



ROTTNEST IS

PROGRAMMED
Facility Management

Programmed Facility Management

for the

Rottnest Island Authority

Annual Drinking Water Report

Rottnest Island Authority

July 2019 – June 2020





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Foreword

The Rottnest Island Authority is committed to providing high quality drinking water that consistently meets the Australian Drinking Water Guidelines (ADWG), other regulatory requirements and consumer expectations in a sustainable way. Further details on Rottnest Island Authority's commitment to Drinking Water Quality can be reviewed under [Rottnest Island Drinking Water Quality Policy](#) on the Rottnest Island website.

The [Rottnest Island Management Plan 2020-24](#), Drinking Water Source Protection Plan, and Groundwater Licence Operating Strategy reflect this commitment and contain the strategies, procedures and processes to meet this objective.

Programmed Facility Management (PFM) continues to operate the major facilities and delivers other services on behalf of the Rottnest Island Authority (RIA). Management of the water network is a component of the utilities services performed by PFM, which includes the production, distribution and monitoring of drinking water.

The 2019-20 Annual Water Quality Report shows that the RIA and PFM have remained consistent with previous years' performance in the management of the Drinking Water supply on Rottnest Island.

Submission Approval

This Annual Report describes Rottnest Island's drinking water quality performance for the 2019-20 reporting period. The Rottnest Island Authority is committed to being transparent on its performance by providing the public with accurate and representative information in this report. The report aims to demonstrate to island customers and visitors, the ongoing commitment to the sustainable production and supply of high-quality drinking water on Rottnest Island.



Acronyms

ADWG	Australian Drinking Water Guidelines	The Australian Drinking Water Guidelines provides a framework for management of drinking water supply.
DoH	Department of Health	The Department of Health oversee compliance of Western Australia's health system.
DWQMP	Drinking Water Quality Management Plan	The Drinking Water Quality Management Plan describes how the production, distribution and monitoring of drinking water is managed on Rottnest Island.
HU	Hazen Unit	A Hazen unit is a measurement of colour
kL	Kilolitre	A kilolitre is a unit of volume in the metric system.
km	Kilometre	A kilometre is a unit of length in the metric system.
mg/L	Milligrams per litre	Milligrams per litre is the mass of a chemical per unit volume of water.
mg-NO ₂ /L	Milligrams of nitrite per litre of water	Milligrams per litre is the mass of nitrite per unit volume of water.
mg-NO ₃ /L	Milligrams of nitrate per litre of water	Milligrams per litre is the mass of nitrate per unit volume of water.
ML	Megalitre	A megalitre is a unit of volume in the metric system.
MoU	Memorandum of Understanding	A memorandum of understanding is an agreement between two or more parties.
NTU	Nephelometric	A Nephelometric Turbidity Unit is a measurement of turbidity
PFM	Programmed Facility Management	Programmed Facility Management (ABN 23001382010) is contracted to manage drinking water supply on Rottnest Island
RIA	Rottnest Island Authority	Rottnest Island Authority is a statutory body who manage Rottnest Island.
TDS	Total Dissolved Solids	Total Dissolved Solids is a measurement of inorganic salts and organic matter dissolved in water
ug/L	Micrograms per litre	Micrograms per litre is a unit of volume in the metric system.



1. Introduction

Rottnest Island is located 19 km west of Fremantle, Western Australia, and is 11 km long and 4.5 km at its widest point. The total land area measures approximately 1,900 hectares and is managed by the Rottnest Island Authority (RIA). The island is a Class A Reserve and a popular destination for local, interstate and international visitors.

Water production facilities include saline groundwater bores, desalination plant, potable water storage tanks, and distribution system. The distribution and supply to customers is via a reticulated network. Programmed Facility Management is contracted by the Rottnest Island Authority to manage the production, distribution and monitoring of the drinking water supply to customers, Rottnest Island residents, visitors and visitors.

The primary source of drinking water on Rottnest Island processed through the desalination plant is the six saline production bores located within the Longreach Borefield. Should abnormal operating conditions occur, Rottnest Island has the capability to source additional water from a freshwater aquifer known as the Wadjemup Borefield (Ground Water Licence GWL172015(2)-Department of Water 2015-2025). Abstraction from the Wadjemup Borefield will only be undertaken in emergency situations, up to 6000 kL, to minimise impact to Rottnest Island diverse environmental requirements (RIA Sustainability Action Plan 2018-2024).

1.1 Policy and Commitment

The Rottnest Island Authority (RIA), and workers, are committed to the effective management of the drinking water; providing safe, high quality drinking water supply to consumers on Rottnest Island.

RIA Drinking Water Quality Policy 2018 is to:

- Manage water quality at all points along the delivery chain from source water to the consumer;
- Use a risk-based approach in which potential threats to water quality are identified and balanced;
- Integrate the needs and expectations of our consumers, stakeholders, regulator and employees into our planning;
- Establish regular monitoring of the quality of drinking water and effective reporting mechanisms to provide relevant and timely information, and promote confidence in the water supply and its management;
- Develop appropriate contingency planning and incident response capability;
- Continually improve our practices by assessing performance against corporate commitments and stakeholder expectations; and
- Ensure that when contracting parties to provide drinking water services on behalf of Rottnest Island Authority that the parties are contracted to deliver on these policy objectives.

Programmed Facility Management as the contracted Facilities Manager is responsible for the safe delivery of drinking water and maintaining effective systems for managing drinking water quality and risks, ensuring compliance requirements are aligned with the documented controls and approved Rottnest Island Authority Drinking Water Quality Management Plan (DWQMP).



The objective of the Rottneast Island Authority Drinking Water Quality Policy is to provide safe, high quality drinking water that consistently meets *Australian Drinking Water Guidelines*, consumer and other regulatory requirements.

A copy of the [RIA Drinking Water Quality Policy](#) can be downloaded from the Rottneast Island Authority website.

1.2 Drinking Water Quality Management

The Drinking Water Quality Management Plan is the principal framework document used by Rottneast Island Authority and Programmed Facility Management to implement the effective management of the drinking water distribution system on Rottneast Island. The Drinking Water Quality Management Plan forms part of the Memorandum of Understanding between the Rottneast Island Authority and the Department of Health and is supported by the drinking water binding protocols. The Drinking Water Quality Management Plan Framework also includes the Drinking Water Incident Response Protocols and other statutory documentation required to ensure compliance with the Australian Drinking Water Guidelines.

A copy of the 2019 [Memorandum of Understanding](#) is available to view on the Rottneast Island Authority website.

The Australian Drinking Water Guidelines are published and updated by the National Health and Medical Research Council, Australia's peak health research body on Australian Drinking Water. The Australian Drinking Water Guidelines are the national standard for Australian Drinking Water; requiring a risk management framework to be established for the effective management of drinking water supplies in Australia.

The Australian Drinking Water Guidelines can be downloaded from:

<https://www.nhmrc.gov.au/guidelines/publications/australian-drinking-water-guidelines>

A key aspect of the Australian Drinking Water Guidelines is a risk management approach. This approach is aimed at ensuring the Australian Drinking Water Guidelines are achieved from the water source, to points of consumption. This ensures, and requires, that there is a monitoring program established with appropriate sampling points throughout the distribution system, whilst providing a robust tool for identifying preventative and corrective actions for the improvement of water quality.

The Australian Drinking Water Guidelines recognise the significance of a preventative, multi-barrier approach for the protection of public health in drinking water supplies and have incorporated a framework for management of drinking water quality. The framework presented in the Australian Drinking Water Guidelines includes twelve elements considered good practice in the systematic management of drinking water supplies.

A Drinking Water Quality Management Plan has been developed for Rottneast Island, utilising the elements within the Australian Drinking Water Guidelines – Framework for the Management of Drinking Water Quality.

The Drinking Water Quality Management Plan is an important requirement of the Memorandum of Understanding, and has included a detailed risk assessment for each element of the system including:

- Wadjemup (freshwater) and Longreach (saline) Borefield.
- Desalination Plant
- Storage Tanks
- Treatment System (Chlorination)



- Pumping System
- Distribution and Reticulation system
- Water sampling and monitoring points

To ensure that the production, monitoring, supply and management of Rottnest Island's drinking water supply continues to remain of high quality, the Drinking Water Quality Management Plan is reviewed at set frequencies.


Where changes are made to the Drinking Water Quality Management Plan, these will be presented within subsequent Quarterly and Annual Drinking Water Reports.

1.3 Memorandum of Understanding

April 2012 saw the commencement of a Memorandum of Understanding (MoU) between the Department of Health and Rottnest Island Authority. This commitment to the Memorandum of Understanding by both parties ensures a strong cooperative relationship for the management of drinking water and the protection of public health. This Memorandum of Understanding was updated and re-signed by the Rottnest Island Authority and the Department of Health in December 2019.

Another important component of the Memorandum of Understanding is the requirement for the Licensee (Rottnest Island Authority) to notify the Department of Health of the provision of other forms of water supply. That is, the supply of water not intended for drinking purposes. The specific items pertaining to management of this commitment as described within the Memorandum of Understanding, and how these items are complied with on Rottnest Island, are detailed within the table overleaf. Primarily, provision of non-potable water on Rottnest Island occurs for the toilet facilities at the western end of Rottnest Island.



