Water Efficiency Report

2011–12
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Sydney Water is planning for the future. Our vision is to provide valued water solutions. To do this, we will put our customers front of mind, focus on business excellence and be forward thinking.

We are applying these three themes to how we meet our Operating Licence requirements for water conservation.

Water use in Sydney continues to remain at historically low levels. At 30 June 2012, total water use was 297 litres per person per day (LPD), well below our Operating Licence water use target of 329 LPD.

This includes water used by the residential sector, businesses, industry and for irrigation. This is an excellent achievement by the community, and reflects ongoing efforts to maintain water saving behaviours adopted during drought restrictions. It also reflects a general decline in the use of drinking water by the non-residential sector. Sydney Water expects that water use will remain about this level until at least 2015.

Figure 2 Daily water use in greater Sydney was 297 litres per person per day in 2011–12

1 All LPD numbers are weather corrected unless noted otherwise. Appendix 2 lists LPD in 2011–12 both corrected and uncorrected for weather.
As noted in last year’s Water Efficiency Report, Sydney Water’s approach to water efficiency is changing. After more than a decade of sustained effort, the biggest gains in water savings are already made. Our overall focus for water efficiency now is to deliver services that customers value, in a way that limits increases to bills.

Customer research (2010) shows that 39% of our customers want their basic needs met at an affordable price, while 61% want more than basic services. To meet these customer expectations, we are developing new products and services we can tailor to customers’ circumstances and deliver cost-effectively.

We are currently in a phase of research, analysis and program development, similar to when Sydney Water first developed a Water Conservation Strategy in the late 1990s. During this period, Sydney Water developed what were then new and untested water efficiency programs, such as WaterFix and the Every Drop Counts Business Program. These programs went on to be highly successful, playing an important role in reducing water use during the last drought. Ongoing savings from these programs will continue over time and help maintain low water use.

In 2011–12, we have invested significant effort in program development and staff training. Our new services will continue to be developed in 2012–13.

We also remain committed to investing in research and data analysis, and to providing the community with expert advice, information and education. Our experience in developing and delivering water efficiency programs has made Sydney Water a world leader in water conservation research.

Through our strong internal capability and research partnerships we will continue to research, assess and evaluate new opportunities to provide valued water solutions for water efficiency, leak management and recycling.

**Water use in Sydney**

Total water use for 2011–12 was 481,930 million litres compared to 496,695 million litres in 2010–11. This is about the same level as in 2007–08, when Level 3 drought restrictions and an extensive water efficiency program were in place.

Weather conditions in both 2007–08 and 2011–12 were wetter than average; however, since 2007–08, there has been about a seven per cent increase in population. The continued low level of total water use reflects a major shift in how the community now uses water.

Currently, residential demand accounts for almost 75% of total water use. Non-residential properties use about 25%. This includes industrial properties (8%), commercial (10%) and government and other (7%).

![Figure 3 Total water use in Sydney was 482 billion litres a year in 2011–12. This is about the same volume used in 2007–08.](image-url)
Water conservation

In 2011–12, Sydney Water continued to implement a range of initiatives to meet our Operating Licence water conservation requirements. These included:

- providing water efficiency initiatives
- reducing leaks from Sydney Water’s and customers’ pipes
- providing recycled water to households and businesses
- promoting water efficiency and water recycling projects.

We also did substantial analysis and research to support and continue to develop these initiatives.

Water saved in people’s homes

In 2011–12, Sydney Water expanded the former WaterFix Program to provide customers with a choice of services to suit their individual needs. This new WaterFix service includes replacing showerheads, toilets and taps, and repairing leaks. We offer the new service to residential customers at cost recovery rates. We will continue to develop WaterFix as we learn from implementing the new service.

Recognising the increasing cost of living, Sydney Water is committed to supporting customers in hardship.

We introduced PlumbAssist in 2011–12, to help customers experiencing financial hardship to reduce their debt by identifying and addressing high water use and its causes. The service provides essential plumbing services and emergency plumbing work, if required, for customers who cannot afford it.

Estimates of water savings from PlumbAssist services provided in 2011–12 are not yet able to be calculated. Sydney Water will analyse savings from this service in 2012–13.

Sydney Water’s new programs are delivered differently from the more general programs of the past. Our new approach is to offer cost-recovery programs tailored to individual customer’s needs, rather than implementing large-scale programs that result in across the board price increases.

Water saved by businesses

This year we have also refocused the way that we work with business customers. Sydney Water’s new Business Customer Services area aims to provide a holistic service to business customers. By bringing together customer connections, trade waste, backflow prevention compliance and water efficiency assistance into one service area we can look at a business’s water use in its entirety.

In 2011–12, Sydney Water helped businesses save water by identifying opportunities to reduce water use through improved management and processes, leak detection, reuse, water efficient devices and industry specific advice such as best practice guidelines.

These initiatives have achieved about 588 million litres of water savings this year.

Sydney Water also continued to work with Councils to help small to medium business. This program saves about 166 million litres of water a year.

Water saved in schools

The Every Drop Counts in Schools Program finished at the end of 2011. However, most participating schools elected to retain the smart meter installed as part of this program. We funded upgrades for technologically out-dated smart meters and training for schools on how to use their meters.

The Every Drop Counts in Schools Program saved about 218 million litres a year. We expect these savings can be retained if schools and the NSW Department of Education and Communities continue to monitor schools’ water use, identify leaks and other unexplained water use, and fix these issues within reasonable timeframes.

Water saved by reducing leaks

Sydney Water has continued to cost-effectively manage leaks by proactively finding concealed leaks, maintaining fast response times to reported leaks and breaks, reducing pressure and renewing water mains.

In total, this program saves over 30 billion litres a year.
Recycled water

In 2011–12, Sydney Water continued to operate recycled water schemes. We also encourage water recycling by other businesses, where it is cost effective. Recycled water is used for irrigation, industrial/business processes, residential outdoor use, toilet flushing and for the environment.

Schemes run by Sydney Water saved about 13 billion litres of drinking water in 2011–12.

The year ahead

In 2012–13, Sydney Water will continue to develop and refine this new approach to water efficiency.

We will look into new options and services we can provide to customers. We will also continue to inform customers how to be water wise through the Sydney Water website and our communication and education initiatives.

Water efficiency will continue to be incorporated into broader education initiatives such as educational tours at operational sites, the Water Recycling Education Centre and educational resources.

We will keep reducing leaks in the water supply system and implementing recycled water schemes, where it is cost-effective.

We will also continue investigating and researching future water use, customer wants and needs, and potential future water efficiency, leak management and recycled water projects, to enable best practice long-term planning.
1 Introduction and regulatory context

Meeting Operating Licence requirements
Sydney Water’s Operating Licence includes water conservation requirements that cover water efficiency, leak management, water recycling and a water use target of 329 litres per person per day (LPD).

In 2011–12, water use was 297 LPD. This is well below the target and slightly lower than last year.

We continue to meet our Operating Licence requirements for water efficiency, leak management and recycling. Our progress in these areas this year is detailed in Section 2, Section 3 and Section 4.

This report is a yearly report on how Sydney Water meets its water conservation requirements under Section 7.5(c) of our Operating Licence 2010–15.

Appendix 1 outlines how this report meets specific requirements in the Operating Licence reporting manual.

1.1 Water Conservation Strategy 2010–15
Sydney Water’s Operating Licence requires us to:

- reduce the quantity of drinking water that we draw from all sources to a level of water use equal to or less than 329 litres per person a day (LPD) by 30 June 2011, and maintain water use at or below this level for the remainder of the Operating Licence term
- ensure that the level of leaks from our drinking water supply system is not over 105 million litres a day
- promote, foster and encourage the production and use of recycled water in our area of operations
- consider water efficiency and other water conservation measures when planning for future services, including reducing leaks
- undertake and promote water efficiency programs.

The licence also required us to develop a Water Conservation Strategy 2010–15 in 2010. We provided this strategy to the Independent Pricing and Regulatory Tribunal (IPART) in December 2010. The strategy describes how we will meet our licence requirements for water conservation and how Sydney Water contributes to the water efficiency (including leak management) and recycling targets in the 2010 Metropolitan Water Plan.

The areas covered by the strategy are:

- water efficiency for residential customers
- water efficiency for business customers
- water efficiency for schools and councils
- leak management
- water recycling projects.

The Water Conservation Strategy says that Sydney Water will review and amend how we achieve Operating Licence requirements over time. We continually adapt water efficiency, leak management and recycling initiatives to take into account forecast demand, our progress against Operating Licence targets and the cost-effectiveness of individual initiatives.

The 2011–12 Water Efficiency Report notes Sydney Water’s change in focus for water efficiency initiatives for residential customers, business customers and schools.

Appendix 6 describes the success of our water conservation strategies between 1999 and 30 June 2011.

1.2 Water use target
Sydney Water continues to maintain water use at equal to or less than 329 litres per

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2 This target includes total water used by residents, businesses and government.
person per day (LPD). In 2011–12, water use was 297 LPD\(^2\). This figure includes water used by the residential sector, businesses, industry and for irrigation and is 11 LPD less than in 2010–11.

This lower demand reflects a decline in the use of drinking water by some non-residential customers. For example, the partial closure of BlueScope Steel at Port Kembla and the start of the new recycled water scheme at Rosehill led to a reduction in drinking water use at these sites. It also reflects the ongoing efforts by customers to maintain water saving behaviours that were established while drought restrictions were in place.

Sydney Water estimates that water use will continue to be well under the Operating Licence water usage target for the rest of the licence period.

1.3 2010 Metropolitan Water Plan

The 2010 Metropolitan Water Plan sets out measures approved by the NSW Government to secure Sydney, the Illawarra and the Blue Mountains’ water supply now and in the future.

The 2010 plan builds on the success of past plans by continuing to concentrate efforts on four major areas – dams, recycling, desalination and water efficiency.

Sydney Water contributes to two targets in the 2010 Metropolitan Water Plan:

- to recycle 70 billion litres of water each year by 2015
- to save 145 billion litres of water each year by 2015 through water efficiency measures (including leak management).

