



# Water Quality Annual Report

2019-20

Melbourne Water

Doc ID. 55330759



Melbourne Water is owned by the Victorian Government. We manage Melbourne's water supply catchments, remove and treat most of Melbourne's sewage, and manage rivers and creeks and major drainage systems throughout the Port Phillip and Westernport region.



**OFFICIAL**



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This report is provided to the Secretary to the Department of Health and Human Services (DHHS) in accordance with Section 26 of the *Safe Drinking Water Act 2003* (Vic) for the 2019-20 financial year.

Melbourne Water makes a vital contribution to the famous Melbourne lifestyle by underpinning human health, enhancing community well-being, supporting economic growth and balancing the natural and man-made environment.

The organisation is responsible for the supply of affordable, high-quality water, reliable sewerage, healthy waterways, integrated drainage and flood management services and cooler greener spaces, helping make greater Melbourne a fantastic place to live.

Today, the organisation employs a passionate, truly diverse, future-focused team of experts, who collaborate with a wide range of partners to skilfully balance the social, economic and liveability needs of the community with the long-term benefit of the environment.

Melbourne Water has a solid history of foresight, ingenuity and best practice. Today, with a strong commitment to understanding and delivering to the needs of customers and the community, we are a leader in the delivery of an outstanding integrated system that is secure, efficient, affordable and sustainable.

Our key stakeholders are customers, government, regulators, other water businesses, land developers, the community and suppliers. These stakeholders and our other strategic partners, including our construction and maintenance partners and research organisations, help us achieve our objectives. We consider social, environmental and financial effects and short-term and long-term implications in all our business decisions.

We are owned by the Victorian Government, with an independent Board of Directors responsible for governance. The responsible Minister is the Minister for Water.

EPA Victoria and the Department of Health and Human Services regulate the environmental and public health aspects of our business. The Essential Services Commission regulates prices and monitors service performance. We work across several arms of the Victorian Government, including the Department of Environment, Land, Water and Planning (DELWP) and the Department of Treasury and Finance.

Our customers include Melbourne's retail water corporations (City West Water, South East Water and Yarra Valley Water), regional water authorities (South Gippsland Water, Gippsland Water, Westernport Water, Western Water and Barwon Water), local councils, land developers, and businesses that divert river water.

We are committed to providing high quality and reliable drinking water that meets or exceeds regulatory and customer service standards.

Melbourne Water and the retail water corporations have developed risk management systems for drinking water quality using the principles of HACCP (Hazard Analysis Critical Control Point) and the quality management system standard ISO 9001. The HACCP process systematically analyses hazards and establishes measures for their control in order to ensure product quality and safety.

## Water supply system

We manage the harvesting of water from catchments, storage of harvest, bulk water transfer, the treatment of water, and the delivery of treated water to numerous interface points with City West Water, South East Water, Yarra Valley Water, Western Water, Barwon Water, South Gippsland Water and Westernport Water (SGW and WPW receive water via the Victorian Desalination Pipeline). Gippsland Water receives untreated water. Westernport Water commenced receiving water in the 2019/20 financial year. In total, we supplied 450 billion Litres of water in 2019-20, which is 2.4% less than last year. This volume included directly connected customers supplied by Melbourne's retail water corporations from our aqueducts (untreated water).

## Source water

The drinking water we supply is sourced from a combination of protected surface water catchments, unprotected surface water catchments, and seawater. Each of these source waters requires a different type of treatment to ensure that the treated water is appropriate for human consumption.

The majority of Melbourne's water is sourced from forested, protected catchments. The catchment system consists of 11 water supply catchments and five water holding storages. The catchments located within National Parks are co-managed with Parks Victoria, with management arrangements outlined in a National Parks Agreement. The catchments located within State Forest are co-managed with DELWP. A Memorandum of Understanding details the arrangements to effectively manage human activity and land use for the purposes of protecting water resources in State Forest. The five water holding storages are solely managed by Melbourne Water. Most of Melbourne's water is supplied via Silvan Reservoir which receives inflows from Thomson Reservoir, Upper Yarra Reservoir, O'Shannassy Reservoir and other small tributaries to the Yarra River. Cardinia and Greenvale Reservoirs are supplied by the Silvan system. These sources are supplied to Melbourne's retail water corporations unfiltered because of the high quality of water drawn from the protected catchments and large storages.

A smaller proportion of Melbourne's source water comes from open catchments. These areas contain farmland, rural properties and state forests that are open to activities such as camping, four-wheel driving and small amounts of timber harvesting, and as such require additional treatment barriers to ensure the safety of the drinking water supply.

The Tarago water supply catchment contains land that is privately owned, with a variety of agricultural uses. We have an interest in the protection and improvement of water quality on this private land and have worked with stakeholders including the Baw Baw Shire Council and the Neerim District Landcare Group to develop a Tarago Catchment Management Plan.

