

	gallons	
	<u>46,952,735,755</u>	
17. System Input Volume		
(Corrected input volume, plus imported water, minus exported water)		
		Assessment Scale
C. Authorized Consumption		
18. Billed Metered	<u>41,793,546,138</u>	<u>3</u>
	gallons	
19. Billed Unmetered	<u>4,265,828</u>	<u>3</u>
	gallons	
20. Unbilled Metered	<u>56,241,600</u>	<u>2</u>
	gallons	
21. Unbilled Unmetered	<u>69,148,969</u>	
	gallons	<u>4</u>
22. Total Authorized Consumption	<u>41,923,202,535</u>	
	gallons	
D. Water Losses		
23. Water Losses	<u>5,029,533,220</u>	
(Line 17 minus Line 22)	gallons	
E. Apparent Losses		
	%	
	<u>97.90</u>	<u>3</u>
24. Average Customer Meter Accuracy (Enter percentage)		
25. Customer Meter Accuracy Loss	<u>896,490,775</u>	
	gallons	
26. Systematic Data Handling Discrepancy	<u>0</u>	<u>4</u>
	gallons	
27. Unauthorized Consumption	<u>117,161,594</u>	<u>4</u>
	gallons	
28. Total Apparent Losses	<u>1,013,652,369</u>	
	gallons	

F. Real Losses

	<u>31,945,240</u>	gallons	<u>5</u>
29. Reported Breaks and Leaks (Estimated volume of leaks & breaks repaired during the audit period)			
30. Unreported Loss (Includes all unknown water loss)	<u>3,983,935,611</u>	gallons	<u>3</u>
31. Total Real Losses (Line 29, plus Line 30)	<u>4,015,880,851</u>	gallons	
32. Water Losses (Apparent + Real) (Line 28 plus Line 31) = Line 23	<u>5,029,533,220</u>	gallons	
33. Non-revenue Water (Water Losses + Unbilled Authorized Consumption) (Line 32, plus Line 20, plus Line 21)	<u>5,154,923,789</u>	gallons	

G. Technical Performance Indicator for Apparent Loss

34. Apparent Losses Normalized (Apparent Loss Volume / # of Retail Service Connections/365)	<u>13</u>	gallons
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H. Technical Performance Indicators for Real Loss

35. Real Loss Volume (Line 31)	<u>4,015,880,851</u>	gallons
36. Unavoidable Annual Real Losses, volume (calculated)	<u>1,478,535,729</u>	gallons
37. Infrastructure Leakage Index (calculated) (Equals real loss volume divided by unavoidable annual real losses)	<u>2.71610</u>	
38. Real Losses Normalized (Real Loss Volume / # of Service Connections / 365) (This indicator applies if service connection density is greater than 32 / mile)	<u>51</u>	gallons
39. Real Losses Normalized (Real Loss Volume/Miles of Main Lines/365)	<u>2,968</u>	gallons

(This indicator applies if service connection density is less than 32/mile)

		Assessment Scale
I. Financial Performance Indicators		
	<u>1,013,652,369</u> gallons	
40. Total Apparent Losses (Line 28)	<u>\$0.00453</u>	
41. Retail Price of Water	<u>\$4,591,845.23</u>	<u>5</u>
42. Cost of Apparent Losses (Apparent loss volume multiplied by retail cost of water, Line 40 x Line 41)	<u>4,015,880,850.92</u>	
43. Total Real Losses (Line 31)	<u>\$0.00041</u>	
44. Variable Production Cost of Water* (*Note: in case of water shortage, real losses might be valued at the retail price of water instead of the variable production cost.)		<u>3</u>
45. Cost of Real Losses (Real Loss multiplied by variable production cost of water, Line 43 x Line 44)	<u>\$1,654,542.91</u>	
46. Total Assessment Scale	<u>\$6,246,388.14</u>	<u>66</u>
47. Total Cost Impact of Apparent and Real Losses		
48. Comments	Half points should be added to the assessment scale to account for situations where efforts exceed one level but do not achieve all criteria for the next level.	
49. Total Water Loss %	<u>10.71</u>	%

October 1, 2014 to September 30, 2013

Item	Item Description	Item Category	Item Unit	Item Value	Item Source	Item Date	Item Comment
1	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
2	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
3	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
4	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
5	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
6	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
7	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
8	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
9	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
10	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
11	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
12	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
13	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
14	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
15	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
16	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
17	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
18	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
19	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA

