Parks Victoria
Water Quality Annual Report

2023/24

Parks VICTORIA

VICTORIA State Government

Acknowledgement of Country

Victoria's network of parks and reserves form the core of Aboriginal cultural landscapes, which have been modified over many thousands of years of occupation. They are reflections of how Aboriginal people engaged with their world and experienced their surroundings and are the product of thousands of generations of economic activity, material culture and settlement patterns. The landscapes we see today are influenced by the skills, knowledge and activities of Aboriginal land managers. Parks Victoria acknowledges the Traditional Owners of these cultural landscapes, recognising their continuing connection to Victoria's parks and reserves and their ongoing role in caring for Country.

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Cover image: Description

Contents

1 Introduction

1.1 Safe drinking water at Parks Victoria

Parks Victoria (PV) is a statutory authority of the Victorian Government created and acting in accordance with the *Parks Victoria Act 2018*. Parks Victoria is responsible for managing a diverse estate of more than 4 million hectares including 3000 land and marine parks and reserves making up approximately 18% of Victoria's land mass, 75% of Victoria's wetlands, and 70% of Victoria's coastline. The estate comprises national and state parks, marine parks and sanctuaries, wilderness areas, regional and metropolitan parks.

Parks Victoria's primary role is to protect and enhance the natural and cultural values of the parks it manages, ensuring parks are healthy and resilient for current and future generations. Parks Victoria also play a pivotal role in connecting people and communities with parks.

At two of its visitor sites, Tidal River Campground in Wilsons Promontory National Park and Twelve Apostles Visitor Facility adjoining Port Campbell National Park (Figure 1.1), PV is responsible for providing drinking water that meets the requirements set by the *Safe Drinking Water Act 2003* (SDW Act) and the *Safe Drinking Water Regulations 2015* (SDW Regulations). At these two sites, PV is called up as a water supplier under the SDW Act and has specific legislative responsibilities it must meet.

Section 26 of the SDW Act requires an annual drinking Water Quality Report for sites regulated under the SDW Act. The report must meet requirements set out in the SDW Act and SDW Regulations and include information on Parks Victoria's water supply systems and water quality performance for the financial year. The report is required to be submitted to the Department of Health (DH) by 31 October each year for the previous financial year and must be made public. This report has been prepared to comply with these requirements and covers the period from 1 July 2023 to 30 June 2024, which is referred to in this report as the reporting period.

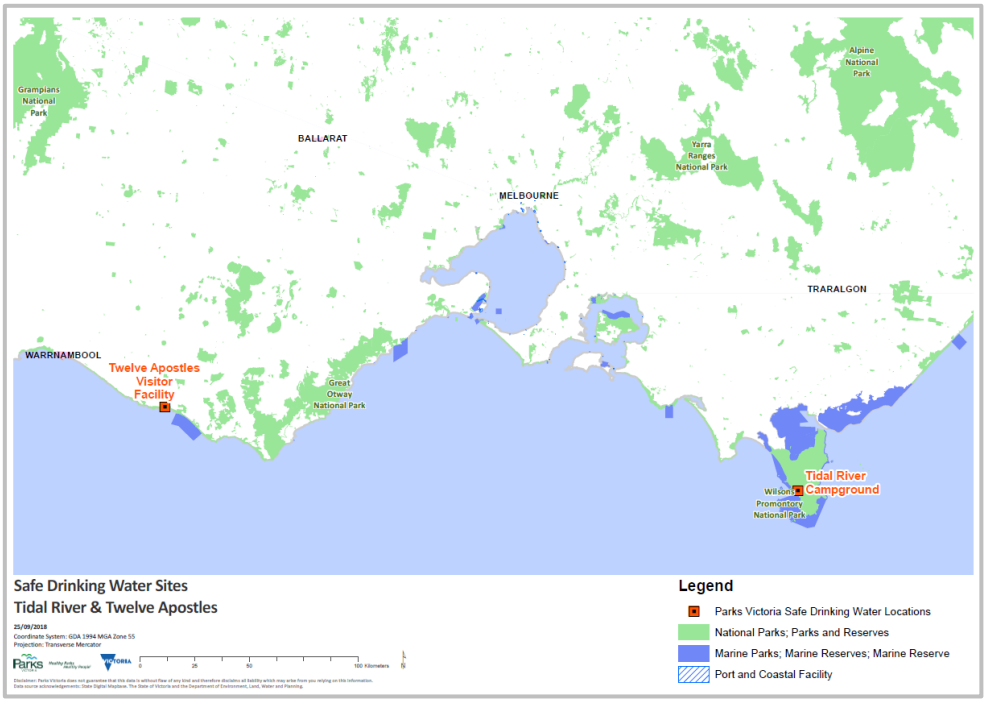


Figure 1.1 Parks Victoria Safe Drinking Water localities

1.2 Regulatory Framework

The *Safe Drinking Water Act 2003* is the principal legislation that sets the regulatory framework for the supply of safe, high-quality drinking water in Victoria. The key objective of the legislation is to protect public health. The SDW Act defines drinking water as water that is intended for human consumption, and places obligations on water suppliers and water storage managers that must be met, including requirements to:

- Prepare, implement, review and revise risk management plans that manage risks in relation to drinking water.
- Have risk management plans and their implementation independently audited by approved auditors at periods declared by the DH.
- Supply water that complies with water quality standards as specified in the SDW Regulations.
- Disclose to the public information on drinking water quality.
- Notify the DH if drinking water does not comply with water quality standards or of any suspected contamination of drinking water.

The framework incorporates a catchment to tap approach to managing risk associated with drinking water supplies. It promotes preventative and proactive management of drinking water quality.

The *Safe Drinking Water Regulations 2015* make further provision for the supply of safe drinking water in Victoria and provide clarity and additional information on legislated requirements. The SDW Regulations outline items to be addressed and included in risk management plans, the water quality standards that must be met, requirements for water quality sample collection and analysis, and requirements for annual reporting.

Drinking water supplied by Parks Victoria at the Tidal River Campground and Twelve Apostles Visitor Facility must meet the obligations set out in the SDW Act and SDW Regulations.

1.3 Australian Drinking Water Guidelines

The Australian Drinking Water Guidelines (ADWG) is the leading authoritative reference for drinking water management in Australia. It defines safe, good quality water, and provides a framework of how to achieve and assure water safety and good management of drinking water supplies.

The ADWG provide a framework for the management of drinking water quality that includes twelve elements as shown in Figure 1.2.