The open mid-Yarra River catchment feeds into Sugarloaf reservoir, where it mixes with water from the protected Maroondah catchment before being treated at the Winneke treatment plant. The Yarra Glen supply is also fed from the Maroondah catchment; however, the transfer aqueduct is not protected, meaning that a greater degree of treatment is required prior to supply.

Yan Yean and Healesville supplies are nominally from protected catchments, however, have some weaknesses relating to transfer aqueduct protection. These sites also have additional treatment barriers, which remove colour and turbidity as well as potential pathogens.

Depending on the volume of water stored in Melbourne's reservoirs, Cardinia Reservoir can also receive desalinated water. The Victorian Desalination Project consists of a 150 gigalitre

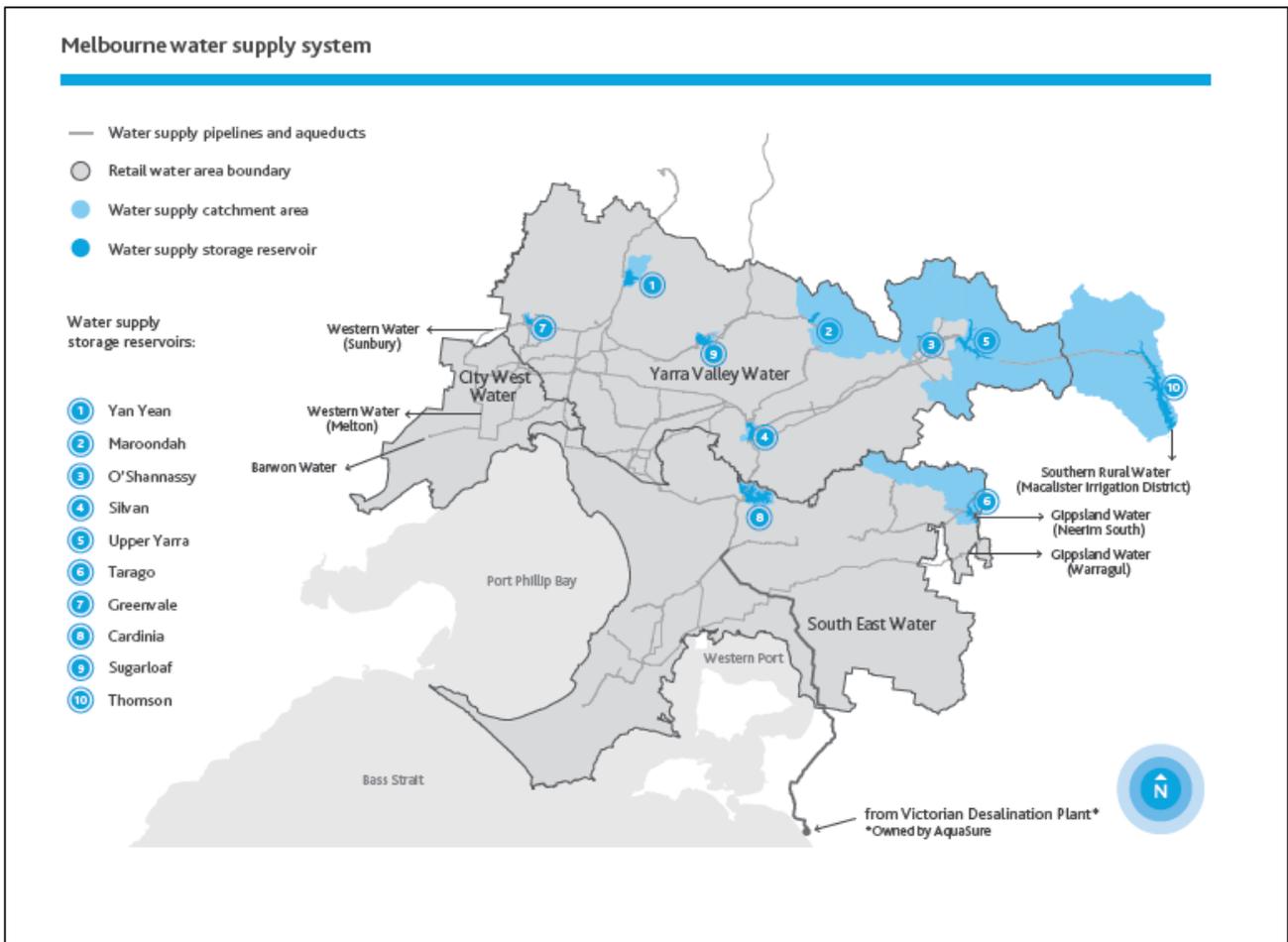
reverse osmosis plant at Wonthaggi, an 84 kilometre underground two-way transfer pipeline to Berwick, and an 87 kilometre underground dedicated power supply from Cranbourne. The plant extracts seawater from Bass Strait near Wonthaggi. Water is fully treated via a series of processes (refer to Table 1 and Table 2 for further details). Water enters an underground transfer pipeline which connects the plant to our existing water supply network, enabling supply to Cardinia Reservoir, directly into the water network at Berwick and to offtakes along the pipeline. The pipeline is two-way, so when the plant is not in use, the pipeline can transfer water from our distribution network to connected regional water businesses, thereby ensuring security of supply. For some regional water businesses, this is the first time they have been directly connected to our distribution network. Supply to South Gippsland Water commenced in June 2018 for the first time.

