

Drinking Water Quality

Annual Report 2023-24



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About this report

Water Corporation's 2023-24 Drinking Water Quality Annual Report is a review of our performance for the financial year ending 30 June 2024.

The Aboriginal Communities Water Services (ACWS) communities were transferred to us on 1 July 2023. At this time many communities' water supplies did not meet all health-related requirements of the ADWG. We are seeking to implement consistent processes to achieve similar outcomes between our existing Water Corporation localities and the ACWS communities, until this is achieved the ACWS communities will be reported in a separate Aboriginal Communities Water Services Annual Report.

This report is designed to provide our customers and the Western Australian public with information on the quality of their drinking water.

Publication of this report allows us to meet the requirements of the [Australian Drinking Water Guidelines](#), our [Water Services Licence](#) with the Economic Regulation Authority, our [Memorandum of Understanding](#) with the Department of Health and the National Performance Reporting requirements under the National Water Initiative.

This is our 22nd Drinking Water Quality Annual Report; we trust it provides our customers with the information they require about their drinking water quality.

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- Department of Water and Environmental Regulation
 - Public Drinking Water Source Areas
 - Hydrography Linear Hierarchy
- Landgate
 - Road Centrelines
 - Town sites
- Geoscience Australia
 - Australian Coastline

Further information and feedback

For further information about our drinking water quality or to provide feedback on this report:

- Call us on 13 13 85
- Visit watercorporation.com.au/drinkingwaterquality
- Email us at report@watercorporation.com.au

In the spirit of reconciliation, Water Corporation acknowledges the Traditional Custodians of Country throughout Western Australia and their enduring connections to land, sea and community. We pay our respects to Elders past and present and extend that respect to all Aboriginal and Torres Strait Islander peoples today.

Acronyms

Acronym	Description
ADWG	Australian Drinking Water Guidelines
ASDP	Alkimos Seawater Desalination Plant
AWRP	Advanced Water Recycling Plant
BRA	Barrier Risk Assessment
CMS	Catchment Management Strategy
DoH	Department of Health
EDR	Electrodialysis reversal
GAR	Goldfields and Agricultural Region
GAWS / GAWSS	Goldfields and Agricultural Water Supply Goldfields and Agricultural Water Supply Scheme
GSR	Great Southern Region
GSTWS / GSTWSS	Great Southern Towns Water Supply / Great Southern Towns Water Supply Scheme
GWR / GWRS	Groundwater Replenishment / Groundwater Replenishment Scheme
IWSS	Integrated Water Supply Scheme
LGSTWS / LGSTWSS	Lower Great Southern Towns Water Supply Lower Great Southern Towns Water Supply Scheme
MIEX	Magnetic Ion Exchange
mg/L	Milligrams per litre
mL	Millilitres
MoU	Memorandum of Understanding
MPN/100mL	Most probable number / 100mL
MWR	Mid West Region
NHMRC	National Health and Medical Research Council

Acronym	Description
NSIB	New Starter Induction Block
NTU	Nephelometric Turbidity Units
NWR	North West Region
PDWSA	Public drinking water source area
PFAS	Per- and poly-fluoroalkyl substances
PFHxS	Perfluorohexane sulfonate
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctane sulfonate
PSDP	Peth Seawater Desalination Plant
RBOM	Risk Based Observational Monitoring
RO	Reverse osmosis
RPZ	Reservoir protection zone
SCADA	Supervisory Control and Data Acquisition
SSDP	Southern Seawater Desalination Plant
SWR	South West Region
TCU	True Colour Units
TDS	Total Dissolved Solids
THM	Trihalomethanes
µg/L	Micrograms per litre
UF	Ultra-filtration
UV	Ultra-violet
WHPZ	Well Head Protection Zone
WTP	Water treatment plant
WQMS	Water Quality Management System

Introduction

Providing safe drinking water is our highest priority. We achieve this by ensuring our drinking water services meet the requirements of our Memorandum of Understanding with Department of Health on Drinking Water.

In 2023-24, we provided drinking water to Perth, Mandurah and more than 220 regional towns and communities throughout Western Australia.

We delivered more than 419 billion litres of drinking water to 1.05 million properties through 34,043 kilometres of water mains. This water came from 40 surface water sources, 85 groundwater sources, two major desalination plants (the Perth Seawater Desalination Plant and Southern Seawater Desalination Plant) and one groundwater replenishment scheme.

Under our [Water Services Licence](#), we comply with a [Memorandum of Understanding \(MoU\)](#) with the DoH. We act in accordance with the microbiological, health related chemical and radiological criteria as specified by the National Health and Medical Research Council (NHMRC) in the Australian Drinking Water Guidelines 2011 (ADWG).

We have an extensive drinking water quality monitoring program and rigorously follow up on outlying results to confirm the safety of the water we provide to our customers.

Our health-related performance for 2023-24 was:

- 99.6 per cent of localities met microbiological criteria at all times
- 100 per cent of localities met health-related chemicals criteria at all times
- 99.6 per cent of localities met health-related radiological guidelines at all times

Our commitment

We are committed to providing our customers with safe, high-quality drinking water that consistently meets the requirements of the ADWG, our customers and other regulatory provisions.

To achieve this, we have partnered with relevant agencies to:

- Manage water quality from water source to water meter and promote confidence in the supply of safe drinking water.
- Incorporate the needs and expectations of our customers, stakeholders, regulators, and employees into our planning.
- Strongly advocate source protection and the primacy of drinking water quality over other land uses.
- Use a risk-based approach to identify and manage hazards and ensure appropriate barriers to protect water quality.
- Routinely monitor our systems and use effective reporting mechanisms to provide relevant and timely information on our performance.
- Use appropriate contingency planning and maintain incident response capability.
- Meet the health-related requirements of the *ADWG and work to progressively improve the aesthetic quality of water supplied.
- Contribute to setting industry regulations and guidelines, and other standards relevant to public health and the water cycle.

- Continually improve our practices by assessing performance against corporate objectives and stakeholder expectations.
- Constantly strive to be a leader in operational training through exploration of visual intelligence technologies to supplement existing face-to-face courses.
- Participate in research and development activities to ensure we continually improve understanding and management of our drinking water supply systems.

We will implement and maintain a drinking water quality management system consistent with the ADWG to effectively manage the risks to drinking water quality. All Water Corporation employees, partners and contractors are responsible for understanding their role in implementing and continuously improving the drinking water quality management and outcomes.

*We have a [Memorandum of Understanding](#) with the DoH that grants exemptions to the nitrate health guideline for 10 towns in the Mid West, and Goldfields and Agricultural regions. We are progressively working to improve the drinking water quality in these towns and are finalising the removal of 5 of these exemptions (refer to *Understanding water quality test results – Nitrate* on page 36).

For further information please refer to our [Drinking Water Quality Policy](#) and [Drinking Water Source Protection Policy](#).

Drinking Water Quality Policy

Water Corporation is committed to effective management of its drinking water supplies to provide a safe, high-quality product that consistently meets the Australian Drinking Water Guidelines, customer and regulatory requirements, and the corporate objectives and vision.

To achieve this, and in partnership with our stakeholders and relevant agencies, we will:

 Manage water	Manage water quality from water source to water meter and promote confidence in the supply of safe drinking water.	Incorporate the needs and expectations of our customers, stakeholders, regulators and employees into our planning.
 Protect our sources	Strongly advocate source protection and the primacy of drinking water quality over other land uses.	Use a risk-based approach to identify and manage hazards and ensure appropriate barriers to protect water quality.
 Protect water quality	Routinely monitor our systems and use effective reporting mechanisms to provide relevant and timely information on our performance.	Use appropriate contingency planning and maintain incident response capability.
 Meet health standards	Meet the health-related requirements of the Australian Drinking Water Guidelines and work to progressively improve the aesthetic quality of water supplied to our customers.	Contribute to setting industry regulations and guidelines, and other standards relevant to public health and the water cycle.
 Improve our practices	Continually improve our practices by assessing performance against corporate objectives and stakeholder expectations.	Participate in research and development activities to ensure we continually improve understanding and management of our drinking water supply systems.

Water Corporation will implement and maintain a drinking water quality management system consistent with the Australian Drinking Water Guidelines to effectively manage the risks to drinking water quality.

All Water Corporation employees, partners and contractors are responsible for understanding their role in implementing and continuously improving drinking water quality management and outcomes.

Water Corporation acknowledges the Traditional Custodians throughout Western Australia and their continuing connection to the land, water and community. We pay our respects to all members of the Aboriginal communities and their cultures; and to Elders past, present and emerging.

Pat Donovan

Pat Donovan
Chief Executive Officer, Water Corporation


PCY261
July 2023



Drinking Water Source Protection Policy

Water Corporation is committed to effective management of its drinking water supplies to provide a safe, high-quality product that consistently meets the Australian Drinking Water Guidelines, customer and regulatory requirements, and the corporate objectives and vision. Source Protection is recognised as a key component of this process.

To achieve this, and in partnership with our stakeholders and relevant agencies, we will:

 Protect water quality	Strongly advocate source protection and the primacy of drinking water quality over other land uses.	Recognise robust source protection practices provide a safer, more practical and economical approach to drinking water safety than water treatment.
 Manage risk	Continuously maintain robust multiple barriers appropriate to the level of potential contamination facing the raw water supply starting with source protection.	Uphold, support and promote catchment protection despite pressure from competing land uses and activities.
 Monitor and respond	Routinely monitor our source protection systems and use effective reporting mechanisms to provide relevant and timely information on their performance.	Maintain active catchment surveillance and protection programs to prevent contamination or degradation of our drinking water sources.
 Protect our sources	Ensure land uses and activities within catchments comply with legislation, approval conditions and best management practices.	Collaborate with key stakeholders and the community to protect drinking water catchments.

Guiding principle 1 of the Australian Drinking Water Guidelines states:

The greatest risks to consumers of drinking water are pathogenic microorganisms. Protection of water sources and treatment are of paramount importance and must never be compromised.

All Water Corporation employees, partners and contractors are responsible for understanding their role in water source protection, and for implementing and continuously improving protection of our drinking water catchments.

Water Corporation acknowledges the Traditional Custodians throughout Western Australia and their continuing connection to the land, water and community. We pay our respects to all members of the Aboriginal communities and their cultures; and to Elders past, present and emerging.

Pat Donovan

Pat Donovan
Chief Executive Officer, Water Corporation

PCY272
July 2023



Where does your water come from?

Perth Metropolitan Region

Integrated Water Supply Scheme (IWSS)

The IWSS is Water Corporation’s largest scheme. Just over 332 billion litres of water were delivered in 2023-24 to more than 858,000 property connections in Perth and Mandurah. This does not include the volume of IWSS water supplied to some towns in the South West, Goldfields and Agricultural Water Supply (GAWS), and the Great Southern Towns Water Supply Scheme (GSTWSS).

The IWSS has four different water source types, desalinated seawater, surface water, groundwater, and groundwater replenishment (GWR). In 2023-24, the percentage of water from each source type was 36 per cent desalinated seawater, 18.7 per cent surface water, 44.6 per cent groundwater and 0.7 per cent GWR. Desalinated seawater and GWR are both climate independent sources.

The IWSS can be split into three interconnected systems:

The northern system covers from Yanchep in the north to Yokine Reservoir at the south. It also includes a standalone scheme at Two Rocks. This scheme is largely supplied through groundwater feeding five groundwater treatment plants.

The central scheme includes Mount Eliza Reservoir, Bold Park Reservoir and Belmont pump station to the north and Tamworth pump station and Serpentine Dam to the south. The sources include the Perth Seawater Desalination Plant (PSDP), groundwater treated at Jandakot groundwater treatment plant and four metropolitan dams. Water may also be transferred in from the northern system. Mundaring Dam exports water to the GAWS.

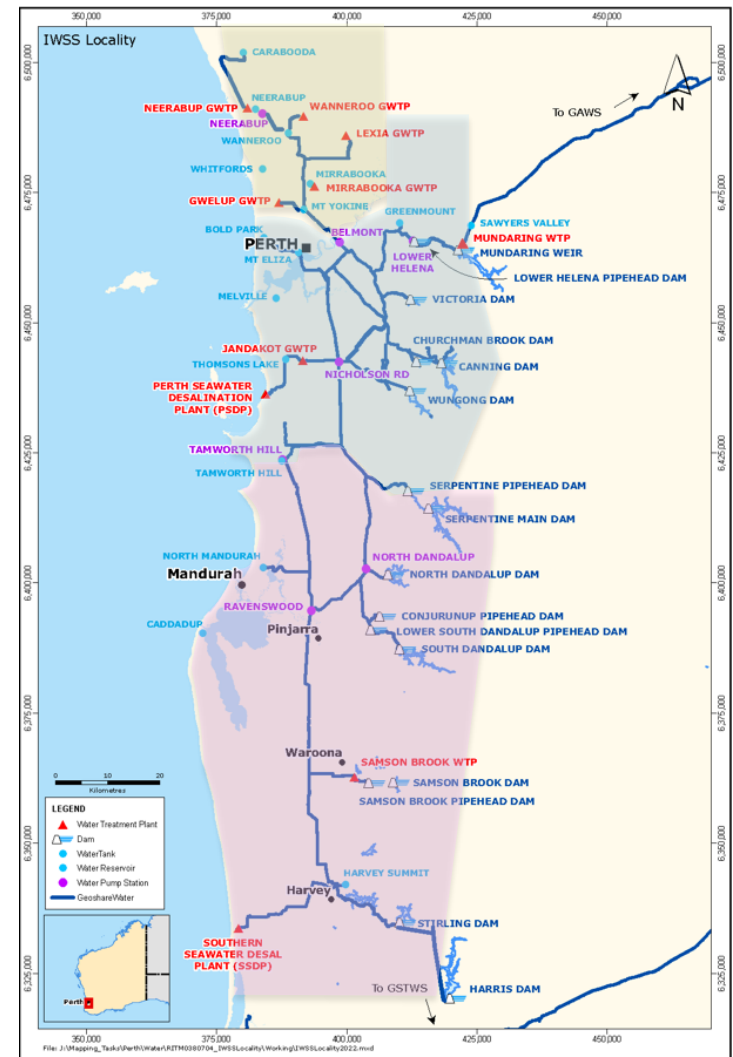


Figure 1: Overview map of the IWSS sources

The southern system includes all assets south of Tamworth pump station and Serpentine Dam. Water is sourced from the Southern Seawater Desalination Plant (SSDP) and the southern dams. Water is transferred into the central system to maintain dam storages.

These 3 systems are further subdivided into 28 water quality zones, called localities, for the purposes of water quality management. Maps of these localities are available in Appendix B and sampling results for 2023-24 are shown, by locality, in Appendix C.

Desalination

The PSDP, located in Kwinana, produced 45.5 billion litres of water for the IWSS in 2023-24. The PSDP desalinated water enters the IWSS via Thomsons Reservoir where it is blended with Jandakot groundwater and scheme water.

The SSDP, located just north of Binningup, produced 74.0 billion litres of water for the IWSS in 2023-24. The SSDP desalinated water enters the IWSS via Harvey summit tanks and is transferred north through the Stirling and Serpentine trunk mains.

For further information, refer to the Desalination section in *Diversifying our sources* (page 17).

Groundwater

Groundwater is abstracted from four aquifers, Superficial, Mirrabooka, Leederville and Yarragadee, across the Gnangara, Perth Coastal, and Jandakot systems. Once abstracted, groundwater is treated at one of six groundwater treatment plants. Most of our abstraction bores are located in Perth's northern suburbs. We also have independent artesian bores which pump water directly into service reservoirs.

In 2023-24, drinking water production from groundwater sources was delivered on target and within the respective water licence allocation. The

total groundwater abstracted volume, including GWR was 148.2 billion litres.

Surface water

The IWSS has a total of 14 surface water dams made up of 11 supply dams (Canning, Churchmans Brook, North Dandalup, Samson Dam, Samson Pipehead, Serpentine, Serpentine Pipehead, South Dandalup, Stirling, Victoria, and Wungong), one principally non-metro supply dam (Mundaring Weir, servicing the GAWS) and three pumpback dams (Lower Helena, Conjurunup and Lower South Dandalup).

In addition to collecting and storing natural inflow water, six of the IWSS dams, Canning, Mundaring, Victoria, Wungong, North Dandalup, and Serpentine Pipehead are used to store scheme water for future source development and climate responsiveness purposes. This stored scheme water is managed through pumpbacks, transfers and direct inflows into the dams when operational capability requires. Surface water is used predominantly in planning and catering for peak demands within the IWSS.

In 2023-24, the volume of surface water supplied into the IWSS was 62.2 billion litres.

Groundwater Replenishment

GWR is the process by which secondary treated wastewater undergoes advanced treatment to a drinking water quality standard. The water is recharged to deep underground aquifers where it is stored for a number of years before being abstracted and further treated as part of the IWSS. In 2023-24 we recharged 16.3 billion litres of water.

Refer to the Groundwater Replenishment section in *Diversifying our sources* (page 17) for further information.

South West Region

Towns in the South West Region (SWR) are supplied with water from a number of surface and groundwater sources. The SWR provided more than 23.8 billion litres of water to more than 47,700 connected properties through 1,805 kilometres of water mains in 2023-24.

Margaret River and Cowaramup are supplied by groundwater and surface water via Ten Mile Brook Dam. Pemberton is supplied by surface water from Big Brook Dam via Lefroy Brook Dam.

Augusta, Boyanup, Dalyellup, Dardanup, Donnybrook, Dunsborough, Capel, Peppermint Grove, and Preston Beach are supplied by locally treated groundwater. Australind, Clifton Park, Eaton, Picton, Kingston, Millbridge, Pelican Point, Treendale, Brunswick Junction, Roelands, and Burekup are supplied with groundwater, via water treatment plants in Australind, Eaton, and Picton.

Balingup, Bridgetown, Boyup Brook, Greenbushes, Hester, Kirup, Manjimup, Mullalyup, and Nannup are connected to the Warren Blackwood Regional Water Supply Scheme. Millstream and Manjimup dams and a Yarragadee bore near Nannup are the main water sources for this scheme. Tanjannerup Dam supplies most of Nannup's water requirements.

Binningup, Hamel, Harvey, Myalup, Waroona, and Yarloop are supplied from the IWSS (refer to *Where does our water come from? – Perth Metropolitan Region* - page 10).

Northcliffe and Quininup are supplied with water carted from either Manjimup or Pemberton, and Logue Brook is supplied with water carted from the IWSS.

The GSTWSS, which supplies Allanson, Collie, and Darkan in the SWR and 38 towns in the Great Southern Region, is supplied from Harris and Stirling dams.



Figure 2: Overview map of the South West Region

Great Southern Region

In the Great Southern Region we have two main water supply schemes, the Great Southern Towns Water Supply Scheme (GSTWSS) and the Lower Great Southern Towns Water Supply Scheme (LGSTWSS), along with around 15 individual supplies. This year the region supplied more than 14.3 billion litres of drinking water to more than 41,300 connected properties through 4,077 kilometres of water mains.

Harris Dam, near Collie in the South West Region, and Stirling Dam, in the Perth IWSS, are the main sources for the GSTWSS. Groundwater from the South Coast borefields near Albany is the main source for the LGSTWSS, although Two Peoples Bay, near Albany, can contribute to the supply if required.

Hopetoun, Bremer Bay, Esperance, Condingup and Gibson are all supplied from local groundwater sources. Denmark, Walpole, Ravensthorpe, Frankland, Ongerup, Jerramungup, Borden, and Salmon Gums are supplied from local surface water sources. Denmark can also be supplemented by a pipeline from the LGSTWSS.

Grass Patch, Lake King, Munglinup, Rocky Gully, Varley and Wellstead are supplied by water carted from various treated water sources such as Albany, Lake Grace, and Esperance. Some localities are also periodically supplied by carted water due to water quality or quantity reasons.



Figure 3: Overview map of the Great Southern Region

Goldfields and Agricultural Region

The Goldfields and Agricultural Region provided more than 28.8 billion litres of water to almost 39,000 connected properties, including farms, mines, and other enterprises, through 9,660 kilometres of water mains in 2023-24.

The main water supply scheme for the region is the Goldfields and Agricultural Water Supply (GAWS) scheme, where water is sourced from Mundaring Weir near Perth before undergoing treatment at Mundaring Water Treatment Plant. Mundaring Weir is supplemented with desalinated seawater, groundwater, and surface water from Lower Helena Pumpback.

In addition to the GAWS, water is carted to Broad Arrow and Menzies from Kalgoorlie, and the towns of Laverton, Leonora, and Wiluna are supplied from local groundwater sources. Wiluna's groundwater is treated using electro dialysis reversal (EDR) to reduce nitrates, while Leonora's groundwater is treated using Reverse Osmosis (RO) to reduce nitrates, hardness, and total dissolved solids (refer to *How is your water treated?* – *Desalination – Reverse osmosis and Electro dialysis reversal* sections, pages 27 and 28). Laverton has a temporary RO plant to maintain nitrates below guideline value, while a permanent solution is designed.

Chloramination is predominantly used in the GAWS to maintain a disinfectant residual across the network. (Refer to *How is your water treated?* – *Disinfection – pathogen removal*, page 30).

There are some communities outside the towns who receive water that, although the water has been potable, may no longer be guaranteed to meet the requirements of the ADWG due to the long mains and distance from disinfection; these are called Non-Standard Water Services.

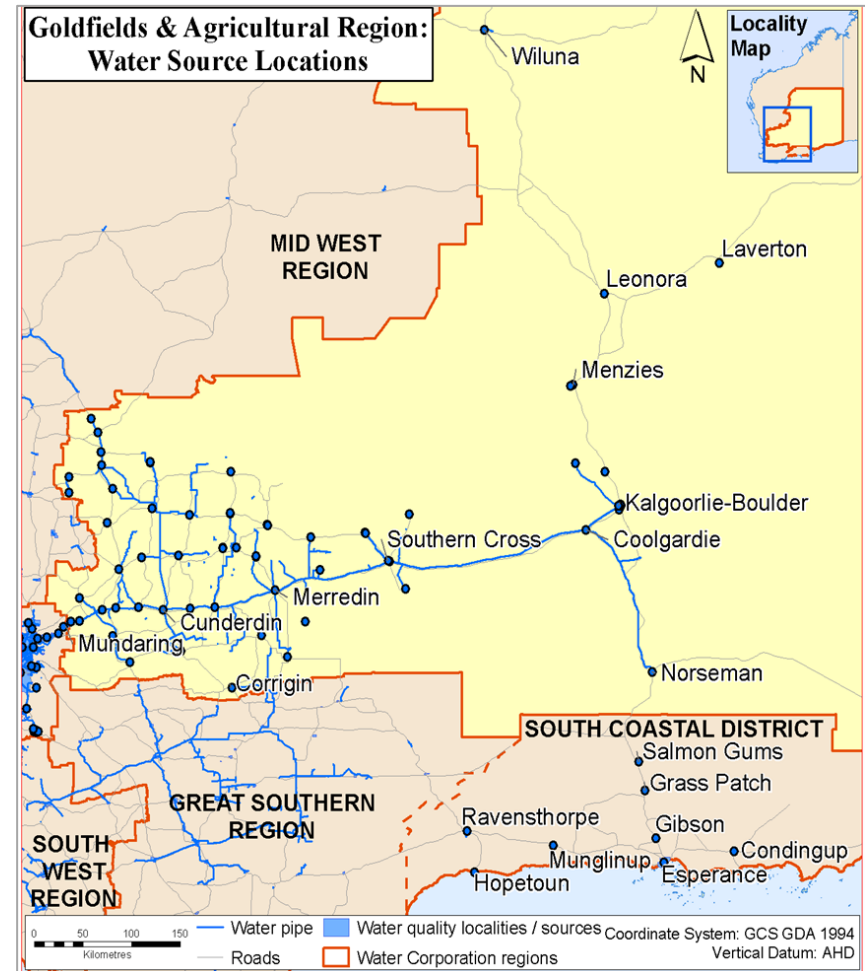


Figure 4: Overview map of the Goldfields and Agricultural Region

Mid West Region

The Mid West Region (MWR) extends along the west coast from Woodridge to Exmouth, 1,130 kilometres north of Perth, and 500 kilometres inland to Sandstone. It is divided into three districts:

- Gascoyne District
- Coastal Midlands District
- Geraldton/Murchison District

Independent, local groundwater borefields from 40 Public Drinking Water Source Areas provide drinking water to 38,300 connected properties in 51 localities through 2,166 kilometres of water mains. The total drinking water supplied from these sources was almost 18.4 billion litres.

The Coastal Midlands has the highest number of small schemes where supply is sourced from individual borefields. Allanooka borefield, located in the Geraldton/Murchison district (supplying Geraldton and the surrounding towns of Dongara, Northampton, Mullewa, Walkaway, Greenough and Narngulu), Carnarvon, and Exmouth, both located in the Gascoyne district, are the largest schemes.

The two communities of Nabawa, and Yuna, receive water carted from Geraldton. Coomberdale receives water carted from Moora as its sole supply and New Norcia now receives water carted from Moora three times per week to reduce the elevated salinity in the local scheme by blending with local groundwater. Drinking water is also carted to some communities to maintain supply when schemes experience asset failure or water quality issues.

RO treatment is used to improve water quality at Gascoyne Junction, Denham, and Coral Bay. Jurien Bay's temporary RO plant was online when required while a permanent solution is developed. Yalgoo, Mt Magnet, Cue, Sandstone and Meekatharra water treatment plants use EDR to remove a number of constituents including nitrate (refer to *How is*

your water treated? – Desalination – Reverse osmosis and Electrodialysis reversal sections on pages 27 and 28 and *Understanding water quality test results - Nitrate*, page 36).

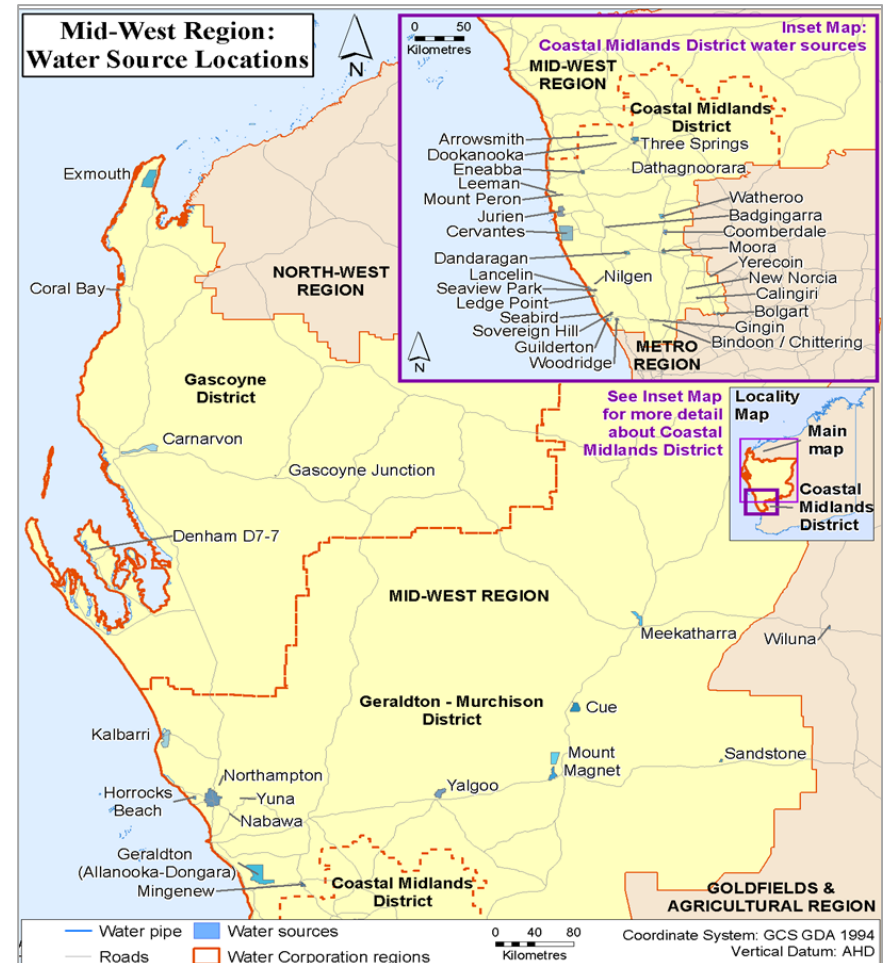


Figure 5: Overview map of the Mid West Region

North West Region

The West Pilbara Water Supply Scheme supplies customers in the towns of Karratha, Dampier, Roebourne, Wickham, Point Samson, Cape Lambert, and the Burrup Peninsula. The scheme has three sources: surface water from Harding Dam, groundwater from the Millstream Aquifer, and the Bungaroo Valley groundwater source (developed by Rio Tinto Iron Ore). Onslow is supplied from the Cane River borefield, with construction of a desalination plant in progress.

The East Pilbara Water Supply Scheme supplies customers in Port Hedland, South Hedland, Wedgefield Industrial Area, and the local port operations. The scheme is supplied with groundwater from the Yule and De Grey River borefields.

In West Kimberley the towns of Broome, Derby, Camballin, and Fitzroy Crossing are supplied from local groundwater sources.

Kununurra and Halls Creek, located in the East Kimberley district, are supplied by local groundwater sources. Wyndham, also in the East Kimberley, is supplied by surface water from Moochalabra Dam.

Newman is supplied with groundwater via BHP operated borefields and water treatment plant.

Overall, the North West Region supplied more than 42.8 billion litres of drinking water to almost 30,200 connected properties through 1,536 kilometres of water mains in 2023-24.

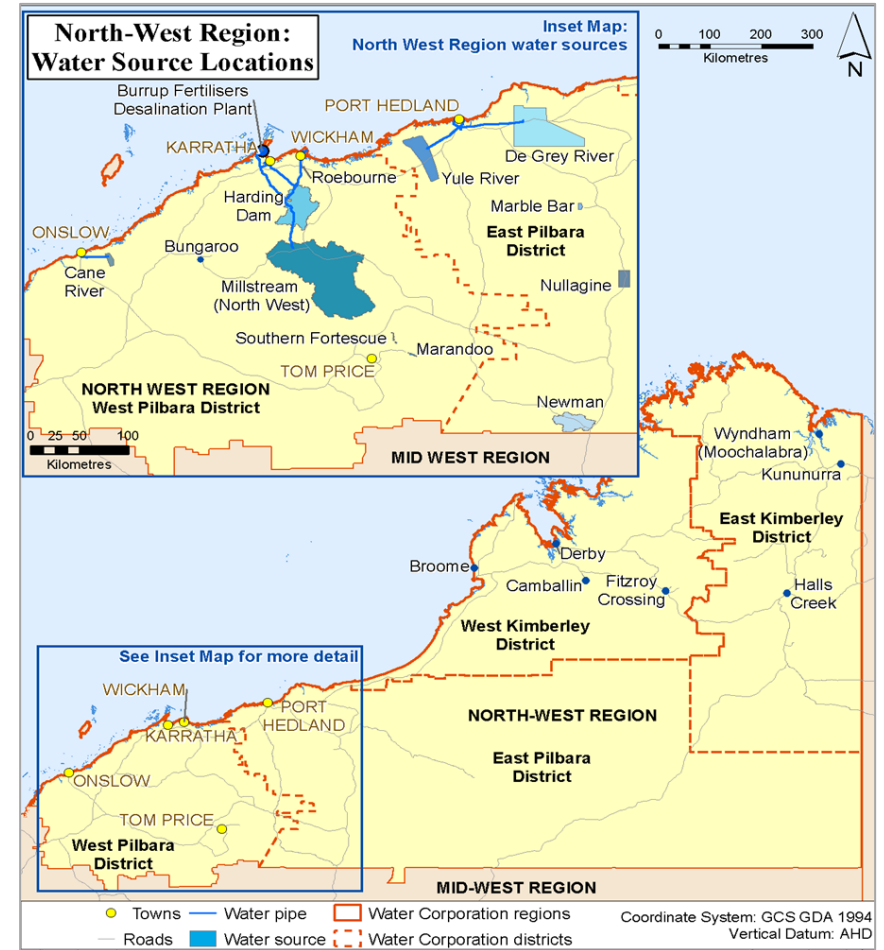


Figure 6: Overview map of the North West Region

Diversifying our sources

We have planned ahead to secure our water supplies in response to climate change, reduced streamflow, industry needs, and expanding population. These plans are based on a three-pronged approach to reduce water use, increase water recycling and develop new water sources such as desalination and groundwater replenishment.

Desalination

Desalination, using RO, is a membrane-based treatment. This process was chosen for both the PSDP, which has been operational since November 2006, and the SSDP, that began supply in September 2011.

Desalination was the second largest source of water for the IWSS in 2023-24, supplying 36 per cent of the drinking water for Perth (refer to *How is your water treated? – Desalination – Reverse osmosis*, page 27).

Perth Seawater Desalination Plant

The PSDP is located in Kwinana and can produce up to 45 billion litres of drinking water a year.

Southern Seawater Desalination Plant

The SSDP, located in Binningup in the South West, can produce up to 100 billion litres of drinking water a year.

Alkimos

We are constructing a new Metropolitan desalination plant at Alkimos to contribute 100 billion litres into the IWSS.

Groundwater replenishment

What is groundwater replenishment?

GWR is the process by which secondary treated wastewater undergoes advanced treatment prior to being recharged into the confined Leederville and Yarragadee aquifers for later use as a drinking water source (refer to *Water treatment for groundwater replenishment*, page 28). Once abstracted, the mixed groundwater will be further treated before being supplied into the IWSS. Figure 7 shows how groundwater replenishment fits into Perth's water cycle.

The Groundwater Replenishment Scheme (GWRS) in Craigie is the first of its kind in Australia. Similar schemes have been used successfully in other parts of the world, such as Orange County California, USA, since the 1970's. Water recycling schemes are also used to supplement drinking water supplies in Singapore and in Windhoek, Namibia.

Benefits of groundwater replenishment

- Does not rely on rainfall
- Sustainable water source
- Has the potential to recycle large volumes of water
- Equivalent volumes of water can be abstracted from the aquifer while reducing impacts to the environment or other water users.

GWR was built in 2 stages. Stage 1 gained approval to recharge in 2017. Approval for Stage 2 was granted in 2020 with commissioning completed in early 2023. The completed GWR scheme is now licensed to recharge up to 28 billion litres each year, providing a climate independent water source.

For the financial year to 30 June 2024, the GWR scheme recharged a total of 16.3 billion litres.

Further information can be found on [our website](#).

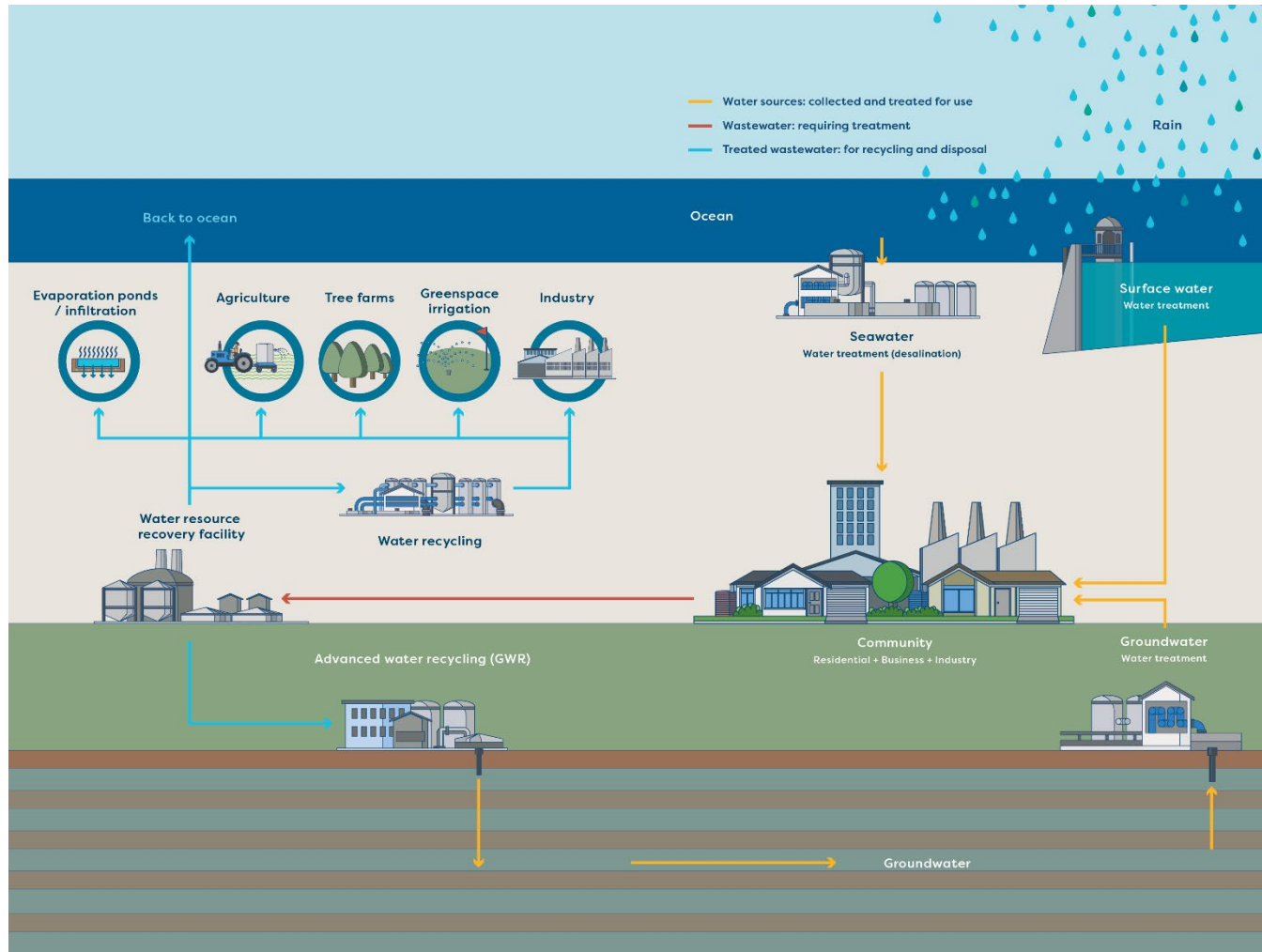


Figure 7: Groundwater replenishment in the water cycle

Drinking water quality risk management

The NHMRC define the requirements for safe drinking water in Australia through the ADWG. These guidelines include a 12 -element framework for best practice management of drinking water supplies (the Framework) designed to integrate all facets of the drinking water quality management and assurance system (refer to figure 8).



Figure 8: Framework for the management of drinking water quality (ADWG)

Engagement with Department of Health

The DoH regulates drinking water quality in Western Australia. We have an MoU with the DoH which requires us to work towards continual improvement in implementing the ADWG and the Framework. More specifically, it requires us to comply with the microbiological, chemical health and radiological parameters as specified in the ADWG or by DoH

(refer to *Appendix A – List of sampling parameters*, page 48), with exemptions to adherence with the nitrate guidelines in 10 towns in the Mid West, and Goldfields and Agricultural regions (refer to *Understanding water quality test results – Nitrate*, page 36). This forms part of our Water Services Licence as issued by the Economic Regulation Authority. Along with the DoH, we recognise the practices and processes used to maintain high levels of drinking water quality need to be transparent to the community.

For aesthetic parameters, the MoU states that we should comply as far as practical with the ADWG. It is accepted full compliance with non-health related characteristics may take many years, bearing in mind the significant investment required to achieve this.

The MoU connects all facets of nationally and internationally recognised drinking water guidelines, standards, and quality management systems to ensure the safe and continuous supply of water to our customers. It requires us to notify DoH within 24 hours if monitoring results are outside ADWG health guideline limits or any event occurs which could pose a risk to public health.

We also provide updates to DoH throughout the year, who regularly review our monitoring results and corrective actions (refer to *Monitoring and incident management – Incident response*, page 32).

The MoU includes a requirement for the DoH to conduct reviews of the performance of our systems and databases used to manage drinking water quality. In consultation with the Economic Regulation Authority, DoH commissions audits in line with our Water Services Licence.

The latest audit commenced in March 2022 and the abridged report is available on our website.

Engagement with Advisory Committee for the Purity of Water

The Advisory Committee for the Purity of Water (ACPoW) is a non-statutory inter-departmental committee chaired by the DoH. As one core function, ACPoW provides advice to the Ministers for Health and Water on protecting, monitoring, and managing drinking water quality in Western Australia and fosters inter-agency co-operation on related matters. Water Corporation is an active member of ACPoW, utilising it for the ongoing review of our drinking water quality management.

ACPoW has two specialist sub-committees on which Water Corporation are active members – one focussing on source protection and catchment management, chaired by the Department of Water and Environmental Regulation (DWER) and the other focusing on drinking water quality management including water sampling, results, and monitoring, chaired by DoH. Both sub-committees provide additional expertise to and advise the committee on any issue affecting drinking water supplies within Western Australia, from water source to water meter.

