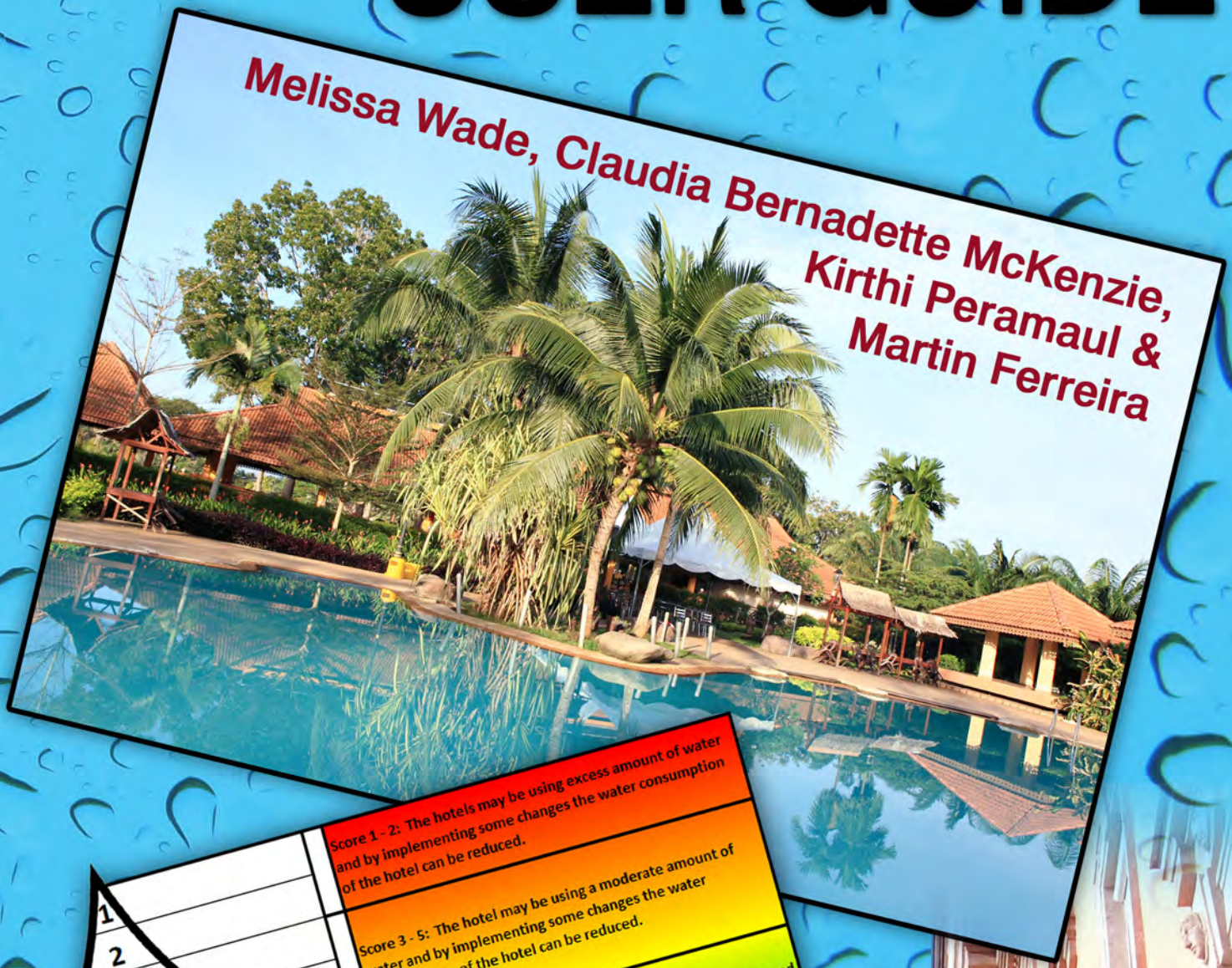
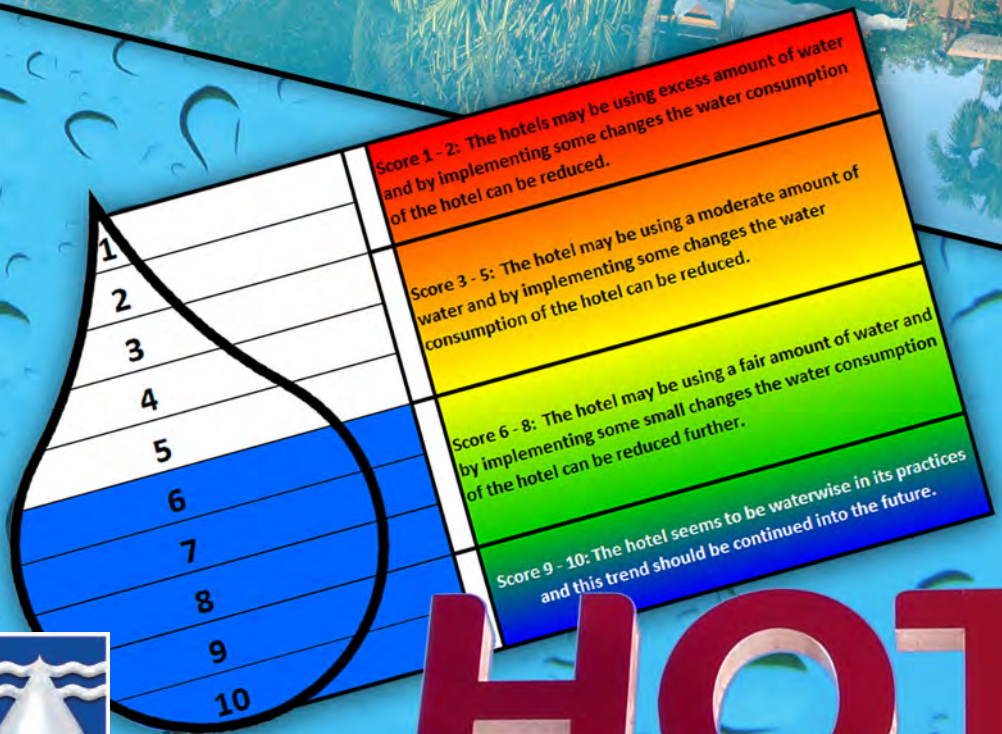
AquaSmart Hotels
USER GUIDE

Melissa Wade, Claudia Bernadette McKenzie, Kirthi Peramaul & Martin Ferreira





WATER RESEARCH COMMISSION
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WATER RESEARCH COMMISSION

AquaSmart HOTELS

USER GUIDE

This user guide has been developed for hotel managers to assist them in using the AquaSmart Hotels tool. The AquaSmart Hotels tool was developed to create awareness regarding water conservation within the hospitality industry by assisting members and owners of hotels, lodges, B&Bs etc., to determine where and how water is being used within their establishment and providing alternative options which could reduce their water consumption. The AquaSmart Hotels tool consists of two Microsoft Excel workbooks. The first workbook is the tool and the second workbook is a database where water consumption information for the hotel can be stored. This guide provides detailed instructions on how to use the tool and database as well as general information on water conservation within the hospitality industry.

The AquaSmart Hotels is available freely for download from the WRC website at http//www.wrc.org.za /software/aquasmart hotels

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BACKGROUND

The concerns regarding the availability of freshwater supplies are shared worldwide, as an estimated 450 million people are already living under severe water stress since 1995 (Gössling *et. al*., 2012). South Africa is not exempt from these concerns, as it is known to be a water scarce country with predictions of chronic water shortages by 2050 (Gössling *et. al*., 2012). It is therefore important that every effort is made to conserve water in all sectors, including the tourism and hospitality industry.

Tourism is both dependant on fresh water resources and a user of freshwater (Gössling *et. al.,* 2012) and the rapid growth of the tourism industry has further increased the pressure on these resources. The impact of the tourism industry on water resources can cause overexploitation and depletion of water, especially in water scarce areas (Tortella and Tirado, 2011).

Traditionally, the hospitality industry generates a high water and energy bill, in order to provide good quality service. A guest is more likely to waste water in a hotel than their own home since the amount of water consumed is not independent of the room charges (Seneviratne, 2008). This can be as much as 3 times the average water consumption of people living at home (Barberán, *et.al*. 2013). Hotels that offer a higher standard of accommodation tend to consume higher water volumes, especially those with spas and large or multiple swimming pools, and this can place pressure on water resources, especially at a local and regional level (Gössling *et. al*., 2012).

Fortunately, many hospitality industries have recognised their impact on the environment as a whole, and have adopted environmentally friendly practices to their core business strategy. Part of the reason for this is that companies are judged on their 'triple bottom line' of economic, social and environmental management by shareholders, investors, employees, customers, environmental and ethical groups and the general public (ITP, 2013). One of these environmentally friendly practices that is being adopted is water conservation, where focus has been placed on being water wise, but still meeting the company's hospitality standards.

The electronic AquaSmart Hotels tool has thus been developed so that it can be used by the hospitality industry to assist with saving water and to increase awareness regarding the current water situation in South Africa.

INTRODUCTION

Water is a precious and scarce commodity and should be conserved by all, especially in South Africa which is such a water scarce country. The conservation of water does not only benefit the environment but also the user and these potential benefits are listed in Table 1.

TABLE 1: BENEFITS OF WATER CONSERVATION FOR THE HOSPITALITY INDUSTRY AND THE USER (COM, 2007; COCT, 2010)

Hospitality industry	Environment
Save on water costs	Reduce the demand on drinking water supply.
Save on energy costs through the reduction in appliance and hot water use	Reduction in the energy consumption required for the transfer and treatment of water and sewerage.
Enhance hotels reputation by being known for its proactive approach towards protecting the environment.	Provide a larger environmental flow for rivers and reducing the need for the construction of more dams.
	Reduces wastewater dischargers to rivers and oceans.

A study by Tortella and Tirado (2011) revealed that water saving initiatives introduced by hotels reduced annual water consumption by up to 13.6%. Some examples of savings that have been made by hotels that have implemented water conservation initiatives are provided below (Still *et. al.,* 2008).

- The Michelangelo Hotel, Sandton, Johannesburg: Installation of independent water meters and the implementation of water use monitoring and reporting resulted in a savings of more than R23 000 per month.
- The Sandton Convention Centre, Sandton, Johannesburg: Installation of cutoff switches on the kitchen cyclowash extractor systems reducing the water consumption in the kitchen by 75% and effective monitoring of the water usage of the pumps and cooling systems reduced water consumption by 30%.
- The Rosebank Hotel, Rosebank, Johannesburg: Monitoring water usage revealed that water was being used by adjacent properties. When this stopped it resulted in a saving of R20 000 a month.

The **AquaSmart Hotels Tool** is an electronic tool developed with the aim to increase awareness regarding water conservation within the hospitality industry and provide suggestions as to how water can be conserved. The objectives of the study were to:

- Determine what water conservation practices can be used in the hospitality industry.
- Develop an interactive electronic tool that can be used by members of the hospitality industry.
- Create awareness for water conservation within the hospitality industry.

This user guide has been developed to document the results of the objectives that were set and has been divided into three sections, namely.

SECTION A: provides information regarding water conservation in the hospitality industry as well as tips on how to save water.

SECTION B: provides an overview of the tool that was developed and a guide on how to use it.

SECTION C: provides the results of case studies of 2 hotels as well as other comments received from members of the hospitality industry regarding water conservation in general and the tool.

Extract from the Hotel and Restaurant website...

Maropeng embraces water conservation technology: "Greg McManus, managing director of the Heritage Environmental Rating Programme, predicts that water costs will rise as much as 45% over the next two years," says Rubin. "This will mean not only a considerable increase in cost to those who have not started implementing conservation initiatives but could also mean a potential loss in consumer support as consumers move towards supporting businesses that are actively making use of green initiatives. Unfortunately the latest water hike announcement also comes at a time when as a country we have been hit by increased fuel and energy costs, and the introduction of e-tolling costs in Gauteng," adds Rubin."

by Susan Reynard (3rd May, 2012)

http://www.hotelandrestaurant.co.za/tourism/maropeng-embraces-water-conservation-technology/

SECTION 1:

WATER CONSERVATION IN THE HOSPITALITY INDUSTRY

Water conservation is the reduction in water use. This includes doing less with less water as is done during a water shortage. It also includes day-to-day demand management to better manage how and when water is used (NCDENR and LoSRC, 1998). .Water efficiency means to use improved technologies and practices that deliver equal or better service with less water (NCDENR and LoSRC, 1998). The majority of water consumption within hotels is within the guest rooms, as indicated in Figure 1, and the majority of this water use is from showers (CoM, 2007). There are various ways to improve water efficiency and to conserve water in the guest room as well as other areas of the hotel and Table 2 provides some examples of the possible water savings that can be achieved if some of the water conservation initiatives are implemented.

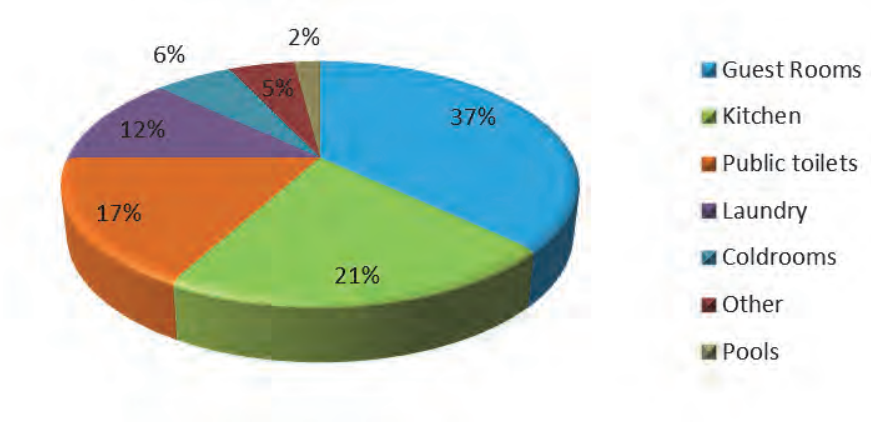


FIGURE 1: TYPICAL WATER USE FOR A HOTEL WITH 300 ROOMS BUT NO IRRIGATION (ETHEKWINI MUNICIPALITY, 2009)

TABLE 2: POSSIBLE WATER SAVINGS BY IMPLEMENTING WATER SAVING INITIATIVES (ETHEKWINI MUNICIPALITY, 2009)

Water conservation initiatives	Possible savings
Install dual flush toilets	Standard toilet uses on average 11 litres/flush whereas a dual flush toilets uses on average 6/3 litres/flush which is a **65%** saving
Install water efficient urinals	Standard urinal flush value uses on average 2.2 litres/flush whereas a water efficient flush value uses on average 1.5 litres/flush which is a **32%** saving
User water efficient showers.	Standard showerhead uses on average 20 litres/min whereas a water efficient showerhead uses on average 7 litres/min which is a **65%** saving
Check for leaking toilets and taps	A leaking toilet can lose **750 litres** of water a day (Green Hotelier, 2013) Repairing dripping taps can save up to **30 litres/hr**.
Install low flow aerated taps	Standard tap uses on average 15 litres/min whereas a low flow

Water conservation initiatives	Possible savings
	aerated tap uses 6 litres/min which is a **60%** saving.
Use a water efficient washing machine	Replacing an old washing machine with a water efficient model can save approximately **30%** in water consumed.
Use as water efficient dishwasher	A new water efficient dishwasher can use up to **50%** less water than a conventional dishwasher. Hand washing could use up to 49 litres of water compared to the 10-12 litres that a dishwasher uses which is approximately a **78%** saving (Rickett Benckiser, 2014).
Implement a linen and towel reuse policy	A medium sized hotel can save approximately **22 710 litres** of water a month according to 'The Caribbean Cares' towels and linen initiative (Greenhotelier magazine, 2005).
Using a pool cover	Reduces evaporation by up to **90%**.
Implement water efficient technologies and practices in the garden	This can reduce water for gardening between **6-30%.**
Install a rainwater harvesting system.	Rainwater harvesting can reduce the amount of municipal water used by **40%.**

Even minor changes and improvements will make a difference to water savings in a hotel but to achieve the greatest substantial saving, changes need to be incorporated throughout the organisation (CoM, 2007). This includes a few simple changes to technology, staff behaviour and internal policies and procedures (Figure 2).