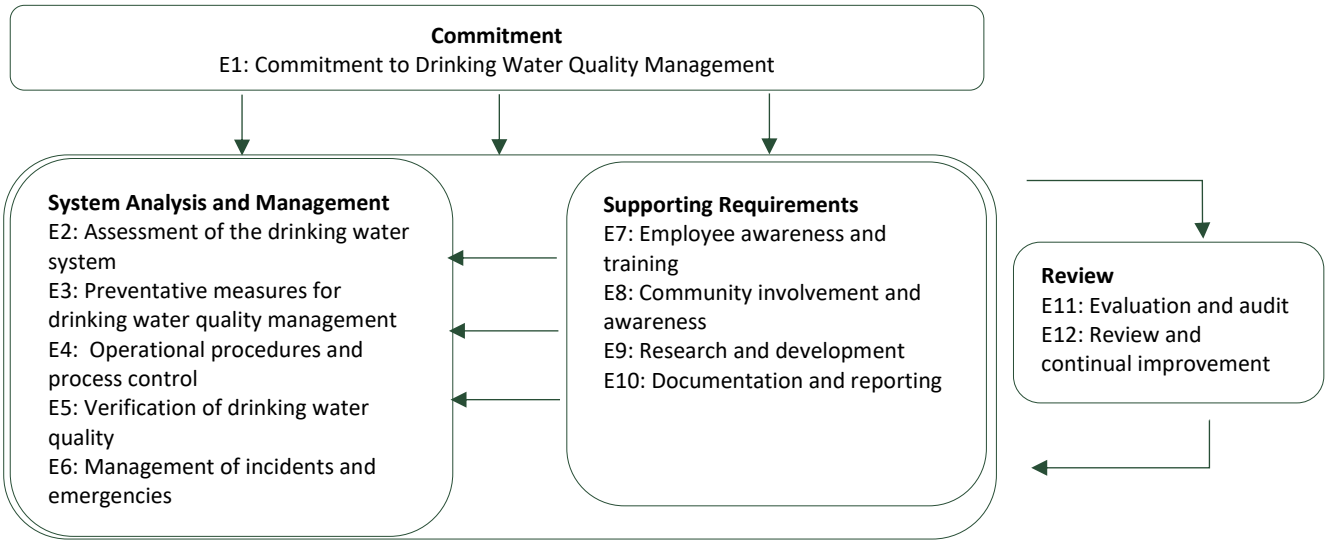


Figure 1.2 Framework for management of drinking water quality (ADWG, 2011)

The ADWG define two types of guideline values for drinking water to assess its suitability for consumption:

- A health-related guideline value specifies the concentration or measure of a water quality characteristic that does not result in any significant risk to health of the consumer over a lifetime of consumption.
- An aesthetic guideline value specifies the concentration or measure of a water quality characteristic that is associated with the acceptability of water to the consumer, such as appearance, taste, and odour.

These health and aesthetic guideline values, together with the water quality standards set in the SDW Regulations, are used as reference in this report.

The Victorian regulatory framework for drinking water is aligned with the approach used in the ADWG.

1.4 Parks Victoria's commitment to drinking water management

Parks Victoria is committed to minimising risk to public health by providing a reliable and safe supply of drinking water at Tidal River Campground and the Twelve Apostles Visitor Facility that is delivered in accordance with the SDW Act, SDW Regulations and framework of the ADWG. This commitment is recognised across the organisation and in Parks Victoria's internal operating framework.

To ensure our visitors are provided with safe drinking water, Parks Victoria maintain a safe drinking water program. Parks Victoria safe drinking water program commits to:

- Complying with the requirements of the SDW Act and SDW Regulations.
- Adopting the twelve elements approach in the ADWG in managing our regulated drinking water systems.
- Managing risks in accordance with Parks Victoria's policy and procedure framework.
- Protecting our drinking water catchments.
- Implementing and reviewing our risk management plans (referred to as safe drinking water risk management plans) to ensure risks to drinking water quality are known and managed from catchment to tap.
- Continually assessing and evaluating water quality and treatment performance.
- Ensuring our people are trained to implement safe drinking water requirements and are equipped to anticipate and manage public health risks.
- Implementing maintenance programs and renewing or upgrading assets where required.
- Remaining aware of water industry research, treatment technologies, and operational practices to ensure continued understanding of drinking water quality issues and their management.
- Continually reviewing and improving practices, performance, and documentation to be the best we can in delivering a safe supply of drinking water to our visitors.

2 Water supply system overview

2.1 Water supply systems

Parks Victoria has two drinking water sites that operate under Victoria's SDW Act and SDW Regulations. A summary of each of the drinking water supply systems is provided in Table 2.1.

There were no changes to the water supply systems or the source water over the reporting period.

Table 2.1 Summary of Parks Victoria's drinking water supply systems

Water sampling locality	Population supplied (estimated)	Source water	Raw water storages	Treatment Plant	Treated water storages
Tidal River Campground	~560,000 visitors annually	Tidal River. Surface water is harvested from a ~2,000ha catchment, within the Wilsons Promontory National Park. Raw water is detained at a small weir and pumped to the water treatment plant.	No raw water storage.	Tidal River Water Treatment Plant (0.4ML/day treatment capacity). Raw water treatment includes coagulation, flocculation, clarification, filtration, and disinfection.	Treated water is held in a clearwater storage tank before being pumped to two elevated storage tanks. Total storage capacity of 1.34ML has capacity for ~6 days water supply in peak season. Water is gravity-fed through Tidal River via a reticulated system.
Twelve Apostles Visitor Facility	~930,000 day-visitors annually	Wannon Water supplied drinking water. Water is supplied by a metered mains pipeline from the Wannon Water Port Campbell drinking water locality network to two storage tanks at the Twelve Apostles Visitor Facility.	No raw water storage.	No onsite treatment.	Treated drinking water is stored in two 28,000L storage tanks. It is distributed to the Twelve Apostles Visitor Facility on demand, including to drinking fountains, a kiosk, a staff tearoom and visitor amenities.

2.1.1 Tidal River Campground

Wilsons Promontory National Park is one of Victoria's oldest and best-loved national parks. The park is a very popular tourist destination and receives an estimated 560,000 visitors annually, including day-visitors and overnight stays. Tidal River Campground is the main accommodation area within the Park with approximately 2,400 overnight visitors during peak periods, plus day-visitors, staff, volunteers, and contractors.

Tidal River Campground hosts a visitor's centre, general store, and a range of accommodation options including camping and caravan sites, cabins, wilderness retreats and group lodges. The campgrounds are serviced by toilet and bathroom blocks. Staff facilities are also provided at Tidal River including offices, staff housing and maintenance buildings.

The Tidal River WTP supplies drinking water to the Tidal River Campground. The Tidal River WTP is a small conventional package water treatment plant with chlorine disinfection, that was constructed in 1999 and has received multiple upgrades to ensure consistent supply of safe drinking water.