Other agencies, such as the Office of Environment & Heritage (OEH), are also responsible for implementing initiatives that contribute to these targets.

Estimated water savings from Sydney Water initiatives in 2011–12 that will contribute to Metropolitan Water Plan targets are reported in Appendix 5.

1.4 Reporting savings from non-Sydney Water programs

In past versions of this report, Sydney Water reported on water savings from programs run by other agencies, recycled water schemes operated by private operators and regulatory measures, such as the Building Sustainability Index (BASIX) and the Water Efficiency Labelling Scheme (WELS).

From 2011–12, water savings from non-Sydney Water initiatives will not be included in this report. The Metropolitan Water Directorate in the Department of Finance & Services now collates water savings from non-Sydney Water programs.

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\(^2\) All LPD numbers are weather corrected unless noted otherwise.

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Figure 4 The NSW Government’s Metropolitan Water Plan is based on the four key elements of the Water for Life equation.
2 Water efficiency in 2011–12

Tailoring our water efficiency initiatives
Sydney Water is changing from having a broad-scale water efficiency program to delivering cost-recovery water efficiency services and assisting customers experiencing financial hardship. Tailoring these services to individual customers’ needs gives customers more flexibility and limits impacts on bills.

Our residential water efficiency services in 2011–12 included PlumbAssist and the new WaterFix (combining the old WaterFix and Toilet Replacement Programs).

We now provide a ‘one stop shop’ for business customers through Business Customer Services (BCS). BCS connects new business customers to Sydney Water services and works with businesses to prevent backflow, improve wastewater quality, become more water efficient and help develop a water contingency plan.

We also worked with schools to wrap up the Every Drop Counts in Schools Program and supported water efficiency programs led by other agencies. Water efficiency will continue to be incorporated into broader education initiatives on the urban water cycle.

2.1 Residential water efficiency
Appendix 5 includes water savings and costs of Sydney Water residential water efficiency services in 2011–12, where possible to calculate.

2.1.1 PlumbAssist
The key focus of Sydney Water’s residential programs in 2011–12 was to provide a tailored water conservation program for customers experiencing financial hardship.

Financial hardship has many causes, such as illness, a death in the family, relationship breakdown, loss of employment or disability. Customers experiencing hardship often have several difficulties, which compound their payment difficulties.

Customers in financial distress can receive help to manage their payment difficulties through Sydney Water’s BillAssist service. Customers are referred to BillAssist by the Sydney Water Contact Centre or external community service agencies. Other customers identified with high and/or long-term debt are proactively offered assistance by BillAssist.

BillAssist staff offer customers case management and a range of assistance options. They check for high water use or a sudden increase in use. As part of the assistance package, BillAssist also does an initial plumbing assessment. Eligible customers with high water use or who cannot afford to fix urgent or essential plumbing services are then referred to PlumbAssist.

PlumbAssist aims to provide customers with essential plumbing services, for example, a working wastewater system, hot water and functioning bathroom fixtures. Plumbers also fix leaks and replace inefficient toilets where required. PlumbAssist reduces water waste, the cost of future water bills and alleviates financial stress for financially vulnerable customer groups. A case study of a PlumbAssist service is included in Box A.

In 2011–12, 228 properties were referred to the PlumbAssist service. Of these, 174 properties had a plumbing issue resolved. Properties received repairs to fix plumbing issues that could affect health, public amenity, safety or water costs.

PlumbAssist is a new service that is still in the early stages of development. Water savings associated with PlumbAssist are difficult to calculate. Savings will vary significantly from house to house due to the variety of plumbing issues fixed through the program.

Currently, there is insufficient water use data available to estimate savings for 2011–12, or potential future water savings, from the PlumbAssist service. As we develop the service and more customers participate, we will be better able to estimate water savings.
We will analyse participants’ water use in more detail in 2012–13. This will assist Sydney Water to understand the potential volume of water savings that may be achieved through this program.

Sydney Water spent $207,996 in 2011–12 to develop and deliver PlumbAssist.

2.1.2 WaterFix

We changed the WaterFix service from 1 July 2011, offering it to customers on a cost-recovery basis. The new service merged the previous WaterFix Program and Toilet Replacement Program (which both ended on 30 June 2011).

Under the new WaterFix service, customers have more flexibility to choose the type of service they need. Costs for the customer vary, depending on the type of service they select.

In 2011–12, the new WaterFix service offered:

- tap and toilet leak repairs
- installation of WELS (Water Efficiency Labelling Scheme) 3-star showerheads
- installation of WELS 4-star, dual flush toilets
- installation of WELS 3-star flow regulating aerators or WELS 4-star in-body flow regulators.

In 2011–12, there was a base charge of $100 for all WaterFix appointments. The rest of the charge to the customer varied, depending on the number of services we provided. For example, tap and/or toilet leak repairs cost $14 for each leak, installing a WELS 3 star-rated showerhead (standard range) cost $30 and installing a WELS 4 star-rated dual flush toilet (standard range) $315. Mid-range and premium range products were also available, at a higher cost. A surcharge applied for Saturday appointments.

The number of shower, toilet and leak-related services provided to customers in 2011–12 is listed in Table 1.

<table>
<thead>
<tr>
<th>WaterFix services</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Shower related</td>
<td>285</td>
</tr>
<tr>
<td>Toilet related</td>
<td>643</td>
</tr>
<tr>
<td>Leak repairs</td>
<td>799</td>
</tr>
</tbody>
</table>

Table 1 Types of services completed for WaterFix participants in 2011–12

Initial estimates of potential water savings from the new WaterFix service are included in Section 5. These estimates are only preliminary because:

- participants in the new WaterFix service may be significantly different from those who participated in the former WaterFix Program. Water savings from the former program cannot be compared to this new service
- we provided around 25% of WaterFix services in 2011–12 to property types that are generally not individually metered (for example, apartments)
- about 30% of WaterFix services in 2011–12 were in tenanted properties.
This is a higher proportion than for the former WaterFix program and is likely to be in response to changes in tenancies legislation

- not enough time has passed since participants joined the program. At least one full year of water use data after participation in the service is needed to reliably estimate water savings
- 846 customers received a new WaterFix service to the end of June 2012. More customers are needed to improve the accuracy of water saving estimates.

Sydney Water spent about $458,000 in 2011–12 in developing and delivering the new WaterFix service.

We will review the WaterFix service in 2012–13. This is discussed in Section 7.

2.1.3 NSW Government Home Saver and rainwater tank rebates

In 2010–11, under the Climate Change Fund, the NSW Government offered rebates to households that installed hot water circulators and dual flush toilets. In 2010–11, Sydney Water also offered rebates for households that installed rainwater tanks. These programs ended on 30 June 2011.

We continued to accept rebate applications until the end of September 2011, for purchases made before the end of June 2011.

The total number of rebates paid and an estimate of water savings achieved over the life of these programs is listed in Table 2.

<table>
<thead>
<tr>
<th>Program</th>
<th>Rebates paid</th>
<th>Water savings (ML/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual flush toilet⁴</td>
<td>9,213</td>
<td>235</td>
</tr>
<tr>
<td>Hot water circulator</td>
<td>11</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Rainwater tank⁵</td>
<td>58,490</td>
<td>2,154</td>
</tr>
</tbody>
</table>

Table 2 Rebates paid by program

Appendix 6 details water savings and costs of each of these programs.

2.2 Business water efficiency

Businesses account for nearly one third of Sydney’s daily water use. Businesses that reduce water use often find they also save money in reduced wastewater, energy and chemical treatment costs.

Appendix 5 includes estimated costs and savings from business water efficiency services in 2011–12.

2.2.1 Business Customer Services

Sydney Water works with business customers through Business Customer Services (BCS). BCS provides a holistic water management service to business customers, helping them achieve best practice water and wastewater management. Water efficiency is part of this broad service.

As well as assisting businesses with water efficiency, BCS works with them to connect new customers to Sydney Water services, prevent backflow, improve wastewater quality and develop water contingency plans.

We provide information and help businesses to:

- benchmark water use
- conduct water use monitoring
- do water audits for different business sectors
- identify water saving opportunities
- implement water saving measures.

Business customers may be able to achieve water savings by improving processes to achieve efficient water and energy use, installing water efficient equipment for business processes and cleaning, monitoring and repairing leaks, using alternative water sources to drinking water and detecting inefficient water use through online monitoring.

Examples of initiatives implemented by business customers in 2011–12 include:

- consolidating production lines
- altering wash-down schedules
- increasing the use of backwash water
- detecting and quickly fixing leaks
- increasing staff awareness of leak prevention.

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⁴ Rebates for dual flush toilets and hot water circulators were paid between January 2010 and the end of September 2011.
⁵ Rebates for rainwater tanks were paid between October 2002 and the end of September 2011.
A case study of a customer working with Business Customer Services is provided in Box B.

**Box B: Benefits of online monitoring**

Business Customer Services encourages business customers to monitor their water meters regularly and, where feasible, to install online monitoring equipment. This helps customers quickly identify and repair leaks and faulty equipment, reducing excessive and unnecessary water use.

In 2011–12, a business customer in western Sydney detected unusual water use patterns from their cooling tower through online monitoring.

An inspection of the cooling tower identified a faulty float, which was quickly repaired.

Installing the online monitoring system has been a great investment for this business, resulting in water savings of 17,000 litres a day of drinking water. This has saved the business more than $10,000 a year.

We estimate water savings from businesses working with Sydney Water in 2011–12 to be around 588 million litres a year, at a cost of about $565,000.

A number of publications and resources to help business customers be water efficient are available on the Sydney Water website. These include fact sheets on trade waste, best practice guidelines to achieve water efficiency, case studies, water efficiency benchmarks for different types of businesses and a do-it-yourself tool to save water in your business.

### 2.2.2 Council Partnerships Program

Through the Council Partnerships Program, Sydney Water works with local councils to help small and medium water-using businesses achieve sustainable water savings. For the past three years, Sydney Water has co-funded the employment of 15 sustainability project officers who work with 20 councils. In 2011–12, two new councils joined the program.

The project officers engage with small and medium businesses to conduct water audits, recommend how they can improve their water efficiency and help them implement water efficiency projects.

