

August 4, 2008



To the EPA WaterSense Program:

The Alliance for Water Efficiency welcomes the publication of the draft specification for WaterSense New Homes. Across our diverse membership of water utilities, environmental organizations, manufacturers, and installers, Alliance members maintain a strong level of support for the WaterSense Program and a desire to see it expand in a timely and orderly way. The April 23 draft of the WaterSense New Homes specification marks a solid beginning for WaterSense participation in the labeling of whole buildings based upon published criteria of sustainability – a field seeing explosive new growth in the level of public interest.

This letter briefly summarizes some general concerns. More detailed section-by-section comments are contained in the attachment. These comments have been prepared by our WaterSense and Water Efficient Products Committee and affirmed by our Board of Directors.

A successful New Homes specification will involve many more WaterSense Partners, and bring with it a concurrent obligation for EPA to remain vigilant that the WaterSense brand is not compromised through its application in dubious circumstances that will raise questions in the minds of the public. As noted in the attachment, WaterSense-labeled new homes built in flood plains or wetlands have great potential to tarnish the brand, and there are many other circumstances as well that could diminish the value of the label. The number of homebuilders is far larger than the number of manufacturers of any single product in the WaterSense program. Accordingly, we recommend that EPA give special attention to the need for close collaboration with WaterSense homebuilder partners, to ensure that technical compliance with the criteria is accompanied by respect for the integrity of the brand.

As noted in the past, the WaterSense Program is designed to bring savings to individuals and to communities. Lowering consumer utility bills and lowering community infrastructure costs are two sides of the same coin. Both aspects of the value of WaterSense should be stressed at every opportunity, including the Scope and Objectives section of the New Homes specification.

While we believe that the April 23 draft is a good start, we note that there are some significant gaps that should be remedied before this version of the specification becomes final. First, the specification is silent about the overall system of compliance verification and certification, although reference is made to a landscape audit. There is an inevitable interplay between the specifics of the performance criteria and the demands of a practical and affordable certification regime. The system of compliance verification should be spelled out before the specification is finalized to ensure that the two are fully compatible.

Similarly, the methodology for preparing and applying a water budget to landscape water use is alluded to but not included in the current draft. It is difficult to assess the likely success of the water budget approach to landscape water management without the opportunity to review the specific methodology. This also should be made available before the specification is finalized.

P.O. Box 804127
Chicago, IL
60680-4127

OFFICE
(773) 360-5100

TOLL-FREE
(866) 730-A4WE

FAX
(773) 345-3636

WEB
www.a4we.org

Also lacking from the draft specification is any targeted metric for the increment of water savings expected or sought from the WaterSense New Homes criteria. Other elements of the program have aimed for at least 20% savings above standard offerings. This would seem to be a reasonable and obtainable goal for the New Homes specification. EPA's intentions in this regard should be shared with stakeholders prior to finalization of the specification.

Additionally, we believe that the lack consideration for stormwater management is a substantial shortcoming that should be remedied. Stormwater management is a significant part of the community water and wastewater infrastructure gap that EPA has identified nationwide. Benefits for the protection of groundwater supplies and surface water quality will leverage additional value from the WaterSense brand without detracting from end-use efficiency measures which have similar objectives. While a truly ambitious set of criteria must necessarily await a subsequent version of this specification, even a basic stormwater management component will make this version of WaterSense New Homes more valuable in more communities. The attached comments offer suggested language for this initial effort.

In future years, the New Homes specification must necessarily be subject to periodic review and revision. We recommend that EPA consider the subject of on-site reuse of reclaimed water and stormwater for comprehensive treatment in a subsequent version of the specification. We also note that product-specific WaterSense specifications are under development for showerheads and irrigation controllers. This first version of the New Homes specification should make provision to incorporate such product-specific specifications when complete, without waiting upon an entire reissuance of the specification.

Finally, several members of the Alliance are among those in the landscape industry requesting a delay in finalizing the specification. In order to allow time for additional stakeholder input, we have no objection to an extension of this comment period for up to 90 additional days.

Thank you for your attention to these views.

Sincerely,



Carole Baker
Chair, Board of Directors
Alliance for Water Efficiency



Al Dietemann
Seattle Public Utilities
Co-Chair
WaterSense & Water Efficient Products Committee
Alliance for Water Efficiency



Rob Zimmerman
The Kohler Company
Co-Chair
WaterSense & Water Efficient Products Committee
Alliance for Water Efficiency



WaterSense New Homes Comments by the Alliance for Water Efficiency On WS Draft Specification Dated 4/23/2008

Alliance comments are provided in Times italic text font immediately following each paragraph of the EPA draft specification.

