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Water Audit Report for: **San Antonio Water System**  
 Reporting Year: **2011** 1/2011 - 12/2011

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 (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: **MILLION GALLONS (US) PER YEAR**

**WATER SUPPLIED**

<< Enter grading in column 'E'

Volume from own sources:	<input type="text" value="10"/>	<input type="text" value="67,448.000"/>	Million gallons (US)/yr (MG/Yr)
Master meter error adjustment (enter positive value):	<input type="text" value="10"/>	<input type="text" value="67.516"/>	<input type="text" value="under-registered"/> MG/Yr
Water imported:	<input type="text" value="10"/>	<input type="text" value="7,181.000"/>	MG/Yr
Water exported:	<input type="text" value="10"/>	<input type="text" value="4,056.000"/>	MG/Yr
<b>WATER SUPPLIED:</b>		<input type="text" value="70,640.516"/>	MG/Yr

**AUTHORIZED CONSUMPTION**

Billed metered:	<input type="text" value="9"/>	<input type="text" value="59,133.000"/>	MG/Yr
Billed unmetered:	<input type="text" value="n/a"/>	<input type="text" value="0.000"/>	MG/Yr
Unbilled metered:	<input type="text" value="9"/>	<input type="text" value="162.946"/>	MG/Yr
Unbilled unmetered:	<input type="text" value="6"/>	<input type="text" value="1,412.809"/>	MG/Yr
<b>AUTHORIZED CONSUMPTION:</b>		<input type="text" value="60,708.755"/>	MG/Yr

Click here: [?](#)  
for help using option buttons below

Pcnt:  Value:

Use buttons to select percentage of water supplied OR value

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

MG/Yr

**Apparent Losses**

Unauthorized consumption:  MG/Yr

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

Customer metering inaccuracies:	<input type="text" value="8"/>	<input type="text" value="3,784.848"/>	MG/Yr
Systematic data handling errors:	<input type="text" value="5"/>	<input type="text" value="123.000"/>	MG/Yr

Pcnt:  Value:

0.25%  6.00%

Choose this option to enter a percentage of billed metered consumption. This is NOT a default value

Apparent Losses:

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

Real Losses = Water Losses - Apparent Losses:  MG/Yr

**WATER LOSSES:**  MG/Yr

**NON-REVENUE WATER**

NON-REVENUE WATER:  MG/Yr

= Total Water Loss + Unbilled Metered + Unbilled Unmetered

**SYSTEM DATA**

Length of mains:	<input type="text" value="10"/>	<input type="text" value="5,216.0"/>	miles
Number of active AND inactive service connections:	<input type="text" value="10"/>	<input type="text" value="410,000"/>	
Connection density:		<input type="text" value="79"/>	conn./mile main
Average length of customer service line:	<input type="text" value="10"/>	<input type="text" value="0.0"/>	ft (pipe length between curbstop and customer meter or property boundary)
Average operating pressure:	<input type="text" value="10"/>	<input type="text" value="85.0"/>	psi

**COST DATA**

Total annual cost of operating water system:	<input type="text" value="10"/>	<input type="text" value="\$177,316,000"/>	\$/Year
Customer retail unit cost (applied to Apparent Losses):	<input type="text" value="10"/>	<input type="text" value="\$5.99"/>	\$/1000 gallons (US)
Variable production cost (applied to Real Losses):	<input type="text" value="10"/>	<input type="text" value="\$776.43"/>	\$/Million gallons

**PERFORMANCE INDICATORS**

**Financial Indicators**

Non-revenue water as percent by volume of Water Supplied:	<input type="text" value="16.3%"/>
Non-revenue water as percent by cost of operating system:	<input type="text" value="17.1%"/>
Annual cost of Apparent Losses:	<input type="text" value="\$24,478,102"/>
Annual cost of Real Losses:	<input type="text" value="\$4,540,029"/>