Multiple barrier approach to drinking water quality management

Preventing contamination and minimising risk is an essential part of providing safe drinking water. The ADWG's guiding principle two states:

“The drinking water system must have, and continuously maintain, robust multiple barriers appropriate to the level of potential contamination facing the raw water supply.”

This approach ensures that if one barrier fails, the effective operation of the other barriers will ensure safe drinking water is maintained throughout the water supply.

Barriers, as recommended by the ADWG, applied from water source to water meter, are:

- Protected catchments and groundwater recharge areas (refer to *Source protection*, page 23).
- Large reservoirs with long water detention (storage) times (refer to *Source protection- Storage barrier*, page 24).
- Water treatment (refer to *How is your water treated?*, page 26).
- Ensuring tanks and bores are sealed to prevent contamination.
- Disinfection of water (refer to *How is your water treated? – Disinfection – pathogen removal*, page 30).
- A sealed distribution system and maintenance of chlorine or monochloramine residuals throughout the system (refer to *How is your water treated? – Disinfection – pathogen removal*, page 30).

Some barriers, such as disinfection and a residual chlorine, are mandatory in every water supply, others are preferred, such as protected catchments and large reservoirs. Additional water treatment barriers may be necessary if the quality of the source water requires it.

We undertake an annual barrier risk assessment that drives necessary operational and capital improvements.

Barrier risk assessment

Quality operational information and data is critical as it informs our Barrier Risk Assessment (BRA). As a part of this process, we fully review our barrier risks annually but also update as required or when new information becomes available. The BRA details water quality risks associated with each of our drinking water schemes across the state. The data and information collected is critical as it informs how our schemes are performing from a water quality risk perspective. The BRA process assists us with identifying and understanding the need for and prioritisation of capital investments to address the identified risks.



Source protection



Large reservoirs with long detention times



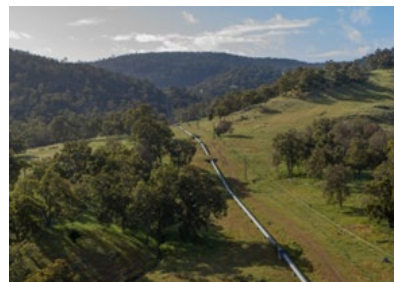
Water treatment



Sealed tanks and bores



Disinfection (chlorination)



Distribution systems protection (including chlorine residuals)

Water Safety Plans

A water safety plan is a comprehensive risk management document that lays out all scheme information pertinent to the safety of a drinking water scheme, including a schematic of the system, how the scheme operates, critical control point and minimum sampling requirements, incident management and key contacts.

Having a water safety plan for each of our schemes is a large part of implementing the Framework. Our water safety plans provide a comprehensive review of each water supply scheme. Using a systematic risk management approach, we assess the risks to each water supply scheme from water source to water meter. This ensures appropriate preventative measures, and all pertinent barriers are in place and identifies the operational controls necessary to guarantee the safety of our drinking water supplies.

We routinely review all water safety plans to re-evaluate the risk, update any site or treatment details, and determine actions to reduce risks or improve performance. During 2023-24, 48 water safety plans from schemes across the state were fully reviewed, and 158 water safety plans were updated to include recent capital upgrades and other modifications to those schemes.

We are continually seeking to improve the water safety planning process to ensure relevant risks are captured, and the process is streamlined and efficient.

Figure 9: Multiple barriers for drinking water quality protection

Training and awareness

Water Corporation has a well-established operator training program which recently included the addition of a new Training Centre at Shenton Park and a New Starter Induction Block (NSIB), where trainees receive intensive two-week training when onboarded. All employees have a detailed online Learning Plan accessible via the intranet, and the learning plan is customised to each employee, therefore ensuring training is aligned to the role being performed, and that assigned training is monitored and managed effectively to ensure competence, safety, wellbeing, and compliance.

Also central to Water Corporation's operator competence is a nationally recognised water industry certification program (Certificate II, III or IV in Water Industry Operations), a Verification of Competence program, plus overarching training in everything from safety and environment to personal growth and development.

The nationally recognised water industry certification program is developed and delivered entirely inhouse and overseen through an auspicing arrangement, with North Metropolitan TAFE as the registered Training Organisation.

A key theme within the certification program is the inclusion of knowledge and skills centred on achieving employee awareness and training as per element seven of the Drinking Water Quality framework (refer to *Drinking water quality risk management*, page 19).

General employee awareness of one of our core business processes, providing safe drinking water, is also captured through various initiatives such as the eLearning module 'Water Quality Awareness', which is a mandatory requirement for all staff.

Training is complex and constantly evolving and improving, as demonstrated by the NSIB. The complexities include the coordination of all training required across the organisation with the challenge of vast distances and remoteness, sourcing providers, managing logistics and communicating broadly with stakeholders to support them in risk reduction and alignment with legislation, guidelines, and internal policy and standards.

Water Corporation strives to be a leader in operational training and continue to explore technologies like visual intelligence that can provide hands free point of vision capabilities, use of eLearning to supplement existing face-to-face courses and expand virtual delivery capability. We are continuing to invest in developing our workforce through plans to develop a simulated experiential learning hub at the Shenton Park training centre and participating in benchmarking processes and systems across Australia, with excellent results.



Figure 10: Learning hub at Shenton Park

Source protection

What is source protection and why do we protect our drinking water catchments?

Source protection is the protection and management of our drinking water catchments in a multiple barrier approach to providing safe drinking water to the community.

A drinking water catchment (also termed public drinking water source area (PDWSA)) is an area of land where rainfall collects in rivers and streams that flow into reservoirs, or seeps into the soil to become groundwater where it is stored in underground aquifers. The captured water later becomes drinking water for the community. Our catchments provide a significant natural barrier to contamination.

The ADWG guiding principle one states:

“The greatest risks to consumers of drinking water are pathogenic microorganisms. Protection of water sources and treatment are of paramount importance and must never be compromised.”

By protecting our drinking water at the source, we minimise the risk of contamination and reduce the level of treatment required before it is supplied to the community. It is the most effective barrier to current and future water quality contamination. Primacy of source water protection is a crucial step for longer term water quality safety. The ADWG states:

“prevention of contamination provides greater surety than removal of contaminants by treatment, so the most effective barrier is protection of source water to the maximum degree practical”.

Within Western Australia, PDWSAs are gazetted under the *Metropolitan Water Supply, Sewerage and Drainage Act 1909* or the *Country Areas*

Water Supply Act 1947. Land development restrictions and by-laws may then be applied to control potentially polluting land uses and activities.

Three priority areas are established within PDWSAs, by DWER, to help guide land management decisions using a risk management approach.

- Priority 1 – the objective is to avoid unnecessary water quality contamination risks,
- Priority 2 – the objective is to minimise water quality contamination risks, and
- Priority 3 – the objective is to manage water quality contamination risks.

Prohibited Zones, such as Reservoir Protection Zones (RPZ), and Wellhead Protection Zones (WHPZ), may also be applied around reservoirs and bores to provide additional protection to those areas closest to the water supply.



Figure 11: Harding Dam catchment

How we protect our drinking water catchments

DWER is responsible for managing and protecting the state's water resources. The MoU for Drinking Water Source Protection between DWER and Water Corporation delegates the responsibility of catchment surveillance and by-law enforcement to Water Corporation.

We manage approximately 109 Drinking Water Source Areas (surface water and groundwater) which supply 251 localities across the state. Our [Drinking Water Source Protection Policy](#) guides catchment operations and highlights our commitment to the primacy of drinking water quality over other catchment land uses.

We operationalise DWER Drinking Water Source Protection Plans into catchment management strategies (CMS) which helps us to know and understand our surface water catchments and borefields. Each CMS includes a comprehensive hazard assessment which considers the risks to drinking water quality from land uses and activities within each catchment and recommends measures to prevent drinking water contamination. The CMS also identifies the operational and strategic requirements to ensure the source protection barrier is maintained within a catchment.

Additionally, in accordance with the 2011 ADWG, a process known as risk based observational monitoring (RBOM) is being progressively rolled out within our catchments across the state. The RBOM process gathers semi-

quantitative data which is used to inform operational responses and substantiate source risk levels.

We employ several strategies to effectively undertake drinking water source protection, including catchment surveillance, electronic surveillance (using vehicles, helicopters, and drones), the installation of physical barriers such as boom gates, fencing and signage, raw water sampling and community education.

Surveillance and by-law enforcement are key elements used to control potentially polluting activities in PDWSAs. In 2023-24, approximately 13,900 surveillance hours were undertaken state-wide with 189 by-law offence prosecutions, 21 infringements and 674 warning letters issued. Further information on drinking water catchment management and protection can be found on the [visiting our dams](#) or [drinking water quality](#) pages of our website or on the [DWER website](#).

Storage barrier

The reservoir in a surface water catchment acts as a storage barrier. A storage barrier promotes natural processes that reduce microbiological contamination and provides a potential buffer to minimise the impact of inflow variation on the quality of water stored in the reservoir.

Groundwater taken from a confined aquifer, with no linkage to surface water, naturally has large storage and detention times.

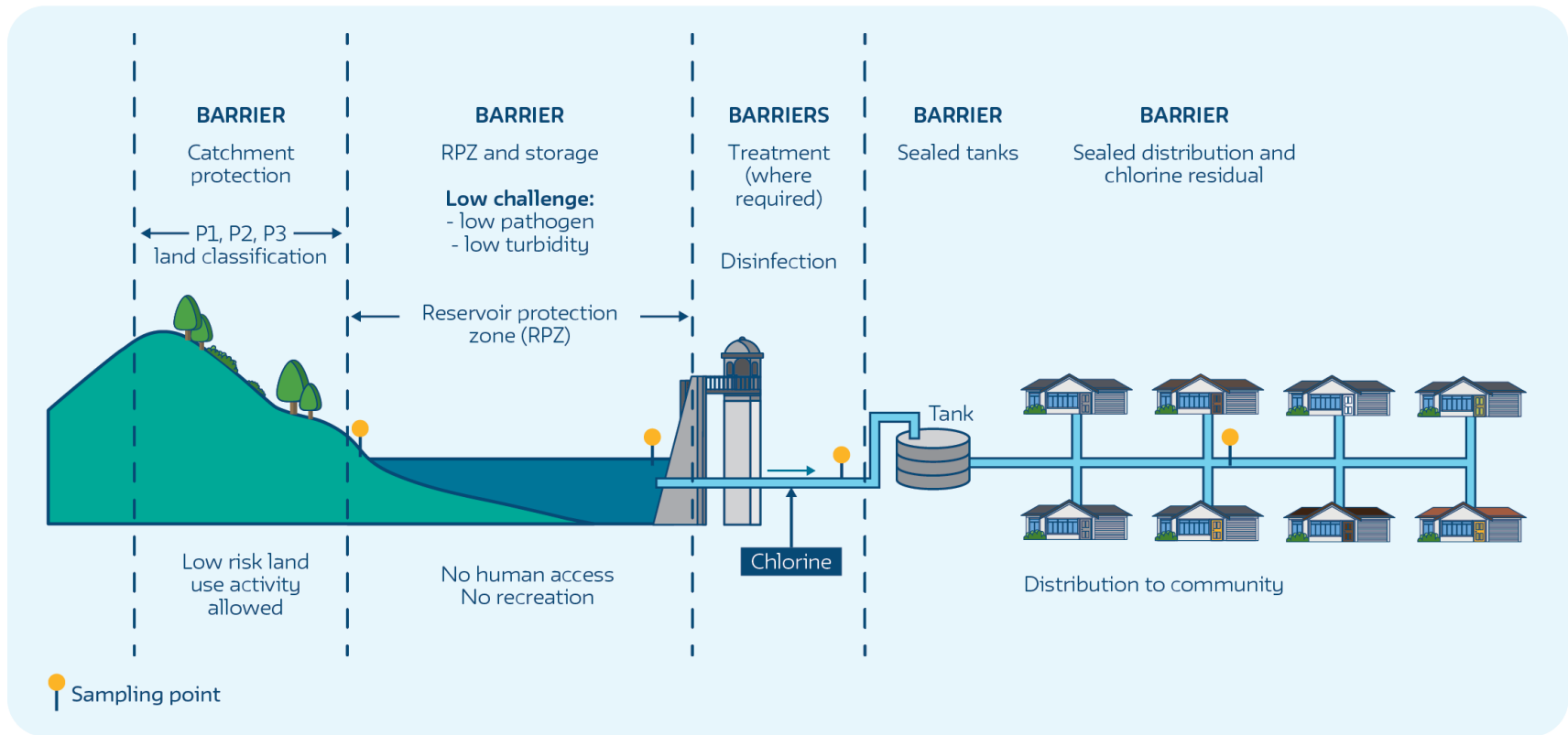


Figure 12: Surface water catchment – showing source (catchment) protection and additional multiple barriers

How is your water treated?

Water treatment

The water quality of each source specifically dictates the necessity and type of water treatment required. Where water comes from large water bodies or some groundwater supplied by fully protected catchment areas, very little treatment is required – often just disinfection (as per figure 13). In other cases, more intensive treatment processes may be required to ensure the drinking water delivered to every house is safe and aesthetically pleasing. From a water safety perspective, water treatment can sometimes be a key barrier in a multiple barrier approach to the management of our water supplies.

Groundwater, which is pumped from underground aquifers, can be treated to remove dissolved gases, iron, manganese, colour and turbidity using a combination of oxidation, coagulation, flocculation, filtration and clarification. In Perth, groundwater treatment plants at Jandakot, Wanneroo, Lexia, Mirrabooka, Neerabup and Gwelup oxidise the water (via aeration and/or chlorination) to increase the amount of dissolved oxygen and remove both carbon dioxide and hydrogen sulphide, and also precipitate iron and manganese. A coagulant (alum) is also added which increases the settling of fine particles caused by iron and natural organic matter. Clarified water then passes through sand filters to remove any

remaining particles. Similar processes occur in many country water schemes.

A crystallisation technology is used to reduce hardness (soften the water) at Neerabup Groundwater Treatment Plant.

Naturally occurring organic substances add colour to the water, which can increase taste and odour and provide precursors for disinfection by-products. Since 2001, we have used a water treatment technology known as MIEX® (magnetic ion exchange) to prevent an intermittent “swampy” odour that occurred in treated groundwater supplied to Perth’s northern suburbs. Unlike conventional processes, MIEX® resin more effectively removes components of dissolved organic carbon, the source of potential taste and odour, from drinking water.

Ultra-filtration

Ultra-filtration (UF) treatment is where source water is forced through a membrane. It is designed to remove suspended solids, bacteria, some viruses, and other pathogens to produce water with very high purity.

UF is being used to treat water at Wyndham, Harding Dam, Pemberton, Denmark, Walpole, Gascoyne Junction, Cranbrook, Frankland, Hopetoun, and Ravensthorpe.

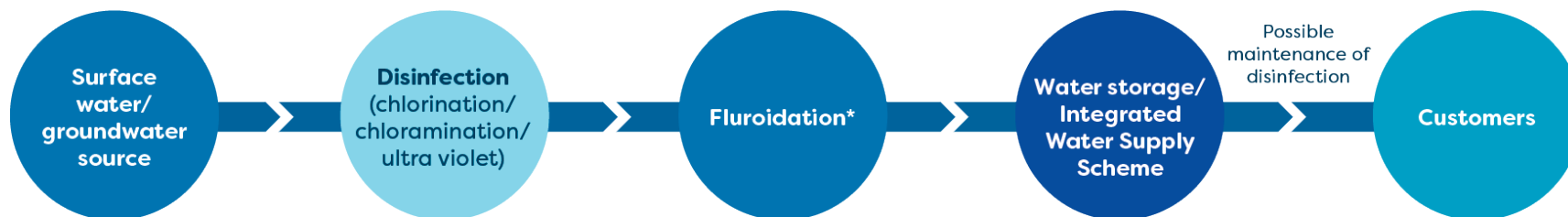


Figure 13: Example of a basic water treatment process. *(see Fluoridation section for those towns that have fluoride added to their water)

Desalination – Reverse osmosis (RO)

Seawater desalination is the removal of salt and impurities from seawater to produce fresh water. Our seawater desalination plants use an RO process. Seawater is pumped into the desalination plant from the ocean and passes through pre-treatment filtration to remove the majority of large and small particles.

The filtered seawater is then forced under pressure through semi-permeable membranes which reverses the osmosis process as it occurs in nature. The pores in the membranes are so tiny that salt, bacteria, viruses and other impurities are separated from the seawater; in essence they act like microscopic strainers. About half of the water that enters the plant from the sea becomes drinking water. The salt and other impurities removed

from the seawater are then returned to the ocean via diffusers, which ensure it mixes quickly to prevent impacts to the marine environment.

The desalinated water is then further treated to meet drinking water standards before it reaches our customers. Water Corporation has two large desalination plants, PSDP and SSDP which contributed 36 per cent of Perth's water in 2023-24 (refer to *Where does your water come from – Perth Metropolitan Region*, page 10).

RO is also being used to treat brackish (saline) groundwater at Denham, Gascoyne Junction, Coral Bay, Hopetoun, and Jurien Bay to improve water quality. We also have RO plants at Leonora and Laverton primarily to reduce nitrates (refer to *Understanding water quality test results – Nitrate*, page 36).

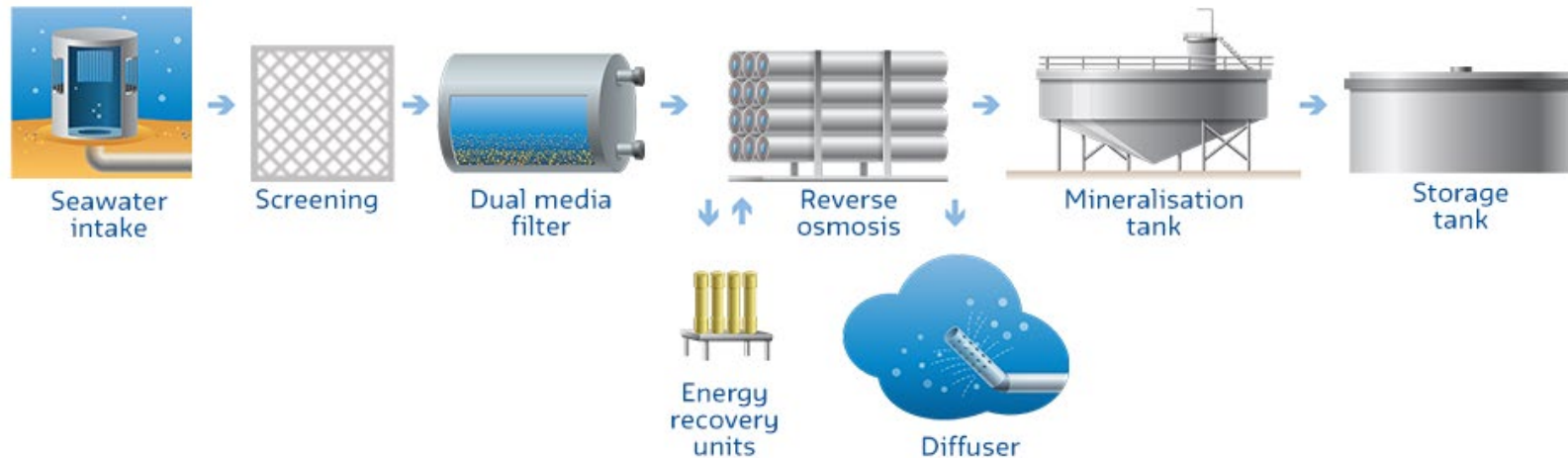


Figure 14: Typical desalination treatment process

Desalination – Electrodialysis reversal

EDR is a water treatment process in which electricity is applied to immersed electrodes to pull the naturally occurring dissolved salts through ion selective membranes, thus separating the water from the salts (the 'electrodialysis' part of EDR). The process produces a stream of fresh water and a much smaller flow containing the concentrated salts. The voltage on the electrodes is reversed every 15 minutes to reduce fouling of the membranes (the 'reversal' part of EDR).

EDR is an effective tool for removing nitrate and also reduces water salinity and hardness (improving water taste and soap lathering). As it only removes 'charged' particles, such as salts (NO_3^- , Na^+), from water, EDR does not remove micro-organisms or most naturally occurring organic compounds that could be present in the water. A separate water treatment step is required for this purpose. EDR is being used at Wiluna, Yalgoo, Mt Magnet, Cue, Sandstone, and Meekatharra.



Figure 15: Wiluna EDR plant

Water treatment for groundwater replenishment

Wastewater undergoes treatment at Beenyup Water Resource Recovery Facility before entering the Advanced Water Recycling Plant (AWRP). This treatment facilitates the removal of most chemicals and microorganisms such as nutrients, detergents, heavy metals, and bacteria.

Treatment at the AWRP (as shown in Figure 16) further reduces the levels of chemicals and microorganisms so that it meets, and in many cases exceeds, drinking water standards. Throughout the treatment process, the water is monitored to ensure strict water quality guidelines are met.

The water is then recharged into an aquifer where it mixes with the existing groundwater. Further treatment then occurs when it is abstracted for drinking water use.

Water quality monitoring

We have systems, processes, and regulations to ensure groundwater replenishment does not put public health or the environment at risk. These include:

- Water quality checkpoints (also known as critical control points) to ensure each stage of the plant works at an optimum level.
- If the water is not treated to a safe level when it reaches a checkpoint, the treatment process shuts down and water is diverted to the ocean outfall.
- The DoH set very strict water quality guidelines that the recycled water must meet at the point of recharge and in the aquifers.
- Independent, accredited laboratories test water quality samples to ensure they meet guidelines.
- Groundwater monitoring provides long-term evaluation of water and aquifer quality, as well as providing immediate notification to any changes to the groundwater environment.
- Independent third-party review of performance to ensure the quality management systems are operating to a level of best practice.

Advanced water treatment process

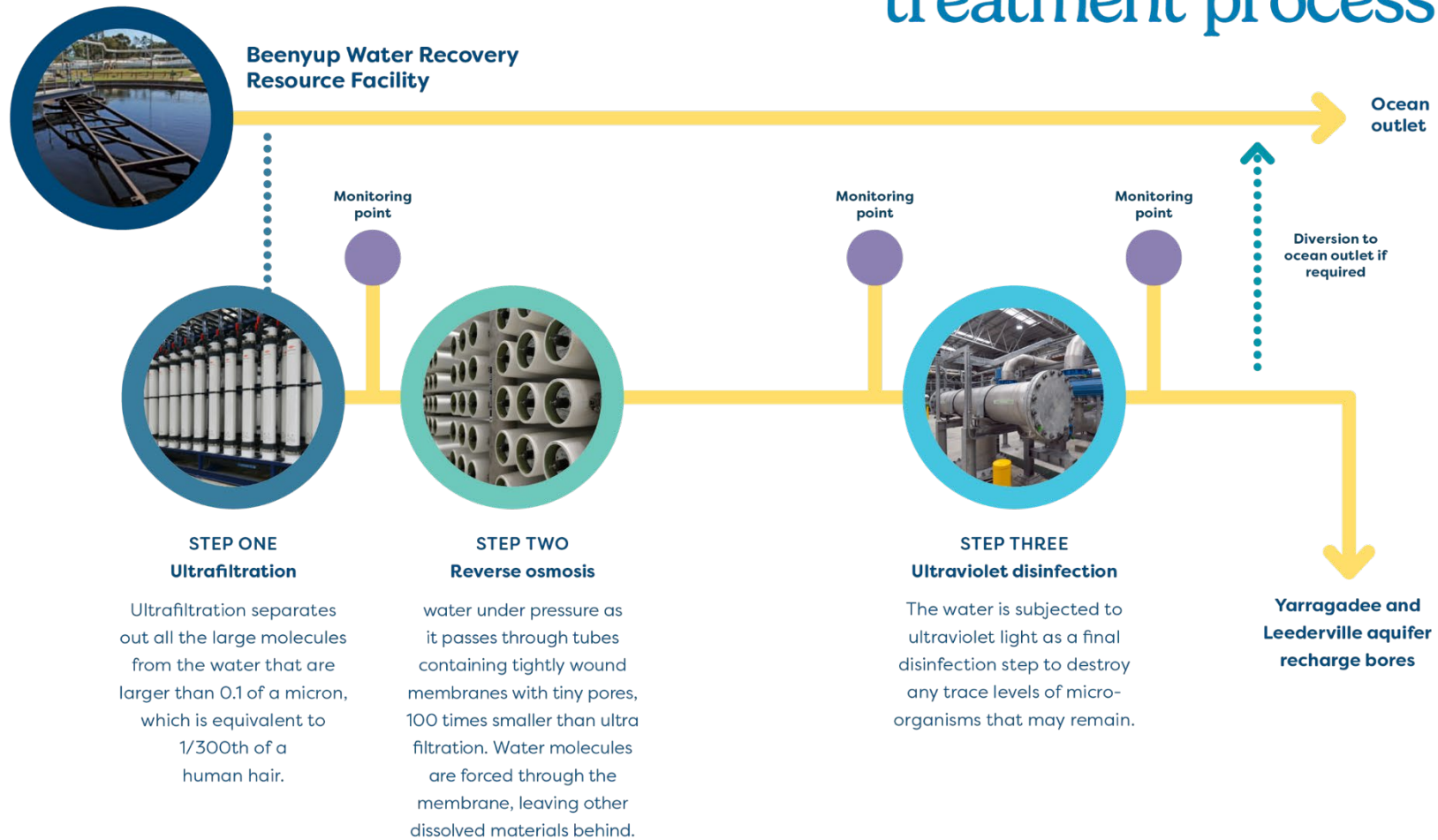


Figure 16: Advanced water treatment process

Disinfection – pathogen removal

Disinfection is undertaken to inactivate pathogenic microorganisms that can cause disease. All our drinking water supply schemes are disinfected with chlorine to protect us against waterborne pathogenic microorganisms. Chlorine is added to our water supplies in sufficient quantities for disinfection and to ensure a residual of chlorine is maintained, within a narrow range in the water. This ensures ongoing disinfection in the distribution system, with a minimal effect on the taste of our water.

For most of the GAWSS, which is an interconnected pipe network extending from Mundaring to large areas of the Goldfields and Agricultural Region, chlorine is combined with ammonia to produce monochloramine in a process called chloramination. Monochloramine is a longer lasting disinfectant, compared to chlorine alone, and is used to maintain a disinfectant residual along the length of the many long pipework extensions.

Ultraviolet (UV) light is used at some water treatment plants across the state for additional disinfection where there are increased microbiological risks from activities in the catchment.

Some schemes also use physical barriers, including media filtration or ultrafiltration, to remove pathogens from the treated water, as an additional pathogen removal step, where bulk pathogens may be present.

UV and filtration do not provide lasting pathogen barriers, so they are always used in combination with chlorination or chloramination.



Figure 17: Mundaring Water Treatment Plant UV

Fluoridation

In Western Australia, fluoridation of community water supplies is regulated by the *Fluoridation of Public Water Supplies Act 1966*, which is administered by DoH. The Fluoridation of Public Water Supplies Advisory Committee oversees fluoridation and makes recommendations to the Minister for Health who may issue or rescind a directive to fluoridate as appropriate.

Community water fluoridation is an important, cost-effective public health measure which plays a critical role in reducing dental decay and improving oral health.

Fluoridation of community water supplies is backed by authoritative health research agencies and government bodies worldwide, including the World Health Organization, the Australian Dental Association, the Australian Medical Association and the National Health and Medical Research Council.

Water fluoridation was introduced in Western Australia in 1968. Today, the vast majority of the state's population is provided with fluoridated drinking water, principally in the Perth metropolitan area and most regional centres, as well as a number of smaller communities supplied from the same source or treatment plant as regional centres.

The water fluoridation process involves adding either fluorosilicic acid or sodium fluoride, in a controlled manner, to result in fluoride levels within the required range, as specified by the directive. Purity and quality control standards for chemicals added to drinking water are strictly controlled by DoH.

Fluoridated water supplies are monitored continuously via an online fluoride analyser at the dosing point. Localities at which fluoride is added to the water are sampled at least weekly to confirm acceptable fluoridation performance, while other localities are sampled at least six monthly.

Some towns in Western Australia, for example Laverton and Onslow, have naturally occurring levels of fluoride in the water supply. In Dunsborough, fluoride is naturally high in the raw water and needs to be maintained below ADWG health guidelines through bore blending and de-fluoridation as required.

Fluoridation performance is reported quarterly to the DoH. The data tables in Appendix C show the localities that receive fluoridated water. More information is available on the [DoH website](#).

Chemicals and materials in contact with drinking water

The MoU between DoH and Water Corporation requires all chemicals and materials that come into contact with drinking water are AS4020 compliant or approved by DoH.¹ Water Corporation may utilise a self-assessment process, as agreed with DoH, and provide all information associated with the self-assessment to DoH.

All chemicals and materials that are approved by DoH, to be used for the provision of drinking water, are listed on the [DoH website](#).

¹ AS/NZS 4020:2018 – Testing of products for use in contact with drinking water.

Monitoring and incident management

Verification monitoring

In accordance with the ADWG, we run an extensive drinking water quality monitoring program to confirm the safety of the water we provide. In 2023-24, we took almost 72,000 water samples from water sources, treatment plants and pipe networks which supply our customers, and had more than 337,800 individual analyses performed by our contracted analytical laboratories.

All our water quality monitoring and reporting is coordinated through our water quality management system (WQMS). WQMS provides many aspects of water quality management and acts as the central database for all information on drinking water quality including sampling program design, sampling analysis, monitoring, and reporting.

Additionally, WQMS automatically issues alerts for results outside guideline and operational limits and prompts remedial action as defined by our water safety plans.

Microbiological, chemical, and radiological analyses are carried out by independent laboratories.

Critical control points

A critical control point (CCP) is a point in a drinking water supply scheme where control of a process can be applied and which is essential to prevent a hazard or reduce it to an acceptable level.

Every Water Corporation drinking water scheme has at least one CCP, including any process used for pathogen removal i.e., chlorination, chloramination, UV, and filtration (refer to *How is your water treated? – Disinfection – pathogen removal*, page 30). Water quality CCP operational

targets and limits are formally set through the water safety planning process and listed in the water safety plan for each scheme (refer to *Drinking water quality risk management - Water safety plans*, page 21).

We continuously monitor the performance of CCPs based on set target levels. Where issues are identified we strive to improve barrier robustness and performance.

Incident response

We are committed to protecting our water sources and supply schemes with multiple barriers and have plans in place to manage any issues with minimum impacts on water quality and the community.

We have a fleet of mobile UF and chlorination plants which allow us to restore high quality drinking water supplies in the event of a treatment plant failure or source water quality issues. Other treatment units, including an RO unit, are available for specialised applications.

A project to build two new, emergency, transportable, 500 kilolitre per day RO plants is due for completion early to mid-2025. The units could be utilised for both RO and EDR treatment plant interruptions, as well as source water quality issues, in particular salinity and nitrates.

In addition, we conduct incident scenarios with DoH to continually improve our incident management processes, as required by our MoU. These incident scenarios provide the opportunity for Water Corporation and DoH to work together through a mock event considering roles and responsibilities, possible responses to the event and technical and operational support that may be required from each agency.

Case Study – Horrocks – continuous electrochlorination

The small town of Horrocks, which has a population approximately 140 people, is a five-hour drive north of Perth. Its water, sourced from an aquifer several kilometres inland, is anaerobic, has high total dissolved solids, chloride, iron and manganese, and a pH level around 5.6, which is below the lower limit specified in the ADWG. It was this water quality mix that made Horrocks an ideal choice for development of the first ever, full-scale continuous electrochlorination (CEC) water treatment plant (WTP) for aesthetics oxidation and disinfection.



Figure 18: Horrocks WTP

CEC converts naturally occurring chloride, found in the raw groundwater, into hypochlorite by passing an electric current through it. Beneficial reactions and their advantages include:

- cell design allows reverse polarity, which means self-cleaning with no need for added chemicals.

- oxidation of dissolved iron, manganese, and other inorganic dissolved solids resulting in a reduction in discoloured water issues, TDS (salinity) and a slight increase in pH levels, reducing or eliminating the need for chemical pH correction.
- the process produces no sludge or by-products other than very small amounts of hydrogen.
- as it uses the chemicals already in the water it significantly reduces or eliminates entirely the need to manufacture and transport chemicals for use onsite. This reduces energy consumption, carbon emissions, operations and maintenance costs, and increases worker and community safety.

Overall the results have been extremely encouraging – so much so that the plant won the Australian Water Association Western Australia's [Infrastructure Project Innovation Award \(Regional\)](#), and went on to compete in the national finals.



Figure 19: Horrocks WTP CEC cells – pretreatment bank

Case Study – Mundaring Water Treatment Plant

Our GAWS scheme spans from Mundaring Weir, near Perth, to Kalgoorlie, almost 600 kilometres to the east. It is our largest scheme, consisting of 9,660 kilometres of pipeline (main conduit and smaller extensions) and supplying water to more than 100,000 customers. All towns between Perth and Kalgoorlie, including Northam, York, Merredin, Kellerberrin, Norseman, Dowerin, Beverley, and Coolgardie, and smaller towns to the north and south receive water from this scheme. Construction for this scheme began in 1898 and it was officially opened in 1903. It is considered to be the longest drinking water supply scheme in the world.



Figure 20: Dual Water Mains: Mundaring Weir to MWTP

The Mundaring Water Treatment plant (MWTP), which feeds the GAWS, is located on the side of the Darling Scarp, approximately 30 kilometres east

of Perth. This year, the plant reached an important milestone, celebrating 10 years of operation, supplying approximately 265 billion litres of drinking water to local suburbs (Sawyers Valley, Mundaring, and Mt Helena) and the GAWS.

The primary treatment objectives of the MWTP are removal and inactivation of pathogens, reduction of dissolved organic matter, removal of algal taste and odour compounds and toxins, and to provide improved residual disinfection with chloramination (refer to *How is your water treated? – Disinfection – pathogen removal*, page 30). The plant has the capacity to treat up to 165 million litres of water each day with zero discharges to the environment and sustainable reuse of the treatment waste, which is recovered and added to soil products to boost iron and manganese for plant growth.



Figure 21: MWTP

Understanding water quality test results

The following summaries are intended to assist you with interpreting the results presented in Appendix C of this report. Additional information can be obtained by referring to the Fact Sheets contained in the ADWG published by the National Health and Medical Research Council.

The tables in Appendix A show the guideline values for all parameters included in the *Summary of test results* in Appendix C.¹ For the purposes of this report, all data are assessed in relation to the ADWG unless otherwise stated.

Escherichia coli (E. coli)

Most human pathogenic microorganisms are found in the gut and faeces of humans and other warm-blooded animals. The bacteria *E. coli* is found in abundance in the intestine of humans and other warm-blooded animals. While most *E. coli* species are not pathogenic to humans, they indicate possible recent contamination by human or animal faecal waste. As it is impractical to test for the presence of all pathogenic microorganisms in water, the ADWG recommends testing for the microbial indicator bacterium *E. coli* to indicate the presence of faecal contamination or pathogenic organisms.

We employ a multiple barrier approach to prevent microbial contamination of water supplies (refer to *Multiple barrier approach to risk management*, page 20), however, if there is an *E. coli* detection it is immediately addressed to ensure the water supplied is safe.

¹ ADWG defines these as the concentration or measure of a water quality characteristic that, based on present knowledge, either does not result in any significant risk to the health of the consumer (health guideline), or is associated with good quality water (aesthetic guideline value).

Thermophilic *Naegleria*

Naegleria are free living amoebae which are almost ubiquitous, being found in fresh water, soils, and sediments. They are not associated with human waste. They grow more freely in waters between 27 to 46°C but may survive for long periods in cyst form in much colder waters and, under certain conditions, may proliferate in pipework and tanks. As they proliferate in warmer water they are referred to as thermophilic or *Naegleria* tolerant to 42°C. This organism is safe to drink but the species *Naegleria fowleri* can cause the disease primary amoebic meningoencephalitis if it enters the body, under pressure, through the nose. Adequate levels of chlorine or chloramine can control *Naegleria* in water. Any detection of thermophilic *Naegleria* is responded to immediately to ensure the potential risk to public health is managed and to ensure the water supplied is safe.

Fluoride

Fluorine is one of the most abundant elements in the Earth's crust and is typically found as the fluoride ion or as organic or inorganic fluoride compounds. It is found naturally in groundwater supplies and is present in most food and beverage products and toothpaste. Additional fluoride is added to a number of water supplies in Western Australia as directed by the Minister for Health (refer to *How is your water treated? - Fluoride*, page 35). While the ADWG health guideline value is 1.5 mg/L, the fluoride concentration after dosing should not exceed the range set by the Fluoridation of Public Water Supplies Advisory Committee, to a maximum limit of 1 mg/L.

Nitrate

In Western Australia, elevated nitrate concentrations are usually due to the natural process of plant decay that has occurred underground over geological time. Some agricultural practices have also led to elevated nitrate concentrations of underlying groundwater. The ADWG specify a health guideline for nitrate of 50 mg/L (as nitrate) for bottle-fed infants less than three months old and a guideline of 100 mg/L for adults and children over three months old. Health effects due to elevated nitrate concentrations in drinking water are very rare and no issues have been recorded in Western Australia.

All our water supplies meet the ADWG guideline limit for adults and children over three months. We currently have infant nitrate exemptions from DoH for 10 towns in the Mid West and Goldfields and Agricultural regions: Wiluna, Yalgoo, Leonora, Laverton, Menzies, Cue, Meekatharra, Mt Magnet, Sandstone and New Norcia (see Schedule 2 of our [MoU with DoH](#)). The Community Health Nurse, in each town with an infant nitrate compliance exemption, provides advice to mothers regarding the use of alternative water for the preparation of bottle feeds. We provide bottled water free of charge via the Community Health Nurse to these towns as required.

Following treatment or operational intervention, all these towns are operating below the infant health limit for all sampling. Final sign-off from DoH on the surrender of exemptions for 5 towns is pending.

Trihalomethanes

Trihalomethanes (THMs) may be present in drinking water, forming as a by-product of disinfection using chlorination (and chloramination to a much lesser extent). We are required to comply with the ADWG health guideline of 0.25 mg/L expressed as an average long-term exposure. For the

purposes of this report, THM compliance is assessed comparing the guideline with the mean annual THM concentration.

Alkalinity (as calcium carbonate)

Alkalinity is a measure of the parameters in water that have acid-neutralising ability, typically expressed in mg/L of equivalent calcium carbonate. Alkalinity can be affected by naturally occurring minerals or water treatment chemicals. Sufficient alkalinity, in conjunction with other parameters, is important to managing the corrosivity of water. There are no aesthetic or health considerations for alkalinity, therefore the ADWG do not provide a guideline value.

Aluminium (acid-soluble)

Acid-soluble aluminium in water primarily originates from the addition of coagulants such as aluminium sulphate or poly-aluminium chloride in the water treatment process. These coagulants are added to aid the removal of constituents that impart colour and particulate matter that causes turbidity. Aluminium can accumulate in pipe sediments and be re-suspended during periods of rapid changes to flow patterns. The ADWG specify an aesthetic guideline of 0.2 mg/L. No health guideline is set.

Chloride

Chloride is present in natural waters from the dissolution of salt deposits. In surface water, the concentration of chloride is typically less than 100 mg/L while groundwater can have higher concentrations, particularly if there is saltwater intrusion. In Australian drinking water supplies, chloride levels range up to 650 mg/L depending on local water source characteristics.

Chloride is essential for humans and animals. It contributes to the osmotic activity of body fluids. Based on aesthetic considerations, the chloride concentration in drinking water should not exceed 250 mg/L (ADWG).

Hardness (as calcium carbonate)

Hardness is caused by the presence of dissolved calcium and magnesium in water. Hard water requires more soap to obtain lather and can also cause scale to form on hot water pipes and fittings. It can also be an important issue to consider when purchasing appliances, such as dishwashers. The ADWG specify an aesthetic hardness guideline of 200 mg/L.

Table 1: ADWG guidance – Degrees of hardness

Hardness (mg/L)	Properties
< 60	Soft and possibly corrosive (depends on pH, alkalinity, and dissolved oxygen concentration)
60 – 200	Good quality for all domestic uses
200 – 500	Will increase scale formation
> 500	Will cause a high-level scaling

Iron

Iron occurs naturally in water from contact with iron-containing soil or rock in the catchment. It can accumulate in pipe sediments and be re-suspended during periods of rapid changes to water flow patterns. Elevated concentrations cause discoloured water and can stain laundry. The ADWG specify an aesthetic guideline of 0.3 mg/L, though we aim to manage below this guideline value due to customer impacts.

Manganese

Manganese in water can come from contact with manganese-containing soil or rock in the catchment. It can accumulate in pipe sediments and be re-suspended during periods of rapid changes to water flow patterns.

