



Augusta Utilities - Water Loss Control Program
2026 Program Review & Analysis **Professional Services Proposal Oct. 2025**

Part 1: Supply Meter Accuracy Testing & Supply Data Analysis

The last round of independent testing conducted was in 2022. Six of the 11 finished-water meters were included in that testing, representing approximately 60% of total system input.

Test methods to be utilized will include a combination of insertion probe and volumetric displacement. AUD's existing ultrasonic meter may be deployed in tandem, if desired, and we will include that data in parallel with our analysis for reference.

Query & compilation of raw SCADA production data to be performed for all 11 finished-water meters. Analysis to be performed for data gaps and anomalies as integrity check for production data recording & archival processes. It is anticipated that the testing will be conducted in the fall of 2026.

Part 1 Budget: 22,500

Part 2: Billing Data Analytics for Level 2 Validation of Billed & Unbilled Consumption

Export of raw billing data at account level, to validate integrity of both 1) the database itself, and 2) the query process that is utilized to provide the monthly and annual consumption volumes. Analytics will include twelve (12) integrity checks, as follows:

1. Count of Accounts per Bill Cycle – A review of the total number of records for each month/bill cycle was conducted. This review provides insight into the completeness of the export as well as identifies any potential issues related to missed bills of existing customers.
2. Verification of Exclusion of Non-Potable Volumes – A utility's billing software is often used to store and bill volumes other than the potable volumes used in the water audit. These volumes are often designated through a rate schedule, customer classification, or other identifier. In this review, any unique identifiers presented in the raw data were used to confirm that only potable volumes were used in the water audit.
3. Duplicate Records – Prior to review of the exported account level data, a check for duplicate records is performed. Often, the export will contain duplicate records where volumes are duplicated in multiple rows of data.
4. Negative Consumption – Negative consumption within the database can be indicative of a data archival issue. Many billing programs maintain a separate database that stores the original, uncorrected readings and usage from the adjusted database where adjustments and corrections are archived. Other negative consumptions are legitimate as a utility may use to correct an errant reading or estimation in a previous period. New meters were installed starting in June of 2024 and read in a bi-directional format and thus, negative reads are plausible based on the type of meter.
5. Monthly Consumption Outliers (High/Low) – A review of each account's monthly consumption pattern was conducted, and outliers were flagged. Many outliers are legitimate, and most were examined by the utility. Higher consumption is to be expected in the summer months and thus, the filters used to determine high volume outliers are less restrictive during those time periods.
6. Active Accounts with Zero Consumption for the Audit Period – An account in the database that is active but has zero consumption for the entire audit period could be indicative of a meter issue or an account that is not active.



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7. Consecutive Months of Zero Consumption – Like active accounts with zero consumption, this review identifies accounts with multiple, consecutive months with zero consumption which could be indicative of a meter or data transmission issue on the account.
8. Accounts with “Blank” Consumption – This is an examination of accounts where a read did not occur in the data for that account. This can be caused by an account getting skipped or can show when an account was read twice during the same billing period. For example, a reading on January 1 and January 31 but not read in February.
9. Days in Read Cycle – This is an examination of any accounts with read cycles over the expected days in a read cycle. Identified accounts will be flagged for review.
10. Read Consumption vs. Billed Consumption – Many billing systems separate the read consumption from the billed consumption. Read consumption is defined as the current reading minus the previous reading while billed consumption is the volume billed to the customer. This examination reviews discrepancies between these volumes to determine if there is a systematic issue with customers not being billed for the consumption their meter is reading.
11. Multiplier vs. Meter Size – One common issue in the billing system comes from the use of multipliers. A multiplier is used to convert from units read to units billed, as many meters in the field are read in different units as the published billing rate units. This can either be a full conversion of units (cubic feet to gallons) but is most commonly a conversion to a different form of the same unit (cubic feet to hundred cubic feet or gallons to thousands of gallons). An incorrect multiplier assigned to a given account results in either an under or over billing of the customer, usually by a factor of 10, 100, etc. A comparison of the assigned multiplier to the meter size can be an indication of an issue with accounts, as it would be common to have the same multiplier on like sized meters, assuming the meters are the same make and model.
12. Verification of the Summary Volume – Most utilities utilize a summary report to record and track volumes monthly. For this review, the account level raw data is summed to compare against the summary report volumes to ensure the summary report is sufficient for monthly tracking. Additionally, a lag time adjustment was performed by subtracting volume from the beginning of the audit period and adding volumes to the end of the audit period based on proration of volumes from read dates.

