

## Assessment Scale Guidelines

The Water Loss Audit worksheet requires a water utility complete an assessment scale for each component, or line, on the Water Loss Audit that data is requested. The assessment scale is a valuation of the quality of data the utility has available for that particular component. The utility should select the assessment score closest to the quality of data available. An assessment scale table has been developed to assist the utility. Each component requesting the assessment is listed in the table and provides a statement relating to the degree of validity based on a scale of 0.5 to 5. A total, out of 100 possible, is calculated on the Water Loss Audit worksheet to represent the relative degree of validity of the water loss audit results.

### What it is?

Assigning the lowest score (0.5) on an individual component indicates the water utility has a very low confidence in the data provided for that component. Conversely, assigning the highest score (5.0) on an individual component signifies the utility has a very high confidence in the data provided for that component. Because each component is not the same, the assessment purposes/statements for each are different.

The purpose of the assessment scale is not necessarily to grade the utility to look good, it is intended to grade the validity of individual components and the water loss audit overall; therefore, the utility can understand where to direct water loss control efforts. Providing an inaccurate assessment only serves to make the task of using the audit to effectively and efficiently control water loss more difficult.

Listed below each possible individual component score are suggested improvements the utility should consider using to improve from one score to the next score, or if a 5 to stay at a 5 and continue to have high confidence (and even greater confidence) in that component's data. These improvements can be implemented over a period of time.

### How to use it?

***The water utility cannot put a zero for any of the components on the water loss audit.***

The utility must choose a score for each component that requests an assessment score. Lines 6, 7, 10, 13, 13a, 14, 14a, 15, 15a, 17, 18, 19, 20, 23, 25, 26, 28, 29, 40, and 43 all require an assessment score. Choosing a half score indicates the utility believes the validity of the data used for that component is in between the statements. For instance a 3.5 means the water utility believes they are implementing the practices in the statement for 3 but are also implementing some of the practices in the statement for 4. The water utility cannot put a zero for any of the components on the water loss audit, but Lines 13, 13a, 14, 14a, 15, and 15a allow the utility to put N/A if the component is not applicable to their system.

The utility should read each component's table to determine their score for each component. For example the assessment scale is required for Line 23 – Average Customer Meter Accuracy. If a utility has reliable recordkeeping for the meter population, meter information is improving as meters are replaced, meter accuracy testing is conducted annually for a small number of meters (other than just customer requests), a limited number of the oldest meters are replaced each year, and the average inaccuracy of the meters is largely an estimate based on the limited testing data in 2017 they should choose a 2 for the assessment score on Line 23, matching the statement listed below 2 on the assessment table for this component. If the utility would like to improve their score for the subsequent audit years they should follow the steps in the gray box below 2 on the assessment table. The improvements would be to standardize the procedures for meter recordkeeping within an electronic information system and accelerate meter accuracy testing and meter replacements guided by testing results. (See picture below)

Component	Average Customer Meter Accuracy Adapted from American Water Works Association				
	0.5	1	1.5	2	2.5
APPARENT LOSSES					
Line 23 Average customer meter accuracy	<p><i>Current condition:</i> Customer meters exist, but with unorganized paper records on meters; no meter accuracy testing or meter replacement program for any size of retail meter. Metering workflow is driven chaotically with no proactive management. Loss volume due to aggregate meter inaccuracy is estimated.</p>	<p><i>Current condition:</i> Poor recordkeeping and meter oversight is recognized by water utility management who has allotted staff and funding resources to organize improved recordkeeping and start meter accuracy testing. Existing paper records gathered and organized to provide cursory disposition of meter population. Customer meters are tested for accuracy only upon customer request.</p>	<p><i>Conditions between 1 and 2</i></p>	<p><i>Current condition:</i> Reliable recordkeeping exists; meter information is improving as meters are replaced. Meter accuracy testing is conducted annually for a small number of meters (more than just customer requests, but less than 1% of inventory). A limited number of the oldest meters are replaced each year. Inaccuracy volume is largely an estimate, but refined based upon limited testing data.</p>	<p><i>Conditions between 2 and 3</i></p>
Improvements to average customer meter accuracy	<p><i>To improve to 1:</i> Gather available meter purchase records. Conduct testing on a small number of meters believed to be the most inaccurate. Review staffing needs of the metering group and budget for necessary resources to better organize meter management.</p>	<p><i>To improve to 2:</i> Implement a reliable record keeping system for customer meter histories, preferably using electronic methods typically linked to, or part of, the Customer Billing System or Customer Information System. Expand meter accuracy testing to a larger group of meters.</p>		<p><i>To improve to 3:</i> Standardize the procedures for meter recordkeeping within an electronic information system. Accelerate meter accuracy testing and meter replacements guided by testing results.</p>	

## *Assessment Scale Component Breakdown*

### **Line 6: Utility's Length of Main Lines**

The scale relates to the quality of records, policies, and procedures that exist for the location of assets, specifically the main lines, in the distribution system. The utility cannot select N/A or zero for the assessment scale.

### **Line 7: Total Retail Metered Connections – Active and Inactive**

The scale relates to the quality of records, policies, and procedures that exist regarding customer connections and billing information. The utility cannot select N/A or zero for the assessment scale.

### **Line 10: Average Yearly System Operating Pressure**

The scale relates to the quality of records and procedures the utility uses for pressure testing throughout the distribution system. The utility cannot select N/A or zero for the assessment scale.

### **Line 13: Produced Water**

Relates to the quality of data generated for the volume of produced water. For this component the scale gauges the level of metering used in obtaining this volume and the level of testing and/or calibration any of these meters undergo. This should be the meter(s) measuring the volume entering the distribution system from the utility's own sources. If there is not a meter at the entry point then using the production source meter(s), if available, will suffice; however, if water is lost in transmission or in treatment the meter doesn't fully represent the volume. If the water utility does not produce its own water then choose not applicable, represented by N/A.

