

# D

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## Appendix D: AWWA Water Audits



# AWWA Free Water Audit Software: Reporting Worksheet

WAS v5.0

American Water Works Association

? Click to access definition  
+ Click to add a comment

**Water Audit Report for: Eastern Municipal Water District (3310009 SRO)**  
**Reporting Year: 2015-2016**      **7/2015 - 6/2016**

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

**All volumes to be entered as: ACRE-FEET PER YEAR**

To select the correct data grading for each input, determine the highest grade where the

**WATER SUPPLIED**

<----- Enter grading in column 'E' and 'J' ----->

Volume from own sources:	+ ?	5	39,038.703	acre-ft/yr
Water imported:	+ ?	5	47,433.023	acre-ft/yr
Water exported:	+ ?	5	12,382.642	acre-ft/yr

**Master Meter and Supply Error Adjustments**

Pcnt:	5	<input checked="" type="radio"/>	<input type="radio"/>	Value:		acre-ft/yr
	2	<input checked="" type="radio"/>	<input type="radio"/>			acre-ft/yr
	3	<input checked="" type="radio"/>	<input type="radio"/>			acre-ft/yr

**WATER SUPPLIED: 74,089.084** acre-ft/yr

Enter negative % or value for under-registration  
Enter positive % or value for over-registration

**AUTHORIZED CONSUMPTION**

Billed metered:	+ ?	8	65,197.120	acre-ft/yr
Billed unmetered:	+ ?	n/a	0.000	acre-ft/yr
Unbilled metered:	+ ?	n/a	0.000	acre-ft/yr
Unbilled unmetered:	+ ?	6	27.360	acre-ft/yr

**AUTHORIZED CONSUMPTION: 65,224.480** acre-ft/yr

Click here: ?  
for help using option buttons below

Pcnt:    Value: 27.360 acre-ft/yr

Use buttons to select percentage of water supplied OR value

**WATER LOSSES (Water Supplied - Authorized Consumption)**

**8,864.604** acre-ft/yr

**Apparent Losses**

Unauthorized consumption:	+ ?		185.223	acre-ft/yr
<b>Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed</b>				
Customer metering inaccuracies:	+ ?	8	658.557	acre-ft/yr
Systematic data handling errors:	+ ?		162.993	acre-ft/yr
<b>Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed</b>				
<b>Apparent Losses:</b>	?		<b>1,006.772</b>	acre-ft/yr

Pcnt: 0.25%   Value:  acre-ft/yr

1.00%   Value:  acre-ft/yr

0.25%   Value:  acre-ft/yr

**Real Losses (Current Annual Real Losses or CARL)**

**Real Losses = Water Losses - Apparent Losses: 7,857.832** acre-ft/yr

**WATER LOSSES: 8,864.604** acre-ft/yr

**NON-REVENUE WATER**

**NON-REVENUE WATER: 8,891.964** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

**SYSTEM DATA**

Length of mains:	+ ?	9	2,576.0	miles
Number of active AND inactive service connections:	+ ?	8	154,989	
Service connection density:	?		60	conn./mile main

Are customer meters typically located at the curbside or property line?  Yes (length of service line, beyond the property boundary, that is the responsibility of the utility)

**Average length of customer service line has been set to zero and a data grading score of 10 has been applied**

Average operating pressure: + ? 5 74.0 psi

**COST DATA**

Total annual cost of operating water system:	+ ?	10	\$111,535,107	\$/Year
Customer retail unit cost (applied to Apparent Losses):	+ ?	4	\$3.75	\$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	+ ?	4	\$872.75	\$/acre-ft <input type="checkbox"/> Use Customer Retail Unit Cost to value real losses

**WATER AUDIT DATA VALIDITY SCORE:**

**\*\*\* YOUR SCORE IS: 61 out of 100 \*\*\***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

**PRIORITY AREAS FOR ATTENTION:**

Based on the information provided, audit accuracy can be improved by addressing the following components:

- 1: Water imported
- 2: Volume from own sources
- 3: Customer retail unit cost (applied to Apparent Losses)



# AWWA Free Water Audit Software: Reporting Worksheet

WAS v5.0

American Water Works Association

? Click to access definition  
+ Click to add a comment

**Water Audit Report for: Eastern Municipal Water District (3310009 SRO)**  
**Reporting Year: 2017      7/2016 - 6/2017**

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

**All volumes to be entered as: ACRE-FEET PER YEAR**

To select the correct data grading for each input, determine the highest grade where the

**WATER SUPPLIED**

----- Enter grading in column 'E' and 'J' ----->

Volume from own sources:	+ ?	6	36,847.860	acre-ft/yr
Water imported:	+ ?	6	54,030.710	acre-ft/yr
Water exported:	+ ?	6	14,032.420	acre-ft/yr

