This presentation premiered at WaterSmart Innovations

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The California Water Loss Technical Assistance Program:

The Largest Water Audit Validation Program Yet

WaterSmart Innovations 2017

American Water Works Association California-Nevada Section

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

CALIFORNIA Water Boards

WSO

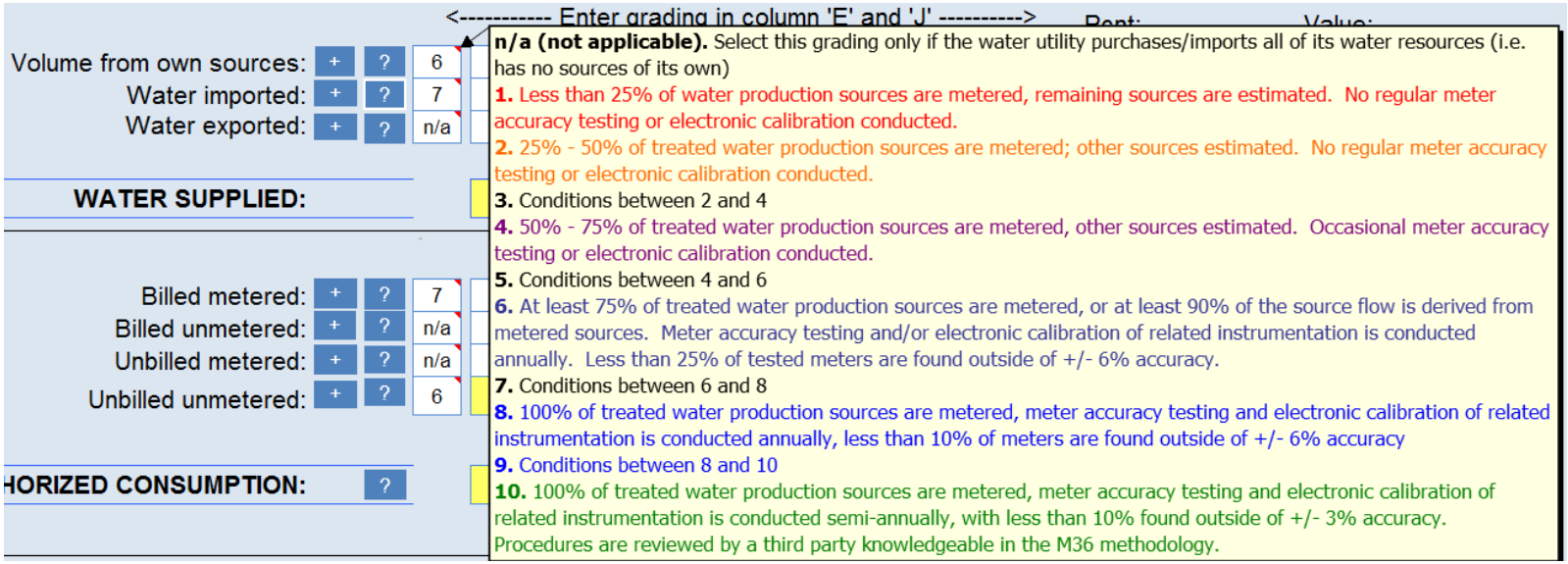
CAVANAUGH Stewardship Through Innovation

Topics

- **Context** – *water loss and validation*
- **Water Loss TAP** – *goals & approach*
- **Participation to date**
- **Insight so far!**

Water Loss 101

AWWA Free Water Audit Software – *volumes, validity*



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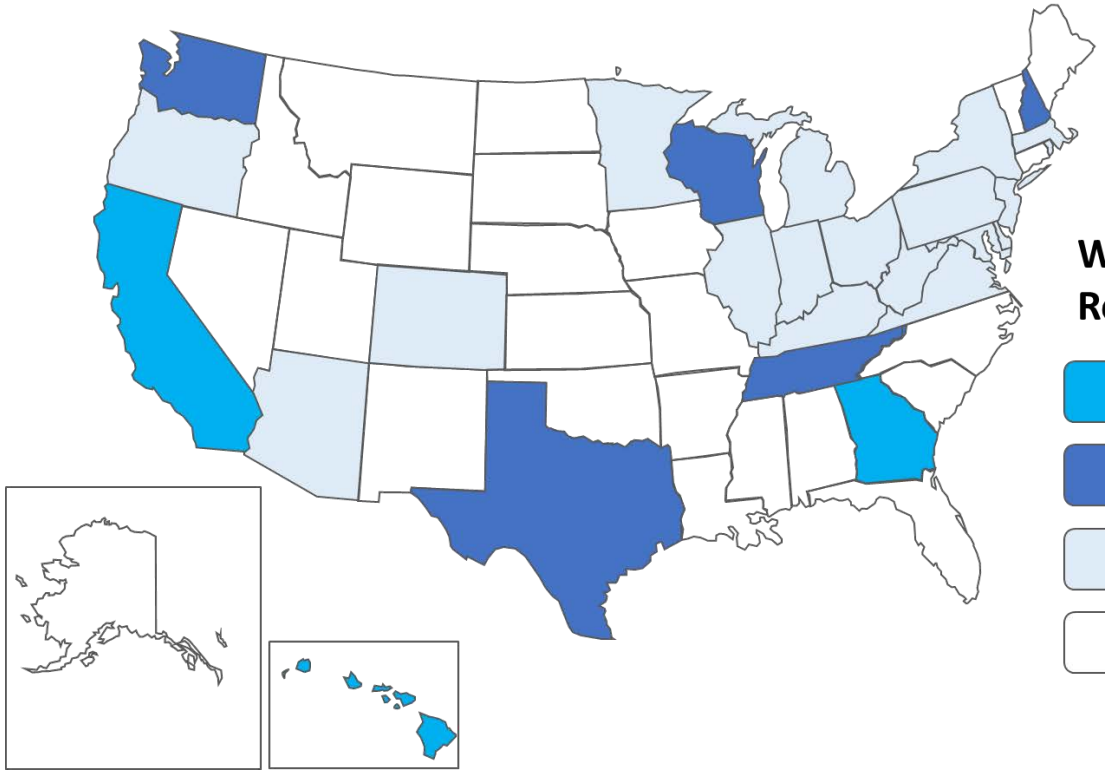
National Context