At the end of 2011–12, around 500 small to medium water using businesses were participating in the program, with total savings to date of around 789 million litres per year.

In 2011–12, Sydney Water spent about $249,000 implementing the Council Partnerships Program.

### 2.2.3 Irrigation and Landscape Efficiency Project

The Australian Government, through its Water for the Future program, funded a Hawkesbury-Nepean River Recovery Program (HNRRP) to improve the health of the river. Sydney Water worked with the HNRRP to implement the Irrigation and Landscape Efficiency Project (ILEP). The project aimed to improve water efficiency and turf and soil management for Greater Sydney’s open spaces (parks and sporting facilities). Savings were made by using improved technology and a range of land and site management practices over 33 sites. These sites were owned by the 23 partner organisations (including councils, golf courses and sporting fields) who participated in the project.

ILEP officially concluded in September 2011. Our involvement in 2011–12 was to provide in-kind support to the project by monitoring water savings achieved.

The project is now estimated to save 1,090 million litres in drinking water per year (exceeding its target of 1,060 million litres a year). These water savings are used for environmental benefits in the Hawkesbury-Nepean River system. As this is not a Sydney Water initiative, water savings from this project are not included in Appendix 5.

Using our ILEP experience, we developed the ‘Best practice guidelines for holistic open space turf management in Sydney’. These are available on the Sydney Water website.

Some projects that received assistance from Sydney Water as part of ILEP are still being implemented by councils. We will continue to monitor water savings from these projects.
2.3 Education initiatives

Sydney Water no longer provides specific water efficiency programs to schools. Instead, water efficiency is integrated into broader education initiatives that focus on the urban water cycle.

We have developed a new education plan that aligns with our Corporate Strategic Plan 2012–16 and our Communication Strategy. Under this plan, educational initiatives will include:

- curriculum-linked excursion programs for secondary schools delivered at the Water Recycling Education Centre
- educational tours of water filtration, water recycling and wastewater treatment plants
- online virtual tours with curriculum linked resources
- professional development for educators to deliver effective and engaging water education
- direct engagement with students through guest lectures at universities and TAFE colleges
- education resources on the Sydney Water website
- sponsorship of other organisations to deliver water education.

2.3.1 Every Drop Counts in Schools Program

Sydney Water ran the Every Drop Counts in Schools Program for four years. The program provided schools with tools and resources to monitor their water use and identify potential leaks.

In 2011, Sydney Water contacted the 121 participating schools to inform them that the program was finishing. We offered schools the option of continuing to use the smart meter installed as part of the program to monitor their water use, with the school maintaining and repairing it. Alternatively, schools could choose to have their smart meter removed free of charge.

We provided all participating schools with a final report card on their water use covering the period from July to December 2011.

We also offered training sessions with Watersave Australia on how to use the smart meter. Watersave provided this training to 66 schools between November 2011 and April 2012.

After the program, 113 schools continued to have a smart meter on their premises6, with 20 of these schools upgrading technologically out-dated smart meters. Schools that identify leaks will continue to manage them independently.

Information on responsible water use and how to be a water efficient school is still available on the Sydney Water website.

Total program investment in the Every Drop Counts in Schools Program in 2011–12 was $154,000. We estimate water savings from the program will remain at about 218 million litres a year, if schools and the NSW Department of Education and Communities continue to monitor schools' water use, identify leaks and other unexplained water use, and fix these issues within reasonable timeframes.

2.3.2 Top 100 Schools Program

The Top 100 Schools Program is run by the NSW Department of Education & Communities (DEC, formerly the Department of Education & Training). The program targets the 100 schools in NSW with the highest water use. Schools are provided with water efficient fixtures and fittings to replace older, inefficient items.

In 2011–12, Sydney Water’s involvement with this program was limited to providing a small amount of school water use data to DEC. We do not anticipate that DEC will require any further support from Sydney Water for this program.

Water savings from the Top 100 Schools Program are estimated to remain at about 296 million litres a year.

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6 As at April 2012, when Sydney Water concluded funding the removal of smart meters.
2.3.3 Educational tours

Sydney Water conducts educational tours at 11 operational sites including water filtration, water recycling and wastewater treatment plants. We provide tours for secondary schools, TAFE colleges, universities and technical and international delegations. Information on water efficiency is included in these tours.

In 2011–12, about 135 tours and presentations were provided to more than 4,300 participants.

Sydney Water opened its Water Recycling Education Centre in February 2011. The centre has displays and interactive resources that explain the four key elements of the NSW Government’s Metropolitan Water Plan – dams, recycling, desalination and water efficiency. Water efficiency is also discussed in educational tours of the water recycling plant at the centre. In 2011–12, more than 1,400 people visited the Water Efficiency Recycling Centre and participated in a tour of the site.

Figure 5 Water efficiency is incorporated into tours and educational resources.
2.4 Regulatory measures

As they are not Sydney Water initiatives, water savings from regulatory measures are not included in water efficiency savings reported in Appendix 5.

2.4.1 BASIX and WELS

Sydney Water’s *Water Conservation Strategy 2010–15* noted that most of the available water efficiency savings from 2010 to 2015, particularly in the area of residential indoor water savings, would be generated by regulatory measures.

The NSW Government’s Building Sustainability Index (BASIX) and the national Water Efficiency and Labelling Scheme (WELS) now play key roles in achieving water savings and will play greater roles in the future. Information on these regulatory measures is available at [www.waterforall.nsw.gov.au](http://www.waterforall.nsw.gov.au).

2.4.2 Water Wise Rules

Water Wise Rules replaced drought restrictions in June 2009. They remain the baseline initiative for outdoor water efficiency. The rules focus on simple, common-sense behaviours:

- watering, including sprinklers and watering systems, is allowed any day before 10 am and after 4 pm. This avoids the heat of the day. Children are allowed to play under sprinklers on hot days
- hand held hoses must be fitted with a trigger nozzle, including for washing vehicles. Hoses must not be left running unattended
- hard surfaces, such as paths or driveways, cannot be hosed, except for health and safety, emergency or construction activity purposes. If hosing is required, only trigger nozzle hoses or high-pressure cleaning devices can be used
- fire hoses may be used for fire fighting activities only.

Sydney Water implements Water Wise Rules on behalf of the NSW Government, in the same way we implemented drought restrictions. Sydney Water’s analysis estimates that Water Wise Rules save about 19 billion litres of water a year.

*Figure 6 Under Water Wise Rules, hand held hoses must be fitted with a trigger nozzle.*
3 Leak management in 2011–12

Best practice leak management

We estimate average water leakage for the twelve months ending 30 June 2012 to be 115 million litres a day. This meets our Operating Licence requirements and reflects international best practice.

In 2011–12 we managed leaks cost-effectively by proactively finding concealed leaks, maintaining fast response times to reported leaks and breaks, reducing pressure and renewing water mains.

In total, our leak management activities save over 30 billion litres of water a year.

3.1 Key leak management statistics

Sydney Water owns and maintains about 21,000 km of pipes that distribute water to customers. We also maintain the 1.3 million connections to customers’ properties.

We continue to meet Operating Licence leakage requirements of 105 ± 16 million litres a day (the accepted range of uncertainty set in the licence). Average water leakage for the twelve months ending 30 June 2012 is estimated to be 115 million litres a day.

The key aspects of leak management that can be quantified include the:

- leakage rate
- number of bursts, breaks and leaks
- average time to repair bursts, breaks and leaks
- length of mains inspected
- economic level of leakage.

Appendix 3 includes an explanation of how we calculate the economic level of leakage.

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leakage</td>
<td>115 ML/day</td>
</tr>
<tr>
<td>Number of bursts, breaks and leaks</td>
<td>13,041</td>
</tr>
<tr>
<td>Average time to repair water main break</td>
<td>36 hours</td>
</tr>
<tr>
<td>Length of mains inspected</td>
<td>12,045 km</td>
</tr>
<tr>
<td>Economic level of leakage</td>
<td>117 ML/day</td>
</tr>
<tr>
<td>Infrastructure Leakage Index</td>
<td>1.5</td>
</tr>
</tbody>
</table>

Table 3 Key leak management statistics

Costs and savings from leak management programs in 2011–12 are included in Appendix 5

3.2 Infrastructure Leakage Index

The Infrastructure Leakage Index (ILI) measures how effectively infrastructure management can reduce leaks. According to leakage experts, it is the best performance indicator for real loss management.

The ILP includes bands from A (reflecting best practice) to D, with recommendations for both developed and developing countries. Sydney Water’s ILI of 1.5 is in the top band (Band A) and compares well against other developed countries.

3.3 Factors affecting leak performance

Like all water pipe networks around the world, leaks and breaks can occur in our supply system. Many things can cause leaks, such as deteriorating joints and fittings, ground movement cracking pipes and changes in water pressure.

Sydney Water implements a number of programs to reduce the likelihood of leaks and the amount of water lost when they do occur. These programs include:

- active leak detection and repair
- pressure management
- improved response times to repair leaks and breaks
- improved flow metering.

In addition, Sydney Water has an ongoing Pipe Renewal Program. By replacing pipes
that have reached the end of their life, this program aims to prevent pipes from breaking and leaking.

Table 4 lists the reported volume of water leakage between 2009–10 and 2011–12.

<table>
<thead>
<tr>
<th>Year</th>
<th>Water leakage (ML/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009–10</td>
<td>97</td>
</tr>
<tr>
<td>2010–11</td>
<td>106</td>
</tr>
<tr>
<td>2011–12</td>
<td>115</td>
</tr>
<tr>
<td>Average</td>
<td>106</td>
</tr>
</tbody>
</table>

Table 4 Water leakage
The 2011–12 leakage figure is higher than the previous two years. Possible reasons for this increase are:
- natural variation due to the uncertainty range in results
- the effects of pressure reduction take time to be realised in leakage results
- the wet weather in 2011–12 meant that some leaks may not have been detected or have been reported later than usual
- a minor increase in unreported or undetected leaks in some areas, due to a more targeted Active Leak Detection Program.

Sydney Water will continue to monitor leaks and, if necessary, will review programs to ensure licence compliance. Appendix 4 explains how we estimate leakage.