Elevated manganese can make water look black and stain laundry. The ADWG specify an aesthetic guideline of 0.1 mg/L, though we aim to manage below this guideline due to customer impacts. Manganese also has a health guideline value of 0.5mg/L. For further information regarding guideline levels for other metals relevant to drinking water, refer to Appendix A, page 48.

Per- and poly-fluoroalkyl substances

Per- and poly-fluoroalkyl substances (PFAS) are manufactured chemicals that do not occur naturally in the environment. They have been used since the 1950s in a range of common household products including clothing, carpets, paper, food wrappings and cosmetic products as well as in industrial products including firefighting foams and hydraulic fluids. As a result of widespread use, PFAS have been found to be present in low levels in soils, surface water and groundwater in most urban areas around the world, including in Western Australia.

In August 2018, the ADWG were amended to incorporate two PFAS health-based guideline values for three PFAS chemicals. These are 0.07 micrograms per litre (µg/L) for combined perfluorooctane sulfonate and perfluorohexane sulfonate (PFOS and PFHxS) and 0.56 µg/L for perfluorooctanoic acid (PFOA).

Most Water Corporation drinking water source catchments are well protected and exclude activities that may introduce PFAS into the drinking water. However, we have conducted a risk assessment, in conjunction with DoH, based on land uses and source characteristics for all drinking water catchments to determine which are more likely to have the presence of

PFAS. We have undertaken a targeted PFAS sampling program across our catchments and reporting sampling results to the DoH and DWER.

Since PFAS sampling commenced in 2019-20, detections have generally occurred at locations where land uses have been less compatible with comprehensive water source protection. At these locations water is managed to maintain supply to customers below ADWG health guideline levels. Further information can be found on the Water Corporation website.

We have also engaged with research partners to better understand the risks associated with PFAS.

The NHMRC are expected to release draft amended PFAS guidelines by the end of 2024. Once these are incorporated into the ADWG they will need to be endorsed by the DoH prior to their adoption in Western Australia.

pH

pH is a measure of water acidity (pH 7 is neutral). The ADWG specify a lower and upper aesthetic value of 6.5 and 8.5, respectively, based on the need to reduce corrosion and scale build-up within pipes and fittings. The guidelines allow for a pH of up to 9.2 for new concrete tanks and cement-lined pipes, which can significantly increase the pH for a short period of time. Elevated pH is often caused by calcium carbonate leaching from the protective cement lining of the pipes after long transit times. Where low pH is experienced, it is typically a consequence of the source characteristic rather than the influence of treatment.

Additionally, the GAWS is operated at a higher pH range due to monochloramine (the primary disinfectant of the GAWS) having improved stability at elevated pH, and the lower concentrations of hardness in the source water presenting a lower risk of scale deposition at this pH level (refer to *How is your water treated? – Disinfection pathogen removal*, page 29).

Silica

In Australia, dissolved silica (SiO_2) can range between 0.6 mg/L in some surface waters to 110 mg/L in ground waters. Dissolved silica can precipitate on some surfaces forming a white residue. In cases where customer complaints occur due to scale build-up, water hardness and silica concentrations are often identified as the primary cause. There are no adverse health considerations associated with silica in drinking water, but to minimise scale build-up on surfaces silica should not exceed 80 mg/L (ADWG).

Sodium

Sodium is widespread in water due to the high solubility of sodium salts and the abundance of mineral deposits. In major Australian reticulated supplies, sodium concentrations range from 3 mg/L to 300 mg/L. While sodium is essential to human life, there is no agreed minimum daily intake level. Based on aesthetic considerations, the concentration of sodium in drinking water should not exceed 180 mg/L (ADWG).

Sulfate

The presence of sulfate in groundwater is due to natural leaching from sulfate containing rocks. In major Australian reticulated supplies, sulfate concentrations range from 1 mg/L to 240 mg/L. The taste threshold for sulfate is 250-500 mg/L. Based on aesthetic considerations, the concentration of sulfate in drinking water should not exceed 250 mg/L (ADWG).

Total Dissolved Solids

Total dissolved solids (TDS) is the sum of all filterable substances in water and comprises salts, such as calcium, magnesium, potassium, sodium bicarbonates, chlorides, and sulphates, as well as small amounts of

organic matter that dissolve in water. TDS is traditionally measured gravimetrically, however, as volatile organic compounds are lost by this method, we use the analytical method referred to as Total filterable solids by summation (TFSS). In this method the constituents of TDS are measured individually and summed.

Water with low TDS can taste flat, while water with high TDS tastes salty and causes scaling in pipes, fittings, and household appliances. The ADWG provide guidance on the palatability of drinking water according to TDS concentration, as shown in Table 2.

Table 2: ADWG guidance – TDS concentration and drinking water palatability (*The ADWG guideline of 600 mg/L is based on taste.*)

TDS (mg/L)	Palatability
0 – 600	Good quality
600 – 900	Fair quality
900 – 1200	Poor quality
> 1200	Unpalatable

True colour

Colour in water originates mainly from natural materials, such as organic matter and minerals, following water drainage through soil and vegetation in a catchment. Corroding metal pipes can also discolour the water, with iron producing a brownish colour and copper a faint blue colour. The ADWG specify an aesthetic guideline of 15 Hazen Units. Water Corporation measures true colour in True Colour Units (TCU) which are numerically identical to Hazen Units. As a guide, 15 TCU is just noticeable in a glass of water.

Turbidity

Turbidity is the cloudy appearance of water caused by the presence of suspended particulate matter. The ADWG specify an aesthetic guideline of 5 Nephelometric Turbidity Units (NTU) which is just noticeable in a glass of water.

Sampling parameters

Appendix A contains a list of regularly sampled parameters within functional groups and their respective health and/or aesthetic guideline values.

Our performance

Health related performance

In 2023-24 we achieved a microbiological performance of 99.6 per cent of Perth and regional localities complying with *E. coli* and 100 per cent for thermotolerant *Naegleria* requirements (see figure 18). We had a non-compliance associated with an *E. coli* detection in one locality (refer to data tables in Appendix C for details). Response protocols were implemented in accordance with DoH requirements. Scheme review and performance was presented to the DoH, with an agreed position that there was continuous supply of safe drinking water to the locality.

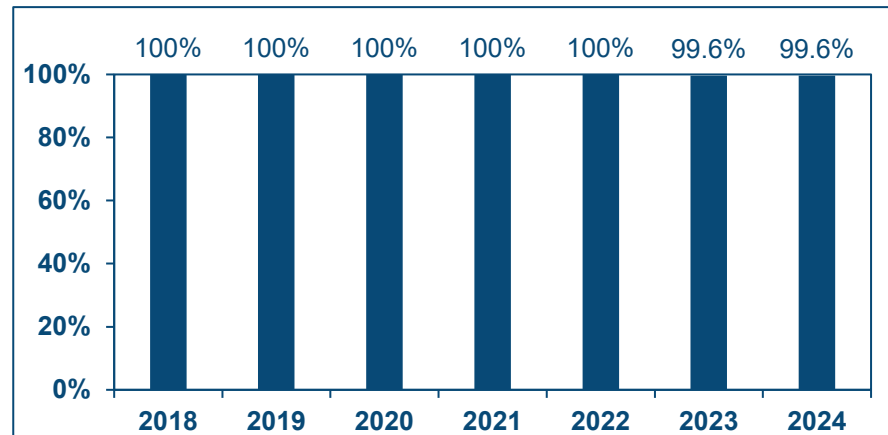


Figure 22: Seven-year microbiological performance (*E. Coli* and *Naegleria*)

We achieved 100 per cent for chemical health performance (see figure 19). For this report, the target is achieved if the yearly average concentration for each chemical is less than the guideline value (refer to *Understanding water quality test results*, page 35).

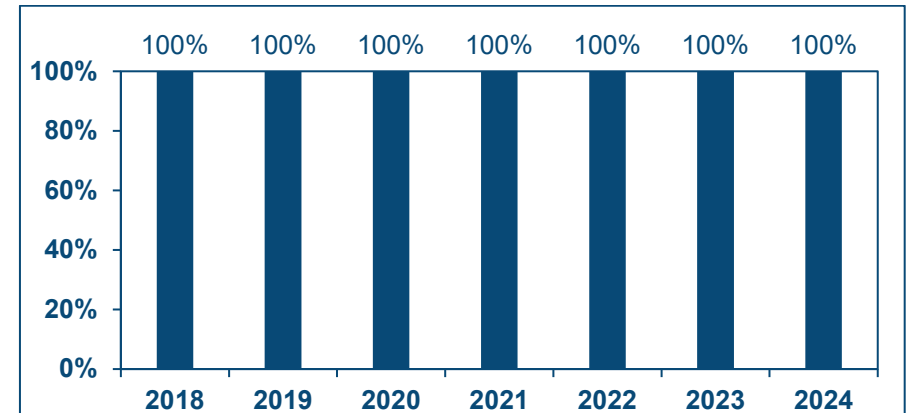


Figure 23: Seven-year chemical health performance

In 2023-24 we had a non-compliance associated with a radiological performance criterion in one locality (refer to data tables in Appendix C for details). Response protocols implemented in accordance with DoH requirements demonstrated continuous supply of safe drinking water to the locality.

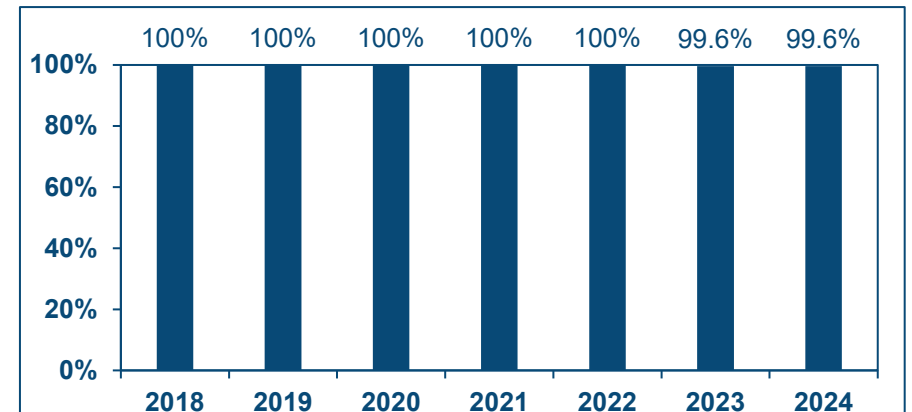


Figure 24: Seven-year radiological health performance

Non-health (aesthetic) related performance

While we strive to meet the ADWG for aesthetic characteristics, this is very difficult to achieve in a state as vast as Western Australia with such diverse water sources. We are committed to improving all aspects of drinking water quality, however, improvements in aesthetic water quality can be very costly and are often hard to achieve.

Detailed performance review for 2023-24

Appendix C provides a detailed summary of test results for each scheme throughout the state. In 2023-24, there were 158 out of 251 schemes where the mean concentration for the year for all aesthetic parameters was less than the aesthetic guidelines. Our performance for all aesthetic analyses (alkalinity, aluminium, true colour, hardness, iron, manganese, pH, TDS, turbidity, sodium, chloride, and silica) across our 251 schemes was 92 per cent, with 8,817 out of 9,568 analyses complying with the aesthetic guidelines.

The results in Appendix C show a small number of exceedances above the guidelines in aesthetic quality. These exceedances are caused by the unique quality of local sources, lack of alternative sources, impact of the drying climate on groundwater production and abstraction from groundwater in proximity to the coast.

For many schemes, these excursions have no, or minimal, influence on the taste of the drinking water (refer to *Understanding water quality test results*, page 35).

Customer expectations

Customer contacts

Water quality related customer contacts (enquiries and complaints) are recorded and monitored continuously to identify any trends and areas for improvement. In 2023-24, our Operations Centre received 7,191 water quality related customer contacts (compared with 7,224 in 2022-23), of which 7,103 were customer enquiries and 88 were related to complaints. Figure 25 shows the category of water quality contacts and their proportion of the total. Note: miscellaneous contacts are predominately related to water hardness).

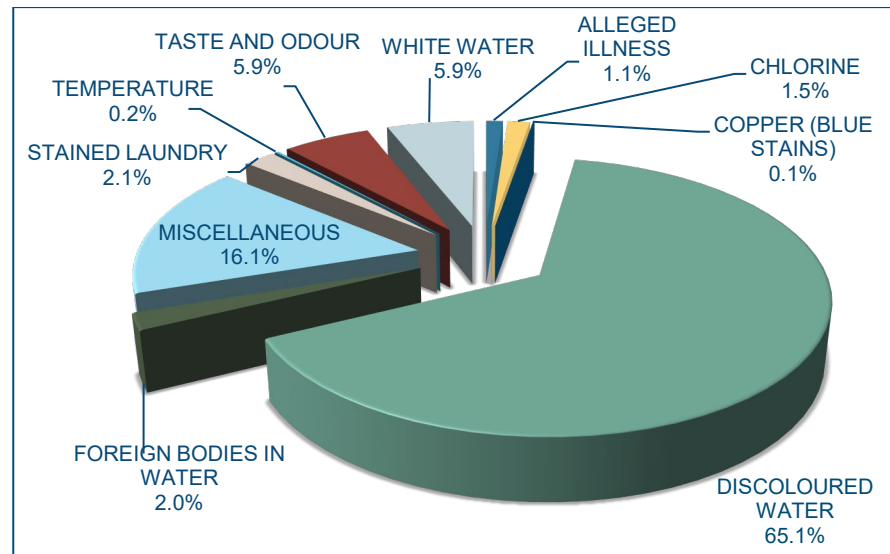


Figure 25: Water quality contacts profile 2023-24 (N=7,191)

Faults responsiveness

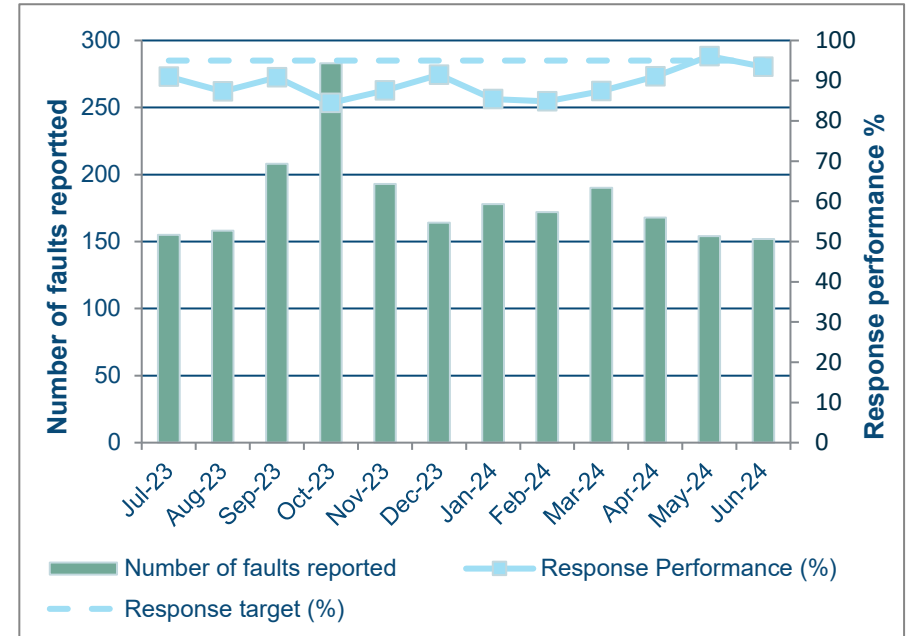


Figure 26: State-wide response performance to water quality faults

For contacts related to water quality faults our customer charter states we will respond within two hours or at an agreed time. We have an agreed customer and business target to achieve this at least 95 per cent of the time. We responded to an average of 88.9 per cent of recorded faults within two hours or at an agreed time (as shown in figure 26, the state-wide monthly faults responsiveness).

Customer research

We measure community perceptions of the quality of drinking water through our quarterly customer value survey.

In our survey, customers are asked to rate the quality of the water supplied to their home in the following categories:

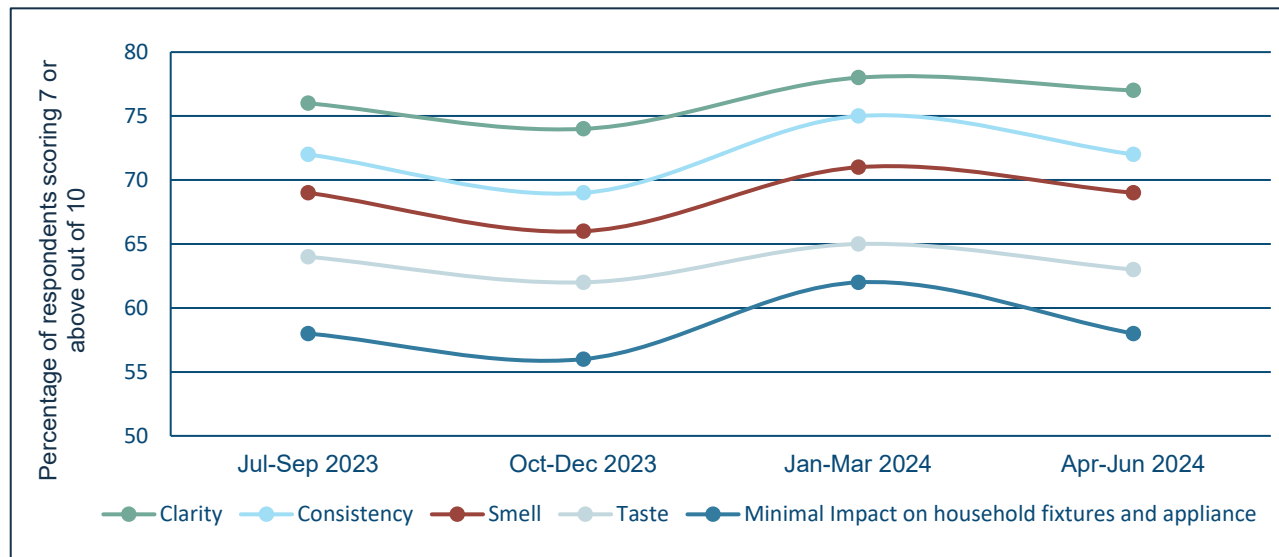
- Overall impressions - thinking about the water that comes out of the tap, how would you rate the quality of the water supplied to your home?
- How would you rate:
 - The clarity/ colour of the water

- Providing a consistent level of water quality
- The smell of the water
- The taste of the water
- The water's impact on household fixtures and appliances (e.g., shower screens, kettles)

The results, shown in Table 3, show the percentage of respondents who score us a 7 or above out of 10 (on a 10 point scale) for each survey question.

Refer to *Improving your water quality*, page 44, for information on improvements we have been making to water safety and aesthetics.

Table 3: Water quality customer perceptions research



Improving your water quality

Monitoring and reporting improvements

We are continuing to strengthen the performance of our operational monitoring and critical control point compliance. These key operational and monitoring requirements are detailed within scheme water safety plans which we update regularly and review in detail on a routine basis (refer to *Drinking water quality risk management – Water safety plans*, page 21). Day to day monitoring and responding to CCPs and other water quality issues is a key part of our business, and we have a dedicated team working with our operational stakeholders to undertake this function (refer to *Monitoring and incident management – Critical control points*, page 32).

Our state-wide chlorination program continues, focusing on upgrading critical chlorinators to the latest SCADA standards. These improvements will ensure enhanced alarming, automation and reporting capability.

Water quality capital improvements

Our program of water quality capital improvements ensure robust multiple barriers are in place from water source to water meter for all our schemes. Some examples of work undertaken this year are described below.

Perth Metropolitan

Due to declining rainfall, a growing population, and a decreasing groundwater allocation, Perth will soon require a new major water source.

The new Alkimos Seawater Desalination Plant (ASDP) will be built on Water Corporation owned land, next to the existing Alkimos Wastewater Treatment Plant, within the Alkimos Water Precinct.

Preparations for construction of the ASDP commenced in late 2023. Stage 1 of the plant will supply up to 50 billion litres of drinking water per year, with a future stage 2 increasing the plant capacity to 100 billion litres per year. First water production is planned for 2028.

We will source 400 megawatts of renewable energy from Western Australian renewables projects.



Figure 27: Artist impression of ASDP stage 1 and 2

For more information refer to: [Alkimos seawater desalination plant project](#).

South West Region

The project to build a new six million litre tank in Collie continues to progress. This project will provide storage for Collie and allow the removal of Worsley Tank, which requires intensive monitoring and management to maintain water quality, from the GSTWSS; thus, reducing water quality risk in Collie and Allanson and significantly reducing water wastage.

A project to install a brand-new chlorinator at Peppermint Grove is progressing. This project will improve operability as well as improve chlorine residual maintenance for Peppermint Grove,

The Warren Blackwood Groundwater Treatment Plant continues to progress. The treatment plant will remove iron and manganese from bore water at Nannup, which supplies over 75 per cent of water to the Warren Blackwood Regional Water Supply Scheme. Currently the water is pumped to Millstream, Tanjannerup, and Manjimup Dams to allow these naturally occurring elements to settle out prior to the water being used by the schemes. By removing these elements through treatment, the dams can be bypassed, and the water can be pumped directly into the scheme. This will reduce the amount of water lost to evaporation. Currently, Millstream Dam loses almost 35 per cent of its inflow to evaporation while Manjimup Dam loses almost 60 per cent.



Figure 28: Millstream Dam

In the Dunsborough Regional Water Supply Scheme, six additional water sample points were installed to monitor the water quality within each supply zone.

North West Region

A project is progressing at Halls Creek to increase source capacity by equipping five new production bores. These higher quality new bores will be used to supply the scheme reducing or removing the need to supplement water from bores with lesser water quality. It is anticipated these bores will be online by 2026.

At Fitzroy Crossing, two granular activated carbon filters are used to treat raw water, these, and their associated pipework, were replaced with new filters and pipework to continue to provide safe drinking water to the community. This work was completed in November 2023.



Figure 29: Granular activated carbon filters at Fitzroy Crossing

Construction of a desalination plant at Onslow continues and will result in a new high-quality water source for customers. This desalination project is due to be providing desalinated water to the community, supplementing the Cane River borefield supply, in 2026.



Figure 30: Conceptual image of Onslow Desalination Plant

In Wyndham, work is underway to refurbish the Mt Dixon 4.5 million litre tank. On inspection, the tank was found to have corroded roof sheets, presenting a risk to the water quality. A temporary tank will be used to enable bypass of the tank during installation of a new roof.

A new section of intake pipework was fabricated and fitted to the offtake structure at Moochalabra Dam in September 2023, providing ongoing reliability of supply to customers in Wyndham.

Goldfields and Agricultural Region

A small project is underway to install a new chlorinator at Muntadgin to improve disinfection residual maintenance for the scheme, it is anticipated that this will be in place by 2025.

Improvements to our monitoring, operation, and control of chemical dosing and monitoring assets are progressing. Installation of more advanced analysers throughout the system has enabled more control of operations and data visibility along the Goldfields pipeline and its extensions. These advanced analysers that have the capability of measuring four water quality parameters, therefore providing water quality information critical for chloramination management. We have recently added advanced analysers at Quairading, Narembeen, Ballidu, and Kalanie.



Figure 31: Advanced analyser installed on GAWS

We maintain trailer mounted mobile chlorine dosing units for use along the GAWS. These units are able to apply a chlorine dose directly into the pipeline and allow for targeted disinfection of pipeline extensions. The original unit was developed during an incident several years ago. Following this event, we invested in more of these mobile dosing units to better manage the water quality within the GAWS.



Figure 32: Mobile chlorine dosing unit

Mid West Region

Historical nitrate and aesthetic water quality issues at Cue, Sandstone, Mt Magnet and Meekatharra have been addressed via EDR water treatment. The water treatment plant at Mt Magnet commenced Operation in 2020, with Cue and Sandstone coming online in 2021, and Meekatharra in 2022.

A new chlorinator will be installed at Nilgen, resulting in an increased ability to manage disinfection and residual maintenance at this small scheme. It is expected to be delivered in 2026.

Integration of the Sovereign Hill and Guilderton water supplies is underway to improve customer reliability and address the issue of rising nitrate levels within the area. The project, to construct a pipeline between the two localities, is scheduled for completion in 2025.

A project has recently commenced to build a tank to replace the existing, open Allanooka Reservoir, which is supplied from the Allanooka and Mt

Hill Borefields. The project will reduce the pathogen risk associated with open reservoirs and improve water quality for the greater Geraldton scheme, the project is expected to be delivered by 2029.

Great Southern Region (GSR)

A new source investigation is underway for Walpole, a trial of three new bores was undertaken over the 2023-24 summer as part of plans to secure a sustainable supply of high-quality drinking water into the future.

Engineering design for three new tank projects will commence soon, new tanks will be located at both Narrogin and Wickepin and one will be located at Katanning. The tanks will enable removal of the last two remaining open reservoirs within the GSTWSS network, Bottle Creek Reservoir and Pinwernying Dam. Once removed, pathogen risk will be reduced, and we should see improved water quality throughout the extensive pipeline.

Investigations are being completed for new water source options to maintain a reliable drinking water supply via the LGSTWSS into the future. The current options include new groundwater sources and local seawater desalination. Community consultation and environmental investigations are underway. A decision is planned for 2025 following a detailed analysis of data and results on the options.

The project to install a new chlorinator upstream of the offtake to Tincurrin to improve disinfection was completed this year.

A project to install a new advanced water treatment plant (ultrafiltration) at Cranbrook is now complete. This has improved the quality and reliability of the water supply for this scheme.

Appendix A – List of sampling parameters

Table 4: Pesticides

Pesticide	Health Guideline Value (µg/L)
2,4-D [(2,4-dichlorophenoxy) acetic acid]	30 µg/L
Aldicarb	4 mg/L
Aldrin + Dieldrin	0.3 µg/L
Ametryn	70 mg/L
Amitraz	9 mg/L
Amitrole	0.9 mg/L
Asulam	70 mg/L
Atrazine	20 µg/L
Azinphos-methyl	30 µg/L
Bioresmethrin	100 mg/L
Bromacil	400 mg/L
Bromoxynil	10 mg/L
Carbaryl	30 mg/L
Carbendazim	90 mg/L
Carbofuran	10 mg/L
Chlorantraniliprole	6000 mg/L
Chlorfenvinphos	2 mg/L
Chlorothalonil	50 µg/L
Chlorpyrifos	10 µg/L
Chlorsulfuron	200 mg/L
Clopyralid	2000 µg/L
Cyfluthrin	50 µg/L
Cypermethrin	200 µg/L
Cyprodinil	90 µg/L
DDT (total isomers)	9 µg/L
Deltamethrin	40 µg/L

Pesticide	Health Guideline Value (µg/L)
Diazinon	4 µg/L
Dicamba	100 µg/L
Dichlobenil	10 mg/L
Dichloroprop	100 mg/L
Dichloropropene	100 mg/L
Dichlorvos	5 mg/L
Diclofop-methyl	5 µg/L
Dieldrin	see Aldrin
Dimethoate	7 µg/L
Diquat	7 mg/L
Disulfoton	4 mg/L
Diuron	20 µg/L
2,2-DPA (2,2-dichloropropionic acid, Dalapon)	500 mg/L
Endosulfan	20 µg/L
Ethion	4 µg/L
Etridiazole	100 mg/L
Fenamiphos	0.5 mg/L
Fenarimol	40 mg/L
Fenitrothion	7 µg/L
Fenthion	7 µg/L
Fenvalerate	60 mg/L
Fipronil	0.7 µg/L
Flamprop-methyl	4 mg/L
Fluazifop ^[1]	10 µg/L
Fluometuron	70 µg/L
Flupropanate	9 mg/L

Pesticide	Health Guideline Value (µg/L)
Glyphosate	1000 µg/L
Heptachlor & heptachlor epoxide (total)	0.3 µg/L
Hexazinone	400 µg/L
Imazapyr	9000 mg/L
Maldison (Malathion)	70 µg/L
MCPA	40 µg/L
Methidathion	6 mg/L
Methiocarb	7 mg/L
Methomyl	20 mg/L
Metolachlor	300 µg/L
Metribuzin	70 mg/L
Metsulfuron-methyl	40 µg/L
Mevinphos	5 mg/L
Napropamide	400 mg/L
Nicarbazin	1000 mg/L
Norflurazon	50 mg/L
Omethoate	1 mg/L
Oryzalin	400 mg/L
Oxamyl	7 mg/L
Paraquat	20 mg/L
Parathion-ethyl	20 µg/L
Parathion-methyl	0.7 µg/L
Pendimethalin	400 mg/L
Permethrin	200 mg/L
Picloram	300 µg/L
Piperonyl butoxide	600 mg/L
Pirimicarb	7 mg/L
Pirimiphos-methyl	90 mg/L
Polihexanide	700 mg/L

Pesticide	Health Guideline Value (µg/L)
Propachlor	70 mg/L
Propargite	7 mg/L
Propiconazole	100 µg/L
Propyzamid	70 mg/L
Pyrasulfotole	40 mg/L
Pyroxsulam	4000 mg/L
Simazine	20 µg/L
Temephos	400 mg/L
Terbacil	200 mg/L
Terbutylazine	10 mg/L
Terbutryn	400 µg/L
Thiophanate	5 mg/L
Toltrazuril	4 mg/L
Triadimefon	90 mg/L
Triclopyr	20 µg/L
Trifluralin	90 µg/L
Vernolate	40 mg/L

Notes:

µg/L = micrograms per litre; 1000 µg = 1 miligram (mg).

Results should not exceed the health guideline value.

^[1] Guideline specific to WA and set by DoH.

Other pesticides may be assessed as indicated.

Table 5: Organic compounds

Compound	Health Guideline Value (µg/L)	Aesthetic Guideline Value (µg/L)
Acrylamide	0.2	Not set
Benzene ^[1]	1	Not set
Carbon tetrachloride	3	Not set
Chloroacetic acids		
Chloroacetic acid	150	Not set
Dichloroacetic acid	100	Not set
Trichloroacetic acid	100	Not set
Chlorobenzene ^[1]	300	10
Chlorophenols		
2-chlorophenol	300	0.1
2,4-dichlorophenol	200	0.3
2,4,6-trichlorophenol	20	2
Dichlorobenzenes ^[1]		
1,2-dichlorobenzene (1,2-DCB)	1500	1
1,3-dichlorobenzene (1,3-DCB)	Not set	20
1,4-dichlorobenzene (1,4-DCB)	40	0.3
Dichloroethanes ^[1]		
1,1-dichloroethane	Not set	Not set
1,2-dichloroethane	3	Not set
Dichloroethenes ^[1]		
1,1-dichloroethene (1,1-DCE)	30	Not set
1,2-dichloroethene (1,2-DCE)	60	Not set
Dichloromethane ^[1]	4	Not set
Epichlorohydrin	0.5	Not set
Ethylbenzene ^[1]	300	3
Ethylenediamine tetraacetic acid (EDTA) ^[1]	250	Not set

Compound	Health Guideline Value (µg/L)	Aesthetic Guideline Value (µg/L)
Hexachlorobutadiene ^[1]	0.7	Not set
Nitrilotriacetic acid (NTA) ^[1]	200	Not set
Organotins ^[1]		
Dialkyltins	Not set	Not set
Tributyltin oxide	1	Not set
Plasticisers ^[1]		
Di(2-ethylhexyl) adipate	Not set	
Di(2-ethylhexyl) phthalate (DEHP)	10	Not set
Polycyclic aromatic hydrocarbons ^[1]		
Benzo-(a) pyrene	0.01	Not set
Styrene (vinylbenzene) ^[1]	30	4
Tetrachloroethene ^[1]	50	Not set
Toluene ^[1]	800	25
Total Trihalomethanes	250	Not set
Trichloroacetaldehyde (chloral hydrate)	20	Not set
Trichlorobenzenes (total) ^[1]	30	5
Trichloroethylene (TCE) ^[1]	Not set	Not set
Vinyl chloride ^[1]	0.3	Not set
Xylene ^[1]	600	20
1,1,1- Trichloroethane ^[1]	Not set	Not set

Notes:

^[1] Included in the hydrocarbons suite shown in the summary of test results tables.

µg/L = micrograms per litre; 1000 µg = 1 milligram (mg).

Results should not exceed the health guideline value.

Table 6: Radiological

Parameter	Health Guideline Value
Radium 226 & 228	1.0 mSv (millisieverts).
Radon 222	100 Bq/L (Becquerels per litre)

Table 7: Inorganic Chemicals

Chemical	Health Guideline Value (mg/L)	Aesthetic Guideline Value (mg/L)
Chloride	Not set	250
Cyanide ^[1]	0.08	Not set
Fluoride ^[2]	1.5	Not set
Iodide ^[1]	0.5	Not set
Nitrate ^[3]	50	Not set
Silica	Not set	80
Sodium	Not set	180
Sulfate	Not set	250

Notes:

^[1] Cyanide and iodide results are shown in the 'Other Health Related' column in the summary of test results tables.

^[2] While the ADWG health guideline value is 1.5 mg/L, the fluoride concentration after dosing should not exceed the range set by the Fluoridation of Public Water Supplies Advisory Committee, to a maximum limit of 1 mg/L.

^[3] Nitrate health guideline is for bottle-fed infants < 3 months of age. The health guideline for adults and children > 3 months is 100 mg/L.

Results should not exceed the health guideline value.

Table 8: Physical Characteristics

Characteristics	Health Guideline Value	Aesthetic Guideline Value
Hardness as CaCO ₃	Not set	200 mg/L
pH	Not set	6.5 – 8.5
Total dissolved solids ^[4]	Not set	600 mg/L
True colour	Not set	15 TCU
Turbidity	Not set	5 NTU

Notes:

^[4] Measured as total filterable solids (by summation); (refer to *Understanding water quality test results – Total dissolved solids*, page 38).

TCU = True colour units.

NTU = Nephelometric turbidity units.

Table 9: Microbiological

Organism	Health Guideline Value
<i>Escherichia coli</i>	0 organisms per 100 ml
<i>Naegleria</i> tolerant to ≤ 42°C	No sample should contain <i>Naegleria fowleri</i> ^[5]

^[5] Guideline set by DoH in Schedule 1 of the MoU - ADWG has not set a guideline value for this organism.

Table 10: Metals

Metal	Health Guideline Value (mg/L)	Aesthetic Guideline Value (mg/L)
Aluminium (acid soluble aluminium) ^[2]	Not set	0.2
Antimony ^[1]	0.003	Not set
Arsenic ^[1]	0.01	Not set
Barium ^[1]	2	Not set
Beryllium ^[1]	0.06	Not set
Boron ^[1]	4	Not set
Cadmium ^[1]	0.002	Not set
Chromium (as Cr[VI]) ^[1]	0.05	Not set
Copper ^[1]	2	1
Iron ^[2]	Not set	0.3
Lead ^[1]	0.01	Not set
Manganese ^[2]	0.5	0.1
Mercury ^[1]	0.001	Not set
Molybdenum ^[1]	0.05	Not set
Nickel ^[1]	0.02	Not set
Selenium ^[1]	0.01	Not set
Silver ^[1]	0.1	Not set
Uranium ^[1]	0.017	Not set
Zinc ^[1]	Not set	3

Notes:

^[1] These metals are sampled in 2 separate metals suites, with a minimum of 1 sample each suite per year. Both suites are shown in the 'Metals' column of the summary of test results tables.

^[2] Aluminium, iron and manganese are sampled as part of a general suite of samples and results are individually listed in the summary of test results tables.

Results should not exceed the health guideline value.