The Tidal River WTP is supplied with raw water from a small weir in Tidal River. Treated water from the Tidal River WTP is stored in water storage tanks and is distributed via gravity to the Tidal River campground water reticulation network.

Parks Victoria manage the Tidal River water supply system, inclusive of the Tidal River Water Treatment Plant (WTP) and its day-to-day operations, in accordance with the Tidal River Campground Safe Drinking Water Risk Management Plan. Requirements include protecting the source water, operating the Tidal River WTP in accordance with set criteria to ensure high-quality compliant drinking water, operational and compliance monitoring, implementing asset maintenance and quality programs, responding to water quality deviations and events, and reporting requirements.

Water usage at the site varies throughout the year based on visitor numbers. This variation in demand is managed operationally. A map of the location of the Tidal River Campground in the Wilsons Promontory National Park is shown in Figure 2.1.

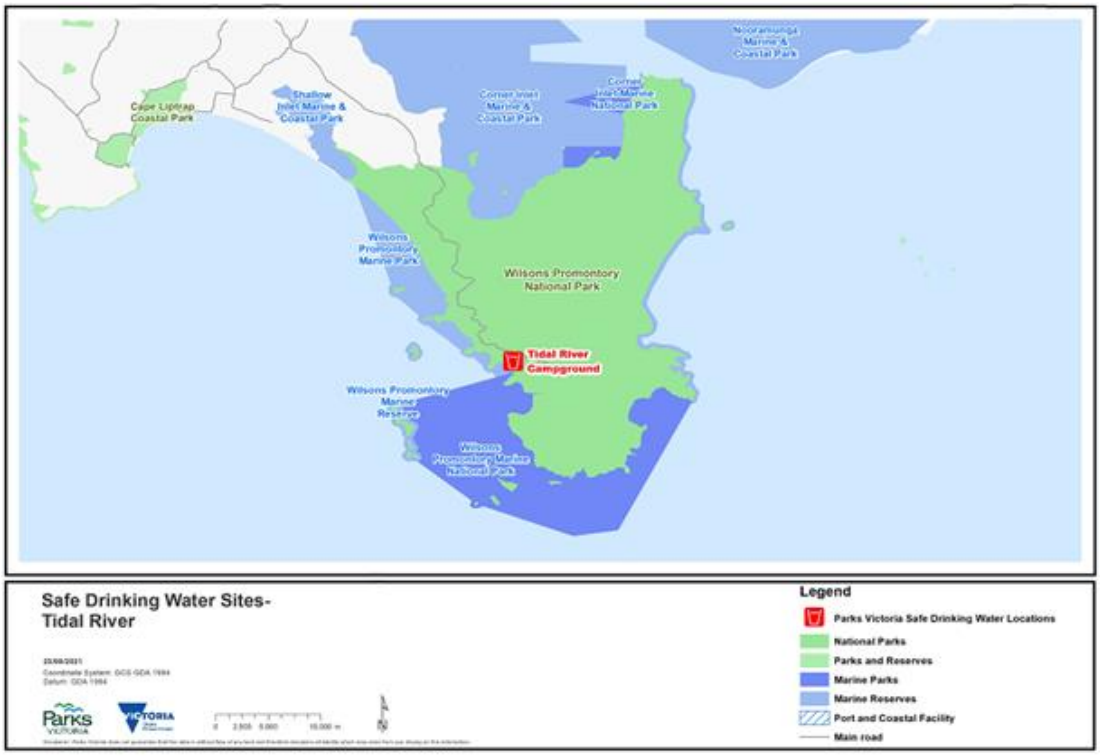


Figure 2.1 Location of Tidal River Campground, Wilsons Promontory National Park

2.1.2 Twelve Apostles Visitor Facility

The Twelve Apostles are located within the Port Campbell National Park and is Parks Victoria's most visited tourist attraction receiving an estimated 930,000 visitors annually. The Twelve Apostles Visitor Facility is the main facility at the Twelve Apostles and is located adjacent to the Port Campbell National Park, outside of the national park boundary. The visitor facility provides car parking, a kiosk, and amenities for visitors to the Twelve Apostles and Port Campbell National Park.

The site is supplied with drinking water from Wannon Region Water Authority (Wannon Water) from the Port Campbell drinking water locality via a metered mains pipeline. The drinking water received already meets the requirements of the SDW Act, therefore Parks Victoria's focus of management at the Twelve Apostles Visitor Facility is on preventing water recontamination during its storage and distribution.

Water usage at the site varies throughout the year based on visitor numbers. The volume of water supplied to the site for the reporting period was 6.6ML.

Whilst PV has overarching responsibility and control of the site, PV has a contractual agreement in place with Wannon Water to maintain the Twelve Apostles water supply system in accordance with the Twelve Apostles Safe Drinking Water Risk Management Plan. Responsibilities include operational and compliance monitoring, asset maintenance, responding to water quality deviations and events, and reporting requirements. A map of the location of the Twelve Apostles Visitor Facility is shown in Figure 2.2.

