SEWERAGE & WATER BOARD OF NEW ORLEANS

AUDIT COMMITTEE MEETING

MONDAY, OCTOBER 19, 2015

2:00 PM

Wm. Raymond Manning, Chair • Dr. Tamika Duplessis, Vice Chair • Scott Jacobs • Robin Barnes • Marion Bracy

FINAL AGENDA

ACTION ITEMS

1. Municipal Water Pollution Prevention Audit East Bank Wastewater Treatment Plant (R-191-2015)
2. Municipal Water Pollution Prevention Audit West Bank Wastewater Treatment Plant (R-192-2015)

PRESENTATION ITEMS

3. Take Home Vehicle Audit
4. Audit Committee Charter
5. Implementation of Customer Service Management System
6. Water Audit FY2008 – FY2014

INFORMATION ITEMS

7. Review of Previous Report

SEWERAGE AND WATER BOARD
Inter-Office Memorandum

Date: October 5, 2015

To: Cedric S. Grant, Executive Director

From: Joseph Becker, General Superintendent

Re: Municipal Water Pollution Prevention Audit (MWPP)
East Bank Wastewater Treatment Plant

Attached please find the MWPP Audit for the period June 1, 2014 to May 31, 2015. There were no areas of concern found during the self-audit conducted by Veolia Water and SWBNO personnel. The facility's LPDES Permit requires the Board of Directors review this document and pass a resolution to document this review. A draft resolution is included for your review.

Please place this item on the agenda for the October Board meeting.

R-191-2015

EAST BANK WASTEWATER TREATMENT PLANT MUNICIPAL WATER POLLUTION PREVENTION ENVIRONMENTAL AUDIT

WHEREAS, on August 12, 2015 the Board's wastewater operator (Veolia Water North America) completed the Louisiana Municipal Water Pollution Prevention report for the East Bank Wastewater Treatment Plant for the period June 1, 2014 to May 31, 2015; and

WHEREAS, the Board has reviewed the Municipal Water Pollution Prevention Environmental Audit Report, prepared for the Louisiana Department of Environmental Quality, which is attached to this resolution; and

WHEREAS, though no corrective action is needed at this time, the Board will continue to take whatever actions are necessary to maintain permit requirements contained in the Louisiana Water Discharge Permit System (LWPDPS) Number LA0038091.

NOW, THEREFORE BE IT RESOLVED that the Board hereby acknowledges receipt and review of the report and assures performance of any actions necessary to maintain permit requirements.

I, Cedric S. Grant, Executive Director, Sewerage and Water Board of New Orleans, do hereby certify that the above and foregoing is a true and correct copy of a Resolution adopted at the Regular Monthly Meeting of said Board, duly called and held, according to law, on October 21, 2015.

CEDRIC S. GRANT
EXECUTIVE DIRECTOR
SEWERAGE AND WATER BOARD OF NEW ORLEANS

LOUISIANA

MUNICIPAL WATER POLLUTION PREVENTION

MWPP

Facility Name:	New Orleans East Bank WWTP
LPDES Permit Number:	LA0038091
Agency Interest (AI) Number:	4859
Address:	6501 Florida Ave. New Orleans, LA 70117
Parish:	Orleans
(Person Completing Form) Name:	Donald Patterson
Title:	Senior Project Manager
Date Completed:	August 12, 2015

Permit # LA0038091

Instructions to the Operator-in-Charge

1. **Complete only the sections of the Environmental Audit which apply to your wastewater treatment system. Leave sections that do not apply blank and enter a "0" for the point value.**

2. **Parts 1 through 7 contain questions for which points may be generated. These points are intended to communicate to the department and the governing body or owner what actions will be necessary to prevent effluent violations. Place the point totals from parts 1 through 7 on the Point Calculation page.**

3. **Add up the point totals.**

4. **Submit the Environmental Audit to the governing body or owner for their review and approval.**

5. **The governing body must pass a resolution which contains the following items:**

   a. **The resolution or letter must acknowledge the governing body or owner has reviewed the Environmental Audit.**

   b. **The resolution must indicate <u>specific</u> actions, if any, will be taken to maintain compliance and prevent effluent violations. Proposed actions should address the parts where maximum or close to maximum points were generated in the Environmental Audit.**

   c. **The resolution should provide any other information the governing body deems appropriate.**

Permit # LA0038091

PART 1: INFLUENT FLOW/LOADINGS

Part 1: Influent Flow/Loadings (All plants)

A. List the average monthly volumetric flows and BOD loadings received at your facility during the last reporting year.

	Col. 1 Average Monthly Flow (million gallons per day, MGD)		**Col. 2** Average Monthly BOD_5 Concentration (mg/l)		**Col. 3** Average Monthly BOD_5 Loading (pounds per day)
Jun-14	105.0	X	68	X 8.34 =	59,547
Jul-14	104.9	X	59	X 8.34 =	51,617
Aug-14	85.0	X	97	X 8.34 =	68,763
Sep-14	110	X	76	X 8.34 =	69,722
Oct-14	86	X	92	X 8.34 =	65,986
Nov-14	78.8	X	132	X 8.34 =	86,749
Dec-14	87.7	X	121	X 8.34 =	88,501
Jan-15	100.8	X	110	X 8.34 =	92,473
Feb-15	91	X	128	X 8.34 =	97,144
Mar-15	94.5	X	131	X 8.34 =	103,245
Apr-15	120.0	X	88	X 8.34 =	88,070
May-15	97.8	X	82	X 8.34 =	66,883

BOD loading = Average Monthly Flow (in MGD) x Average Monthly BOD concentration (in mg/l) x 8.34.

B. List the design flow and design BOD loading for your facility in the blanks below. If you are not aware of these design quantities, refer to your Operation and Maintenance Manual (O & M) or contact your consulting engineer.

Design Flow, MGD	122	X 0.90 =	110
Design BOD, lb/day	254,370	X 0.90 =	228,933

Permit # LA0038091

C. How many months did the monthly flow (Col. 1) to the wastewater treatment plant (WWTP) exceed 90% of design flow?
Circle the number of months and corresponding point total. Write the point total in the box below at the right.

months	(0)	1	2	3	4	5	6	7	8	9	10	11	12	months
points	(0)	0	0	0	0	5	5	5	5	5	5	5	5	points

Write 0 or 5 in the C point total box [0] C Point Total

D. How many months did the monthly flow (Col. 1) to the WWTP exceed the design flow?
Circle the number of months and corresponding point total. Write the point total in the box below at the right.

months	(0)	1	2	3	4	5	6	7	8	9	10	11	12	months
points	(0)	5	5	10	10	15	15	15	15	15	15	15	15	points

Write 0, 5, 10, or 15 in the D point total box [0] D Point Total

E. How many months did the monthly BOD loading (Col. 3) to the WWTP exceed 90% of the design loading?
Circle the number of months and corresponding point total. Write the point total in the box below at the right.

months	(0)	1	2	3	4	5	6	7	8	9	10	11	12	months
points	(0)	0	5	5	5	0	10	10	10	10	10	10	10	points

Write 0, 5, or 10 in the E point total box [0] E Point Total

F. How many times did the monthly BOD loading (Col. 3) to the WWTP exceed the design loading?
Circle the number of months and corresponding point total. Write the point total in the box below at the right.

months	(0)	1	2	3	4	5	6	7	8	9	10	11	12	months
points	(0)	10	20	30	40	50	50	50	50	50	50	50	50	points

Write 0, 10, 20, 30, 40, or 50 in the F point total box [0] F Point Total

G. Add together each point total for C through F and place this sum in the box below at the right.

TOTAL POINT VALUE FOR PART 1 [0] **(max=80)**

Also enter this value on the point calculation table on page 16.

Permit # LA0038091

PART 2: EFFLUENT QUALITY/PLANT PERFORMANCE

A. List the monthly average effluent BOD and TSS concentrations produced by your facility during the last reporting year.

Month	**Column 1** Avg. Monthly BOD (mg/l)	**Column 2** Avg. Monthly TSS (mg/l)
Jun-2014	18	13
Jul-2014	20	10
Aug -2014	16	9
Sep – 2014	21	12
Oct – 2014	23	10
Nov – 2014	19	11
Dec – 2013	24	12
Jan – 2015	18	13
Feb – 2015	13	10
Mar – 2015	20	15
Apr – 2015	17	16
May – 2015	17	14

B. List the monthly average permit limits for your facility in the blanks below.

	Permit Limit		90% of Permit Limit
BOD, mg/l	30	X 0.90 =	27
TSS, mg/l	30	X 0.90 =	27

Permit # LA0038091

C. Continuous Discharge to Surface Water

i. How many months did the effluent BOD concentration (Col. 1) exceed 90% of permit limits? Circle the number of months and corresponding point total. Write the point total in the box below at the right.

months	(0)	1	2	3	4	5	6	7	8	9	10	11	12	months
points	(0)	0	10	20	30	40	40	40	40	40	40	40	40	points

Write 0, 10, 20, 30 or 40 in the i point total box [0] i Point Total

ii. How many months did the effluent BOD concentration (Col. 1) exceed permit limits? Circle the number of months and corresponding point total. Write the point total in the box below at the right.

months	(0)	1	2	3	4	5	6	7	8	9	10	11	12	months
points	(0)	5	5	10	10	10	10	10	10	10	10	10	10	points

Write 0, 5, or 10 in the ii point total box [0] ii Point Total

iii. How many months did the effluent TSS concentration (Col. 2) exceed 90% of permit limits? Circle the number of months and corresponding point total. Write the point total in the box below at the right.

months	(0)	1	2	3	4	5	6	7	8	9	10	11	12	months
points	(0)	0	10	20	30	40	40	40	40	40	40	40	40	points

Write 0, 10, 20, 30, or 40 in the iii point total box [0] iii Point Total

iv. How many months did the effluent TSS concentration (Col.2) exceed permit limits? Circle the number of months and corresponding point total. Write the point total in the box below at the right.

months	(0)	1	2	3	4	5	6	7	8	9	10	11	12	months
points	(0)	5	5	10	10	10	10	10	10	10	10	10	10	points

Write 0, 5, or 10 in the iv point total box [0] iv Point Total

v. Add together each point total for i through iv and place this sum in the box below at the right.

TOTAL POINT VALUE FOR PART 2
Also enter this value on the point calculation table on page 16. [0] **(max=100)**

Permit # LA0038091

D. Other Monitoring and Limits

i. At any time in the past year was there an exceedance of a permit limit for other pollutants such as: ammonia-nitrogen, phosphorus, pH, residual chlorine, or fecal coliform?

❄ Check one box [X] Yes [ ] No If yes, please describe:

12/20/2014 – Fecal exceeded permit limits – the cause of the non-compliance is believed to be operator error at the time of sampling. The chlorine residual was sufficient at the time of sampling to properly disinfect the effluent discharged to the Mississippi River.

ii. At any time in the past year was there a "failure" of a Biomonitoring (Whole Effluent Toxicity) test of the effluent?

❄ Check one box [ ] Yes [X] No If yes, please describe:

iii. At any time in the past year was there an exceedance of a permit limit for a toxic substance?

❄ Check one box [X] Yes [ ] No If yes, please describe:

In the past year the following toxic substances were exceeded:

Substance:	Limit:	Result:	Date:
Selenium	5ug/l	8.2ug/l	9/25/14
Phenols	10ug/l	67ug/l	12/23/14
Cyanide	10ug/l	11ug/l	12/23/14

Permit # LA0038091

PART 3: AGE OF THE WASTEWATER TREATMENT FACILITIES

A. What year was the wastewater treatment plant constructed or last major expansion/improvements completed? 1974

Current Year	-	(Answer to A)	=	Age in years	
2015	-	1974	=	41	years

Enter Age in Part C below.

B. Check the type of treatment facility that is employed:

		Factor
X	Mechanical Treatment Plant (Trickling filter, activated sludge, etc.) Specify Type Activated Sludge	2.5
	Aerated Lagoon	2.0
	Stabilization Pond	1.5
	Other (Specify)	1.0

C. Multiply the factor listed next to the type of facility your community employs by the age of your facility to determine the total point value of Part 3:

TOTAL POINT VALUE FOR PART 3 = 2.5 (**FACTOR**) **x** 41 (**AGE**) = 102.5 **(max. = 50)**

Also enter this value or 50, which ever is less, on the point calculation table on page 16.

D. Please attach a schematic of the treatment plant.

Permit # LA0038091

PART 4: OVERFLOWS AND BYPASSES

A. (1) List the number of times in the last year there was an overflow, bypass, or unpermitted discharge of untreated or incompletely treated wastewater due to heavy rain: 1

(Circle One) 0 = 0 points | (1 = 5 points) | 2 = 10 points
3 = 15 points | 4 = 30 points | 5 or more = 50 points

(2) List the number of bypasses, overflows, or unpermitted discharges shown in A (1) that were within the collection system and the number at the treatment plant.

Collection System 1 Treatment Plant 0

B. (1) List the number of times in the last year there was a bypass or overflow of untreated or incompletely treated wastewater due to equipment failure, either at the treatment plant or due to pumping problems in the collection system: 6

(Circle One) 0 = 0 points | 1 = 5 points | 2 = 10 points
3 = 15 points | 4 = 30 points | (5 or more = 50 points)

(2) List the number of bypasses or overflows shown in B (1) that were within the collection system and the number at the treatment plant.

Collection System 6 Treatment Plant 0

C. Specify whether the bypasses came from the city or village sewer system or from contract or tributary communities/sanitary districts, etc.
All of the aforementioned bypasses came from the City's sanitary sewerage system.

D. Add the point values circled for A and B and place the total in the box below.

TOTAL POINT VALUE FOR PART 4 | 55 | **(max=100)**

Also enter this value on the point calculation table on page 16.

E. List the person responsible for reporting overflows, bypasses, or unpermitted discharges to State and Federal authorities:

N.O. S&WB, Cedric Grant, Executive Director and Environmental Affairs Department

Describe the procedure for gathering, compiling, and reporting:

RJN Cassworks Infrastructure Maintenance Management System is used to track overflows by retrieving pertinent information from work orders.

Permit # LA0038091

PART 5: SLUDGE STORAGE AND DISPOSAL SITES

A. Sludge Storage

How many months of sludge storage capacity does your wastewater treatment facility have available, either on-site or off-site?

Circle the number of months and corresponding point total. Write the point total in the box below at the right.

months	<2	2	3	4 to 5	(>6)	months
points	50	30	20	10	(0)	points

Write 0, 10, 20, 30, or 50 in the A point total box [0] A Point Total

B. For how many months does your facility have access to (and approval for) sufficient land disposal sites to provide proper land disposal?

Circle the number of months and corresponding point total. Write the point total in the box below at the right.

months	<2	6 to 11	12 to 23	24 to 35	(>36)	months
points	50	30	20	10	(0)	points

Write 0, 10, 20, 30, or 50 in the B point total box [0] B Point Total

C. Add together the A and B point values and place this sum in the box below at the right:

TOTAL POINT VALUE FOR PART 5 [0] **(max=100)**

Also enter this value on the point calculation table on page 16.

Permit # LA0038091

PART 6: NEW DEVELOPMENT

A. Please provide the following information for the total of all sewer line extensions which were installed during the last year. N/A

Design Population:_____

Design Flow:_____MGD

Design BOD_5:_____mg/l

B. Has an industry (or other development) moved into the community or expanded production in the past year, such that either flow or pollutant loadings to the sewerage system were significantly increased (5% or greater)?

(Circle One) (No) = 0 points Yes = 15 points

Describe:_____

List any new pollutants:_____

C. Is there any development (industrial, commercial, or residential) anticipated in the next 2-3 years, such that either flow or pollutant loadings to the sewerage system could significantly increase?

(Circle One) No = 0 points (Yes) = 15 points

Describe: The opening of two new hospitals: The Veterans Administration Hospital and LSU Teaching Hospital.

List any new pollutants that you anticipate: Increased Flow and TSS into the POTW.

D. Add together the point value circled in B and C and place the sum in the blank below.

TOTAL POINT VALUE FOR PART 6 15 **(max=30)**

Also enter this value on the point calculation table on page 16.

Permit # LA0038091

PART 7: OPERATOR CERTIFICATION AND EDUCATION

A. What was the name of the operator-in-charge for the reporting year? **James Porter**

B. What is his/her certification number? **#15-607; October 1992**

C. What level of certification is the operator-in-charge required to have to operate the wastewater treatment plant?

Class IV Wastewater Treatment

D. What is the level of certification of the operator-in-charge? Class IV Wastewater Treatment **Level Certified**

E. Was the operator-in-charge of the report year certified at least at the grade level required in order to operate this plant?

❄ Check one box [X] yes = 0 points [ ] no = 50 points

Write 0 or 50 in the E point total box [0] E Point Total

F. Has the operator-in-charge maintained recertification requirements during the reporting year?

❄ Check one box [X] yes [ ] no

G. How many hours of continuing education has the operator-in-charge completed over the last two calendar years?

❄ Check one box [X] 12 hours or more = 0 points [ ] Less than 12 hours = 50 points

Write 0 or 50 in the G point total box [0] G Point Total

H. Is there a written policy regarding continuing education and training for wastewater treatment plant employees?

❄ Check one box [X] yes [ ] no

Explain:

All personnel maintained at least 16 hours of training every two years. Veolia Water implements an internal training and safety program that meets all State Operator Certification training requirements. Additionally, 16 hours of cross training are provided to each employee.

I. What percentage of the continuing education expenses of the operator-in-charge were paid for:

By the permittee? _____

By the operator? 100% Veolia Water

J. Add together the E and G point values and place this sum in the box below at the right:

TOTAL POINT VALUE FOR PART 7 [0] **(max=100)**

Also enter this value on the point calculation table on page 16.

Permit # LA0038091

PART 8: FINANCIAL STATUS

A. Are User-Charge Revenues sufficient to cover operation and maintenance expenses?

❄ Check one box [X] Yes [ ] No If no, how are O & M costs being financed?

Explain:

Sewer rate increase 10% every year for the next 8 years.

B. What financial resources do you have available to pay for your wastewater improvements and reconstruction needs?

Revenues in excess of expenses and proceeds from bond issues.

PART 9: SUBJECTIVE EVALUATION

A. Collection System Maintenance

1. Describe what sewer system maintenance work has been done in the last year.

The Board and its contractors inspected 8,094 sewer manholes, completed 3,487 repairs, and cleaned 1,442,493.20 feet of the sewer system in 2014. Also, the Board and its contractors inspected a cumulative total of 38,280.00 feet of sewer line utilizing CCTV and a cumulative total of 907,645.50 feet of sewer line utilizing Smoke Testing in 2014. During the first and second halves of 2014, the Board inspected and maintained 68 known air release valves. In addition, 172 sewer force main isolation valves were inspected and exercised. 22 cathodic protection surveys were conducted and (100%) of the 102 miles of sewer force mains were visually inspected.

2. Describe what lift station work has been done in the last year.

The Board's Operations and Facility Maintenance personnel completed 4,941 sewage pumping station preventive maintenance tasks through December 31, 2014.

3. What collection system improvements does the community have under consideration for the next 5 years?

Permit # LA0038091

Collection system improvements are planned in accordance with the Third Modified Consent Decree.

B. If you have ponds, please answer the following questions: N/A

1. Do you have duckweed buildup in your ponds?	☐ Yes	☐ No
2. Do you mow your dikes regularly (at least monthly), to the waters edge?	☐ Yes	☐ No
3. Do you have bushes or trees growing on the dikes or in the ponds?	☐ Yes	☐ No
4. Do you have excess sludge buildup (>1 foot) on the bottom of any of your ponds?	☐ Yes	☐ No
5. Do you exercise all of your valves?	☐ Yes	☐ No
6. Are your control manholes in good structural shape?	☐ Yes	☐ No
7. Do you maintain at least three feet of freeboard in all your ponds?	☐ Yes	☐ No
8. Do you visit your pond system, at least weekly?	☐ Yes	☐ No

C. Treatment Plants

1. Have the influent and effluent flow meters been calibrated in the last year? ☒ Yes ☐ No

Influent flow meter calibration dates(s):	Effluent flow meter calibration date(s):
May 16, 2014; calibrated monthly	May 16, 2014; calibrated monthly

2. What problems, if any, have been experienced over the last year that has threatened treatment?

None

3. Is your community presently involved in formal planning for treatment facility upgrading?

☐ Yes ☒ No If yes, describe:

Permit # LA0038091

D. Preventive Maintenance

1. Does your plant have a written plan for preventive maintenance on major equipment items?

[X] Yes [ ] No If yes, describe:

Current system utilizes a computer generated maintenance work order system for both preventive and emergency repairs on all components in the plants.

Each piece of equipment's O&M manual is closely followed to ensure all factory preventive maintenance recommendations are performed.

2. Does this preventive maintenance program depict frequency of intervals, types of lubrication, and other preventive maintenance tasks necessary for each piece of equipment? [X] Yes [ ] No

3. Are these preventive maintenance tasks, as well as equipment problems, being recorded and filed so future maintenance problems can be assessed properly? [X] Yes [ ] No

E. Sewer Use Ordinance

1. Does your community have a sewer use ordinance that limits or prohibits the discharge of excessive conventional pollutants (BOD, TSS, or pH) or toxic substances to the sewer from industries, commercial users, and residences?

[X] Yes [ ] No If yes, describe:

E.P.A. approved Pretreatment Program and Section 16 of the Sewerage & Water Board of New Orleans Plumbing Code.

2. Has it been necessary to enforce? [X] Yes [ ] No If yes, describe:

E.P.A. approved Pretreatment Program requires sampling/monitoring of Significant Industrial Users to demonstrate compliance with applicable Federal, State and Local discharge requirements.

F. Any additional comments about your treatment plant or collection system? (Attach additional sheet if necessary.)

Permit # LA0038091

POINT CALCULATION TABLE

Fill in the values from parts 1 through 7 in the columns below. Add the numbers in the left column to determine the point total that the wastewater system has generated for the previous year.