Memorandum of Understanding and the Provision of Non-Drinking Water on Rottnest Island	
MOU	Rottnest Island Authority Provision
Ensure advice is given to customers and their tenants or visitors that this water supply is not to be used for drinking or food preparation.	Where water provided is unsuitable for drinking/food preparation, public signage has been installed. Example provided below. 
Annual requirement by way of written reminders of water quality. Inspections to ensure affected taps are labelled with “non-drinking water”.	Water quality is reported annually and quarterly. Points have been labelled where the water provided is unsuitable for drinking.
If the Licensee provides non-drinking water to open public space areas, accessible to general public or via standpipes, then adequate signage advising “not suitable for drinking” is required.	Where non-drinking water is used in public open spaces, and areas accessible to the general public, appropriate signage has been installed clearly stating non-drinking water is in use.



2. Water Provider Information

Rottnest Island Authority Contact Details	
Name of Company	Rottnest Island Authority
Company Address	1st Floor E – Shed, Victoria Quay, Fremantle WA 6160
Company Phone	Ph (08) 9432 9300 Fax (08) 9432 9301
Company Website	www.rotnnestisland.com
Company Email	enquiries@rotnnestisland.com
A/Executive Director	Jason Banks
Director Environment Heritage and Parks	Arvid Hogstrom
Manager Environment, Sustainability and Compliance	Shane Kearney
Island Operations Manager (PFM)	John McManus

2.1 System Information

2.1.1 Consumers

Water demand is highly seasonal and directly related to tenancy and visitation to Rottnest Island. Typically, consumption is low in winter and high in summer.

The number of beds on the island for visitors totals 2,150, with the average length of stay being 3.5 nights. In addition, there are approximately 150 permanent residents on the island, however this value fluctuates with seasonal staffing demands.

In a typical year Rottnest Island experiences an average low season minimum between June-August and an average high season maximum between December – February. Due to the COVID-19 Pandemic only 727,000 visits were made to Rottnest Island for this reporting period, down from 785,000 from the previous year.

The Island was officially closed to visitors from the 24th March 2020 and reopened to the public on 6th June 2020. During this time only essential Island staff travelled to the Island. The peak visitation period for this reporting year was November 2019 to January 2020 with approximately 74,000 to 95,000 visitors per month during this period.

During the Island closure some of the accommodation units were used for self-isolation purposes for travellers returning from overseas. On the 30th March, 198 passengers on board the cruise ship, Vasco De Gama, were transferred to Rottnest Island for 14 days isolation and were returned to Fremantle on the 13th April. Approximately two weeks later, 196 travellers from South Africa stayed on Rottnest Island to self-isolate from 30th April to 14th May 2020.



Prior to reopening on the 6th June 2020, the RIA developed an Island restart Program for Drinking Water to ensure drinking water was compliant with the Australian Drinking Water Guidelines. This program included flushing of the potable water lines from all accommodation units, sampling of potable water from the potable water sampling points and maintenance performed on the drinking water fountains. This document followed the guidelines “Building recommissioning – water supply and water related services”.

The number of beds on Rottnest Island for guests is approximately 2,150, with the average length of stay being 3.5 nights. In addition to this, there are approximately 150 permanent residents on Rottnest Island, which also fluctuates in accordance with high and low seasons. However, due to the outbreak of the Coronavirus Pandemic the number of staff and permanent residents living on Rottnest Island has reduced.

Reduced number of visitors and closure of the drinking water fountains were the two key COVID-19 related impacts with respect to the drinking water quality operations.

2.1.2 Distribution System & Water Supply

The drinking water quality parameters are regularly monitored by the PFM Quality and Compliance Officer and hydraulic technicians to ensure that drinking water produced on Rottnest Island meets the requirements of the Australian Drinking Water Guidelines. A graphical representation of the drinking water distribution system is provided in Figure 1.

During the reporting period, 471,358 kL of saline groundwater were abstracted from the Longreach Borefield . (Ground Water Licence GWL177495(1) – Department of Water 2015-2025) for desalination purposes. No water abstracted from the Wadjemup Borefield was used to supplement the potable water system.

The water demand on Rottnest Island is highly seasonal, with monthly consumption ranging from approximately 14,000 kL in July (low season) to 22,000 kL in January (peak season). During the 2019-20 reporting period, the lowest monthly consumption period was during the Island closure period April to early June 2020. The combined storage capacity of the drinking water infrastructure is around 14.5 ML, which provides approximately 22 days’ worth of potable water storage at full capacity. Water security is targeted at a minimum of seven days storage during peak periods.

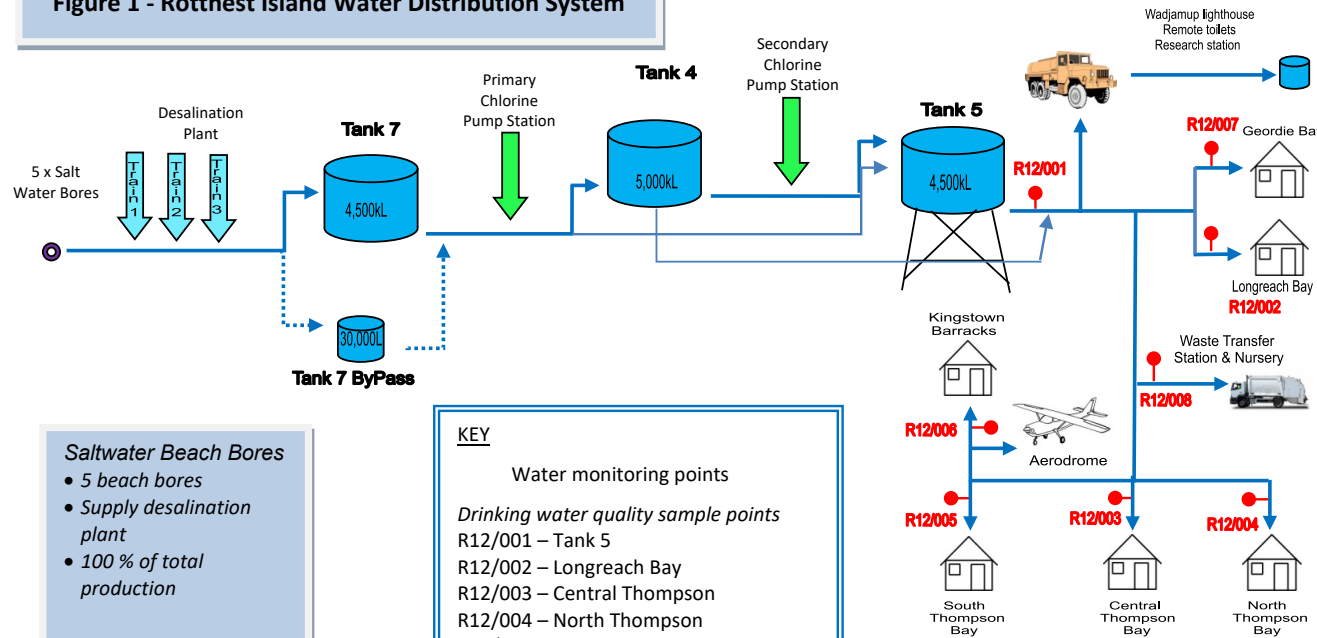
2.1.3 Sampling Schedule & Procedure

The Drinking Water Quality Management Plan details a comprehensive sampling schedule developed by a specialist consultant based on a risk management strategy and adopted by the RIA and PFM. The schedule includes eight nominated sampling points throughout the distribution system. The nominated sample points allow for fair representation of the water supply on Rottnest Island.

The sampling locations are shown in Figure 1 – Rottnest Island Water Distribution System and Figure 2 – Map of the Sampling Locations.

Sampling and in-house monitoring procedures are carried out in accordance with best industry practice and executed by qualified hydraulics technicians. Nominated samples in the sampling schedule are analysed by a NATA accredited laboratory in accordance with the requirements of the Department of Health.

Figure 1 - Rottnest Island Water Distribution System



Saltwater Beach Bores

- 5 beach bores
- Supply desalination plant
- 100 % of total production

KEY

- Water monitoring points
- Drinking water quality sample points
- R12/001 – Tank 5
 - R12/002 – Longreach Bay
 - R12/003 – Central Thompson
 - R12/004 – North Thompson
 - R12/005 – South Thompson
 - R12/006 – Kingstown Barracks
 - R12/007 – Geordie Bay
 - R12/008 – Nursery

Treatment Systems

- Filtering of saltwater to remove particulate matter
- Reverse osmosis (RO) desalination plant
- Three RO trains can produce 273,000kL/annum (750kL/day)
- Calcite filter after RO plant

Disinfection

- Chlorine gas is a primary & secondary disinfection
- Dose before & after tank 4

Quality Issues

- Saltwater bores subject to iron bacteria contamination
- Increased contact time with Chlorine can form Bromate

Demand

- 750,000 visitors annually
- Monthly consumption 14,000 – 22,000kL
- Winter demand 250kL/day
- Summer demand 750kL/day

Storage

- Combined total potable operational tank capacity is 14,000 kL
- Treated disinfected water is stored in Tank 5
- Maintain 7 days storage
- Maximum resistance time to maintain residual chlorine level 4.5 days
- Winter actual resistance time 115 days
- Summer actual resistance time 38 days
- Tank 5 must be closely controlled to maintain residual chlorine levels

Distribution System

- Gravity fed from Tank 5
- Bulk cartage to Wadjemup lighthouse tank, remote toilets & UWA house.
- Waste transfer station & Nursery site used for rubbish truck wash down facility and irrigation, is now monitored
- Remote water tanks not suitable for drinking are signed accordingly
- Can bypass Tank 7 through Tank 7 Bypass.
- Potential to feed gravity feed from tank 4



Figure 2 - Map of the Sampling Locations



3. Microbial Performance

The results in Section 3.1 summarise the outcome of microbial characteristics monitored during the 2019-20 period. 100% compliance was reported at the eight nominated sampling points in 2019-20 maintaining the compliance rate set in 2018-19.

