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California IOUs Title 20 Residential Lavatory Faucets Effective Date Delay Response

Additional submitted attachment is included below.

Faucets

Codes and Standards Enhancement (CASE) Initiative
For PY 2015: Title 20 Standards Development

Comments regarding draft regulations:
Faucets

The Statewide Utility C&S Team's Response to Plumbing Manufacturers International Request to Delay Effective Date of Title 20 Faucet Standards

Docket: #15-AAER-05, Water Appliances

July 31, 2015

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1 Introduction

On April 8, 2015, the California Energy Commission (CEC) adopted revisions to the efficiency standards for faucets and faucet aerators (CEC 2015). Before the revised standards were adopted, the maximum allowable flow rate for all types of faucets and faucet aerators was 2.2 gallons per minute (gpm) rated at 60 pounds per square inch (psi). The updated standards currently require faucets sold or offered for sale in California after January 1, 2016 to meet the following efficiency requirements:

- Residential lavatory faucets and aerators shall not exceed a flow rate of 1.2 gpm rated at 60 psi.
- Kitchen faucets and aerators shall not exceed a flow rate of 1.8 gpm rated at 60 psi; flow rate may have capability to increase to 2.2 gpm temporarily for filling pots and pans.
- Public lavatory faucets shall not exceed a flow rate of 0.5 gpm rated at 60 psi.

Plumbing Manufacturers International (PMI) submitted a request that CEC revise the standards for residential lavatory faucets. Specifically, PMI had requested that CEC delay the effective date of 1.2 gpm at 60 psi until January 1, 2017 and adopt a maximum flow rate requirement of 1.5 gpm rated at 60 psi effective immediately (PMI 2015a, PMI 2015b).This document presents the Statewide Utility Codes and Standard (C&S) Team's response to PMI's request to revise the standards for residential lavatory faucets and addresses the concerns discussed at the July 28th CEC Commissioner Lead Workshop.

Based on the discussion that took place at the workshop, the Statewide Utility C&S Team proposes a tiered approach for implementing the 1.2 gpm faucet standard:

- Tier 1: Establish a January 1, 2016 effective date for the sale of threaded faucets and threaded aerators that are rated at 1.2 gpm (or lower) at 60 psi.
- Tier 2: Establish an April 8, 2016 effective date for the manufacturing all other faucets and aerators that are rated at 1.2 gpm (or lower) at 60 psi.
- Tier 3: Establish a July 1, 2016 effective date where only faucets and aerators rated at 1.2 gpm (or lower) at 60 psi are allowed to be sold or offered for sale.

In addition, the C&S Team agrees with CEC's proposal to adopt an interim 1.5 gpm faucets and aerators standard effective September 1, 2015.

2 Statewide Utility C&S Team Supports Adopting 1.5 gpm Standard Effective Immediately

PMI recommended that CEC adopt a standard that would take effect immediately and would require residential lavatory faucets to meet the maximum flow rate requirement of 1.5 gpm rated at 60 psi.

The Statewide Utility C&S Team supports this recommendation, as California is in the midst of a severe drought and the state needs to apply all feasible water savings measures immediately to help curtail the adverse impacts. Although 1.5 gpm faucets already represent a significant portion of the

market in California, it is still legal to sell 2.2 gpm faucets. Adopting the 1.5 gpm standard effective immediately will result in water savings from the 2.2 gpm faucets that would have been sold between now and the effective date of the new Title 20 standard. The fact that manufacturers are encouraging CEC to adopt a 1.5 gpm standard effective immediately indicates that manufacturers are comfortable pulling 2.2 gpm faucets from retail stores now, thereby eliminating the possibility of retailers offering low-efficiency 2.2 gpm faucets at this critical time when the state is taking unprecedented actions to achieve water savings. These less efficient 2.2 gpm faucets can be sold elsewhere in the United States where efficiency standards are not as stringent and where water supply constraints are not as pronounced as in California.

