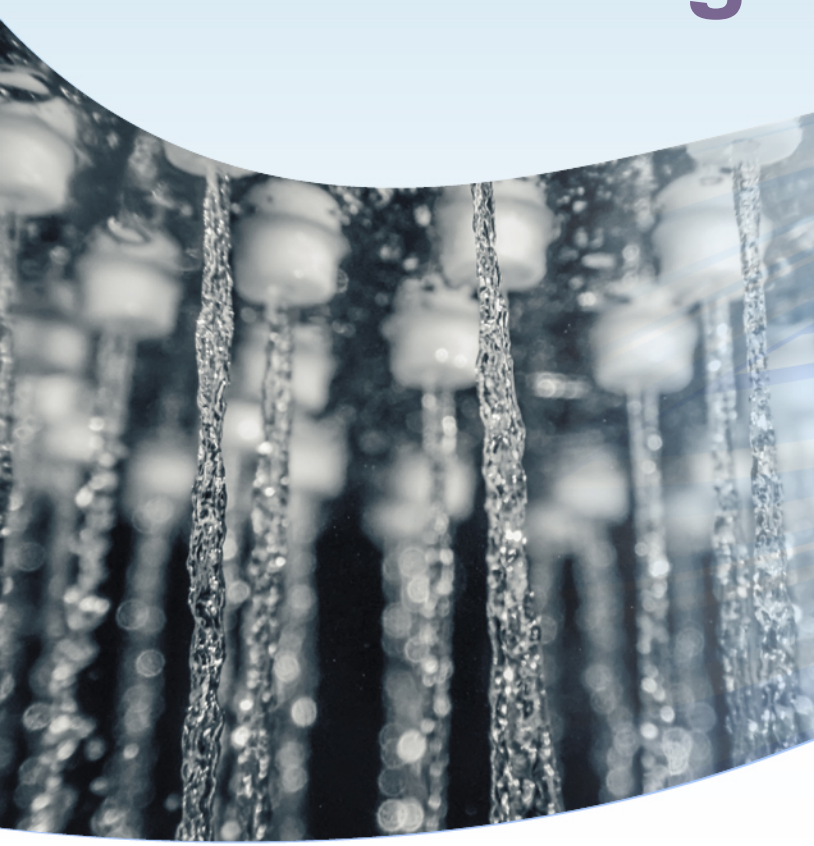
WaterSense®

Plumbing Fittings Webinar



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April 24, 2019

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 and a meeting summary will be posted on the public website
- Submit written comments to: watersense-products@erg.com
- This meeting is meant to be an open discussion
- All questions, comments, and concerns are welcome!

Meeting Objective

- Present information EPA has collected as part of its specification review
- Summarize issues and considerations EPA must address if it decides to revise the scope, water efficiency criteria, and/or performance criteria of a specification
- Review public comments received to date on the *Notice of Specification Review,* as they relate to plumbing fittings
- Solicit additional feedback and information from manufacturer stakeholders
- EPA does not intend to make a determination as to whether to move forward with a specification revision during this meeting

Agenda

- Lavatory Faucet Specification Considerations
  - Water Efficiency Criteria
  - Performance Criteria
  - Scope Expansion
    - Kitchen Faucets
    - Metering Faucets
- Showerhead Specification Considerations
  - Water Efficiency Criteria
  - Performance Criteria
- General Considerations
  - Declining Flows
  - Water Quality
  - Public Health
- Next Steps

Specification Review Process

Thru Mar 2019

Internal Research
- Update product information, analyze WaterSense product database, conduct industry research
- Issue *Notice of Specification Review* and hold first stakeholder meeting

Mar-Jun 2019

Stakeholder Engagement
- Hold meetings with individual partners, standards committees, industry experts, and utilities
- Review comments, conduct additional analysis based on in house data
- Hold product type meetings with stakeholders to review information collection to date

We are here

Jun-Aug 2019

Analysis
- Compile additional comments received and post to website
- Review and analyze information collected
- Continue engagement with standard committees and industry as necessary

Aug-Dec 2019

Develop Recommendations and Announce to Stakeholders by 31 December 2019
- Develop recommendations and review with EPA Management
- By December, present recommendations, post material to website, host public meetings

Part 1

Lavatory Faucets Specification Considerations

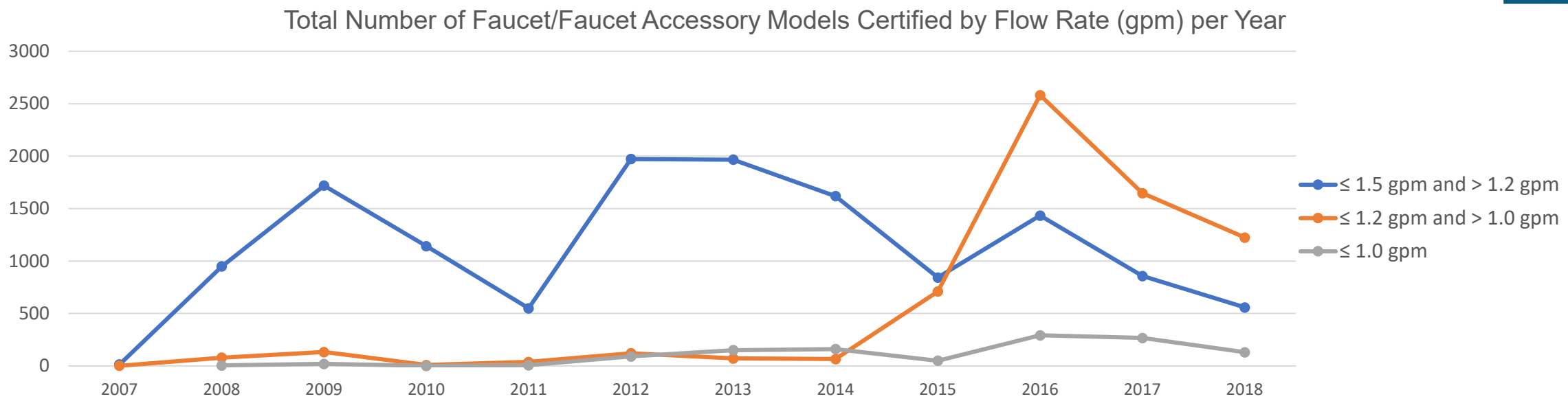
Specification for High-Efficiency Lavatory Faucets