1.0 Scope and Objective

This specification establishes the criteria for water-efficient new homes under the United States EPA WaterSense® Program. It is applicable to newly constructed single-family homes and townhomes, three stories or less in size. A new home must meet all of the identified criteria to be labeled as a WaterSense home by a Builder Partner of the WaterSense Program.

Alliance Comment: Support.

The intent of this specification is to reduce indoor and outdoor water usage in new residential homes and encourage community infrastructure savings. This specification is not intended to contravene local codes and ordinances. Unless indicated, criteria for individual components do not constitute criteria for a WaterSense label for that component or product category. Individual component criteria are valid only in the context of this specification.

Alliance Comments:

A. In light of the WaterSense program's intent to encourage community water and wastewater infrastructure savings, storm water management criteria which preserve local groundwater resources, displace the use of potable water, protect source water quality, and reduce wastewater infrastructure costs should also be developed for this and future versions of the New Homes specification.

B. The language on local codes and ordinances remains ambiguous. Clarify that homes failing to comply with applicable state and local codes, standards, and ordinances will not qualify for the WaterSense label.

C. EPA should be mindful of the need to maintain the integrity of the WaterSense label, not only with regard to conformity with individual criteria, but also with regard to the relationship of new homes to natural water features and riparian environments. WaterSense labeled new homes built in flood plains and wetlands have great potential to tarnish the brand. EPA should consider this aspect of brand integrity in both the development of new homes performance criteria and in the evolving relationship with WaterSense partner homebuilders. Maintaining respect for the natural hydrology of home sites is completely consistent with the purpose of WaterSense.

2.0 Summary of Criteria

New homes must meet criteria in three areas:

- Indoor water use including plumbing and plumbing fixtures and fittings, appliances, and other water using equipment;
- Outdoor water use including landscape design and irrigation systems, if installed; and
- Homeowner education.

3.0 Indoor Water Efficiency Criteria

Alliance Comment: A fundamental requirement for implementing any water efficiency program is missing here. A water meter should be required, whether the new home is connected to a public water system (including reclaimed or untreated source water conveyed through a distribution system) or is supplied by onsite well water. For efficiency programs to be effective, water consumption must be measurable and available to the consumer.

- 3.1** Service Pressure – The static service pressure shall be 60 pounds per square inch (psi) (4.2 kilograms per square centimeter (kg/cm²)) or less. Compliance shall be achieved by use of a pressure-regulating valve (PRV) downstream of the water meter. All fixture connections shall be downstream of the pressure regulator.

Alliance Comment: Clarify to state that a PRV is not required, but rather that if service pressure at the home is over 60 psi, then compliance may be achieved with a PRV.

- 3.2** Toilets – All toilets shall be WaterSense labeled high efficiency toilets.

Alliance Comment: Support.

3.3 Bathroom and Kitchen Faucets

3.3.1 All bathroom (lavatory) faucets shall be WaterSense labeled high efficiency faucets.

3.3.2 Water efficiency criteria have not been developed for kitchen faucets. These faucets shall comply with Federal standards for maximum flow rate of 2.2 gpm @ 60 psi (8.3 lpm @ 4.2 kg/cm²).

Alliance Comment: Support.

- 3.4** Showerheads – Water efficiency criteria have not yet been developed for showerheads. These showerheads shall comply with the 1992 EPA standard for maximum flow rate of 2.5 gpm @ 80 psi (9.5 lpm @ 5.62 kg/cm²). Showers shall be equipped with an automatic compensating valve that complies with ASSE 1016 or ASME A112.18.1/CSA B125.1 and specifically designed to provide thermal shock and scald protection at the flow rate specified above.

The total allowable flow rate from all showerheads flowing at any given time, including rain systems waterfalls, bodysprays, and jets, shall be limited to 2.5 gpm per shower compartment, where the floor area of the shower compartment is less than 2,500 in² (1.61 m²). For each increment of 2,500 in² (1.61 m²) of floor area thereafter or part thereof, additional showerheads with total allowable flow rate from all flowing devices equal to or less than the allowable flow rate specified above are allowed.

Exception: Recirculating showers.

These criteria will be revised after the release of the final specification for WaterSense labeled showerheads. A copy of EPA's notice of intent to develop draft performance specifications for showerheads and related devices can be found at http://www.epa.gov/watersense/docs/showerhead_noi508.pdf.