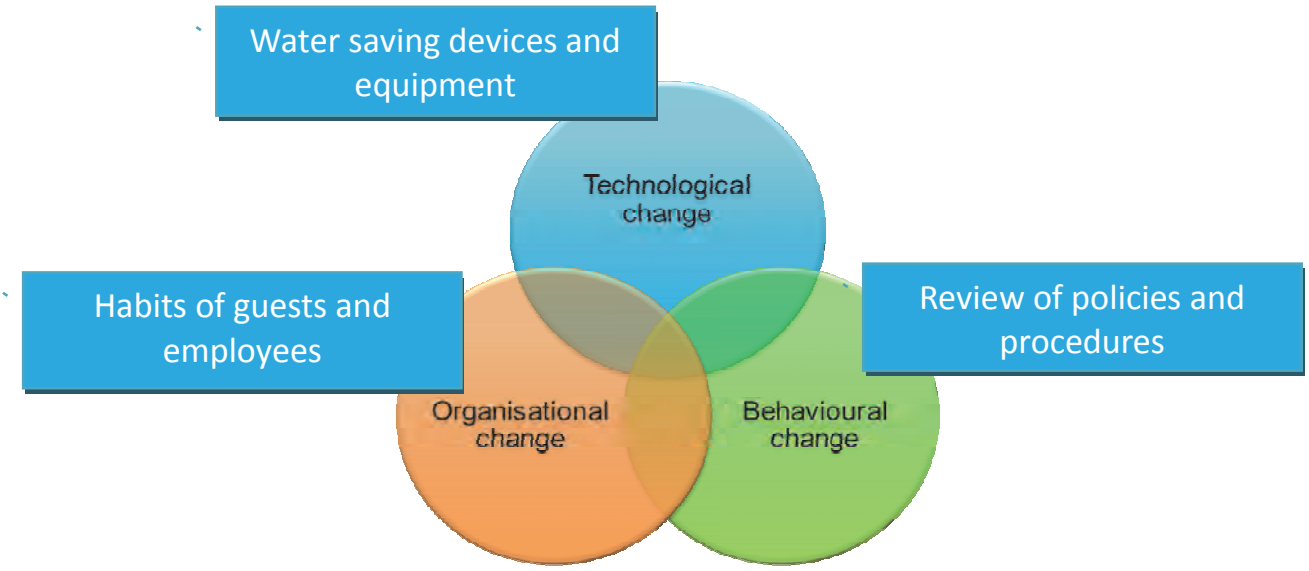


FIGURE 2: REQUIREMENTS OF A SUCCESSFUL WATER EFFICIENCY PROGRAM

- Technological changes: The installation of water saving equipment and devices to improve water efficiency.
- Organisational changes: A review of the policies and procedures that need to be in place that will help to reduce utility costs. The support of senior management and the training of staff are very important in this regard.
- Behavioural changes: The efficiency of water use within the establishment is dependent on the habits of guests and employees.

The water conservation tips below will consider these three aspects for each area of the hotel.

1.1 LAUNDRY

To reduce the large amount of laundry and to reduce the water consumption within the laundry room itself, the following measure and policies can be implemented (CoM, 2007; CoCT, 2010):

1.1.1 TECHNOLOGICAL CHANGES

- Consider using ozone laundry systems. These inject ozone into the water, which works in conjunction with the laundry chemicals to provide a more efficient wash.
- If possible, use washing machines that have a good water consumption rating.
- 500 room plus hotels could consider installing a continuous batch washer (CBW), which uses all the pre-washing and main suds operation.
- Consider the reuse of water from previous rinse cycles for the first wash of the next cycle by installing temporary holding tanks.

1.1.2 ORGANISATIONAL CHANGES

- Implement a no-change policy for towels and linen.

1.1.3 BEHAVIOURAL CHANGES

- If guests would like to have their towels washed, then they should leave the towels on the floor, otherwise they should hang the towels up if they are willing to use them again.
- Inform guests that the linen will not be changed daily but will be done so on request. The guests must be made aware of this policy so that there is no confusion.
- Train the staff on the policies and how to inform the guests about the policies.
- Wash small quantities in 5kg machines and only use the washing machines when they are fully loaded.
- Minimise rinse cycle as much as possible without reducing quality.
- When equipment is not in use, switch off and isolate the steam supply to conserve energy and reduce the amount of make-up water consumed by the boiler.
- Maintenance is also key: Check regularly for leaking dump valves, ensure all water inlet valves are closing properly and check that level controls on water reuse tanks are working properly.

Did you know...

One of the biggest consumers of water and energy in a hotel is laundry, especially the washing of towels and linen.

(CoCT, 2010)

1.2 SHOWERS

The single most effective way for hotels to conserve water is to install low-flow showerheads and faucet aerators which could reduce both the water consumption and energy cost of heating the water by as much as 50% (CoCT, 2010).

The World Health Organisation (2006) classifies the water efficiency of showers as specified in Table 3.

TABLE 3: WHO CLASSIFICATION OF SHOWERS

Flow rate	Classification
6-8 litres per minute	Very good
8-12 litres per minute	Good
12-18 litres per minute	Reasonable
18-24 litres per minute	Fair
> 24 litres per minute	Poor and very wasteful

1.3 TOILETS

Toilets can account for 15% to 40% of the total water usage in public amenities, depending on the type of system used (CoCT, 2010). Installing water efficient devices or waterless urinals in public areas is very cost effective due to the large number of people that make use of the facilities (CoCT, 2010).

The following changes can be made to reduce water consumption in toilets (CoCT, 2010; Green Hotelier, 2013; Still *et.al.,* 2008):

1.3.1 TECHNOLOGICAL CHANGES

- Install waterless urinals. Waterless urinals operate with no water and have one way traps or seals that allow the urine to pass into the sewer but blocks any smells from rising up the pipe. It is possible, in some instances, to retrofit the one-way seal into existing urinals to make them waterless which is cheaper than installing new urinals.
- Install a dual flush system in all toilets. This system allows the users to choose between a light flush that uses about three litres of water and a longer flush that uses about six litres. This dual system can save between 30% and 50% of water used. They range from 11 or 6 litres, 6 or 3 litres and 4 or 2.5 litres.
- Low flow toilets use an average of just 6 or 4.5 litres per flush, compared to older models which use roughly two to four times more than that (9, 11 or 13 litres). If dual flush system can't be installed in all toilets, you can reduce the water used in flushing by placing a brick or a bottle in the cistern (effectively displacing some of the water).
- Ultra low volume flush toilets have a variable flush with a maximum volume of 3 litres.
- Installing a hippo bag or another displacement item in the cistern of older toilets that have a volume of more than 6 litres of water. This will reduce the volume of water in the cistern but may result in having to flush twice when a full flush is needed. A hippo bag is a polyethylene unit that opens to look like a box, which is placed in the cistern of the toilet to reduce the amount of water need to fill the cistern after every flush.

1.3.2 ORGANISATIONAL CHANGES

- Implement a maintenance plan – a leaking toilet can lose 750 litres of water a day.

1.4 TAPS

It is estimated that almost 80% of drinking water is used in washbasins and toilets, which goes straight into the sewerage system (CoCT, 2010).

1.4.1 TECHNOLOGICAL CHANGES

- Aerators can be installed inside the taps to restrict the flow of water without reducing the water pressure and reducing the water usage by more than 50%. To achieve the best results, the correct aerator needs to be installed for the required flow rates. A 5 litre/minute aerator is best for hand basins and a 7.6 litre/minute aerator is best for kitchen and laundry basins (CoCT, 2010). Aerators are not recommended for baths as they take too long to fill the bath (eThekwini Municipality, 2009). There are three different types of aerators, namely:
    - Aerated flow type. This aerator introduces air into the water stream and softens the stream and reduces water splash.
    - Laminar flow type. This type removes air to provide a clear water stream and is often used in hospitals and clinics to prevent airborne bacteria from entering the water.
    - Spray flow type. This type spreads the water stream over a wider area and is best for low flow conditions where aerators and laminar devices would not function effectively. It ensures full coverage when washing hands in a basin and is recommended for use in public toilets
- When taps have to be replaced or new taps and hand basins are to be installed, push-button taps, spring-loaded taps or taps with an electronic sensor can be installed so that only a set amount of water is released at a time.
- Jets in spa baths should be located low in the baths so they can be operated with minimal water.

1.5 KITCHENS

The following are some general tips for reducing water consumption within the kitchen, other than placing aerators in the taps (CoM, 2007):

1.5.1 TECHNOLOGICAL CHANGES

- Pedal operated tap controllers can be installed to ensure that valves are closed when not in use.
- Sensor-activated taps can be installed so that water flow is only triggered when needed.
- Taps in kitchens should have a maximum flow of 10 litres per minute.
- Place an aerator in the taps.

1.5.2 BEHAVIOURAL CHANGES

- Do not use running water to thaw vegetables and other frozen food. Rather plan ahead and defrost frozen foods in the refrigerator.
- Do not clean the floor by hosing it, rather use brooms and mops.
- Dishwashers and rack machines should only be operated when full.
- Pre-soaking utensils and dishes saves running water. Similarly wash vegetables and fruits in a sink of water rather than a running water rinse.

1.6 GARDENS

It is very important that gardens are planned and organised well to maximise water savings and reduce maintenance (CoCT, 2010). A comprehensive design plan is the initial step to a water-efficient landscape. A well thought out and researched design will minimize cost and attain a proper strategy for plant and sprinkler placement (NCDPPEA, 2009). The following are some recommendations with regards to planning the garden (CoCT, 2010; CoM, 2007; NCDPPEA, 2009):

1.6.1 TECHNOLOGICAL CHANGES

- Plant water wise lawns that require less irrigation
- Mulch can be used around plants to help the soil retain water and evaporation can be reduced in this way by up to 70%. Fine textured mulches are more efficient at retaining moisture than course textured mulches. The mulch should be spread 3-4cm deep to insulate the roots from heat and to reduce the growth of weeds.
- Use rainwater harvesting techniques to divert and capture rainwater from roofs and gutters. Water can be diverted into underground storage tanks or water butts. Plants also prefer rainwater to treated water from taps. This will save money and reduce the consumption of potable water.
- Use rain and / or soil moisture sensors that switch off the irrigation system when sufficient moisture is in the soil.
- If possible, use grey water from baths and sinks for irrigation. Consider installing a treatment system that will enable you to use black water from toilets; management of these systems needs to be well controlled.

1.6.2 ORGANISATIONAL CHANGES

- Develop a comprehensive design plan for the garden.

1.6.3 BEHAVIOURAL CHANGES

- The lawn should not be mowed too short. 2cm or higher of leaf should be left and this length should be maintained by cutting only the top third of the leaf area in the dry conditions. The leaf clippings can be left on the lawn to keep the moisture in the ground.
- Trees, shrubs and grass all require different amounts of water. Plants should be placed in groups according to their respective water needs, called hydrozones. This way, an irrigation system can be designed to properly match the needs of the plants, soils and weather conditions.

- Where possible, try to use indigenous plants and water wise plants that suite the climate and don't require excessive watering. This will reduce the amount or irrigation required and reduces the amount of maintenance.
- Automate the irrigation system so that it can be programmed to water the garden before 10am and after 5pm. This will reduce the loss of water through evaporation and heat and can save up to 70% of water used for irrigation.

- Where possible, do not irrigate the garden during strong winds as this can waste up to 70% of the water being sprayed.
- It is best to water the base of the plants so that the water can go directly to the roots where it is needed. Drip irrigation systems work well for this.
- Incorporate high water demanding plants at the bottom of slopes.
- Consider creating shade areas, which can be 20 degrees cooler than non-shaded areas.
- Make sure that the plants are not overwatered and adjust the irrigation system according to the seasons.
- Whenever possible, plant alternative groundcovers that require less water, or consider the use of patios and decks, further reducing water demand.

1.7 SWIMMING POOLS

The following are some water conservation ideas for the swimming pool (CoM, 2007; Gössling et. al. 2012):

1.7.1 TECHNOLOGICAL CHANGES

- Cover the pool with a pool cover to reduce evaporation.
- Drainage barriers can be installed around pools to collect overflows and splashes and this water can be reused.

1.7.2 ORGANISATIONAL CHANGES

- Develop a maintenance plan for the swimming pool. Conduct regular maintenance to prevent leaks. Checking for leaks is best done by reading water meters last thing at night and first thing in the morning.

1.7.3 BEHAVIOURAL CHANGES

- Water losses from splashing in swimming pools can be reduced by lowering the level of the water in the pool.
- Ensure that the back-washing of the pool is kept to a minimum without compromising public health and safety standards and divert the water into lawns and shrubs or collect for reuse.

1.8 COOLING TOWERS

Larger hotels use cooling towers as part of their air conditioning systems (CoM, 2007). Cooling towers offer the means to remove heat from air conditioning systems and from a wide variety of industrial process that generate excess heat (SAWC, 2009). Optimising operation and maintenance can offer the establishment a significant savings in water consumption, as cooling towers can consume between 10 to 25% of the total water used in a commercial building (CoM, 2007). The following are some suggestions on how a reduction in water consumption by cooling towers can be achieved (SAWC, 2009):

1.8.1 TECHNOLOGICAL CHANGES

- Blowdown: Is the term used for water that is removed from the re-circulating cooling water to reduce contaminant build up in the tower. Blowdown can be controlled manually or automatically by valves actuated by timers or conductivity meters.
- Drift: Is the loss of water in the form of mist carried out of the tower by an air draft. Reduction in drift through baffles or drift eliminators will conserve water and improve operating efficiency.
- Overflows: Is an uncontrolled water loss caused by water flowing back into the cold water basin once the circulating pump has stopped. Where the volume of water is greater than the basin the water will overflow. In order to prevent an overflow event the ball flow valve should be able to close preventing uncontrolled flow. The overflow pipe should be installed at the corrected level and checked for leakages.
- Consider using rainwater, recycled water or stormwater in the cooling tower.