		Actual Values	Maximum
Part 1:	Influent Flow/Loadings	0	80 Points
Part 2:	Effluent Quality/Plant Performance	0	100 Points
Part 3:	Age of WWTP	50	50 Points
Part 4:	Overflows and Bypasses	55	100 Points
Part 5:	Ultimate Disposition of Sludge	0	100 Points
Part 6:	New Development	15	30 Points
Part 7:	Operator Certification Training	0	100 Points

TOTAL POINTS 120

Permit # LA0038091

ATTACHMENT 3

SAMPLE MWPP RESOLUTION

Resolved that the city/town of _____ informs Louisiana Department of Environmental Quality that the following actions were taken by the _____ (governing body).

1. Reviewed the Municipal Water Pollution Prevention Environmental Audit Report which is attached to this resolution.

2. Set forth the following actions necessary to maintain permit requirements contained in the Louisiana Water Discharge Permit System (LWDPS) number _____ .

(Please be specific in listing the actions that will be taken to address the problems identified in the audit report.)

a.

b.

c.

d.

etc.

Passed by a majority/unanimous (circle one) vote of the _____ on _____ (date).

_____

_____

CLERK

SEWERAGE AND WATER BOARD
Inter-Office Memorandum

Date: October 5, 2015

To: Cedric S. Grant, Executive Director

From: Joseph Becker, General Superintendent

Re: Municipal Water Pollution Prevention Audit (MWPP)
West Bank Wastewater Treatment Plant

Attached please find the West Bank Wastewater Treatment Plant MWPP Audit for the period September 1, 2014 to August 31, 2015. There were no areas of concern found during the self-audit conducted by Veolia Water and SWBNO personnel. The facility's LPDES Permit requires the Board of Directors review this document and pass a resolution to document this review. A draft resolution is included for your review.

Please place this item on the agenda for the October Board meeting.

R-192-2015

WEST BANK WASTEWATER TREATMENT PLANT MUNICIPAL WATER POLLUTION PREVENTION ENVIRONMENTAL AUDIT

WHEREAS, on September 29, 2015, the Board's wastewater operator (Veolia Water North America) submitted the Louisiana Municipal Water Pollution Prevention report for the West Bank Wastewater Treatment Plant for the period September 1, 2014 to August 31, 2015; and

WHEREAS, the Board has reviewed the Municipal Water Pollution Prevention Environmental Audit Report, prepared for the Louisiana Department of Environmental Quality, which is attached to this resolution; and

WHEREAS, though no corrective action is needed at this time, the Board will continue to take whatever actions are necessary to maintain permit requirements contained in the Louisiana Water Discharge Permit System (LWPDPS) Number LA0038105.

NOW, THEREFORE BE IT RESOLVED that the Board acknowledges receipt and review of the report and assures performance of any actions necessary to maintain permit requirements.

I, Cedric S. Grant, Executive Director, Sewerage and Water Board of New Orleans, do hereby certify that the above and foregoing is a true and correct copy of a Resolution adopted at the Regular Monthly Meeting of said Board, duly called and held, according to law, on October 21, 2015.

CEDRIC S. GRANT
EXECUTIVE DIRECTOR
SEWERAGE AND WATER BOARD OF NEW ORLEANS

LOUISIANA

MUNICIPAL WATER POLLUTION PREVENTION

MWPP

Facility Name:	New Orleans West Bank WWTP
LPDES Permit Number:	LA0038105
Agency Interest (AI) Number:	4688
Address:	3501 Canal Street New Orleans, LA 70131
Parish:	Orleans
(Person Completing Form) Name:	Donald Patterson
Title:	Senior Project Manager
Date Completed:	September 25, 2015

Permit # LA0038105

Instructions to the Operator-in-Charge

1. **Complete only the sections of the Environmental Audit which apply to your wastewater treatment system. Leave sections that do not apply blank and enter a "0" for the point value.**

2. **Parts 1 through 7 contain questions for which points may be generated. These points are intended to communicate to the department and the governing body or owner what actions will be necessary to prevent effluent violations. Place the point totals from parts 1 through 7 on the Point Calculation page.**

3. **Add up the point totals.**

4. **Submit the Environmental Audit to the governing body or owner for their review and approval.**

5. **The governing body must pass a resolution which contains the following items:**

   a. **The resolution or letter must acknowledge the governing body or owner has reviewed the Environmental Audit.**

   b. **The resolution must indicate specific actions, if any, will be taken to maintain compliance and prevent effluent violations. Proposed actions should address the parts where maximum or close to maximum points were generated in the Environmental Audit.**

   c. **The resolution should provide any other information the governing body deems appropriate.**

Permit # LA0038105

PART 1: INFLUENT FLOW/LOADINGS

Part 1: Influent Flow/Loadings (All plants)

A. List the average monthly volumetric flows and BOD loadings received at your facility during the last reporting year.

	Col. 1 Average Monthly Flow (million gallons per day, MGD)		**Col. 2** Average Monthly BOD_5 Concentration (mg/l)		**Col. 3** Average Monthly BOD_5 Loading (pounds per day)
Sep-14	8.1	X	74	X 8.34 =	4,998
Oct-14	6.1	X	89	X 8.34 =	4,527
Nov 14	5.9	X	107	X 8.34 =	5,265
Dec-14	7.2	X	106	X 8.34 =	6,365
Jan-15	9.4	X	90	X 8.34 =	7,055
Feb-15	7.5	X	101	X 8.34 =	6,317
Mar-15	10.3	X	89	X 8.34 =	7,645
Apr-15	12.4	X	73	X 8.34 =	7,549
May-15	7.6	X	87	X 8.34 =	5,514
Jun-15	6.6	X	92	X 8.34 =	5,064
Jul-15	6.5	X	109	X 8.34 =	5,908
Aug-15	6.6	X	100	X 8.34 =	5504

BOD loading = Average Monthly Flow (in MGD) x Average Monthly BOD concentration (in mg/l) x 8.34.

B. List the design flow and design BOD loading for your facility in the blanks below. If you are not aware of these design quantities, refer to your Operation and Maintenance Manual (O & M) or contact your consulting engineer.

Design Flow, MGD	20	X 0.90 =	18
Design BOD, lb/day	14,972	X 0.90 =	13,475

Permit # LA0038105

C. How many months did the monthly flow (Col. 1) to the wastewater treatment plant (WWTP) exceed 90% of design flow?
Circle the number of months and corresponding point total. Write the point total in the box below at the right.

months	(0)	1	2	3	4	5	6	7	8	9	10	11	12	months
points	(0)	0	0	0	0	5	5	5	5	5	5	5	5	points

Write 0 or 5 in the C point total box [0] C Point Total

D. How many months did the monthly flow (Col. 1) to the WWTP exceed the design flow?
Circle the number of months and corresponding point total. Write the point total in the box below at the right.

months	(0)	1	2	3	4	5	6	7	8	9	10	11	12	months
points	(0)	5	5	10	10	15	15	15	15	15	15	15	15	points

Write 0, 5, 10, or 15 in the D point total box [0] D Point Total

E. How many months did the monthly BOD loading (Col. 3) to the WWTP exceed 90% of the design loading?
Circle the number of months and corresponding point total. Write the point total in the box below at the right.

months	(0)	1	2	3	4	5	6	7	8	9	10	11	12	months
points	(0)	0	5	5	5	0	10	10	10	10	10	10	10	points

Write 0, 5, or 10 in the E point total box [0] E Point Total

F. How many times did the monthly BOD loading (Col. 3) to the WWTP exceed the design loading?
Circle the number of months and corresponding point total. Write the point total in the box below at the right.

months	(0)	1	2	3	4	5	6	7	8	9	10	11	12	months
points	(0)	10	20	30	40	50	50	50	50	50	50	50	50	points

Write 0, 10, 20, 30, 40, or 50 in the F point total box [0] F Point Total

G. Add together each point total for C through F and place this sum in the box below at the right.

TOTAL POINT VALUE FOR PART 1 [0] **(max=80)**

Also enter this value on the point calculation table on page 16.

Permit # LA0038105

PART 2: EFFLUENT QUALITY/PLANT PERFORMANCE

A. List the monthly average effluent BOD and TSS concentrations produced by your facility during the last reporting year.

Month	**Column 1** Avg. Monthly BOD (mg/l)	**Column 2** Avg. Monthly TSS (mg/l)
Sep-14	6	8
Oct-14	10	10
Nov 14	6	7
Dec-14	9	7
Jan-15	12	11
Feb-15	12	11
Mar-15	14	10
Apr-15	15	16
May-15	9	12
Jun-15	5	8
Jul-15	7	9
Aug-15	4	7

B. List the monthly average permit limits for your facility in the blanks below.

	Permit Limit		90% of Permit Limit
BOD, mg/l	30	X 0.90 =	27
TSS, mg/l	30	X 0.90 =	27

Permit # LA0038105

C. Continuous Discharge to Surface Water

i. How many months did the effluent BOD concentration (Col. 1) exceed 90% of permit limits? Circle the number of months and corresponding point total. Write the point total in the box below at the right.

months	(0)	1	2	3	4	5	6	7	8	9	10	11	12	months
points	(0)	0	10	20	30	40	40	40	40	40	40	40	40	points

Write 0, 10, 20, 30 or 40 in the i point total box [0] i Point Total

ii. How many months did the effluent BOD concentration (Col. 1) exceed permit limits? Circle the number of months and corresponding point total. Write the point total in the box below at the right.

months	(0)	1	2	3	4	5	6	7	8	9	10	11	12	months
points	(0)	5	5	10	10	10	10	10	10	10	10	10	10	points

Write 0, 5, or 10 in the ii point total box [0] ii Point Total

iii. How many months did the effluent TSS concentration (Col. 2) exceed 90% of permit limits? Circle the number of months and corresponding point total. Write the point total in the box below at the right.

months	(0)	1	2	3	4	5	6	7	8	9	10	11	12	months
points	(0)	0	10	20	30	40	40	40	40	40	40	40	40	points

Write 0, 10, 20, 30, or 40 in the iii point total box [0] iii Point Total

iv. How many months did the effluent TSS concentration (Col.2) exceed permit limits? Circle the number of months and corresponding point total. Write the point total in the box below at the right.

months	(0)	1	2	3	4	5	6	7	8	9	10	11	12	months
points	(0)	5	5	10	10	10	10	10	10	10	10	10	10	points

Write 0, 5, or 10 in the iv point total box [0] iv Point Total

v. Add together each point total for i through iv and place this sum in the box below at the right.

TOTAL POINT VALUE FOR PART 2
Also enter this value on the point calculation table on page 16. [0] **(max=100)**

Permit # LA0038105

D. Other Monitoring and Limits

i. At any time in the past year was there an exceedance of a permit limit for other pollutants such as: ammonia-nitrogen, phosphorus, pH, residual chlorine, or fecal coliform?

❄ Check one box [ ] Yes [x] No If yes, please describe:

ii. At any time in the past year was there a "failure" of a Biomonitoring (Whole Effluent Toxicity) test of the effluent?

❄ Check one box [ ] Yes [X] No If yes, please describe:

iii. At any time in the past year was there an exceedance of a permit limit for a toxic substance?

❄ Check one box [X] Yes [ ] No If yes, please describe:

Substance:	Limit:	Result:	Date:
Selenium	5ug/l	6.7ug/l	9/24/14

Permit # LA0038105

PART 3: AGE OF THE WASTEWATER TREATMENT FACILITIES

A. What year was the wastewater treatment plant constructed or last major expansion/improvements completed? 1974

Current Year	-	(Answer to A)	=	Age in years	
2015	-	1974	=	41	years

Enter Age in Part C below.

B. Check the type of treatment facility that is employed:

		Factor
X	Mechanical Treatment Plant (Trickling filter, activated sludge, etc.) Specify Type Trickling Filter	2.5
	Aerated Lagoon	2.0
	Stabilization Pond	1.5
	Other (Specify)	1.0

C. Multiply the factor listed next to the type of facility your community employs by the age of your facility to determine the total point value of Part 3:

TOTAL POINT VALUE FOR PART 3 = 2.5 (**FACTOR**) **x** 41 (**AGE**) = 102.5 **(max. = 50)**

Also enter this value or 50, which ever is less, on the point calculation table on page 16.

D. Please attach a schematic of the treatment plant.

Permit # LA0038105

PART 4: OVERFLOWS AND BYPASSES

A. (1) List the number of times in the last year there was an overflow, bypass, or unpermitted discharge of untreated or incompletely treated wastewater due to heavy rain: 1

(Circle One) 0 = 0 points (1 = 5 points) 2 = 10 points
3 = 15 points 4 = 30 points 5 or more = 50 points

(2) List the number of bypasses, overflows, or unpermitted discharges shown in A (1) that were within the collection system and the number at the treatment plant.

Collection System 1 Treatment Plant 0

B. (1) List the number of times in the last year there was a bypass or overflow of untreated or incompletely treated wastewater due to equipment failure, either at the treatment plant or due to pumping problems in the collection system: 0

(Circle One) (0 = 0 points) 1 = 5 points 2 = 10 points
3 = 15 points 4 = 30 points 5 or more = 50 points

(2) List the number of bypasses or overflows shown in B (1) that were within the collection system and the number at the treatment plant.

Collection System 0 Treatment Plant 0

C. Specify whether the bypasses came from the city or village sewer system or from contract or tributary communities/sanitary districts, etc.
The single bypass came from the city's sewer system.

D. Add the point values circled for A and B and place the total in the box below.

TOTAL POINT VALUE FOR PART 4 5 **(max=100)**

Also enter this value on the point calculation table on page 16.

E. List the person responsible for reporting overflows, bypasses, or unpermitted discharges to State and Federal authorities:

Bypass report is signed by the Executive Director of the SWBNO. The report is submitted to the Department of Environmental Quality.

Describe the procedure for gathering, compiling, and reporting:

RJN Cassworks Infrastructure Maintenance Management System is used to track overflows by retrieving pertinent information from work orders.

Permit # LA0038105

PART 5: SLUDGE STORAGE AND DISPOSAL SITES

A. Sludge Storage

How many months of sludge storage capacity does your wastewater treatment facility have available, either on-site or off-site?

Circle the number of months and corresponding point total. Write the point total in the box below at the right.

months	<2	2	3	4 to 5	>6	months
points	50	30	20	10	0	points

Write 0, 10, 20, 30, or 50 in the A point total box [0] A Point Total

B. For how many months does your facility have access to (and approval for) sufficient land disposal sites to provide proper land disposal?

Circle the number of months and corresponding point total. Write the point total in the box below at the right.

months	<2	6 to 11	12 to 23	24 to 35	>36	months
points	50	30	20	10	0	points

Write 0, 10, 20, 30, or 50 in the B point total box [0] B Point Total

C. Add together the A and B point values and place this sum in the box below at the right:

TOTAL POINT VALUE FOR PART 5 [0] **(max=100)**

Also enter this value on the point calculation table on page 16.

Permit # LA0038105

PART 6: NEW DEVELOPMENT

A. Please provide the following information for the total of all sewer line extensions which were installed during the last year. NA

Design Population:_____

Design Flow:_____MGD

Design BOD_5:_____mg/l

B. Has an industry (or other development) moved into the community or expanded production in the past year, such that either flow or pollutant loadings to the sewerage system were significantly increased (5% or greater)?

(Circle One) (No) = 0 points Yes = 15 points

Describe:_____

_____

_____

List any new pollutants:_____

_____

C. Is there any development (industrial, commercial, or residential) anticipated in the next 2-3 years, such that either flow or pollutant loadings to the sewerage system could significantly increase?

(Circle One) (No) = 0 points Yes = 15 points

Describe:_____

_____

_____

List any new pollutants that you anticipate:_____

_____

D. Add together the point value circled in B and C and place the sum in the blank below.

TOTAL POINT VALUE FOR PART 6 0 **(max=30)**

Also enter this value on the point calculation table on page 16.

Permit # LA0038105

PART 7: OPERATOR CERTIFICATION AND EDUCATION

A. What was the name of the operator-in-charge for the reporting year? **Cantrelle Larkins**

B. What is his/her certification number? **#15-250 October, 1992**

C. What level of certification is the operator-in-charge required to have to operate the wastewater treatment plant?

Class IV Wastewater Treatment

D. What is the level of certification of the operator-in-charge? Class IV Wastewater Treatment **Level Certified**

E. Was the operator-in-charge of the report year certified at least at the grade level required in order to operate this plant?

❄ Check one box [X] yes = 0 points [ ] no = 50 points

Write 0 or 50 in the E point total box [0] E Point Total

F. Has the operator-in-charge maintained recertification requirements during the reporting year?

❄ Check one box [X] yes [ ] no

G. How many hours of continuing education has the operator-in-charge completed over the last two calendar years?

❄ Check one box [X] 12 hours or more = 0 points [ ] Less than 12 hours = 50 points

Write 0 or 50 in the G point total box [0] G Point Total

H. Is there a written policy regarding continuing education and training for wastewater treatment plant employees?

❄ Check one box [X] yes [ ] no

Explain:

All personnel maintained at least 16 hours of training every two years for Wastewater Treatment certifications. Veolia implements an internal training and safety program that meets all State Operator Certification training requirements. Additionally, 16 hours of cross training are provided

I. What percentage of the continuing education expenses of the operator-in-charge were paid for:

By the permittee? _____

By the operator? 100% Veolia

J. Add together the E and G point values and place this sum in the box below at the right:

TOTAL POINT VALUE FOR PART 7 [0] **(max=100)**

Also enter this value on the point calculation table on page 16.

Permit # LA0038105

PART 8: FINANCIAL STATUS

A. Are User-Charge Revenues sufficient to cover operation and maintenance expenses?

Check one box [x] Yes [ ] No If no, how are O & M costs being financed?

Explain:

Sewer rate increase 10% every year for the next 8 years.

B. What financial resources do you have available to pay for your wastewater improvements and reconstruction needs?

Revenues in excess of expenses and proceeds from bond issues.

Permit # LA0038105

PART 9: SUBJECTIVE EVALUATION

A. Collection System Maintenance

1. Describe what sewer system maintenance work has been done in the last year.

Sewer Line Inspection: 12,488 feet
Sewer Line Cleaning: 95,621 feet
Sewer Repairs: 62

2. Describe what lift station work has been done in the last year.

1372 Preventative Maintenance Actions
156 Corrective Maintenance Actions

3. What collection system improvements does the community have under consideration for the next 5 years?

Even though the West Bank is not mandated to improve the collection system in accordance with the Third Modified Consent Decree, repairs and improvements are made when identified through sewer main inspections, sewer main cleaning and manhole inspections.

B. If you have ponds, please answer the following questions: N/A

1. Do you have duckweed buildup in your ponds? ☐ Yes ☐ No
2. Do you mow your dikes regularly (at least monthly), to the waters edge? ☐ Yes ☐ No
3. Do you have bushes or trees growing on the dikes or in the ponds? ☐ Yes ☐ No
4. Do you have excess sludge buildup (>1 foot) on the bottom of any of your ponds? ☐ Yes ☐ No
5. Do you exercise all of your valves? ☐ Yes ☐ No
6. Are your control manholes in good structural shape? ☐ Yes ☐ No
7. Do you maintain at least three feet of freeboard in all your ponds? ☐ Yes ☐ No
8. Do you visit your pond system, at least weekly? ☐ Yes ☐ No

Permit # LA0038105

C. Treatment Plants

1. Have the influent and effluent flow meters been calibrated in the last year? [X] Yes [ ] No

Influent flow meter calibration dates(s):	Effluent flow meter calibration date(s):
August 14, 2015; calibrated monthly	August 14, 2015; calibrated monthly

2. What problems, if any, have been experienced over the last year that have threatened treatment?

None

3. Is your community presently involved in formal planning for treatment facility upgrading?

[ ] Yes [X] No If yes, describe:

Permit # LA0038105

D. Preventive Maintenance

1. Does your plant have a written plan for preventive maintenance on major equipment items?

[X] Yes [ ] No If yes, describe:

Current system utilizes a computer generated maintenance work order system for both preventive and emergency repairs on all components in the plants.
Each piece of equipment's O&M manual is closely followed to ensure all factory preventive maintenance recommendations are performed.

2. Does this preventive maintenance program depict frequency of intervals, types of lubrication, and other preventive maintenance tasks necessary for each piece of equipment? [X] Yes [ ] No

3. Are these preventive maintenance tasks, as well as equipment problems, being recorded and filed so future maintenance problems can be assessed properly? [X] Yes [ ] No

E. Sewer Use Ordinance

1. Does your community have a sewer use ordinance that limits or prohibits the discharge of excessive conventional pollutants (BOD, TSS, or pH) or toxic substances to the sewer from industries, commercial users, and residences?

[X] Yes [ ] No If yes, describe:

2. Has it been necessary to enforce? [X] Yes [ ] No If yes, describe:

F. Any additional comments about your treatment plant or collection system? (Attach additional sheet if necessary.)

Permit # LA0038105

POINT CALCULATION TABLE

Fill in the values from parts 1 through 7 in the columns below. Add the numbers in the left column to determine the point total that the wastewater system has generated for the previous year.

		Actual Values	Maximum
Part 1:	Influent Flow/Loadings	0	80 Points
Part 2:	Effluent Quality/Plant Performance	0	100 Points
Part 3:	Age of WWTP	50	50 Points
Part 4:	Overflows and Bypasses	5	100 Points
Part 5:	Ultimate Disposition of Sludge	0	100 Points
Part 6:	New Development	0	30 Points
Part 7:	Operator Certification Training	0	100 Points

TOTAL POINTS 55

Permit # LA0038105

ATTACHMENT 3

SAMPLE MWPP RESOLUTION

Resolved that the city/town of _____ informs Louisiana Department of Environmental Quality that the following actions were taken by the _____ (governing body).