While eliminating the sale of 2.2 gpm faucets now will result in savings, the magnitude of the savings may be somewhat limited because more than 46 percent of the faucets that are sold in California have flow rates of 1.5 gpm or less.[1]

3 Statewide Utility C&S Team's Recommendations

In the recently adopted Title 20 water efficiency standards, responding to Governor Brown's call to action to address the current drought emergency, CEC allotted nine months between the adoption date (April 8, 2015) and the effective date (January 1, 2016). CEC's action to adopt the Title 20 standards is the type of response the state needs in light of the serious emergency, and we commend CEC for requesting that the plumbing industry make a meaningful contribution to the statewide drought response effort by taking the necessary actions to make compliant products available as soon as possible. However, six manufacturers have already certified 92 unique models of replacement aerators that meet the 1.2 gpm standard in the Department of Energy Compliance Certification Database as of July 22, 2015 (DOE 2015). These aerators or their components can easily replace respective parts in some existing faucet models. Despite the current availability of products, we also recognize that the rest of the plumbing industry will need to make a significant effort to meet the deadline.

In this section, we have provided information to put the product development process and the product development schedule into context. Only manufacturers themselves will know the details on the time required for product design and testing. However, information that the Statewide Utility C&S Team has been able to collect indicates that the plumbing industry could meet a tiered set of standards based on the market segmentation and availability of products. As such, we recommend that CEC maintain the previously adopted January 1, 2016 effective date for 1.2 gpm faucets for to allow the sale of only threaded faucets and threaded aerators rated at 1.2 gpm (or less) at 60 psi.[2] In addition, we recommend an 1.2 gpm effective date for the manufacturing all other faucets and aerators of one year after the April 8, 2015 adoption of the standard in order to align with CEC's standard adoption practice for non-emergency conditions. There is no technical reason why the plumbing industry should be granted more time than other industries that are

[1] In the CASE Report (CA IOUs 2013) analysis, the C&S Team assumed that 46 percent of the residential lavatory faucets sold in Californian consume have a flow rate of 1.5gpm or less. This is a conservative assumption as the market share may be higher, and manufacturers' support for adopting a 1.5 gpm standard effective immediately led the C&S Team to believe that the market share of 1.5 gpm faucets may in fact be higher than is estimated.

[2] If CEC adopts this standard, Title 20 will need to include a definition for threaded faucets and threaded aerators, such as: "threaded lavatory faucet" means a lavatory faucet with an outlet that is threaded to accept an aerator or any similar accessory that serves to regulate the flow of the faucet.

subject to Title 20 regulations to comply with the new water efficiency standards, particularly at this time when the state is facing a severe drought and water savings are urgently needed.

The Statewide C&S Team also recommends that CEC establish a third effective date to prevent non-compliant products from being sold in California after July 1, 2016. In order to meet this timeline, we also recommend that CEC prioritize and streamline the plumbing products database certification process to support expedited compliance. By adopting a tiered approach for implementing the 1.2 gpm standard based on the timeline proposed by the Statewide C&S Team, CEC will be addressing the concerns of manufacturers and retailers while retaining the adopted January 1, 2016 effective date for a large subset of compliant products already available in the marketplace.

Based on our research, there are many compliant products already available for sale today—particularly threaded faucets and threaded aerators at the 1.0 gpm level.[3] Increasing the production volume of these 1.0 gpm products does not require time for product development, testing, certification or design/re-design of product marking and labeling. Though manufacturers may wish to have 1.2 gpm products available, many manufacturers have the option of selling a higher volume of 1.0 gpm products while 1.2 gpm products are under development. Increasing the production volume of compliant products and shipping those compliant products to distributers and retailers can be accomplished within the timeframe that CEC allots between adopting the new Title 20 standards on April 8, 2015 and the proposed tiered effective dates.

3.1 Product Development and Production

The technical challenges of making compliant faucets are minimal relative small as compared to challenges that other industries have overcome to comply with other Title 20 standards. Figure 1 and Figure 2 present an example lavatory faucet and the parts breakdown for the faucet, respectively. The faucet accessory, or aerator,[4] controls the flow rate of water that is discharged from the faucet. To achieve the desired flow rate, manufacturers can modify the accessory without making significant modifications to faucet design or the design of other parts that make up the faucet assembly. For example, aerators tend to come in standard sizes and are contained in housing often with standard thread dimensions as outlined in Sections 4.4 and 4.5 of ASME A112.18.1 / CSA B125.1 – Plumbing Supply Fittings (ASME 2012[5]). We anticipate that the aerator design can be modified to change the flow rate without changing the design, size of the aerator, or its housing. Since designing and manufacturing 1.2 gpm accessories is a substantial portion of the product design and development process to provide 1.2 gpm faucet assemblies, the overall time needed should be significantly less relative to a full re-design.