**Operational Efficiency Indicators**

Apparent Losses per service connection per day:	<input type="text" value="27.29"/>	gallons/connection/day
Real Losses per service connection per day*:	<input type="text" value="39.07"/>	gallons/connection/day
Real Losses per length of main per day*:	<input type="text" value="N/A"/>	
Real Losses per service connection per day per psi pressure:	<input type="text" value="0.46"/>	gallons/connection/day/psi
<input type="text" value="10"/> Unavoidable Annual Real Losses (UARL):	<input type="text" value="2,783.52"/>	million gallons/year
From Above, Real Losses = Current Annual Real Losses (CARL):	<input type="text" value="5,847.31"/>	million gallons/year
<input type="text" value="10"/> Infrastructure Leakage Index (ILI) [CARL/UARL]:	<input type="text" value="2.10"/>	

\* only the most applicable of these two indicators will be calculated

**WATER AUDIT DATA VALIDITY SCORE:**

**\*\*\* YOUR SCORE IS: 93 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: Unauthorized consumption**
- 2: Systematic data handling errors**
- 3: Customer metering inaccuracies**

[For more information, click here to see the Grading Matrix worksheet](#)



TEXAS WATER DEVELOPMENT BOARD

P.O. BOX 13231, CAPITOL STATION

AUSTIN, TX 78711-3231

2011 Water Audit Report

**D. Water Losses**

23. Water Losses 10,368,059,429 gallons  
(Line 17 minus Line 22)

**E. Apparent Losses**

24. Average Customer Meter Accuracy (Enter percentage)	<u>94.00</u> %	<u>3</u>
25. Customer Meter Accuracy Loss	<u>3,774,446,809</u> gallons	
26. Systematic Data Handling Discrepancy	<u>312,980,434</u> gallons	<u>3</u>
27. Unauthorized Consumption	<u>176,364,571</u> gallons	<u>0</u>
<b>28. Total Apparent Losses</b>	<u>4,263,791,813</u> gallons	

**F. Real Losses**

29. Reported Breaks and Leaks (Estimated volume of leaks & breaks repaired during the audit period)	<u>2,313,170,000</u> gallons	<u>3</u>
30. Unreported Loss (Includes all unknown water loss)	<u>3,791,097,616</u> gallons	<u>0</u>
<b>31. Total Real Losses</b> (Line 29, plus Line 30)	<u>6,104,267,616</u> gallons	
32. Water Losses (Apparent + Real) (Line 28 plus Line 31) = Line 23	<u>10,368,059,429</u> gallons	
33. Non-revenue Water (Water Losses + Unbilled Authorized Consumption) (Line 32, plus Line 20, plus Line 21)	<u>11,412,828,283</u> gallons	

**G. Technical Performance Indicator for Apparent Loss**

34. Apparent Losses Normalized 32 gallons  
(Apparent Loss Volume / # of Retail Service Connections/365)

**H. Technical Performance Indicators for Real Loss**

35. Real Loss Volume (Line 31)	<u>6,104,267,616</u> gallons
36. Unavoidable Annual Real Losses, volume (calculated)	<u>2,512,289,708</u> gallons
37. Infrastructure Leakage Index (calculated) (Equals real loss volume divided by unavoidable annual real losses)	<u>2.42980</u>
38. Real Losses Normalized <u>46</u> gallons (Real Loss Volume / # of Service Connections / 365) (This indicator applies if service connection density is greater than 32 / mile)	

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39. Real Losses Normalized 3,353 gallons  
 (Real Loss Volume/Miles of Main Lines/365)  
 (This indicator applies if service connection density is less than 32/mile)

**I. Financial Performance Indicators**

Assessment  
Scale

40. Total Apparent Losses (Line 28)	<u>4,263,791,813</u> gallons	
41. Retail Price of Water	<u>\$0.00529</u>	<u>5</u>
42. Cost of Apparent Losses (Apparent loss volume multiplied by retail cost of water, Line 40 x Line 41)	<u>\$22,555,458.69</u>	
43. Total Real Losses (Line 31)	<u>6,104,267,616.08</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>\$0.00024</u>	<u>5</u>
45. Cost of Real Losses (Real Loss multiplied by variable production cost of water, Line 43 x Line 44)	<u>\$1,477,232.76</u>	
<b>46. Total Assessment Scale</b>		<u>53</u>
<b>47. Total Cost Impact of Apparent and Real Losses</b>	<u>\$24,032,691.45</u>	