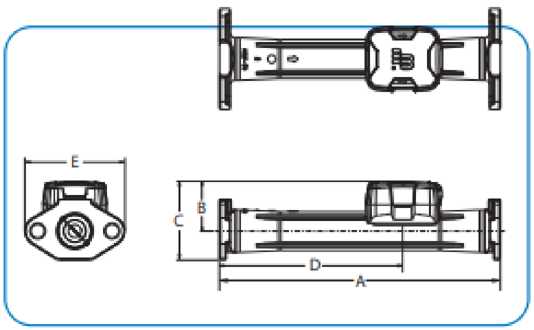
MATERIALS

Meter Housing	316 stainless steel
Measuring Element	Pair of ultrasonic sensors located in the flow tube
Register Housing & Lid	Engineered polymer
Metering Insert	Engineered polymer & stainless steel
Transducers	Piezo-ceramic device with wetted surface of stainless CrNiMo

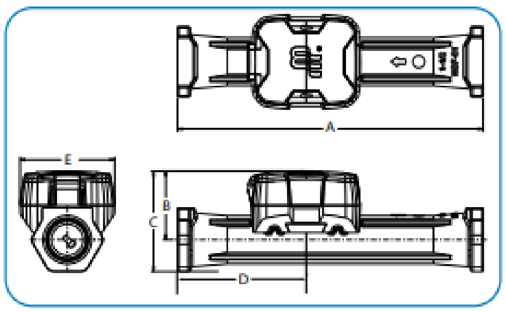
PHYSICAL DIMENSIONS

E-Series Ultrasonic Meter Size	1-1/2 in. (40 mm)	1-1/2 in. (40 mm)	2 in. (50 mm)	2 in. (50 mm)
Housing	**Elliptical**	**HEX**	**Elliptical**	**HEX**
Size Designation X Lay Length	1-1/2 x 13 in. (38 x 330 mm)	1-1/2 x 12.62 in. (38 x 321 mm)	2 x 17 in. (51 x 432 mm)	2 x 15.25 in. (51 x 387 mm)
Weight (without AMR)	8.2 lb (3.7 kg)	6.5 lb (2.9 kg)	11.9 lb (5.4 kg)	8.9 lb (4.0 kg)
See illustration below for Measurement Designations.				
Length (A)	13 in. (330 mm)	12.62 in. (321 mm)	17 in. (432 mm)	15.25 in. (387 mm)
Height (B)	2.80 in. (71 mm)	2.84 in. (72 mm)	3.01 in. (77 mm)	3.06 in. (78 mm)
Height (C)	4.55 in. (116 mm)	4.15 in. (105 mm)	4.76 in. (121 mm)	4.68 in. (119 mm)
Length (D)	7.10 in. (180 mm)	5.31 in. (135 mm)	11.10 in. (282 mm)	5.05 in. (128 mm)
Width (E)	5.50 in. (140 mm)	3.90 in. (99 mm)	6.08 in. (154 mm)	3.90 in. (99 mm)
Bore Size	1-1/2 in. (40 mm)	1-1/2 in. (40 mm)	2 in. (51 mm)	2 in. (51 mm)
Two-Bolt Elliptical Flange (AWWA)	1-1/2 in. (40 mm)	—	2 in. (51 mm)	—
Bolt Hole Diameter	0.69 in. (17.53 mm)	—	0.81 in. (20.57 mm)	—
Companion Flange	1-1/2 in. (40 mm)	—	2 in. (51 mm)	—
Internal Thread Size	—	1-1/2 in. NPT	—	2 in. NPT

Elliptical Measurement Designations

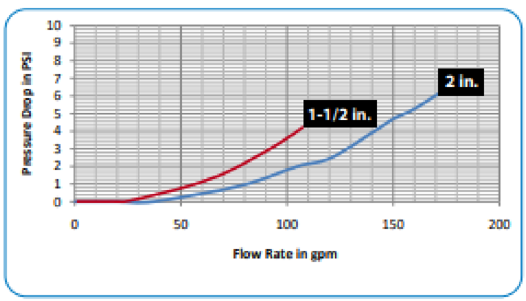


HEX Measurement Designations



PRESSURE LOSS CHART

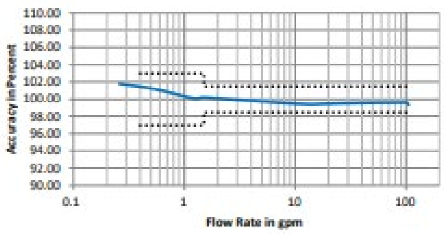
Flow rate in Gallons Per Minute (gpm)



