



BUSSELTON WATER

Busselton Water

Report to the Department of Health

for the period

1 July to 30 September 2023

Busselton Water
PO Box 57
Busselton WA 6280
P: (08) 9781 0500
F: (08) 9754 1075
www.busseltonwater.wa.gov.au

Submitted to:
The Advisory Committee for the Purity of Water
Busselton Water's Website
CEO, Busselton Water (David Hughes-Owen)

Table of Contents

1.0	WATER PROVIDER INFORMATION	2
1.1	System Information	2
2.0	PERFORMANCE SUMMARY	3
2.1	Treated Water – Microbiological Water Quality	3
2.2	Distributed Water - Microbiological Water Quality	4
3.0	MICROBIAL PERFORMANCE	5
3.1	Microbiological - Exception Notifications	5
3.2	Microbiological - Incident Specific Information	5
4.0	CHEMICAL – HEALTH RELATED PERFORMANCE	6
4.1	Chemical – Health Related – Exception Notifications	6
4.2	Chemical – Health Related - Chart	6
5.0	PHYSICAL AND CHEMICAL – AESTHETIC PERFORMANCE	9
5.1	Physical and Chemical - Aesthetic – Chart	9
6.0	RADIOLOGICAL PERFORMANCE	11
6.1	Radiological – Exception Notifications	11
6.2	Radiological Performance	11
7.0	PLANNED SAMPLE SUMMARY (QUARTER ENDING 30 SEPTEMBER 2023)	12
7.1	Planned Sample Exceptions	12
8.0	GENERAL NOTES / OTHER NEWS	12

1.0 Water Provider Information

Water Provider Contact Details	
Name of Company	Busselton Water
Company Address	1 Fairbairn Road, Busselton WA 6280
Company Phone	08 9781 0500
Company Email	admin@busseltonwater.wa.gov.au
Chief Executive Officer	David Hughes-Owen
DoH Liaison Officer	Chris Temple, Acting General Manager Operations

1.1 System Information

Busselton Water operates one large, interconnected water supply system with five bore sites consisting of eight active production bores, supplying three water treatment plants. Busselton Water operates its distribution system as one locality ("Busselton") and has strategically placed sampling points throughout the distribution system.

Busselton Water's water supply is sourced from bores constructed in the Leederville and Yarragadee aquifers. The raw groundwater has turbidity and total iron concentrations above the drinking water guideline limits, but these are readily removed by oxidation, aeration and filtration, and then disinfected at Busselton Water's treatment plants before distribution into the reticulation network. Significant focus and planning for growth is being applied to the establishment of an inland borefield that avoids the impacts of saltwater intrusion.

Busselton Water supplies drinking water to more than 28,000 people within the Busselton townsite and close environs such as Port Geographe, Siesta Park, Vasse and Wonnerup. Water is also supplied to the Water Corporation under a Water Supply Agreement to augment their Dunsborough supply. As a sought-after tourist destination, this figure can rise significantly during weekends and holiday periods. The average daily system demand for the reporting period was 11.3 ML/day (extracted).

2.0 Performance Summary

2.1 Treated Water – Microbiological Water Quality

Microbiological water quality analyses for treated water samples are collected downstream of the chlorinators at the water treatment plants. Compliance limits are summarised in the following table.

Samples were analysed for thermotolerant coliforms, *E. coli* and Thermophilic *Naegleria* during the period. No microbial activity in relation to these parameters was detected during the period at any of the sample locations. Busselton Water remains fully compliant with the Australian Drinking Water Guidelines (ADWG) and the Memorandum of Understanding with the Department of Health in respect to *E. coli* and *N. fowleri*¹.

Period	<i>Escherichia coli</i> (<i>E. Coli</i>)				Thermophilic <i>Naegleria</i>			<i>Naegleria Fowleri</i> ¹		
	No. of Samples	No. of Non-conforming Samples	Maximum Individual Value	Rolling 12 Months Compliance	No. of Samples	Detected	Rolling 12 Months Compliance	No. of Samples	Detected	Rolling 12 Months Compliance
Jul-23	24	0	est <1	100%	24	0	100%	0	-	100%
Aug-23	18	0	est <1	100%	18	0	100%	0	-	100%
Sep-23	20	0	est <1	100%	20	0	100%	0	-	100%
Total for Third Quarter 2023	62	0	-	-	62	0	-	0	-	-
Third Quarter 2023 Performance	100%			-	100%		-	100%		-
Required Compliance:	100%				95%			100%		

Note 1: Tests for *Naegleria Fowleri* only required if Thermophilic *Naegleria* is detected.