1.8.2 ORGANISATIONAL CHANGES

- Implement a maintenance plan. Leaks result in chemical and water wastage and disturb the water balance of the system. Leaks are minimised by regular maintenance and visual inspections. Water meters and consumption levels should be monitored in order to detect changes in usage patterns. A sharp increase in water use could indicate a leak in the system.

1.9 RAINWATER HARVESTING

Water that is reused directly without treatment, like rainwater, cannot be used as potable water but can be used for irrigation and other non-potable uses (Wyngaard and De Lange, 2013). Rainwater harvesting is the storage of rainwater, normally from rooftops, in tanks for future use. The volume of potential rainwater that can be harvested can be calculated by the following equation (SAWC, 2009):

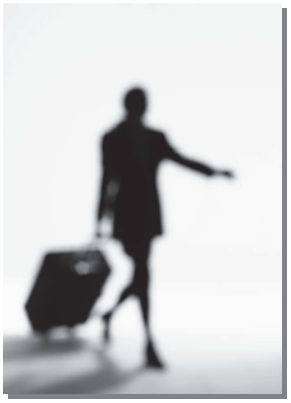
Potential Rainwater Harvest (m^3) = Annual rainfall (mm) x Rooftop area (m^2) / 1000

The volume of rainwater that is stored is dependent on the size of the storage tank (Wyngaard and De Lange, 2013). The size of the tank required to store all the rainwater calculated above is dependent on the short term fluctuations in rainfall patterns for the area as well as matching the demand for the rainwater with the supply (SAWC, 2009). According to Wyngaard and De Lange (2013), the most effective way for this rainwater to be used by hotels is for irrigation and ideally sub-surface irrigation. Sub-surface irrigation requires that pipes from the rainwater storage tanks lead underground to the plants. The harvesting of rainwater decreases the pressure on available surface water in South Africa (Wyngaard and De Lange, 2013).

1.10 GREYWATER RECYCLING

Greywater is water that is lightly polluted, such as water from showers and hand basins and can also be collected for reuse after it has been treated (SAWC, 2009). The water is collected in tanks where it settles and solids are removed before it is subjected to further treatments such as disinfection. The treated water can then be pumped and used for irrigation or for use in toilet flushing. It is imperative that the volume of water to be collected and treatment specifications are determined before considering recycling as an option. The projected uses should also be well matched to the volumes of grey water recovered. It would be a sensible choice to choose water uses that require an excess amount of water that will be recovered so that all recovered water is reused, making the capital investment more justifiable. This kind of initiative would need to take into account local regulations in order to determine if recycling is permitted, and health related risks should also be considered as the regulator would specify water quality standards that should be met (SAWC, 2009).

1.11 GUEST AWARENESS



The installation of some of the modern fixtures (as mentioned in the sections above) in guest bathrooms, can save water without compromising on the guests comfort, but guest should still be encouraged to be water wise (CoCT, 2010). The effectiveness of guest awareness campaigns is often dependent on how the message is conveyed to the guests (Cashman and Moore, 2012). Below are some suggestions as to how this can be achieved (CoCT, 2010):

1.11.1 ORGANISATIONAL CHANGES

- Many hotels have adopted a “green room” initiative where guests are advised that by placing a green card on their bed, hanging up their towels or placing a notice on their doors, the towels and linen will not be changed that day. This encourages guests to get involved and also reduces the amount of water, energy and resources that are used and lowers the amount of chemicals that are released into the environment

1.11.2 BEHAVIOURAL CHANGES

- The guests should be informed about the hotel’s environmental and water conservation policy so that they can assist in the program, for example by reusing their towels.
- Water saving practices can be encouraged by displaying signs in bathrooms, encouraging shorter showers and advising against leaving water running unnecessarily.

1.12 EMPLOYEE TRAINING

Employees can be made aware of the company's water conservation policies and initiatives through staff training. Some of the aspects that should be included in the training and incentives that can be given are (CoM, 2007; NCDENR and LoSRC, 1998):

1.12.1 ORGANISATIONAL CHANGES

- The location of the major water consuming devices / equipment so that they can be inspected regularly for leaks.
- Encourage staff to provide suggestions as to how water consumption can be reduced.
- Advise staff of any new water saving initiative and retrofits that is to be installed so that they are informed if questioned by guests.
- Place water saving signs in strategic areas, like the kitchen, to remind staff to conserve water.
- Develop graphs and charts that graphically show the financial savings achieved through saving water.
- Incentivise staff in the following ways:
    - Reward staff who submit water saving ideas that are implemented.
    - Include water conservation in employees' performance reviews.
    - Pay the staff a percentage of the first year's direct savings as a bonus

Did you know...

Staff housing generally uses 250ℓ of water per day per staff member and 30ℓ of water per day for each staff member during working hours.

(Gössling *et. al., 2012)*

1.13 MONITORING WATER CONSUMPTION

The monitoring of water consumption is very important in identifying water saving opportunities and also to identify any water leakages (CoCT, 2010). Water readings can be taken overnight to identify base flows and leakages. Overnight base flows can be a result of toilets and cooling towers (where applicable) and should be taken into consideration. Any abnormal readings may be an indication of a leakage and should be investigated. Sub meters can also be installed to determine where water is being used and can monitor the efficiency of water saving initiatives that are implemented. These sub meters can be installed at the following locations:

- Hot water supply
- Kitchen
- Cooling tower
- Public amenities
- Laundry
- Outdoor areas
- Swimming pool
- Irrigation system

Sub meters can be expensive to install in all these locations as the piping may not be designed for having separate meters so they should be placed in areas where they can be optimised the most by monitoring them and getting information from them (CoCT, 2010). To determine the appropriate size of the sub-meter to be installed, the actual flow-rate should be used and not just the pipe-size (NCDENR and LoSRC, 1998). Temporary meters can be installed to determine if it would be cost effective to install permanent meters (NCDENR and LoSRC, 1998).

Theodore Roosevelt said...

"To waste, to destroy our natural resources, to skin and exhaust the land instead of using it so as to increase its usefulness, will result in undermining in the days of our children the very prosperity which we ought by right to hand down to them amplified and developed."

1.14 LEAK MONITORING

The monitoring of leaks in itself will not save any water or money but it will detect any irregular increases in water usage (CoCT, 2010). The cause of this increase can then be investigated and the necessary maintenance can be undertaken. The fixing of a leaking toilet, for example, is the most cost effective maintenance that can be undertaken. Other suggestions are provided below (CoCT, 2010):

1.14.1 TECHNOLOGICAL CHANGES

- When taps have to be tightened more and more to seal them, it is an indication that the washers need to be replaced.

1.14.2 ORGANISATIONAL CHANGES

- Train staff to look out for leaking pipes, dripping taps and running toilets and to report any instances so that they can be repaired quickly to avoid as much water loss as possible. Establish an uncomplicated reporting procedure to make it easier for staff to report water leakages.
- The monitoring of water usage, including the regular reading of water meters, should be included in all maintenance schedules

Example...

According to the City of Cape Town, in 2010, 1000 litres of water cost R9.81 excluding VAT. This included the water cost of R6.99 and the sewage costs of R2.82. This would mean that in 2010, a slow dripping tap would cost R65 per year excluding VAT and a fast dripping tap R860 per year excluding VAT based on the leaking tap audit in

	6 min	1 hour	1day	1 year
Slow drip	75ml	750ml	18L	6570L
Fast drip	1000ml	10L	240L	87600L

1.15 WATER BALANCE & WATER AUDITS

It is advised to do a site water balance to understand how water is currently being used within the hotel (CoM, 2007). The water balance involves understanding where the water enters the hotel e.g. main water into the kitchens, bars and any rainwater and greywater and where the water exits the hotel e.g. sewerage lines in bathrooms, kitchens etc. and stormwater runoff). The easiest way of undertaking a water balance is to use water accounts for the previous 12-36 months of normal operating conditions. To gain more accurate information for the water balance, sub-metering can be undertaken to determine true water movements and opportunities for water savings. Alternative sources of water, such as rainwater and greywater, which are used by the hotel, should also be included in the calculations (CoM, 2007).

A water audit is the key to any successful water efficiency program and is conducted to identify potential water savings for a hotel (CoM, 2007; NCDENR and LoSRC, 1998). A site water audit consists of a site walk-through to inspect water consuming devices and activities, as well as interviews with staff and permanent and seasonal contractors and visitors. The amount of water consuming fixtures and their current water flow is identified, and meters, pumps, cooling towers and garden water systems are inspected (CoM, 2007).

Information that should be collected before the audit is undertaken includes the following (NCDENR and LoSRC, 1998):

- The physical size of the hotel including the number of buildings and floor space for each.
- Plumbing drawings, riser diagrams and irrigation plans.
- Record of number of meals served, guest rooms and occupancy data.
- Operating schedule of number of employees per shift.
- Water use profile or graph indicating the water use per month.
- Utility accounts for the past 2 years and all water delivery records from water meters etc. Determine the location of all water supply meters and their size.
- List of water-using equipment and the manufacturers recommended flow requirements.
- Inventory of all sanitary fixtures and water saving features.
- Irrigation controls and outdoor water use.

An example of a water audit is provided in Table 4.

TABLE 4: EXAMPLE OF A WATER AUDIT FOR A HOTEL (COM, 2007)

Item	Area	Type	Water flow	Number of fixtures and type
Taps	Kitchen	Single lever		
		2 taps/ 1 spout		
		Other		
	Amenities	Single lever		
		2 taps/ 1 spout		
		Other		
Toilets	Guests	Single flush		
		Dual flush		
	Amenities	Single flush		
		Dual flush		
Urinals	Public	Trough		
		Urinal		
		Waterless		
Showers	Guest rooms	Rose		
Fountain	Public area	Technology type		
		Frequency of use		
Dishwasher	Kitchen	Type		
		Frequency of use		
Garden watering	Garden areas	Type of water		
		Frequency		

SECTION 2:

AquaSmart HOTEL TOOL

2.1 OVERVIEW OF THE AquaSmart HOTELS TOOL

The electronic **AquaSmart Hotels tool** has been developed specifically for the hospitality industry. The tool has been developed in order to assist members and owners of hotels, lodges, B&Bs etc., in determining where and how water is being used within their establishment and providing alternative options which could reduce its consumption.

The AquaSmart Hotels tool consists of two Microsoft Excel workbooks. The first workbook is the tool and the second workbook is a database where water consumption information for the hotel can be stored.

2.1.1 THE TOOL

The tool consists of various worksheets that have been designed to perform the following actions:

- To establish the current water practices in terms of the technology used, organisational practices and behavioural practices.
- Provide examples of what the payback period would be if new utilities were to be installed. For example, if the establishment installs eco-showerheads in the showers, the tool will calculate how much water that would save. By providing the estimated cost of the eco-showerhead, the payback period will be calculated based on the amount of water that is saved.
- Provide information on proposed standards for water efficient utilities and other useful information.
- Provide information on the top water saving tips for the hospitality industry.
- Provide references on where further information can be sourced.

Did you know...

The average medium to large hotel uses 79,000 litres per day or 301 litres per room, which is the equivalent of using 29 Olympic pools of water each year..

(CoM, 2007)

The tool consists of nine worksheets as displayed in Figure 3.

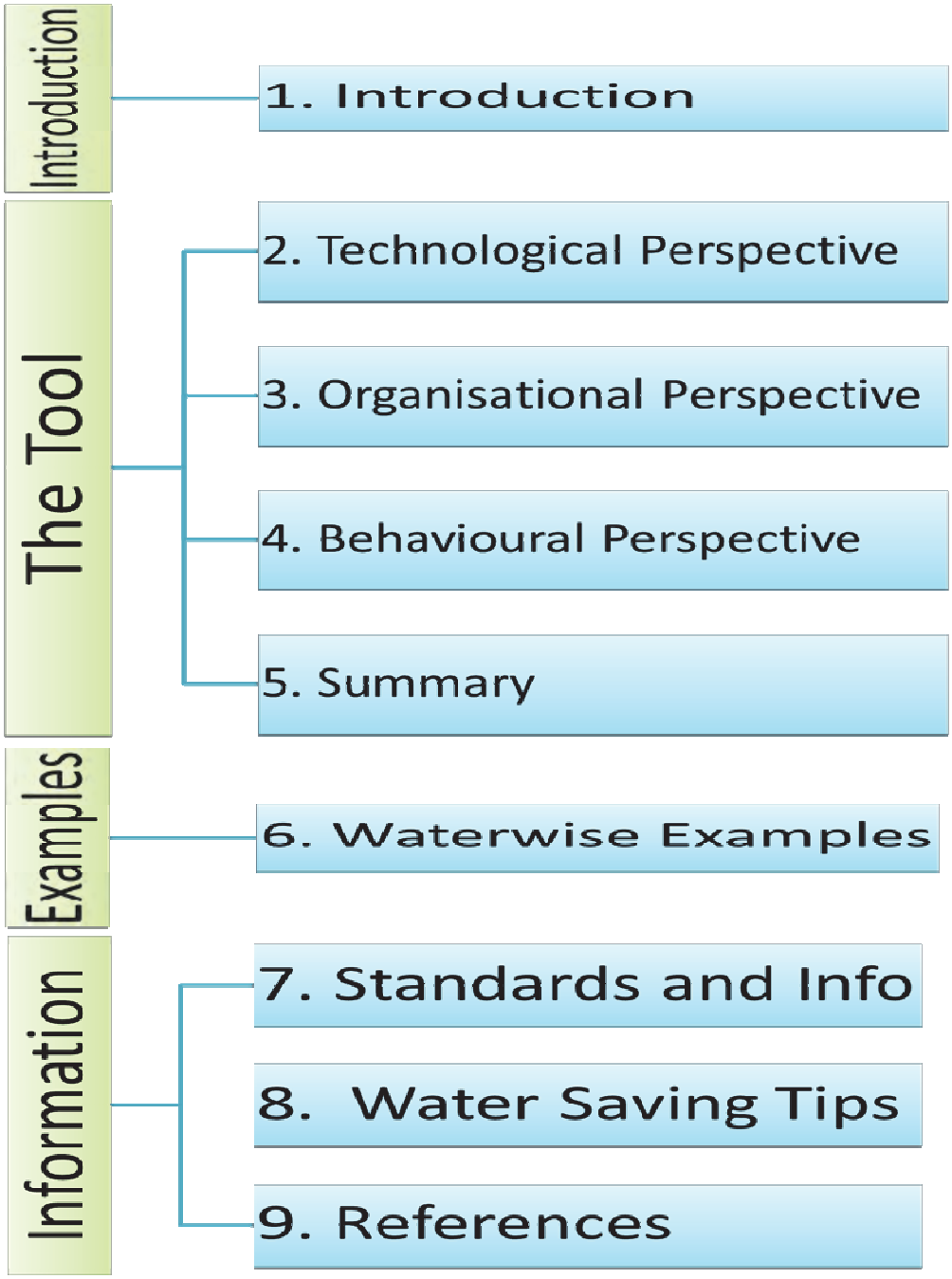


FIGURE 3: WORKSHEETS OF THE TOOL

The **Introduction Worksheet** provides a basis introduction to the tool, a disclaimer and explains the purpose and content of the tool.