Treatment processes are described in Table 1.

Figure 1 shows our supply area.

118 billion litres were supplied from the Victorian Desalination Plant this year. There were no major changes in the arrangements for water supply compared to last year, however there was one minor change, that being the commencement of supply to Westernport Water. The relative contribution from each source was similar to the previous year. We continued to optimise which sources we harvested from throughout the year to meet forecast demand and climate variability, as per regularly updated plans.

Figure 1 - Melbourne's water supply system



We manage the catchments and source water storages used for the supply of drinking water to the Melbourne metropolitan area. Untreated and treated drinking water is supplied to consumers by Melbourne's retail water corporations. The water is monitored from catchments, through major storages and treatment plants to the interface points with the retail water corporations to ensure that it meets the requirements of relevant drinking water quality guidelines and agreements with these corporations.

We prioritise our actions to protect source water from contamination using our drinking water quality risk assessment. The risk assessment covers catchments, storage reservoirs, treatment and bulk water transfer to the interface with the retail water corporations. Operational monitoring is used to provide early warning of issues which could affect drinking water quality, before critical limits are reached. Examples of this monitoring include catchment inspections, manual water quality sampling and online monitoring.

We routinely monitor the water quality within the catchments and distribution system through regular sampling and analysis according to a risk-based laboratory monitoring program. The sampling and analysis is contracted out to external National Association of Testing Authorities (NATA) accredited Laboratories. The level of monitoring is designed to complement risk management and HACCP systems, meet the requirements of the Bulk Water Supply Agreements (BWSAs), monitor treatment processes and assist Melbourne's retail water corporations and regional water authorities' needs in meeting the Safe Drinking Regulations 2015.

We maintain a certified management system, Hazards Analysis Critical Control Points (HACCP), for operation of the water treatment plants and supply system to ensure the delivery of safe drinking water. This risk-based management system verifies that treatment processes are operating in accordance with design intent and are achieving the required level of pathogen reduction.

The supply areas of Melbourne's retail water corporations are divided into water quality zones and these zones can have one or more water sources during the day or year due to the demand, seasonal variation and complexity of our water supply system. The retail water corporations must comply with the Safe Drinking Water Regulations at their customer's taps in these zones as part of their licence agreement with the Essential Services Commission.

## Improvement initiatives

### Improving our Investment Decisions

Adopting a microbial health-based target in the Drinking Water Quality Strategy has been a strong driver in identifying opportunities for improvement within our existing processes to deliver safe, secure and affordable drinking water to our customers and the community. The Catchment Management Optimisation Program (CMOP), delivered with Parks Victoria, and DELWP, was finalised in 2019. The CMOP outcomes are now driving an evidence-based investment program to enable prudent and efficient achievement of our health-based target. The program includes a range of prioritised capital and operational initiatives, including water treatment and other infrastructure improvements, additional catchment security, pest animal management, and bushfire management. A key focus of the investment program will be to ensure we meet a Health Based Target of 1 microDALY<sup>1</sup> and implement improvements to maintain category 1 for Silvan, Greenvale and Cardinia catchments in the face of urban growth.

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<sup>1</sup> Health Based Target aligns with World Health Organisation

Bushfires have long been recognised as a key risk for the water supply system in Melbourne, especially given the protected, forested water supply catchments which enable us to supply safe, affordable drinking water to the majority of Melbourne without the need for filtration treatment. Given this, Melbourne Water already invests in bushfire risk management initiatives, which have enabled effective responses to the bushfires in Melbourne's water supply catchments in recent years. However, in light of the catastrophic bushfire season which affected South Eastern Australia during 2019/20, a review is currently underway to reassess the strategic resilience of the water supply system to bushfires, and to characterise a portfolio of potential investment pathways to ensure appropriate strategic resilience is maintained over the short, medium, and long-term.

### **Implementing Upgrades and Renewals**

There have also been a number of significant plant upgrades and renewal works. A major project has commenced with the asset upgrade of the Silvan and Cardinia chlorine plants as part of the Chlorine Risk Reduction project across Melbourne Water sites. The upgrades are due to be completed by January 2021.