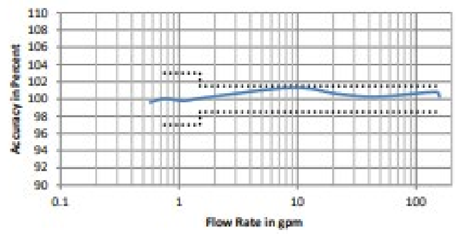
ACCURACY CHARTS

Rate of Flow in gallons per minute (gpm)

1-1/2 in. Meter



2 in. Meter



***SMART WATER IS** BADGER METER*

Recordall®
RCDL | Mechanical Flow Meters

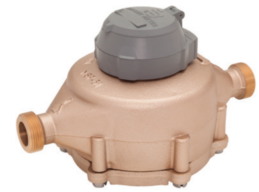
Recordall® Disc Meters

Lead-Free Bronze Alloy, Sizes 5/8, 5/8 x 3/4, 3/4 & 1 inch NSF/ANSI/CAN Standards 61 and 372 Certified

Model 25—5/8 in., 5/8 × 3/4 in.

Model 35—3/4 in.

Model 55—1 in.



Model 70—1 in.

DESCRIPTION

The Recordall Disc Series meters meet or exceed the most recent revision of AWWA Standard C700 and are available in a lead-free bronze alloy. The meters comply with the lead-free provisions of the Safe Drinking Water Act, are certified to NSF/ANSI/CAN Standards 61 and 372 (Trade Designations: M25-LL, M35-LL, M55-LL, M70-LL) and carry the NSF-61 mark on the housing. All components of the lead-free bronze alloy meter (housing, measuring element, seals, and so on) comprise the certified system.

Applications: For use in measurement of potable cold water in residential, commercial and industrial services where flow is in one direction only.

Operation: Water flows through the meter's strainer and into the measuring chamber where it causes the disc to nutate. The disc, which moves freely, nutates on its own ball, guided by a thrust roller. A drive magnet transmits the motion of the disc to a follower magnet located within the permanently sealed register. The follower magnet is connected to the register gear train. The gear train reduces the disc nutations into volume totalization units displayed on the register or encoder face.

Operating Performance: The Recordall Disc Series meters meet or exceed registration accuracy for the low flow rates (95%), normal operating flow rates (100 ±1.5%), and maximum continuous operation flow rates as specifically stated in AWWA Standard C700.

Construction: Recordall Disc meter construction, which complies with ANSI/AWWA standard C700, consists of three basic components: meter housing, measuring chamber and permanently sealed register or encoder. The meter is available in a lead-free bronze alloy with externally threaded spuds. A corrosion-resistant engineered polymer material is used for the measuring chamber.

Magnetic Drive: Direct magnetic drive, through the use of high-strength magnets, provides positive, reliable and dependable register coupling for straight-reading or AMR/AMI meter reading options.

Tamper-Proof Features: Unauthorized removal of the register or encoder is inhibited by the option of a tamper detection seal wire screw, TORX® tamper-resistant seal screw or the proprietary tamper-resistant keyed seal screw. Each can be installed at the meter site or at the factory.

Maintenance: Badger Meter Recordall Disc Series meters are designed and manufactured to provide long-term service with minimal maintenance. When maintenance is required, it can be performed easily either at the meter installation or at any other convenient location.

To simplify maintenance, the register, measuring chamber, and strainer can be replaced without removing the meter housing from the installation. No change gears are required for accuracy calibration. Interchangeability of parts among like-sized meters and meter models also minimizes spare parts inventory investment. The built-in strainer has an effective straining area of twice the inlet size.

Connections: Tailpieces/Unions for installations of meters on various pipe types and sizes, including misaligned pipes, are available as an option.

Meter Spud and Connection Sizes

Model	Size Designation (in.)	×	"L" Laying Length (in.)	"B" Bore Dia. (in.)	Coupling Nut and Spud Thread (in.)	Tailpiece Pipe Thread (NPT) (in.)
25	5/8	×	7-1/2	5/8	3/4 (5/8)	1/2
	5/8 x 3/4	×	7-1/2	5/8, 3/4	1 (3/4)	3/4
35	3/4	×	7-1/2	3/4	1 (3/4)	3/4
	3/4	×	9	3/4	1 (3/4)	3/4
	3/4 x 1	×	9	3/4	1-1/4 (1)	1
55	1	×	10-3/4	1	1-1/4 (1)	1
70	1	×	10-3/4	1	1-1/4 (1)	1