The **Tool Worksheets** consists of the Technological, Organisational and Behavioural Perspective worksheets and a Summary worksheet. The Technological, Organisational and Behavioural

Perspective worksheets each contains a list of scored questions that need to be answered by the user to provide an indication of the current water usage and water management within the hotel. The results of these three worksheets are provided in the Summary Worksheet. The aim of the Summary worksheet is to highlight the areas in the hotel were currently water usage may be high or the management and awareness of water related issues is lacking. Once these areas have been identified, the user can use the Example and Information worksheets of the tool to identify ways in which water consumption can be reduced and awareness and water management can be improved. If these water wise initiatives are implemented in the hotel, it should result in water savings for the hotel. The Summary Worksheet also provides a final water wise score for the hotel, based on the responses from the questions and can be used by the user as a gauge to see how well they are faring.

The aim of the **Water Wise Example Worksheet** is to illustrate how much water can be saved if current utilities are replaced by water wise utilities or products and what the saving would be on the water bill. It allows the user to input the cost of a water wise utility or product and the tool will determine the payback period in months based on the amount of water that will be saved. This worksheet should be treated as an example and more research should be done by the user to determine actual costs and savings before purchasing new utilities.

The **Information Worksheets** provides different information and ideas on how water can be saved in the hotel. It includes suggested 'water wise' standards for utilities to ensure that those that are installed do not use excessive amounts of water. It also provides links to various websites where more information can be downloaded.

Each worksheet will be discussed in detail in Section 2.3:

2.1.2 THE DATABASE

The database enables the user to record monthly information, for example the water tariff, monthly water consumption and occupancy rate for 5 years. This information is used to determine the monthly cost of the water as well as the average water consumption per guest.

The database consists of the worksheets displayed in Figure 4 which are all discussed in detail in Section 2.4:

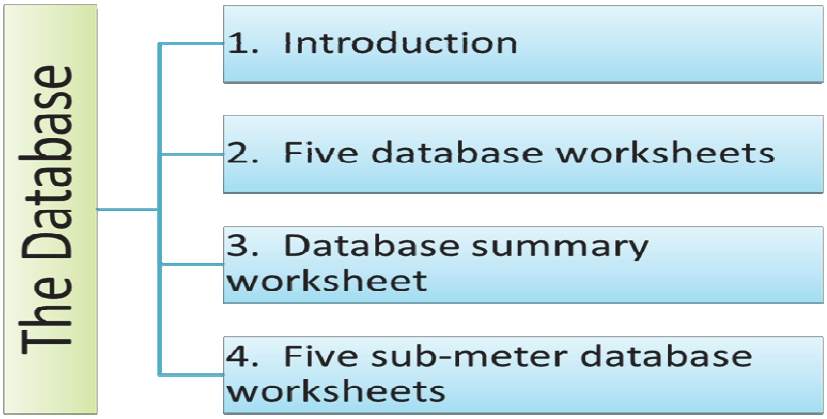


FIGURE 4: WORKSHEETS OF THE DATABASE

The **Introduction Worksheet** provides a basis introduction to the database, a disclaimer and explains the purpose and content of the database.

The **Database Worksheets** provides space for the user to record monthly water consumption data for 5 years. The monitoring of water consumption is very important in identifying water saving opportunities and also to identify any water leakages. It helps to determine whether water saving targets have been met and are being maintained. The Database Worksheets can assist with this as each Database Worksheet illustrates trends and patterns by displaying the results in four different graphs, namely:

- Water consumption vs. occupancy rate;
- Total cost vs. occupancy rate;
- Water consumption vs. total cost ;
- Average water consumption per guest per day.

The **Database Summary Worksheet** provides a summary of all the information recorded in the five Database Worksheets. The averages and totals provided in the summary are also plotted as graphs so that trends can be determined and comparisons can be made over the different years

The **Sub-meter Database Worksheets** enables the user to record monthly sub-meter readings, if sub-meters have been installed in the establishment, and these readings are compared to the monthly consumption as recorded on the utility bill. By recording these amounts, the manager can monitor the movement of water within the establishment and identify and fix leaks quickly. It can also assist in identifying areas where water consumption is consistently high. Staff may need to be encouraged to conserve water in these areas or more water efficient utilities need to be installed.

2.2 APPLYING THE AquaSmart HOTELS TOOL

The three worksheets, after the introduction worksheet, form the basis of the tool. The aim of these three worksheets is to determine how water wise the hotel is. To achieve this, each worksheet contains a list of questions which need to be answered by the user. The first of these worksheets contains questions related to technological changes that have been made by the hotel, the second organisational changes and the third behavioural changes. The worksheets are further divided into different divisions as illustrated in Figure 5. The answers provided by the user are all scored which is used to determine an overall score for the hotel which gives an indication of how water wise the hotel is. More information on how to use the tool and the remaining worksheets are provided in the sections below.

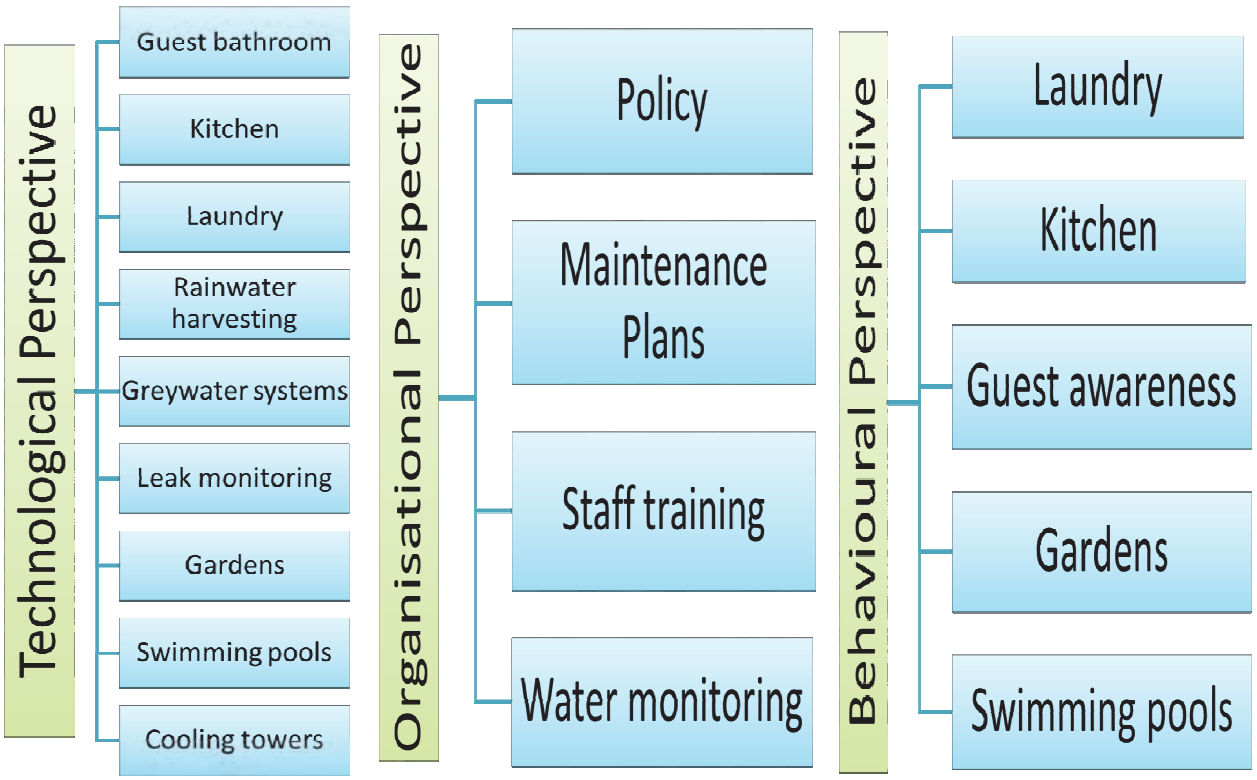


FIGURE 5: THE DIFFERENT DIVISIONS OF THE TOOL

Technological Perspective worksheet: Flow restrictions, toilets, low flow showerheads, dishwashers, washing machine, etc., are all constantly improving and provide greater water efficiency. The

Technology Perspective worksheet provides a list of questions to determine the type of technologies and utilities that are being used by the hotel.

Organisational Perspective worksheet: The reduction in water consumption is not only achieved through the installation of water saving technologies but also through organisational and behavioural interventions implemented by management and staff. Organisational changes include reviews of policies and procedures, perpetuation of staff and guest awareness, as well as support from senior management and training of staff. The Organisational Perspective worksheet provides a list of questions for the different management sectors, designed to determine what the management and staff of the establishment's perspective and actions are on water conservation and water demand management.

Behavioural Perspective worksheet: The Behavioural Perspective worksheet is similar to the Organisational Perspective worksheet and provides a lists of questions designed to determine if the hotel's current operations are water wise or not.

2.3 GETTING STARTED

In order for the tool to be user friendly, each worksheet has a header, which consists of the worksheet name with labelled water droplets on either side followed by a Basis Instruction box as illustrated in Figure 6. The water droplets can be used to navigate between the various worksheets of the tool as well as the tabs at the bottom of the worksheet. The Basic Instruction box provides instructions on what is required from the user to complete the worksheet.

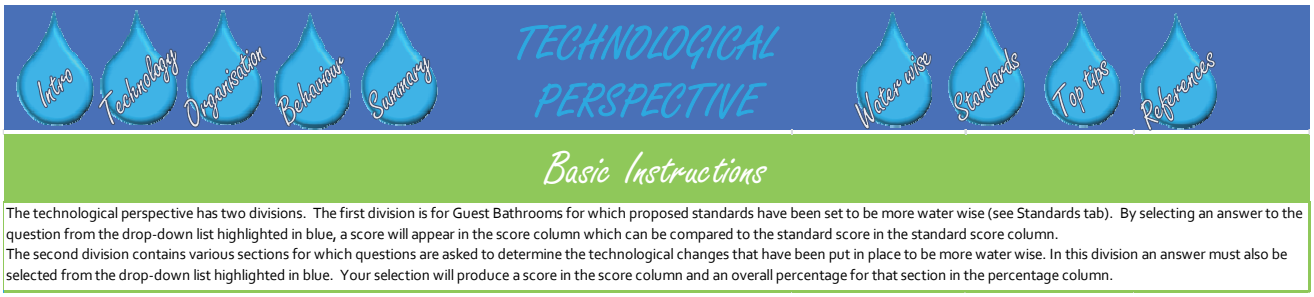


FIGURE 6: AN EXAMPLE OF THE TOOLS HEADERS

As the final tool has various calculations in it, all worksheets are protected so that only the cells that require input from the user can be changed. It is important to note that the tool, while endeavouring to be as accurate as possible, is unlikely to guarantee 100% accuracy due to various reasons, for example:

- the individual nature of billing by municipalities (there are various discrepancies according to step/block/fixed tariffs that are unique to each municipality);
- the use of research based estimations to determine the amount of times guests will flush the toilet per day or use the shower;
- the variations in how water is used and managed by hotels;
- the changes in the costs of utilities.

The tool does however give a good indication as to where and how water is being used on the premises, as well as where water savings can be made.

The Tourism Grading Council of South Africa (TGCSA) includes water management as part of their grading criteria. These criteria have been taken into consideration and have been included in the tool and the TGCSA points allocated for each criterion have been indicated.

2.3.1 TECHNOLOGICAL, ORGANISATIONAL AND BEHAVIOURAL PERSPECTIVE WORKSHEETS

The technological, organisational and behavioural perspective worksheets all provide a list of questions that need to be answered by the user. The answer to the questions can be selected from the blue highlighted dropdown lists as illustrated in Figure 7.

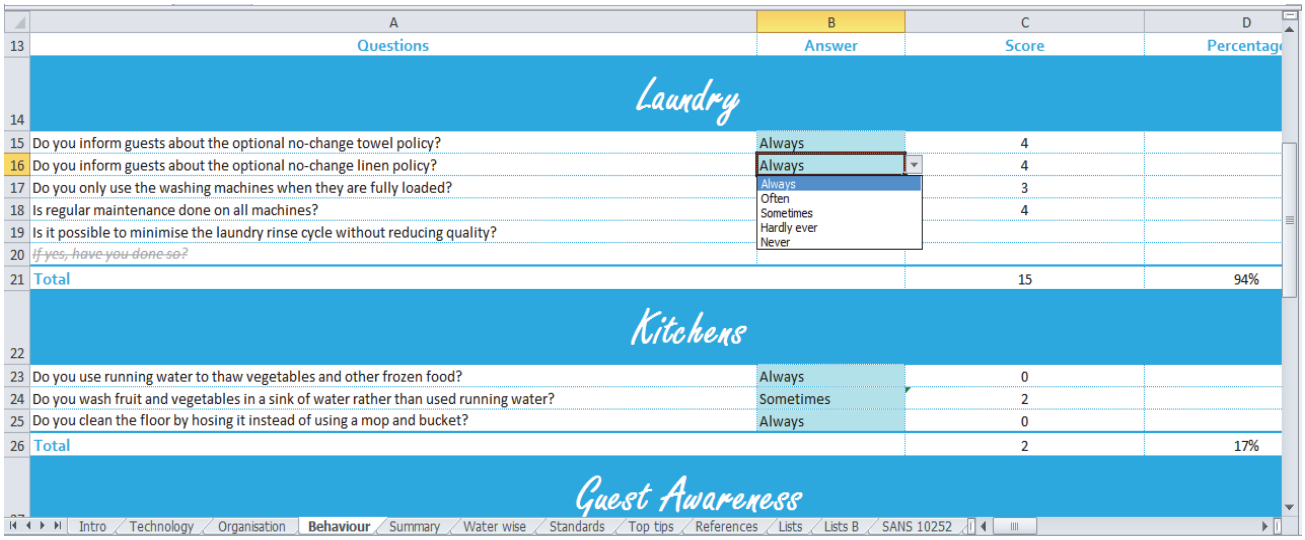


FIGURE 7: AN EXAMPLE OF A DROPDOWN LIST USED TO ANSWER THE QUESTIONS IN THE TOOL

Most of the questions are Yes/No questions or a choice between Always, Often, Sometimes, Hardly ever and Never. These answers are scored and provide a score in the Score column (Figure 7). A total score is provided for each division, as in the example above a total score of 2 was scored for Kitchens. The tool calculates the percentage score based on the total score in the score column and the total score that can be achieved for that division and the result is provided in the Percentage column and this percentage is carried forward to the Summary worksheet which is discussed in Section 2.3.2.