Integrity analysis to be summarized with flags, conclusions and recommendations in a Technical Memo.

Part 2 Budget: \$33,750

Part 3: Practices Assessment, Leakage Component Analysis, and Economic Gap Analysis

3.1 Practices Assessment

Re-orientation meetings with key personnel in pertinent departmental areas to evaluate current processes related to operational and data collection practices. Interviews to include:

- Supply & Distribution
- Customer Meter Reading
- Customer Meter Testing & Maintenance
- Billing & Customer Service
- Financial/Management



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- Engineering/IT/GIS

The purpose of the meetings and interviews will be to assess the integrity of data collection relative to the water audit, and water loss control activities relative to best-practices in the AWWA M36 Methodology. Interviews and information gathered will be compiled into a practices summary.

3.2 Leakage Component Analysis

Conduct Leakage Component Analysis to develop Real Loss cost profile. Methodology shall conform to component-based Breaks and Background Estimates (BABE) and Fixed and Variable Area Discharge (FAVAD) analysis, as described in the AWWA M36 Manual and Water Research Foundation Project 4372A, and shall include the following:

- Determination of Background Leakage from system characteristics and infrastructure condition & age, including sensitivity analysis on Infrastructure Condition Factor
- Determination of Reported Leakage from distribution system leak and break repair data, tank overflow data, and analysis of awareness-location-repair times
- Determination of Unreported (Hidden) Leakage via reconciliation between AWWA Water Balance, Background Leakage and Reported Leakage
- Cost assessment for Real Loss components to develop cost profile
- Review leak/break repair tracking protocol to determine if improvements should be recommended

3.3 Economic Gap Analysis

Economic analysis to determine cost of current Water Loss Control Program versus cost of optimized Water Loss Control Program, to establish preliminary business case and prioritization of NRW components;

Development of NRW component mapping and economic analysis for preliminary target setting:

- Unbilled Consumption components;
- Apparent Loss components with emphasis on optimizing metering losses;
- Real Loss components with emphasis on optimizing unreported losses;
- Aggregated NRW economic target setting;

Short- and medium- term program recommendations for data improvement, water loss reduction and revenue recovery activities will be developed. Review of AU's current Water Loss Control Program to be included.

Practices summary, analysis results, recommended targets and Water Loss Control Program recommendations will be provided in a Technical Memo.

Part 3 Budget: \$51,000

Part 4: Program Facilitation

Facilitate bi-monthly meetings over the course of 11 months with key personnel together as the Non-Revenue Water (NRW) team. The purpose of these team meetings is to provide support and accountability for action items related to Water Loss Control Program.

It is anticipated that individual training and education be conducted with new staff members, not previously involved in the program.

Updates to NRW performance metrics tracking tool will be provided. Support for monthly data validation will be provided as needed.



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Provide review and oversight of the annual water loss audit reporting prior to submission to the State of Georgia.

Provide analysis of newly replaced small customer meters to evaluate existing customer metering inaccuracies input.

Part 4 Budget: \$95,000

Budget Summary

<i>Part 1</i>	<i>Supply Meter Accuracy Testing & Supply Data Analysis</i>	<i>\$ 22,500.00</i>
<i>Part 2</i>	<i>Billing Data Analytics for Level 2 Validation of Billed & Unbilled Consumption</i>	<i>\$ 33,750.00</i>
<i>Part 3</i>	<i>Practices Assessment, Leakage Component Analysis, and Economic Gap Analysis</i>	<i>\$ 51,000.00</i>
<i>Part 4</i>	<i>Program Facilitation (11 months)</i>	<i>\$ 95,000.00</i>
	Total Lump Sum Fee	\$ 202,250.00

It is anticipated that this scope will be performed from February 2026 through December 2026

This Agreement is respectfully submitted by:

Tory N. Wagoner, P.E.

Vice-President
Cavanaugh & Associates, P.A.

Authorization

Signed _____ Date _____
Augusta Utilities