



BUSSELTON WATER

BUSSELTON WATER
Report to the Department of Health
for the period

1 July to 30 September 2017

Busselton Water
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Submitted to:
The Advisory Committee for the Purity of Water
Busselton Water's Website
CEO, Busselton Water (Mr Chris Elliott)



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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 | Fax | 08 9754 1075 |
| Company Email | admin@busseltonwater.wa.gov.au | | |
| Chief Executive Officer | Chris Elliott | | |
| DoH Liaison Officer | Peter Addison, General Manager Operations | | |

1.1 System Information

Busselton Water operates one large interconnected water supply system with four bore sites consisting of eight 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.

Busselton Water supplies potable water to more than 26,000 customers within the Busselton townsite and close environs such as Port Geographe, Siesta Park, Vasse and Wonnerup. 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 8.57ML/day.

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.

Sixty-one samples were tested for thermotolerant coliforms, *E. coli* and Thermophilic *Naegleria* during the third quarter of 2017 (July to September). No microbial activity in relation to these parameters was detected during the three months at any of the sample locations. Busselton Water remains 100% compliant with the 2004 Australian Drinking Water Guidelines 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-17 | 25 | 0 | est <1 | 100% | 25 | 0 | 100% | 0 | - | 100% |
| Aug-17 | 16 | 0 | est <1 | 100% | 16 | 0 | 100% | 0 | - | 100% |
| Sep-17 | 20 | 0 | est <1 | 100% | 20 | 0 | 100% | 0 | - | 100% |
| Total for Third Quarter 2017 | 61 | 0 | - | - | 61 | 0 | - | 0 | - | - |
| Third Quarter 2017 Compliance | 100% | | | - | 100% | | - | 100% | | - |
| Required Compliance (ADWG 2004) (MOU 2011) | 100% | | | | 95% | | | 100% | | |

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

Note 2 Several storage tanks were off-line at various times during August 2017, for annual maintenance.

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.

Ninety-one samples were tested for thermotolerant coliforms, *E. coli* and Thermophilic *Naegleria* during the third quarter of 2017 (July to September). No microbial activity in relation to these parameters was detected during the three months at any of the sample locations. Busselton Water remains 100% compliant with the 2004 Australian Drinking Water Guidelines 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-17 | 35 | 0 | est <1 | 100% | 35 | 0 | 100% | 0 | - | 100% |
| Aug-17 | 28 | 0 | est <1 | 100% | 28 | 0 | 100% | 0 | - | 100% |
| Sep-17 | 28 | 0 | est <1 | 100% | 28 | 0 | 100% | 0 | - | 100% |
| Total for Third Quarter 2017 | 91 | 0 | | - | 91 | 0 | - | 0 | - | - |
| Third Quarter 2017 Compliance | 100% | | | - | 100% | | - | 100% | | - |
| Required Compliance (ADWG 2004) (MOU 2011) | 98% | | | | 95% | | | 100% | | |

Note 1 Tests for *N. fowleri* only required if Thermophilic *Naegleria* (TN) is detected.