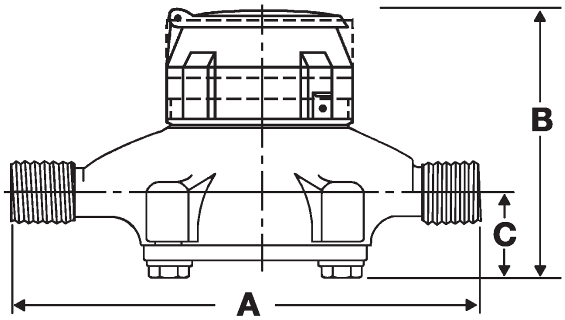
SPECIFICATIONS

	Model 25 (5/8 in. & 5/8 × 3/4 in.)	Model 35 (3/4 in.)	Model 55 (1 in.)	Model 70 (1 in.)
Typical Operating Range (100% ±1.5%)	0.5…25 gpm (0.11…5.7 m^3/hr)	0.75…35 gpm (0.17…7.9 m^3/hr)	1…55 gpm (0.23…12.5 m^3/hr)	1.25…70 gpm (0.28…16 m^3/hr)
Low Flow	0.25 gpm (0.057 m^3/hr) Min. 98.5%	0.375 gpm (0.085 m^3/hr) Min. 97%	0.5 gpm (0.11 m^3/hr) Min. 95%	0.75 gpm (0.17 m^3/hr) Min. 95%
Maximum Continuous Operation	15 gpm (3.4 m^3/hr)	25 gpm (5.7 m^3/hr)	40 gpm (9.1 m^3/hr)	50 gpm (11.3 m^3/hr)
Pressure Loss at Maximum Continuous Operation	**5/8 in. size**: 3.5 psi @ 15 gpm (0.24 bar @ 3.4 m^3/hr) **5/8 × 3/4 in. size**: 2.8 psi @ 15 gpm (0.19 bar @ 3.4 m^3/hr)	5 psi @ 25 gpm (0.37 bar @ 5.7 m^3/hr)	3.4 psi @ 40 gpm (0.23 bar @ 9.1 m^3/hr)	6.5 psi @ 50 gpm (0.45 bar @ 11.3 m^3/hr)
Maximum Operating Temperature	80° F (26° C)			
Maximum Operating Pressure	150 psi (10 bar)			
Measuring Element	Nutating disc, positive displacement			
Meter Connections	*Available in NL bronze and engineered polymer to fit spud thread bore diameter sizes:*			
	5/8 in. size: 5/8 in. (DN 15 mm) **5/8 × 3/4 in. size**: 3/4 in. (DN 15 mm)	3/4 in. (DN 20 mm)	1 in. (DN 25 mm)	1 in. (DN 25 mm)

MATERIALS

	Model 25 (5/8 in. & 5/8 × 3/4 in.)	Model 35 (3/4 in.)	Model 55 (1 in.)	Model 70 (1 in.)
Meter Housing	Lead-free bronze alloy			
Housing Bottom Plates	Cast iron, lead-free bronze alloy, engineered polymer	Cast iron, lead-free bronze alloy		
Measuring Chamber	Engineered polymer			
Disc	Engineered polymer			
Trim	Stainless steel			
Strainer	Engineered polymer			
Disc Spindle	Stainless steel	Stainless steel	Engineered polymer	Stainless steel
Magnet	Ceramic	Ceramic	Ceramic	Ceramic
Magnet Spindle	Engineered polymer	Engineered polymer	Engineered polymer	Stainless steel
Register Lid and Shroud	Engineered polymer, bronze			

DIMENSIONS



Meter Size	Model	A Laying Length	B Height Reg.	C Centerline Base	Width	Approx. Shipping Weight
5/8 in. (15 mm)	25	7-1/2 in. (190 mm)	4-15/16 in. (125 mm)	1-11/16 in. (42 mm)	4-1/4 in. (108 mm)	4-1/2 lb (2 kg)
5/8 in. × 3/4 in. (15 mm)		7-1/2 in. (190 mm)	4-15/16 in. (125 mm)	1-11/16 in. (42 mm)	4-1/4 in. (108 mm)	4-1/2 lb (2 kg)
3/4 in. (20 mm)	35	7-1/2 in. (190 mm)	5-1/4 in. (133 mm)	1-5/8 in. (41 mm)	5 in. (127 mm)	5-1/2 lb (2.5 kg)
3/4 in. (20 mm)		9 in. (229 mm)	5-1/4 in. (133 mm)	1-5/8 in. (41 mm)	5 in. (127 mm)	5-3/4 lb (2.6 kg)
3/4 in. × 1 in. (20 mm)		9 in. (229 mm)	5-1/4 in. (133 mm)	1-5/8 in. (41 mm)	5 in. (127 mm)	6 lb (2.7 kg)
1 in. (25 mm)	55	10-3/4 in. (273 mm)	6 in. (152 mm)	2-1/32 in. (52 mm)	6-1/4 in. (159 mm)	8-3/4 lb (3.9 kg)
1 in. (25 mm)	70	10-3/4 in. (273 mm)	6-1/2 in. (165 mm)	2-5/16 in. (59 mm)	7-3/4 in. (197 mm)	11-1/2 lb (5.2 kg)