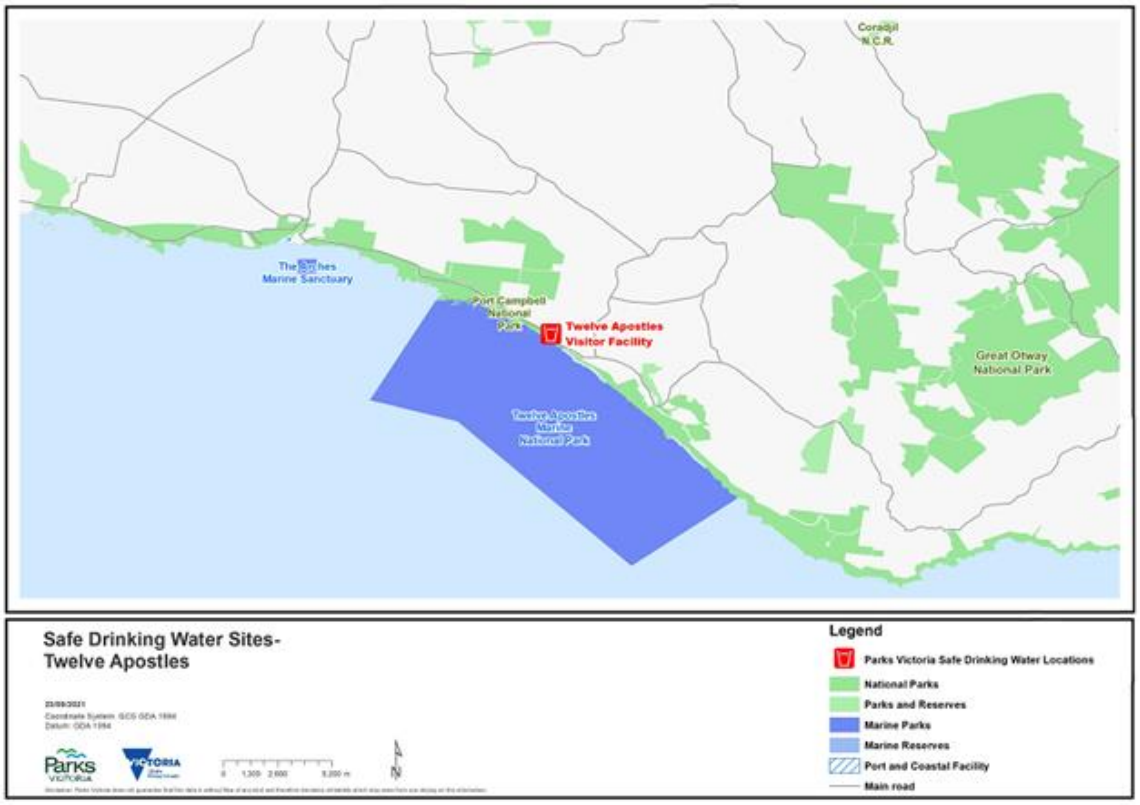


Figure 2.2 Location of Twelve Apostles Visitor Facility, Port Campbell National Park

2.2 Source Water

2.2.1 Tidal River Campground

The catchment at Tidal River consists of an approximate 2000-hectare conservation zone within the Wilsons Promontory National Park (Figure 2.3). The catchment is managed by Parks Victoria, is densely vegetated and has minimal human activity, limited to 2 km of walking track and 2.5 km of a sealed no-through road.

The catchment has been classified as a Category 2 Source based on the completion of a Health Based Target Assessment undertaken in accordance with the WSAA Health-Based Target for Drinking Water Safety Manual. The condition of the catchment informs the source water classification, and the source water classification is important as it determines the level of water treatment required.

The catchment classification is routinely reviewed to confirm its accuracy and raw water quality sampling is routinely conducted to monitor catchment conditions, microbial quality, and the source water categorisation. Review in the reporting period indicates no major catchment changes and confirmation of the Category 2 Source classification.

Parks Victoria place high importance on protecting the catchment at Tidal River. Catchment protection is the first step in ensuring safe drinking water.

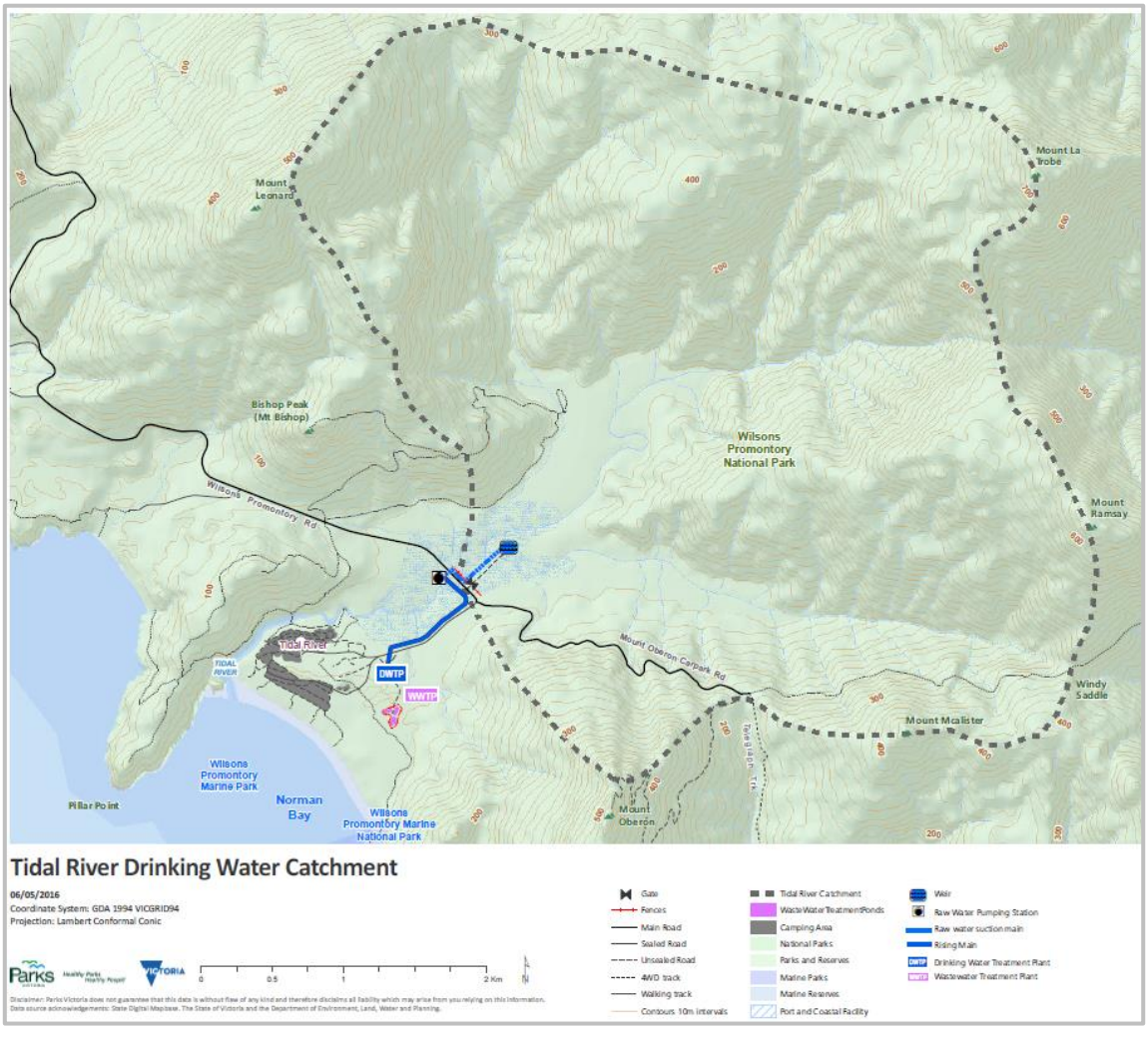


Figure 2.3 Tidal River Campground drinking water catchment

2.2.1 Twelve Apostles Visitor Facility

The Twelve Apostles Visitor Facility is supplied with water already treated to a drinking water standard by Wannon Water (as a water supplier) via the Port Campbell drinking water locality network. The water is supplied via a mains pipeline in accordance with a drinking water metered supply agreement with Parks Victoria as a customer of Wannon Water.

Wannon Water are responsible for treating water to a drinking water standard and have procedures and processes in place to ensure that drinking water quality is maintained across their Port Campbell drinking water locality network prior to the water being supplied to Parks Victoria. Source water risks are assessed and managed by Wannon Water.