1. Reviewed the Municipal Water Pollution Prevention Environmental Audit Report which is attached to this resolution.

2. Set forth the following actions necessary to maintain permit requirements contained in the Louisiana Water Discharge Permit System (LWDPS) number _____ .

(Please be specific in listing the actions that will be taken to address the problems identified in the audit report.)

a.

b.

c.

d.

etc.

Passed by a majority/unanimous (circle one) vote of the _____ on _____ (date).

_____

_____

CLERK

Internal Audit Department

Take Home Vehicle Inventory Use and Availability Status

October 15, 2015

Executive Summary

The Sewerage & Water Board's inventory of Take Home Vehicles made available to assigned, eligible employees at the beginning of 2015 was 105. After a re-evaluation of this issue, the Executive Director considered the following factors to determine the necessity and justification of the number of vehicles for take home status:

1. Current Operational workloads, not requiring a take home vehicle at certain departments
2. Alternative vehicle availability to eligible employees who would garage the assigned vehicle at a Board facility at the end of the work day
3. Alternative access arrangements, not requiring a take home vehicle assignment
4. Retiring employees still listed on the Take home Vehicle list would be removed
5. Eligible employees who voluntarily surrendered the assigned vehicle back to inventory

From these considerations, the Take Home Vehicle list was reduced to 87 from the General Superintendent Division and 2 from the Administrative Division.

Take Home Vehicle Use Analysis

Those employees assigned and utilize take home vehicles are, according to Board Policy 94, charged through payroll deduction a bi-weekly rate of $48 per pay period in consideration to their domicile within proximity of 20 miles of the parish line (Tier 1). Those employees whose domicile is 20+ miles of the parish line are charged a higher rate of $144 per pay period (Tier2).

Internal Audit utilized information obtained through The Office Support Services consisting of Equipment Management (EMSI) Reports, Take Home Vehicle status reports from managers to Support Services and data compiled for Internal Audit including employee timesheets, Payroll Deduction Reports, Employee Domicile Reports, GPS Mapping for determining distances in miles from the employees' domicile to the Orleans Parish line to determine accurate charges per pay period. The attached spreadsheet provides detail, outlining vehicle disposition for Take Home and other designations by employee and organization group as of August 2015. Here is a summary of that data per the attachments for further review:

1. Total Vehicles Approved for Take Home as of January 2015 – **105**
2. Total Vehicles Approved for Take Home as of August 2015 – **89**
3. Total Previously Assigned Take Home Vehicles Now Garaged – **16**
4. Total Vehicles Not-Assigned as Take Home but are Currently Taken Home on Rotational Basis for On Call or other job related assignments – **3**
5. Total Employees Not Properly Charged for Vehicle Use – **9**

Conclusions

Internal Audit considers the Take Home Vehicles usage by Board employees and management reasonable and within the guidelines of Board Policy 94 with only a few cases in departments where senior management discretion is exercised for operational necessity.

Timekeeping protocols should be adhered to by management to accurately document all Take Home Vehicle usage and apply the proper usage to employees who may be permitted to access a Board vehicle not originally assigned an employee to be used for Take Home privileges.

DATE: March 3, 2015

FROM: Cedric S. Grant, Executive Director

TO: All Employees

RE: Company Vehicle Policy

Policy Memorandum
No.94
Revised 03/15

This latest revision of the Company Vehicle Policy replaces the existing Board Policy No. 94. All Sewerage and Water Board personnel should acquaint themselves with the new procedures relative to the assignment, operation, and use of all Board owned vehicles and any other vehicle operated on behalf of the Board for S&WB business purposes.

This Policy Memorandum covers five categories that directly affect all employees who use and or have access to company vehicles. These categories include: Driver Eligibility, Responsibility & Personal Use, Selection and Assignment of Board Vehicles, Vehicle Operating Guidelines, Accident Procedure, and Insurance Licensing & Registration.

It is mandatory that all Board employees read and familiarize themselves with this revised policy to insure that all vehicles are handled responsibly. Employees should further note that any other Board policies relative to the use and operation of Sewerage and Water Board vehicles remain in effect.

These revisions were disseminated to Executive Staff in December 2014 so that its implementation could be efficient. Therefore the restatement of the existing policy as contained herein will be effective immediately.

Cedric S. Grant

Cedric S. Grant
Executive Director

COMPANY VEHICLE POLICY

Date: March 3, 2015

Policy Memorandum No. 94

CONTENTS

Page

PURPOSE

- TO ESTABLISH A STANDARIZED POLICY FOR ALL EMPLOYEES TO FOLLOW IN THE ASSIGNMENT, AND USE OF SEWERAGE AND WATER BOARD VEHICLES OR ANY OTHER VEHICLES FOR THE EXPRESS PURPOSES OF CARRYING OUT BOARD DUTIES AND RESPONSIBILITIES.

POLICY STATEMENT

- It is the general policy of the Sewerage and Water Board of New Orleans that any and all vehicles used for Board business purposes be operated in a prudent and responsible manner. Only authorized employees shall be granted the use of Board vehicles or approved to use their personal vehicle in the performance of their job duties.

- Personal use of Board vehicles should be kept to an absolute minimum and only with the authorization of the employee's supervisor.

- The goal of the Sewerage and Water Board of New Orleans is to ensure the effective and efficient use of any and all vehicles operated in the performance of Board business.

I. DRIVER / VEHICLE ELIGIBILITY, ASSIGNMENT & RESPONSIBILITY

A. GENERAL INFORMATION

Only S&WB employees are allowed to operate S&WB vehicles and equipment. Contracted maintenance personnel are exempt from this prohibition while performing the duties of their respective jobs, provided such personnel secure permission from a qualified S&WB Supervisor.

Prior to operation of any vehicle on behalf of and/or in the performance of Board duties or responsibilities an individual must have a valid LA State driver's license, which is not suspended or revoked, appropriate for the type of vehicle he or she will operate.

The Executive Director may assign a Board take-home vehicle based upon the employee's job assignment and responsibilities where it is beneficial to accomplish specific Sewerage and Water Board of New Orleans functions and according to the take home assignment criteria.

Employees will not presume any special privileges with Board take home vehicles, nor shall a take-home assignment be for the purpose of compensating an employee or for an employee's convenience.

S&WB vehicles are to be used primarily for Board business only.

The S&WB also prohibits the transport of a hitchhiker or family members.

Any employee assigned a take home vehicle who will be absent more than two (2) consecutive days due to annual or personal leave must so notify their immediate supervisor and make arrangements for the assigned vehicle to be returned to its assigned domicile (Board facility) where it can be garaged in the vehicle pool.

B. USE OF PERSONAL VEHICLE FOR BOARD BUSINESS

The use of an employee's personal vehicle for business purposes should be kept to an absolute minimum and is permitted only with the prior authorization from the Board's Risk Manager.

The following personal vehicle insurance coverage is mandatory for authorization:

1) **Pre-Inspection** and approval of vehicle type and physical condition.

2) **Minimum Limit of Personal Automobile**

Liability Insurance	$100,000.00 BI/PD Combined Single Limit $100,000 / $300,000 Bodily Injury $100,000 Property Damage

3) **Business Use Endorsement** on Personal Vehicle Policy.

4) **Additional Insured Endorsement** in favor of the Sewerage and Water Board of New Orleans.

Prior to any authorization of the use of an employee's personal vehicle for S&WB business purposes, evidence of all such applicable insurance satisfactorily of the Board shall be filed with the Risk Management Office of the Sewerage and Water Board of New Orleans.

C. GUIDELINES FOR ASSIGNMENT OF TAKE-HOME VEHICLE

Board employees may be assigned a S&WB vehicle to use in the performance of job duties during normal work hours and other than normal work hours to commute to and from the work site and their actual domicile (as defined in the City Code, Part II, Chapter 2, Article X, Sec 2-972) or any portion thereof.

These additional rules and procedures apply specifically to vehicles that have been assigned to employees as take-home vehicles:

1) **Take-Home Assignment Criteria.** The following are the fundamental take-home vehicle assignment criteria as determined by the Executive Director. These are the minimum requirements that must be applied to all take-home assignments in addition to any departmental assignment criteria:

Take-home vehicles will only be assigned to full-time S&WB employees who need to respond on-site to S&WB business related incidents on a 24-hour basis. This criterion will not be considered to be attained by employees simply being available on a 24-hour basis. This provision will be considered to be attained when an employee, because of their skill and position, is regularly and recurrently called out during an employee's non-traditional working hours to perform duties associated with that employee's duties and responsibilities.
A take-home vehicle may not be assigned to an employee when the one-way driving distance from the employee's actual domicile to Orleans Parish is greater than 40 miles, except if that employee holds a critical position as set forth in Section (3) hereof.

2) **Take-Home Vehicle Use.** Take-home vehicles are to be used to conduct S&WB business. In addition, employees are permitted to travel to and from work in accordance with Internal Revenue Service rules and regulations, and during those times when they could be recalled to work as determined by their

appointing authority. Employees of the S&WB are entrusted by our customers to safeguard our assets through efficient management. Therefore , as a general rule, S&WB vehicles should not be used to perform personal business. However, in some instances, take-home cars may be used to perform minor, personal errands so long as the errands are conducted to and from work, are brief in nature, and do not detract from the employee's activities as a public servant. Any abuse of the discretion of S&WB vehicle use is grounds for removal of take-home vehicle privileges and/or disciplinary action, up to and including dismissal.

3) Key Position Vehicle Use. However, there exists within the S&WB, certain key positions that require these individuals to be available for a 24hrs/7 days a week availability that is linked to timely and immediate response based upon the activities of the departments supervised and the duties for which they are responsible. Not having use of a take-home vehicle could jeopardize the performance of their duties during critical times. Therefore, those individuals holding the following positions will be authorized an assigned take-home vehicle:

Executive Director
General Superintendent
Emergency Management
Deputy General Superintendent
Chief of Engineering
Chief of Operations
Chief of Network Engineering
Chief of Plumbing
Chief of Facility Maintenance
Director of Environmental Affairs
Director of Support Services
Plant Maintenance Head
Electric Shop Head
Welding Shop Head
Machine Shop Head
Plant Maintenance Head

4) Take-Home Vehicle Use Charge. Employees with take-home vehicles will share in the operating expenses through changes and/or increases in the Take Home Vehicle Use Charge. This fee is for the purpose of reimbursement for operational costs and deferred maintenance incurred as a result of use of the vehicle to and from the work site. This fee will be automatically deducted from the employee's payroll check as follows:

For those employees on a bi-weekly pay cycle, $48.08 per pay period will be deducted bi-weekly for the personal use of a take-home vehicle, where the employee is domiciled in Orleans parish or the one way driving distance from the employee's actual domicile to the Orleans parish boundary is less than 20 miles; and

For those employees on a bi-weekly pay cycle, $144.24 per pay period will be deducted bi-weekly for the personal use of a take-home vehicle, where the one way driving distance from the employee's actual domicile to the Orleans parish boundary is over 20 miles.

5) Taxable Fringe Benefit. Employees with assigned take-home vehicles may be subject to fringe benefit withholding as provided for under Internal Revenue Service rules and regulations

D. BOARD POOL VEHICLES

All S&WB vehicles not assigned to a primary operator for business usage or as a take-home vehicle shall be considered a pool vehicle and must be parked and garaged over-night in designated parking areas determined by the supervisor at one of the Board owned facilities:

This pool of vehicles will be available for assignment and use by all Board employees and shall be maintained by the designed department manager and/or location supervisor under the jurisdiction of the Board's Support Services Administrator in collaboration with the Board's "Vehicle Committee".

Pool vehicles with special tools and/or equipment, required to perform specialized work, will be reserved for use by employees of specific departments and such vehicles will only be assigned to employees within those departments.

Requests for assignment of pool vehicles will be made by the S&WB employee, with the approval of their departmental supervisor, according to the following criteria:

1) Vehicle is required to perform scheduled work and/or report to the jobsite with special tools or equipment that can only be carried by or is a permanent part of the vehicle needed to accomplish the work.

2) Vehicle is needed to attend a meeting or other Board related business away from their regularly assigned work area.

3) Employee and departmental supervisor responsible have satisfied all requirements of the normal chain of command in making their request and have obtained authorization from their responsible Department Head and the approval of their Division Administrator.

4) Pre-Operation and Post-Operation visual inspections must be performed by the vehicle operator and recorded into the written log of the assigned pool vehicle.

E. WITHDRAWAL OF PRIVILEGE TO OPERATE BOARD VEHICLE

The privilege of driving a S&WB vehicle may be withdrawn by the Executive Director for any reason, to include but not be limited to the following:

1) Abuse or misuse of the vehicle or failure to comply with the rules and procedures stipulated in this company policy.

2) A driving record that becomes deficient (i.e., more than 3 moving violations in a consecutive 3 yr. period; license revoked; etc.) during the course of employment.

3) Conviction or a guilty plea to driving a S&WB vehicle under the influence of alcohol or an illegal controlled substance. (Ref. Policy # 67 on Substance and Alcohol Abuse).

4) Any eligible driver who has had a long-term disability, upon recovery and return to work, must be cleared by Board medical before being assigned another S&WB vehicle.

5) Any employee who is transferred, promoted or change duties on the job is subject to review at the time the change takes place and must be reinstated by fulfilling the conditions set forth in this section. Any employee who fails to meet the criteria as set forth above is subject to being removed from the list of employees who are approved for assignment of a Board take home vehicle.

6) Anyone who repeatedly fails to respond to emergency or standby request when called within a 45-minute response time.

F. DRIVER RESPONSIBILITIES

All eligible drivers are responsible for driving their assigned Board vehicle in a safe and reliable manner. Employees must know and abide by all driving laws in all areas where they operate the company vehicle. Additionally, employees must maintain a valid driver's license for the State of Louisiana. If, for any reason, an employee's driver license is revoked, suspended, or restricted, it is mandatory that the employee notify his/ her Supervisor and Department Head immediately. However, if the employee fails to notify the aforementioned personnel the employee may be subject to a disciplinary action.

The Board will secure an annual driver's license check for all eligible drivers and random checks may be conducted. Where Board vehicles are used by more than one driver, the designated location supervisor who

assigns the vehicle must keep a daily log of each driver who operates the vehicle that includes the time frame used in case of accident or damage.

G. SAFETY GUIDELINES

It is mandatory that all occupants of a Board vehicle use seat belts at all times, without exception. It is the Board driver's responsibility to ensure that all occupants fasten their seatbelts prior to operating the vehicle. Any malfunctioning seat belt should be reported to the Automotive Maintenance Garage immediately so that it can be repaired and/or replaced as soon as possible. The Board reserves the right to revoke the driving privilege of any driver not complying with this policy.

In addition, all employees are expected to drive defensively at all times, to obey the traffic laws, and not to drive under the influence of drugs, alcohol, or prescription drugs that affect one's ability to react quickly or cause drowsiness.

If during the course of driving an operator begins to experience a physical and/ or mental feeling that affects his or her operation of the Board vehicle the driver should pull over to the side of the road as soon as it is safe to do so and call for assistance in lieu of attempting to continue driving the vehicle.

Operation of all types of communication equipment should never be conducted while driving and only when the vehicle is legally and safely parked to the side of the roadway in a manner that does not affect the moving flow of traffic.

H. TRAFFIC VIOLATIONS

Multiple speeding violations, accidents, and /or a reckless driving citation may exclude an employee from being covered by the company-provided insurance and may make him/ her ineligible to operate any S&WB owned vehicle.

Should an employee for any reason, receive a summons for a traffic violation or a parking ticket, he or she must personally pay it as soon as possible. Under no circumstances are tickets for moving violations or illegal parking fines to be charged to the Board. All traffic moving violations should be reported to the employee's supervisor and to the Risk Manager as quickly as possible. All parking tickets involving S&WB vehicles should be reported immediately to the Administrative Services Department, Room 247, 625 St. Joseph St. as specified in Board Policy Memorandum No. 71.

A driver with three (3) moving violations while operating a Board vehicle or any combination of three accidents and/or moving violations within a consecutive three-year period may be prohibited from driving a S&WB vehicle.

I. AUTOMATIC TRAFFIC ENFORCEMENT
(Red light Cameras)

The City of New Orleans has instituted an Automated Traffic Enforcement System. This program, commonly referred to as "Red light Cameras", was instituted to promote safety and homogeneous traffic flow in the City of New Orleans. All drivers/operators of Board vehicles are subject to the traffic rules of the City of New Orleans as enforced by NOPD or the Automated Traffic Enforcement System. Tickets issued by the Automated Traffic Enforcement System are considered moving violations by the Board, subject to loss of driving privileges as stated in Section H.

Upon receipt of tickets from the City of New Orleans, or any other jurisdiction, for violations captured by the Automated Traffic Enforcement System the Board will notify the employee who is assigned to the vehicle. The employee is expected to pay the violation, or contest liability, before the "Administrative Hearing Date", which is printed on the Notice of Violation, or provide proof that he/she was not the driver. When the ticket has been paid he/she should then bring the proof of payment receipt to the Administrative Services Department Rm. 247, St Joseph Street. It is the employee's responsibility to provide proof of payment.

If the employee fails to pay the fine on or before the "Administrative Hearing Date" an additional penalty will be imposed. If the violation has not been paid on or before the Administrative Hearing Date, the Board will pay the amount owed. The employee must reimburse the Board, within ten (10) days of the Administrative Hearing Date, the amount paid. However, if the employee fails to timely pay the amount owed and the Board pays the violation the employee shall be subject to disciplinary action. In addition to a disciplinary action, the employee must reimburse the Board, the amount of the ticket, including any penalties and late fees, an administrative fee of twenty percent (20%) will be deducted from his/her paycheck. This deduction will be considered reimbursement rather than a fine. All driver/operators, either express or implied, agree to this deduction by virtue of use of the SWB vehicle.

J. VEHICLE MAINTENANCE

Every driver of a S&WB vehicle is expected to maintain his or her assigned vehicle in a safe operating condition. Maintenance schedules maintained by the Board's Automotive Maintenance facilities must be adhered to and documentation on the prescribed service work shall be

maintained as completed. Particular attention should be paid to performing the preventative maintenance requirements necessary to keep a vehicle's warranty in effect, i.e. maintaining liquid levels of oil, water and transmission fluid, etc. No driver should ever leave a S&WB vehicle at a Board service facility without specific instruction as to what work needs to be done. Employees who are assigned a Board take home vehicle are responsible for washing, and cleaning, as needed to promote a positive public image.

K. PARKING/STORAGE

Employees who use Board vehicles are responsible for ensuring all necessary precautions are taken to prevent damage and theft at all times. Whenever and wherever a S&WB vehicle is parked, employees should take the following precautions:

1) Roll up all windows.

2) Lock all doors.

3) Do not leave merchandise and equipment in open view inside a vehicle, which may tempt break-in. Lock all valuable items inside the trunk when the vehicle is left unattended.

Take reasonable precautions to safeguard the vehicle and its contents. For instance, when possible, select an off-street, lighted area (park in a legal parking space in the direction of traffic flow close to a business or hotel entrance where normal police surveillance or security protection exists, if nearby). All employees must follow Policy Memo No. 71 concerning parking citations.

II. SELECTION AND ASSIGNMENT OF BOARD VEHICLES

A. VEHICLE ASSIGNMENT

Before a S&WB vehicle is assigned to an employee, it is the Board's policy to first determine if there is an unassigned vehicle currently available with the S&WB's vehicle fleet. If an appropriate vehicle is available, it will be assigned to the employee.

B. VEHICLE SELECTION

Board standards for vehicle size; make; model; equipment, and/ or replacement cycle are reviewed annually by the Support Services Administrator.

No optional equipment may be installed without the prior approval of the S & W B Fleet Manager and the authorization of the Support Services Administrator.

C VEHICLE REPLACEMENT /EXCHANGE

A vehicle turn-in must be conducted at the time of an employee's departure from the Board or when an employee changes classification or departments within the Board. A condition report on the vehicle must be carefully prepared by the employee and verified by his immediate supervisor at that time. This report must be completed in the presence of the employee's immediate supervisor. Upon completion of the report, both the employee, to whom the vehicle was assigned, and his/her immediate supervisor must sign off on the form and submit one copy of it to the Automotive & Stores Superintendent and one copy to their Department Head.

Prior to turning in a Board vehicle, the driver must have the vehicle's interior and exterior washed and cleaned and ashtrays and trunks must be emptied.

When a replacement Board vehicle is picked up, the Employee assigned the vehicle should conduct a "walk around" inspection to insure the vehicle is not damaged and all equipment is operational and fill out a condition report which he must sign and forward to the Equipment Maintenance information System (EMIS) Supervisor and their Department Head as notification of the date the vehicle was picked up. This report should contain all vehicle identification data such as make and model, vehicle identification number (VIN), and mileage on the odometer at the time of pickup, as well as the name and group number to whom it will be assigned.

D. S&WB VEHICLE ODOMETERS

S&WB vehicle odometers shall be maintained in accordance with the following federal odometer laws and regulations:

1) Change of mileage indicated on the odometer is prohibited. No person shall disconnect, reset, or alter, or cause to be disconnected, reset, or altered, the odometer of any motor vehicle with intent to change the number of miles indicated thereon.

2) Operation of a motor vehicle with knowledge of disconnected or non-functional odometer is prohibited.

3) No person shall, with intent to defraud, operate a motor vehicle on any street or highway knowing that the odometer of such vehicle is disconnected or non-functional.

4) Criminal penalties: Any person who knowingly and willfully commits any of the two items listed above is liable to be fined not more than $50,000 or imprisoned not more than three years, or both.

Any employee who knowingly violates the federal laws specified in items 1 and/or 2 above will be immediately terminated and the Board may pursue available civil remedies.

III. VEHICLE OPERATING GUIDELINES

A. VEHICLE OPERATING EXPENSES.

The Board pays for all costs to operate a Board vehicle except for the employee's transportation cost to and from work and the washing, cleaning and waxing of a Board vehicle which are the driver's responsibility.