As mentioned above, most of the questions are Yes/ No questions with the exception of the questions in the Guest Bathroom division of the Technology Perspective worksheet. These questions are aimed at determining the types of toilets, taps and showerheads that have been installed in the guest bathrooms (Figure 8). The answers to these questions can once again be selected from a drop down list and an associated score appears in the score column. These scores also differ from the other scores as these are weighted scores based on water usage statistics for a water efficient guest room in Australia[1] (CoM, 2007) (Figure 9)[2].

[1] These statistics were used as no statistic could be sourced for South Africa.

Questions	Answer	Score	Standard score
Guest Bathroom			
What type of toilet is installed in the guest bathrooms?	Low volume flush (4.5 litre	18.2	15.0
What type of taps is installed in the guest bathrooms?	Aerated taps (6 l/min)	6.3	6.3
What type of showerhead is installed in the guest bathrooms?	12-18 litres per minute	34.6	34.6
Total		59%	56%

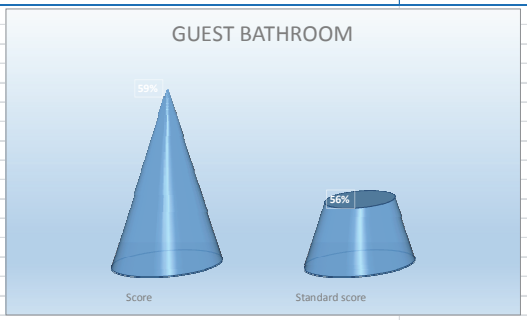


FIGURE 8: AN EXAMPLE OF THE GUEST BATHROOM DIVISION OF THE TECHNOLOGICAL PERSPECTIVE WORKSHEET

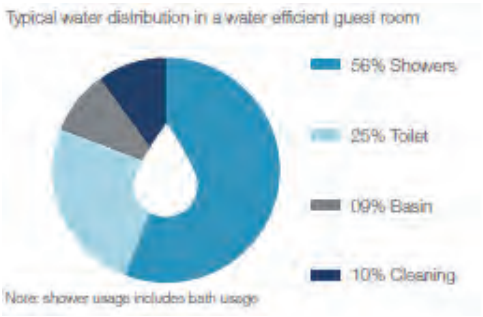


FIGURE 9: TYPICAL WATER USAGE IN A WATER EFFICIENT GUESTROOM (COM, 2007)

The score in the Score column is then compared to a standard score in the Standard Score column. These are standards which are used to determine if a utility is water efficient and is taken from a WRC report titled "Status and use of drinking water conservation and saving devices in the domestic and commercial environments in South Africa" by D Still, S Erskine, N Walker & D Hazelton (2008) (Report No TT 358/08). The total scores for the Score column and the Standard Score column are then reflected as a percentage. A 100% score in the Score column would mean that the most water efficient toilets, taps and showerheads have been installed in the hotel. The standard percentage is 56%, so any score above that is better than the standard. The results are illustrated as a graph so that the user can see how the hotel is fairing versus the standard.

How am I doing?

All three of these worksheets end with a button. This button will take the user to the Summary worksheet.

[2] The 10% for cleaning was not considered in the weighed score so the remaining percentages were converted to a total percentage out of 90 and not 100.

2.3.2 SUMMARY WORKSHEET

The Summary worksheet contains all the percentage scores from all the various divisions in the Technological, Organisational and Behavioural Perspective worksheets as illustrated in Figure 10. This summary provides the user with an indication of where more attention can be given to reduce the water consumption of the hotel even more. In the Technological Perspective in the example below, the user only scored 25% for kitchens as they were using 15mm sink taps that use approximately 12 l/min of water. This can be mitigated by installing an aerator or flow restrictor in the taps. They were also hand washing the dishes as they did not have a dishwasher. Hand washing could use up to 49 litres of water compared to the 10-12 litres that a dishwasher uses (Rickett Benckiser, 2014). The kitchen is therefore an area where some changes could be considered to reduce the water consumption of the hotel. The example below also indicates that cooling tower is N/A (not applicable) as the hotel in this example does not use a cooling tower. The user selected No from the drop down list for the question whether the hotel used a cooling tower in the Cooling Tower division. Similar questions are asked in the Gardens and Swimming Pools divisions.

Technology Perspective

Description	Percentage
Guest bathroom	56%
Kitchen	25%
Laundry	100%
Rainwater harvesting	0%
Greywater system	100%
Leak monitoring	88%
Garden	100%
Swimming pool	100%
~~Cooling tower~~	~~#N/A~~

Organisational Perspective

Description	Percentage
Policy	100%
Maintenance plans	50%
Staff training	42%
Water monitoring	50%

Behavioural Perspective

Description	Percentage
Laundry	94%
Kitchen	17%
Guest awareness	50%
Gardens	100%
Swimming pool	25%

FIGURE 10: AN EXAMPLE OF THE SUMMARY WORKSHEET

The results from the Summary above are also displaced graphically as spider diagrams (Figure 11). The closer the red line is to the centre of the diagram, the worse the score, and the further out the line the better the score. Once again there is no line to the cooling towers in this example as they are not applicable.

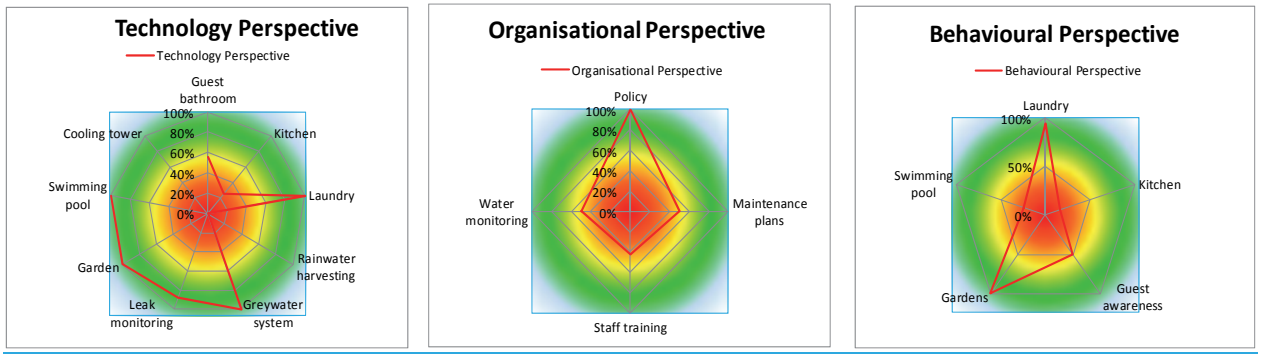


FIGURE 11: AN EXAMPLE OF THE SPIDER DIAGRAMS IN THE SUMMARY WORKSHEET

Under the spider diagrams in the Summary worksheet there is a section labelled 'How Water Wise is my Hotel?' (Figure 12). This provides a final score out of 10 for the hotel and is based on all the scores in the summary. In this case the hotel scores 6.28 and therefore the water droplet is filled to 6. A description of the significance of the score is provided to the right of the water droplet.

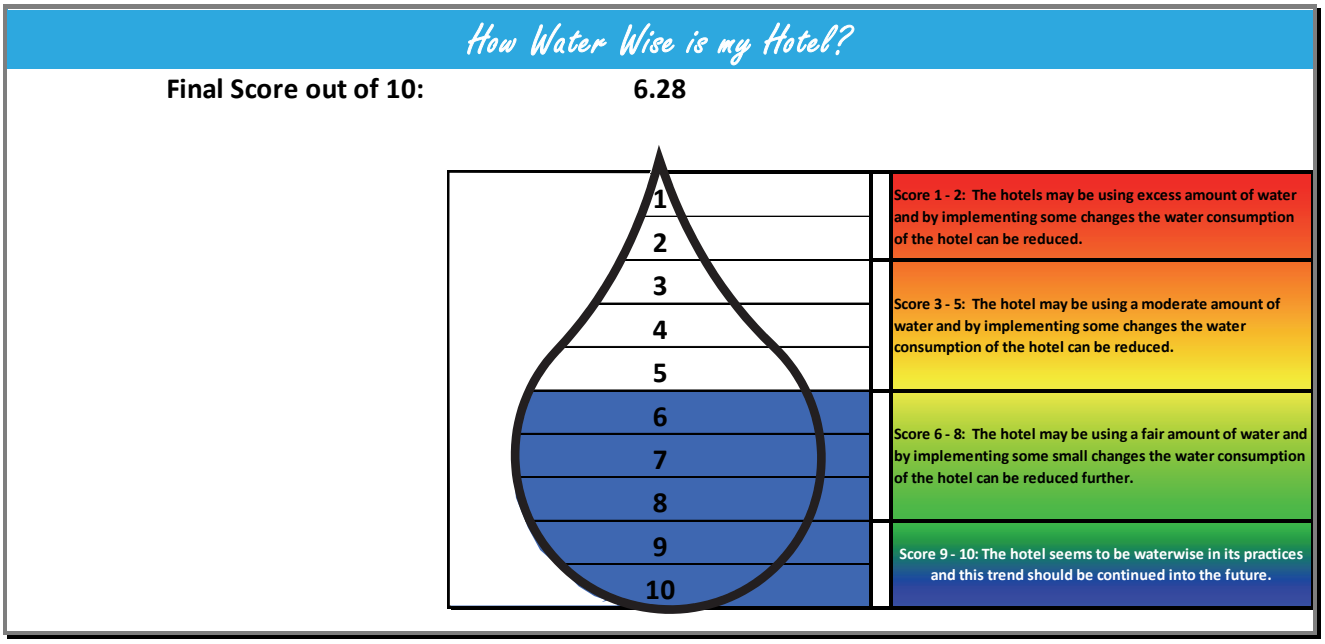


FIGURE 12: AN EXAMPLE OF THE FINAL WATER WISE SCORE

2.3.3 WATER WISE EXAMPLES WORKSHEET

The aim of the Water Wise Examples worksheet is to illustrate how much water can be saved if current utilities are replaced by water wise utilities or products and what the saving would be on the water bill. The calculations are based on the average number of guests per month and the water tariff information supplied by the user as illustrated in Figure 13. As many of the water bills have a stepped billing system, the user is required to provide the total water cost for a month and the total water consumption for that month from the water bill. The tool will determine the average cost per kilolitre of water for that month and this is the amount that will be used in the calculations.

Average number of guests a month	30	
Water tariff information		
Please provide the following information from your latest utility bill:		
Total water cost (ex Vat)	R	4 000.00
Consumption (kl)		200
Average cost /kl	R	20.00

FIGURE 13: AN EXAMPLE OF THE WATER TARIFF INFORMATION REQUIRED

Note...

Although every effort has been made to ensure that the calculations are accurate, this worksheet should be treated as an example and more research should be done by the user before purchasing new utilities.

The user can then select what current utilities are installed in the hotel from the blue highlighted cells (Figure 14). The tool will calculate how much water that utility uses per month based on the number of guests specified by the user. The tool uses the following statistics for the calculations (Horner, n.d):

- On average a guest uses and flushes the toilet 5 times a day;
- Guests wash their hands after each toilet use for an average duration of 6-10 seconds per use. Other bathroom sink uses per day average an additional 2 minutes per day, totalling about 3 minutes of use a day.
- Shower use is an average duration of 8-10 minutes per day.

The tool also calculates the total cost of the water usage for that utility based on the average water cost calculated in the water tariff information section.

Current Utility in Use				Possible changes			Predicted saving	
Utility	Description	Total water usage (kl/month)	Total cost (per month)	Description (Select from drop-down list)	Total water usage (kl/month)	Total cost of water (per month)	Total water saved (kl/month)	Total cost saved (per month)
Toilet	Large cistern (13 litres)	1.95	R 39.00	Install displacement devise eg hippo bag (10	1.5	R 30.00	0.45	R 9.00
Taps	15mm sink tap (12 l/min)	1.08	R 21.60	Install spray taps (2.4 l/min)	0.216	R 4.32	0.86	R 17.28
Showers	> 24 litres per minute	7.50	R 150.00	Install a 12-18 litres per minute showerhead	4.5	R 90.00	3.00	R 60.00

FIGURE 14: AN EXAMPLE OF THE WATER WISE EXAMPLE TOOL

The user can then choose a more water wise utility from the green highlighted cells (Figure 14). The tool will calculate the water usage and total cost based on the same calculations mentioned above. The orange section calculates that difference between the total water usage and the total cost of the blue and green sections to give an indication of how much water can be saved by installing the water wise utility and how much money this equates to.

The purple section of the tool also calculates the possible payback period for installing the water wise utility (Figure 15). The user provides the estimated cost of the water wise utility as well as how many need to be installed in the highlighted purple cells. The tool will calculate the replacement cost of the water wise utilities based on the information provided by the user. It will also calculate the payback period for installing the water wise utility based on the amount of water that will be saved that was calculated in the orange section.

Estimated replacement costs			
Estimated cost (per unit)	Number to be replace	Replacement cost (excluding labour)	Payback period (months)
R 500.00	15	R 7 500.00	833.33
R 200.00	5	R 1 000.00	57.87
R 100.00	2	R 200.00	3.33

FIGURE 15: AN EXAMPLE OF THE PURPLE SECTION OF THE WATER WISE EXAMPLE WORKSHEET

Although every effort has been made to ensure that the calculations are accurate, this worksheet should be treated as an example and more research should be done by the user before purchasing new utilities to determine more accurate results.

The Water Wise Examples worksheet provides a rainfall harvesting calculator (Figure 16) to determine the amount of water that could be harvested and therefore what size tank is required. The general rule for calculating the size of tank is: 1mm of rainfall over 1m^2 of roof will give you 1 litre of rainwater. The size of your tank will also depend on how often the rainwater is utilised between rainfalls.

Rainfall per year (mm)	
Roof area (m2)	
Litres of rainwater	0.00

FIGURE 16: AN EXAMPLE OF THE RAINFALL HARVESTING CALCULATOR

2.3.4 STANDARDS & INFORMATION WORKSHEET

The Standards & Information worksheet provides a list of proposed water efficient measures that should be imposed to ensure that more water efficient utilities are used in South Africa (Figure 17). These proposed standards were taken from a WRC report titled "Status and use of drinking water conservation and saving devices in the domestic and commercial environments in South Africa" by D Still, S Erskine, N Walker & D Hazelton (2008) (Report No TT 358/08). These standards were also used in the Guest Bathroom section of Technological Perspective worksheet.

Standards

The standards provided below were taken from a Water Research Commission report titled "Status and use of drinking water conservation and saving devices in the domestic and commercial environments in South Africa" by D Still, S Erskine, N Walker & D Hazelton (2008) (Report No TT 358/08).