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[3] As of June 2015 there are 160 basic lavatory replacement aerator models in the U.S. Department of Energy Compliance Certification Database – 74 (46%) of which have a flowrate of 1.2 gpm or less. There are 290 unique lavatory replacement aerator models, 152 (52%) of which have a flowrate of 1.2 gpm or less. There are 2,467 basic lavatory faucet models in the DOE database – 217 (11%) of which have a flowrate of 1.2 gpm or less. There are 5,791unique lavatory faucet models, 1,250 (22%) of which have a flowrate of 1.2 gpm or less.

[4] Common faucet accessories include aerators, laminar flow devices, and spray devices.

[5] Example: NEOPERL®, a major manufacturer, advertises the standard ASME A112 18.1 sizing and housing options, with a few additional options (e.g., IG 3/8, M19x1, M20x1): http://www.neoperl.net/en/oem/products/aerators/sizeshousings.html.

The world's largest faucet accessory manufacturer, NEOPERL®, has worked quickly to develop 1.2 gpm accessories. NEOPERL® manufactures a vast majority (over 90%) of lavatory faucet accessories used within the industry, and supplies accessories to all major faucet manufacturers. In May 2015, NEOPERL® informed CEC staff that that they had developed prototypes of 1.2 gpm accessories and were ready to ship these prototypes to manufacturers so they could test the new accessory products in faucet assemblies. NEOPERL® will bear a large portion of the burden when multiple manufacturers request 1.2 gpm aerators for use in faucet assemblies. The fact that NEOPERL® has worked so quickly to develop new products indicates that NEOPERL® is committed to collaborating with faucet manufacturers that wish to develop new products in a short timeframe. It also indicates that developing a 1.2 gpm aerator, the integral component for regulating flow rate, has not proven to be a significant technical challenge.

Figure 1: American Standard Colony Centerset Bathroom Faucet with Speed Connect Technology (Model Number 2275.503)

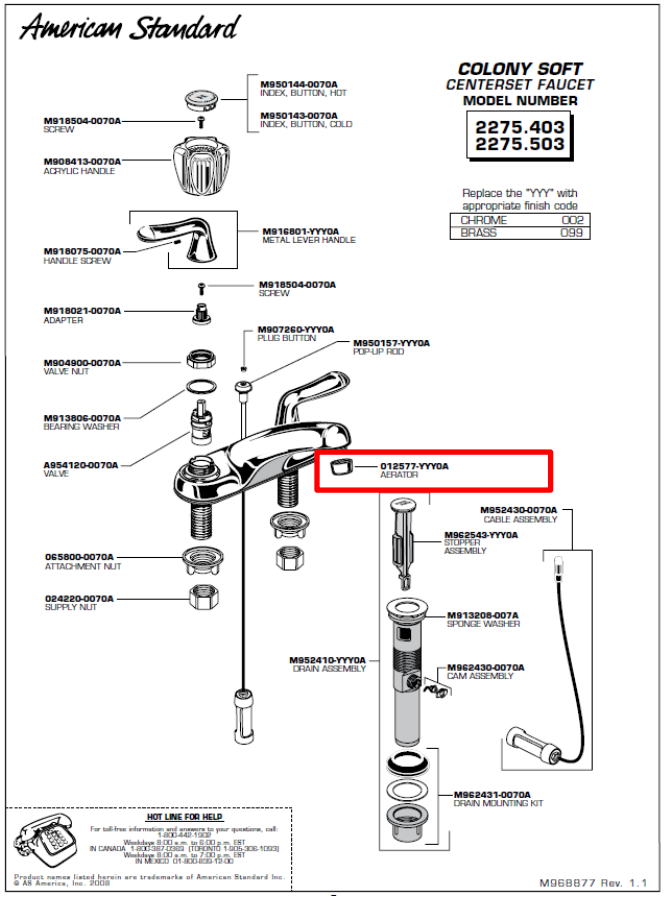

Figure 2: American Standard Colony Centerset Bathroom Faucet Parts Breakdown

Manufacturers must test the entire faucet assembly, the faucet, and the 1.2 gpm faucet accessory, to ensure that it meets state and federal regulations and their own performance and quality specifications. Manufacturers will likely conduct their own internal test before third party certification testing to identify and address any issues that could prevent the faucet from meeting federal and state regulations (see the section below for more details). Conducting internal testing will help expedite the third-party certification process. Manufacturers' internal specifications may aim to ensure spray quality (e.g., spray force, spray area), durability, health and safety (e.g., scalding, chemical leaching), or other performance characteristics. For many if not most faucets, manufacturers will be able to produce 1.2 gpm faucets by equipping existing faucet assemblies with 1.2 gpm accessories including aerators. Since only one component of the assembly is changing, it is anticipated that internal testing will not take as long as it would if the faucet was being completely re-designed. If manufacturers choose to completely re-design 1.2 gpm faucets, the product design and development process will take longer.

