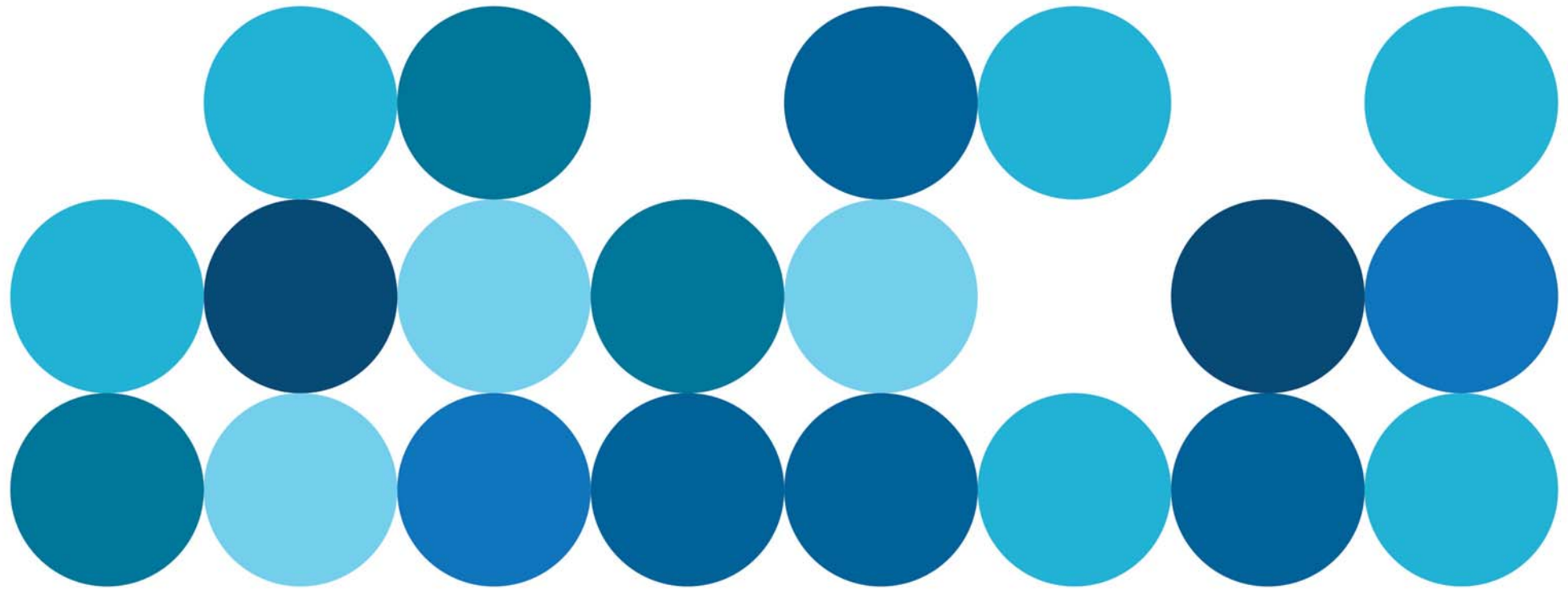


# Drinking Water Quality

Annual Report 2016 - 17





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## About this report

**The Water Corporation's 2016-17 Drinking Water Quality Annual Report is a review of our performance for the financial year ending 30 June 2017.**

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.

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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



## Acronyms

Acronym	Description
ADWG	Australian Drinking Water Guidelines
AWRP	Advanced Water Recycling Plant
BRA	Barrier Risk Assessment
DoH	Department of Health
DWER	Department of Water and Environmental Regulation
EDR	Electro Dialysis Reversal
GAWS	Goldfields and Agricultural Water Supply
GSTWS	Great Southern Towns Water Supply
IWSS	Integrated Water Supply Scheme
LGSTWS	Lower Great Southern Towns Water Supply
MIEX	Magnetic Ion Exchange
MoU	Memorandum of Understanding
NHMRC	National Health and Medical Research Council
NTU	Nephelometric Turbidity Units
PDWSA	Public Drinking Water Source Area
RO	Reverse Osmosis

Acronym	Description
TCU	True Colour Units
TDS	Total Dissolved Solids
THM	Trihalomethanes
UF	Ultra-filtration
UV	Ultra-violet
WQMS	Water Quality Management System
WSP	Water Safety Plan
WTP	Water Treatment Plant



## Summary

Ensuring supply of safe drinking water is our highest priority. In 2016-17, we achieved compliance with the health-related requirements and met all our health targets for drinking water quality set by the Department of Health (DoH).

### Our health related performance

- 100 percent compliance with microbiological guidelines
- 100 percent compliance with health related chemical guidelines

### Non-health (aesthetic) related performance

While we strive to meet guidelines for aesthetic characteristics, this can be challenging to achieve across the diverse water sources in Western Australia.

This is especially the case in some of our small country water schemes where there may be few sources of drinking water available, and where installation of treatment can be very costly (refer page 16).

In 2016-17 our performance for all aesthetic analyses was 94 per cent (refer page 32). Although we meet all obligations under our [Water Services Licence](#), we recognise there are always opportunities for improvement.

This is our 15<sup>th</sup> Drinking Water Quality Annual Report and we trust it provides our customers with the information they require about their drinking water quality.

We welcome any comments and feedback by phone on 13 13 75 or by email at [report@watercorporation.com.au](mailto:report@watercorporation.com.au).





## Our commitment to you

We are committed to providing our customers with safe, high-quality drinking water that consistently meets the requirements of the [Australian Drinking Water Guidelines \(ADWG\)](#), our customers and other regulatory provisions.

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

- Take a 'catchment to tap' approach to managing and protecting water quality.
- Strongly advocate source protection and primacy of drinking water quality over other land uses.
- Use a risk-based approach to identify and manage potential threats to water quality.
- Comply with the health-related criteria of the ADWG and work to progressively improve compliance with aesthetic criteria.
- Use best practice contingency planning and incident response procedures.
- Routinely monitor the quality of drinking water and promote confidence in the water supply and its management.
- Participate in research and development activities to ensure timely management of emerging drinking water quality issues.
- Contribute to industry regulations and guidelines, and other standards relevant to public health and the water cycle.
- Continually improve our practices by assessing performance against corporate commitments and stakeholder expectations.

We will implement and maintain a management system consistent with the ADWG to protect our drinking water quality. All managers and employees involved in the supply of drinking water are responsible for understanding, implementing, maintaining and continuously improving the drinking water quality management system.



## Introduction

We provide drinking water to Perth, Mandurah and more than 220 regional communities throughout Western Australia.

This year we delivered 361 billion litres of drinking water to more than 1.27 million properties through 34,799 kilometres of water mains. This has come from 128 dams and weirs, 94 licensed borefields, two major desalination plants (the Perth Seawater Desalination and Southern Seawater Desalination plants) and eight regional water treatment plants that use desalination technology.

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 parameters as specified by the National Health and Medical Research Council (NHMRC) in the ADWG.

Our health performance (chemical, microbiological, and radiological) has again resulted in 100 percent of metropolitan and country localities meeting the high standards set by the DoH.

Our extensive and sophisticated drinking water quality monitoring program confirms the safety of the water we provide to our customers. Microbiological, chemical and radiological analyses are carried out by independent laboratories.



**Valves inside Ravenswood Pumping Station**





## Where does your water come from?

### Perth metropolitan region

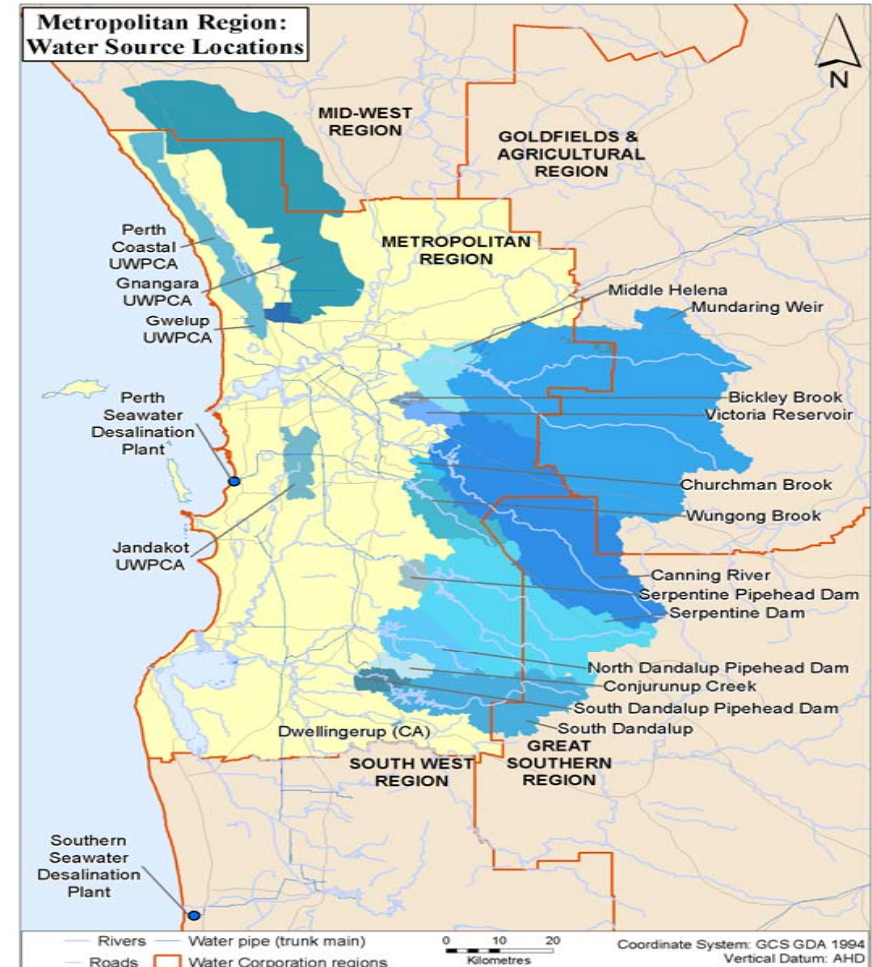
Our largest scheme, the Integrated Water Supply Scheme (IWSS) delivered more than 283 billion litres of water to more than two million customers in Perth, Mandurah, parts of the Goldfields and Agricultural Region, and parts of the South West.

Surface water comes from eight dams in the Darling Range: South and North Dandalup, Serpentine, Wungong, Churchman Brook, Canning, Victoria and Mundaring Weir. Water is also supplied from Stirling and Samson Dams in our South West Region.

Groundwater is drawn from the Yarragadee, Leederville, and Mirrabooka aquifers, and is treated at six groundwater treatment plants. Most of our 180 bores are located in Perth's northern suburbs. There are also 13 independent artesian bores which pump water directly into service reservoirs.

In 2016-17, drinking water production for the IWSS was delivered on target and within overall water allocation and licence parameters. Total groundwater abstracted was 139.6 billion litres, against an allocation of 147.5 billion litres. More than half of the water supplied to the IWSS was manufactured through seawater desalination.

To optimise the amount of water available for the IWSS, customers may receive a mix of groundwater, surface water and desalinated seawater. The percentage of each depends on seasonal factors.





Yanchep and Two Rocks are not connected to the IWSS, with water for these suburbs sourced from independent groundwater supplies. It is anticipated these suburbs will eventually connect to the IWSS to meet growing demand and provide a more secure water supply.

### **Climate independent sources**

The Perth Seawater Desalination Plant in Kwinana delivered 47.3 billion litres of water into the IWSS in 2016-17. The desalinated water enters the IWSS through Thomsons Reservoir where it is blended with Jandakot groundwater and surface water. A portion can be stored in Canning Dam and Wungong Dam during periods of low demand in the winter. The Southern Seawater Desalination Plant near Binningup produced 102.4 billion litres of water for the IWSS in 2016-17. Together, these two climate independent water sources have the capacity to supply around half of Perth's drinking water.

The next climate independent water source for the IWSS is the full-scale Groundwater Replenishment Scheme in Craigie, which has the capacity to recharge 14 billion litres of water each year.

Groundwater replenishment is the process by which secondary treated wastewater undergoes advanced treatment to produce recycled water. The recycled water is recharged to an aquifer for later use as a drinking water source.

Construction of the Advance Water Recycling Plant (AWRP) was completed in 2016-17, with the plant commissioned in mid-2017.

Construction of the Stage 2 expansion of the AWRP Stage 2 begins in late 2017 and will bring the scheme's total recharge capacity to 28 billion litres of water each year.



**Advanced Water Recycling Plant**



## South West Region

Towns in the South West Region are supplied with water from a number of surface and groundwater sources that are largely independent.

Margaret River is supplied by groundwater and surface water via Ten Mile Brook Dam.

Boyanup, Dalyellup, Dardanup, Donnybrook, Dunsborough, Capel, Peppermint Grove Beach, Preston Beach and Augusta are supplied by groundwater via local treatment plants.

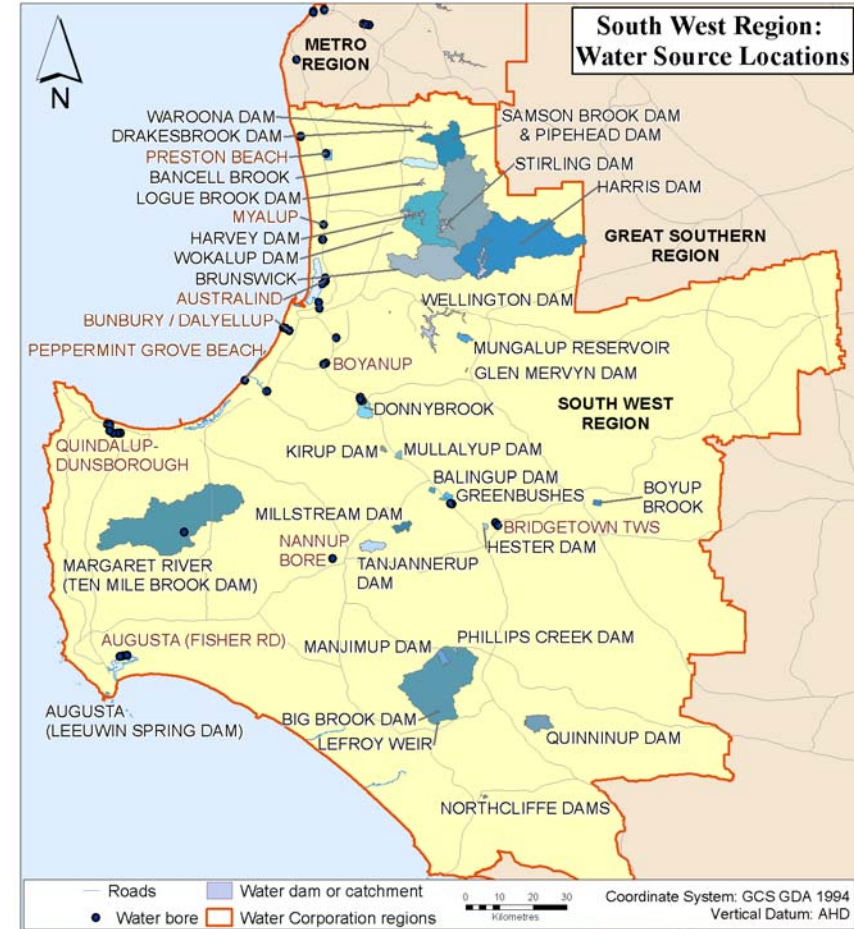
Bridgetown, Nannup, Hester, Boyup Brook, Greenbushes, Balingup and Manjimup are connected to the Warren Blackwood Regional Water Scheme. Millstream and Manjimup Dams and a Yarragadee Bore near Nannup are the main water sources for this scheme with Tanjannerup Dam supplying most of Nannup's water requirements. Kirup and Mullalyup are supplied from surface water or groundwater from Donnybrook (depending upon the current storage at Kirup Dam).

Quinninup and Northcliffe are supplied with carted water from either Manjimup or Pemberton Schemes.

Pemberton is supplied by surface water from Big Brook Dam via Lefroy Brook Dam.

Australind, Clifton Park, Eaton, Pelican Point, Millbridge, Trendale, Kingston, Brunswick Junction, Roelands and Burekup are supplied with groundwater, via water treatment plants in Australind, Eaton and Picton.

Harris Dam supplies Collie, Allanson and Darkan in the South West Region as well as around 38 towns in the Great Southern Region via the Great Southern Towns Water Supply Scheme (GSTWS).



Harvey, Waroona, Hamel, Binningup, Myalup and Yarloop are supplied from the Integrated Water Supply Scheme (IWSS).



## Goldfields and Agricultural Region

The Goldfields and Agricultural Water Supply scheme (GAWS) consists of 9,599 kilometres of water mains that service more than 100,000 customers. Water is sourced from Mundaring Weir near Perth and undergoes treatment at Mundaring Water Treatment Plant before it is supplied to the majority of towns in the Goldfields and Agricultural Region. Mundaring Weir is supplemented with desalinated water and groundwater.

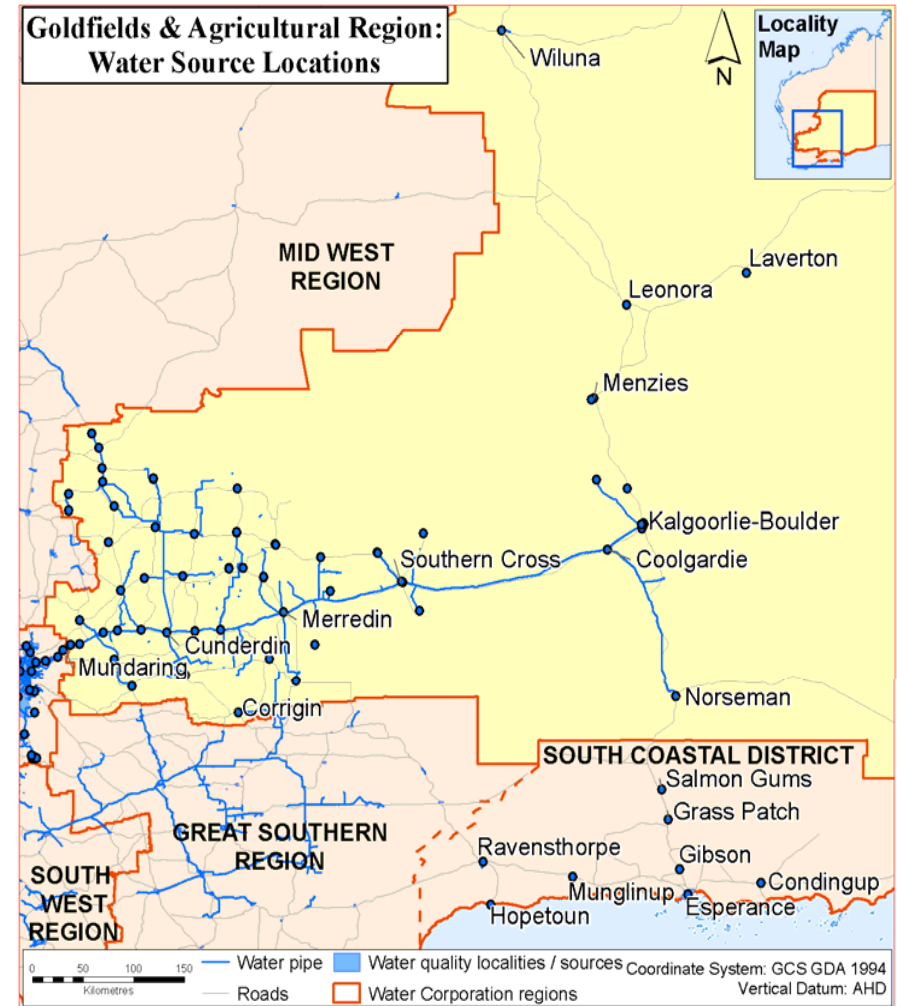
The remaining towns Laverton, Leonora, Menzies and Wiluna are supplied from local groundwater sources

We have an ongoing program of work to upgrade tanks and reservoirs in the Goldfields and Agricultural Region to improve water quality, which will continue over the coming years. We recently constructed a new 2.5 million litre tank in Wundowie and a 6 million litre tank in Waddouring. In 2016-17, construction was also underway on two new 37.5 million litre tanks in Cunderdin.

Chloramination is used in the GAWS to maintain a disinfectant residual across the network. (Refer to “How is your water treated?” on page 16). Additional disinfection facilities have largely been installed throughout the distribution system. Both of these initiatives will improve disinfection management within the GAWS.



**Goldfields Pipeline**





## Great Southern Region

In the Great Southern Region, we have two main water supply schemes - the Great Southern Towns Water Supply Scheme (GSTWS) and the Lower Great Southern Towns Water Supply Scheme (LGSTWS). Harris Dam, near Collie, is the main source for the GSTWS. Groundwater from the South Coast borefields near Albany is the main source for the LGSTWS, although some local sources can contribute to the supply if required.

Hopetoun, Bremer Bay, Esperance, Condingup and Gibson are all supplied from local groundwater sources. Ravensthorpe and Salmon Gums are all supplied from local surface water sources. Grass Patch is supplied by carted water from Esperance or Salmon Gums.

We recently upgraded water treatment plants in Frankland, Ongerup and Jerramungup. These projects improve the water quality supplied to customers in these towns, by upgrading the filtration and disinfection systems at these plants.



Gnowangerup road to the hills





## North West Region

The West Pilbara Water Supply Scheme supplies customers in Karratha, Dampier and the neighbouring towns of Roebourne, Wickham, Point Samson, Cape Lambert and the Burrup Peninsula. The scheme currently has three sources: Harding Dam, groundwater from the Millstream Aquifer and the Bungaroo Valley groundwater source, developed by Rio Tinto Iron Ore.

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. Newman is supplied with groundwater via BHP Billiton operated borefields.

In the Kimberley area, the town of Kununurra is supplied by a local groundwater source. The remaining towns in the North West Region are supplied by local independent groundwater sources, with the exception of Wyndham which is supplied by Mooloolaba Dam.



**Mooloolaba Dam**





## Mid-West Region

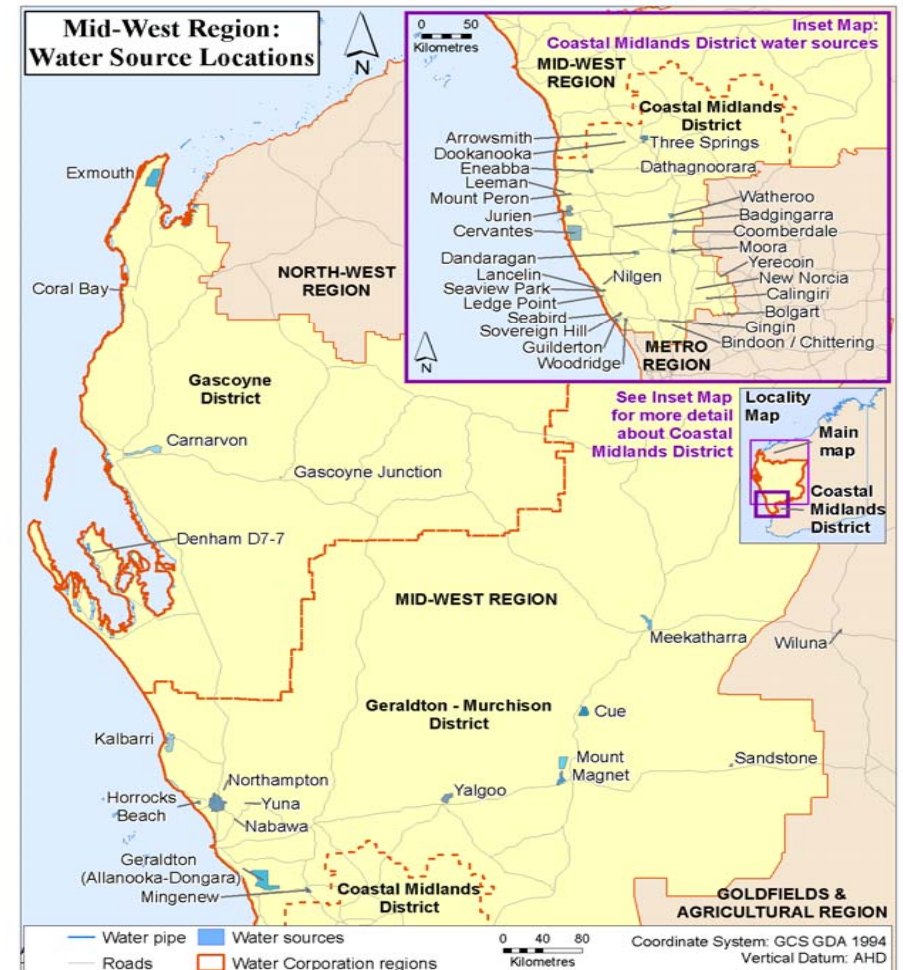
Drinking water throughout the Mid-West Region is supplied from local sources, with 42 independent groundwater borefields provide drinking water to 51 localities. Our largest borefield is Allanooka, which supplies Geraldton and the surrounding towns of Dongara, Northampton, Mullewa, Walkaway, Greenough and Narngulu. Carnarvon is supplied with groundwater from bores located along the Gascoyne River, which also provide water for irrigated horticulture. Exmouth is supplied with groundwater from bores located along the western side of the Cape Range Peninsula. The communities Coomberdale, Nabawa and Yuna are supplied with water carted from the nearby towns Geraldton and Moora.

The Coastal Midlands schemes are mostly small independent groundwater sources where we operate a number of water treatment plants to manage the natural characteristics in the groundwater.

We also operate a number of specialised water treatment plants in the Murchison area, and in 2016-17 we undertook a project to engage with the community to better understand their water quality concerns. We are now proceeding with a program of work to address nitrate levels and improve aesthetic water quality in the towns of Cue, Meekatharra, Mount Magnet and Sandstone (refer “How is your water treated” page16).



Yalgoo – EDR upgrade





## How is your water treated?

### Water treatment

The specific water quality of each source dictates the type of 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. In other cases, more intensive treatment processes may be required to ensure the drinking water delivered to every house is safe and aesthetically pleasing.

Groundwater, which is pumped from underground aquifers, can be treated to remove dissolved gases, iron, manganese, colour and turbidity. In Perth, groundwater treatment plants at Jandakot, Wanneroo, Lexia, Mirrabooka 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. 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. At Neerabup Groundwater Treatment Plant, we use a crystallisation technology to reduce hardness (soften the water) and salinity (total dissolved solids).

Naturally occurring organic substances present an issue for many water sources because they 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 (magnetised ion exchange) to prevent an intermittent “swampy” odour occurring in treated groundwater supplied to Perth’s northern suburbs. Unlike conventional processes, MIEX resin more effectively removes dissolved organic carbon from drinking water, the source of the odour and taste concerns.

The MIEX Treatment Plant has provided a considerable reduction in swampy odour contacts from customers supplied from the Wanneroo Groundwater Treatment Plant.

### Desalination

Desalination, using reverse osmosis (RO), a membrane based treatment, has been used in Denham for many years to treat brackish groundwater. RO was the desalination process chosen for both the Perth Seawater Desalination Plant, which has been operational since November 2006, and the Southern Seawater Desalination Plant, that began supply in September 2011.

Similar technology exists at Leonora, Gascoyne Junction, Coral Bay, Hopetoun and Cocos Islands to improve the aesthetic water quality. Other methods of desalination available include Electrodialysis Reversal (EDR) which is in use at Wiluna and Yalgoo to remove nitrates.

EDR works like a form of desalination, however, it uses the EDR process in place of the traditional desalination process – reverse osmosis. The EDR process removes salts in water by inducing ion movement using electrical currents. The groundwater that supplies Yalgoo is affected by salinity, hardness, nitrates and silica. As a result of this, the water had an undesirable taste for some people, was difficult to form soap lather with and left white crystalline deposits when evaporated. To help address these issues and cater for future growth in the town, we installed a new EDR plant at Yalgoo’s water treatment plant. This will allow 180,000 litres of water to be treated each day in Yalgoo.





## Ultra-filtration

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

UF is being used at Wyndham, Harding Dam, Pemberton, Denmark, Hyden, Walpole, Gascoyne Junction, Salmon Gums, Frankland and Kirup.

## Disinfection

All drinking water supply schemes are disinfected with chlorine or chloramine to protect against pathogenic bacteria and viruses. The chlorine dose is maintained within a narrow range to ensure adequate disinfection is achieved with a minimal effect on the taste of our water.

Chloramination involves the use of chlorine and ammonia to produce a longer lasting disinfectant. Chloramination is used in the Goldfields and Agricultural Water Supply Scheme to maintain a disinfectant residual along the length of the extensive pipe network.

Ultraviolet (UV) light is used as an additional disinfectant in combination with chlorination at some towns where there are additional risks due to activities in the catchment. UV is used at a number of water treatment plants across the State, including Kirup Dam, Hester, Greenbushes, Salmon Gums and Cranbrook.

## Fluoridation

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 in Australia and worldwide, including the World Health Organization; the Australian Dental Association; the Australian Medical Association; the National Health and Medical Research Council, and numerous others.

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

Water fluoridation was introduced in Western Australia in 1968. Currently, around 91 per cent of the WA 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 the regional centres.

Some regional centres in WA have naturally occurring levels of fluoride in the water supply.

The water fluoridation process involves adding fluoride in a controlled manner to the recommended optimum concentration. Fluoridated water supplies are monitored continuously via an online fluoride analyser at a dosing point, and sampled at least weekly to confirm acceptable fluoridation performance. Purity and quality control standards for chemicals added to drinking water are also strictly controlled by the Department of Health. Fluoridation performance is reported quarterly to the Advisory Committee for Purity of Water. Table 1 shows the localities requiring fluoridation under the Act.



**Table 1 Localities requiring fluoridation under Fluoridation of Public Water Supplies Act 1966**

Region / Scheme	Locality
Perth Integrated Water Supply Scheme	Armadale/Kelmscott
	Bold Park
	Buckland Hill
	Foothills
	Greenmount
	Greenmount/Darlington
	Hamilton Hill
	Harvey
	Hills Direct
	Lake Thompson
	Lexia
	Mandurah
	Melville
	Mirrabooka
	Mt. Eliza
	Mt. Hawthorn
	Mt. Yokine
	Mundaring
	Neerabup
	Pinjarra
	South Perth/Kewdale
	Tamworth Hill
	Wanneroo
	Waroona
	West Yokine
	Whitfords

Region / Scheme	Locality
Great Southern Region	Albany
	Esperance
	Katanning (GSTWS)
	Mt Barker
	Narrogin (GSTWS)
Goldfields & Agricultural Water Supply Scheme	Kalgoorlie
	Merredin
	Northam
	York
North West Region	Broome
	Derby
	Hedland
	Karratha
South West Region	Collie (GSTWS)
	Manjimup
Mid-West Region	Dongara/Port Denison
	Exmouth
	Geraldton
	Moora

**Notes:**

1. Dunsborough is de-fluoridated (as fluoride is naturally occurring). Although the scheme is not covered by the Fluoridation Act, the recommended range and optimum concentration have been specified to provide a duty of care target (0.7-1.0mg/L and 0.9mg/L respectively).
2. The Water Corporation is working towards implementing the fluoridation directives, issued by the Department of Health, at Kununurra, Newman and Yanchep.