A program to upgrade all of the membrane treatment plants in our network also continued into 2019-20. Frogley water treatment plant works were completed in late 2019, and was the final membrane treatment plant to be upgraded.

A new sodium hypochlorite plant was constructed at Winneke treatment plant to replace the bulk liquefied chlorine gas chlorination system as part of Melbourne Water's Chlorine Risk Reduction Program. The plant is currently operational and the chlorine gas system was decommissioned in 2019 and Worksafe has removed Winneke's Major Hazard Facility status.

In July 2019, Melbourne Water took over the Yan Yean treatment plant, previously owned by Trility Pty Ltd. The plant is not in operation, and a capital project is underway to upgrade the plant and introduce treated Yan Yean water into supply by April 2022.

## **Drinking water treatment processes**

The water we supply to retail water corporations is treated, with the exception of:

- Gippsland Water - Untreated water from our Tarago source is fed into Gippsland Water's treatment plants and then into supply for consumption by the customers.
- South Gippsland Water – Treated water from the Victorian Desalination Pipeline where quality may deteriorate in the pipeline. This water is treated in South Gippsland Water's treatment plants prior to being supplied to customers.
- Supply by Agreement Customers – some customers directly connect to our untreated water assets. The retail water corporations have processes to ensure these customers are informed that their water is not suitable for drinking.

Water treatment plants are located where water from open storages first enters the distribution system. Whilst long retention times in storage reservoirs and primary disinfection plants help inactivate microorganisms such as pathogenic bacteria, protozoa and viruses in the untreated water, additional treatment barriers are required depending on the risk level of the water. Chlorination and ultraviolet (UV) irradiation are the methods we use to disinfect the water. Chlorination is the most common form of disinfection used to treat Melbourne's water supply, with chlorination plants located at all of the major water treatment plants. Chlorination primary disinfection is effective against viruses and bacteria, and also provides a residual to control biofilm growth in the downstream network. We also operate six UV irradiation disinfection plants, which provide effective initial disinfection, but do not provide a

disinfection residual for protection against downstream biofilm growth. UV disinfection at Tarago is discussed below. At Warburton (Martyr Road), Woori Yallock and Launching Place (Lusatia Park), East Warburton (Brahams Road and Lyrebird Avenue) and Yarra Junction, UV disinfection at each site provides primary disinfection, and sodium hypochlorite addition provides secondary disinfection to control biofilm growth.

Water from unprotected catchments is treated by filtration in addition to chlorine disinfection, to ensure protozoa removal. We operate two large filtration plants. Winneke water treatment plant is a sand filtration plant that treats water at the outlet of Sugarloaf Reservoir. The Winneke water treatment plant incorporates processes including coagulation, clarification, filtration and chemical addition for fluoridation, chlorination and pH correction. The Tarago water treatment plant at Drouin West is gravity fed from Tarago Reservoir, and incorporates processes including permanganate pre-dosing, coagulation, Dissolved Air Flotation and Filtration (DAFF), UV irradiation and chemical addition for pH correction, fluoridation and chlorination. At the Tarago water treatment plant, UV irradiation is used as an additional barrier downstream of filtration to ensure the inactivation of protozoa.

There are three relatively small membrane filtration plants; two that supply Healesville (Frogley and Cresswell water treatment plants) and one that supplies Yarra Glen. These plants remove particles in the untreated water from their respective aqueduct sources to ensure that parameters such as turbidity and colour are reduced to acceptable levels, particularly during storm events. In addition, pathogens attached to the filtered particles are removed. Reducing the turbidity to below 1 nephelometric turbidity unit (NTU) also ensures more effective chlorine disinfection of the filtered water.

Water from the Victorian Desalination Plant is treated via a series of processes which include filtration, reverse osmosis, disinfection and fluoridation.

The Yan Yean water treatment plant was privately owned and operated and could supply treated water into the water supply system under our direction. This plant is now under Melbourne Water operation since July 2019. This plant did not supply treated water for consumption during the year and is being upgraded as part of a capital upgrade due for completion in April 2022.

Eleven fluoridation plants are operated at the direction of the Department of Health and Human Services to protect the dental health of our community. The operation of the fluoridation plants is a statutory requirement under the *Health (Fluoridation) Act 1973* (Vic). The eleven plants are comprised of:

- Seven fluorosilicic acid plants operating at: Silvan (three plants), Cardinia (two plants), Winneke (one plant) and Tarago (one plant)
- Two sodium fluoride solution plants operating at Monbulk and Kallista
- The Yan Yean fluorosilicic acid plant is being upgraded and is not in operation.
- The Victorian Desalination Plant which uses fluorosilicic acid. AquaSure operates the Victorian Desalination Plant under a public private partnership project managed by DELWP.