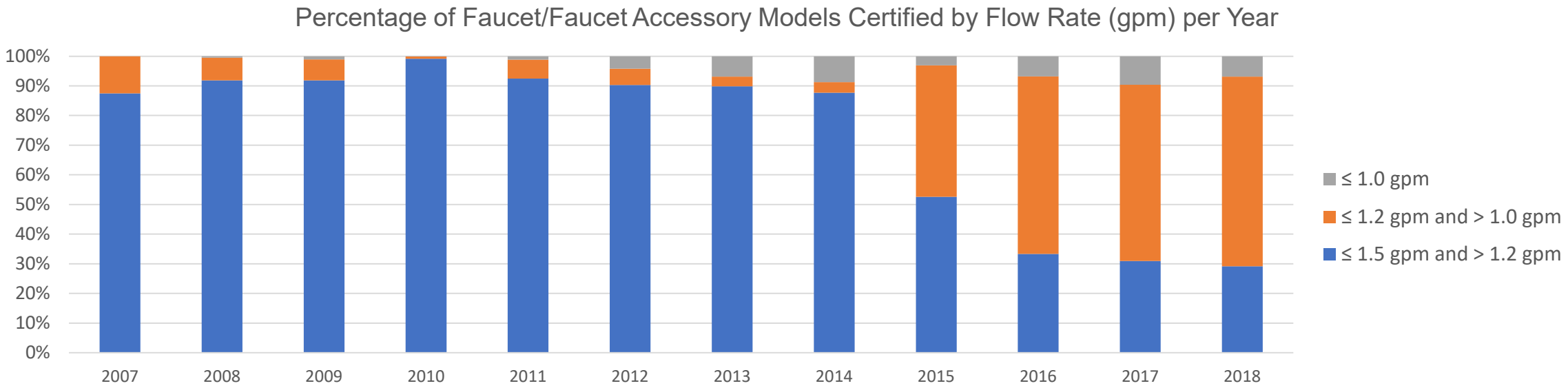
WaterSense High-Efficiency Lavatory Faucet Specification

- Released October 1, 2007
- Approximately 300 manufacturer partners
- Scope includes lavatory faucets, faucet accessories (e.g., aerators, laminar flow control devices), and bar sinks

Maximum Flow Rate	≤ 1.5 gpm and > 1.2 gpm	≤ 1.2 gpm and > 1.0 gpm	≤ 1.0 gpm	Total
Number of Models	9,534	5,847	1,164	16,545
Percentage of Total	57.6%	35.5%	7.0%	-

Certification Trends





Specification for High-Efficiency Lavatory Faucets

Water Efficiency Requirements

- The **maximum flow rate** shall be ≤ 1.5 gallons per minute (gpm) at a flowing pressure of 60 pounds per square inch (psi)

Performance Requirements

- Lavatory faucets and faucet accessories shall **conform to applicable ASME requirements**
- The **minimum flow rate** shall ≥ 0.8 gpm at a flowing pressure of 20 psi
- The product and/or product packaging shall be **marked** with the maximum flow rate

Water Efficiency Considerations

Reducing the maximum flow rate criteria below 1.5 gpm

Background

- Four states and multiple municipalities have adopted regulations mandating that faucets have a maximum flow rate of 1.5 gpm or less, consistent with the WaterSense water efficiency criteria
- As of 2016, the California Appliance Efficiency Regulations require lavatory faucets sold in California to flow at 1.2 gpm or less
- The California Modernized Appliance Efficiency Database System (MAEDBS) lists more than 21,000 compliant models flowing at 1.2 gpm or 1.0 gpm
- 42% of WaterSense labeled lavatory faucets and faucet accessories achieve a maximum flow rate of 1.2 gpm or less

Retail Market Research

- As part of its comments on the *Notice of Specification Review*, the Metropolitan North Georgia Water Planning District conducted retail market research on lavatory faucets
- Visited 12 different locations of Home Depot, Lowe's, and Walmart
- Georgia has a statewide maximum allowable flow rate of 1.5 gpm for lavatory faucets
- Findings
  - 98% of all lavatory faucets had flow rates at or below 1.2 gpm

Water Savings Studies & Analysis

The EPA examined the following resources to evaluate the water savings potential of a lower faucet flow rate:

Water Research Foundation (WRF) Residential End Uses of Water (REU) Study (2016)*

- Average household faucet use in 2016 was 26.3 gallons per household per day (gphd), down just 1.5 percent from 1999
- 95% of the faucet events had flow rates of 1.39 gpm or less, most with flow rates less than 0.48 gpm

Aquacraft East Bay Municipal District (2000) and Seattle (2003) studies (as cited in current specification supporting statement)*