Once the internal tests are complete, the manufacturer will adjust their manufacturing and assembling processes to accommodate the revised design. The faucet accessory manufacturers (namely NEOPERL®) will need to make the largest adjustments to their manufacturing process, as the flow rate is dictated by the accessory. The faucet manufacturers are already accustomed to assembling faucets using parts that come from various suppliers. If faucet manufacturers opt to modify existing faucet assemblies as opposed to building re-designed faucets, they can use their existing suppliers and assembly processes for 1.2 gpm faucets with a different accessory. Manufacturers will also need to make adjustments to the marking on the faucet itself. Modifying the marking is a relatively simple revision to the manufacturing process. It does not have an impact on how the faucet works, only the external cosmetics of the faucet assembly.

3.1.1 Third-party Testing, Product Certification, and Listing

Before a faucet can be offered for sale in California it must meet the required safety and performance certifications. Specifically, an accredited certification body must certify that the faucet meets the requirements of the following standards:

- *NSF/ANSI Standard 61 – Drinking Water System Components- Health Effects*: this standard establishes minimum health effects requirements for chemical contaminants that could come into contact with drinking water by way of water coming into contact with products, components and materials used in drinking water systems. The standard tests are for lead and other metals, volatile organic chemicals, phthalates and bisphenol A (BPA). Residential lavatory faucets must meet the requirements in Section 9 (Mechanical Plumbing Devices) of NSF/ANSI Standard 61.
- *NSF/ANSI Standard 372 – Drinking Water System Components – Lead Content:* this standard establishes a test method to evaluate the lead content of plumbing products. This test is used when there is a "leadfree" requirement in place, as there is in California, which requires products contain no more than 0.25 percent lead in wetted surfaces.
- *ASME A112.18.1 / CSA B125.1 – Plumbing Supply Fittings:* This standard establishes minimum design and performance requirements as well as requirements for markings, packaging, and installation instructions.

In addition to verifying compliance with the three standards specified above, many manufacturers will want to pursue WaterSense® certification at the same time. Products do not need to be

certified with WaterSense to be compliant with the new Title 20 standard, but the WaterSense label can help market the product. To earn a WaterSense label, an EPA approved certification body must certify that the faucet or faucet accessory meets the requirements included in the WaterSense High-Efficiency Lavatory Faucet Specification (WaterSense 2007). The WaterSense Specification covers both faucets and faucet accessories. If an assembled faucet uses a WaterSense certified accessory, the licensed certifying body can make a determination that the entire faucet assembly does not need to undergo testing to confirm that the assembled faucet meets the WaterSense requirements. Even if the licensed certifying body does not re-test each faucet assembly, every faucet model does need to be certified and registered with WaterSense (WaterSense 2009). While there is no guarantee that they will waive testing for all assembled faucets that use WaterSense certified accessories, there is a reasonable chance that the same WaterSense certified accessory can be used in multiple faucet assemblies and each faucet assembly will not have to undergo testing.

The third-party accredited certifying bodies listed below can certify that faucets meet the requirements of NSF/ANSI 61, NSF/ANSI 372, and ASME A112.18.1. All of these entities except Underwriters Laboratories are also licensed by the United States Environment Protection Agency (EPA) as approved product certifying bodies for lavatory faucets:

- CSA Group
- International Association of Plumbing and Mechanical Officials (IAPMP)
- International Codes Council - Evaluation Service (ICC-ES)
- Intertek Testing Services NA, Inc.
- NSF International
- Underwriters Laboratories
- Water Quality Association

Representatives from these certifying bodies indicated that they can work with manufacturers to certify residential lavatory faucets in about 90 days. If the manufacturer submits all information in a timely fashion, there are no errors in the submittals, and the products do not fail any of the tests, some certifying bodies have indicated they can complete the certification process in 30-45 days. However, the certification process can take over 90 days if the product fails one or more test and/or the manufacturer does not submit data correctly or in a timely fashion. The third-party certifying bodies suggest that the testing and certification process can be expedited if manufacturers keep the standards in mind when making design decisions. Many third-party certifying bodies offer consulting services in which representatives from the certifying body can work with manufacturers during the design process to help ensure that products will adhere to the regulatory standards.