3.4 Active leak detection and repair
Active leak detection and repair involves acoustically scanning for concealed leaks in buried pipes and repairing pipes identified. Leaks are generally found in water mains, connections to the mains and in fittings such as hydrants and valves. Active leak detection and repair is a continuous process. Without it, leaks from pipes would increase each year.

All 180 of Sydney Water’s supply zones and the new pressure managed zones are prioritised for active leak detection and targeted accordingly. Sydney Water has worked with the broader water industry to improve leak detection techniques.

We inspected 12,045 km of pipes in 2011–12 (covering 90 reservoir zones and 7 pressures zones). Since the Active Leak Detection Program began almost 152,000 kilometres of pipes have been inspected. It is estimated that this program achieves about 2.3 billion litres of water savings a year.

Sydney Water spent almost $2.5 million on active leak detection and repair in 2011–12.
3.5 Improving flow metering

Flow metering helps us identify leaks and monitor leak reduction programs. Improved flow metering has improved our monitoring of the effectiveness of the Active Leak Detection Program.

To the end of June 2012, Sydney Water has installed 242 bulk water flow meters.

3.6 Improved leak/break response times

Leaks from buried pipes that reach the surface are reported by customers and Sydney Water staff. Improving Sydney Water’s response time to repair these leaks reduces water loss. We prioritise all reported leaks by the size and risk of the leak.

3.7 Pressure management

Sydney Water aims to supply water in a pressure range suitable for households and businesses, while reducing leaks and breaks. However, in some areas water pressure remains unnecessarily high. High pressure in pipes can cause them to break and can cause problems with household appliances such as hot water systems.

The Pressure Management Program involves installing pressure-reducing valves in high-pressure areas. This reduces water pressure in the system and also reduces main breaks and leaks. Sydney Water has implemented about 181 pressure reduction schemes between 2005 and 2012.

To the end of June 2012, we estimate water savings from the program to be 5 billion litres a year. In addition, each customer that has their pressure reduced saves an extra 3,900 litres a year, on average.

In 2011–12, Sydney Water spent about $7 million to deliver the Pressure Management Program.

3.8 Additional leak management services

Leak detection services have become a standard practice service included in Sydney Water’s water efficiency services. Participants in PlumbAssist and WaterFix and businesses working with Business Customer Services are offered leak detection, repair and assistance to self-detect leaks as part of these services.

The Sydney Water website also contains information to help customers identify leaks.
4 Water recycling in 2011–12

Promoting and encouraging water recycling
Water recycling in Sydney has more than quadrupled over the past twelve years from about 11 billion litres in 2000 to 46 billion litres in 2012.

Sydney Water has now implemented all financially viable recycled water servicing opportunities from our wastewater and water recycling plants. This includes very large projects such as the Rosehill Recycled Water Scheme and the St Marys Water Recycling Project.

Future water recycling schemes are likely to be small, localised sewer mining or stormwater harvesting projects. Sydney Water enables others to develop water recycling schemes by accessing water resources from our wastewater and stormwater systems.

4.1 Promoting and encouraging water recycling
Water recycling is a key component in securing the water supply for greater Sydney and the environment.

The NSW Government’s 2010 Metropolitan Water Plan retained the commitment identified in the 2006 Plan to use 70 billion litres of recycled water a year for industry, environmental and residential use. Sydney Water works with relevant government agencies to deliver water recycling schemes that are economically, technically and environmentally feasible.

We particularly encourage water recycling where it can replace drinking water, such as green space irrigation, industrial/business processes and residential outdoor use and toilet flushing.

Sydney Water’s approach includes:

- engaging stakeholders and the community about future water recycling opportunities
- initiating and participating in research projects to quantify the real and perceived costs and benefits of recycling
- developing guidelines and documents for local government about developing recycled water sources.

4.2 Industrial customers
There are challenges in supplying recycled water to industrial customers, as their demand can fluctuate subject to business needs. For example, in 2011–12:

- a foundation customer of the Rosehill Recycled Water Scheme, Shell (Refining) Australia, announced that it will pull out of the scheme in 2014 after concluding refining operations at Camellia
- VISYPET announced that it will build a facility for washing plastic bottles at its Smithfield site. We expect this facility will also use the Rosehill scheme’s recycled water in its operations.
4.3 Water recycling projects

Sydney Water operates 18 plants from which we provide 23 recycled water schemes. We also provide recycled water for use at our own wastewater treatment plants. Table 5 provides details of our recycled water schemes, including the volume of recycled water and how much drinking water this saves each year.

Other significant achievements over the past year include:

- commencing operation of the Rosehill Recycled Water Scheme
- continuing construction work on Hoxton Park Recycled Water Scheme
- signing two new sewer mining agreements with third parties
- consulting with stakeholders on six potential recycled water schemes
- running a workshop at OzWater 2012, based on research examining the costs and benefits of water recycling and building industry capacity to make water recycling investment decisions.

Volumes of water recycled by Sydney Water in 2011–12 are listed in Table 5 and Appendix 5.

4.3.1 Rosehill Recycled Water Scheme

The Rosehill Recycled Water Scheme began operating in October 2011. The scheme supplies high quality recycled water to Sydney Water’s six foundation customers at Rosehill and Smithfield, and three other customers.

The scheme can supply up to 7.3 billion litres of recycled water a year. In 2011–12, more than two billion litres of drinking water was saved by this scheme.

This project is delivered through a public private partnership.

4.3.2 Hoxton Park Recycled Water Scheme

In 2011–12, work continued on the Hoxton Park Recycled Water Scheme. Construction of the scheme is almost complete. Testing of the recycled water plant will occur from mid-2012. By the end of 2013, about 400 households and several light industrial properties will be supplied with recycled water from the scheme.

By 2015, we expect the scheme to supply recycled water to about 2,300 dwellings.

To date, the cost of developing the Hoxton Park Recycled Water Scheme is about $83 million. Expected Sydney Water expenditure in 2012–13 is $5 million.

Figure 8 Since 2006, Sydney Water has provided high quality recycled water to BlueScope Steel.
<table>
<thead>
<tr>
<th>Recycled water scheme</th>
<th>Source of recycled water</th>
<th>Volume of water recycled (ML/year)</th>
<th>Water savings (ML/year)</th>
<th>Type of use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kiama Golf Course</td>
<td>Bombo</td>
<td>53</td>
<td>-</td>
<td>Irrigation, golf course</td>
</tr>
<tr>
<td>BlueScope Steel</td>
<td>Wollongong</td>
<td>6,838</td>
<td>6,838</td>
<td>Industrial</td>
</tr>
<tr>
<td>Port Kembla Coal Terminal</td>
<td>Wollongong</td>
<td>353</td>
<td>353</td>
<td>Industrial</td>
</tr>
<tr>
<td>Wollongong Golf Club</td>
<td>Wollongong</td>
<td>19</td>
<td>19</td>
<td>Irrigation, golf course</td>
</tr>
<tr>
<td>Wollongong City Council</td>
<td>Wollongong</td>
<td>3</td>
<td>3</td>
<td>Irrigation, parks, sports fields</td>
</tr>
<tr>
<td>Warwick Farm Racecourse</td>
<td>Liverpool</td>
<td>59</td>
<td>-</td>
<td>Irrigation, race course</td>
</tr>
<tr>
<td>Liverpool Golf Club</td>
<td>Liverpool</td>
<td>19</td>
<td>14</td>
<td>Irrigation, golf course</td>
</tr>
<tr>
<td>Industrial Foundation(^7) and Rosehill Racecourse</td>
<td>Rosehill</td>
<td>2,156</td>
<td>2,156</td>
<td>Industrial, race course</td>
</tr>
<tr>
<td>Hickey's Lane</td>
<td>Penrith</td>
<td>2</td>
<td>-</td>
<td>Irrigation, parks, sports fields</td>
</tr>
<tr>
<td>Penrith Council parks</td>
<td>Penrith</td>
<td>4</td>
<td>4</td>
<td>Irrigation, parks, sports fields</td>
</tr>
<tr>
<td>Ashlar Golf Course</td>
<td>Quakers Hill</td>
<td>24</td>
<td>-</td>
<td>Irrigation, golf course</td>
</tr>
<tr>
<td>Agricultural release</td>
<td>Quakers Hill</td>
<td>366</td>
<td>-</td>
<td>Agricultural release</td>
</tr>
<tr>
<td>Rouse Hill residential</td>
<td>Rouse Hill</td>
<td>1,873</td>
<td>1,873(^8)</td>
<td>Residential, commercial</td>
</tr>
<tr>
<td>Castle Hill Golf Course</td>
<td>Castle Hill</td>
<td>22</td>
<td>-</td>
<td>Irrigation, golf course</td>
</tr>
<tr>
<td>Dunheved Golf Course</td>
<td>St Marys</td>
<td>46</td>
<td>2</td>
<td>Irrigation, golf course</td>
</tr>
<tr>
<td>Agricultural release</td>
<td>St Marys</td>
<td>2,436</td>
<td>-</td>
<td>Agricultural release</td>
</tr>
<tr>
<td>Hawkesbury-Nepean replacement flows(^9)</td>
<td>St Marys WRP(^10)</td>
<td>13,362</td>
<td>-</td>
<td>Environmental flows</td>
</tr>
<tr>
<td>Elizabeth Macarthur Agricultural Institute</td>
<td>West Camden</td>
<td>170</td>
<td>-</td>
<td>Irrigation, farm</td>
</tr>
<tr>
<td>Agricultural release</td>
<td>West Camden</td>
<td>1,830</td>
<td>-</td>
<td>Agricultural release</td>
</tr>
<tr>
<td>Richmond Golf Course</td>
<td>Richmond</td>
<td>25</td>
<td>-</td>
<td>Irrigation, golf course</td>
</tr>
<tr>
<td>University of Western Sydney, Hawkesbury</td>
<td>Richmond</td>
<td>62</td>
<td>-</td>
<td>Irrigation, farms, parks, sports fields</td>
</tr>
<tr>
<td>Picton Farm</td>
<td>Picton</td>
<td>362</td>
<td>-</td>
<td>Irrigation, farm</td>
</tr>
<tr>
<td>Aorangi Farm</td>
<td>Gerroa</td>
<td>23</td>
<td>-</td>
<td>Irrigation, farm</td>
</tr>
<tr>
<td>Sydney Water reuse at wastewater recycling and treatment plants</td>
<td></td>
<td>15,823</td>
<td>1,929</td>
<td>Industrial</td>
</tr>
<tr>
<td><strong>Total for recycled water projects(^11)</strong></td>
<td></td>
<td><strong>45,929</strong></td>
<td><strong>13,191</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table 5 Summary of total recycled water supplied and volume of drinking water replaced by recycled water initiatives in 2011–12

\(^7\) This refers to customers provided with recycled water from the Rosehill Recycled Water Scheme.