ENCODER / REGISTER

High Resolution Encoders (HR-E®, HR-E® LCD) for AMR/AMI Reading Solutions

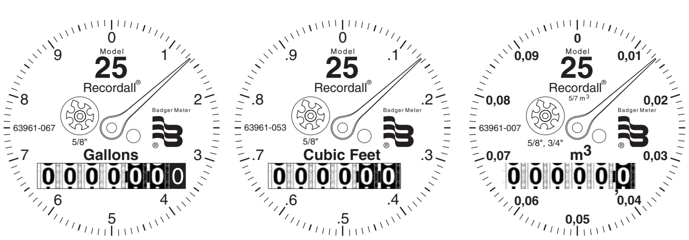
High resolution encoder solutions are available for all Recordall Disc Series meters. Badger Meter high resolution encoders provide years of reliable, accurate readings for a variety of applications. See details at ***badgermeter.com***.

Local Register—Mechanical Sweep-Hand Registration

The local register is a straight-reading, permanently sealed magnetic drive register. The register is permanently sealed to eliminate the intrusion of moisture, dirt or other contaminants. The register achieves true water resistance due the unique adhesive technology used to seal the glass dome to the corrosion-resistant metal bottom. Due to this sealing process, the register exceeds all applicable requirements of AWWA Standard C707 and is suitable for installation in all environments, including meter pits subject to continuous submergence.

The local register has a six-odometer wheel totalization display, 360° test circle with center sweep hand, and flow finder to detect leaks. Register gearing is made of self-lubricating engineered polymer, which minimizes friction and provides long life. The multi-position register simplifies meter installation and reading. The register capacity is 10,000,000 gallons (1,000,000 ft^3, 100,000 m^3).

A Model 25 register is used in the following example:

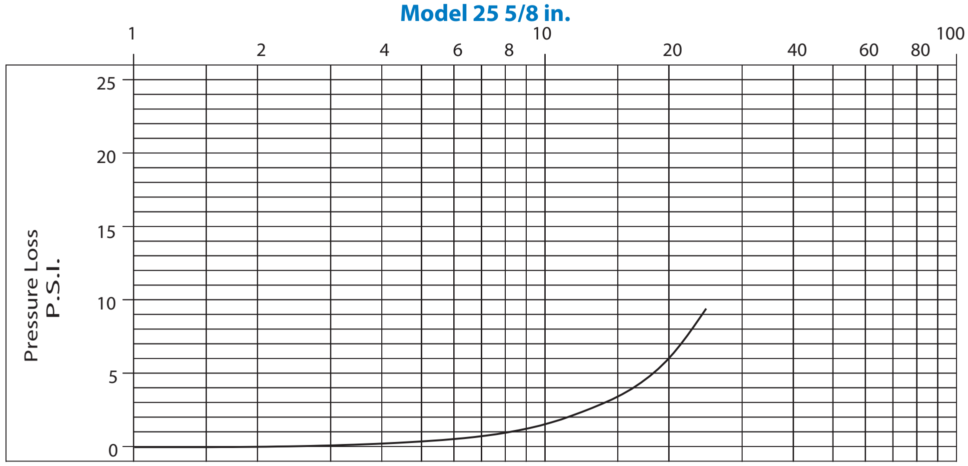


Model	Gallon	Cubic Feet	Cubic Meter
25 (5/8 in.)	10	1	0.1/0.01
25 (5/8 × 3/4 in.)	10	1	0.1/0.01
35	10	1	0.1
55	10	1	0.1
70	10	1	0.1