B. TIRE CONSERVATION

Tires are a costly operating expense. An employee must comply with the following to reduce operating costs of the Board vehicle by:

1) Maintain the manufacturer's recommended tire pressure.

2) Check tire pressure at least once a week, including the spare.

3) Carefully inspect tires for uneven wear, cuts, fabric breaks and abrasions.

Proper tire inflation is a do-it-yourself job that requires only a few minutes of work each week that will minimize expenses by extending tire life and enhancing the safe operation of the vehicle.

The repair of flat tires resulting from the operation of Board vehicle is the Board's responsibility. The employee should stop the vehicle as soon as they realize they have a flat tire and not attempt to ride on the flat tire, which could ruin both the tire and the rim. The employee should then call

the Automotive Garage, during regular work hours or the On-Call Mechanic after hours, to remove, repair and reinstall the tire.

The determination of Driver abuse is a function of the Automotive Maintenance Shop and shall be dealt with through the Board's disciplinary policies and procedures where applicable.

C. FUEL CONSERVATION

Drivers are not to exceed the posted speed limit while operating a Board owned vehicle.

A vehicle's engine is not to be left running when the vehicle is not occupied by the driver.

D. ALTERNATE TRANSPORTATION

An employee can be reimbursed for use of a personal vehicle on Board business by completing a S&WB expense report (showing business miles driven which does not include commuting mileage to work and home), reference Section III and Policy Memorandum 46.

E.. USE OF VOICE/ DATA TRANSMISSION DEVICES

For safety reasons, it is mandatory that all drivers pull to the side of the road before attempting to receive or send any voice or data transmissions. The driver should pull off the side of the road, completely out of the flow of traffic, as soon as it is safe to do so.

F. TRAILER TOWING

No Board vehicle should be fitted with a trailer hitch to pull a trailer or boat without prior authorization from the Support Services Director. In addition, a Board vehicle should not be used to push another vehicle.

G. BUMPER STICKERS, DECALS, ETC.

Political Activity is prohibited. No bumper or window stickers, i.e., political endorsements, slogans, etc. should be affixed to a Board vehicle. (includes tinted glass and other decals that reduce light or vision - See Policy Memorandum # 51).

IV. ACCIDENT PROCEDURE

All accidents involving a S&WB vehicle must be immediately reported to the Board's Risk Manager and to the driver's immediate Supervisor. The driver involved in the accident must fully complete the S&WB Accident Investigation Form (within 24 hrs. of the accident) and submit this form to the Board's Risk Manager (See instructions set forth in S&WB Board Policy Memorandum's 11, 34, and 44).

V. INSURANCE, LICENSING, & REGISTRATION

A. BOARD INSURANCE

Board owned vehicles are insured through the Board's Vehicle Fleet insurance policies. The name of the company covering your vehicle along with appropriate information on the vehicle's insurance coverage will be supplied to you at the time a Board vehicle is assigned. If you do not receive this information at the time your vehicle is assigned to you, please contact the S&WB Fleet Manager and EMIS Supervisor immediately.

Insurance cards and packets are issued once a year, and these are to be kept in the vehicle at all times. Failure to do so will result in a fine in most states.

Terminations, new hires, and driver change of vehicles should be reported by the department managers to the S&WB Fleet Manager and EMIS Supervisor as soon as they take place in order to keep the Board's driver information and fleet vehicle records current and accurate.

The Board's Vehicle Fleet insurance policies do not provide individual liability coverage for vehicles owned by S&WB employees. Liability protection is afforded to the Board only.

B. LICENSING/ REGISTRATION/ RENEWALS

All licensing, registration and renewals of Board vehicles will be administered by the S&WB Fleet Manager. Vehicle registration, insurance cards, and accident report envelopes and forms must be kept current and in the glove compartment of the vehicle. The proper information must be typed on the insurance card. As an assigned driver of the vehicle, it is the employee's responsibility to maintain these items in the vehicle at all times.

The S&WB Fleet Manager will authorize payment for all vehicle renewal notices from the State Motor Vehicle Department and distribute tags to the

vehicles as required. The Board will pay the cost of license and registration fee where applicable.

VI. S&WB POLICIES

The following Sewerage and Water Board Policies have been referenced in this policy and remain in effect:

A. Policy Memorandum No. 11, "New Worker's Compensation Procedure" as revised November 11, 1991.

B. Policy Memorandum No. 30, "Traffic Violations" dated June 13, 1980.

C. Policy Memorandum No. 34, "Vehicular Accident Procedure: as revised December 1, 1994.

D. Policy Memorandum No. 44, "Reporting of Accidents To The Police" dated October 1, 1981

E. Policy memorandum No. 51, "Bumper Stickers on S&WB Vehicles" and "Unauthorized Passengers in S&WB Vehicles" dated May 27, 1983.

F. Policy Memorandum No. 67, "Substance and Alcohol Abuse Policy" as revised January 31, 2014.

G. Policy Memorandum No. 71, "Parking Citations" as revised January 14, 2004.

H. Policy Memorandum No. 97, "Communication Policy" as revised April 2, 2014.

Sewerage & Water Board of New Orleans

Audit Committee Charter

2015

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Charter Purpose

1. Developing a charter is key to audit committee effectiveness. This audit committee charter was developed as recommended by the National Association of Corporate Directors blue ribbon commission on audit committees. The commission's report states that, "…to oversee financial reporting, risk management (including controls), and the audit function, the audit committee must have a charter. The audit committee should develop and maintain a charter, and assess the committee's performance against this charter periodically." Therefore, the Sewerage & Water Board has developed this audit committee charter as a best practice in corporate governance.

Committee Role

2. The committee's role is to act on behalf of the Board and oversee all material aspects of the company's reporting, control, and audit functions, except those specifically related to the responsibilities of another standing committee of the Board. The audit committee's role includes a particular focus on the qualitative aspects of financial reporting and on company processes for the management of business/financial risk and for compliance with significant applicable legal, ethical, and regulatory requirements as they relate to such business and financial risks.

3. The role also includes coordination with other Board committees and maintenance of strong positive working relationships with management, external and internal auditors, counsel, and other committee advisors.

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Committee Membership

4. The Committee shall consist of at least three independent Board members. Committee members shall have (1) a working knowledge of the water industry; (2) a firm understanding of Sewerage & Water Board's financial statements, including the balance sheet, income statement, statement of cash flow, and key performance indicators; and (3) a sound grasp of key business and financial risks and related controls and control processes. The committee shall have access to its own counsel and other advisors at the committee's sole discretion.

5. One member, preferably the chairperson, should be literate in business and financial reporting and control, including knowledge of the accounting regulatory requirements, and should have past employment experience in finance or accounting or other comparable experience or background. Committee membership should be considerate of corporate values for diversity. Committee

appointments and the committee chairperson shall be approved annually by the full Board upon recommendation of the President.

Committee Operating Principles

The committee shall fulfill its responsibilities within the context of the following overriding principles:

6. **Communications** – The chairperson and others on the committee shall, to the extent appropriate, have contact throughout the year with senior management, other board members, etc., as applicable, to strengthen the committee's knowledge of relevant current and prospective business issues.

7. **Committee Education/Orientation** – The committee, with management, shall develop and participate in a process for review of important financial and reporting topics that present potential significant risk to the company. Additionally, individual committee members are encouraged to participate in relevant and appropriate self-study education to assure understanding of the business environment in which the company operates.

8. **Annual Plan** – The committee, with input from management and other key committee advisors, shall develop an annual plan responsive to the "primary committee responsibilities" detailed herein. The annual plan shall be reviewed and approved by the full Board.

9. **Meeting Agenda** – Committee meeting agendas shall be the responsibility of the committee chairperson, with input from committee members, management, internal audit, and other committee advisors as appropriate.

10. **Committee Expectations and Information Needs** – The committee shall communicate committee expectations and the nature, timing, and extent of committee information needs to management, internal audit, and external parties, including external auditors. Written materials, including audit reports, financial reports, and other appropriate management documentation, shall be received from management, auditors, and others at least three working days in advance of meeting dates.

11. **External Resources** – The committee shall be authorized to access internal and external resources, including authority to engage and funding for independent counsel and public accounting firms and other advisors, as the committee requires, to carry out its responsibilities.

12. **Committee Meeting Attendees** – The committee shall request members of management, counsel, internal audit, and external auditors, as applicable, to participate in committee meetings, as necessary, to carry out the committee's

responsibilities. Periodically, and at least annually, the committee shall meet in private session with only the committee members. It shall be understood that either internal or external auditors, or counsel, may, at any time, request a meeting with the audit committee or committee chairperson with or without management attendance. In any case, the committee shall consider meeting without management attendance separately with internal and external auditors, at least annually.

13. **Reporting to the Full Board** – The committee, through the committee chairperson, shall report periodically, as deemed necessary, but at least semi-annually, to the full Board. In addition, summarized minutes from the committee meetings, separately identifying monitoring activities from approvals, shall be available to each board member prior to the subsequent Board Meeting.

14. **Committee Self Assessment** – The committee shall review, discuss, and assess its own performance as well as the committee role and responsibilities, seeking input from senior management, the full board, and others. Changes in role and/or responsibilities, if any, shall be recommended to the full board for approval.

Meeting Frequency

15. The committee shall meet at least quarterly. Additional meetings shall be scheduled as considered necessary by the committee or chairperson.

Committee's Relationship with External and Internal Auditors

16. The external auditors, in their capacity as independent public accountants, shall report to the board of directors and the audit committee as representatives of the citizens.

17. The committee shall be responsible for pre-approving all audit and non-audit services, including the scope of such work performed by the external auditors.

18. As the external auditors review financial reports, they will be reporting to the audit committee. They shall report all relevant issues, including any new information, to the committee responsive to agreed-upon committee expectations. They shall immediately notify the committee of any material weakness in internal controls or potential fraud identified during an audit engagement. In executing its oversight role, the board of committee should review the methods, audit techniques, and the basis for any findings of external auditors.

19. The committee shall annually review the performance (effectiveness, objectivity, and independence) of the external and internal auditors. The external auditors shall conduct their audit engagement under the independence rules of the AICPA.

The committee shall ensure receipt of a formal written statement from the external auditors consistent with standards set by the Independence Standards Board. Additionally, the committee shall discuss with the auditor relationships or services that may affect auditor objectivity or independence. If the committee is not satisfied with the auditor's assurances of independence, it shall take or recommend to the full board appropriate action to ensure the independence of the external auditor.

20. If the committee decides to retain an audit firm following review, the committee shall, at a minimum, rotate the lead audit partner and audit review partner every five years.

21. The committee shall review annually the external auditor's policies and certifications regarding workpaper retention and destruction.

22. If either the internal or the external auditors identify significant issues relative to the overall board responsibility that have been communicated to management but, in their judgment, have not been adequately addressed, they should communicate these issues to the committee chairperson.

23. Changes in the director of internal audit shall be subject to committee approval.

Primary Committee Responsibilities

The committee should review and assess:

24. ***Risk Management*** – The Company's business risk management process, including the adequacy of the company's overall control environment and controls in selected areas representing significant financial and business risk.

25. ***Annual Reports and Other Major Regulatory Filings*** – All major financial reports in advance of filing or distribution.

26. ***Internal Controls and Regulatory Compliance*** – Management's assessment of the system of internal controls for detecting accounting and reporting financial errors, fraud and defalcations, legal violations, and noncompliance with the corporate code of conduct.

27. ***Internal Audit Responsibilities*** – The annual audit plan and the process used to develop the plan. Status of activities, significant findings, recommendations, and management's response.

28. ***Regulatory Examinations*** – The results of examinations by regulatory authorities in terms of important findings, recommendations, and management's response.

29. ***External Audit Responsibilities*** – Auditor independence and the overall scope and focus of the annual/interim audit, including the scope and level of involvement with unaudited interim-period information.

30. ***Financial Reporting and Controls*** – Key financial statement issues and risks, their impact or potential effect on reported financial information, the processes used by management to address such matters, related auditor views, and the basis for audit conclusions. Important conclusions on interim and/or year-end audit work in advance of the public release of financials.

31. ***Auditor Recommendations*** – Important internal and external auditor recommendations on financial reporting, controls, other matters, and management's response. The views of management and auditors on the overall quality of annual and interim financial reporting.

32. ***Complaint Procedures*** – Procedures established for the receipt, retention, and treatment of complaints received regarding accounting, auditing matters, and internal controls.

33. ***Officer Questionnaire Responses*** – Review the Code of Ethics Questionnaire responses and Internal Control Questionnaire responses from Company officers.

The committee should review, assess, and approve:

34. The Code of ethical conduct.

35. The internal audit charter.

36. Changes in important accounting principles and the application thereof in both interim and annual financial reports.

37. Significant conflicts of interests and related-party transactions.

38. External auditor performance and changes in external audit firm (subject to ratification by the full board.

39. Internal auditor performance and changes in internal audit leadership and/or key financial management.

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Audit Committee Charter 2015

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Chair, Audit Committee Date

_____ _____

Vice Chair Date

_____ _____

Executive Director Date

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Sewerage & Water Board of New Orleans - CAM Replacement Project

Summary of Risk Assessment - October 2015

Ref	Risk	Prob.	Impact	Action	Oct 2015	Sept 2015	Aug 2015	July 2015	June 2015	May 2015	April 2015	Mar 2015	Jan 2015	Dec 2014
2	Missed Deliverable Dates	Certain	Significant	Monitor	Y	Y	Y	Y	Y	Y	Y	Y	Y	R
The Board will continue to monitor the delivery of scheduled deliverables. Several deliverables have been delayed; however the Board's PM does not believe that those outstanding deliverables should cause a delay. However, Cogsdale management is currently reviewing the schedule and may provide an updated schedule soon. Their new schedule may propose moving the go-live timing out approximately 60 -90 days (from the end of April to the June / July period.)														
12	Training & Configuration	Likely	Significant	Action recommended	Y	R	R	Y	Y	Y	Y	Y		
The Board should budget for contract staff (Cogsdale or the Board's in-house IT contract staff) to make all configuration changes, since it has been determined that it is very unlikely that SWB staff will make software configuration changes in the future.														
16	School Board Billing	Likely	Significant		Y		G	Y	Y	Y				
The Board is still preparing communications for the School Board explaining its authorization for School Board billing as well as the billing procedures themselves. There are a number of billing issues that could create a substantial drain on Customer Service resources if they are not resolved before go-live. At least one full billing and collection cycle for School Board Billing must be completed prior to go-live with Cogsdale.														
17	General PC Training	Likely	Significant	Action Recommended	Y	Y	Y	Y	Y	Y				
The Board's project manager and the heads of Revenue and Information Systems are in the process of making arrangements for the training-who should be trained, what computer skills they will need for their job, etc. However, plans are still incomplete.														
21	The Perfect Storm- activity overload	Likely	Significant	Action Recommended	Y	Y	Y	Y						
Cogsdale has indicated that they will rework the schedule to avoid projected activity overload for the Christmas holiday season. In order to avoid the project team's needing to perform multiple project activities simultaneously, a substantial separation of activities will need to occur. The separation of activities may also lengthen the project schedule.														

Sewerage & Water Board of New Orleans - CAM Replacement Project

Summary of Risk Assessment - October 2015

Ref	Risk	Prob.	Impact	Action	Oct 2015	Sept 2015	Aug 2015	July 2015	June 2015	May 2015	April 2015	Mar 2015	Jan 2015	Dec 2014
22	Steering Committee	Likely	Significant	Action Recommended	Y	R	Y							
The Steering Committee weekly meetings will be moved to Tuesday mornings. In addition, the Project Sponsor has agreed to attend one meeting a month, on Friday mornings.														
23	GIS Interface	Likely	Significant	Action recommended	Y	Y	Y							
The SWB and City must review and approve the GIS Interface Specification document submitted by Cogsdale. The preliminary review of the document is promising.														
24	Conversion Issues	Likely	Significant	Action Recommended	R	R	Y							
Conversion activity is slowing down due to increasing conversion turnaround time for larger data extracts. In addition the actual conversion load time is running in excess of 40 hours, which will be unacceptable for a 3 day cutover plan. Conversion times should be monitored both with and without other concurrent mainframe processes to determine if there are ways to speed up the conversion runs.														
25	Bandwidth Issue	Likely	Significant	Monitor	R	R	Y							
Detailed descriptions of each connectivity problem are being studied to determine the various reasons for "bandwidth problems." There is some indication that some of the problems may also be related to software issues. The Board will continue to monitor and address each problem separately while also working to increase the bandwidth.														
26	SWBNO Reorganization	Certain	Minor	Action recommended	Y	Y	Y							
The Steering Committee should continue to monitor the Board's progress in its re-organization. As soon as the reorganization is finalized and made public, the PMO and Project Leads should meet to assess any impact on the project, including all staffing / training requirements, and then develop a plan to accommodate any required changes.														

Sewerage & Water Board of New Orleans - CAM Replacement Project

Summary of Risk Assessment - October 2015

Ref	Risk	Prob.	Impact	Action	Oct 2015	Sept 2015	Aug 2015	July 2015	June 2015	May 2015	April 2015	Mar 2015	Jan 2015	Dec 2014
27	Loss of Cogsdale Project Manager	Certain	Significant	Action recommended	Y	R								
The new Cogsdale Project Manager has assumed his onsite duties. In addition, the Cogsdale Project Manager Director has been engaged to supplement the project management transition. The Steering Committee will continue to monitor this change, but it appears that the two of them are working diligently to re-evaluation remaining work and continue the progress of the project.														
28	Sanitation OIG Audit	Possible	Significant	Monitor	R									
The Office of Inspector General is revisiting the sanitation audit done previously. Every effort will be made to assign all requests to the current CAM programmer; however, if the OIG audit requires the time and expertise of programming staff currently assigned to the Cogsdale project, there will certainly be negative consequences on the current conversion activities which will probably delay the go-live date.														
29	End User Training	Likely	Major	Action recommended	R									
Cogsdale should assign someone full time to the development of SWB specific training materials so that these training materials can be tested for use during the subject matter expert training sessions, and tweaked as needed. Additionally, the SWB and Cogsdale need to jointly develop and agree on the proper approach and materials needed for for competency testing and certification.														

Nora Freeman

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Water Audit

FY 2008 – FY 2014

Technical Memorandum

Sewerage and Water Board of New Orleans

September 4, 2015

Water Audit
Sewerage and Water Board of New Orleans
Fiscal Years 2008 – 2014

Technical Memorandum

To: Bob Miller, Deputy Director SWBNO

From: Nora Freeman, Freeman LLC

Date: September 4, 2015

Executive Summary

A water audit for the Sewerage and Water Board of New Orleans (SWBNO) was performed by the consultant using the standard methodology outlined in the 2009 American Water Works Association's (AWWA) M36 Manual: Water Audits and Loss Control. This methodology was co-developed by AWWA and the International Water Association (IWA) and includes clear steps to conduct the audit along with standard definitions.

The objectives of the water audit were to prepare the 2014 Infrastructure Leak Index (ILI) without additional data development and field work, document source data, trend water audit key indicators over the last seven years (2008 – 2014), compare the SWBNO ILI results to similar utilities in size, age and infrastructure and to present recommendations for a reasonable ILI target and associated actions for improvement.

Based on the data inputs provided, SWBNO's ILI and Non-Revenue Water (NRW) annual performance for the past seven years is as follows:

FISCAL YEAR	ILI	NRW % by Cost
2008	46.0	22.9%
2009	46.6	24.3%
2010	41.9	20.1%
2011	44.7	16.2%
2012	43.2	16.5%
2013	36.8	17.1%
2014	37.1	16.5%

SWBNO's 2014 ILI was the second lowest (37.1) of the seven years of calculations. The 2013 ILI was only slightly lower with a result of 36.8. This result is driven by two factors: 1) Slight reduction in Real Losses in FY2013 and FY2014 and 2) the Unavoidable Annual Real Loss (UARL) in FY2013 and FY2014 is the highest it has been over the seven years of water audit calculations. The UARL increase in

FY2013 and FY2014 was driven by both the increase in miles of main and number of customers in both these years. UARL is a reference value representing the technical low limit of leakage that could be achieved if all of today's best technology could be successfully applied. It is a theoretical value formulated based on factors provided by the AWWA methodology.

NRW is defined as the difference between System Input Volume and Billed Authorized Consumption. Said another way, NRW is all Unbilled Water, plus Real Losses plus Apparent Losses.

SWBNO's ILI and NRW annual performance continues to indicate an opportunity for significant improvement. One improvement that can be more directly implemented is the development of methodology to account for its Real Losses and Apparent Losses. In this current analysis, the majority of losses in both the Real Losses and Apparent Losses categories were input at zero since SWNBO does not currently have estimates they feel are accurate. SWBNO NRW will certainly decrease as accurate estimates can be obtained.

In order for SWBNO to improve water accounting, staff should consider indentifying a single point of accountability for updating the water audit and ILI performance. This accountability could be with a single manager or a team of managers. It is recommended that the accountable individual(s) focus on making incremental year-over-year improvements to the inputs of the water audit data in two categories: Real Losses and Apparent Losses. Real Losses include water loss that could be recoverable within the distribution system such as assumed leaks on active water mains or abandoned service lines, any type of errors or overflows that are captured through the SCADA system and leaks that occur on private property (after the meter).

Improvements to water audit data inputs should also be made to the Apparent Losses category of the audit. The Apparent Losses are "paper" losses of water that can occur in the billing system. For instance, "paper" losses can occur when accounts are not entered into the billing system correctly or when there are conversion errors when data is transferred into the billing system either from meter reading or when new services are set up. Apparent Losses also include water losses due to broken or malfunctioning meters, adjustments made to customer accounts due to the customer's water leak and any unauthorized use of water (e.g., theft).

Furthermore, SWBNO should examine and ensure the accuracy of the Water System Input Volume number. This figure relies almost exclusively on the exactness of the SWBNO production master meters. The testing results and

routines for these production meters should be considered, and adjustments to the System Input Volume made accordingly.