## What drinking water guidelines must we meet?

The NHMRC define the requirements for safe drinking water in Australia through the ADWG. These Guidelines include a framework for best practice management of drinking water supplies designed to integrate all facets of the drinking water quality management and assurance system.

We have a [Memorandum of Understanding](#) with the DoH which requires our compliance with the microbiological, chemical health and radiological parameters as specified in the ADWG. This forms part of our [Water Services Licence](#) as issued by the Economic Regulation Authority. We, along with the DoH, recognise the practices and processes used to establish and maintain high levels of drinking water quality need to be open and transparent to the community.

For aesthetic parameters, the [Memorandum of Understanding](#) states that we should comply as far as practical with the ADWG for non-health related characteristics. It is accepted full compliance with non-health related characteristics may take a number of years bearing in mind the significant investment required to achieve this. For more information on our program of water quality improvements please refer to “Improving Your Water Quality” on page 35.

## Multiple barrier approach

Preventing contamination and minimising risk is an essential part of providing our customers with safe drinking water. The ADWG emphasise the importance of using multiple barriers to ensure the safety of drinking water. Barriers include:

- Protected catchments and groundwater recharge areas;
- Large reservoirs with long water detention (storage) times;
- Water treatment (refer to “How is your water treated?” on page 16);
- Ensuring tanks and bores are sealed to prevent contamination;
- Disinfection of water; and
- Maintaining chlorine residuals through our distribution system.

We strive to continually improve the robustness and performance of our barriers.



## Water Safety Plans

Having a Water Safety Plan (WSP) for each of our schemes is a large part of implementing the ADWG Framework for Management of Drinking Water Quality. WSPs use a systematic risk management approach from catchment to tap assessing the risks to each water supply scheme, ensuring appropriate preventative measures are in place and identifying the operational controls necessary to consistently ensure the safety of drinking water. We review WSPs at least every five years to re-evaluate the schemes' risks and update any site or treatment details. This year has seen reviews of 37 schemes across the State. In addition, 88 WSPs were updated to show recent capital upgrades and other modifications of those schemes.

## Source Protection

We manage approximately 140 drinking water sources at over 250 localities across the State. Catchment management and protection is the first barrier in providing safe, good quality drinking water to the community. 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 employ several strategies to effectively undertake drinking water source protection. Surveillance and by-law enforcement are key elements, carried out under delegated authority from the Department of Water and Environmental Regulation (DWER), to control potentially polluting activities in gazetted Public Drinking Water Source Areas (PDWSAs). In 2016-17, approximately 20,500 surveillance hours were undertaken state-wide with 274 by-law offence prosecutions initiated and over 410 warning letters sent out.

By-law enforcement was historically restricted to application of the *Metropolitan Water Supply, Sewerage and Drainage By-laws 1981* within metropolitan PDWSAs and limited catchments under the *Country Areas Water Supply By-laws 1957*. In January 2013, a change in the delegation enabled by-law application within all gazetted PDWSAs across the State. In April 2014, we were also given the power to prosecute for offences under the *Water Services Act 2012* and *Water Services Regulations 2013*.

Elements of this legislation may be used to improve our catchment management performance by applying the provisions relating to the protection of our assets such as drinking water reservoirs and bores. The DWER delegates responsibility to us to undertake activities including surveillance, signage, raw water sampling and DWER Land Management in PDWSAs.

## Monitoring

In accordance with the ADWG, we run an extensive drinking water quality monitoring program to confirm the safety of the water we provide to our customers. In 2016-17 we took more than 66,000 water samples from water sources, treatment plants and pipe networks which supply our customers, and had in excess of 250,000 individual analyses performed by our contracted analytical laboratories.

All our water quality monitoring and reporting is coordinated through our Water Quality Management System (WQMS). This software 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 (WSPs).



**Water sampling in a catchment in the Perth hills**

## **Incident response**

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

We maintain a fleet of mobile ultra-filtration (UF) plants which allow us to rapidly restore high quality drinking water supplies. Our UF plants can be mobilised quickly to provide a minimum of 500,000 litres of high quality water per day. Other treatment units, including a Reverse Osmosis (RO) unit, are available for specialised applications.

In addition, we conduct regular incident scenarios with DoH to continually improve our incident management processes.



## Engagement with Department of Health

DoH regulates drinking water quality in Western Australia. We have a [Memorandum of Understanding](#) with DoH for managing drinking water quality, which 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 when any sample exceeds a set health value or any event occurs which could pose a risk to public health.

We also provide updates to DoH throughout the year, with DoH regularly reviewing our monitoring results and corrective actions.

The Memorandum of Understanding provides for 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 commission audits in line with our [Water Services Licence](#).

For more information on the last audit, please visit the drinking water quality section of our webpage [www.watercorporation.com.au](http://www.watercorporation.com.au).



Advanced Water Recycling Plant



## Case Study – Updated map to guide recreation in drinking water catchments

An updated map of public drinking water source areas (PDWSAs) in the Perth Hills and further south to Boyup Brook has been released to provide guidance on recreation in and around protected drinking water catchments. The map covers Perth Hills, Dwellingup, Donnybrook, Serpentine, Waroona, Balingup, Jarrahdale, Harvey, Greenbushes, Pinjarra, Collie and Boyup Brook.

It has been produced by the DWER, with support from Water Corporation, Department of Local Government, Sport and Cultural Industries, Department of Biodiversity, Conservation and Attractions, and DoH. These parties are part of an interagency collaborative working group which manage recreation in drinking water catchments.

The map and accompanying guide

- Advises the community of up-to-date PDWSAs and drinking water source protection rules,
- Outlines where the public can recreate near sensitive catchments, and
- Reflects where recreation opportunities have opened up as a result of removing by-laws or abolishing PDWSAs that are no longer required for drinking water and to support recreational access in Western Australia.

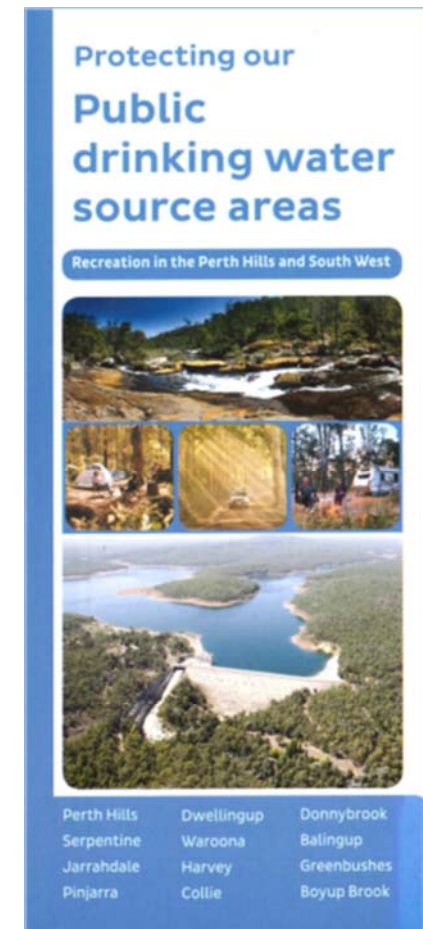
The map is one of the final commitments relating to the State government's review of PDWSAs, and confirms the value of source protection to ensure safe drinking water quality. The removal of drinking water protection legislation in areas no longer required for drinking water, means more development, recreation and tourism opportunities can be

considered. This updated map clearly outlines where the community can recreate around important catchments.

The best way to ensure our drinking water supplies are safe is to provide clear guidance on where people can access recreation opportunities in and around catchments. This map and guide make it easy to know where you can camp, hike, boat, fish and water ski in the Perth Hills and South West, without compromising our precious drinking water.

The map is available in limited hardcopies from selected Water Corporation, DWER, and Department of Biodiversity, Conservation and Attractions offices.

It is also available from the DWER [website](#).



## Case study – Addressing drinking water quality risks across diverse regional schemes

We operate and maintain over 250 drinking water supply schemes, supplying over two million customers and spread over 2.6 million square



kilometres. Water is currently sourced from surface water, groundwater and desalinated seawater. Groundwater replenishment will soon start contributing to groundwater supplies, by recharging recycled water treated to drinking water quality to aquifers below Perth.

The five regions outside Perth include standalone schemes, many of which supply less than 50 services, through to large integrated schemes such as the Goldfields and Agricultural Water Supply. Challenges to drinking water quality (DWQ) management are diverse and include the impacts of elevated water temperatures, drying climate, cyclonic conditions, microbial contamination, undesirable naturally occurring parameters within the source water (e.g. total dissolved solids) and accessing remote areas. Each scheme must be assessed and treated individually, although we have developed comprehensive methods for assessing and treating common major risks.

The Australian Drinking Water Guidelines (ADWG) is the Australian “standard” for managing drinking water quality. The Framework for Management of drinking water quality (the Framework) is an integral part of the 2004 and 2011 ADWG. It advocates a structured and systematic approach to the management of drinking water quality from catchment to customer. This ensures the safety and reliability of the water we supply, by assessing and managing risks.

A key to our risk management is a robust risk assessment methodology providing consistent risk outcomes, to ensure appropriate mitigation strategies can be implemented. The provision of barriers against identified risks from water quality hazards, as required by our standards based on the ADWG, other international guidelines and our own experience, enables these risks to be acceptably alleviated. Barriers include source protection, extended raw water detention, water treatment, disinfection and a sealed reticulation system. We have developed a Barrier Risk Assessment (BRA) process that provides guidance on how water quality risks should be assessed, prioritised and mitigated. Significantly, the BRA

ranks drinking water quality risks against other specific water quality risks, rather than seeking to compare between the multiple risk drivers of a water utility (e.g. adequate source volume, adequate and aging conveyance systems, adequacy of wastewater treatment and disposal etc.).

The development of our standards, reflecting the required level of risk treatment, for planning, design, operation and maintenance of drinking water supply systems was an important first step in the development of the BRA. This ensured there would be no new assets or systems with inadequate risk barriers and allowed for capital funding to bring existing assets up to standard.

#### **Water Safety Plans and the Barrier Risk Assessment**

The Water Safety Planning process is a comprehensive scheme risk assessment, from catchment to customer, undertaken in each scheme every 5 years, which addresses many of the requirements of the Framework. In between this major risk assessment an assessment on the degree of challenge and adequacy of barriers (BRA) is conducted on each scheme annually. Outputs from both of these processes inform our capital, operations or maintenance programs.



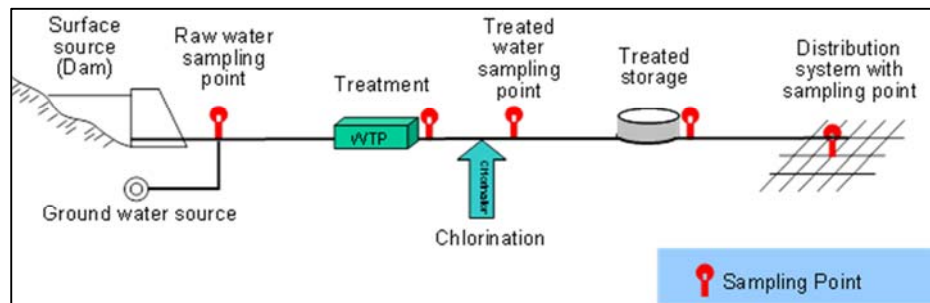


Four major water quality hazards are assessed in the completion of the BRA of each water supply system. These are the risk of supplying water to customers that may:

- Contain pathogens
- Contain *Naegleria*
- Contain chemicals, or
- Be aesthetically displeasing

There are 11 hazardous events assessed within these four categories, for example trihalomethanes (THMs) and pesticides both reside in the 'contain chemicals' risk.

To ensure consistency across schemes and enable prioritisation of mitigation strategies, the consequence of each hazardous event is fixed based on our risk assessment criteria ratings. As expected, when considering the consequence of drinking water quality risks, the criteria accounts for impacts to public health, but also financial, reputational and compliance consequences.



Example of a simple WSP schematic

The likelihood is measured based on the degree to which the challenge from a hazardous event is mitigated by a barrier. The closer the barrier is to our standard, the closer the likelihood is to being effectively mitigated (i.e. a 'rare' likelihood). For example, to meet our standards, an "unprotected" drinking water catchment requires a treatment barrier (filtration) plus disinfection barriers (UV disinfection and chlorination). Where the likelihood of a hazardous event is greater than 'rare', actions are captured to bring the system up to our standard.

### Conclusion

The Water Safety Planning and BRA processes have been refined over the years and have enhanced understanding of drinking water quality risk throughout the business. The information gained through these processes is used to optimise the allocation of funding to mitigate the highest drinking water quality risks. As we become increasingly risk focussed, the visibility and flexibility provided by the BRA will become increasingly critical in achievement of the 'continual improvement' element of the Framework.



## Case Study – Water Treatment Plant logbooks

We have been a leader in the development and adoption of the multiple barrier approach to managing drinking water quality risks. The majority of data on the performance of these barriers is collected and stored electronically. This includes continuous SCADA based data from on-line instrumentation monitoring treatment plant operations and grab sample based data that operators and laboratories generate. The data is stored in a number of different systems and this was identified as requiring a more robust solution.

We have almost 200 water treatment plants across our country regions, of which over 50 are considered more 'complex' as they have more than just simple chlorine disinfection as part of the water treatment process. The use of logbooks for recording field readings at these more complex plants has resulted in a number of process improvements and the prevention of many water quality incidents.

Logbooks are created as group of MS Excel data sheets that are uniquely built for each treatment plant. They outline the monitoring requirements for each treatment process and enable reporting of the performance of these processes as part of our multiple barrier approach to managing drinking water quality risk. In particular, reporting performance of water treatment against critical regulatory and risk management performance criteria. Field operators, operations managers, water quality coordinators and water treatment specialists use the logbooks to review historical data and maintain knowledge of plant performance. The logbooks are also used to monitor and identify issues with treatment plant performance that may require operational and/or capital investment to assure the delivery of safe drinking water.

The limitations of maintaining the logbooks in MS Excel resulted in the creation of a project in 2016/17 to develop a more robust IT solution. The solution identified involves using a mobile application (app) that will allow operators enter field data directing into our systems and receive real-time notification for 'out-of-spec' readings requiring a response action. The mobile application allows:

- Field data capture with online and offline capability;
- Real-time notifications for out-of-spec readings;
- Ability to register events/actions with defined escalation process;
- Ability to audit settings and administer user security permissions;
- Connectivity to established business systems;
- Retention of historical records with customised reporting; and
- Adoption of a corporately supported data management system for water treatment plant logbooks.

The mobile application has been trialled at a number of regional water treatment plants, some of which have, until now, been unable to transfer field data directly from the operator at the treatment plant into our systems without the use of offline paper-based processes. The success of this application development was shared at this year's WA IT Leaders' Summit in Perth where we discussed some of the solutions that were developed to manage performance data from remote treatment plants.



## Understanding water quality test results

The following summaries are intended to assist you with interpreting the results presented in 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 and our website [www.watercorporation.com.au](http://www.watercorporation.com.au).

For the purposes of this report, all data are assessed in relation to the ADWG.

### Escherichia coli (E. coli)

Most human pathogenic microorganisms are found in the gut and faeces of humans and other warm blooded animals along with other non-pathogenic microorganisms. The bacteria *E. coli* is found in abundance in the intestine of warm blooded animals and, although most species are not pathogenic to humans, they indicate possible contamination by human or animal 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 contamination. If there is *E. coli* there may also be pathogenic organisms. We employ the multiple barrier approach (refer to page 19) to prevent microbial contamination, however if there is an *E. coli* detection it is immediately addressed to ensure the water supplied to customers is safe.

### Thermophilic *Naegleria*

Thermophilic *Naegleria* refers to a group of amoebae that thrive in water between 20°C and 42°C, which includes *Naegleria fowleri*. This organism is safe to drink but can cause the disease primary amoebic meningoencephalitis if it enters the body through the nose. It is found in the environment, is not associated with human waste and, under certain conditions, may proliferate in pipework and tanks. Adequate levels of chlorine or chloramine can control *Naegleria*. Any detection of thermophilic *Naegleria* is responded to immediately to ensure the potential risk to public health is managed.

### 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 fluorides. 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 "Fluoridation" on page 17). The fluoride concentration after dosing is set by the Fluoridation of Public Water Supplies Advisory Committee, and does not exceed 1 mg/L. Notwithstanding this, the ADWG health guideline for fluoride is 1.5 mg/L, applicable to both fluoridated and non-fluoridated localities.



## Nitrate

In Western Australia, elevated nitrate concentrations are usually due to the natural process of plant decay underground that has occurred over geological time. The ADWG specify a health guideline for nitrate of 50 mg/L for bottle-fed infants less than three months old and a guideline of 100 mg/L for adults and children over three months old. Nitrate poisoning is very rare and to date no case, due to nitrate in drinking water, has been recorded in Western Australia.

The following localities have a nitrate levels between 50 mg/L and 100 mg/l and have an exemption from compliance with the nitrate guidelines by the Department of Health:

- Mid-West Region - Cue, Meekatharra, Mt Magnet, Nabawa, New Norcia, Sandstone, and Yalgoo.
- Goldfields and Agricultural Region - Laverton, Leonora, Menzies, and Wiluna.

In these towns, the Community Health Nurse 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 as required.



**Water testing**



## Trihalomethanes

Trihalomethanes (THMs) are present in drinking water as a by-product of disinfection using chlorination (and chloramination to a lesser extent). We are required to comply with the ADWG health guideline of 0.25mg/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. There are no aesthetic or health considerations for alkalinity, and 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 colour and 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 salt water intrusion. In Australian drinking water supplies chloride levels range up to 650 mg/L depending on local 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)

Hard water requires more soap to obtain lather. It can also cause scale to form on hot water pipes and fittings. Hardness is caused by the presence of dissolved calcium and magnesium. Water with hardness:

- Less than 60 mg/L is soft and possibly corrosive (depends on pH, alkalinity and dissolved oxygen concentration);
- Between 60 and 200 mg/L is deemed good quality for all domestic uses;
- Between 200 and 500 mg/L will increase scale formation; and
- Greater than 500 mg/L will cause a high level scaling.

Hardness can be an important issue when purchasing appliances such as dishwashers. Hardness can be expressed in a number of units of measure. To convert the hardness values presented in this report (expressed in mg/L) to dH (German degree) units, divide by 17.8. To convert hardness to millimol (mmol) units, divide by 100 and to convert to milliequivalent (mEq) divide by 50. The ADWG specify an aesthetic hardness guideline of 200 mg/L.



## Iron

Iron occurs naturally in water as a result of contact with soil or rock in the catchment. It can accumulate in pipe sediments, and be re-suspended during periods of rapid changes to flow patterns. Elevated concentrations cause discoloured water and can stain laundry. The ADWG specify an aesthetic guideline of 0.3 mg/L.

## Manganese

Manganese in water can come from contact with soil or rock in the catchment. It can accumulate in pipe sediments, and be re-suspended during periods of rapid changes to 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. For further information regarding guideline levels for other metals relevant to drinking water, refer to Appendix A, page 40.

## 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. 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, or may be required as part of chloramine disinfection (refer to page 17). These conditions may be found at a number of localities in our large water supply schemes. Where low pH is experienced, this is typically a consequence of the source characteristic rather than the influence of treatment. Buffering is a treatment process that stabilises the pH of the water.

## Silica

In Australia, dissolved silica 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 is 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 consideration the concentration of sodium in drinking water should not exceed 180 mg/L (ADWG).



## Total Dissolved Solids

Total Dissolved Solids (TDS) consist of inorganic (natural) salts and small amounts of organic matter dissolved in water. TDSs comprise sodium, potassium, calcium, magnesium, chloride, sulphate, bicarbonate, carbonate, silica, organic matter, fluoride, iron, manganese, nitrate and phosphate.

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 in the palatability of drinking water according to TDS concentration:

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

*The ADWG guideline of 600 mg/L is based on taste.*

## True colour

Colour in water originates mainly from natural 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 True Colour Units (TCU). As a guide, 15 TCU is just noticeable in a glass.

## Turbidity

Turbidity is the cloudy appearance of water caused by the presence of suspended 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 guideline values.



**Harding Dam Overflowing**



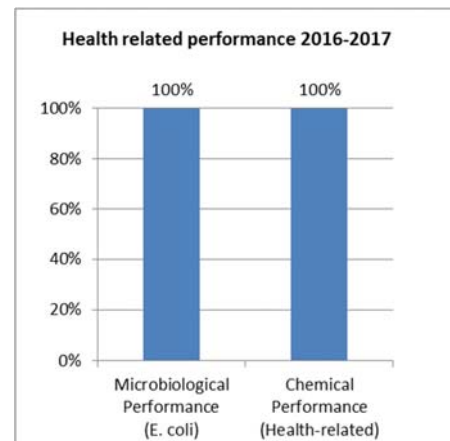
## Our performance

### Health related performance

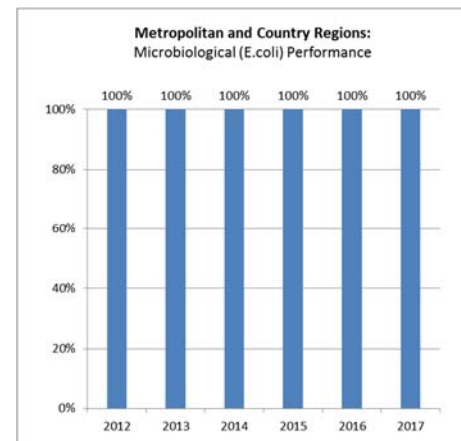
We again achieved excellent microbiological performance in 2016-17 with 100 per cent of schemes complying with *Escherichia coli* and thermotolerant *Naegleria* requirements. We also achieved 100 per cent for chemical health performance (see graph 1).

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 on page 27).

Microbiological performance requirements of our MoU with DoH were all met for the past six years (graph 2).



**Graph 1: Microbiological and Chemical Health Performance**



**Graph 2: Six year microbiological 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 2016-17

Appendix B provides a detailed summary of test results for each scheme throughout the State. In 2016-17 there were 157 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 94 per cent, with 8,406 out of 8,918 analyses complying with the aesthetic guidelines.

The results in Appendix B show a small number of excursions above the guidelines in aesthetic quality. These excursions 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.

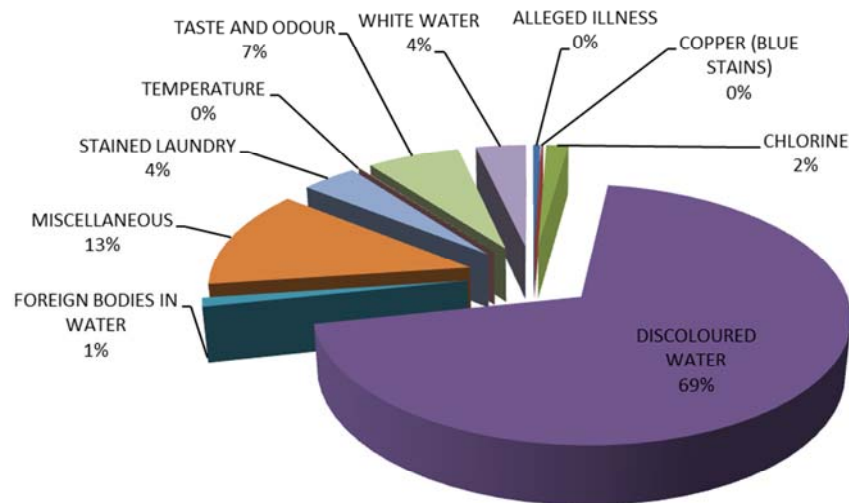




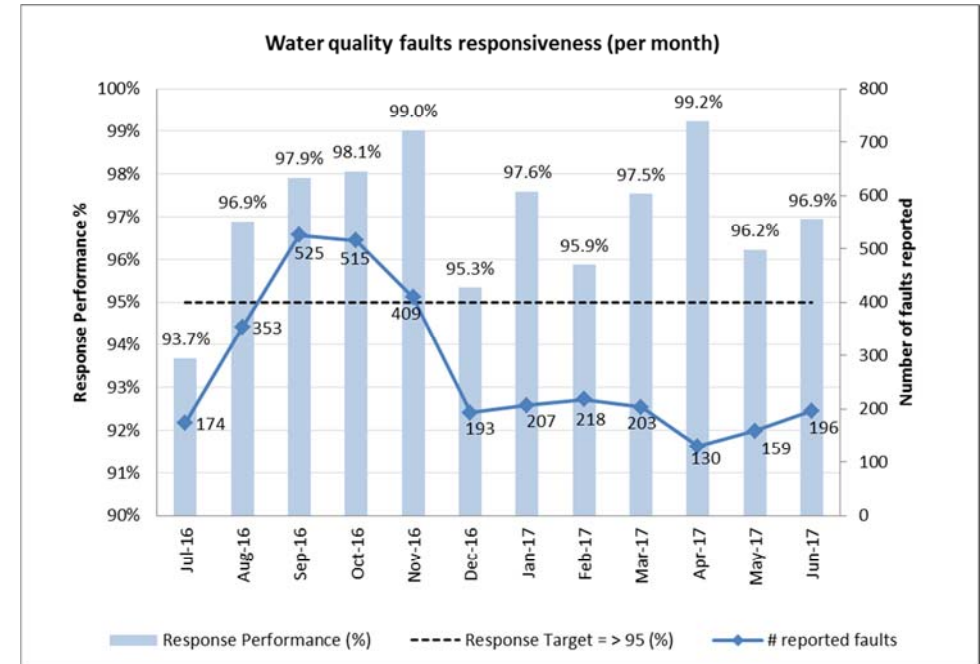
## Customer expectations

### Customer contacts

Water quality related customer contacts (enquiries and complaints) are recorded and monitored continuously to identify any trends and areas for improvement. In 2016-17 our Operations Centre received 9,399 water quality related customer contacts (compared with 6,844 in 2015-16). The graph below shows the type and proportion of the water quality contacts (Note: miscellaneous contacts are predominately related to water hardness).



### Water Quality Contacts Profile 2016-17



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 percent of the time.

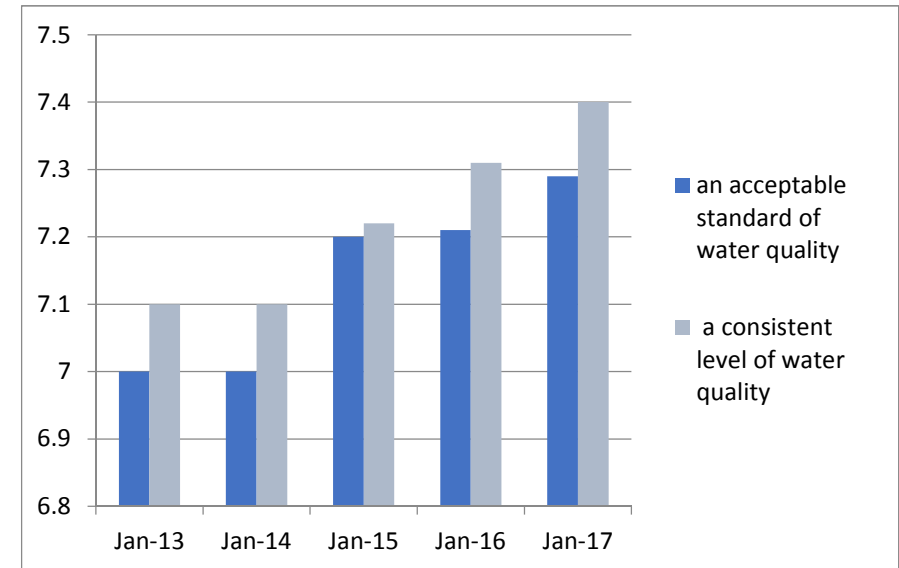
In 2016-17, once a fault was recorded we responded to 97.0 percent within the target of two hours (see graph above for monthly, State-wide statistics).



## Customer research

We measure community perceptions of the quality of their drinking water through our quarterly Customer Performance Index (CPI) survey. In this survey, customers are asked to indicate the degree to which they either agree or disagree with two statements in relation to water quality (where 1 is 'poor' and 10 is 'excellent'). The rating for these questions, for each quarter of the year, is shown below.

In March 2017, we began a formal, extensive State-wide community engagement and customer research program known as 'Tap In'. Through this program, we will plan customer feedback into our strategic and business planning processes to continue to ensure we are truly a customer led organisation.



Responses to Survey Questions over the past 5 years:

Survey Questions	September 2016	December 2016	March 2017	June 2017	End of year average
How would you rate the Water Corporation on providing an acceptable standard of water quality?	7.28	7.35	7.24	7.31	7.29
How would you rate the Water Corporation on providing a consistent level of water quality?	7.38	7.49	7.37	7.40	7.40



## Improving your water quality

### Monitoring and reporting improvements

We continue to strengthen the performance of our operational monitoring which informs our Barrier Risk Assessment (see page 24). The Barrier Risk Assessment is a process we routinely apply to review the risk associated with our drinking water supply schemes. This process assists us with identifying and understanding the need for and prioritisation of our investment to address those risks.

### Water quality capital improvements

We continue to progress our program of water quality capital improvements. These projects ensure robust multiple barriers are in place from “catchment to tap” for all our schemes. Some examples of work undertaken this year are described throughout this report.

### Monitoring and control systems

Installation of instrumentation that allows continuous monitoring of key water quality parameters at each water supply ensures unsatisfactory performance is detected quickly and remedial actions initiated.

This year six Chemsan analysers were installed within the Goldfields and Agricultural Water Supply (GAWS). The analysers are capable of measuring and providing high quality and reliable data necessary to inform and manage this complex chloraminated system.

Additional fencing and signage was installed at several of our drinking water catchments within the North West and Great Southern Regions. This infrastructure is an effective method in reducing the occurrence of undesirable activity within our precious catchment areas.

## Chlorination

We continue with our chlorination program, upgrading the visibility of chlorinators to the latest standards. Improvements will ensure enhanced alarming, automation and reporting capability.

