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# WaterSense® Public Meeting

## Notice of Intent (NOI) for Bath and Shower Diverters

Public Meeting  
February 8, 2017  
Stephanie Tanner, EPA

# Housekeeping

- All attendees are muted to minimize background noise.
- Please type questions into the Questions box in the GoToWebinar control panel. We will have a dedicated time for Q&A at the end of each section and at the end of the presentation as time allows.
- This PowerPoint presentation will be posted on the partner website following the call.
- Submit written comments to: [watersense-products@erg.com](mailto:watersense-products@erg.com)
- This meeting is meant to be an open discussion.
- All questions, comments, and concerns are welcome!

# Meeting Agenda



- Introduction to WaterSense
- Bath and Shower Diverter Background
- Notice of Intent (NOI) for Bath and Shower Diverters
  - Scope
  - Leak rate criteria
  - Performance criteria and product testing
  - Product marking and marketing
- Other Issues and Next Steps

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Part 1:

# Introduction to WaterSense





# What Is WaterSense?

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- Voluntary partnership and labeling program launched by EPA in 2006 designed to reduce municipal water use across the country
- Simple way for consumers to identify products that are water-efficient **and** perform well
- A label with integrity—products are independently certified
- Aims to increase the adoption of water-efficient products, homes, and programs by consumers and organizations



# WaterSense Product Evaluation Factors

WaterSense uses several factors to determine which products to label.

- Products must:
  - Offer equivalent or superior performance
  - Be about 20 percent more water-efficient than standard models
  - Realize water savings on a national level
  - Provide measurable results
  - Achieve water efficiency through several technological options
  - Be effectively differentiated by the WaterSense label
  - Be independently certified

# WaterSense Labeled Products



**Flushing  
Urinals**



**Lavatory  
Faucets**



**Irrigation  
Controllers**

**More than 21,000  
product models have  
earned the  
WaterSense label**



**Tank-Type  
Toilets**



**Showerheads**



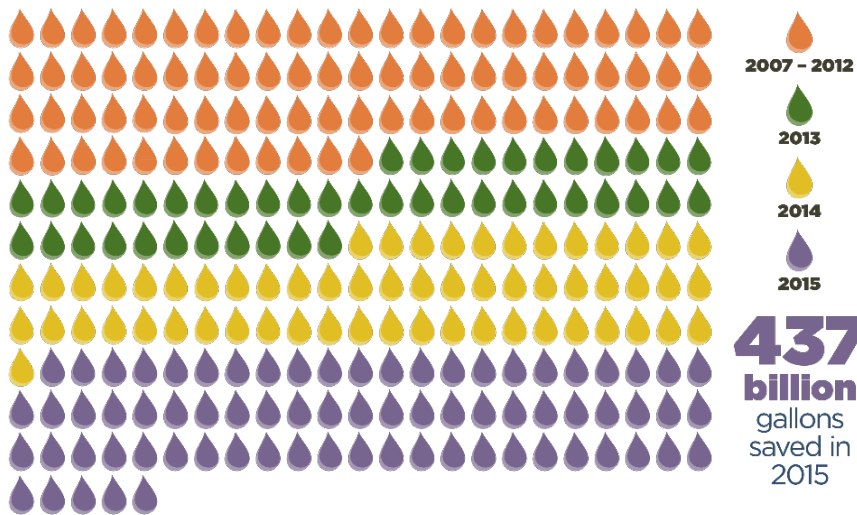
**Pre-Rinse  
Spray Valves**



**Flushometer-Valve  
Toilets**

# Accomplishments

**1.5 trillion** gallons of water saved since 2006!

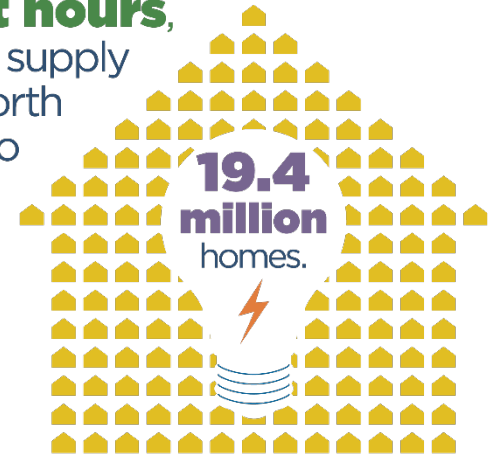


That's **more than** the amount of water used by all of the households in **California** for a year!