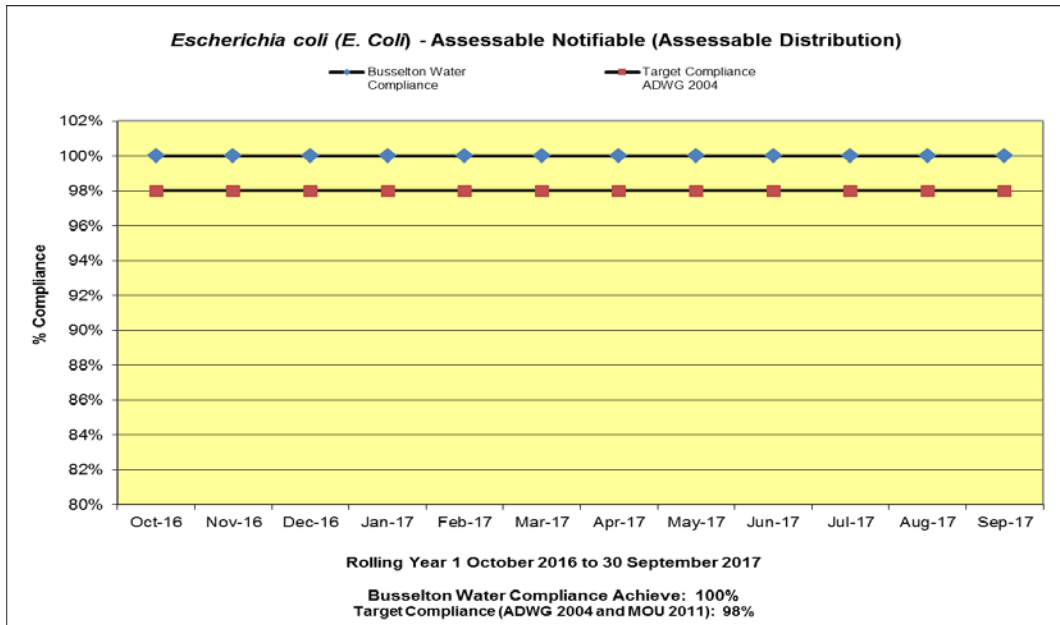
3.0 Microbial Performance (Rolling 12 Months ending 30 September 2017)

3.1 Microbiological - Exception Notifications

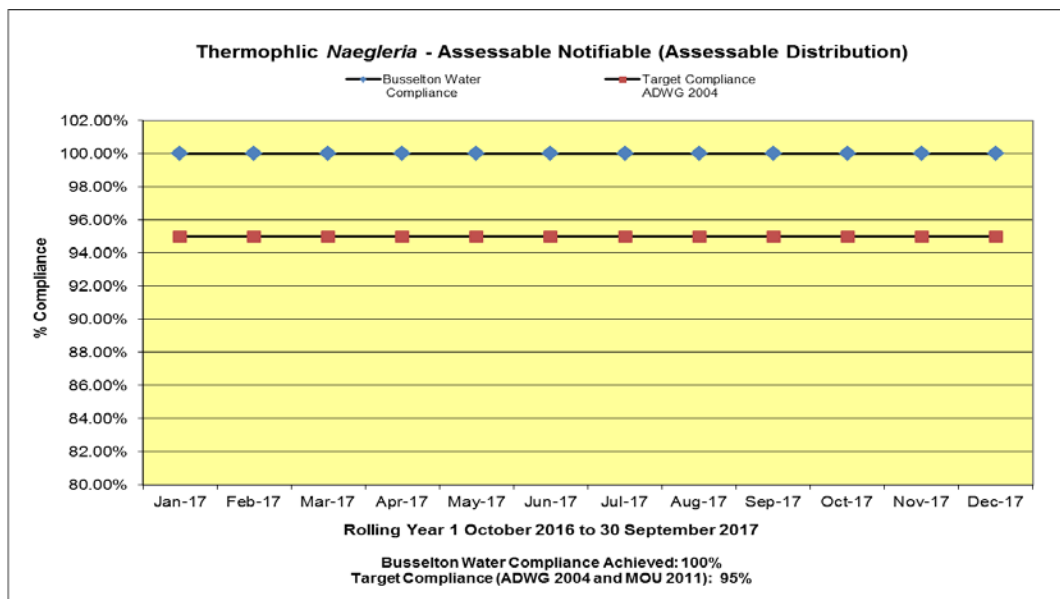
| Microbiological Water Quality Exceptions | | | | | | | |
|---|-------------------|---------------------------------|--------------------------------|-----------------|-----------------|--------------|----------------|
| Region/Scheme/ Zone/ Service Provider | Population Served | Date | Microbiological Characteristic | MoU Alert Level | Remedial Action | DoH Notified | Close Out Date |
| Busselton | >26,000 | 01/10/2016 to 30/09//2017 | | | NIL | | |

3.2 Microbiological Charts - Busselton

3.2.1 *Escherichia coli* (E. Coli) – Distribution System



3.2.2 Thermophilic *Naegleria* – Distribution System



3.3 Microbiological Incident Specific Information

| Microbiological Incidents | | | | |
|---|---------------------|---------------------|--------------------|-----------------|
| Region/Scheme/ Zone/ Service Provider | 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 third quarter of 2017 (July to September) are summarised in Table 4.2 for health related guidelines. They show that the water supply is 100% compliant with the 2004 health-related guidelines for drinking water, the operating licence issued by the ERA, the protocols of Busselton Water's Memorandum of Understanding with the Department of Health and the groundwater licence issued by the Department of Water.

