



# **Quarterly Drinking Water Report to the Department of Health by the Rottneest Island Authority**

**1 January – 31 March 2024**





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## 1. Water Provider Information

Rottnest Island Authority Contact Details			
<b>Name of Company</b>	Rottnest Island Authority		
<b>Company Address</b>	1 Mews Road, Fremantle WA 6160		
<b>Company Phone</b>	<b>Ph.</b> (08) 9432 9300	<b>Fax</b>	(08) 9432 9301
<b>Company Website</b>	<a href="http://www.rotnnestisland.com">www.rotnnestisland.com</a>		
<b>Company Email</b>	<a href="mailto:enquiries@rotnnestisland.com">enquiries@rotnnestisland.com</a>		
<b>Executive Director</b>	Jason Banks		
<b>Director Environment Heritage and Parks</b>	Arvid Hogstrom		
<b>Director Infrastructure</b>	Martin Mareerwa		
<b>Manager Environment and Compliance</b>	Rebecca Gabbitus		
<b>Quality and Compliance Officer (PFM)</b>	Jason Vogel		

### 1.1 System Information

#### 1.1.1 Consumers

The water demand on Wadjemup / Rottnest Island is related to tenancy and is highly seasonal, being low in winter and high in summer. During the 2022-2023 reporting period there were 729,588 visitors to the Island.

During January 2024, a total of 125,477 ferry visitor numbers were recorded with 81,259 in February 2024. Visitor numbers were not available for March 2024 at the time of reporting.

The number of beds on Rottnest Island for guests is approximately 4,320, with the average length of stay being 2 nights. In addition to this, there are approximately 150 permanent residents on Wadjemup / Rottnest Island, which also fluctuates in accordance with high and low seasons.

#### 1.1.2 Distribution System & Water Supply

The Rottnest Island distribution system is relatively small, consisting of approximately 22 km of mains. Water is supplied by six saline (seawater) bores located in the Longreach Borefield. Water abstracted from the saline bores feed into the desalination plant, where reverse osmosis (RO) occurs. Desalinated water is then disinfected through a dual chlorination system, which ensures the provision of safe drinking water to Rottnest Island customers.

The water demand on Rottnest Island is becoming more consistent throughout the year with reduced seasonal variability. Monthly consumption can range from approximately 14,000kL in July to 24,000kL in December.

Consumption levels for January 2024 were 21,388 kL, with 19,257 kL in February 2024 and 20,692 kL in March 2024. During the summer months an additional RO train is used to provide more potable water.

Rottnest Island has a combined storage capacity of 14,000 kL, which provides approximately 22 days of potable water storage at full capacity, however, water security is targeted at a minimum of seven days storage during peak periods. At the time of reporting the desalination plant is nearing its end of life with three RO trains operational producing 660 m<sup>3</sup> of potable water per day. The RIA has appointed a contractor to upgrade the existing desalination plant with two new 500 m<sup>3</sup>/day SWRO desalination trains. It is expected this work will be completed by the end of 2025. Remote locations outside the main settlement, such as the outer island ablutions, Wadjemup Lighthouse and surrounding area, are supplied with water via a tanker. The supplied water in these areas is deemed not suitable for drinking and warning signs are posted accordingly.



Figure 1 Example of Public Signage

### 1.1.3 Sampling Schedule & Procedure

Potable water sampling is carried out in accordance with the Australian Drinking Water Guidelines (ADWG) and is scheduled in accordance with the Rottnest Island *Drinking Water Quality Risk Management Plan* dated November 2022.

To respond to emerging trends, and to further ensure the safety of the drinking water quality, further monitoring or adjustment of the schedule can occur in response to:

- Risk assessment;
- New information or industry best practice;
- Guidance or specialist recommendations from Government Departments; or
- Post incident.

In addition to the sampling regime presented in the *Drinking Water Quality Risk Management Plan (2022)*, the Rottnest Island Authority (RIA) are additionally testing:

- Tanks 4 and 7, however, the data does not form part of the statistical data required for analysis in this quarterly report.
- Drinking water fountains, as recommended by the Department of Health (DoH) in 2017.
- Bromate, following testing for additional minerals and metals in 2017. Bromate was identified, and weekly sampling occurs to monitor the results.



## 2. Performance Summary

Summary of Water Quality results compared to the ADWG January – March 2024			
Parameters	No. of Analyses	No. of Analyses Complying with ADWG	No. of ADWG exceedance events
<b>Microbial</b>			
Bacterial ( <i>E.coli</i> )	59 <sup>1</sup>	59	0
Thermotolerant Coliforms	59 <sup>2</sup>	59	0
Thermophilic Amoebae	29 <sup>3</sup>	29	0
Amoeba (Thermophilic <i>Naegleria</i> )	29 <sup>4</sup>	29	0
<b>Chemical &amp; Physical</b>			
Health	319 <sup>5</sup>	319	0
Aesthetic	366 <sup>6</sup>	259	107
<b>Radiological</b>			
Gross Alpha	0	NA	NA
Gross Beta	0	NA	NA

<sup>1</sup> This number does not include Tank 7

<sup>2</sup> Ibid

<sup>3</sup> Ibid

<sup>4</sup> Ibid

<sup>5</sup> Ibid

<sup>6</sup> Ibid



## 3. Microbial Performance

During the January – March 2024 reporting period, there were no reported exceedances of microbiological parameters compared against the ADWG in the potable water distribution system.