Alliance Comments:

A. If a showerhead with a maximum flow rate of less than 2.5 gpm is to be installed, the code-required automatic compensating valve (scald protection valve) connected to that showerhead must be certified to the ASSE 1016 performance standard at the specific rated flow rate(s) of that showerhead across the full range of the system pressures, i.e., at 20, 50, and 80 psi.

B. We support the establishment of 2500 sq. inches as a reasonable delineation between an individual shower and a two-person shower. (Note that there is no limit on shower compartment size per se.) However, all of the showerheads, (including rain systems, waterfalls, body sprays, and jets) directed to the additional increment of floor area must be on separate controls from the showerheads directed to the initial increment of floor area.

C. Recirculating shower exception – If retained, a clear definition of a recirculating shower is needed. However, a better approach would be to eliminate separate reference to recirculating showers and specify that the total allowable flow rate from all showerheads flowing at any given time is limited to 2.5 gpm of potable water per shower compartment, or per increment of personal shower space in a multi-person shower compartment.

3.5 Hot Water Delivery System – All hot water pipes, both above and below ground, shall be insulated to a minimum of R4. In addition, each home shall be equipped with at least one of the features described below to minimize water loss in delivering hot water. Compliance will be measured through performance testing. The features described below can be combined as appropriate.

3.5.1 Demand-initiated hot water recirculating system - System should optimize both water and energy efficiency and shall be designed such that less than 0.13 gallons (0.49 liters) of water are in the piping between the recirculating loop and any hot water fixture.

3.5.2 Whole house manifold system – System shall be designed such that less than 0.38 gallons (1.44 liters) of water are in the piping between the hot water source and any hot water fixture.

3.5.3 Core plumbing system – System shall minimize pipe volume between the hot water source and any hot water fixture to 0.38 gallons (1.44 liters) or less.

Alliance Comments:

A. Pipe Insulation – Non-permeable insulation should be required for any hot water runs below ground or in unconditioned space, to avoid degradation due to moisture.

B. We recommend a more straightforward approach to a performance standard rather than requiring the use of one or more of three enumerated delivery systems. The second sentence of paragraph 3.5 should be replaced (and paragraphs 3.5.1, 3.5.2, and 3.5.3 removed) with the following:

In addition, to minimize water loss in delivering hot water, sensibly hot water shall be available at every showerhead, lavatory faucet, and kitchen faucet in the home within 10 seconds of a draw of not more than 1.5 liters. Due to high energy consumption, timer-initiated hot water recirculating systems are not eligible to meet this requirement.

C. Performance testing – More specificity is needed about the performance test that will measure compliance with the hot water delivery specification. For example –

- *hot water should be defined (105 degrees F. recommended);*
- *if a storage water heater is used, the maximum temperature setting for test should be specified (somewhere between 125 and 140 degrees F. recommended);*
- *the interval of inactivity or “cool down” before a test draw at each fitting to be tested should be specified.*

3.6 Appliances – If the following types of appliances are offered, financed, installed, or sold as upgrades through the homebuilder, they shall meet these criteria:

3.6.1 Dishwasher – Dishwashers shall be ENERGY STAR® labeled.

Alliance Comment: Support, with the addition of a water factor of less than or equal to 5.8 gallons per cycle.

3.6.2 Clothes washer – Clothes washers shall be ENERGY STAR labeled with a water factor of less than or equal to 6.0 gallons of water per cycle per cubic foot capacity.

Alliance Comment: Support. The separately stated water factor for clothes washers of 6.0 is consistent with utility incentive programs being offered today, and will become the Energy Star level in January 2011.

3.7 Other Equipment – If the following pieces of equipment are offered, financed, installed, or sold as upgrades through the homebuilder, they shall meet these standards:

3.7.1 Evaporative air conditioners – Shall use a maximum of 5 gallons (18.93 liters) of water per ton-hour of cooling when adjusted to maximum water use. Blow-down shall be based on time of operation, not to exceed 3 times in 24 hour period of operating (every 8 hours). Reservoir discharge outlet should be easily visible so the user can see when refill valve is leaking.

3.7.2 Water softeners – All devices shall be certified to meet the NSF/ANSI 44 standard. All water softeners shall be demand-initiated regeneration. If the device uses an ion exchange technology, it shall be capable of using potassium rather than sodium salt. Devices that use auto-initiated regeneration (fixed schedule) do not meet this specification.