**WaterSense** has helped **reduce** the amount of **energy needed** to heat, pump, and treat water by

**212 billion**

**kilowatt hours,** enough to supply a year's worth of power to more than



WaterSense partners helped...



...**consumers** **save**

**\$32.6 billion**

in water and energy bills



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Part 2:

# Bath and Shower Diverter Background

Richa Sharma, EPA

# Bath and Shower Diverter Background

- A bath and shower diverter diverts the flow of water either to the bath tub through the tub spout or to the showerhead.
- Commonly found in residential bathrooms and private commercial restrooms (e.g., hotels)



Tub Spout Diverters



Tub-to-Shower Diverters

# Bath and Shower Diverter Background

- There are 4 common types of diverters:

## Tub Spout Diverters

### 1. Lift-type



### 2. Pull-type



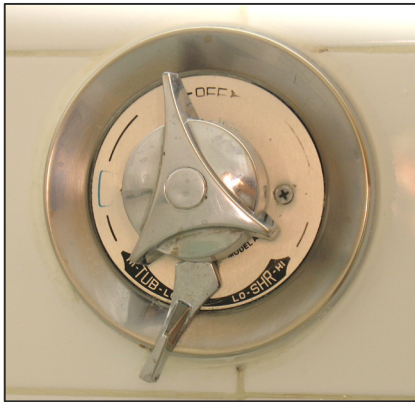


# Bath and Shower Diverter Background

- There are 4 common types of diverters:

## Tub-to-Shower Diverters

### 3. Turn-type



### 4. Push-type





# Bath and Shower Diverter Background

- Bath and shower diverters can leak water through the tub spout when the entire flow should be diverted to the showerhead.
- Leakage occurs throughout the shower event
- Leak rates typically increase over the lifetime of the product
- Often leak hot water, resulting in water **and** energy waste



# Bath and Shower Diverter Background

## Existing performance/efficiency standards:

- **National:** *ASME A112.18.1/CSA B125.1 Plumbing Supply Fittings*
- **State:** California Energy Commission's (CEC) *Appliance Efficiency Regulations*

Standard	Pre-Life Cycle Leak Rate	Post-Life Cycle Leak Rate
ASME A112.18.1/ CSA B125.1	0.1 gallons per minute (gpm)	0.2 gpm
CEC Appliance Efficiency Regulations	0.01 gpm	0.05 gpm

# Taitem Engineering Field Study

- In 2011, Taitem Engineering, PC, LLC. assessed bath and shower diverter leaks for the New York State Housing and Community Renewal Weatherization Assistance program.
- Examined 120 bath and shower diverters in residential apartment buildings:
  - 34 percent of diverters leaked more than 0.1 gpm
  - The largest leak observed was 3.0 gpm
  - The average of all leaks greater than 0.1 gpm was 0.8 gpm



Taitem Engineering, PC, 2011.  
“Leaking Shower Diverters”

# Fort Carson Field Surveys

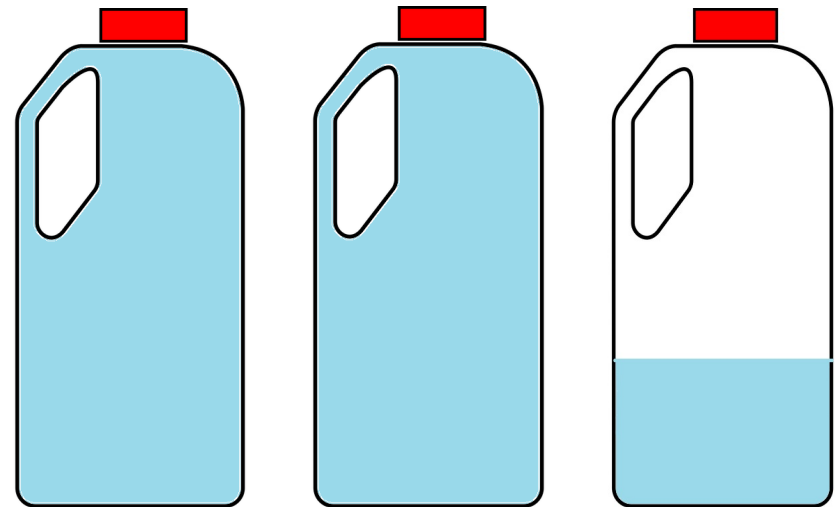
- In 2015, Johnson Controls, Inc. assessed bath and shower diverter leak rates in Fort Carson, Colorado.
- Examined 82 bath and shower diverters:
  - All diverters examined are estimated to be more than 10 years old.
  - Found an average leak rate of 0.7 gpm.