Appendix B – Perth localities maps

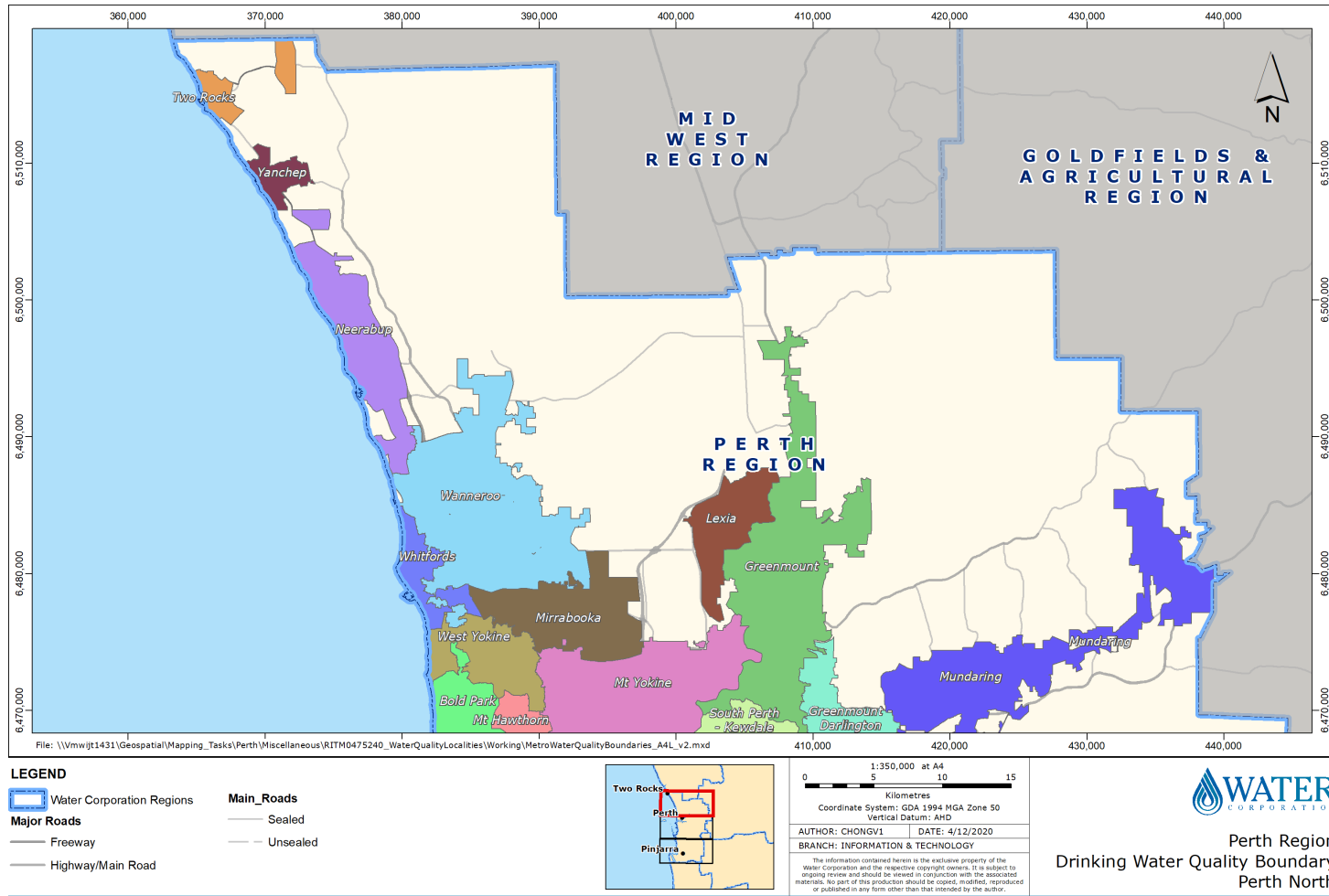


Figure 33: Perth north localities

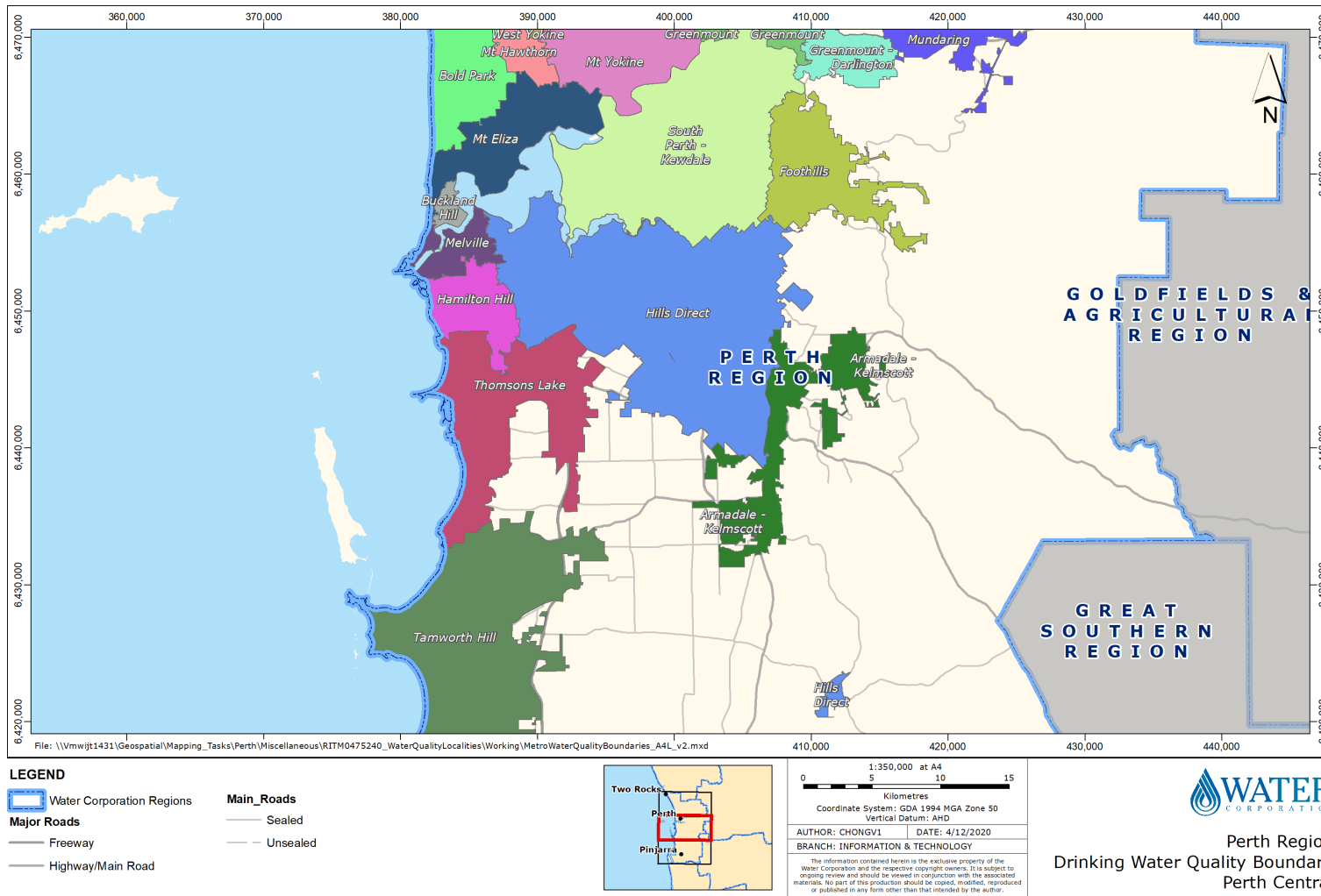


Figure 34: Perth central localities

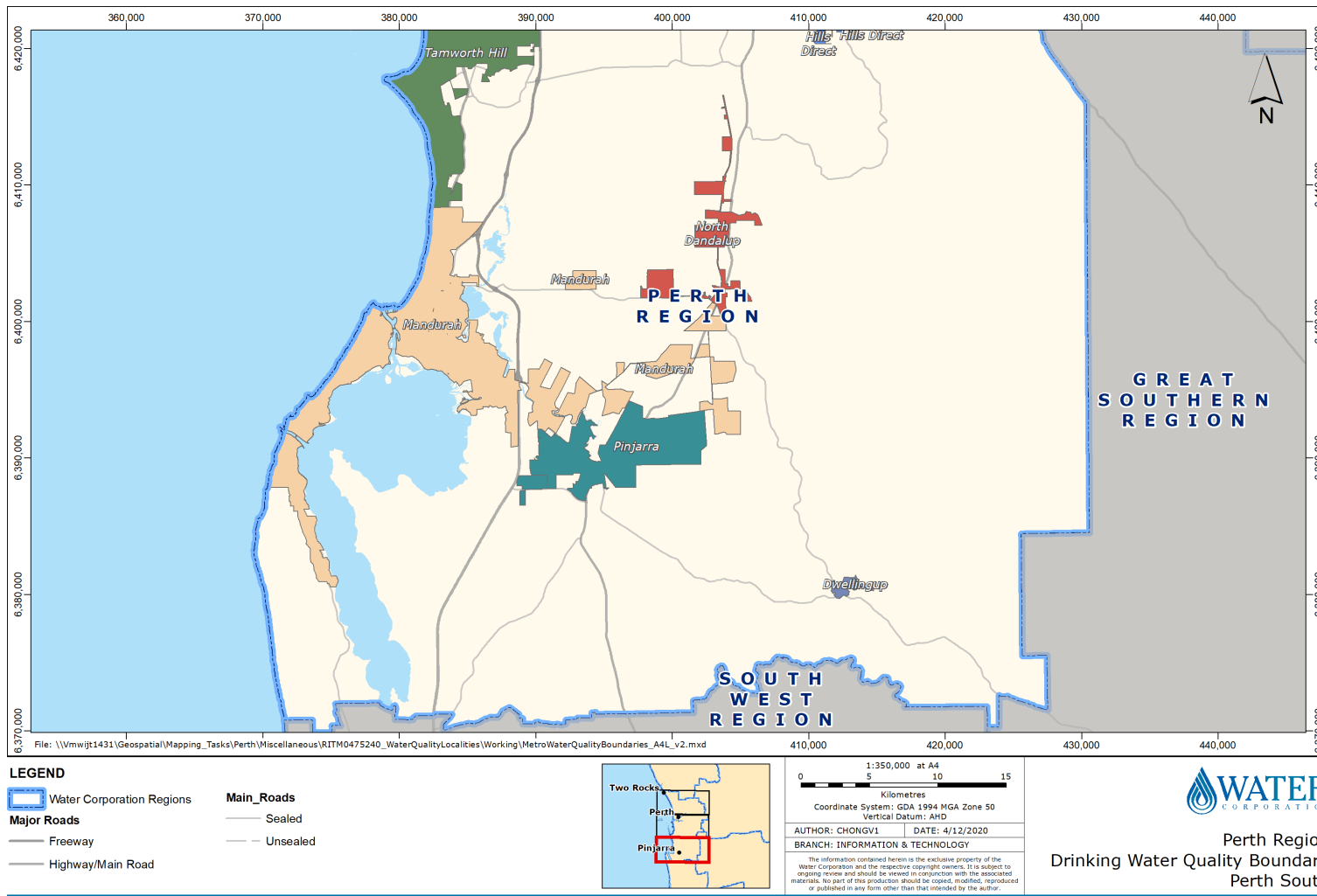


Figure 35: Perth south localities

Appendix C – Summary of water quality test results

Perth Metropolitan Region

Health-related Tables 1 and 2

Aesthetic Tables 3, 4 and 5

Mid West Region

Health-related Tables 6 and 7

Aesthetic Tables 8, 9 and 10

Goldfields and Agricultural Region

Health-related Tables 11 and 12

Aesthetic Tables 13, 14 and 15

South West Region

Health-related Tables 16 and 17

Aesthetic Tables 18, 19 and 20

Great Southern Region

Health-related Tables 21 and 22

Aesthetic Tables 23, 24 and 25

North West Region

Health-related Tables 26 and 27

Aesthetic Tables 28, 29 and 30

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Table 1																
Health related variables																
Perth Region	<i>E. coli</i>				Thermophilic <i>Naegleria</i>			Fluoride				Hydrocarbons		Metals		
Locality	Samples Taken	Samples >0 cfu/100mL	Max cfu/100mL	Requirement Met	Samples Taken	Samples with Thermophilic <i>Naegleria</i>	Requirement Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Guideline Met	Samples Taken	Guideline Met
									Min	Max	Mean					
Armadale/Kelmscott	374	0	0	✓	297	0	✓	52	0.75	0.90	0.83	(2)	2	✓	4	✓
Bold Park	390	0	0	✓	169	0	✓	52	0.75	0.90	0.82	(2)	1	✓	2	✓
Buckland Hill	104	0	0	✓	52	0	✓	52	0.70	0.85	0.77	(2)	2	✓	2	✓
Dwellingup	13	0	0	✓	6	0	✓	2	<0.1	<0.1	<0.1	✓	0	(1)	2	✓
Foothills	143	0	0	✓	130	0	✓	52	0.75	0.90	0.82	(2)	0	(1)	2	✓
Greenmount	195	0	0	✓	104	0	✓	52	0.75	0.90	0.83	(2)	0	(1)	2	✓
Greenmount/Darlington	113	0	0	✓	78	0	✓	52	0.75	0.85	0.81	(2)	0	(1)	2	✓
Hamilton Hill	235	0	0	✓	105	0	✓	52	0.75	0.90	0.81	(2)	0	(1)	2	✓
Hills Direct	826	0	0	✓	286	0	✓	51	0.70	0.85	0.81	(2)	0	(1)	2	✓
Lexia	221	0	0	✓	91	0	✓	52	0.70	0.85	0.78	(2)	0	(1)	2	✓
Mandurah	390	0	0	✓	299	0	✓	52	0.75	0.90	0.82	(2)	0	(1)	4	✓
Melville	183	0	0	✓	105	0	✓	52	0.70	0.85	0.77	(2)	0	(1)	2	✓
Mirrabooka	338	0	0	✓	117	0	✓	52	0.50	0.85	0.78	(2)	0	(1)	2	✓
Mt. Eliza	468	0	0	✓	117	0	✓	53	0.70	0.85	0.77	(2)	2	✓	2	✓
Mt. Hawthorn	156	0	0	✓	78	0	✓	52	0.75	0.90	0.82	(2)	0	(1)	2	✓
Mt. Yokine	520	0	0	✓	195	0	✓	52	0.75	0.90	0.83	(2)	1	✓	2	✓
Mundaring	117	0	0	✓	117	0	✓	52	0.75	0.90	0.82	(2)	0	(1)	2	✓
Neerabup	338	0	0	✓	130	0	✓	52	0.70	0.95	0.84	(2)	0	(1)	2	✓
North Dandalup	18	0	0	✓	6	0	✓	2	<0.1	0.75	0.38	✓	0	(1)	2	✓
Pinjarra	65	0	0	✓	52	0	✓	52	0.70	0.95	0.83	(2)	0	(1)	2	✓
South Perth/Kewdale	541	0	0	✓	224	0	✓	52	0.75	0.85	0.82	(2)	2	✓	2	✓
Tamworth Hill	430	0	0	✓	186	0	✓	52	0.75	0.90	0.83	(2)	0	(1)	2	✓
Thomsons Lake	367	0	0	✓	91	0	✓	53	0.70	0.85	0.80	(2)	2	✓	2	✓
Two Rocks	78	0	0	✓	39	0	✓	2	0.15	0.15	0.15	✓	0	(1)	2	✓
Wanneroo	546	0	0	✓	169	0	✓	52	0.70	0.85	0.78	(2)	0	(1)	2	✓
West Yokine	271	0	0	✓	117	0	✓	52	0.55	0.90	0.81	(2)	0	(1)	2	✓
Whitfords	152	0	0	✓	66	0	✓	52	0.70	0.85	0.79	(2)	1	✓	2	✓
Yanchep	91	0	0	✓	65	0	✓	52	0.75	0.95	0.84	(2)	1	✓	2	✓

(1) No samples required in this 12 month period.

(2) Receives water from a fluoridated source within the dosing range set by the Fluoridation of Water Supplies Advisory Committee.

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Perth Region		Health related variables														
Locality	Samples Taken	Nitrate				Pesticides		Radiological		Trihalomethanes					Other Health Related	
		Concentration (mg/L)			Guideline Met	Samples Taken	Guideline Met	Samples Taken	Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Requirement Met
		Min	Max	Mean							Min	Max	Mean			
Armadale/Kelmscott	3	<0.2	<0.2	<0.2	✓	1	✓	3	✓	13	0.042	0.094	0.060	✓	0	(1)
Bold Park	2	<0.2	<0.2	<0.2	✓	1	✓	2	✓	13	0.036	0.095	0.058	✓	1	✓
Buckland Hill	5	<0.2	0.9	0.4	✓	1	✓	0	(1)	13	0.041	0.120	0.082	✓	2	✓
Dwellingup	2	<0.2	<0.2	<0.2	✓	1	✓	2	✓	13	0.023	0.036	0.030	✓	0	(1)
Foothills	2	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	13	0.051	0.110	0.071	✓	0	(1)
Greenmount	5	0.9	3.1	1.8	✓	1	✓	0	(1)	12	0.080	0.140	0.113	✓	1	✓
Greenmount/Darlington	2	<0.2	0.4	0.4	✓	1	✓	2	✓	13	0.082	0.140	0.099	✓	1	✓
Hamilton Hill	2	<0.2	<0.2	<0.2	✓	1	✓	2	✓	13	0.042	0.074	0.058	✓	0	(1)
Hills Direct	5	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	13	0.021	0.051	0.032	✓	0	(1)
Lexia	2	0.4	2.6	1.3	✓	1	✓	1	✓	6	0.078	0.130	0.102	✓	0	(1)
Mandurah	4	<0.2	1.8	0.4	✓	2	✓	0	(1)	26	0.001	0.077	0.018	✓	0	(1)
Melville	4	<0.2	<0.2	<0.2	✓	1	✓	2	✓	13	0.041	0.110	0.067	✓	1	✓
Mirrabooka	4	1.3	1.8	1.3	✓	1	✓	2	✓	13	0.086	0.140	0.116	✓	2	✓
Mt. Eliza	4	<0.2	0.4	<0.2	✓	1	✓	1	✓	13	0.046	0.093	0.069	✓	0	(1)
Mt. Hawthorn	4	0.9	1.8	1.8	✓	1	✓	0	(1)	6	0.076	0.120	0.103	✓	1	✓
Mt. Yokine	4	0.9	2.6	1.8	✓	1	✓	0	(1)	13	0.079	0.130	0.107	✓	2	✓
Mundaring	2	0.4	0.4	0.4	✓	1	✓	2	✓	13	0.016	0.035	0.026	✓	0	(1)
Neerabup	4	5.7	7.5	6.6	✓	1	✓	0	(1)	13	0.037	0.087	0.055	✓	1	✓
North Dandalup	2	<0.2	<0.2	<0.2	✓	1	✓	2	✓	13	0.022	0.053	0.033	✓	0	(1)
Pinjarra	2	<0.2	<0.2	<0.2	✓	1	✓	1	✓	13	<0.001	0.023	0.007	✓	0	(1)
South Perth/Kewdale	4	0.4	1.8	1.3	✓	1	✓	2	✓	13	0.046	0.130	0.105	✓	1	✓
Tamworth Hill	2	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	13	<0.001	0.031	0.009	✓	1	✓
Thomsons Lake	5	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	13	0.022	0.100	0.060	✓	0	(1)
Two Rocks	4	3.5	4.4	4.0	✓	1	✓	1	✓	13	0.002	0.008	0.005	✓	0	(1)
Wanneroo	5	2.2	4.0	3.1	✓	1	✓	2	✓	13	0.057	0.120	0.091	✓	1	✓
West Yokine	5	0.4	4.0	1.8	✓	0	(2)	2	✓	13	0.088	0.180	0.131	✓	1	✓
Whitfords	2	2.6	3.5	3.1	✓	1	✓	0	(1)	13	0.059	0.120	0.087	✓	1	✓
Yanchep	5	6.6	8.4	7.5	✓	1	✓	2	✓	13	0.017	0.087	0.053	✓	0	(1)

(1) No samples required in this 12 month period. (2) Annual sample moved from June to July - all parameters within guideline values

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Table 3

Aesthetic (non-health related) variables

Perth Region	Alkalinity (as CaCO ₃)				Aluminium				Chloride				Hardness							
Locality	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Armadale/Kelmscott	3	57	68	64	(1)	3	0.014	0.016	0.015	✓	3	140	175	160	✓	3	69	81	77	✓
Bold Park	2	39	59	49	(1)	2	0.010	0.018	0.014	✓	2	90	145	118	✓	2	50	74	62	✓
Buckland Hill	5	44	82	63	(1)	5	<0.008	0.014	0.009	✓	5	90	200	164	✓	5	49	76	63	✓
Dwellingup	2	9	11	10	(1)	2	<0.008	<0.008	<0.008	✓	2	60	70	65	✓	2	26	32	29	✓
Foothills	2	62	76	69	(1)	2	0.018	0.025	0.022	✓	2	145	205	175	✓	2	79	93	86	✓
Greenmount	5	70	130	100	(1)	5	<0.008	0.020	<0.008	✓	5	160	195	176	✓	5	89	110	95	✓
Greenmount/Darlington	2	56	88	72	(1)	2	0.010	0.014	0.012	✓	2	135	160	148	✓	2	67	79	73	✓
Hamilton Hill	2	66	82	74	(1)	2	<0.008	0.010	<0.008	✓	2	145	170	158	✓	2	78	80	79	✓
Hills Direct	5	25	44	31	(1)	5	0.010	0.016	0.012	✓	5	55	90	75	✓	5	38	55	46	✓
Lexia	2	110	120	115	(1)	2	0.008	0.010	0.009	✓	2	90	170	130	✓	2	120	170	145	✓
Mandurah	4	46	56	51	(1)	4	0.016	0.030	0.025	✓	4	36	42	38	✓	4	50	56	54	✓
Melville	4	45	60	56	(1)	4	<0.008	0.030	0.018	✓	4	145	180	158	✓	4	48	57	54	✓
Mirrabooka	4	46	58	51	(1)	4	0.010	0.020	0.015	✓	4	175	210	191	✓	4	120	130	128	✓
Mt. Eliza	4	56	84	70	(1)	3	0.010	0.014	0.012	✓	4	165	230	189	✓	4	56	83	69	✓
Mt. Hawthorn	4	110	130	123	(1)	4	<0.008	<0.008	<0.008	✓	4	185	205	191	✓	4	100	120	110	✓
Mt. Yokine	4	120	130	123	(1)	4	<0.008	<0.008	<0.008	✓	4	180	195	188	✓	4	91	110	103	✓
Mundaring	2	60	68	64	(1)	2	<0.008	0.018	0.009	✓	2	200	205	203	✓	2	96	100	98	✓
Neerabup	4	150	180	163	(1)	4	<0.008	0.020	<0.008	✓	4	170	185	175	✓	4	180	200	190	✓
North Dandalup	2	11	13	12	(1)	2	<0.008	0.010	<0.008	✓	2	65	80	73	✓	2	29	37	33	✓
Pinjarra	2	51	56	54	(1)	2	0.012	0.016	0.014	✓	2	34	39	37	✓	2	57	63	60	✓
South Perth/Kewdale	4	120	140	125	(1)	4	<0.008	<0.008	<0.008	✓	4	175	185	180	✓	4	72	110	97	✓
Tamworth Hill	2	48	54	51	(1)	2	0.025	0.025	0.025	✓	2	32	35	34	✓	2	52	54	53	✓
Thomsons Lake	5	37	97	74	(1)	5	<0.008	0.012	<0.008	✓	5	55	230	175	✓	5	46	110	86	✓
Two Rocks	4	200	220	210	(1)	4	<0.008	<0.008	<0.008	✓	4	105	110	106	✓	4	220	230	228	(2)
Wanneroo	5	98	110	106	(1)	5	<0.008	0.016	<0.008	✓	5	155	165	159	✓	5	120	140	124	✓
West Yokine	5	54	130	94	(1)	5	<0.008	<0.008	<0.008	✓	5	165	215	192	✓	5	110	120	114	✓
Whitfords	2	95	99	97	(1)	2	<0.008	0.018	0.009	✓	2	155	165	160	✓	2	120	120	120	✓
Yanchep	5	160	210	174	(1)	5	<0.008	<0.008	<0.008	✓	5	145	165	157	✓	5	190	220	204	(2)

(1) No guideline value available as per ADWG 2011. (2) Elevated hardness is characteristic of the source supplying this locality

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Table 4

Aesthetic (non-health related) variables

Perth Region	Iron				Manganese				pH				Silica							
Locality	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Value (pH units)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Armadale/Kelmscott	3	0.025	0.060	0.038	✓	3	<0.002	0.003	<0.002	✓	3	7.69	7.93	7.83	✓	3	2.0	2.8	2.4	✓
Bold Park	2	0.010	0.060	0.035	✓	2	0.003	0.006	0.005	✓	2	7.77	7.79	7.78	✓	2	2.0	4.1	3.1	✓
Buckland Hill	5	0.020	0.045	0.033	✓	5	0.003	0.007	0.005	✓	5	7.47	7.97	7.81	✓	5	3.1	9.7	6.4	✓
Dwellingup	2	0.045	0.050	0.048	✓	2	0.004	0.004	0.004	✓	2	6.87	7.17	7.02	✓	2	1.4	1.4	1.4	✓
Foothills	2	0.020	0.180	0.100	✓	2	0.004	0.014	0.009	✓	2	7.63	8.15	7.89	✓	2	3.7	4.2	4.0	✓
Greenmount	5	0.004	0.020	0.013	✓	5	<0.002	0.003	<0.002	✓	5	7.94	8.37	8.13	✓	5	4.7	18.0	12.3	✓
Greenmount/Darlington	2	0.015	0.020	0.018	✓	2	0.002	0.003	0.003	✓	2	7.80	8.01	7.91	✓	2	3.1	7.2	5.2	✓
Hamilton Hill	2	0.015	0.015	0.015	✓	2	0.003	0.004	0.004	✓	2	7.94	8.06	8.00	✓	2	3.9	4.4	4.2	✓
Hills Direct	5	0.025	0.060	0.040	✓	5	<0.002	0.008	0.004	✓	5	7.31	7.70	7.46	✓	5	1.6	1.9	1.7	✓
Lexia	2	0.010	0.020	0.015	✓	2	0.003	0.014	0.009	✓	2	7.69	7.70	7.70	✓	2	14.0	17.0	15.5	✓
Mandurah	4	<0.003	0.020	0.010	✓	4	<0.002	0.004	<0.002	✓	4	8.04	8.79	8.47	✓	4	1.0	1.9	1.4	✓
Melville	4	0.030	0.050	0.040	✓	4	0.003	0.008	0.005	✓	4	7.54	8.05	7.79	✓	4	4.0	5.3	4.5	✓
Mirrabooka	4	0.015	0.030	0.020	✓	4	0.003	0.025	0.011	✓	4	6.63	7.24	7.04	✓	4	13.0	14.0	13.5	✓
Mt. Eliza	4	0.040	0.100	0.056	✓	4	0.006	0.012	0.009	✓	4	7.60	7.95	7.82	✓	4	4.5	7.1	6.1	✓
Mt. Hawthorn	4	0.020	0.045	0.033	✓	4	0.003	0.008	0.006	✓	4	7.74	8.05	7.90	✓	4	15.0	17.0	16.5	✓
Mt. Yokine	4	0.015	0.070	0.034	✓	4	0.003	0.012	0.006	✓	4	7.81	8.03	7.88	✓	4	15.0	18.0	16.8	✓
Mundaring	2	0.004	0.010	0.007	✓	2	<0.002	<0.002	<0.002	✓	2	8.29	8.58	8.44	✓	2	4.7	5.7	5.2	✓
Neerabup	4	0.010	0.120	0.048	✓	4	0.003	0.035	0.015	✓	4	7.45	7.90	7.60	✓	4	20.0	20.0	20.0	✓
North Dandalup	2	0.045	0.050	0.048	✓	2	<0.002	0.005	0.003	✓	2	6.89	7.02	6.96	✓	2	1.6	2.0	1.8	✓
Pinjarra	2	0.004	0.010	0.007	✓	2	<0.002	<0.002	<0.002	✓	2	8.00	8.14	8.07	✓	2	1.6	1.7	1.7	✓
South Perth/Kewdale	4	0.010	0.070	0.040	✓	4	<0.002	0.012	0.007	✓	4	7.66	7.97	7.80	✓	4	16.0	18.0	17.0	✓
Tamworth Hill	2	<0.003	0.004	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	8.12	8.34	8.23	✓	2	0.7	0.8	0.8	✓
Thomsons Lake	5	<0.003	0.030	0.014	✓	5	0.002	0.030	0.009	✓	5	7.52	8.00	7.85	✓	5	1.8	6.9	4.9	✓
Two Rocks	4	<0.003	0.006	0.004	✓	4	<0.002	<0.002	<0.002	✓	4	7.54	7.70	7.59	✓	4	11.0	12.0	11.5	✓
Wanneroo	5	0.006	0.025	0.013	✓	5	0.002	0.007	0.004	✓	5	7.09	7.76	7.43	✓	5	17.0	19.0	18.2	✓
West Yokine	5	0.015	0.035	0.025	✓	5	<0.002	0.008	0.005	✓	5	7.28	7.92	7.53	✓	5	15.0	18.0	16.2	✓
Whitfords	2	0.010	0.040	0.025	✓	2	0.004	0.014	0.009	✓	2	7.63	7.79	7.71	✓	2	17.0	18.0	17.5	✓
Yanchep	5	0.008	0.050	0.017	✓	5	0.003	0.020	0.007	✓	5	7.27	7.90	7.64	✓	5	18.0	20.0	19.0	✓

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Table 5

Aesthetic (non-health related) variables																									
Perth Region		Sodium				Sulphate				Total Dissolved Solids				True Colour				Turbidity							
Locality	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Value (TCU)			Guideline Met	Samples Taken	Value (NTU)			Guideline Met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Armadale/Kelmscott	3	87	100	96	✓	3	17	19	18	✓	3	350	416	391	✓	3	<1	<1	<1	✓	3	0.1	0.4	0.2	✓
Bold Park	2	51	85	68	✓	2	9	15	12	✓	2	220	352	286	✓	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Buckland Hill	5	56	125	103	✓	5	9	19	15	✓	5	234	488	396	✓	5	<1	<1	<1	✓	5	<0.1	0.3	0.2	✓
Dwellingup	2	32	38	35	✓	2	9	10	9	✓	2	131	152	142	✓	2	<1	1	<1	✓	2	0.3	0.4	0.4	✓
Foothills	2	89	125	107	✓	2	17	23	20	✓	2	366	493	430	✓	2	<1	2	<1	✓	2	0.5	0.7	0.6	✓
Greenmount	5	97	130	113	✓	5	20	23	22	✓	5	443	575	488	✓	5	<1	<1	<1	✓	5	<0.1	0.2	<0.1	✓
Greenmount/Darlington	2	77	99	88	✓	2	16	18	17	✓	2	330	425	378	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Hamilton Hill	2	94	105	100	✓	2	17	21	19	✓	2	375	434	405	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Hills Direct	5	31	49	40	✓	5	5	9	7	✓	5	142	219	183	✓	5	<1	<1	<1	✓	5	0.1	0.4	0.3	✓
Lexia	2	47	98	73	✓	2	23	55	39	✓	2	435	495	465	✓	2	<1	2	<1	✓	2	<0.1	0.3	0.2	✓
Mandurah	4	20	24	22	✓	4	1	4	2	✓	4	141	153	147	✓	4	<1	<1	<1	✓	4	<0.1	0.2	<0.1	✓
Melville	4	87	105	94	✓	4	10	12	11	✓	4	324	386	356	✓	4	<1	<1	<1	✓	4	0.2	0.4	0.3	✓
Mirrabooka	4	91	125	109	✓	4	54	68	64	✓	4	463	527	495	✓	4	<1	<1	<1	✓	4	<0.1	0.3	0.2	✓
Mt. Eliza	4	105	145	118	✓	4	13	20	16	✓	4	385	528	444	✓	4	<1	<1	<1	✓	4	<0.1	0.3	0.2	✓
Mt. Hawthorn	4	120	140	126	✓	4	24	33	29	✓	4	549	591	564	✓	4	<1	<1	<1	✓	4	<0.1	0.3	<0.1	✓
Mt. Yokine	4	125	140	130	✓	4	22	30	27	✓	4	553	567	560	✓	4	<1	<1	<1	✓	4	<0.1	0.1	<0.1	✓
Mundaring	2	110	115	113	✓	2	29	30	30	✓	2	454	480	467	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Neerabup	4	89	100	93	✓	4	14	17	15	✓	4	559	619	584	✓	4	<1	<1	<1	✓	4	0.1	1.4	0.5	✓
North Dandalup	2	36	39	38	✓	2	8	10	9	✓	2	148	162	155	✓	2	<1	<1	<1	✓	2	0.2	0.4	0.3	✓
Pinjarra	2	22	24	23	✓	2	3	4	3	✓	2	151	157	154	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
South Perth/Kewdale	4	115	130	125	✓	4	22	28	25	✓	4	519	568	542	✓	4	<1	<1	<1	✓	4	<0.1	0.2	<0.1	✓
Tamworth Hill	2	19	21	20	✓	2	1	1	1	✓	2	139	139	139	✓	2	<1	<1	<1	✓	2	0.1	0.3	0.2	✓
Thomsons Lake	5	29	150	105	✓	5	5	30	20	✓	5	156	578	431	✓	5	<1	<1	<1	✓	5	<0.1	0.5	0.2	✓
Two Rocks	4	55	59	57	✓	4	15	17	16	✓	4	519	550	535	✓	4	<1	<1	<1	✓	4	<0.1	<0.1	<0.1	✓
Wanneroo	5	88	94	92	✓	5	18	24	21	✓	5	464	491	479	✓	5	<1	<1	<1	✓	5	0.1	0.2	0.2	✓
West Yokine	5	100	125	116	✓	5	26	55	39	✓	5	518	546	531	✓	5	<1	<1	<1	✓	5	<0.1	0.2	<0.1	✓
Whitfords	2	91	95	93	✓	2	22	23	23	✓	2	459	476	468	✓	2	<1	<1	<1	✓	2	0.1	0.2	0.2	✓
Yanchep	5	77	85	82	✓	5	13	15	14	✓	5	559	605	576	✓	5	<1	<1	<1	✓	5	<0.1	0.6	0.3	✓

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Table 6		Health related variables														
Mid West Region	<i>E. coli</i>				Thermophilic <i>Naegleria</i>			Fluoride				Hydrocarbons		Metals		
Locality	Samples Taken	Samples >0 cfu/100mL	Max cfu/100mL	Requirement Met	Samples Taken	Samples with Thermophilic <i>Naegleria</i>	Requirement Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Guideline Met	Samples Taken	Guideline Met
									Min	Max	Mean					
Badgingarra	13	0	0	✓	13	0	✓	2	<0.1	<0.1	<0.1	✓	0	(1)	5	✓
Bindoon /Chittering	49	0	0	✓	24	0	✓	2	0.35	0.35	0.35	✓	0	(1)	2	✓
Bolgart	13	0	0	✓	9	0	✓	2	0.15	0.20	0.18	✓	0	(1)	2	✓
Calingiri	13	0	0	✓	9	0	✓	2	<0.1	<0.1	<0.1	✓	0	(1)	2	✓
Carnamah	13	0	0	✓	13	0	✓	3	<0.1	<0.1	<0.1	✓	0	(1)	2	✓
Carnarvon	65	0	0	✓	39	0	✓	2	0.30	0.40	0.35	✓	0	(1)	2	✓
Cervantes	52	0	0	✓	13	0	✓	2	0.15	0.15	0.15	✓	0	(1)	2	✓
Coomberdale	13	0	0	✓	9	0	✓	2	0.80	0.85	0.83	(2)	0	(1)	2	✓
Coorow	13	0	0	✓	13	0	✓	3	<0.1	<0.1	<0.1	✓	1	✓	2	✓
Coral Bay	12	0	0	✓	12	0	✓	2	<0.1	<0.1	<0.1	✓	2	✓	2	✓
Cue	13	0	0	✓	13	0	✓	2	0.20	0.20	0.20	✓	2	✓	2	✓
Dandaragan	13	0	0	✓	9	0	✓	2	0.20	0.25	0.23	✓	0	(1)	2	✓
Denham	51	0	0	✓	26	0	✓	2	<0.1	<0.1	<0.1	✓	0	(1)	2	✓
Dongara/Denison	65	0	0	✓	26	0	✓	52	0.55	0.90	0.79	(2)	0	(1)	2	✓
Eneabba	13	0	0	✓	13	0	✓	2	0.15	0.20	0.18	✓	0	(1)	15	✓
Exmouth	60	0	0	✓	36	0	✓	51	0.40	0.80	0.71	(2)	2	✓	2	✓
Gascoyne Junction	25	0	0	✓	25	0	✓	2	<0.1	<0.1	<0.1	✓	0	(1)	2	✓
Geraldton	180	0	0	✓	156	1	(3)	52	0.45	0.90	0.80	(2)	0	(1)	4	✓
Gingin	49	0	0	✓	26	0	✓	2	<0.1	0.30	0.15	✓	0	(1)	2	✓
Greenhead	52	0	0	✓	26	0	✓	2	<0.1	<0.1	<0.1	✓	0	(1)	7	✓
Guilderton	51	0	0	✓	18	0	✓	2	0.25	0.25	0.25	✓	0	(1)	2	✓
Horrocks	13	0	0	✓	13	0	✓	2	0.35	0.40	0.38	✓	0	(1)	2	✓
Jurien Bay	52	0	0	✓	13	0	✓	2	0.20	0.20	0.20	✓	0	(1)	2	✓
Kalbarri	52	0	0	✓	26	0	✓	3	<0.1	<0.1	<0.1	✓	2	✓	2	✓
Lancelin	51	0	0	✓	26	0	✓	2	0.20	0.20	0.20	✓	0	(1)	2	✓
Latham	52	0	0	✓	13	0	✓	2	<0.1	<0.1	<0.1	✓	0	(1)	2	✓
Ledge Point	51	0	0	✓	13	0	✓	2	0.15	0.15	0.15	✓	0	(1)	2	✓
Leeman	52	0	0	✓	13	0	✓	2	<0.1	<0.1	<0.1	✓	0	(1)	7	✓
Meekatharra	52	0	0	✓	13	0	✓	2	0.25	0.30	0.28	✓	0	(1)	14	✓
Mingenew	13	0	0	✓	13	0	✓	2	0.15	0.20	0.18	✓	0	(1)	2	✓
Moora	52	0	0	✓	26	0	✓	52	0.25	1.00	0.80	(2)	0	(1)	2	✓
Morawa	52	0	0	✓	13	0	✓	2	<0.1	<0.1	<0.1	✓	1	✓	2	✓
Mt Magnet	52	0	0	✓	13	0	✓	2	0.15	0.15	0.15	✓	1	✓	2	✓
Mullewa	13	0	0	✓	13	0	✓	2	0.75	0.90	0.83	(2)	2	✓	2	✓
Nabawa	13	0	0	✓	13	0	✓	2	0.75	0.90	0.83	(2)	0	(1)	2	✓
New Norcia	13	0	0	✓	9	0	✓	2	0.15	0.60	0.38	✓	0	(1)	2	✓
Nilgen (Ocean Farms)	13	0	0	✓	9	0	✓	2	<0.1	0.10	<0.1	✓	0	(1)	6	✓
Northampton	52	0	0	✓	13	0	✓	2	0.80	0.80	0.80	(2)	0	(1)	2	✓
Perenjori	13	0	0	✓	13	0	✓	2	<0.1	<0.1	<0.1	✓	2	✓	2	✓
Piawaning	26	0	0	✓	9	0	✓	2	<0.1	<0.1	<0.1	✓	1	✓	2	✓
Port Kalbarri	13	0	0	✓	13	0	✓	2	0.10	0.15	0.13	✓	0	(1)	2	✓
Sandstone	13	0	0	✓	13	0	✓	2	0.25	0.25	0.25	✓	0	(1)	2	✓
Seabird	12	0	0	✓	8	0	✓	2	0.25	0.30	0.28	✓	0	(1)	2	✓
Seaview Park	13	0	0	✓	9	0	✓	2	<0.1	<0.1	<0.1	✓	0	(1)	2	✓
Sovereign Hills	26	0	0	✓	18	0	✓	2	<0.1	<0.1	<0.1	✓	0	(1)	2	✓
Three Springs	13	0	0	✓	13	0	✓	2	<0.1	<0.1	<0.1	✓	0	(1)	2	✓
Watheroo	12	0	0	✓	9	0	✓	2	<0.1	0.10	<0.1	✓	0	(1)	2	✓
Woodridge	12	0	0	✓	8	0	✓	2	0.20	0.30	0.25	✓	0	(1)	2	✓
Yalgoo	13	0	0	✓	13	0	✓	2	0.10	0.15	0.13	✓	2	✓	2	✓
Yerecoin	13	0	0	✓	9	0	✓	2	<0.1	<0.1	<0.1	✓	0	(1)	2	✓
Yuna	13	0	0	✓	13	0	✓	2	0.75	0.80	0.78	(2)	0	(1)	2	✓

(1) No samples required in this 12 month period. (2) Receives water from a fluoridated source within the dosing range set by the Fluoridation of Water Supplies Advisory Committee. (3) Response protocols were implemented in accordance with DoH requirements. Identified as not *Naegleria fowleri*.

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Table 7

Mid West Region	Health related variables															
	Nitrate					Pesticides		Radiological		Trihalomethanes					Other Health Related	
	Locality	Samples Taken	Concentration (mg/L)			*Guideline Met	Samples Taken	Guideline Met	Samples Taken	Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken
Min			Max	Mean	Min							Max	Mean			
Badgingarra	6	0.9	0.9	0.9	✓	1	✓	0	(1)	2	<0.001	<0.001	<0.001	✓	0	(1)
Bindoon /Chittering	2	<0.2	<0.2	<0.2	✓	1	✓	2	✓	2	0.004	0.007	0.005	✓	0	(1)
Bolgart	5	29.9	38.7	34.3	✓	1	✓	1	✓	2	0.002	0.004	0.003	✓	0	(1)
Calingiri	4	17.6	33.9	24.2	✓	1	✓	8	(3)	2	0.005	0.064	0.027	✓	0	(1)
Carnamah	4	0.9	1.3	1.3	✓	0	(2)	0	(1)	3	0.005	0.010	0.007	✓	0	(1)
Carnarvon	2	2.6	3.1	2.6	✓	1	✓	2	✓	2	0.003	0.003	0.003	✓	0	(1)
Cervantes	4	15.4	16.7	16.3	✓	1	✓	0	(1)	2	0.005	0.009	0.007	✓	0	(1)
Coomberdale	3	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	2	0.033	0.042	0.038	✓	0	(1)
Coorow	4	0.9	1.8	1.3	✓	1	✓	0	(1)	3	0.005	0.010	0.008	✓	0	(1)
Coral Bay	2	<0.2	<0.2	<0.2	✓	1	✓	2	✓	2	<0.001	<0.001	<0.001	✓	2	✓
Cue*	4	16.7	19.4	17.6	✓	1	✓	0	(1)	2	0.002	0.008	0.005	✓	0	(1)
Dandaragan	4	<0.2	<0.2	<0.2	✓	1	✓	2	✓	2	0.004	0.006	0.005	✓	0	(1)
Denham	2	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	2	<0.001	0.002	<0.001	✓	0	(1)
Dongara/Denison	4	2.2	3.1	2.6	✓	1	✓	1	✓	3	0.001	0.014	0.007	✓	1	✓
Eneabba	5	<0.2	<0.2	<0.2	✓	1	✓	1	✓	2	0.005	0.008	0.006	✓	0	(1)
Exmouth	4	7.9	7.9	7.9	✓	1	✓	2	✓	2	<0.001	<0.001	<0.001	✓	0	(1)
Gascoyne Junction	3	<0.2	0.4	0.4	✓	1	✓	2	✓	1	0.005	0.005	0.005	✓	0	(1)
Geraldton	4	2.6	2.6	2.6	✓	2	✓	2	✓	4	0.007	0.007	0.007	✓	0	(1)
Gingin	3	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	2	<0.001	0.039	0.020	✓	0	(1)
Greenhead	2	4.0	4.0	4.0	✓	1	✓	1	✓	2	<0.001	0.001	<0.001	✓	0	(1)
Guilderton	5	32.6	39.2	37.0	✓	1	✓	2	✓	2	0.01	0.021	0.015	✓	1	✓
Horrocks	4	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	2	0.009	0.009	0.009	✓	0	(1)
Jurien Bay	26	10.1	16.7	13.6	✓	1	✓	0	(1)	2	0.004	0.005	0.005	✓	0	(1)
Kalbarri	2	2.6	2.6	2.6	✓	1	✓	0	(1)	2	<0.001	0.003	<0.001	✓	0	(1)
Lancelin	4	4.0	9.7	6.2	✓	1	✓	0	(1)	2	0.008	0.009	0.009	✓	0	(1)
Latham	4	0.9	0.9	0.9	✓	1	✓	2	✓	2	0.085	0.110	0.098	✓	0	(1)
Ledge Point	5	20.7	23.8	22.4	✓	1	✓	0	(1)	2	0.006	0.008	0.007	✓	0	(1)
Leeman	2	4.0	4.4	4.0	✓	1	✓	0	(1)	2	0.002	0.002	0.002	✓	0	(1)
Meekatharra*	14	14.1	28.2	20.2	✓	1	✓	2	✓	2	0.002	0.009	0.005	✓	1	✓
Mingenew	5	12.3	13.2	12.8	✓	1	✓	0	(1)	2	0.002	0.003	0.002	✓	0	(1)
Moora	2	<0.2	<0.2	<0.2	✓	1	✓	2	✓	2	0.015	0.028	0.022	✓	0	(1)
Morawa	4	0.9	0.9	0.9	✓	1	✓	2	✓	2	0.003	0.005	0.004	✓	0	(1)
Mt Magnet*	4	23.8	26.0	25.1	✓	1	✓	1	✓	2	0.001	0.002	0.002	✓	1	✓
Mullewa	4	2.2	2.6	2.6	✓	4	✓	0	(1)	2	0.024	0.024	0.024	✓	0	(1)
Nabawa	4	2.2	3.1	2.6	✓	1	✓	0	(1)	2	0.008	0.011	0.010	✓	1	✓
New Norcia*	9	13.6	46.6	36.1	✓	1	✓	1	✓	2	0.007	0.008	0.008	✓	0	(1)
Nilgen (Ocean Farms)	2	22.0	26.0	24.2	✓	1	✓	0	(1)	2	0.002	0.003	0.002	✓	0	(1)
Northampton	2	2.2	2.6	2.6	✓	1	✓	0	(1)	2	0.021	0.032	0.027	✓	0	(1)
Perenjori	4	0.4	0.9	0.9	✓	1	✓	0	(1)	2	0.003	0.008	0.006	✓	0	(1)
Piawaning	4	13.6	24.6	21.6	✓	1	✓	0	(1)	2	0.058	0.097	0.078	✓	0	(1)
Port Kalbarri	3	0.4	0.9	0.9	✓	1	✓	2	✓	2	0.042	0.066	0.054	✓	0	(1)
Sandstone*	4	19.4	27.7	22.0	✓	1	✓	2	✓	2	0.002	0.003	0.003	✓	0	(1)
Seabird	2	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	2	0.030	0.043	0.037	✓	0	(1)
Seaview Park	4	23.3	25.5	24.2	✓	1	✓	1	✓	2	0.002	0.002	0.002	✓	0	(1)
Sovereign Hills	4	1.3	2.2	1.3	✓	1	✓	1	✓	2	0.015	0.017	0.016	✓	0	(1)
Three Springs	4	0.9	2.6	1.8	✓	1	✓	0	(1)	2	0.006	0.009	0.008	✓	0	(1)
Watheroo	5	<0.2	<0.2	<0.2	✓	1	✓	2	✓	5	0.082	0.120	0.107	✓	0	(1)
Woodridge	5	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	4	0.068	0.097	0.082	✓	0	(1)
Yalgoo*	4	18.9	26.4	22.0	✓	4	✓	1	✓	2	0.009	0.014	0.012	✓	0	(1)
Yerecoin	4	4.4	25.1	16.7	✓	1	✓	2	✓	2	0.066	0.078	0.072	✓	1	✓
Yuna	3	2.6	3.1	2.6	✓	1	✓	0	(1)	2	0.035	0.041	0.038	✓	0	(1)

(1) No samples required in this 12 month period. (2) Annual sample moved from June to July - all parameters within guideline values. (3) Non-compliance associated with radiological performance criterion as defined in the MoU with DoH. Response protocols implemented in accordance with DoH requirements demonstrated continuous supply of safe drinking water to the locality.
 *Cue, Meekatharra, Mount Magnet, New Norcia, Sandstone and Yalgoo have been granted an exemption from compliance with the infant health nitrate guideline by the Department of Health, however, following treatment or operational intervention these towns have achieved compliance with the infant health limit. Carers of infants younger than 3 months should seek advice from the Community Health Nurse regarding the use of alternative water sources for the preparation of bottle feeds. Water Corporation provides bottled water free of charge for this purpose. Note: The water supplied has always met the guideline for adults and children over the age of 3 months - for a full list of towns with nitrate exemptions and how we are improving water quality in these towns - please refer to 'Understanding water quality test results - Nitrate' section of the annual report.