In addition, new chlorinators have been installed / upgraded this financial year at Marvel Loch, Kellerberrin North, Mocardy and East Miling. The new chlorinators will improve the residual maintenance capability for GAWS by better maintaining and extending the disinfection residual throughout the system. Provision of an adequate disinfection residual results in reducing the occurrence of nitrification which can have a significant water quality impact.

## Water treatment

New treatment plants, and upgrades to existing plants continue to be installed across the State to provide an additional barrier to microbiological contamination.

This year new water treatment plants have been installed within the Great Southern Towns of Salmon Gums, Jerramungup, Frankland and Ongerup. These new treatment plants increase the robustness of the current treatment in place to further reduce water quality risks for these towns.

Treatment upgrade projects have progressed primarily within the Mid-West Region with an objective to improve the aesthetic quality of water within several towns including Cue, Horrocks, Meekatharra Moora, Mt Magnet, Sandstone and Yalgoo. A project to upgrade the existing iron removal treatment within the South West Region town of Australind is also nearing completion.



## Tanks and pipelines

Construction of new pipelines and modification to the flow of water through tanks and reservoirs prevents stagnation of water in storage. The result will improve residual maintenance capability within schemes through adequate mixing and minimising water age in tanks and pipelines.

Currently there are several projects underway which will enable isolation of open reservoirs. Projects within the GAWS include:

- New bypass pipework to enable abandonment of Spargoville reservoir which supplies the town of Kambalda
- New tank projects at Cunderdin, Barbalin, and Waddouring to replace the local reservoirs/dams.

These projects will significantly reduce water quality risks associated with microbiological contamination and will support disinfection management.



**Construction of the Cunderdin storage tanks**



## Appendix A – List of sampling parameters

### Pesticide

Pesticide	Health Guideline Value (µg/L)
2,4,5-T (2,4,5-trichlorophenoxyacetic acid)	100
2,4-D ([2,4-dichlorophenoxy]acetic acid)	30
Aldrin + Dieldrin	0.3
Atrazine	20
Azinphos-methyl	30
Bromophos-ethyl	10
Chlordane	2
Chlorothalonil	50
Chlorpyrifos	10
Clopyralid	2000
DDT (total isomers)	9
Diazinon	4
Dicamba	100
Diclofop-methyl	5
Dieldrin	see Aldrin
Dimethoate	7
Diuron	20
Endosulfan	20
Ethion	4
Fenitrothion	7
Fluazifop [1]	10
Fluometuron	70
Glyphosate	1000

Pesticide	Health Guideline Value (µg/L)
Heptachlor & heptachlor epoxide (total)	0.3
Hexachlorobenzene	Value not set
Hexazinone	400
Lindane	10
Maldison	70
Methoxychlor	300
Metolachlor	300
Metsulfuron-methyl	40
Molinate	4
Parathion-ethyl	20
Parathion-methyl	0.7
Picloram	300
Propazine	50
Propiconazole	100
Simazine	20
Terbutryn	400
Triclopyr	20
Trifluralin	90

#### Notes:

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

[1] Guideline specific to WA and set by Department of Health (WA)

Other pesticides may be assessed as indicated



## 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

Compound	Health Guideline Value (µg/L)	Aesthetic Guideline Value (µg/L)
Ethylenediamine tetra acetic (EDTA) [1]	250	Not set
Hexachlorobutadiene [1]	0.7	Not set
Nitrilotriacetic acid (NTA) [1]	200	Not set
Organotin [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:

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

[1] These are part of the hydrocarbons suite in the sampling results tables



## Radiological

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

## Inorganic Chemicals

Chemical	Health Guideline Value (mg/L)	Aesthetic Guideline Value (mg/L)
Chloride	Not set	250
Cyanide [1]	0.08	Not set
Fluoride	1.5	Not set
Iodide [1]	0.5	Not set
Nitrate [2]	50 mg/L	Not set
Silica	Not set	80
Sodium	Not set	180
Sulphate	500	250

### Notes:

[1] Other health related chemicals in the summary of test results tables includes cyanide and iodide.

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

## Physical Characteristics

Characteristics	Health Guideline Value	Aesthetic Guideline Value
Hardness as CaCO <sub>3</sub>	Not set	200 mg/L
pH	Not set	6.5 – 8.5
Total filterable solids (by summation)	Not set	600 mg/L
True colour	Not set	15 HU
Turbidity	Not set	5 NTU

### Notes:

HU = Hazen Units

NTU = Nephelometric turbidity units

## Microbiological

Organism
<i>Escherichia coli</i>
<i>Naegleria</i> tolerant to ≤ 42°C



## Metals

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

Notes:

[3] These are part of the metals suite in the sampling results tables



## **Appendix B – Summary of 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 Regions**

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	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	Concentration (mg/L)			Samples Taken	Guideline Met	Samples Taken	Guideline Met	
								Min	Max	Mean					
Armadale/Kelmscott	276	1	2	✓	273	0	✓	52	0.70	0.95	0.82	0	(1)	2	✓
Bold Park	340	0	0	✓	146	0	✓	52	0.75	0.90	0.83	0	(1)	2	✓
Buckland Hill	104	0	0	✓	78	0	✓	52	0.70	0.90	0.80	0	(1)	2	✓
Dwellingup	13	0	0	✓	6	0	✓	2	<0.1	0.10	<0.1	2	✓	2	✓
Foothills	143	0	0	✓	143	0	✓	52	0.70	0.90	0.81	0	(1)	2	✓
Greenmount	173	0	0	✓	104	0	✓	52	0.70	0.90	0.80	0	(1)	2	✓
Greenmount/Darlington	117	0	0	✓	92	0	✓	52	0.75	0.85	0.81	0	(1)	2	✓
Hamilton Hill	234	0	0	✓	91	0	✓	52	0.75	0.90	0.82	0	(1)	2	✓
Hills Direct	720	0	0	✓	319	0	✓	52	0.75	0.95	0.85	0	(1)	4	✓
Lexia	143	0	0	✓	52	0	✓	52	0.65	0.90	0.76	0	(1)	2	✓
Mandurah	380	0	0	✓	310	0	✓	49	0.80	0.90	0.84	0	(1)	6	✓
Melville	169	0	0	✓	94	0	✓	52	0.70	0.90	0.78	0	(1)	2	✓
Mirrabooka	339	0	0	✓	120	0	✓	52	0.70	0.85	0.75	0	(1)	2	✓
Mt. Eliza	402	0	0	✓	130	0	✓	49	0.70	0.85	0.80	0	(1)	2	✓
Mt. Hawthorn	157	0	0	✓	79	0	✓	52	0.70	0.85	0.80	0	(1)	2	✓
Mt. Yokine	495	0	0	✓	191	0	✓	52	0.70	0.90	0.79	0	(1)	2	✓
Mundaring	117	0	0	✓	117	0	✓	52	0.60	0.95	0.85	0	(1)	2	✓
Neerabup	243	0	0	✓	121	0	✓	52	0.65	0.95	0.83	1	✓	4	✓
North Dandalup	13	0	0	✓	7	0	✓	2	<0.1	0.90	0.45	0	(1)	2	✓
Pinjarra	65	0	0	✓	52	0	✓	52	0.80	0.90	0.85	0	(1)	2	✓
South Perth/Kewdale	497	0	0	✓	223	0	✓	52	0.70	0.95	0.80	0	(1)	2	✓
Tamworth Hill	376	0	0	✓	143	0	✓	52	0.75	0.90	0.85	0	(1)	2	✓
Thomsons Lake	283	0	0	✓	86	0	✓	52	0.70	0.85	0.78	0	(1)	2	✓
Two Rocks	104	0	0	✓	41	0	✓	2	0.15	0.15	0.15	2	✓	2	✓
Wanneroo	438	0	0	✓	157	0	✓	53	0.55	0.90	0.75	0	(1)	4	✓
West Yokine	234	0	0	✓	118	0	✓	52	0.75	0.90	0.80	0	(1)	2	✓
Whitfords	144	0	0	✓	66	0	✓	52	0.60	0.90	0.74	0	(1)	2	✓
Yanchep	104	0	0	✓	52	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓

(1) No samples required in this 12 month period

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Table 2 Health related variables

Perth Region	Health related variables															
Locality	Samples Taken	Nitrate <sup>‡</sup>				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	4	<0.22	<0.22	<0.22	✓	1	✓	1	✓	10	0.050	0.096	0.067	✓	0	(1)
Bold Park	4	<0.22	<0.22	<0.22	✓	1	✓	2	✓	9	0.028	0.077	0.054	✓	0	(1)
Buckland Hill	4	<0.22	0.44	<0.22	✓	1	✓	2	✓	9	0.022	0.110	0.063	✓	0	(1)
Dwellingup	4	0.44	0.44	0.44	✓	1	✓	0	(1)	2	0.045	0.072	0.059	✓	2	✓
Foothills	5	<0.22	1.33	0.44	✓	1	✓	0	(1)	13	0.021	0.140	0.075	✓	0	(1)
Greenmount	4	0.44	2.21	1.33	✓	1	✓	2	✓	13	0.035	0.180	0.118	✓	0	(1)
Greenmount/Darlington	4	0.44	1.33	0.88	✓	1	✓	2	✓	10	0.057	0.160	0.093	✓	0	(1)
Hamilton Hill	3	<0.22	<0.22	<0.22	✓	1	✓	1	✓	10	0.006	0.073	0.050	✓	0	(1)
Hills Direct	7	<0.22	<0.22	<0.22	✓	2	✓	2	✓	21	<0.001	0.045	0.014	✓	0	(1)
Lexia	3	<0.22	2.65	1.77	✓	1	✓	1	✓	9	0.051	0.170	0.114	✓	1	✓
Mandurah	12	<0.22	<0.22	<0.22	✓	3	✓	4	✓	39	<0.001	0.028	0.003	✓	0	(1)
Melville	4	<0.22	<0.22	<0.22	✓	1	✓	2	✓	13	0.012	0.079	0.051	✓	0	(1)
Mirrabooka	4	1.33	1.77	1.77	✓	1	✓	2	✓	13	0.077	0.180	0.120	✓	0	(1)
Mt. Eliza	2	0.44	0.44	0.44	✓	1	✓	1	✓	13	0.024	0.091	0.057	✓	0	(1)
Mt. Hawthorn	4	0.88	1.77	1.33	✓	1	✓	1	✓	9	0.100	0.160	0.127	✓	0	(1)
Mt. Yokine	4	1.33	1.77	1.33	✓	1	✓	2	✓	13	0.068	0.170	0.113	✓	0	(1)
Mundaring	3	<0.22	0.88	0.44	✓	1	✓	2	✓	10	0.007	0.029	0.015	✓	0	(1)
Neerabup	4	3.09	12.82	8.40	✓	1	✓	2	✓	8	0.034	0.072	0.051	✓	0	(1)
North Dandalup	4	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	2	0.047	0.096	0.072	✓	0	(1)
Pinjarra	4	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	2	0.001	0.008	0.005	✓	0	(1)
South Perth/Kewdale	5	<0.22	1.33	0.88	✓	1	✓	2	✓	9	0.009	0.160	0.085	✓	0	(1)
Tamworth Hill	4	<0.22	<0.22	<0.22	✓	1	✓	1	✓	13	<0.001	0.012	0.002	✓	0	(1)
Thomsons Lake	4	<0.22	<0.22	<0.22	✓	1	✓	2	✓	13	0.024	0.120	0.071	✓	0	(1)
Two Rocks	5	2.65	6.19	4.86	✓	1	✓	2	✓	10	0.006	0.012	0.009	✓	2	✓
Wanneroo	4	2.21	3.98	3.09	✓	1	✓	0	(1)	9	0.073	0.150	0.103	✓	0	(1)
West Yokine	5	1.32	2.21	1.77	✓	1	✓	1	✓	10	0.094	0.170	0.143	✓	0	(1)
Whitfords	5	0.44	4.86	3.09	✓	1	✓	2	✓	9	0.072	0.150	0.101	✓	0	(1)
Yanchep	4	4.42	4.42	4.42	✓	1	✓	2	✓	2	0.001	0.006	0.004	✓	0	(1)

(1) No samples required in this 12 month period

‡ Nitrate data is converted from laboratory analysis reported as "Nitrate plus Nitrite as Nitrogen" based on the assumption that all nitrite is converted to nitrate under oxidative conditions during sampling.

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Table 3 Aesthetic (Non-health related) Variables

Perth 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 Value	Max Value	Mean Value			Min	Max	Mean			Min Value	Max Value	Mean Value			Min	Max	Mean	
Armadale/Kelmscott	4	63	78	68	(1)	4	0.018	0.030	0.023	✓	4	145	190	161	✓	4	74	93	80	✓
Bold Park	4	41	66	53	(1)	3	0.020	0.030	0.025	✓	4	65	90	75	✓	4	44	58	52	✓
Buckland Hill	4	42	75	59	(1)	4	0.020	0.030	0.025	✓	4	50	200	125	✓	4	49	66	58	✓
Dwellingup	4	12	17	15	(1)	4	0.008	0.018	0.012	✓	4	70	85	76	✓	4	36	40	38	✓
Foothills	5	58	100	75	(1)	5	0.018	0.025	0.022	✓	5	55	170	106	✓	5	55	96	74	✓
Greenmount	4	72	140	111	(1)	4	0.010	0.020	0.014	✓	4	95	190	163	✓	4	71	110	96	✓
Greenmount/Darlington	4	59	97	80	(1)	4	0.016	0.025	0.020	✓	4	75	150	126	✓	4	66	85	79	✓
Hamilton Hill	3	46	71	61	(1)	3	0.025	0.030	0.027	✓	3	75	150	108	✓	3	51	80	67	✓
Hills Direct	7	34	54	46	(1)	7	0.020	0.070	0.042	✓	7	29	85	45	✓	7	35	59	52	✓
Lexia	3	82	92	88	(1)	3	0.025	0.035	0.032	✓	3	75	160	105	✓	4	88	170	115	✓
Mandurah	12	30	55	51	(1)	12	0.025	0.055	0.038	✓	12	30	38	33	✓	12	31	57	52	✓
Melville	4	54	80	67	(1)	4	0.020	0.030	0.026	✓	4	75	210	163	✓	4	54	63	59	✓
Mirrabooka	4	49	64	56	(1)	4	0.020	0.025	0.024	✓	4	145	190	170	✓	4	110	140	125	✓
Mt. Eliza	2	56	75	66	(1)	2	0.018	0.030	0.024	✓	2	65	190	128	✓	2	61	68	65	✓
Mt. Hawthorn	4	110	120	113	(1)	4	0.012	0.016	0.014	✓	4	155	195	181	✓	4	92	110	102	✓
Mt. Yokine	4	110	130	118	(1)	4	0.014	0.020	0.016	✓	4	155	195	176	✓	4	96	110	102	✓
Mundaring	3	55	68	63	(1)	3	0.012	0.090	0.047	✓	3	140	160	150	✓	3	80	89	83	✓
Neerabup	4	100	170	145	(1)	4	0.014	0.025	0.018	✓	4	75	135	110	✓	4	100	190	160	✓
North Dandalup	4	18	38	25	(1)	4	0.014	0.035	0.022	✓	4	55	80	73	✓	4	41	53	46	✓
Pinjarra	4	36	58	51	(1)	3	0.030	0.060	0.045	✓	4	31	39	35	✓	4	37	58	51	✓
South Perth/Kewdale	5	55	110	94	(1)	5	0.014	0.025	0.020	✓	5	41	180	122	✓	5	56	100	87	✓
Tamworth Hill	4	35	59	49	(1)	4	0.025	0.060	0.039	✓	4	31	37	33	✓	4	34	55	49	✓
Thomsons Lake	4	69	86	77	(1)	4	0.014	0.020	0.017	✓	4	75	205	168	✓	4	77	96	86	✓
Two Rocks	5	190	200	192	(1)	4	0.010	0.010	0.010	✓	5	105	105	105	✓	5	220	230	226	(2)
Wanneroo	4	82	100	94	(1)	4	0.016	0.020	0.018	✓	4	90	170	130	✓	4	97	110	104	✓
West Yokine	5	110	140	120	(1)	4	0.014	0.018	0.016	✓	5	165	185	174	✓	5	91	110	100	✓
Whitfords	5	71	100	86	(1)	5	0.016	0.020	0.018	✓	5	85	160	109	✓	5	76	120	99	✓
Yanchep	4	190	200	193	(1)	4	<0.008	0.010	<0.008	✓	4	105	110	106	✓	4	230	240	233	(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 Value	Max Value	Mean Value	
Armadale/Kelmscott	4	0.015	0.040	0.021	✓	4	<0.002	0.004	<0.002	✓	5	7.75	8.09	7.92	✓	4	2.8	5.1	3.7	✓
Bold Park	4	0.050	0.070	0.060	✓	4	0.004	0.008	0.006	✓	5	7.75	8.06	7.90	✓	4	2.0	4.0	2.9	✓
Buckland Hill	4	0.030	0.160	0.098	✓	4	0.003	0.010	0.006	✓	4	7.75	8.14	7.94	✓	4	1.3	6.4	4.0	✓
Dwellingup	4	0.045	0.300	0.121	✓	4	0.002	0.009	0.004	✓	4	6.95	7.36	7.16	✓	4	2.4	3.3	2.7	✓
Foothills	5	0.020	0.100	0.041	✓	5	<0.002	0.006	0.003	✓	5	7.66	7.98	7.86	✓	5	2.1	15.0	7.6	✓
Greenmount	4	<0.003	0.080	0.025	✓	4	<0.002	0.003	<0.002	✓	4	8.00	8.43	8.19	✓	4	8.6	19.0	16.2	✓
Greenmount/Darlington	4	0.015	0.120	0.046	✓	4	<0.002	0.005	0.003	✓	5	7.99	8.34	8.12	✓	4	3.7	12.0	8.9	✓
Hamilton Hill	3	0.015	0.030	0.020	✓	3	0.004	0.007	0.005	✓	4	7.74	8.07	7.89	✓	3	2.0	4.5	3.1	✓
Hills Direct	7	<0.003	0.045	0.015	✓	7	<0.002	0.008	<0.002	✓	9	7.63	8.74	8.09	✓	7	0.7	1.9	1.2	✓
Lexia	3	0.008	0.020	0.014	✓	3	0.003	0.012	0.008	✓	4	7.06	8.18	7.49	✓	3	14.0	19.0	16.3	✓
Mandurah	12	0.004	0.015	0.008	✓	12	<0.002	<0.002	<0.002	✓	12	8.01	8.60	8.31	✓	12	0.7	1.5	1.0	✓
Melville	4	0.015	0.100	0.046	✓	4	0.002	0.025	0.009	✓	4	7.76	8.14	7.98	✓	4	1.8	6.3	4.8	✓
Mirrabooka	4	0.020	0.050	0.035	✓	4	<0.002	0.002	<0.002	✓	4	7.10	7.48	7.32	✓	4	13.0	15.0	14.3	✓
Mt. Eliza	2	0.060	0.070	0.065	✓	2	0.006	0.009	0.008	✓	2	8.05	8.06	8.06	✓	2	3.5	6.5	5.0	✓
Mt. Hawthorn	4	0.015	0.240	0.081	✓	4	0.002	0.009	0.004	✓	4	7.67	7.90	7.79	✓	4	18.0	19.0	18.3	✓
Mt. Yokine	4	0.025	0.920	0.260	(1)	4	0.002	0.025	0.009	✓	4	7.72	7.93	7.82	✓	4	18.0	18.0	18.0	✓
Mundaring	3	<0.003	<0.003	<0.003	✓	3	<0.002	<0.002	<0.002	✓	4	7.93	8.25	8.16	✓	3	5.0	5.9	5.5	✓
Neerabup	4	0.008	0.015	0.012	✓	4	<0.002	0.004	<0.002	✓	4	7.61	7.83	7.69	✓	4	17.0	22.0	20.3	✓
North Dandalup	4	0.030	0.100	0.066	✓	4	<0.002	0.006	<0.002	✓	4	7.32	8.12	7.72	✓	4	1.5	2.5	2.0	✓
Pinjarra	4	0.004	0.006	0.006	✓	4	<0.002	<0.002	<0.002	✓	4	8.14	8.68	8.36	✓	4	0.9	1.5	1.1	✓
South Perth/Kewdale	5	0.010	0.050	0.022	✓	5	<0.002	0.004	<0.002	✓	5	7.83	7.97	7.91	✓	5	1.4	16.0	10.9	✓
Tamworth Hill	4	0.004	0.015	0.009	✓	4	<0.002	<0.002	<0.002	✓	4	8.08	8.47	8.24	✓	4	0.8	1.5	1.0	✓
Thomsons Lake	4	<0.003	0.004	<0.003	✓	4	0.002	0.006	0.004	✓	4	7.90	8.02	7.96	✓	4	4.1	5.7	5.2	✓
Two Rocks	5	<0.003	<0.003	<0.003	✓	5	<0.002	<0.002	<0.002	✓	5	7.42	7.64	7.56	✓	5	11.0	14.0	12.6	✓
Wanneroo	4	0.004	0.010	0.007	✓	4	<0.002	0.002	<0.002	✓	4	7.42	7.90	7.61	✓	4	18.0	19.0	18.8	✓
West Yokine	5	0.020	0.035	0.027	✓	5	<0.002	0.004	<0.002	✓	6	7.80	8.12	7.96	✓	5	16.0	18.0	17.4	✓
Whitfords	5	0.004	0.015	0.009	✓	5	<0.002	0.004	<0.002	✓	5	7.60	8.10	7.79	✓	5	17.0	18.0	17.6	✓
Yanchep	4	<0.003	0.004	<0.003	✓	4	<0.002	<0.002	<0.002	✓	4	7.49	7.79	7.57	✓	4	15.0	16.0	15.3	✓

(1) Elevated iron August 2016 associated with build up of sediment in sample point and main; sample point replaced and mains scoured and flushed. Readings following have been below guideline levels.

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Table 5 Aesthetic (Non-health related) Variables

Perth Region	Sodium			TDS			True Colour			Turbidity										
Locality	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 Value	Max Value	Mean Value			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Armadale/Kelmscott	4	90	120	99	✓	4	364	468	399	✓	4	<1	1	<1	✓	4	0.1	0.5	0.2	✓
Bold Park	4	42	61	50	✓	4	190	271	223	✓	4	<1	<1	<1	✓	4	0.2	0.3	0.2	✓
Buckland Hill	4	30	130	79	✓	4	167	473	317	✓	4	<1	2	<1	✓	4	<0.1	0.4	0.2	✓
Dwellingup	4	36	44	40	✓	4	160	184	170	✓	4	<1	4	<1	✓	4	0.3	2.0	0.8	✓
Foothills	5	42	110	71	✓	5	201	457	323	✓	5	<1	<1	<1	✓	5	0.1	0.2	0.2	✓
Greenmount	4	60	135	110	✓	4	296	572	487	✓	4	<1	<1	<1	✓	4	<0.1	<0.1	<0.1	✓
Greenmount/Darlington	4	45	105	83	✓	4	227	444	366	✓	4	<1	<1	<1	✓	4	0.1	0.2	0.1	✓
Hamilton Hill	3	48	91	66	✓	3	211	383	294	✓	3	<1	<1	<1	✓	3	0.1	0.2	0.2	✓
Hills Direct	7	19	48	27	✓	7	112	211	155	✓	7	<1	<1	<1	✓	7	<0.1	0.2	<0.1	✓
Lexia	3	37	96	64	✓	3	318	460	383	✓	3	<1	2	<1	✓	3	0.2	0.2	0.2	✓
Mandurah	12	19	23	21	✓	12	105	154	140	✓	12	<1	<1	<1	✓	12	<0.1	0.2	<0.1	✓
Melville	4	47	135	104	✓	4	224	493	392	✓	4	<1	<1	<1	✓	4	0.1	0.7	0.3	✓
Mirrabooka	4	79	105	94	✓	4	413	497	459	✓	4	<1	<1	<1	✓	4	<0.1	<0.1	<0.1	✓
Mt. Eliza	2	39	125	82	✓	2	206	460	333	✓	2	<1	<1	<1	✓	2	0.2	0.2	0.2	✓
Mt. Hawthorn	4	110	130	121	✓	4	493	556	535	✓	4	<1	<1	<1	✓	4	<0.1	0.2	<0.1	✓
Mt. Yokine	4	110	150	125	✓	4	503	592	538	✓	4	<1	1	<1	✓	4	<0.1	0.8	0.3	✓
Mundaring	3	80	97	89	✓	3	355	413	385	✓	3	<1	<1	<1	✓	3	<0.1	<0.1	<0.1	✓
Neerabup	4	58	75	67	✓	4	339	527	459	✓	4	<1	<1	<1	✓	4	<0.1	0.2	0.2	✓
North Dandalup	4	28	43	38	✓	4	158	180	172	✓	4	<1	2	<1	✓	4	0.1	0.8	0.4	✓
Pinjarra	4	20	21	20	✓	4	111	152	140	✓	4	<1	<1	<1	✓	4	<0.1	0.1	<0.1	✓
South Perth/Kewdale	5	26	120	83	✓	5	161	510	388	✓	5	<1	<1	<1	✓	5	<0.1	0.1	<0.1	✓
Tamworth Hill	4	19	21	20	✓	4	112	147	137	✓	4	<1	<1	<1	✓	4	<0.1	0.2	<0.1	✓
Thomsons Lake	4	52	125	107	✓	4	263	503	430	✓	4	<1	<1	<1	✓	4	<0.1	<0.1	<0.1	✓
Two Rocks	5	55	57	56	✓	5	509	526	516	✓	5	<1	<1	<1	✓	5	<0.1	0.1	<0.1	✓
Wanneroo	4	56	105	82	✓	4	333	484	414	✓	4	<1	<1	<1	✓	4	<0.1	0.1	<0.1	✓
West Yokine	5	115	130	123	✓	5	508	541	528	✓	5	<1	<1	<1	✓	5	<0.1	<0.1	<0.1	✓
Whitfords	5	55	96	67	✓	5	296	452	365	✓	5	<1	<1	<1	✓	5	<0.1	<0.1	<0.1	✓
Yanchep	4	52	54	53	✓	4	509	524	516	✓	4	<1	<1	<1	✓	4	<0.1	<0.1	<0.1	✓

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Table 6 Health related variables

Mid West Locality	E. coli				Thermophilic Naegleria			Fluoride			Hydrocarbons		Metals		
	Samples Taken	Samples >0 cfu/100mL	Max cfu/100mL	Requirement Met	Samples Taken	Samples with Thermophilic Naegleria	Requirement Met	Concentration (mg/L)			Samples Taken	Guideline Met	Samples Taken	Guideline Met	
								Min	Max	Mean					
Badgingarra	13	0	0	✓	9	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Bindoon /Chittering	52	0	0	✓	28	0	✓	2	0.35	0.35	0.35	1	✓	2	✓
Bolgart	13	0	0	✓	9	0	✓	2	0.20	0.20	0.20	0	(1)	2	✓
Calingiri	13	0	0	✓	9	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Carnamah	12	0	0	✓	12	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Carnarvon	63	0	0	✓	38	0	✓	2	0.55	0.60	0.58	0	(1)	2	✓
Cervantes	52	0	0	✓	9	0	✓	2	0.15	0.15	0.15	0	(1)	2	✓
Coomberdale	12	0	0	✓	8	0	✓	2	0.10	0.15	0.13	0	(1)	2	✓
Coorow	12	0	0	✓	12	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Coral Bay	12	0	0	✓	11	0	✓	3	<0.1	<0.1	<0.1	1	✓	2	✓
Cue	13	0	0	✓	13	0	✓	2	0.30	0.30	0.30	0	(1)	2	✓
Dandaragan	13	0	0	✓	9	0	✓	2	0.25	0.25	0.25	0	(1)	2	✓
Denham	49	0	0	✓	24	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Dongara/Denison	51	0	0	✓	26	0	✓	49	0.20	0.85	0.51 (2)	0	(1)	2	✓
Eneabba	13	0	0	✓	13	0	✓	2	0.15	0.15	0.15	0	(1)	6	✓
Exmouth	61	0	0	✓	39	0	✓	53	0.40	0.75	0.68 (2)	0	(1)	2	✓
Gascoyne Junction	25	0	0	✓	25	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Geraldton	168	0	0	✓	168	0	✓	56	0.75	0.90	0.80	1	✓	4	✓
Gingin	52	0	0	✓	18	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Greenhead	52	0	0	✓	12	0	✓	2	<0.1	<0.1	<0.1	0	(1)	5	✓
Guilderton	51	0	0	✓	17	0	✓	2	0.20	0.20	0.20	1	✓	2	✓
Horrocks	13	0	0	✓	13	0	✓	2	0.35	0.40	0.38	0	(1)	2	✓
Jurien Bay	52	0	0	✓	9	0	✓	1	0.30	0.30	0.30	0	(1)	2	✓
Kalbarri	52	0	0	✓	26	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Lancelin	52	0	0	✓	18	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	52	0	0	✓	9	0	✓	2	0.15	0.15	0.15	0	(1)	2	✓
Leeman	52	0	0	✓	12	0	✓	2	<0.1	<0.1	<0.1	0	(1)	5	✓
Meekatharra	50	0	0	✓	13	0	✓	2	0.60	0.60	0.60	0	(1)	14	✓
Mingenew	13	0	0	✓	13	0	✓	2	0.15	0.15	0.15	0	(1)	2	✓
Moora	51	0	0	✓	16	0	✓	50	<0.1	0.85	0.34 (2)	0	(1)	2	✓
Morawa	52	0	0	✓	13	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Mt Magnet	50	0	0	✓	13	0	✓	2	0.30	0.30	0.30	0	(1)	2	✓
Mullewa	13	0	0	✓	13	0	✓	2	0.70	0.75	0.73	0	(1)	2	✓
Nabawa	26	0	0	✓	13	0	✓	2	0.75	0.80	0.78	0	(1)	2	✓
New Norcia	13	0	0	✓	9	0	✓	2	0.20	0.20	0.20	0	(1)	2	✓
Nilgern (Ocean Farms)	13	0	0	✓	9	0	✓	2	<0.1	<0.1	<0.1	2	✓	2	✓
Northampton	50	0	0	✓	12	0	✓	2	0.75	0.75	0.75	0	(1)	2	✓
Perenjori	13	0	0	✓	13	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Piawaning	26	0	0	✓	9	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Port Kalbarri	13	0	0	✓	13	0	✓	2	0.15	0.15	0.15	0	(1)	2	✓
Sandstone	12	0	0	✓	12	0	✓	2	0.40	0.45	0.43	0	(1)	6	✓
Seabird	26	0	0	✓	9	0	✓	3	0.25	0.30	0.27	0	(1)	2	✓
Seaview Park	13	0	0	✓	9	0	✓	2	<0.1	<0.1	<0.1	1	✓	2	✓
Sovereign Hills	26	0	0	✓	17	0	✓	2	<0.1	<0.1	<0.1	0	(1)	5	✓
Three Springs	13	0	0	✓	13	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Watheroo	13	0	0	✓	9	0	✓	2	<0.1	<0.1	<0.1	2	✓	2	✓
Woodridge	13	0	0	✓	9	0	✓	2	0.25	0.30	0.28	0	(1)	2	✓
Yalgoo	13	0	0	✓	13	0	✓	2	0.15	0.20	0.18	0	(1)	2	✓
Yerecoin	13	0	0	✓	9	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Yuna	13	0	0	✓	13	0	✓	2	0.80	0.80	0.80	0	(1)	2	✓