2.2 Distributed Water - Microbiological Water Quality

Microbiological water quality analyses for the seven locations within the distribution system are sampled weekly and are summarised in the following table.

Samples were analysed for thermotolerant coliforms, *E. coli* and Thermophilic *Naegleria* during the period. No microbial activity in relation to these parameters was detected during the three months at any of the sample locations. Busselton Water remains fully compliant with the Australian Drinking Water Guidelines (ADWG) and the Memorandum of Understanding with the Department of Health in respect to *E. coli* and *N. fowleri* ¹.

Period	<i>Escherichia coli</i> (<i>E. Coli</i>)				Thermophilic <i>Naegleria</i>			<i>Naegleria Fowleri</i> ¹		
	No. of Samples	No. of Non-conforming Samples	Maximum Individual Value	Rolling 12 Months Compliance	No. of Samples	Detected	Rolling 12 Months Compliance	No. of Samples	Detected	Rolling 12 Months Compliance
Jul-23	35	0	est <1	100%	35	0	100%	0	-	100%
Aug-23	28	0	est <1	100%	28	0	100%	0	-	100%
Sep-23	28	0	est <1	100%	28	0	100%	0	-	100%
Total for Third Quarter 2023	91	0	-	-	91	0	-	0	-	-
Third Quarter 2023 Performance	100%			-	100%		-	100%		-
Required Compliance:	100%				95%			100%		

Note 1: Tests for *Naegleria Fowleri* only required if Thermophilic *Naegleria* is detected.

Note 2: Sampling for *E. Coli* in the Distribution System commenced on 30 March 2010. There has not been an *E. Coli* detection in the Distribution System to date.

Note 3: The last known Thermophilic *Naegleria* detection in the Distribution System was at Vernon Track on 16 August 2011.

3.0 Microbial Performance

3.1 Microbiological - Exception Notifications

Microbiological Water Quality Exceptions							
Locality	Population Served	Date	Microbiological Characteristic	MoU Alert Level	Remedial Action	DoH Notified	Close Out Date
Busselton	>28,000	01/07/2023 to 30/09/2023	Nil				

3.2 Microbiological - Incident Specific Information

Microbiological Incidents				
Locality	Date of Incident	Details of Incident	MoU Alert Level	Remedial Action
Busselton	Nil			

4.0 Chemical – Health Related Performance

The results of water samples collected from the operating production bores (raw water) and at the assessable distribution sampling points (distribution water) during the period are summarised in Table 4.2 for health-related guidelines. They show that the water supply is fully compliant with the health-related Australian Drinking Water Guidelines, the operating licence issued by the ERA and the protocols of Busselton Water's Memorandum of Understanding with the Department of Health.

4.1 Chemical – Health Related – Exception Notifications

Health-Related Chemical Water Quality Exceptions							
Locality	Population served	Date	Health Related Chemical Characteristic	MoU Alert Level	Remedial Action	DoH Notified	Close Out Date
Busselton	>28,000	01/07/2023 to 30/09/2023	NIL				

4.2 Chemical – Health Related - Chart

Type	Unit	ADWG Guideline (mg/L)	Lab Limit of Reporting (mg/L)	Raw Water (Bores)			Distribution Water			
				Number Assessed	Number Complying with ADWG Guideline	Maximum Individual Value	Number Assessed	Number Complying with ADWG Guideline	Maximum Individual Value (mg/L)	Compliance (%)
Antimony	mg/L	0.003	0.001	NR			4	4	ND	100%
Arsenic	mg/L	0.01	0.001	NR			4	4	ND	100%
Barium	mg/L	2.0	0.01	NR			4	4	0.39	100%
Beryllium	mg/L	0.06	0.001	NR			4	4	ND	100%
Boron	mg/L	4.0	0.05	NR			4	4	0.24	100%