4.1 Chemical – Health Related – Exception Notifications

| Health-Related Chemical Water Quality Exceptions | | | | | | | |
|--|-------------------|--------------------------|--|-----------------|-----------------|--------------|----------------|
| Region/Scheme/Zone/ Service Provider | Population served | Date | Health Related Chemical Characteristic | MoU Alert Level | Remedial Action | DoH Notified | Close Out Date |
| Busselton | >26,000 | 01/07/2017 to 30/09/2017 | | | NIL | | |

4.2 Chemical – Health Related

| Type | ADWG 2004 Limit (mg/L) | Lab Limit of Reporting (mg/L) | Raw Water (Bores) | | | Distribution Water | | | |
|-----------|------------------------|-------------------------------|-------------------|---------------------------------------|--------------------------|--------------------|---------------------------------------|-------------------------------|----------------|
| | | | Number Assessed | Number Complying with ADWG 2004 Limit | Maximum Individual Value | Number Assessed | Number Complying with ADWG 2004 Limit | Maximum Individual Value mg/L | Compliance (%) |
| Antimony | 0.003 | 0.001 | | | | 4 | 4 | ND | 100% |
| Arsenic | 0.007 | 0.001 | | | | 4 | 4 | ND | 100% |
| Barium | 0.7 | 0.001 | | | | 4 | 4 | 0.29 | 100% |
| Beryllium | - | 0.001 | | | | 4 | 4 | ND | 100% |
| Boron | 4.0 | 0.005 | | | | 4 | 4 | 0.16 | 100% |

| Type | ADWG 2004 Limit (mg/L) | Lab Limit of Reporting (mg/L) | Raw Water (Bores) | | | Distribution Water | | | |
|-----------------------|------------------------|-------------------------------|-------------------|---------------------------------------|--------------------------|--------------------|---------------------------------------|-------------------------------|----------------|
| | | | Number Assessed | Number Complying with ADWG 2004 Limit | Maximum Individual Value | Number Assessed | Number Complying with ADWG 2004 Limit | Maximum Individual Value mg/L | Compliance (%) |
| Bromodichloromethane | 0.25* | 0.0005 | NR | - | - | 3 | 3 | ND | 100% |
| Bromoform | 0.25* | 0.0005 | NR | - | - | 3 | 3 | 0.0019 | 100% |
| Cadmium | 0.002 | 0.0001 | | | | 4 | 4 | ND | 100% |
| Chlorine (Total) | 5 | | NR | - | - | 127 | 127 | 0.77 | 100% |
| Chloroform | 0.25* | 0.0005 | NR | - | - | 3 | 3 | ND | 100% |
| Copper | 2.0 | 0.001 | | | | 4 | 4 | 0.012 | 100% |
| Dibromochloromethane | 0.25* | 0.0005 | NR | - | - | 3 | 3 | 0.0013 | 100% |
| Fluoride | 1.5 | 0.1 | NR | - | - | 21 | 21 | 0.4 | 100% |
| Lead | 0.01 | 0.001 | | | | 4 | 4 | ND | 100% |
| Manganese (Soluble) | 0.5 | 0.005 | 21 | 21 | 0.091 | 21 | 21 | ND | 100% |
| Manganese (Total) | 0.5 | 0.005 | 21 | 21 | 0.092 | 21 | 21 | ND | 100% |
| Mercury | 0.001 | 0.00005 | | | | 4 | 4 | ND | 100% |
| Molybdenum | 0.05 | 0.001 | | | | 4 | 4 | ND | 100% |
| Nickel | 0.02 | 0.001 | | | | 4 | 4 | ND | 100% |
| Nitrate | 50 | 0.05 | 7 | 7 | ND | NR- | - | - | - |
| Nitrite | 3 | 0.005 | 7 | 7 | ND | NR | - | - | - |
| Selenium | 0.01 | 0.001 | | | | 4 | 4 | ND | 100% |
| Silver | 0.1 | 0.001 | | | | 4 | 4 | ND | 100% |
| Total Trihalomethanes | 0.25* | 0.0005 | NR | - | - | 3 | 3 | 0.0031 | 100% |