SWBNO should also continue its efforts to improve the integrity of its distribution system. These two undertakings, working on improving water audit data inputs and improving the distribution system integrity performed in parallel, will bring consistent improvement in the ILI and NRW indicators.

Finally, it needs to be pointed out that SWBNO provides significant amounts of free water to local government institutions, according to state statutes. SWBNO should continue to evaluate whether changes in the number and types of institutions receiving free water is reasonable. The water industry as a whole as moved to greater accountability for all its water use, including water that is provided for public or charitable purposes. Many utilities in the country use an inter-fund transfer for payment of water and related services to other city or public agencies/departments.

SWBNO should also seek to lower the caps in the amount of free water provided to the revenue-generating public agencies. These caps are almost 30 years old and water usage trends nationally have declined dramatically in the last 10 years.

With regard to a recommended ILI target for SWBNO, the focus again should be on achieving year-over-year improvements to the ILI. Based on the ILI results in 2008 - 2014, an annual goal of reducing the ILI by 4 appears to be a reasonable target. Further, the annual goal reductions should be made based off the even year ILI average of 42.4, as using a multi-year average reduces the variability in year-to-year results. This translates into a recommended 5 year ILI target goal of reaching 22.4 by 2020. At that time, hopefully the distribution system integrity and economic conditions are both greatly improved and an ILI target consistent with industry ranges can be planned.

SWBNO is in a unique operating and economic environment due to the destruction and damage caused ten years ago by the 2005 Hurricane Katrina. Its circumstances and performance is not readily comparable to any other utility in the country nor was its exceptional situation considered by the Water Loss Control Committee when they were drafting the target range recommendations for the M36 manual (that can be found later in this report). Thus, ILI comparisons to other utilities will be of minimal value now and likely into the near future as well. Available ILI data is presented later in this report, however, for reference.

Introduction

The consultant performed a water audit using data available from SWBNO and the standard methodology outlined in the 2009 AWWA M36 Manual: Water Audits and Loss Control. This methodology was co-developed by AWWA and the IWA and includes clear steps to conduct the audit along with standard definitions.

The scope of work for the SWBNO water audit included:

- Customizing the basic AWWA water audit spreadsheet software application for SWBNO
- Gathering the data needed to populate the water audit model without additional field work
- Documenting source data and identifying estimates used for the calculations
- Reviewing SWBNO's Water Contributed for Public Purposes
- Computing SWBNO's ILI for the past five years
- Obtaining ILI data from other utilities using the AWWA and IWA standards
- Preparing a final water audit report along with the electronic version of the water audit model.
-

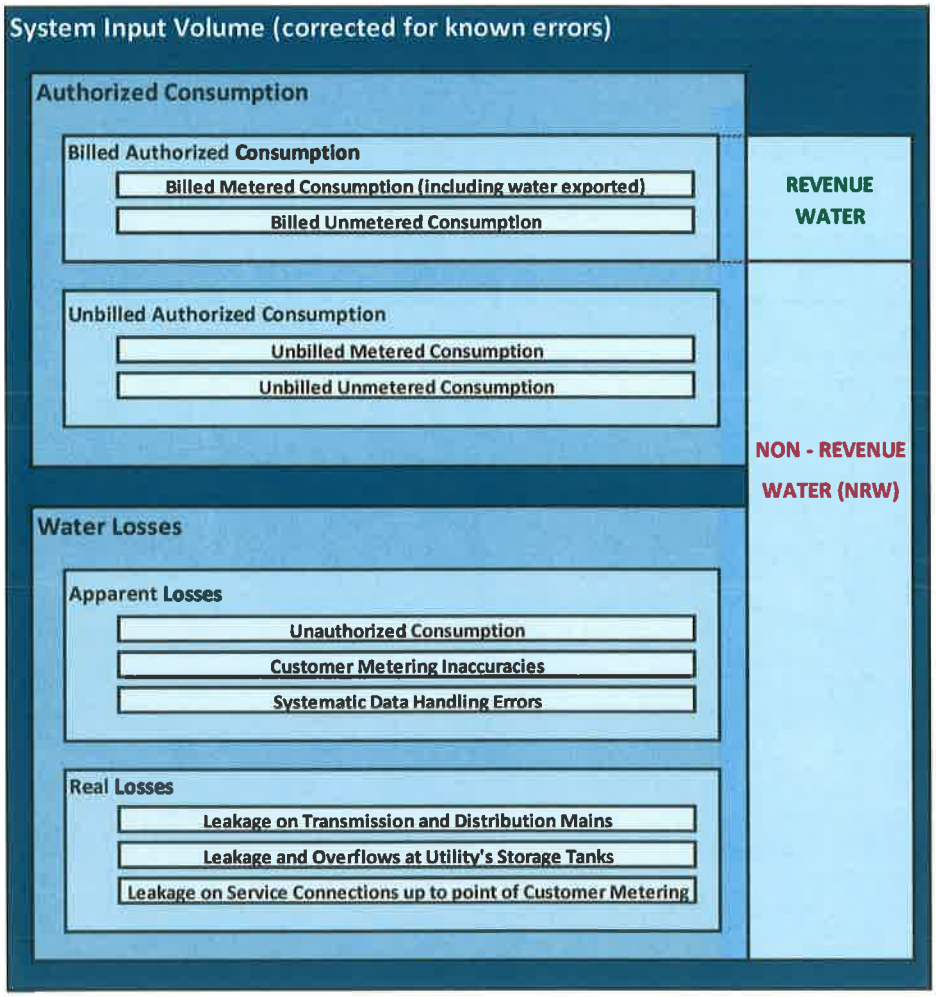
To accompany the new M36 Manual: Water Audits and Loss Control, free water audit software, in Excel format, is available on AWWA's website. The software can be found by copying or typing the below into your web browser: http://www.awwa.org/home/awwa-news-details/articleid/2641/awwa-free-water-audit-software-version-5-0-now-available.aspx

This software is an elementary start for those utilities that want to complete a water audit for a single year. Since SWBNO desired multiple years of data for this water audit, a more detailed water audit Excel model and workbook was built exclusively for SWBNO. This Detailed Water Audit workbook is based upon the work of the Philadelphia Water Department (PWD) and George Kunkel, a national leader in water auditing, and the Louisville Water Company (LWC), which has been piloting annual water audits using the new methodology, in beta form beginning in 2005. This customized Excel model will also be maximally beneficial for SWBNO's future water auditing work.

It should be pointed out that 2010 was first time SWBNO has conducted a water audit using the new AWWA/IWA methodology. This methodology is currently only being used by the most progressive and/or most water-challenged utilities around the country. SWBNO staff are to be commended for their forward-thinking in taking this first step in improved water accounting and setting a baseline upon which future improvements can be quantitatively measured.

AWWA Water Audit Methodology: A Review

The AWWA M36 Manual: Water Audits and Loss Control that was published in 2009 provides standard definitions to calculate water loss for the first time in US water industry's history. These standard definitions and calculations assist with target-setting for the utility along with benchmarking across utilities (although most utilities have yet to implement the model and the few utilities that are using it are often reluctant to share their data). The AWWA methodology is based on the IWA's own methodology and is summarized in the following diagram:



Definitions for the components of the water audit can be found in Appendix A.

SWBNO Water Audit Results

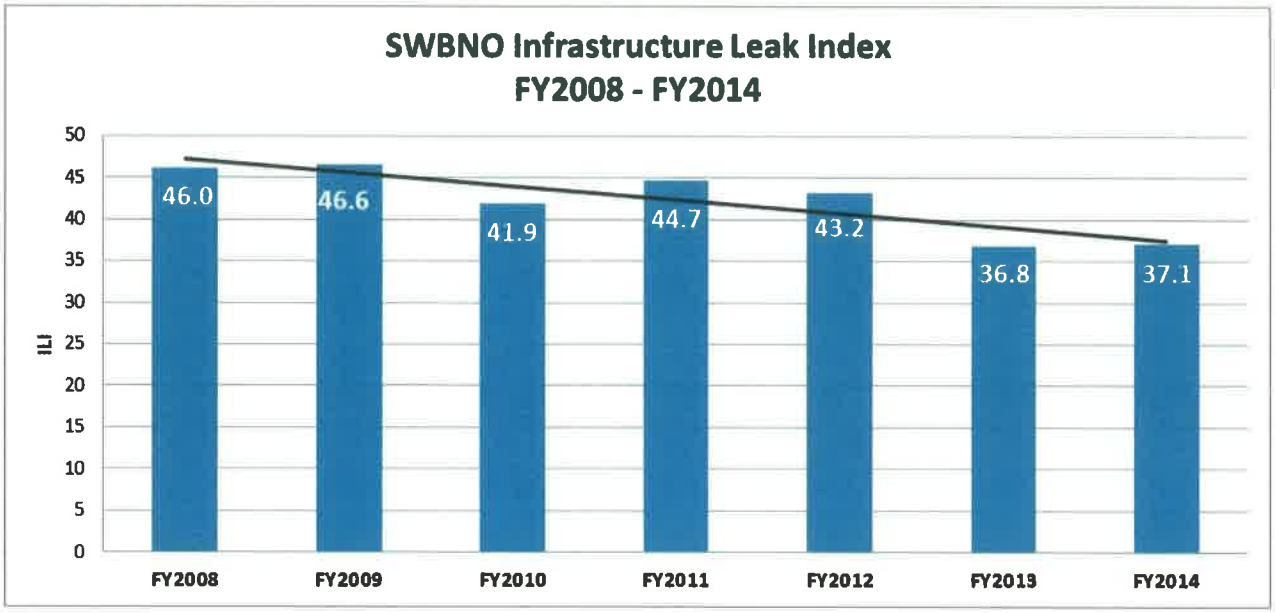
The Water Audit Model and calculation spreadsheets that comprise the SWBNO Detailed Water Audit for FY2008 – FY2014 can be found in Appendix B. The results of the water audit performance indicators for fiscal years 2008 -2014 are summarized below.

PERFORMANCE INDICATOR	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	FY2014
Financial Indicators							
Non-Revenue Water as percent by Volume	75.1%	75.2%	71.3%	73.5%	73.8%	71.1%	72.1%
Non-Revenue Water as percent by Cost	22.9%	24.3%	20.1%	16.2%	16.5%	17.1%	16.5%
Water Resources Indicators							
Inefficiency of use of Water as a Resource	58.3%	59.7%	53.9%	57.0%	57.6%	54.6%	55.4%
Operational Efficiency Indicators							
Apparent Losses as % of System Input Volume	0.75%	0.74%	0.86%	0.80%	0.79%	0.87%	0.84%
Real Losses per Service Connection per Day	819.4	811.8	704.5	725.7	707.5	616.9	620.0
Real losses per Mile of Main per Day	46,931	49,695	48,565	56,731	53,730	43,074	43,752
Real Losses per Service Connection per Day per psi	13.2	13.1	11.4	11.7	11.4	9.9	10.0
Unavoidable Annual Real Losses (UARL)	1.83	1.91	1.84	1.93	1.99	2.11	2.13
Infrastructure Leakage Index (ILI)	46.0	46.6	41.9	44.7	43.2	36.8	37.1

The ILI is a key performance indicator in the water audit. SWBNO's lowest ILI performance was in FY2013. The FY2014 ILI performance was the second lowest of the seven year study period with a result of 37.1. The SWBNO ILI ranges from a low of 36.8 in FY2013 to a high of 46.6 in FY2009.

The low FY2013 and FY2014 ILI result is driven by two factors: 1) Slight reduction in Real Losses in FY2013 and FY2014 and 2) the Unavoidable Annual Real Loss (UARL) in FY2013 and FY2014 is the highest it has been over the seven years of water audit calculations. The UARL increase in FY2013 and FY2014 was driven by both the increase in miles of main and number of customers in both these years. UARL is a reference value representing the technical low limit of leakage that could be achieved if all of today's best technology could be successfully applied. It is a theoretical value formulated based on factors provided by the AWWA methodology.

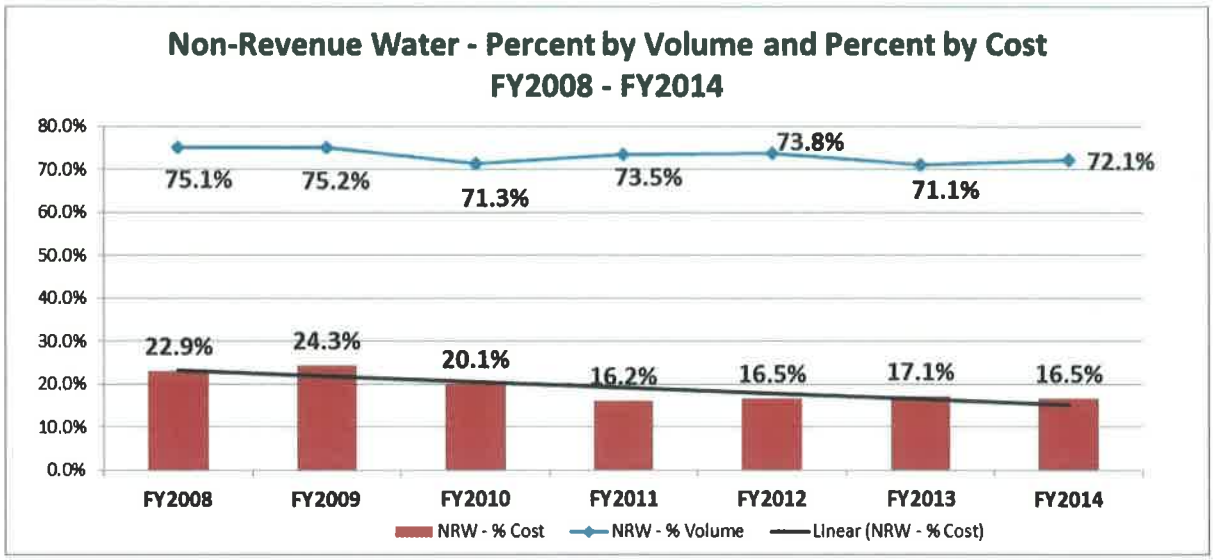
Future improvements in estimating Real and Apparent Losses within the water audit will directly impact the ILI indicator in a positive direction. The following chart illustrates SWBNO's ILI performance from FY2008 - FY2014.



The ILI is calculated by taking the Real Losses in the distribution system and dividing by the UARL. Again, the UARL is a reference value representing the technical low limit of leakage that could be achieved if all of today's best technology could be successfully applied. It is a theoretical value formulated based on factors provided by the AWWA methodology

SWBNO's ILI performance greatly exceeds any other large water utility in the United States currently performing water auditing, as demonstrated in the next section of the report. SWBNO staff is to be commended, however, for establishing their ILI baseline as part of this study and should seize the opportunity to make significant improvements to its water accounting and auditing in the coming years.

Non-Revenue Water (NRW) is calculated both as a percent of water volume and a percent of cost. Along with the ILI, both are key performance indicators to track as a part of the water audit. NRW as a percent of cost ranged from a low of 16.2% in FY2011 to high of 24.3% in FY2009. NRW as a percent of cost has remained relatively stable for the last four years ranging between 16-17%. NRW as a percent of volume ranged from a low of 71.1% in FY2013 to a high of 75.2% in FY2009. NRW as a percent of volume has remained fairly consistent over the seven year study period. The following chart illustrates NRW as a percent of cost and volume for 2008-2014.



It should be noted that SWBNO's NRW by volume (70+%) is extremely high for municipal water utilities. This is due in part to the amount of free water that is contributed by SWBNO for public purposes. For comparative purposes, the Philadelphia Water Department (PWD) may be a good example to look at due to the fact that the utility has been conducting water audits for many years and it is of similar age, size, demographics and infrastructure to SWBNO. PWD's NRW by volume has ranged from a high of 36.3% to a low of 32.1% between the years 2000 and 2008.

ILI Comparisons

Research into ILI performance at other water utilities using AWWA's new methodology was performed as part of this analysis for SWBNO. This new water audit approach is not yet standard for many US water utilities and only a select few states, where water is a scarce resource, are moving to mandate water auditing. Utilities that have begun to use this approach are just starting to share their audit and ILI data.

Key Performance Indicator	# of utilities	Average	Range	SWBNO FY2014 Results
NRW - % by Volume	21	22.6%	6.8% - 45.5%	72.1%
NRW - % by Cost	21	10.0%	1.7% - 23.0%	16.5%
NRW - Total Annual Cost (million $)	21	5.81	0.04 - 42.97	48.14
Apparent Losses (gals/conn/day)	21	14.95	2.36 - 65.89	0.8%
Real Losses (gals/conn/day)	18	63.32	17.07 - 149.71	620
Real Losses (gals/mile of main/day)	3	1,821.15	645.42 - 3,496.21	43,752
Infrastructure Leak Index (ILI)	21	3.57	1.15 - 12.68	37.13

In 2011, twenty one water utilities provided their water audit data to members of the AWWA Water Loss Control Committee for review and careful validation of their data. This is the first validated ILI data set from individual North American water utilities, and this work has not been repeated since 2011. This data was presented at the 2011 AWWA Annual Conference and Exposition and at the 2011 AWWA Distribution System Symposium.

The key performance indicators for these twenty one utilities are shown below where average and a minimum and maximum range for each key performance indicator is presented.

As SWNBO is a large utility, the below table may be most helpful for comparison purposes as it outlines the differences in the water audit key performance indicators for large and small utilities (defined as less than and greater than 50,000 connections).

	# connections < 50,000			# connections > 50,000		
Key Performance Indicator	**# of utilities**	**Average**	**Range**	**# of utilities**	**Average**	**Range**
NRW - % by Volume	10	24.1%	12.2% - 45.5%	11	21.4%	6.8% - 39.6%
NRW - % by Cost	10	9.3%	3.1% - 17.5%	11	10.6%	1.7% - 23.0%
Apparent Losses (gals/conn/day)	7	10.38	2.36 - 20.64	11	19.11	6.45 - 65.89
Real Losses (gals/conn/day)	3	58.71	26.08 - 149.71	11	66.24	17.07 - 124.36
Real Losses (gals/mile of main/day)	10	1,821	645 - 3,496	0		
Infrastructure Leak Index (ILI)	10	3.51	1.24 - 12.68	11	3.62	1.15 - 9.89

The twenty one utilities that participated in this 2011 AWWA water audit data validation study include:

1. City of Asheboro (NC)
2. Austin Water Utility (TX)
3. City of Belmont (NC)
4. Birmingham Water Works Board (AL)
5. City of Calgary, Alberta (Canada)
6. Greater Cincinnati Water Works (OH)
7. Cobb County Water System (GA)
8. Dalton Utilities (GA)
9. DC Water and Sewer Authority (Washington DC)
10. Golden State Water Company, Clearlake (CA)
11. Golden State Water Company, Ojai (CA)
12. Halifax Regional Water Commission, Nova Scotia (Canada)
13. Louisville Water Company (KY)
14. Orange County Utilities Department (FL)
15. Philadelphia Water Department (PA)
16. Pennsylvania American Water, Pittsburgh (PA)
17. City of Rio Rancho (NM)
18. Washington County Service Authority (VA)
19. City of Wauwatosa Water Utility (WI)
20. City of Wilmington (DE)
21. Water and Wastewater Authority of Wilson County (TN)

For more specific utility ILI performance, below is 2012 ILI data provided by the American Water Works Association. Of the utilities in this list, DC Water and Sewer is probably most comparable to SWBNO given the age, urban demographic and complexity of its infrastructure.

Utility	2012 ILI
DC Water & Sewer Authority (Washington DC)	7.2
Greater Philadelphia (107 systems)	4.0
Birmingham Water Works	4.0
Pennsylvania American Water, Pittsburgh	3.3
Metro Water Services (Nashville)	3.3
Austin Water Utility	3.0
Louisville Water Company	2.4
Greater Cincinnati Water Works	2.4
Orange County (FL) Utilities Department (Orlando)	1.3
Cobb County Water System (Atlanta)	1.1

It needs to be pointed out that many utilities found in the table above have been conducting water audits for many years and over that time have developed sophisticated methods for estimating water losses across the audit. As SWBNO continues to refine its water audit methodology and develop confident estimates of water loss, their ILI will reduce.

Recommendations for ILI Target and Actions for Improvement

The AWWA M36 Manual recommends that ILI target-setting be an internal process for each utility and that the goal should be improvement to the ILI over time, not reaching some "ideal target" or mean ILI of comparable utilities. AWWA's Water Loss Control Committee and their M36 Manual recommends the following financial, operational and water resource considerations be evaluated by a utility when looking to set an ILI target:

Target ILI Range	Financial Considerations	Operational Considerations	Water Resource Considerations
<1.0	Two possibilities exist if the ILI is less than 1.0: 1) You are maintaining your leakage at low levels in a class with the top worldwide performers in leakage control or 2) A portion of your data may be flawed, causing your losses to be greatly understated. This is likely if you calculate a low ILI but do not employ extensive leakage control practices in your operations.		
1.0 – 3.0	Water resources are costly to develop or purchase; ability to increase revenues via water rates is greatly limited because of regulations or low ratepayer affordability.	Operating with system leakage above this level would require expansion of existing infrastructure and/or additional water resources to meet the demand.	Available resources are greatly limited and are very difficult and/or environmentally unsound to develop.
>3.0 – 5.0	Water resources can be developed or purchased at reasonable expense; periodic water rate increases can be feasibly imposed and are tolerated by the customer population.	Existing water supply infrastructure capability is sufficient to meet long-term demand as long as reasonable leakage management controls are in place.	Water resources are believed to be sufficient to meet long-term needs, but demand management interventions are included in the long-term planning.
>5.0-8.0	Cost to purchase or obtain/treat water is low, as are rates charged to customers.	Superior reliability, capacity and integrity of the water supply infrastructure make it relatively immune to supply shortages.	Water resources are plentiful, reliable, and easily extracted.
Greater than 8.0	Although operational and financial considerations may allow a long-term ILI greater than 8.0, such a level of leakage is not an effective use of water as a resource. Setting a target level greater than 8.0, other than as an incremental goal to a smaller long-term target, is discouraged.		

