



....a dialogue for California's water conservation community

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## **This issue.....special focus on:**

- **Three comprehensive Residential End-Use Studies now available for download**
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  - **Updates on Toilet Fixture and Tank Trim Standards**
  - **UNAR....what is it and why?**
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### **1. Three Residential End-Use Studies Available**

In 1999, the AWWA and its Research Foundation published the groundbreaking report on the "Residential End Uses of Water" Study (REUWS), documenting a research project begun three years earlier and headed by Aquacraft, Inc., Boulder, CO. That study included approximately four weeks of continuously monitored water use within 1,188 homes (mostly non-conserving) across North America and provided valuable information on the profile of water use within the residential sector.

Immediately following the REUWS work, Aquacraft took on the task of replacing non-conserving plumbing fixtures and appliances within a representative portion of the 1,188 homes, installing the latest water-efficient products. The primary objective of the follow-on work was to identify and quantify water efficiency opportunities. Three separate,

comprehensive studies, funded in part by the U.S. Environmental Protection Agency, have been completed.

The final reports present before-and-after paired comparisons of water use patterns in 96 households within the service areas of Seattle Public Utilities (37 homes), East Bay Municipal Utility District (33 homes), and Tampa Water Department (26 homes).

Among the water-efficient products replacing non-efficient models within the 96 households were:

- Clothes washers: Frigidaire Gallery; Maytag Neptune; Whirlpool Super Capacity Plus, Duet, and Calypso; Fisher & Paykel EcoSmart
- Toilet fixtures: Caroma Caravelle dual-flush, Niagara Flapperless, Toto Drake
- Showerheads: Niagara Earth Massage, Brass Craft, AM Conservation Spoiler
- Lavatory Faucets: Delta e-Flow Electronic Faucet
- Kitchen Faucet Controller: Aqua-Lean

Download the final reports for [Seattle](#), [EBMUD](#), and [Tampa Water](#).

NOTE: Each of the three reports is a PDF file of approximately 2 MB in size.

## **2. National Multi-Family Sub-Metering Study Released**

The National Multiple Family Submetering and Allocation Billing Program Study was a comprehensive three-year effort to determine the water savings potential in the apartment sector that would result from requiring residents to pay for their water consumption separately from their rent. Conducted by Aquacraft under the direction of Dick Bennett of the EBMUD, this study found that 85 percent of apartment properties still include the cost of water within the monthly rent.

Go to the website of Aquacraft and download the study:

<http://www.aquacraft.com/Projects/submeter.htm>

## **3. New National Standard for Toilet Fixtures Released**

It's been in the "works" for a number of years, and finally it has arrived! The American Society of Mechanical Engineers (ASME) Standards Committee A112 approved a revised toilet fixture standard in early 2003. Subsequently, on June 30, 2003, this standard was approved by the American National Standards Institute (ANSI) as a national standard. Now, the ASME has published the standard and made it available to the general public.

ASME A112.19.2-2003, *Vitreous China Plumbing Fixtures and Hydraulic Requirements for Water Closets and Urinals*, consolidates two previous standards for toilet fixtures and urinals, A112.19.2M-1998 and A112.19.6-1995. It may be purchased from ASME for \$75 through their website:

<http://members.asme.org/catalog/ItemView.cfm?ItemNumber=J01203>

The [new testing and performance requirements](#) for toilet fixtures are more rigorous than those in the earlier standards and are summarized in a simple table.

In addition to these new requirements, the standard also incorporates a substantial portion of the Los Angeles Supplementary Purchase Specification (SPS) as a Non-Mandatory Appendix. Thus, water agencies and municipalities throughout the U.S. can adopt the requirements within the appendix for their own toilet replacement programs and thereby govern the maximum flush volume when the OEM flapper is replaced with a standard flapper in a gravity-fed toilet fixture. To download the SPS, accompanying documents, and lists of fixtures already certified to the SPS, go to the Council's technical information page:

[http://www.cuwcc.org/products\\_tech.lasso](http://www.cuwcc.org/products_tech.lasso)

NOTE: The A112.19.2-2003 standard is copyrighted by the ASME and cannot be reproduced without the permission of the organization. Please do not request copies of the standard from the Council, but instead contact the ASME for an original document.

#### **4. New Tank Trim (Flappers) Standards in Development**

For years, water conservation professionals and plumbing industry engineers have acknowledged that toilet flappers represent what some of us term the toilet fixture's "weak link" in water efficiency. Some background on why this is the case may be found in this history:

<http://www.cuwcc.org/Uploads/product/Flappers-Weak-Link.pdf>

Two areas of concern are being actively addressed by the responsible ASME Project Team A112.19.5. Here is an update....