### 3.1 Microbial – Compliance Summary

Rottnest Island Distribution System January – March 2024				
Microbial Characteristic	Memorandum of Understanding Compliance Criteria	No. of Analyses	No. of Analyses Complying with Memorandum of Understanding	% Compliance
<b>Bacterial</b>				
<i>E.coli</i>	Non-Detect	59	59	100%
Thermotolerant Coliforms	Non-Detect	59	59	100%
<b>Amoeba</b>				
Thermophilic Amoebae	Non-Detect	29	29	100%
Thermophilic <i>Naegleria</i>	Non-Detect	29	29	100%

## 4. Chemical: Health Related Performance

During the January – March 2024 reporting period no results reported in exceedance of the chemical health parameters outlined in the ADWG in the potable water distribution system, the details of which are outlined in Section 4.3.

### 4.1 Chemical: Health Related – Compliance Summary

Rottnest Island Distribution System January – March 2024					
Health Parameter	ADWG Compliance Criteria (mg/L)	No. of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG	Max Value of Analysis (mg/L)
Antimony (Sb)	0.003	24	24	100%	0.001
Bromate (BrO <sub>3</sub> <sup>-</sup> )	0.02	103	103	100%	0.019
Chlorine Total (Cl <sub>2</sub> ) <i>(in house testing Total Residual)</i>	5	104	104	100%	1.76
Copper (Cu)	2	3	3	100%	0.004
Fluoride (F)	1.5	32	32	100%	0.30
Lead (Pb)	0.01	3	3	100%	< 0.001
Nickel (Ni)	0.02	3	3	100%	0.001
Nitrate (NO <sub>3</sub> <sup>-</sup> )	50	3	3	100%	0.020
Nitrite (NO <sub>2</sub> <sup>-</sup> )	3	14	14	100%	< 0.02
Trihalomethanes (THMs)	0.25	14	14	100%	0.083

### 4.2 Chemical: Health Related – Exception Notifications

Nothing to report.

### 4.3 Chemical: Health Related Incident Specific Information

Nothing to report.

## 5. Chemical: Aesthetic Performance

### 5.1 Chemical: Aesthetic - Compliance Summary

During the January – March 2024 reporting period, there were 107 sample exceedances of chemical aesthetic parameters in the potable water distribution system, the details of which are outlined in Section 5.2.

Rottneest Island Distribution System January – March 2024					
Aesthetic Parameter	ADWG (mg/L unless stated)	No. of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG	Max Value of Analysis (mg/L)
Aluminium (Al)	0.2	3	3	100%	0.08
Ammonia (NH <sub>3</sub> )	0.5	14	14	100%	0.04
Chloride (Cl <sup>-</sup> )	250	1	1	100%	100
Chlorine Free Residual (Cl) <i>(in house testing)</i>	0.6	104	0	0%	1.51
Colour	15 (HU)	7	7	100%	< 5
Hardness (CaCO <sub>3</sub> )	200	1	1	100%	9.2
Hydrogen Sulphide	0.05	3	3	100%	< 0.05
Iron (Fe)	0.3	23	20	87%	1.60
pH	6.5 – 8.5	104	104	100%	6.94, 8.08 <sup>7</sup>
Sodium (Na)	180	95	95	100%	86
Sulphate	250	1	1	100%	1.80
TDS	600	1	1	100%	230
Turbidity	5 (NTU)	7	7	100%	0.6 (NTU)
Zinc (Zn)	3	3	3	100%	0.022

<sup>7</sup> The two numbers represent the lowest and the highest pH values measured respectively.



## 5.2 Chemical: Aesthetic – Incident Specific Information

- **Chlorine (free):** During this reporting period, 104 out of 104 recorded samples were reported with chlorine values above the ADWG aesthetic limit of 0.6 mg/L.

The ADWG state that chlorine has an aesthetic odour threshold of 0.6 mg/L, however, the reported concentrations exceeding this threshold do not pose any health risks, as all values are below the specific health guideline value of 5.0 mg/L.

The aesthetic exceedances were reported across multiple distribution sampling points over the three-month period. All results were reported well below the health limit, with the maximum value of 1.51 mg/L reported at one sampling point on 13 February 2024.

Whilst impacts to the aesthetic quality of drinking water may occur due to greater concentrations of chlorine, it is important to note that adequate disinfection is paramount for the provision of safe drinking water.

- **Iron:** There were three values in exceedance of the ADWG aesthetic limit of 0.30 mg/L. No health limit is currently available in the ADWG. The exceedances were recorded at the following dates and locations:
  - 16 January 2024: 1.20 mg/L at R12-008
  - 13 February 2024: 1.60 mg/L at R12-008
  - 12 March 2024: 0.90 mg/L at R12-008.