3.1 Microbial – Compliance Summary

Rottnest Island Distribution System 2019 – 20				
Microbial Characteristic	Memorandum of Understanding Compliance Criteria	No. of Analyses	No. of Analyses Complying with Memorandum of Understanding	% Compliance
Bacterial				
<i>E.coli</i>	Non Detect	267	267	100%
Amoeba				
Thermophilic <i>Naegleria</i>	Non Detect	107	107	100%

3.2 Microbial Incident Specific Information

There were no recorded microbial non-conformances for *E.coli*, thermotolerant coliforms or thermophilic *Naegleria* at the eight nominated sample points during the 2019-20 reporting period.

4. Chemical: Health Related Performance

The results in Section 4.1 summarise the outcome of health characteristics monitored during the 2019-20 reporting period.

The health characteristics monitored within the eight nominated sampling points recorded 99% overall compliance with the Australian Drinking Water Guidelines. The reported exceedances were related to the presence of bromate in the drinking water system.

Specific details are described in the below section 4.2 Health Related Incident Specific Information.

4.1 Chemical: Health Related – Compliance Summary

Rottnest Island Distribution System 2019 - 20					
Health Characteristic	Australian Drinking Water Guidelines (mg/L)	No. of Analyses	No. of Analyses Complying with Australian Drinking Water Guidelines	% Compliance with Australian Drinking Water Guidelines	Max Value of Analysis (mg/L)
Antimony (Sb)	0.003	104	104	100%	<0.005
Bromate (BrO ₃ ⁻)	0.02	437	434	99%	0.022
Cadmium (Cd)	0.002	16	16	100%	<0.0002
Chlorine Total (Cl ₂)	5	188	188	100%	1.46
Copper (Cu)	2	17	17	100%	0.02
Fluoride (F)	1.5	96	96	100%	<0.5
Lead (Pb)	0.01	17	17	100%	<0.001
Manganese (Mn)	0.5	19	19	100%	<0.005
Nickel (Ni)	0.02	17	17	100%	<0.001
Nitrate (NO ₃) (Nitrate as nitrate)	50 mg-NO ₃ /L	22	22	100%	0.11
Nitrite (NO ₂)	3 mg-NO ₂ /L	46	46	100%	<0.02
¹ Trihalomethanes (THM)	0.25	46	46	100%	0.038

Notes:

¹Trihalomethanes can be present in drinking water as a by-product of chlorination or chloramination. Chlorine is the only source of disinfection currently used on Rottnest.

4.2 Chemical: Health Related Incident Specific Information

The health characteristics sampled during the 2019-20 reporting period returned continued improved results compared to those taken during the 2018-19 period, returning 3 exceedances compared with 12 exceedances in the previous reporting period.

Bromate testing was added to the agreed sampling schedule in the 2017-18 reporting period. This followed a request from the Department of Health to participate in a voluntary monitoring program for bromate. Rottneest Island Authority and Programmed Facility Management continue to manage bromate formation, with regular flushing as the most successful measure to reduce bromate formation, along with optimisation of chlorination and tank levels. The Department of Health recommend for bromate to be included in the regular sampling program, and exceedances no longer appear in the distribution system. RIA manage bromate through proactive and reactive management:

Proactive

- Close monitoring of tank levels, water retention times and their relationship with bromate formation. The holding time in pipes is believed to be a contributing factor in the production of bromate in the drinking water system.
- Avoidance of excessive chlorination and oxidation of bromide to bromate by optimising chlorine levels in the storage tanks before distribution in the water network.
- Regular maintenance and replacement of membranes, which improves the quality of the permeate, in turn lowering bromide levels.

Reactive

- Flushing regime – Flushing of the distribution system when the bromate levels are reported approximately 25% below the limit set out in the ADWG.

5. Chemical: Aesthetic Related Performance

5.1 Chemical: Aesthetic – Compliance Summary

The following table summarises the outcomes for Rottneast Island Authority Distribution System, for specific aesthetic related characteristics during the 2019-20 reporting period.

Rottneast Island Distribution System 2019 - 20					
Aesthetic Characteristic	Australian Drinking Water Guidelines (mg/L)	No. of Analyses	No. of Analyses Complying with Australian Drinking Water Guidelines	% Compliance with Australian Drinking Water Guidelines	Max Value of Analysis (mg/L)
Aluminium (Al)	0.2	12	12	100%	<0.05
Ammonia (NH ₃)	0.5	46	46	100%	0.03
Chloride (Cl ⁻)	250	4	4	100%	160
Chlorine (Cl ₂) Free Residual	0.6	188	20	11%	1.45
Colour	15 (HU)	26	26	100%	2
Hardness (CaCO ₃)	200	4	4	100%	14
Iron (Fe)	0.3	112	111	99%	3.8
pH	6.5 - 8.5	128	121	95%	10
Sodium (Na)	180	437	437	100%	120
Sulphate (SO ₄ ²⁻)	250	4	4	100%	<5
Hydrogen Sulphide (H ₂ S)	0.05	14	14	100%	<0.05
TDS	600	4	4	100%	570
Turbidity	5 (NTU)	27	27	100%	1.3
Zinc (Zn)	3	17	17	100%	0.035

5.2 Chemical: Aesthetic Incident Specific Information

Whilst exceedances of aesthetic guidelines can affect consumer experience, it is important to note that exceedances to aesthetic guidelines refer only to palatability to consumers, including appearance, taste and odour.

There were several instances where analytical results exceeded the aesthetic guidelines for chemical and physical properties as follows:

- **Chlorine:** 168 out of 188 samples reported chlorine concentrations above the Australian Drinking Water Guidelines aesthetic value of 0.6 mg/L, with the highest concentration reported at 1.45 mg/L in February 2020. The Australian Drinking Water Guidelines states 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 values are below the specific health guideline value of 5 mg/L.

Whilst impacts to 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. No complaints were recorded during the year with regards to odour.

- **Iron:** 1 of the 112 samples recorded iron concentrations above the Australian Drinking Water Guidelines aesthetic value of 0.3 mg/L, with the highest concentration reported at 3.8 mg/L at R12/007 in November 2019. This was likely due to upstream pipework maintenance occurring in the area prior to sampling and was the only iron exceedance experienced at the designated sampling points.

Iron has a taste threshold of 0.3 mg/L in water, and becomes objectionable above 3 mg/L.

Three complaints were received regarding iron staining and the colour of water in residential housing and accommodation units in December 2019. This issue was addressed using flushing with long-term plans to update the aging pipeline infrastructure in affected areas.

- **pH:** 7 of 128 samples reported pH values outside the Australian Drinking Water Guidelines aesthetic pH range of 6.5 - 8.5. The exceedances for the 2019-20 period were at the following locations:

R12/002 September 2019 and May 2020, reported a pH of 10, 1.5 pH units above the Australian Drinking Water Guideline upper limit.

R12/004, R12/006 and R12/008 December 2019, all reported pH values below the 6.5 lower limit. These values ranged from 5.9 to 6.2.

R12/001 reported values under the 6.5 lower limit twice in April 2020. Both values were reported as 6.4.

To manage reactive upper limit pH values, flushing is implemented at specific flushing points within the potable water distribution line at the instruction of the RIA.

6. Special Interest Performance

6.1 Compliance Summary for Drinking Fountains

The following table summarises the outcomes for the Drinking Water Quality Monitoring Program completed at the Rottnest Island drinking fountains. This program monitors health and aesthetic related characteristics during the 2019-20 reporting period. The frequency of sampling of the drinking fountains changed from fortnightly to monthly from January 2020. This change was based on no exceedances for the preceding 12 months.

It is important to note that the drinking fountains were isolated and closed to public use on the 24th March 2020 due to the COVID-19 pandemic. Drinking fountains were not sampled monthly from that date to the end of the reporting period except for the 2nd June 2020, where drinking fountains were included in the Island restart sampling program.

Health - Rottnest Island Drinking Fountain Network 2019 – 20					
Health Characteristic	Australian Drinking Water Guidelines (mg/L)	No. of Analyses	No. of Analyses Complying with Australian Drinking Water Guidelines	% Compliance with Australian Drinking Water Guidelines	Max Value of Analysis (mg/L)
Antimony (Sb)	0.003	245	245	100%	<0.005
Cadmium (Cd)	0.002	245	245	100%	<0.0002
Lead (Pb)	0.01	245	245	100%	0.003
Nickel (Ni)	0.02	245	245	100%	0.004

There were no health exceedances for this reporting period.



Aesthetic - Rottnest Island Drinking Fountain Network 2019 – 20					
Aesthetic Characteristic	Australian Drinking Water Guidelines (mg/L)	No. of Analyses	No. of Analyses Complying with Australian Drinking Water Guidelines	% Compliance with Australian Drinking Water Guidelines	Max Value of Analysis (mg/L)
Copper (Cu)	1	245	245	100%	0.11
Zinc (Zn)	3	245	245	100%	0.29

As part of the reopening of the drinking fountains to public use in June 2020, the drinking fountains were sampled for microbial characteristics. All drinking fountains returned non-detect results for Total Coliforms, *E.coli* and Faecal Coliforms. Despite the drinking fountains returning results within the Australian Drinking Water Guideline limits, the drinking fountains remained closed to public use for the remainder of the reporting period.

