

Water Outlook for Melbourne

1 December 2016



CityWest Water™



**Melbourne
Water**



**Yarra
Valley
Water**



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**Melbourne
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**Yarra
Valley
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In **2015/16**
Melbourne
residents used
**166 litres per
person per day**



Melbourne's
storages are
72.6% full

Melbourne's
diverse water
sources, including
desal, ensure that we
have enough **water**
for the coming years



Remembering that we all need to keep using water wisely.

**WORKING
TOWARDS** **TARGET
155**

Water availability

Melbourne's water availability is secure for next 12 months

Melbourne's water storages are in the High Zone and are likely to remain in this zone for the next 12 months under a range of possible future streamflow scenarios and consumer water demand assumptions – refer Chart 1.

Melbourne's water storages are at a similar level to 12 months ago at 72.6% of their capacity as of 30 November 2016 compared with 71.5% on 30 November 2015. This means the existing water supply system, which includes the Victorian Desalination Plant, has enough water for coming years without storages entering the Low Zone under a range of modelled climate and demand scenarios. Consequently, water restrictions are not required for the coming year. Permanent Water Use Rules are in place and the Target 155 voluntary water efficiency program has been launched to encourage Melburnians to continue to use water efficiently.

The Victorian Desalination Plant will supply Melbourne with 50 billion litres of desalinated water by 30 June 2017 to redress a three-year reduction in water storage levels and have the ability to manage the potential impact of a three-year severe drought sequence, like the one that occurred from 2006 to 2008. The desalinated water order adopted by the Minister for Water in March 2016 was based on advice from Melbourne's four metropolitan water businesses which considered a range of factors such as the then storage level of 68.7% (as at 17 February 2016), the Bureau of Meteorology's climate outlooks and customer bill impacts¹. A decision on whether any water should be ordered from the Desalination Plant in 2017/18 will be made by 1 April 2017.

Over the past three years, Melbourne's storages have dropped by 151 billion litres. Based on current storage volumes, the 50 billion litres of desalinated water to be delivered in 2016/17 and modelling to assess possible future water supply conditions, it is likely that Melbourne's storages will be in the High Zone on 30 November 2017 unless extreme drought conditions should occur in 2017.

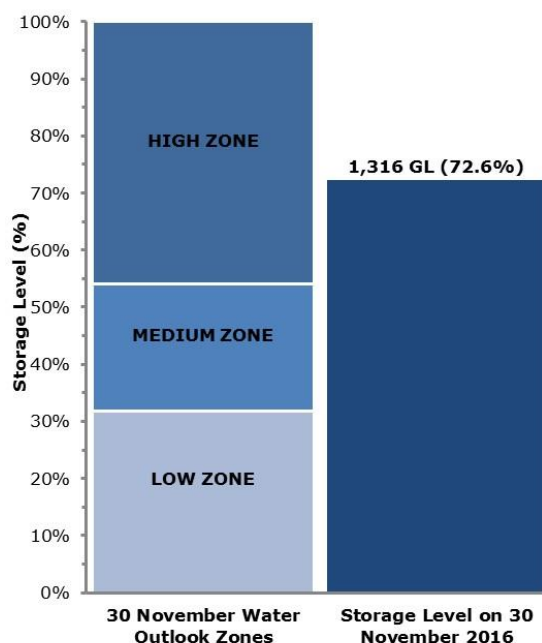


Chart 1 – Storage level as at 30 November 2016

¹ The report explaining the technical analysis is available at <http://melbournewater.com.au/whatwedo/supply-water/Documents/Summary%20of%20Technical%20Analysis%20March%202016.pdf>



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Water use increased in 2015-16 due to hot dry conditions

Melbourne's water usage rose in 2015-16 due to the extended hot dry conditions with water use growing slightly each year due to Melbourne's growing population.

Chart 2 shows that total water use in Melbourne increased in 2015-16 driven by the extended hot dry conditions during the year but remains lower than consumption levels in the early 2000s. The long-term trend is being influenced by increased population but is offset by water efficient behaviours and investment in alternative water projects.