As shown previously in Figure 2, faucets are composed of various parts. Certifying bodies can work with manufacturers to certify each unique part, but certifying bodies have recommended that using certified parts can help simplify the certification process for the entire assembly. If each part is certified, then the certification body does not need to visit the manufacturing plants for each part when certifying the faucet assembly. Rather, the certifying body would only need to visit the location where parts are assembled to ensure that the manufacturers are using the certified parts as claimed. If manufacturers opt to modify faucets that have already been certified for sale in California with 1.2 gpm aerators without making significant revisions to other aspects of the faucet,

the certification process could be streamlined because the faucet assembly that uses a different aerator has already been certified.

Finally, since NEOPERL® will be supplying the faucet accessories for most faucet assemblies, the faucet certification process can be streamlined if NEOPERL® certifies its 1.2 gpm faucet aerators. NEOPERL® already has 1.2 gpm faucet accessory prototypes available, and they could proceed with third-party certification of their products in the near term so they can offer certified 1.2 gpm products for use in faucet assemblies. NEOPERL® already manufacturers a number of accessories rated at a variety of flow rates that meet the federal and state health and safety regulations. It is likely that NEOPERL® is modifying its existing products without significant revisions to the materials that are used or the manufacturing process itself. The material(s) used within the accessory is an important factor because *NSF/ANSI Standard 61* and *NSF/ANSI Standard 372* require that materials that come into contact with drinking water do not leach harmful substances to the water. Using materials that have already been shown to comply with human health regulations will help minimize the time requirements to get the new products certified.

If the product meets all of the requirements, at the end of this 30-90 day period the certifying body will confirm that the product meets the requirements of all required standards and WaterSense. Typically, manufacturers will work with certifying bodies to confirm that their sample products and their manufacturing/assembly processes meet appropriate requirements. Once products have been certified, manufacturing/assembly production volume can be ramped up. If manufacturers have opted to modify an existing faucet assembly with a new aerator without modifying other aspects of the faucet, some manufacturers may feel comfortable proceeding with assembling the faucet at the same time the third-party is certifying the product.

If a manufacturer is seeking WaterSense certification and the WaterSense label for a product, the manufacturer will apply directly to a licensed product certifying body to obtain the licensure and authorization to use the WaterSense label. After verifying the product meets the applicable requirements, the certifying body will provide the certification decision to the manufacturer and authorize them to use the WaterSense label. The certifying body and the manufacturer will execute a licensing agreement that outlines the terms and conditions for certification and the use of the WaterSense label. The certifying body notifies EPA of products that have been certified on a monthly basis. EPA uses information that the certifying body provides in their monthly reports to update the WaterSense product registry (WaterSense 2011).

Once a certifying body confirms that a product meets all of the requirements, the manufacturer must submit documentation to the appropriate regulatory bodies indicating that the product they wish to sell is in compliance with the applicable federal and state standards. To be in compliance with Title 20, manufacturers or a third-party must submit documentation to CEC demonstrating compliance with the Title 20 standards. CEC has up to 30 calendar days to respond to any data submittal, application, or similar request.

The Statewide Utility C&S Team recommends that CEC prioritize updating the data certification forms and instructions for plumbing products[6] and updating the Appliance Efficiency Database[7] so it only lists plumbing products that meet the new Title 20 standards. The Statewide Utility C&S

[6] Documents related to Data Certification Forms and Instructions for Manufacturers Plumbing, which need to be updated to reflect recent changes to the Title 20 standards are available here: http://www.energy.ca.gov/appliances/database/forms_instructions_cert/Plumbing_Products/.

[7] CEC's Appliance Efficiency Database is available here: http://www.appliances.energy.ca.gov/.

Team also recommends that CEC temporarily offer expedited review of data submittals and applications of plumbing products that will comply with the new efficiency standards. It is recommended that CEC respond to submissions related to plumbing products within 10 calendar days. Prioritizing updates to the compliance certification instructions, compliance forms, and the Appliance Efficiency Database, as well as expediting review of plumbing product submittals, could help alleviate some of the pressure manufacturers may be experiencing as they attempt to develop and release new products to the market by the January 1, 2016 effective date.