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

(2) Schemes for Dongara/Denison, Exmouth & Moora not meeting the dosing range of 0.7-1.0mg/L

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Table 7

Health related variables

Mid West	Health related variables															
	Locality	Samples Taken	Nitrate <sup>‡</sup>				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
Min	Max	Mean							Min	Max	Mean					
Badgingarra	2	0.88	0.88	0.88	✓	1	✓	2	✓	2	<0.001	<0.001	<0.001	✓	0	(1)
Bindoon /Chittering	2	<0.22	<0.22	<0.22	✓	1	✓	1	✓	2	0.009	0.009	0.009	✓	0	(1)
Bolgart	2	31.38	34.03	32.71	✓	1	✓	1	✓	2	0.006	0.007	0.007	✓	0	(1)
Calingiri	5	13.26	21.22	19.01	✓	1	✓	2	✓	2	0.015	0.016	0.016	✓	0	(1)
Carnamah	2	0.88	0.88	0.88	✓	1	✓	2	✓	2	0.007	0.017	0.012	✓	0	(1)
Carnarvon	2	3.54	3.54	3.54	✓	10	(3)	1	✓	2	0.005	0.007	0.006	✓	0	(1)
Cervantes	5	14.59	15.91	15.47	✓	1	✓	2	✓	1	0.015	0.015	0.015	✓	0	(1)
Coomberdale	2	<0.22	0.44	<0.22	✓	1	✓	2	✓	2	0.0-35	0.200	0.118	✓	0	(1)
Coorow	2	0.44	0.88	0.44	✓	1	✓	2	✓	2	0.012	0.017	0.015	✓	0	(1)
Coral Bay	2	0.44	0.44	0.44	✓	1	✓	2	✓	2	<0.001	0.001	<0.001	✓	0	(1)
Cue	7	44.20	53.92	49.50	(2)	1	✓	2	✓	2	0.003	0.009	0.006	✓	0	(1)
Dandaragan	2	<0.22	<0.22	<0.22	✓	1	✓	2	✓	2	0.004	0.007	0.006	✓	0	(1)
Denham	2	0.44	0.44	0.44	✓	1	✓	2	✓	2	0.003	0.009	0.006	✓	0	(1)
Dongara/Denison	4	3.09	12.82	5.30	✓	1	✓	1	✓	2	0.006	0.011	0.009	✓	0	(1)
Eneabba	4	<0.22	<0.22	<0.22	✓	1	✓	1	✓	2	0.004	0.009	0.007	✓	0	(1)
Exmouth	2	7.51	8.40	7.96	✓	1	✓	1	✓	2	<0.001	0.002	<0.001	✓	0	(1)
Gascoyne Junction	2	0.44	0.44	0.44	✓	1	✓	0	(1)	2	0.008	0.018	0.013	✓	1	✓
Geraldton	4	2.65	3.09	2.65	✓	2	✓	2	✓	4	0.007	0.011	0.009	✓	2	✓
Gingin	2	<0.22	<0.22	<0.22	✓	1	✓	2	✓	2	<0.001	0.003	0.002	✓	0	(1)
Greenhead	2	3.98	3.98	3.98	✓	1	✓	2	✓	2	0.001	0.003	0.002	✓	0	(1)
Guilderton	16	31.82	40.22	35.80	✓	1	✓	2	✓	2	0.020	0.023	0.022	✓	2	✓
Horrocks	4	<0.22	0.44	<0.22	✓	1	✓	2	✓	2	0.014	0.019	0.017	✓	0	(1)
Jurien Bay	4	13.26	14.59	14.14	✓	1	✓	2	✓	2	0.008	0.011	0.010	✓	0	(1)
Kalbarri	2	3.09	3.09	3.09	✓	1	✓	2	✓	2	<0.001	0.004	0.002	✓	0	(1)
Lancelin	2	5.75	5.75	5.75	✓	1	✓	2	✓	2	0.009	0.010	0.010	✓	0	(1)
Latham	2	0.88	0.88	0.88	✓	1	✓	1	✓	2	0.027	0.030	0.029	✓	0	(1)
Ledge Point	4	19.01	21.22	19.89	✓	1	✓	1	✓	2	0.005	0.018	0.012	✓	0	(1)
Leeman	2	3.98	3.98	3.98	✓	1	✓	2	✓	2	0.003	0.004	0.004	✓	0	(1)
Meekatharra	4	60.11	70.28	64.09	(2)	1	✓	1	✓	2	0.003	0.005	0.004	✓	0	(1)
Mingenew	3	3.09	5.30	3.98	✓	1	✓	2	✓	2	0.001	0.004	0.003	✓	0	(1)
Moora	2	<0.22	<0.22	<0.22	✓	1	✓	2	✓	2	0.016	0.019	0.018	✓	0	(1)
Morawa	2	0.88	0.88	0.88	✓	1	✓	0	(1)	2	<0.001	0.004	0.002	✓	0	(1)
Mt Magnet	6	63.21	72.49	67.63	(2)	1	✓	1	✓	2	0.003	0.012	0.008	✓	0	(1)
Mullewa	2	2.65	3.09	2.65	✓	1	✓	2	✓	2	0.030	0.037	0.034	✓	0	(1)
Nabawa	2	2.65	3.09	2.65	✓	1	✓	2	✓	2	0.010	0.011	0.011	✓	0	(1)
New Norcia	10	45.97	54.37	49.50	(2)	1	✓	1	✓	2	0.006	0.012	0.009	✓	0	(1)
Nilgern (Ocean Farms)	2	22.54	24.31	23.43	✓	1	✓	2	✓	2	<0.001	0.004	0.002	✓	2	✓
Northampton	2	2.65	3.09	3.09	✓	1	✓	2	✓	2	0.022	0.026	0.024	✓	0	(1)
Perenjori	2	0.88	0.88	0.88	✓	1	✓	2	✓	2	<0.001	0.020	0.010	✓	0	(1)
Piawaning	2	10.17	12.38	11.49	✓	1	✓	2	✓	2	0.065	0.089	0.077	✓	0	(1)
Port Kalbarri	2	0.44	0.44	0.44	✓	1	✓	2	✓	2	0.005	0.008	0.007	✓	0	(1)
Sandstone	6	52.16	58.34	54.81	(2)	1	✓	2	✓	2	<0.001	0.018	0.009	✓	0	(1)
Seabird	2	<0.22	0.44	<0.22	✓	1	✓	2	✓	3	0.039	0.047	0.043	✓	1	✓
Seaview Park	3	19.89	23.43	22.10	✓	1	✓	3	✓	2	0.002	0.003	0.003	✓	4	✓
Sovereign Hills	6	2.65	11.49	5.75	✓	1	✓	1	✓	2	0.026	0.027	0.027	✓	1	✓
Three Springs	2	1.33	1.33	1.33	✓	1	✓	2	✓	2	0.004	0.004	0.004	✓	0	(1)
Watheroo	4	<0.22	0.44	<0.22	✓	1	✓	0	(1)	4	0.069	0.150	0.115	✓	2	✓
Woodridge	2	<0.22	<0.22	<0.22	✓	1	✓	2	✓	2	0.082	0.097	0.090	✓	0	(1)
Yalgoo	2	32.27	34.48	33.59	✓	1	✓	2	✓	2	0.016	0.031	0.024	✓	0	(1)
Yerecoin	2	13.70	15.47	14.59	✓	5	✓	1	✓	2	0.072	0.079	0.076	✓	1	✓
Yuna	2	3.09	3.09	3.09	✓	1	✓	2	✓	2	0.023	0.031	0.027	✓	0	(1)

(1) No samples required in this 12 month period. (2) Cue, Meekatharra, Mount Magnet, New Norcia and Sandstone have been granted an exemption from compliance with the infant nitrate guideline by the Department of Health. The water supplied is safe for adults and children over the age of 3 months. 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. The Water Corporation provides bottled water free of charge for this purpose. (3) Data are for samples from previous 5 years average

‡ Nitrate data is converted from laboratory analysis reported as "Nitrate plus Nitrite as Nitrogen" based on the assumption that all nitrite is converted to nitrate under oxidative conditions during sampling.



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Table 8 Aesthetic (Non-health related) Variables

Mid West	Aesthetic (Non-health related) Variables																			
Locality	Alkalinity (as CaCO3)					Aluminium					Chloride					Hardness				
	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 Value	Max Value	Mean Value			Min	Max	Mean			Min Value	Max Value	Mean Value			Min	Max	Mean	
Badgingarra	2	69	76	73	(1)	2	<0.008	<0.008	<0.008	✓	2	225	235	230	✓	2	45	46	46	✓
Bindoon /Chittering	2	74	93	84	(1)	2	<0.008	0.010	<0.008	✓	2	155	160	158	✓	2	50	52	51	✓
Bolgart	2	31	32	32	(1)	2	<0.008	<0.008	<0.008	✓	2	255	260	258	(2)	2	120	120	120	✓
Calingiri	5	22	51	29	(1)	5	<0.008	<0.008	<0.008	✓	5	375	500	425	(2)	5	140	230	170	✓
Carnamah	2	9	13	11	(1)	2	<0.008	<0.008	<0.008	✓	2	410	435	423	(2)	2	120	140	130	✓
Carnarvon	2	98	100	99	(1)	2	<0.008	<0.008	<0.008	✓	2	190	195	193	✓	2	210	220	215	(3)
Cervantes	5	230	240	232	(1)	5	<0.008	0.014	<0.008	✓	5	275	285	279	(2)	5	310	320	314	(3)
Coomberdale	2	23	190	107	(1)	2	0.020	0.020	0.020	✓	2	205	260	233	(2)	2	74	280	177	(3)
Coorow	2	11	14	13	(1)	2	<0.008	<0.008	<0.008	✓	2	405	420	413	(2)	2	120	140	130	✓
Coral Bay	2	84	85	85	(1)	2	<0.008	0.010	<0.008	✓	2	39	42	41	✓	2	74	87	81	✓
Cue	2	58	62	60	(1)	2	<0.008	<0.008	<0.008	✓	2	280	285	283	(2)	2	170	190	180	✓
Dandaragan	2	100	110	105	(1)	2	<0.008	<0.008	<0.008	✓	2	245	250	248	✓	2	92	92	92	✓
Denham	2	17	22	20	(1)	2	0.012	0.018	0.015	✓	2	160	185	173	✓	2	57	68	63	✓
Dongara/Denison	4	63	110	76	(1)	4	<0.008	0.010	<0.008	✓	4	340	385	370	(2)	4	110	110	110	✓
Eneabba	4	16	18	17	(1)	4	<0.008	<0.008	<0.008	✓	4	300	350	329	(2)	4	97	100	99	✓
Exmouth	2	240	240	240	(1)	2	<0.008	<0.008	<0.008	✓	2	255	260	258	(2)	2	340	340	340	(3)
Gascoyne Junction	2	21	22	22	(1)	2	<0.008	<0.008	<0.008	✓	2	100	225	163	✓	2	47	92	70	✓
Geraldton	4	62	65	64	(1)	4	<0.008	<0.008	<0.008	✓	4	375	405	389	(2)	4	110	120	115	✓
Gingin	2	33	35	34	(1)	2	<0.008	<0.008	<0.008	✓	2	100	100	100	✓	2	27	29	28	✓
Greenhead	2	22	23	23	(1)	2	<0.008	0.010	<0.008	✓	2	285	290	288	(2)	2	110	110	110	✓
Guilderton	4	190	190	190	(1)	4	<0.008	0.010	<0.008	✓	4	295	345	323	(2)	4	270	320	300	(3)
Horrocks	4	96	140	124	(1)	4	<0.008	<0.008	<0.008	✓	4	585	620	601	(2)	4	130	140	133	✓
Jurien Bay	4	240	250	243	(1)	4	<0.008	<0.008	<0.008	✓	4	210	290	254	(2)	4	300	330	315	(3)
Kalbarri	2	7	7	7	(1)	2	<0.008	<0.008	<0.008	✓	2	190	190	190	✓	2	65	68	67	✓
Lancelin	2	200	210	205	(1)	2	0.010	0.010	0.010	✓	2	195	195	195	✓	2	270	270	270	(3)
Latham	2	40	42	41	(1)	2	0.010	0.010	0.010	✓	2	295	305	300	(2)	2	92	100	96	✓
Ledge Point	4	200	200	200	(1)	4	<0.008	0.012	<0.008	✓	4	170	180	174	✓	4	250	270	260	(3)
Leeman	2	21	23	22	(1)	2	0.010	0.010	0.010	✓	2	300	300	300	(2)	2	110	110	110	✓
Meekatharra	4	160	160	160	(1)	4	<0.008	<0.008	<0.008	✓	4	290	305	296	(2)	4	280	300	290	(3)
Mingenew	3	16	23	20	(1)	3	<0.008	0.010	<0.008	✓	3	305	355	328	(2)	3	61	90	76	✓
Moora	2	15	17	16	(1)	2	<0.008	<0.008	<0.008	✓	2	240	240	240	✓	2	61	62	62	✓
Morawa	2	21	22	22	(1)	2	<0.008	0.010	<0.008	✓	2	285	305	295	(2)	2	73	73	73	✓
Mt Magnet	2	180	190	185	(1)	2	<0.008	<0.008	<0.008	✓	2	245	280	263	(2)	2	270	280	275	(3)
Mullewa	2	72	72	72	(1)	2	0.010	0.016	0.013	✓	2	395	395	395	(2)	2	130	130	130	✓
Nabawa	2	64	64	64	(1)	2	0.012	0.016	0.014	✓	2	380	380	380	(2)	2	120	120	120	✓
New Norcia	6	29	31	30	(1)	2	<0.008	<0.008	<0.008	✓	6	560	655	602	(2)	6	230	250	238	(3)
Nilgern (Ocean Farms)	2	230	230	230	(1)	2	0.010	0.014	0.012	✓	2	135	135	135	✓	2	240	250	245	(3)
Northampton	2	68	74	71	(1)	2	0.010	0.010	0.010	✓	2	365	425	395	(2)	2	120	120	120	✓
Perenjori	2	22	25	24	(1)	2	0.008	0.010	0.009	✓	2	295	300	298	(2)	2	74	78	76	✓
Piawaning	2	43	78	61	(1)	2	<0.008	<0.008	<0.008	✓	2	150	305	228	(2)	2	110	140	125	✓
Port Kalbarri	2	71	77	74	(1)	2	<0.008	<0.008	<0.008	✓	2	335	340	338	(2)	2	120	120	120	✓
Sandstone	2	89	97	93	(1)	2	<0.008	0.008	<0.008	✓	2	320	345	333	(2)	2	310	330	320	(3)
Seabird	2	79	80	80	(1)	2	<0.008	<0.008	<0.008	✓	2	215	220	218	✓	2	94	99	97	✓
Seaview Park	3	170	180	177	(1)	3	<0.008	0.010	<0.008	✓	3	90	95	93	✓	3	190	200	193	✓
Sovereign Hills	3	140	200	170	(1)	3	<0.008	<0.008	<0.008	✓	3	170	245	212	✓	3	250	250	250	(3)
Three Springs	2	24	24	24	(1)	2	<0.008	0.010	<0.008	✓	2	320	355	338	(2)	2	82	84	83	✓
Watheroo	4	190	200	193	(1)	4	<0.008	0.012	<0.008	✓	4	185	200	194	✓	4	240	290	265	(3)
Woodridge	2	53	54	54	(1)	2	0.045	0.060	0.053	✓	2	185	190	188	✓	2	50	56	53	✓
Yalgoo	2	100	110	105	(1)	2	<0.008	<0.008	<0.008	✓	2	120	135	128	✓	2	97	100	99	✓
Yerecoin	2	49	57	53	(1)	2	<0.008	<0.008	<0.008	✓	2	145	150	148	✓	2	100	120	110	✓
Yuna	2	62	66	64	(1)	2	0.020	0.020	0.020	✓	2	375	385	380	(2)	2	110	120	115	✓

(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	Aesthetic (Non-health related) Variables																			
Locality	Iron					Manganese					pH					Silica				
	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 Value	Max Value	Mean Value	
Badgingarra	2	0.006	0.015	0.011	✓	2	0.002	0.003	0.003	✓	2	6.62	6.85	6.74	✓	2	45.0	45.0	45.0	✓
Bindoon /Chittering	2	0.030	0.035	0.033	✓	2	<0.002	<0.002	<0.002	✓	2	7.03	7.30	7.17	✓	2	34.0	37.0	35.5	✓
Bolgart	2	0.025	0.030	0.028	✓	2	<0.002	<0.002	<0.002	✓	2	7.17	7.24	7.21	✓	2	40.0	41.0	40.5	✓
Calingiri	5	0.025	0.040	0.034	✓	5	<0.002	<0.002	<0.002	✓	5	6.69	6.86	6.77	✓	5	15.0	19.0	17.6	✓
Carnamah	2	0.015	0.070	0.043	✓	2	<0.002	<0.002	<0.002	✓	2	6.66	6.83	6.75	✓	2	24.0	28.0	26.0	✓
Carnarvon	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.78	7.87	7.83	✓	2	47.0	49.0	48.0	✓
Cervantes	5	<0.003	0.006	<0.003	✓	5	<0.002	<0.002	<0.002	✓	5	7.55	7.69	7.64	✓	5	13.0	15.0	14.0	✓
Coomberdale	2	0.050	0.060	0.055	✓	2	<0.002	0.004	<0.002	✓	2	8.28	8.46	8.37	✓	2	15.0	19.0	17.0	✓
Coorow	2	0.025	0.045	0.035	✓	2	<0.002	<0.002	<0.002	✓	2	6.75	6.80	6.78	✓	2	25.0	27.0	26.0	✓
Coral Bay	2	0.006	0.008	0.007	✓	2	<0.002	0.002	<0.002	✓	2	7.55	7.63	7.59	✓	2	0.4	0.4	0.4	✓
Cue	2	<0.003	0.004	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.66	7.90	7.78	✓	2	80.0	85.0	82.5	(3)
Dandaragan	2	0.050	0.220	0.135	✓	2	<0.002	0.010	0.005	✓	2	7.03	7.12	7.08	✓	2	42.0	43.0	42.5	✓
Denham	2	0.025	0.060	0.043	✓	2	<0.002	<0.002	<0.002	✓	2	7.24	7.61	7.43	✓	2	2.0	2.0	2.0	✓
Dongara/Denison	4	0.010	0.460	0.129	(1)	4	<0.002	0.003	<0.002	✓	4	6.86	7.56	7.22	✓	4	23.0	34.0	26.3	✓
Eneabba	4	0.015	0.020	0.019	✓	4	<0.002	<0.002	<0.002	✓	4	6.99	7.46	7.22	✓	4	45.0	48.0	46.5	✓
Exmouth	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.51	7.52	7.52	✓	2	15.0	16.0	15.5	✓
Gascoyne Junction	2	<0.003	0.004	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	6.94	7.19	7.07	✓	2	3.6	4.0	3.8	✓
Geraldton	4	0.015	0.035	0.026	✓	4	<0.002	<0.002	<0.002	✓	4	7.00	7.16	7.05	✓	4	23.0	27.0	24.8	✓
Gingin	2	0.050	0.050	0.050	✓	2	<0.002	<0.002	<0.002	✓	2	7.19	7.45	7.32	✓	2	29.0	30.0	29.5	✓
Greenhead	2	0.040	0.070	0.055	✓	2	<0.002	<0.002	<0.002	✓	2	7.12	7.56	7.34	✓	2	22.0	26.0	24.0	✓
Guilderton	4	<0.003	<0.003	<0.003	✓	4	<0.002	<0.002	<0.002	✓	4	7.67	7.99	7.78	✓	4	8.8	9.1	9.0	✓
Horrocks	4	0.030	0.120	0.085	✓	4	0.005	0.016	0.010	✓	4	7.18	7.87	7.45	✓	4	13.0	16.0	15.0	✓
Jurien Bay	4	<0.003	<0.003	<0.003	✓	4	<0.002	<0.002	<0.002	✓	4	7.45	7.72	7.59	✓	4	15.0	16.0	15.3	✓
Kalbarri	2	0.006	0.006	0.006	✓	2	<0.002	<0.002	<0.002	✓	2	6.77	6.79	6.78	✓	2	41.0	44.0	42.5	✓
Lancelin	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.87	7.92	7.90	✓	2	15.0	16.0	15.5	✓
Latham	2	0.030	0.030	0.030	✓	2	<0.002	<0.002	<0.002	✓	2	8.93	9.00	8.97	(2)	2	39.0	50.0	44.5	✓
Ledge Point	4	<0.003	<0.003	<0.003	✓	4	<0.002	<0.002	<0.002	✓	4	7.51	7.74	7.66	✓	4	15.0	16.0	15.3	✓
Leeman	2	0.015	0.030	0.023	✓	2	<0.002	<0.002	<0.002	✓	2	7.44	7.84	7.64	✓	2	23.0	26.0	24.5	✓
Meekatharra	4	<0.003	<0.003	<0.003	✓	4	<0.002	<0.002	<0.002	✓	4	8.01	8.18	8.10	✓	4	75.0	80.0	78.8	✓
Mingenew	3	0.025	0.070	0.043	✓	3	<0.002	<0.002	<0.002	✓	3	6.75	7.03	6.89	✓	3	55.0	55.0	55.0	✓
Moora	2	0.060	0.080	0.070	✓	2	<0.002	<0.002	<0.002	✓	2	7.06	7.12	7.09	✓	2	21.0	24.0	22.5	✓
Morawa	2	0.010	0.015	0.013	✓	2	<0.002	<0.002	<0.002	✓	2	6.97	7.38	7.18	✓	2	46.0	48.0	47.0	✓
Mt Magnet	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.98	8.14	8.06	✓	2	75.0	80.0	77.5	✓
Mullewa	2	0.025	0.035	0.030	✓	2	<0.002	<0.002	<0.002	✓	2	7.88	8.04	7.96	✓	2	22.0	24.0	23.0	✓
Nabawa	2	0.040	0.040	0.040	✓	2	<0.002	0.003	<0.002	✓	2	7.71	7.77	7.74	✓	2	22.0	25.0	23.5	✓
New Norcia	6	0.015	0.030	0.018	✓	6	<0.002	<0.002	<0.002	✓	6	6.27	6.69	6.51	✓	6	45.0	47.0	45.8	✓
Nilgern (Ocean Farms)	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.45	7.52	7.49	✓	2	20.0	22.0	21.0	✓
Northampton	2	0.015	0.025	0.020	✓	2	<0.002	0.002	<0.002	✓	2	7.91	8.37	8.14	✓	2	23.0	24.0	23.5	✓
Perenjori	2	0.020	0.030	0.025	✓	2	<0.002	0.003	<0.002	✓	2	7.03	7.20	7.12	✓	2	46.0	50.0	48.0	✓
Piawaning	2	0.006	0.025	0.016	✓	2	<0.002	<0.002	<0.002	✓	2	7.28	7.35	7.32	✓	2	17.0	18.0	17.5	✓
Port Kalbarri	2	0.008	0.015	0.012	✓	2	<0.002	0.003	<0.002	✓	6	7.09	7.63	7.39	✓	2	46.0	47.0	46.5	✓
Sandstone	2	<0.003	0.004	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.54	7.56	7.55	✓	2	35.0	39.0	37.0	✓
Seabird	2	0.010	0.030	0.020	✓	2	<0.002	<0.002	<0.002	✓	2	7.65	7.89	7.77	✓	2	18.0	18.0	18.0	✓
Seaview Park	3	<0.003	<0.003	<0.003	✓	3	<0.002	<0.002	<0.002	✓	3	8.03	8.05	8.04	✓	3	17.0	18.0	17.3	✓
Sovereign Hills	3	<0.003	0.004	<0.003	✓	3	<0.002	<0.002	<0.002	✓	3	7.81	7.97	7.89	✓	3	20.0	20.0	20.0	✓
Three Springs	2	0.045	0.090	0.068	✓	2	0.005	0.014	0.010	✓	2	7.52	7.61	7.57	✓	2	50.0	50.0	50.0	✓
Watheroo	4	0.008	0.010	0.009	✓	4	<0.002	<0.002	<0.002	✓	4	7.42	7.49	7.44	✓	4	13.0	15.0	14.0	✓
Woodridge	2	0.015	0.020	0.018	✓	2	0.004	0.005	0.005	✓	2	7.25	7.46	7.36	✓	2	25.0	26.0	25.5	✓
Yalgoo	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.25	7.77	7.51	✓	2	70.0	85.0	77.5	(2)
Yerecoin	2	0.008	0.025	0.017	✓	2	<0.002	<0.002	<0.002	✓	2	7.32	7.75	7.54	✓	2	17.0	18.0	17.5	✓
Yuna	2	0.100	0.120	0.110	✓	2	0.004	0.006	0.005	✓	2	7.65	7.74	7.70	✓	2	23.0	24.0	23.5	✓

(1) High Iron 10 times greater than supply average due to new pipeline commissioning. (2) High pH due to long mains supplying this locality. (3) Elevated silica is characteristic of the source supplying this locality.

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Table 10 Aesthetic (Non-health related) Variables

Mid West	Aesthetic (Non-health related) Variables																			
Locality	Sodium					TDS					True Colour					Turbidity				
	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 Value	Max Value	Mean Value			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Badgingarra	2	150	165	158	✓	2	550	579	565	✓	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Bindoon /Chittering	2	110	120	115	✓	2	440	467	454	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Bolgart	2	135	140	138	✓	2	577	610	594	(2)	2	<1	<1	<1	✓	2	0.3	0.4	0.4	✓
Calingiri	5	200	295	242	(1)	5	702	999	825	(2)	5	<1	<1	<1	✓	5	0.1	0.2	0.1	✓
Carnamah	2	235	245	240	(1)	2	782	825	804	(2)	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Carnarvon	2	90	91	91	✓	2	594	603	599	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Cervantes	5	150	160	154	✓	5	885	910	896	(2)	5	<1	<1	<1	✓	5	<0.1	<0.1	<0.1	✓
Coomberdale	2	95	135	115	✓	2	508	666	587	(2)	2	<1	<1	<1	✓	2	0.1	0.2	0.2	✓
Coorow	2	230	240	235	(1)	2	786	787	787	(2)	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Coral Bay	2	26	29	28	✓	2	204	215	210	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Cue	2	165	180	173	✓	2	800	820	810	(2)	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Dandaragan	2	160	165	163	✓	2	634	653	644	(2)	2	<1	<1	<1	✓	2	0.3	0.4	0.4	✓
Denham	2	92	105	99	✓	2	333	389	361	✓	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Dongara/Denison	4	235	250	245	(1)	4	823	856	839	(2)	4	<1	<1	<1	✓	4	<0.1	2.7	0.7	✓
Eneabba	4	175	185	181	(1)	4	618	667	642	(2)	4	<1	<1	<1	✓	4	<0.1	0.1	<0.1	✓
Exmouth	2	130	135	133	✓	2	842	852	847	(2)	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Gascoyne Junction	2	59	130	95	✓	2	233	472	353	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Geraldton	4	245	250	249	(1)	4	828	858	842	(2)	4	<1	<1	<1	✓	4	<0.1	0.2	<0.1	✓
Gingin	2	63	68	66	✓	2	262	267	265	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Greenhead	2	160	160	160	✓	2	576	580	578	✓	2	<1	<1	<1	✓	2	<0.1	0.3	0.2	✓
Guilderton	4	155	200	180	(1)	4	859	984	930	(2)	4	<1	<1	<1	✓	4	<0.1	0.1	<0.1	✓
Horrocks	4	400	415	408	(1)	4	1273	1358	1318	(2)	4	<1	<1	<1	✓	4	0.2	0.5	0.4	✓
Jurien Bay	4	115	150	138	✓	4	791	908	859	(2)	4	<1	<1	<1	✓	4	<0.1	<0.1	<0.1	✓
Kalbarri	2	100	100	100	✓	2	388	392	390	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Lancelin	2	96	97	97	✓	2	676	684	680	(2)	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Latham	2	185	190	188	(1)	2	673	675	674	(2)	2	<1	<1	<1	✓	2	0.1	0.3	0.2	✓
Ledge Point	4	100	105	104	✓	4	689	705	695	(2)	4	<1	<1	<1	✓	4	<0.1	<0.1	<0.1	✓
Leeman	2	160	160	160	✓	2	586	586	586	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Meekatharra	4	200	210	204	(1)	4	1047	1083	1069	(2)	4	<1	<1	<1	✓	4	<0.1	<0.1	<0.1	✓
Mingenew	3	185	210	198	(1)	3	639	717	676	(2)	3	<1	<1	<1	✓	3	<0.1	0.3	0.2	✓
Moora	2	130	130	130	✓	2	473	474	474	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Morawa	2	185	185	185	(1)	2	620	636	628	(2)	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Mt Magnet	2	170	185	178	✓	2	935	1004	970	(2)	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Mullewa	2	255	265	260	(1)	2	875	893	884	(2)	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Nabawa	2	250	250	250	(1)	2	830	833	832	(2)	2	<1	<1	<1	✓	2	0.4	2.0	1.2	✓
New Norcia	6	315	355	336	(1)	6	1126	1269	1190	(2)	6	<1	<1	<1	✓	6	0.2	0.5	0.3	✓
Nilgern (Ocean Farms)	2	90	94	92	✓	2	668	671	670	(2)	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Northampton	2	250	250	250	(1)	2	829	879	854	(2)	2	<1	<1	<1	✓	2	0.2	0.2	0.2	✓
Perenjori	2	180	195	188	(1)	2	633	654	644	(2)	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Piawaning	2	79	185	132	✓	2	392	696	544	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Port Kalbarri	2	210	215	213	(1)	2	765	782	774	(2)	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Sandstone	2	180	185	183	(1)	2	932	981	957	(2)	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Seabird	2	125	135	130	✓	2	533	552	543	✓	2	<1	<1	<1	✓	2	0.1	0.2	0.2	✓
Seaview Park	3	60	68	63	✓	3	485	509	496	✓	3	<1	<1	<1	✓	3	<0.1	<0.1	<0.1	✓
Sovereign Hills	3	105	120	112	✓	3	672	682	678	(2)	3	<1	<1	<1	✓	3	<0.1	<0.1	<0.1	✓
Three Springs	2	210	215	213	(1)	2	689	719	704	(2)	2	<1	<1	<1	✓	2	0.1	0.4	0.3	✓
Watheroo	4	87	93	89	✓	4	614	664	637	(2)	4	<1	<1	<1	✓	4	<0.1	<0.1	<0.1	✓
Woodridge	2	125	150	138	✓	2	467	507	487	✓	2	<1	<1	<1	✓	2	0.1	0.1	0.1	✓
Yalgoo	2	91	95	93	✓	2	492	525	509	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Yerecoin	2	76	82	79	✓	2	391	414	403	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Yuna	2	250	250	250	(1)	2	824	839	832	(2)	2	<1	<1	<1	✓	2	0.5	0.9	0.7	✓