- Estimated average 0.6 gallons per capita per day (gcpd) savings associated with lowering lavatory faucet flow rate from 2.2 to 1.5 gpm

Aquacraft Tampa Study (2004) (as cited in current specification supporting statement)*

- Evaluated savings from reducing the flow rate to 1.0 gpm for lavatory faucet aerators and 1.5 gpm for kitchen faucets
- Found a savings of 3.2 gcpd, though the savings contribution was not be differentiated between kitchen and lavatory faucets

CEC Staff Analysis (2014)

- Estimated that lowering the flow rate to 1.2 gpm would save 2.5 billion gallons of water in the first year of implementation in California
- Differentiates kitchen and lavatory faucet use based on theoretical assumptions

**Did not differentiate between kitchen and lavatory faucet use*

Preliminary Water Savings Potential

- Lowering the flow rate maximum to:
  - 1.2 gpm would represent an additional 20% increase in efficiency over the current WaterSense specification and 45% increase over the national standard
  - 1.0 gpm would represent an additional 33% increase in efficiency over the current WaterSense specification and 55% increase over the national standard

Gallons Per Minute (gpm)	Potential Annual Savings Beyond 1.5 gpm for New Lavatory Faucets (billion gallons)	Potential Annual Savings Beyond 1.2 gpm for Existing Lavatory Faucets (billion gallons)	Total Savings Assuming 10% Market Share (billion gallons)
1.2 gpm*	0.3	26.1	2.6
1.0 gpm	0.5	45.8	4.6

*Excludes savings from California

Performance Considerations

Change Minimum Flow Rate

- Current Requirement
  - The minimum flow rate of 0.8 gpm at 20 psi ensures adequate flow for typical bathroom functions (face washing, shaving, teeth brushing)
  - Utility programs with 1.0 gpm faucet aerators have shown a high level of user satisfaction

- Revision Considerations
  - If EPA were to lower its maximum flow rate requirements, the current minimum flow rate could become harder to achieve. However, there are currently many faucets with flow rates between 1.2 and 1.0 gpm capable of meeting WaterSense's minimum criteria
  - Lowering the maximum flow rate will likely drive incorporation of pressure compensation rather than fixed orifice flow control

Outstanding Questions

- Are there existing studies on the water efficiency and/or performance of lavatory faucets of which WaterSense should be aware?
- If WaterSense lowers the maximum flow rate criteria, should it also modify the minimum flow rate criteria?
- Is there anything else about water efficiency or performance that WaterSense should consider during its review process?

Questions and Discussion

Poll Question

Question: Based on what has been presented, does WaterSense have enough information to determine whether to revise its specification for lavatory faucets?

- Yes
- No

Poll Question

Question: In your opinion, should EPA revise the water efficiency criteria of the *WaterSense Specification for Lavatory Faucets*?

- Yes
- No
- Need more information

Scope Considerations

Current Specification Scope

- Applies to bar sink and lavatory faucets and accessories in private use
- Explicitly excludes metering faucets, lavatory faucets in public use, and kitchen faucets

Opportunities for Scope Expansion

- Residential kitchen faucets
- Metering faucets

Residential Kitchen Faucet Background

- The current federal standard is 2.2 gpm at 60 psi
- ASME A112.18.1/CSA B125.1 does not currently define residential kitchen faucets, however, they are defined in California Title 20 as follows:
  - “Kitchen Faucet means a faucet designed for discharge into a kitchen sink.”
- Excluded from the current scope because they have different uses, such as effectively rinsing dishes and filling pots and containers
- Consideration of residential kitchen faucets is driven by changes in the market, availability of products, and newly emerging state regulations
- Residential kitchen faucets are different than commercial kitchen faucets, which are intended for more specialized uses in commercial kitchens

Water Efficiency Considerations

- California and Vermont have adopted regulations mandating that residential kitchen faucets have a maximum flow rate of 1.8 gpm or less, but allow a temporary override up to 2.2 gpm
- Georgia requires kitchen faucets to flow at 2.0 gpm or less
- The California Modernized Appliance Efficiency Database System (MAEDBS) lists more than 19,000 compliant kitchen faucets and 1,400 kitchen faucet aerators flowing between 1.5 gpm and 1.8 gpm

Reported Flow Rate (gpm)		Number of Products		Percent	
		Kitchen Faucets	Kitchen Faucet Aerators	Kitchen Faucets	Kitchen Faucet Aerators
Qualifying Products in CEC Appliance Efficiency Database	< 0.5	999	8	4%	0.5%
	0.5 - 0.99	2,048	41	8%	2.5%
	1.0 -1.49	3,324	78	13%	5%
	1.5 - 1.69	6,386	946	25%	61%
	1.7 - 1.8	12,815	484	50%	31%
	Total	**25,572**	**1,557**	**100%**	**100%**

Retail Market Research

- Metropolitan North Georgia Water Planning District conducted retail market research on residential kitchen faucets
- Georgia has a statewide maximum allowable flow rate of 2.0 gpm for residential kitchen faucets
- Findings
  - 79% of faucets had flow rates of 1.8 gpm
  - 19% of faucets had flow rates of 1.5 gpm

Water Savings Studies & Analysis

WaterSense is not aware of any studies that have solely examined the use and savings specifically from kitchen faucets. The EPA examined the following resources to evaluate the water savings potential of a lower faucet flow rate:

Water Research Foundation (WRF) Residential End Uses of Water (REU) Study (2016)*

- Did not identify significantly different water use from faucets in the intervening years
- 95 percent of faucets had average flow rate events of 1.39 gpm or less, a majority of which were 0.48 gpm or less