## **6. Radiological Performance**

Nothing to report.



## 7. Planned Sample Summary

### 7.1 Planned Sample – Compliance Summary

Planned Samples January to March 2024								
Microbial			Chemical			Radiological		
Planned <sup>8</sup>	Taken <sup>9</sup>	% Taken	Planned	Taken	% Taken	Planned	Taken	% Taken
177	177	100%	689	686	99.56%	0	0	NA

### 7.2 Planned Sample - Exception Notifications

On 6 February 2024 sample point R12-004 (Bathurst) was inaccessible due to plumbing work nearby therefore samples were not taken from that location on that date. Samples were missed to test for bromate, sodium and electrical conductivity.

<sup>8</sup> A planned sample is defined as being included in the sampling schedule for this reporting period.

<sup>9</sup> A taken sample in the physical sample taken for this reporting period.



## 8. Customer Complaints

Nothing to Report.

## 9. Comments

### 9.1 Bromate Management

The RIA continues to monitor and manage bromate formation across the distribution network based on the decision from the Quarterly Meeting held between the RIA, PFM and DoH on 26 September 2019. Bromate is tested weekly at locations R12/001 – R12/008, Tank 4 and the Homestead. Bromide is tested weekly at Tank 7.

### 9.2 Drinking Fountain Monitoring Initiative

The RIA commenced a drinking fountain monitoring initiative in December 2017 following a recommendation from DoH. Results obtained from the sampling program supported the island’s drinking fountain replacement project, which included the replacement of all existing drinking fountains and the addition of new amenities around the settlement.

The drinking fountain monitoring program and sampling results are reported separately to the distribution system or network. The drinking fountain results are represented in the below table for the January – March 2024 quarter. Drinking fountain sampling occurs once every four weeks. There were no exceedance events this quarter.

Rottnest Island Drinking Fountain January – March 2024					
Health Characteristic	ADWG (mg/L)	No. of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG	Max Value of Analysis (mg/L)
Antimony (Sb)	0.003	66	66	100%	< 0.001
Cadmium (Cd)	0.002	66	66	100%	< 0.0001
Copper (Cu)	2	66	66	100%	0.160
Lead (Pb)	0.010	66	66	100%	0.006
Nickel (Ni)	0.02	66	66	100%	0.009
Aesthetic Characteristic	ADWG (mg/L)	No. of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG	Max Value of Analysis (mg/L)
Zinc (Zn)	3	66	66	100%	0.540

#### 9.2.1 Drink Fountain Exemption Notifications

Nothing to report.

## 9.3 Ad Hoc Monitoring

There was one ad hoc sample taken during this quarter on 16 January 2024 from the water main near the Homestead. This was taken to assess the bromate concentration in the water main before it reached the Homestead building. The sample returned a bromate concentration of 0.006 mg/L.

## 9.4 Other Sampling

### 9.4.1 Homestead

PFM commenced monthly sampling of a potable water storage tank installed at the Rottnest Island Homestead shortly after its installation in November 2022. Currently the Homestead water tank is sampled weekly for bromate and monthly for microbiological parameters.

During the reporting period there were eight bromate exceedances reported at the Homestead Water storage tank. In accordance with the Rottnest Island Flushing Plan and the Drinking Water Emergency Response Protocol 10, the following actions took place after every exceedance event was reported:

- The tank was flushed until empty upon receiving the laboratory report.
- Monitoring of weekly samples continued.
- CCPs were checked. The reverse osmosis and chlorination stations were all performing within desired limits.

Previous investigations into bromate exceedances have concluded that prolonged retention of chlorinated water increases bromate concentration. The Homestead is at the furthest limit of the distribution network so the water that arrives there has had a relatively long retention time in the pipework. This is made worse because the Homestead is now the only point of supply on the gravity fed water line since Kingstown was disconnected and connected to the pressure main.

Given the continuation of bromate exceedances reported at the homestead during the reporting period, "Do Not Drink" signs were placed within the Homestead building at all water outlets and a mobile water trailer containing potable water was mobilised to the Homestead to provide drinking water.

On 28 February a 50 kL water storage tank was installed at the Homestead to replace the 2 kL tank. This new tank is connected to the pressurised water main that feeds the Kingstown Barracks area to provide the Homestead with water that has had less retention time in the network. Bromate reported below the ADWG limit in the next two consecutive weekly samples at 0.009 mg/L on 28 February 2024 and at 0.013 mg/L on 5 March 2024. The exceedance in bromate event was closed out, DoH was notified and "do not drink" sign removed as per Drinking Water Response Protocol 10.



Other Sampling Exceedances				
January – March 2024				
Date	Location	Parameter	Australian Drinking Water Guideline limit	Result
02 January 2024	Homestead	Bromate	0.020 mg/L	0.036 mg/L
09 January 2024				0.034 mg/L
16 January 2024				0.064 mg/L
23 January 2024				0.034 mg/L
30 January 2024				0.036 mg/L
06 February 2024				0.120 mg/L
13 February 2024				0.041 mg/L
20 February 2024				0.031 mg/L