As previously noted, SWBNO is in a unique operating environment due to the destruction and damage caused by Hurricane Katrina in 2005. Its circumstances and performance is not readily comparable to any other utility in the country nor was its exceptional situation considered by the Water Loss Control Committee when they were drafting the above target range recommendations for the M36 manual. SWBNO needs to focus, therefore, not on reaching a certain target ILI range, but rather on the incremental year-over-year improvement to the ILI as part of its internal processes and annual goal-setting. Based on the ILI results in 2008 - 2014, an annual goal of reducing the ILI by 4 appears to be a reasonable target. Further, the annual goal reductions should be made based off the even year ILI average of 42.4, as using a multi-year average reduces the variability in year-to-year results. This translates into a recommended 5 year ILI target goal of reaching 22.4 by 2020. At that time, hopefully the distribution system integrity and economic conditions are both improved and a 5-10 year ILI target in the range of similar utilities can be planned.

The following suggestions are offered to SWBNO as ways to improve its ILI performance over time:

1. **Update the Water Audit Annually.** The water audit should be updated on an annual basis. A single manager or group of managers should be identified to take responsibility for SWBNO's water audit and the identified person(s) should be held accountable for the utility's water auditing progress. The responsible person(s) should select a cross-functional team consisting of in-house staff from distribution operations, treatment plant operations, billing and customer service, finance, information technology and engineering. Finance will be a key player on the team and it may be useful to consider having one of the accountable persons be named from the finance department. The water audit should receive the same rigorous attention as the annual financial audit and ideally the updating of the water audit should coincide with the financial audit. The water audit should become part of a long-term strategy to track changes in SWBNO operations management, customer demand and utility policy. The implementation of water auditing is growing in popularity all across the US and water audits are now part of state reporting requirements for California, Texas, North Georgia, New Mexico and the Delaware River Basin Commission (DRBC) which encompasses New York, Pennsylvania, Delaware and the Army Corps of Engineers.

2. **Add and Refine Estimates of Unbilled and Unmetered Water Loss in the Audit.** Potentially the most cost-effective and most impactful way to improve the ILI is to continue data collection to confidently estimate Authorized Water Consumption in the Unbilled and Unmetered category. Authorized Unbilled and Unmetered water is part of every water utility's water loss. Current SWBNO databases should be examined to identify low-cost data capture techniques and estimating for water lost during activities including:

   - all water main flushing, including after a main break repair, after a new main installation and to address and maintain distribution water quality
   - fire hydrant testing
   - finished water storage tank draining.

3. **Add and Refine Estimates of Apparent Losses.** Apparent Losses are "paper" losses and consist of customer water use that is not recorded due to metering error, billing error, leak adjustments/credits and incorrect assumptions of unmeasured use or unauthorized consumption. The economic impact of Apparent Losses is greater than Real Losses, since the marginal cost of Apparent Losses occurs at the retail rate charged to customers. For this audit, SWBNO Apparent Losses were all input at zero since accurate estimates of loss could not be confidently obtained, with the exception of customer meter under registration. A conservative estimate of 3% loss for each customer class was used to estimate loss. Apparent Losses are absolutely occurring with the SWBNO metering and billing systems. For reference and perhaps a future benchmark, PWD Apparent Losses for its 2008 water audit (including meter inaccuracy, unauthorized consumption and systematic data handling errors) were 8.2% of total system input volume. Current SWBNO databases should be examined to identify low-cost data capture techniques and estimating methods for Apparent Losses including:

   - unauthorized consumption or theft. This includes illegal connections by-passing the meter, water taken out of fire hydrants for heat relief, irrigation, etc. and illegal water restorations of water service after a turn-off for non-payment.
   - billing procedure errors. This can include occurrences of accounts not entered into/created in the billing system but a customer is receiving water service and accounts with active consumption but not billed (or held) for some reason. The losses associated with these types of errors are generally more complicated for utilities to discover and estimate but internal discussions and options for estimating these losses should be considered by SWBNO.

- broken or defective meters. There are Apparent Losses for the utility between the time a broken or defective meter is identified in the field and ultimately repaired or exchanged.
- missing meter. There are Apparent Losses for the utility between the time a meter is identified as missing in the field and ultimately replaced.
- leak adjustments. These are adjustments made to customer accounts, through internal policies, for leaks that occur on the customer side of the meter.

4. **Add and Refine Estimates of Real Losses.** Real Losses are the physical escape of water from the distribution system and include leakage and overflows prior to the point of end use (customer meter). This is water loss that could be recoverable within the distribution system. For this audit, SWBNO Real Losses were all input at zero since accurate estimates of loss could not be confidently obtained. Real Losses are absolutely occurring with the SWBNO distribution system, and are typically the largest volume of water lost by utilities within the water audit framework. SWBNO is not likely to be an exception to this rule. For reference and perhaps a future benchmark, PWD Real Losses for its 2008 water audit were 9.9% of total system input volume. Current SWBNO databases should be examined to identify low-cost data capture techniques and estimating methods for Real Losses including:

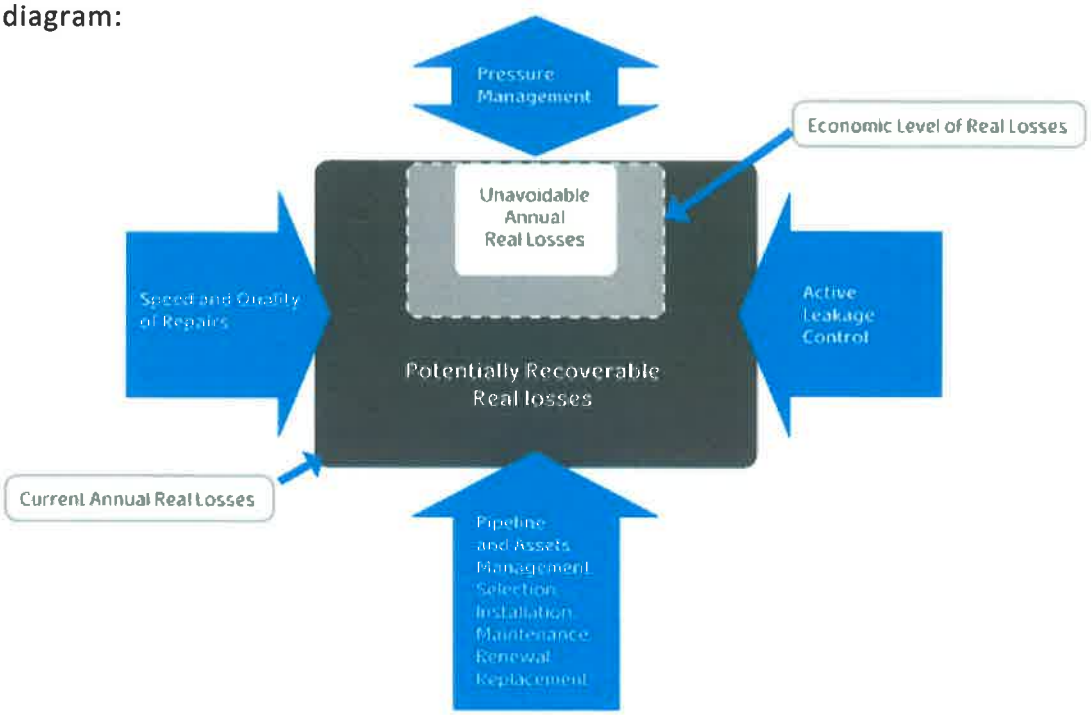
   - water lost before a transmission or distribution main break is repaired, both for reported breaks and breaks/leaks that SWBNO thinks goes unreported
   - unreported and reported leaks on fire hydrants
   - unreported and reported leaks on distribution system valves
   - assumed leaks on abandoned service lines before detection and service discontinuance
   - storage tank errors or overflows that are captured through the SCADA system
   - water leakage or seepage that occurs at the finished water storage sites.

   Although real water loss occurs at the cost of production (involving treatment, operations and maintenance costs), improvements in distribution system integrity should be a high priority for SWBNO. It should be noted, however, that even with improvements to the distribution system and added water audit refinement to Apparent Loss volumes, Real Losses are always likely to be higher.

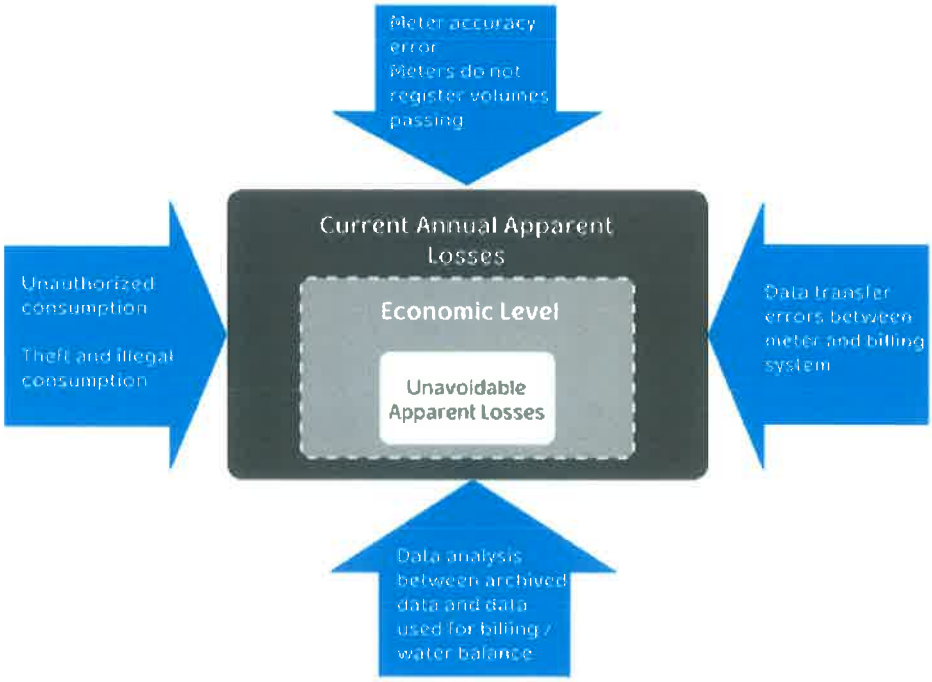
5. **Validate the Accuracy of the System Input Volume.** The System Input Volume is perhaps the most important piece of data in the water audit. All water loss categories are calculated and figured from this number. Therefore, is it vital that the System Input Volume be recorded as accurately as possible. The System Input Volume should include corrections for meter accuracy of the master production meters at the water treatment plants. SWBNO staff should look at the last time the production meters were tested and include appropriate adjustments to System Input Volume within the water audit based on the testing frequency and results. Other factors to consider are SCADA and plant instrumentation outage/maintenance histories, mass balance comparisons of flows into and out of water treatment plants and any specific operational history at the treatment plant facility that could impact production meter accuracy or data reporting.

6. **Identify and Implement Processes to reduce Real and Apparent Loss.** Once confident estimates of Real and Apparent Loss are developed – and this process can take several years - and an updated water audit has been validated, methods to reduce Real and Apparent Loss volumes through field and billing process improvements should be evaluated. This evaluation should include calculating the economic level of loss for both Real and Apparent Losses. This should be balanced with the cost-effectiveness of any new process or procedure implemented.

Factors to consider in the management of Real Losses are outlined in the below diagram:



Factors to consider in the management of Apparent Losses are outlined in the below diagram:



7. **Review and Revise the Quantity of Free Water Provided** – The caps that have been set for the three revenue-generating public agencies (City Park, Audubon Park and the New Orleans Museum of Art) are almost 30 years old. Water Conservation philosophies and the installation of water conservation fixtures has been a continual national trend since these caps were established. Utilities all over the country have seen their water consumption decline across each customer class as a result and this trend is most pronounced in the water utilities serving an urban population. These caps need to be analyzed against actual consumption and re-setting should be considered. Corresponding to the water conservation trend, the water industry has experienced an increased accountability in tracking and ensuring payment for the water consumed. This development can be seen in the establishment of revenue protection units and departments within water utilities and also in the decline of water provided for completely free, even for public or charitable purposes. Many water utilities track water use at public agencies many times inter-fund transfers are charged for the water and related services. SWBNO should consider investigating changes in the state statutes to the number and types of institutions being provided free water.

Summary

The goal of the water audit is to as accurately as possible document all the places – in the street and on paper – that water is lost within the utility. As more water is accounted for within the audit confidently, improvements to the performance indicators will be seen. Then, decisions can be considered about process changes needed to drive increased recovery of operational costs. The water audit data can drive, for instance, discussions on whether it is more economical to implement a program to stop leaking abandoned service lines and ferrules (real loss) or to implement a replacement program to update failing meters (apparent loss).

SWBNO has taken the first step required to quantitatively discuss its water loss and related improvements in economic terms. SWBNO has significant opportunities for improvement to its water auditing and can be successful in their future audit efforts by focusing internally on incremental improvement over time, not on comparisons to other utilities.

Appendix A

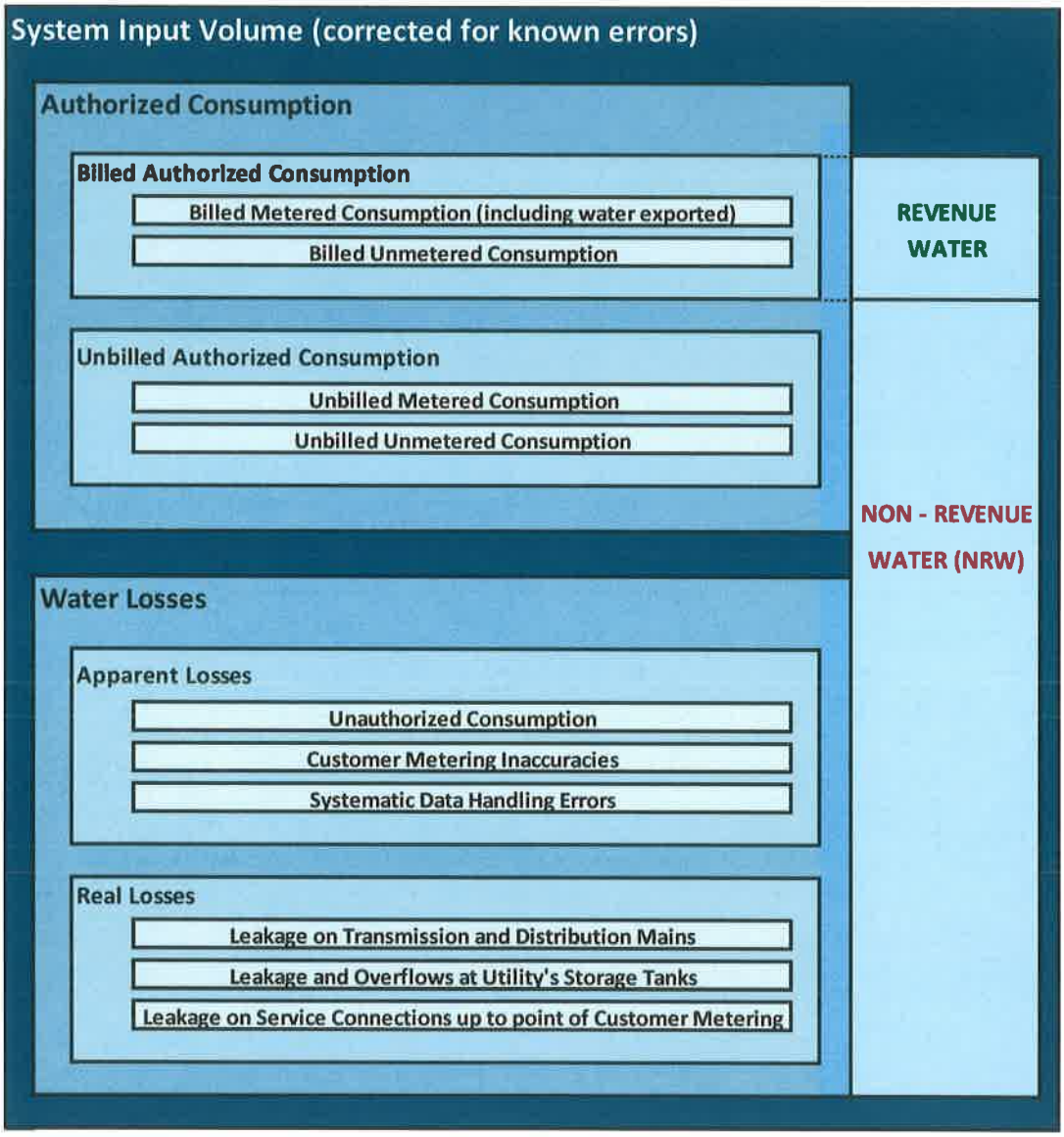
Water Audit

Components and Definitions

Sewerage and Water Board of New Orleans

September 4, 2015

The format and components of the water audit are as follows:



The components of the water audit are defined as follows:

System Input Volume: The annual volume input to the water supply system.

Authorized Consumption: The annual volume of metered and/or unmetered water taken by registered customers, the water supplier and others who are authorized to do so.

Water Losses: The difference between system Input Volume and Authorized Consumption, consisting of Apparent Losses plus Real Losses.

Apparent Losses: Unauthorized Consumption, all types of metering inaccuracies and systematic data handling errors.

Real Losses: The annual volumes lost through all types of leaks, breaks and overflows on mains, service reservoirs and service connections, up to the point of customer metering.

Revenue Water: Those components of System Input Volume which are billed and produce revenue.

Non-Revenue Water (NRW): The difference between System Input Volume and Billed Authorized Consumption.

Unavoidable Annual Real Losses (UARL): A theoretical reference value representing the technical low limit of leakage that could be achieved if all of today's best technology could be successfully applied. A key variable in the calculation of the ILI.

UARL (gallons/ day) = 5.41Lm + 0.15Nc) + 7.5Lp x P where
Lm = length of water mains, miles
Nc = number of service connections
Lp = total length of private pipe, miles = Nc x average distance from curbstop to customer meter
P = average pressure in the system, psi

Infrastructure leak Index (ILI): Ratio of Current Annual Real Losses (CARL) to Unavoidable Annual Real Losses (UARL); good for operational benchmarking for Real Loss control.

Definitions are taken from the 2009 M36 Manual: Water Audits and Loss Control.

Appendix B

Detailed Water Audit

FY 2008 – 2014

Excel Workbook Model and Spreadsheets

Sewerage and Water Board of New Orleans

September 4, 2015

SWBNO Detailed Water Audit for FY 2008 - 2014

using American Water Works Association Format

	Category / Components	Consumption Amount							Annual Cost							Source and Notes
1	I. System Input Volume	FY14	FY13	FY12	FY11	FY10	FY09	FY08								
2	I-a. Finished water delivered from plants	52,195	51,958	54,469	55,151	52,264	54,451	52,656								2013 & 2014 CAFR IV-20 & IV-21, 2012, 2011, 2010 CAFR Table IV-E, 2009 CAFR IV-8, 2008 CAFR IV-8
3	II. Authorized Usage															
4	a. Billed Metered															
5	Retail customers	FY14	FY13	FY12	FY11	FY10	FY09	FY08								
6	Residential	7,366	7,511	6,639	6,801	7,122	7,153	6,674								2013 & 2014 Report SABR190, 2012, 2011, 2010, 2009 and 2008 CAM Residential + Multi-Family
			FY13	FY12	FY11	FY10	FY09	FY08								
7	Commercial	6,977	7,323	7,434	7,625	7,632	6,024	6,067								2013 & 2014 Report SABR190, 2012, 2011, 2010, 2009 and 2008 CAM Commercial
			FY13	FY12	FY11	FY10	FY09	FY08								
8	Industrial	227	158	194	209	261	327	362								2013 & 2014 Report SABR190, 2012, 2011, 2010, 2009 and 2008 CAM Industrial
9	b. Billed Unmetered	0	0	0	0	0	0	0								
10	c. Unbilled Metered															
11	Non-Revenue Water	FY14	FY13	FY12	FY11	FY10	FY09	FY08	FY14	FY13	FY12	FY11	FY10	FY09	FY08	
12	City of New Orleans & public instit.	1,415	1,339	1,295	1,423	1,744	972	1,599	465,091	$336,751	$278,014	$308,489	$439,384	$267,378	$554,120	2013 & 2014 Tiffany Julien, 2012, 2011, 2010, 2009 and 2008 Water Contributed for Public Purpos
		2.7%	2.6%	2.4%	2.6%	3.3%	1.8%	3.0%								
13	d. Unbilled Unmetered															
		FY14	FY13	FY12	FY11	FY10	FY09	FY08								
14	Capital main construction flushing	1	1	1	1	1	1	1								Estimate based on 49 chlorination jobs in 2011 and 51 in 2012 with 25K gallons used to flush on each job. (25K estimate is based on 12.5K gal/hr measured on auto flushing device used in system for 2 hour flush).
15	Fire-fighting, street cleaning, flushing sewers, cleaning public spaces	5,220	5,196	5,447	5,515	5,226	5,445	5,266								Assume 10% of water pumped in each of 2014 - 2008.
16	Distribution Water Quality	FY14	FY13	FY12	FY11	FY10	FY09	FY08								
17	Flushing for Carrollton & Algiers	57.5	27.8	38.3	36.3	10.0	6.7	34.7								Carrollton estimate based on metered automatic flushing (in 2009) and manual flushing (2008 & 2009). Manual flushing during June-Sept, 3 time per week, 8 hrs per flush. Auto flushing gal/hr used to estimate manual flushing volume. Only data for Venetial Isles subdivision used for this estimate. Other flushing amounts not quantified (very few).Estimate of additional 30 MG used during boil advisory in Sept - Oct of 2008 due to hurricanes Gustav & Ike. Algiers (.1MG per year) estimate based on 2-3 flushing events per year for 2-3 hour duration. Flushing volume not metered but assumed to be approximately equal to 12K gallons/hr. 2010 assumes similar auto and manual flushing in Venetian Isles to maintain water quality. No emergency flushing in 2010. Limited flushing in Algiers.
18	Plant Usage	FY14	FY13	FY12	FY11	FY10	FY09	FY08								
19	Carrollton	1,450	1,435.3	1,507.2	1,526.1	1,501.2	1,513.0	1,466.0								Estimate based on approximately 3% of production.
20	Algiers	107.7	123.5	126.8	128.4	123.2	118.1	113.7								Estimate based on approximately 3% of production.
21	Total Authorized Water Consumption	22,822	23,114	22,683	23,258	23,621	21,560	21,583								
22	III.Water Losses (Item I - Item II)	29,373	28,844	31,786	31,893	28,643	32,891	31,073								