Wannon Water's Water Quality Annual Report provides further source water and treatment information for the Port Campbell drinking water locality. A summary is provided in Table 2.2. Information on water quality from the Wannon Water Port Campbell drinking water locality is shared as required and in the event of a water quality issue, with no occurrence of the latter occurring in the reporting period.

Table 2.2: Wannon Water Port Campbell drinking water locality information

Wannon Water Water Treatment Plant	**Source Water**	**Treatment process**
Port Campbell	Groundwater from the Dilwyn aquifer	Aeration, filtration, disinfection via chlorine gas

2.3 Water Treatment

The water treatment process applied at Tidal River Campground is outlined in Table 2.3. Any substances added to water as part of the treatment process is also included in Table 2.3. There was no change to the treatment process and there were no issues with the application of treatment processes at Tidal River Campground during the reporting period.

At the Twelve Apostles Visitor Facility, no water treatment occurs. The site is supplied with water that has already been treated to a drinking water standard and as supported by a water quality risk assessment, further treatment of the water is not required. There were no changes at the Twelve Apostles Visitor Facility during the reporting period.

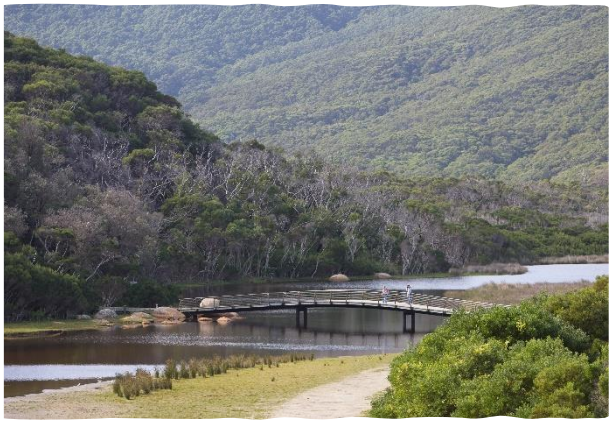
Table 2.3: Drinking water treatment processes – Tidal River Campground and Twelve Apostles Visitor Facility

Water sampling locality	**Treatment process**	**Process description**	**Added substances(s)**
Tidal River Campground	Coagulation	Chemicals are added to the water to enable fine particles to join to form larger particles.	Soda Ash PAC23
	Flocculation	Water enters the mixing compartment where polymer is added, and particles bind into floc particles. Water then travels into the flocculator zone where it is slowly and continuously mixed allowing the formation of larger floc particles.	Polymer
	Clarification	The clarifier receives flocculated water. Particles settle via gravity and water is transferred to the filters.	None
	Dual media filtration	Water is passed, by gravity, through a dual-media (anthracite/silica) sand filter.	None
	Disinfection	Water is disinfected using sodium hypochlorite (chlorine) so that no pathogens remain in the water. An adequate free chlorine is maintained through the treated water storage and reticulation.	Sodium Hypochlorite

Water sampling locality	Treatment process	Process description	Added substances(s)
Tidal River Campground	pH correction	pH is adjusted through the addition of soda ash to ensure disinfection, minimise the risk of corrosion in the distribution network and improve water taste.	Soda Ash
Twelve Apostles Visitor Facility	None	No further treatment of water is required.	None

3 Drinking Water Quality Standards for 2023/24

3.1 Monitoring program



Parks Victoria has developed a water quality sampling program for each site based on regulated water quality standards and site-specific hazards. Water samples are collected in accordance with the water quality sampling program, and analysis of samples is undertaken by an independent National Association of Testing Authorities (NATA) accredited laboratory.

For the reporting period, the water quality standards under the SDW Act and SDW Regulations applied. SDW Regulation 16(f) requires water suppliers to include information relating to compliance with Regulations 12, 13 and Schedule 2 in their annual report. SDW Regulation 16(k) requires water suppliers to include information related to aesthetic characteristics of drinking water quality supplied.

A summary of water quality parameters monitored at Tidal River Campground and the Twelve Apostles Visitor Facility, and their frequency of monitoring, is outlined in Table 3.1.

For this reporting period, the weekly sampling frequency resulted in 52 weekly sample rounds at both sites.

Table 3.1: Water quality monitoring program – Tidal River Campground and Twelve Apostles Visitor Facility

Parameter	Tidal River	Twelve Apostles
***Escherichia coli* (*E. coli*)**	Weekly	Weekly
Turbidity	Weekly	Weekly
Trihalomethane	Monthly	Monthly
Chloroacetic acid	Quarterly	Not applicable
Dichloroacetic acid	Quarterly	
Trichloroacetic acid	Quarterly	
Metals	Quarterly	Not applicable
pH	Weekly/Monthly**	Monthly
Colour	Monthly	Not applicable***
Aluminium	Monthly	
Alkalinity	Monthly	

** For Tidal River, the sampling frequency for chloroacetic acid, dichloroacetic acid, and trichloroacetic acid was reduced from monthly to quarterly in 2023. This reduction in sampling frequency considered the high level of historical compliance at Tidal River for these parameters and the exclusion of these parameters from Schedule 2 when the Safe Drinking Water Regulations 2015 came into effect.*

*** pH monitoring occurs weekly from the treated water storage tank and monthly at customer taps.*

**** At Twelve Apostles Visitor Facility, the only aesthetic parameter monitored is pH. As the water is treated to drinking water standard and supplied to the site by Wannon Water's drinking water reticulation network, water supplied does not have any aesthetic characteristics of concern and therefore no additional monitoring of aesthetic parameters is undertaken by PV.*

3.2 Compliance with Regulation 12(a)

Regulation 12(a) requires that drinking water suppliers test drinking water for *Escherichia coli* (*E. coli*), trihalomethanes and turbidity. A summary of results for each of the parameters is included in the following sections.

3.2.1 *Escherichia coli* (*E. coli*)

Schedule 2 of the SDW Regulations requires all samples of drinking water to contain no E. coli (0 organisms per 100 millilitres of drinking water).

All samples at Tidal River Campground and the Twelve Apostles Visitor Facility were compliant for E. coli in the reporting period. A summary of results is included in Table 3.2.

Table 3.2 Results summary for *Escherichia coli*

Water sampling locality	Sampling frequency	Number of samples	Maximum detected (orgs/100mL*)	Number of detections and investigations conducted (s. 22)	Number of samples where standard was not met (s. 18)
Tidal River	Weekly	156**	0	0	0
Twelve Apostles	Weekly	104***	0	0	0

** Escherichia coli organisms per 100mL*
*** Number of samples representative of treated water samples - treatment (52), water storage (52), rotating customer tap (52).*
**** Number of samples representative of treated water samples - water storage (52), rotating customer tap (52).*

3.2.2 Trihalomethanes (THM)

Schedule 2 of the SDW Regulations require total trihalomethanes to be less than or equal to 0.25mg/L of drinking water.