CEC Staff Analysis (2014)

- Estimated that lowering the flow rate to 1.8 gpm would save 3.3 billion gallons of water in the first year of implementation in California
- Estimates that 72 percent of faucet use occurred in kitchens amounting to 41.6 occurrences per day based on the frequency of toilet and showerhead use to distinguish lavatory from kitchen faucet events

Tampa Study (2004) (as cited in current specification supporting statement)*

- Evaluated savings from kitchen faucets with a flow rate of 1.5 gpm and lavatory faucets with a flow rate of 1.0 gpm, but did not differentiate use or savings between the two
- The gallons per capita per day water use reduction from that study was more significant than the EMBUD and Seattle retrofit studies that did not evaluate a change in kitchen faucet flow rate (3.2 gpcd compared to 0.6 gcpd weighted average)

**Did not differentiate between kitchen and lavatory faucet use*

Water Efficiency Considerations and Preliminary Water Savings Potential

Efficiency Considerations

- Many faucet manufacturers have already transitioned residential kitchen faucet product lines
- Flow Rates of 1.8 gpm, 1.75 gpm, or 1.5 gpm would result in an 18%, 20%, and 32% increase in efficiency over the national standard, respectively
- A flow rate of 1.8 gpm would be consistent with state regulations in California and Vermont

Gallons Per Minute (gpm)	Potential Annual Savings for New Residential Kitchen Faucets (billion gallons)	Potential Annual Savings for Existing Residential Kitchen Faucets (billion gallons)	Total Savings Assuming 10% Market Share (billion gallons)
1.8 gpm*	0.9	86.9	8.8
1.75 gpm	1.0	99.5	10.1
1.5 gpm	1.6	160.0	16.2

*Excludes savings from California and Vermont

Performance Considerations

Temporary Override

- California and Vermont efficiency regulations allow for a temporary override
- Intended to counter perceived performance concerns, allowing for faster filling times and improved user satisfaction
- Most available kitchen faucets do not have this feature
- Neither ASME A112.18.1/CSA B125.1 nor the state efficiency regulations prescribe requirements or performance testing criteria for this feature

Multiple Modes

- Many residential kitchen faucets allow the user to switch from a traditional single stream of water to a spray stream for improved rinsing
- WaterSense would likely consider these types of faucets as “multi-modal”—only one mode is subject to all performance requirements but all modes must meet the maximum flow rate criteria

Minimum Flow Rate

- A minimum flow rate may be necessary to ensure adequate performance
- California and Vermont efficiency regulations do not have a minimum requirements

Metering Faucets Background

- Definitions:
  - ASME A112.18.1/CSA B125.1: A self-closing faucet that discharges water for a predetermined amount of time (i.e., cycle) or discharges a predetermined quantity of water before shutting off
  - California Title 20: a faucet that, when turned on, will gradually shut itself off over a period of several seconds
  - CalGreen: a self-closing faucet that dispenses a specific volume of water for each actuation cycle. The volume or cycle duration can be fixed or adjustable
- Metering faucets were excluded from the current scope because they have differing use patterns and user expectations compared to residential lavatory faucets
- Consideration of metering faucets is driven by
  - No maximum flow rate, only maximum volume per cycle. Cycle length is not defined
  - Reports that WaterSense aerators are being used on metering faucets to claim they are labeled

Metering Faucet Market Information

Products in DOE Compliance Certification Database

Reported Flow Rate (gpc)		Number of Models	Percent
Products in DOE Compliance Certification Database	≤0.10	169	9%
	0.11-0.15	92	5%
	0.16-0.20	134	8%
	0.21-0.25	1391	78%
Total		1786	100%

Products in California Appliance Efficiency Database

Reported Flow Rate (gpc)		Number of Models	Percent
Products in CEC Appliance Efficiency Database	≤0.10	332	18%
	0.11-0.15	136	7%
	0.16-0.20	80	4%
	0.21-0.25	1332	71%
Total		1880	100%

Applicable Requirements

Federal Requirement (EPAct)
Maximum water usage rate: 0.25 gallons per cycle (gpc)

California Title 20
Maximum water usage rate: 0.25 gpc

CalGreen
Maximum water usage rate: 0.20 gpc

American Disabilities Act (ADA)
Minimum cycle length: 10 seconds

- It is unclear how many metering faucets are sold in the U.S. each year compared to non-metering public faucets
- WaterSense may need to seek additional market data to understand the potential for savings

Water Efficiency Considerations

Consider lowering the metering faucet maximum water usage below 0.25 gpc

- Cycle length dictates the allowable flow rate of the metering faucet. For example, a 0.25 gpc metering faucet with a 10 second cycle (which is ADA-compliant) can have a flow rate up to 1.5 gpm
- If the faucet is run for multiple cycles totaling 20 seconds (comparable to the CDC recommended time that is necessary for effective handwashing) this could result in water use 0.5 gallons (assuming two, 10-second cycles)
- By comparison, a non-metering public lavatory faucet (max flow rate of 0.5 gpm) would only dispense 0.17 gallons during that same period
- Actual handwashing averages approximately 7 seconds, equaling 0.06 gallons of water use on a non-metering public lavatory faucet. Even at one cycle, a metering faucet could use as much as 4 times that

Water Efficiency Considerations

WaterSense could also consider establishing a maximum cycle time

- Currently there is no set standard that specifies the cycle length of a metering faucet

Code or Standard	Cycle Length	Corresponding Gallons per Minute	Volume Used with 0.5 gpm Aerator
ASME A112.18.1/CSA B125.1	5 seconds (required for testing of adjustable faucets)	3.0 gpm	0.04 gallons
2010 ADA Standard	10 seconds	1.5 gpm	0.08 gallons
LEED v2009	12 seconds	1.25 gpm	0.10 gallons

- A Michigan State University study found that actual handwashing time averages approximately 7 seconds.

