

**MUNICIPAL WATER DISTRICT OF ORANGE COUNTY  
AGENCIES MANAGERS MEETING**

**Moulton Niguel Water District  
Water Loss Control  
Program Development**

**February 19, 2015**

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# Outline

- MNWD Initial Water Loss Assessment – 2013
- Water Audit and Water Loss Management Approach
- Identifying Non-Revenue Water Loss Components
- Audit Deliverables
- Preliminary Results

# 2013 Initial Water Loss Assessment

- Large Potable Water Distribution System
- Questions on Accuracy of Past Reported Loss % Values
- Ensure Accuracy for Reporting and Management
- Standardized and Industry Accepted Method
- CUWCC BMP 1.2 Reporting
- Performed by MNWD Staff

# 2013 Water Loss Assessment

- Loss calculation approach – AWWA M36
- Customer Billing Data, Imported Metered, Exported Metered, Unmetered, Unbilled, and Operational Use Estimates

Water In	Water out					
	Billed Authorized			Unbilled Authorized		
1 <u>Volume From Own Sources</u>  (OC79 + OC81 + CM10 + SC2B)	4 <u>Water Exported</u>  (SJC, SCWD, ETWD)	5 <u>Billed Metered</u>  Domestic + Commercial minus Exported Water	6 <u>Billed Unmetered</u>  SCWD 920 Zone	7 <u>Unbilled Metered</u>  JRP, SOCWA, 3A, 2A Basins	8 <u>Unbilled Unmetered</u>  Flushing and VACCON Water Loss	14 <u>REAL LOSSES</u>  Line Breaks, Service Line Leaks, Sheared Hydrants, Over Flowing Tanks

# CY 2013 Water Loss Results

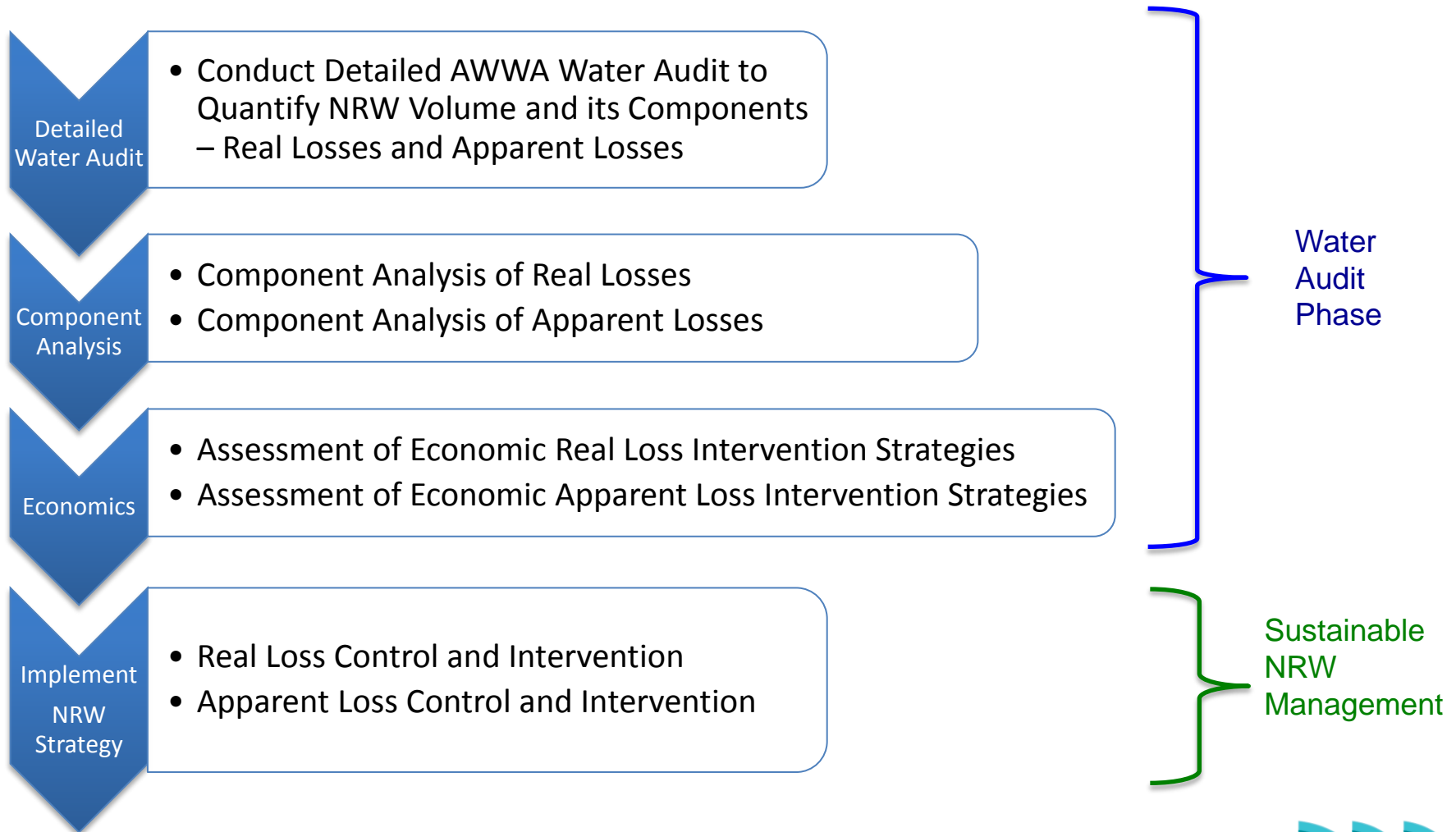
## January – December 2013:

Water Source Volume	= 29, 095 AF
<u>Consumption + Accounted-for-Losses</u>	= <u>26, 363 AF</u>
<b>Estimated Water Losses (Apparent/Real)</b>	<b>= 2,732 AF</b>
	<b>= 9.4 % Water Loss</b>
Theoretical Unavoidable Real Losses	= 4.0 %
<b>Potentially Recoverable Water Losses</b>	<b>= 1,570 AF</b>

# Water Audit and Loss Management Approach

- Expert Consultant - Water System Optimization (WSO)
- Develop Scope of Work
- Define Audit Period
- Data Validation
- Prepare Tailored Water Balance Model – AWWA Water Audit
- Identify Non-Revenue Water Loss Components
- Develop Appropriate Water Loss Control Strategies

# Non-Revenue Water Loss Management Strategy



# Components of Water Audit

<b>WATER SUPPLIED</b>	<b>Authorized Consumption</b>	<b>Billed Authorized Consumption</b>	<b>Billed Metered Authorized Consumption</b>	<b>REVENUE WATER</b>	
			<b>Billed Unmetered Authorized Consumption</b>		
		<b>Unbilled Authorized Consumption</b>	<b>Unbilled Metered Authorized Consumption</b>		
			<b>Unbilled Unmetered Authorized Consumption</b>		
	<b>Water Losses</b>	<b>Apparent Losses</b>	<b>Consumption metering errors</b>		
			<b>Unauthorized consumption</b>		
		<b>Real Losses</b>	<b>Leakage/overflow at service reservoirs</b>		
			<b>Leakage from trunk mains</b>		
			<b>Leakage from distribution mains</b>		
			<b>Leakage from service connections</b>		



# Revenue Water

<b>WATER SUPPLIED</b>	<b>Authorized Consumption</b>	<b>Billed Authorized Consumption</b>	<b>Billed Metered Authorized Consumption</b>	<b>REVENUE WATER</b>
			<b>Billed Unmetered Authorized Consumption</b>	
	<b>Authorized Consumption</b>	<b>Unbilled Authorized Consumption</b>		<b>Unbilled Metered Authorized Consumption</b>
				<b>Unbilled Unmetered Authorized Consumption</b>
	<b>Water Losses</b>	<b>Apparent Losses</b>		<b>Consumption metering errors</b>
				<b>Unauthorized consumption</b>
		<b>Real Losses</b>		<b>Leakage/overflow at service reservoirs</b>
				<b>Leakage from trunk mains</b>
				<b>Leakage from distribution mains</b>
				<b>Leakage from service connections</b>