Secondary disinfection chlorination plants are also located at a number of points within the treated water network. The purpose of secondary disinfection is to prevent taste and odour problems, and to control biofilm growth within the closed distribution system where the water has already been treated by primary disinfection. Chlorine residual limits are also set to ensure that disinfection by-products do not exceed health limits specified in the *Australian Drinking Water Guidelines*.

Tables 1 – 2 describe the water treatment sources, treatment processes and substances added at each treatment plant.

Table 1: Summary of water supply systems and areas serviced

Water Supply System	Source Water / Catchment	Storage	Treatment Plant	Treatment Storages	Area Supplied <i>(Retail water corporation supplied)</i>
Cardinia	Transfer from Silvan Reservoir without being treated at Silvan water treatment plant Treated water from Desalination plant	Cardinia Reservoir	Cardinia Treatment Plant	N/A	Mornington Peninsula and south eastern suburbs. Note: pump station at Cardinia can also pump water back to Silvan Reservoir <i>(South East Water, Yarra Valley Water, South Gippsland Water)</i>
Victorian Desalination Plant	Desalination plant offtake from Bass Strait	Direct to supply or Cardinia Reservoir	Wonthaggi Desalination Plan	Cardinia Reservoir / direct supply to townships	Capable of supplying primarily Mornington Peninsula, south eastern suburbs and South Gippsland area through direct delivery points and contributing to water businesses connected to the Melbourne Water supply through Cardinia Reservoir which is blended with catchment supplies. <i>(South East Water, Yarra Valley Water, South Gippsland Water)</i>
Greenvale	Transfer from Silvan Reservoir (after treated at Silvan), or from Winneke water treatment plant. See Silvan and Winneke water supply systems	Greenvale Reservoir	Greenvale St Albans	N/A	Western suburbs and Sunbury/Melton <i>(City West Water, Yarra Valley Water, Western Water, Barwon Water)</i>
			Greenvale-Yuroke	N/A	
Lower Yarra Valley Townships	Maroondah Catchment	Maroondah Reservoir	Yarra Glen	Yarra Glen Service Reservoir	Yarra Glen <i>(Yarra Valley Water)</i>
Lower Yarra Valley Townships	Coranderrk and Graceburn Catchments		Cresswell	Cresswell Service Reservoir	Healesville <i>(Yarra Valley Water)</i>
			Frogley	Frogley Service Reservoir	

Water Supply System	Source Water / Catchment	Storage	Treatment Plant	Treatment Storages	Area Supplied <i>(Retail water corporation supplied)</i>
Silvan	Thomson Catchment Upper Yarra Catchment O'Shannassy Catchment Armstrong Catchment McMahons Catchment Starvation Catchment Coranderrk Catchment Treated water from Desalination plant via Cardinia	Silvan Reservoir	Silvan-Olinda Silvan-Preston Silvan-Waverley	N/A	Eastern, central, northern & western suburbs, including Seville and Wandin <i>(City West Water, South East Water, Yarra Valley Water)</i>
			Monbulk	Monbulk Service Reservoir 1 & 2	Monbulk, Silvan, Sherbrooke, Sassafras, Ferny Creek, Olinda, Mount Dandenong <i>(Yarra Valley Water)</i>
			Kallista	Johns Hill Service Reservoir	Emerald, Kallista, Menzies Creek, Cockatoo <i>(Yarra Valley Water)</i>
Tarago	Tarago Catchment	Tarago Reservoir	Tarago	Tarago Clearwater Storage	Neerim South, Drouin/Warragul <i>(Gippsland Water)</i> Mornington Peninsula, West Gippsland townships, southern suburbs <i>(South East Water)</i>
Upper Yarra Valley Townships	Thomson Catchment Upper Yarra Catchment	Thomson Reservoir Upper Yarra Reservoir	Brahams Rd Lusatia Park Lyrebird Martyr Rd Yarra Junction	N/A	Woori Yallock, Launching Place, Yarra Junction, Warburton, East Warburton <i>(Yarra Valley Water)</i>
Winneke	Transfer from Maroondah Reservoir, Yarra River, Goulburn River <sup>2</sup>	Sugarloaf Reservoir	Winneke Treatment Plant	Winneke Clearwater Reservoir	Northern, eastern, central & western suburbs <i>(City West Water, South East Water, Yarra Valley Water)</i>
Yan Yean <sup>3</sup>	Wallaby Creek Catchment Toorourrong Catchment Yan Yean Catchment Transfer from Silvan Reservoir	Yan Yean Reservoir	Yan Yean	Yan Yean Service Reservoir	Northern suburbs <i>(Yarra Valley Water)</i>

<sup>2</sup> This source is only used when the relevant conditions specified in the Statement of Obligations (System Management) are met, and was not used this year.

<sup>3</sup> No water was supplied from the Yan Yean WTP this year.