Category	Item	Item Description	Item Unit	Item Value	Item Source	Item Date	Item Comment
1	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
2	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
3	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
4	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
5	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
6	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
7	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
8	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
9	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
10	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
11	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
12	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
13	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
14	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
15	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
16	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
17	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
18	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA
19	Water Utility Sales	Water Utility Sales	NA	NA	NA	NA	NA

Assessment table				
1	2	3	4	5

Authors Rating (three dots yellow highlighted cells)	Rate used for Reliability Matrix Judgment	Authors Year when Score Achieved	Source

[illegible]

[illegible][illegible][illegible]

[illegible][illegible]

Project Line Number	Calculated Value	Provisional Value / Less: Calculated Subcontract Items	Agreed Value (Less Design Allowance)	Unit	Source	Comments	Additional Information
25	1,057,727.084	1,057,727.084	1,057,727.084				
26	2,364,420.00	2,364,420.00	2,364,420.00				
27	1,980,864.5112	1,980,864.5112	1,980,864.5112	2,369,600 Cdn 23,977,700 US\$	Open Contract Open Contract	Water Loss Report Run See above	Tells for "on-the-line" use - ensuring that water will be from intake or below, rather than from the water treatment plant or distribution system. See above.
28	4,022,668.7512	4,022,668.7512	4,022,668.7512				
29	8,029,532.2034	8,029,532.2034	8,029,532.2034				
30	1,154,627.7861	1,154,627.7861	1,154,627.7861				
31	42,774,024.0444	42,774,024.0444	42,774,024.0444				
32	4,022,668.7512	4,022,668.7512	4,022,668.7512				
33	4,022,668.7512	4,022,668.7512	4,022,668.7512				
34	4,022,668.7512	4,022,668.7512	4,022,668.7512				
35	4,022,668.7512	4,022,668.7512	4,022,668.7512				
36	4,022,668.7512	4,022,668.7512	4,022,668.7512				
37	4,022,668.7512	4,022,668.7512	4,022,668.7512				
38	4,022,668.7512	4,022,668.7512	4,022,668.7512				
39	4,022,668.7512	4,022,668.7512	4,022,668.7512				
40	1,057,727.084	1,057,727.084	1,057,727.084				
41	84,620	84,620	84,620	1000 1000	Per Metric Tons	From Volume 8, however, not used in FY 2017 COB works. (Volume 8 is not used in this work).	
42	84,620	84,620	84,620				
43	4,022,668.7512	4,022,668.7512	4,022,668.7512				
44	84,620	84,620	84,620				
45	1,057,727.084	1,057,727.084	1,057,727.084				
46	84,620	84,620	84,620				
47	84,620	84,620	84,620				
48	84,620	84,620	84,620				
49	84,620	84,620	84,620				
50	84,620	84,620	84,620				
51	84,620	84,620	84,620				
52	84,620	84,620	84,620				
53	84,620	84,620	84,620				
54	84,620	84,620	84,620				
55	84,620	84,620	84,620				
56	84,620	84,620	84,620				
57	84,620	84,620	84,620				
58	84,620	84,620	84,620				
59	84,620	84,620	84,620				
60	84,620	84,620	84,620				
61	84,620	84,620	84,620				
62	84,620	84,620	84,620				
63	84,620	84,620	84,620				
64	84,620	84,620	84,620				
65	84,620	84,620	84,620				
66	84,620	84,620	84,620				
67	84,620	84,620	84,620				
68	84,620	84,620	84,620				
69	84,620	84,620	84,620				
70	84,620	84,620	84,620				
71	84,620	84,620	84,620				
72	84,620	84,620	84,620				
73	84,620	84,620	84,620				
74	84,620	84,620	84,620				
75	84,620	84,620	84,620				
76	84,620	84,620	84,620				
77	84,620	84,620	84,620				
78	84,620	84,620	84,620				
79	84,620	84,620	84,620				
80	84,620	84,620	84,620				
81	84,620	84,620	84,620				
82	84,620	84,620	84,620				
83	84,620	84,620	84,620				
84	84,620	84,620	84,620				
85	84,620	84,620	84,620				
86	84,620	84,620	84,620				
87	84,620	84,620	84,620				
88	84,620	84,620	84,620				
89	84,620	84,620	84,620				
90	84,620	84,620	84,620				
91	84,620	84,620	84,620				
92	84,620	84,620	84,620				
93	84,620	84,620	84,620				
94	84,620	84,620	84,620				
95	84,620	84,620	84,620				
96	84,620	84,620	84,620				
97	84,620	84,620	84,620				
98	84,620	84,620	84,620				
99	84,620	84,620	84,620				
100	84,620	84,620	84,620				