| Type | ADWG 2004 Limit (mg/L) | Lab Limit of Reporting (mg/L) | Raw Water (Bores) | | | Distribution Water | | | |
|---------|------------------------|-------------------------------|-------------------|---------------------------------------|--------------------------|--------------------|---------------------------------------|-------------------------------|----------------|
| | | | Number Assessed | Number Complying with ADWG 2004 Limit | Maximum Individual Value | Number Assessed | Number Complying with ADWG 2004 Limit | Maximum Individual Value mg/L | Compliance (%) |
| Uranium | 0.02 | 0.001 | | | | 4 | 4 | ND | 100% |

- Note 1** Chlorine Total is a Busselton Water in-house test. All others are 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 concentration of trihalomethanes, either individually or in total, in drinking water should not exceed 0.25 mg/L
- Note 3** Busselton Water does not add fluoride to the water. The naturally occurring fluoride levels vary from bore to bore. The maximum value shown is not indicative of the level throughout the Busselton water supply. Fluoride levels in the drinking water vary with location and time and can be between 0.03 and 0.6 mg/L.

| | |
|-------|--------------------------------------|
| ADWG | Australian Drinking Water Guidelines |
| Bq/L | Becquerel 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 third quarter of 2017 (July to September) are summarised in Table 5.1 for aesthetic related guidelines. The process of aeration and filtration reduces colour and iron content to below those levels specified in the Australian Drinking Water Guidelines 2004 (ADWG 2004).

5.1 Physical and Chemical - Aesthetic – Chart

| Type | ADWG 2004 Limit (mg/L) | Lab Limit of Reporting (mg/L) | Raw Water (Bores) | | | Distribution Water | | | |
|---------------------------------------|------------------------|-------------------------------|-------------------|---------------------------------------|--------------------------|--------------------|---------------------------------------|---------------------------------|----------------|
| | | | Number Assessed | Number Complying with ADWG 2004 Limit | Maximum Individual Value | Number Assessed | Number Complying with ADWG 2004 Limit | Maximum Individual Value (mg/L) | Compliance (%) |
| Alkalinity (Bicarbonate) | - | 5 | 7 | 7 | 210 | 4 | 4 | 170 | 100% |
| Alkalinity (Carbonate) | - | 5 | 7 | 7 | ND | 4 | 4 | ND | 100% |
| Alkalinity (Hydroxide) | - | 5 | 7 | 7 | ND | 4 | 4 | ND | 100% |
| Alkalinity (Total) | - | 5 | 7 | 7 | 170 | 4 | 4 | 140 | 100% |
| Aluminium (Soluble) | 0.2 | 0.02 | 7 | 7 | ND | 4 | 4 | ND | 100% |
| Aluminium (Total) | 0.2 | 0.02 | 7 | 7 | ND | 4 | 4 | ND | 100% |
| Ammonia | 0.5 | 0.005 | NR | - | - | 4 | 4 | ND | 100% |
| Calcium | - | 0.2 | NR | - | - | 4 | 4 | 24 | 100% |
| Chloride | 250 | 1 | 7 | 7 | 130 | NR | - | - | - |
| Colour True | 15 HU | 1HU | 21 | 21 | 5 | 21 | 21 | ND | 100% |
| Electrical Conductivity | - | 2 uS/cm | 21 | 21 | 740 | 21 | 21 | 620 | 100% |
| Filterable Reactive Phosphorus | - | 0.005 | 7 | 7 | 0.017 | NR | - | - | - |
| Filterable Reactive Phosphorus as PO4 | - | 0.01 | 7 | 7 | 0.05 | NR | - | - | - |
| Hardness (as CaCO3) | 200 | 5 | 7 | 7 | 130 | 4 | 4 | 110 | 100% |
| Iron (Soluble) | 0.3 | 0.005 | 21 | 3 | 8.1 | 21 | 21 | 0.022 | 100% |
| Iron (Total) | 0.3 | 0.005 | 21 | 3 | 8.1 | 21 | 21 | 0.022 | 100% |
| Magnesium | - | 0.1 | NR | - | - | 4 | 4 | 13 | 100% |
| pH | pH 6.5-8.5 | | 21 | 21 | 7.8 | 110 | 110 | 8.3 | 100% |
| Salinity (as Total Dissolved Solids) | 500 | 10 | 21 | 21 | 390 | NR | - | - | - |

