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## Systematic Municipal Water Use Accounting and GPCD Calculations

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*NM Office of the State Engineer*

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# Systematic Municipal Water Use Accounting and GPCD Calculations

John W. Longworth, P.E. -- Chief  
Water Use and Conservation Bureau  
NM Office of the State Engineer



# Background

- To provide standardization for administrative review
  - 40-Year Water Planning
  - Water Conservation Plans
  - Permitting Requirements
- Two considerations
  - System
  - End user

# Water Use Accounting

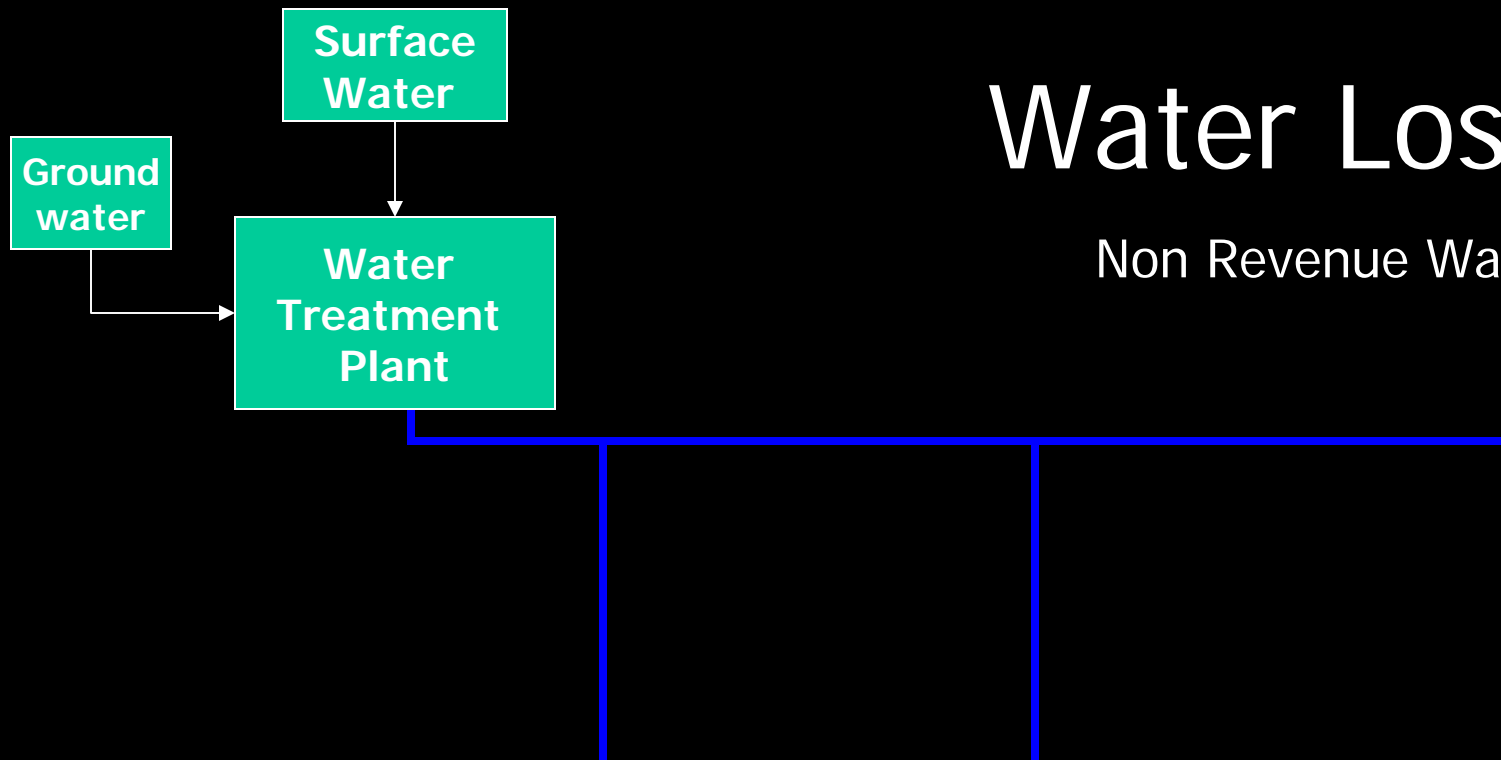
- AWWA Standards for Water System Audits
  - 1991 “Unaccounted for Water”
  - 2000 IWA/AWWA Water Balance
    - Provides consistent terminology
    - Water Use Accounting nothing left “unaccounted for”
    - Meaningful Assessment of Revenue and Non-Revenue Water
- System focus