WEIGHTED AVERAGE CUSTOMER METER ACCURACY CALCULATION						For:	October 1, 2012 to September 30, 2013
		Totals from Info Tracker	% of total	Meter Sizes	(Input from Tests)		
					Meter Accuracy		
	Wholesale	2,979,254,000.0 Gals	7.13%	10" - 8"	98.00%	Weighted Avg Meter Accuracy	6.99%
	Industrial	3,007,934,636.0 Gals	7.20%	8" - 6"	98.00%		7.05%
	Commercial	10,816,321,906.0 Gals	25.89%	6" - 3"	98.00%		25.37%
	Multifamily	8,848,262,696.0 Gals	21.18%	3" - 1"	98.00%		20.75%
	Residential	16,131,849,800.0 Gals	38.61%	1" - 5/8"	97.70%**		37.72%
		41,783,623,038.0 TOTAL					97.88%
						Average Customer	Meter Accuracy
				** This rate estimated based on best info			
	Meter size	gallons	% of total		meter accuracy	Weighted Avg Meter Accuracy	
	5/8"	14,930,015,700.00	34.30%		97.66%	33.49%	
	3/4"	2,046,596,000.00	4.70%		98.90%	4.65%	
	1"	2,005,664,710.00	4.61%		97.37%	4.49%	
	1 1/4"	962,200.00	0.00%		98.00%	0.00%	
	1 1/2"	2,199,288,800.00	5.05%		98.27%	4.97%	
	2"	4,581,045,400.00	10.52%		98.09%	10.32%	
	3"	2,727,623,300.00	6.27%		98.00%	6.14%	
	4"	3,317,993,200.00	7.62%		98.00%	7.47%	
	6"	3,682,814,500.00	8.46%		98.00%	8.29%	
	8"	3,169,241,800.00	7.28%		98.00%	7.13%	
	10"	4,020,702,400.00	9.24%		98.00%	9.05%	
	12"	848,349,000.00	1.95%		98.00%	1.91%	
		43,530,297,010.00	100.00%			97.91863%	Average Customer Meter Accuracy

There is a difference between total gallons by meter size and total gallons by customer class because customer class has had billing adjustments subtracted from it

AWU Water Loss Calculation

for: October 1, 2012 to September 30, 2013

				Assessment Values	
Line #	Field Description (from TWDB Water Audit Reporting Form)	Value	Score	Max Points	
A. WATER UTILITY GENERAL INFORMATION					
1	Water Utility Name	Austin Water Utility			
2	Contact				
		Dan Strub AWU			
		Name Pipeline Operations			
		Telephone # (512) 972-0349			
		Email Address [REDACTED]			
3	Reporting Period	October 1, 2012 to September 30, 2013			
4	Source Water Utilization, percentage				
		Surface Water % 100%			
		Groundwater % 0%			
5	Population Served				
	a Retail Population Served	874,406			
	b Wholesale Population Served	53,620			
					System Data Points
6	Utility's Length of Main Lines, miles	3,707	5		5
7	Number of Wholesale Connections Served	56			
8	Number of Retail Service Connections Served	215,904			
9	Service Connection Density (Number of retail service connections/Miles of main lines)	58.24 conn/mile			
10	Average Yearly System Operating Pressure (psi)	77.3 psi	5		5
11	Volume Units of Measure (check one) acre-ft million gallons thousand gallons gallons	Gallons			
B. SYSTEM INPUT VOLUME					
					Water Supplied Points
12	Water Volume from own Sources	45,927,345,000.0 gals	4.5		5
13	Production Meter Accuracy (%)	98.00% pct	4.5		5
14	Corrected Input Volume	46,864,637,755.1 gals			
15	Wholesale Water Imported	88,098,000.0 gals	4.5		5
16	Wholesale Water Exported	0.0 gals	5		5
17	System Input Volume	46,952,735,755.1 gals 100.00%			
C. AUTHORIZED CONSUMPTION					
					Authorized Consumption Points
18	Billed Metered	41,793,546,138.0 gals 89.01%	3.5		5
19	Billed Unmetered	4,265,828.0 gals 0.01%	3		5
20	Unbilled Metered (amount used at AWU buildings/facilities)	56,241,600.0 gals 0.12%	2		5
21	Unbilled Unmetered (amount used by other city Departments) **	69,148,968.7 gals 0.15%	4		5
22	Total Authorized Consumption	41,923,202,534.7 gals 89.29%			
NOTES:					
** Most of the water used by other City Departments is included in line 18					
D. WATER LOSSES					
23	Water Losses (Line 17 minus Line 22)	5,029,533,220.4 gals 10.71%			
E. APPARENT LOSSES					
					Apparent Losses Points
24	Average Customer Meter Accuracy %	97.92% pct	3		5
25	Customer Meter Accuracy Loss	889,561,875.0 gals 1.89%			
26	Systematic Data Handling Discrepancy	0.0 gals 0.00%	4		5
27	Unauthorized Consumption	117,161,594.4 gals 0.25%	4		5
28	Total Apparent Losses	1,006,723,469.4 gals 2.14%			
F. REAL LOSSES					
					Real Losses Points
29	Reported Breaks and Leaks (Estimated volume of leaks and breaks repaired during the audit period)	31,945,240.0 gals 0.07%	5		5
30	Unreported Loss (Includes all unknown water loss) (Calculated as Water Losses - Total Apparent Losses - Reported Breaks & Leaks)	3,990,864,511.0 gals 8.50%	2.5		5
31	Total Real Losses (Line 29, plus Line 30)	4,022,809,751.0 gals 8.57%			
32	Water Losses (Apparent + Real) (Line 28 plus Line 31) should = Line 23	5,029,533,220.4 gals 10.71%			
33	Non-revenue Water (Water Losses + Unbilled Authorized Consumption) (Line 32, plus Line 20, plus Line 21)	5,154,923,789.1 gals 10.98%			
G. TECHNICAL PERFORMANCE INDICATOR FOR APPARENT LOSS					