7. Radiological – Performance

Radiological sampling for gross alpha and gross beta is required every two years. The results in Section 7.1 summarise the outcome of radiological characteristics monitored during the 2019-20 reporting period.

7.1 Radiological – Compliance Summary

Biennial testing for gross alpha and gross beta occurred in November 2019 at the eight distribution sampling locations. There were no exceedances identified for Gross Alpha and Gross Beta.

Rottnest Island Distribution System 2019-20					
Radiological Characteristic	Australian Drinking Water Guidelines (Bq/L)	No. of Analyses	No. of Analyses Complying with Australian Drinking Water Guidelines	% Compliance with Australian Drinking Water Guidelines	Max Value of Analysis (Bq/L)
Gross Alpha	0.5	8	8	100%	0.016
Gross Beta	0.5	8	8	100%	0.035

8. Pesticides

Rottnest Island is a Class A Reserve and maintains certification as a sustainable destination from Earth Check. As part of Rottnest Island commitment to providing a sustainable environment, pesticide usage is minimised and applied in a controlled manner on Rottnest Island. Rottnest Island Authority plan to complete a sample set in the next water reporting period (July 2020 to June 2021) in line with the Department of Health *'Pesticides Monitoring Exclusion Policy' (2018)* and Binding Protocol 2 from the MOU between RIA and DoH.

9. Customer Service & Notifiable Incidents

9.1 Customer Service Charter

The Rottnest Island Authority Customer Service Charter sets out the principal terms and conditions upon which the Rottnest Island Authority intends to provide water services to its customers, in accordance with the license issued by the Economic Regulation Authority under the *Water Services Act 2012*.

The charter informs the customers of Rottnest Island of their rights in accordance with the provisions of the license, including service interruptions, levels of service, and complaint procedures.

A copy of the operating license is available on request from the RIA or from the Economic Regulation Authority.

9.2 Customer Complaints

The RIA and PFM are committed to handling complaints and enquiries in a courteous and efficient manner. The customer complaints procedure is available to view on the RIA website www.ria.wa.gov.au.

Complaints are managed centrally by the Rottnest Island Authority and each complaint is assigned a unique identification number and delegated to an appropriate Rottnest Island Authority representative to resolve. Complaints received are continuously monitored to identify any trends and areas for improvement.

Where the Rottnest Island Authority is in receipt of complaints, the issue is investigated immediately to determine the best process for resolution and rectification of the concern.

There were three complaints related to the drinking water quality reported during the 2019-20 reporting period. These were all regarding the iron staining in residential and accommodation units in December 2019.

9.3 Notifiable Incidents

During the 2019-20 reporting period there were 3 health exceedance samples out of 437 samples for bromate reportable to the Department of Health concerning the drinking water distribution system.

One Iron exceedance within the 2019-20 reporting period was reported to the Department of Health.

Microbial detections associated with non – disinfected water in Tank 7 were reported to the Department of Health on ten occasions in the 2019-20 period.

Improvements

Due to ongoing issues with existing infrastructure there were several microbial detections in Tank 7. In the short term, Tank 7 is being managed under the *2020 Interim Microbial Exceedance Management Plan for Tank 7* (accepted by DoH). The RIA has secured federal funding to be used on new and existing



water infrastructure, where part of this funding will be allocated to upgrading Tank 7. The RIA is planning to have the capital works completed by the end of 2020-2021 Financial Year.

Other Key Improvements on Rottnest Island:

- Annual maintenance of the Longreach Saline Bores.
- Development of the *Rottnest Island Water Services Restart Procedure* based on the *COVID-19 Building Recommissioning Water Supply and Water related Services* document produced by the Department of Health.

10. Comments

PFAS testing

Following the Drinking Water Quarterly Meeting held on 5 June 2019, the Department of Health recommended a one-off sampling for PFAS to take place at two locations along the potable water distribution line. From this point onwards, PFAS has been tested on an annual basis. Samples for this reporting period were taken 2nd June 2020 and were taken at R12/001 and R12/008.

Per- and poly-fluoroalkyl substances (PFAS) are manufactured chemicals that do not occur naturally in the environment. PFAS chemicals include perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA) and perfluorohexane sulfonate (PFHxS) amongst a large group of other compounds. PFAS are persistent in the environment, show the potential for bioaccumulation and biomagnification, and are toxic in animal studies (potential developmental, reproductive and systemic toxicity). They have been used in a wide range of consumer products including surface treatments such as non-stick cookware, and notably in aqueous film forming foam used to extinguish fires.

Results are presented in the below table.

Rottnest Island Distribution System 2019-20					
Health Characteristic	Australian Drinking Water Guidelines (ug/L)	No. of Analyses	No. of Analyses Complying with Australian Drinking Water Guidelines	% Compliance with Australian Drinking Water Guidelines	Max Value of Analysis (ug/L)
Sum of Perfluorooctane sulfonate (PFOS) and perfluorohexane sulfonate (PFHxS)	0.07	2	2	100%	<0.01
Perfluorooctanoic acid PFOA	0.56	2	2	100%	<0.01

Annual Mock Incident Scenario

The annual mock incident scenario was not performed in this water reporting year (July 2019 to June 2020) given the Island was closed to the public and used for self-isolation. The annual mock incident scenario is planned for the next water reporting year (July 2020 to June 2021).



11. Acknowledgements

The Rottnest Island Authority acknowledges the work of Programmed Facility Management in managing Drinking Water Quality at Rottnest Island, and the assistance of the Department of Health throughout the year.

12. Enquiries

To request further information, or to seek clarification on information provided within this Rottnest Island Annual Drinking Water Report, please contact the Rottnest Island Authority Administration by phone at (08) 9432 9300 (8:30 am to 5:00 pm, Monday to Friday). Alternatively, enquiries may also be sent by e-mail to rotnest.compliance@dbca.wa.gov.au.

13. Appendices

13.1 Annual Data Summary

Health Characteristic	Australian Drinking Water Guidelines (mg/L)	July - September 2019				October - December 2019				January - March 2020				April - June 2020				2019-20 Summary			
		No. Of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG	Max Value of Analysis (mg/L)	No. Of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG	Max Value of Analysis (mg/L)	No. Of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG	Max Value of Analysis (mg/L)	No. Of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG	Max Value of Analysis (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%	<0.005	32	32	100%	<0.003	24	24	100%	<0.003	24	24	100%	<0.003	104	104	100%	<0.005
Bromate (BrO3-)	0.02	104	104	100%	0.016	112	112	100%	0.012	104	104	100%	0.016	117	114	97%	0.022	437	434	99%	0.022
Cadmium (Cd)	0.002	8	8	100%	<0.0002	0	0	100%	-	8	8	100%	<0.0002	0	0	100%	-	16	16	100%	<0.0002
Chlorine Total (In house)	5	46	46	100%	1.25	49	49	100%	1.16	45	45	100%	1.46	48	48	100%	1.38	188	188	100%	1.46
Copper (Cu)	2	3	3	100%	0.011	4	4	100%	0.009	6	6	100%	0.02	4	4	100%	0.016	17	17	100%	0.02
Fluoride (F-)	1.5	24	24	100%	<0.5	24	24	100%	<0.5	24	24	100%	<0.5	24	24	100%	<0.5	96	96	100%	<0.5
Lead (Pb)	0.01	3	3	100%	<0.001	4	4	100%	<0.001	6	6	100%	<0.001	4	4	100%	<0.001	17	17	100%	<0.001
Manganese (Mn)	0.5	8	8	100%	<0.005	0	0	100%	-	11	11	100%	<0.005	0	0	100%	-	19	19	100%	<0.005
Nickel (Ni)	0.02	3	3	100%	<0.001	4	4	100%	<0.001	6	6	100%	<0.001	4	4	100%	<0.001	17	17	100%	<0.001
Nitrate (NO3-)	50	3	3	100%	0.03	4	4	100%	<0.02	7	7	100%	0.03	4	4	100%	0.11	22	22	100%	0.11
Nitrite (NO2-)	3	11	11	100%	<0.02	10	10	100%	<0.02	14	14	100%	<0.02	11	11	100%	<0.02	46	46	100%	<0.02
Trihalomethane (THM)	0.25	11	11	100%	0.09	10	10	100%	0.009	14	14	100%	0.021	11	11	100%	0.038	46	46	100%	0.038