**Master Meter and Supply Error Adjustments**

Pcnt:	3	<input checked="" type="radio"/>	<input type="radio"/>	Value:		acre-ft/yr
	2	<input checked="" type="radio"/>	<input type="radio"/>			acre-ft/yr
	3	<input checked="" type="radio"/>	<input type="radio"/>			acre-ft/yr

**WATER SUPPLIED: 76,846.150** acre-ft/yr

Enter negative % or value for under-registration  
Enter positive % or value for over-registration

**AUTHORIZED CONSUMPTION**

Billed metered:	+ ?	7	70,593.100	acre-ft/yr
Billed unmetered:	+ ?	n/a	0.000	acre-ft/yr
Unbilled metered:	+ ?	n/a	0.000	acre-ft/yr
Unbilled unmetered:	+ ?	5	32.040	acre-ft/yr

**AUTHORIZED CONSUMPTION: 70,625.140** acre-ft/yr

Click here: ?  
for help using option buttons below

Pcnt:    Value:  acre-ft/yr

Use buttons to select percentage of water supplied OR value

**WATER LOSSES (Water Supplied - Authorized Consumption)**

**6,221.010** acre-ft/yr

**Apparent Losses**

Unauthorized consumption: + ? **192.115** acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	+ ?	7	354.739	acre-ft/yr
Systematic data handling errors:	+ ?		176.483	acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

**Apparent Losses: 723.337** acre-ft/yr

Pcnt: 0.25%   Value:

0.50%   Value:

0.25%   Value:

**Real Losses (Current Annual Real Losses or CARL)**

**Real Losses = Water Losses - Apparent Losses: 5,497.673** acre-ft/yr

**WATER LOSSES: 6,221.010** acre-ft/yr

**NON-REVENUE WATER**

**NON-REVENUE WATER: 6,253.050** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

**SYSTEM DATA**

Length of mains:	+ ?	9	2,576.0	miles
Number of active AND inactive service connections:	+ ?	8	157,519	
Service connection density:	?		61	conn./mile main

Are customer meters typically located at the curbside or property line?

(length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: + ? 4 74.0 psi

**COST DATA**

Total annual cost of operating water system:	+ ?	10	\$121,089,214	\$/Year
Customer retail unit cost (applied to Apparent Losses):	+ ?	4	\$3.71	\$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	+ ?	6	\$885.55	\$/acre-ft <input type="checkbox"/> Use Customer Retail Unit Cost to value real losses

**WATER AUDIT DATA VALIDITY SCORE:**

**\*\*\* YOUR SCORE IS: 63 out of 100 \*\*\***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

**PRIORITY AREAS FOR ATTENTION:**

Based on the information provided, audit accuracy can be improved by addressing the following components:

- 1: Water imported
- 2: Customer retail unit cost (applied to Apparent Losses)
- 3: Volume from own sources



# AWWA Free Water Audit Software: Reporting Worksheet

WAS v5.0

American Water Works Association

? Click to access definition  
+ Click to add a comment

**Water Audit Report for:** Eastern Municipal Water District (3310009 SRO)  
**Reporting Year:** 2018    7/2017 - 6/2018

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

**All volumes to be entered as: ACRE-FEET PER YEAR**

To select the correct data grading for each input, determine the highest grade where

**WATER SUPPLIED**

----- Enter grading in column 'E' and 'J' ----->

Volume from own sources:	+ ?	7	34,988.040	acre-ft/yr
Water imported:	+ ?	7	65,369.400	acre-ft/yr
Water exported:	+ ?	7	17,592.890	acre-ft/yr

**Master Meter and Supply Error Adjustments**

Pcnt:	Value:	acre-ft/yr
+ ? 4	<input type="radio"/> <input checked="" type="radio"/>	29.920
+ ? 4	-0.28% <input checked="" type="radio"/> <input type="radio"/>	
+ ? 3	-0.60% <input checked="" type="radio"/> <input type="radio"/>	

Enter negative % or value for under-registration  
Enter positive % or value for over-registration

**WATER SUPPLIED:** 82,811.984 acre-ft/yr

**AUTHORIZED CONSUMPTION**

Billed metered:	+ ?	7	78,470.600	acre-ft/yr
Billed unmetered:	+ ?	n/a	0.000	acre-ft/yr
Unbilled metered:	+ ?	n/a	0.000	acre-ft/yr
Unbilled unmetered:	+ ?	4	20.050	acre-ft/yr

Click here: ?  
for help using option buttons below

Pcnt:	Value:	acre-ft/yr
<input type="radio"/> <input checked="" type="radio"/>	20.050	