Type	Unit	ADWG Guideline (mg/L)	Lab Limit of Reporting (mg/L)	Raw Water (Bores)			Distribution Water			
				Number Assessed	Number Complying with ADWG Guideline	Maximum Individual Value	Number Assessed	Number Complying with ADWG Guideline	Maximum Individual Value (mg/L)	Compliance (%)
Bromodichloromethane	mg/L	0.25*	0.005	NR			3	3	ND	100%
Bromoform	mg/L	0.25*	0.005	NR			3	3	0.002	100%
Cadmium	mg/L	0.002	0.0005	NR			4	4	ND	100%
Chlorine (Total)	mg/L	5		NR			91	91	0.7	100%
Chloroform	mg/L	0.25*	0.0005	NR			3	3	ND	100%
Copper	mg/L	2.0	0.001	NR			4	4	0.003	100%
Dibromochloromethane	mg/L	0.25*	0.001	NR			3	3	ND	100%
Fluoride	mg/L	1.5	0.1	24	24	0.8	21	21	0.6	100%
Lead	mg/L	0.01	0.001	NR			4	4	ND	100%
Manganese (Soluble)	mg/L	0.5	0.01	24	24	0.093	21	21	ND	100%
Manganese (Total)	mg/L	0.5	0.01	24	24	0.098	21	21	ND	100%
Mercury	mg/L	0.001	0.0001	NR			4	4	ND	100%
Molybdenum	mg/L	0.05	0.001	NR			4	4	ND	100%
Nickel	mg/L	0.02	0.001	NR			4	4	ND	100%
Nitrate-N	mg/L	50	0.05	8	8	ND	NR			
Nitrite N	mg/L	3	0.05	8	8	ND	NR			
Selenium	mg/L	0.01	0.001	NR			4	4	0.002	100%
Silver	mg/L	0.1	0.001	NR			4	4	ND	100%
Total Trihalomethanes	mg/L	0.25*	0.001	NR			3	3	0.002	100%

Type	Unit	ADWG Guideline (mg/L)	Lab Limit of Reporting (mg/L)	Raw Water (Bores)			Distribution Water			
				Number Assessed	Number Complying with ADWG Guideline	Maximum Individual Value	Number Assessed	Number Complying with ADWG Guideline	Maximum Individual Value (mg/L)	Compliance (%)
Uranium	mg/L	0.02	0.001	NR			4	4	ND	100%

- Note 1:** Chlorine Total is a Busselton Water in-house test. All others are NATA accredited test results. The operating target for residual chlorine in the reticulation system is 0.4 – 0.6 mg/L. Total chlorine levels will be higher than residual levels.
- Note 2:** The average Chlorine Total level in the distribution network for the reporting period was 0.57 mg/L.
- Note 3:** The maximum Chlorine Total level of 0.7 mg/L in the distribution network for the reporting period was recorded in two locations: Thomas Street on 27 July 2023 and Spinnaker Boulevard on 21 September 2023. No adverse customer or operational impacts resulted. The aesthetic guideline value of 0.6 mg/L is exceeded on some occasions to ensure the microbiological safety of our water supply.
- Note 4:** Busselton Water does not add fluoride to the water. The naturally occurring fluoride levels vary from bore to bore. Fluoride levels in the drinking water vary with location and time and historically have fallen anywhere between 0.1 mg/L and 1.0 mg/L. The 12 month (Oct-22 to Sep-23) average Fluoride level in the distribution network was 0.8 mg/L.
- Note 5:** * The concentration of trihalomethanes, either individually or in total, in drinking water should not exceed 0.25 mg/L.

ADWG	Australian Drinking Water Guidelines
Bq/L	Becquerels per litre
CFU	colony forming units
HU	Hazen Units
mg/L	milligrams per litre
NA	Not Applicable
ND	Not Detected
NR	Not Required
NTU	Nephelometric Turbidity Units
pH	Acidity/basicity
uS/cm	Micro siemens per centimetre

5.0 Physical and Chemical – Aesthetic Performance

The results of water samples collected from the operating production bores (i.e., raw water) and at the assessable distribution sampling points (i.e., distribution water) during the period are summarised in Table 5.1 for aesthetic related guidelines. The treatment process reduces colour and iron content to below those levels specified in the Australian Drinking Water Guidelines (ADWG).