# Bath and Shower Diverter Background

- EPA estimates there are 145 million bath and shower diverters installed in homes and another 3 million in hotels across the United States.
- Field studies show older models can leak as much as 3.0 gpm, and on average, leak 0.3 gpm.
- A 0.3 gpm diverter leak during a typical shower will produce 2.3 gallons of wasted water!

2.3 Gallons



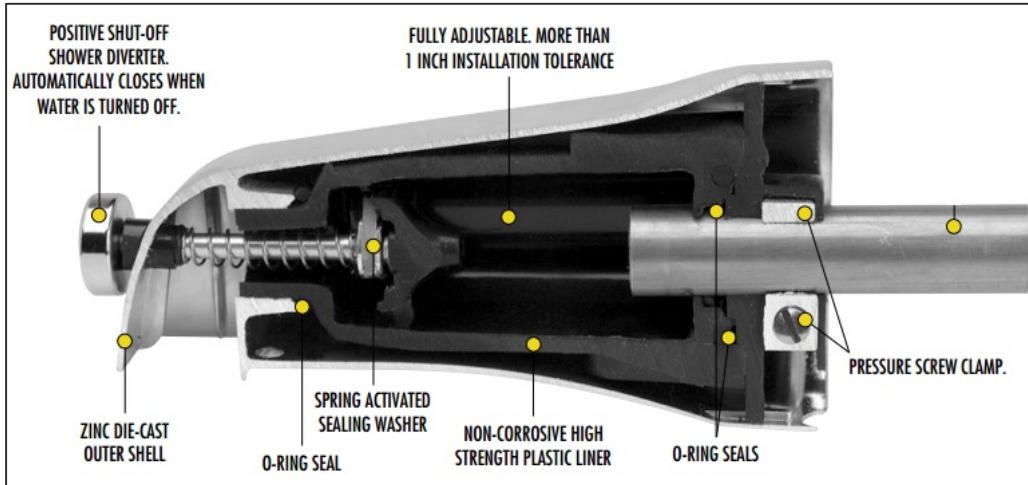
# Bath and Shower Diverter Background

- One American household could eliminate an average of more than **1,500 gallons of water waste every year** by replacing all of its old, leaky bath and shower diverters with models with no significant leakage.
- Many models currently on the market can eliminate leaks entirely.



# Bath and Shower Diverter Background

- New, innovative designs



# Bath and Shower Diverter Background Summary

WaterSense Labeled Product	Estimated Annual Water Savings (gal)
Pre-Rinse Spray Valves	7,000
Flushing Urinals	4,600
Showerheads	2,900
<b>Bath and Shower Diverters</b>	<b>1,500</b>
Faucet Aerators	700

A utility serving 200,000 households that replace their old, leaky bath and shower diverters could save  
**309 million gallons a year.**



# Bath and Shower Diverter Background Summary

- A WaterSense specification for bath and shower diverters would
  - Draw attention to old, leaky diverters that persistently waste water and energy
  - Recognize the top performing technologies on the market
  - Drive the market to offer even more options that effectively do not leak

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# Questions?



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Part 3:

# Notice of Intent (NOI) for Bath and Shower Diverters

Tessa Roscoe, Eastern Research Group

# Scope Considerations

- WaterSense labeling criteria for bath and shower diverters will apply to:
  - Product Category: Bath and Shower Diverters
  - Product Families: Tub Spout and Tub-to-Shower Diverters
  - These categories will be defined for the draft specification
- WaterSense intends to exclude:
  - Other types of diverters (shower-to-shower, bidet, shampoo, shower-to-body spray diverters, etc.)
  - Companion products such as twin ell adaptors, vacuum breakers, or in-line flow control devices



# Scope and Definitions



- **Bath and Shower Diverter:** a device used to direct the flow of water either toward a tub spout or toward a secondary outlet intended for showering purposes (e.g., showerhead, body spray)
- **Tub spout diverter:** a diverter mechanism that is embedded in the tub spout fitting
- **Tub-to-shower diverter:** a diverter mechanism that is embedded as a valve in the plumbing hidden behind the wall



# Scope Questions and Discussion



- Are there any other accepted industry or regulatory definitions of which WaterSense should be aware?
- Are there any companion products that impact the water efficiency and performance of bath and shower diverters that need to be considered for a draft specification?
- Other questions/discussion?