All samples at Tidal River Campground and the Twelve Apostles Visitor Facility were compliant for trihalomethanes in the reporting period. A summary of results is included in Table 3.3.

Table 3.3 Results summary for trihalomethanes

Water sampling locality	Sampling frequency	Number of samples	Drinking water quality standard (mg/L)	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met (s. 18)
Tidal River	Monthly	12	0.25	0.15	0.11	0
Twelve Apostles	Monthly	12	0.25	0.03	0.02	0

3.2.3 Turbidity

Schedule 2 of the SDW Regulations require the 95th percentile of turbidity results for samples in any 12-month period to be less than or equal to 5.0 Nephelometric Turbidity Units (NTU).

All samples at Tidal River Campground and the Twelve Apostles Visitor Facility were compliant for turbidity in the reporting period. A summary of results is included in Table 3.4.

Table 3.4 Results summary for turbidity

Water sampling locality	Sampling frequency	Number of samples	Maximum turbidity in a sample (NTU*)	95th percentile of turbidity results in last 12 months (NTU)	Number of 95th percentile of results in last 12 months above standard (s. 18)
Tidal River	Weekly	104**	3.8	0.7	0
Twelve Apostles	Weekly	104***	0.4	0.3	0

** Nephelometric Turbidity Units*

*** Number of samples representative of treated water samples - water storage (52), rotating customer tap (52).*

**** Number of samples representative of treated water samples – water storage (52), rotating customer tap (52).*

3.3 Compliance with Regulation 12(b)

Under Regulation 12(b) of the SDW Regulations, water suppliers are to ensure that drinking water supplied does not contain any toxin, pathogen, substances or chemical, either alone or in combination with another, in amounts that may pose a risk to human health.

Where parameters have been identified for monitoring in accordance with Regulation 12(b) of the SDW Regulations, the corresponding health limit in the ADWG has been listed for comparison with results. A summary of results for each of the parameters is included in the following sections.

3.3.1 Chloroacetic acid

Chloroacetic acid is monitored at Tidal River Campground only. The ADWG health limit for chloroacetic acid in drinking water is 0.15mg/L.

All samples at Tidal River Campground were compliant for chloroacetic acid in the reporting period. A summary of results is included in Table 3.5.

Table 3.5 Results summary of chloroacetic acid

Water sampling locality	Sampling Frequency	Number of samples	Drinking water quality standard (mg/L)	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met (s. 18)
Tidal River	Quarterly	12*	0.15	0.01*	0.01**	0

** While the sampling frequency for chloroacetic acid is quarterly, samples were collected monthly therefore all sample results have been reported on.*

*** All samples <0.01 mg/L*

3.3.2 Dichloroacetic acid

Dichloroacetic acid is monitored at Tidal River Campground only. The ADWG health limit for dichloroacetic acid in drinking water is 0.1mg/L.

All samples at Tidal River Campground were compliant for dichloroacetic acid in the reporting period. A summary of results is included in Table 3.6.

Table 3.6 Results summary of dichloroacetic acid

Water sampling locality	Sampling Frequency	Number of samples	Drinking water quality standard (mg/L)	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met (s. 18)
Tidal River	Quarterly	12	0.1	0.015	0.009	0

** While the sampling frequency for dichloroacetic acid is quarterly, samples were collected monthly therefore all sample results have been reported on.*

3.3.3 Trichloroacetic acid

Trichloroacetic acid is monitored at Tidal River Campground only. The ADWG health limit for trichloroacetic acid in drinking water is 0.15mg/L.

All samples at Tidal River Campground were compliant for trichloroacetic acid in the reporting period. A summary of results is included in Table 3.7.

Table 3.7 Results summary of trichloroacetic acid

Water sampling locality	Sampling Frequency	Number of samples	Drinking water quality standard (mg/L)	Maximum (mg/L)	Average (mg/L)	Number of samples where standard was not met (s. 18)
Tidal River	Quarterly	12	0.1	0.006	0.005	0

** While the sampling frequency for trichloroacetic acid is quarterly, samples were collected monthly therefore all sample results have been reported on.*

3.3.4 Other health-related parameters

At Tidal River Campground, quarterly metals monitoring at consumer taps occurred in the reporting period to assess for any potential leaching risks associated with the water distribution network. All results were compliant with results less than the corresponding health-limit in the ADWG. A summary of results is included in Table 3.8. One quarterly sample for mercury was not analysed by the laboratory and is discussed in Section 6.2.

Table 3.8 Results summary for metals

Water sampling locality	Parameter	Sampling Frequency	Number of samples	Drinking water quality standard (mg/L)	Maximum (mg/L)	Number of samples where standard was not met (s. 18)
Tidal River	Aluminium	Quarterly	4	n/s	0.01	n/a
Tidal River	Antimony	Quarterly	4	0.003	<0.001	0
Tidal River	Arsenic	Quarterly	4	0.01	<0.001	0
Tidal River	Barium	Quarterly	4	2	0.013	0
Tidal River	Beryllium	Quarterly	4	0.06	<0.001	0
Tidal River	Boron	Quarterly	4	4	0.030	0
Tidal River	Cadmium	Quarterly	4	0.002	<0.001	0
Tidal River	Chromium	Quarterly	4	0.05	<0.001	0
Tidal River	Cobalt	Quarterly	4	n/s	<0.001	n/a
Tidal River	Copper	Quarterly	4	2	0.07	0
Tidal River	Iron	Quarterly	4	0.3*	0.02	0

Water sampling locality	Parameter	Sampling Frequency	Number of samples	Drinking water quality standard (mg/L)	Maximum (mg/L)	Number of samples where standard was not met (s. 18)
Tidal River	Lead	Quarterly	4	0.01	0.002	0
Tidal River	Manganese	Quarterly	4	0.5	0.003	0
Tidal River	Mercury	Quarterly	3**	0.001	<0.0001	0
Tidal River	Molybdenum	Quarterly	4	0.05	<0.001	0
Tidal River	Nickel	Quarterly	4	0.02	<0.001	0
Tidal River	Selenium	Quarterly	4	0.01	<0.001	0
Tidal River	Silver	Quarterly	4	0.1	<0.001	0
Tidal River	Strontium	Quarterly	4	n/s	0.04	n/a
Tidal River	Thallium	Quarterly	4	n/s	<0.001	n/a
Tidal River	Thorium	Quarterly	4	n/s	0.003	n/a
Tidal River	Tin	Quarterly	4	n/s	<0.001	n/a
Tidal River	Titanium	Quarterly	4	n/s	<0.001	n/a
Tidal River	Uranium	Quarterly	2	0.02	<0.001	0
Tidal River	Vanadium	Quarterly	2	n/s	<0.001	n/a
Tidal River	Zinc	Quarterly	2	3*	0.03	0

n/s = no standard – no health or aesthetic limits for these parameters are found in the ADWG. These parameters are included as part of the NATA laboratories metal analysis scan.