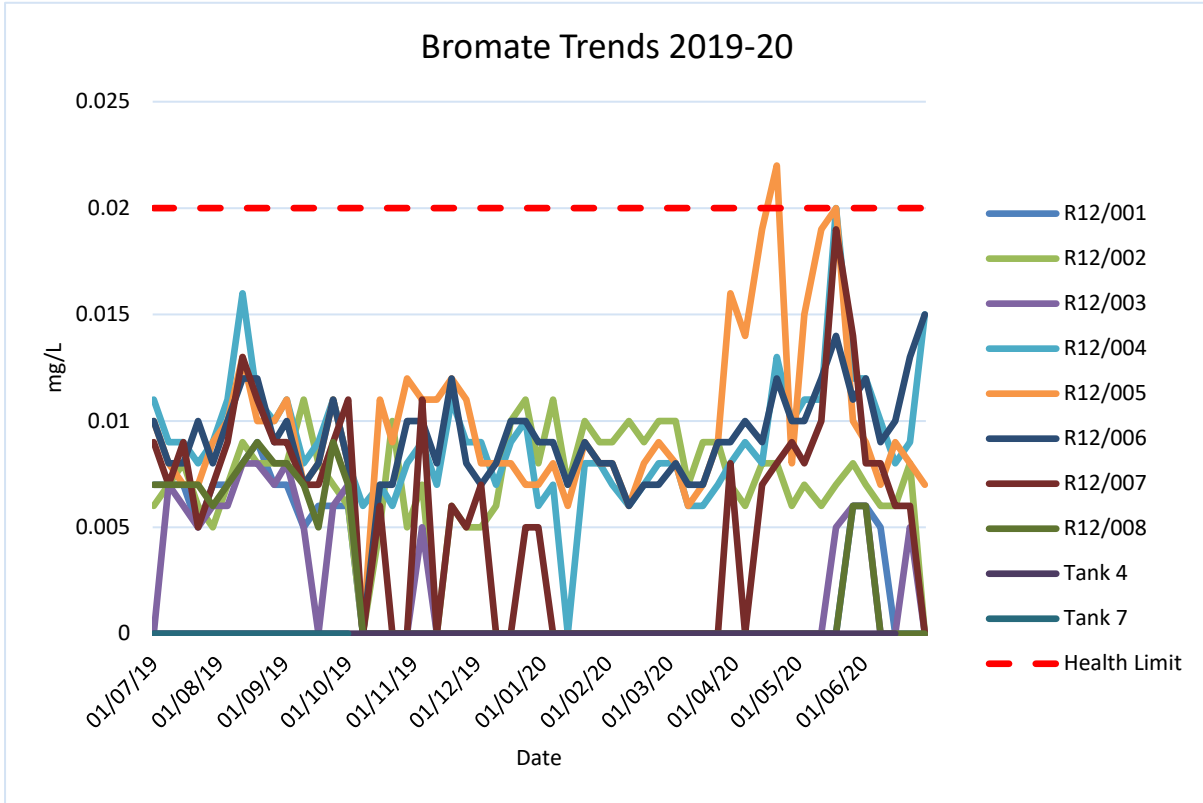
Aesthetic Characteristic	Australian Drinking Water Guidelines (mg/L)	July - September 2019				October - December 2019				January - March 2020				April - June 2020				2019-20 Summary			
		No. Of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG	Max Value of Analysis (mg/L)	No. Of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG	Max Value of Analysis (mg/L)	No. Of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG	Max Value of Analysis (mg/L)	No. Of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG	Max Value of Analysis (mg/L)	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%	<0.05	3	3	100%	<0.05	3	3	100%	<0.05	3	3	100%	<0.05	12	12	100%	<0.05
Ammonia (NH3)	0.5	11	11	100%	0.03	10	10	100%	<0.01	14	14	100%	<0.01	11	11	100%	0.02	46	46	100%	0.03
Chloride (Cl-)	250	1	1	100%	160	1	1	100%	150	1	1	100%	160	1	1	100%	140	4	4	100%	160
Free Chlorine (In house)	0.6	46	1	2%	1.08	49	4	8%	1.03	45	7	16%	1.45	48	9	19%	1.36	188	20	11%	1.45
Colour	15 HU	6	6	100%	<2	7	7	100%	<2	6	6	100%	<2	7	7	100%	2	26	26	100%	2
Hardness (CaCO3)	200	1	1	100%	14	1	1	100%	13	2	2	100%	9.6	0	0	100%	-	4	4	100%	14
Iron (Fe)	0.3	24	24	100%	0.29	32	31	97%	3.8	32	32	100%	0.13	24	24	100%	0.24	112	111	99%	3.8
pH	6.8 - 8.5	31	30	97%	10	32	29	91%	7.8	34	34	100%	7.6	31	28	90%	10	128	121	95%	10
Sodium (Na)	180	104	104	100%	110	112	112	100%	120	104	104	100%	100	117	117	100%	98	437	437	100%	120
Sulphate (SO4)	250	1	1	100%	<5	1	1	100%	<5	1	1	100%	<5	1	1	100%	<5	4	4	100%	<5
Sulphide (H2S)	0.05	3	3	100%	<0.05	4	4	100%	<0.05	3	3	100%	<0.05	4	4	100%	<0.05	14	14	100%	<0.05
TDS	600	1	1	100%	570	1	1	100%	300	1	1	100%	260	1	1	100%	250	4	4	100%	570
Turbidity	5 NTU	6	6	100%	<1	7	7	100%	1.1	7	7	100%	<1	7	7	100%	1.3	27	27	100%	1.3
Zinc (Zn)	3	3	3	100%	0.025	4	4	100%	0.021	6	6	100%	0.035	4	4	100%	0.021	17	17	100%	0.035

Microbial Characteristic	Memorandum of Understanding Compliance Criteria	July - September 2019			October - December 2019			January - March 2020			April - June 2020			2019-20 Summary		
		No. Of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG	No. Of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG	No. Of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG	No. Of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG	No. Of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG
Bacterial																
<i>E.coli</i>	Non Detect	58	58	100%	63	63	100%	62	62	100%	84	84	100%	267	267	100%
Amoeba																
Thermophilic <i>Naegleria</i>	Non Detect	24	24	100%	27	27	100%	32	32	100%	24	24	100%	107	107	100%

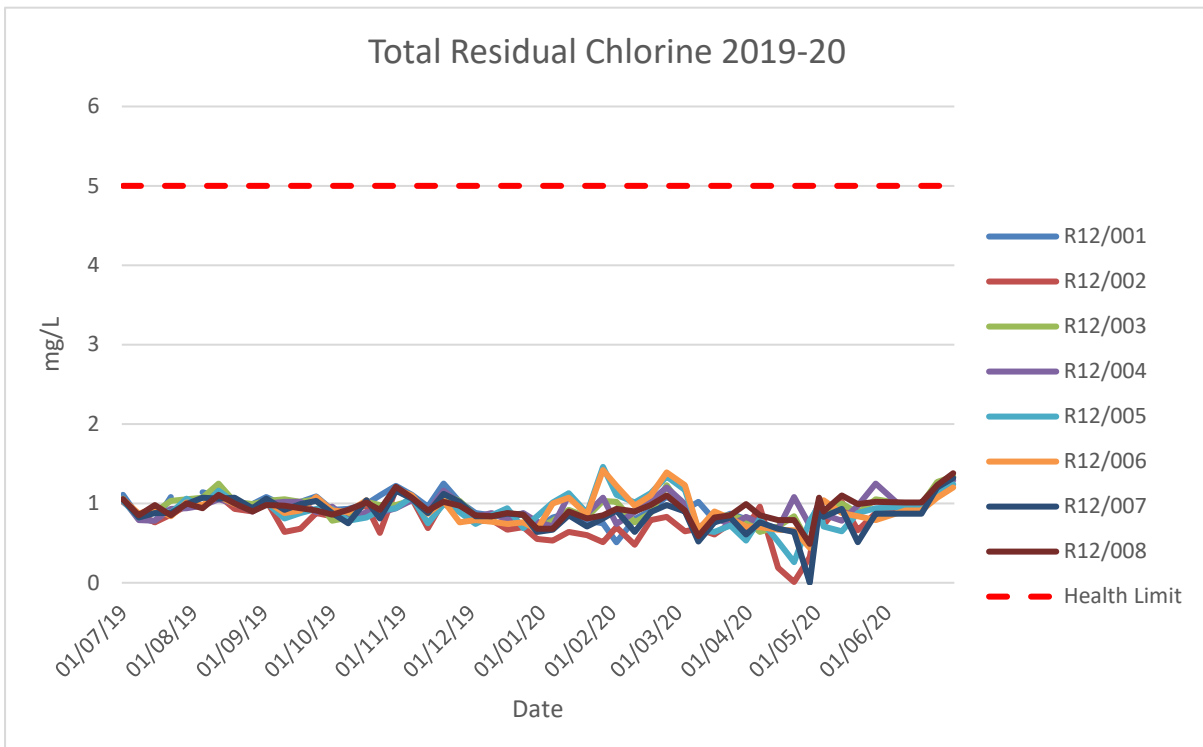
Drinking Fountain Analytes	Australian Drinking Water Guidelines (mg/L)	July - September 2019				October - December 2019				January - March 2020				April - June 2020				2019-20 Summary			
		No. Of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG	Max Value of Analysis (mg/L)	No. Of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG	Max Value of Analysis (mg/L)	No. Of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG	Max Value of Analysis (mg/L)	No. Of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG	Max Value of Analysis (mg/L)	No. Of Analyses	No. of Analyses Complying with ADWG	% Compliance with ADWG	Max Value of Analysis (mg/L)
Health Characteristics																					
Antimony (Sb)	0.003	98	98	100%	<0.003	98	98	100%	<0.003	42	42	100%	<0.003	7	7	100%	<0.005	245	245	100%	<0.005
Cadmium (Cd)	0.002	98	98	100%	<0.0002	98	98	100%	<0.0002	42	42	100%	<0.0002	7	7	100%	<0.0002	245	245	100%	<0.0002
Lead (Pb)	0.01	98	98	100%	<0.001	98	98	100%	<0.001	42	42	100%	<0.001	7	7	100%	<0.001	245	245	100%	<0.001
Nickel (Ni)	0.02	98	98	100%	0.001	98	98	100%	0.004	42	42	100%	0.002	7	7	100%	<0.001	245	245	100%	0.004
Aesthetic Characteristics																					
Copper (Cu)	1	98	98	100%	0.04	98	98	100%	0.081	42	42	100%	0.11	7	7	100%	<0.001	245	245	100%	0.11
Zinc (Zn)	3	98	98	100%	0.29	98	98	100%	0.19	42	42	100%	0.16	7	7	100%	0.068	245	245	100%	0.29