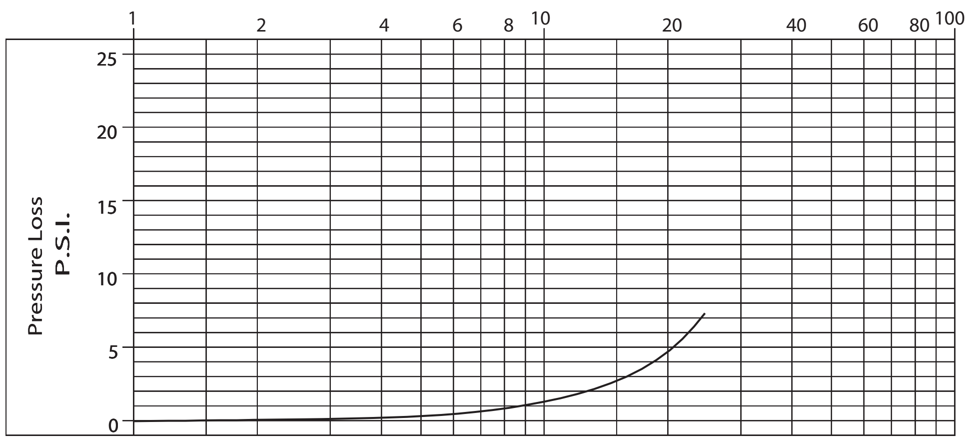
PRESSURE LOSS CHARTS

Rate of Flow in Gallons per Minute

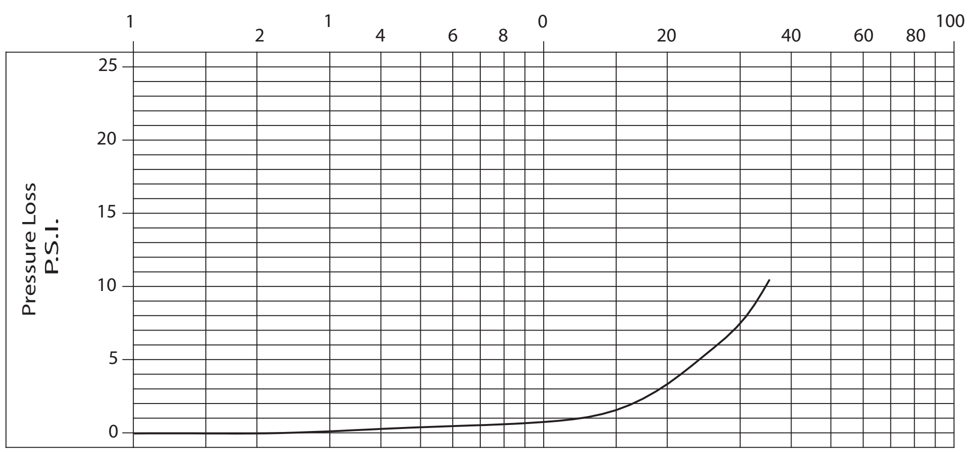
Model 25 5/8 in.



Model 25 5/8 × 3/4 in.



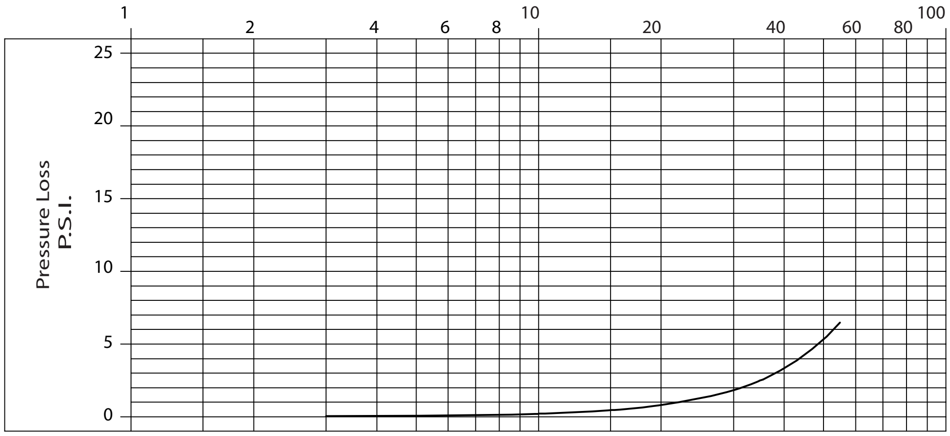
Model 35 3/4 in.



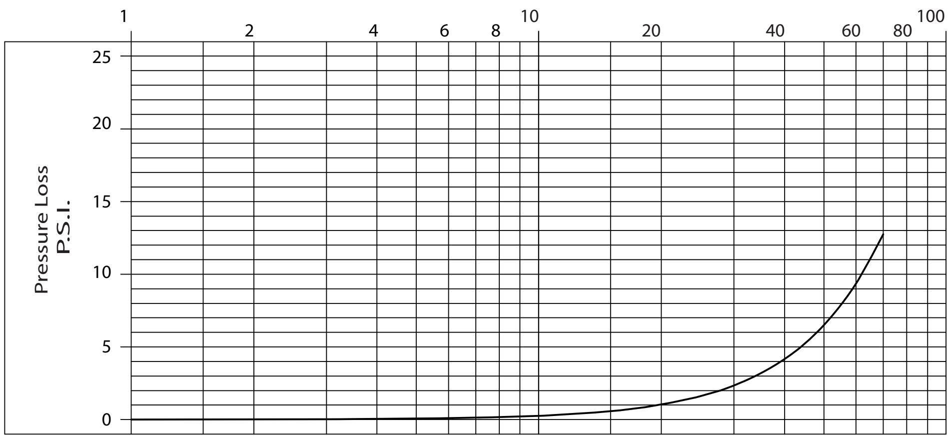
PRESSURE LOSS CHARTS (CONTINUED)

Rate of Flow in Gallons per Minute

Model 55 1 in.