(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 Health related variables

Goldfields and Agricultural 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	Concentration (mg/L)			Samples Taken	Guideline Met	Samples Taken	Guideline Met	
								Min	Max	Mean					
Ardath	12	0	0	✓	12	0	✓	2	0.80	0.85	0.83	0	(1)	2	✓
Avon Hills	56	0	0	✓	56	0	✓	2	0.80	0.80	0.80	0	(1)	2	✓
Ballidu	12	0	0	✓	12	0	✓	2	0.90	0.90	0.90	0	(1)	2	✓
Beacon	12	0	0	✓	12	0	✓	2	0.80	0.85	0.83	0	(1)	2	✓
Bencubbin	12	0	0	✓	12	0	✓	2	0.85	0.85	0.85	0	(1)	2	✓
Beverley	52	0	0	✓	26	0	✓	1	0.85	0.85	0.85	0	(1)	2	✓
Bind Bindi	12	0	0	✓	12	0	✓	2	0.80	0.85	0.83	0	(1)	2	✓
Broad Arrow	12	0	0	✓	12	0	✓	2	0.80	0.90	0.85	0	(1)	2	✓
Bruce Rock	52	0	0	✓	12	0	✓	2	0.90	0.90	0.90	0	(1)	2	✓
Bullfinch	12	0	0	✓	12	0	✓	2	0.75	0.90	0.83	0	(1)	2	✓
Buntine	12	0	0	✓	12	0	✓	2	0.80	0.85	0.83	0	(1)	1	✓
Cadoux	12	0	0	✓	12	0	✓	2	0.90	0.95	0.93	0	(1)	1	✓
Coolgardie	52	0	0	✓	26	0	✓	2	0.75	0.85	0.80	0	(1)	2	✓
Corrigin	52	0	0	✓	26	0	✓	2	0.85	0.85	0.85	0	(1)	2	✓
Cunderdin	52	0	0	✓	12	0	✓	2	0.85	0.95	0.90	0	(1)	2	✓
Dalwallinu	52	0	0	✓	12	0	✓	2	0.85	0.90	0.88	0	(1)	2	✓
Dowerin	12	0	0	✓	12	0	✓	2	0.90	0.95	0.93	0	(1)	2	✓
Goomalling	52	0	0	✓	12	0	✓	2	0.90	0.95	0.93	0	(1)	2	✓
Greater Bodallin	12	0	0	✓	12	0	✓	2	0.80	0.85	0.83	0	(1)	2	✓
Greater Burracoppin	36	0	0	✓	36	0	✓	2	0.80	0.85	0.83	0	(1)	2	✓
Greater Doolakine	36	0	0	✓	36	0	✓	2	0.80	0.80	0.80	0	(1)	2	✓
Greater Meckering	38	0	0	✓	37	0	✓	2	0.85	0.90	0.88	0	(1)	2	✓
Greenhills	11	0	0	✓	11	0	✓	2	0.85	0.85	0.85	0	(1)	2	✓
Jennacubbine	12	0	0	✓	12	0	✓	2	0.75	0.80	0.78	0	(1)	2	✓
Kalannie	12	0	0	✓	12	0	✓	2	0.85	0.90	0.88	0	(1)	2	✓
Kalgoorlie	156	0	0	✓	130	0	✓	54	0.70	0.95	0.85	0	(1)	4	✓
Kambalda	50	0	0	✓	50	0	✓	2	0.75	0.90	0.83	2	✓	2	✓
Kellerberrin	52	0	0	✓	26	0	✓	2	0.80	0.80	0.80	0	(1)	2	✓
Koolyanobbing	12	0	0	✓	12	0	✓	2	0.90	0.90	0.90	0	(1)	2	✓
Koorda	12	0	0	✓	12	0	✓	2	0.90	0.90	0.90	0	(1)	2	✓
Kununoppin	12	0	0	✓	12	0	✓	2	0.90	0.95	0.93	0	(1)	2	✓
Laverton	11	0	0	✓	8	0	✓	2	1.20	1.20	1.20	0	(1)	8	✓
Leonora	52	0	0	✓	17	0	✓	2	0.50	0.55	0.53	0	(1)	2	✓
Marvel Loch	12	0	0	✓	12	0	✓	2	0.80	0.85	0.83	0	(1)	2	✓
Menzies	12	0	0	✓	8	0	✓	2	0.75	0.95	0.85	0	(1)	12	✓
Merredin	52	0	0	✓	52	0	✓	52	0.70	0.95	0.85	1	✓	2	✓
Miling	12	0	0	✓	12	0	✓	2	0.85	0.85	0.85	0	(1)	2	✓
Mukinbudin	12	0	0	✓	12	0	✓	2	0.85	0.85	0.85	0	(1)	2	✓
Muntadgin	12	0	0	✓	12	0	✓	2	0.75	0.85	0.80	0	(1)	2	✓
Narembeen	12	0	0	✓	12	0	✓	2	0.80	0.85	0.83	0	(1)	2	✓
Norseman	51	0	0	✓	26	0	✓	2	0.75	0.95	0.85	0	(1)	2	✓
Northam	77	0	0	✓	77	0	✓	52	0.65	1.00	0.84	0	(1)	2	✓
Nungarin	12	0	0	✓	12	0	✓	2	0.85	0.95	0.90	0	(1)	2	✓
Ora Banda	12	0	0	✓	12	0	✓	2	0.75	0.80	0.78	0	(1)	2	✓
Pithara	12	0	0	✓	12	0	✓	2	0.85	0.90	0.88	0	(1)	2	✓
Quairading	52	0	0	✓	26	0	✓	2	0.85	0.90	0.88	0	(1)	2	✓
Seabrook	12	0	0	✓	12	0	✓	2	0.80	0.85	0.83	0	(1)	2	✓
Shackleton	12	0	0	✓	12	0	✓	2	0.75	0.85	0.80	0	(1)	2	✓
Southern Cross	52	0	0	✓	39	0	✓	2	0.70	0.90	0.80	0	(1)	2	✓
Spencers Brook	12	0	0	✓	12	0	✓	2	0.80	0.85	0.83	0	(1)	2	✓
Tammin	24	0	0	✓	24	0	✓	2	0.80	0.95	0.88	0	(1)	2	✓
Toodyay	52	0	0	✓	26	0	✓	2	0.80	0.90	0.85	0	(1)	2	✓
Trayning	12	0	0	✓	12	0	✓	2	0.85	0.95	0.90	0	(1)	2	✓
Warralakin	12	0	0	✓	12	0	✓	2	0.80	0.85	0.83	0	(1)	2	✓
Westonia	12	0	0	✓	12	0	✓	2	0.85	0.90	0.88	0	(1)	2	✓
Wiluna	12	0	0	✓	12	0	✓	2	0.20	0.20	0.20	0	(1)	2	✓
Wongan Hills	52	0	0	✓	26	0	✓	2	0.90	0.90	0.90	0	(1)	2	✓
Wubin	12	0	0	✓	12	0	✓	2	0.80	0.85	0.83	0	(1)	2	✓
Wyalkatchem	12	0	0	✓	12	0	✓	2	0.90	0.90	0.90	0	(1)	2	✓
York	78	0	0	✓	76	0	✓	52	0.65	1.00	0.84	0	(1)	2	✓

(1) No samples required in this 12 month period

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Table 12 Health related variables

Goldfields and Agricultural Region	Health related variables															
	Samples Taken	Nitrate <sup>‡</sup>				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
Locality	Min	Max	Mean							Min	Max	Mean				
Ardath	2	0.44	3.98	2.21	✓	1	✓	0	(1)	2	0.007	0.009	0.008	✓	0	(1)
Avon Hills	2	0.44	0.44	0.44	✓	1	✓	0	(1)	2	0.008	0.015	0.012	✓	0	(1)
Ballidu	2	1.33	2.65	2.21	✓	1	✓	0	(1)	2	0.014	0.019	0.017	✓	0	(1)
Beacon	2	0.88	11.49	6.19	✓	1	✓	0	(1)	2	0.004	0.038	0.021	✓	0	(1)
Bencubbin	2	1.77	3.98	3.09	✓	1	✓	0	(1)	2	0.006	0.038	0.022	✓	0	(1)
Beverley	2	0.44	2.21	1.33	✓	1	✓	0	(1)	2	0.010	0.025	0.018	✓	0	(1)
Bind Bindi	2	1.33	5.30	3.09	✓	1	✓	0	(1)	2	0.010	0.015	0.013	✓	0	(1)
Broad Arrow	2	1.77	4.42	3.09	✓	1	✓	0	(1)	2	0.059	0.060	0.060	✓	0	(1)
Bruce Rock	2	1.33	7.51	4.42	✓	1	✓	0	(1)	2	0.030	0.042	0.036	✓	0	(1)
Bullfinch	2	5.30	6.19	5.75	✓	1	✓	0	(1)	2	0.035	0.052	0.043	✓	0	(1)
Buntine	2	3.09	6.63	4.86	✓	1	✓	0	(1)	2	0.007	0.039	0.023	✓	0	(1)
Cadoux	2	0.88	2.21	1.77	✓	1	✓	0	(1)	2	0.004	0.012	0.008	✓	0	(1)
Coolgardie	2	0.88	2.21	1.77	✓	1	✓	0	(1)	2	0.019	0.042	0.031	✓	0	(1)
Corrigin	2	0.88	4.86	2.65	✓	1	✓	0	(1)	2	0.002	0.014	0.008	✓	0	(1)
Cunderdin	2	0.44	0.88	0.44	✓	1	✓	0	(1)	2	<0.001	0.015	0.008	✓	0	(1)
Dalwallinu	2	0.88	1.33	1.33	✓	1	✓	0	(1)	2	0.011	0.016	0.014	✓	0	(1)
Dowerin	2	1.33	3.98	2.65	✓	1	✓	0	(1)	2	0.004	0.010	0.007	✓	0	(1)
Goomalling	2	0.44	2.21	1.33	✓	1	✓	0	(1)	2	0.004	0.013	0.009	✓	0	(1)
Greater Bodallin	2	0.44	2.21	1.33	✓	1	✓	0	(1)	2	<0.001	0.007	0.004	✓	0	(1)
Greater Burracoppin	2	0.44	3.09	1.77	✓	1	✓	0	(1)	2	0.001	0.007	0.004	✓	0	(1)
Greater Doolakine	2	0.44	0.88	0.44	✓	1	✓	0	(1)	2	0.011	0.020	0.016	✓	0	(1)
Greater Meckering	2	0.88	1.33	0.88	✓	1	✓	0	(1)	2	0.001	0.016	0.009	✓	0	(1)
Greenhills	2	1.77	3.98	3.09	✓	1	✓	0	(1)	2	0.016	0.021	0.019	✓	0	(1)
Jennacubbine	2	1.33	3.98	2.65	✓	1	✓	0	(1)	2	0.016	0.023	0.020	✓	0	(1)
Kalannie	2	0.88	3.98	2.21	✓	1	✓	0	(1)	2	0.024	0.034	0.029	✓	0	(1)
Kalgoorlie	4	1.33	2.65	1.77	✓	2	✓	0	(1)	4	0.023	0.081	0.050	✓	0	(1)
Kambalda	2	1.33	2.65	1.77	✓	1	✓	0	(1)	2	0.047	0.067	0.057	✓	0	(1)
Kellerberrin	2	0.44	0.44	0.44	✓	1	✓	0	(1)	2	0.007	0.014	0.011	✓	0	(1)
Koolyanobbing	2	1.33	5.75	3.54	✓	1	✓	0	(1)	2	0.002	0.017	0.010	✓	0	(1)
Koorda	2	2.21	3.09	2.65	✓	1	✓	0	(1)	2	0.003	0.010	0.007	✓	0	(1)
Kununoppin	2	1.33	3.54	2.65	✓	1	✓	0	(1)	2	0.008	0.009	0.009	✓	0	(1)
Laverton	10	31.38	37.13	34.03	(2)	1	✓	2	✓	2	0.049	0.056	0.053	✓	0	(1)
Leonora	10	18.56	32.71	26.52	(2)	1	✓	0	(1)	2	<0.001	<0.001	<0.001	✓	0	(1)
Marvel Loch	2	0.88	4.86	3.09	✓	1	✓	0	(1)	2	0.011	0.019	0.015	✓	0	(1)
Menzies	4	2.65	3.54	3.09	✓	1	✓	0	(1)	2	0.050	0.062	0.056	✓	0	(1)
Merredin	2	0.44	3.98	2.21	✓	1	✓	0	(1)	2	0.009	0.014	0.012	✓	0	(1)
Miling	2	0.88	4.42	2.65	✓	1	✓	0	(1)	2	0.003	0.011	0.007	✓	0	(1)
Mukinbudin	2	1.33	11.49	6.63	✓	1	✓	0	(1)	2	0.001	0.007	0.004	✓	0	(1)
Muntadgin	2	0.44	4.42	2.65	✓	1	✓	0	(1)	2	0.004	0.014	0.009	✓	0	(1)
Narembeen	2	0.88	2.21	1.33	✓	1	✓	0	(1)	2	0.010	0.013	0.012	✓	0	(1)
Norseman	2	1.33	3.98	2.65	✓	1	✓	0	(1)	2	0.050	0.079	0.065	✓	0	(1)
Northam	2	0.88	2.65	1.77	✓	1	✓	0	(1)	2	0.005	0.017	0.011	✓	0	(1)
Nungarin	2	0.88	1.33	0.88	✓	1	✓	0	(1)	2	0.005	0.007	0.006	✓	0	(1)
Ora Banda	2	1.33	2.65	2.21	✓	1	✓	0	(1)	2	0.028	0.033	0.031	✓	0	(1)
Pithara	2	0.88	2.21	1.77	✓	1	✓	0	(1)	2	0.011	0.014	0.013	✓	0	(1)
Quairading	2	1.77	2.65	2.21	✓	1	✓	0	(1)	2	0.008	0.029	0.019	✓	0	(1)
Seabrook	2	0.88	3.54	2.21	✓	1	✓	0	(1)	2	0.012	0.017	0.015	✓	0	(1)
Shackleton	2	0.44	0.88	0.88	✓	1	✓	0	(1)	2	0.007	0.024	0.016	✓	0	(1)
Southern Cross	2	0.88	3.98	2.65	✓	1	✓	0	(1)	2	0.005	0.009	0.007	✓	0	(1)
Spencers Brook	2	0.44	0.88	0.44	✓	1	✓	0	(1)	2	0.010	0.012	0.011	✓	0	(1)
Tammin	2	0.88	3.54	2.21	✓	1	✓	0	(1)	2	0.012	0.023	0.018	✓	0	(1)
Toodyay	2	1.33	3.54	2.21	✓	1	✓	0	(1)	2	0.004	0.011	0.008	✓	0	(1)
Trayning	2	0.88	3.98	2.21	✓	1	✓	0	(1)	2	0.020	0.024	0.022	✓	0	(1)
Warralakin	2	0.88	8.40	4.86	✓	1	✓	0	(1)	2	0.004	0.017	0.011	✓	0	(1)
Westonia	2	0.88	7.07	3.98	✓	1	✓	0	(1)	2	0.006	0.016	0.011	✓	0	(1)
Wiluna	2	29.61	36.69	33.15	(2)	1	✓	0	(1)	2	0.002	0.005	0.004	✓	0	(1)
Wongan Hills	2	0.44	0.88	0.88	✓	1	✓	0	(1)	2	0.004	0.061	0.033	✓	0	(1)
Wubin	2	1.77	6.19	3.98	✓	1	✓	0	(1)	2	0.008	0.023	0.016	✓	0	(1)
Wyalkatchem	2	0.88	0.88	0.88	✓	1	✓	0	(1)	2	0.004	0.010	0.007	✓	0	(1)
York	2	0.88	1.77	1.33	✓	1	✓	0	(1)	2	0.005	0.020	0.013	✓	0	(1)

(1) No samples required in this 12 month period. (2) Laverton, Leonora, Menzies and Wiluna have been granted an exemption from compliance with the infant nitrate guideline by the Department of Health. The water supplied is safe for adults and children over the age of 3 months. 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. The Water Corporation provides bottled water free of charge for this purpose.

‡ Nitrate data is converted from laboratory analysis reported as "Nitrate plus Nitrite as Nitrogen" based on the assumption that all nitrite is converted to nitrate under oxidative conditions during sampling.

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Table 13 Aesthetic (Non-health related) Variables

Goldfields and Agricultural Region	Alkalinity (as CaCO3)				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 Value	Max Value	Mean Value			Min	Max	Mean			Min Value	Max Value	Mean Value		Min	Max	Mean		
Ardath	2	65	66	66	(1)	2	0.030	0.040	0.035	✓	2	145	160	153	✓	2	81	98	90	✓
Avon Hills	2	63	72	68	(1)	2	0.060	0.065	0.063	✓	2	140	155	148	✓	2	82	86	84	✓
Ballidu	2	65	93	79	(1)	2	0.030	0.065	0.048	✓	2	155	160	158	✓	2	94	95	95	✓
Beacon	2	65	76	71	(1)	2	0.020	0.060	0.040	✓	2	130	175	153	✓	2	84	110	97	✓
Bencubbin	2	61	70	66	(1)	2	0.014	0.035	0.025	✓	2	155	160	158	✓	2	92	94	93	✓
Beverley	2	65	69	67	(1)	2	0.035	0.060	0.048	✓	2	135	155	145	✓	2	84	93	89	✓
Bind Bindi	2	61	70	66	(1)	2	0.025	0.075	0.050	✓	2	150	160	155	✓	2	98	100	99	✓
Broad Arrow	2	59	65	62	(1)	2	0.040	0.050	0.045	✓	2	155	165	160	✓	2	94	100	97	✓
Bruce Rock	2	56	64	60	(1)	2	0.040	0.040	0.040	✓	2	145	165	155	✓	2	87	95	91	✓
Bullfinch	2	56	62	59	(1)	2	0.016	0.040	0.028	✓	2	140	165	153	✓	2	81	91	86	✓
Buntine	2	67	69	68	(1)	2	0.025	0.050	0.038	✓	2	160	165	163	✓	2	100	100	100	✓
Cadoux	2	64	70	67	(1)	2	0.035	0.075	0.055	✓	2	145	155	150	✓	2	89	92	91	✓
Coolgardie	2	54	60	57	(1)	2	0.035	0.060	0.048	✓	2	145	170	158	✓	2	85	97	91	✓
Corrigin	2	62	68	65	(1)	2	0.018	0.055	0.037	✓	2	155	170	163	✓	2	88	95	92	✓
Cunderdin	2	64	67	66	(1)	2	0.065	0.100	0.083	✓	2	140	150	145	✓	2	88	89	89	✓
Dalwallinu	2	64	75	70	(1)	2	0.035	0.050	0.043	✓	2	135	165	150	✓	2	85	100	93	✓
Dowerin	2	72	93	83	(1)	2	0.035	0.045	0.040	✓	2	135	155	145	✓	2	89	93	91	✓
Goomalling	2	62	71	67	(1)	2	0.040	0.065	0.053	✓	2	140	155	148	✓	2	78	90	84	✓
Greater Bodallin	2	66	72	69	(1)	2	0.050	0.085	0.068	✓	2	140	165	153	✓	2	86	89	88	✓
Greater Burracoppin	2	65	66	66	(1)	2	0.045	0.070	0.058	✓	2	145	165	155	✓	2	85	92	89	✓
Greater Doolakine	2	64	69	67	(1)	2	0.060	0.090	0.075	✓	2	135	160	148	✓	2	82	92	87	✓
Greater Meckering	2	67	76	72	(1)	2	0.065	0.095	0.080	✓	2	140	150	145	✓	2	87	89	88	✓
Greenhills	2	62	64	63	(1)	2	0.040	0.065	0.053	✓	2	135	155	145	✓	2	78	94	86	✓
Jennacubbine	2	65	71	68	(1)	2	0.060	0.080	0.070	✓	2	140	170	155	✓	2	84	100	92	✓
Kalannie	2	61	73	67	(1)	2	0.045	0.055	0.050	✓	2	160	160	160	✓	2	89	91	90	✓
Kalgoorlie	4	63	69	67	(1)	4	0.030	0.045	0.036	✓	4	145	170	156	✓	4	90	98	94	✓
Kambalda	2	66	76	71	(1)	2	0.035	0.070	0.053	✓	2	145	170	158	✓	2	90	98	94	✓
Kellerberrin	2	63	76	70	(1)	2	0.055	0.090	0.073	✓	2	155	155	155	✓	2	87	87	87	✓
Koolyanobbing	2	72	82	77	(1)	2	0.030	0.040	0.035	✓	2	140	165	153	✓	2	89	99	94	✓
Koorda	2	63	64	64	(1)	2	0.030	0.070	0.050	✓	2	150	150	150	✓	2	88	94	91	✓
Kununoppin	2	71	73	72	(1)	2	0.035	0.050	0.043	✓	2	140	160	150	✓	2	87	93	90	✓
Laverton	6	110	110	110	(1)	2	<0.008	<0.008	<0.008	✓	6	140	150	144	✓	6	110	110	110	✓
Leonora	6	110	120	113	(1)	2	<0.008	<0.008	<0.008	✓	6	165	170	167	✓	6	150	160	152	✓
Marvel Loch	2	58	63	61	(1)	2	0.030	0.045	0.038	✓	2	150	165	158	✓	2	84	93	89	✓
Menzies	4	57	66	61	(1)	1	0.060	0.060	0.060	✓	4	155	180	164	✓	5	95	100	96	✓
Merredin	2	62	71	67	(1)	2	0.055	0.070	0.063	✓	2	145	155	150	✓	2	85	90	88	✓
Miling	2	61	74	68	(1)	2	0.035	0.045	0.040	✓	2	140	165	153	✓	2	87	100	94	✓
Mukinbudin	2	76	77	77	(1)	2	0.025	0.035	0.030	✓	2	155	170	163	✓	2	92	110	101	✓
Muntadgin	2	64	66	65	(1)	2	0.045	0.070	0.058	✓	2	140	170	155	✓	2	92	92	92	✓
Narembeen	2	63	64	64	(1)	2	0.050	0.055	0.053	✓	2	140	155	148	✓	2	85	89	87	✓
Norseman	2	61	67	64	(1)	2	0.030	0.050	0.040	✓	2	165	180	173	✓	2	100	110	105	✓
Northam	2	59	74	67	(1)	2	0.055	0.085	0.070	✓	2	145	150	148	✓	2	86	88	87	✓
Nungarin	2	66	67	67	(1)	2	0.040	0.060	0.050	✓	2	140	160	150	✓	2	90	93	92	✓
Ora Banda	2	74	88	81	(1)	2	0.025	0.030	0.028	✓	2	155	175	165	✓	2	110	120	115	✓
Pithara	2	61	68	65	(1)	2	0.030	0.050	0.040	✓	2	145	155	150	✓	2	93	99	96	✓
Quairading	2	63	68	66	(1)	2	0.035	0.065	0.050	✓	2	150	160	155	✓	2	90	94	92	✓
Seabrook	2	58	70	64	(1)	2	0.045	0.075	0.060	✓	2	140	155	148	✓	2	74	98	86	✓
Shackleton	2	58	60	59	(1)	2	0.025	0.045	0.035	✓	2	140	160	150	✓	2	81	93	87	✓
Southern Cross	2	62	71	67	(1)	2	0.040	0.050	0.045	✓	2	140	165	153	✓	2	84	93	89	✓
Spencers Brook	2	64	67	66	(1)	2	0.040	0.080	0.060	✓	2	135	160	148	✓	2	83	91	87	✓
Tammin	2	71	77	74	(1)	2	0.050	0.055	0.053	✓	2	140	150	145	✓	2	83	86	85	✓
Toodyay	2	62	67	65	(1)	2	0.045	0.070	0.058	✓	2	140	155	148	✓	2	81	91	86	✓
Trayning	2	71	72	72	(1)	2	0.030	0.040	0.035	✓	2	140	160	150	✓	2	88	95	92	✓
Warralakin	2	66	70	68	(1)	2	0.040	0.050	0.045	✓	2	145	165	155	✓	2	86	95	91	✓
Westonia	2	65	69	67	(1)	2	0.045	0.055	0.050	✓	2	145	165	155	✓	2	84	91	88	✓
Wiluna	2	79	87	83	(1)	2	<0.008	<0.008	<0.008	✓	2	70	70	70	✓	2	89	110	100	✓
Wongan Hills	2	69	70	70	(1)	2	0.040	0.050	0.045	✓	2	140	170	155	✓	2	89	100	95	✓
Wubin	2	70	70	70	(1)	2	0.025	0.065	0.045	✓	2	145	170	158	✓	2	94	99	97	✓
Wyalkatchem	2	66	69	68	(1)	2	0.030	0.070	0.050	✓	2	145	150	148	✓	2	86	89	88	✓
York	2	62	67	65	(1)	2	0.040	0.080	0.060	✓	2	140	155	148	✓	2	87	92	90	✓

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

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Table 14 Aesthetic (Non-health related) Variables