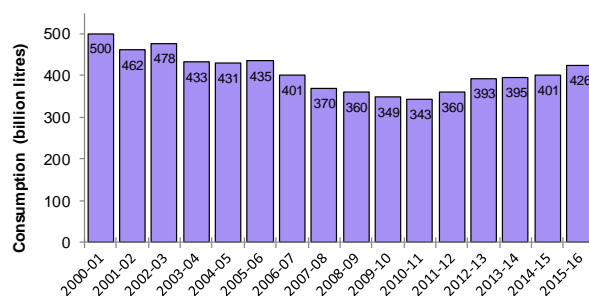


Chart 2 – Total water use in Melbourne
(billion litres)

Melbourne's water is mainly used by residential customers

Residential water use comprised 64% of Melbourne's total water use in 2015-16.

Chart 3 shows the distribution of water use in 2015-16 between residential, non-residential and non-revenue water uses. Non-residential water use includes water used by large and small businesses, schools, universities, hospitals, parks and sportsgrounds. Non-revenue water is water that is not billed to customers and includes loss of water through water main bursts and leaks, water used for firefighting and theft of water.

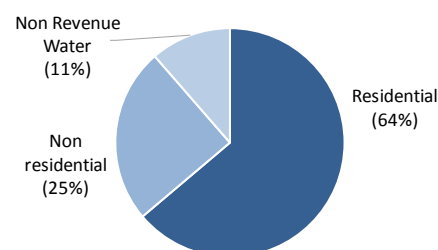


Chart 3 – Melbourne's water use in 2015-16

Residential water

Chart 4 shows that residential water use on a per person basis rose to **166 litres per person per day** in 2015-16 due, in part, to the hot dry conditions – an increase of 6 litres per person per day from the 2014-15 level of 160 litres per person per day.

The water retailers continue to provide water efficiency education and advice to the community and recently, with the Victorian Government, implemented the Target 155 voluntary water efficiency program.

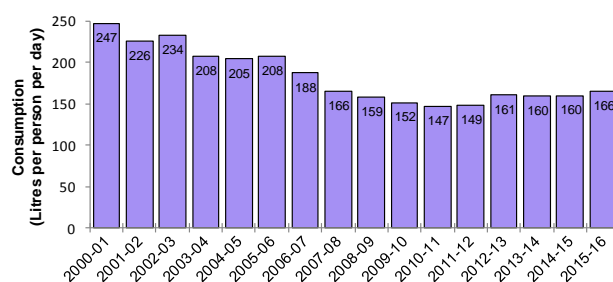


Chart 4 – Residential water use in Melbourne
(litres per person per day)



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Non-residential water

Chart 5 shows that non-residential water use rose to 106 billion litres in 2015-16 due to the extended hot dry conditions, compared to 100 billion litres in 2014-15.

There is a continued focus by customers on water efficiency.

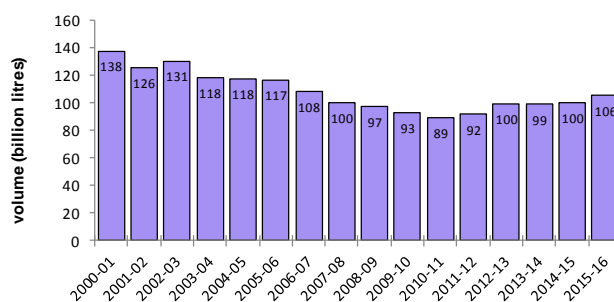


Chart 5 – Non-residential water use in Melbourne (billion litres)

Non-revenue water

Chart 6 shows that non-revenue water rose slightly in 2015-16 to 48 billion litres due to losses from increased leakage and water main bursts. The water businesses continue to invest in proactive system leak detection to ensure Melbourne's level of non-revenue water remains among the lowest in the world.

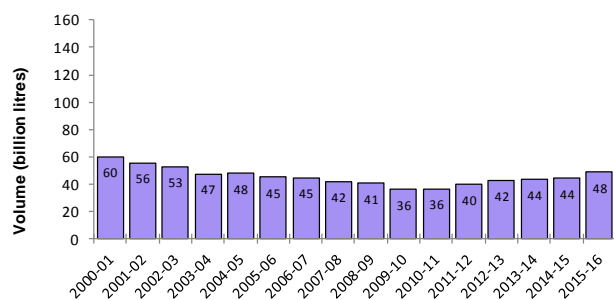


Chart 6 – Non-revenue water in Melbourne (billion litres)



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Drier and warmer than average summer ahead

The Bureau of Meteorology seasonal climate outlook for the next three months indicates a drier and warmer than average summer for most of eastern Australia.