5.1 Physical and Chemical - Aesthetic – Chart

Type	Unit	ADWG Guideline	Lab Limit of Reporting (mg/L)	Raw Water (Bores)			Distribution Water			
				Number Assessed	Number Complying with ADWG Guideline	Maximum Individual Value	Number Assessed	Number Complying with ADWG Guideline	Maximum Individual Value	Compliance (%)
Alkalinity (Bicarbonate)	mg CaCO ₃ /L	No Guideline	5	8	No Guideline	200	4	No Guideline	240	No Guideline
Alkalinity (Carbonate)	mg CaCO ₃ /L	No Guideline	5	8	No Guideline	ND	4	No Guideline	ND	No Guideline
Alkalinity (Hydroxide)	mg CaCO ₃ /L	No Guideline	5	8	No Guideline	ND	4	No Guideline	ND	No Guideline
Alkalinity (Total)	mg CaCO ₃ /L	No Guideline	5	8	No Guideline	200	4	No Guideline	240	No Guideline
Aluminium (Soluble)	mg/L	0.2	0.05	8	8	ND	4	4	ND	100%
Aluminium (Total)	mg/L	0.2	0.05	8	8	ND	4	4	ND	100%
Ammonia-N	mg/L	0.5	0.02	NR			4	4	0.05	100%
Calcium	mg/L	200	0.5	NR			4	4	29	100%
Chloride	mg/L	250	5	8	8	120	NR			
Colour True	PCU	15	5	24	24	5.4	21	21	ND	100%
Electrical Conductivity	uS/cm	No Guideline	10	24	No Guideline	830	21	No Guideline		No Guideline
Filterable Reactive Phosphorus	mg/L	No Guideline	0.01	8	No Guideline	0.05	NR			
Hardness	mg CaCO ₃ /L	200	5	8	8	140	4	4	130	100%
Iron (Soluble)	mg/L	0.3	0.01	24	10	8.7	21	21	ND	100%
Iron (Total)	mg/L	0.3	0.01	24	6	9.6	21	21	0.02	100%
Magnesium	mg/L	No Guideline	0.5	NR			4	No Guideline	16	No Guideline
pH	pH	6.5-8.5		16	16	7.8	70	70	8.4	100%
Silica	mg/L	80	0.1	8	8	16	NR			
Sodium	mg/L	180	0.5	8	8	140	NR			

Type	Unit	ADWG Guideline	Lab Limit of Reporting (mg/L)	Raw Water (Bores)			Distribution Water			
				Number Assessed	Number Complying with ADWG Guideline	Maximum Individual Value	Number Assessed	Number Complying with ADWG Guideline	Maximum Individual Value	Compliance (%)
Sulfate	mg/L	250	1	8	8	22	NR			
Total Dissolved Solids	mg/L	600	5	24	23	640	21	21	460	100%
Turbidity	NTU	5		24	24	0.5	91	91	0.23	100%
Zinc	mg/L	3	0.005	NR			4	4	0.061	100%

Note 1: pH and Turbidity are Busselton Water in-house tests. All others are NATA accredited test results.

Note 2: Sampling of Total Dissolved Solids in distribution water commenced in June 2023.

Note 3: Total Dissolved Solids results vary from bore to bore and are being carefully monitored for the impacts of borefield saline intrusion.

ADWG	Australian Drinking Water Guidelines
Bq/L	Becquerels per litre
CFU	Colony Forming Units
HU	Platinum-Cobalt Units
mg/L	milligrams per litre
NTU	Nephelometric Turbidity Units
pH	Acidity/basicity
uS/cm	Micro siemens per centimetre
mg CaCO ₃ /L	milligrams per litre as calcium carbonate
ND	Not Detected
NR	Not Required
No Guideline	No ADWG guideline. Compliance is not required or shown for these analytes/

6.0 Radiological Performance

6.1 Radiological – Exception Notifications

Radiological Water Quality Exceptions							
Locality	Population served	Date	Radiological Characteristic	MoU Alert Level	Remedial Action	DoH Notified	Close Out Date
Busselton	>28,000	01/07/2023 to 30/09/2023	NIL				

6.2 Radiological Performance

Radiological performance is sampled every two years, in April. It was conducted in April 2022 and will next be undertaken in April 2024.

7.0 Planned Sample Summary (Quarter Ending 30 September 2023)

Locality	Microbiological			Physical and Chemical			Radiological			Fluoride		
	Planned	Taken	% Taken	Planned	Taken	% Taken	Planned	Taken	% Taken	Planned	Taken	% Taken
Busselton	153	153	100%	863	834	97%	Nil	Nil	N/A	45	45	100%

Note 1: Chemical testing totals shown in Table 7.0 relate to scheduled NATA and in-house sampling undertaken in accordance with Busselton Water's Water Quality Monitoring Program, which has been endorsed by the Department of Health.

7.1 Planned Sample Exceptions

Planned Sample Exceptions			
Locality	Characteristic (Microbiological/ Physical and Chemical/ Radiological)	Number of Samples	Reason for missed sample
Busselton	Physical and Chemical - Aesthetic	29	Eight raw and 21 distribution pH samples were not taken during July 2023, due to failure of the pH meter. The meter was replaced in late July which enabled the remainder of scheduled pH samples for the quarter to be taken.

8.0 General Notes / Other News

Nil.