Guidelines for Applicants

Assessment Criteria

This is one of a series of guidelines to help applicants to the Smart Approved WaterMark, Australia's outdoor water conservation label. Applications to the Smart WaterMark are assessed by an Independent Technical Expert Panel against the following four criteria:

1. **Water Saving -** ☐The primary purpose of the product is directly related to reducing actual water use where there is a direct correlation between the use of the product and water savings.
2. **Fitness for Purpose -**☐Supporting documentation (such as instructions and marketing material) helps ensure that users get the best water savings/efficiency from the product.
3. **Meeting Regulations and Standards -**☐The product is of high quality and meets industry standards, and customer and community expectations.
4. **Environmentally Sustainable -**☐The product, while satisfying the above three criteria, is environmentally sustainable i.e. that in making water savings the product will not adversely impact on the environment in other areas.

Supporting Evidence

Applications to the Smart Water Mark are assessed on the basis of independent, verifiable evidence to justify claimed water savings submitted with each application. Applications that are not supported by this information will not be considered by the Expert Panel.

Independent means that the author or compiler of the evidence has no commercial interest in the sale or promotion of the product which is the subject of the application. Evidence can be derived from any method chosen by the applicant and could include case studies, laboratory testing and product appraisal by independent consultants or organisations. Results from international and Australian tests are acceptable provided that data is presented in English and uses metric units.

Specific guidelines for different types of equipment are prepared to advise applicants on the sorts of testing or evidence that might be acceptable. Applicants are not obliged to follow these guidelines and can present any evidence in support of their application provided that it is independent and verifiable.

Further information

The Smart WaterMark stakeholder web site has further information on the application process including forms, timetables and fee rates at: www.smartwatermark.info. If you have any questions about these guidelines or your application please contact the Smart WaterMark national office. Email: info@smartwatermark.info Landline: +61 (0) 2 9223 3322

Guideline 4.
Irrigation Equipment

General

Water efficient irrigation occurs when a skilled operator uses a well designed system, which is made up of good quality water efficient equipment.

The design of the irrigation system, which determines how the individual pieces of equipment are put together and how the system is operated are the main determinants of irrigation water use efficiency. Consultancies offering water-efficient design, evaluation and operation of irrigation systems can submit an application to the Smart Water Mark scheme as a service. This Guideline is concerned with the equipment which makes up irrigation systems.

A water efficient irrigation system comprises equipment that is fit for purpose and which operates efficiently. The major potential sources of water waste in an irrigation system are:

- Leakage through equipment made to a poor standard
- Distribution of water from the equipment outside or not on the target area
- Overwatering because a component has not closed or opened correctly
- Errors in scheduling or watering times and durations because of poor quality equipment.

Previous successful applications to the Smart Water Mark scheme for irrigation equipment have described how the use of the particular piece of equipment has led to water savings. The reasons have included various equipment features such as pressure regulation, improved watering uniformity and reduced leakage. Some other possible ways of demonstrating water saving are outlined below.

For all irrigation devices case studies showing a reduction in water use following the installation of a device are an excellent way to demonstrate the water saving potential of a product.

The International Standards Organisation (ISO) publishes a list of standards for irrigation equipment. These standards contain a range of tests for irrigation equipment which could be used to produce evidence of water efficiency and water savings. A list of these standards is on the Irrigation Australia Limited website (www.irrigation.org.au).

Electronic controllers

The Smart Approved Water Mark encourages the use of products and services that represent best practice in the relevant industry. For electronic irrigation controllers it is considered that best practice is represented by controllers that use environmentally based sensors to schedule irrigation. The sensor(s) might measure any relevant agronomic factor such as evapo-transpiration or soil moisture to determine irrigation schedules.

Applicants can use any suitable method to demonstrate that the controller supplies only the amount of water required by the plant. As a guide, the Smart Water Application Technology program (www.irrigation.org/SWAT/Industry/) in the USA compares the performance of a controller with a theoretical optimum to determine the efficacy of the controller. The irrigation industry believes that an irrigation controller should be able to deliver irrigation water to within 5% of the theoretical optimum. The Smart Water Mark Expert Panel has adopted this standard as a benchmark for assessing electronic irrigation controller applications.

Tap mounted controllers

Tap mounted controllers which use a clock mechanism to regulate a home garden irrigation system have two key features that give them the potential to save water when compared with a manually controlled watering system. These are the timing mechanism and the valve which controls the flow of water. Some tap mounted controllers may be fitted with environmental sensors.

Demonstration of water savings could include evidence of the water tightness of the device and verification of the accuracy of the timing mechanism. Case studies that compare water use before and after installation of a tap mounted controller could provide the required evidence.

Sensors

The key water-saving feature of sensors is their ability to turn off (or on) the irrigation system with interaction with a controller. The testing protocols for sensors therefore should be aimed at testing this function.

For **soil moisture sensors** the testing should examine the soil moisture conditions under which the sensor "triggers" a response.

For **rain sensors**, the depth of rainfall required to trigger the sensor should be measured. The University of Florida has developed a testing protocol for evaluating rain sensors (http://edis.ifas.ufl.edu/). The protocol is designed to test the functionality of the sensor in regard to sensing rain, drying out before another rain event, and repeating the cycle. The tests measure the accuracy of the sensor, in other words the amount of rain required to activate the sensor as compared with the amount of rain reported by the sensor and the precision of the sensor, which measures the repeatability of the measurement of rain.

For **evaporation sensors**, a comparison could be made between official evaporation figures such as those from the Australian Bureau of Meteorology (www.bom.gov.au) and the measurements made by the sensing device.

Sprinklers and sprayers

There are existing international standards for sprayers and emitters which contain detailed testing protocols on a range of equipment features.

The tests cover many aspects of the products including:

- Discharge at different inlet pressures
- Radius and height of throw
- Coverage pattern and uniformity of coverage
- Water tightness of assembled sprinklers and sprayers

The use of sprinklers and sprayers can result in water waste through uneven watering or watering of areas other than the target area.

In the situation where a sprinkler or sprayer is designed to operate as a stand alone unit and not in an array with other sprinklers or sprayers it is expected that the distribution uniformity (DU) will be at least 75%.

In all other cases it is expected that the spray head would have independently verified flow rates within 5% of the manufacturer's specified flow rate.

Drip emitters

Drip emitters can be considered separately from sprayers, sprinklers and hand held emitters. Drip emitters as a category include individual drip emitters that can be fixed to a poly pipe at selected locations chosen by the installer as well as in-line drip emitters where the individual dripper units are manufactured in the pipe. This type of product is sometimes known as emitting pipe.

Since drip emitters are manufactured to operate at low discharge rates it is important that the discharge performance of the dripper is confirmed with a low coefficient of manufacturing variation (a flow rate variation from the nominal flow rate within 5%). If the device is pressure compensating, evidence of the potential water savings resulting from the range of pressure compensation could be presented.

Trigger nozzles and hand held devices

Water waste with such devices usually occurs because the device waters outside the target area or the opening and closing mechanism is inefficient.

Tests could be done to demonstrate the water tightness of the device and the efficacy of the opening and closing mechanism.

Other tests could measure the uniformity of different spray patterns.