California Context

SB555 – requires annual reporting of AWWA water audit with level 1 validation

2019-2020: water loss performance targets

No targets/standards until then!

Level 1 Validation

Goals: quality and consistency

1. Review audit methodology and input determinations
2. Verify Data Validity Grade selections

Guidance manual: Water Research Foundation 4639

Water Loss TAP

1. Level 1 validate retail urban water supplier water audits submitted from across the state to DWR in 2017 submittal cycle

2. Teach water auditing and water loss control best-practice methods

Standardize Data Validity Grade criteria application in CA

Water Loss TAP Phases

WAVE 1	WAVE 2	WAVE 3	WAVE 4
in-person work session	teleconference work session	in-person work session	teleconference validation session
Aug 2016			Oct 2017

- progressive learning model
- value of practice rounds in Wave 2
- two tracks to accommodate different experiences

Some Numbers – Audit Validations

424 Retail urban water suppliers subject to SB555

408 Retail urban water suppliers registered (96%)

28 Wholesale water suppliers registered

400 Water audits validated to date in Wave 4!

Some Numbers - Participants

1,500 People participated over 4 Waves

73 Workshops taught

Observations

• Water audits are familiar to some (UWMPs, early adopters)	→	• Opportunities for refining audit inputs and institutionalizing audit practices
• Production meter accuracy testing is not standard *Electronic calibration is much more common*	→	• Uncertainty around accuracy of Water Supplied volumes and resulting Water Loss volumes
• Customer meter testing programs are infrequent and focus on targeted groups (large meters, old meters)	→	• Apparent Losses are estimated, reducing confidence in Real Loss estimation

Observations

- Data Validity Grade language requires some interpretation →
- Additional guidance necessary to standardize grade application

BILLED METERED – DVG CRITERIA	ADDITIONAL GUIDANCE
4. At least 75% of customers are metered……only very limited meter accuracy testing is conducted. Customer meters are replaced only upon complete failure. Computerized billing records exist, but only sporadic internal auditing conducted.	Very limited testing (reactive) = complaint based or consumption flag testing only Sporadic = less than annual
6. At least 90% of customers are metered……only limited meter accuracy testing is conducted. Regular replacement is conducted for the oldest meters. Computerized billing records exist with annual auditing of summary statistics conducted by utility personnel.	Limited testing (proactive) = more than reactive testing (per DVG of 4), targeted to certain subsets but not representative sampling of full meter population Summary statistics = monthly, or annual, total volumes year to year

Observations

- AWWA Free Water Audit Software isn't designed for wholesale systems

Table 1: Performance Indicators Applicable to Wholesale Agencies

	APPLICABLE?	UNITS
FINANCIAL PERFORMANCE INDICATORS		
Non-Revenue as percent by volume of Water Supplied	NO	
Non-Revenue as percent by cost of operating system	NO	
annual cost of Apparent Losses	**YES**	*valued at customer retail unit cost*
annual cost of Real Losses	**YES**	*valued at variable production cost*
OPERATIONAL EFFICIENCY PERFORMANCE INDICATORS		
Apparent Losses per service connection per day	**YES**	gal / conn / day
Real Losses per service connection per day	NO	gal / conn / day
Real Losses per length of main per day	**YES**	gal / mile / day
Real Losses per service connection per day per PSI of pressure	NO	gal / conn / day / PSI

→

- Wholesale guide to Water Audit Software is necessary; some data validity grades and performance indicators don't apply to wholesalers

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Observations

- Level 1 validation doesn't fix all errors embedded in water audits
  15 Wave 4 validated water audits currently indicate negative leakage
  → Deeper analytic (level 2) or field (level 3) validation may be necessary

- All departments contribute to the water audit
  → Building a utility water audit team makes water auditing easier and more accurate

What's Next?

Involving the stragglers – utilities that didn't submit by 10/1

2018 audit compilation, validation, and submission

How will audits be validated?

2019-2020 benchmarking and target setting

Target Setting

Water loss targets depend on:

- Infrastructure
- Value of water

} ***Every agency is unique!***

Volumes

Values

Validity

No percent targets (obsolete)

SAVE THE DATE

December 3 - 5, 2017
Paradise Point Resort · San Diego, CA

The North American Water Loss Conference (NAWL) will assemble policy and technical experts on non-revenue water management in North America.

Presented by: American Water Works Association California-Nevada Section

In cooperation with the American Water Works Association, the Alliance for Water Efficiency and the NAWL 2017 Conference Planning Committee.

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Sponsorships will be available.

Partnering Organizations:

Alliance for Water Efficiency

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EPA WaterSense

www.northamericanwaterloss.org

Questions?

www.californiawaterloss.org

Water audit data to be published by CA DWR.