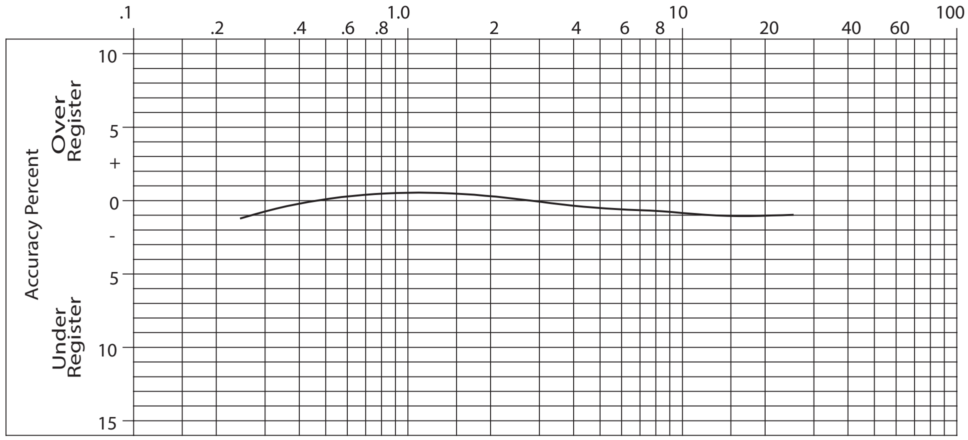


Model 70 1 in.

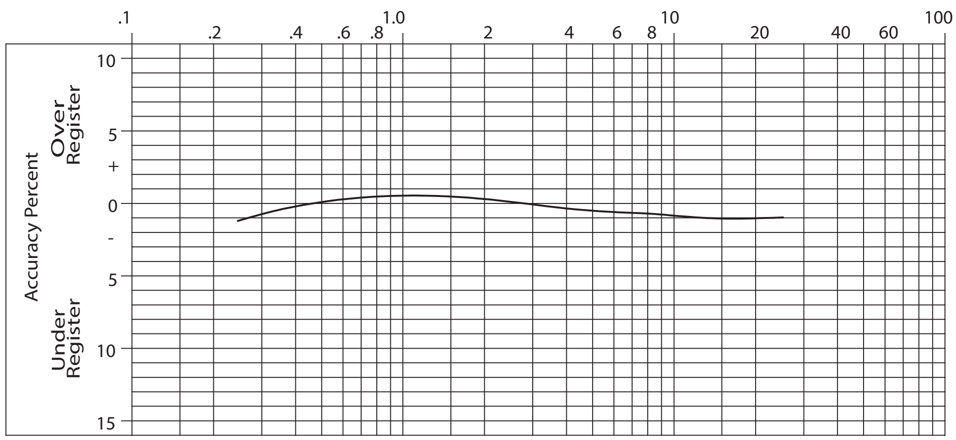


ACCURACY CHARTS

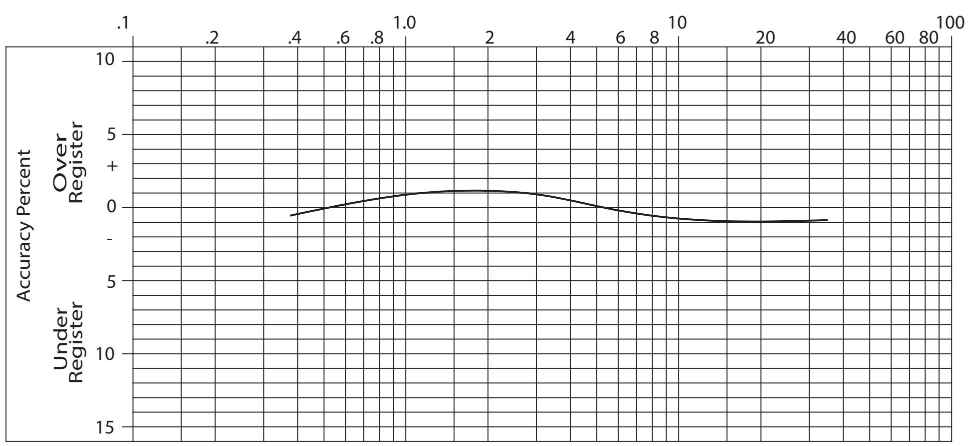
Model 25 5/8 in.



Model 25 5/8 × 3/4 in.

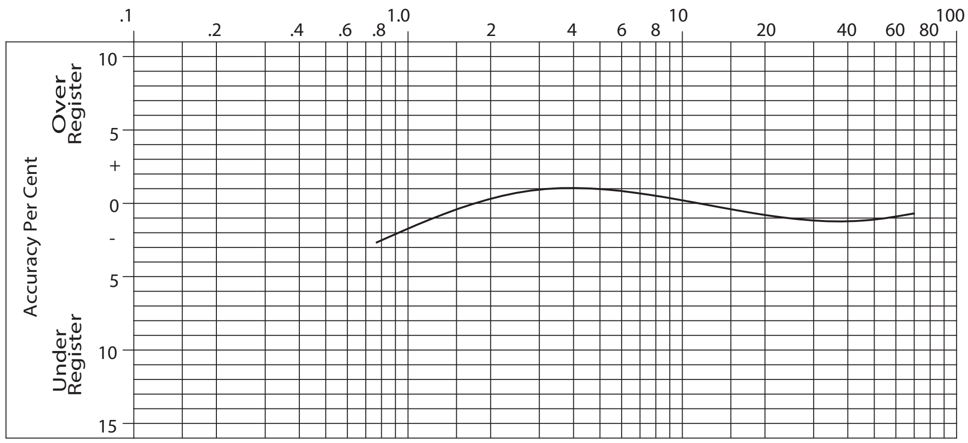


Model 35 3/4 in.