- 3.7.3** Drinking water treatment systems – Drinking water treatment systems must be certified to meet applicable NSF/ANSI certifications. Such systems shall have an efficiency rate of not less than 85 percent.

Alliance Comments:

A. *Evaporative air conditioners* – The definition is incorrect (the definition provided is for Evaporative Coolers, or “swamp coolers.” Additionally, the performance criterion of 5 gallons per ton-hour is unnecessarily weak, in light of the products available today from several manufacturers. We recommend that this entire provision be restated as follows:

Evaporative air conditioners – The only evaporative cooling units permitted shall be of the central cooling type and shall be ENERGY STAR[®] labeled. The HVAC system shall be installed with an ENERGY STAR[®] qualified programmable thermostat.

Additionally, evaporative cooling systems:

- Shall use a maximum of 3.5 gallons (13.25 liters) of water per ton-hour of cooling when adjusted to maximum water use.
- Shall be installed such that pre-wetting of pads / packing is accomplished prior to fan draft.
- Shall have pads / packing of a rigid or semi-rigid engineered type only (i.e. paper packing does not qualify).
- Shall have a fan with a minimum of two speeds to reduce evaporation during low use periods.
- Once-through or single-pass cooling systems do not qualify, nor does continuous blowdown (continuous bleedoff).
- Shall be plumbed such that blowdown or other drained water is disposed of as regionally appropriate or per local ordinances.
- Shall have blowdown mediated by conductivity or basin water temperature based controllers. Systems with timer-only mediated blowdown management do not qualify. Blowdown may not occur more than 3 times in 24 hours and such events may not last more than 40 minutes.

B. *Water softeners* – “All devices” should be replaced with “all self-regenerating water softeners”, since this specification is meant to apply to units with on-site regeneration, rather than portable exchange tanks provided by an exchange service provider.

C. *Drinking water treatment systems* – Support. However, the efficiency rate is ambiguous, and should be clarified that it relates to the relative recovery and reject streams rather than some other operating characteristic, such as the level of removal of impurities. For example, “Such systems shall yield at least 85 gallons of treated water for each 100 gallons of water processed.

D. *Other indoor equipment missing from the specification, to be added as follows:*

- *Humidifiers* -- Any whole-house humidifier shall not be of the flow through variety. Other commercially available technologies make use of a high-consumption flow through humidifier unnecessary.
- *Bathtubs* [insert after paragraph 3.4] are not to exceed 75 gallons capacity, measured at the level of the overflow drain. This volume will accommodate a generously proportioned (6' x

3.5') conventional bath tub. Larger tubs will require significantly more water even if not filled to capacity.

- Bidets are not to exceed a flow rate of 2.5 gpm.

4.0 Outdoor Water Efficiency Criteria

- 4.1** Landscape – The goal of the water-efficient landscape criteria is to reduce or obviate the need for supplemental irrigation. EPA has developed two options for designing the landscape of WaterSense labeled new homes, builders shall choose and implement one of the options. Option 1 provides a turf allowance and Option 2 allows the builder/landscape professional to design a landscape that is sustainable with a specified amount of water, i.e., a water budget.

The entire yard shall be landscaped to meet the criteria in either option.

Alliance Comments:

A. We recommend that the goal of the landscape criteria be restated. The goal should be to significantly reduce the amount of water used for supplemental irrigation in the landscapes surrounding new homes.

B. We recognize the potential to capture additional water savings where the property is fully landscaped to meet WaterSense specifications. However, builder participation is crucial to the success of the WaterSense New Homes program. Thus, we recommend against a uniform requirement that the entire yard be landscaped, as this will tend to greatly reduce the potential for participation in WaterSense by builders in markets where the prevailing practice is to sell new homes with only the front yard landscaped by the builder. In such markets, the outdoor water efficiency criteria should apply to any landscaping and outdoor features that are offered, financed, installed, or sold as upgrades by or through the homebuilder. In addition, the surface area of the property must be stabilized to prevent erosion and excessive stormwater runoff (see recommendations below for new Sec. 5.0). EPA should gather sufficient regionally-specific information on new home landscaping practices to allow it to determine the specific housing markets where the landscaping of entire yards will be required.

4.1.1 Landscape Design

- 4.1.1.1** Option 1 – Turf shall not exceed 40% of the landscapable area.
Turf shall not be installed on slopes greater than 4:1.