Temperature and rainfall influence water use, especially during summer periods for watering gardens, parks, and sportsgrounds. At the same time, rainfall and temperature also influence catchment soil moisture levels and inflows to Melbourne's storage reservoirs. The water businesses continually monitor storage conditions and the Bureau's seasonal climate outlooks, which are updated monthly.

Rainfall outlook – The Australian Bureau of Meteorology outlook for rainfall (issued on 24 November 2016 – Chart 7) for the period from December 2016 to February 2017 indicates that summer rainfall is likely to be below average for Melbourne and its water supply catchments.

Temperature outlook – The Australian Bureau of Meteorology outlook for temperature (issued on 24 November 2016 – Chart 8) for the period from December 2016 to February 2017 indicates that the chances of a warmer than average summer are more likely.

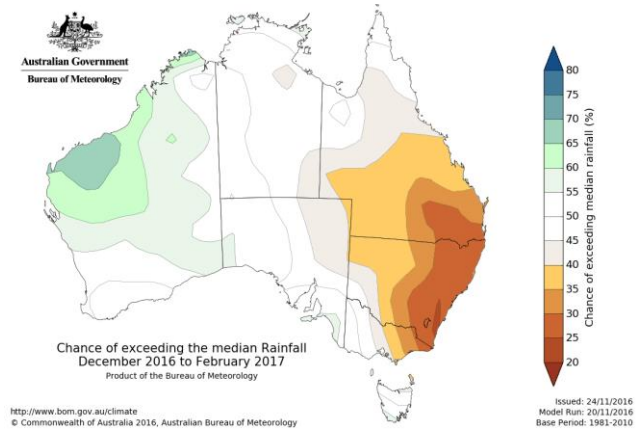


Chart 7 – Seasonal rainfall outlook for December 2016 to February 2017

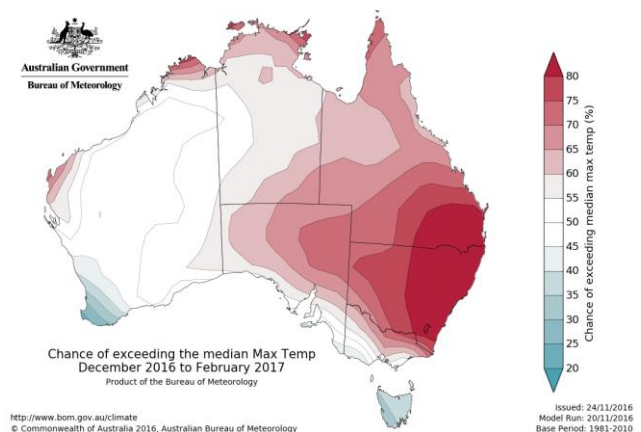


Chart 8 – Seasonal temperature outlook for December 2016 to February 2017

Determining water availability

Predicting Melbourne's future water storage levels is complex and uncertain.

This is primarily because it is not possible to accurately forecast the timing and extent of rainfall events and consequently the catchments' runoff response to them up to one year ahead. For example, El Niño and La Niña events typically break down over autumn. Therefore, meteorologists face a predictability barrier and typically cannot reliably forecast these events until after the end of autumn.

The water businesses undertake modelling to assess possible future water supply system conditions based on a range of inflow and demand scenarios. These include possible drought scenarios, water releases to support the environment and demand for water from customers.



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Permanent Water Use Rules

Permanent Water Use Rules are currently in place for Melbourne for everyday water use.

Permanent Water Use Rules are currently in place across Melbourne. These rules require the community to use common sense as part of their everyday use of water.

Melbourne's households and businesses have demonstrated a strong commitment to the efficient use of water over recent years and the water supply system is currently meeting the needs of customers. Water efficiency programs such as Target 155 continue to encourage these water wise habits.

More information on Permanent Water Use Rules is available from water retailer websites.