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Table 8

Aesthetic (non-health related) variables

Mid West Region	Alkalinity (as CaCO3)					Aluminium					Chloride					Hardness				
Locality	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Badgingarra	6	96.0	150.0	129.3	(1)	2	<0.008	<0.008	<0.008	✓	6	220	235	230	✓	6	42	43	43	✓
Bindoon /Chittering	2	88.0	100.0	94.0	(1)	2	<0.008	<0.008	<0.008	✓	2	160	170	165	✓	2	51	52	52	✓
Bolgart	5	32.0	37.0	34.2	(1)	5	<0.008	<0.008	<0.008	✓	5	205	280	240	✓	5	110	140	120	✓
Calingiri	4	22.0	63.0	39.8	(1)	4	<0.008	<0.008	<0.008	✓	4	330	560	459	(2)	4	100	210	170	✓
Carnamah	4	8.0	14.0	10.3	(1)	4	<0.008	<0.008	<0.008	✓	4	430	465	451	(2)	4	130	150	140	✓
Carnarvon	2	110.0	120.0	115.0	(1)	2	<0.008	<0.008	<0.008	✓	2	140	140	140	✓	2	170	180	175	✓
Cervantes	4	220.0	250.0	235.0	(1)	4	<0.008	<0.008	<0.008	✓	4	305	355	326	(2)	4	320	340	325	(3)
Coomberdale	3	80.0	86.0	82.0	(1)	3	0.008	0.018	0.013	✓	3	235	285	260	(2)	3	63	110	81	✓
Coorow	4	9.0	21.0	13.0	(1)	4	<0.008	<0.008	<0.008	✓	4	370	455	426	(2)	4	82	150	128	✓
Coral Bay	2	73.0	98.0	85.5	(1)	2	<0.008	<0.008	<0.008	✓	2	21	22	22	✓	2	62	86	74	✓
Cue	4	37.0	41.0	39.0	(1)	4	<0.008	<0.008	<0.008	✓	4	105	120	113	✓	4	34	41	38	✓
Dandaragan	4	140.0	190.0	172.5	(1)	4	<0.008	<0.008	<0.008	✓	4	240	255	249	✓	4	91	100	94	✓
Denham	2	61.0	79.0	70.0	(1)	2	0.010	0.014	0.012	✓	2	75	80	78	✓	2	55	65	60	✓
Dongara/Denison	4	60.0	69.0	65.0	(1)	4	<0.008	<0.008	<0.008	✓	4	380	420	400	(2)	4	110	130	120	✓
Eneabba	5	15.0	21.0	17.4	(1)	5	<0.008	<0.008	<0.008	✓	5	320	355	345	(2)	5	98	110	101	✓
Exmouth	4	240.0	260.0	250.0	(1)	4	<0.008	<0.008	<0.008	✓	4	245	250	248	✓	4	320	340	333	(3)
Gascoyne Junction	3	14.0	36.0	27.0	(1)	3	<0.008	<0.008	<0.008	✓	3	55	150	102	✓	3	33	100	68	✓
Geraldton	4	61.0	66.0	63.3	(1)	4	<0.008	<0.008	<0.008	✓	4	365	420	401	(2)	4	110	130	120	✓
Gingin	3	21.0	50.0	37.3	(1)	3	<0.008	<0.008	<0.008	✓	3	105	115	110	✓	3	27	33	30	✓
Greenhead	2	20.0	21.0	20.5	(1)	2	<0.008	<0.008	<0.008	✓	2	280	290	285	(2)	2	100	100	100	✓
Guilderton	5	180.0	210.0	196.0	(1)	5	<0.008	<0.008	<0.008	✓	5	395	525	437	(2)	5	320	360	342	(3)
Horrocks	4	46.0	100.0	80.8	(1)	4	<0.008	<0.008	<0.008	✓	4	585	610	593	(2)	4	130	140	133	✓
Jurien Bay	26	150.0	290.0	226.2	(1)	26	<0.008	<0.008	<0.008	✓	26	175	485	283	(2)	26	230	350	300	(3)
Kalbarri	2	6.0	8.0	7.0	(1)	2	<0.008	<0.008	<0.008	✓	2	160	165	163	✓	2	43	47	45	✓
Lancelin	4	200.0	220.0	210.0	(1)	4	<0.008	<0.008	<0.008	✓	4	195	255	220	✓	4	280	300	290	(3)
Latham	4	34.0	41.0	37.8	(1)	4	<0.008	<0.008	<0.008	✓	4	325	335	330	(2)	4	98	100	99	✓
Ledge Point	5	190.0	220.0	206.0	(1)	5	<0.008	<0.008	<0.008	✓	5	145	155	152	✓	5	230	250	244	(3)
Leeman	2	22.0	25.0	23.5	(1)	2	<0.008	<0.008	<0.008	✓	6	280	305	293	(2)	2	100	110	105	✓
Meekatharra	2	83.0	86.0	84.5	(1)	2	<0.008	<0.008	<0.008	✓	2	105	105	105	✓	2	51	51	51	✓
Mingenew	5	24.0	31.0	26.8	(1)	5	<0.008	<0.008	<0.008	✓	5	355	395	379	(2)	5	90	100	95	✓
Moora	2	64.0	78.0	71.0	(1)	2	<0.008	<0.008	<0.008	✓	2	255	265	260	(2)	2	63	93	78	✓
Morawa	4	17.0	22.0	19.0	(1)	4	<0.008	<0.008	<0.008	✓	4	280	345	324	(2)	4	61	87	76	✓
Mt Magnet	4	93.0	110.0	100.3	(1)	4	<0.008	<0.008	<0.008	✓	4	90	115	99	✓	4	53	66	59	✓
Mullewa	4	72.0	79.0	76.0	(1)	4	<0.008	<0.008	<0.008	✓	4	390	415	400	(2)	4	130	140	135	✓
Nabawa	4	60.0	65.0	63.5	(1)	4	<0.008	<0.008	<0.008	✓	4	375	420	404	(2)	4	110	130	120	✓
New Norcia	9	35.0	55.0	40.3	(1)	9	<0.008	<0.008	<0.008	✓	9	400	965	717	(2)	9	140	350	258	(3)
Nilgen (Ocean Farms)	2	170.0	220.0	195.0	(1)	2	<0.008	<0.008	<0.008	✓	2	95	125	110	✓	2	170	240	205	(3)
Northampton	2	69.0	71.0	70.0	(1)	2	<0.008	<0.008	<0.008	✓	2	375	400	388	(2)	2	120	140	130	✓
Perenjori	4	17.0	22.0	20.3	(1)	4	<0.008	<0.008	<0.008	✓	4	295	350	326	(2)	4	72	83	79	✓
Piawaning	4	28.0	34.0	31.5	(1)	4	<0.008	<0.008	<0.008	✓	4	325	570	421	(2)	4	150	250	190	✓
Port Kalbarri	3	48.0	98.0	78.7	(1)	3	<0.008	<0.008	<0.008	✓	3	340	345	343	(2)	3	120	120	120	✓
Sandstone	4	47.0	59.0	52.8	(1)	4	<0.008	<0.008	<0.008	✓	4	120	165	138	✓	4	61	83	68	✓
Seabird	2	110.0	120.0	115.0	(1)	2	<0.008	<0.008	<0.008	✓	2	210	215	213	✓	2	98	100	99	✓
Seaview Park	4	160.0	180.0	172.5	(1)	4	<0.008	<0.008	<0.008	✓	4	80	80	80	✓	4	180	180	180	✓
Sovereign Hills	4	200.0	230.0	217.5	(1)	4	<0.008	<0.008	<0.008	✓	4	190	195	194	✓	4	240	250	248	(3)
Three Springs	4	15.0	23.0	20.5	(1)	4	<0.008	<0.008	<0.008	✓	4	345	395	374	(2)	4	82	92	88	✓
Watheroo	5	190.0	210.0	200.0	(1)	5	<0.008	<0.008	<0.008	✓	5	205	215	207	✓	5	250	290	264	(3)
Woodridge	5	48.0	63.0	52.6	(1)	5	0.045	0.070	0.054	✓	5	185	195	189	✓	5	41	50	46	✓
Yalgoo	4	73.0	86.0	77.3	(1)	4	<0.008	<0.008	<0.008	✓	4	75	100	85	✓	4	26	56	37	✓
Yerecoin	4	29.0	82.0	51.3	(1)	4	<0.008	<0.008	<0.008	✓	4	245	485	360	(2)	4	100	220	160	✓
Yuna	3	61.0	66.0	63.3	(1)	3	0.010	0.016	0.013	✓	3	375	420	400	(2)	3	110	130	120	✓

(1) No guideline value available as per ADWG 2011. (2) Elevated chloride is characteristic of the source supplying this locality. (3) Elevated hardness is characteristic of the source supplying this locality.

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Table 9

Aesthetic (non-health related) variables

Mid West Region	Iron				Manganese				pH				Silica							
Locality	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Value (pH units)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Badgingarra	6	<0.003	0.010	0.005	✓	6	<0.002	0.004	<0.002	✓	6	7.15	7.47	7.30	✓	6	38.0	43.0	41.0	✓
Bindoon /Chittering	2	0.025	0.030	0.028	✓	2	<0.002	<0.002	<0.002	✓	2	7.04	7.47	7.26	✓	2	33.0	36.0	34.5	✓
Bolgart	5	0.015	0.035	0.022	✓	5	<0.002	<0.002	<0.002	✓	5	6.33	6.90	6.59	✓	5	37.0	39.0	38.0	✓
Calingiri	4	0.015	0.060	0.033	✓	4	<0.002	<0.002	<0.002	✓	4	6.38	6.92	6.68	✓	4	15.0	17.0	16.0	✓
Carnamah	4	0.015	0.030	0.020	✓	4	<0.002	<0.002	<0.002	✓	4	6.51	6.86	6.74	✓	4	23.0	26.0	24.0	✓
Carnarvon	2	<0.003	0.004	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.37	7.84	7.61	✓	2	36.0	42.0	39.0	✓
Cervantes	4	<0.003	<0.003	<0.003	✓	4	<0.002	<0.002	<0.002	✓	4	7.31	7.52	7.42	✓	4	13.0	13.0	13.0	✓
Coomberdale	3	0.045	0.140	0.082	✓	3	<0.002	0.004	<0.002	✓	3	8.21	8.47	8.36	✓	3	21.0	21.0	21.0	✓
Coorow	4	0.010	0.020	0.018	✓	4	<0.002	0.004	<0.002	✓	4	6.56	7.38	6.83	✓	4	23.0	44.0	29.0	✓
Coral Bay	2	0.006	0.008	0.007	✓	2	<0.002	0.003	<0.002	✓	2	7.23	7.80	7.52	✓	2	<0.2	<0.2	<0.2	✓
Cue	4	<0.003	0.004	<0.003	✓	4	<0.002	<0.002	<0.002	✓	4	7.78	8.03	7.92	✓	4	75.0	80.0	78.8	✓
Dandaragan	4	0.045	0.070	0.059	✓	4	0.004	0.007	0.006	✓	4	7.46	7.65	7.59	✓	4	37.0	39.0	38.3	✓
Denham	2	0.015	0.090	0.053	✓	2	0.003	0.016	0.010	✓	2	7.60	7.90	7.75	✓	2	1.3	1.5	1.4	✓
Dongara/Denison	4	0.008	0.040	0.020	✓	4	<0.002	0.003	<0.002	✓	4	6.75	7.25	7.05	✓	4	22.0	24.0	23.0	✓
Eneabba	5	0.010	0.025	0.020	✓	5	<0.002	0.003	<0.002	✓	5	6.84	7.24	7.03	✓	5	41.0	44.0	42.6	✓
Exmouth	4	<0.003	0.008	<0.003	✓	4	<0.002	<0.002	<0.002	✓	4	7.36	7.70	7.52	✓	4	15.0	16.0	15.3	✓
Gascoyne Junction	3	<0.003	0.015	0.006	✓	3	<0.002	<0.002	<0.002	✓	3	7.02	7.21	7.14	✓	3	3.5	5.2	4.2	✓
Geraldton	4	0.010	0.025	0.016	✓	4	<0.002	<0.002	<0.002	✓	4	6.43	7.31	6.95	✓	4	22.0	24.0	23.0	✓
Gingin	3	0.080	0.120	0.097	✓	3	0.002	0.025	0.010	✓	3	6.88	7.42	7.16	✓	3	27.0	29.0	28.3	✓
Greenhead	2	0.015	0.025	0.020	✓	2	<0.002	<0.002	<0.002	✓	2	6.91	7.14	7.03	✓	2	23.0	23.0	23.0	✓
Guilderton	5	<0.003	0.004	<0.003	✓	5	<0.002	<0.002	<0.002	✓	5	7.58	7.99	7.85	✓	5	8.7	9.5	9.0	✓
Horrocks	4	0.020	0.045	0.030	✓	4	0.003	0.007	0.005	✓	4	7.12	7.70	7.52	✓	4	14.0	15.0	14.3	✓
Jurien Bay	26	<0.003	0.006	<0.003	✓	26	<0.002	<0.002	<0.002	✓	26	7.16	7.80	7.51	✓	26	8.7	15.0	12.9	✓
Kalbarri	2	<0.003	0.004	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	6.78	6.88	6.83	✓	2	39.0	39.0	39.0	✓
Lancelin	4	<0.003	0.006	<0.003	✓	4	<0.002	<0.002	<0.002	✓	4	7.79	7.99	7.92	✓	4	15.0	15.0	15.0	✓
Latham	4	0.015	0.100	0.044	✓	4	<0.002	0.005	<0.002	✓	4	8.72	9.13	8.99	(1)	4	40.0	46.0	43.5	✓
Ledge Point	5	<0.003	0.006	<0.003	✓	5	<0.002	<0.002	<0.002	✓	5	7.64	7.99	7.86	✓	5	14.0	15.0	14.8	✓
Leeman	2	0.010	0.025	0.018	✓	2	<0.002	<0.002	<0.002	✓	2	6.82	7.35	7.09	✓	2	23.0	24.0	23.5	✓
Meekatharra	2	0.004	0.004	0.004	✓	2	<0.002	<0.002	<0.002	✓	2	7.87	8.05	7.96	✓	2	75.0	80.0	77.5	✓
Mingenew	5	0.006	0.045	0.017	✓	5	<0.002	<0.002	<0.002	✓	5	6.79	7.44	7.20	✓	5	50.0	55.0	51.0	✓
Moora	2	0.015	0.070	0.043	✓	2	<0.002	0.002	<0.002	✓	2	7.79	7.87	7.83	✓	2	21.0	21.0	21.0	✓
Morawa	4	0.008	0.025	0.017	✓	4	<0.002	<0.002	<0.002	✓	4	6.74	7.19	7.02	✓	4	41.0	45.0	43.0	✓
Mt Magnet	4	<0.003	<0.003	<0.003	✓	4	<0.002	<0.002	<0.002	✓	4	7.96	8.19	8.09	✓	4	70.0	80.0	75.0	✓
Mullewa	4	0.030	0.040	0.033	✓	4	<0.002	<0.002	<0.002	✓	4	7.83	8.31	8.07	✓	4	20.0	26.0	23.5	✓
Nabawa	4	0.015	0.025	0.020	✓	4	<0.002	0.003	<0.002	✓	4	7.68	7.82	7.75	✓	4	22.0	25.0	23.3	✓
New Norcia	9	0.020	0.120	0.039	✓	9	<0.002	0.004	<0.002	✓	9	6.20	7.61	6.68	✓	9	27.0	46.0	40.1	✓
Nilgen (Ocean Farms)	2	<0.003	0.006	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.41	8.13	7.77	✓	2	16.0	18.0	17.0	✓
Northampton	2	0.020	0.045	0.033	✓	2	<0.002	0.004	<0.002	✓	2	8.06	8.31	8.19	✓	2	22.0	24.0	23.0	✓
Perenjori	4	0.006	0.025	0.015	✓	4	<0.002	<0.002	<0.002	✓	4	7.09	7.51	7.25	✓	4	44.0	46.0	45.0	✓
Piawaning	4	0.008	0.010	0.010	✓	4	<0.002	<0.002	<0.002	✓	4	7.11	7.42	7.31	✓	4	18.0	19.0	18.8	✓
Port Kalbarri	3	0.004	0.010	0.007	✓	3	<0.002	<0.002	<0.002	✓	3	6.64	7.60	7.20	✓	3	42.0	44.0	42.7	✓
Sandstone	4	<0.003	0.008	<0.003	✓	4	<0.002	<0.002	<0.002	✓	4	7.29	7.84	7.64	✓	4	33.0	35.0	33.8	✓
Seabird	2	0.030	0.045	0.038	✓	2	<0.002	<0.002	<0.002	✓	2	7.68	7.86	7.77	✓	2	17.0	18.0	17.5	✓
Seaview Park	4	<0.003	<0.003	<0.003	✓	4	<0.002	<0.002	<0.002	✓	4	7.77	7.96	7.87	✓	4	16.0	16.0	16.0	✓
Sovereign Hills	4	<0.003	<0.003	<0.003	✓	4	<0.002	<0.002	<0.002	✓	4	7.68	7.91	7.83	✓	4	19.0	19.0	19.0	✓
Three Springs	4	0.020	0.035	0.026	✓	4	0.004	0.007	0.006	✓	4	6.98	7.50	7.28	✓	4	45.0	49.0	46.5	✓
Watheroo	5	0.004	0.025	0.010	✓	5	<0.002	<0.002	<0.002	✓	5	7.43	7.71	7.56	✓	5	13.0	14.0	13.4	✓
Woodridge	5	0.015	0.025	0.020	✓	5	0.002	0.003	0.003	✓	5	7.21	7.35	7.27	✓	5	23.0	25.0	23.8	✓
Yalgoo	4	<0.003	0.004	<0.003	✓	4	<0.002	<0.002	<0.002	✓	4	7.40	7.88	7.58	✓	4	80.0	85.0	81.3	(2)
Yerecoin	4	0.035	0.070	0.048	✓	4	<0.002	<0.002	<0.002	✓	4	7.51	7.88	7.69	✓	4	18.0	19.0	18.5	✓
Yuna	3	0.060	0.180	0.107	✓	3	0.003	0.008	0.005	✓	3	7.73	7.79	7.76	✓	3	22.0	25.0	23.0	✓

(1) Elevated pH due to long mains supplying this locality. (2) Elevated silica is characteristic of the source supplying this locality.

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Table 10

Mid West Region	Aesthetic (non-health related) variables																								
	Sodium					Sulphate					Total Dissolved Solids					True Colour					Turbidity				
	Locality	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Value (TCU)			Guideline Met	Samples Taken	Value (NTU)		
Min			Max	Mean	Min			Max	Mean	Min			Max	Mean	Min			Max	Mean	Min			Max	Mean	Min
Badgingarra	10	170	190	181	(1)	6	21	22	21	✓	6	608	682	654	(2)	7	<1	<1	<1	✓	7	<0.1	0.2	<0.1	✓
Bindoon /Chittering	2	120	120	120	✓	2	19	20	20	✓	2	472	484	478	✓	2	<1	<1	<1	✓	2	0.1	0.2	0.2	✓
Bolgart	5	110	140	124	✓	5	21	24	23	✓	5	487	607	540	✓	4	<1	<1	<1	✓	4	0.2	0.7	0.5	✓
Calingiri	4	195	300	255	(1)	4	30	47	40	✓	4	667	1046	895	(2)	4	<1	<1	<1	✓	4	<0.1	0.3	<0.1	✓
Carnamah	4	245	260	253	(1)	4	50	53	52	✓	4	813	863	841	(2)	5	<1	<1	<1	✓	5	<0.1	0.3	<0.1	✓
Carnarvon	2	78	84	81	✓	2	57	59	58	✓	2	520	532	526	✓	2	<1	<1	<1	✓	2	<0.1	0.4	0.2	✓
Cervantes	4	160	195	174	✓	4	30	38	34	✓	4	952	1012	973	(2)	5	<1	<1	<1	✓	5	<0.1	0.2	<0.1	✓
Coomberdale	3	155	165	162	✓	3	26	28	27	✓	3	575	646	611	(2)	2	<1	<1	<1	✓	2	0.2	0.3	0.3	✓
Coorow	4	210	260	240	(1)	4	44	54	50	✓	4	727	857	807	(2)	5	<1	<1	<1	✓	5	<0.1	0.3	<0.1	✓
Coral Bay	2	16	16	16	✓	2	1	2	1	✓	2	155	192	174	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Cue	4	73	84	78	✓	4	17	22	20	✓	4	350	390	369	✓	4	<1	<1	<1	✓	4	<0.1	<0.1	<0.1	✓
Dandaragan	4	185	210	196	(1)	4	26	28	27	✓	4	718	791	758	(2)	5	<1	<1	<1	✓	5	0.1	0.3	0.2	✓
Denham	2	48	54	51	✓	2	2	2	2	✓	2	221	262	242	✓	2	<1	<1	<1	✓	2	0.1	0.2	0.2	✓
Dongara/Denison	4	235	265	250	(1)	4	50	61	55	✓	4	815	868	854	(2)	4	<1	2	<1	✓	4	<0.1	1.7	0.5	✓
Eneabba	5	175	185	180	✓	5	27	29	28	✓	5	617	677	654	(2)	4	<1	3	<1	✓	4	0.1	0.3	0.2	✓
Exmouth	4	115	125	121	✓	4	27	29	28	✓	4	837	851	843	(2)	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Gascoyne Junction	3	31	76	53	✓	3	20	52	34	✓	3	139	363	251	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Geraldton	4	230	265	250	(1)	4	51	56	54	✓	4	788	890	851	(2)	4	<1	<1	<1	✓	4	<0.1	<0.1	<0.1	✓
Gingin	3	63	69	67	✓	3	10	12	11	✓	3	259	291	279	✓	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Greenhead	2	155	160	158	✓	2	34	34	34	✓	2	558	572	565	✓	2	<1	<1	<1	✓	2	<0.1	0.3	0.2	✓
Guilderton	5	220	280	246	(1)	5	48	63	54	✓	5	1056	1298	1148	(2)	4	<1	<1	<1	✓	4	<0.1	0.2	<0.1	✓
Horrocks	4	380	395	389	(1)	4	90	95	92	✓	4	1176	1263	1238	(2)	4	<1	<1	<1	✓	4	0.2	0.4	0.3	✓
Jurien Bay	26	96	280	155	✓	26	18	52	31	✓	26	652	1169	884	(2)	26	<1	<1	<1	✓	26	<0.1	0.2	<0.1	✓
Kalbarri	2	80	86	83	✓	2	16	17	17	✓	2	322	336	329	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Lancelin	4	92	125	107	✓	4	17	24	20	✓	4	706	774	730	(2)	5	<1	<1	<1	✓	5	<0.1	<0.1	<0.1	✓
Latham	4	190	210	199	(1)	4	46	50	48	✓	4	691	726	710	(2)	4	<1	<1	<1	✓	4	<0.1	0.3	0.2	✓
Ledge Point	5	89	97	93	✓	5	36	40	38	✓	5	645	687	664	(2)	3	<1	<1	<1	✓	3	<0.1	0.1	<0.1	✓
Leeman	2	155	165	160	✓	2	36	36	36	✓	2	572	577	575	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Meekatharra	2	87	87	87	✓	2	22	24	23	✓	2	435	442	439	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Mingenew	5	215	240	225	(1)	5	37	42	41	✓	5	736	811	776	(2)	4	<1	<1	<1	✓	4	<0.1	0.2	<0.1	✓
Moora	2	165	165	165	✓	2	26	26	26	✓	2	593	597	595	✓	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Morawa	4	160	215	189	(1)	4	40	53	47	✓	4	580	713	658	(2)	3	<1	<1	<1	✓	3	<0.1	0.1	<0.1	✓
Mt Magnet	4	83	95	87	✓	4	14	16	15	✓	4	422	485	447	✓	4	<1	<1	<1	✓	4	<0.1	0.2	<0.1	✓
Mullewa	4	230	270	250	(1)	4	52	61	56	✓	4	845	913	880	(2)	4	<1	<1	<1	✓	4	0.1	0.4	0.3	✓
Nabawa	4	235	265	249	(1)	4	50	57	55	✓	4	811	896	855	(2)	4	<1	<1	<1	✓	4	0.1	0.5	0.3	✓
New Norcia	9	220	530	388	(1)	9	32	91	64	✓	9	817	1814	1371	(2)	5	<1	<1	<1	✓	5	0.3	1.0	0.5	✓
Nilgen (Ocean Farms)	2	58	85	72	✓	2	13	19	16	✓	2	481	637	559	✓	3	<1	<1	<1	✓	3	<0.1	<0.1	<0.1	✓
Northampton	2	240	265	253	(1)	2	51	60	56	✓	2	820	885	853	(2)	2	<1	<1	<1	✓	2	0.1	0.4	0.3	✓
Perenjori	4	180	200	191	(1)	4	43	50	47	✓	4	619	703	668	(2)	4	<1	<1	<1	✓	4	<0.1	0.2	<0.1	✓
Piawaning	4	170	305	224	(1)	4	44	74	56	✓	4	679	1107	845	(2)	4	<1	<1	<1	✓	4	<0.1	<0.1	<0.1	✓
Port Kalbarri	3	205	230	222	(1)	3	45	46	45	✓	3	737	821	791	(2)	2	2	2	2	✓	2	<0.1	0.2	<0.1	✓
Sandstone	4	82	100	89	✓	4	24	32	27	✓	4	374	463	402	✓	4	<1	<1	<1	✓	4	<0.1	0.2	<0.1	✓
Seabird	2	140	140	140	✓	2	34	35	35	✓	2	586	590	588	✓	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Seaview Park	4	55	57	56	✓	4	13	14	14	✓	4	462	480	474	✓	4	<1	<1	<1	✓	4	0.1	0.5	0.3	✓
Sovereign Hills	4	98	100	99	✓	4	16	19	18	✓	4	670	703	690	(2)	4	<1	<1	<1	✓	4	<0.1	0.2	<0.1	✓
Three Springs	4	215	220	219	(1)	4	42	45	43	✓	4	708	762	741	(2)	4	<1	<1	<1	✓	4	0.1	0.3	0.2	✓
Watheroo	5	93	100	96	✓	5	18	20	19	✓	5	651	676	665	(2)	4	<1	<1	<1	✓	4	<0.1	0.1	<0.1	✓
Woodridge	5	120	130	127	✓	5	35	39	37	✓	5	449	481	466	✓	4	<1	<1	<1	✓	4	<0.1	0.1	<0.1	✓
Yalgoo	4	70	78	75	✓	4	4	10	6	✓	4	354	407	379	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Yerecoin	4	160	260	205	(1)	4	33	68	50	✓	4	611	967	770	(2)	4	<1	<1	<1	✓	4	<0.1	0.2	<0.1	✓
Yuna	3	230	270	253	(1)	3	52	60	57	✓	3	804	888	858	(2)	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓

(1) Elevated Sodium is characteristic of the source supplying this locality. (2) Elevated TDS is characteristic of the source supplying this locality.

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Table 11

Goldfields and Agricultural Region	Health related variables															
	E. coli				Thermophilic Naegleria			Fluoride					Hydrocarbons		Metals	
	Locality	Samples Taken	Samples >0 cfu/100mL	Max cfu/100mL	Requirement Met	Samples Taken	Samples with Thermophilic Naegleria	Requirement Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Guideline Met	Samples Taken
Min										Max	Mean					
Ardath	12	0	0	✓	12	0	✓	2	0.85	0.85	0.85	(2)	0	(1)	2	✓
Avon Hills	60	0	0	✓	60	0	✓	2	0.85	0.90	0.88	(2)	0	(1)	2	✓
Ballidu	12	0	0	✓	12	0	✓	2	0.85	0.90	0.88	(2)	0	(1)	2	✓
Beacon	12	0	0	✓	12	0	✓	2	0.80	0.85	0.83	(2)	1	✓	2	✓
Bencubbin	12	0	0	✓	12	0	✓	2	0.80	0.80	0.80	(2)	0	(1)	1	(3)
Beverley	52	0	0	✓	26	0	✓	2	0.75	0.85	0.80	(2)	0	(1)	2	✓
Bindi Bindi	12	0	0	✓	12	0	✓	2	0.80	0.80	0.80	(2)	0	(1)	2	✓
Broad Arrow	12	0	0	✓	12	0	✓	2	0.80	0.85	0.83	(2)	0	(1)	2	✓
Bruce Rock	51	0	0	✓	12	0	✓	2	0.80	0.85	0.83	(2)	0	(1)	2	✓
Bullfinch	12	0	0	✓	12	0	✓	2	0.80	0.85	0.83	(2)	0	(1)	2	✓
Buntine	12	0	0	✓	12	0	✓	2	0.75	0.80	0.78	(2)	0	(1)	2	✓
Cadoux	12	0	0	✓	12	0	✓	2	0.80	0.85	0.83	(2)	0	(1)	2	✓
Coolgardie	52	0	0	✓	26	0	✓	2	0.70	0.80	0.75	(2)	0	(1)	2	✓
Corrigin	51	0	0	✓	26	0	✓	2	0.80	0.85	0.83	(2)	0	(1)	2	✓
Cunderdin	52	0	0	✓	12	0	✓	2	0.85	0.85	0.85	(2)	0	(1)	2	✓
Dalwallinu	51	0	0	✓	12	0	✓	2	0.80	0.80	0.80	(2)	0	(1)	2	✓
Dowerin	12	0	0	✓	12	0	✓	2	0.85	0.90	0.88	(2)	0	(1)	2	✓
Goomalling	51	0	0	✓	12	0	✓	2	0.80	0.90	0.85	(2)	1	✓	2	✓
Greater Bodallin	12	0	0	✓	12	0	✓	2	0.90	0.90	0.90	(2)	0	(1)	2	✓
Greater Burracoppin	36	0	0	✓	36	0	✓	2	0.80	0.80	0.80	(2)	0	(1)	2	✓
Greater Doodlakine	36	0	0	✓	36	0	✓	2	0.85	0.85	0.85	(2)	0	(1)	2	✓
Greater Meckering	39	0	0	✓	39	0	✓	2	0.85	0.85	0.85	(2)	0	(1)	2	✓
Greenhills	12	0	0	✓	12	0	✓	2	0.80	0.80	0.80	(2)	0	(1)	2	✓
Jennacubbine	12	0	0	✓	12	0	✓	2	0.80	0.85	0.83	(2)	0	(1)	2	✓
Kalannie	12	0	0	✓	12	0	✓	2	0.85	0.90	0.88	(2)	0	(1)	2	✓
Kalgoorlie	156	0	0	✓	130	0	✓	54	0.70	0.90	0.82	(2)	0	(1)	2	✓
Kambalda	52	0	0	✓	52	0	✓	2	0.85	0.85	0.85	(2)	0	(1)	2	✓
Kellerberrin	51	0	0	✓	26	0	✓	2	0.80	0.85	0.83	(2)	0	(1)	2	✓
Koolyanobbing	12	0	0	✓	12	0	✓	2	0.85	0.85	0.85	(2)	0	(1)	2	✓
Koorda	12	0	0	✓	12	0	✓	2	0.85	0.85	0.85	(2)	0	(1)	2	✓
Kununoppin	12	0	0	✓	12	0	✓	2	0.80	0.80	0.80	(2)	0	(1)	2	✓
Laverton	12	0	0	✓	12	0	✓	4	0.65	0.70	0.68	✓	0	(1)	2	✓
Leonora	52	0	0	✓	25	0	✓	2	0.45	0.50	0.48	✓	0	(1)	2	✓
Marvel Loch	12	0	0	✓	12	0	✓	2	0.80	0.90	0.85	(2)	0	(1)	2	✓
Menzies	12	0	0	✓	12	0	✓	2	0.75	0.85	0.80	(2)	0	(1)	2	✓
Merredin	52	0	0	✓	52	0	✓	52	0.70	1.10	0.82	(2)	0	(1)	2	✓
Miling	12	0	0	✓	12	0	✓	2	0.80	0.80	0.80	(2)	0	(1)	2	✓
Mukinbudin	12	0	0	✓	12	0	✓	2	0.80	0.85	0.83	(2)	0	(1)	2	✓
Muntadgin	12	0	0	✓	12	0	✓	2	0.80	0.85	0.83	(2)	0	(1)	2	✓
Narembeen	12	0	0	✓	12	0	✓	2	0.75	0.80	0.78	(2)	0	(1)	2	✓
Norseman	51	0	0	✓	26	0	✓	2	0.75	0.85	0.80	(2)	0	(1)	2	✓
Northam	78	0	0	✓	65	0	✓	52	0.75	0.90	0.82	(2)	0	(1)	2	✓
Nungarin	12	0	0	✓	12	0	✓	2	0.75	0.95	0.85	(2)	0	(1)	2	✓
Ora Banda	12	0	0	✓	12	0	✓	2	0.80	0.90	0.85	(2)	0	(1)	2	✓
Pithara	12	0	0	✓	12	0	✓	2	0.80	0.85	0.83	(2)	0	(1)	2	✓
Quairading	52	0	0	✓	26	0	✓	2	0.85	0.85	0.85	(2)	0	(1)	2	✓
Seabrook	12	0	0	✓	12	0	✓	2	0.65	0.80	0.73	(2)	0	(1)	2	✓
Shackleton	12	0	0	✓	12	0	✓	2	0.80	0.85	0.83	(2)	0	(1)	2	✓
Southern Cross	52	0	0	✓	39	0	✓	2	0.80	0.85	0.83	(2)	0	(1)	2	✓
Spencers Brook	11	0	0	✓	12	0	✓	2	0.80	0.90	0.85	(2)	0	(1)	2	✓
Tammin	24	0	0	✓	24	0	✓	2	0.80	0.90	0.85	(2)	0	(1)	2	✓
Toodyay	52	0	0	✓	26	0	✓	2	0.85	0.85	0.85	(2)	0	(1)	2	✓
Trayning	12	0	0	✓	12	0	✓	2	0.80	0.85	0.83	(2)	0	(1)	2	✓
Warralakin	12	0	0	✓	12	0	✓	2	0.80	0.80	0.80	(2)	0	(1)	2	✓
Westonia	12	0	0	✓	12	0	✓	1	0.80	0.80	0.80	(2)	0	(1)	2	✓
Wiluna	13	0	0	✓	13	0	✓	2	0.20	0.20	0.20	✓	0	(1)	2	✓
Wongan Hills	52	0	0	✓	39	0	✓	2	0.85	0.85	0.85	(2)	0	(1)	2	✓
Wubin	12	0	0	✓	12	0	✓	2	0.75	0.85	0.80	(2)	0	(1)	2	✓
Wyalkatchem	12	0	0	✓	12	0	✓	2	0.85	0.85	0.85	(2)	0	(1)	2	✓
York	78	0	0	✓	78	0	✓	52	0.70	0.90	0.82	(2)	0	(1)	2	✓

(1) No samples required in this 12 month period (2) Receives water from a fluoridated source within the dosing range set by the Fluoridation of Water Supplies Advisory Committee (3) Sample due in June, taken on July 3 - all metals in the suite within ADWG limits