### **Line 13a: Production Meter Accuracy**

Relates to the quality of data the meters generate for the produced water volume (Line 13). For this component the scale gauges the level of production meter data logging, review and correction of data, and the incorporation of tank storage facility elevation changes in Line 13 volume. If the utility does not produce its own water then choose not applicable, represented by N/A.

### **Line 14: Total Treated Purchased Water**

Relates to the quality of data generated for the total treated purchased water volume. For this component the scale gauges the level of metering used in obtaining this volume and the level of testing and/or calibration any of these meters undergo. This should be the meter(s) measuring the volume entering the distribution system purchased from other utility's sources. Select the assessment score closest to the quality of data used in generating this component's volume

during the reporting period. If the utility does not purchase water from other utilities then choose not applicable, represented by N/A.

**Line 14a: Treated Purchased Water Meter Accuracy**

Relates to the quality of data the meters generate for the total treated water purchased volume (Line 14). For this component the scale gauges the level of purchase meter data logging, review and correction of data, and the agreement between utilities. If the utility does not purchase water from other utilities then choose not applicable, represented by N/A.

**Line 15: Total Treated Wholesale Water Sales**

Relates to the quality of data generated for the total treated wholesale water sales volume. For this component the scale gauges the level of metering used in obtaining this volume and the level of testing and/or calibration any of these meters undergo. If the utility does not sell water to other utilities then choose not applicable, represented by N/A.

**Line 15a: Treated Wholesale Water Meter Accuracy**

Relates to the quality of data the meters generate for the total treated wholesale water sales volume (Line 15). For this component the scale gauges the level of wholesale meter data logging, review and correction of data, and the agreement between utilities. If the utility does not sell water to other utilities then choose not applicable, represented by N/A.

**Line 17: Billed Metered**

Relates to the quality of data gathered to generate the billed metered volume. For this component the scale gauges the level of billing and meter reading accuracy and the quality of verification of this data.

**Line 18: Billed Unmetered**

Relates to the quality of data gathered to generate the billed unmetered volume. For this component the scale gauges the level of policy for customer metering, data collection for unmetered volumes, and verification of data. If the utility sells billed unmetered water but put this volume in billed metered either: (1) correct the Water Use Survey to include this volume as unmetered or (2) put zero for volume in billed unmetered and select a score based on the volume of billed unmetered credited to the billed metered volume. The utility cannot select N/A or zero for the assessment scale but may choose 5 if it is the policy of the water utility to meter all customer connections and it has been confirmed the utility has followed this policy.

**Line 19: Unbilled Metered**

Relates to the quality of data gathered to generate the unbilled metered volume. For this component the scale gauges the level of policy regarding billing exemptions, and data collection

validity and auditing. If the utility has billing exempt uses of water but put this volume in billed metered either: (1) correct the Water Use Survey to include this volume as unmetered or (2) put zero for volume in unbilled metered and select a score based on the volume of billed unmetered credited to the billed metered volume. The utility cannot select N/A or zero for the assessment scale but may choose 5 if it is the policy of the utility to not meter any billing exempt consumption, i.e. municipal building uses.

**Line 20: Unbilled Unmetered**

Relates to the quality of data gathered to generate the unbilled unmetered volume. For this component the scale gauges the level of estimation for the volume of water exempt from billing and metering. If the utility has billing and metered exempt water use but put this volume in billed metered either: (1) correct the Water Use Survey to include this volume as unmetered or (2) put zero for this volume in unbilled unmetered and select a score based on the volume of unbilled unmetered credited to the billed metered volume. The utility cannot select N/A or zero for the assessment scale. The utility may use the default industry standard default calculation of 1.25% of total system input volume for unbilled unmetered and choose a 2.5 for the assessment scale.

**Line 23: Average Customer Meter Accuracy**

Relates to the quality of meter testing and replacement program the utility has in place for the customer retail meters. For this component the scale gauges the level of meter testing and replacement, and the quality of verification of meter data to find errors in specific meters. The utility cannot select N/A or zero for the assessment scale.

**Line 25: Systematic Data Handling Errors**

This scale relates to the quality of review of the billing system data. The utility cannot select N/A or zero for the assessment scale. The utility may use the default industry standard default calculation of 0.25% of billed metered volume for systematic data handling errors and choose a 2.5 for the assessment scale.

**Line 26: Unauthorized Consumption**

This scale relates to the quality of estimate used in generating the unauthorized consumption volume and whether a monitoring and enforcement program or evaluation of unauthorized consumption exists. The utility cannot select N/A or zero for the assessment scale. The utility may use the default industry standard default calculation of 0.25% of total system input volume for systematic data handling errors and choose a 2.5 for the assessment scale.

**Line 28: Reported Breaks and Leaks**

This scale relates to the quality of documentation and call-to-repair times used in generating the volume of reported breaks and leaks. The utility cannot select N/A or zero for the assessment scale.

**Line 29: Unreported Loss**

Relates to the quality of the leak detection program the utility uses to control water loss in the distribution system. The utility cannot select N/A or zero for the assessment scale.

**Line 40: Retail Price of Water**

Relates to the quality of data used to generate the retail price of water. For this component the scale gauges the level of the water rate structure and the use of a weighted average in determining the retail price of water. The utility cannot select N/A or zero for the assessment scale.

**Line 43: Variable Production Cost of Water**

Relates to the quality of data used to generate the variable production cost of water. For this component the scale gauges the level of accounting system and auditing of the data in determining the variable production cost of water. The utility cannot select N/A or zero for the assessment scale.