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

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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

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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: ?

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	\$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:	<input type="button" value="+"/> <input style="border: 1px solid black; padding: 2px; width: 20px; height: 15px;" type="button" value="?"/>	7	40,545.710	acre-ft/yr	<input type="button" value="+"/> <input style="border: 1px solid black; padding: 2px; width: 20px; height: 15px;" type="button" value="?"/>
Water imported:	<input type="button" value="+"/> <input style="border: 1px solid black; padding: 2px; width: 20px; height: 15px;" type="button" value="?"/>	7	53,578.970	acre-ft/yr	<input type="button" value="+"/> <input style="border: 1px solid black; padding: 2px; width: 20px; height: 15px;" type="button" value="?"/>
Water exported:	<input type="button" value="+"/> <input style="border: 1px solid black; padding: 2px; width: 20px; height: 15px;" type="button" value="?"/>	7	18,362.290	acre-ft/yr	<input type="button" value="+"/> <input style="border: 1px solid black; padding: 2px; width: 20px; height: 15px;" type="button" value="?"/>

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:	<input type="button" value="+"/> <input style="border: 1px solid black; padding: 2px; width: 20px; height: 15px;" type="button" value="?"/>	9	68,282.700	acre-ft/yr
Billed unmetered:	<input type="button" value="+"/> <input style="border: 1px solid black; padding: 2px; width: 20px; height: 15px;" type="button" value="?"/>	n/a	0.000	acre-ft/yr
Unbilled metered:	<input type="button" value="+"/> <input style="border: 1px solid black; padding: 2px; width: 20px; height: 15px;" type="button" value="?"/>	n/a	0.000	acre-ft/yr
Unbilled unmetered:	<input type="button" value="+"/> <input style="border: 1px solid black; padding: 2px; width: 20px; height: 15px;" type="button" value="?"/>	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:	<input type="button" value="+"/> <input style="border: 1px solid black; padding: 2px; width: 20px; height: 15px;" type="button" value="?"/>	7	829.345	acre-ft/yr
Systematic data handling errors:	<input type="button" value="+"/> <input style="border: 1px solid black; padding: 2px; width: 20px; height: 15px;" type="button" value="?"/>	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:	<input type="button" value="+"/> <input style="border: 1px solid black; padding: 2px; width: 20px; height: 15px;" type="button" value="?"/>	9	2,314.0	miles
Number of <u>active AND inactive</u> service connections:	<input type="button" value="+"/> <input style="border: 1px solid black; padding: 2px; width: 20px; height: 15px;" type="button" value="?"/>	8	162,904	
Service connection density:	<input style="border: 1px solid black; padding: 2px; width: 20px; height: 15px;" type="button" value="?"/>		70	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 76.0 psi

COST DATA

Total annual cost of operating water system:	<input type="button" value="+"/> <input style="border: 1px solid black; padding: 2px; width: 20px; height: 15px;" type="button" value="?"/>	10	\$129,435,936	\$/Year
Customer retail unit cost (applied to Apparent Losses):	<input type="button" value="+"/> <input style="border: 1px solid black; padding: 2px; width: 20px; height: 15px;" type="button" value="?"/>	7	\$4.21	\$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	<input type="button" value="+"/> <input style="border: 1px solid black; padding: 2px; width: 20px; height: 15px;" type="button" value="?"/>	7	\$841.65	\$/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



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

Pcmt:	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

AUTHORIZED CONSUMPTION: 74,323.550 acre-ft/yr

Click here: ?
for help using option

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

Use buttons to select percentage of water supplied
OR
value

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

3.00%		acre-ft/yr
0.25%		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

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 <u>active AND inactive</u> 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