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Cation Exchange Water Softener Notification of Intent (NOI)

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Housekeeping

- Please mute your phone if you aren't speaking
  - Use your phone's mute button, or
  - Press *6 to mute your line
- At the end of the meeting, participants will be able to ask questions
  - To create a "virtual line," please type your name in the chat window of GoToMeeting
  - Once your name is called, you can unmute your line by pressing #6
- **Do not place the call on hold**
  - **If you need to take a call, please disconnect from the conference line and call back when you are finished**

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Meeting Objectives

- Explain the specification development process
- Clarify the intent of NOI
- Discuss stakeholder feedback
- Gather input on a path forward

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What is WaterSense?

- Voluntary partnership and labeling program launched by EPA in 2006
- Simple way for consumers to identify products that use 20% less water and perform well
- Backed by EPA's efficiency and performance criteria
- Independently tested and certified

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WaterSense Product Evaluation

To earn the WaterSense label a product must:

- Be about 20 percent more water-efficient than conventional models
- Offer equivalent or superior performance
- Use or control the use of water
- Realize water savings on a national level
- Provide measurable results
- Achieve water efficiency through several technology options
- Be effectively differentiated by the WaterSense label
- Perform its intended function in its intended system
- Be independently certified

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WaterSense Product Categories

- WaterSense product categories are designed to be broad enough to differentiate products with similar function and/or design
- Some products share a similar function with WaterSense labeled products, but are not included in the WaterSense program
- Because these alternative technologies use no water as part of the process, WaterSense has no basis to propose improvements to their water use
- The program has chosen not to use its limited funding to develop specifications for these products at this time

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Non-Water Using Product Clarification

- To assist manufacturers of such products WaterSense will begin posting a clarification on its web site in the next few months. As follows:
  - It is not the intent of the WaterSense program to place these products at any disadvantage in the marketplace or in their eligibility for water conservation incentives, purchasing guidelines, or specifications. EPA recognizes that many of these products may meet applicable national standards and can be appropriate water efficiency options. Decision-makers should consider them as equally eligible for the same rebates, tax incentives, procurement guidelines, and other conservation incentives as WaterSense-labeled products. Where a specification exists for a specific category of products, the WaterSense label should be used.
- Manufacturers should use this clarification if they feel they have been unfairly excluded from incentive programs

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WaterSense Labeling Support

EPA relies on industry and other interested parties with experience in:

- Design
- Manufacture
- Installation
- Maintenance

EPA and its stakeholders

- Define important performance attributes
- Develop test methods to evaluate the attributes
- Establish performance and efficiency levels

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Specification Development Approach

1. Technical analysis and market research
2. NOI to develop a specification
3. Draft specification
4. Final specification

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Technical and Market Research

1. Technical analysis and market research
   - How water-efficient products are differentiated from their standard counterparts
   - Existence of widely accepted performance and efficiency standards/specifications
   - Water and cost savings from national adoption of the water-efficient product
   - Environmental impacts
   - Level of stakeholder support

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Notification of Intent (NOI)

2. NOI to develop a specification
   - Identify data gaps and research needs to stakeholders
   - Solicit input and request further data on outstanding technical issues
   - Begin working with stakeholders to define
     - Important performance attributes and evaluation methods (if none exist)
     - Correlation between performance and user satisfaction
     - Water efficiency and performance levels
   - Work may be done through consensus-based standards development groups or through less formal stakeholder groups

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Draft Specification

3. Draft specification
   - Issued when technical issues and information gaps are adequately addressed
   - To the extent possible, based on existing standards and specifications
   - Opportunity for formal public comment on specific product evaluation criteria and performance levels
   - Released with a supporting statement
     - Provides rationale and justification for water efficiency and performance criteria
     - Indicates water savings potential
     - Describes cost-effectiveness for consumers

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Final Specification

4. Final specification
   - Consider and resolve comments received on draft specification
     - Publish compilation of public comments
     - Publish public meeting presentation and summary
     - Publish response to public comments
     - Revise supporting statement to reflect changes
   - Establish third-party infrastructure for certifying products to meet specification criteria for water-efficiency and performance

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Why Cation Exchange Water Softeners?

- There are an estimated 6-10 million residential cation exchange water softeners currently installed in the United States.
- Many existing water softeners are inefficient, using large volumes of water during the regeneration process and regenerating more frequently than necessary.
- Recent advances in technology have been able to reduce overall water consumption by using demand-initiated regeneration (DIR) and demonstrated the potential for substantial water savings.
- Additionally, WaterSense has identified other environmental impacts of water softeners that may be improved upon through performance requirements.