AWU Water Loss Calculation

for: October 1, 2012 to September 30, 2013

				Assessment Values	
Line #	Field Description (from TWDB Water Audit Reporting Form)	Value	Score	Max Points	
34	Apparent Losses Normalized (Apparent Loss Volume/# of Retail Service Connections/365)	12 775 gals/conn/day			
H. TECHNICAL PERFORMANCE INDICATORS FOR REAL LOSS					
35	Real Loss Volume (Line 31) (shown as total gallons/year)	4,022,809,751 0 gals	8 57%		
36	Unavoidable Annual Real Losses, volume (calculated) in MGD	4,054,297 7 MGD	3 15%		
37	Infrastructure Leakage Index (calculated) (Equals real loss volume (div by 365) divided by unavoidable annual real losses)	2 718			
38	Real Losses Normalized (Real Loss Volume/# of Service Connections/365) (This indicator applies if service connection density is greater than 32/mile)	51 034 gals/conn/day			Austin's Serv Conn Density > 32/mile so this calc is used
39	Real Losses Normalized (Real Loss Volume/Miles of Main Lines/365) (This indicator applies if service connection density is less than 32/mile)	2,973 131 gals/mile/day			This one not used
I. FINANCIAL PERFORMANCE INDICATORS					
40	Total Apparent Losses (Line 28)	1,006,723,469 4 gals			Cost Data Points
41	Retail Price of Water	\$4 53 Per 1,000 Gals	5		5
42	(Apparent loss volume multiplied by retail cost of water - Line 40/1000 x Line 41)	\$4,560,457 32			
43	Total Real Losses (Line 31)	4,022,809,751 0 gals			
44	Variable Production Cost of Water* (*Note: In case of water shortage, real losses might be valued at the retail price of water instead of the variable production cost.)	\$0 41 Per 1,000 Gals	3		5
45	(Real loss multiplied by variable production cost of water - Line 43/1000 x Line 44)	\$1,657,397 62			
46	Total Assessment Score		67 5		85 0
47	Total Cost Impact of Apparent and Real Losses	\$6,217,854.93			79 41%
				Percentage of points available	

LEGEND:
 = calculated item
 = reliability assessment required
 = Update Needed

ASSESSMENT VALUE SCORING

Data considered Preliminary; Do not benchmark to other Utilities or use for planning

< 40

Progressively greater validity of data, use for planning & developing targeted loss control efforts, sufficient validity to compare to similarly assessed data from other utilities.

40 to 70

Mature programs of "auditing" & loss control; data is reliable in guiding and tracking advanced programs in apparent and real loss control, performance tracking and benchmarking to other utilities can be carried out in a reliable manner

70 to 85

AWU Water Use/Loss Breakdown