3.1.1 Update Product Marking, Labeling, and Literature

For products to be shipped, product marking (on the product itself), labeling (packaging) and literature (specifications, user manuals, installation instructions, etc.) will need to be updated.[8] The manufacturing process used to create cosmetic markings on the surface of the faucet assembly will need to be modified so the flow restricting device (i.e. faucet accessory) indicates the correct flow rate.

The flow rate listed on the packaging will need to be updated as will the model number. Designing and printing new packaging can take significant time if the manufacturer couples the package design with revisions with the marketing and branding strategy. If manufacturers opt to modify existing faucet assemblies with a new aerator without making significant revisions to other aspects of the faucet, manufacturers do have the option of printing stickers to place on the existing packaging to update outdated information. See Figure 3 for an example of a manufacturer using a sticker to document compliance with regulations as opposed to re-designing the entire package.

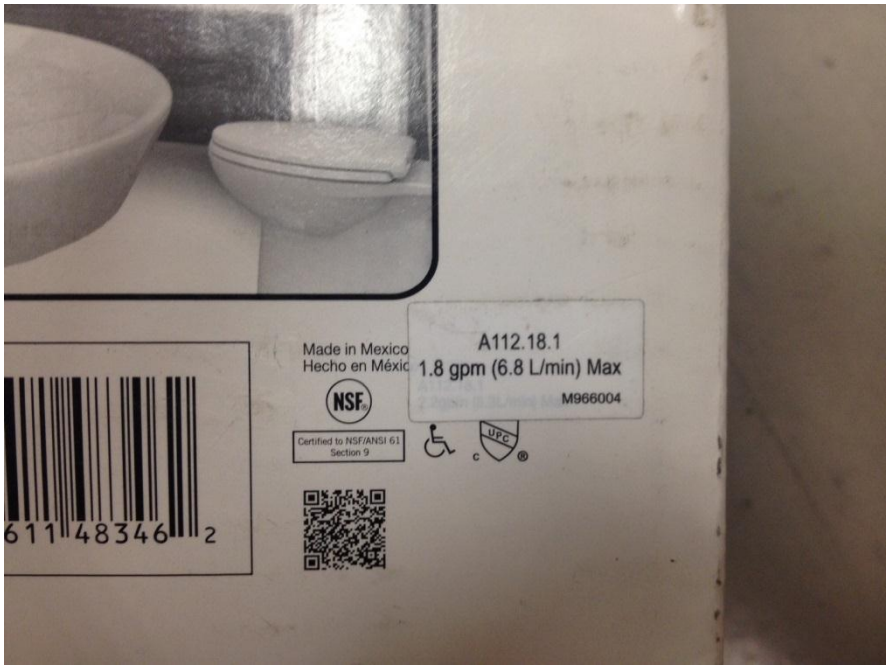

Figure 3: Example Use of a Sticker to Modify Information on Packaging of a Kitchen Faucet

Product literature will also need to be updated. The revised literature will include updated specifications on the faucet flow rate and updated information about the faucet accessory used in the assembly. The third-party certifying body will review product literature as part of the

[8] See 16 CFR Part 305 for federal water efficiency labeling requirements.

certification process, so manufacturers will need to have literature finalized when they submit product materials to the certifying body. As such, the updates to literature will occur towards the end of the product development stage when the design is finished but before certification occurs. Manufacturers can work with printers to prepare for printing product literature at the same time that the certifying body is reviewing the literature. However, the manufacturer may want to wait to print materials until the product is certified.

3.1.2 Product Distribution

Compliant products will need to be shipped to wholesalers and retailers prior to the January 1, 2016 effective date. As mentioned above, manufacturers often produce and package their products at the same time that third-party certification is taking place. In fact, the third-party certifying body is required to review the manufacturing process to ensure that products submitted for testing are consistent with products that are being manufactured for sale. As such, manufacturers often have products ready to ship as soon as they receive notification that the certification process is complete.