Table 2: Water treatment processes and added substances at each drinking water treatment plant

Water Supply System	Treatment Plant	Treatment Process	Added Substances	Role of Each Process
Cardinia	Cardinia 1400 Cardinia 1700	Chlorination	Chlorine gas	Disinfection
		Fluoridation	Fluorosilicic acid	Provide dental health benefit
		pH Correction	Lime	pH correction
Victorian Desalination Plant	Wonthaggi Desalination Plant	Coagulation /Flocculation	Ferric sulphate / Sulphuric acid / Polydadmac	Improve performance of filtration
		Filtration (Drum screens, dual media pressure filters, cartridge filters)	-	Protect RO membranes
		Reverse Osmosis	Antiscalant / Sodium hydroxide/ Sodium bisulfite	Removal of salts from the water
		Reverse Osmosis Cleaning	Membrane cleaning chemicals (caustic, detergent, acid)	Maximise performance of RO
		Chlorination	Chlorine gas	Disinfection
		Fluoridation	Fluorosilicic acid	Provide dental health benefit
		Remineralisation	Hydrated lime / Carbon dioxide	Stabilise water and pH correction
		Membrane preservation	Sodium bisulfite	Protect membranes when not in use
Sludge thickening/dewatering	Polymer	Washwater recovery		
Greenvale	Greenvale St Albans Greenvale Yuroke	Chlorination	Sodium hypochlorite	Disinfection
Lower Yarra Valley Townships	Cresswell Frogley Yarra Glen	Coagulation / flocculation	Aluminium chlorohydrate	Colour & organics removal
		Membrane ultrafiltration	-	Remove pathogens/turbidity
		Membrane cleaning	Citric acid / Sodium hypochlorite	Optimise membrane performance
		Chlorination	Sodium hypochlorite	Disinfection
		pH correction	Sodium carbonate	pH correction
Silvan	Silvan-Olinda Silvan-Preston Silvan-Waverley	Chlorination	Chlorine gas	Disinfection
		Fluoridation	Fluorosilicic acid	Provide dental health benefit
		pH correction	Lime	pH correction
	Monbulk Kallista	Chlorination	Sodium hypochlorite	Disinfection
Fluoridation		Sodium fluoride	Provide dental health benefit	
Tarago	Tarago	Pre-treatment chemical dosing	Powdered activated carbon / lime / carbon dioxide	Optimise treatment plant performance
		Coagulation/flocculation	Aluminium chlorohydrate / PolyDADMAC / Polyacrylamide	Improve filter performance
		Dissolved air flotation filtration (DAFF)	-	Removal of pathogens/turbidity
		Chlorination	Chlorine gas	Disinfection

Water Supply System	Treatment Plant	Treatment Process	Added Substances	Role of Each Process
		Ultraviolet (UV) irradiation	-	Disinfection
		Fluoridation	Fluorosilic acid	Provide dental health benefit
		pH correction	Lime / Carbon dioxide	pH correction
		Sludge thickening / dewatering	Polyacrylamide	Washwater recovery
		Iron / manganese removal	Potassium permanganate	Removal of iron and manganese
Upper Yarra Valley Townships	Brahams Rd Lusatia Park Lyrebird Ave Martyr Rd Yarra Junction	Ultraviolet (UV) irradiation	-	Disinfection
		Chlorination	Sodium hypochlorite	Secondary disinfection to provide a chlorine residual to customer tap
Winneke	Winneke Treatment Plant	Coagulation / flocculation	Aluminium sulphate / Polymer	Colour & organics removal
		Clarification	-	Remove pathogens / turbidity
		Rapid media filtration	-	Remove pathogens / turbidity
		Chlorination	Sodium Hypochlorite	Disinfection
		Fluoridation	Fluorosilic acid	Provide dental health benefit
		pH correction	Lime	Optimise disinfection, and pH correction
		Sludge thickening / dewatering	Polyacrylamide	Washwater recovery
Yan Yean <sup>4</sup>	Yan Yean	Coagulation/floculation	Aluminium sulphate / PolyDADMAC / Polyacrylamide	Colour & organics removal / Filtration aid
		Rapid media filtration	-	Remove pathogens / turbidity
		Chlorination	Chlorine gas / Sodium hypochlorite	Disinfection
		Fluoridation	Fluorosilic acid	Provide dental health benefit
		pH correction	Lime	pH correction

<sup>4</sup> No water was supplied from the Yan Yean WTP this year.

## Issues

### Wide Spread Customer Complaints

There were no events causing or with potential to cause widespread complaint in 2019-20.