##### Flush Valve Seal (Flapper) Durability

The ASME Project Team has concluded its work on a draft of the proposed durability standard. That standard is based largely upon the extensive 1990s work of the Metropolitan Water District as it manifested itself in the very successful Los Angeles Supplementary Purchase Specification (see above). A revised and updated A112.19.5 standard awaits completion of work on flush valve seal (flapper) identification and marking.

##### Flush Valve Seal (Flapper) Identification and Marking

Recognizing the need to better equip consumers with the information that they require to replace a worn or leaking flapper, the ASME Project Team considered and approved a first draft of a proposed identification standard. Included within that draft are additional requirements related to marking part numbers and manufacturer contact information in or on the toilet tank.

Once completed, both drafts will be incorporated into a proposed revision to the A112.19.5 standard and balloted. ASME and ANSI approval of a revised standard could be expected in 2005.

## **5. Unified North American Requirements (UNAR) – Toilet Fixtures**

The current patchwork of toilet specifications, requirements, and “approved toilet lists” promulgated by water authorities in the U.S. and Canada do not always serve the cause of water conservation in the most effective way. Nor does this fragmented approach take advantage of the highly competitive market environment that exists within the plumbing industry. As a consequence, there has been some confusion in the marketplace, a very limited availability of qualified products in some areas, and possibly higher product prices resulting from a smaller customer base.

Therefore, a small group of individuals representing the conservation interests of some of the largest water providers in North America met in Austin TX in January 2004 to discuss proposals to initiate an effort to develop a set of minimum requirements for toilets subsidized through their water conservation programs. As a result, the Unified North American Requirements (UNAR) for toilet fixtures is evolving.

The development of UNAR is a cooperative effort undertaken by the water industry working in conjunction with plumbing industry stakeholders. A core team of representatives from both groups is being formed. In July 2004, those water and plumbing industry stakeholders met in Seattle to share views on what UNAR should encompass and how it should be implemented. Over the next few months, the requirements to be contained within UNAR will be identified and communicated.

For a more complete description of UNAR, its goals, and areas of consideration, download the appeal for support communicated to the water industry:

<http://www.cuwcc.org/Uploads/product/UNAR.pdf>

## **6. High-Efficiency Toilets – Dual-Flush and others**

Starting with the introduction of the dual-flush toilet in 1998, numerous high-efficiency toilet fixtures began appearing in the U.S. marketplace. (Those fixtures generally fall into two categories: dual-flush gravity-fed fixtures and 1.0-gallon pressure-assist fixtures.) Some water agencies and municipalities have chosen to offer higher rebates for fixtures with design flush volumes below 1.6-gallons per flush. Other water agencies are choosing to subsidize only those types of fixtures. Because no clear fixture definitions or flush volume thresholds were available for these toilet replacement programs, the Council developed a definition for its California members and identified the products that appear to meet that definition.

A definition of the high-efficiency toilet (or HET), as well as a listing of the seven HET manufacturers and 24 HET fixtures now on the market, download this PDF file:

<http://www.cuwcc.org/Uploads/product/HET.pdf>

## 7. Pre-Rinse Spray Valves – “Real World” Savings Data From 19 Field Studies!

Over 17,000 hot water pre-rinse spray valves were replaced through Council’s Phase 1 Pre-Rinse Spray Valve Program...a Herculean effort by Honeywell and individuals all over California! One significant requirement of the Council’s agreement with the California Public Utilities Commission was the measurement of energy savings achieved through these replacements. As a result, the Council contracted with SBW Consulting, Inc. of Bellevue WA to measure “before” and “after” water and energy use at 19 randomly selected valve installation locations in northern and southern California. Their study has been completed and these results replace earlier estimates made in the laboratory.

	<b>Water Savings</b>		
	CCF	Gallons	Acre-Feet
Annually	66.4	50,000	0.153
5-Year Life of PRSV	332	250,000	0.765

	<b>Energy Savings</b>	
	Water heated by natural gas	Water heated by electricity
Annually	335 therms	7,600 kWh
5-Year Life of PRSV	1,675 therms	38,000 kWh

The above figures define water and energy savings within food service operations categorized as "very small" and "small", mostly independent establishments. High-volume food service facilities that serve meals throughout the day are expected to yield significantly higher savings.

## 8. And, finally, toilets that talk!

<http://edition.cnn.com/2004/WORLD/europe/08/30/talking.toilets.reut/index.html>

**NEXT ISSUE.....all about landscape irrigation!**