Target 155 voluntary water efficiency program

Target 155 has commenced in Melbourne to encourage Melbourne residential customers to continue to use water efficiently.

Melburnians have adopted a great culture of saving water – using 22 per cent less than ten years ago - but as Melbourne's population continues to grow and climate change uncertainty and weather variability (i.e. droughts and floods) continue to impact our water storages, it's important that Melburnians continue to use water responsibly. Small changes today will help secure water supplies for current and future generations. The desalination plant increases the resilience of Victoria's water supplies, but sensible water saving measures can help keep Melbourne's water use at reasonable levels and keep water bills affordable.

Target 155 is a voluntary water efficiency program that encourages Melbourne households to use water efficiently, aiming for 155 litres per person per day. Saving water at home has a big impact on our water supplies. Alternative water sources, such as rainwater, storm water and recycled water, are actively used within our homes, businesses, schools and communities and can contribute to water savings.

There are simple and easy changes Melburnians can make to save water. **Some simple tips for saving water around the home and business as well as information on programs that Melburnians may be able to take advantage of to help using water more efficiently is available from the water retailer websites.**

Action Plans

The three water retailers' Drought Response Plans require them to report on the Annual Action Plans and Medium term Action Plans in order to maintain water security. This Water Outlook reflects the plans – annual and longer term – being undertaken at a number of tiers of resource planning. These are contained in the following appendices and reflect:

- Joint retailer programs with Melbourne Water to enhance water availability and drought resilience for bulk water supplies; and
- Investment at a local level by each individual water business.



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South East
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Appendix 1 – Joint water business programs to enhance water availability

PROGRAM/PROJECT NAME	DESCRIPTION	RESPONSIBILITY	TIMING/ STATUS
Permanent Water Use Rules	Continue to inform the community about the common sense rules that ensure the wise use of water at all times	City West Water South East Water Yarra Valley Water	Ongoing
Target 155 voluntary water efficiency program	Continue to deliver the Victorian Government's Target 155 voluntary water efficiency program that encourages metropolitan Melbourne households to use water efficiently, aiming for 155 litres per person per day.	City West Water South East Water Yarra Valley Water	Ongoing
<i>Water for Victoria</i> delivery	Assist the Department of Environment, Land, Water and Planning in delivering the Government's <i>Water for Victoria</i> policy that covers: <ul style="list-style-type: none"> • Climate change • Waterway and catchment health • Water for agriculture • Resilient and liveable cities and towns • Recognising and managing Aboriginal values • Recognising recreational values • Water entitlements and planning • Realising the potential of a water grid and markets • Jobs, economy and innovation. 	City West Water South East Water Yarra Valley Water Melbourne Water	New and ongoing
Urban Water Strategies	Continued development and completion of Urban Water Strategies across a 50-year planning horizon that include levels of service, measures to integrate urban water cycle management into planning, options to facilitate efficient investment in projects, measures to adapt to climate change and measures to maintain a balance between supply and demand.	City West Water South East Water Yarra Valley Water	March 2017
Melbourne Water System Strategy	Melbourne Water, in collaboration with other water corporations, is developing a Melbourne Water System Strategy. The Strategy will outline available water in the Melbourne system across a 50-year planning horizon and options for enhancing water availability and ensuring resilient water supplies.	Melbourne Water	March 2017
Drought Preparedness Plans	Continued development of each water retailers' Drought Preparedness Plan, which is an Appendix to the Urban Water Strategies. The Plans integrate past Drought Response Plans to ensure ongoing drought preparedness and timely response to severe drought periods (in conjunction with Melbourne Water).	City West Water South East Water Yarra Valley Water	March 2017
Drought Preparedness Plans - priority green spaces to be watered during droughts	Working with local Councils to identify priority green spaces to be watered during droughts	City West Water South East Water Yarra Valley Water	New and ongoing
Desalinated Water Order Advice	Annually review the level of water availability and provide advice to the Minister for Water on the need for a desalinated water order.	City West Water South East Water Yarra Valley Water Melbourne Water	1 April 2017
Water Outlook	Review of the Water Outlook to account for changes in patterns of demand, increased population and the impacts of climate change on our catchments following completion of Urban Water Strategies and Melbourne Water System Strategy. This includes reviewing the water outlook zones to provide for drought resilient water supplies.	City West Water South East Water Yarra Valley Water Melbourne Water	November 2017