# Proposed Criteria: Product Life Cycle

- WaterSense is considering setting leak rate limits that apply to the entirety of a bath and shower diverter's life cycle by establishing:
  - a pre-life cycle leak rate limit and
  - a post-life cycle leak rate limit
- WaterSense is considering adopting 15,000 cycles for a bath and shower diverter life cycle, same as the ASME/CSA standard.
- 15,000 cycles = +22 years of use in a typical home



# Proposed Criteria: Leak Rate



- WaterSense is considering setting “0-0” limits for bath and shower diverters.

Standard	Pre-Life Cycle Leak Rate	Post-Life Cycle Leak Rate
National: ASME/CSA	0.1 gpm	0.2 gpm
State: CEC	0.01 gpm	0.05 gpm
WaterSense	0 gpm	0 gpm



# Proposed Criteria: Leak Rate



Diverter	Total Models in Database	No. Models With “0-0” Test Results	% Models With “0-0” Test Results
Lift-Type	1907	535	28%
Pull-Type	183	69	38%
Push-Type	149	53	36%
Turn-Type	658	596	91%
<b>Total</b>	<b>2,897</b>	<b>1,253</b>	<b>43%</b>

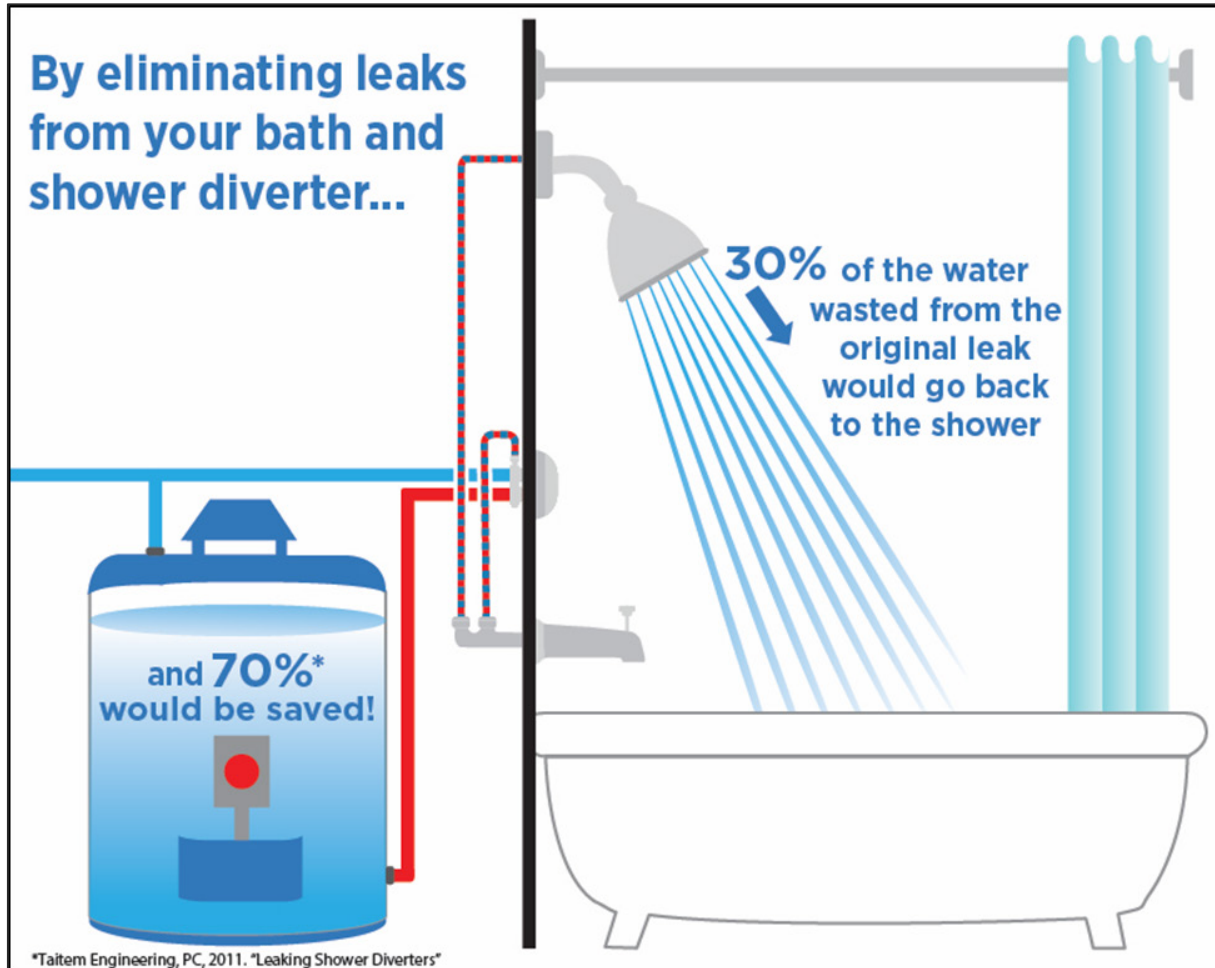
- WaterSense aims to drive the market to offer even more options that effectively do not leak.