### Fluoride Outage Notifications

We notified DHHS and the retail water corporations of 4 occasions when the concentration of fluoride supplied was less than 0.6 mg/L for longer than 72 hours, and therefore notification was required under the *Code of Practice for Fluoridation of Drinking Water Supplies* (Vic). These occasions occurred when fluoridation was turned off as a precautionary measure while we confirmed potential irregularities with plant processes or undertook necessary maintenance.

We notified DHHS and the retail water companies of 4 occasions when the 12 month annual rolling average fluoride concentration dropped below the required range of 0.8-1.0mg/L.

We notified DHHS and the retail water companies of 1 event where online monitoring detected an elevated fluoride concentration for a short time (up to 15 minutes) and subsequently the fluoride plant shut down automatically. The fluoride concentration on the outlet was confirmed to be normal so there was deemed to have been no impact on public health.

Root causes were identified and learnings were applied across all fluoridation plants (e.g. improved spares inventory, modified maintenance regimes to improve reliability, additional PLC controls, etc).

## Emergency, incident and event management

### Issues with known or suspected water contamination

We had 3 instances of known or suspected contamination to report under Section 22 of the *Safe Drinking Water Act*:

A Section 22 Notification was submitted on 4 July 2019 due to suspicion of possible contamination of drinking water from leaking air valves passing water. A faulty air valve was found with the air valve pit filled with water that was passing into the main. A subsequent review was completed which identified six additional valves with potentially similar issues which were inspected and one additional air valve was found to be passing water. Laboratory analysis of samples collected from the affected valve pits found that most of the water was treated water which had leaked out of the valve and was then re-entering through the air valve. The chlorine residual within the main was considered adequate (0.6-0.9mg/L) so this incident was deemed to have a very low risk to public health. Following the incident, a network-wide review was conducted and where appropriate the air valves were raised, upgraded or isolated.

A Section 22 Notification was submitted in response to an *E. coli* detection at the Dromana Detention Point. On Tuesday January 7<sup>th</sup> our external laboratory services provider, AWQC, detected *E. Coli* in a routine sample, collected at the Dromana Detention Point on Monday January 6, and notified us immediately. We reviewed the chlorine residual in the water on the Monday, upstream sample results from the same day, integrity of the tank and sampling points, and the performance of the Cardinia treatment plants, Tarago treatment plant, Tyabb secondary dosing plant and Dromana Service Reservoir outlet secondary dosing plant which had treated the water supplied at the time of sampling, all of which were normal. Further

Further characterisation of the *E.coli* using clade analysis (ANU, David Gordon), indicated that the *E.coli* was of environmental origin. This characterisation is important as the presence of *E.coli* in a treated water sample forms the long term verification of the drinking water risk management system based on HACCP. There are sub-species of *E.coli* that are able to return a positive result in defined substrate media, as well as other Enterobacteriaceae that are similar to *E.coli*, such as Klebsiella. These bacteria exist naturally in the environment and can be resistant to chlorination and as such, are not considered an indication of faecal contamination of the water supply. In the absence of control measure failures such as treatment and vermin proofing, these detections are considered false-positives and do not indicate a failure of the HACCP control measures.. A thorough follow-up investigation demonstrated that this result was a false positive, and no further action was required.

A Section 22 Notification was submitted in response to an *E. coli* detection at the Mount View Reservoir Tank. On Friday February 28<sup>th</sup> our external laboratory services provider, AWQC, detected *E. Coli* in a routine sample, collected at the Mount View Reservoir Tank, after the secondary chlorine treatment plant, on Thursday February 27<sup>th</sup>, and notified us immediately. We reviewed the chlorine residual in the water on the Thursday, upstream sample results from the same day, integrity of the tank and sampling points, and the performance of the Silvan treatment plant and Mount View Service Reservoir outlet secondary dosing plant which had treated the water supplied at the time of sampling, all of which were normal. Further speciation of the *E. coli* detection to identify the sub-species found it to be of environmental origin rather than from faecal contamination (refer to previous paragraph). A thorough follow-up investigation demonstrated that this result was a false positive, and no further action was required.

### **Issues with potential to impact water supply**

On March 11 2020 the World Health Organisation declared a global pandemic for the COVID-19 virus. Melbourne Water enacted its Pandemic Contingency Plan and began managing an incident under a General Emergency Management Structure. A number of safety protocols were put in place to ensure the continuity of supply of drinking water including confirming chemical supplies, segregating operations teams into A and B teams based at different sites, establishing protocols around essential maintenance and split amenities at sites, rules around staff members visiting multiple water sites, a backup "bench" of skilled workers who could backfill operators and technical support personnel if any staff members were unable to work due to illness, and general instructions for all staff to work from home unless presence at site was deemed essential. An incident recovery team was deployed as restrictions eased in Melbourne in June. Melbourne Water continued to operate with COVID-19 protocols in place to the end of the financial year and beyond all the while ensuring that supply of safe drinking water was maintained.