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Appendix 2- Investment at a local level by each individual water business

City West Water Programs/ Projects

PROGRAM/PROJECT NAME	DESCRIPTION	RESPONSIBILITY	TIMING/ STATUS
Partnerships in Stormwater Reuse Program	Partnering with local government to deliver stormwater harvesting projects for irrigation	City West Water	Ongoing Six projects have been commissioned. Further projects are under investigation.
Greening the West	A preventative health initiative to link sustainable water supplies to enable healthy communities through increased greening.	City West Water Melbourne Water Local Government Department of Environment Land Water and Planning Victorian Planning Authority	Ongoing
Efficiency programs – non-residential customers	Continue to work with non-residential customers to deliver water efficiency projects. Focus on sector specific targeting for toilet replacement program, irrigation best practice guidelines and cooling tower efficiency calculator.	City West Water	Ongoing
Network efficiency	Undertake active leak detection, reticulation mains renewals, pressure management, intelligent network technologies and rapid response to bursts and leaks	City West Water	Ongoing
West Werribee dual supply project	Provision of 'fit for purpose' alternative water supply to service new urban development and public open spaces	City West Water	Supply of blended class A recycled water and potable water is expected to commence by December 2016.
Aquifer storage and recovery	Using aquifers in regions to store alternative water.	City West Water Southern Rural Water	The construction of the 1st Aquifer Storage and Recovery (ASR) project has been completed and a nine-month operational trial is expected to commence in February 2017. The preliminary investigation of a 2nd ASR project has been completed and six- month injection trial is expected to commence in mid-2017.
East Werribee Employment Precinct (EWEP) IWCM Strategy	Development of the servicing strategy for EWEP using an integrated water management approach.	City West Water Melbourne Water Victorian Planning Authority Wyndham City Council	Under development
2015/16 KEY ACHIEVEMENTS: <ul style="list-style-type: none"> Stormwater Projects: All six projects have been commissioned. West Werribee ASR: Construction has been completed. Ballan Rd ASR: Preliminary investigation completed. Potential for ASR confirmed and project scheduled to proceed to the injection trial stage. Greening the West: 200,000 trees planted. Stony Creek project commenced (A transformation of a 1.5km concrete lined drainage channel to a revitalised waterway and wetland with recreational facilities for residents, schools and community groups). 			



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South East Water Programs/ Projects

PROGRAM/PROJECT NAME	DESCRIPTION	RESPONSIBILITY	TIMING/ STATUS
Dual pipe recycled water schemes	Ongoing provision of recycled water products to 110,000 customers across the growth areas of Casey (50,000), Officer (20,000), Berwick (5,000), Cranbourne (30,000) and Pakenham (6,000) To date, 9000 properties connected and supplied with recycled water and 10,000 connected and not supplied	South East Water	Ongoing Construction of interconnectors to bring total connections to 19,000 in 2017
Water Efficiency	Continue to enhance the education of customers and stakeholders via our new water education site Work with customers, in particular open space managers, to provide information and guidance on best practice irrigation plus explore resilient supply arrangements	South East Water	Ongoing 2017 -2019
Hi-density Development	Through the use of metering technology – at the dwelling, building and network level – explore the drivers of peak loads and assess the role water efficiency could have in reducing demand (and hence deferring augmentation)	South East Water	Data – Ongoing Analysis – 2017
Rainwater tanks risk framework	Undertake research and trials to assess long term regulatory risk and solutions for rainwater tanks.	South East Water	Options Paper – 2016
Smart Tanks and Distributed storage networks	Development of control systems to automate discharge from rainwater tanks in advance of heavy rainfall, reducing peak stormwater flows	South East Water	Testing of prototypes (2016) Development of additional approaches to control discharge (2017)
Fishermans Bend Redevelopment – Service Strategy	In conjunction with Melbourne Water, local government and other stakeholders develop an integrated water management solution for the redevelopment of Fishermans Bend	South East Water	Servicing Strategy (2016) Investment Evaluation (2017)
Monash Employment Cluster	Commence engagement with Victorian Planning Authority, Melbourne Water, Yarra Valley Water and local councils to identify opportunities for integrated water management solutions	South East Water	Servicing Strategy 2017
Aquarevo	Integrated water and energy management solutions for 470 house estate development in Lyndhurst with the objective to reduce potable demand by up to 70% First residents expected 2017-2018	South East Water	Technology solutions developed and tested 2017 Complete health risk assessment for supply of rainwater for residential hot water (2017)
2015/16 KEY ACHIEVEMENTS: <ul style="list-style-type: none"> Casey Clyde and Pakenham East: Decisions made to include reticulated third pipes in the subdivision developments at Casey Clyde and Pakenham East however options still remain open for localised waste treatment and recycling or recycled stormwater. Water Efficiency Appliance Survey: Completed a survey of 1,100 customers to assess the uptake of water efficient appliances and to gain perspective of water use behaviours. Analysis is to be completed. Aquarevo: Planning permit approved which included a strong focus on integrating water sensitive urban planning to enhance liveability 			