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Table 12

Goldfields and Agricultural Region	Health related variables															
	Nitrate					Pesticides		Radiological		Trihalomethanes				Other Health Related		
	Locality	Samples Taken	Concentration (mg/L)			*Guideline Met	Samples Taken	Guideline Met	Samples Taken	Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken
Min			Max	Mean	Min							Max	Mean			
Ardath	2	0.9	1.8	1.3	✓	1	✓	2	✓	2	0.028	0.034	0.031	✓	0	(1)
Avon Hills	2	0.4	0.4	0.4	✓	1	✓	2	✓	2	0.032	0.033	0.033	✓	1	✓
Ballidu	2	0.4	1.8	0.9	✓	1	✓	0	(1)	2	0.017	0.030	0.024	✓	1	✓
Beacon	2	0.4	2.2	1.3	✓	1	✓	2	✓	2	0.014	0.022	0.018	✓	0	(1)
Bencubbin	2	0.9	3.1	1.8	✓	1	✓	2	✓	2	0.026	0.110	0.068	✓	1	✓
Beverley	2	1.3	1.3	1.3	✓	1	✓	0	(1)	2	0.018	0.023	0.021	✓	1	✓
Bindi Bindi	2	0.9	2.2	1.8	✓	1	✓	2	✓	2	0.018	0.150	0.084	✓	1	✓
Broad Arrow	2	0.9	1.3	0.9	✓	1	✓	2	✓	2	0.110	0.110	0.110	✓	0	(1)
Bruce Rock	2	0.9	0.9	0.9	✓	1	✓	2	✓	2	0.013	0.018	0.016	✓	0	(1)
Bullfinch	2	2.6	2.6	2.6	✓	1	✓	0	(1)	2	0.031	0.066	0.049	✓	0	(1)
Buntine	2	1.3	2.2	1.8	✓	1	✓	2	✓	2	0.008	0.099	0.054	✓	1	✓
Cadoux	2	0.4	1.8	1.3	✓	1	✓	2	✓	2	0.016	0.033	0.025	✓	1	✓
Coolgardie	2	0.9	0.9	0.9	✓	1	✓	2	✓	2	0.052	0.060	0.056	✓	1	✓
Corrigin	2	0.9	0.9	0.9	✓	1	✓	2	✓	2	0.011	0.025	0.018	✓	0	(1)
Cunderdin	2	0.4	0.4	0.4	✓	1	✓	2	✓	2	0.021	0.032	0.027	✓	1	✓
Dalwallinu	2	0.9	1.3	0.9	✓	1	✓	2	✓	2	0.018	0.030	0.024	✓	1	✓
Dowerin	2	<0.2	0.9	0.4	✓	1	✓	0	(1)	2	0.017	0.026	0.022	✓	1	✓
Goomalling	2	0.4	0.4	0.4	✓	1	✓	2	✓	2	0.018	0.029	0.024	✓	1	✓
Greater Bodallin	2	0.4	0.9	0.9	✓	1	✓	2	✓	2	0.023	0.026	0.025	✓	0	(1)
Greater Burracoppin	2	0.4	0.9	0.4	✓	1	✓	2	✓	2	0.028	0.032	0.030	✓	0	(1)
Greater Doodlakine	2	0.4	0.9	0.9	✓	1	✓	2	✓	2	0.034	0.038	0.036	✓	0	(1)
Greater Meckering	2	0.4	0.4	0.4	✓	1	✓	2	✓	2	0.020	0.028	0.024	✓	1	✓
Greenhills	2	0.9	1.3	0.9	✓	1	✓	2	✓	2	0.021	0.026	0.024	✓	0	(1)
Jennacubbine	2	1.3	1.8	1.8	✓	1	✓	0	(1)	2	0.014	0.018	0.016	✓	0	(1)
Kalannie	2	1.8	4.0	3.1	✓	1	✓	2	✓	2	0.028	0.066	0.047	✓	1	✓
Kalgoorlie	2	0.9	0.9	0.9	✓	1	✓	2	✓	2	0.097	0.140	0.119	✓	1	✓
Kambalda	2	0.9	1.3	0.9	✓	1	✓	0	(1)	4	0.075	0.130	0.106	✓	1	✓
Kellerberrin	2	0.4	0.4	0.4	✓	1	✓	0	(1)	2	0.026	0.034	0.030	✓	1	✓
Koolyanobbing	2	0.4	0.9	0.4	✓	1	✓	1	✓	2	0.008	0.013	0.010	✓	1	✓
Koorda	2	0.4	0.9	0.9	✓	1	✓	2	✓	2	0.012	0.025	0.019	✓	1	✓
Kununoppin	2	1.3	1.8	1.3	✓	1	✓	2	✓	2	0.017	0.026	0.022	✓	1	✓
Laverton*	55	21.1	40.5	30.4	✓	1	✓	0	(1)	2	0.019	0.022	0.021	✓	1	✓
Leonora*	10	25.5	35.2	28.6	✓	1	✓	0	(1)	2	<0.001	<0.001	<0.001	✓	1	✓
Marvel Loch	2	0.4	3.5	2.2	✓	1	✓	0	(1)	2	0.028	0.040	0.034	✓	1	✓
Menzies*	6	0.9	1.8	1.3	✓	1	✓	2	✓	2	0.110	0.120	0.115	✓	1	✓
Merredin	2	0.4	0.4	0.4	✓	1	✓	0	(1)	2	0.022	0.029	0.026	✓	1	✓
Miling	2	1.3	4.4	3.1	✓	1	✓	0	(1)	2	0.018	0.021	0.020	✓	1	✓
Mukinbudin	2	0.4	0.9	0.9	✓	1	✓	2	✓	2	0.016	0.025	0.021	✓	1	✓
Muntadgin	2	0.4	1.3	0.9	✓	1	✓	1	✓	2	0.021	0.037	0.029	✓	1	✓
Narembeen	2	0.9	0.9	0.9	✓	1	✓	2	✓	2	0.016	0.023	0.020	✓	1	✓
Norseman	2	1.3	1.8	1.8	✓	1	✓	2	✓	2	0.015	0.044	0.030	✓	0	(1)
Northam	2	0.9	1.3	1.3	✓	1	✓	0	(1)	2	0.021	0.027	0.024	✓	1	✓
Nungarin	2	0.4	0.9	0.4	✓	1	✓	2	✓	2	0.025	0.031	0.028	✓	1	✓
Ora Banda	2	0.9	0.9	0.9	✓	1	✓	2	✓	2	0.049	0.140	0.095	✓	1	✓
Pithara	2	0.4	0.4	0.4	✓	1	✓	2	✓	2	0.019	0.035	0.027	✓	1	✓
Quairading	2	0.9	2.2	1.3	✓	1	✓	0	(1)	2	0.012	0.051	0.032	✓	1	✓
Seabrook	2	0.4	0.9	0.4	✓	1	✓	1	✓	2	0.024	0.033	0.029	✓	0	(1)
Shackleton	2	0.4	2.6	1.8	✓	1	✓	2	✓	2	0.023	0.032	0.028	✓	0	(1)
Southern Cross	2	0.4	0.9	0.4	✓	1	✓	2	✓	2	0.011	0.016	0.014	✓	1	✓
Spencers Brook	2	0.4	0.9	0.9	✓	1	✓	0	(1)	2	0.016	0.031	0.024	✓	0	(1)
Tammin	2	0.4	0.4	0.4	✓	1	✓	2	✓	2	0.023	0.024	0.024	✓	1	✓
Toodyay	2	0.4	0.9	0.4	✓	1	✓	2	✓	2	0.017	0.024	0.021	✓	1	✓
Trayning	2	0.9	0.9	0.9	✓	1	✓	2	✓	2	0.019	0.021	0.020	✓	1	✓
Warralakin	2	0.4	0.9	0.4	✓	1	✓	2	✓	2	0.022	0.025	0.024	✓	1	✓
Westonia	2	0.9	1.3	0.9	✓	1	✓	2	✓	2	0.018	0.023	0.021	✓	1	✓
Wiluna*	2	29.9	33.4	31.7	✓	1	✓	1	✓	2	0.005	0.005	0.005	✓	0	(1)
Wongan Hills	2	0.4	0.4	0.4	✓	1	✓	2	✓	2	0.011	0.025	0.018	✓	1	✓
Wubin	2	1.8	2.2	1.8	✓	1	✓	2	✓	2	0.004	0.011	0.008	✓	1	✓
Wyalkatchem	2	0.4	0.9	0.4	✓	1	✓	2	✓	2	0.014	0.028	0.021	✓	1	✓
York	2	0.4	0.9	0.4	✓	1	✓	2	✓	2	0.030	0.034	0.032	✓	1	✓

(1) No samples required in this 12 month period.

*Wiluna, Laverton, Leonora and Menzies have been granted an exemption from compliance with the infant health nitrate guideline by the Department of Health, however, following treatment or operational intervention these towns have achieved compliance with the infant health limit. Carers of infants younger than 3 months should seek advice from the Community Health Nurse regarding the use of alternative water sources for the preparation of bottle feeds. Water Corporation provides bottled water free of charge for this purpose. Note: The water supplied has always met the guideline for adults and children over the age of 3 months - for a full list of towns with nitrate exemptions and how we are improving water quality in these towns - please refer to 'Understanding water quality test results - Nitrate' section of the annual report.

Drinking Water Quality Annual Report Data 01/07/2023 to 30/06/2024

Table 13

Aesthetic (non-health related) variables

Goldfields and Agricultural Region	Alkalinity (as CaCO ₃)				Aluminium				Chloride				Hardness							
	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met					
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean						
Ardath	2	68	72	70	(1)	2	0.012	0.045	0.029	✓	2	205	205	205	✓	2	100	100	100	✓
Avon Hills	2	64	68	66	(1)	2	0.012	0.014	0.013	✓	2	180	210	195	✓	2	96	100	98	✓
Ballidu	2	64	73	69	(1)	2	0.008	0.020	0.014	✓	2	195	200	198	✓	2	100	110	105	✓
Beacon	2	69	73	71	(1)	2	0.014	0.020	0.017	✓	2	200	210	205	✓	2	110	110	110	✓
Bencubbin	2	66	68	67	(1)	2	0.012	0.014	0.013	✓	2	215	215	215	✓	2	100	110	105	✓
Beverley	2	69	85	77	(1)	2	0.008	0.030	0.019	✓	2	185	195	190	✓	2	98	110	104	✓
Bindi Bindi	2	66	78	72	(1)	2	0.010	0.025	0.018	✓	2	200	210	205	✓	2	110	110	110	✓
Broad Arrow	2	56	61	59	(1)	2	0.020	0.025	0.023	✓	2	205	220	213	✓	2	110	110	110	✓
Bruce Rock	2	66	72	69	(1)	2	0.012	0.025	0.019	✓	2	190	205	198	✓	2	100	110	105	✓
Bullfinch	2	66	70	68	(1)	2	0.020	0.035	0.028	✓	2	195	230	213	✓	2	110	110	110	✓
Buntine	2	71	76	74	(1)	2	0.012	0.030	0.021	✓	2	200	215	208	✓	2	110	110	110	✓
Cadoux	2	64	68	66	(1)	2	0.010	0.025	0.018	✓	2	195	195	195	✓	2	100	110	105	✓
Coolgardie	2	56	66	61	(1)	2	0.014	0.025	0.020	✓	2	195	210	203	✓	2	95	110	103	✓
Corrigin	2	62	69	66	(1)	2	0.010	0.045	0.028	✓	2	205	210	208	✓	2	100	110	105	✓
Cunderdin	2	63	68	66	(1)	2	<0.008	0.018	0.009	✓	2	190	195	193	✓	2	98	100	99	✓
Dalwallinu	2	67	71	69	(1)	2	0.014	0.018	0.016	✓	2	185	215	200	✓	2	100	110	105	✓
Dowerin	2	68	70	69	(1)	2	0.014	0.014	0.014	✓	2	185	210	198	✓	2	97	110	104	✓
Goomalling	2	63	71	67	(1)	2	0.012	0.018	0.015	✓	2	175	210	193	✓	2	96	99	98	✓
Greater Bodallin	2	66	70	68	(1)	2	0.008	0.025	0.017	✓	2	195	205	200	✓	2	100	100	100	✓
Greater Burracoppin	2	67	73	70	(1)	2	0.008	0.030	0.019	✓	2	190	205	198	✓	2	98	100	99	✓
Greater Doodlakine	2	69	72	71	(1)	2	<0.008	0.025	0.013	✓	2	195	205	200	✓	2	98	99	99	✓
Greater Meckering	2	62	68	65	(1)	2	<0.008	0.016	<0.008	✓	2	190	195	193	✓	2	97	100	99	✓
Greenhills	2	71	81	76	(1)	2	<0.008	0.025	0.013	✓	2	200	200	200	✓	2	100	110	105	✓
Jennacubbine	2	73	74	74	(1)	2	<0.008	0.025	0.013	✓	2	195	205	200	✓	2	100	110	105	✓
Kalannie	2	65	68	67	(1)	2	0.010	0.025	0.018	✓	2	205	220	213	✓	2	100	110	105	✓
Kalgoorlie	2	55	80	68	(1)	2	0.014	0.025	0.020	✓	2	200	220	210	✓	2	100	110	105	✓
Kambalda	2	60	66	63	(1)	2	0.012	0.018	0.015	✓	2	200	215	208	✓	2	100	110	105	✓
Kellerberrin	2	68	71	70	(1)	2	0.012	0.020	0.016	✓	2	195	205	200	✓	2	95	110	103	✓
Koolyanobbing	2	72	72	72	(1)	2	0.014	0.025	0.020	✓	2	175	215	195	✓	2	96	110	103	✓
Koorda	2	62	71	67	(1)	2	0.008	0.018	0.013	✓	2	200	200	200	✓	2	100	100	100	✓
Kununoppin	2	68	70	69	(1)	2	0.018	0.025	0.022	✓	2	190	210	200	✓	2	100	110	105	✓
Laverton	6	64	97	77	(1)	2	<0.008	<0.008	<0.008	✓	6	75	135	94	✓	6	44	99	63	✓
Leonora	6	100	130	112	(1)	2	<0.008	<0.008	<0.008	✓	6	155	180	168	✓	6	130	150	137	✓
Marvel Loch	2	58	65	62	(1)	2	0.020	0.030	0.025	✓	2	205	205	205	✓	2	100	110	105	✓
Menzies	2	52	58	55	(1)	2	0.008	0.030	0.019	✓	2	205	210	208	✓	2	110	110	110	✓
Merredin	2	63	72	68	(1)	2	0.010	0.025	0.018	✓	2	195	195	195	✓	2	99	100	100	✓
Miling	2	68	68	68	(1)	2	0.012	0.018	0.015	✓	2	190	215	203	✓	2	110	110	110	✓
Mukinbudin	2	68	74	71	(1)	2	0.018	0.018	0.018	✓	2	185	190	188	✓	2	92	95	94	✓
Muntadgin	2	66	70	68	(1)	2	0.008	0.035	0.022	✓	2	195	205	200	✓	2	99	100	100	✓
Narebeeen	2	64	68	66	(1)	2	0.010	0.035	0.023	✓	2	195	205	200	✓	2	98	100	99	✓
Norseman	2	66	66	66	(1)	2	0.014	0.030	0.022	✓	2	205	235	220	✓	2	110	120	115	✓
Northam	2	68	68	68	(1)	2	0.010	0.020	0.015	✓	2	195	215	205	✓	2	99	100	100	✓
Nungarin	2	66	73	70	(1)	2	0.010	0.030	0.020	✓	2	195	200	198	✓	2	99	100	100	✓
Ora Banda	2	68	71	70	(1)	2	0.014	0.018	0.016	✓	2	210	220	215	✓	2	120	120	120	✓
Pithara	2	64	71	68	(1)	2	<0.008	0.030	0.015	✓	2	195	200	198	✓	2	100	110	105	✓
Quairading	2	63	68	66	(1)	2	0.008	0.020	0.014	✓	2	195	210	203	✓	2	110	110	110	✓
Seabrook	2	69	73	71	(1)	2	<0.008	0.025	0.013	✓	2	185	200	193	✓	2	100	100	100	✓
Shackleton	2	65	72	69	(1)	2	<0.008	0.025	0.013	✓	2	200	205	203	✓	2	100	100	100	✓
Southern Cross	2	71	88	80	(1)	2	0.014	0.018	0.016	✓	2	190	215	203	✓	2	99	100	100	✓
Spencers Brook	2	67	72	70	(1)	2	<0.008	0.020	0.010	✓	2	195	205	200	✓	2	100	100	100	✓
Tammin	2	65	66	66	(1)	2	0.014	0.018	0.016	✓	2	185	210	198	✓	2	97	100	99	✓
Toodyay	2	67	75	71	(1)	2	<0.008	0.030	0.015	✓	2	190	205	198	✓	2	96	100	98	✓
Trayning	2	64	72	68	(1)	2	0.016	0.016	0.016	✓	2	190	210	200	✓	2	100	110	105	✓
Warralakin	2	66	71	69	(1)	2	0.014	0.020	0.017	✓	2	200	215	208	✓	2	100	110	105	✓
Westonia	2	63	72	68	(1)	2	0.016	0.020	0.018	✓	2	200	215	208	✓	2	100	110	105	✓
Wiluna	2	71	88	80	(1)	2	<0.008	<0.008	<0.008	✓	2	60	70	65	✓	2	65	82	74	✓
Wongan Hills	2	70	72	71	(1)	2	0.012	0.025	0.019	✓	2	195	205	200	✓	2	100	110	105	✓
Wubin	2	76	78	77	(1)	2	0.012	0.020	0.016	✓	2	195	205	200	✓	2	110	110	110	✓
Wyalkatchem	2	61	67	64	(1)	2	0.008	0.025	0.017	✓	2	195	195	195	✓	2	99	100	100	✓
York	2	67	78	73	(1)	2	<0.008	0.018	0.009	✓	2	185	195	190	✓	2	97	110	104	✓

(1) No guideline value available as per ADWG 2011.

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Table 14

Aesthetic (non-health related) variables

Goldfields and Agricultural Region	Aesthetic (non-health related) variables																			
	Iron					Manganese					pH					Silica				
	Locality	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Value (pH units)			Guideline Met	Samples Taken	Concentration (mg/L)		
Min			Max	Mean	Min			Max	Mean	Min			Max	Mean	Min			Max	Mean	
Ardath	2	0.008	0.015	0.012	✓	2	<0.002	<0.002	<0.002	✓	2	8.90	8.99	8.95	✓	2	4.9	5.1	5.0	✓
Avon Hills	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	8.31	8.32	8.32	✓	2	4.9	5.1	5.0	✓
Ballidu	2	0.015	0.035	0.025	✓	2	<0.002	<0.002	<0.002	✓	2	8.61	9.01	8.81	(1)	2	4.6	5.3	5.0	✓
Beacon	2	<0.003	0.004	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	8.72	8.84	8.78	(1)	2	4.5	5.0	4.8	✓
Bencubbin	2	0.008	0.010	0.009	✓	2	<0.002	<0.002	<0.002	✓	2	7.94	8.40	8.17	✓	2	4.6	5.3	5.0	✓
Beverley	2	0.006	0.020	0.013	✓	2	<0.002	<0.002	<0.002	✓	2	8.42	8.63	8.53	(1)	2	4.8	5.0	4.9	✓
Bindi Bindi	2	<0.003	0.010	0.005	✓	2	<0.002	<0.002	<0.002	✓	2	8.53	8.81	8.67	(1)	2	5.0	5.5	5.3	✓
Broad Arrow	2	0.020	0.030	0.025	✓	2	<0.002	<0.002	<0.002	✓	2	7.78	7.93	7.86	✓	2	4.5	5.0	4.8	✓
Bruce Rock	2	0.004	0.004	0.004	✓	2	<0.002	<0.002	<0.002	✓	2	8.58	8.76	8.67	✓	2	4.8	5.4	5.1	✓
Bullfinch	2	0.004	0.015	0.010	✓	2	<0.002	<0.002	<0.002	✓	2	8.57	8.65	8.61	(1)	2	3.9	5.5	4.7	✓
Buntine	2	0.015	0.025	0.020	✓	2	<0.002	<0.002	<0.002	✓	2	8.64	8.75	8.70	(1)	2	4.9	5.3	5.1	✓
Cadoux	2	0.006	0.015	0.011	✓	2	<0.002	<0.002	<0.002	✓	2	8.45	8.70	8.58	✓	2	4.8	5.2	5.0	✓
Coolgardie	2	0.015	0.025	0.020	✓	2	<0.002	<0.002	<0.002	✓	2	7.22	7.82	7.52	✓	2	4.8	5.9	5.4	✓
Corrigin	2	0.004	0.015	0.010	✓	2	<0.002	<0.002	<0.002	✓	2	8.62	8.96	8.79	(1)	2	4.8	5.0	4.9	✓
Cunderdin	2	<0.003	0.008	0.004	✓	2	<0.002	<0.002	<0.002	✓	2	8.33	8.43	8.38	✓	2	4.6	5.4	5.0	✓
Dalwallinu	2	0.006	0.020	0.013	✓	2	<0.002	<0.002	<0.002	✓	2	8.11	8.80	8.46	(1)	2	4.9	5.9	5.4	✓
Dowerin	2	0.008	0.010	0.009	✓	2	<0.002	<0.002	<0.002	✓	2	8.69	8.74	8.72	(1)	2	4.7	5.7	5.2	✓
Goomalling	2	<0.003	0.008	0.004	✓	2	<0.002	<0.002	<0.002	✓	2	8.34	8.69	8.52	✓	2	5.1	5.3	5.2	✓
Greater Bodallin	2	<0.003	0.004	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	8.66	8.87	8.77	✓	2	4.6	5.2	4.9	✓
Greater Burracoppin	2	0.004	0.004	0.004	✓	2	<0.002	<0.002	<0.002	✓	2	8.67	8.93	8.80	✓	2	4.7	5.3	5.0	✓
Greater Doodlakine	2	<0.003	0.004	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	8.57	8.71	8.64	(1)	2	4.9	5.3	5.1	✓
Greater Meckering	2	0.006	0.010	0.008	✓	2	<0.002	<0.002	<0.002	✓	2	8.49	8.61	8.55	✓	2	4.5	5.3	4.9	✓
Greenhills	2	<0.003	0.030	0.015	✓	2	<0.002	<0.002	<0.002	✓	2	8.36	8.38	8.37	✓	2	4.6	5.1	4.9	✓
Jennacubbine	2	0.004	0.010	0.007	✓	2	<0.002	<0.002	<0.002	✓	2	8.86	8.96	8.91	(1)	2	4.7	5.2	5.0	✓
Kalannie	2	0.006	0.025	0.016	✓	2	<0.002	<0.002	<0.002	✓	2	8.06	8.29	8.18	✓	2	4.9	4.9	4.9	✓
Kalgoorlie	2	0.015	0.030	0.023	✓	2	<0.002	<0.002	<0.002	✓	2	7.46	8.02	7.74	✓	2	4.3	5.4	4.9	✓
Kambalda	2	0.008	0.008	0.008	✓	2	<0.002	<0.002	<0.002	✓	2	7.49	8.12	7.81	✓	2	4.7	6.1	5.4	✓
Kellerberrin	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	8.44	8.48	8.46	✓	2	4.8	5.3	5.1	✓
Koolyanobbing	2	0.006	0.030	0.018	✓	2	<0.002	<0.002	<0.002	✓	2	8.74	8.91	8.83	(1)	2	4.5	5.5	5.0	✓
Koorda	2	0.008	0.015	0.012	✓	2	<0.002	<0.002	<0.002	✓	2	8.49	8.58	8.54	✓	2	4.9	5.2	5.1	✓
Kununoppin	2	0.004	0.006	0.005	✓	2	<0.002	<0.002	<0.002	✓	2	8.54	8.68	8.61	(1)	2	5.0	6.5	5.8	✓
Laverton	6	0.006	0.015	0.010	✓	6	<0.002	<0.002	<0.002	✓	6	7.55	7.97	7.77	✓	6	22.0	28.0	23.8	✓
Leonora	6	<0.003	0.006	<0.003	✓	6	<0.002	<0.002	<0.002	✓	6	7.29	7.82	7.62	✓	6	27.0	30.0	28.8	✓
Marvel Loch	2	0.015	0.030	0.023	✓	2	<0.002	<0.002	<0.002	✓	2	7.29	8.43	7.86	✓	2	5.0	5.1	5.1	✓
Menzies	2	0.010	0.020	0.015	✓	2	<0.002	<0.002	<0.002	✓	2	7.67	8.02	7.85	✓	2	5.0	5.1	5.1	✓
Merredin	2	0.004	0.008	0.006	✓	2	<0.002	<0.002	<0.002	✓	2	8.74	8.91	8.83	✓	2	5.0	5.1	5.1	✓
Miling	2	0.006	0.008	0.007	✓	2	<0.002	<0.002	<0.002	✓	2	8.36	8.38	8.37	(1)	2	4.9	5.7	5.3	✓
Mukinbudin	2	<0.003	0.008	0.004	✓	2	<0.002	<0.002	<0.002	✓	2	8.43	8.96	8.70	(1)	2	4.6	5.7	5.2	✓
Muntadgin	2	<0.003	0.004	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	8.63	8.69	8.66	✓	2	5.0	5.3	5.2	✓
Naremben	2	0.006	0.006	0.006	✓	2	<0.002	<0.002	<0.002	✓	2	8.48	8.64	8.56	✓	2	4.8	5.0	4.9	✓
Norseman	2	0.006	0.010	0.008	✓	2	<0.002	<0.002	<0.002	✓	2	8.08	8.17	8.13	✓	2	4.6	6.1	5.4	✓
Northam	2	<0.003	0.008	0.004	✓	2	<0.002	<0.002	<0.002	✓	2	8.36	8.44	8.40	✓	2	4.6	5.3	5.0	✓
Nungarin	2	<0.003	0.004	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	8.78	8.96	8.87	✓	2	4.9	5.2	5.1	✓
Ora Banda	2	0.006	0.008	0.007	✓	2	<0.002	<0.002	<0.002	✓	2	8.14	8.27	8.21	✓	2	4.8	6.5	5.7	✓
Pithara	2	0.015	0.070	0.043	✓	2	<0.002	<0.002	<0.002	✓	2	8.75	8.90	8.83	(1)	2	4.7	5.1	4.9	✓
Quairading	2	0.006	0.010	0.008	✓	2	<0.002	<0.002	<0.002	✓	2	7.82	8.47	8.15	✓	2	4.6	4.9	4.8	✓
Seabrook	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	8.76	8.76	8.76	(1)	2	5.1	5.3	5.2	✓
Shackleton	2	0.006	0.008	0.007	✓	2	<0.002	<0.002	<0.002	✓	2	8.66	8.78	8.72	(1)	2	5.2	6.2	5.7	✓
Southern Cross	2	<0.003	0.004	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	8.58	8.81	8.70	✓	2	4.7	5.4	5.1	✓
Spencers Brook	2	<0.003	0.015	0.008	✓	2	<0.002	<0.002	<0.002	✓	2	8.31	8.45	8.38	(1)	2	4.9	5.2	5.1	✓
Tammin	2	<0.003	0.015	0.008	✓	2	<0.002	<0.002	<0.002	✓	2	8.59	8.64	8.62	✓	2	4.9	5.3	5.1	✓
Toodyay	2	<0.003	0.010	0.005	✓	2	<0.002	<0.002	<0.002	✓	2	8.44	8.54	8.49	(1)	2	4.8	5.4	5.1	✓
Trayning	2	0.006	0.006	0.006	✓	2	<0.002	<0.002	<0.002	✓	2	8.56	8.77	8.67	✓	2	4.6	5.7	5.2	✓
Warralakin	2	0.004	0.010	0.007	✓	2	<0.002	<0.002	<0.002	✓	2	8.68	8.89	8.79	✓	2	4.7	5.0	4.9	✓
Westonia	2	<0.003	0.010	0.005	✓	2	<0.002	<0.002	<0.002	✓	2	8.49	8.86	8.68	✓	2	4.6	5.1	4.9	✓
Wiluna	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.88	8.11	8.00	✓	6	39.0	90.0	77.3	(2)
Wongan Hills	2	0.004	0.010	0.007	✓	2	<0.002	<0.002	<0.002	✓	2	8.89	8.97	8.93	✓	2	4.5	5.4	5.0	✓
Wubin	2	0.008	0.025	0.017	✓	2	<0.002	<0.002	<0.002	✓	2	8.96	9.00	8.98	(1)	2	4.7	5.0	4.9	✓
Wyalkatchem	2	0.006	0.015	0.011	✓	2	<0.002	<0.002	<0.002	✓	2	8.57	8.64	8.61	✓	2	5.2	5.2	5.2	✓
York	2	<0.003	0.010	0.005	✓	2	<0.002	<0.002	<0.002	✓	2	8.46	8.61	8.54	(1)	2	4.4	5.3	4.9	✓

(1) Elevated pH is a result of the pH adjustment as part of Chloramination process. Experience shows that pH at this level is not objectionable to our customers. (2) Elevated Silica is a natural characteristic of the source supplying this locality.

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Table 15

Goldfields and Agricultural Region	Aesthetic (non-health related) variables																								
	Sodium					Sulphate					Total Dissolved Solids					True Colour				Turbidity					
	Localities	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Value (TCU)			Guideline Met	Samples Taken	Value (NTU)		
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Ardath	2	110	120	115	✓	2	29	31	30	✓	2	477	483	480	✓	2	<1	<1	<1	✓	2	0.1	0.2	0.2	✓
Avon Hills	2	105	115	110	✓	2	29	30	30	✓	2	441	486	464	✓	2	<1	<1	<1	✓	2	0.3	0.5	0.4	✓
Ballidu	2	110	110	110	✓	2	28	29	29	✓	2	464	471	468	✓	2	<1	<1	<1	✓	2	0.2	0.5	0.4	✓
Beacon	2	110	120	115	✓	2	29	31	30	✓	2	474	502	488	✓	2	<1	2	<1	✓	2	<0.1	0.3	0.2	✓
Bencubbin	2	115	120	118	✓	2	29	31	30	✓	2	488	500	494	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Beverley	2	105	120	113	✓	2	29	31	30	✓	2	450	498	474	✓	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Bindi Bindi	2	110	115	113	✓	2	29	31	30	✓	2	468	506	487	✓	2	<1	<1	<1	✓	2	0.1	0.2	0.2	✓
Broad Arrow	2	115	125	120	✓	2	31	31	31	✓	2	471	502	487	✓	2	<1	<1	<1	✓	2	0.2	0.3	0.3	✓
Bruce Rock	2	110	125	118	✓	2	29	30	30	✓	2	458	491	475	✓	2	<1	<1	<1	✓	2	0.2	0.2	0.2	✓
Bullfinch	2	115	135	125	✓	2	31	33	32	✓	2	478	528	503	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Buntine	2	110	120	115	✓	2	29	29	29	✓	2	480	509	495	✓	2	<1	<1	<1	✓	2	0.1	0.2	0.2	✓
Cadoux	2	110	115	113	✓	2	29	30	30	✓	2	458	476	467	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Coolgardie	2	105	125	115	✓	2	26	30	28	✓	2	440	491	466	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Corrigin	2	110	120	115	✓	2	29	31	30	✓	2	472	486	479	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Cunderdin	2	105	110	108	✓	2	28	29	29	✓	2	451	462	457	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Dalwallinu	2	110	120	115	✓	2	28	30	29	✓	2	452	496	474	✓	2	<1	<1	<1	✓	2	0.1	0.2	0.2	✓
Dowerin	2	105	115	110	✓	2	29	30	30	✓	2	450	485	468	✓	2	<1	<1	<1	✓	2	<0.1	0.3	0.2	✓
Goomalling	2	105	120	113	✓	2	27	31	29	✓	2	433	493	463	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Greater Bodallin	2	115	115	115	✓	2	29	30	30	✓	2	465	476	471	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Greater Burracoppin	2	110	115	113	✓	2	30	30	30	✓	2	456	484	470	✓	2	<1	<1	<1	✓	2	0.1	0.3	0.2	✓
Greater Doodlakine	2	110	120	115	✓	2	29	31	30	✓	2	464	486	475	✓	2	<1	<1	<1	✓	2	0.1	0.2	0.2	✓
Greater Meckering	2	105	105	105	✓	2	28	29	29	✓	2	449	456	453	✓	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Greenhills	2	110	115	113	✓	2	30	30	30	✓	2	473	494	484	✓	2	<1	<1	<1	✓	2	0.2	0.3	0.3	✓
Jennacubbine	2	105	115	110	✓	2	28	30	29	✓	2	462	488	475	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Kalannie	2	125	130	128	✓	2	31	31	31	✓	2	494	508	501	✓	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Kalgoorlie	2	105	120	113	✓	2	29	30	30	✓	2	454	516	485	✓	2	<1	<1	<1	✓	2	0.1	0.2	0.2	✓
Kambalda	2	105	120	113	✓	2	29	30	30	✓	2	455	495	475	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Kellerberrin	2	110	125	118	✓	2	29	31	30	✓	2	460	493	477	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Koolyanobbing	2	105	120	113	✓	2	28	30	29	✓	2	440	500	470	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Koorda	2	110	110	110	✓	2	29	30	30	✓	2	457	475	466	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Kununoppin	2	105	120	113	✓	2	30	32	31	✓	2	457	503	480	✓	2	<1	<1	<1	✓	2	0.1	0.1	0.1	✓
Laverton	6	67	110	84	✓	6	25	52	35	✓	6	308	517	384	✓	6	<1	<1	<1	✓	6	<0.1	0.2	<0.1	✓
Leonora	6	115	135	123	✓	6	68	80	73	✓	6	572	663	608	(1)	6	<1	<1	<1	✓	6	<0.1	<0.1	<0.1	✓
Marvel Loch	2	110	120	115	✓	2	28	34	31	✓	2	470	487	479	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Menzies	2	110	125	118	✓	2	30	32	31	✓	2	461	485	473	✓	2	<1	<1	<1	✓	2	0.1	0.1	0.1	✓
Merredin	2	110	115	113	✓	2	29	31	30	✓	2	457	471	464	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Miling	2	110	120	115	✓	2	28	30	29	✓	2	462	498	480	✓	2	<1	2	<1	✓	2	0.2	0.3	0.3	✓
Mukinbudin	2	105	120	113	✓	2	29	33	31	✓	2	448	474	461	✓	2	<1	<1	<1	✓	2	0.1	0.2	0.2	✓
Muntadgin	2	110	115	113	✓	2	29	30	30	✓	2	458	486	472	✓	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Narembeen	2	110	115	113	✓	2	29	30	30	✓	2	457	478	468	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Norseman	2	110	125	118	✓	2	28	31	30	✓	2	474	524	499	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Northam	2	110	120	115	✓	2	29	30	30	✓	2	465	492	479	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Nungarin	2	110	120	115	✓	2	29	30	30	✓	2	459	482	471	✓	2	<1	<1	<1	✓	2	<0.1	0.5	0.3	✓
Ora Banda	2	110	120	115	✓	2	30	32	31	✓	2	493	513	503	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Pithara	2	105	110	108	✓	2	28	29	29	✓	2	455	471	463	✓	2	<1	<1	<1	✓	2	0.1	0.4	0.3	✓
Quairading	2	115	120	118	✓	2	30	31	31	✓	2	472	494	483	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Seabrook	2	105	115	110	✓	2	30	31	31	✓	2	456	484	470	✓	2	<1	<1	<1	✓	2	<0.1	0.3	0.2	✓
Shackleton	2	110	115	113	✓	2	29	30	30	✓	2	471	487	479	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Southern Cross	2	105	120	113	✓	2	29	30	30	✓	2	456	514	485	✓	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Spencers Brook	2	105	115	110	✓	2	30	30	30	✓	2	460	482	471	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Tammin	2	110	120	115	✓	2	28	30	29	✓	2	449	484	467	✓	2	<1	<1	<1	✓	2	0.1	0.2	0.2	✓
Toodyay	2	105	115	110	✓	2	29	30	30	✓	2	452	488	470	✓	2	<1	<1	<1	✓	2	0.2	0.2	0.2	✓
Trayning	2	105	120	113	✓	2	30	31	31	✓	2	451	499	475	✓	2	<1	<1	<1	✓	2	0.1	0.2	0.2	✓
Warralakin	2	115	120	118	✓	2	31	32	32	✓	2	474	504	489	✓	2	<1	<1	<1	✓	2	0.2	0.3	0.3	✓
Westonia	2	115	120	118	✓	2	31	31	31	✓	2	470	502	486	✓	2	<1	<1	<1	✓	2	0.1	0.2	0.2	✓
Wiluna	2	56	63	60	✓	2	14	20	17	✓	2	362	408	385	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Wongan Hills	2	110	115	113	✓	2	29	31	30	✓	2	467	487	477	✓	2	<1	<1	<1	✓	2	0.1	0.1	0.1	✓
Wubin	2	110	115	113	✓	2	29	30	30	✓	2	475	496	486	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Wyalkatchem	2	110	110	110	✓	2	28	29	29	✓	2	458	466	462	✓	2	<1	<1	<1	✓	2	<0.1	0.4	0.2	✓
York	2	105	115	110	✓	2	31	31	31	✓	2	450	487	469	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓

(1) Elevated TDS associated with the ability for the scheme to meet demand. Experience shows that TDS at this level is not objectionable to our customers.

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Table 16		Health related variables														
South West Region	<i>E. coli</i>				Thermophilic <i>Naegleria</i>			Fluoride					Hydrocarbons		Metals	
Locality	Samples Taken	Samples >0 cfu/100mL	Max cfu/100mL	Requirement Met	Samples Taken	Samples with Thermophilic <i>Naegleria</i>	Requirement Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Guideline Met	Samples Taken	Guideline Met
									Min	Max	Mean					
Allanson	13	0	0	✓	9	0	✓	4	0.70	0.90	0.80	(2)	1	✓	2	✓
Augusta	58	0	0	✓	39	0	✓	2	0.20	0.25	0.23	✓	0	(1)	4	✓
Australind	102	0	0	✓	102	0	✓	53	0.55	0.95	0.80	(2)	0	(1)	2	✓
Balingup	13	0	0	✓	6	0	✓	2	0.10	0.10	0.10	✓	0	(1)	2	✓
Binningup	52	0	0	✓	26	0	✓	2	0.75	0.85	0.80	(2)	1	✓	2	✓
Boyanup	52	0	0	✓	12	0	✓	2	0.15	0.15	0.15	✓	0	(1)	2	✓
Boyup Brook	52	0	0	✓	19	0	✓	2	0.10	0.15	0.13	✓	0	(1)	2	✓
Bridgetown	65	0	0	✓	39	0	✓	2	0.10	0.15	0.13	✓	0	(1)	2	✓
Brunswick Junction	52	0	0	✓	24	0	✓	2	0.75	0.85	0.80	(2)	0	(1)	2	✓
Capel	52	0	0	✓	39	0	✓	2	0.15	0.20	0.18	✓	0	(1)	2	✓
Collie	76	0	0	✓	48	0	✓	54	0.10	0.90	0.79	(2)	0	(1)	2	✓
Cowaramup	52	0	0	✓	18	0	✓	2	0.20	0.35	0.28	✓	0	(1)	2	✓
Dalyellup	65	0	0	✓	39	0	✓	54	0.70	0.85	0.80	(2)	1	✓	2	✓
Dardanup	26	0	0	✓	26	0	✓	2	<0.1	<0.1	<0.1	✓	0	(1)	2	✓
Darkan	13	0	0	✓	10	0	✓	4	0.75	0.85	0.80	(2)	1	✓	2	✓
Donnybrook	52	0	0	✓	39	0	✓	2	<0.1	<0.1	<0.1	✓	2	✓	5	✓
Dunsborough	104	0	0	✓	104	0	✓	56	0.50	1.10	0.90	✓	0	(1)	2	✓
Eaton	78	0	0	✓	78	0	✓	54	0.70	0.90	0.80	(2)	0	(1)	2	✓
Greenbushes	26	0	0	✓	13	0	✓	2	0.10	0.15	0.13	✓	2	✓	2	✓
Harvey	52	0	0	✓	52	0	✓	52	0.75	1.00	0.81	(2)	2	✓	2	✓
Hester	12	0	0	✓	7	0	✓	2	0.15	0.15	0.15	✓	0	(1)	2	✓
Kirup	13	0	0	✓	7	0	✓	2	0.10	0.10	0.10	✓	0	(1)	2	✓
Logue Brook	12	0	0	✓	7	0	✓	2	0.70	0.75	0.73	(2)	0	(1)	2	✓
Manjimup	69	0	0	✓	47	0	✓	54	0.70	0.80	0.76	(2)	0	(1)	5	✓
Margaret River	78	0	0	✓	45	0	✓	2	0.25	0.30	0.28	✓	0	(1)	2	✓
Mullalyup	13	0	0	✓	6	0	✓	2	0.15	0.15	0.15	✓	0	(1)	2	✓
Myalup	13	0	0	✓	13	0	✓	2	0.80	0.85	0.83	(2)	2	✓	2	✓
Nannup	52	1	1	(3)	19	0	✓	2	<0.1	<0.1	<0.1	✓	0	(1)	2	✓
Northcliffe	13	0	0	✓	6	0	✓	2	0.40	0.45	0.43	✓	2	✓	4	✓
Pemberton	52	0	0	✓	17	0	✓	2	<0.1	<0.1	<0.1	✓	1	✓	2	✓
Peppermint Grove	52	0	0	✓	11	0	✓	2	0.20	0.25	0.23	✓	0	(1)	2	✓
Preston Beach	52	0	0	✓	22	0	✓	2	<0.1	0.10	<0.1	✓	0	(1)	2	✓
Quinninup	12	0	0	✓	6	0	✓	2	<0.1	0.65	0.33	✓	0	(1)	2	✓
Waroona	52	0	0	✓	52	0	✓	54	0.65	1.00	0.84	(2)	2	✓	2	✓
Yarloop	13	0	0	✓	9	0	✓	2	0.80	0.85	0.83	(2)	0	(1)	2	✓

(1) No samples required in this 12 month period (2) Receives water from a fluoridated source within the dosing range set by the Fluoridation of Water Supplies Advisory Committee (3) Naturally occurring fluoride above the ADWG guideline - scheme undergoes defluoridation. (4) Non-compliance associated with microbiological performance criterion as defined in the MoU with DoH. Response protocols implemented in accordance with DoH requirements demonstrated continuous supply of safe drinking water to the locality.