SWBNO Detailed Water Audit for FY 2008 - 2014

using American Water Works Association Format

	Category / Components	Consumption Amount							Annual Cost							Source and Notes
23	**IV. Documented Water Losses**															
24	**A. Apparent Losses**															
25	Customer meter under registration	FY14	FY13	FY12	FY11	FY10	FY09	FY08	FY14	FY13	FY12	FY11	FY10	FY09	FY08	
26	**Residential, Commercial, Industrial**	437	450	428	439	450	405	399	$143,636	$113,215	$ 91,872	$ 95,175	$113,461	$111,464	$136,196	Assume 3% loss of consumption for each customer class.
27	Unauthorized Consumption (theft)	0	0	0	0	0	0	0								
28	Customer meter malfunction (broken meter)	0	0	0	0	0	0	0								
29	Accounts lacking proper billing	0	0	0	0	0	0	0								
30	Accounts not entered into system															
31	Conversion of data															
32	Internal process failures															
33	Leak adjustments (actual revenue loss)	0	0	0	0	0	0	0								
	Apparent Loss Total	437	450	428	439	450	405	399								
34	**B. Real Losses**	FY14	FY13	FY12	FY11	FY10	FY09	FY08								
35	Operator error /overflows	0	0	0	0	0	0	0								
36	Known															
37	Unknown-SCADA problems															
38	**Unavoidable annual real loss (UARL)**	779	771	727	704	682	697	668								See UARL worksheet for calculation.
39	Recoverable leakage															
40	Transmission and distribution main leaks		0	0	0	0	0	0								
41	Service lines		0	0	0	0	0	0								
42	Leaks on private properties		0	0	0	0	0	0								
43	Other Estimated Loss from Distribution Sys		0	0	0	0	0	0								
44																
		FY14	FY13	FY12	FY11	FY10	FY09	FY08	FY14	FY13	FY12	FY11	FY10	FY09	FY08	
45	**Real Loss Total**	779	771	727	704	682	697	668	$256,123	$193,920	$156,064	$152,577	$171,830	$191,818	$231,517	
		FY14	FY13	FY12	FY11	FY10	FY09	FY08	FY14	FY13	FY12	FY11	FY10	FY09	FY08	
46	**Documented Water Losses**	1,216	1,221	1,155	1,142	1,133	1,102	1,061	399,759	$307,134	$247,936	$247,752	$285,290	$303,282	$367,713	
		FY14	FY13	FY12	FY11	FY10	FY09	FY08								
47	**Undocumented Water Losses**	28,157	27,623	30,631	30,750	27,510	31,799	30,011								Item III - Item IV. Also referred to "Balancing Error (Gap)"

Unavoidable Annual Real Loss Calculation

Assumptions

	FY2014	FY2013	FY2012	FY2011	FY2010	FY2009	FY2008	Notes
Miles of Main	1,812	1,806	1,599	1,519	1,590	1,791	1,791	2014, 2013, 2012, 2011, 2010 CAFR IV-32, 2008 CAFR, 2009 data duplicated 2008 valu
Average psi	62	62	62	62	62	62	62	Post Katrina East Bank psi avg is 62-68 psi. West Bank maintains 62 psi exiting treatment plants (Info on Recovery Drive).
Days in year	365	365	366	365	365	365	366	2008 and 2012 were leap years w/ 366 days.
Curb stop to meter connections	127,876	126,106	121,435	118,745	111,834	109,640	102,575	B&V Final Report on Operations
Average length of curb-stop to meter (ft)	30	30	30	30	30	30	30	Estimated used based on industry average (30)

Calculation

Component	UARL factor	FY 2014 Calculation	
Mains (gal/mile/day/psi)	5.41	221,840,080	Mains x miles of main x avg. psi x days
Service Connections			
Units rate per gal/service connection/day/psi	0.15	434,075,082	units rate per gal x connections x avg. psi x days
Units rate per gal/mile/day/psi	7.5	123,316,785	units rate per gal/mile/day/psi x connections x avg. psi x days x avg length of curb-stop to meter
FY 2014 Total		779,231,946	**779.23**

Component	UARL factor	FY 2013 Calculation	
Mains (gal/mile/day/psi)	5.41	221,105,510	Mains x miles of main x avg. psi x days
Service Connections			
Units rate per gal/service connection/day/psi	0.15	428,066,817	units rate per gal x connections x avg. psi x days
Units rate per gal/mile/day/psi	7.5	121,609,891	units rate per gal/mile/day/psi x connections x avg. psi x days x avg length of curb-stop to meter
FY 2013 Total		770,782,218	**770.78**

Component	UARL factor	FY 2012 Calculation	
Mains (gal/mile/day/psi)	5.41	196,299,188	Mains x miles of main x avg. psi x days
Service Connections			
Units rate per gal/service connection/day/psi	0.15	413,340,453	units rate per gal x connections x avg. psi x days
Units rate per gal/mile/day/psi	7.5	117,426,265	units rate per gal/mile/day/psi x connections x avg. psi x days x avg length of curb-stop to meter
FY 2012 Total		727,065,906	**727.07**

Component	UARL factor	FY 2011 Calculation	
Mains (gal/mile/day/psi)	5.41	185,968,588	Mains x miles of main x avg. psi x days
Service Connections			
Units rate per gal/service connection/day/psi	0.15	403,079,903	units rate per gal x connections x avg. psi x days
Units rate per gal/mile/day/psi	7.5	114,511,336	units rate per gal/mile/day/psi x connections x avg. psi x days x avg length of curb-stop to meter
FY 2011 Total		703,559,826	**703.56**

Component	UARL factor	FY 2010 Calculation	
Mains (gal/mile/day/psi)	5.41	194,715,233	Mains x miles of main x avg. psi x days
Service Connections			
Units rate per gal/service connection/day/psi	0.15	379,620,513	units rate per gal x connections x avg. psi x days
Units rate per gal/mile/day/psi	7.5	107,846,737	units rate per gal/mile/day/psi x connections x avg. psi x days x avg length of curb-stop to meter
FY 2010 Total		682,182,482	**682.18**

Component	UARL factor	FY 2009 Calculation	
Mains (gal/mile/day/psi)	5.41	219,269,085	Mains x miles of main x avg. psi x days
Service Connections			
Units rate per gal/service connection/day/psi	0.15	372,172,980	units rate per gal x connections x avg. psi x days
Units rate per gal/mile/day/psi	7.5	105,730,960	units rate per gal/mile/day/psi x connections x avg. psi x days x avg length of curb-stop to meter
FY 2009 Total		697,173,026	**697.17**

Component	UARL factor	FY 2008 Calculation	
Mains (gal/mile/day/psi)	5.41	219,869,823	Mains x miles of main x avg. psi x days
Service Connections			
Units rate per gal/service connection/day/psi	0.15	349,144,785	units rate per gal x connections x avg. psi x days
Units rate per gal/mile/day/psi	7.5	99,188,859	units rate per gal/mile/day/psi x connections x avg. psi x days x avg length of curb-stop to meter
FY 2008 Total		668,203,467	**668.20**

FY 2014 PERFORMANCE INDICATORS

		MG Per Year	MG Per Day	
FINISHED WATER DELIVERED	**Total System Input Volume:**	**52,195**	**143.00**	Plant Pumpage
AUTHORIZED CONSUMPTION	Billed Metered:	14,570.00	39.92	
	Billed Unmetered:	-	0.00	
	Unbilled Metered:	1,415.00	3.88	
	Unbilled Unmetered:	6,836.61	18.73	
	Total Authorized Consumption:	**22,821.61**	**62.52**	
WATER LOSSES				
Apparent Losses				
	Unauthorized Consumption:	0.00	0.00	Theft or illegal use
	Customer Metering Inaccuracies & Leak Adjustments:	437	1.20	3% Customer meter under registration and leak adjustments
	Data Handling Errors:	-	0.00	Accounts lacking proper billing (no estimation available)
	Total Apparent Losses:	**437**	**1.20**	"Paper loss"
Real Losses				
	Total Real Losses:	**28,936**	**79.28**	Physical loss of water from the distribution system
	TOTAL WATER LOSSES:	29,373	**80.48**	Apparent Losses plus Real Losses
SYSTEM DATA				
	Length of Mains:	1,812	1,812	length (miles) of all pipelines except service connections
	Number of Service Connections:	127,876	127,876	number of customers
	Connection Density:	**71**	71	# of connections / length of mains (miles)
(pipe length between curbside customer meter or property boundary)	Average Length (feet) of Private Pipe:	30.0	30	length between stop & main (not included in length of main)
	Average Operating Pressure:	62.00	62	psi

COST DATA			
Total Annual Cost of Operating Water System Per Year:	$ 88,562,278	Total O&M	
Customer Retail Unit Cost Per MG:	$ 5,540.34	Total O&M / Total Consumption Sold	Total Consumption is Billed and Unbilled Metered
Short-Term Marginal Production Cost Per MG:	$ 328.69	Energy & Chemicals / Total Finished Water Delivered	

PERFORMANCE INDICATORS		
Financial Indicators		
Non-revenue water as percent by volume:	**72.1%**	Unbilled Metered & Unmetered plus Total Water Losses / Total System Input Volume
*** Non-revenue water as percent by cost:**	**16.5%**	See footnote for formula
Water Resources Indicators		
Inefficiency of use of water as a resource:	**55.4%**	Total Real Losses / Total System Input Volume
Operational Efficiency Indicators		
Apparent Losses per as percent of system input volume:		Total Apparent Losses / Total System Input Volume
Real losses per service connection per day (when system is pressurized):		Total Real Losses / Number of Service Connections
Real losses per mile of main per day (when system is pressurized):		Total Real Losses / Length of Mains
Real losses per service connection per day per psi (when system is pressurized):	**10.00**	Total Real Losses / Number of Service Connections / Average Operating Pressure
**** Unavoidable Annual Real Losses (UARL):**	**2.13**	UARL estimated using IWA method (See footnote)
Infrastructure Leakage Index (ILI) [Real Losses/UARL]:	**37.13**	

Non-Revenue Water as Percent by Cost:	
(unbilled metered + unbilled unmetered + total real losses) x short-term marginal production cost	33,488.19
total apparent losses x customer retail unit cost	6,633.22
total nonrevenue water x 365 days	14,644,315.69
total nonrevenue water per day / total annual cost of operating water system	16.54%

IWA/AWWA Calculation for Unavoidable Annual Real Loss (UARL) for FY2014:	
length of mains x unit rate for UARL per gal/miles/day/psi	9,803
# of service connections x unit rate for UARL per gal/service/day/psi	19,181.40
(# of service connections x avg length of pipe / 5280 ft/mile) x unit rate per gal/mile/day/psi	5,449.26
add totals	34,433.58
total x avg operating pressure	2,134,882.04
divide by 1,000,000 to calculate per MG per day	2.13

FY 2013 PERFORMANCE INDICATORS

		MG Per Year	MG Per Day	
FINISHED WATER DELIVERED	**Total System Input Volume:**	**51,958**	**142.35**	Plant Pumpage
AUTHORIZED CONSUMPTION	Billed Metered:	14,992.00	41.07	
	Billed Unmetered:	-	0.00	
	Unbilled Metered:	1,338.50	3.67	
	Unbilled Unmetered:	6,783.53	18.59	
	Total Authorized Consumption:	**23,114.03**	**63.33**	
WATER LOSSES				
Apparent Losses				
	Unauthorized Consumption:	0.00	0.00	Theft or illegal use
	Customer Metering Inaccuracies & Leak Adjustments:	450	1.23	3% Customer meter under registration and leak adjustments
	Data Handling Errors:	-	0.00	Accounts lacking proper billing (no estimation available)
	Total Apparent Losses:	**450**	**1.23**	"Paper loss"
Real Losses				
	Total Real Losses:	**28,394**	**77.79**	Physical loss of water from the distribution system
	TOTAL WATER LOSSES:	**28,844**	**79.02**	Apparent Losses plus Real Losses
SYSTEM DATA				
	Length of Mains:	1,806	1,806	length (miles) of all pipelines except service connections
	Number of Service Connections:	126,106	126,106	number of customers
	Connection Density:	**70**	70	# of connections / length of mains (miles)
(pipe length between curbside customer meter or property boundary)	Average Length (feet) of Private Pipe:	30.0	30	length between stop & main (not included in length of main)
	Average Operating Pressure:	62.00	62	psi
COST DATA				
	Total Annual Cost of Operating Water System Per Year:		$ 64,170,327	Total O&M
	Customer Retail Unit Cost Per MG:		$ 3,929.48	Total O&M / Total Consumption Sold (Total Consumption is Billed and Unbilled Metered)
	Short-Term Marginal Production Cost Per MG:		$ 251.59	Energy & Chemicals / Total Finished Water Delivered
PERFORMANCE INDICATORS				
Financial Indicators				
	Non-revenue water as percent by volume:		**71.1%**	Unbilled Metered & Unmetered plus Total Water Losses / Total System Input Volume
	*** Non-revenue water as percent by cost:**		**17.1%**	See footnote for formula
Water Resources Indicators				
	Inefficiency of use of water as a resource:		**54.6%**	Total Real Losses / Total System Input Volume
Operational Efficiency Indicators				
	Apparent Losses per as percent of system input volume:		**0.9%**	Total Apparent Losses / Total System Input Volume
	Real losses per service connection per day (when system is pressurized):		**616.88**	Total Real Losses / Number of Service Connections
	Real losses per mile of main per day (when system is pressurized):		**43,074**	Total Real Losses / Length of Mains
	Real losses per service connection per day per psi (when system is pressurized):		**9.95**	Total Real Losses / Number of Service Connections / Average Operating Pressure
	**** Unavoidable Annual Real Losses (UARL):**		**2.11**	UARL estimated using IWA method (See footnote)
	Infrastructure Leakage Index (ILI) [Real Losses/UARL]:		**36.84**	

* **Non-Revenue Water as Percent by Cost:**

(unbilled metered + unbilled unmetered + total real losses) x short-term marginal production cost	25,169.83
total apparent losses x customer retail unit cost	4,844.56
total nonrevenue water x 365 days	10,955,254.03
total nonrevenue water per day / total annual cost of operating water system	17.07%

** **IWA/AWWA Calculation for Unavoidable Annual Real Loss (UARL) for FY2013:**

length of mains x unit rate for UARL per gal/miles/day/psi	9,770
# of service connections x unit rate for UARL per gal/service/day/psi	18,915.90
(# of service connections x avg length of pipe / 5280 ft/mile) x unit rate per gal/mile/day/psi	5,373.84
add totals	34,060.20
total x avg operating pressure	2,111,732.10
divide by 1,000,000 to calculate per MG per day	2.11

FY 2012 PERFORMANCE INDICATORS

		MG Per Year	MG Per Day	
FINISHED WATER DELIVERED	**Total System Input Volume:**	**54,469**	**149.23**	Plant Pumpage
AUTHORIZED CONSUMPTION				
	Billed Metered:	14,267.00	39.09	
	Billed Unmetered:	-	0.00	
	Unbilled Metered:	1,295.20	3.55	
	Unbilled Unmetered:	7,120.36	19.51	
	Total Authorized Consumption:	**22,682.56**	**62.14**	
WATER LOSSES				
Apparent Losses				
	Unauthorized Consumption:	0.00	0.00	Theft or illegal use
	Customer Metering Inaccuracies & Leak Adjustments:	428	1.17	3% Customer meter under registration and leak adjustments
	Data Handling Errors:	-	0.00	Accounts lacking proper billing (no estimation available)
	Total Apparent Losses:	**428**	**1.17**	"Paper loss"
Real Losses				
	Total Real Losses:	**31,358**	**85.91**	Physical loss of water from the distribution system
	TOTAL WATER LOSSES:	**31,786**	**87.09**	Apparent Losses plus Real Losses
SYSTEM DATA				
	Length of Mains:	1,599	1,599	length (miles) of all pipelines except service connections
	Number of Service Connections:	121,435	121,435	number of customers
	Connection Density:	**76**	76	# of connections / length of mains (miles)
(pipe length between curbside customer meter or property boundary)	Average Length (feet) of Private Pipe:	30.0	30	length between stop & main (not included in length of main)
	Average Operating Pressure:	62.00	62	psi

COST DATA			
Total Annual Cost of Operating Water System Per Year:	$ 61,988,096	Total O&M	
Customer Retail Unit Cost Per MG:	$ 3,983.25	Total O&M / Total Consumption Sold	Total Consumption is Billed and Unbilled Metered
Short-Term Marginal Production Cost Per MG:	$ 214.65	Energy & Chemicals / Total Finished Water Delivered	

PERFORMANCE INDICATORS		
Financial Indicators		
Non-revenue water as percent by volume:	**73.8%**	Unbilled Metered & Unmetered plus Total Water Losses / Total System Input Volume
*** Non-revenue water as percent by cost:**	**16.5%**	See footnote for formula
Water Resources Indicators		
Inefficiency of use of water as a resource:	**57.6%**	Total Real Losses / Total System Input Volume
Operational Efficiency Indicators		
Apparent Losses per as percent of system input volume:	**0.8%**	Total Apparent Losses / Total System Input Volume
Real losses per service connection per day (when system is pressurized):	**707.49**	Total Real Losses / Number of Service Connections
Real losses per mile of main per day (when system is pressurized):	**53,730**	Total Real Losses / Length of Mains
Real losses per service connection per day per psi (when system is pressurized):	**11.41**	Total Real Losses / Number of Service Connections / Average Operating Pressure
**** Unavoidable Annual Real Losses (UARL):**	**1.99**	UARL estimated using IWA method (See footnote)
Infrastructure Leakage Index (ILI) [Real Losses/UARL]:	**43.25**	

* **Non-Revenue Water as Percent by Cost:**

(unbilled metered + unbilled unmetered + total real losses) x short-term marginal production cost	**23,390.31**
total apparent losses x customer retail unit cost	**4,670.88**
total nonrevenue water x 365 days	**10,242,331.32**
total nonrevenue water per day / total annual cost of operating water system	**16.52%**

** **IWA/AWWA Calculation for Unavoidable Annual Real Loss (UARL) for FY2012:**

length of mains x unit rate for UARL per gal/miles/day/psi	**8,651**
# of service connections x unit rate for UARL per gal/service/day/psi	**18,215.25**
(# of service connections x avg length of pipe / 5280 ft/mile) x unit rate per gal/mile/day/psi	**5,174.79**
add totals	**32,040.63**
total x avg operating pressure	**1,986,518.87**
divide by 1,000,000 to calculate per MG per day	**1.99**

FY 2011 PERFORMANCE INDICATORS

		MG Per Year	MG Per Day	
FINISHED WATER DELIVERED	**Total System Input Volume:**	**55,151**	**151.10**	Plant Pumpage
AUTHORIZED CONSUMPTION				
	Billed Metered:	14,629.00	40.08	
	Billed Unmetered:	-	0.00	
	Unbilled Metered:	1,422.50	3.90	
	Unbilled Unmetered:	7,206.84	19.74	
	Total Authorized Consumption:	**23,258.34**	**63.72**	
WATER LOSSES				
Apparent Losses				
	Unauthorized Consumption:	0.00	0.00	Theft or illegal use
	Customer Metering Inaccuracies & Leak Adjustments:	439	1.20	3% Customer meter under registration and leak adjustments
	Data Handling Errors:	-	0.00	Accounts lacking proper billing (no estimation available)
	Total Apparent Losses:	**439**	**1.20**	"Paper loss"
Real Losses				
	Total Real Losses:	**31,454**	**86.17**	Physical loss of water from the distribution system
	TOTAL WATER LOSSES:	**31,893**	**87.38**	Apparent Losses plus Real Losses
SYSTEM DATA				
	Length of Mains:	1,519	1,519	length (miles) of all pipelines except service connections
	Number of Service Connections:	118,745	118,745	number of customers
	Connection Density:	**78**	78	# of connections / length of mains (miles)
(pipe length between curbside customer meter or property boundary)	Average Length (feet) of Private Pipe:	30.0	30	length between stop & main (not included in length of main)
	Average Operating Pressure:	62.00	62	psi
COST DATA				
	Total Annual Cost of Operating Water System Per Year:		$ 64,677,227	Total O&M
	Customer Retail Unit Cost Per MG:		$ 4,029.36	Total O&M / Total Consumption Sold (Total Consumption is Billed and Unbilled Metered)
	Short-Term Marginal Production Cost Per MG:		$ 216.86	Energy & Chemicals / Total Finished Water Delivered
PERFORMANCE INDICATORS				
Financial Indicators				
	Non-revenue water as percent by volume:		**73.5%**	Unbilled Metered & Unmetered plus Total Water Losses / Total System Input Volume
	*** Non-revenue water as percent by cost:**		**16.2%**	See footnote for formula
Water Resources Indicators				
	Inefficiency of use of water as a resource:		**57.0%**	Total Real Losses / Total System Input Volume
Operational Efficiency Indicators				
	Apparent Losses per as percent of system input volume:		**0.8%**	Total Apparent Losses / Total System Input Volume
	Real losses per service connection per day (when system is pressurized):		**725.71**	Total Real Losses / Number of Service Connections
	Real losses per mile of main per day (when system is pressurized):		**56,731**	Total Real Losses / Length of Mains
	Real losses per service connection per day per psi (when system is pressurized):		**11.71**	Total Real Losses / Number of Service Connections / Average Operating Pressure
	**** Unavoidable Annual Real Losses (UARL):**		**1.93**	UARL estimated using IWA method (See footnote)
	Infrastructure Leakage Index (ILI) [Real Losses/UARL]:		**44.71**	