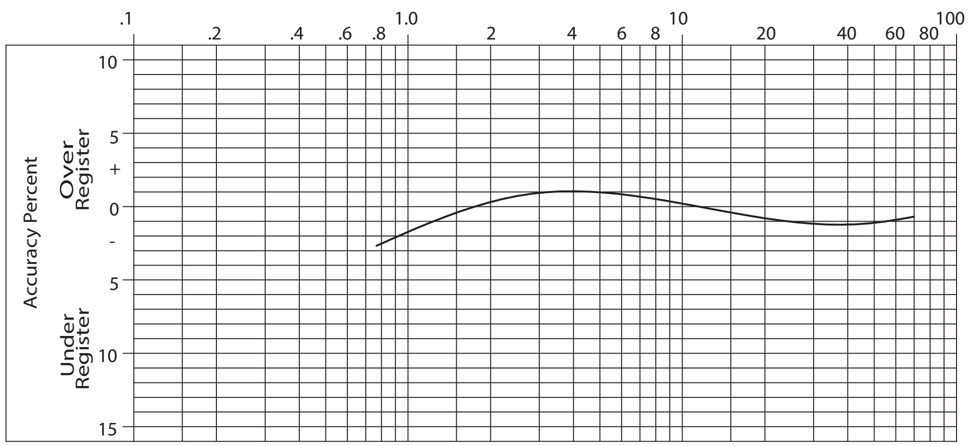


ACCURACY CHARTS (CONTINUED)

Model 55 1 in.



Model 70 1 in.



ORION® Cellular/Fixed Network Solutions

ORION® Cellular Water Endpoints

DESCRIPTION

ORION® Cellular water endpoints are innovative, two-way endpoints for smart water applications. The endpoints utilize existing IoT (Internet of Things) cellular infrastructure to efficiently and securely deliver meter reading data to the utility in a Network as a Service (NaaS) approach. Leveraging existing cellular infrastructure, the NaaS solution offers all the performance benefits of AMI, while eliminating network-related maintenance and technology concerns and enhancing deployment flexibility.

Cellular endpoints are members of the time-tested ORION family of products from Badger Meter, designed for maximum flexibility. Since 2002, the ORION product family has provided comprehensive Advanced Metering Analytics (AMA) for interval meter reading and data capture using both one-way and two-way communications.

ORION Cellular HLD endpoint (pictured)

FUNCTIONALITY

Operation: ORION Cellular water endpoints communicate with the encoder and capture 15-minute interval read data and meter status information. The endpoints then automatically broadcast the information, including endpoint status information, via the cellular network to BEACON® Software as a Service (SaaS). ORION NaaS is powered by the proven ORION system for interval data capture and two-way communication. The solution employs cellular endpoints which, as they leverage the public cellular network and require no proprietary gateways to operate, dramatically reduce infrastructure requirements compared to a traditional fixed network. This speeds installations and simplifies expansion as a system evolves.

The endpoints are designed to call in four times each workday and feature a configurable schedule that enables utility customers to select call-in times that best support their processes.

Activation: ORION Cellular water endpoints are shipped in an inactive, non-transmitting state. The Badger Meter IR Communication Device can be used to activate the endpoints and verify the encoder connection. Successful endpoint function can be confirmed through a web app demonstrating that communication has been verified to both the encoder and the network.

Alternatively, the endpoints offer a Smart Activation feature. After installation, the endpoints begin broadcasting data when the encoder senses the first usage of water. No field programming or special tools are required.

Broadcast Mode: ORION Cellular water endpoints broadcast fixed network reading data through the secure cellular network within the service area.

Specific configurations also transmit a radio frequency (RF) message to facilitate troubleshooting in the field. See *"Configurations" on page 2.*

Data Storage: The endpoints store 42 days of 15-minute data.

Output Message: ORION Cellular water endpoints broadcast a unique serial number, meter reading data, and applicable status indicators. As an advanced data security measure, each message is securely transported to BEACON SaaS only via private network and never over the public internet.

APPLICATION

Configurations: ORION Cellular water endpoints are multi-purpose endpoints that can be deployed in indoor, outdoor and pit (non-metal pit lid) applications. The electronics and battery assembly are fully encapsulated in epoxy for environmental integrity. The endpoint is available with a connector assembly for ease of installation.