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Table 17		Health related variables														
South West Region	Nitrate				Pesticides		Radiological		Trihalomethanes					Other Health Related		
Locality	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Guideline Met	Samples Taken	Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Requirement Met
		Min	Max	Mean							Min	Max	Mean			
Allanson	2	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	4	0.021	0.079	0.042	✓	1	✓
Augusta	2	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	2	0.005	0.008	0.007	✓	0	(1)
Australind	4	<0.2	<0.2	<0.2	✓	1	✓	2	✓	2	0.007	0.011	0.009	✓	0	(1)
Balingup	2	0.4	0.4	0.4	✓	1	✓	2	✓	2	0.013	0.054	0.034	✓	0	(1)
Binningup	2	<0.2	<0.2	<0.2	✓	1	✓	1	✓	2	0.001	0.029	0.015	✓	2	✓
Boyanup	4	<0.2	<0.2	<0.2	✓	1	✓	2	✓	2	<0.001	0.003	<0.001	✓	0	(1)
Boyup Brook	3	<0.2	0.4	<0.2	✓	1	✓	0	(1)	2	0.094	0.150	0.122	✓	0	(1)
Bridgetown	4	0.4	0.4	0.4	✓	1	✓	2	✓	2	0.003	0.050	0.027	✓	0	(1)
Brunswick Junction	2	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	2	0.008	0.022	0.015	✓	0	(1)
Capel	4	<0.2	<0.2	<0.2	✓	1	✓	2	✓	2	<0.001	<0.001	<0.001	✓	0	(1)
Collie	4	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	2	0.065	0.066	0.066	✓	0	(1)
Cowaramup	5	<0.2	<0.2	<0.2	✓	1	✓	2	✓	5	0.090	0.120	0.108	✓	2	✓
Dalyellup	2	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	2	0.030	0.067	0.049	✓	0	(1)
Dardanup	2	<0.2	<0.2	<0.2	✓	1	✓	2	✓	2	<0.001	<0.001	<0.001	✓	0	(1)
Darkan	2	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	4	0.062	0.110	0.077	✓	0	(1)
Donnybrook	2	12.8	12.8	12.8	✓	1	✓	1	✓	2	0.003	0.005	0.004	✓	1	✓
Dunsborough	4	<0.2	<0.2	<0.2	✓	1	✓	1	✓	2	0.017	0.022	0.020	✓	1	✓
Eaton	4	<0.2	<0.2	<0.2	✓	1	✓	2	✓	2	0.005	0.028	0.017	✓	1	✓
Greenbushes	2	0.4	0.9	0.9	✓	1	✓	1	✓	2	0.054	0.071	0.063	✓	0	(1)
Harvey	2	<0.2	<0.2	<0.2	✓	1	✓	2	✓	2	0.002	0.053	0.027	✓	1	✓
Hester	4	<0.2	0.9	0.4	✓	1	✓	0	(1)	2	0.075	0.150	0.113	✓	0	(1)
Kirup	4	<0.2	0.9	0.4	✓	1	✓	2	✓	2	0.042	0.067	0.055	✓	0	(1)
Logue Brook	2	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	2	<0.001	0.007	0.004	✓	0	(1)
Manjimup	4	<0.2	<0.2	<0.2	✓	4	✓	2	✓	2	0.069	0.089	0.079	✓	1	✓
Margaret River	4	<0.2	<0.2	<0.2	✓	1	✓	1	✓	2	0.100	0.100	0.100	✓	0	(1)
Mullalyup	4	0.4	1.3	0.4	✓	1	✓	2	✓	2	0.012	0.073	0.043	✓	0	(1)
Myalup	2	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	2	0.013	0.098	0.056	✓	2	✓
Nannup	2	<0.2	<0.2	<0.2	✓	1	✓	2	✓	2	0.040	0.042	0.041	✓	0	(1)
Northcliffe	4	0.4	0.9	0.9	✓	3	✓	0	(1)	2	0.066	0.078	0.072	✓	0	(1)
Pemberton	2	0.9	2.2	1.3	✓	4	✓	0	(1)	2	0.100	0.110	0.105	✓	0	(1)
Peppermint Grove	2	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	2	<0.001	<0.001	<0.001	✓	0	(1)
Preston Beach	4	4.0	4.4	4.0	✓	1	✓	0	(1)	4	0.073	0.110	0.092	✓	0	(1)
Quinninup	2	<0.2	0.4	<0.2	✓	1	✓	1	✓	2	0.081	0.110	0.096	✓	0	(1)
Waroona	2	<0.2	<0.2	<0.2	✓	1	✓	2	✓	2	0.020	0.024	0.022	✓	1	✓
Yarloop	2	<0.2	<0.2	<0.2	✓	1	✓	2	✓	2	0.003	0.028	0.016	✓	0	(1)

(1) No samples required in this 12 month period.

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Table 18

Aesthetic (non-health related) variables

South West Region	Alkalinity (as CaCO ₃)			Aluminium			Chloride			Hardness										
Locality	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met					
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean						
Allanson	2	4	17	11	(1)	2	0.010	0.025	0.018	✓	2	60	90	75	✓	2	23	43	33	✓
Augusta	2	23	33	28	(1)	2	<0.008	<0.008	<0.008	✓	2	145	165	155	✓	2	62	64	63	✓
Australind	4	130	130	130	(1)	4	<0.008	<0.008	<0.008	✓	4	170	170	170	✓	4	77	84	80	✓
Balingup	2	110	120	115	(1)	2	<0.008	0.018	0.009	✓	2	105	105	105	✓	2	120	140	130	✓
Binningup	2	36	45	41	(1)	2	0.012	0.016	0.014	✓	2	36	65	51	✓	2	45	54	50	✓
Boyanup	4	110	120	115	(1)	4	<0.008	<0.008	<0.008	✓	4	100	100	100	✓	4	100	110	105	✓
Boyup Brook	3	110	120	117	(1)	3	<0.008	0.020	<0.008	✓	3	105	135	117	✓	3	130	140	137	✓
Bridgetown	4	100	120	113	(1)	4	<0.008	0.020	0.010	✓	4	100	110	104	✓	4	120	140	133	✓
Brunswick Junction	2	130	130	130	(1)	2	<0.008	<0.008	<0.008	✓	2	170	175	173	✓	2	83	89	86	✓
Capel	4	75	81	78	(1)	4	<0.008	<0.008	<0.008	✓	4	55	60	59	✓	4	44	48	47	✓
Collie	4	4	17	11	(1)	4	0.010	0.020	0.015	✓	4	65	85	74	✓	4	23	44	34	✓
Cowaramup	5	40	52	46	(1)	5	0.008	0.018	0.013	✓	5	80	100	92	✓	5	38	45	41	✓
Dalyellup	2	120	140	130	(1)	2	<0.008	<0.008	<0.008	✓	2	100	105	103	✓	2	75	76	76	✓
Dardanup	2	29	56	43	(1)	2	<0.008	<0.008	<0.008	✓	2	85	90	88	✓	2	25	27	26	✓
Darkan	2	9	17	13	(1)	2	0.012	0.014	0.013	✓	2	65	75	70	✓	2	31	40	36	✓
Donnybrook	2	87	110	99	(1)	2	0.130	0.190	0.160	✓	2	220	240	230	✓	2	89	100	95	✓
Dunsborough	4	150	170	158	(1)	4	<0.008	<0.008	<0.008	✓	4	100	170	146	✓	4	67	78	72	✓
Eaton	4	100	130	118	(1)	4	<0.008	<0.008	<0.008	✓	4	130	150	140	✓	4	110	120	118	✓
Greenbushes	2	110	120	115	(1)	2	<0.008	<0.008	<0.008	✓	2	105	110	108	✓	2	130	130	130	✓
Harvey	2	37	60	49	(1)	2	<0.008	0.020	0.010	✓	2	32	65	49	✓	2	52	56	54	✓
Hester	4	110	120	118	(1)	4	<0.008	0.020	<0.008	✓	4	100	120	108	✓	4	130	140	138	✓
Kirup	4	99	120	112	(1)	4	<0.008	0.035	0.017	✓	4	100	110	105	✓	4	110	140	130	✓
Logue Brook	2	48	71	60	(1)	2	0.012	0.014	0.013	✓	2	38	60	49	✓	2	48	69	59	✓
Manjimup	4	22	76	62	(1)	4	0.018	0.030	0.022	✓	4	85	105	94	✓	4	50	110	89	✓
Margaret River	4	39	51	44	(1)	4	0.008	0.016	0.013	✓	4	95	100	96	✓	4	37	45	41	✓
Mullalyup	4	110	120	118	(1)	4	<0.008	0.030	0.011	✓	4	100	110	106	✓	4	130	140	135	✓
Myalup	2	58	58	58	(1)	2	0.018	0.030	0.024	✓	2	31	35	33	✓	2	56	56	56	✓
Nannup	2	37	40	39	(1)	2	<0.008	0.020	0.010	✓	2	75	90	83	✓	2	94	100	97	✓
Northcliffe	4	26	51	45	(1)	4	0.020	0.030	0.025	✓	4	75	85	80	✓	4	50	82	68	✓
Pemberton	2	28	37	33	(1)	2	0.018	0.035	0.027	✓	2	75	80	78	✓	2	46	51	49	✓
Peppermint Grove	2	85	86	86	(1)	2	<0.008	<0.008	<0.008	✓	2	60	60	60	✓	2	54	55	55	✓
Preston Beach	4	260	300	278	(1)	4	<0.008	<0.008	<0.008	✓	4	160	180	170	✓	4	290	300	293	(2)
Quinninup	2	40	57	49	(1)	2	0.020	0.030	0.025	✓	2	85	95	90	✓	2	73	79	76	✓
Waroona	2	51	57	54	(1)	2	0.025	0.030	0.028	✓	2	36	36	36	✓	2	55	56	56	✓
Yarloop	2	44	50	47	(1)	2	0.020	0.025	0.023	✓	2	38	42	40	✓	2	44	54	49	✓

(1) No guideline value available as per ADWG 2011. (2) Elevated hardness is characteristic of the source supplying this locality.

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Table 19

Aesthetic (non-health related) variables

South West Region	Iron				Manganese				pH				Silica							
Locality	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Value (pH units)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Allanson	2	0.040	0.045	0.043	✓	2	<0.002	0.025	0.013	✓	2	6.30	6.93	6.62	✓	2	1.2	5.7	3.5	✓
Augusta	2	0.070	0.090	0.080	✓	2	0.002	0.002	0.002	✓	2	6.79	7.10	6.95	✓	2	12.0	13.0	12.5	✓
Australind	4	0.015	0.030	0.021	✓	4	<0.002	0.003	<0.002	✓	4	7.07	7.51	7.31	✓	4	43.0	50.0	46.5	✓
Balingup	2	0.030	0.180	0.105	✓	2	<0.002	0.006	0.003	✓	2	8.17	8.42	8.30	✓	2	4.5	16.0	10.3	✓
Binningup	2	0.025	0.030	0.028	✓	2	0.005	0.010	0.008	✓	2	7.77	8.12	7.95	✓	2	2.3	5.5	3.9	✓
Boyanup	4	0.010	0.035	0.018	✓	4	<0.002	<0.002	<0.002	✓	4	7.43	8.03	7.72	✓	4	18.0	19.0	18.3	✓
Boyup Brook	3	0.015	0.120	0.078	✓	3	0.004	0.030	0.013	✓	3	7.76	8.37	8.02	✓	3	2.5	16.0	7.3	✓
Bridgetown	4	0.010	0.760	0.259	✓	4	0.002	0.045	0.014	✓	4	7.71	8.06	7.92	✓	4	0.9	19.0	10.2	✓
Brunswick Junction	2	0.020	0.035	0.028	✓	2	<0.002	0.003	<0.002	✓	2	7.69	7.94	7.82	✓	2	43.0	48.0	45.5	✓
Capel	4	0.060	0.070	0.063	✓	4	<0.002	<0.002	<0.002	✓	4	6.40	6.87	6.63	✓	4	13.0	14.0	13.5	✓
Collie	4	0.045	0.060	0.054	✓	4	0.002	0.016	0.009	✓	4	6.53	7.06	6.79	✓	4	1.3	5.5	3.0	✓
Cowaramup	5	0.080	0.160	0.116	✓	5	<0.002	0.009	0.006	✓	5	6.95	7.74	7.46	✓	5	6.1	13.0	8.0	✓
Dalyellup	2	0.035	0.060	0.048	✓	2	0.004	0.006	0.005	✓	2	7.85	8.05	7.95	✓	2	16.0	17.0	16.5	✓
Dardanup	2	0.004	0.008	0.006	✓	2	<0.002	<0.002	<0.002	✓	2	7.06	7.22	7.14	✓	2	19.0	19.0	19.0	✓
Darkan	2	0.040	0.045	0.043	✓	2	<0.002	0.008	0.004	✓	2	7.34	7.69	7.52	✓	2	3.2	5.0	4.1	✓
Donnybrook	2	0.006	0.160	0.083	✓	2	0.003	0.005	0.004	✓	2	7.44	7.63	7.54	✓	2	9.7	11.0	10.4	✓
Dunsborough	4	<0.003	0.015	0.008	✓	4	<0.002	<0.002	<0.002	✓	4	8.30	8.41	8.35	✓	4	16.0	16.0	16.0	✓
Eaton	4	0.045	0.060	0.056	✓	4	<0.002	<0.002	<0.002	✓	4	7.36	7.73	7.54	✓	4	25.0	31.0	28.0	✓
Greenbushes	2	0.015	0.040	0.028	✓	2	<0.002	0.002	<0.002	✓	2	7.94	8.08	8.01	✓	2	3.8	8.8	6.3	✓
Harvey	2	<0.003	0.025	0.013	✓	2	<0.002	0.008	0.004	✓	2	7.81	8.51	8.16	✓	2	1.0	5.5	3.3	✓
Hester	4	0.035	0.200	0.086	✓	4	0.004	0.014	0.010	✓	4	8.03	8.20	8.10	✓	4	1.3	16.0	6.5	✓
Kirup	4	0.015	0.460	0.129	✓	4	<0.002	0.030	0.008	✓	4	8.27	8.39	8.33	✓	4	3.4	18.0	8.4	✓
Logue Brook	2	0.010	0.040	0.025	✓	2	<0.002	<0.002	<0.002	✓	2	7.95	8.14	8.05	✓	2	1.4	8.9	5.2	✓
Manjimup	4	0.030	0.070	0.050	✓	4	0.004	0.020	0.010	✓	4	7.17	8.08	7.80	✓	4	3.9	8.4	6.5	✓
Margaret River	4	0.100	0.140	0.120	✓	4	0.005	0.009	0.006	✓	4	7.49	7.69	7.59	✓	4	6.1	9.3	7.1	✓
Mullalyup	4	0.010	0.320	0.104	✓	4	<0.002	0.010	0.004	✓	4	7.77	8.22	8.01	✓	4	3.5	18.0	8.4	✓
Myalup	2	0.004	0.004	0.004	✓	2	<0.002	<0.002	<0.002	✓	2	8.33	8.35	8.34	✓	2	1.5	1.8	1.7	✓
Nannup	2	0.015	0.020	0.018	✓	2	<0.002	<0.002	<0.002	✓	2	7.06	7.55	7.31	✓	2	2.6	7.0	4.8	✓
Northcliffe	4	0.015	0.025	0.023	✓	4	0.002	0.014	0.008	✓	4	7.82	8.07	7.96	✓	4	5.0	6.6	5.9	✓
Pemberton	2	0.010	0.015	0.013	✓	2	<0.002	0.008	0.004	✓	2	7.69	7.79	7.74	✓	2	3.8	5.4	4.6	✓
Peppermint Grove	2	0.035	0.035	0.035	✓	2	<0.002	<0.002	<0.002	✓	2	7.10	7.20	7.15	✓	2	14.0	15.0	14.5	✓
Preston Beach	4	0.004	0.015	0.009	✓	4	<0.002	<0.002	<0.002	✓	4	8.03	8.45	8.26	✓	4	15.0	17.0	16.0	✓
Quinninup	2	0.025	0.035	0.030	✓	2	0.004	0.014	0.009	✓	2	7.71	8.08	7.90	✓	2	6.0	6.7	6.4	✓
Waroona	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.54	7.57	7.56	✓	2	2.1	2.6	2.4	✓
Yarloop	2	0.006	0.008	0.007	✓	2	<0.002	<0.002	<0.002	✓	2	8.08	8.12	8.10	✓	2	0.9	1.9	1.4	✓

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Table 20

South West Region	Aesthetic (non-health related) variables																								
	Sodium					Sulphate					Total Dissolved Solids					True Colour					Turbidity				
	Locality	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Value (TCU)			Guideline Met	Samples Taken	Value (NTU)		
Min			Max	Mean	Min			Max	Mean	Min			Max	Mean	Min			Max	Mean	Min			Max	Mean	Min
Allanson	2	32	47	40	✓	2	8	13	11	✓	2	123	197	160	✓	2	<1	<1	<1	✓	2	0.2	0.3	0.3	✓
Augusta	2	71	79	75	✓	2	12	15	14	✓	2	312	326	319	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Australind	4	115	130	120	✓	4	10	14	12	✓	4	541	558	547	✓	4	<1	<1	<1	✓	4	<0.1	0.2	<0.1	✓
Balingup	2	50	50	50	✓	2	11	16	14	✓	2	363	391	377	✓	2	<1	<1	<1	✓	2	0.3	1	0.7	✓
Binningup	2	20	32	26	✓	2	2	9	5	✓	2	132	177	155	✓	2	<1	<1	<1	✓	2	0.2	0.4	0.3	✓
Boyanup	4	58	61	60	✓	4	15	16	16	✓	4	381	398	387	✓	4	<1	<1	<1	✓	4	<0.1	<0.1	<0.1	✓
Boyup Brook	3	51	65	56	✓	3	11	16	13	✓	3	384	415	398	✓	3	<1	2	<1	✓	3	0.5	0.9	0.7	✓
Bridgetown	4	49	52	50	✓	4	11	16	14	✓	4	355	390	374	✓	4	<1	<1	<1	✓	4	0.3	2.4	1.3	✓
Brunswick Junction	2	115	120	118	✓	2	10	12	11	✓	2	541	551	546	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Capel	4	46	48	47	✓	4	16	18	18	✓	4	257	272	263	✓	4	<1	<1	<1	✓	4	<0.1	0.3	0.2	✓
Collie	4	32	47	39	✓	4	9	13	11	✓	4	126	193	159	✓	4	<1	<1	<1	✓	4	<0.1	0.4	0.3	✓
Cowaramup	5	46	54	51	✓	5	11	12	12	✓	5	236	270	253	✓	5	<1	3	2	✓	5	0.2	0.8	0.5	✓
Dalyellup	2	75	76	76	✓	2	14	15	15	✓	2	406	418	412	✓	2	<1	<1	<1	✓	2	0.2	0.3	0.3	✓
Dardanup	2	54	62	58	✓	2	8	8	8	✓	2	217	257	237	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Darkan	2	33	37	35	✓	2	9	11	10	✓	2	137	170	154	✓	2	<1	<1	<1	✓	2	0.2	0.3	0.3	✓
Donnybrook	2	145	150	148	✓	2	18	19	19	✓	2	566	569	568	✓	2	<1	<1	<1	✓	2	0.1	0.6	0.4	✓
Dunsborough	4	105	150	136	✓	4	18	35	30	✓	4	477	595	557	✓	4	<1	<1	<1	✓	4	<0.1	<0.1	<0.1	✓
Eaton	4	70	85	77	✓	4	14	17	16	✓	4	421	487	457	✓	4	<1	<1	<1	✓	4	<0.1	0.2	<0.1	✓
Greenbushes	2	52	54	53	✓	2	16	16	16	✓	2	385	387	386	✓	2	<1	<1	<1	✓	2	0.2	0.2	0.2	✓
Harvey	2	19	34	27	✓	2	1	10	5	✓	2	148	181	165	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Hester	4	49	60	53	✓	4	11	17	14	✓	4	372	406	389	✓	4	<1	1	<1	✓	4	0.2	1.3	0.7	✓
Kirup	4	49	55	52	✓	4	11	17	15	✓	4	347	391	376	✓	4	<1	<1	<1	✓	4	0.1	2.3	0.7	✓
Logue Brook	2	22	36	29	✓	2	2	6	4	✓	2	142	231	187	✓	2	<1	<1	<1	✓	2	0.1	0.2	0.2	✓
Manjimup	4	41	50	46	✓	4	15	27	23	✓	4	220	336	287	✓	4	<1	1	<1	✓	4	0.2	0.5	0.4	✓
Margaret River	4	50	54	52	✓	4	11	12	12	✓	4	241	276	256	✓	4	2	3	2	✓	4	0.4	0.6	0.5	✓
Mullalyup	4	48	54	51	✓	4	11	17	15	✓	4	356	399	384	✓	4	<1	<1	<1	✓	4	<0.1	1.9	0.7	✓
Myalup	2	19	20	20	✓	2	1	1	1	✓	2	145	150	148	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Nannup	2	51	60	56	✓	2	72	89	81	✓	2	293	331	312	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Northcliffe	4	50	52	51	✓	4	36	41	38	✓	4	230	282	261	✓	4	<1	<1	<1	✓	4	<0.1	0.3	0.2	✓
Pemberton	2	56	56	56	✓	2	43	44	44	✓	2	237	250	244	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Peppermint Grove	2	45	47	46	✓	2	16	16	16	✓	2	277	279	278	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Preston Beach	4	86	100	94	✓	4	16	18	17	✓	4	738	796	757	(1)	4	<1	1	<1	✓	4	<0.1	0.2	<0.1	✓
Quinninup	2	50	58	54	✓	2	35	42	39	✓	2	280	282	281	✓	2	<1	<1	<1	✓	2	0.1	0.3	0.2	✓
Waroona	2	20	22	21	✓	2	1	1	1	✓	2	145	153	149	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Yarloop	2	21	24	23	✓	2	1	3	2	✓	2	132	154	143	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓

(1) Elevated TDS is characteristic of the source supplying this locality.

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Table 21

Great Southern Region	Health related variables															
	E. coli				Thermophilic Naegleria			Fluoride					Hydrocarbons		Metals	
	Locality	Samples Taken	Samples >0 cfu/100mL	Max cfu/100mL	Requirement Met	Samples Taken	Samples with Thermophilic Naegleria	Requirement Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Guideline Met	Samples Taken
Min										Max	Mean					
Albany	169	0	0	✓	169	0	✓	52	0.25	0.90	0.80	(2)	2	✓	9	✓
Boddington	52	0	0	✓	52	0	✓	4	0.80	0.85	0.83	(2)	0	(1)	2	✓
Borden	12	0	0	✓	8	0	✓	2	<0.1	<0.1	<0.1	✓	2	✓	2	✓
Bremer Bay	52	0	0	✓	35	0	✓	4	0.50	0.55	0.51	✓	0	(1)	2	✓
Brookton	52	0	0	✓	52	0	✓	5	0.75	0.85	0.81	(2)	0	(1)	2	✓
Broomehill	12	0	0	✓	12	0	✓	4	0.75	0.90	0.83	(2)	0	(1)	2	✓
Bullaring	12	0	0	✓	12	0	✓	4	0.75	0.85	0.81	(2)	0	(1)	2	✓
Condingup	12	0	0	✓	8	0	✓	2	0.25	0.30	0.28	✓	0	(1)	2	✓
Cranbrook	12	0	0	✓	8	0	✓	2	0.65	0.80	0.73	✓	2	✓	2	✓
Cuballing	12	0	0	✓	12	0	✓	4	0.75	0.90	0.83	(2)	0	(1)	2	✓
Denmark	65	0	0	✓	44	0	✓	5	<0.1	0.20	<0.1	✓	0	(1)	2	✓
Dudinin	12	0	0	✓	12	0	✓	4	0.75	0.90	0.83	(2)	0	(1)	2	✓
Dumbleyung	12	0	0	✓	12	0	✓	4	0.75	0.90	0.81	(2)	0	(1)	2	✓
Esperance	91	0	0	✓	91	0	✓	52	0.70	0.85	0.80	(2)	0	(1)	4	✓
Frankland	12	0	0	✓	8	0	✓	2	<0.1	<0.1	<0.1	✓	0	(1)	2	✓
Gibson	12	0	0	✓	8	0	✓	2	0.35	0.35	0.35	✓	0	(1)	2	✓
Gnowangerup	52	0	0	✓	52	0	✓	4	0.75	0.85	0.80	(2)	2	✓	2	✓
Grass Patch	12	0	0	✓	8	0	✓	4	0.75	0.80	0.79	(2)	2	✓	2	✓
Harrismith	12	0	0	✓	12	0	✓	4	0.75	0.85	0.80	(2)	0	(1)	2	✓
Highbury	12	0	0	✓	12	0	✓	4	0.80	0.85	0.83	(2)	0	(1)	2	✓
Hopetoun	52	0	0	✓	35	0	✓	2	<0.1	0.15	<0.1	✓	1	✓	2	✓
Hyden	12	0	0	✓	12	0	✓	4	0.75	0.90	0.83	(2)	0	(1)	2	✓
Jerramungup	12	0	0	✓	8	0	✓	2	<0.1	<0.1	<0.1	✓	0	(1)	2	✓
Karlgarin	12	0	0	✓	12	0	✓	4	0.80	0.90	0.83	(2)	0	(1)	2	✓
Katanning	65	0	0	✓	65	0	✓	52	0.75	0.95	0.84	(2)	0	(1)	2	✓
Kendenup	12	0	0	✓	7	0	✓	4	0.75	0.90	0.81	(2)	0	(1)	2	✓
Kojonup	52	0	0	✓	52	0	✓	5	0.75	0.85	0.82	(2)	0	(1)	2	✓
Kondinin	12	0	0	✓	12	0	✓	4	0.75	0.85	0.80	(2)	0	(1)	2	✓
Kukerin	12	0	0	✓	12	0	✓	4	0.75	0.95	0.84	(2)	0	(1)	2	✓
Kulin	12	0	0	✓	12	0	✓	4	0.75	0.85	0.81	(2)	0	(1)	2	✓
Lake Grace	52	0	0	✓	52	0	✓	4	0.75	0.90	0.83	(2)	2	✓	2	✓
Lake King	12	0	0	✓	12	0	✓	4	0.75	0.90	0.83	(2)	0	(1)	2	✓
Mt Barker	52	0	0	✓	35	0	✓	52	0.40	0.90	0.81	(2)	0	(1)	2	✓
Munglinup	12	0	0	✓	8	0	✓	4	0.75	0.80	0.79	(2)	2	✓	2	✓
Muradup	12	0	0	✓	12	0	✓	4	0.80	0.85	0.84	(2)	0	(1)	2	✓
Narrilup	12	0	0	✓	8	0	✓	4	0.80	0.90	0.84	(2)	0	(1)	2	✓
Narrogin	65	0	0	✓	65	0	✓	52	0.60	0.90	0.81	(2)	0	(1)	2	✓
Newdegate	12	0	0	✓	12	0	✓	4	0.75	0.80	0.78	(2)	2	✓	2	✓
Nyabing	12	0	0	✓	12	0	✓	4	0.80	0.90	0.84	(2)	2	✓	2	✓
Ongerup	12	0	0	✓	8	0	✓	2	<0.1	<0.1	<0.1	✓	2	✓	2	✓
Pingaring	12	0	0	✓	12	0	✓	4	0.75	0.85	0.81	(2)	0	(1)	2	✓
Pingelly	52	0	0	✓	52	0	✓	4	0.80	0.90	0.85	(2)	0	(1)	2	✓
Pingrup	12	0	0	✓	12	0	✓	4	0.70	0.90	0.81	(2)	2	✓	2	✓
Popanyinning	12	0	0	✓	12	0	✓	4	0.80	0.85	0.83	(2)	0	(1)	2	✓
Porongurup	12	0	0	✓	8	0	✓	4	0.75	0.85	0.80	(2)	2	✓	2	✓
Ravensthorpe	12	0	0	✓	8	0	✓	2	<0.1	<0.1	<0.1	✓	2	✓	2	✓
Rocky Gully	12	0	0	✓	8	0	✓	4	0.75	0.90	0.83	(2)	0	(1)	2	✓
Salmon Gums	12	0	0	✓	12	0	✓	2	0.80	0.80	0.80	(3)	0	(1)	2	✓
Tambellup	12	0	0	✓	12	0	✓	4	0.75	0.90	0.81	(2)	2	✓	2	✓
Tincurrin	12	0	0	✓	12	0	✓	4	0.80	0.90	0.84	(2)	0	(1)	2	✓
Varley	12	0	0	✓	12	0	✓	4	0.75	0.85	0.78	(2)	2	✓	2	✓
Wagin	52	0	0	✓	52	0	✓	5	0.70	0.90	0.80	(2)	0	(1)	2	✓
Walpole	52	0	0	✓	35	0	✓	2	<0.1	0.55	0.28	✓	0	(1)	2	✓
Wandering	12	0	0	✓	12	0	✓	4	0.75	0.90	0.83	(2)	2	✓	2	✓
Wellstead	12	0	0	✓	8	0	✓	4	0.75	0.85	0.81	(2)	0	(1)	2	✓
Wickepin	12	0	0	✓	12	0	✓	4	0.80	0.90	0.83	(2)	0	(1)	2	✓
Williams	12	0	0	✓	12	0	✓	4	0.80	0.90	0.85	(2)	0	(1)	2	✓
Woodanilling	12	0	0	✓	12	0	✓	4	0.75	0.85	0.83	(2)	2	✓	2	✓
Yealering	12	0	0	✓	12	0	✓	4	0.80	0.90	0.84	(2)	0	(1)	2	✓

(1) No samples required in this 12 month period. (2) Receives water from a fluoridated source within the dosing range set by the Fluoridation of Water Supplies Advisory Committee. (3) Local source is not fluoridated, however receives water from a fluoridated source during drought conditions.

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Table 22

Great Southern Region	Health related variables															
	Nitrate					Pesticides		Radiological		Trihalomethanes					Other Health Related	
	Locality	Samples Taken	Concentration (mg/L)			*Guideline Met	Samples Taken	Guideline Met	Samples Taken	Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken
Min			Max	Mean	Min							Max	Mean			
Albany	16	0.88	1.32	0.88	✓	4	✓	8	✓	17	0.067	0.130	0.099	✓	2	✓
Boddington	2	<0.2	0.44	<0.2	✓	1	✓	0	(1)	5	0.037	0.087	0.064	✓	0	(1)
Borden	2	<0.2	0.44	<0.2	✓	1	✓	2	✓	2	0.025	0.043	0.034	✓	1	✓
Bremer Bay	4	25.52	30.8	28.16	✓	1	✓	2	✓	2	0.046	0.050	0.048	✓	0	(1)
Brookton	2	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	5	0.032	0.060	0.046	✓	0	(1)
Broomehill	2	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	4	0.045	0.080	0.060	✓	0	(1)
Bullaring	4	<0.2	0.44	0.44	✓	1	✓	0	(1)	4	0.059	0.096	0.074	✓	0	(1)
Condingup	4	1.76	2.64	2.20	✓	1	✓	2	✓	2	0.008	0.009	0.009	✓	1	✓
Cranbrook	2	0.88	1.32	0.88	✓	1	✓	0	(1)	4	0.053	0.110	0.081	✓	1	✓
Cuballing	2	<0.2	0.44	<0.2	✓	1	✓	0	(1)	4	0.042	0.087	0.058	✓	0	(1)
Denmark	5	<0.2	0.88	0.44	✓	1	✓	1	✓	5	0.023	0.094	0.057	✓	0	(1)
Dudinin	4	<0.2	<0.2	<0.2	✓	1	✓	2	✓	4	0.086	0.160	0.117	✓	0	(1)
Dumbleyung	2	<0.2	0.44	<0.2	✓	1	✓	0	(1)	4	0.043	0.110	0.081	✓	0	(1)
Esperance	9	8.80	13.64	11.00	✓	2	✓	0	(1)	4	0.011	0.023	0.017	✓	0	(1)
Frankland	4	<0.2	0.44	<0.2	✓	1	✓	0	(1)	4	0.043	0.062	0.052	✓	0	(1)
Gibson	4	10.12	13.64	11.44	✓	1	✓	2	✓	2	0.036	0.062	0.049	✓	1	✓
Gnowangerup	4	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	4	0.047	0.065	0.055	✓	0	(1)
Grass Patch	4	9.24	12.76	11.00	✓	1	✓	2	✓	2	0.053	0.068	0.061	✓	0	(1)
Harrismith	4	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	4	0.094	0.180	0.141	✓	0	(1)
Highbury	4	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	4	0.025	0.059	0.042	✓	0	(1)
Hopetoun	4	1.32	3.08	2.64	✓	1	✓	0	(1)	2	0.006	0.006	0.006	✓	0	(1)
Hyden	4	<0.2	<0.2	<0.2	✓	1	✓	1	✓	4	0.110	0.130	0.120	✓	0	(1)
Jerramungup	4	<0.2	0.88	0.44	✓	1	✓	0	(1)	2	0.026	0.049	0.038	✓	0	(1)
Karlgarin	2	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	4	0.088	0.110	0.100	✓	0	(1)
Katanning	5	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	5	0.019	0.041	0.030	✓	0	(1)
Kendenup	4	0.88	1.32	0.88	✓	1	✓	0	(1)	4	0.083	0.150	0.105	✓	0	(1)
Kojonup	2	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	5	0.050	0.087	0.069	✓	0	(1)
Kondinin	4	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	4	0.081	0.140	0.120	✓	0	(1)
Kukerin	4	<0.2	0.44	<0.2	✓	1	✓	0	(1)	4	0.078	0.120	0.099	✓	0	(1)
Kulin	4	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	4	0.084	0.140	0.114	✓	0	(1)
Lake Grace	4	<0.2	<0.2	<0.2	✓	1	✓	2	✓	4	0.086	0.100	0.095	✓	2	✓
Lake King	2	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	4	0.051	0.083	0.066	✓	0	(1)
Mt Barker	5	0.88	1.32	1.32	✓	1	✓	0	(1)	5	0.091	0.130	0.107	✓	0	(1)
Munglinup	4	11.00	14.08	12.32	✓	1	✓	2	✓	4	0.035	0.077	0.060	✓	2	✓
Muradup	2	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	4	0.043	0.077	0.058	✓	0	(1)
Narrikup	4	0.88	1.32	0.88	✓	1	✓	0	(1)	4	0.082	0.130	0.101	✓	0	(1)
Narrogin	4	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	4	0.036	0.044	0.040	✓	0	(1)
Newdegate	2	<0.2	<0.2	<0.2	✓	1	✓	2	✓	4	0.064	0.086	0.077	✓	2	✓
Nyabing	2	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	2	0.053	0.075	0.064	✓	2	✓
Ongerup	2	<0.2	0.44	<0.2	✓	1	✓	2	✓	2	0.021	0.031	0.026	✓	2	✓
Pingaring	4	<0.2	0.44	<0.2	✓	1	✓	0	(1)	4	0.058	0.130	0.082	✓	0	(1)
Pingelly	2	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	4	0.049	0.070	0.057	✓	0	(1)
Pingrup	2	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	4	0.031	0.061	0.047	✓	2	✓
Popanyinning	4	<0.2	<0.2	<0.2	✓	1	✓	1	✓	4	0.068	0.100	0.081	✓	0	(1)
Porongurup	4	0.88	1.32	1.32	✓	1	✓	0	(1)	4	0.074	0.083	0.080	✓	0	(1)
Ravensthorpe	4	<0.2	2.64	0.88	✓	4	✓	0	(1)	4	0.012	0.064	0.045	✓	2	✓
Rocky Gully	4	0.88	1.32	1.32	✓	1	✓	0	(1)	2	0.079	0.085	0.082	✓	0	(1)
Salmon Gums	4	8.80	13.64	11.44	✓	1	✓	0	(1)	2	0.064	0.064	0.064	✓	0	(1)
Tambellup	2	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	4	0.043	0.066	0.051	✓	2	✓
Tincurrin	4	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	4	0.100	0.140	0.128	✓	0	(1)
Varley	4	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	4	0.024	0.049	0.036	✓	2	✓
Wagin	2	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	5	0.031	0.066	0.048	✓	0	(1)
Walpole	4	<0.2	2.64	0.88	✓	1	✓	0	(1)	4	0.063	0.150	0.113	✓	0	(1)
Wandering	2	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	4	0.057	0.089	0.078	✓	0	(1)
Wellstead	4	0.88	1.32	0.88	✓	1	✓	0	(1)	4	0.066	0.110	0.086	✓	0	(1)
Wickepin	4	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	4	0.037	0.063	0.052	✓	0	(1)
Williams	2	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	4	0.047	0.085	0.063	✓	0	(1)
Woodanilling	2	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	4	0.066	0.110	0.079	✓	1	✓
Yealering	4	<0.2	<0.2	<0.2	✓	1	✓	0	(1)	4	0.084	0.110	0.094	✓	0	(1)

(1) No samples required in this 12 month period.

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Table 23

Aesthetic (non-health related) variables

Great Southern Region	Alkalinity (as CaCO ₃)				Aluminium				Chloride				Hardness							
	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met					
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean						
Albany	16	200	230	216	(1)	16	<0.008	<0.008	<0.008	✓	16	105	175	142	✓	16	240	300	265	(3)
Boddington	2	8	11	10	(1)	2	0.016	0.020	0.018	✓	2	65	75	70	✓	2	29	37	33	✓
Borden	2	12	18	15	(1)	2	0.020	0.020	0.020	✓	2	14	18	16	✓	2	17	21	19	✓
Bremer Bay	4	270	290	283	(1)	4	<0.008	<0.008	<0.008	✓	4	165	170	169	✓	4	220	230	225	(3)
Brookton	2	10	11	11	(1)	2	0.018	0.030	0.024	✓	2	75	85	80	✓	2	39	46	43	✓
Broomehill	2	11	13	12	(1)	2	0.018	0.025	0.022	✓	2	80	100	90	✓	2	43	51	47	✓
Bullaring	4	21	28	25	(1)	4	<0.008	0.020	0.012	✓	4	75	90	83	✓	4	50	63	57	✓
Condingup	4	120	140	133	(1)	4	<0.008	<0.008	<0.008	✓	4	375	390	383	(2)	4	72	75	73	✓
Cranbrook	2	160	210	185	(1)	2	<0.008	<0.008	<0.008	✓	2	120	125	123	✓	2	220	260	240	(4)
Cuballing	2	6	7	7	(1)	2	0.014	0.040	0.027	✓	2	80	80	80	✓	2	36	37	37	✓
Denmark	5	4	77	23	(1)	5	0.012	0.020	0.015	✓	5	155	200	177	✓	5	43	120	67	✓
Dudinin	4	21	26	23	(1)	4	0.010	0.025	0.017	✓	4	80	90	88	✓	4	52	59	55	✓
Dumbleyung	2	22	23	23	(1)	2	0.014	0.016	0.015	✓	2	80	85	83	✓	2	51	53	52	✓
Esperance	9	260	290	276	(1)	9	<0.008	<0.008	<0.008	✓	9	195	260	217	✓	9	330	360	348	(3)
Frankland	4	1	3	2	(1)	4	<0.008	0.012	<0.008	✓	4	16	19	17	✓	4	12	15	14	✓
Gibson	4	70	78	73	(1)	4	<0.008	0.014	<0.008	✓	4	220	235	228	✓	4	39	46	44	✓
Gnowangerup	4	16	22	18	(1)	4	0.018	0.030	0.025	✓	4	85	95	90	✓	4	48	58	52	✓
Grass Patch	4	270	290	280	(1)	4	<0.008	<0.008	<0.008	✓	4	205	230	215	✓	4	340	370	353	(3)
Harrismith	4	13	28	22	(1)	4	0.012	0.018	0.014	✓	4	75	90	84	✓	4	42	61	53	✓
Highbury	4	6	11	8	(1)	4	0.010	0.014	0.012	✓	4	80	85	83	✓	4	36	39	38	✓
Hopetoun	4	79	150	120	(1)	4	<0.008	<0.008	<0.008	✓	4	235	290	261	(2)	4	64	180	144	✓
Hyden	4	14	20	17	(1)	4	0.020	0.055	0.031	✓	4	75	90	84	✓	4	50	58	53	✓
Jerramungup	4	6	9	8	(1)	4	0.008	0.020	0.013	✓	4	31	40	37	✓	4	15	17	16	✓
Karlgarin	2	14	15	15	(1)	2	0.014	0.025	0.020	✓	2	80	85	83	✓	2	44	56	50	✓
Katanning	5	10	12	11	(1)	5	0.008	0.025	0.014	✓	5	80	95	88	✓	5	39	49	44	✓
Kendenu	4	210	240	220	(1)	4	<0.008	<0.008	<0.008	✓	4	105	170	139	✓	4	240	280	260	(3)
Kojonup	2	14	16	15	(1)	2	0.025	0.030	0.028	✓	2	80	95	88	✓	2	42	51	47	✓
Kondinin	4	14	18	15	(1)	4	0.014	0.020	0.019	✓	4	75	95	85	✓	4	43	55	50	✓
Kukerin	4	21	22	22	(1)	4	0.010	0.014	0.012	✓	4	80	95	86	✓	4	53	57	55	✓
Kulin	4	13	16	14	(1)	4	0.012	0.020	0.014	✓	4	75	90	85	✓	4	41	50	47	✓
Lake Grace	4	17	24	19	(1)	4	0.016	0.018	0.017	✓	4	75	95	85	✓	4	47	60	53	✓
Lake King	2	17	23	20	(1)	2	0.020	0.020	0.020	✓	2	75	95	85	✓	2	47	58	53	✓
Mt Barker	5	200	240	216	(1)	5	<0.008	<0.008	<0.008	✓	5	105	160	138	✓	5	240	280	262	(3)
Munglinup	4	250	290	270	(1)	4	<0.008	<0.008	<0.008	✓	4	210	225	215	✓	4	330	360	340	(3)
Muradup	2	16	17	17	(1)	2	0.025	0.045	0.035	✓	2	80	100	90	✓	2	50	59	55	✓
Narrikup	4	200	230	215	(1)	4	<0.008	<0.008	<0.008	✓	4	115	175	143	✓	4	230	280	258	(3)
Narrogin	4	5	9	7	(1)	4	0.010	0.012	0.011	✓	4	80	85	83	✓	4	33	39	37	✓
Newdegate	2	17	21	19	(1)	2	0.014	0.016	0.015	✓	2	75	90	83	✓	2	48	57	53	✓
Nyabing	2	10	12	11	(1)	2	0.010	0.016	0.013	✓	2	80	95	88	✓	2	40	52	46	✓
Ongerup	2	8	12	10	(1)	2	0.025	0.035	0.030	✓	2	11	14	13	✓	2	11	16	14	✓
Pingaring	4	26	31	29	(1)	4	<0.008	0.018	0.011	✓	4	75	95	85	✓	4	57	69	64	✓
Pingelly	2	5	10	8	(1)	2	0.016	0.030	0.023	✓	2	75	85	80	✓	2	35	44	40	✓
Pingrup	2	8	9	9	(1)	2	0.010	0.014	0.012	✓	2	80	95	88	✓	2	40	47	44	✓
Popanyinning	4	7	11	8	(1)	4	0.010	0.014	0.012	✓	4	75	85	81	✓	4	32	41	37	✓
Porongurup	4	210	220	213	(1)	4	<0.008	<0.008	<0.008	✓	4	115	180	144	✓	4	240	280	258	(3)
Ravensthorpe	4	12	140	48	(1)	4	<0.008	0.018	<0.008	✓	4	19	270	87	✓	4	13	160	53	✓
Rocky Gully	4	210	220	218	(1)	4	<0.008	<0.008	<0.008	✓	4	110	165	139	✓	4	240	280	263	(3)
Salmon Gums	4	270	290	283	(1)	4	<0.008	<0.008	<0.008	✓	4	210	235	223	✓	4	360	390	373	(3)
Tambellup	2	15	20	18	(1)	2	0.018	0.035	0.027	✓	2	80	100	90	✓	2	45	57	51	✓
Tincurrin	4	16	22	19	(1)	4	0.020	0.030	0.025	✓	4	80	90	88	✓	4	50	54	53	✓
Varley	4	12	23	20	(1)	4	0.012	0.020	0.017	✓	4	75	90	84	✓	4	47	58	52	✓
Wagin	2	3	7	5	(1)	2	0.012	0.018	0.015	✓	2	75	85	80	✓	2	32	37	35	✓
Walpole	4	25	180	85	(1)	4	<0.008	0.010	<0.008	✓	4	105	190	154	✓	4	48	230	115	✓
Wandering	2	12	14	13	(1)	2	0.014	0.210	0.112	✓	2	75	80	78	✓	2	37	42	40	✓
Wellstead	4	200	220	208	(1)	4	<0.008	<0.008	<0.008	✓	4	115	165	139	✓	4	240	280	258	(3)
Wickepin	4	5	10	8	(1)	4	0.012	0.020	0.016	✓	4	75	85	80	✓	4	33	39	37	✓
Williams	2	10	17	14	(1)	2	0.012	0.014	0.013	✓	2	75	90	83	✓	2	35	42	39	✓
Woodanilling	2	10	10	10	(1)	2	0.018	0.020	0.019	✓	2	80	80	80	✓	2	38	44	41	✓
Yealering	4	20	26	22	(1)	4	0.020	0.030	0.025	✓	4	75	90	84	✓	4	47	54	50	✓

(1) No guideline value available as per ADWG 2011. (2) Elevated chloride is characteristic of the source supplying this locality. (3) Elevated hardness is characteristic of the source supplying this locality (4) Water carted from Albany while the water treatment plant was built and commissioned in March.