Alliance Comments:

A. The value of Option 1 is to provide a computationally simple method for ensuring that newly installed landscapes are more water efficient than typical offerings. Since the water budget concept is still new and unfamiliar in many parts of the country, we support an “EZ” track for builders and landscapers in these areas. Option 1 would be stronger and more effective, however, if the percentage limitation were not stated to apply to turf per se, but rather to all plant material with high or medium water use requirements. We recommend that EPA work with states, universities, and trade allies to establish and

maintain easily accessible lists of the most commonly used landscape vegetation grouped into high, medium, and low water use plants for each of the USDA climate zones.

B. It is critically important that Option 1 include an absolute cap, as well as a proportionate cap, on the area devoted to high and medium water use plants. We recommend a cap of 40% or 2,000 sq. feet, whichever is less (or 1,000 square feet if only a portion of the landscapable area, i.e., the front yard, is installed by the builder, as per our recommendation above). An absolute cap at this level will still allow functional turf areas for active play, entertainment, and similar activities for which turf is desirable, while ensuring that water-demanding plants will not be used on larger lots simply to fill space.

We note that Option 2 will provide builders with greater flexibility to install water-intensive plantings, provided that such water consumption is appropriately balanced with low water-using elements to yield a landscape that is water efficient overall, i.e. 60 % of reference ET. Under Option 1, however, substantial expanses of high water use plants could be installed without constraint, save for the size of the lot itself. At lot sizes of one-quarter acre and above, Option 1 will allow water consumption in such yards that will largely negate the water savings achieved elsewhere in a WaterSense new home. For example, a WaterSense new home might be expected to reduce indoor use by 20 gallons per capita per day, or about 30,000 gallons per year for a four-person household. In the dryer portions of Southern California, for example, less than 700 square feet of turf would consume that amount of water, assuming a reference ET of 74 inches, and other high water use plant varieties could demand as much or more. While less arid portions of the country experience lower rates of ET, outdoor irrigation remains a dominant factor in the seasonal peak for residential water demand. Thus, limiting installation of high and medium water use plants by builders is both reasonable and necessary to ensure that WaterSense new homes are substantially more water efficient than the average residence.

4.1.1.2 Option 2 – Develop the landscape design using a water budget approach. The evapotranspiration (ET) limit on the landscapable area shall be no more than 60 percent of the reference ET (ET_o) for cool-season grass. For purposes of the ET calculation, the available precipitation shall be no more than 25 percent of the average annual rainfall amount. Turf shall not be installed on slopes greater than 4:1. Builders keeping a natural landscape that requires no supplemental irrigation would meet the requirements of this option.

Alliance Comments:

A. The lack of a specific methodology for computing water budgets makes the efficacy of Option 2 difficult to ascertain. The methodology should be made available for public review before the New Homes specification is finalized.

B. Referring to slopes with the shorthand of 4:1 can be misinterpreted. The specification should spell this out more clearly in narrative form, such as slopes greater than one foot rise for each four feet of horizontal distance. Also, as noted in Alliance Comment A under Option 1 above, the slope limitation should apply to all plant material with high or medium water use requirements, rather than simply to turf.

- 4.1.2 Mulching** – Non-turf, non-hardscape areas shall include a 2 to 3-inch layer of mulching material.
- 4.1.3 Pools/spas** – If installed prior to owner occupancy, the water surface area shall be deducted from the turf allowance under Landscape Design Option 1 and included as landscapable area under Landscape Design Option 2.
- 4.1.4 Ornamental water feature** – Builders shall not install or facilitate the installation of ornamental water features.

Alliance Comments:

A. Narrow strips of turf. Under either Option 1 or Option 2, narrow strips of turf invite irrigation that is difficult to maintain with precision and ultimately wasteful. The specification should identify a width, such as four feet, below which strips of turf may not be installed.

B. Mulching – Replace “2 to 3-inch layer” with “layer of at least 2 inches”.

C. Pools and spas – We note that this provision lacks any limit on the size of pools and spas. The lack of an absolute cap on turf area means that a home could have 40% of its landscapable area as pool surface and still be eligible for the WaterSense label. We recommend that an ample but reasonable limit, such as 3,000 sq. feet, be considered for the surface area of pools and spas if no turf area limitation is embraced.

We also note that the specification is silent regarding pool and spa covers to reduce evaporative losses. While the usage of covers is up to the occupants, a cover can't be used if it is not installed. Any builder-installed swimming pool or spa should come with a cover.