	Item Description	Specification regarding water efficiency	Notes
		Toilets	
	Single flush cisterns & pans	No more than 9l to clear.	More efficient systems requiring 6l or less should be encouraged using a labelling system.
	Dual flush cisterns & pans	No more than 6l to clear.	
	Interruptible flush cisterns & pans	These are an acceptable alternative to low flush and dual flush options .	Pan should be able to clear with no more than 9l of water.
	Urinals	Automatic flushing urinals should be illegal.	
		Urinal flushing should be user activated and should use on more than 2l of water per flush.	
		Taps	
	Bath taps	Flows should not exceed 10l per minute for single taps and 18l per minute for mixer taps at 4 bar pressure .	
	Basin taps	Flows should not exceed 6l per minute for single taps and 10l per minute for mixer taps at 4 bar pressure.	Tap flows should be aerated.
		Taps over basins without plugs should not exceed 4l per minute flow.	
	External taps	Flows should not exceed 10l per minute for single taps and 18l per minute for mixer taps at 4 bar pressure .	Taps in public places that are not used for irrigation should be self closing after a certain period of time or volume of water has been delivered.
		Shower	
	Shower	Shower roses should not deliver more than 18l per second at 4 bar pressure.	
		Showers should be aerated to deliver 10l or less.	
		Bath & basins	
	Bath	Should not hold more than 250l to the overflow level.	
	Bathroom basin	Limited to 10l	
	Washroom basin	Limited to 5l	
	Kitchen basin	Limited to 20l	
		Other	
	Hosepipe	Use of hosepipes for washing paved surfaces should be illegal. Hosepipes should be fitted with shut-off valves at the user end.	
	Irrigation system	Irrigation systems should be switched off using timers and/or soil moisture gauges.	

FIGURE 17: AN EXAMPLE OF THE STANDARDS IN THE STANDARDS & INFORMATION WORKSHEET

Other useful information is provided in the worksheet as illustrated below.

How to measure usage from fixtures:	
Showers	Set the flow using hot and cold to a comfortable level that you would use for your daily routine and record the time it takes to fill a bucket. The volume of the bucket divided by the time will provide the flow rate in litres per time (l/min).
Toilets	Use a bucket to fill an empty cistern and measure the amount required.
Basins	Use a flow cup to determine the flow.

Water consumption within the hospitality industry (http://hotelexecutive.com/business_review/3282/water-benchmarking-is-it-important-to-your-hotel):
Guests, on average, use the toilets 5 times per day
Guests wash their hands after each toilet use for an average duration of 6-10 seconds per use
Other bathroom sink uses per day average an additional 2 minutes per day
Shower usage averages 8-10 minutes per day per guest
Housekeeping flushes the toilet, on average, 2 times with each room cleaning

FIGURE 18: AN EXAMPLE OF THE INFORMATION IN THE STANDARDS & INFORMATION WORKSHEET

2.3.5 WATER SAVINGS TIPS WORKSHEET

The Top Tips worksheet provides the user with information on how water can be saved through technological, organisational and behavioural changes in different areas of the hotel. An example for rainwater harvesting is provided in Figure 19.

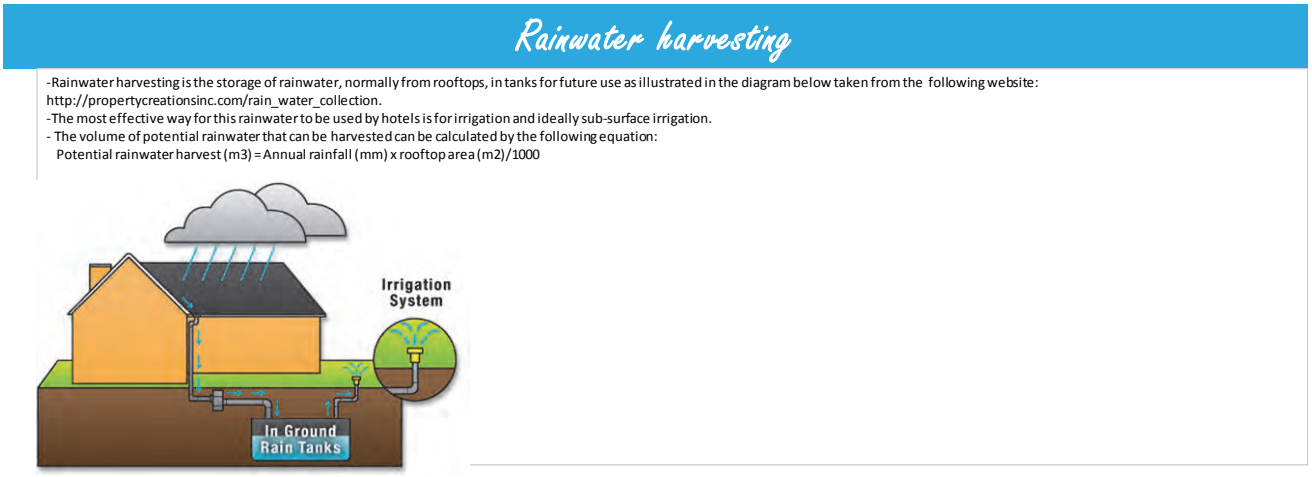


FIGURE 19: AN EXAMPLE OF THE WATER SAVING TIPS WORKSHEET

At the top of the worksheet there are small water drops as illustrated below in Figure 20. These water droplets can be used to navigate to the various categories.

FIGURE 20: AN EXAMPLE OF THE NAVIGATING DROPLETS IN THE WATER SAVING TIPS WORKSHEET

2.3.6 REFERENCES WORKSHEET

This worksheet provides a list of South African and International References that were used in creating this tool (Figure 21). The website links have also been provided so that the user can download additional information if desired.

South African References	
Guideline for Baseline Water Use Determination and Target Setting in the Commercial Sector	http://www.thedti.gov.za/industrial_development/docs/fridge/Guideline_Commercial.pdf
The Status and use of drinking water conservation and savings devices in the domestic and commercial environments in South Africa. Still, D., Erskine, S., Walker, N. and Hazelton, D. (2008).	Water Research Commission Report No: TT 358/08.
Tourism Grading Council of South Africa	http://www.tourismgrading.co.za
Water Conservation guideline. Environmental Planning and Climate Protection Department, eThekwini Municipality	http://www.imaginedurban.org/Pages/Guidesandmanuals.aspx
Water use and management: Guidelines for the Hospitality Industry. City of Cape Town.	http://www.capetown.gov.za/en/GreenGoal/Documents/Water_Use_and_Management.pdf
International References	
Going Green. Minimal standards towards a sustainable hotel.	http://www.tourismpartnership.org/images/content/downloads/pdf/going_green_english_final.pdf?phpMyAdmin=Zd1KntrIWrp5naH36prpqkf%2Cai0&phpMyAdmin=cpubnqEvF6EtPsurLpUs99ncVv3
Hospitality 2015: Tourism, Hospitality, and Leisure Trends	http://www.deloitte.com/assets/Dcom-UnitedStates/Local%20Assets/Documents/Consumer%20Business/us_thl_hospitality2015_053111.pdf
Hotel Water Conservation: A Seattle Demonstration	http://savewaternc.org/Documents/HotelWaterConservationPilotDec2003.pdf
How a dishwasher uses less water than the sink.	http://dishwashingexpert.co.za/officially-less-water-than-the-sink
Maropeng embraces water conservation technology	http://www.hotelandrestaurant.co.za/tourism/maropeng-embraces-water-conservation-technology/
Tourism Industry needs to do more to save water.	http://www.waterandenergyconsultants.com/pdf/industrial_water_treatment.pdf
Towel and linen programmes	https://www.greenbiz.com/sites/default/files/document/CustomO16C45F64991.pdf
Water Benchmarking: Is it Important to Your Hotel? The benefit of developing an indicator for how your hotel compares to global indices	http://hotelexecutive.com/business_review/3282/water-benchmarking-is-it-important-to-your-hotel
Water efficiency manual for commercial, industrial and institutional facilities	http://documents.northgeorgiawater.org/P2AD_WATER_EFFICIENCY_MANUAL.pdf
Water Efficiency, Water management options: Landscaping	http://www.savewaternc.org/Documents/WaterEfficiencyLandscaping.pdf
Water Management and Responsibility in Hotels	http://www.greenhotelier.org/know-how/water-management-and-responsibility-in-hotels/
Water Wise Hotels Toolkit. Smart Water Fund. City of Melbourne (CoM) Council, Victoria. (2007)	http://www.melbourne.vic.gov.au/enterprisemelbourne/environment/Documents/WaterWiseHotelsToolkitSavingsCity.PDF

FIGURE 21: AN EXAMPLE OF THE REFERENCE WORKSHEET

2.4 APPLYING THE AquaSmart HOTELS DATABASE

The database enables the user to record their monthly data so that trends for can be monitored easily and efficiently.

The database consists of the following worksheets:

1. Introduction
2. five database worksheets
3. Database summary worksheet
4. five sub-meter database worksheets for those hotels that might have sub-meters installed

2.4.1 DATABASE WORKSHEETS

The database worksheet allows the user to store the following data monthly in the blue highlighter cells as indicated in Figure 22:

1. Water tariff as per the water bill;
2. The monthly water consumption in kl;
3. The monthly occupancy rate
4. Number of guests who stayed in the hotel per month

Year	2014											
Month	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Water tariff: R	R 18.20	R 17.90	R 18.30	R 18.20	R 18.20	R 17.70	R 18.10	R 18.20	R 19.70	R 19.70	R 19.70	R 15.90
Consumption (kl/month)	196	193	198	172	212	216	248	267	269	214	187	191
Total cost (per month)	R 3 567.20	R 3 454.70	R 3 623.40	R 3 130.40	R 3 858.40	R 3 823.20	R 4 488.80	R 4 859.40	R 5 299.30	R 4 215.80	R 3 683.90	R 3 036.90
Occupancy rate	60%	65%	59%	54%	72%	75%	66%	61%	64%	54%	69%	69%
Number of guests for the month	18	19	17	15	23	24	19	18	19	15	20	20
Average water consumption per guest (l)	10888.89	10157.89	11647.06	11466.67	9217.39	9000.00	13052.63	14833.33	14157.89	14266.67	9350.00	9550.00
Notes:												

FIGURE 22: AN EXAMPLE OF THE DATABASE WORKSHEETS WHERE THE INFORMATION CAN BE STORED

The tool will use the information provided by the user to determine the total monthly cost of the water consumed, based on the water tariff and consumption information.

The tool will also calculate the average water consumption per guest. This calculation is purely based on the monthly consumption and the number of guests that stayed in the hotel during that month. The aim of this calculation is to give an indication of how much water is used by the hotel in total per guest that comes to stay at the hotel. It is not an indication of how much water is solely used by a guest.

The Notes section (Figure 22) provides space for the user to make notes on any water saving initiatives that might have been implemented or devices installed and in this way monitor what the resultant water savings was in the following months.

The next section of the worksheet provides all the totals and averages for the year (Figure 23) based on the information provided in the section above. These totals are carried over to the Database Summary worksheet.

Totals and averages for the year	
Average water tariff: R	R 18.32
Total Consumption (kl)	2563
Total cost	R 47 041.40
Average occupancy rate	64%
Average number of guests per month	18.9
Average water consumption per guest (l)	11465.7

FIGURE 23: AN EXAMPLE OF THE TOTALS SECTION IN THE DATABASE WORKSHEET

Each Database worksheet also populates graphs of the monthly information recorded so that trends can be determined and comparisons made. The following graphs are provided as illustrated in Figure 24:

- Water consumption versus occupancy rate;
- Total cost versus occupancy rate;
- Water consumption versus total cost;
- Average water consumption per guest in litres.

FIGURE 24: AN EXAMPLE OF THE GRAPHS PROVIDED IN EACH DATABASE WORKSHEET

The last section of the database worksheet lets the user record the nationalities of the guests that stayed at the hotel during a certain month (Figure 25). This is recorded as a percentage and the nationality options that are provided are:

- Africa
- Asia – China
- Asia – India
- Asia – Russia
- Asia – Other
- Australia
- Europe
- Middle East
- North America
- South America
- South Africa
- Other

This information is also presented as a graph and can be used by the hotel to determine if local or international guests use more water as hoteliers have noticed that certain nationalities are less educated in water conservation.

Guest demographics

Month	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Africa		3%								5%		5%
Asia - China	30%			30%	30%	10%			15%		30%	5%
Asia - India		3%		1%	5%							5%
Asia - Russia		5%	5%		5%			5%		10%		18%
Asia - Other					20%		5%				4%	5%
Australia		5%			20%			10%		50%	5%	4%
Europe	45%	20%	15%	12%		60%	75%	50%		2%	1%	5%
Middle East	5%		30%		20%				25%			33%
North America	10%	15%		53%		30%	15%	15%		3%	30%	5%
South America				2%				5%				10%
South AfricA (Local)	10%	50%	50%	2%			5%	15%	60%	30%	30%	5%
Other												
Total (%)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Notes:												

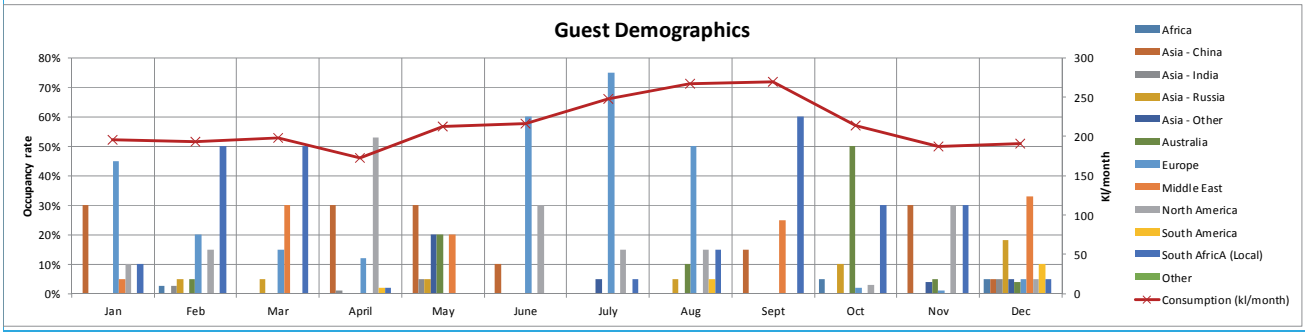


FIGURE 25: AN EXAMPLE OF THE GUEST DEMOGRAPHICS SECTION OF THE DATABASE WORKSHEET

2.4.2 DATABASE SUMMARY WORKSHEET

The database summary worksheet provides a summary of all the information recorded in the five database worksheets. The summary worksheet provides the yearly totals and averages for the following (Figure 26):

- Average water tariff;
- Total water consumption for the year;
- Total cost per year;
- Average occupancy rate;
- Average number of guests per month;
- Average water consumption per guest (l).