Goldfields and Agricultural Region	Iron				Manganese				pH				Silica							
	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 Value	Max Value	Mean Value	
Ardath	2	0.015	0.030	0.023	✓	2	<0.002	<0.002	<0.002	✓	2	8.33	8.76	8.55	(1)	2	4.2	4.8	4.5	✓
Avon Hills	2	<0.003	0.004	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	8.22	8.31	8.27	✓	2	6.0	6.1	6.1	✓
Ballidu	2	0.006	0.015	0.011	✓	2	<0.002	<0.002	<0.002	✓	2	7.20	8.52	7.86	✓	2	4.4	5.5	5.0	✓
Beacon	2	0.035	0.090	0.063	✓	2	<0.002	0.004	<0.002	✓	2	8.17	9.02	8.60	(1)	2	3.9	6.1	5.0	✓
Bencubbin	2	0.010	0.030	0.020	✓	2	<0.002	0.002	<0.002	✓	2	7.70	8.29	8.00	✓	2	5.3	5.7	5.5	✓
Beverley	2	0.006	0.010	0.008	✓	2	<0.002	<0.002	<0.002	✓	2	8.45	8.77	8.61	(1)	2	4.4	5.6	5.0	✓
Bind Bindi	2	0.004	0.020	0.012	✓	2	<0.002	<0.002	<0.002	✓	2	7.79	8.85	8.32	✓	2	4.4	5.5	5.0	✓
Broad Arrow	2	0.060	0.120	0.090	✓	2	<0.002	<0.002	<0.002	✓	2	7.82	8.03	7.93	✓	2	4.8	5.5	5.2	✓
Bruce Rock	2	0.010	0.025	0.018	✓	2	<0.002	<0.002	<0.002	✓	2	7.48	7.81	7.65	✓	2	5.8	6.6	6.2	✓
Bullfinch	2	<0.003	0.004	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	8.60	8.71	8.66	(1)	2	4.5	5.1	4.8	✓
Buntine	2	0.008	0.015	0.012	✓	2	<0.002	<0.002	<0.002	✓	2	8.21	8.35	8.28	✓	2	4.4	5.3	4.9	✓
Cadoux	2	0.010	0.015	0.013	✓	2	<0.002	<0.002	<0.002	✓	2	8.08	8.32	8.20	✓	2	4.3	5.6	5.0	✓
Coolgardie	2	0.010	0.015	0.013	✓	2	<0.002	<0.002	<0.002	✓	2	7.43	7.48	7.46	✓	2	4.8	5.5	5.2	✓
Corrigin	2	0.008	0.010	0.009	✓	2	<0.002	<0.002	<0.002	✓	2	8.12	8.53	8.33	✓	2	4.1	5.4	4.8	✓
Cunderdin	2	<0.003	0.006	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.90	8.03	7.97	✓	2	4.8	5.4	5.1	✓
Dalwallinu	2	0.015	0.030	0.023	✓	2	<0.002	<0.002	<0.002	✓	2	8.71	8.72	8.72	(1)	2	4.8	5.6	5.2	✓
Dowerin	2	0.006	0.015	0.011	✓	2	<0.002	<0.002	<0.002	✓	2	8.18	8.53	8.36	(1)	2	5.7	6.0	5.9	✓
Goomalling	2	0.008	0.010	0.009	✓	2	<0.002	<0.002	<0.002	✓	2	8.10	8.39	8.25	✓	2	4.8	6.3	5.6	✓
Greater Bodallin	2	0.006	0.006	0.006	✓	2	<0.002	<0.002	<0.002	✓	2	8.08	8.17	8.13	✓	2	4.6	5.7	5.2	✓
Greater Burracoppin	2	<0.003	0.006	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	8.17	8.47	8.32	✓	2	4.6	5.5	5.1	✓
Greater Doolakine	2	0.004	0.004	0.004	✓	2	<0.002	<0.002	<0.002	✓	2	8.34	8.58	8.46	✓	2	4.8	6.1	5.5	✓
Greater Meckering	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.99	8.24	8.12	✓	2	4.5	5.4	5.0	✓
Greenhills	2	0.010	0.020	0.015	✓	2	<0.002	<0.002	<0.002	✓	2	7.82	8.18	8.00	✓	2	5.1	5.6	5.4	✓
Jennacubbine	2	0.010	0.020	0.015	✓	2	<0.002	<0.002	<0.002	✓	2	8.46	8.68	8.57	(1)	2	4.6	5.8	5.2	✓
Kalannie	2	0.015	0.030	0.023	✓	2	<0.002	<0.002	<0.002	✓	2	7.99	8.33	8.16	✓	2	5.2	5.4	5.3	✓
Kalgoorlie	4	0.006	0.015	0.009	✓	4	<0.002	<0.002	<0.002	✓	4	7.55	7.77	7.65	✓	4	4.8	5.5	5.2	✓
Kambalda	2	0.015	0.260	0.138	✓	2	<0.002	0.025	0.013	✓	2	8.10	8.18	8.14	✓	2	4.4	5.6	5.0	✓
Kellerberrin	2	0.004	0.004	0.004	✓	2	<0.002	<0.002	<0.002	✓	2	7.96	8.43	8.20	✓	2	5.4	5.8	5.6	✓
Koolyanobbing	2	0.008	0.010	0.009	✓	2	<0.002	<0.002	<0.002	✓	2	8.26	8.50	8.38	✓	2	5.8	6.8	6.3	✓
Koorda	2	0.006	0.010	0.008	✓	2	<0.002	<0.002	<0.002	✓	2	7.45	8.04	7.75	✓	2	4.4	5.4	4.9	✓
Kununoppin	2	0.006	0.010	0.008	✓	2	<0.002	<0.002	<0.002	✓	2	8.68	8.72	8.70	(1)	2	6.0	7.2	6.6	✓
Laverton	6	0.010	0.035	0.022	✓	6	<0.002	<0.002	<0.002	✓	6	7.81	7.97	7.91	✓	6	35.0	44.0	40.3	✓
Leonora	6	<0.003	<0.003	<0.003	✓	6	<0.002	<0.002	<0.002	✓	6	7.51	7.79	7.61	✓	6	14.0	25.0	20.3	✓
Marvel Loch	2	0.006	0.010	0.008	✓	2	<0.002	<0.002	<0.002	✓	2	7.50	8.02	7.76	✓	2	4.4	5.6	5.0	✓
Menzies	4	0.015	0.025	0.018	✓	4	<0.002	<0.002	<0.002	✓	4	7.95	8.16	8.04	✓	4	5.9	6.2	6.1	✓
Merredin	2	0.006	0.015	0.011	✓	2	<0.002	<0.002	<0.002	✓	2	7.94	8.37	8.16	✓	2	4.5	5.3	4.9	✓
Miling	2	0.010	0.035	0.023	✓	2	<0.002	<0.002	<0.002	✓	2	8.38	8.74	8.56	(1)	2	5.3	5.6	5.5	✓
Mukinbudin	2	0.010	0.280	0.145	✓	2	<0.002	0.010	0.005	✓	2	7.90	8.27	8.09	✓	2	3.5	6.0	4.8	✓
Muntadgin	2	0.015	0.020	0.018	✓	2	<0.002	<0.002	<0.002	✓	2	7.69	8.42	8.06	✓	2	4.8	5.5	5.2	✓
Narembeen	2	0.010	0.090	0.050	✓	2	<0.002	<0.002	<0.002	✓	2	8.08	8.27	8.18	✓	2	4.1	5.2	4.7	✓
Norseman	2	0.008	0.035	0.022	✓	2	<0.002	0.003	<0.002	✓	2	7.76	7.77	7.77	✓	2	4.5	5.5	5.0	✓
Northam	2	0.004	0.006	0.005	✓	2	<0.002	<0.002	<0.002	✓	2	7.79	8.39	8.09	✓	2	5.0	5.8	5.4	✓
Nungarin	2	<0.003	0.004	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	8.43	8.85	8.64	(1)	2	4.8	6.1	5.5	✓
Ora Banda	2	0.004	0.008	0.006	✓	2	<0.002	<0.002	<0.002	✓	2	8.38	8.42	8.40	✓	2	5.1	5.4	5.3	✓
Pithara	2	0.010	0.025	0.018	✓	2	<0.002	<0.002	<0.002	✓	2	7.78	8.18	7.98	✓	2	4.5	5.4	5.0	✓
Quairading	2	0.008	0.010	0.009	✓	2	<0.002	<0.002	<0.002	✓	2	7.89	8.37	8.13	✓	2	4.8	5.4	5.1	✓
Seabrook	2	<0.003	0.006	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	8.39	8.75	8.57	(1)	2	4.6	6.0	5.3	✓
Shackleton	2	0.004	0.008	0.006	✓	2	<0.002	<0.002	<0.002	✓	2	8.46	8.64	8.55	(1)	2	4.2	4.7	4.5	✓
Southern Cross	2	0.004	0.008	0.006	✓	2	<0.002	<0.002	<0.002	✓	2	7.89	8.30	8.10	✓	2	5.2	5.8	5.5	✓
Spencers Brook	2	<0.003	0.008	0.004	✓	2	<0.002	<0.002	<0.002	✓	2	8.29	8.31	8.30	✓	2	5.1	5.8	5.5	✓
Tammin	2	0.008	0.015	0.012	✓	2	<0.002	<0.002	<0.002	✓	2	7.98	8.00	7.99	✓	2	5.9	6.0	6.0	✓
Toodyay	2	<0.003	0.004	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	8.06	8.07	8.07	✓	2	5.0	5.3	5.2	✓
Trayning	2	0.008	0.010	0.009	✓	2	<0.002	<0.002	<0.002	✓	2	8.51	8.78	8.65	(1)	2	5.7	6.7	6.2	✓
Warralakin	2	<0.003	0.004	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.96	8.56	8.26	✓	2	6.1	6.3	6.2	✓
Westonia	2	<0.003	0.006	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.89	8.33	8.11	✓	2	6.0	6.3	6.2	✓
Wiluna	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.96	7.99	7.98	✓	2	80.0	85.0	82.5	(2)
Wongan Hills	2	0.006	0.020	0.013	✓	2	<0.002	<0.002	<0.002	✓	2	8.30	8.72	8.51	(1)	2	4.5	5.4	5.0	✓
Wubin	2	0.020	0.025	0.023	✓	2	<0.002	<0.002	<0.002	✓	2	8.22	8.68	8.45	✓	2	4.1	5.6	4.9	✓
Wyalkatchem	2	<0.003	0.006	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	8.32	8.43	8.38	✓	2	4.1	5.6	4.9	✓
York	2	0.008	0.008	0.008	✓	2	<0.002	<0.002	<0.002	✓	2	8.26	8.37	8.32	✓	2	4.6	5.9	5.3	✓

1) Elevated pH is a result of the pH adjustment as part of Chloramination (disinfection) 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 Aesthetic (Non-health related) Variables

Goldfields and Agricultural Region	Aesthetic (Non-health related) Variables																			
	Sodium					TDS					True Colour					Turbidity				
	Locality	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 Value			Max Value	Mean Value	Min			Max	Mean	Min			Max	Mean	Min			Max	Mean	
Ardath	2	92	97	95	✓	2	377	418	398	✓	2	<1	<1	<1	✓	2	0.1	0.2	0.2	✓
Avon Hills	2	85	93	89	✓	2	368	404	386	✓	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Ballidu	2	95	99	97	✓	2	405	443	424	✓	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Beacon	2	77	110	94	✓	2	353	471	412	✓	2	<1	2	<1	✓	2	0.3	1.7	1.0	✓
Bencubbin	2	98	105	102	✓	2	412	417	415	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Beverley	2	82	97	90	✓	2	359	413	386	✓	2	<1	<1	<1	✓	2	0.1	0.7	0.4	✓
Bind Bindi	2	94	98	96	✓	2	402	419	411	✓	2	<1	<1	<1	✓	2	0.1	0.2	0.2	✓
Broad Arrow	2	91	100	96	✓	2	394	427	411	✓	2	<1	<1	<1	✓	2	0.4	1.0	0.7	✓
Bruce Rock	2	86	99	93	✓	2	373	425	399	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Bullfinch	2	87	100	94	✓	2	372	421	397	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Buntine	2	95	98	97	✓	2	418	424	421	✓	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Cadoux	2	86	94	90	✓	2	382	399	391	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Coolgardie	2	85	120	103	✓	2	364	444	404	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Corrigin	2	100	105	103	✓	2	413	423	418	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Cunderdin	2	89	93	91	✓	2	379	393	386	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Dalwallinu	2	82	100	91	✓	2	363	435	399	✓	2	<1	1	<1	✓	2	0.1	0.2	0.2	✓
Dowerin	2	92	95	94	✓	2	410	415	413	✓	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Goomalling	2	82	95	89	✓	2	361	412	387	✓	2	<1	1	<1	✓	2	<0.1	<0.1	<0.1	✓
Greater Bodallin	2	88	105	97	✓	2	383	418	401	✓	2	<1	<1	<1	✓	2	0.1	0.1	0.1	✓
Greater Burracoppin	2	85	100	93	✓	2	375	423	399	✓	2	<1	<1	<1	✓	2	0.1	0.1	0.1	✓
Greater Doolakine	2	83	97	90	✓	2	388	415	402	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Greater Meckering	2	87	93	90	✓	2	374	404	389	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Greenhills	2	79	97	88	✓	2	353	407	380	✓	2	<1	<1	<1	✓	2	0.1	0.3	0.2	✓
Jennacubbine	2	83	92	88	✓	2	395	427	411	✓	2	<1	<1	<1	✓	2	0.3	0.4	0.4	✓
Kalannie	2	93	97	95	✓	2	401	415	408	✓	2	<1	<1	<1	✓	2	0.1	0.2	0.2	✓
Kalgoorlie	4	92	100	97	✓	4	393	429	410	✓	4	<1	<1	<1	✓	4	<0.1	<0.1	<0.1	✓
Kambalda	2	86	99	93	✓	2	394	429	412	✓	2	<1	<1	<1	✓	2	0.1	2.4	1.3	✓
Kellerberrin	2	90	93	92	✓	2	391	406	399	✓	2	<1	<1	<1	✓	2	0.1	0.2	0.2	✓
Koolyanobbing	2	92	105	99	✓	2	405	439	422	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Koorda	2	85	94	90	✓	2	380	399	390	✓	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Kununoppin	2	88	100	94	✓	2	386	424	405	✓	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Laverton	6	120	125	123	✓	6	575	591	584	✓	6	<1	<1	<1	✓	6	<0.1	0.2	<0.1	✓
Leonora	6	115	125	122	✓	6	597	605	601	(1)	6	<1	<1	<1	✓	6	<0.1	<0.1	<0.1	✓
Marvel Loch	2	94	98	96	✓	2	385	415	400	✓	2	<1	<1	<1	✓	2	0.1	0.8	0.5	✓
Menzies	4	89	105	94	✓	4	397	446	410	✓	4	<1	<1	<1	✓	4	0.1	0.2	0.2	✓
Merredin	2	88	93	91	✓	2	382	399	391	✓	2	<1	<1	<1	✓	2	0.1	0.2	0.2	✓
Miling	2	83	100	92	✓	2	368	439	404	✓	2	<1	1	<1	✓	2	0.2	0.2	0.2	✓
Mukinbudin	2	91	105	98	✓	2	416	453	435	✓	2	<1	<1	<1	✓	2	<0.1	1.2	0.6	✓
Muntadgin	2	97	100	99	✓	2	392	421	407	✓	2	<1	<1	<1	✓	2	0.1	0.2	0.2	✓
Narembeen	2	83	93	88	✓	2	363	401	382	✓	2	<1	<1	<1	✓	2	0.2	3.0	1.6	✓
Norseman	2	93	100	97	✓	2	413	447	430	✓	2	<1	<1	<1	✓	2	0.3	0.3	0.3	✓
Northam	2	91	95	93	✓	2	380	406	393	✓	2	<1	<1	<1	✓	2	0.1	0.2	0.2	✓
Nungarin	2	81	97	89	✓	2	367	413	390	✓	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Ora Banda	2	88	100	94	✓	2	431	451	441	✓	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Pithara	2	88	93	91	✓	2	385	398	392	✓	2	<1	<1	<1	✓	2	0.2	0.2	0.2	✓
Quairading	2	93	95	94	✓	2	394	413	404	✓	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Seabrook	2	82	96	89	✓	2	353	413	383	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Shackleton	2	97	100	99	✓	2	378	406	392	✓	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Southern Cross	2	85	97	91	✓	2	369	427	398	✓	2	<1	1	<1	✓	2	<0.1	<0.1	<0.1	✓
Spencers Brook	2	77	100	89	✓	2	355	414	385	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Tammin	2	88	95	92	✓	2	393	404	399	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Toodyay	2	84	93	89	✓	2	363	406	385	✓	2	<1	<1	<1	✓	2	0.2	0.5	0.4	✓
Trayning	2	88	100	94	✓	2	383	430	407	✓	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Warralakin	2	86	100	93	✓	2	382	434	408	✓	2	<1	1	<1	✓	2	<0.1	0.1	<0.1	✓
Westonia	2	87	105	96	✓	2	381	430	406	✓	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Wiluna	2	58	59	59	✓	2	407	412	410	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Wongan Hills	2	88	96	92	✓	2	378	426	402	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Wubin	2	91	98	95	✓	2	399	428	414	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Wyalkatchem	2	85	96	91	✓	2	377	399	388	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
York	2	79	99	89	✓	2	363	411	387	✓	2	<1	<1	<1	✓	2	0.1	0.2	0.2	✓

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



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Table 16 Health related variables

South 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	Concentration (mg/L)			Samples Taken	Guideline Met	Samples Taken	Guideline Met	
								Min	Max	Mean					
Allanson	13	0	0	✓	7	0	✓	4	0.75	0.90	0.83	1	✓	2	✓
Augusta	65	0	0	✓	31	0	✓	2	0.15	0.25	0.20	0	(1)	2	✓
Australind	117	0	0	✓	117	0	✓	4	0.20	0.25	0.23	1	✓	4	✓
Balingup	12	0	0	✓	6	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Binningup	52	0	0	✓	26	0	✓	4	0.80	0.85	0.84	0	(1)	2	✓
Boyanup	52	0	0	✓	13	0	✓	2	0.15	0.15	0.15	0	(1)	2	✓
Boyup Brook	52	0	0	✓	13	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Bridgetown	65	0	0	✓	33	0	✓	2	0.10	0.10	0.10	0	(1)	2	✓
Brunswick Junction	52	0	0	✓	13	0	✓	2	0.20	0.20	0.20	0	(1)	2	✓
Capel	52	0	0	✓	12	0	✓	2	0.15	0.20	0.18	0	(1)	2	✓
Collie	78	0	0	✓	32	0	✓	52	0.25	0.95	0.82	2	✓	4	✓
Cowaramup	52	0	0	✓	6	0	✓	2	0.20	0.25	0.23	0	(1)	2	✓
Dalyellup	65	0	0	✓	39	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Dardanup	13	0	0	✓	7	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Darkan	13	0	0	✓	7	0	✓	4	0.75	0.85	0.81	0	(1)	2	✓
Donnybrook	52	0	0	✓	26	0	✓	2	<0.1	<0.1	<0.1	0	(1)	5	✓
Dunsborough	91	0	0	✓	91	0	✓	56	0.70	1.00	0.82	0	(1)	2	✓
Eaton	78	0	0	✓	78	0	✓	2	0.15	0.15	0.15	1	✓	2	✓
Greenbushes	26	0	0	✓	13	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Harvey	52	0	0	✓	52	0	✓	52	0.75	0.90	0.85	0	(1)	2	✓
Hester	13	0	0	✓	6	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Kirup	13	0	0	✓	7	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Logue Brook	13	0	0	✓	7	0	✓	2	0.55	0.80	0.68	1	✓	2	✓
Manjimup	65	0	0	✓	32	0	✓	52	0.65	0.95	0.83	0	(1)	2	✓
Margaret River	93	0	0	✓	44	0	✓	2	0.20	0.25	0.23	0	(1)	2	✓
Mullalyup	13	0	0	✓	7	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Myalup	13	0	0	✓	13	0	✓	2	0.85	0.85	0.85	0	(1)	2	✓
Nannup	26	0	0	✓	13	0	✓	4	<0.1	<0.1	<0.1	0	(1)	4	✓
Northcliffe	13	0	0	✓	7	0	✓	2	0.45	0.60	0.53	0	(1)	2	✓
Pemberton	52	0	0	✓	12	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Peppermint Grove	52	0	0	✓	7	0	✓	2	0.25	0.25	0.25	0	(1)	2	✓
Preston Beach	52	0	0	✓	12	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Quinninup	12	0	0	✓	6	0	✓	2	0.30	0.50	0.40	0	(1)	2	✓
Waroona	52	0	0	✓	52	0	✓	54	0.75	0.95	0.84	1	✓	2	✓
Yarloop	13	0	0	✓	7	0	✓	2	0.80	0.85	0.83	1	✓	2	✓

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

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Table 17 Health related variables

South West Region	Nitrate <sup>‡</sup>			Pesticides		Radiological		Trihalomethanes				Other Health Related				
Locality	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Guideline Met	Samples Taken	Guideline Met	Concentration (mg/L)			Guideline Met	Samples Taken	Requirement Met	
		Min	Max	Mean						Min	Max	Mean				
Allanson	2	<0.22	0.44	<0.22	✓	1	✓	0	(1)	2	0.110	0.140	0.125	✓	1	✓
Augusta	4	<0.22	<0.22	<0.22	✓	1	✓	2	✓	2	0.017	0.018	0.018	✓	0	(1)
Australind	8	<0.22	<0.22	<0.22	✓	2	✓	4	✓	4	0.004	0.064	0.033	✓	0	(1)
Balingup	2	<0.22	0.44	<0.22	✓	1	✓	0	(1)	2	0.093	0.190	0.142	✓	0	(1)
Binningup	2	<0.22	<0.22	<0.22	✓	1	✓	2	✓	2	<0.001	<0.001	<0.001	✓	0	(1)
Boyanup	2	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	2	<0.001	0.002	<0.001	✓	0	(1)
Boyup Brook	4	<0.22	0.44	0.44	✓	1	✓	2	✓	4	0.081	0.160	0.119	✓	0	(1)
Bridgetown	2	0.44	0.44	0.44	✓	1	✓	0	(1)	2	0.023	0.064	0.044	✓	0	(1)
Brunswick Junction	3	<0.22	<0.22	<0.22	✓	1	✓	2	✓	2	0.009	0.014	0.012	✓	0	(1)
Capel	4	<0.22	<0.22	<0.22	✓	1	✓	2	✓	2	<0.001	<0.001	<0.001	✓	0	(1)
Collie	4	<0.22	0.44	<0.22	✓	2	✓	0	(1)	4	0.100	0.130	0.113	✓	2	✓
Cowaramup	4	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	4	0.100	0.180	0.128	✓	0	(1)
Dalyellup	3	<0.22	<0.22	<0.22	✓	1	✓	2	✓	2	0.023	0.057	0.040	✓	0	(1)
Dardanup	2	<0.22	0.44	<0.22	✓	1	✓	0	(1)	2	<0.001	0.002	<0.001	✓	0	(1)
Darkan	2	0.44	0.44	0.44	✓	1	✓	2	✓	4	0.140	0.190	0.173	✓	1	✓
Donnybrook	4	15.03	18.12	16.8	✓	1	✓	1	✓	2	0.003	0.004	0.004	✓	0	(1)
Dunsborough	4	<0.22	0.44	<0.22	✓	1	✓	1	✓	2	0.024	0.034	0.029	✓	0	(1)
Eaton	2	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	2	<0.001	<0.001	<0.001	✓	1	✓
Greenbushes	4	<0.22	0.44	<0.22	✓	1	✓	2	✓	2	0.075	0.130	0.103	✓	0	(1)
Harvey	2	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	2	<0.001	<0.001	<0.001	✓	0	(1)
Hester	2	<0.22	0.44	<0.22	✓	1	✓	2	✓	2	0.062	0.071	0.067	✓	0	(1)
Kirup	4	<0.22	20.77	5.30	✓	1	✓	0	(1)	2	0.051	0.110	0.081	✓	0	(1)
Logue Brook	2	<0.22	4.42	2.21	✓	1	✓	2	✓	2	<0.001	0.005	0.003	✓	0	(1)
Manjimup	3	<0.22	<0.22	<0.22	✓	4	✓	0	(1)	2	0.046	0.120	0.083	✓	0	(1)
Margaret River	4	<0.22	<0.22	<0.22	✓	1	✓	1	✓	2	0.120	0.130	0.125	✓	0	(1)
Mullalyup	2	<0.22	0.44	<0.22	✓	1	✓	2	✓	2	0.047	0.089	0.068	✓	0	(1)
Myalup	2	<0.22	<0.22	<0.22	✓	1	✓	1	✓	2	0.004	0.006	0.005	✓	0	(1)
Nannup	8	<0.22	0.44	<0.22	✓	2	✓	0	(1)	4	0.043	0.074	0.059	✓	0	(1)
Northcliffe	4	0.44	1.77	0.88	✓	1	✓	0	(1)	2	0.048	0.072	0.060	✓	0	(1)
Pemberton	2	1.33	1.77	1.77	✓	4	✓	2	✓	2	0.066	0.120	0.093	✓	0	(1)
Peppermint Grove	4	<0.22	<0.22	<0.22	✓	1	✓	2	✓	2	<0.001	<0.001	<0.001	✓	0	(1)
Preston Beach	4	3.98	5.30	4.86	✓	1	✓	2	✓	4	0.100	0.130	0.113	✓	0	(1)
Quinninup	4	0.44	1.33	0.88	✓	1	✓	2	✓	4	0.067	0.120	0.098	✓	0	(1)
Waroona	2	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	4	<0.001	0.055	0.021	✓	0	(1)
Yarloop	2	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	2	<0.001	0.008	0.004	✓	1	✓

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

‡ Nitrate data is converted from laboratory analysis reported as "Nitrate plus Nitrite as Nitrogen" based on the assumption that all nitrite is converted to nitrate under oxidative conditions during sampling.

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Table 18 Aesthetic (Non-health related) Variables

South West Region	Alkalinity (as CaCO <sub>3</sub> )				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 Value	Max Value	Mean Value			Min	Max	Mean			Min Value	Max Value	Mean Value			Min	Max	Mean	
Allanson	2	19	27	23	(1)	2	0.018	0.018	0.018	✓	2	90	100	95	✓	2	45	56	51	✓
Augusta	4	62	67	65	(1)	4	<0.008	<0.008	<0.008	✓	4	130	150	139	✓	4	86	110	97	✓
Australind	8	110	140	126	(1)	8	<0.008	0.008	<0.008	✓	8	145	170	159	✓	8	78	110	93	✓
Balingup	2	33	92	63	(1)	2	0.030	0.035	0.033	✓	2	90	90	90	✓	2	50	110	80	✓
Binningup	2	49	68	59	(1)	2	0.055	0.070	0.063	✓	2	33	34	34	✓	2	52	56	54	✓
Boyanup	2	110	110	110	(1)	2	<0.008	<0.008	<0.008	✓	2	100	100	100	✓	2	96	110	103	✓
Boyup Brook	4	68	100	82	(1)	4	0.018	0.040	0.028	✓	4	85	100	93	✓	4	84	130	106	✓
Bridgetown	2	72	100	86	(1)	2	0.020	0.060	0.040	✓	2	85	100	93	✓	2	100	120	110	✓
Brunswick Junction	3	110	130	120	(1)	3	<0.008	<0.008	<0.008	✓	3	160	170	165	✓	3	80	82	81	✓
Capel	4	72	77	75	(1)	4	<0.008	<0.008	<0.008	✓	4	55	60	59	✓	4	48	51	50	✓
Collie	4	16	22	19	(1)	4	0.016	0.020	0.018	✓	4	90	100	95	✓	4	43	51	47	✓
Cowaramup	4	26	41	33	(1)	4	0.012	0.035	0.025	✓	4	80	90	85	✓	4	35	41	39	✓
Dalyellup	3	130	140	137	(1)	3	<0.008	<0.008	<0.008	✓	3	85	185	122	✓	3	69	93	78	✓
Dardanup	2	66	68	67	(1)	2	<0.008	<0.008	<0.008	✓	2	85	90	88	✓	2	27	28	28	✓
Darkan	2	22	27	25	(1)	2	0.020	0.020	0.020	✓	2	95	100	98	✓	2	54	56	55	✓
Donnybrook	4	51	63	58	(1)	4	0.110	0.250	0.213	(2)	4	175	205	191	✓	4	60	79	73	✓
Dunsborough	4	130	170	150	(1)	4	<0.008	0.016	0.012	✓	4	95	170	138	✓	4	64	70	67	✓
Eaton	2	110	120	115	(1)	2	<0.008	<0.008	<0.008	✓	2	125	160	143	✓	2	93	120	107	✓
Greenbushes	4	58	92	74	(1)	4	0.020	0.035	0.029	✓	4	80	110	93	✓	4	76	120	98	✓
Harvey	2	53	55	54	(1)	2	0.050	0.060	0.055	✓	2	30	35	33	✓	2	51	57	54	✓
Hester	2	66	92	79	(1)	2	0.025	0.025	0.025	✓	2	85	90	88	✓	2	81	110	96	✓
Kirup	4	6	54	20	(1)	3	0.020	0.095	0.047	✓	4	37	155	77	✓	4	15	56	29	✓
Logue Brook	2	54	63	59	(1)	2	0.030	0.045	0.038	✓	2	33	75	54	✓	2	50	58	54	✓
Manjimup	2	10	58	34	(1)	2	0.020	0.035	0.028	✓	2	75	75	75	✓	2	41	80	61	✓
Margaret River	4	29	42	36	(1)	4	0.010	0.045	0.027	✓	4	80	90	85	✓	4	36	41	39	✓
Mullalyup	2	5	11	8	(1)	2	0.020	0.030	0.025	✓	2	39	85	62	✓	2	16	23	20	✓
Myalup	2	53	57	55	(1)	2	0.050	0.055	0.053	✓	2	30	33	32	✓	2	54	57	56	✓
Nannup	8	4	8	6	(1)	8	0.025	0.060	0.038	✓	8	39	55	48	✓	8	32	44	39	✓
Northcliffe	4	13	29	21	(1)	4	0.020	0.055	0.034	✓	4	70	80	76	✓	4	45	67	51	✓
Pemberton	2	21	24	23	(1)	2	0.016	0.060	0.038	✓	2	75	85	80	✓	2	46	55	51	✓
Peppermint Grove	4	84	87	85	(1)	4	<0.008	0.008	<0.008	✓	4	60	60	60	✓	4	54	57	56	✓
Preston Beach	4	260	290	268	(1)	4	<0.008	0.010	<0.008	✓	4	170	210	191	✓	4	310	340	325	(3)
Quinninup	4	16	26	21	(1)	4	0.030	0.055	0.043	✓	4	75	80	78	✓	4	47	62	55	✓
Waroona	2	41	48	45	(1)	2	0.070	0.090	0.080	✓	2	33	35	34	✓	2	41	51	46	✓
Yarloop	2	52	53	53	(1)	2	0.025	0.050	0.038	✓	2	31	32	32	✓	2	53	57	55	✓

(1) No guideline value available as per ADWG 2011. (2) Elevated aluminium is characteristic of the source supplying this locality. (3) 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 Value	Max Value	Mean Value	
Allanson	2	0.060	0.090	0.075	✓	2	0.006	0.020	0.013	✓	2	7.12	7.49	7.31	✓	2	1.4	1.8	1.6	✓
Augusta	4	0.060	0.120	0.088	✓	4	<0.002	<0.002	<0.002	✓	4	7.29	7.65	7.48	✓	4	10.0	16.0	13.8	✓
Australind	8	0.040	0.120	0.069	✓	8	<0.002	0.004	<0.002	✓	8	7.13	8.28	7.85	✓	8	22.0	50.0	38.4	✓
Balingup	2	0.010	0.030	0.020	✓	2	<0.002	0.025	0.013	✓	2	8.07	8.22	8.15	✓	2	3.8	5.5	4.7	✓
Binningup	2	0.006	0.025	0.016	✓	2	<0.002	<0.002	<0.002	✓	2	8.52	8.57	8.55	(2)	2	1.1	1.1	1.1	✓
Boyanup	2	0.025	0.035	0.030	✓	2	<0.002	<0.002	<0.002	✓	2	7.87	8.18	8.03	✓	2	19.0	20.0	19.5	✓
Boyup Brook	4	0.010	0.035	0.020	✓	4	<0.002	0.003	<0.002	✓	4	7.88	8.54	8.14	✓	4	2.6	5.5	4.2	✓
Bridgetown	2	0.025	0.070	0.048	✓	2	<0.002	<0.002	<0.002	✓	2	7.75	7.75	7.75	✓	2	3.0	5.1	4.1	✓
Brunswick Junction	3	0.070	0.070	0.070	✓	3	0.003	0.004	0.003	✓	3	7.91	7.94	7.93	✓	3	50.0	55.0	53.3	✓
Capel	4	0.050	0.060	0.055	✓	4	<0.002	<0.002	<0.002	✓	4	6.61	6.98	6.77	✓	4	14.0	15.0	14.8	✓
Collie	4	0.060	0.070	0.065	✓	4	0.006	0.050	0.026	✓	4	7.03	7.21	7.12	✓	4	0.9	1.7	1.3	✓
Cowaramup	4	0.070	0.100	0.085	✓	4	0.004	0.006	0.005	✓	4	7.49	7.63	7.56	✓	4	6.8	9.4	8.0	✓
Dalyellup	3	0.040	0.100	0.062	✓	3	0.004	0.009	0.007	✓	3	7.77	8.05	7.88	✓	3	15.0	18.0	16.7	✓
Dardanup	2	0.010	0.015	0.013	✓	2	<0.002	<0.002	<0.002	✓	2	7.31	7.41	7.36	✓	2	18.0	21.0	19.5	✓
Darkan	2	0.050	0.070	0.060	✓	2	0.006	0.020	0.013	✓	2	7.47	8.32	7.90	✓	2	1.9	2.8	2.4	✓
Donnybrook	4	0.015	0.090	0.034	✓	4	<0.002	0.002	<0.002	✓	4	6.86	7.26	7.01	✓	4	9.7	10.0	9.9	✓
Dunsborough	4	0.004	0.010	0.008	✓	4	<0.002	<0.002	<0.002	✓	4	7.98	8.46	8.19	✓	4	17.0	18.0	17.8	✓
Eaton	2	0.070	0.100	0.085	✓	2	<0.002	0.003	<0.002	✓	2	7.74	8.01	7.88	✓	2	25.0	44.0	34.5	✓
Greenbushes	4	0.015	0.060	0.028	✓	4	<0.002	<0.002	<0.002	✓	4	7.94	8.18	8.06	✓	4	2.9	5.3	4.4	✓
Harvey	2	0.006	0.015	0.011	✓	2	<0.002	<0.002	<0.002	✓	2	8.22	8.27	8.25	✓	2	1.0	1.0	1.0	✓
Hester	2	0.010	0.015	0.013	✓	2	<0.002	<0.002	<0.002	✓	2	8.17	8.64	8.41	✓	2	2.4	5.2	3.8	✓
Kirup	4	0.006	0.010	0.007	✓	4	<0.002	<0.002	<0.002	✓	4	6.97	7.35	7.16	✓	4	3.6	9.8	5.9	✓
Logue Brook	2	0.010	0.020	0.015	✓	2	<0.002	<0.002	<0.002	✓	2	7.95	8.05	8.00	✓	2	0.9	6.7	3.8	✓
Manjimup	2	0.040	0.680	0.360	(1)	2	0.003	0.016	0.010	✓	2	6.95	7.78	7.37	✓	2	5.2	7.9	6.6	✓
Margaret River	4	0.070	0.120	0.093	✓	4	0.004	0.007	0.005	✓	4	7.29	7.42	7.37	✓	4	6.8	9.5	8.0	✓
Mullalyup	2	<0.003	0.008	0.004	✓	2	<0.002	<0.002	<0.002	✓	2	6.65	7.44	7.05	✓	2	3.2	5.2	4.2	✓
Myalup	2	<0.003	0.004	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	8.54	8.77	8.66	(2)	2	1.3	1.5	1.4	✓
Nannup	8	<0.003	0.060	0.024	✓	8	<0.002	0.030	0.007	✓	8	7.02	7.39	7.20	✓	8	4.0	7.5	6.3	✓
Northcliffe	4	0.015	0.090	0.041	✓	4	0.004	0.010	0.006	✓	4	7.56	7.70	7.64	✓	4	5.4	6.7	5.9	✓
Pemberton	2	0.015	0.035	0.025	✓	2	<0.002	0.003	<0.002	✓	2	7.27	7.68	7.48	✓	2	5.8	6.7	6.3	✓
Peppermint Grove	4	0.025	0.045	0.034	✓	4	<0.002	<0.002	<0.002	✓	4	6.91	7.43	7.08	✓	4	15.0	16.0	15.5	✓
Preston Beach	4	0.008	0.035	0.017	✓	4	<0.002	<0.002	<0.002	✓	4	8.06	8.43	8.28	✓	4	17.0	18.0	17.3	✓
Quinninup	4	0.040	0.070	0.053	✓	4	0.003	0.006	0.004	✓	4	7.34	8.14	7.79	✓	4	4.9	6.7	6.1	✓
Waroona	2	0.004	0.035	0.020	✓	2	<0.002	0.009	0.005	✓	2	8.21	8.22	8.22	✓	2	1.6	2.3	2.0	✓
Yarloop	2	0.008	0.015	0.012	✓	2	<0.002	<0.002	<0.002	✓	2	8.04	8.34	8.19	✓	2	0.8	1.0	0.9	✓

(1) Elevated iron December 2016 associated with build up of sediment in sample point. Pipework scoured and flushed. (2) 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.