## Risk management plan audit results

There was a requirement for an audit in 2019-20 under the *Safe Drinking Water Act 2003* and Melbourne Water scheduled an audit for April 2020. Due to the COVID-19 pandemic the due date for audits was extended by DHHS from 31 May to 28 August so no audit was completed during the 2019-20 financial year. The audit was rescheduled and completed in late July 2020. Audit findings will be included in the 2020-21 Annual Report to DHHS.

We also continued our third-party HACCP certification, with the certificate shown in the appendix.

## Exemptions under Section 8 of the Act

No exemptions were in place during the year.

## Undertakings under Section 30 of the Act

No undertakings were entered into or completed during the year and there were none in place from previous years.

## Further information

This report and further information regarding drinking water quality is available on our website at [www.melbournewater.com.au](http://www.melbournewater.com.au) or by contacting the customer service team:

**Telephone:** 131 722  
**Translation Service:** 131 450  
**Speak and Listen:** 1300 555 727  
**Fax:** (03) 9679 7099  
**Mail:** Melbourne Water  
PO Box 4342  
Melbourne, Victoria 3001

## Appendix

### Risk management plan audit certificate

#### Safe Drinking Water Regulations 2015 - Regulation 10

Certificate Number: 168

Audit period: 31 May 2018 to 28 August 2020

To: Sylvia Campbell, Technical Management Systems Lead

Melbourne Water, 990 La Trobe Street, Docklands, Melbourne 3008

Australian Business Number (ABN): 81 945 386 953

I, Dr Daniel Deere, after conducting a risk management plan audit of the water supplied by Melbourne Water am of the opinion that -

Melbourne Water has complied with the obligations imposed by section 8(1) of the *Safe Drinking Water Act 2003* during the audit period.

Signature of approved auditor: *D Deere* Date: 28 Aug 2020



## CERTIFICATE OF APPROVAL

This is to certify that the HACCP System of:

**Melbourne Water Corporation  
990 Latrobe Street  
Melbourne, Victoria  
Australia**

has been approved by Lloyd's Register Quality Assurance to the following standard:

### **HACCP Codex Alimentarius Annex to CAC/RCP 1-1969 (2009)**

The HACCP system is applicable to:

**Management of catchments, reservoirs, treatment facilities and transfer networks for the wholesale supply of drinking water and treatment facilities for the supply of Class A recycled water.**

This certificate forms part of the approval identified by certificate number MEL1300023/A-B

Approval  
Certificate No: MEL1300023/B

Original Approval: 19 September 2014

Current Certificate: 19 September 2017

Certificate Expiry: 18 September 2020

Issued by: Lloyd's Register Quality Assurance Limited

Level 16, 461 Bourke Street, Melbourne, Vic, 3000

This approval is carried out in accordance with the LRQA assessment and certification procedures and monitored by LRQA.  
Version Number 12

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## Glossary

Term	Definition
Air valve	Valves installed at high points in water main which allow air trapped in mains to escape while preventing water from escaping
Aqueduct	An open channel used for water transfer between harvesting reservoirs and storage reservoirs
Bulk Water Supply Agreement	Agreements between Melbourne Water and Retail Water Corporations which outline the drinking water quality specifications required for treated water at the interface points with Retail Water Corporations.
Bulk water transfer	Transfer of raw or treated water between storage reservoirs
COVID-19	A novel Coronavirus discovered in December 2019 which was implicated in a global pandemic in 2020
<i>E. coli</i>	<i>Escherichia coli</i> , a bacteria found in the intestines of humans and animals. <i>E. coli</i> is used as an indicator for the presence of other more harmful bacteria
HACCP	Hazard Analysis Critical Control Point – a set of principles to manage risk in product quality of food and water production
Holding storage	A reservoir that receives water from a harvesting reservoir, that is used to store water prior to treatment. Water level in holding storages is controlled by Melbourne Water to meet drinking water demands.
ISO 9001	An international standard for certification of a quality management system. The standard is used by organizations to demonstrate their ability to consistently provide products and services that meet customer and regulatory requirements and to demonstrate continuous improvement.
Microbial Health-Based Target	Health-based targets are measurable health, water quality or performance objectives that are established based on a judgement of safety and on risk assessments of waterborne hazards, in this case microbial hazards.
MicroDALY	DALY stands for Disability Adjusted Life Years. It is a metric used by the World Health Organisation to quantify the impact of a burden of disease on a population. A microDALY is one thousandths of one DALY.
Pathogen	A microbe (bacteria, virus or protozoa) that can cause illness or disease
Raw Water	Water that has not yet been treated
Retail Water Corporation	Water Agencies that receive treated drinking water from Melbourne Water's transfer network and supply it to customers via distribution mains
Source water	Raw water that feeds into a treatment plant which may originate from different sources (eg protected or unprotected catchments)