Year	2014	2015	2016	2017	2018
Average water tariff: R	R 18.32	R -	R -	R -	R -
Total consumption (kl/year)	2563	0	0	0	0
Total cost (per year)	R 47 041.40	R -	R -	R -	R -
Average occupancy rate	64%	0%	0%	0%	0%
Average number of guests for the month	18.9	0.0	0.0	0.0	0.0
Average water consumption per guest (l)	11465.7	0.0	0.0	0.0	0.0

FIGURE 26: AN EXAMPLE OF THE SUMMARY IN THE DATABASE SUMMARY WORKSHEET

The averages and totals provided in the summary above are also plotted as graphs so that trends can be determined and comparisons can be made over the different years. The following graphs are provided as illustrated in Figure 27:

- Water consumption versus occupancy rate;
- Total cost versus occupancy rate;
- Water consumption versus total cost;
- Average water consumption per guest in litres.

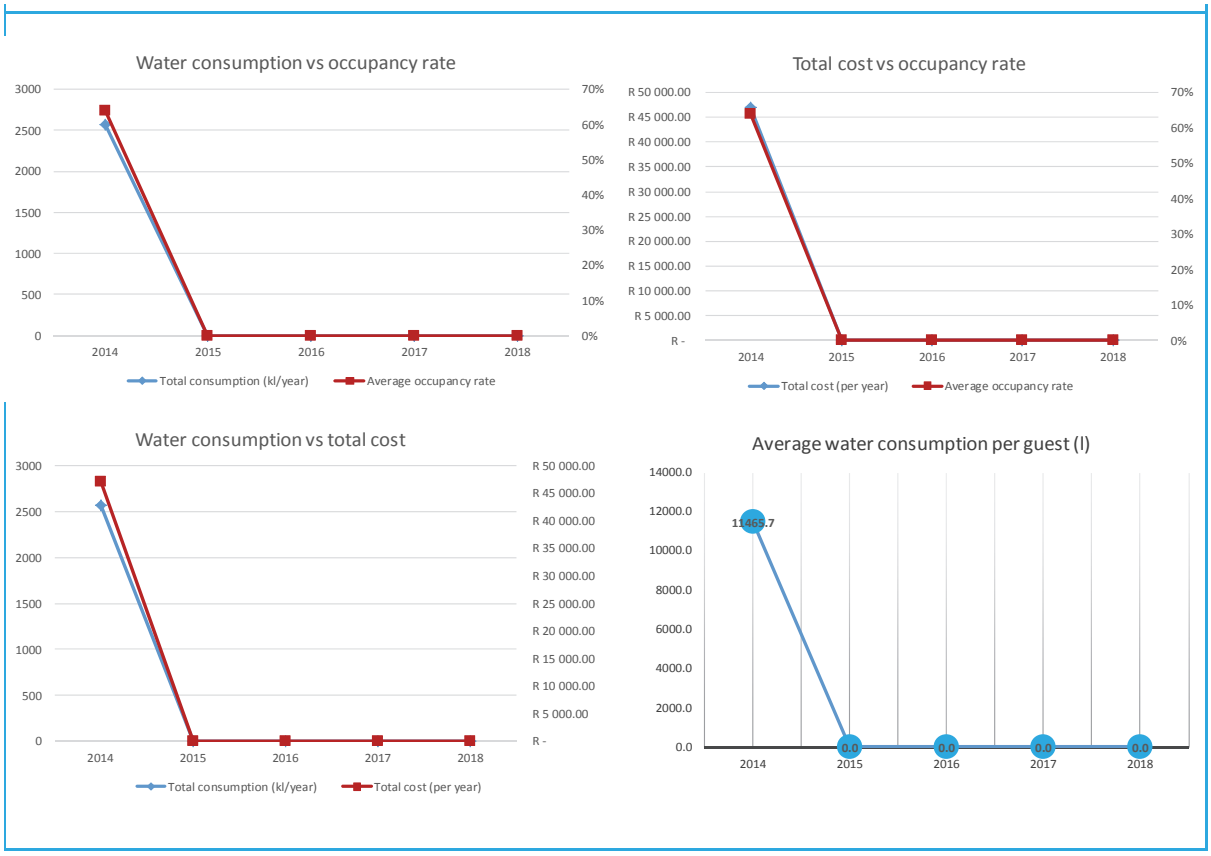


FIGURE 27: AN EXAMPLE OF THE GRAPHS IN THE DATABASE SUMMARY WORKSHEET

2.4.3 SUB-METER DATABASE WORKSHEETS

The five sub-meter database worksheets are for hotels that have sub-meters installed and would like to record the monthly readings for each sub-meter.

The sub-meter worksheet consists of two sections. The first section allows the user to list all the sub-meters that are installed in the hotel and their monthly consumption, in kilolitres, in the blue highlighted section (Figure 28). The tool will total up the consumption of all the sub-meters per month and will provide the total at the bottom of the worksheet. The next row of the worksheet provides the total monthly consumption as specified in the utility bill that was recorded in the corresponding data worksheet. The final line of the worksheet provides the difference between these two amounts. This difference could indicate the water usage of areas in the hotel that do not have sub-meters or indicate if there is a discrepancy with the amount of water the hotel is being billed for.

Water meter	Description	2014											
		Consumption per month (Kl/month)											
		Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1	Kitchen	20.00											
2	Laundry	30.00											
3	Garden	25.00											
Total Consumption per month as per sub-meters (kl)		75.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Consumption per month as per utility bill (kl)		196	193	198	172	212	216	248	267	269	214	187	191
Difference between meter reading and utility bill (kl)		121	193	198	172	212	216	248	267	269	214	187	191

FIGURE 28: AN EXAMPLE OF THE SUB-METER CONSUMPTION SECTION OF THE SUB-METER DATABASE WORKSHEETS

The second section of the worksheet is located next to the first section and provides the percentage of total use for each sub-meter per month (Figure 29). This percentage will give an indication on where the most water is being used per month.

2014											
Percentage of total use											
Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
26.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
40.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
33.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

FIGURE 29: AN EXAMPLE OF THE PERCENTAGE OF TOTAL USE SECTION OF THE SUB-METER DATABASE WORKSHEET

SECTION 3:

CASE STUDIES

3.1 CASE STUDY 1: THE PEECH HOTEL

The Peech Hotel is an eco-chic boutique hotel located in Melrose in Johannesburg. It has sixteen bedrooms spread across a lush one acre garden with a bistro restaurant and a swimming pool.

The hotel was a residential home which was transformed into a hotel in 2003 by James Peech and opened for its first guests in November 2004.

The hotel aims to have as small an impact as possible on the environment and as big an impact as possible on the community by implementing a sustainability policy that is centred on recycling, energy conservation and green design.

3.1.1 CURRENT WATER WISE INITIATIVES

- The Peech Hotel has training measures in place to educate the staff on the importance of conserving water. It has been difficult to get the staff to take the water saving initiatives seriously as employees tend to not be too concerned about their actions when it is not their own capital being affected.
- Greywater system has been installed that is linked to the garden suites which consist of 2 rooms.
- They have been monitoring their water consumption and savings since 2011. They take the water meter reading at the end of every month and also compare it to the meter reading specified on their water bill.

3.1.2 RESULTS FROM THE AquaSmart HOTELS TOOL

The results of the completed AquaSmart Hotels tool are provided in Figure 30. These results indicate that:

- Some technological changes can be considered in the laundry, garden and swimming pool and that a rainwater harvesting system has not been installed as yet.
- Staff training and water monitoring may need to be reviewed by management.
- Behavioural changes regarding the swimming pool can be taken into consideration.

Technology Perspective

Description	Percentage
Guest bathroom	56%
Kitchen	75%
Laundry	13%
Rainwater harvesting	0%
Greywater system	100%
Leak monitoring	50%
Garden	17%
Swimming pool	0%
~~Cooling tower~~	~~#N/A~~

Organisational Perspective

Description	Percentage
Policy	100%
Maintenance plans	100%
Staff training	50%
Water monitoring	50%

Behavioural Perspective

Description	Percentage
Laundry	100%
Kitchen	100%
Guest awareness	100%
Gardens	78%
Swimming pool	50%

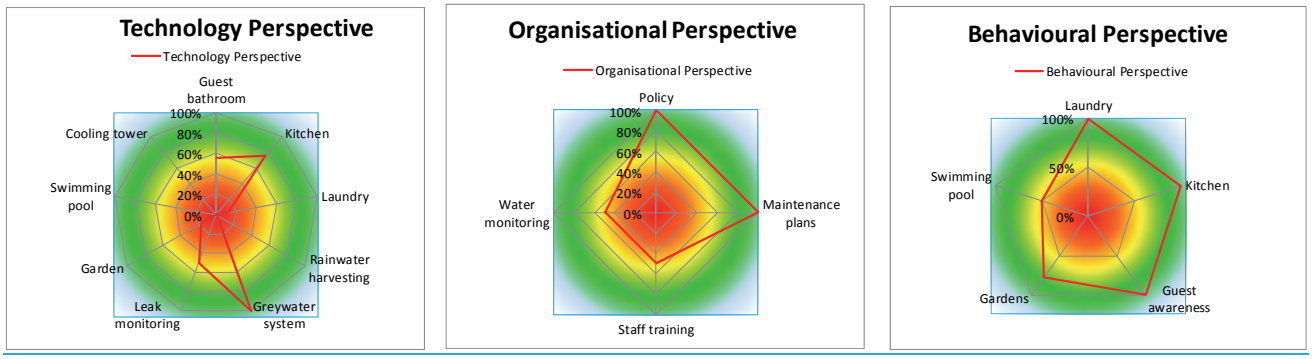


FIGURE 30: WATER WISE TOOL SUMMARY RESULTS FOR THE PEECH HOTEL

The results in the summery (Figure 30) was converted to a score out of 10 and The Peech Hotel scored 6.64 (Figure 31). This score indicates that the hotel may be using a fair amount of water but with a few small changes, the water consumption of the hotel may be reduced further.

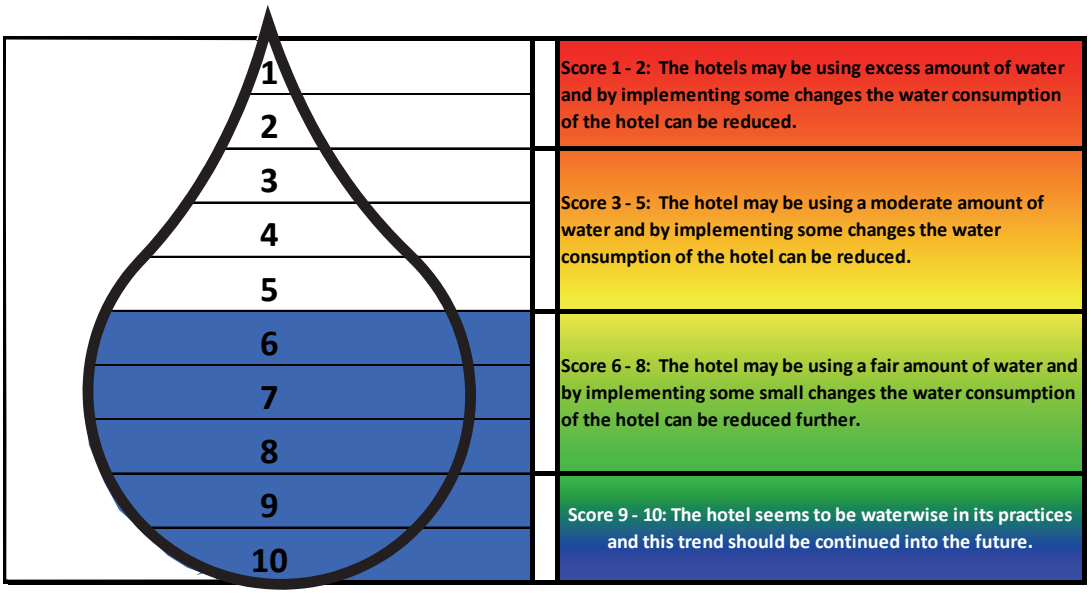


FIGURE 31: WATER WISE SCORE FOR THE PEECH HOTEL

3.1.3 RESULTS FROM THE AquaSmart HOTELS DATABASE

The Peech Hotel has been monitoring its water consumption since 2011 and the information for 2012, 2013 and January to April of 2014 was recorded in the AquaSmart Hotels Database. The summary report (Table 5) indicates that the total water consumption decreased by approximately 10% between 2012 and 2013 although the average occupancy rate for the same time period only decreased by 4%. This is an overall saving of 6% in the water consumption over this time period. Unfortunately it is not certain what this can be attributed to.

TABLE 5: DATABASE SUMMARY FOR THE PEECH HOTEL

SUMMARY

Year	2012	2013	2014	2015	2016
Average water tariff: R	R 16.74	R 16.68	R 7.08	R -	R -
Total consumption (kl/year)	2858	2563	841	0	0
Total cost (per year)	R 47 898.60	R 43 357.50	R 17 943.20	R -	R -
Average occupancy rate	68%	64%	23%	0%	0%
Average number of guests for the month	0.0	0.0	0.0	0.0	0.0
Average water consumption per guest (l)	0.0	0.0	0.0	0.0	0.0

Although it appears as if the lower water consumption in 2013 resulted in a lower water tariff, this is not a true reflection, as no water tariff was available for November 2013. Unfortunately no information was available regarding the number of guests that stayed per month, as the hotel records only room nights, so this information could not be included in the database. The information from the summary is shown graphically in Figure 32.