\(^8\) This includes recycled water used in BASIX properties in Rouse Hill.

\(^9\) The St Marys Water Recycling Project (Replacement Flows) means that there is up to 18 billion litres more drinking water supply in Warragamba dam. However, the project does not reduce the demand for drinking water so the number is not included in the total for drinking water saved.

\(^10\) Water Recycling Plant (WRP)

\(^11\) Totals listed may not balance exactly with numbers in the table due to rounding.
5 Research, analysis and support in 2011–12

Leading edge research, modelling and analysis
Sydney Water continues to invest in research and data analysis to identify new opportunities to provide valued water solutions for water efficiency, leak management and recycling.

Our experience in developing and delivering water efficiency and reuse projects has resulted in Sydney Water becoming a leader in water conservation research.

We have strong internal analytical capability to assess the feasibility and likely success of potential initiatives. We also have joint research agreements with a number of industry partners and centres of excellence. This gives us access to important national and international research developments.

5.1 Communicating with customers on water efficiency
In 2011–12, Sydney Water maintained information for customers on the Sydney Water website on:

- how to be water efficient in the home, in the garden and in business
- Water Wise Rules and general tips on how to use water wisely
- educational resources on the water cycle for both teachers and students
- helping customers prevent leaks
- water recycling projects, including recycling in residential areas, industry, the environment, irrigation, recycled water quality and pricing.

Sydney Water customers can also register for the new expanded WaterFix service online or by calling a toll-free phone number. The new WaterFix service was also promoted in 2011–12 in our customer newsletter, Waterwrap. The newsletter is sent to customers with their bills and provides information to help customers compare their water use to that of an efficient household with the same number of people. There is also a tool to do this on the Sydney Water website.

5.2 Water use trends and forecasting
Understanding water use trends is vital to better understanding customers, planning future services and forecasting possible future water use. In 2011–12, Sydney Water completed a number of projects to help inform future decisions on the feasibility and success of potential services and initiatives.

5.2.1 Peer review of new short-term demand forecast model
Sydney Water has a new approach to forecasting water use. In 2010–11, we created two models to forecast short-term residential and non-residential water demand separately. Splitting water use in this way provides greater transparency and reliability in the demand forecast. Sydney Water uses these models to consider possible influences on water use at a household level and non-residential property level to predict whether demand is likely to change in the future.

In 2011–12, Sapere Research Group peer reviewed Sydney Water's new short-term demand forecasting model. The review concluded that our approach is robust, transparent, likely to produce more accurate results than alternatives and that assumptions made when developing the model were justified.

There has been a high level of interest from industry and other water utilities in our new approach to forecasting. The short-term demand forecast was an important element of Sydney Water’s pricing submission to the Independent Pricing & Regulatory Tribunal in 2011.

In 2012–13, Sydney Water will extend this new approach to long-term demand forecasting. This is discussed in Section 7.
5.2.2 Residential behavioural change

Sydney Water continually considers the influences on demand for water and how they are changing. In 2011–12, we did preliminary analysis on the apparent shift in residential water use since the last drought began in the late 1990s.

After past droughts, water use returned to pre-restricted levels quickly (within a year) once restrictions were lifted. The ‘bounce back’ in demand that occurred after the most recent drought was much smaller than expected. Sydney Water’s initial assessment of residential water use since Water Wise Rules were introduced indicates that the community has continued water efficient behaviours they adopted during drought restrictions in place from November 2002 to June 2009.

We estimate that, currently, total residential demand has reduced by about 30 billion litres each year due to sustained behavioural change. This is a conservative estimate, correcting for factors such as price increases and Water Wise Rules.

5.2.3 End use panel data analysis

In previous years, Sydney Water has collected data on key end uses of water within the home (such as toilet flushing, clothes washing and showering). Work on analysing this data began in 2011–12 and is continuing in 2012–13.

This information will help us better understand the way customers use water and the water efficiency of home appliances and fittings.

Depending on the results of this analysis, Sydney Water may gather follow up data from the same households to further understand how and why customers’ water use changes over time.

5.3 Analysis for new water efficiency services

5.3.1 WaterFix

Sydney Water has done preliminary analysis of the water use of initial participants in WaterFix in 2011–12, to gain an idea of possible water savings from this new service. This analysis is preliminary and restricted, due to the small number of properties with sufficient water use data available after the service has been completed.

Estimates made this early in the delivery of a project may be biased. Water saving estimates are significantly influenced by the type of fitting that was replaced as part of the service. Initial estimates may reflect the most common fittings and the most popular services of the current participants, rather than accurately reflect long-term average water savings that could be expected from the new WaterFix service.

While noting these potential biases, our preliminary analysis of around 480 initial participants in the new WaterFix service indicates that, on average, each property is likely to save around 27,000 litres a year.

This is higher than the average water savings from Sydney Water’s former WaterFix Program and Toilet Replacement Program, which saved about 21,000 and 24,000 litres a year per property, respectively.

5.3.2 Hardship analysis

To help Sydney Water deliver the PlumbAssist service and other hardship programs for customers in financial hardship, we analysed billing and water use records. This helps us identify customers that are in debt and have high water use.

The analysis provided us with information on the length of time a customer has been in debt and if this is likely to have been related to plumbing problems. We then contacted potential customers who could benefit and assessed them for eligibility for PlumbAssist or other services that may be able to help them manage their payment difficulties.

Analysis done in 2011–12 also highlighted particular suburbs that may benefit most from different types of targeted assistance, such as information stalls at community centres, working with charity organisations or mail-outs.

We will continue analysis in 2012–13 to help us deliver these types of services in the future.
5.4 Water Conservation Program Implementation Review

In 2011–12, Sydney Water reviewed its Water Conservation Strategy from 1995 to 2010 to capture information on how we had developed and implemented water efficiency programs. The review focused on practicalities, such as engaging suppliers and contractors, developing partnerships with business customers, managing databases and IT support, but did not consider program water savings and costs.

The review also captured lessons staff had learnt by implementing programs over the last 15 years. This will preserve corporate knowledge that may benefit the development of future Sydney Water programs, and assist other water utilities. Results of the review will be published in 2012–13.

5.5 Pipe condition assessment

Sydney Water is the leading industry partner in a $16 million five-year international research project to examine when and why critical water mains burst. This research will develop advanced condition assessment and failure prediction techniques that can help us better evaluate remaining pipe life. The research outcomes will be used to better target critical mains renewals and reduce pipe bursts. As part of this project, current and emerging condition assessment tools will be evaluated in the world’s first large diameter test bed pipe.

The Sydney Water test bed pipe is now established in Sydney. We began researching condition assessment technologies in January 2012. We have already tested various technologies, providing valuable baseline data for research. The research program will continue over the next four years.

5.6 Leak detection

Work continued in 2011–12 to trial different technologies to identify accurate and cost-effective ways to detect leaks, where conventional techniques used for smaller diameter mains are unsuitable.

We successfully carried out leak detection surveys on two trunk mains over a distance of 14 km, using ‘SmartBall’ technology. In 80 km of trunk mains we also assessed four other devices that both detect and locate leaks.

We are still validating results of the leaks found during these assessments and evaluating the technology trials. The project is due to finish in December 2012.

5.7 Smart Grid Smart City

Smart Grid Smart City is a federally funded project that Sydney Water is participating in with Ausgrid. The project aims to determine the benefits of integrating advanced metering infrastructure for water and energy. It will show how receiving real time water and energy use information affects customer behaviour, and will provide high quality information on household leaks.

The project includes trials at five locations in Sydney and Newcastle. Metering equipment is likely to be installed later in 2012. The project is due to finish in December 2013.

5.8 Smart Home

The Smart Home project aims to showcase current best practice in efficient household products and appliances.

The home provides a real life laboratory for testing products and appliances that will help reduce energy use and greenhouse gas emissions and reduce water use in the home. We believe this is the first home in Australia to use recycled water for clothes washing.

In 2010, the first family moved into the Smart Home in Newington. They used about 17% less water over their 18 month stay than a water efficient household of the same size in Sydney.

In April 2012, a new family moved into the home to trial these technologies and provide feedback to the community via a blog.

Figure 9 A water efficient garden in the Smart Home at Newington
5.9 Smart metering residential project

As noted in the 2010–11 Water Efficiency Report, Sydney Water trialled a Smart Metering Residential Project with over 600 properties and almost 2,000 customers in Westleigh in Sydney’s north-west, to assess the costs and benefits of smart metering technology. We installed automatic meter reading devices on residential water meters to enable remote meter readings. Some customers also trialled a digital in-home display that provided real time water-use information. The project was completed in June 2011.

Further results from the trial show an overall 7–10% reduction in water use in households fitted with a digital in-home display. About 80% of the properties in the study had a leak at some time during the project and between 10–17% of properties had leaks on any given day.

The overall findings from this project suggest that smart metering is costly and there are limitations to the technology currently available. However, it is an effective tool to detect leaks and influence customers’ water use through in-home displays.

5.10 BASIX multi-dwelling monitoring study

The aim of this study is to determine if multi-unit dwellings built under the NSW Government’s BASIX policy are achieving the 40% water savings target. The field data collected as part of this study will also help Sydney Water determine whether to revise its infrastructure design criteria for multi-dwelling developments.

The Department of Planning and Infrastructure is helping Sydney Water with this project, which began in May 2011. To date, six properties have agreed to participate in the study and their water use is currently being monitored.