Water Savings Studies

Existing Savings Studies and Data

- Thames Water Research and Technology (Thames Water) in England (2000)
  - Collectively, 240 faucets in five identical towers were evaluated, equipped with three types of faucet controls:
    - infrared sensor control (48 in total)
    - push-top metered control (96 in total)
    - conventional swivel top manual control (96 in total)
  - Infrared sensor automatic controlled and push-top manually controlled metering faucets both on average expressed an almost 100 percent increase in water consumption than traditional manually controlled faucets
  - Retrofitting the push top faucets to flow for 7 seconds rather than 15 seconds after activation resulted in a significant reduction in water usage

Performance Considerations

- The national testing methodology and performance standards for metering faucets are established by the ASME A112.18.1/CSA B125.1 standard
- The standard includes life cycle testing, defined as 150,000 cycles
- The ASME/CSA standard does not establish a minimum flow rate or other performance requirements that could be pertinent to user satisfaction

Public Comments Received to Date

Plumbing Manufacturers International (PMI)

- Recommends that no changes be made to the lavatory faucets specification
- Referenced two EPA funded studies looking into the impact of water conservation on public health
- Refenced the CUWA white paper regarding declining flows

Metropolitan North Georgia Water District

- Suggested revising the specification with a maximum flow rate of 1.0 gpm and a minimum flow rate of 0.5 gpm
- Suggested creating specification criteria for kitchen faucets, requiring a maximum flow rate of 1.5 gpm or less

Outstanding Questions

- Are there faucet types EPA should consider for inclusion in its WaterSense specification (other than residential kitchen and metering faucets)?
- Are there existing studies on the water efficiency and/or performance of residential kitchen faucets or metering faucets of which WaterSense should be aware?
- If EPA develops a specification, should minimum flow rates be established for residential kitchen faucets and/or metering faucets to ensure user satisfaction?
- Could a label for metering faucets set other public lavatory faucet types at a disadvantage in the marketplace?
- Should additional faucet types be in separate specifications or included in one?

Questions and Discussion

Poll Question

Question: Which product categories should WaterSense expand the scope of its faucet specification to include?

- Both residential kitchen faucets and metering faucets
- Only residential kitchen faucets
- Only metering faucets
- Neither, leave the specification scope as is