Source: MAEDBS: Appliance Efficiency Database (AED). California Energy Commission, 2017.

# Leak Rate Criteria: Savings Factor

- When a diverter leak is fixed, some of the water is diverted to the showerhead and used in the shower event.
- Taitem Engineering's study quantifies the fraction of water not diverted back to the shower as the savings factor.
- Based on Taitem Engineering's study, the actual household savings from replacing leaking diverters would be reduced.
- The savings factor can be impacted by system water pressure, the magnitude of the initial leak, and showerhead selection.

# Leak Rate Criteria: Savings Factor



# Leak Rate Criteria: Poll Follow-up Questions

- Are there any other life cycle definitions for bath and shower diverters that WaterSense should consider?
- If so, is there additional information WaterSense should consider when determining an appropriate value for this savings factor?





# Leak Rate Criteria Questions and Discussion



- What constitutes “zero leakage”?
- How much leak tolerance is required, if any, to encompass automatic reset diverters?
- Other questions/discussion?

# Product and Performance Testing

- Bath and shower diverters must conform to applicable requirements within the ASME/CSA standard.
- Bath and shower diverters shall be tested for leakage:
  - At 10 psi flowing pressure
  - Measured between the diverter and the secondary outlet at 12 inches from the diverter
  - With water at  $100 \pm 10^{\circ}\text{F}$
  - Measurements shall be taken for 5 minutes, beginning 1 minute after the diverter is activated

# Performance Requirements Questions and Discussion

- Are there other factors that can cause a bath and shower diverter to leak that should be addressed?
- Does fixing a leaking bath and shower diverter cause any impacts to the system or to user health and safety that WaterSense has not considered?
- Other questions/discussion?

# Product Marking for Bath and Shower Diverters

- Currently, no existing standard or regulation requires rated leak rates to be marked on product packaging.
- Under a WaterSense specification, bath and shower diverters and their packaging would be marked in accordance with the ASME/CSA standard.



# Marking for Combination Packages

- Sometimes a showerhead and a tub spout complete with a bath and shower diverter are packaged together in a showerhead-tub spout diverter combination.
- WaterSense is considering requiring both products in combination packages to be individually certified for the combination package to earn the WaterSense label.

# Product Marking Questions and Discussion

- Currently, how are bath and shower diverters and their packaging and documentation marked to communicate tested leak rates?
- Are there any unforeseen impacts of requiring both a showerhead and a bath and shower diverter to earn the WaterSense label in order for their combination packaging to bear the label?

# Product Terminology and Marketing

- WaterSense does not anticipate using common efficiency descriptors (such as water-efficient or high-efficiency) to describe bath and shower diverters.
- Alternative descriptors for bath and shower diverters:
  - Leakless
  - Dripleless

# Product Marketing Questions and Discussion

- Should the proposed terms and definitions also be used for marketing purposes?
- What other phrasing or terminology conveys a concept of no measurable leakage throughout the lifetime of the bath and shower diverter?

# Product Marketing Questions and Discussion

- What are the best ways to raise consumer awareness of bath and shower diverter leaks and the availability of product versions that eliminate leaks?
- What are the best ways to engage the plumbing community in this specification design process?
- Questions/discussion?



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# Part 4: Other Issues and Next Steps

Stephanie Tanner, EPA

# Next Steps

- NOI can be reviewed at:
  - [www.epa.gov/watersense/products/bath\\_and\\_shower\\_diverters.html](http://www.epa.gov/watersense/products/bath_and_shower_diverters.html)
- Submit written comments to:  
[watersense-products@erg.com](mailto:watersense-products@erg.com)
- EPA will make the comments received public before the publication of the draft specification. .
- Draft specification anticipated in Spring/Summer 2017

# Contact Us



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