Figure 10 An apartment building taking part in the BASIX multi-dwelling monitoring study
5.11 Recycling research projects

In 2011–12, Sydney Water took part in a number of projects with research partners on water recycling. These included:

- participating in a National Water Commission project to evaluate biological assays as a screening tool for recycled water quality
- working with the University of NSW via an Australian Research Council grant to develop tools to detect failures in recycled water treatment and distribution, and detect cross connections
- contributing to a Water Quality Research Australia project to develop an online sensor to detect recycled water contamination of drinking water.

Ongoing research projects we contributed to in 2011–12 and will continue to be involved with in 2012–13 include:

- participating in a Water Quality Research Australia project to develop suitable and safe testing methods for membrane integrity, specifically in relation to viruses
- participating in an Australian Water Recycling Centre of Excellence project to develop a national engagement and demonstration program to support recycled water as a supply option for drinking water
- providing advice to the Australian Water Recycling Centre of Excellence on developing a consistent validation framework for recycled water treatment processes across Australia
- participating in a research project through the Australian Water Recycling Centre of Excellence to build industry capability to make recycled water investment decisions. Sydney Water has contributed both funding and in-kind support to this project
- funding a PhD project through the University of Technology Sydney to understand the full costs and benefits of small-scale recycled water schemes.

5.12 Recycling database

In 2011–12, Sydney Water developed the Knowledge Bank database to capture information and outcomes from investigations into proposed recycled water schemes over the last 13 years. The database provides a quick reference resource to address general customer enquiries and will help us to streamline the provision of advice on potential schemes.

We plan to continue to add to the database as other recycled water proposals are investigated.
Planning for a liveable city

Sydney Water’s Operating Licence requires us to consider water efficiency and other water conservation measures when planning for the delivery of future services. Our design guidelines and approach to planning take into account water efficiency, leak management and recycling, as well as the impact of regulatory measures.

6.1 Servicing and asset strategies

Sydney Water’s servicing and asset strategies provide direction when we develop future products and services. They enable us to continue to provide water and wastewater services that meet customer and community needs.

The strategies include current customer requirements and the changing commercial, social, regulatory and physical environment in which Sydney Water operates. They also guide Sydney Water staff and management on how to maintain existing assets and services while planning for future challenges like population growth, climate change impacts and policies, and changes to legislation, including those that promote competition in the water industry.

Overall, the strategies help ensure that Sydney Water’s products and services are aligned with community expectations and are delivered efficiently.

Water efficiency is specifically considered when planning future water related services through the options assessment process used for Area Plans and System Plans. We have adjusted design guidelines to reflect changes in water use due to the success of past demand management programs. We also take into account BASIX, other legislative drivers that improve water efficiency, water efficient fittings and non-drinking water options when developing Area Plans.

6.2 Sustainability Planning Manual

Sydney Water’s Sustainability Planning Manual was developed in line with the Water Services Association of Australia (WSAA) Sustainability Framework. The manual helps us make decisions about infrastructure.

The Sustainability Planning Manual highlights the need to:

- set objectives
- assign appropriate measures to assess options
- engage stakeholders
- identify multiple potential options
- identify the importance of individual criteria (by assigning weights to environment, social, technical and financial impacts) and evaluate options appropriately
- identify how sensitive assessments are to change and further compare options.

The Sustainability Planning Manual works within Sydney Water’s Strategic Asset Management Framework. It has been applied to the decision making process for Sydney Water projects such as growth planning, the biosolids strategy, the cost of carbon abatement and for managing wet weather sewer overflows.
6.3 Options library

The options library is a centralised source of up-to-date information on major aspects of water-related servicing options, especially for urban growth areas. Examples of resource documents in the library include rainwater tanks, recycled water reticulation, sewer mining and decentralised wastewater systems. The library also contains tools to help planners estimate relative drinking water savings and energy requirements for different servicing options, based on Sydney Water’s current understanding of expected water use.

The options library allows us to more easily and consistently compare options. It forms a strong base of information to help us compare different servicing approaches and develop servicing strategies. This follows the multi-criteria analysis set out in the Sustainability Planning Manual.

6.4 Strategic Infrastructure and Resource Review

During 2011–12, Sydney Water finalised a strategic review of its products and services. This involved analysing future threats, risks and opportunities to providing services from an infrastructure perspective.

The review considered potential impacts of population and demographic changes, as well as water efficiency. Scenario analysis supporting the review considered risks and opportunities around different infrastructure approaches for recycling water and other resources such as nutrients and energy.

Information and outcomes from this review are now being used by Sydney Water planning staff.

6.5 Capital Investment Prioritisation Framework

In 2012, Sydney Water revised its capital investment framework to align with Sydney Water’s Corporate Strategic Plan 2012–16. The strategic plan establishes a view of valued water solutions and a mission of putting customers front of mind and contributing to liveable cities.

The aim of the renewed framework is to help Sydney Water identify the best mix of projects that balance managing risk with achieving value for the customer. We determine customer value by considering the potential cost efficiency of a project (for example, the economic level of leakage), the long-term benefits the project will provide (for example, meeting the long-term demand for water) and customer demand for the project.

The new framework will be used for capital investment planning from 2013–14 onwards.
7 Projects planned for 2012–13

Looking to the year ahead

In 2012–13, Sydney Water will continue to undertake and promote water efficiency, water recycling and leak management projects.

We will continue to refine our new approach to residential water efficiency, focusing on customers who are experiencing financial hardship, and work with businesses and councils through a partnership approach.

We will keep working on ongoing and new analysis and research projects, to work out how to deliver initiatives more cost-effectively, understand water use patterns and trends, and investigate potential future water efficiency, leak management and recycling projects.

7.1 Water efficiency services

7.1.1 PlumbAssist

In 2012–13, Sydney Water’s key focus for residential water efficiency will be to continue to provide a proactive, tailored water efficiency service for customers in financial hardship who are high water users.

As we gain more experience in delivering PlumbAssist, we will consider ways to deliver the service more efficiently. Changes will focus on administrative and operational efficiencies within Sydney Water. We do not expect changes to affect our PlumbAssist customers. The service will remain free of charge.

We will also continue to refine estimates of water savings from the PlumbAssist program.

Sydney Water’s estimated expenditure for PlumbAssist in 2012–13 is about $450,000.

7.1.2 WaterFix service

In 2012–13, Sydney Water will review the financial viability of the new WaterFix service to ensure that it can be delivered on a cost-recovery basis, as part of our continual review of water efficiency initiatives. We will consider customer demand for the service as part of this review.

Depending on customer demand, we estimate that costs and savings will be similar to those achieved through the new WaterFix service in 2011–12, as listed in Appendix 5.

7.1.3 Business Customer Services

In 2012–13, Business Customer Services (BCS) will continue working with businesses to achieve sustainable water management.

BCS initiatives planned for 2012–13 include:

- benchmarking water use for significant business customers (customers using more than 150,000 litres a day)
- monitoring water use and working with businesses to investigate any large increases in use.

Sydney Water is also playing a key role in developing the National Business Water Efficiency Benchmark tool (NBweb). This tool is being developed in collaboration with other Australian water utilities and the Water Services Association of Australia (WSAA).

The Council Partnerships Program is scheduled to run until 30 June 2013. We have contracted BMT WBM to run the program in 2012–13. BMT WBM will engage additional councils to achieve further water savings with small to medium water use businesses.

The 2012–13 budget for BCS is about $957,000 (including the Council Partnerships Program). BCS expects to achieve water savings of around 1.5 million litres a day in 2012–13.

7.1.4 Education initiatives

From 2012–13, Sydney Water will focus its education initiatives on increasing customers’ understanding of the urban water cycle, the value of water, and water services for sustainable and liveable cities. Water efficiency information will be integrated into education initiatives and resources provided on the Sydney Water website.

In 2012–13, Sydney Water will research customer needs to inform planning and development of a professional development program for educators, including teachers,
lecturers, and local and state government educators. We aim to increase educators’ capability and confidence to explore issues, complexities and innovations in sustainable water services.

Sydney Water will also continue to conduct educational tours of operational sites and at the Water Recycling Education Centre. These tours include information on the role of water efficiency in Sydney Water’s operations and as part of broader sustainable water management.

7.1.5 Communicating with customers

In 2012–13, Sydney Water will continue to inform customers on how to use water efficiently in the home, in the garden, in business and in schools through the Sydney Water website. We will also promote our water efficiency services through the website and customer newsletter, Waterwrap.

We will continue to refer customers who may benefit from PlumbAssist through the Sydney Water Contact Centre, the BillAssist program or by direct contact.

7.2 Water Conservation Support

7.2.1 Research & Development projects

In 2012–13, Sydney Water will continue to be involved with the following research projects:

- Smart Grid, Smart City
- Smart Home
- BASIX multi-unit monitoring study.

Project details are included in Section 5.

7.2.2 Review of peaking factors

Water use in Sydney has changed significantly in recent years and demand per person is at historically low levels. To ensure we provide infrastructure efficiently and deliver maximum value for customers, we are planning to review how water use is changing, including possible changes in peak demands and how that may influence future network design.

This project will be completed in 2012–13.

7.2.3 Monitor water use trends and understand customers

Sydney Water continually monitors water use to identify potential trends and patterns that may influence future demand. This includes understanding the impact of long-term water efficiency initiatives.

In 2012–13, Sydney Water plans to:

- review savings from Water Wise Rules
- further review reductions in demand due to long-term behavioural change
- investigate likely savings from future drought restrictions.

In previous years, Sydney Water has collected data on key end uses of water within the home (such as toilet flushing, clothes washing and showering). We will analyse this data in 2012–13.

We will also investigate broader changes in water uses and assess how they may impact on future water demand. This knowledge will help us plan future services and products that will better meet customer needs.

Outcomes from this work will be also used as inputs to metropolitan water supply-demand planning, which is led by the Department of Finance & Services.

7.2.4 Long-term demand forecast

Sydney Water will be developing a long-term (50+ years) demand forecast in 2012–13. This model will be used for Sydney Water’s system and financial planning and used by the Sydney Catchment Authority to plan for Sydney’s future water supply needs. The long-term demand forecast will be a key input to the review of metropolitan water planning being led by the Department of Finance & Services.