D. Ornamental water features – The definition should change “solely” to “principally”, to prevent decorative features with nominal functionality from avoiding this classification. In addition,

- *This requirement should be limited to water features supplied by potable water; and*
- *This requirement should not preclude installation of water features established as part of a registered/certified back yard habitat program.*

The water surface area of any eligible water feature should be deducted from the allowable caps on high and medium water use plants under Option 1 and included as landscapable area under Option 2, as with pools and spas.

E. Soil preparation requirements should be included, since water demand can be exacerbated by installation on compacted subsoil, as is typically found at graded and backfilled building sites. A minimum of four inches of substrate, appropriate to the needs of each major element of the landscape plant palette, should be required. For compliance, small samples of substrate should be retained on-site and the installed landscape spot-checked with a probe.

- 4.2 Irrigation System Design** - Irrigation systems, if installed, shall meet the following criteria:

4.2.1 Design and Installation

4.2.1.1 All irrigation systems shall be designed, installed, and audited by a WaterSense Irrigation Partner. A listing of Irrigation Partners by State can be found at

<http://www.epa.gov/watersense/pp/irrprof.htm>

4.2.1.2 Irrigation systems shall be designed to sustain the landscape without creating flow or spray that leaves the property during a minimum continuous operating duration. This will be measured during the irrigation audit and the minimum continuous operating durations shall be 7 minutes for pop-up, fixed-spray sprinklers; 10 minutes for subsurface irrigation; 10 minutes for flood bubblers; 20 minutes for rotor sprinkler heads; and 30 minutes for drip irrigation.

Alliance Comments:

A. *The nature and specifics of the irrigation system “audit” should be described and defined in the specification.*

B. *The first sentence of paragraph 4.2.1.2 should state that irrigation systems “shall be designed **and installed** to sustain the landscape without creating”*

C. *To strike a practical balance between identifying installation problems and limiting the time required for on-site inspection, we recommend a minimum operating duration of 7 minutes per zone, applicable to all types of systems.*

4.2.1.3 Sprinkler heads shall not be used to water plantings other than maintained turf grass.

Alliance Comment: The limitation on sprinkler heads in 4.2.1.3 should be restated as a limitation on spray irrigation, so the provision would read “Spray irrigation, other than as components of a microirrigation system, shall not be used to water plantings other than maintained turf grass.” Microspray heads are appropriate for many non-turf applications.

4.2.1.4 Microirrigation shall be used for planting beds and turf installed in strips of less than 8 feet wide.

Alliance Comment: The definition of microirrigation contains an unrealistically low flow-rate for the system or station as a whole. The flow limitation should be set for each emitter.

4.2.2 Irrigation Controller

Irrigation controllers shall contain the following features:

- Multiple programming capabilities – shall be capable of storing a minimum of 3 different programs to allow for separate schedules.
- Multiple start times (cycling, cycle/soak, stackable start times) – shall be capable of a minimum of 3 different start times to allow for multiple irrigation cycles on the same zone for areas prone to run off.
- Variable run times – shall be capable of varying run times, for example from 1 minute to 1 hour.
- Variable scheduling – shall be capable of interval scheduling (minimum of 14 days) to allow for watering on even day scheduling, odd day scheduling, calendar day scheduling, and interval scheduling.
- Percent adjust (water budget) feature – shall include a “Percent Up/Down Adjust” feature (or “Water Budget” feature) such as a button or dial that permits the user to increase or decrease the run-times or application rates for each zone by a prescribed percentage, by means of one adjustment without modifying the settings for that individual zone.
- Capability to accept external soil moisture and/or rain sensors.
- Non-volatile memory or self-charging battery circuit.
- Complete shut off capability for total cessation of outdoor irrigation.

These criteria will be revised if and when EPA develops a final specification for weather-based or sensor-based irrigation control technology. Information on the development of a draft specification for these technologies can be found at <http://www.epa.gov/watersense/specs/controltech.htm>.

Alliance Comments:

A. The requirements listed for irrigation controllers are commonly available, and will achieve little additional water savings over standard offerings. The commitment to revise the specification following completion of the product specific WaterSense specifications for weather-based and sensor-based controllers should be at least as strong as the commitment to revise the specification for showerheads following completion of a product-specific specification for showerheads.

B. The specification should also state that the latest SWAT protocol is to be used for the testing and validation of performance requirements.

- 4.2.3** Sprinkler Heads – Sprinkler heads shall have a 4 inch or greater pop-up height and matched precipitation nozzles.
- 4.2.4** Microirrigation Systems – At a minimum, microirrigation systems shall be equipped with pressure regulators, filters, and flush end assemblies.