Part 2

Showerhead Specification Considerations

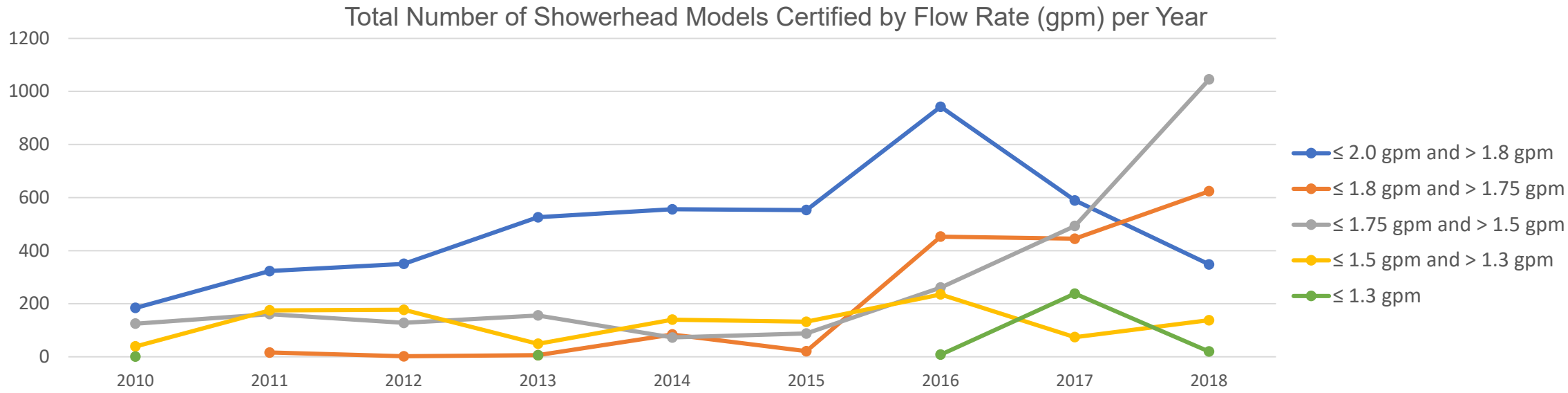
Specification for Showerheads

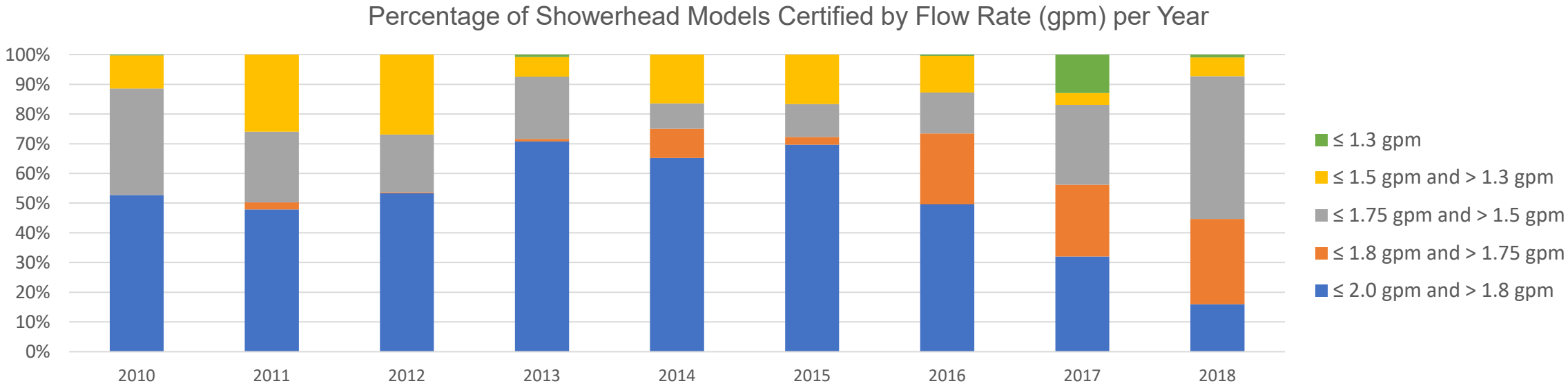
WaterSense Specification for Showerheads

- Released March 4, 2010
- Revised July 26, 2018 (Version 1.1)
- 178 manufacturer partners
- Number and percentage of WaterSense labeled showerheads by flow rate:

Maximum Flow Rate (gpm)	≤ 2.0 and > 1.8	≤ 1.8 and > 1.75	≤ 1.75 and > 1.5	≤ 1.5 and > 1.3	≤ 1.3	Total
Number of Models	3,471	1,383	2,216	977	269	8,316
Percentage of Total	41.7%	16.6%	26.6%	11.8%	3.2%	-

Certification Trends





Specification for Showerheads

Water Efficiency Requirements

- The **maximum flow rate** shall be ≤ 2.0 gpm

Performance Requirements

- Showerheads shall **conform to requirements in the applicable ASME standard**.
- The **minimum flow rate** tested at a flowing pressure of 20 psi must not be < 60 percent of the maximum flow rate
- The **minimum flow rate** tested at a flowing pressure of 45 psi and 80 psi must not be < 75 percent of the maximum flow rate
- The **minimum spray force** shall not be < 2.0 ounces of force at flowing pressure of 20 psi
- The **spray coverage** of the showerhead shall meet criteria included in the applicable ASME standard
- Showerheads and associated packaging shall be **marked** according to ASME A112.18.1/CSA B125.1, including the maximum flow rate marking

Scope Considerations

Current Specification Scope

- Includes showerheads, rain showers, and handheld showerheads
- Excludes body sprays

Opportunities for Scope Expansion

- EPA has not identified any new product types that would fall under the overarching showerheads product category that it is considering including the specification scope

Water Efficiency Considerations

Reduce the maximum flow rate criteria below 2.0 gpm

Background

- Three states and multiple municipalities have adopted regulations mandating a maximum flow rate of 2.0 gpm or less, consistent with the WaterSense water efficiency criteria
- As of 2018, the California Appliance Efficiency Regulations require showerheads sold in California to flow at 1.8 gpm or less
- The California Modernized Appliance Efficiency Database System (MAEDBS) lists more than 11,500 compliant models
- 58 percent of WaterSense labeled showerheads achieve a maximum flow rate of 1.8 gpm or less

Retail Market Research

- Metropolitan North Georgia Water Planning District conducted retail market research on showerheads
- Georgia does not set its state standard below the Federal level (2.5 gpm)
- Findings
  - 77% of available showerheads were WaterSense labeled
  - 40% of all showerheads had flow rates at or below 1.8 gpm
  - 55% of WaterSense labeled showerheads had flow rates at or below 1.8 gpm

Water Savings Studies & Analysis

The EPA examined the following resources to evaluate the water savings potential of a lower showerhead flow rate:

Water Research Foundation (WRF) Residential End Uses of Water (REU) Study (2016)

- Average household faucet use in 2016 was 28.1 gallons per household per day (gphd), down 8.7 percent from 1999
- 82% of shower events flowed at 2.5 gpm or less
- Average shower length of 7.8 minutes

Aquacraft Tampa Study (2004)

- Evaluated savings from reducing the flow rate to 1.75 gpm for showerheads
- Found a savings of 9.8 gphd, or 28% from pre-retrofit

CEC Staff Analysis (2015)

- Estimated that lowering the flow rate to 1.8 gpm would save 1.4 billion gallons of water in the first year of implementation in California

MaP Testing Shower-Based Water Savings (2017)

- Shower length increased by only 2 seconds per 0.2 gpm flow rate reduction
- A 1.44 gallon reduction in shower volume was achieved per 0.2 gpm flow rate reduction
- They concluded that people do not compensate for lower flow rates by increasing the duration of their showers