* **Non-Revenue Water as Percent by Cost:**

(unbilled metered + unbilled unmetered + total real losses) x short-term marginal production cost	23,815.29
total apparent losses x customer retail unit cost	4,844.83
total nonrevenue water x 365 days	10,460,945.02
total nonrevenue water per day / total annual cost of operating water system	16.17%

** **IWA/AWWA Calculation for Unavoidable Annual Real Loss (UARL) for FY2011:**

length of mains x unit rate for UARL per gal/miles/day/psi	8,218
# of service connections x unit rate for UARL per gal/service/day/psi	17,811.75
(# of service connections x avg length of pipe / 5280 ft/mile) x unit rate per gal/mile/day/psi	5,060.16
add totals	31,089.70
total x avg operating pressure	1,927,561.17
divide by 1,000,000 to calculate per MG per day	1.93

FY 2010 PERFORMANCE INDICATORS

		MG Per Year	MG Per Day	
FINISHED WATER DELIVERED	**Total System Input Volume:**	**52,264**	**143.19**	Plant Pumpage
AUTHORIZED CONSUMPTION	Billed Metered:	15,015.00	41.14	
	Billed Unmetered:	-	0.00	
	Unbilled Metered:	1,744.40	4.78	
	Unbilled Unmetered:	6,861.80	18.80	
	Total Authorized Consumption:	**23,621.20**	**64.72**	
WATER LOSSES				
Apparent Losses				
	Unauthorized Consumption:	0.00	0.00	Theft or illegal use
	Customer Metering Inaccuracies & Leak Adjustments:	450	1.23	3% Customer meter under registration and leak adjustments
	Data Handling Errors:	-	0.00	Accounts lacking proper billing (no estimation available)
	Total Apparent Losses:	**450**	**1.23**	"Paper loss"
Real Losses				
	Total Real Losses:	**28,192**	**77.24**	Physical loss of water from the distribution system
	TOTAL WATER LOSSES:	**28,643**	**78.47**	Apparent Losses plus Real Losses
SYSTEM DATA				
	Length of Mains:	1,590	1,590	length (miles) of all pipelines except service connections
	Number of Service Connections:	109,640	109,640	number of customers
	Connection Density:	**69**	69	# of connections / length of mains (miles)
(pipe length between curbside customer meter or property boundary)	Average Length (feet) of Private Pipe:	30.0	30	length between stop & main (not included in length of main)
	Average Operating Pressure:	62.00	62	psi
COST DATA				
	Total Annual Cost of Operating Water System Per Year:		$ 53,161,832	Total O&M
	Customer Retail Unit Cost Per MG:		$ 3,172.06	Total O&M / Total Consumption Sold (Total Consumption is Billed and Unbilled Metered)
	Short-Term Marginal Production Cost Per MG:		$ 251.88	Energy & Chemicals / Total Finished Water Delivered
PERFORMANCE INDICATORS				
Financial Indicators				
	Non-revenue water as percent by volume:		**71.3%**	Unbilled Metered & Unmetered plus Total Water Losses / Total System Input Volume
	*** Non-revenue water as percent by cost:**		**20.1%**	See footnote for formula
Water Resources Indicators				
	Inefficiency of use of water as a resource:		**53.9%**	Total Real Losses / Total System Input Volume
Operational Efficiency Indicators				
	Apparent Losses per as percent of system input volume:		**0.9%**	Total Apparent Losses / Total System Input Volume
	Real losses per service connection per day (when system is pressurized):		**704.48**	Total Real Losses / Number of Service Connections
	Real losses per mile of main per day (when system is pressurized):		**48,585**	Total Real Losses / Length of Mains
	Real losses per service connection per day per psi (when system is pressurized):		**11.38**	Total Real Losses / Number of Service Connections / Average Operating Pressure
	**** Unavoidable Annual Real Losses (UARL):**		**1.84**	UARL estimated using IWA method (See footnote)
	Infrastructure Leakage Index (ILI) [Real Losses/UARL]:		**41.91**	

* **Non-Revenue Water as Percent by Cost:**

(unbilled metered + unbilled unmetered + total real losses) x short-term marginal production cost	**25,394.29**
total apparent losses x customer retail unit cost	**3,914.67**
total nonrevenue water x 365 days	**10,697,769.69**
total nonrevenue water per day / total annual cost of operating water system	**20.12%**

** **IWA/AWWA Calculation for Unavoidable Annual Real Loss (UARL) for FY2010:**

length of mains x unit rate for UARL per gal/miles/day/psi	**8,604**
# of service connections x unit rate for UARL per gal/service/day/psi	**16,446.00**
(# of service connections x avg length of pipe / 5280 ft/mile) x unit rate per gal/mile/day/psi	**4,672.16**
add totals	**29,722.48**
total x avg operating pressure	**1,842,792.25**
divide by 1,000,000 to calculate per MG per day	**1.84**

FY 2009 PERFORMANCE INDICATORS

		MG Per Year	MG Per Day	
FINISHED WATER DELIVERED	**Total System Input Volume:**	**54,451**	**149.18**	Plant Pumpage
AUTHORIZED CONSUMPTION				
	Billed Metered:	13,504.00	37.00	
	Billed Unmetered:	-	0.00	
	Unbilled Metered:	971.80	2.66	
	Unbilled Unmetered:	7,083.86	19.41	
	Total Authorized Consumption:	**21,559.66**	**59.07**	
WATER LOSSES				
Apparent Losses				
	Unauthorized Consumption:	0.00	0.00	Theft or illegal use
	Customer Metering Inaccuracies:	405.12	1.11	Customer meter under registration
	Data Handling Errors:	-	0.00	Accounts lacking proper billing (no estimation available)
	Total Apparent Losses:	**405.12**	**1.11**	"Paper loss"
Real Losses				
	Total Real Losses:	**32,486.22**	**89.00**	Physical loss of water from the distribution system
	TOTAL WATER LOSSES:	**32,891.34**	**90.11**	Apparent Losses plus Real Losses
SYSTEM DATA				
	Length of Mains:	1,791	1,791	length (miles) of all pipelines except service connections
	Number of Service Connections:	109,640	109,640	number of customers
	Connection Density:	**61**	61	# of connections / length of mains (miles)
(pipe length between curbside customer meter or property boundary)	Average Length (feet) of Private Pipe:	30.0	30	length between stop & main (not included in length of main)
	Average Operating Pressure:	62.00	62	psi

COST DATA			
Total Annual Cost of Operating Water System Per Year:	$ 51,983,969	Total O&M	
Customer Retail Unit Cost Per MG:	$ 3,591.09	Total O&M / Total Consumption Sold	Total Consumption is Billed and Unbilled Metered
Short-Term Marginal Production Cost Per MG:	$ 275.14	Energy & Chemicals / Total Finished Water Delivered	
PERFORMANCE INDICATORS			
Financial Indicators			
Non-revenue water as percent by volume:	**75.2%**	Unbilled Metered & Unmetered plus Total Water Losses / Total System Input Volume	
* **Non-revenue water as percent by cost:**	**24.3%**	See footnote for formula	
Water Resources Indicators			
Inefficiency of use of water as a resource:	**59.7%**	Total Real Losses / Total System Input Volume	
Operational Efficiency Indicators			
Apparent Losses per as percent of system input volume:	**0.7%**	Total Apparent Losses / Total System Input Volume	
Real losses per service connection per day (when system is pressurized):	**811.78**	Total Real Losses / Number of Service Connections	
Real losses per mile of main per day (when system is pressurized):	**49,695**	Total Real Losses / Length of Mains	
Real losses per service connection per day per psi (when system is pressurized):	**13.09**	Total Real Losses / Number of Service Connections / Average Operating Pressure	
** **Unavoidable Annual Real Losses (UARL):**	**1.91**	UARL estimated using IWA method (See footnote)	
Infrastructure Leakage Index (ILI) [Real Losses/UARL]:	**46.60**		

* **Non-Revenue Water as Percent by Cost:**

(unbilled metered + unbilled unmetered + total real losses) x short-term marginal production cost	**30,560.51**
total apparent losses x customer retail unit cost	**3,985.82**
total nonrevenue water x 365 days	**12,609,409.84**
total nonrevenue water per day / total annual cost of operating water system	**24.26%**

** **IWA/AWWA Calculation for Unavoidable Annual Real Loss (UARL) for FY2009:**

length of mains x unit rate for UARL per gal/miles/day/psi	**9,689**
# of service connections x unit rate for UARL per gal/service/day/psi	**16,446.00**
(# of service connections x avg length of pipe / 5280 ft/mile) x unit rate per gal/mile/day/psi	**4,672.16**
add totals	**30,807.47**
total x avg operating pressure	**1,910,063.08**
divide by 1,000,000 to calculate per MG per day	**1.91**

FY 2008 PERFORMANCE INDICATORS

		MG Per Year	MG Per Day	
FINISHED WATER DELIVERED	**Total System Input Volume:**	**52,656**	**144.26**	Plant Pumpage
AUTHORIZED CONSUMPTION	Billed Metered:	13,103.00	35.90	
	Billed Unmetered:	-	0.00	
	Unbilled Metered:	1,599.30	4.38	
	Unbilled Unmetered:	6,880.99	18.85	
	Total Authorized Consumption:	**21,583.29**	**59.13**	
WATER LOSSES				
Apparent Losses				
	Unauthorized Consumption:	0.00	0.00	Theft or illegal use
	Customer Metering Inaccuracies:	393.09	1.08	Customer meter under registration
	Data Handling Errors:	-	0.00	Accounts lacking proper billing (no estimation available)
	Total Apparent Losses:	**393.09**	**1.08**	"Paper loss"
Real Losses				
	Total Real Losses:	**30,679.62**	**84.05**	Physical loss of water from the distribution system
	TOTAL WATER LOSSES:	31,072.71	85.13	Apparent Losses plus Real Losses
SYSTEM DATA				
	Length of Mains:	1,791	1,791	length (miles) of all pipelines except service connections
	Number of Service Connections:	102,575	102,575	number of customers
	Connection Density:	**57**	57	# of connections / length of mains (miles)
(pipe length between curbside customer meter or property boundary)	Average Length (feet) of Private Pipe:	30.0	30	length between stop & main (not included in length of main)
	Average Operating Pressure:	62.00	62	psi

COST DATA			
Total Annual Cost of Operating Water System Per Year:	$ 66,989,084	Total O&M	
Customer Retail Unit Cost Per MG:	$ 4,556.37	Total O&M / Total Consumption Sold	Total Consumption is Billed and Unbilled Metered
Short-Term Marginal Production Cost Per MG:	$ 346.48	Energy & Chemicals / Total Finished Water Delivered	

PERFORMANCE INDICATORS		
Financial Indicators		
Non-revenue water as percent by volume:	**75.1%**	Unbilled Metered & Unmetered plus Total Water Losses / Total System Input Volume
* **Non-revenue water as percent by cost:**	**22.9%**	See footnote for formula
Water Resources Indicators		
Inefficiency of use of water as a resource:	**58.3%**	Total Real Losses / Total System Input Volume
Operational Efficiency Indicators		
Apparent Losses per as percent of system input volume:	**0.7%**	Total Apparent Losses / Total System Input Volume
Real losses per service connection per day (when system is pressurized):	**819.44**	Total Real Losses / Number of Service Connections
Real losses per mile of main per day (when system is pressurized):	**46,931**	Total Real Losses / Length of Mains
Real losses per service connection per day per psi (when system is pressurized):	**13.22**	Total Real Losses / Number of Service Connections / Average Operating Pressure
** **Unavoidable Annual Real Losses (UARL):**	**1.83**	UARL estimated using IWA method (See footnote)
Infrastructure Leakage Index (ILI) [Real Losses/UARL]:	**46.04**	

* **Non-Revenue Water as Percent by Cost:**

(unbilled metered + unbilled unmetered + total real losses) x short-term marginal production cost	**37,172.58**
total apparent losses x customer retail unit cost	**4,907.02**
total nonrevenue water x 365 days	**15,359,055.14**
total nonrevenue water per day / total annual cost of operating water system	**22.93%**

** **IWA/AWWA Calculation for Unavoidable Annual Real Loss (UARL) for FY2008:**

length of mains x unit rate for UARL per gal/miles/day/psi	**9,689**
# of service connections x unit rate for UARL per gal/service/day/psi	**15,386.25**
(# of service connections x avg length of pipe / 5280 ft/mile) x unit rate per gal/mile/day/psi	**4,371.09**
add totals	**29,446.65**
total x avg operating pressure	**1,825,692.53**
divide by 1,000,000 to calculate per MG per day	**1.83**

SWBNO Detailed Water Audit **FY 2008 - FY2014**

Cost Data

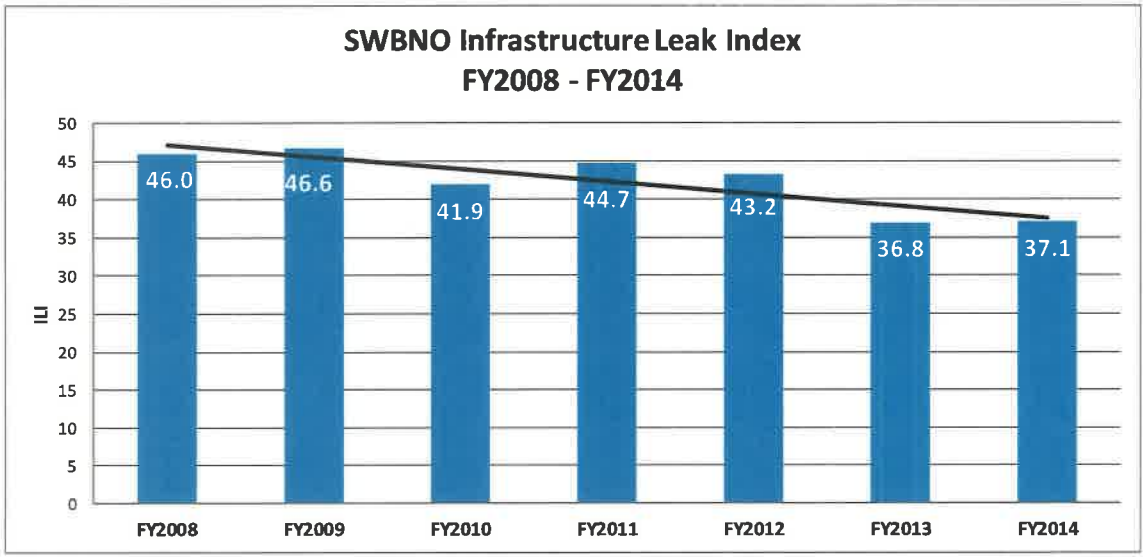
Annual Costs								Source
	FY2014	FY2013	FY2012	FY2011	FY2010	FY2009	FY2008	
O&M Costs	88,562,278	$64,170,327	$61,988,096	$64,677,227	$53,161,832	$51,983,969	$66,989,084	2014 CAFR II-71, Schedule 2, 2013 CAFR II-67, 2012, 2011, 2010 CAFR II-258, 2009 and 2008 CAFR II-57
Total Chem and Energy	17,155,785	$13,072,012	$11,691,736	$11,960,257	$13,164,393	$14,981,504	$18,244,072	AFIN 880C-13th 2014, 2013, 2012, 2011, 2010, 2009, 2008

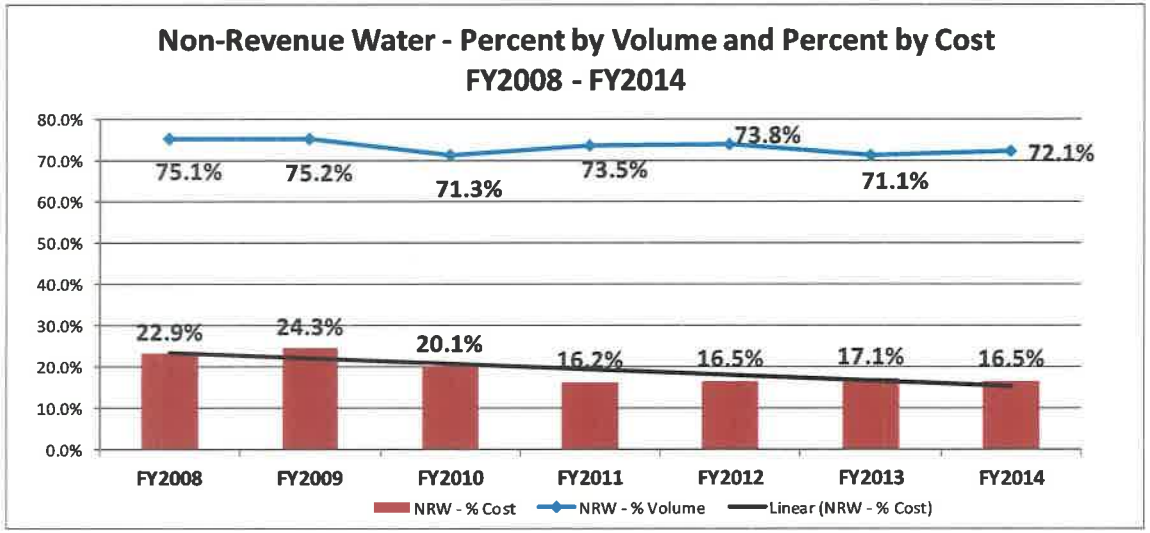
Total Metered Sales Revenue								
	FY2014	FY2013	FY2012	FY2011	FY2010	FY2009	FY2008	
	70,818,255	$64,398,609	$60,256,304	$59,890,312	$55,079,772	$50,677,054	$43,995,732	2014 CAFR II-71, Schedule 2, 2013 CAFR II-67, 2012, 2011, 2010 CAFR II-58, 2009 and 2008CAFR II-57

Total Consumption								Source
	FY2014	FY2013	FY2012	FY2011	FY2010	FY2009	FY2008	
	13,353	13,600	13,802	14,083	13,745	13,379	13,284	2013 & 2014 CAFR IV-8, 2012, 2011, 2010, 2009, 2008 CAFR IV-9

Revenue / Consumption								Source
	FY2014	FY2013	FY2012	FY2011	FY2010	FY2009	FY2008	
	530,355	473,519	436,577	425,267	400,726	378,781	331,193	Total metered sales revenue / total consumption

SWBNO Detailed Water Audit
ILI and NRW Charts
FY 2008 - FY2014





SWBNO Detailed Water Audit
FY2008 - FY2014
Performance Indicator Summary

PERFORMANCE INDICATOR	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	FY2014
Financial Indicators							
Non-Revenue Water as percent by Volume	75.1%	75.2%	71.3%	73.5%	73.8%	71.1%	72.1%
Non-Revenue Water as percent by Cost	22.9%	24.3%	20.1%	16.2%	16.5%	17.1%	16.5%
Water Resources Indicators							
Inefficiency of use of Water as a Resource	58.3%	59.7%	53.9%	57.0%	57.6%	54.6%	55.4%
Operational Efficiency Indicators							
Apparent Losses as % of System Input Volume	0.75%	0.74%	0.86%	0.80%	0.79%	0.87%	0.84%
Real Losses per Service Connection per Day	819.4	811.8	704.5	725.7	707.5	616.9	620.0
Real losses per Mile of Main per Day	46,931	49,695	48,565	56,731	53,730	43,074	43,752
Real Losses per Service Connection per Day per psi	13.2	13.1	11.4	11.7	11.4	9.9	10.0
Unavoidable Annual Real Losses (UARL)	1.8	1.9	1.8	1.9	2.0	2.1	2.1
Infrastructure Leakage Index (ILI)	46.0	46.6	41.9	44.7	43.2	36.8	37.1

September 14, 2015

The Audit Committee met on Monday, September 14, 2015 in the 2nd Floor Board Room, 625 St. Joseph Street, New Orleans, LA. The meeting convened at 9:30 AM.

PRESENT:
Wm. Raymond Manning (Chairman)
Dr. Tamika Duplessis (Vice Chairman)
Scott Jacobs
Robin Barnes
Marion Bracy

ABSENT:
None

OTHER COMMITTEE/BOARD MEMBERS PRESENT:
Kerri Kane
Alan Arnold

ACTION ITEM:

There were no action items.

PRESENTATION ITEMS:

2015 INDEPENDENT FINANCIAL AUDITING SERVICES

Staff has recommended approval to the Finance Committee for a third renewal of the contract with Postlethwaite & Netterville and Bruno and Tervalon as joint venture for independent financial audit services.

ORGANIZATION COMMMITTEE RESPONSIBLILITIES

On August 19, 2015, the Board adopted recommended changes to S&WB By-Laws and Committee Restructuring. A crosswalk document was provided for review and discussion of what topics the new Audit Committee will be monitoring and furnishing advice and recommendations to the Board. A supplemental table was distributed highlighting specific recommended topics the committee:

- CAFR Audit Findings
- OIG Audit Findings
- FEMA Audit Findings
- Regulatory Compliance Audit Findings
- Internal Audit Plan
- Implementation of New Customer Service Management System
- Procurement Process
- Consent Decree Compliance
- Internal Controls Assessment
- DBE Program Compliance

INFORMATIONAL ITEMS

There were no additional information items.

There being no further business to come before the Committee, the meeting adjourned at 10:40 AM.

Respectfully Submitted,

_____
Wm. Raymond Manning
Chairman