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Yarra Valley Water Programs/ Projects

PROGRAM/PROJECT NAME	DESCRIPTION	RESPONSIBILITY	TIMING/ STATUS
Efficiency programs – residential customers	Continue to provide customers with water efficiency education and advice programs.	Yarra Valley Water	Ongoing
Efficiency programs – non-residential customers	Continue to work with non-residential customers to deliver water intelligent network technologies and rapid response to bursts and leaks. Specific targeting of non-revenue water.	Yarra Valley Water	Ongoing
Network Efficiency	Undertake active leak detection, reticulation mains renewals, pressure management,	Yarra Valley Water	Ongoing
Dual Pipe Recycled Water Projects – Doncaster Hill	Planning provision of recycled water to approximately 6,000 new lots in Doncaster Hill, predominantly high rise developments.	Yarra Valley Water Manningham Council	Further work is being completed by Yarra Valley Water in consultation with local Councils regarding the siting of the Recycled Water Treatment Plant Facility.
Dual pipe recycled water projects – Yarra Valley Water	Ongoing provision of recycled water projects to some 97,000 customers across Epping, Craigieburn West, Kalkallo, Wallan and Croydon.	Yarra Valley Water	Planning and construction of recycled water infrastructure within the Northern Growth Area and Croydon is continuing as development progresses in these areas. 3,000 additional properties were supplied with recycled water in the 2015/16 financial year.
Kalkallo stormwater harvesting project as part of Merrifield development	Harvest stormwater from a large commercial development near Kalkallo and treat to drinking water standard with initial re-use into the recycled water system.	Yarra Valley Water	The scheme's treatment plant has been constructed and will commence operation once sufficient additional development occurs within its catchment.
Kalkallo retarding basin stormwater harvesting	Feasibility analysis for large scale recycling of stormwater for potable use in the Kalkallo area with water harvested from the proposed Kalkallo stormwater retarding basin owned by Melbourne Water	Yarra Valley Water Victorian Planning Authority Melbourne Water	Options for the scheme's integrated water storage have been developed. Yarra Valley Water is working with the Victorian Planning Authority and Melbourne Water to complete further feasibility analysis for this scheme.
Craigieburn Household Water Use Study	A device was attached to the water meter at approx. 1,600 properties in Craigieburn to provide customers with better and more timely information about their water usage, and provide Yarra Valley Water with more accurate consumption data.	Yarra Valley Water	Ongoing. Continue to advise customers of potential leaks identified on their property.
2015/16 KEY ACHIEVEMENTS: <ul style="list-style-type: none"> Recycled water projects: continued roll-out in the Hume corridor to allow additional areas to connect to recycled water. Wallan treatment plant: construction of a new treatment plant to be commissioned in early 2017 to allow delivery of recycled water to residential customers in Wallan and Beveridge. Water recycling at Latrobe National Employment Cluster and other areas: working with DELWP, Melbourne Water and local Councils to review opportunities for water recycling in areas of planned redevelopment. Non-revenue water reduction: investment in additional flow monitoring infrastructure and detailed analysis to better pinpoint irregular usage and potential leaks. 			



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