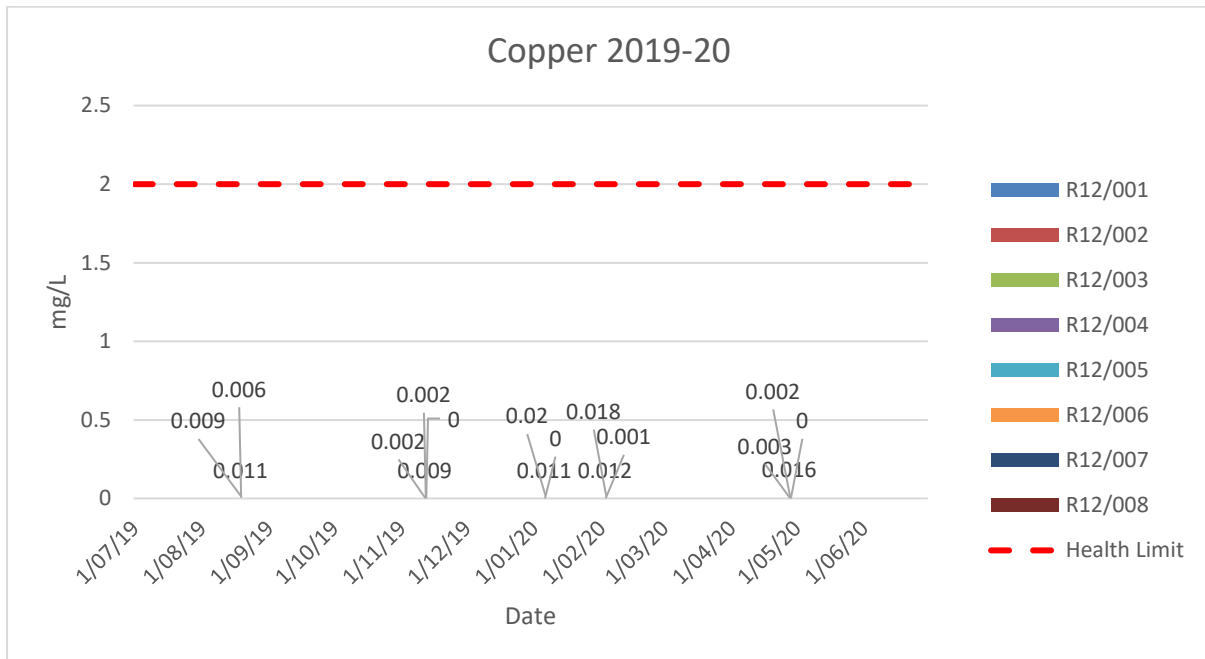
13.2 ADWG Sample Point Graph Summaries (Health)

There were no detects for Antimony during the reporting period, therefore there is no graph.



There were no detects for Cadmium during the reporting period, therefore there is no graph.



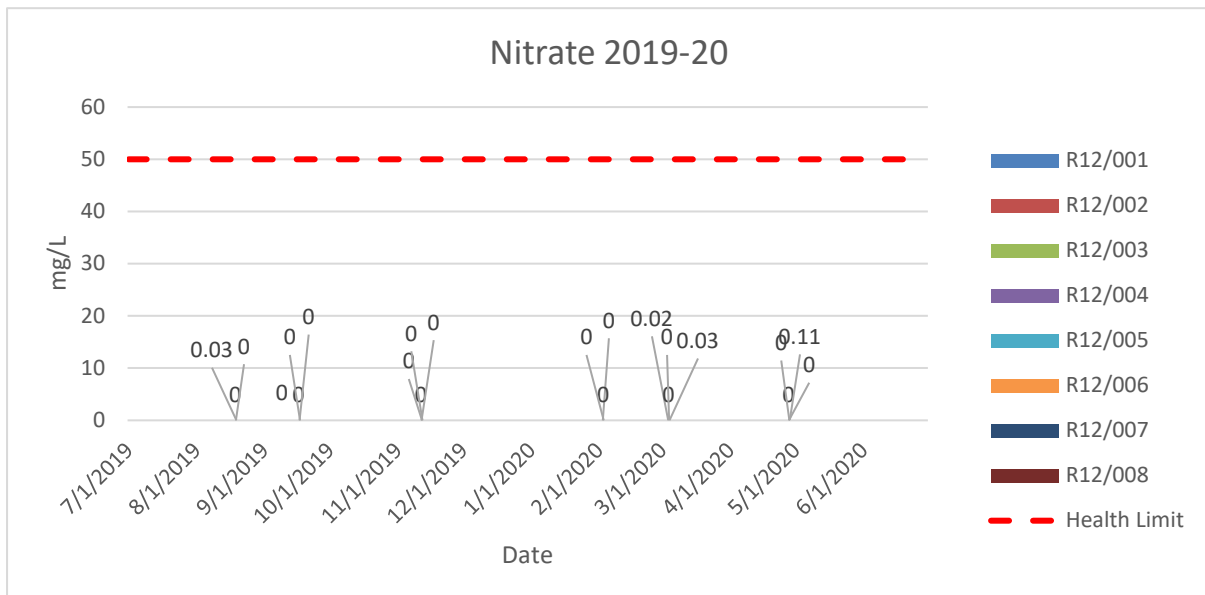


There were no detects for Fluoride during the reporting period, therefore there is no graph.

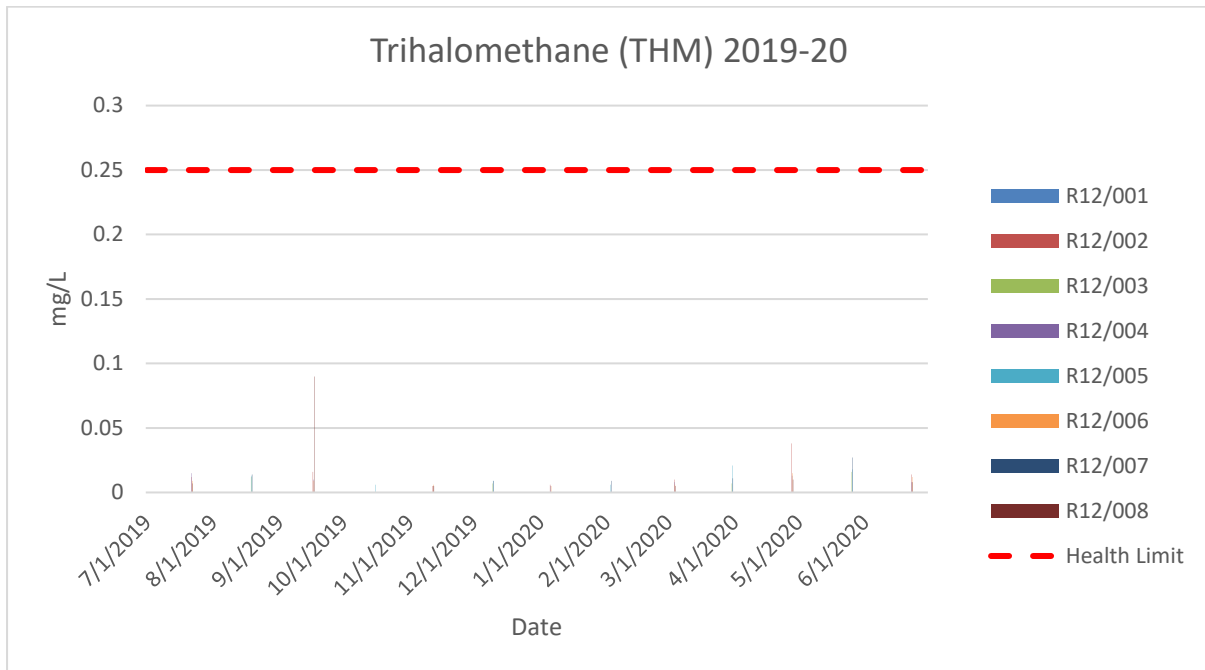
There were no detects for Lead during the reporting period, therefore there is no graph.

There were no detects for Manganese during the reporting period, therefore there is no graph.

There were no detects for Nickel during the reporting period, therefore there is no graph.