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Table 24

Aesthetic (non-health related) variables

Great Southern Region	Iron					Manganese					pH					Silica				
Locality	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Value (pH units)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Albany	16	0.030	0.120	0.060	✓	16	<0.002	0.003	<0.002	✓	16	7.16	7.88	7.59	✓	16	13.0	15.0	13.8	✓
Boddington	2	0.040	0.060	0.050	✓	2	<0.002	0.007	0.004	✓	2	6.88	7.33	7.11	✓	2	4.2	4.4	4.3	✓
Borden	2	0.006	0.020	0.013	✓	2	<0.002	0.007	0.004	✓	2	6.69	6.98	6.84	✓	2	1.8	2.6	2.2	✓
Bremer Bay	4	<0.003	0.006	<0.003	✓	4	<0.002	<0.002	<0.002	✓	4	7.52	7.93	7.81	✓	4	48.0	50.0	49.0	✓
Brookton	2	0.080	0.100	0.090	✓	2	0.004	0.004	0.004	✓	2	7.72	8.00	7.86	✓	2	3.2	3.5	3.4	✓
Broomehill	2	0.160	0.260	0.210	✓	2	0.004	0.008	0.006	✓	2	7.29	7.73	7.51	✓	2	1.8	1.8	1.8	✓
Bullaring	4	0.020	0.100	0.053	✓	4	<0.002	0.003	<0.002	✓	4	7.30	7.89	7.65	✓	4	3.1	4.9	3.8	✓
Condongup	4	0.015	0.035	0.023	✓	4	<0.002	<0.002	<0.002	✓	4	6.42	6.82	6.65	✓	4	60.0	65.0	61.3	✓
Cranbrook	2	0.020	0.020	0.020	✓	2	<0.002	<0.002	<0.002	✓	2	8.01	8.10	8.06	✓	2	11.0	13.0	12.0	✓
Cuballing	2	0.140	0.240	0.190	✓	2	0.006	0.080	0.043	✓	2	6.79	6.89	6.84	✓	2	3.2	3.5	3.4	✓
Denmark	5	0.008	0.015	0.011	✓	5	<0.002	0.004	<0.002	✓	5	6.75	7.94	7.29	✓	5	5.3	8.2	6.3	✓
Dudinin	4	0.100	0.520	0.230	✓	4	0.003	0.030	0.010	✓	4	8.76	9.96	9.45	(1)	4	2.8	4.1	3.3	✓
Dumbleyung	2	0.060	0.140	0.100	✓	2	0.002	0.003	0.003	✓	2	8.30	9.30	8.80	(1)	2	3.4	3.7	3.6	✓
Esperance	9	0.006	0.040	0.016	✓	9	<0.002	<0.002	<0.002	✓	9	7.42	8.00	7.64	✓	9	10.0	11.0	10.9	✓
Frankland	4	0.010	0.040	0.020	✓	4	<0.002	<0.002	<0.002	✓	4	5.62	6.57	6.11	(2)	4	1.3	2.7	2.2	✓
Gibson	4	0.020	0.090	0.050	✓	4	<0.002	<0.002	<0.002	✓	4	6.59	6.99	6.79	✓	4	42.0	46.0	44.0	✓
Gnowangerup	4	0.080	0.200	0.165	✓	4	0.002	0.009	0.006	✓	4	7.59	7.79	7.73	✓	4	1.5	1.9	1.7	✓
Grass Patch	4	0.006	0.015	0.010	✓	4	<0.002	<0.002	<0.002	✓	4	8.00	8.20	8.11	✓	4	10.0	11.0	10.8	✓
Harrismith	4	0.090	0.160	0.123	✓	4	0.003	0.010	0.006	✓	4	9.16	10.00	9.47	(1)	4	2.7	4.2	3.5	✓
Highbury	4	0.100	0.320	0.185	✓	4	0.006	0.012	0.009	✓	4	6.88	7.05	6.94	✓	4	1.7	3.5	2.8	✓
Hopetoun	4	<0.003	0.004	<0.003	✓	4	<0.002	<0.002	<0.002	✓	4	6.84	7.45	7.25	✓	4	24.0	28.0	26.3	✓
Hyden	4	0.100	0.280	0.160	✓	4	0.002	0.055	0.018	✓	4	8.21	9.30	8.55	(1)	4	2.6	3.8	3.2	✓
Jerramungup	4	0.020	0.030	0.025	✓	4	<0.002	<0.002	<0.002	✓	4	6.72	7.27	7.02	✓	4	3.9	6.1	5.1	✓
Karlgarin	2	0.090	0.100	0.095	✓	2	0.002	0.005	0.004	✓	2	7.55	8.16	7.86	✓	2	3.0	3.6	3.3	✓
Katanning	5	0.120	0.500	0.224	✓	5	0.004	0.030	0.011	✓	5	6.79	7.32	6.99	✓	5	0.9	1.8	1.3	✓
Kendenu	4	0.025	0.035	0.030	✓	4	<0.002	<0.002	<0.002	✓	4	7.87	8.17	8.07	✓	4	13.0	15.0	14.0	✓
Kojonup	2	0.100	0.240	0.170	✓	2	0.003	0.006	0.005	✓	2	7.59	7.62	7.61	✓	2	1.2	1.8	1.5	✓
Kondinin	4	0.080	0.160	0.108	✓	4	0.003	0.012	0.007	✓	4	7.78	8.74	8.04	✓	4	3.0	4.6	3.6	✓
Kukerin	4	0.045	0.100	0.069	✓	4	<0.002	0.005	<0.002	✓	4	7.64	8.88	8.16	✓	4	3.0	3.6	3.4	✓
Kulin	4	0.070	0.140	0.098	✓	4	0.003	0.007	0.006	✓	4	7.80	8.97	8.27	✓	4	2.5	4.0	3.3	✓
Lake Grace	4	0.045	0.100	0.074	✓	4	0.002	0.005	0.004	✓	4	8.10	8.84	8.49	✓	4	2.6	4.5	3.5	✓
Lake King	2	0.070	0.140	0.105	✓	2	0.005	0.012	0.009	✓	2	7.56	7.83	7.7	✓	2	2.7	3.8	3.3	✓
Mt Barker	5	0.020	0.070	0.043	✓	5	<0.002	<0.002	<0.002	✓	5	7.96	8.19	8.09	✓	5	13.0	17.0	14.6	✓
Munglinup	4	0.008	0.015	0.010	✓	4	<0.002	<0.002	<0.002	✓	4	8.07	8.27	8.19	✓	4	10.0	12.0	11.0	✓
Muradup	2	0.160	0.260	0.210	✓	2	0.006	0.009	0.008	✓	2	7.41	7.61	7.51	✓	2	1.2	1.5	1.4	✓
Narrakup	4	0.025	0.060	0.043	✓	4	<0.002	<0.002	<0.002	✓	4	7.46	7.92	7.76	✓	4	14.0	17.0	14.8	✓
Narrogin	4	0.070	0.140	0.113	✓	4	0.003	0.016	0.009	✓	4	6.74	7.17	6.99	✓	4	2.5	4.1	3.0	✓
Newdegate	2	0.090	0.100	0.095	✓	2	0.003	0.006	0.005	✓	2	7.66	8.47	8.07	✓	2	3.4	3.6	3.5	✓
Nyabing	2	0.090	0.280	0.185	✓	2	0.002	0.006	0.004	✓	2	7.14	7.25	7.20	✓	2	0.7	1.6	1.2	✓
Ongerup	2	<0.003	0.006	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	6.99	7.03	7.01	✓	2	0.7	1.4	1.1	✓
Pingaring	4	0.035	0.140	0.078	✓	4	<0.002	0.010	0.003	✓	4	9.34	9.65	9.56	(1)	4	2.8	4.1	3.3	✓
Pingelly	2	0.140	0.200	0.170	✓	2	0.004	0.025	0.015	✓	2	6.79	7.24	7.02	✓	2	2.8	4.8	3.8	✓
Pingrup	2	0.120	0.220	0.170	✓	2	0.003	0.007	0.005	✓	2	6.84	6.90	6.87	✓	2	0.9	2.0	1.5	✓
Popanyinning	4	0.070	0.140	0.108	✓	4	0.003	0.008	0.006	✓	4	6.59	7.23	7.02	✓	4	2.5	4.2	3.2	✓
Porongurup	4	0.020	0.140	0.056	✓	4	<0.002	0.002	<0.002	✓	4	8.38	8.53	8.44	✓	4	14.0	14.0	14.0	✓
Ravensthorpe	4	0.004	0.020	0.010	✓	4	<0.002	<0.002	<0.002	✓	4	6.73	8.02	7.25	✓	4	1.9	28.0	9.0	✓
Rocky Gully	4	0.025	0.030	0.026	✓	4	<0.002	<0.002	<0.002	✓	4	8.13	8.44	8.30	✓	4	13.0	15.0	14.3	✓
Salmon Gums	4	0.004	0.008	0.006	✓	4	<0.002	<0.002	<0.002	✓	4	8.18	8.45	8.34	✓	4	10.0	12.0	10.8	✓
Tambellup	2	0.090	0.240	0.165	✓	2	0.003	0.010	0.007	✓	2	8.26	8.27	8.27	✓	2	1.1	1.7	1.4	✓
Tincurrin	4	0.220	0.340	0.295	✓	4	0.006	0.020	0.013	✓	4	7.57	8.42	7.92	✓	4	2.9	3.9	3.4	✓
Varley	4	0.050	0.080	0.070	✓	4	0.002	0.005	0.004	✓	4	7.01	7.74	7.41	✓	4	3.0	3.9	3.4	✓
Wagin	2	0.080	0.140	0.110	✓	2	0.012	0.012	0.012	✓	2	6.62	7.08	6.85	✓	2	3.1	4.7	3.9	✓
Walpole	4	0.006	0.060	0.021	✓	4	<0.002	<0.002	<0.002	✓	4	7.23	8.3	7.67	✓	4	6.8	46.0	18.9	✓
Wandering	2	0.060	0.400	0.230	✓	2	0.007	0.055	0.031	✓	2	6.93	7.38	7.16	✓	2	3.4	3.4	3.4	✓
Wellstead	4	0.025	0.050	0.035	✓	4	<0.002	<0.002	<0.002	✓	4	8.09	8.46	8.28	✓	4	14.0	15.0	14.3	✓
Wickepin	4	0.060	0.180	0.115	✓	4	0.006	0.025	0.012	✓	4	6.74	7.25	7.02	✓	4	2.6	4.2	3.2	✓
Williams	2	0.045	0.070	0.058	✓	2	0.009	0.016	0.013	✓	2	6.50	6.96	6.73	✓	2	1.7	1.8	1.8	✓
Woodanilling	2	0.090	0.100	0.095	✓	2	<0.002	0.009	0.005	✓	2	7.12	7.32	7.22	✓	2	3.1	3.5	3.3	✓
Yealering	4	0.080	0.220	0.125	✓	4	0.004	0.014	0.009	✓	4	7.35	7.55	7.45	✓	4	2.7	4.2	3.5	✓

(1) Elevated pH is caused by leaching of calcium carbonate from the protective cement lining of the pipes after long water transit times. This characteristic is found in a number of our localities on our large water supply schemes. Experience shows that pH at this level is not objectionable to our customers. (2) Low pH is characteristic of the source supplying the locality.

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Table 25

Great Southern Region	Aesthetic (non-health related) variables																								
	Sodium					Sulphate					Total Dissolved Solids					True Colour					Turbidity				
	Locality	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Value (TCU)			Guideline Met	Samples Taken	Value (NTU)		
Min			Max	Mean	Min			Max	Mean	Min			Max	Mean	Min			Max	Mean	Min			Max	Mean	Min
Albany	16	51.0	89.0	71.6	✓	16	18	40	26	✓	16	553	702	620	(2)	16	<1	<1	<1	✓	16	<0.1	0.7	0.3	✓
Boddington	2	31.0	38.0	34.5	✓	2	9	11	10	✓	2	133	163	148	✓	2	<1	<1	<1	✓	2	0.2	0.2	0.2	✓
Borden	2	7.5	8.5	8.0	✓	2	1	2	1	✓	2	52	66	59	✓	2	<1	<1	<1	✓	2	0.1	0.2	0.2	✓
Bremer Bay	4	135.0	140.0	137.5	✓	4	24	26	25	✓	4	815	852	837	(2)	4	<1	<1	<1	✓	4	<0.1	<0.1	<0.1	✓
Brookton	2	36.0	40.0	38.0	✓	2	10	11	10	✓	2	158	179	169	✓	2	1	2	2	✓	2	0.2	0.2	0.2	✓
Broomehill	2	38.0	44.0	41.0	✓	2	8	11	10	✓	2	166	200	183	✓	2	3	4	4	✓	2	0.6	0.8	0.7	✓
Bullaring	4	35.0	43.0	39.0	✓	4	9	12	10	✓	4	173	216	194	✓	4	<1	1	<1	✓	4	0.1	0.5	0.3	✓
Condingup	4	280.0	305.0	292.5	(1)	4	57	64	60	✓	4	896	1025	971	(2)	4	<1	<1	<1	✓	4	<0.1	<0.1	<0.1	✓
Cranbrook	2	64.0	68.0	66.0	✓	2	21	22	22	✓	2	509	579	544	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Cuballing	2	39.0	39.0	39.0	✓	2	9	11	10	✓	2	156	163	160	✓	2	<1	1	<1	✓	2	0.5	1.1	0.8	✓
Denmark	5	80.0	105.0	90.8	✓	5	17	26	22	✓	5	278	464	348	✓	5	<1	<1	<1	✓	5	<0.1	0.2	<0.1	✓
Dudin	4	38.0	42.0	40.8	✓	4	9	12	11	✓	4	183	198	194	✓	4	1	1	1	✓	4	0.2	2.6	1.0	✓
Dumbleyung	2	36.0	38.0	37.0	✓	2	9	10	10	✓	2	177	188	183	✓	2	<1	1	<1	✓	2	0.1	0.5	0.3	✓
Esperance	9	105.0	120.0	111.1	✓	9	33	38	35	✓	9	798	892	843	(2)	9	<1	<1	<1	✓	9	<0.1	0.3	<0.1	✓
Frankland	4	5.0	7.0	6.0	✓	4	2	3	2	✓	4	40	50	44	✓	4	<1	<1	<1	✓	4	<0.1	0.2	<0.1	✓
Gibson	4	185.0	190.0	186.3	(1)	4	68	80	74	✓	4	636	672	654	(2)	4	<1	<1	<1	✓	4	0.1	1.2	0.5	✓
Gnowangerup	4	37.0	45.0	41.3	✓	4	8	11	10	✓	4	177	206	193	✓	4	2	3	3	✓	4	0.4	0.7	0.6	✓
Grass Patch	4	105.0	120.0	111.3	✓	4	35	36	36	✓	4	840	868	853	(2)	4	<1	<1	<1	✓	4	0.1	0.2	0.1	✓
Harrismith	4	35.0	43.0	39.3	✓	4	9	12	11	✓	4	160	208	188	✓	4	<1	2	<1	✓	4	0.2	0.4	0.3	✓
Highbury	4	39.0	43.0	41.0	✓	4	9	12	11	✓	4	161	177	169	✓	4	<1	2	<1	✓	4	0.4	1.5	0.7	✓
Hopetoun	4	140.0	190.0	160.0	✓	4	29	34	31	✓	4	660	707	679	(2)	4	<1	<1	<1	✓	4	<0.1	0.2	<0.1	✓
Hyden	4	36.0	42.0	40.0	✓	4	10	12	11	✓	4	173	198	187	✓	4	1	2	1	✓	4	0.1	0.5	0.4	✓
Jerramungup	4	19.0	24.0	22.0	✓	4	6	6	6	✓	4	82	98	91	✓	4	<1	<1	<1	✓	4	<0.1	0.2	0.2	✓
Karlgarin	2	35.0	42.0	38.5	✓	2	9	12	11	✓	2	166	188	177	✓	2	1	1	1	✓	2	0.2	0.2	0.2	✓
Katanning	5	37.0	44.0	40.6	✓	5	8	11	10	✓	5	159	192	176	✓	5	<1	5	2	✓	5	0.4	2.4	0.9	✓
Kendenu	4	52.0	81.0	67.8	✓	4	19	35	26	✓	4	549	661	616	(2)	4	<1	<1	<1	✓	4	0.1	0.4	0.2	✓
Kojonup	2	37.0	42.0	39.5	✓	2	9	11	10	✓	2	167	195	181	✓	2	1	5	3	✓	2	0.2	0.7	0.5	✓
Kondinin	4	36.0	43.0	40.0	✓	4	9	12	11	✓	4	164	201	184	✓	4	<1	1	<1	✓	4	0.2	0.5	0.4	✓
Kukerin	4	37.0	43.0	40.0	✓	4	10	12	11	✓	4	177	205	193	✓	4	<1	1	<1	✓	4	<0.1	0.2	<0.1	✓
Kulin	4	36.0	42.0	39.5	✓	4	9	12	11	✓	4	161	190	179	✓	4	1	2	2	✓	4	0.2	0.4	0.3	✓
Lake Grace	4	36.0	44.0	39.8	✓	4	9	12	10	✓	4	170	212	189	✓	4	<1	2	<1	✓	4	0.2	0.3	0.3	✓
Lake King	2	35.0	44.0	39.5	✓	2	9	12	11	✓	2	166	211	189	✓	2	<1	<1	<1	✓	2	0.3	0.5	0.4	✓
Mt Barker	5	51.0	86.0	70.4	✓	5	19	30	24	✓	5	543	654	614	(2)	5	<1	<1	<1	✓	5	0.1	0.4	0.3	✓
Munglinup	4	105.0	115.0	107.5	✓	4	32	36	34	✓	4	803	876	831	(2)	4	<1	<1	<1	✓	4	<0.1	0.2	<0.1	✓
Muradup	2	41.0	48.0	44.5	✓	2	10	12	11	✓	2	178	214	196	✓	2	2	5	4	✓	2	0.5	0.8	0.7	✓
Narrikup	4	57.0	83.0	69.5	✓	4	20	29	25	✓	4	550	673	615	(2)	4	<1	<1	<1	✓	4	<0.1	0.3	0.2	✓
Narrogin	4	37.0	42.0	39.8	✓	4	9	12	11	✓	4	151	169	164	✓	4	<1	3	2	✓	4	0.3	0.7	0.5	✓
Newdegate	2	35.0	40.0	37.5	✓	2	9	11	10	✓	2	170	191	181	✓	2	<1	2	<1	✓	2	0.1	0.2	0.2	✓
Nyabing	2	35.0	43.0	39.0	✓	2	9	11	10	✓	2	156	194	175	✓	2	1	6	4	✓	2	0.3	0.8	0.6	✓
Ongerup	2	5.5	9.5	7.5	✓	2	2	2	2	✓	2	36	52	44	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Pingaring	4	35.0	44.0	39.5	✓	4	9	13	11	✓	4	179	224	201	✓	4	<1	1	<1	✓	4	0.1	0.5	0.3	✓
Pingelly	2	36.0	42.0	39.0	✓	2	9	11	10	✓	2	151	177	164	✓	2	<1	1	<1	✓	2	0.4	0.9	0.7	✓
Pingrup	2	37.0	43.0	40.0	✓	2	8	11	10	✓	2	157	188	173	✓	2	1	3	2	✓	2	0.5	1.0	0.8	✓
Popanyinning	4	36.0	42.0	39.3	✓	4	9	12	11	✓	4	148	178	165	✓	4	<1	2	<1	✓	4	0.1	0.4	0.3	✓
Porongurup	4	55.0	82.0	70.3	✓	4	18	36	25	✓	4	553	676	611	(2)	4	<1	<1	<1	✓	4	0.1	0.5	0.3	✓
Ravensthorpe	4	13.0	155.0	51.8	✓	4	5	31	12	✓	4	69	718	246	✓	4	<1	1	<1	✓	4	<0.1	0.2	<0.1	✓
Rocky Gully	4	54.0	80.0	67.0	✓	4	20	28	24	✓	4	556	656	609	(2)	4	<1	<1	<1	✓	4	<0.1	0.2	<0.1	✓
Salmon Gums	4	105.0	115.0	110.0	✓	4	34	39	36	✓	4	844	881	862	(2)	4	<1	<1	<1	✓	4	<0.1	<0.1	<0.1	✓
Tambellup	2	36.0	45.0	40.5	✓	2	9	11	10	✓	2	166	213	190	✓	2	1	5	3	✓	2	0.3	1.0	0.7	✓
Tincurrin	4	38.0	42.0	40.5	✓	4	9	12	11	✓	4	174	200	191	✓	4	<1	3	2	✓	4	0.3	1.4	0.8	✓
Varley	4	36.0	41.0	38.8	✓	4	9	12	10	✓	4	176	202	187	✓	4	<1	<1	<1	✓	4	0.2	0.4	0.3	✓
Wagin	2	36.0	41.0	38.5	✓	2	9	11	10	✓	2	143	170	157	✓	2	<1	2	<1	✓	2	0.4	0.5	0.5	✓
Walpole	4	74.0	120.0	92.0	✓	4	15	49	31	✓	4	303	592	447	✓	4	<1	<1	<1	✓	4	<0.1	0.2	<0.1	✓
Wandering	2	39.0	44.0	41.5	✓	2	11	12	12	✓	2	165	182	174	✓	2	<1	2	<1	✓	2	0.3	9.0	4.7	✓
Wellstead	4	58.0	83.0	70.5	✓	4	18	33	25	✓	4	564	638	602	(2)	4	<1	<1	<1	✓	4	0.2	0.4	0.3	✓
Wickepin	4	35.0	42.0	39.0	✓	4	9	11	11	✓	4	146	171	162	✓	4	<1	1	<1	✓	4	0.3	0.6	0.5	✓
Williams	2	39.0	46.0	42.5	✓	2	12	13	13	✓	2	163	194	179	✓	2	<1	2	<1	✓	2	0.3	0.3	0.3	✓
Woodanilling	2	37.0	41.0	39.0	✓	2	10	12	11	✓	2	161	171	166	✓	2	<1	1	<1	✓	2	0.2	0.5	0.4	✓
Yealering	4	38.0	44.0	42.0	✓	4	9	12	11	✓	4	174	210	195	✓	4	<1	2	<1	✓	4	0.3	1.1	0.5	✓

(1) Elevated sodium is characteristic of the source supplying this locality. (2) Elevated TDS is characteristic of the source supplying this locality.

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Table 26		Health related variables														
North West Region	E. coli				Thermophilic Naegleria			Fluoride					Hydrocarbons		Metals	
Locality	Samples Taken	Samples >0 cfu/100mL	Max cfu/100mL	Requirement Met	Samples Taken	Samples with Thermophilic Naegleria	Requirement Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Guideline Met	Samples Taken	Guideline Met
									Min	Max	Mean					
Broome	104	0	0	✓	78	0	✓	52	0.65	0.80	0.75	(2)	0	(1)	2	✓
Burrup	24	0	0	✓	24	0	✓	2	0.55	0.75	0.65	(2)	2	✓	2	✓
Camballin	12	0	0	✓	12	0	✓	2	0.25	0.30	0.28	✓	2	✓	2	✓
Cape Lambert	12	0	0	✓	12	0	✓	2	0.70	0.75	0.73	(2)	0	(1)	2	✓
Derby	54	0	0	✓	54	0	✓	52	0.65	0.75	0.69	(2)	1	✓	2	✓
Fitzroy Crossing	11	0	0	✓	11	0	✓	2	0.25	0.25	0.25	✓	0	(1)	2	✓
Halls Creek	51	0	0	✓	51	0	✓	2	0.65	0.70	0.68	✓	0	(1)	2	✓
Hedland	104	0	0	✓	78	0	✓	52	0.45	0.90	0.76	(2)	1	✓	2	✓
Karratha	111	0	0	✓	111	0	✓	52	0.60	0.95	0.76	(2)	1	✓	2	✓
Kununurra	62	0	0	✓	49	0	✓	51	0.35	0.85	0.72	(2)	0	(1)	2	✓
Marble Bar	12	0	0	✓	12	0	✓	2	0.65	0.70	0.68	✓	1	✓	2	✓
Newman	65	0	0	✓	52	0	✓	40	0.25	0.85	0.66	✓	2	✓	8	✓
Nullagine	12	0	0	✓	12	0	✓	2	0.50	0.55	0.53	✓	1	✓	2	✓
Onslow	52	0	0	✓	26	0	✓	2	0.80	0.80	0.80	✓	1	✓	5	✓
Point Samson	11	0	0	✓	11	0	✓	2	0.70	0.70	0.70	(2)	2	✓	2	✓
Roebourne	52	0	0	✓	52	0	✓	2	0.65	0.70	0.68	(2)	2	✓	2	✓
Wickham	52	0	0	✓	52	0	✓	2	0.65	0.70	0.68	(2)	1	✓	2	✓
Wyndham				✓	52	0	✓	2	<0.1	<0.1	<0.1	✓	1	✓	2	✓

(1) No samples required in this 12 month period. (2) Receives water from a fluoridated source within the dosing range set by the Fluoridation of Water Supplies Advisory Committee.

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Table 27		Health related variables														
North West Region	Nitrate					Pesticides		Radiological		Trihalomethanes					Other Health Related	
Locality	Samples Taken	Concentration (mg/L)			*Guideline Met	Samples Taken	Guideline Met	Samples Taken	Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Requirement Met
		Min	Max	Mean							Min	Max	Mean			
Broome	2	24.2	24.6	24.6	✓	1	✓	0	✓	2	0.001	0.002	0.002	✓	0	(1)
Burrup	2	4.8	6.2	5.7	✓	1	✓	2	(1)	2	0.001	0.001	0.001	✓	2	✓
Camballin	2	<0.2	<0.2	<0.2	✓	1	✓	2	(1)	2	<0.001	<0.001	<0.001	✓	1	✓
Cape Lambert	2	5.7	6.6	6.2	✓	1	✓	2	(1)	2	<0.001	<0.001	<0.001	✓	0	(1)
Derby	3	<0.2	<0.2	<0.2	✓	1	✓	0	✓	2	0.001	0.002	0.002	✓	0	(1)
Fitzroy Crossing	2	4.0	4.4	4.4	✓	5	✓	0	✓	2	<0.001	<0.001	<0.001	✓	0	(1)
Halls Creek	2	4.8	5.3	5.3	✓	1	✓	5	(1)	2	0.003	0.003	0.003	✓	2	✓
Hedland	4	4.0	4.0	4.0	✓	1	✓	0	✓	2	0.001	0.001	0.001	✓	0	(1)
Karratha	1	2.6	2.6	2.6	✓	1	✓	2	(1)	4	0.054	0.140	0.096	✓	1	✓
Kununurra	4	<0.2	<0.2	<0.2	✓	1	✓	0	✓	2	0.017	0.026	0.022	✓	1	✓
Marble Bar	2	6.6	7.0	7.0	✓	1	✓	0	✓	2	0.003	0.005	0.004	✓	0	(1)
Newman	4	0.9	0.9	0.9	✓	1	✓	0	✓	2	0.001	0.003	0.002	✓	0	(1)
Nullagine	2	5.3	5.7	5.7	✓	1	✓	1	(1)	2	<0.001	<0.001	<0.001	✓	2	✓
Onslow	4	1.8	1.8	1.8	✓	1	✓	4	(1)	2	0.001	0.002	0.001	✓	0	(1)
Point Samson	2	4.8	6.6	5.7	✓	1	✓	1	(1)	4	<0.001	0.070	0.025	✓	0	(1)
Roebourne	2	6.2	6.6	6.6	✓	1	✓	0	✓	4	<0.001	0.039	0.010	✓	2	✓
Wickham	2	6.6	6.6	6.6	✓	1	✓	1	(1)	4	<0.001	0.130	0.034	✓	2	✓
Wyndham	4	<0.2	1.32	0.44	✓	1	✓	0	✓	2	0.029	0.075	0.052	✓	1	✓

(1) No samples required in this 12 month period.

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Table 28 Aesthetic (non-health related) variables

North West Region	Aesthetic (non-health related) variables																			
	Alkalinity (as CaCO3)					Aluminium					Chloride					Hardness				
	Locality	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)		
Min			Max	Mean	Min			Max	Mean	Min			Max	Mean	Min			Max	Mean	
Broome	2	73	79	76	(1)	2	<0.008	<0.008	<0.008	✓	2	90	95	93	✓	2	43	46	45	✓
Burrup	2	140	200	170	(1)	2	<0.008	<0.008	<0.008	✓	2	60	85	73	✓	2	150	230	190	✓
Camballin	2	54	60	57	(1)	2	<0.008	<0.008	<0.008	✓	2	40	40	40	✓	2	42	43	43	✓
Cape Lambert	2	200	200	200	(1)	2	<0.008	<0.008	<0.008	✓	2	80	95	88	✓	2	230	250	240	(2)
Derby	3	150	170	157	(1)	3	<0.008	<0.008	<0.008	✓	3	90	90	90	✓	3	12	17	14	✓
Fitzroy Crossing	2	170	190	180	(1)	2	<0.008	<0.008	<0.008	✓	2	50	50	50	✓	2	160	170	165	✓
Halls Creek	2	320	360	340	(1)	2	<0.008	<0.008	<0.008	✓	2	175	190	183	✓	2	330	330	330	(2)
Hedland	4	160	190	178	(1)	4	<0.008	<0.008	<0.008	✓	4	140	195	168	✓	4	220	240	225	(2)
Karratha	1	170	170	170	(1)	1	<0.008	<0.008	<0.008	✓	1	80	80	80	✓	1	180	180	180	✓
Kununurra	4	190	220	210	(1)	4	<0.008	<0.008	<0.008	✓	4	17	21	18	✓	4	160	160	160	✓
Marble Bar	2	380	390	385	(1)	2	<0.008	<0.008	<0.008	✓	2	190	195	193	✓	2	290	300	295	(2)
Newman	4	130	160	148	(1)	4	<0.008	<0.008	<0.008	✓	4	65	80	71	✓	4	140	150	143	✓
Nullagine	2	140	160	150	(1)	2	<0.008	<0.008	<0.008	✓	2	65	85	75	✓	2	160	200	180	✓
Onslow	4	170	180	175	(1)	4	<0.008	<0.008	<0.008	✓	4	75	85	78	✓	4	160	170	163	✓
Point Samson	2	190	200	195	(1)	2	<0.008	<0.008	<0.008	✓	2	80	100	90	✓	2	220	240	230	(2)
Roebourne	2	170	210	190	(1)	2	<0.008	<0.008	<0.008	✓	2	70	95	83	✓	2	180	240	210	(2)
Wickham	2	170	210	190	(1)	2	<0.008	<0.008	<0.008	✓	2	70	100	85	✓	2	180	250	215	(2)
Wyndham	4	42	61	49	(1)	3	<0.008	0.016	<0.008	✓	4	39	44	42	✓	4	49	58	54	✓

(1) No guideline value available as per ADWG 2011. (2) Elevated hardness is characteristic of the source supplying this locality.

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Table 29 Aesthetic (non-health related) variables

North West Region	Aesthetic (non-health related) variables																			
	Iron					Manganese					pH					Silica				
	Locality	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Value (pH units)			Guideline Met	Samples Taken	Concentration (mg/L)		
Min			Max	Mean	Min			Max	Mean	Min			Max	Mean	Min			Max	Mean	
Broome	2	<0.003	0.004	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.86	8.19	8.03	✓	2	90	90	90	(1)
Burrup	2	<0.003	0.004	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	8.43	8.44	8.44	✓	2	49	60	55	✓
Camballin	2	0.008	0.010	0.009	✓	2	<0.002	<0.002	<0.002	✓	2	7.28	7.74	7.51	✓	2	23	23	23	✓
Cape Lambert	2	<0.003	0.006	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.91	8.24	8.08	✓	2	50	55	53	✓
Derby	4	0.004	0.008	0.006	✓	4	<0.002	<0.002	<0.002	✓	3	7.73	7.87	7.81	✓	3	15	16	15	✓
Fitzroy Crossing	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.53	7.54	7.54	✓	2	20	21	21	✓
Halls Creek	2	<0.003	0.004	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.40	7.79	7.60	✓	2	45	47	46	✓
Hedland	4	<0.003	<0.003	<0.003	✓	4	<0.002	<0.002	<0.002	✓	4	7.82	8.04	7.94	✓	4	50	55	51	✓
Karratha	1	<0.003	<0.003	<0.003	✓	1	<0.002	<0.002	<0.002	✓	1	8.23	8.23	8.23	✓	1	33	33	33	✓
Kununurra	4	<0.003	<0.003	<0.003	✓	4	0.003	0.007	0.005	✓	4	7.61	7.91	7.77	✓	4	50	55	53	✓
Marble Bar	2	<0.003	0.010	0.005	✓	2	<0.002	<0.002	<0.002	✓	2	7.43	7.52	7.48	✓	2	38	40	39	✓
Newman	4	<0.003	0.006	<0.003	✓	4	<0.002	<0.002	<0.002	✓	4	6.78	7.40	7.13	✓	4	16	16	16	✓
Nullagine	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	6.87	7.46	7.17	✓	2	32	32	32	✓
Onslow	4	<0.003	<0.003	<0.003	✓	4	<0.002	<0.002	<0.002	✓	4	7.96	8.21	8.14	✓	4	70	75	71	✓
Point Samson	2	<0.003	0.008	0.004	✓	2	<0.002	<0.002	<0.002	✓	2	8.05	8.18	8.12	✓	2	50	55	53	✓
Roebourne	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.74	8.13	7.94	✓	2	50	55	53	✓
Wickham	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	8.04	8.33	8.19	✓	2	50	55	53	✓
Wyndham	4	<0.003	0.025	0.009	✓	4	<0.002	0.020	0.005	✓	4	7.63	8.12	7.85	✓	4	8	12	10	✓

(1) Elevated silica is characteristic of the source supplying this locality.

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Table 30

Aesthetic (non-health related) variables

North West Region	Aesthetic (non-health related) variables																								
	Sodium					Sulfate					Total Dissolved Solids					True Colour					Turbidity				
	Locality	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Value (TCU)			Guideline Met	Samples Taken	Value (NTU)		
Min			Max	Mean	Min			Max	Mean	Min			Max	Mean	Min			Max	Mean	Min			Max	Mean	Min
Broome	2	74	74	74	✓	2	4	5	5	✓	2	392	392	392	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Burrup	2	35	49	42	✓	2	22	36	29	✓	2	400	565	483	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Camballin	2	36	36	36	✓	2	33	34	34	✓	2	226	235	231	✓	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Cape Lambert	2	48	52	50	✓	2	37	43	40	✓	2	548	574	561	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Derby	3	110	125	117	✓	3	5	5	5	✓	3	420	455	433	✓	3	<1	<1	<1	✓	3	<0.1	<0.1	<0.1	✓
Fitzroy Crossing	2	40	43	42	✓	2	9	9	9	✓	2	395	423	409	✓	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Halls Creek	2	145	150	148	✓	2	62	65	64	✓	2	947	987	967	(2)	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Hedland	4	83	96	90	✓	4	27	35	31	✓	4	599	659	637	(2)	4	<1	<1	<1	✓	4	<0.1	0.2	<0.1	✓
Karratha	1	58	58	58	✓	1	49	49	49	✓	1	492	492	492	✓	1	<1	<1	<1	✓	1	<0.1	<0.1	<0.1	✓
Kununurra	4	29	32	30	✓	4	2	2	2	✓	4	391	429	417	✓	4	<1	<1	<1	✓	4	<0.1	<0.1	<0.1	✓
Marble Bar	2	190	190	190	(1)	2	60	60	60	✓	2	1053	1055	1054	(2)	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Newman	4	47	58	55	✓	4	31	36	33	✓	4	382	413	400	✓	4	<1	<1	<1	✓	4	<0.1	0.2	<0.1	✓
Nullagine	2	52	57	55	✓	2	42	54	48	✓	2	420	502	461	✓	2	<1	<1	<1	✓	2	0.1	0.2	0.2	✓
Onslow	4	39	42	41	✓	4	9	9	9	✓	4	473	486	477	✓	4	<1	<1	<1	✓	4	<0.1	<0.1	<0.1	✓
Point Samson	2	47	51	49	✓	2	36	42	39	✓	2	536	576	556	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Roebourne	2	40	53	47	✓	2	29	44	37	✓	2	469	592	531	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Wickham	2	40	56	48	✓	2	29	46	38	✓	2	469	611	540	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Wyndham	4	18	22	21	✓	4	0.12	0.24	0.15	✓	4	138	178	157	✓	4	<1	<1	<1	✓	4	<0.1	0.3	<0.1	✓

(1) Elevated Sodium is a characteristic of the source supplying this locality. (2) Elevated TDS is a characteristic of the source supplying this locality.