Alliance Comment: *This provision should specify a maximum microirrigation system pressure (30 psi) and the use of pressure compensating emitters.*

- 4.2.5** Schedule – Two seasonal water schedules shall be posted at the controller. One schedule shall be designed to address the initial grow-in phase of the landscape and the second schedule shall be designed to address an established landscape.

Alliance Comment: In addition to the initial grow-in schedule, the established landscape should have separate schedules for the dry season and for the wet season. The text should be clarified to ensure that such schedules are posted.

Proposed New Section 5.0

Alliance Comment: A new Section 5.0 – Stormwater Management is recommended. Stormwater management criteria that preserve local groundwater resources, displace the use of potable water, protect source water quality, and reduce wastewater infrastructure costs should be established. We recommend the following:

5.0 Surface Water Management

- 5.1 Erosion Prevention – All erodible surfaces within the lot line shall be stabilized with vegetative or non-vegetative groundcover, terracing, or other permanent non-vegetative treatment.
- 5.2 Stormwater Management – Ensure the ability to recharge (or to retain on-site for at least 24 hours) the first inch of a rainfall event at the site, through any combination of the following techniques consistent with local codes –
- * vegetative landscape;
 - * permeable pavement;
 - * cisterns;
 - * vegetated swale, rain garden, or other infiltration features.

This suggested language will allow homebuilders and landscapers wide flexibility to install design features that stabilize the site and capture the important “first-flush” of storm events. Performance may be documented through standard references prepared or assembled by EPA. Future versions of the WaterSense New Homes specification should consider additional criteria to facilitate additional recharge and/or on-site use of stormwater.

5.0 Homeowner Education

- 5.1 Operating Manual – The builder shall develop and provide to the homebuyer a written operating and maintenance manual for all water-using equipment or controls installed in the house or yard. If clothes washers or dishwashers are not provided, information about water-efficient appliances shall be included.

Alliance Comment: In addition to an explanation of equipment and controls, the manual should identify by species all major components of the installed landscape, and provide regionally specific instructions regarding watering requirements and other maintenance. A schematic diagram of the irrigation system as installed should be provided.

6.0 Definitions

Alliance Comment: “Audit” of newly installed irrigation systems should be defined.

Core plumbing system – Hot water distribution system where water volumes in the pipes are reduced by a combination of smaller pipe diameters and shorter pipe runs due to a centrally located water heater.

Demand-initiated recirculating hot water delivery system – Recirculating hot water delivery systems use a pump to rapidly move water from a water heater to the fixtures. In this system, a recirculating pump rapidly pulls hot water from a water heater while simultaneously sending cooled-off water from the hot water lines back to the water heater to be reheated. Demand-initiated hot water recirculation systems can be activated by the push of a button or motion sensor. Hot water recirculation systems generally consist of a pump, an integrated electronic controller, and a zone valve. When the activation button is pushed, the pump starts recirculating cooled water that's been sitting in the hot water line and sends it back to the water heater through a dedicated return line or the cold water line. When the water reaches a desired temperature a control closes the zone valve and turns off the pump. It is much like turning on the hot water faucet and letting the water run until it gets hot, but instead of the water going down the drain it is simply returned back to the water heater. When the hot water faucet is turned on, hot water is readily available.

ENERGY STAR dishwashers – A listing of these dishwashers can be found at http://www.energystar.gov/index.cfm?c=dishwash.pr_dishwashers

ENERGY STAR clothes washers – A listing of these clothes washers can be found at http://www.energystar.gov/index.cfm?c=clotheswash.pr_clothes_washers

ET limit (ET_o) - ET_o is defined as the reference evapotranspiration rate from an extensive, uniform surface of dense, actively growing, cool-season grass with an approximate height of 4.7 inches and that is not short of soil water. Calculation of ET values should be performed using generally accepted equations and methods such as the ASCE Standardized Reference Evapotranspiration Equation (American Society of Civil Engineers, 2005). The Irrigation Association lists sources of ET information at http://www.irrigation.org/gov/default.aspx?r=1&pg=et_connection.htm

Evaporative air conditioners – Also called “swamp coolers” cool the air using water evaporation. There are two types of evaporative coolers: direct and indirect (all called two-stage). In a direct evaporative cooler, a blower forces air through a permeable, water-soaked pad. As the air passes through the pad, it is filtered, cooled, and humidified. An indirect evaporative cooler has a secondary heat exchanger which prevents humidity from being added to the airstream which enters the home. Cooling systems are defined by the temperatures they can “hold” either in the space and/or the process or equipment, and the amount of heat they can remove at full capacity. This heat removal is normally expressed in tons of cooling (or refrigeration) capacity. One ton of cooling equals precisely 12,000 Btu heat removal per hour (abbreviated Btu/h) and comes from the way air handlers were originally rated -- that is, how many pounds of ice would have to be loaded into them to provide the required space cooling. When melting, ice gives up 144 Btu per pound. Therefore, one ton of cooling provides the same amount of cooling energy as melting one ton of ice in 24 hours.