The new long-term forecasting approach will be similar to our new approach to forecast short-term demand. The new model will forecast long-term residential and non-residential demand separately. It will include a number of inputs to enable consideration of the impacts from weather, water prices, recycling, water efficiency, drought restrictions and population changes.

The project will involve consulting with water supply and management agencies. We will complete the first version of the model in 2012–13.
7.2.5 Hardship investigation

To help Sydney Water deliver the PlumbAssist and other hardship programs to customers that need them most, we will continue to analyse bills and water use records in 2012–13.

More information, such as demographic data, will be incorporated into this analysis to help us understand how we can better target our assistance.

7.3 Leak management

Sydney Water will continue to reduce leaks in its water supply system, where it is cost-effective.

It is estimated Sydney Water will spend about $6 million on its leak management program in 2012–13.

In 2012–13, we will also continue our involvement with the SmartBall leak detection trial and pipe condition assessment research project. Project details are included in Section 5.

7.4 Water recycling

Sydney Water seeks to develop water recycling services that are financially viable.

In 2012–13, we will continue to participate in projects that contribute to our understanding of the viability and support for recycled water schemes. A number of these projects will be done in collaboration with the Australian Recycled Water Centre of Excellence.

Projects details for continuing research projects in 2012–13 are outlined in Section 5.
8 Water use forecast

Our current demand forecast predicts a decline in per person water use to about 286 litres per person per day (LPD) in 2014–15. We expect to keep meeting or exceeding our Operating Licence water use target to end of the current licence.

8.1 2010–15 Operating Licence water use target

In 2011–12, water use was 297\(^{12}\) litres per person per day (LPD). Our current demand forecast (see Figure 12) of 286 LPD in 2014–15 assumes average weather conditions.

8.2 Key factors in forecast

Sydney Water expects total water use to remain below 493 billion litres until the end of Sydney Water’s current Operating Licence. Key factors influencing this forecast include:

- Rosehill Recycled Water Scheme began operating in October 2011. We expect this scheme will reduce drinking water demand by about 4 billion litres a year from 2012–13.
- A partial shutdown at BlueScope Steel in late 2011–12 reduced its demand for unfiltered water.
- A privately owned and operated recycled water project at Kurnell planned to begin operating in early 2012–13 will reduce total demand for drinking water.
- A slight decrease in demand resulting from price increases in July 2011 set by IPART. (There is a time lag between when price increases occur and their effect on demand.)
- A continued downward trend in average water use for non-residential properties reflects property growth in industrial and commercial units, which have small per property water use.
- We expect residential customers to continue using water at the low levels of recent years. The most significant factor increasing future demand from this sector is population growth.
- The BASIX program will continue to ensure new residential properties, and significantly altered existing properties, are water efficient.

![Water Use Forecast (LPD) Actual water use 329 LPD - Operating Licence Target](image)

Figure 12 Total demand will continue to remain below the Operating Licence target until 30 June 2015

\(^{12}\) All LPD numbers are weather corrected unless noted otherwise.
# Appendix 1  Reporting requirements

<table>
<thead>
<tr>
<th>Reporting Manual requirement</th>
<th>Subject</th>
<th>Location in report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clause 4.1.1</td>
<td>Reduce the quantity of water drawn to 329 LPD by 30 June 2011</td>
<td>Section 1.2, Section 8</td>
</tr>
<tr>
<td></td>
<td>Continue to maintain the water use level for the rest of the licence term (measured at 30 June each year)</td>
<td>Section 1.2, Section 8</td>
</tr>
<tr>
<td></td>
<td>Quantity of potable water drawn in LPD, both uncorrected and corrected for weather</td>
<td>Section 1.2, Appendix 2</td>
</tr>
<tr>
<td></td>
<td>List of current financial year projects, including description, estimate of costs and savings</td>
<td>Section 7</td>
</tr>
<tr>
<td></td>
<td>Update on projects in previous financial year, including description, costs and savings</td>
<td>Section 2, 3, 5 Appendix 5</td>
</tr>
<tr>
<td>Clause 4.1.2</td>
<td>Leakage rate including uncertainty band</td>
<td>Section 3, Appendix 4</td>
</tr>
<tr>
<td></td>
<td>Reasons for variation in performance in the preceding financial year and prior years</td>
<td>Section 3</td>
</tr>
<tr>
<td></td>
<td>Discuss major factors that have influenced the water leakage performance:</td>
<td>Section 3</td>
</tr>
<tr>
<td></td>
<td>- flow measurement (optional)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- system water pressure management (optional)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- the effectiveness of maintenance (optional)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- any research into leakage (optional)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- number of bursts, breaks or leaks and average time taken to repair them (mandatory)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- length of mains inspected for leakage (mandatory)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- program for inspecting and rehabilitating reservoir zones to prevent or correct leakage (mandatory).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Contribution of leak management activities to objectives and targets outlined in the <em>Metropolitan Water Plan</em></td>
<td>Section 1</td>
</tr>
<tr>
<td></td>
<td>Economic level of leakage for the preceding financial year (including calculation)</td>
<td>Appendix 3</td>
</tr>
<tr>
<td>Clause 4.1.3</td>
<td>Efforts to promote and encourage water recycling</td>
<td>Section 4</td>
</tr>
<tr>
<td></td>
<td>Recycling projects, water end use, annual use of recycled water in each scheme</td>
<td>Section 4</td>
</tr>
<tr>
<td></td>
<td>Contribution of recycling projects to objectives and targets outlined in the <em>Metropolitan Water Plan</em></td>
<td>Section 1</td>
</tr>
<tr>
<td>Clause 4.1.3</td>
<td>Details of planned water efficiency projects including estimate of costs and savings</td>
<td>Section 7</td>
</tr>
<tr>
<td></td>
<td>Details of water efficiency projects in the previous financial year including costs and savings</td>
<td>Section 2, Appendix 5</td>
</tr>
<tr>
<td></td>
<td>Contribution of water efficiency projects to objectives and targets outlined in the <em>Metropolitan Water Plan</em></td>
<td>Section 1</td>
</tr>
</tbody>
</table>

Table 6  Reporting guide for auditors
Appendix 2  Correcting for weather

Weather correction

Climatic conditions have a strong influence on the levels of customer water use, mainly because they affect residential outdoor use. Water use by residential customers is seasonal, with higher use over summer months and lower use during colder winter months. However, the difference in water use between summer and winter has weakened since drought restrictions were implemented. Day-to-day and week-to-week changes in the weather can also cause short term fluctuations in water use, significantly above or below the seasonal trend.

The purpose of weather correction (or ‘climate’ correction) is to remove, as much as we can, the impact of climatic variations. This helps us determine how much water would have been used under ‘average weather conditions’. This is important, as year-to-year total demand figures may show significant variation. Weather correction is necessary to monitor and identify underlying demand trends.

The weather correction model used by Sydney Water does not remove seasonal variations in demand. However, corrections are made for weather conditions (temperature, rainfall and an evaporation index) that are significantly above or below average for that period of the year.

Sydney Water reviewed its weather correction model in 2009–10. As part of the review, we modified the model calibration method and period, to improve the predictive ability of the model. We also updated documentation of the model as part of this process.

Measuring against an ‘average year’

Sydney Water uses a model that reports ‘average year’ demand as a 365 day rolling average of water use in litres per person per day.

Results from the weather correction model at 30 June 2012 estimate an upward correction to demand (that is, under normal weather conditions we would have used more water than we actually did). The 365-day moving average of demand at 30 June 2012 was 286 LPD with a weather correction of +10.4 LPD\(^13\). This gives a weather corrected demand of 297 LPD at 30 June 2012. Weather corrected per person demand has been decreasing since early 2002, with the decline steepening after mandatory restrictions were introduced in October 2003.

![Figure 13](image-url)

**Figure 13** The much wetter and cooler weather in 2011–12 meant that each person used over 10 litres less water than they would have in a year with average weather conditions.

\(^{13}\) Numbers listed may not balance exactly due to rounding.
Appendix 3  Calculating the economic level of leakage

The economic level of leakage (ELL) is the point where the cost of reducing leaks equals the value of the water saved. It is based on a least-cost model to determine the best rate of expenditure to manage leaks.

In 2011–12 the ELL was estimated to be 117 million litres a day, being the combined effect of the economically justified programs. The leakage result for 2011–12 was 115 million litres a day, which is within an acceptable range of the ELL.

Initially, Sydney Water determined the economic level of leakage based on the *Best Practice Principles in the Economic Level of Leakage Calculation*, a report published by the United Kingdom water industry regulator, the Office of Water Services, in 2002. The methods in the report are limited to evaluating leak management programs such as Active Leak Detection and Repair.

Over time, we have improved our method for determining the economic level of leakage to include the effects of pressure management. This approach is based on International Water Association best practice customised for Australian National Performance Reporting.

The chart below is a simplified presentation of an economic level of leakage analysis. Higher rates of expenditure result in lower levels of leakage and lower rates of expenditure result in higher levels of leakage. Sydney Water aims to implement a mix of leak management and pressure management programs to achieve the economic level of expenditure, in order to provide value for customers.

![Economic Level of Leakage Chart](image-url)

*Figure 14 The economic level of leakage*
Appendix 4  Estimating leakage

Sydney Water uses the water balance method to estimate average losses (leakage) from our water supply systems. The water balance is a reconciliation of the volume of water produced by Sydney Water’s water filtration plants with all known and estimated end uses subtracted. The remaining volume is deemed to be leakage.

Sydney Water follows the methods, definitions and terminology recommended by the International Water Association (IWA). The Water Services Association of Australia (WSAA) also supports this approach.