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Existing Performance Standard

- *NSF/ANSI 44-2004 Residential Cation Exchange Water Softeners*
- Voluntary water and salt efficiency requirements:
  - maximum of 5 gallons of water used per 1,000 grains of hardness removed for residential DIR water softeners
  - 3,350 grains of hardness removed per pound of salt
- Industry data shows a number of softener models exceed these requirements

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NOI Scope

- The NOI indentifies the following characteristics for products covered by a potential specification:
  - Cation exchange water softeners designed for removal of hardness and reduction of specific contaminants
  - Intended for residential and possibly commercial use
  - Equipped with DIR

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NOI Efficiency and Performance Criteria

- WaterSense will consider establishing criteria in these areas:
  - Water efficiency
  - Softening performance
  - Salt efficiency
  - Regeneration efficiency
  - Multiple salt dosage settings
  - Power supplies

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NOI: Efficiency

- Water efficiency:
  - Defined as the amount of water consumed during regeneration per 1,000 grains of hardness removed during the exchange cycle
  - Considering improving upon the existing NSF 44 voluntary water efficiency requirement of 5 gallons per 1,000 grains of hardness removed by at least 20 percent - or more if market data supports it
  - Lowering the water efficiency level will reduce water used during regeneration and increase water savings

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NOI: Performance

- Softening performance:
  - NSF 44 requires water softeners to deliver water that contains less than 1 gpg hardness
  - By allowing more hardness to pass through the system, less salt could be needed
  - WaterSense is interested in whether a performance requirement could be developed to address this issue

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NOI: Performance

- Salt efficiency:
  - Defined as the grains of hardness removed per pound of salt used to remove that hardness
  - WaterSense is considering improving upon the existing NSF 44 voluntary salt efficiency requirement of 3,350 grains of hardness removed per pound of salt
    - May adopt California's salt efficiency requirement of 4,000 grains of hardness removed per pound of salt
  - Raising the salt efficiency level may reduce the sodium and chloride contribution from water softeners

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NOI: Performance

- Regeneration Efficiency:
  - Defined as the amount of hardness removed during the exchange cycle as a percentage of a softener's rated hardness removal capacity
  - WaterSense is interested in developing regeneration efficiency criteria to ensure that products do not regenerate more frequently than is necessary
  - Improving the regeneration efficiency will reduce the frequency of regeneration, which could in turn reduce the overall amount of water used and the sodium and chloride contribution from water softeners

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NOI: Performance

- Multiple Salt Dosage Settings
  - Water softeners have multiple salt dosage settings that can be selected based on incoming water hardness and average daily water use
  - NSF 44 allows for units to become voluntary efficiency rated on an “efficiency setting”
  - WaterSense would like to ensure that units operate efficiently on all salt dosage settings so that users can choose a setting appropriate for their household

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WaterSense Water Savings

- Many existing water softeners are inefficient timer-based units that regenerate on a prescribed time interval
- Even existing DIR unit water use can be improved upon by increasing the water efficiency and reducing the frequency of regeneration
- Improving the water efficiency over the current NSF 44 voluntary efficiency requirements by just 20% could result in savings between **1,000 and 6,000 gallons per softener per year!**
- If all new units sold met this requirement, we could save between **700 million and 1 billion gallons per year nationally!**

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Issues to Consider

- Effects of increased sodium and chloride on on-site septic system performance
- Impacts of sodium and chloride discharged to municipal systems that recycle wastewater for irrigation or other use
- Chloride and TDS restrictions/limitations for wastewater treatment plants and impaired waters
- Any additional issues?

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Data Needs

- WaterSense is seeking the following market data:
  - Capacity and water use during regeneration for multiple salt dosages of a single unit
  - Amount of hardness removed by water softeners during the exchange cycle compared to the rated capacity
  - Comprehensive data of salt and water efficiencies of products currently on the market

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Data Needs

- WaterSense is seeking the following specification impact data:
  - How improvements to the salt and water efficiency of water softeners will affect the amount and concentration of sodium and chloride in water softener discharge
  - Additional costs associated with treating water with high levels of chloride or TDS from water softeners
  - Effectiveness of the California legislation that improved water softener salt efficiency
  - Input from utilities on what other performance characteristics WaterSense should consider in order to reduce the impact of water softeners in their service territory

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Next Steps

- WaterSense will meet with utility groups during January and February
- Stakeholders interested in participating in the specification development process should e-mail watersense-products@erg.com

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More Information

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