3.2 Alternative Product Development Schedule

Figure 4 presents a product development schedule with time estimates that the Statewide Utility C&S Team was able to verify. As noted above, we already know that NEOPERL® has been providing manufacturers with 1.2 gpm aerators to use in their faucet assembly designs. The activities highlighted in gray – time required to design, test, manufacture, assemble, and ship faucet assemblies – are estimates based on the discussion above. If manufacturers use the expedited third-party testing and certification schedule (30 days as opposed to 90 days), and CEC is able to expedite review and registration of qualifying products (10 days as opposed to 30), then manufacturers will have an additional 2.5 months to complete, revise, and finalize their designs. That is, manufacturers will have 7.5 months to design, test, manufacture, and ship products. This appears to be a sufficient amount of time to modify existing faucet assemblies with 1.2 gpm aerators. For threaded faucets capable of accepting a currently available 1.2 gpm or less aerator, this schedule would be even further expedited.

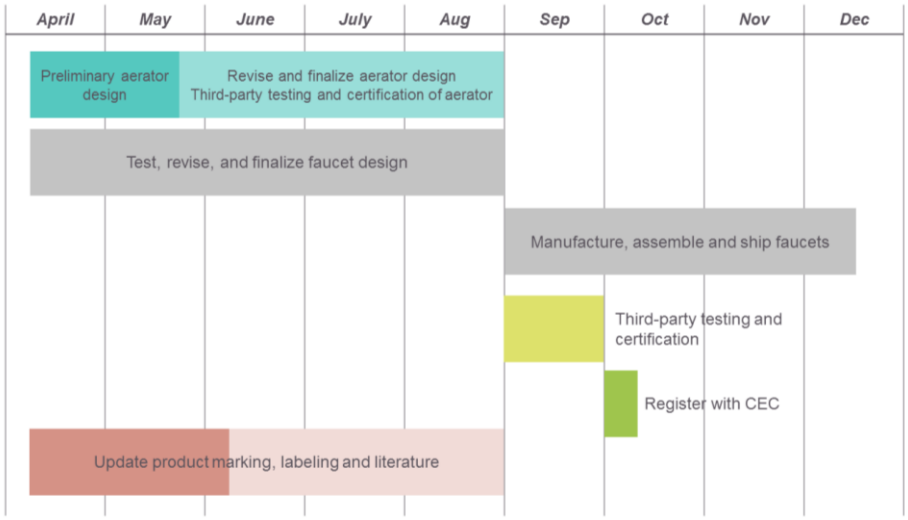

Figure 4: Product Development Schedule

4 Conclusion

In response to the concerns of manufacturers and retailers, as well as the water needs of California, the Statewide Utility C&S Team recommends that CEC adopt a tiered implementation schedule for 1.2 gpm faucets and faucet aerators as follows:

- Tier 1: Establish a January 1, 2016 effective date for the sale of threaded faucets and threaded aerators that are rated at 1.2 gpm (or lower) at 60 psi.
- Tier 2: Establish an April 8, 2016 effective date for the manufacturing all other faucets and aerators that are rated at 1.2 gpm (or lower) at 60 psi.
- Tier 3: Establish a July 1, 2016 effective date where only faucets and aerators rated at 1.2 gpm (or lower) at 60 psi are allowed to be sold or offered for sale.

In addition, the Statewide Utility C&S Team agrees with CEC's proposal to adopt an interim 1.5 gpm faucet and aerator standard effective September 1, 2015.

Further, we recommended prioritizing updates to data certification forms, instructions for plumbing products,[9] and the Appliance Efficacy Database[10] so it only lists plumbing products that meet the amended Title 20 faucet standards. Moreover, we suggest that CEC temporarily offer the expedited review of manufacturer data submittals and applications of plumbing products to ensure quicker compliance with the updated efficiency standards.

The Statewide Utility C&S Team believes that manufacturers will be able to meet the proposed effective dates, especially since there are several products currently available in the market that can meet the January 1, 2016 date for 1.2 gpm threaded faucets and threaded aerators, and that for most other Title 20 regulated products, one year from the adoption date for meeting compliance is the standard practice.

5 Resources

[ASME]. American Society of Mechanical Engineers (ASME) and Canadian Standards Association (CSA). "Standard ASME-A112.18.1-2012 / CSA B125.1-12: Plumbing supply fittings." December 2012.

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[9] Documents related to Data Certification Forms and Instructions for Manufacturers Plumbing, which need to be updated to reflect recent changes to the Title 20 Standards are available here: http://www.energy.ca.gov/appliances/database/forms_instructions_cert/Plumbing_Products/.

[10] CEC's Appliance Efficiency Database is available here: http://www.appliances.energy.ca.gov/.

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