<table>
<thead>
<tr>
<th>Water supplied</th>
<th>Authorised water use</th>
<th>429,868</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Billed authorised use</td>
<td>424,863</td>
</tr>
<tr>
<td></td>
<td>Unbilled authorised use</td>
<td>5,004</td>
</tr>
<tr>
<td></td>
<td>Unbilled authorised use</td>
<td>5,004</td>
</tr>
<tr>
<td></td>
<td>Unbilled metered use</td>
<td>331</td>
</tr>
<tr>
<td></td>
<td>Unbilled unmetered use</td>
<td>4,673</td>
</tr>
<tr>
<td></td>
<td>Unauthorised use</td>
<td>481</td>
</tr>
<tr>
<td></td>
<td>Customer meter under-registration</td>
<td>8,623</td>
</tr>
<tr>
<td></td>
<td>Non-revenue water</td>
<td>56,350</td>
</tr>
<tr>
<td></td>
<td>Real losses</td>
<td>42,241</td>
</tr>
<tr>
<td></td>
<td>Real losses from distribution system</td>
<td>42,241 - 8%* (115 ML/day)</td>
</tr>
</tbody>
</table>

* Percentage in relation to base year of 2005–06

Table 7 Water Balance table for 2011–12

<table>
<thead>
<tr>
<th>Sectoral water use</th>
<th>Billed metered water use</th>
<th>Single residence</th>
<th>210,301</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td></td>
<td>Multi-unit</td>
<td>102,305</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
<td>35</td>
</tr>
<tr>
<td>Non-residential</td>
<td>Industrial</td>
<td>35,060</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Commercial</td>
<td>43,438</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Government</td>
<td>19,129</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Primary producers</td>
<td>1,710</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>10,328</td>
<td></td>
</tr>
<tr>
<td>Residential and non-residential</td>
<td>Billed unmetered</td>
<td>2,314</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unbilled metered and unmetered use</td>
<td>5,004</td>
<td></td>
</tr>
</tbody>
</table>

Table 8 Sectoral water use 2011–12 (ML)
Appendix 5  Water savings and program investment in 2011–12

Table 9 lists the water savings achieved by Sydney Water’s water efficiency and recycling programs and services in 2011-12. Residential program figures are correct as of 12 July 2012. Savings from new initiatives that commenced in 2011–12 will build on savings achieved from programs that ran until the date of our Operating Licence water use target, 30 June 2011.

Appendix 6 includes an overview of savings achieved by initiatives included in Sydney Water’s Water Conservation Strategies up to 30 June 2011.

<table>
<thead>
<tr>
<th>Program/service</th>
<th>2011–12</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Water savings (ML/yr)</td>
<td>Investment ($'000, gross)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water efficiency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PlumbAssist</td>
<td>Not available(^{14})</td>
<td>208</td>
<td></td>
</tr>
<tr>
<td>WaterFix</td>
<td>Not available(^{14})</td>
<td>458</td>
<td></td>
</tr>
<tr>
<td>Business Customer Service</td>
<td>39(^{15})</td>
<td>565</td>
<td></td>
</tr>
<tr>
<td>Council Partnerships</td>
<td>789</td>
<td>249</td>
<td></td>
</tr>
<tr>
<td>Leak management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active Leak Detection</td>
<td>22,780</td>
<td>2,474</td>
<td></td>
</tr>
<tr>
<td>Pressure management</td>
<td>7,636</td>
<td>7,040</td>
<td></td>
</tr>
<tr>
<td>Water recycling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BlueScope Steel</td>
<td>6,838</td>
<td></td>
<td>2,302</td>
</tr>
<tr>
<td>Port Kembla Coal Terminal</td>
<td>353</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wollongong Golf Club</td>
<td>19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wollongong City Council</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial Foundation(^{16}) and Rosehill Racecourse</td>
<td>2,156</td>
<td>11,219</td>
<td></td>
</tr>
<tr>
<td>Rouse Hill residential</td>
<td>1,873</td>
<td>1,483</td>
<td></td>
</tr>
<tr>
<td>Other minor schemes</td>
<td>1,949</td>
<td>319</td>
<td></td>
</tr>
<tr>
<td>Hoxton Park Recycled Water Scheme</td>
<td>-</td>
<td>35,614</td>
<td></td>
</tr>
<tr>
<td>(under construction)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>44,435(^{17})</strong></td>
<td><strong>61,930</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table 9 Water savings and program investment in 2011–12

---

\(^{14}\) It is not possible to estimate water savings from these programs at this time. Refer to Section 2 and Section 7 for a more detailed explanation.

\(^{15}\) Water savings achieved above the Water Conservation Strategy 2010–15 commitment to maintain non-residential water savings. Total savings achieved by Business Customer Services in 2011–12 was 588 million litres a year.

\(^{16}\) This refers to customers provided with recycled water from the Rosehill Recycled Water Scheme.

\(^{17}\) This total does not include water savings achieved from the PlumbAssist or WaterFix services. It is not possible to estimate water savings from these programs at this time. Refer to Section 2 and 7 for a more detailed explanation.

\(^{18}\) The total water savings does not include water savings achieved from programs that are no longer running. Water savings and investment for these past programs are listed in Appendix 6.
Appendix 6  Savings achieved between June 1999 to June 2011

Sydney Water first developed a five-year Water Conservation Strategy in 1995, in accordance with our Operating Licence. Each Operating Licence since then has included this requirement and we have developed a strategy to cover each licence period.

In 1995, there was little information to help customers save water and no regulation to promote water efficiency. Sydney Water provided information and education, and developed an extensive range of programs, rebates and incentives to help customers reduce water use.

Our water efficiency programs began in earnest in 1999. Water efficiency programs implemented by Sydney Water have been extremely successful in reducing water use, seeing water savings grow to 121 billion litres a year by the end of June 2011 (Table 10). Savings from these initiatives should continue in the future, despite the completion of the programs, as water efficient fixtures installed and behaviours established under these programs continue to affect water use.

While total water savings from water efficiency programs continued to increase each year, annual growth in savings from residential water efficiency programs peaked in 2006–07, then began to decline. A similar pattern occurred in the non-residential sector from 2007–08. This downward trend in savings growth occurs because of a natural decline in the ability of programs to generate new savings as time passes. Interested customers are most likely to participate in the early stages of a program. As the program continues, cumulative savings continue to increase but the rate of new savings achieved each year slows down. Some programs, such as rebates, are intentionally designed to be in place for a limited period of time. For example, rebates may be used to shift market preference or to provide just enough financial incentive to encourage customers to take up initiatives they had been deferring because of cost. When the desired effect is achieved, the rebate is removed.

The key objective of our Water Conservation Strategy when it was first developed was to meet our Operating Licence water use target of 329 litres per person per day (LPD) by 30 June 2011. This objective has been retained in subsequent strategies developed by Sydney Water to comply with Operating Licence requirements. At 30 June 2011, water use was well under the target and remains so. We expect to continue to exceed the water use target until the end of the current licence period.

We have always reviewed and adapted our water efficiency programs to ensure they are cost effective and targeting the largest uses of water. As we approached the date of the water use target, our analysis showed that many of our water efficiency programs were approaching maturity and that future water efficiency gains would largely be achieved through regulatory measures that Sydney Water does not implement.

After more than a decade of sustained effort, there is now little scope for the broad-scale water efficiency programs implemented by Sydney Water in the past to continue to produce additional water savings cost-effectively. From July 2011, Sydney Water’s water efficiency focus has been to develop new cost-recovery services and provide services to help customers experiencing financial hardship.
Table 10 Yearly water savings (ML/year) achieved through Sydney Water’s Water Conservation Strategy between the end of June 1999 and end of June 2011

<table>
<thead>
<tr>
<th>Program</th>
<th>99-00</th>
<th>00-01</th>
<th>01-02</th>
<th>02-03</th>
<th>03-04</th>
<th>04-05</th>
<th>05-06</th>
<th>06-07</th>
<th>07-08</th>
<th>08-09</th>
<th>09-10</th>
<th>10-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WaterFix</td>
<td>765</td>
<td>2,525</td>
<td>3,559</td>
<td>4,285</td>
<td>4,889</td>
<td>5,901</td>
<td>7,270</td>
<td>9,002</td>
<td>9,747</td>
<td>9,918</td>
<td>10,030</td>
<td>10,144</td>
</tr>
<tr>
<td>DIY Water Saving Kits</td>
<td>40</td>
<td>180</td>
<td>618</td>
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19 2010-11 water savings estimates for WaterFix, Dual flush toilet and hot water circulator rebate programs are different from what was reported in the Water Efficiency Report 2010-11 as program participation data was finalised after the report was published due to time lags with data entry and the extension for rebate program applications until the end of September 2011.
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## Glossary

| **Building and Sustainability Index (BASIX)** | State-wide planning policy that ensures new residential dwellings are designed to use less drinking water and be responsible for fewer greenhouse gas emissions by setting energy and water reduction targets. BASIX also applies to extensions and alterations of existing residential properties. |
| **Economic level of leakage** | The point where the cost of leak reduction activities equals the savings from reduced demand. |
| **Recycled water** | Recycled water is water that has been used before and is then cleaned again to remove impurities. Recycled water (sometimes called reclaimed water) comes from wastewater, which includes greywater and stormwater. Sydney Water treats recycled water to *Australian Recycled Water Guidelines* and NSW Health standards so that it is suitable and safe for its intended use. |
| **Sewer mining** | The extraction of wastewater upstream and/or downstream of a wastewater treatment plant for treatment and reuse as recycled water. |
| **Stormwater harvesting** | The collection, treatment, storage and use of stormwater runoff. |
| **Water Conservation Strategy** | In 2010, Sydney Water prepared a five year water conservation strategy document that includes:  
| | • strategies relating to water leakage, recycled water, water efficiency  
| | • how these strategies contribute to the objectives and targets outlined in the *Metropolitan Water Plan*  
| | • analysis of current and future programs and projects  
| | • an outline of water conservation objectives, targets and timetable for the entire term of the licence. |
| **Water Efficiency Labelling Scheme (WELS)** | National scheme that involves mandatory water efficiency rating and labelling for a range of appliances and fittings. |
| **Water Wise Rules** | Long-term water saving rules introduced by the NSW Government in June 2009. The rules focus on simple, common-sense behaviours, such as watering in the cool parts of the day, no hosing of hard surfaces and fitting hand-held hoses with trigger nozzles. |
| **Weather Correction** | The removal of year-to-year variation in water use relating to changes in weather conditions. |
### Appendix 8  List of acronyms and units

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