Use buttons to select percentage of water supplied  
**OR**  
value

**AUTHORIZED CONSUMPTION:** 78,490.650 acre-ft/yr

**WATER LOSSES (Water Supplied - Authorized Consumption)**

4,321.334 acre-ft/yr

**Apparent Losses**

Unauthorized consumption: 207.030 acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	+ ?	7	473.666	acre-ft/yr
Systematic data handling errors:	+ ?		196.177	acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

**Apparent Losses:** 876.872 acre-ft/yr

Pcnt:	Value:	acre-ft/yr
0.25% <input checked="" type="radio"/> <input type="radio"/>		

0.60% <input checked="" type="radio"/> <input type="radio"/>		
0.25% <input checked="" type="radio"/> <input type="radio"/>		

**Real Losses (Current Annual Real Losses or CARL)**

**Real Losses = Water Losses - Apparent Losses:** 3,444.462 acre-ft/yr

**WATER LOSSES:** 4,321.334 acre-ft/yr

**NON-REVENUE WATER**

**NON-REVENUE WATER:** 4,341.384 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

**SYSTEM DATA**

Length of mains:	+ ?	9	2,281.1	miles
Number of <u>active AND inactive</u> service connections:	+ ?	8	160,017	
Service connection density:	?		70	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

(length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 74.0 psi

**COST DATA**

Total annual cost of operating water system:	+ ?	10	\$129,977,810	\$/Year
Customer retail unit cost (applied to Apparent Losses):	+ ?	5	\$3.73	\$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	+ ?	6	\$886.17	\$/acre-ft

Use Customer Retail Unit Cost to value real losses

**WATER AUDIT DATA VALIDITY SCORE:**

**\*\*\* YOUR SCORE IS: 68 out of 100 \*\*\***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

**PRIORITY AREAS FOR ATTENTION:**

Based on the information provided, audit accuracy can be improved by addressing the following components:

- 1: Water imported
- 2: Customer retail unit cost (applied to Apparent Losses)
- 3: Billed metered



# AWWA Free Water Audit Software: Reporting Worksheet

WAS v5.0  
American Water Works Association

**Water Audit Report for:** Eastern Municipal Water District (3310009 SRO)  
**Reporting Year:** 2019 7/2018 - 6/2019

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the

**All volumes to be entered as: ACRE-FEET PER YEAR**

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

**WATER SUPPLIED**

<----- Enter grading in column 'E' and 'J' ----->

Volume from own sources:	+	?	7	40,545.710	acre-ft/yr	+	?
Water imported:	+	?	7	53,578.970	acre-ft/yr	+	?
Water exported:	+	?	7	18,362.290	acre-ft/yr	+	?

**Master Meter and Supply Error Adjustments**

	Pcnt:		Value:				
5		<input type="radio"/>	<input checked="" type="radio"/>	-	24.000	acre-ft/yr	
4	-0.18%	<input checked="" type="radio"/>	<input type="radio"/>			acre-ft/yr	
3	-1.20%	<input checked="" type="radio"/>	<input type="radio"/>			acre-ft/yr	

Enter negative % or value for under-registration  
Enter positive % or value for over-registration

**WATER SUPPLIED:** 75,659.982 acre-ft/yr

**AUTHORIZED CONSUMPTION**

Billed metered:	+	?	9	68,282.700	acre-ft/yr	+	?
Billed unmetered:	+	?	n/a	0.000	acre-ft/yr	+	?
Unbilled metered:	+	?	n/a	0.000	acre-ft/yr	+	?
Unbilled unmetered:	+	?	4	17.740	acre-ft/yr	+	?

Click here:  for help using option

	Pcnt:		Value:				
		<input type="radio"/>	<input checked="" type="radio"/>	17.740	acre-ft/yr		

Use buttons to select percentage of water supplied **OR** value

**AUTHORIZED CONSUMPTION:** 68,300.440 acre-ft/yr

**WATER LOSSES (Water Supplied - Authorized Consumption)**

7,359.542 acre-ft/yr

**Apparent Losses**

Unauthorized consumption: 189.150 acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	+	?	7	829.345	acre-ft/yr	+	?
Systematic data handling errors:	+	?	5	170.707	acre-ft/yr	+	?