**Did not differentiate between kitchen and lavatory faucet use*

Preliminary Water Savings Potential

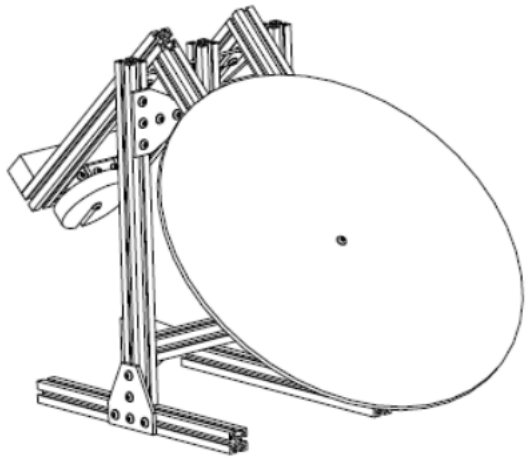
- Lowering the flow rate maximum to:
  - 1.8 gpm would represent an additional 10 percent increase in efficiency over the current WaterSense specification and 28 percent increase over the national standard
  - 1.75 gpm would represent an additional 13 percent increase in efficiency over the current WaterSense specification and 30 percent increase over the national standard

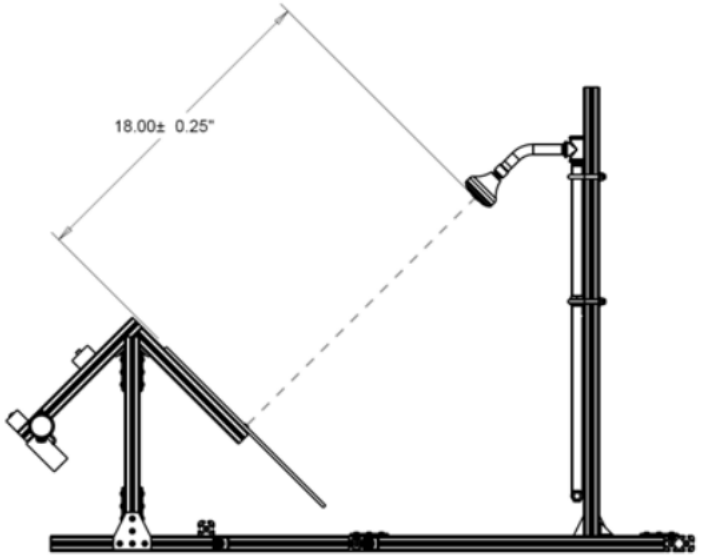
Gallons Per Minute (gpm)	Potential Annual Savings Beyond 2.0 gpm for New Showerheads (billion gallons)	Potential Annual Savings Beyond 2.0 gpm for Existing Showerheads (billion gallons)	Total Savings Assuming 10% Market Share (billion gallons)
1.8 gpm*	0.9	91.1	9.2
1.75 gpm	1.2	117.0	11.8
1.5 gpm	2.4	246.2	24.9

*Excludes savings from California

Performance Considerations

- EPA has no data to suggest that users are dissatisfied with the current performance of labeled showerhead
- Some research has been done to indicate the current force balance test method does not accurately represent a showerhead's actual spray force
- EPA could alternatively measure spray force using a force gauge, which is similar to pre-rinse spray valves and some international test methods





International Harmonization

- European Union (EU) Unified Water Label recently adopted performance criteria similar to the current WaterSense specification
- Includes
  - Minimum flow rate requirements (pressure independency)
  - Spray coverage
- Excludes
  - Spray force testing and criteria

Health and Safety Considerations

- During the initial specification development, WaterSense considered whether reducing the flow rate would increase the risk of thermal shock or scalding
- Industry has since worked to harmonize the automatic-compensating mixing valve and the showerhead standards to address incompatibilities of these components and to ensure products are marked and packaged consistently to educate the purchasers/specifiers on these risks

Public Comments Received to Date

Plumbing Manufacturers International (PMI)

- Recommends that no changes be made to the showerheads specification
- Referenced two EPA funded studies looking into the impact of water conservation on public health
- Refenced the CUWA white paper regarding declining flows

Metropolitan North Georgia Water District

- Suggested revising the specification to require a flow rate of 1.8 gpm, indicating that a significant portion of the market already have a maximum flow rate of 1.8 gpm or less

Denver Water

- Suggested adopting 1.8 gpm maximum flow rate, based on California shifting the market for these products

Outstanding Questions

Questions?

- Are there other product types EPA should consider for inclusion in the showerheads specification?
- Are there existing studies on the water efficiency and/or performance of high-efficiency showerheads of which WaterSense should be aware?
- Could decreasing the maximum flow rate for showerheads result in additional concerns related to thermal shock or scalding?
- Is there anything else about water efficiency or performance that WaterSense should consider during its review process?

Questions and Discussion

Poll Question

Question: Based on what has been presented, does WaterSense have enough information to determine whether to revise its specification for showerheads?

- Yes
- No

Poll Question

Question: In your opinion, should EPA revise the water efficiency criteria of the *WaterSense Specification for Showerheads*?

- Yes
- No
- Need more information

Part 3

General Water Efficiency Considerations

General Considerations

In its public comments, PMI referenced three reports for EPA's consideration

California Urban Water Agencies (CUWA), "Adapting to Change: Utility Systems and Declining Flows", November 2017

- Study aimed at understanding the impacts of declining flows resulting from substantial reductions in indoor water use and how utilities are adapting to these circumstances
- 50% of the utilities experienced impact on water/wastewater infrastructure
- Strategies do not suggest abandoning conservation, but recommend:
  - Taking a holistic approach to policy to account for lower flows in planning and allow more flexibility for utilities
  - Separating/distinguishing between short term (emergency response for demand reductions during drought) and long term (water use efficiency for sustained demand management) initiatives, as short term initiatives may not be suitable for long term implementation
  - Not solely relying on water use efficiency to manage future water demands

General Considerations

Water Conservation and Water Quality: Understanding the Impacts of New Technologies and New Operational Strategies