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Table 20 Aesthetic (Non-health related) Variables

South West Region	Sodium				TDS				True Colour				Turbidity							
Locality	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 Value	Max Value	Mean Value			Min	Max	Mean			Min	Max	Mean			Min	Max	Mean	
Allanson	2	46	54	50	✓	2	198	232	215	✓	2	1	2	2	✓	2	0.3	0.5	0.4	✓
Augusta	4	65	77	70	✓	4	346	372	358	✓	4	<1	<1	<1	✓	4	0.1	0.3	0.2	✓
Australind	8	94	120	106	✓	8	501	531	517	✓	8	<1	1	<1	✓	8	0.1	0.7	0.3	✓
Balingup	2	49	49	49	✓	2	219	329	274	✓	2	<1	2	<1	✓	2	<0.1	0.3	0.2	✓
Binningup	2	20	23	22	✓	2	135	164	150	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Boyanup	2	60	61	61	✓	2	374	385	380	✓	2	<1	<1	<1	✓	2	<0.1	0.1	<0.1	✓
Boyup Brook	4	46	50	48	✓	4	272	355	312	✓	4	<1	<1	<1	✓	4	0.1	0.4	0.3	✓
Bridgetown	2	45	50	48	✓	2	289	347	318	✓	2	<1	1	<1	✓	2	0.2	0.7	0.5	✓
Brunswick Junction	3	120	120	120	✓	3	527	541	535	✓	3	<1	<1	<1	✓	3	0.2	0.3	0.3	✓
Capel	4	45	49	47	✓	4	257	270	262	✓	4	<1	<1	<1	✓	4	0.1	0.2	0.2	✓
Collie	4	44	51	47	✓	4	192	219	205	✓	4	1	2	2	✓	4	0.4	0.9	0.6	✓
Cowaramup	4	43	48	46	✓	4	210	240	224	✓	4	1	2	2	✓	4	0.5	1.1	0.7	✓
Dalyellup	3	78	135	98	✓	3	413	576	473	✓	3	<1	<1	<1	✓	3	0.1	0.3	0.2	✓
Dardanup	2	69	71	70	✓	2	276	282	279	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Darkan	2	49	49	49	✓	2	213	223	218	✓	2	<1	2	<1	✓	2	0.4	0.4	0.4	✓
Donnybrook	4	115	125	121	✓	4	414	465	448	✓	4	<1	<1	<1	✓	4	0.1	0.3	0.2	✓
Dunsborough	4	105	155	135	✓	4	474	592	543	✓	4	<1	<1	<1	✓	4	<0.1	0.2	<0.1	✓
Eaton	2	71	110	91	✓	2	426	524	475	✓	2	<1	<1	<1	✓	2	0.2	0.2	0.2	✓
Greenbushes	4	46	58	52	✓	4	267	330	305	✓	4	<1	<1	<1	✓	4	0.2	0.8	0.4	✓
Harvey	2	22	24	23	✓	2	143	146	145	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Hester	2	43	53	48	✓	2	272	321	297	✓	2	<1	<1	<1	✓	2	0.2	0.3	0.3	✓
Kirup	4	29	100	53	✓	4	111	384	200	✓	4	<1	<1	<1	✓	4	<0.1	0.3	<0.1	✓
Logue Brook	2	22	50	36	✓	2	142	244	193	✓	2	<1	<1	<1	✓	2	<0.1	0.2	<0.1	✓
Manjimup	2	38	41	40	✓	2	168	267	218	✓	2	<1	6	3	✓	2	0.3	0.7	0.5	✓
Margaret River	4	43	49	46	✓	4	218	244	233	✓	4	<1	2	2	✓	4	0.4	1.0	0.6	✓
Mullalyup	2	31	62	47	✓	2	113	209	161	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Myalup	2	18	20	19	✓	2	135	146	141	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Nannup	8	40	57	48	✓	8	170	218	197	✓	8	<1	1	<1	✓	8	<0.1	0.2	<0.1	✓
Northcliffe	4	46	57	50	✓	4	201	244	219	✓	4	<1	<1	<1	✓	4	0.1	0.3	0.2	✓
Pemberton	2	55	55	55	✓	2	226	240	233	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Peppermint Grove	4	45	49	47	✓	4	277	283	280	✓	4	<1	<1	<1	✓	4	<0.1	0.2	<0.1	✓
Preston Beach	4	87	115	101	✓	4	754	804	783	(1)	4	<1	2	<1	✓	4	<0.1	<0.1	<0.1	✓
Quinninup	4	45	59	50	✓	4	195	247	221	✓	4	<1	<1	<1	✓	4	0.1	0.2	0.2	✓
Waroona	2	21	21	21	✓	2	123	139	131	✓	2	<1	<1	<1	✓	2	<0.1	0.3	0.2	✓
Yarloop	2	19	21	20	✓	2	138	143	141	✓	2	<1	<1	<1	✓	2	0.1	0.1	0.1	✓

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

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Table 21 Health related variables

Great Southern 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	Concentration (mg/L)			Samples Taken	Guideline Met	Samples Taken	Guideline Met	
								Min	Max	Mean					
Albany	156	0	0	✓	79	0	✓	52	0.65	0.85	0.73	0	(1)	8	✓
Boddington	50	0	0	✓	50	0	✓	5	0.80	0.85	0.81	0	(1)	2	✓
Borden	12	0	0	✓	6	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Bremer Bay	52	0	0	✓	26	0	✓	4	0.55	0.60	0.58	0	(1)	2	✓
Brookton	51	0	0	✓	52	0	✓	4	0.75	0.85	0.81	0	(1)	2	✓
Broomehill	12	0	0	✓	12	0	✓	4	0.75	0.90	0.84	0	(1)	2	✓
Bullaring	12	0	0	✓	12	0	✓	4	0.80	0.90	0.83	0	(1)	2	✓
Condingup	12	0	0	✓	8	0	✓	2	0.30	0.30	0.30	2	✓	2	✓
Cranbrook	12	0	0	✓	6	0	✓	2	0.20	0.70	0.45	0	(1)	2	✓
Cuballing	12	0	0	✓	11	0	✓	4	0.75	0.85	0.81	0	(1)	2	✓
Denmark	65	0	0	✓	32	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Dudinin	12	0	0	✓	12	0	✓	4	0.75	0.85	0.80	1	✓	2	✓
Dumbleyung	12	0	0	✓	12	0	✓	4	0.75	0.85	0.80	0	(1)	2	✓
Esperance	91	0	0	✓	61	0	✓	52	0.45	0.85	0.77	0	(1)	4	✓
Frankland	12	0	0	✓	6	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	0.70	0.85	0.81	0	(1)	2	✓
Grass Patch	12	0	0	✓	8	0	✓	4	0.70	0.80	0.76	0	(1)	2	✓
Harrismith	12	0	0	✓	12	0	✓	4	0.80	0.90	0.85	0	(1)	2	✓
Highbury	12	0	0	✓	12	0	✓	4	0.80	0.90	0.85	0	(1)	2	✓
Hopetoun	52	0	0	✓	26	0	✓	2	0.10	0.10	0.10	0	(1)	2	✓
Hyden	13	0	0	✓	12	0	✓	4	0.60	0.85	0.75	2	✓	2	✓
Jerramungup	12	0	0	✓	6	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Karlgarin	12	0	0	✓	12	0	✓	4	0.80	0.95	0.88	0	(1)	2	✓
Katanning	66	0	0	✓	66	0	✓	52	0.70	0.95	0.83	2	✓	2	✓
Kendenup	12	0	0	✓	6	0	✓	4	0.75	0.80	0.76	0	(1)	2	✓
Kojonup	52	0	0	✓	52	0	✓	5	0.75	0.95	0.82	0	(1)	2	✓
Kondinin	12	0	0	✓	12	0	✓	4	0.75	0.95	0.85	2	✓	2	✓
Kukerin	12	0	0	✓	12	0	✓	4	0.80	0.85	0.81	0	(1)	2	✓
Kulin	12	0	0	✓	12	0	✓	4	0.75	0.90	0.80	1	✓	2	✓
Lake Grace	53	0	0	✓	53	0	✓	4	0.75	0.85	0.80	0	(1)	2	✓
Lake King	12	0	0	✓	6	0	✓	4	0.75	0.85	0.81	2	✓	2	✓
Mt Barker	52	0	0	✓	26	0	✓	52	0.60	0.80	0.73	0	(1)	2	✓
Munglinup	12	0	0	✓	6	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Muradup	12	0	0	✓	12	0	✓	4	0.75	0.85	0.81	0	(1)	2	✓
Narrikup	12	0	0	✓	6	0	✓	4	0.70	0.75	0.73	0	(1)	2	✓
Narrogin	61	0	0	✓	61	0	✓	51	0.70	0.95	0.82	0	(1)	2	✓
Newdegate	12	0	0	✓	12	0	✓	4	0.75	0.85	0.81	0	(1)	2	✓
Nyabing	12	0	0	✓	12	0	✓	4	0.75	0.85	0.83	0	(1)	2	✓
Ongerup	12	0	0	✓	6	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Pingaring	12	0	0	✓	12	0	✓	4	0.75	0.90	0.83	0	(1)	2	✓
Pingelly	51	0	0	✓	52	0	✓	4	0.75	0.85	0.80	0	(1)	2	✓
Pingrup	12	0	0	✓	12	0	✓	4	0.75	0.90	0.81	0	(1)	2	✓
Popanyinning	12	0	0	✓	12	0	✓	4	0.75	0.85	0.81	0	(1)	2	✓
Ravensthorpe	12	0	0	✓	6	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓
Rocky Gully	12	0	0	✓	6	0	✓	4	0.70	0.75	0.73	0	(1)	2	✓
Salmon Gums	12	0	0	✓	8	0	✓	2	0.35	0.40	0.38	0	(1)	2	✓
Tambellup	12	0	0	✓	12	0	✓	4	0.75	0.90	0.83	0	(1)	2	✓
Tincurrin	12	0	0	✓	12	0	✓	4	0.75	0.90	0.83	0	(1)	2	✓
Varley	12	0	0	✓	6	0	✓	4	0.75	0.90	0.81	0	(1)	2	✓
Wagin	52	0	0	✓	52	0	✓	4	0.80	0.85	0.81	0	(1)	2	✓
Walpole	52	0	0	✓	26	0	✓	2	<0.1	<0.1	<0.1	2	✓	2	✓
Wandering	12	0	0	✓	12	0	✓	4	0.75	0.85	0.81	0	(1)	2	✓
Wellstead	12	0	0	✓	6	0	✓	2	0.15	0.75	0.45	0	(1)	2	✓
Wickepin	12	0	0	✓	12	0	✓	4	0.80	0.90	0.84	0	(1)	2	✓
Williams	12	0	0	✓	12	0	✓	4	0.55	0.85	0.78	0	(1)	2	✓
Woodanilling	12	0	0	✓	12	0	✓	4	0.75	0.85	0.83	0	(1)	2	✓
Yealering	12	0	0	✓	12	0	✓	4	0.80	0.90	0.84	0	(1)	2	✓

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

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Table 22 Health related variables

Great Southern Region	Health related variables															
Locality	Samples Taken	Nitrate †				Pesticides		Radiological		Trihalomethanes				Other Health Related		
		Min	Max	Mean	Guideline Met	Samples Taken	Guideline Met	Samples Taken	Guideline Met	Samples Taken	Min	Max	Mean	Guideline Met	Samples Taken	Requirement Met
Albany	16	0.44	0.88	0.88	✓	4	✓	0	(1)	8	0.079	0.150	0.120	✓	0	(1)
Boddington	2	0.44	0.44	0.44	✓	1	✓	0	(1)	4	0.070	0.120	0.105	✓	0	(1)
Borden	2	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	2	0.025	0.038	0.032	✓	0	(1)
Bremer Bay	4	21.66	26.52	24.31	✓	1	✓	0	(1)	2	0.074	0.120	0.097	✓	0	(1)
Brookton	2	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	4	0.072	0.120	0.094	✓	0	(1)
Broomehill	2	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	4	0.087	0.130	0.105	✓	0	(1)
Bullaring	4	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	4	0.120	0.230	0.160	✓	0	(1)
Condingup	4	1.33	1.77	1.33	✓	1	✓	0	(1)	2	0.010	0.022	0.016	✓	0	(1)
Cranbrook	2	0.44	0.88	0.44	✓	1	✓	0	(1)	4	0.051	0.140	0.085	✓	0	(1)
Cuballing	2	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	4	0.092	0.150	0.126	✓	0	(1)
Denmark	4	<0.22	1.33	0.88	✓	1	✓	0	(1)	4	0.083	0.120	0.101	✓	0	(1)
Dudinin	4	<0.22	0.44	<0.22	✓	1	✓	0	(1)	2	0.057	0.079	0.068	✓	0	(1)
Dumbleyung	2	0.44	0.44	0.44	✓	1	✓	0	(1)	4	0.094	0.140	0.111	✓	0	(1)
Esperance	10	6.63	34.48	13.70	✓	2	✓	4	✓	4	0.010	0.070	0.033	✓	1	✓
Frankland	4	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	3	0.046	0.091	0.063	✓	0	(1)
Gibson	4	9.72	20.77	15.91	✓	1	✓	1	✓	2	0.028	0.046	0.037	✓	1	✓
Gnowangerup	4	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	4	0.110	0.240	0.190	✓	0	(1)
Grass Patch	4	7.07	31.38	18.56	✓	1	✓	0	(1)	2	0.031	0.082	0.057	✓	0	(1)
Harrismith	4	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	4	0.150	0.200	0.170	✓	0	(1)
Highbury	4	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	4	0.074	0.150	0.103	✓	0	(1)
Hopetoun	4	1.33	4.86	2.65	✓	1	✓	2	✓	2	0.010	0.022	0.016	✓	0	(1)
Hyden	4	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	4	0.038	0.097	0.069	✓	0	(1)
Jerramungup	4	<0.22	0.44	<0.22	✓	1	✓	0	(1)	2	0.025	0.069	0.047	✓	0	(1)
Karlgarin	2	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	4	0.057	0.074	0.065	✓	0	(1)
Katanning	4	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	4	0.057	0.210	0.107	✓	1	✓
Kendenup	4	0.44	0.88	0.88	✓	1	✓	2	✓	4	0.130	0.150	0.145	✓	0	(1)
Kojonup	3	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	5	0.091	0.120	0.103	✓	0	(1)
Kondinin	4	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	4	0.053	0.100	0.086	✓	0	(1)
Kukerin	4	0.44	0.44	0.44	✓	1	✓	0	(1)	4	0.100	0.150	0.128	✓	0	(1)
Kulin	4	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	4	0.120	0.180	0.158	✓	0	(1)
Lake Grace	4	<0.22	0.44	<0.22	✓	1	✓	0	(1)	4	0.150	0.190	0.168	✓	0	(1)
Lake King	2	<0.22	0.44	<0.22	✓	1	✓	0	(1)	4	0.100	0.110	0.108	✓	1	✓
Mt Barker	4	0.88	0.88	0.88	✓	1	✓	2	✓	5	0.110	0.140	0.124	✓	0	(1)
Munglinup	2	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	2	0.041	0.043	0.042	✓	0	(1)
Muradup	2	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	4	0.100	0.170	0.133	✓	0	(1)
Narrikup	4	0.44	0.88	0.88	✓	1	✓	2	✓	4	0.140	0.160	0.150	✓	0	(1)
Narrogin	2	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	2	0.081	0.092	0.087	✓	0	(1)
Newdegate	2	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	4	0.110	0.190	0.138	✓	0	(1)
Nyabing	4	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	2	0.087	0.130	0.109	✓	0	(1)
Ongerup	2	<0.22	0.88	0.44	✓	1	✓	0	(1)	2	0.042	0.072	0.057	✓	0	(1)
Pingaring	4	<0.22	0.44	<0.22	✓	1	✓	0	(1)	4	0.150	0.210	0.180	✓	0	(1)
Pingelly	2	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	4	0.056	0.170	0.105	✓	0	(1)
Pingrup	2	0.44	0.44	0.44	✓	1	✓	0	(1)	4	0.036	0.048	0.043	✓	0	(1)
Popanyinning	2	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	4	0.084	0.170	0.134	✓	0	(1)
Ravensthorpe	4	<0.22	<0.22	<0.22	✓	4	✓	0	(1)	4	0.054	0.071	0.063	✓	0	(1)
Rocky Gully	4	0.88	0.88	0.88	✓	1	✓	2	✓	2	0.100	0.110	0.105	✓	0	(1)
Salmon Gums	4	0.88	4.86	1.77	✓	1	✓	0	(1)	2	0.100	0.120	0.110	✓	0	(1)
Tambellup	2	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	4	0.083	0.130	0.105	✓	0	(1)
Tincurrin	4	<0.22	0.44	0.44	✓	1	✓	0	(1)	4	0.110	0.150	0.133	✓	0	(1)
Varley	2	<0.22	0.44	<0.22	✓	1	✓	0	(1)	2	0.080	0.110	0.095	✓	0	(1)
Wagin	2	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	4	0.120	0.180	0.140	✓	0	(1)
Walpole	5	0.88	0.88	0.88	✓	1	✓	0	(1)	5	0.084	0.160	0.121	✓	2	✓
Wandering	2	0.44	0.44	0.44	✓	1	✓	0	(1)	4	0.071	0.140	0.107	✓	0	(1)
Wellstead	2	<0.22	0.88	0.44	✓	1	✓	0	(1)	2	0.031	0.170	0.101	✓	0	(1)
Wickepin	4	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	4	0.087	0.150	0.119	✓	1	✓
Williams	2	<0.22	0.44	<0.22	✓	1	✓	0	(1)	3	0.097	0.130	0.116	✓	0	(1)
Woodanilling	2	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	4	0.110	0.190	0.148	✓	0	(1)
Yealering	4	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	4	0.160	0.270	0.203	✓	0	(1)

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

† Nitrate data is converted from laboratory analysis reported as "Nitrate plus Nitrite as Nitrogen" based on the assumption that all nitrite is converted to nitrate under oxidative conditions during sampling.

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Table 23 Aesthetic (Non-health related) Variables

Great Southern 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 Value	Max Value	Mean Value			Min	Max	Mean			Min Value	Max Value	Mean Value			Min	Max	Mean	
Albany	16	150	210	197	(1)	16	<0.008	0.020	0.012	✓	16	110	140	123	✓	16	200	290	255	(3)
Boddington	2	15	24	20	(1)	2	0.020	0.025	0.023	✓	2	90	100	95	✓	2	47	56	52	✓
Borden	2	14	15	15	(1)	2	0.030	0.040	0.035	✓	2	13	14	14	✓	2	17	20	19	✓
Bremer Bay	4	270	280	278	(1)	4	<0.008	<0.008	<0.008	✓	4	190	195	191	✓	4	160	180	168	✓
Brookton	2	17	26	22	(1)	2	0.035	0.055	0.045	✓	2	110	115	113	✓	2	59	65	62	✓
Broomehill	2	16	22	19	(1)	2	0.025	0.030	0.028	✓	2	115	125	120	✓	2	58	67	63	✓
Bullaring	4	26	36	30	(1)	4	0.020	0.040	0.025	✓	4	110	115	114	✓	4	63	77	70	✓
Condingup	4	130	140	135	(1)	4	<0.008	<0.008	<0.008	✓	4	390	410	401	(2)	4	79	84	81	✓
Cranbrook	2	26	210	118	(1)	2	0.018	0.055	0.037	✓	2	27	125	76	✓	2	32	260	146	✓
Cuballing	2	14	14	14	(1)	2	0.020	0.025	0.023	✓	2	110	115	113	✓	2	52	55	54	✓
Denmark	4	7	11	9	(1)	4	0.012	0.030	0.021	✓	4	165	210	188	✓	4	58	71	64	✓
Dudinin	4	26	29	28	(1)	4	0.012	0.025	0.018	✓	4	110	120	114	✓	4	67	72	70	✓
Dumbleyung	2	28	32	30	(1)	2	0.020	0.030	0.025	✓	2	105	110	108	✓	2	66	73	70	✓
Esperance	10	260	280	266	(1)	10	<0.008	0.014	<0.008	✓	10	175	210	193	✓	10	320	360	337	(3)
Frankland	4	2	5	3	(1)	4	<0.008	0.025	0.011	✓	4	13	14	14	✓	4	8	16	11	✓
Gibson	4	61	71	66	(1)	4	<0.008	0.016	<0.008	✓	4	205	220	210	✓	4	33	41	38	✓
Gnowangerup	4	21	24	23	(1)	4	0.035	0.045	0.039	✓	4	110	125	116	✓	4	61	71	66	✓
Grass Patch	4	250	280	265	(1)	4	0.008	0.014	0.012	✓	4	180	220	199	✓	4	340	350	348	(3)
Harrismith	4	23	28	25	(1)	4	0.018	0.020	0.020	✓	4	105	115	109	✓	4	59	69	64	✓
Highbury	4	13	21	17	(1)	4	0.014	0.025	0.019	✓	4	100	110	108	✓	4	48	55	53	✓
Hopetoun	4	47	200	115	(1)	4	<0.008	0.012	<0.008	✓	4	190	260	226	✓	4	54	220	137	✓
Hyden	4	15	30	26	(1)	3	0.010	0.035	0.023	✓	4	50	125	101	✓	4	38	78	65	✓
Jerramungup	4	2	8	6	(1)	4	0.045	0.120	0.075	✓	4	33	40	37	✓	4	12	17	15	✓
Karlgarin	2	26	31	29	(1)	2	0.020	0.025	0.023	✓	2	110	120	115	✓	2	68	73	71	✓
Katanning	4	16	22	19	(1)	4	0.012	0.025	0.019	✓	4	100	120	111	✓	4	56	63	60	✓
Kendenup	4	210	210	210	(1)	4	<0.008	0.016	0.011	✓	4	115	125	120	✓	4	270	290	275	(3)
Kojonup	3	21	24	23	(1)	3	0.025	0.040	0.032	✓	3	105	125	115	✓	3	57	68	62	✓
Kondinin	4	30	32	31	(1)	4	0.025	0.035	0.029	✓	4	110	125	119	✓	4	73	79	76	✓
Kukerin	4	27	32	29	(1)	4	0.025	0.025	0.025	✓	4	105	115	109	✓	4	62	76	68	✓
Kulin	4	26	32	29	(1)	4	0.014	0.030	0.025	✓	4	105	115	110	✓	4	66	69	68	✓
Lake Grace	4	27	35	31	(1)	4	0.016	0.030	0.022	✓	4	110	115	111	✓	4	70	81	75	✓
Lake King	2	31	39	35	(1)	2	0.030	0.030	0.030	✓	2	105	115	110	✓	2	72	75	74	✓
Mt Barker	4	200	220	208	(1)	4	0.010	0.014	0.011	✓	4	120	125	121	✓	4	260	270	263	(3)
Munglinup	2	4	4	4	(1)	2	0.014	0.016	0.015	✓	2	24	26	25	✓	2	12	13	13	✓
Muradup	2	25	25	25	(1)	2	0.025	0.030	0.028	✓	2	115	125	120	✓	2	60	67	64	✓
Narrikup	4	210	210	210	(1)	4	<0.008	0.012	0.009	✓	4	115	125	120	✓	4	270	270	270	(3)
Narrogin	2	11	22	17	(1)	2	0.018	0.018	0.018	✓	2	95	110	103	✓	2	50	54	52	✓
Newdegate	2	32	37	35	(1)	2	0.016	0.030	0.023	✓	2	110	115	113	✓	2	73	77	75	✓
Nyabing	4	14	17	16	(1)	4	0.014	0.030	0.020	✓	4	105	120	114	✓	4	55	61	58	✓
Ongerup	2	10	14	12	(1)	2	0.010	0.014	0.012	✓	2	19	29	24	✓	2	16	20	18	✓
Pingaring	4	32	40	36	(1)	3	0.016	0.020	0.018	✓	4	110	120	114	✓	4	80	84	82	✓
Pingelly	2	16	16	16	(1)	2	0.030	0.035	0.033	✓	2	110	115	113	✓	2	58	62	60	✓
Pingrup	2	15	16	16	(1)	2	0.014	0.014	0.014	✓	2	110	120	115	✓	2	54	61	58	✓
Popanyinning	2	16	18	17	(1)	2	0.016	0.030	0.023	✓	2	105	110	108	✓	2	55	57	56	✓
Ravensthorpe	4	24	28	26	(1)	4	0.045	0.050	0.046	✓	4	27	32	29	✓	4	24	28	27	✓
Rocky Gully	4	200	210	205	(1)	4	<0.008	0.018	0.012	✓	4	115	130	123	✓	4	240	270	263	(3)
Salmon Gums	4	170	190	178	(1)	4	0.020	0.025	0.024	✓	4	40	60	46	✓	4	100	140	113	✓
Tambellup	2	22	24	23	(1)	2	0.035	0.045	0.040	✓	2	110	120	115	✓	2	60	69	65	✓
Tincurrin	4	23	29	26	(1)	3	0.020	0.030	0.027	✓	4	105	115	110	✓	4	60	72	65	✓
Varley	2	34	35	35	(1)	2	0.025	0.030	0.028	✓	2	115	120	118	✓	2	76	81	79	✓
Wagin	2	14	22	18	(1)	2	0.020	0.025	0.023	✓	2	105	115	110	✓	2	53	59	56	✓
Walpole	5	21	33	25	(1)	5	0.012	0.030	0.018	✓	5	75	135	109	✓	5	33	45	41	✓
Wandering	2	17	27	22	(1)	2	0.020	0.030	0.025	✓	2	95	105	100	✓	2	49	57	53	✓
Wellstead	2	3	200	102	(1)	2	0.012	0.020	0.016	✓	2	26	120	73	✓	2	9	270	140	✓
Wickepin	4	12	20	16	(1)	3	0.018	0.020	0.019	✓	4	105	110	108	✓	4	50	57	53	✓
Williams	2	11	22	17	(1)	2	0.016	0.020	0.018	✓	2	85	100	93	✓	2	44	50	47	✓
Woodanilling	2	17	17	17	(1)	2	0.025	0.025	0.025	✓	2	110	110	110	✓	2	55	59	57	✓
Yealering	4	23	31	27	(1)	4	0.025	0.060	0.034	✓	4	105	110	109	✓	4	59	67	63	✓

(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 24 Aesthetic (Non-health related) Variables