** ADWG aesthetic limit, no ADWG health limit available.*

*** Missed sample event. Refer to Section 6.2.*

Cryptosporidium, Giardia, blue-green algae, and the 5-yearly radionuclide screen (gross alpha and gross beta) were also monitored on the source water at Tidal River to assess source water risks. All results were either less than the detection limits or at levels which presented no risk.

At Twelve Apostles Visitor Facility, event-based monitoring of metals and volatile organic carbons occurred to validate that there were no impacts to drinking water quality from new assets installed at the site in the reporting period and previous reporting periods. All results were compliant with the corresponding health-limits in the ADWG.

3.4 Aesthetic characteristics

Where aesthetic parameters have been identified for monitoring, the corresponding aesthetic limit in the ADWG has been listed for comparison with results.

3.4.1 pH

The ADWG aesthetic range for pH in drinking water is 6.5 – 8.5.

All samples at Tidal River Campground and Twelve Apostles Visitor Facility were compliant for pH during the reporting period. A summary of results is included in Table 3.9.

Table 3.9 Results summary of pH

Water sampling locality	Sampling frequency	Number of samples	Aesthetic operating range	Minimum	Maximum
Tidal River	Weekly/Monthly	64*	6.5 - 8.5	6.9	7.8
Twelve Apostles	Monthly	24**	6.5 – 8.5	7.6	8.1

** Number of samples representative of treated water samples - water storage (52), rotating customer tap (12).*

*** Number of samples representative of treated water samples- water storage (12), rotating customer tap (12).*

3.4.2 Colour

The ADWG aesthetic guideline limit for colour in drinking water is 15 Hazen.

Colour is monitored at Tidal River Campground only. All samples at Tidal River Campground were compliant for colour during the reporting period. A summary of results is included in Table 3.10.

Table 3.10 Results summary of colour

Water sampling locality	Sampling frequency	Number of samples	Aesthetic guideline (Hazen)	Maximum (Hazen)	Average (Hazen)
Tidal River	Monthly	12	15	6*	5*

** The minimum laboratory reporting value for colour is 5 Hazen.*

3.4.3 Aluminium (acid-soluble)

Aluminium (PAC23) is used as a coagulant to assist with improving the filtration process and is removed during the treatment process. The ADWG aesthetic limit for aluminium (acid-soluble) in drinking water is 0.2mg/L.

Aluminium (acid-soluble) is monitored at Tidal River Campground only. All samples at Tidal River Campground were compliant for aluminium (acid-soluble) in the reporting period. A summary of results is included in Table 3.11.

Table 3.11 Results summary of aluminium (acid soluble)

Water sampling locality	Sampling Frequency	Number of samples	Aesthetic operating range (mg/L)	Maximum (mg/L)	Average (mg/L)
Tidal River	Monthly	12	0.2	0.14	0.02

3.4.4 Alkalinity

ADWG aesthetic limit is 200 mg/L for alkalinity and is the sum of the carbonate, bicarbonate and hydroxide content.

Alkalinity is monitored at Tidal River Campground only. All samples at Tidal River Campground were compliant for alkalinity in the reporting period. A summary of results is included in Table 3.12.

Table 3.12 Results summary of alkalinity

Water sampling locality	Sampling frequency	Number of samples	Aesthetic guideline (mg/L)	Maximum (mg/L)	Average (mg/L)
Tidal River	Monthly	12	200	49	37

4 Analysis of water quality results

4.1 Water quality results 2023/24

Results for this reporting period have been compared to results from the previous two reporting periods, as per Regulation 16(h). A summary is included in Table 4.1.

Table 4.1 Compliance comparison for parameters for most three recent reporting periods

Water sampling locality	Water Quality Parameter	Percentage of samples compliant with drinking water quality standard or aesthetic guidelines		
		2020/21	2022/23	2023/24
Tidal River	Escherichia coli	98.7%	100 %	100 %
	Turbidity	100 %	100 %	100 %
	Trihalomethanes (THM)	100 %	100 %	100 %
	Chloroacetic acid	100 %	100 %	100 %
	Dichloroacetic acid	100 %	100 %	100 %
	Trichloroacetic acid	100 %	100 %	100 %
	Metals	-*	100 %	100%
	pH	98.4%	100 %	100 %
	Colour	100 %	100 %	100 %
	Aluminium	100 %	100 %	100 %
	Alkalinity	100 %	100 %	100 %
Twelve Apostles	Escherichia coli	100 %	100 %	100 %
	Turbidity	100 %	100 %	100 %
	Trihalomethanes (THM)	100 %	100 %	100 %
	pH	100%	100%	100 %

** Metals monitoring commenced at Tidal River in the 2022/23 reporting period*

The analysis shows full compliance with drinking water standards at both Tidal River Campground and the Twelve Apostles Visitor Facility for the reporting period. Compliance remains consistent with the previous reporting period.

5 Water Quality Customer Complaints

5.1 Customer Complaints 2023/24

Parks Victoria take customer complaints seriously. If a complaint is received regarding water quality, it is recorded and investigated with corrective action implemented as needed.

There were no water quality complaints received in the reporting period. This is consistent with the last two reporting periods as outlined in Table 5.1.

Table 5.1 Complaints comparison for three reporting periods

Water sampling locality	Number of complaints			Comparison with previous reporting periods
	Current reporting period	2022/23	2021/22	
Tidal River	0	0	0	No change
Twelve Apostles	0	0	0	No change

6 Emergency and Incident Management

6.1 Incident management

No Section 18 or Section 22 (SDW Act) notification events occurred at the Tidal River Campground or Twelve Apostles Visitor Facility for the reporting period.

6.2 Other notifications

In April 2024, Parks Victoria notified DH of a missed analysis event at the Tidal River Campground.

6.2.3 Tidal River Campground - missed analysis event, 2 January 2024

On 2 January 2024, a drinking water sample was collected from a customer tap at the Tidal River Campground in accordance with the sampling program set out in the site risk management plan, however the parameter mercury (analysed as part of a metals suite) was not analysed by the NATA-accredited laboratory as scheduled.

The missed analysis was identified in April 2024 during a manual data entry process. The event was notified to DH and a missed analysis event was recorded as Parks Victoria did not meet the requirement under 14(2) of the SDW Regulations to ensure that samples given to an accredited laboratory for analysis, be analysed as per the parameters set out in the sampling program in its risk management plan.