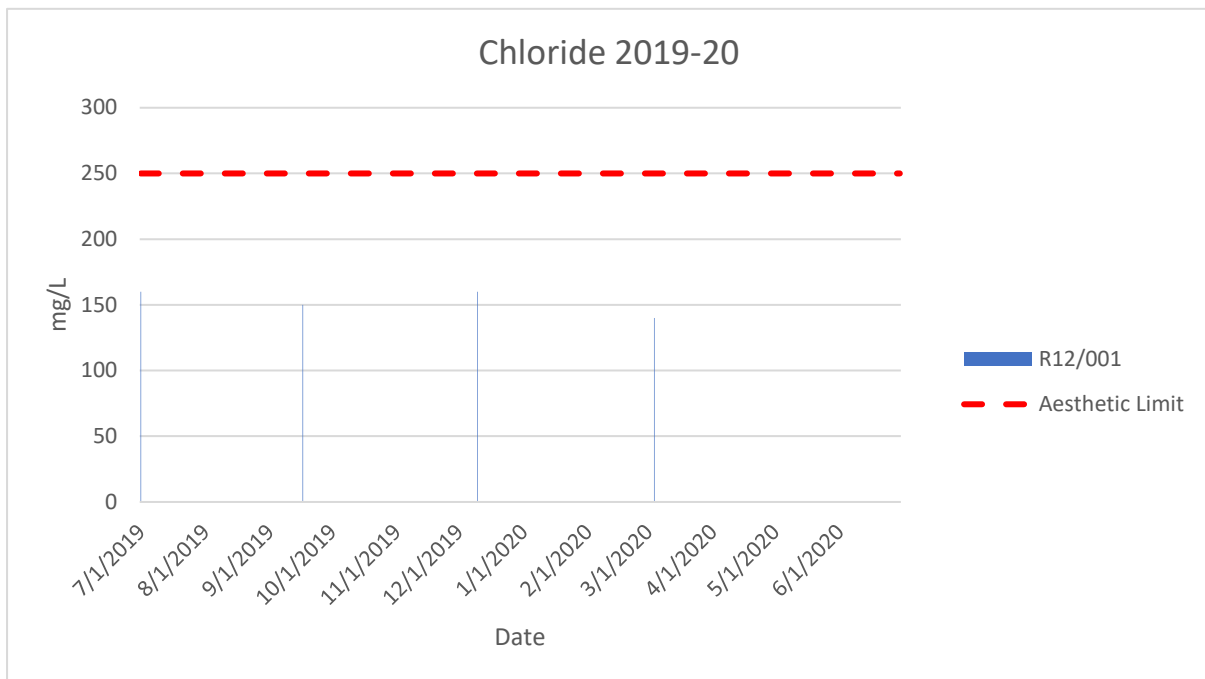
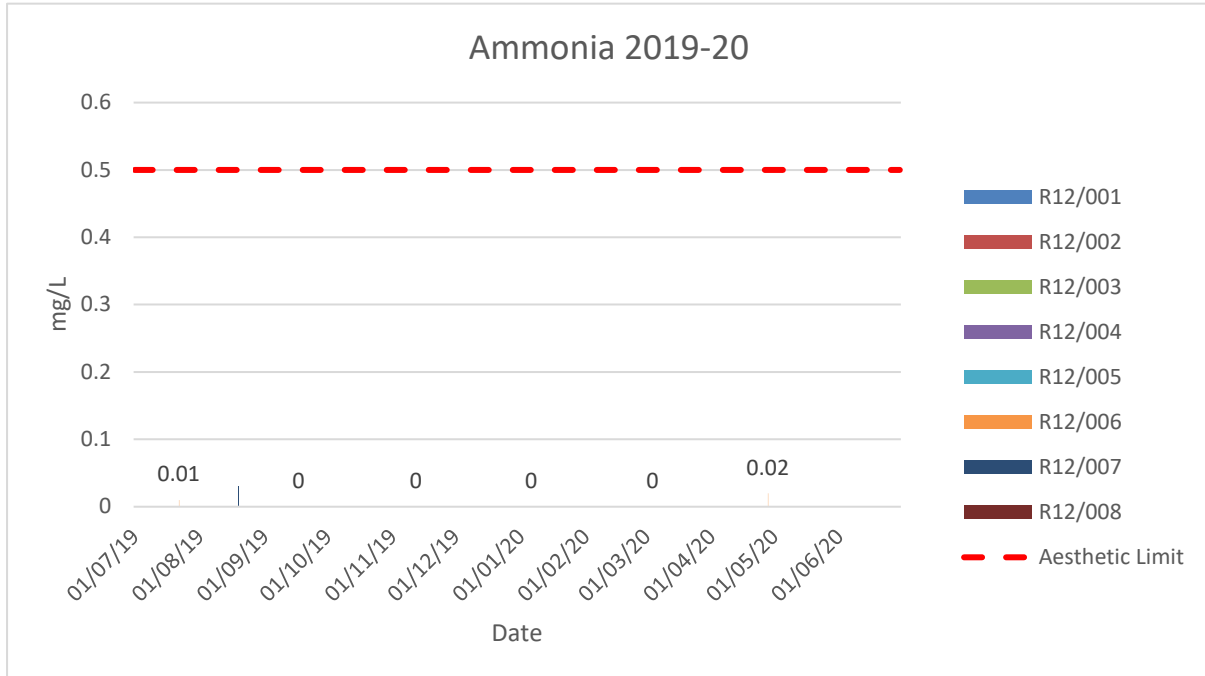


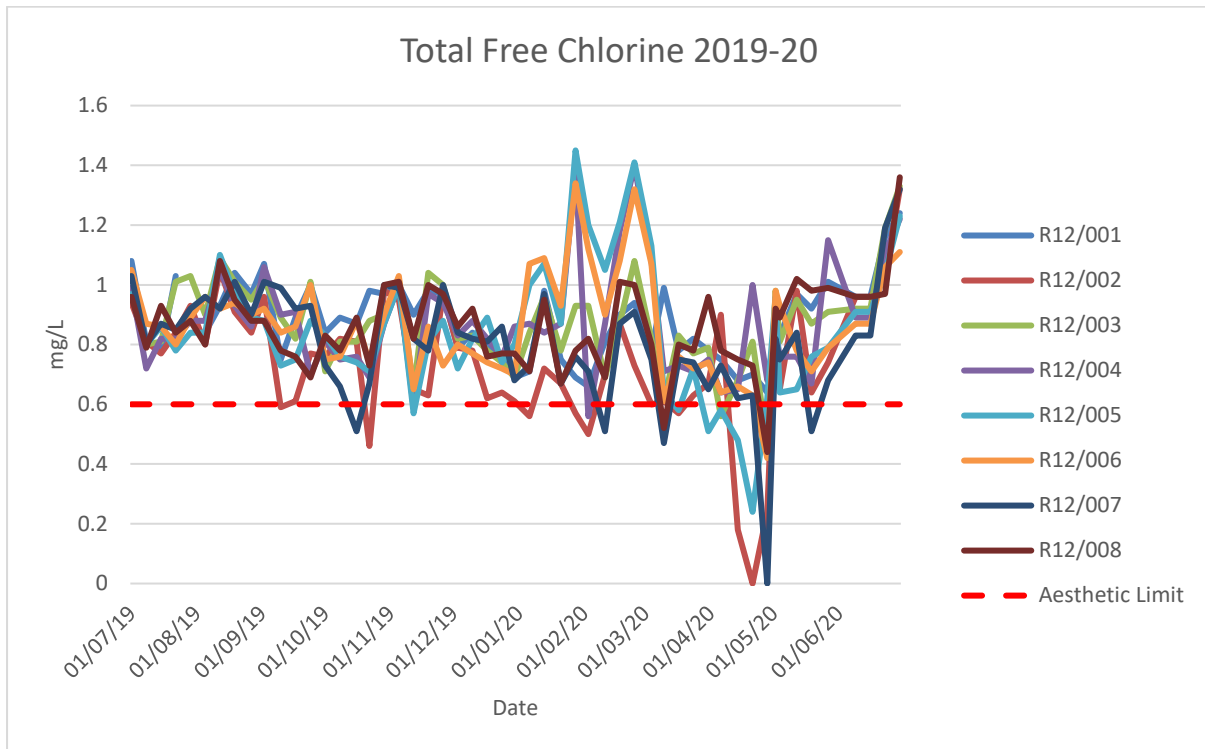
There were no detects for Nitrite during the reporting period, therefore there is no graph.



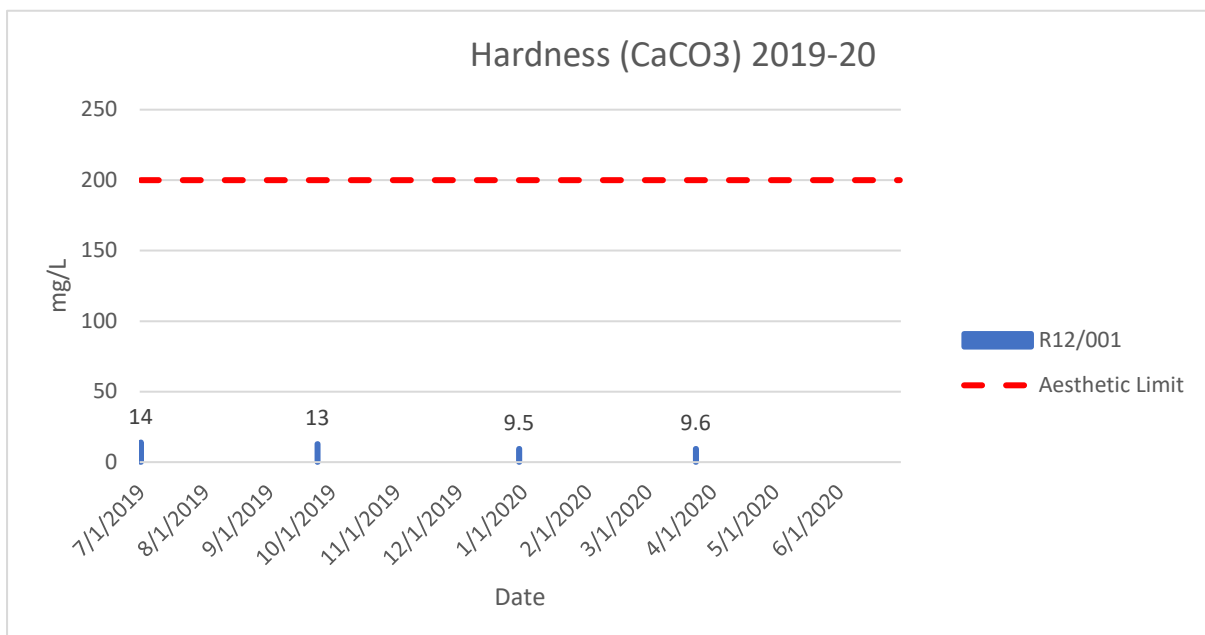
13.3 ADWG Sample Point Graph Summaries (Aesthetic)