# AWWA Water Loss Accounting

System Input Volume (corrected for known errors)	Authorized Consumption	Billed Authorized Consumption	Billed Metered Consumption (including water exported)	Revenue Water
			Billed Unmetered Consumption	
	Unbilled Authorized Consumption	Unbilled Metered Consumption	Non- Revenue Water (NRW)	
		Unbilled Unmetered Consumption		
	Apparent Losses	Unauthorized Consumption	Non- Revenue Water (NRW)	
		Customer Metering Inaccuracies		
		Data Handling Errors		
	Water Losses  Real Losses	Leakage on Transmission and Distribution Mains	Non- Revenue Water (NRW)	
		Leakage and Overflows at Utility's Storage Tanks		
		Leakage on Service Connections up to point of Customer metering		

# Water Losses

Non Revenue Water

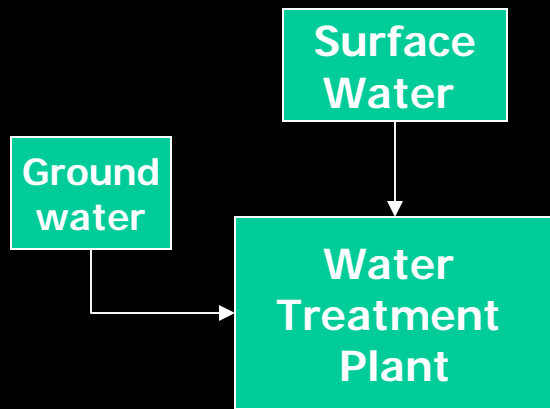


## Apparent Losses

- Meter Inaccuracies
- Data Handling Errors
- Unauthorized Consumption

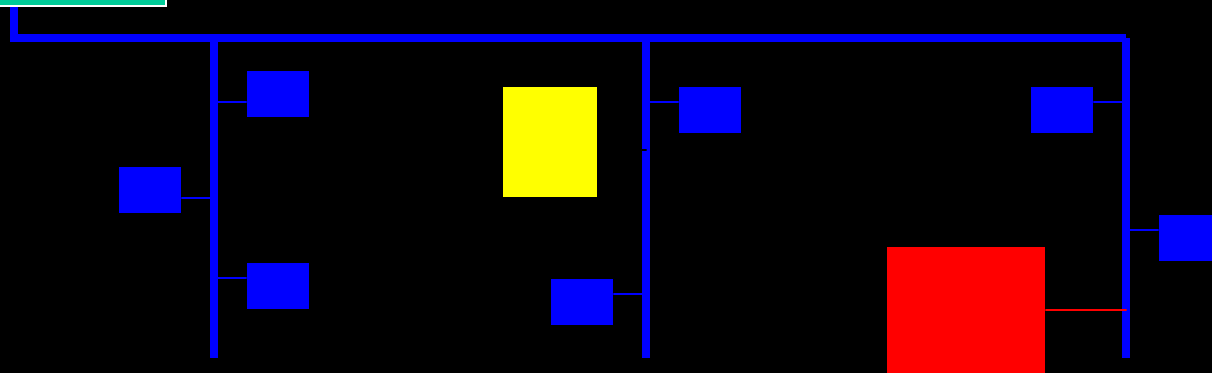
## Real Losses

- Leaks in Distribution
- Overflows at Storage Tank



# Authorized Consumption

Billed/Revenue Water

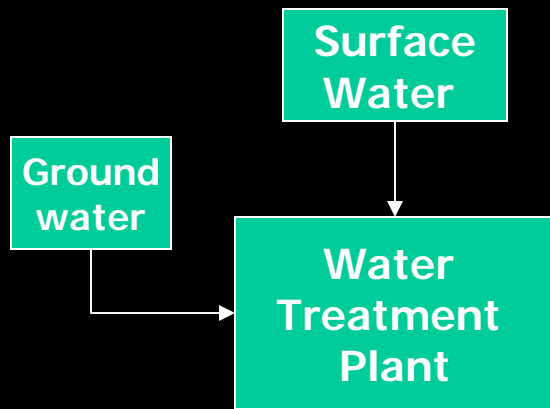


## Billed Metered

- By Sector
  - SF Residential
  - MF Residential
  - Commercial
  - Institutional