An investigation into the missed analysis was completed and identified that the analysis did not occur due to a human error at the laboratory. The laboratory template that is used to inform metals analysis requirements for Tidal River had been manually updated by laboratory staff, but the parameter mercury had not been included in the updated template.

To prevent reoccurrence, a correction was made to the laboratory template for metals analysis to include the parameter mercury. As a secondary measure, the chain of custody form now identifies each parameter requiring analysis in a metals suite, in the event of any future laboratory template issues. Closer screening of incoming metals reports is also occurring by Parks Victoria.

Since implementation of these actions, there has been no further occurrence of missed analysis.

There was no risk to water safety in the absence of the mercury result. Previous and subsequent results for mercury show compliance and no detection within the Tidal River water supply system.

7 Risk Management Plan Audit

7.1 Audit 2023/24

The SDW Act requires water suppliers to prepare, implement, review and revise risk management plans for the supply of drinking water and details the matters that must be contained in a risk management plan. Parks Victoria implement site-specific safe drinking water risk management plans at each of their drinking water localities. The plans consider risks across the whole water supply system, from catchment to tap, and have been developed to meet the requirements of the SDW Act.

At periods declared by DH, the risk management plan is required to be audited by an approved third-party auditor under the SDW Act. The audits of risk management plans are conducted to determine compliance with the legislative risk management plan requirements and are an opportunity to drive improvement.

The requirement for a risk management plan audit did not fall within this reporting period, however the status of the four opportunities for improvement identified in the previous March 2023 audit are listed in Table 7.1

Table 7.1 Risk Management Plan audit March 2023, summary of opportunities for improvement

Item No.	Opportunity for Improvement	Status
1	Before the next review of the Tidal River risk assessment, it is recommended that a new process flow diagram is created that includes detail of the treatment plant. This could be an additional diagram to the scheme diagram.	Closed. A new process diagram was developed and included in the risk management plan.
2	Maintain a record of staff competencies for training in Standard Operating Procedures.	Closed. Record-keeping requirements for training in drinking water Safe Work Practices are now included in the risk management plan.
3	Consider adding more detail in the RMP on the rationale for the numbers of samples taken. For instance, relate the number of *E. coli* samples taken to the site population, water consumption or another metric.	Closed. Detail on the rationale for the numbers of samples taken at each of the drinking water localities is now included in the risk management plan.
4	Restrict the access to critical limit alarms for critical control points (CCPs) so that operators cannot inadvertently change them. Also, consider an alarm or timer on the instrument inhibit functionality so it cannot be inadvertently left on.	Closed. The opportunity for improvement is included in the improvement plan register for Tidal River as part of the supervisory control and data acquisition (SCADA) upgrade project. The implementation of the opportunity for improvement has not occurred however inclusion in the improvement plan register enables review and implementation of this action as part of the SCADA upgrade project.

8 Other Reporting Requirements

8.1 Undertakings

Under the SDW Regulations, Regulation 16, a summary of every written undertaking by the water supplier accepted by the Secretary under s.30 of the SDW Act is required.

No undertakings were carried out or commenced during the reporting period.

8.2 Section 19 Aesthetic Standard Variations

There were no SDW Act s 19 variations or s 21 notices in place or issued during the reporting period, as required under Regulation 16(i)(i) of the SDW Regulations.

8.3 Section 20 Exemptions and Section 21 notices

There were no s 20 exemptions or s 21 notices in place or issued during the reporting period, as required under Regulation 16(i)(ii) of the SDW Regulations.

8.4 Regulated Water

Regulated water is “water that is not intended for drinking but could reasonably be mistaken as drinking water” that has been gazetted under s 6 of the SDW Act.

Parks Victoria does not supply regulated water pursuant to s 6 of the SDW Act.

9 Glossary of Terms

ADWG Health limit	The concentration or measure of a water quality characteristic set by the ADWGs that, based on present knowledge, does not result in any significant risk to the health of the consumer over a lifetime of consumption.
ADWG Aesthetic limit	The concentration or measure of a water quality characteristic set by the ADWGs that is associated with the acceptability of water to the consumer, e.g. appearance, taste, and odour.
DH	Department of Health
Drinking water sample	A sample of water taken from a site whereby water has undergone treatment to meet drinking water sample standards. It includes samples taken post-treatment, through to storage and to consumer sample points/taps.
Laboratory	An external accredited facility used to analyse water quality samples in accordance with accepted methodologies and standards. Laboratories used by Parks Victoria are accredited under the National Association of Testing Authorities, Australia (NATA).
PAC 23	Polyaluminium chlorite. A liquid inorganic coagulant containing aluminium compounds and is used in the treatment of water.
Polymer	An additive to promote the formation of floc particles and hence the clarification of water.
Reporting period	The span of time covering the extent of a report. For this report, the reporting period is 1 July 2023 to 30 June 2024 and includes results from sample rounds and events that occurred within the time period.
Sample standard / drinking water quality standard	The SDW Regulations Schedule 2 sets three drinking water quality standards, as summarised below: • *E. coli* – All samples of drinking water collected are found to contain no Escherichia coli organisms per 100 mL of drinking water, with the exception of any false positive sample • Total Trihalomethanes – less than or equal to 0.25 mg/L of drinking water • Turbidity – the 95th percentile of results for samples in any 12-month period must be less than or equal to 5.0 Nephelometric Turbidity Units (NTU)
SDW Act	Safe Drinking Water Act 2003
SDW Regulations	Safe Drinking Water Regulations 2015
Section 18 notification	Refers to a notification required if non-complying water is supplied or if the supplied water is unlikely to comply with the relevant water quality standard. The water quality standard refers to the standards specified under r.12 of the SDW Regulations. Notifications must be made in writing to the Department of Health within 10 days of detection.
Section 22 notification	Refers to a report of known or suspected drinking water contamination. Notifications must be reported immediately to the Department of Health verbally and in writing when the: • water may be the cause of an illness • level of a water quality standard is such that it may pose a risk to human health • water may cause widespread complaints.
Soda Ash	Sodium carbonate. pH corrector raising pH to near-neutral.
Sodium hypochlorite	Used in the chlorination/disinfection of drinking water.

Parks Victoria complies with s 23 of the Act through the annual publishing of the Annual Report on the Parks Victoria website. Interested readers may receive further information from Parks Victoria on drinking water provided at the two sampling localities (Tidal River Campground and Twelve Apostles Visitor Facility) by calling 13 1963.

A copy of the Parks Victoria Water Quality Annual Repot 2023/24 can be found at www.parks.vic.gov.au.

Parks Victoria
Level 10, 535 Bourke St, Melbourne VIC 3000
parks.vic.gov.au
13 1963