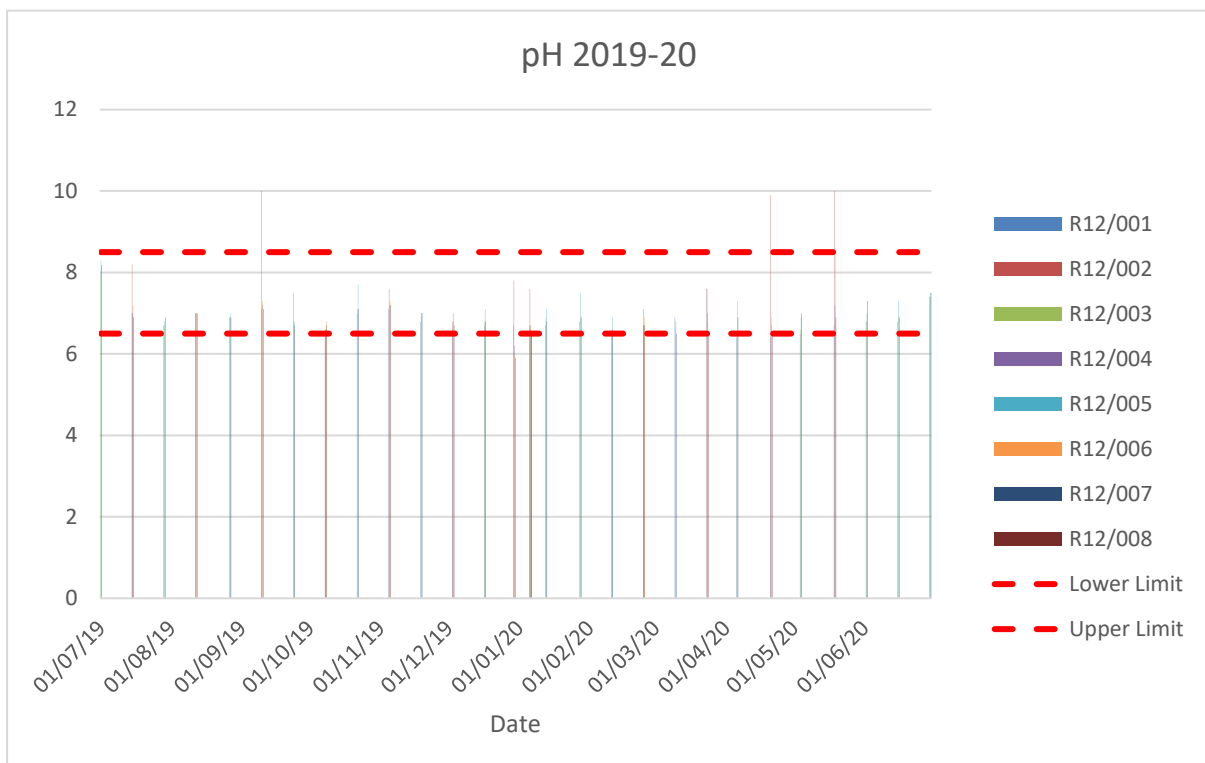
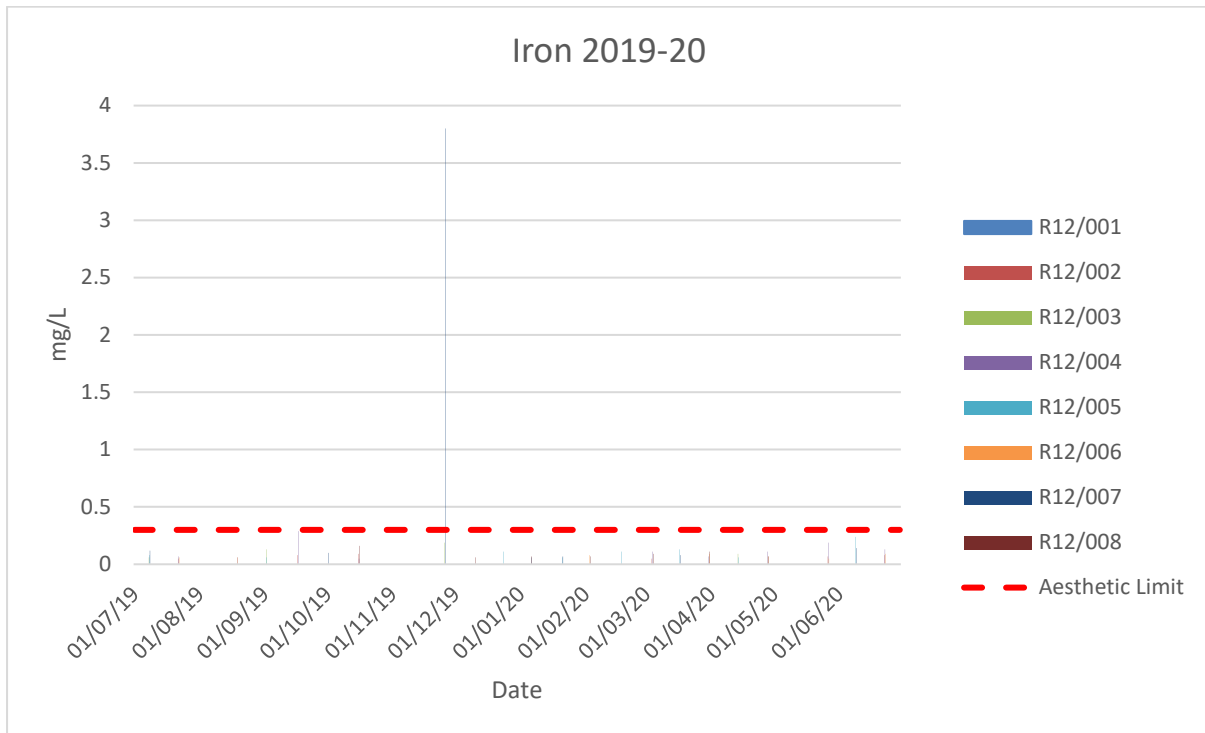
There were no detects for Aluminium during the reporting period, therefore there is no graph.

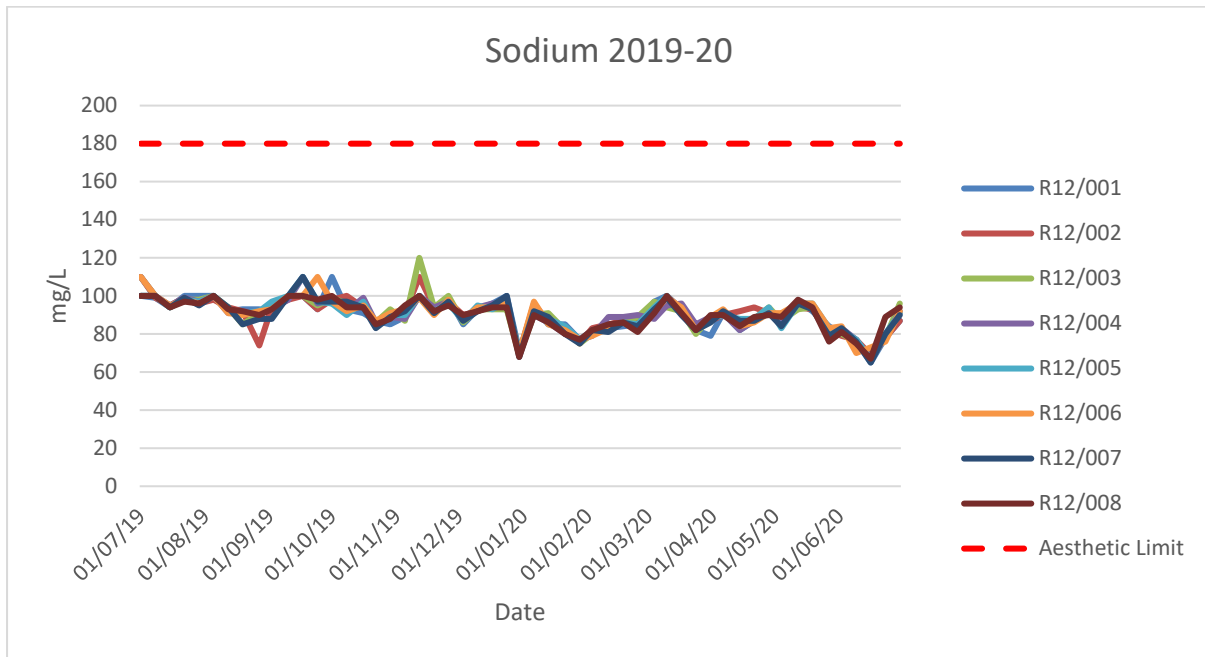




There were no detects for True Colour during the reporting period, therefore there is no graph.







There were no detects for Sulphate during the reporting period, therefore there is no graph.

There were no detects for Sulphide during the reporting period, therefore there is no graph.