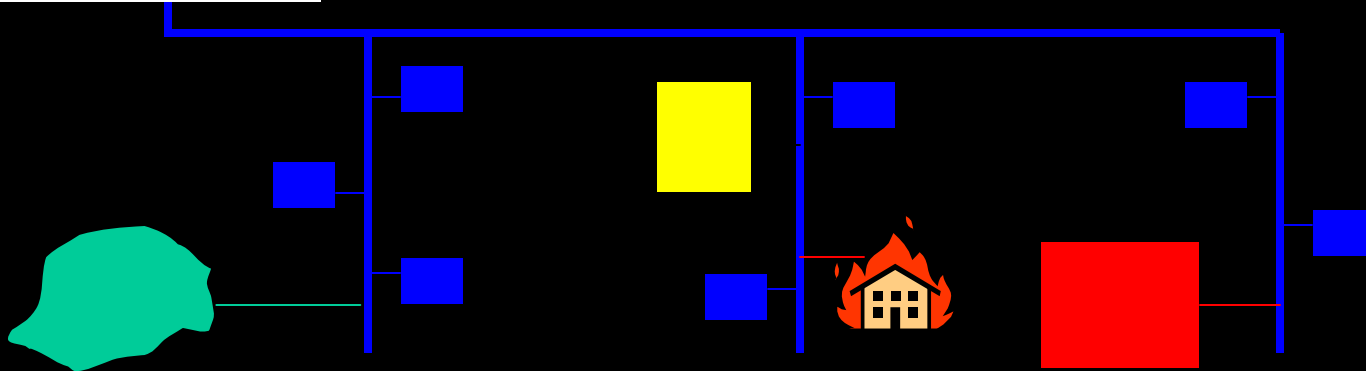
## Billed Unmetered

- Estimates
- Flat rates



# Authorized Consumption

Unbilled/Non Revenue Water



## Unbilled Metered

- City Parks/Pools
- City Buildings

## Unbilled Unmetered

- Fire Fighting
- Street Cleaning
- Line Flushing



# AWWA Water Loss Accounting

System Input Volume (corrected for known errors)	Authorized Consumption	Billed Authorized Consumption	Billed Metered Consumption (including water exported)	Revenue Water	
			Billed Unmetered Consumption		
	Water Losses	Unbilled Authorized Consumption	Unbilled Authorized Consumption	Unbilled Metered Consumption	Non- Revenue Water (NRW)
				Unbilled Unmetered Consumption	
		Apparent Losses		Unauthorized Consumption	
				Customer Metering Inaccuracies	
				Data Handling Errors	
		Real Losses		Leakage on Transmission and Distribution Mains	
				Leakage and Overflows at Utility's Storage Tanks	
				Leakage on Service Connections up to point of Customer metering	

# NM Water Use Accounting Pilot Projects

- Gallup
  - Ruidoso
  - Las Vegas
  - Rio Rancho – results pending
- } online at [www.ose.nm.us](http://www.ose.nm.us)

It provides detailed understanding of where all the water is going.

# GPCD Calculations

- Researched other state's approaches
- Proposed methodology
  - Obtained outside peer review
- End users measure

# GPCD Research

- States implementing standardized GPCD
  - Kansas, Arizona, Texas and Florida
- All States had unique methodology
  - Similarities
    - Diversion over population
  - Differences
    - Adjustments to diversions
  - Concerns
    - Populations calculation
    - Difficult to compare -- System

# NMOSE Proposed Methodology

- More than one “GPCD” necessary to paint comparable picture
  - Total System
  - Residential
- Population calculated by:
  - Persons per household from US Census Bureau
  - Single family residential connections
  - Multifamily units
  - Vacancy rate from US Census Bureau
- Monthly or seasonal averages helpful for conservation assessment

# NMOSE Proposed Methodology

- Residential GPCD = total residential billed/  
residential population
- Total System = total production/ (residential  
population + multifamily population)
- Difference between total system and  
residential = ICI and system losses
  - Considering these as separate indicators

# Implementation

NMOSE is currently:

- Evaluating the research, peer reviews and pilot projects
- Evaluating the benefits of a potential pilot of the GPCD methodology
- Considering all options for implementation of both the water use accounting and GPCD methodologies

# Questions?

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[www.ose.state.nm.us/water-info/conservation](http://www.ose.state.nm.us/water-info/conservation)