# Non Revenue Water

<b>WATER SUPPLIED</b>	<b>Authorized Consumption</b>	<b>Billed Authorized Consumption</b>	<b>Billed Metered Authorized Consumption</b>	<b>REVENUE WATER</b>	
			<b>Billed Unmetered Authorized Consumption</b>		
		<b>Unbilled Authorized Consumption</b>	<b>Unbilled Metered Authorized Consumption</b>		<b>NON REVENUE WATER</b>
			<b>Unbilled Unmetered Authorized Consumption</b>		
	<b>Water Losses</b>	<b>Apparent Losses</b>	<b>Consumption metering errors</b>		
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		<b>Real Losses</b>	<b>Leakage/overflow at service reservoirs</b>		
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# Revenue Optimization

<b>WATER SUPPLIED</b>	<b>Authorized Consumption</b>	<b>Billed Authorized Consumption</b>	<b>Billed Metered Authorized Consumption</b>	<b>REVENUE WATER</b>
			<b>Billed Unmetered Authorized Consumption</b>	
		<b>Unbilled Authorized Consumption</b>	<b>Unbilled Metered Authorized Consumption</b>	
			<b>Unbilled Unmetered Authorized Consumption</b>	
	<b>Water Losses</b>	<b>Apparent Losses</b>	<b>Consumption metering errors</b>	<b>NON REVENUE WATER</b>
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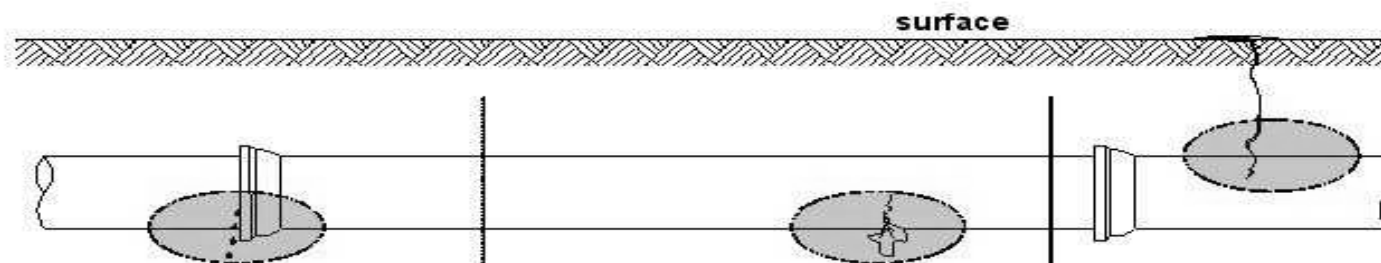
*REVENUE OPTIMIZATION*

# Real Loss Reduction

WATER SUPPLIED	Authorized Consumption	Billed Authorized Consumption	Billed Metered Authorized Consumption	REVENUE WATER
			Billed Unmetered Authorized Consumption	
		Unbilled Authorized Consumption	Unbilled Metered Authorized Consumption	
			Unbilled Unmetered Authorized Consumption	
	Water Losses	Apparent Losses	Consumption metering errors	NON REVENUE WATER
			Unauthorized consumption	
		Real Losses	Leakage/overflow at service reservoirs	
			Leakage from trunk mains	
	Leakage from distribution mains			
	Leakage from service connections			

*REAL LOSS REDUCTION*

# Understanding The Components of Real Losses



## Background leakage

Un-reported and un-detectable using traditional acoustic equipment.

### Tools

- Pressure reduction
- Main and service replacement
- Reduction in the number of joints and fittings

## Un-reported leakage

Often does not surface but is detectable using traditional acoustic equipment.

### Tools

- Pressure reduction
- Main and service replacement
- Reduction in the number of joints and fittings
- Proactive leak detection

## Reported leakage

Often surfaces and is reported by the public or utility workers

### Tools

- Pressure reduction
- Main and service replacement
- Optimized repair time



# Water Audit Deliverables – MNWD

1. Tailored Water Balance Worksheet
  - Water Supplied
  - Authorized Consumption
  - Apparent Loss (Meters) Determination
  - Real Loss Determination
  - Component Analysis Summary
2. Water Audit Data Collection Protocols and Training – BMP 1.2
3. Final Tech Memo
  - Findings
  - General Water Loss Control Recommendations

# Preliminary Water Loss Results

Audit Period Selected	-	FY 2013 – 14
Preliminary Water Loss %	-	8.3 %
Apparent Meter Loss	-	Very Low (0.6%) = Excellent
Real Water Losses	-	< 7.7%
<b>Water Loss Control Strategies-</b>		<b>TBD</b>

# Questions?