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

**Apparent Losses:** 1,189.201 acre-ft/yr

	Pcnt:		Value:				
0.25%	<input checked="" type="radio"/>	<input type="radio"/>			acre-ft/yr		

	Pcnt:		Value:				
1.20%	<input checked="" type="radio"/>	<input type="radio"/>			acre-ft/yr		
0.25%	<input checked="" type="radio"/>	<input type="radio"/>			acre-ft/yr		

**Real Losses (Current Annual Real Losses or CARL)**

**Real Losses = Water Losses - Apparent Losses:** 6,170.341 acre-ft/yr

**WATER LOSSES:** 7,359.542 acre-ft/yr

**NON-REVENUE WATER**

**NON-REVENUE WATER:** 7,377.282 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

**SYSTEM DATA**

Length of mains:	+	?	9	2,314.0	miles	+	?
Number of <u>active AND inactive</u> service connections:	+	?	8	162,904		+	?
Service connection density:	?			70	conn./mile main	+	?

Are customer meters typically located at the curbside or property line? Yes (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 76.0 psi

**COST DATA**

Total annual cost of operating water system:	+	?	10	\$129,435,936	\$/Year	+	?
Customer retail unit cost (applied to Apparent Losses):	+	?	7	\$4.21	\$/100 cubic feet (ccf)	+	?
Variable production cost (applied to Real Losses):	+	?	7	\$841.65	\$/acre-ft	+	?

Use Customer Retail Unit Cost to value real losses

**WATER AUDIT DATA VALIDITY SCORE:**

**\*\*\* YOUR SCORE IS: 73 out of 100 \*\*\***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

**PRIORITY AREAS FOR ATTENTION:**

Based on the information provided, audit accuracy can be improved by addressing the following components:

- 1: Water imported
- 2: Volume from own sources
- 3: Unauthorized consumption



# AWWA Free Water Audit Software: Reporting Worksheet

WAS v5.0  
American Water Works Association

? Click to access definition  
+ Click to add a comment

**Water Audit Report for: Eastern Municipal Water District (3310009 SRO)**  
Reporting Year: **2020**      7/2019 - 6/2020

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input

**All volumes to be entered as: ACRE-FEET PER YEAR**

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

### WATER SUPPLIED

<----- Enter grading in column 'E' and 'J' ----->

Volume from own sources:	+ ?	7	36,583.280	acre-ft/yr	+ ?
Water imported:	+ ?	7	58,985.230	acre-ft/yr	+ ?
Water exported:	+ ?	7	15,786.150	acre-ft/yr	+ ?

### Master Meter and Supply Error Adjustments

Pcnt:	Value:	acre-ft/yr
5	5.130	acre-ft/yr
4 -0.22%		acre-ft/yr
3 -3.00%		acre-ft/yr

Enter negative % or value for under-registration  
Enter positive % or value for over-registration

**WATER SUPPLIED: 79,419.052** acre-ft/yr

### AUTHORIZED CONSUMPTION

Billed metered:	+ ?	9	74,299.500	acre-ft/yr
Billed unmetered:	+ ?	n/a	0.000	acre-ft/yr
Unbilled metered:	+ ?	n/a	0.000	acre-ft/yr
Unbilled unmetered:	+ ?	4	24.050	acre-ft/yr

Click here: ?  
for help using option

Pcnt:	Value:	acre-ft/yr
	24.050	acre-ft/yr

Use buttons to select percentage of water supplied  
**OR**  
value

**AUTHORIZED CONSUMPTION: 74,323.550** acre-ft/yr

### WATER LOSSES (Water Supplied - Authorized Consumption)

**5,095.502** acre-ft/yr

#### Apparent Losses

Unauthorized consumption: + ?      198.548      acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	+ ?	7	2,297.923	acre-ft/yr
Systematic data handling errors:	+ ?	5	185.749	acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

**Apparent Losses: 2,682.219** acre-ft/yr

Pcnt:	Value:	acre-ft/yr
0.25%		acre-ft/yr

3.00%		acre-ft/yr
0.25%		acre-ft/yr

### Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: ?      2,413.283      acre-ft/yr

**WATER LOSSES: 5,095.502** acre-ft/yr

### NON-REVENUE WATER

**NON-REVENUE WATER: 5,119.552** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

### SYSTEM DATA

Length of mains:	+ ?	9	2,338.6	miles
Number of active AND inactive service connections:	+ ?	8	165,627	
Service connection density:	?		71	conn./mile main

Are customer meters typically located at the curbstop or property line?      Yes

Average length of customer service line: + ?      (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: + ?      4      74.1      psi

### COST DATA

Total annual cost of operating water system:	+ ?	10	\$140,926,497	\$/Year
Customer retail unit cost (applied to Apparent Losses):	+ ?	7	\$4.26	\$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	+ ?	7	\$1,014.17	\$/acre-ft <input type="checkbox"/> Use Customer Retail Unit Cost to value real losses

### WATER AUDIT DATA VALIDITY SCORE:

**\*\*\* YOUR SCORE IS: 73 out of 100 \*\*\***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

### PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Water imported

2: Volume from own sources

3: Unauthorized consumption