- Funded under EPA grant funded
- Study being conducted by Drexel University, Penn State, and UC Boulder
- Objective: The project will combine literature information with novel experimental results to develop and validate predictive models of the risk of failing to meet water quality goals for premise plumbing. The models will be encoded in a web-based decision support tool usable by facilities managers and utility personnel to identify high risk conditions for premise plumbing water quality and potential remedial actions
- Hypothesis: Decreases in water consumption result in lower flows of water through water system pipes that were designed to manage higher flows, which may negatively impact water quality
- Project funded through September 2019

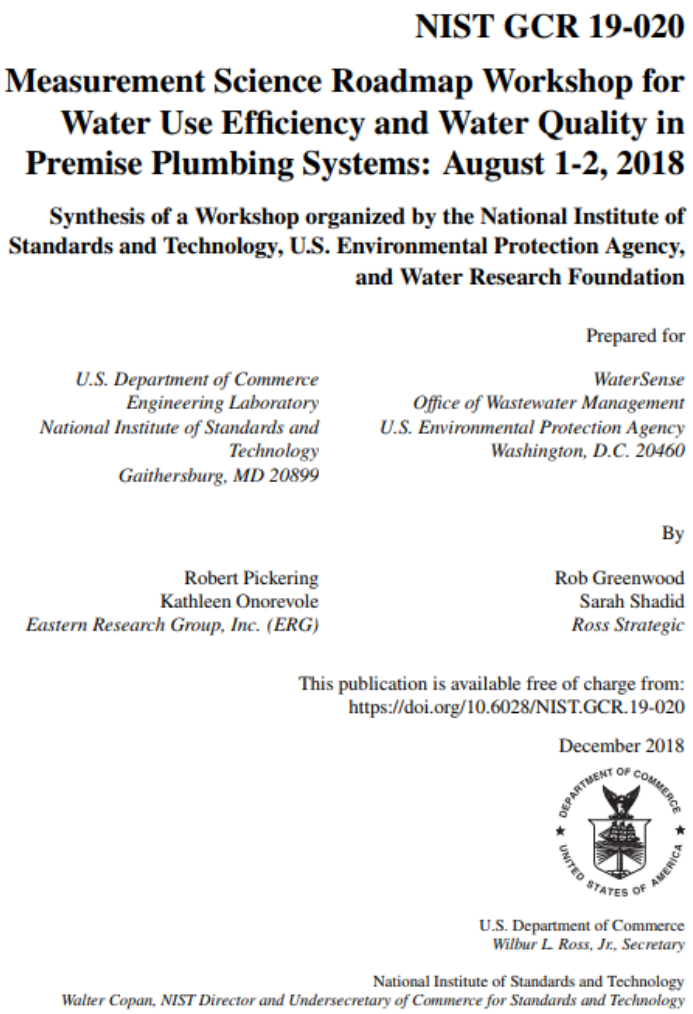
General Considerations

Right Sizing Tomorrow's Water Systems for Efficiency, Sustainability, and Public Health

- Funded under EPA grant funded
- Study being conducted by Purdue, Michigan State, San Jose State, and Tulane
- Objective: The project goal is to better understand and predict water quality and health risks posed by declining water usage and low flows
- One case study of a newly plumbed residential green building which did find:
  - An increased organic carbon, bacteria, and heavy metal levels
  - Different fixture use patterns resulted in disparate water quality within a single-family home
  - The greatest drinking water quality changes were detected at the least frequently used fixture
- Project funded through March 2021

Premise Plumbing Research

- WaterSense collaborated with NIST and the Water Research Foundation (WRF) to organize a workshop in August 2018 focused on research needs to inform premise plumbing design, installation, and maintenance.
- Workshop synthesis report released in December 2018 - https://nvlpubs.nist.gov/nistpubs/gcr/2019/NIST.GCR.19-020.pdf



NIST GCR 19-020

Measurement Science Roadmap Workshop for Water Use Efficiency and Water Quality in Premise Plumbing Systems: August 1-2, 2018

Synthesis of a Workshop organized by the National Institute of Standards and Technology, U.S. Environmental Protection Agency, and Water Research Foundation

Prepared for

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December 2018

U.S. Department of Commerce
Wilbur L. Ross, Jr., Secretary

National Institute of Standards and Technology
Walter Copan, NIST Director and Undersecretary of Commerce for Standards and Technology

Part 4

Future Stakeholder Meetings and Next Steps

Future Industry Webinars

WaterSense will continue to hold industry meetings on specific product categories to discuss information received as a result of the *Notice of Specification Review*

- **Webinar for Plumbing Fixture (Tank-Type Toilets and Flushing Urinals) Manufacturers:** May 9, 2019
- **Webinar for Weather-based Irrigation Controllers Manufacturers:** May 16, 2019
- **Webinar for Utilities and Promotional Partners:** June 5, 2019

Register at: www.epa.gov/watersense/product-specification-review#webinars

Next Steps

- Pertinent information and comments and still be submitted to watersense-products@erg.com
- WaterSense will summarize information collected and issue a decision on whether it intends to move forward with a specification revision for each product category by **the end of 2019**
- If a specification revision is needed, WaterSense will:
  - Identify existing data gaps, concerns, and next steps (as applicable) related to development of a draft specification
  - Provide opportunity for public comments prior to and following the development of the draft specification
  - Hold additional stakeholder meetings, as appropriate, before issuing a final specification

Questions and Discussion

Contact Us

General E-mail: watersense@epa.gov

Comment Submission E-mail: watersense-products@erg.com

Website: www.epa.gov/watersense

Helpline: (866) WTR-SENS (987-7367)