Alliance Comment: As mentioned in the comments earlier, “swamp coolers” are not the same thing as evaporative air conditioners; these are not interchangeable terms.

Hardscape – The part of a house's grounds consisting of structures, such as patios, decks, retaining walls, and walkways, made with hard materials.

Landscapable area – The area of a site less the building area, driveways, paved walkways, pools and spas, natural water features, and hardscapes such as decks and patios.

Alliance Comments:

A. “Site” is ambiguous. “Lot” would be a clearer term, and appropriate for single-family homes.

B. Any undisturbed natural areas that are restricted against improvement by recorded easement, deed covenant, land trust instrument, or similar written restriction should be excluded from the landscapable area.

C. To fully account for its water consumption, a green (vegetated) roof should be included in the landscapable area.

Manifold system – Also called parallel pipe or home run systems have a manifold connected to the water heater from which individual pipes are connected to each water fixture.

Microirrigation system – The application of small quantities of water directly on or below the soil surface, usually as discrete drops, tiny streams, or miniature sprays through emitters placed along the water delivery pipes (laterals). Microirrigation encompasses a number of low-flow, low-volume irrigation systems with any type of emission device, including surface drip irrigation systems, subsurface drip irrigation systems, and pop-up surface microirrigation systems. These systems shall have flow rates of no more than 25 gallons per hour.

Mulching material – Covering placed around plants to reduce water loss and erosion, and to help regulate soil temperature. Permeable artificial turf is considered to meet this definition.

Ornamental water feature – Includes fountains, ponds, waterfalls, man-made streams and other decorative water-related constructions provided solely for aesthetic or beautification purposes.

Recirculating shower – Showers designed to recirculate the water used in a shower by pumping water captured in a basin through the shower system. Most of these systems are designed to be switched on after initial cleaning is performed using a conventional showerhead and may include a filtering process.

Sprinkler head – A component in an irrigation system where pipes are buried underground. Sprinkler heads are spaced at desired intervals to deliver the water. Pop-up sprinkler heads pop-up when the water is on and recess into the ground when the water flow is off.

Static water pressure – The pipeline or municipal water supply pressure when water is not flowing.

Alliance Comment: The term used in the specification is static service pressure, for which this definition would be appropriate.

Water budget – A water budget is used to calculate the amount of water a landscape needs taking into account the inputs and outputs of water to and from the root zone. Inputs, such

as precipitation, are subtracted from outputs, such as evapotranspiration, to calculate the water needs of the landscape. Many factors are taken into consideration when calculating a water budget, such as plant type and irrigation system efficiencies. Specific methodology and worksheets will follow the release of this draft specification. Methodology will be based on the Irrigation Association's "Landscape Irrigation Scheduling and Water Management."

WaterSense bathroom (lavatory) faucets – These faucets have a flow rate that does not exceed 1.5 gallons per minute (gpm) (5.7 liters per minute) at a pressure of 60 psi (4.2 kg/cm²) at the inlet, when water is flowing; and is not less than 0.8 gpm (3.0 liters per minute) at a pressure of 20 psi (1.4 kg/cm²) at the inlet, when water is flowing. The specification can be found at http://www.epa.gov/watersense/specs/faucet_final.htm.

WaterSense high-efficiency toilets – These toilets have a flush volume that does not exceed 1.28 gallons (4.8 liters), a solid waste removal of 350 grams or greater, and conform to the adjustability and other supplementary requirements included in the specification. The specification can be found at <http://www.epa.gov/watersense/specs/het.htm> and a list of labeled toilet models can be found at http://www.epa.gov/watersense/pp/find_het.htm.

WaterSense irrigation partner – These professionals are certified through WaterSense labeled programs for their expertise in water-efficient irrigation technology and techniques. A listing of Irrigation Partners by State can be found at <http://www.epa.gov/watersense/pp/irrprof.htm>