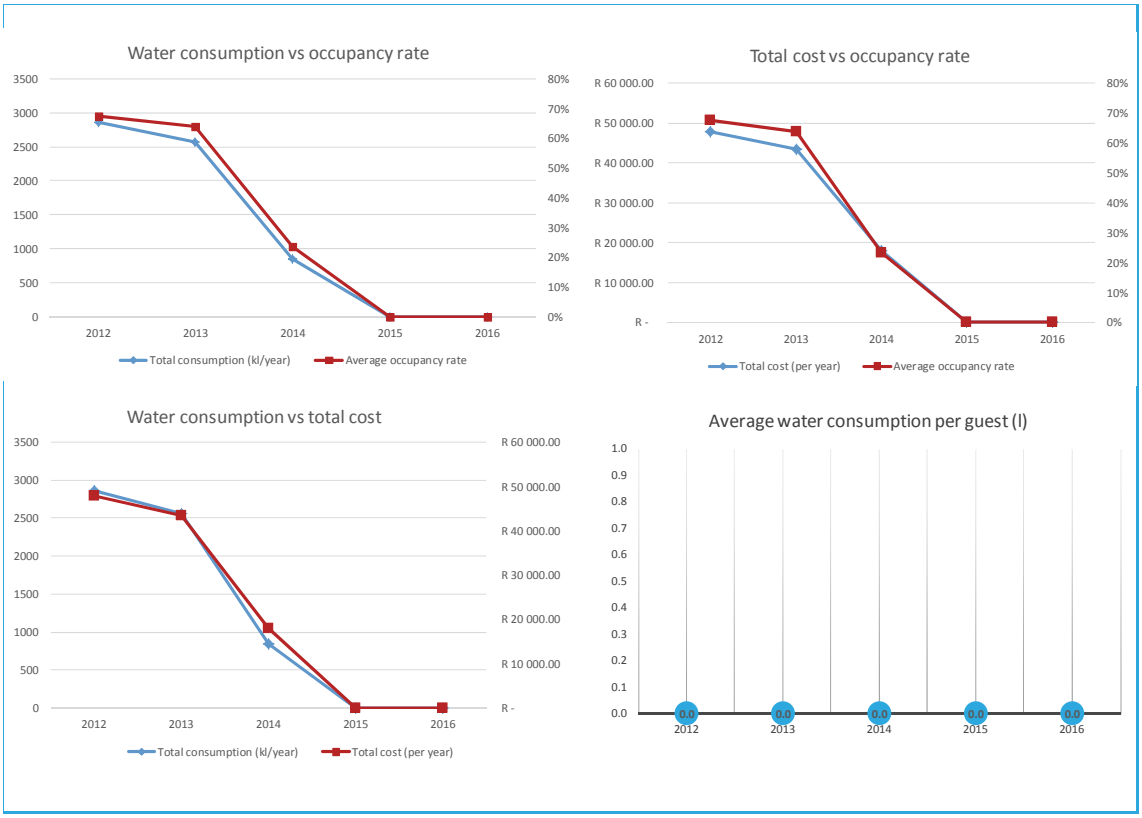


FIGURE 32: GRAPHS OF THE SUMMARY FOR THE PEECH HOTEL

3.1.4 PEECH HOTEL COMMENTS ON THE TOOL

- The tool is user friendly and will create awareness regarding water conservation in the industry.
- The tool will be a useful addition to the business.
- The monthly database could be a useful tool for them although they have an issue with separating water usage by guests from water usage for the rest of the hotel - gardens, restaurant etc. Considering the occupancy directly against usage means this can get distorted if they have an abnormally busy (or quiet) month. This problem could be addressed through the installation of sub-meters but it is not easy to retrofit these. A comprehensive water audit could also be undertaken to determine the amount of water that is being used in the various areas of the hotel.
- The owner of the Peech Hotel thinks that his garden is using a lot of water and would like more information on how this could be monitored.

3.2 CASE STUDY 2: ZOETE INVAL TRAVELLERS LODGE

Zoete Inval Travellers Lodge is located in Hermanus in the Western Cape and is a backpackers hostel as well as a B&B. It has been described as having the comfort of B&B accommodation with the convenience of back-packer-style self-catering accommodation.

The lodge was opened in 1993 by Jan and Marilyn van der Velden. It provides 7 private B&B rooms as well as a loft with 2 dormitories, a double room and a family suite that are all self-catering.

3.2.1 CURRENT WATER WISE INITIATIVES

- Zoete Inval has a rainwater harvesting system and the water is used to water the garden.
- Staff are trained to wash dishes in plastic containers within the basin. When the wash water is dirty this gets emptied and the rinse water gets used for washing.
- They have a hot tub which is emptied on a regular basis (in season) and the water gets used in the garden.
- Low flow showerheads have been installed in all the bathrooms.

3.2.2 RESULTS FROM THE AquaSmart HOTELS TOOL

The results of the completed AquaSmart Hotels tool are provided in Figure 33. These results indicate that:

- Some technological changes can be considered in the kitchen, laundry, leak monitoring and the garden.

- Policy, staff training and water monitoring may need to be reviewed by management.
- Behavioural changes regarding the laundry, kitchen and guest awareness can be taken into consideration.

Technology Perspective

Description	Percentage
Guest bathroom	56%
Kitchen	38%
Laundry	31%
Rainwater harvesting	100%
Greywater system	100%
Leak monitoring	50%
Garden	50%
~~Swimming pool~~	~~#N/A~~
~~Cooling tower~~	~~#N/A~~

Organisational Perspective

Description	Percentage
Policy	75%
Maintenance plans	100%
Staff training	63%
Water monitoring	25%

Behavioural Perspective

Description	Percentage
Laundry	75%
Kitchen	75%
Guest awareness	75%
Gardens	100%
~~Swimming pool~~	~~#N/A~~

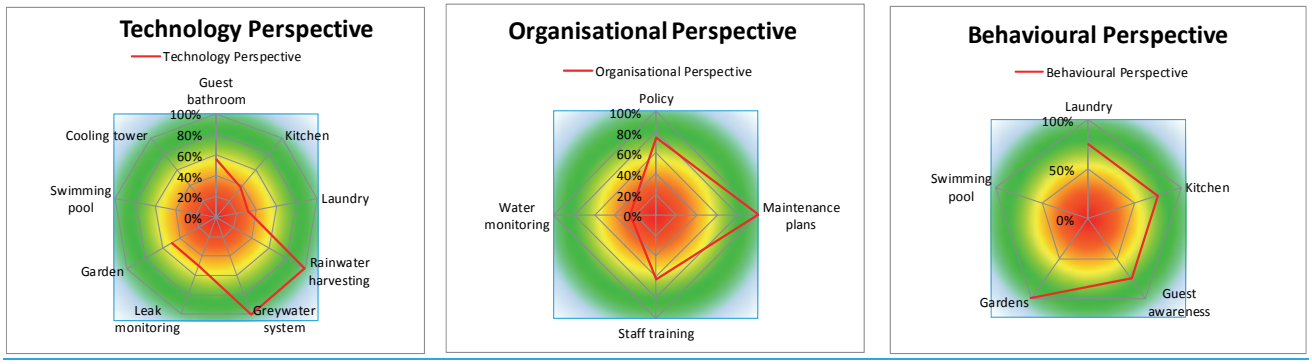


FIGURE 33: WATER WISE TOOL SUMMARY RESULTS FOR ZOETE INVAL

The results in the summary (Figure 33) was converted to a score out of 10 and Zoete Inval scored 6.92 (Figure 34). This score indicates that the hotel may be using a fair amount of water, but with a few small changes, the water consumption of the hotel may be reduced further.

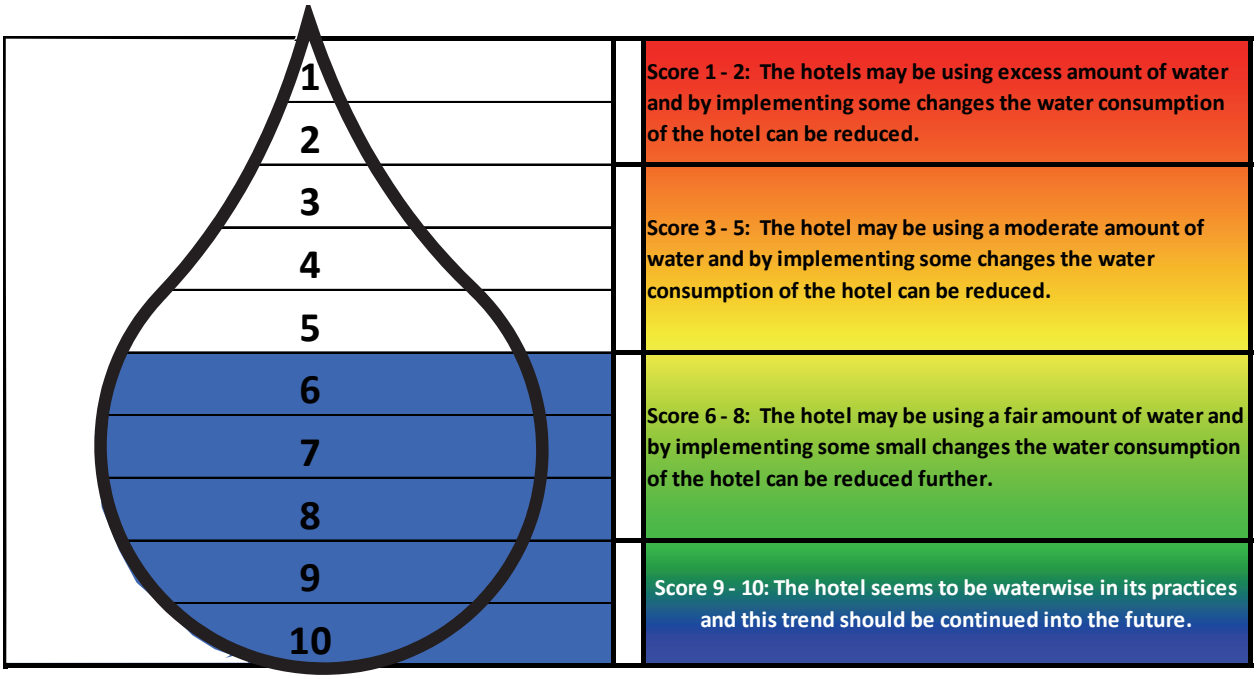


FIGURE 34: WATER WISE SCORE FOR ZOETE INVAL

3.2.3 ZOETE INVAL COMMENTS ON THE TOOL

- The tool is user friendly.
- The tool has provided information that will assist in making their hotel more water wise.
- They will use the AquaSmart Hotels Database to monitor their water consumption in the future as they are currently not doing so.
- May consider including jacuzzi's to the tool.
- "Thank you for raising awareness and being a mirror into which we can look to see the reflection of ourselves and what and how we are doing in the area of water use."

3.3 COMMENTS FROM HOSPITALITY INDUSTRY

3.3.1 COMMENTS ON WATER CONSERVATION

Five hotels were approached at the beginning of this project to provide information regarding water conservation and management within their hotel. A summary of their responses is provided below.

Environmental Policy: It appears that most establishments which replied have some form of environmental policy in place, whether it is an informal one or working towards getting certification, such as the Green Leaf Certification programme for water management. This seems to be reflective of the larger hotel chains being able to achieve certification whereas the smaller institutions implement their own policy be it formal or informal.

Self-Water Audits: The only respondent to have performed a self-water audit did so because it was implemented by the Western Cape government (this was many years ago). One establishment performs a basic monthly self-water audit looking at water consumption and comparing it to occupancy figures and compares it to previous months and years. The hotel group which is currently in the process of getting Green Leaf Certification will undergo audits in the near future as part of the programme. Otherwise, most of the respondents whether or not they implement major water saving initiatives do not perform a self-water audit.

Implementation of Water Saving Initiatives: Most establishments have implemented some form of water saving initiatives, the most common being the towel reuse programme. Some have implemented more since their environmental policy was formally established.

The interventions found to have had the most impact vary according to the circumstances of the establishment. One establishment situated on a large property is able to maximise its space to run a large greywater recycling facility which incorporates a man-made dam, this is used to water the property. They have found this to be the most effective intervention in terms of saving costs and water. Other institutions find that reusing towels is effective, putting sprinkler systems on a timer in the early mornings and early evening and running laundry machines only when they are full. Reusing water from water features to water the garden when the sprinkler system is off in winter. Staff education was also mentioned by one establishment as having the greatest impact in terms of conserving water, and instils proper training measures so that their staff is well informed.

A backpackers establishment catches all its own water and makes use of a gravity fed system which is stored in tanks (kept separately for: toilets, showers and drinking) as well as a groundwater storage tank. They also use bucket showers which limit the user to 25 litres of water and have waterways surrounding the accommodation huts to catch further greywater. Collected runoff is used to water the vegetable garden as well as reed beds at the lowest gradient point of the property.

One institution found that they were not seeing the desired results of their initiatives.

Ease of Implementation: According to the survey, the easiest intervention to implement has been low flow/water efficient showerheads, diverters in the toilet flush system were also mentioned as well as staff training.

Difficulty of Implementation: A number of difficulties came up for various reasons. The cost and time that went into installing a greywater system at the one establishment was high, so while being the most effective system it was the most difficult to implement. Other initiatives which have been challenging have been waterless urinals – due to the correct maintenance and cleaning procedures which need to be followed and drip irrigation – due to expense. Getting staff to take water saving initiatives seriously was also mentioned as the biggest challenge, especially as employees tend to not be too concerned about their actions where it is not their own capital being affected. The backpackers establishment found the installation of waterways around their accommodation huts to be the most challenging.

Responsiveness of Guests: Most institutions found that there is some participation from guests, mostly in response to the towel reuse programme, however even this is lacking. Most institutions found that there is a lack of awareness and education regarding water issues and that people are likely to complain if they think the hotel is trying to save costs as opposed to water. The backpackers establishment however, implements an educational awareness system whereby guests receive a 3 page comprehensive email before they arrive, propagating the ethos of its eco-tourism-based initiatives and finds that the guests are enthusiastic and willing to participate.

Water Savings Made to Date: Most institutions are unable to calculate what savings have been made to date, apart from monitoring monthly invoices. They do not have a measurement tool in place to measure this. Those who are doing so have only started to do it fairly recently. One hotel was able to calculate the approximate water usage per guest between 2012 and 2013 and found that insignificant savings regarding water had been made (unable to determine why at this stage).

Most institutions apart from one (just recently had meters installed) did not have historical data to compare records with. The hotel group will start to maintain records with the Green Leaf Certification Programme.

None of the institutions make use of a tool or system to calculate savings and costs.

All institutions indicated that they would make use of user-friendly Excel spreadsheet to calculate water costs and potential savings.

New Technologies: A variety of new technologies were mentioned which the participating institutions would like to know more about, such as; grey water installation, using borehole water to supply the hotel with water for more than just garden use, and the use of water and energy (using windmills and turbine pumps to transport water). Another respondent expressed interest in knowing how to determine if leaks are affecting their water consumption figures. And a number of respondents indicated that they would be interested in any technologies that could have an impact on water savings but would not affect the comfort of their guests.

Recommendations for the Hospitality Industry: The Respondents supplied a number of suggestions for water conservation measures, such as greywater recycling, harvesting rainwater and using tanks with stone filters, ensuring showerheads are replaced with water efficient models, upgrading of old toilets, use of energy efficient washing machines and dishwashers, training of staff to implement and maintain water conservation measures.

3.3.2 HOSPITALITY INDUSTRY COMMENTS ON THE TOOL

A workshop was held in Hermanus, Western Cape, with members of the hospitability industry and the Whale Coast Conservancy (WWC) to create awareness regarding water conservation and to introduce the tool. Comments received after the workshop included the following:

- The tool is user friendly and provides information that will assist the hotels in making their establishment more Water Wise.
- Only some hotels are currently monitoring their water usage but most would consider using the AquaSmart Hotels Database to monitor water consumption in the future.
- “Good Workshop. Some tweaks on the programme would possibly make it even more useful” H Hofmeyr, General Manager Marine Hotel
- “Thanks a lot. Very nice workshop. Will use this wisely.” J Braud, Operations Windsor Hotel.
- “Thank you for raising awareness and being a mirror into which we can look to see the reflection of ourselves and what and how we are doing in the area of water use.” M van der Velden, Owner Zoete Inval.
- “WWC would like to promote the use of the tool in the local hospitality industry.” R Fryer, Manager Whale Coast Conservation.

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