Meter Compatibility: When attached to a Badger Meter High Resolution Encoder, the ORION Cellular water endpoint is compatible with all current Badger Meter Recordall® Disc, Turbo Series, Compound Series, Combo Series and Fire Service meters and assemblies, and with E-Series G2® Ultrasonic, E-Series® Ultrasonic, E-Series® Ultrasonic Plus, and ModMAG® electromagnetic flow meters.

Encoder Compatibility: The ORION Cellular water endpoint is suitable for use with a Badger Meter High Resolution Encoder as well as the following Badger Meter approved three-wire encoder registers that have a manufacture date within 10 years of the current date as long as the encoder has three wires connected to it and is programmed into the three-wire output mode for AMR/AMI: Honeywell® (Elster/ABB) ScanCoder, evoQ4 meter with Sensus® protocol module; Master Meter® Octave® Ultrasonic meter encoder output; Metron-Farnier Hawkeye; Mueller Systems 420 Solid State Register (SSR) LCD; Neptune® ProRead, E-Coder®, ARB-V®, and ProCoder; and Sensus iPerl®.

SPECIFICATIONS

Dimensions	5.125 in. (130 mm) (H) 1.75 in. (44 mm) Diameter at top 2.625 in. (W) x 2.875 in. (D) at base (67 mm (W) x 73 mm (D) at base)
Broadcast Network	LTE-M cellular network (primary communication technology)
	NB-IoT (secondary communication technology for certain variants)
RF Message for Troubleshooting	Where available (see table below) frequency is FCC-regulated 902…928 MHz frequency hopping modulation
Operating Temperature Range	
• Storage, Meter Reading and RF Message (for troubleshooting)	–40…60° C (–40…140° F)
• Cellular Communications	–20…60° C (–4…140° F)
Humidity	0%…100% condensing
Battery	One (1) lithium thionyl chloride D cell (nonreplaceable)

Construction: All ORION Cellular water endpoints are housed in an engineered polymer enclosure with an ORION RF board, battery and antenna. For long-term performance, the enclosure is fully potted to withstand harsh environments and to protect the electronics in flooded or submerged pit applications.

Wire Connections: ORION Cellular water endpoints are available with inline connectors (Twist Tight® or Nicor®) for easy installation and connection to compatible encoders/meters. The endpoints are also available with flying leads for field splice connections. Other wire connection configurations may be available upon request.

FEATURES

Smart City Ready	Future-proof technology
Communication Type	Two-way
Application Type	Control/Monitor
Endpoint Communication	Configurable call-in schedule, up to four times each workday
Reading Interval Type	15-minute
Encoder Compatibility	Absolute
Fixed Network Reading	✓
Cut-Wire Indication	✓
Encoder Error	✓
Low Battery Indication	✓
Remote Clock Synchronization	✓
Firmware Upgrades	✓

CONFIGURATIONS

Endpoint	Notes
ORION Cellular C	Includes RF and IR messages for troubleshooting
ORION Cellular HLD	Includes RF and IR messages for troubleshooting
ORION Cellular LTE-M	Includes RF and IR messages for troubleshooting

NOTE: For the ORION Cellular LTE-MP endpoint, see the *ORION Cellular LTE-MP Endpoint product data sheet*, available at *www.badgermeter.com*.

ORION® Cellular endpoints are IoT Network Certified for Smart Connected Infrastructure™ by CTIA, an association representing the U.S. wireless communications industry and companies throughout the mobile ecosystem. The certification signifies that the endpoints meet global 4G and 5G, 3GPP, NIST, and CTIA certification standards for cybersecurity and network performance, and are suitable to support critical infrastructure operations.

License Requirements: ORION Cellular water endpoints comply with Part 15, Part 22, Part 24, and Part 27 of the FCC Rules. No license is required by the utility to operate an ORION meter reading system. This device complies with Industry Canada license-exempt RSS standard(s). The device shall be used in such a manner that the potential for human contact in normal operation is minimized. This equipment complies with RSS-102 radiation exposure limits. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body. This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

Transportation: **WARNING**: The operation of transmitters and receivers on airlines is strictly prohibited by the Federal Aviation Administration. As such, the shipping of radios and endpoints via air is prohibited. Please follow all Badger Meter return and/or shipping procedures to prevent exposure to liability.

Warning: To reduce the possibility of electrical fire and shock hazards, never connect the cable from the endpoint to any electrical supply source. The endpoint cable provides SELV low voltage limited energy power to the load and should only be connected to passive elements of a water meter register.

Caution: Endpoint batteries are *not* replaceable. Users should make no attempt to replace the batteries.
Changes or modifications to the equipment that are not expressly approved by Badger Meter could void the user's authority to operate the equipment.