Great Southern 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 Value			Max Value	Mean Value	
Albany	16	0.030	0.280	0.133	✓	16	<0.002	<0.002	<0.002	✓	16	7.53	7.93	7.66	✓	16	14.0	26.0	17.4	✓
Boddington	2	0.060	0.080	0.070	✓	2	0.010	0.020	0.015	✓	2	7.45	7.99	7.72	✓	2	1.7	1.8	1.8	✓
Borden	2	0.006	0.008	0.007	✓	2	<0.002	<0.002	<0.002	✓	2	7.33	7.36	7.35	✓	2	0.6	1.0	0.8	✓
Bremer Bay	4	<0.003	0.004	<0.003	✓	4	<0.002	<0.002	<0.002	✓	4	8.00	8.24	8.11	✓	4	50.0	55.0	53.8	✓
Brookton	2	0.140	0.200	0.170	✓	2	0.012	0.012	0.012	✓	2	8.02	8.29	8.16	✓	2	1.3	1.8	1.6	✓
Broomehill	2	0.100	0.140	0.120	✓	2	0.003	0.004	0.004	✓	2	7.53	7.77	7.65	✓	2	0.8	1.1	1.0	✓
Bullaring	4	0.080	0.300	0.155	✓	4	0.002	0.014	0.007	✓	4	7.80	9.12	8.30	✓	4	0.8	1.6	1.3	✓
Condingup	4	0.035	0.050	0.045	✓	4	<0.002	<0.002	<0.002	✓	4	6.69	7.32	6.90	✓	4	65.0	65.0	65.0	✓
Cranbrook	2	0.070	0.070	0.070	✓	2	<0.002	0.004	<0.002	✓	2	7.32	8.10	7.71	✓	2	3.8	13.0	8.4	✓
Cuballing	2	0.160	0.240	0.200	✓	2	0.012	0.055	0.034	✓	2	7.40	7.51	7.46	✓	2	0.4	1.2	0.8	✓
Denmark	4	0.008	0.030	0.015	✓	4	<0.002	<0.002	<0.002	✓	4	6.93	8.67	7.48	✓	4	5.9	7.8	6.9	✓
Dudinin	4	0.140	0.260	0.200	✓	4	0.003	0.008	0.006	✓	4	8.71	9.30	9.06	(2)	4	0.8	1.6	1.2	✓
Dumbleyung	2	0.050	0.260	0.155	✓	2	0.004	0.014	0.009	✓	2	7.79	8.04	7.92	✓	2	0.9	1.5	1.2	✓
Esperance	10	<0.003	0.035	0.006	✓	10	<0.002	<0.002	<0.002	✓	10	7.40	7.76	7.54	✓	10	9.6	13.0	11.0	✓
Frankland	4	0.008	0.100	0.032	✓	4	<0.002	<0.002	<0.002	✓	4	6.56	7.25	6.86	✓	4	1.1	2.7	1.9	✓
Gibson	4	0.020	0.080	0.056	✓	4	<0.002	<0.002	<0.002	✓	4	6.58	6.89	6.71	✓	4	44.0	47.0	45.5	✓
Gnowangerup	4	0.070	0.140	0.113	✓	4	<0.002	0.005	0.003	✓	4	7.53	8.59	8.02	✓	4	0.9	1.5	1.2	✓
Grass Patch	4	<0.003	0.010	0.004	✓	4	<0.002	<0.002	<0.002	✓	4	8.03	8.18	8.09	✓	4	10.0	11.0	10.5	✓
Harrismith	4	0.120	0.200	0.155	✓	4	0.007	0.016	0.011	✓	4	8.06	8.96	8.65	(2)	4	0.7	1.3	1.0	✓
Highbury	4	0.100	0.220	0.155	✓	4	0.009	0.065	0.027	✓	4	6.94	7.33	7.15	✓	4	0.5	1.5	1.0	✓
Hopetoun	4	<0.003	0.020	0.008	✓	4	<0.002	0.002	<0.002	✓	4	6.78	7.61	7.30	✓	4	22.0	28.0	25.3	✓
Hyden	4	0.015	0.090	0.054	✓	4	<0.002	<0.002	<0.002	✓	4	7.21	7.83	7.48	✓	4	1.2	2.2	1.8	✓
Jerramungup	4	0.040	0.070	0.050	✓	4	<0.002	<0.002	<0.002	✓	4	6.43	7.50	7.06	✓	4	2.7	4.1	3.5	✓
Karlgarin	2	0.045	0.070	0.058	✓	2	<0.002	<0.002	<0.002	✓	2	7.58	7.82	7.70	✓	2	1.1	1.8	1.5	✓
Katanning	4	0.120	0.140	0.125	✓	4	<0.002	0.004	0.003	✓	4	7.06	7.55	7.39	✓	4	0.3	1.8	0.8	✓
Kendenup	4	0.035	0.080	0.061	✓	4	<0.002	<0.002	<0.002	✓	4	8.02	8.25	8.12	✓	4	14.0	15.0	14.8	✓
Kojonup	3	0.120	0.160	0.140	✓	3	0.003	0.006	0.005	✓	3	7.63	8.10	7.83	✓	3	0.6	0.8	0.7	✓
Kondinin	4	0.050	0.070	0.063	✓	4	<0.002	0.003	<0.002	✓	4	7.84	8.26	8.03	✓	4	1.4	2.0	1.7	✓
Kukerin	4	0.045	0.120	0.076	✓	4	<0.002	0.003	<0.002	✓	4	8.16	8.92	8.44	✓	4	0.8	1.6	1.2	✓
Kulin	4	0.080	0.200	0.145	✓	4	0.004	0.030	0.013	✓	4	7.48	8.45	7.96	✓	4	1.1	1.5	1.3	✓
Lake Grace	4	0.080	0.120	0.098	✓	4	0.004	0.005	0.005	✓	4	8.37	8.88	8.61	(2)	4	1.2	1.8	1.5	✓
Lake King	2	0.100	0.100	0.100	✓	2	0.007	0.007	0.007	✓	2	7.68	7.99	7.84	✓	2	1.2	1.6	1.4	✓
Mt Barker	4	0.045	0.080	0.066	✓	4	<0.002	<0.002	<0.002	✓	4	7.73	7.89	7.82	✓	4	13.0	17.0	15.5	✓
Munglinup	2	0.090	0.140	0.115	✓	2	<0.002	0.003	<0.002	✓	2	6.54	6.60	6.57	✓	2	0.3	0.4	0.4	✓
Muradup	2	0.100	0.120	0.110	✓	2	<0.002	<0.002	<0.002	✓	2	7.38	7.66	7.52	✓	2	0.7	1.5	1.1	✓
Narrikup	4	0.060	0.080	0.073	✓	4	<0.002	<0.002	<0.002	✓	4	7.61	7.87	7.74	✓	4	14.0	16.0	15.0	✓
Narrogin	2	0.160	0.240	0.200	✓	2	0.018	0.025	0.022	✓	2	6.78	7.34	7.06	✓	2	0.8	1.0	0.9	✓
Newdegate	2	0.100	0.100	0.100	✓	2	0.002	0.003	0.003	✓	2	7.75	8.10	7.93	✓	2	1.2	1.6	1.4	✓
Nyabing	4	0.090	0.120	0.108	✓	4	<0.002	0.003	<0.002	✓	4	7.15	7.53	7.27	✓	4	0.3	1.0	0.6	✓
Ongerup	2	0.006	0.008	0.007	✓	2	<0.002	<0.002	<0.002	✓	2	6.69	7.30	7.00	✓	2	3.1	3.5	3.3	✓
Pingaring	4	0.040	0.100	0.071	✓	4	<0.002	0.003	<0.002	✓	4	9.04	9.42	9.20	(2)	4	1.1	1.7	1.4	✓
Pingelly	2	0.140	0.140	0.140	✓	2	0.010	0.012	0.011	✓	2	7.47	7.89	7.68	✓	2	1.0	1.8	1.4	✓
Pingrup	2	0.120	0.160	0.140	✓	2	0.002	0.005	0.004	✓	2	6.89	6.93	6.91	✓	2	0.4	0.8	0.6	✓
Popanyinning	2	0.140	0.220	0.180	✓	2	0.007	0.012	0.010	✓	2	7.36	7.36	7.36	✓	2	1.0	1.5	1.3	✓
Ravensthorpe	4	0.035	0.060	0.044	✓	4	<0.002	0.005	0.003	✓	4	6.91	7.44	7.20	✓	4	1.1	1.5	1.3	✓
Rocky Gully	4	0.035	0.090	0.071	✓	4	<0.002	<0.002	<0.002	✓	4	8.30	8.38	8.34	✓	4	15.0	15.0	15.0	✓
Salmon Gums	4	<0.003	0.004	<0.003	✓	4	<0.002	<0.002	<0.002	✓	4	8.39	8.67	8.51	(2)	4	6.0	6.8	6.4	✓
Tambellup	2	0.080	0.280	0.180	✓	2	<0.002	0.014	0.007	✓	2	7.74	7.79	7.77	✓	2	0.8	1.6	1.2	✓
Tincurrin	4	0.160	0.260	0.220	✓	4	0.005	0.014	0.009	✓	4	7.37	7.85	7.66	✓	4	0.9	2.2	1.5	✓
Varley	2	0.120	0.120	0.120	✓	2	0.006	0.010	0.008	✓	2	7.77	7.84	7.81	✓	2	1.1	1.9	1.5	✓
Wagin	2	0.100	0.300	0.200	✓	2	0.008	0.018	0.013	✓	2	7.42	7.60	7.51	✓	2	1.2	1.5	1.4	✓
Walpole	5	<0.003	0.010	0.006	✓	5	<0.002	<0.002	<0.002	✓	5	7.63	7.67	7.64	✓	5	5.7	8.1	7.4	✓
Wandering	2	0.080	0.660	0.370	(1)	2	0.012	0.014	0.013	✓	2	7.85	8.01	7.93	✓	2	1.7	1.9	1.8	✓
Wellstead	2	0.070	0.140	0.105	✓	2	<0.002	<0.002	<0.002	✓	2	6.06	7.89	6.98	✓	2	<0.2	16.0	8.0	✓
Wickepin	4	0.070	0.180	0.128	✓	4	0.012	0.025	0.017	✓	4	7.28	7.69	7.49	✓	4	0.7	1.3	0.9	✓
Williams	2	0.040	0.070	0.055	✓	2	0.016	0.025	0.021	✓	2	6.80	7.18	6.99	✓	2	1.3	1.6	1.5	✓
Woodanilling	2	0.140	0.200	0.170	✓	2	0.007	0.060	0.034	✓	2	6.94	7.73	7.34	✓	2	0.8	1.8	1.3	✓
Yealering	4	0.100	0.340	0.210	(1)	4	0.005	0.020	0.014	✓	4	8.87	9.39	9.06	(2)	4	0.9	1.5	1.2	✓

(1) Caused by mobilisation of sediment within the distribution system. (2) 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.

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Table 25

Aesthetic (Non-health related) Variables

Great Southern Region	Aesthetic (Non-health related) Variables																							
	Sodium						TDS						True Colour						Turbidity					
	Locality	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 Value			Max Value	Mean Value	Min			Max	Mean	Min			Max	Mean	Min			Max	Mean					
Albany	16	58	78	65	✓	16	531	605	581	✓	16	<1	<1	<1	✓	16	0.2	1.1	0.6	✓				
Boddington	2	47	52	50	✓	2	197	228	213	✓	2	1	1	1	✓	2	0.3	0.5	0.4	✓				
Borden	2	7	7	7	✓	2	52	54	53	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓				
Bremer Bay	4	175	180	178	✓	4	857	879	872	(2)	4	<1	<1	<1	✓	4	<0.1	0.1	<0.1	✓				
Brookton	2	51	53	52	✓	2	224	246	235	✓	2	2	2	2	✓	2	0.4	0.5	0.5	✓				
Broomehill	2	54	56	55	✓	2	229	257	243	✓	2	1	2	2	✓	2	0.3	0.6	0.5	✓				
Bullaring	4	53	58	56	✓	4	245	266	252	✓	4	1	2	2	✓	4	0.2	0.6	0.4	✓				
Condingup	4	305	315	311	(1)	4	1026	1052	1042	(2)	4	<1	<1	<1	✓	4	0.1	0.2	0.1	✓				
Cranbrook	2	15	64	40	✓	2	107	591	349	✓	2	<1	2	<1	✓	2	0.3	0.5	0.4	✓				
Cuballing	2	53	55	54	✓	2	218	226	222	✓	2	2	2	2	✓	2	0.6	0.9	0.8	✓				
Denmark	4	86	105	94	✓	4	308	375	340	✓	4	<1	<1	<1	✓	4	<0.1	<0.1	<0.1	✓				
Dudinin	4	51	53	52	✓	4	239	254	246	✓	4	2	3	2	✓	4	0.5	0.7	0.6	✓				
Dumbleyung	2	53	54	54	✓	2	238	252	245	✓	2	<1	2	<1	✓	2	0.2	0.7	0.5	✓				
Esperance	10	95	110	103	✓	10	765	850	797	(2)	10	<1	<1	<1	✓	10	<0.1	0.6	<0.1	✓				
Frankland	4	5	6	5	✓	4	34	43	37	✓	4	<1	2	<1	✓	4	<0.1	0.4	<0.1	✓				
Gibson	4	175	180	178	✓	4	615	625	622	(2)	4	<1	<1	<1	✓	4	0.2	0.8	0.5	✓				
Gnowangerup	4	53	57	55	✓	4	235	260	247	✓	4	1	2	2	✓	4	0.3	0.5	0.4	✓				
Grass Patch	4	105	115	110	✓	4	805	849	823	(2)	4	<1	<1	<1	✓	4	<0.1	0.2	<0.1	✓				
Harrismith	4	51	55	53	✓	4	227	251	238	✓	4	1	3	2	✓	4	0.3	0.6	0.5	✓				
Highbury	4	49	57	53	✓	4	203	230	221	✓	4	1	3	2	✓	4	0.4	1.1	0.7	✓				
Hopetoun	4	115	160	141	✓	4	559	723	621	(2)	4	<1	<1	<1	✓	4	<0.1	0.6	0.2	✓				
Hyden	4	23	60	48	✓	4	121	269	225	✓	4	<1	2	<1	✓	4	<0.1	0.3	0.2	✓				
Jerramungup	4	18	21	20	✓	4	70	87	82	✓	4	<1	<1	<1	✓	4	0.2	0.5	0.3	✓				
Karlgarin	2	51	54	53	✓	2	243	256	250	✓	2	<1	1	<1	✓	2	0.2	0.2	0.2	✓				
Katanning	4	52	58	56	✓	4	222	251	235	✓	4	<1	3	2	✓	4	0.3	1.4	0.7	✓				
Kendenup	4	59	69	63	✓	4	584	615	599	✓	4	<1	<1	<1	✓	4	0.2	0.4	0.3	✓				
Kojonup	3	54	57	55	✓	3	228	258	242	✓	3	2	2	2	✓	3	0.6	0.9	0.7	✓				
Kondinin	4	55	56	55	✓	4	253	271	263	✓	4	<1	2	<1	✓	4	0.2	0.3	0.3	✓				
Kukerin	4	49	56	52	✓	4	234	259	243	✓	4	<1	2	<1	✓	4	0.1	0.3	0.2	✓				
Kulin	4	50	54	53	✓	4	243	254	246	✓	4	<1	2	<1	✓	4	0.2	0.7	0.4	✓				
Lake Grace	4	51	57	53	✓	4	242	263	255	✓	4	<1	2	<1	✓	4	0.2	0.3	0.2	✓				
Lake King	2	54	55	55	✓	2	255	260	258	✓	2	1	2	2	✓	2	0.2	0.3	0.3	✓				
Mt Barker	4	60	64	62	✓	4	580	609	593	✓	4	<1	1	<1	✓	4	0.2	0.5	0.3	✓				
Munglinup	2	12	13	13	✓	2	66	68	67	✓	2	2	2	2	✓	2	1.1	1.7	1.4	✓				
Muradup	2	55	59	57	✓	2	238	258	248	✓	2	1	2	2	✓	2	0.3	0.4	0.4	✓				
Narrikup	4	60	71	65	✓	4	588	608	599	✓	4	<1	<1	<1	✓	4	0.2	0.4	0.3	✓				
Narrogin	2	51	53	52	✓	2	204	231	218	✓	2	2	3	3	✓	2	0.5	0.9	0.7	✓				
Newdegate	2	50	51	51	✓	2	250	259	255	✓	2	1	3	2	✓	2	0.2	0.3	0.3	✓				
Nyabing	4	53	55	54	✓	4	222	240	230	✓	4	2	2	2	✓	4	0.3	0.5	0.4	✓				
Ongerup	2	13	14	14	✓	2	67	76	72	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓				
Pingaring	4	50	55	53	✓	4	252	266	260	✓	4	<1	2	<1	✓	4	0.1	0.3	0.2	✓				
Pingelly	2	55	63	59	✓	2	229	247	238	✓	2	2	2	2	✓	2	0.4	0.5	0.5	✓				
Pingrup	2	53	55	54	✓	2	219	237	228	✓	2	2	2	2	✓	2	0.4	0.5	0.5	✓				
Popanyinning	2	51	54	53	✓	2	219	230	225	✓	2	1	3	2	✓	2	0.4	0.5	0.5	✓				
Ravensthorpe	4	19	23	20	✓	4	98	117	107	✓	4	<1	1	<1	✓	4	0.5	1.1	0.8	✓				
Rocky Gully	4	59	70	64	✓	4	578	607	591	✓	4	<1	<1	<1	✓	4	0.2	0.5	0.4	✓				
Salmon Gums	4	61	65	63	✓	4	365	438	392	✓	4	<1	1	<1	✓	4	<0.1	0.1	<0.1	✓				
Tambellup	2	41	54	48	✓	2	229	253	241	✓	2	2	2	2	✓	2	0.5	0.6	0.6	✓				
Tincurrin	4	48	52	50	✓	4	226	254	238	✓	4	1	4	3	✓	4	0.5	0.6	0.6	✓				
Varley	2	54	58	56	✓	2	259	272	266	✓	2	<1	1	<1	✓	2	0.3	0.3	0.3	✓				
Wagin	2	52	54	53	✓	2	216	240	228	✓	2	2	4	3	✓	2	0.4	0.5	0.5	✓				
Walpole	5	62	83	73	✓	5	242	308	274	✓	5	<1	<1	<1	✓	5	<0.1	<0.1	<0.1	✓				
Wandering	2	49	54	52	✓	2	205	237	221	✓	2	1	2	2	✓	2	0.5	2.7	1.6	✓				
Wellstead	2	14	66	40	✓	2	57	590	324	✓	2	<1	2	<1	✓	2	0.6	0.8	0.7	✓				
Wickepin	4	51	54	52	✓	4	209	236	220	✓	4	<1	2	<1	✓	4	0.4	0.5	0.5	✓				
Williams	2	47	52	50	✓	2	187	223	205	✓	2	<1	2	<1	✓	2	0.5	0.6	0.6	✓				
Woodanilling	2	53	56	55	✓	2	224	233	229	✓	2	2	2	2	✓	2	0.3	0.7	0.5	✓				
Yealering	4	52	56	54	✓	4	227	249	239	✓	4	2	4	3	✓	4	0.4	0.9	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	Concentration (mg/L)			Samples Taken	Guideline Met	Samples Taken	Guideline Met	
								Min	Max	Mean					
Broome	88	0	0	✓	75	0	✓	51	0.55	0.90	0.71	0	(1)	2	✓
Burrup LNG	13	0	0	✓	13	0	✓	2	0.55	0.65	0.60	0	(1)	2	✓
Burrup Supply	13	0	0	✓	13	0	✓	2	0.55	0.70	0.63	0	(1)	2	✓
Camballin	12	0	0	✓	12	0	✓	2	0.20	0.25	0.23	0	(1)	2	✓
Cape Lambert	13	0	0	✓	13	0	✓	2	0.45	0.65	0.55	0	(1)	2	✓
Derby	51	0	0	✓	51	0	✓	51	0.50	0.65	0.60	1	✓	2	✓
Fitzroy Crossing	12	0	0	✓	12	0	✓	2	0.25	0.25	0.25	2	✓	2	✓
Halls Creek	48	0	0	✓	49	0	✓	2	0.60	0.60	0.60	1	✓	2	✓
Hedland	91	0	0	✓	78	0	✓	43	0.45	0.75	0.65	1	✓	4	✓
Karratha	91	0	0	✓	78	0	✓	52	0.35	0.75	0.61	0	(1)	2	✓
Kununurra	65	0	0	✓	51	0	✓	2	0.40	0.40	0.40	0	(1)	2	✓
Marble Bar	12	0	0	✓	12	0	✓	2	0.70	0.70	0.70	0	(1)	2	✓
Newman	65	0	0	✓	52	0	✓	2	0.20	0.25	0.23	0	(1)	1	✓
Nullagine	12	0	0	✓	12	0	✓	2	0.40	0.40	0.40	0	(1)	2	✓
Onslow	50	0	0	✓	26	0	✓	2	0.70	0.95	0.83	1	✓	2	✓
Point Samson	13	0	0	✓	13	0	✓	2	0.45	0.65	0.55	0	(1)	2	✓
Roebourne	52	0	0	✓	39	0	✓	2	0.70	0.70	0.70	0	(1)	2	✓
Wickham	51	0	0	✓	39	0	✓	2	0.35	0.70	0.53	0	(1)	2	✓
Wyndham	52	0	0	✓	52	0	✓	2	<0.1	<0.1	<0.1	0	(1)	2	✓

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

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Table 27 Health related variables

North West Region	Nitrate <sup>‡</sup>				Pesticides		Radiological		Trihalomethanes				Other Health Related			
Locality	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Guideline Met	Samples Taken	Guideline Met	Concentration (mg/L)			Guideline Met	Samples Taken	Requirement Met	
		Min	Max	Mean						Min	Max	Mean				
Broome	2	22.10	24.31	23.43	✓	1	✓	2	✓	2	<0.001	<0.001	<0.001	✓	2	✓
Burrup LNG	2	6.19	6.63	6.63	✓	5	(2)	1	✓	1	0.004	0.004	0.004	✓	0	(1)
Burrup Supply	2	6.19	6.63	6.63	✓	1	✓	1	✓	2	0.001	0.003	0.002	✓	0	(1)
Camballin	2	<0.22	<0.22	<0.22	✓	1	✓	0	(1)	2	0.001	0.005	0.003	✓	0	(1)
Cape Lambert	2	6.19	6.19	6.19	✓	1	✓	1	✓	2	<0.001	<0.001	<0.001	✓	0	(1)
Derby	2	<0.22	<0.22	<0.22	✓	1	✓	2	✓	2	<0.001	0.003	0.002	✓	0	(1)
Fitzroy Crossing	2	3.98	4.42	3.98	✓	1	✓	2	✓	2	<0.001	0.001	<0.001	✓	1	✓
Halls Creek	2	4.42	4.42	4.42	✓	1	✓	2	✓	2	<0.001	<0.001	<0.001	✓	0	(1)
Hedland	4	3.54	4.42	3.98	✓	2	✓	0	(1)	4	<0.001	0.005	0.003	✓	1	✓
Karratha	2	6.19	6.63	6.63	✓	1	✓	2	✓	2	0.003	0.004	0.004	✓	0	(1)
Kununurra	4	<0.22	<0.22	<0.22	✓	1	✓	2	✓	2	0.011	0.037	0.024	✓	0	(1)
Marble Bar	2	5.30	5.30	5.30	✓	1	✓	2	✓	2	0.004	0.008	0.006	✓	0	(1)
Newman	2	0.88	1.33	1.33	✓	1	✓	2	✓	2	0.001	0.002	0.002	✓	0	(1)
Nullagine	2	1.77	4.42	3.09	✓	1	✓	0	(1)	2	<0.001	0.003	0.002	✓	0	(1)
Onslow	2	2.21	2.21	2.21	✓	1	✓	2	✓	2	0.001	0.002	0.002	✓	0	(1)
Point Samson	2	6.19	6.19	6.19	✓	1	✓	1	✓	3	<0.001	<0.001	<0.001	✓	1	✓
Roebourne	2	6.19	6.63	6.63	✓	1	✓	2	✓	2	<0.001	0.002	<0.001	✓	0	(1)
Wickham	2	6.63	6.63	6.63	✓	1	✓	1	✓	2	<0.001	0.005	0.003	✓	0	(1)
Wyndham	2	0.44	1.33	0.88	✓	1	✓	2	✓	4	0.043	0.059	0.054	✓	0	(1)

(1) No samples required in this 12 month period (2) Data are for samples from previous 5 years average

‡ Nitrate data is converted from laboratory analysis reported as "Nitrate plus Nitrite as Nitrogen" based on the assumption that all nitrite is converted to nitrate under oxidative conditions during sampling.

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Table 28 Aesthetic (Non-health related) Variables

North West Region	Alkalinity (as CaCO <sub>3</sub> )				Aluminium				Chloride				Hardness							
	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 Value	Max Value	Mean Value			Min	Max	Mean			Min Value	Max Value	Mean Value			Min	Max	Mean	
Broome	2	73	78	76	(1)	2	<0.008	<0.008	<0.008	✓	2	125	135	130	✓	2	67	72	70	✓
Burrup LNG	2	170	180	175	(1)	2	<0.008	0.012	<0.008	✓	2	80	85	83	✓	2	210	230	220	(3)
Burrup Supply	2	180	180	180	(1)	2	<0.008	0.012	<0.008	✓	2	80	90	85	✓	2	220	230	225	(3)
Camballin	2	57	58	58	(1)	2	<0.008	0.010	<0.008	✓	2	40	48	44	✓	2	44	48	46	✓
Cape Lambert	2	190	210	200	(1)	2	<0.008	0.010	<0.008	✓	2	85	100	93	✓	2	240	240	240	(2)
Derby	2	150	200	175	(1)	1	0.008	0.008	0.008	✓	2	90	95	93	✓	2	6	16	11	✓
Fitzroy Crossing	2	170	180	175	(1)	2	<0.008	0.016	<0.008	✓	2	42	44	43	✓	2	160	160	160	✓
Halls Creek	2	330	330	330	(1)	2	<0.008	<0.008	<0.008	✓	2	140	145	143	✓	2	280	280	280	(2)
Hedland	4	170	180	178	(1)	4	<0.008	0.012	<0.008	✓	4	155	200	179	✓	4	240	250	243	(2)
Karratha	2	180	190	185	(1)	2	<0.008	0.010	<0.008	✓	2	90	100	95	✓	2	230	230	230	(3)
Kununurra	4	210	210	210	(1)	4	0.008	0.010	0.009	✓	4	18	19	19	✓	4	160	170	165	✓
Marble Bar	2	380	390	385	(1)	2	0.010	0.012	0.011	✓	2	210	230	220	✓	2	290	300	295	(2)
Newman	2	140	180	160	(1)	2	<0.008	<0.008	<0.008	✓	2	70	80	75	✓	2	150	210	180	✓
Nullagine	2	150	190	170	(1)	2	<0.008	0.012	<0.008	✓	2	90	135	113	✓	2	190	230	210	(2)
Onslow	2	180	190	185	(1)	2	<0.008	<0.008	<0.008	✓	2	110	120	115	✓	2	200	200	200	✓
Point Samson	2	190	200	195	(1)	2	<0.008	0.010	<0.008	✓	2	85	100	93	✓	2	230	240	235	(3)
Roeboorne	2	160	200	180	(1)	2	0.010	0.012	0.011	✓	2	75	85	80	✓	2	210	270	240	(3)
Wickham	2	190	250	220	(1)	2	<0.008	0.010	<0.008	✓	2	80	130	105	✓	2	230	350	290	(3)
Wyndham	2	28	45	37	(1)	2	0.025	0.025	0.025	✓	2	29	32	31	✓	2	37	41	39	✓

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

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Table 29 Aesthetic (Non-health related) Variables

North West Region	Aesthetic (Non-health related) Variables																				
	Locality	Samples Taken	Iron			Guideline Met	Samples Taken	Manganese			Guideline Met	Samples Taken	pH			Guideline Met	Samples Taken	Silica			Guideline Met
			Concentration (mg/L)					Concentration (mg/L)					Value (pH units)					Concentration (mg/L)			
		Min	Max	Mean			Min	Max	Mean			Min	Max	Mean			Min Value	Max Value	Mean Value		
Broome	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.83	8.10	7.97	✓	2	90.0	95.0	92.5	(1)	
Burrup LNG	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	8.32	8.39	8.36	✓	2	55.0	55.0	55.0	✓	
Burrup Supply	2	<0.003	0.004	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	8.28	8.35	8.32	✓	2	55.0	55.0	55.0	✓	
Camballin	2	0.025	0.030	0.028	✓	2	<0.002	0.003	<0.002	✓	2	6.99	7.01	7.00	✓	2	24.0	25.0	24.5	✓	
Cape Lambert	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.99	8.10	8.05	✓	2	55.0	55.0	55.0	✓	
Derby	2	0.006	0.006	0.006	✓	2	<0.002	<0.002	<0.002	✓	2	7.82	8.18	8.00	✓	2	15.0	16.0	15.5	✓	
Fitzroy Crossing	2	<0.003	0.006	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.27	7.52	7.40	✓	2	22.0	23.0	22.5	✓	
Halls Creek	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.71	7.82	7.77	✓	2	50.0	55.0	52.5	✓	
Hedland	4	<0.003	0.008	<0.003	✓	4	<0.002	<0.002	<0.002	✓	4	8.01	8.05	8.03	✓	4	50.0	55.0	52.5	✓	
Karratha	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	8.18	8.20	8.19	✓	2	50.0	55.0	52.5	✓	
Kununurra	4	<0.003	<0.003	<0.003	✓	4	0.003	0.012	0.007	✓	4	7.41	7.84	7.66	✓	4	55.0	60.0	56.3	✓	
Marble Bar	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.63	7.81	7.72	✓	2	44.0	44.0	44.0	✓	
Newman	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.01	7.33	7.17	✓	2	20.0	25.0	22.5	✓	
Nullagine	2	<0.003	0.020	0.010	✓	2	<0.002	<0.002	<0.002	✓	2	7.10	7.57	7.34	✓	2	27.0	33.0	30.0	✓	
Onslow	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	8.21	8.31	8.26	✓	2	75.0	75.0	75.0	✓	
Point Samson	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	8.05	8.20	8.13	✓	2	55.0	55.0	55.0	✓	
Roeboorne	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.74	8.08	7.91	✓	2	55.0	60.0	57.5	✓	
Wickham	2	<0.003	<0.003	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	8.04	8.05	8.05	✓	2	55.0	55.0	55.0	✓	
Wyndham	2	<0.003	0.004	<0.003	✓	2	<0.002	<0.002	<0.002	✓	2	7.84	8.06	7.95	✓	2	8.0	8.2	8.1	✓	

(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					TDS					True Colour					Turbidity				
	Locality	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 Value			Max Value	Mean Value	Min			Max	Mean	Min			Max	Mean	Min			Max	Mean	
Broome	2	87	98	93	✓	2	449	479	464	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Burrup LNG	2	44	46	45	✓	2	506	525	516	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Burrup Supply	2	45	48	47	✓	2	528	532	530	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Camballin	2	36	41	39	✓	2	233	248	241	✓	2	<1	1	<1	✓	2	<0.1	<0.1	<0.1	✓
Cape Lambert	2	49	55	52	✓	2	568	579	574	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Derby	2	110	140	125	✓	2	411	498	455	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Fitzroy Crossing	2	36	37	37	✓	2	379	391	385	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Halls Creek	2	125	130	128	✓	2	863	879	871	(2)	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Hedland	4	105	105	105	✓	4	647	701	678	(2)	4	<1	<1	<1	✓	4	<0.1	<0.1	<0.1	✓
Karratha	2	49	55	52	✓	2	541	552	547	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Kununurra	4	31	32	32	✓	4	417	427	421	✓	4	<1	<1	<1	✓	4	<0.1	0.2	<0.1	✓
Marble Bar	2	200	210	205	(1)	2	1097	1121	1109	(2)	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Newman	2	56	56	56	✓	2	407	491	449	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Nullagine	2	56	105	81	✓	2	480	675	578	✓	2	<1	<1	<1	✓	2	<0.1	0.5	0.3	✓
Onslow	2	55	64	60	✓	2	546	588	567	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Point Samson	2	48	54	51	✓	2	557	572	565	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Roebourne	2	44	53	49	✓	2	488	584	536	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Wickham	2	45	71	58	✓	2	531	763	647	(2)	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓
Wyndham	2	17	21	19	✓	2	106	139	123	✓	2	<1	<1	<1	✓	2	<0.1	<0.1	<0.1	✓

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