| Type | ADWG 2004 Limit (mg/L) | Lab Limit of Reporting (mg/L) | Raw Water (Bores) | | | Distribution Water | | | |
|-------------------------------|------------------------|-------------------------------|-------------------|---------------------------------------|--------------------------|--------------------|---------------------------------------|---------------------------------|----------------|
| | | | Number Assessed | Number Complying with ADWG 2004 Limit | Maximum Individual Value | Number Assessed | Number Complying with ADWG 2004 Limit | Maximum Individual Value (mg/L) | Compliance (%) |
| Silica | 80 | 0.05 | 7 | 7 | 18 | NR | - | - | - |
| Sodium | 180 | 0.5 | 7 | 7 | 73 | NR | - | - | - |
| Sulphate | 250 | 1 | 7 | 7 | 17 | NR | - | - | - |
| Total Hardness by Calculation | 200 | 1 | 7 | 7 | 130 | 4 | 4 | 110 | 100% |
| Turbidity | 5 NTU | | 21 | 21 | 3.62 | 127 | 127 | 0.24 | 100% |
| Zinc | - | 0.005 | | | | 4 | 4 | 0.009 | 100% |

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

| | |
|-------|--------------------------------------|
| ADWG | Australian Drinking Water Guidelines |
| Bq/L | Becquerel 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 |

6.0 Radiological Performance

6.1 Radiological – Exception Notifications

| Radiological Water Quality Exceptions | | | | | | | |
|---------------------------------------|-------------------|--------------------------|-----------------------------|-----------------|-----------------|--------------|----------------|
| Region/Scheme/Zone/ Service Provider | Population served | Date | Radiological Characteristic | MoU Alert Level | Remedial Action | DoH Notified | Close Out Date |
| Busselton | >26,000 | 01/07/2017 to 30/09/2017 | | | Nil | | |

6.2 Radiological Performance

Radiological Performance is tested annually in April.

7.0 Planned Sample Summary (Quarter Ending 30 September 2017)

| Region/ Scheme/ Zone | Microbiological | | | Physical and Chemical | | | Radiological | | | Fluoride | | |
|----------------------------|-----------------|-------|---------|-----------------------|-------|---------|--------------|-------|---------|----------|-------|---------|
| | Planned | Taken | % Taken | Planned | Taken | % Taken | Planned | Taken | % Taken | Planned | Taken | % Taken |
| Busselton | 156 | 152 | 97.4% | 931 | 914 | 98.1% | Nil | Nil | N/A | 21 | 21 | 100% |

Note 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 | | | |
|----------------------------|--|----------------------|---|
| Region/ Scheme/ Zone | Characteristic (Microbiological/ Physical and Chemical/ Radiological) | Number of Samples | Reason for missed sample |
| Busselton | Microbiological | 4 | Storage tanks were emptied for annual clean and inspection. |
| Busselton | Physical and Chemical | 17 | pH meter would not calibrate. New probe purchased. |

8.0 General Notes / Other News

Nil