

**PARKS VICTORIA**

**Water Quality Annual Report**

**2021/2022**

October 2022



*Healthy Parks  
Healthy People®*



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# 1 INTRODUCTION

Parks Victoria (PV) is a statutory authority of the Victorian Government responsible for the management of a diverse parks and reserves estate covering more than 4 million hectares, approximately 18% of Victoria. The portfolio comprises of 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 plays a pivotal role in connecting people and communities with parks.

At two of its visitor sites, Tidal River Campground and Twelve Apostles Visitor Facility (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).

Section 26 of the SDW Act requires that PV produces an annual drinking *Water Quality Report* for its two sites. 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. The report must meet the information requirements set out in the SDW Act and SDW Regulations. This report has been prepared to comply with these requirements and covers the period from 1 July 2021 to 30 June 2022, which is referred to as the reporting period.

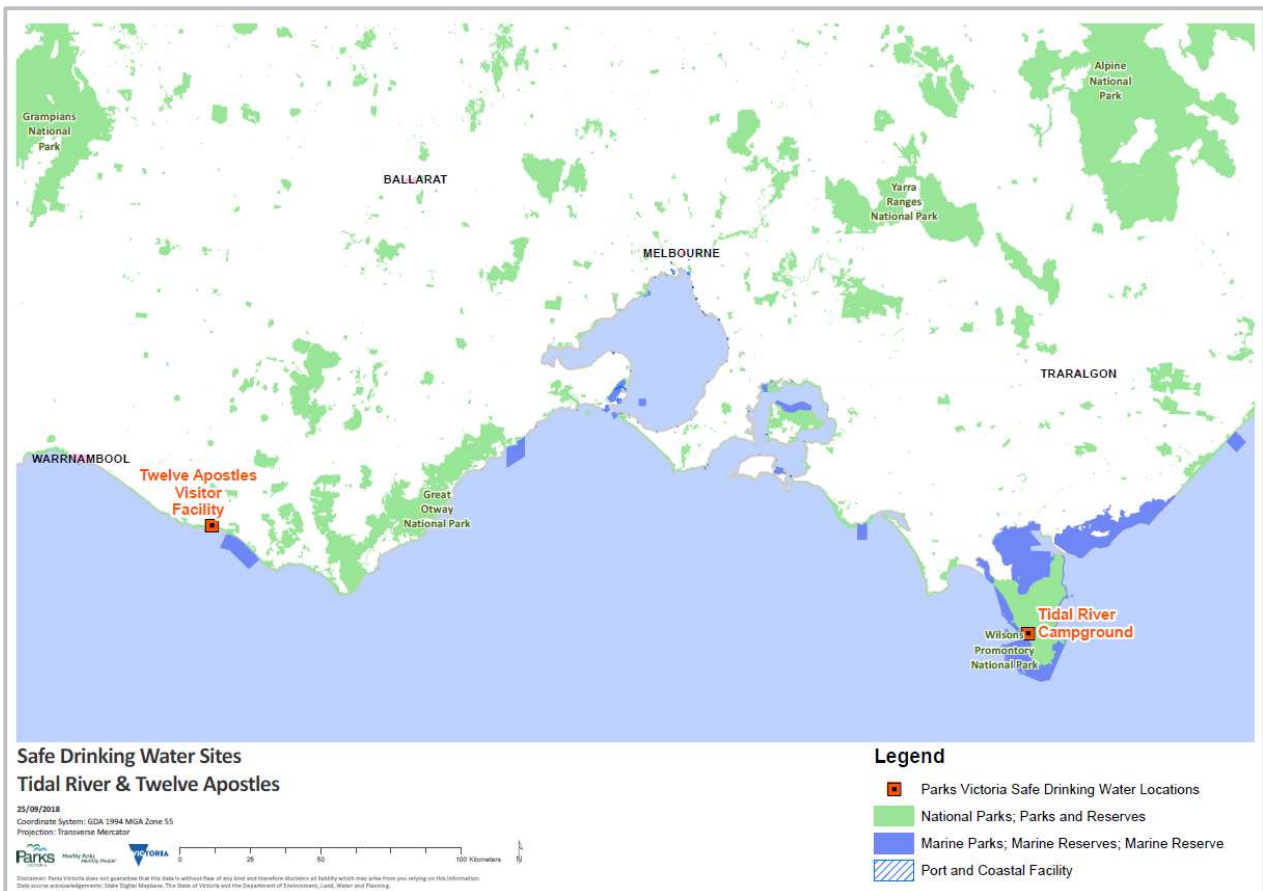


Figure 1-1: Parks Victoria Safe Drinking Water Localities

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## 1.1 Regulatory Framework

Drinking water in Victoria is managed in accordance with the safe drinking water regulatory framework (SDW Act and SDW Regulations) and the *Australian Drinking Water Guidelines* (ADWGs). The SDW Act is the main piece of legislation in Victoria under which water suppliers must operate. The purpose of the SDW Act is to make provision for the supply of safe, high-quality drinking water in Victoria. The SDW Regulations make further provision for the supply and management of safe drinking water.

### Need to supply safe drinking water

The SDW Act requires water suppliers to ensure that the drinking water they supply meets quality standards specified by the SDW Regulations by conducting frequent water quality monitoring and comparing these against water quality standards. Water suppliers are also required to:

- implement a 'catchment to tap' risk management framework
- report specified non-compliances or breaches to the DH
- provide an annual summary report to the DH detailing required information (this report)
- provide this information publicly.

### Need to have a risk management plan

The SDW Act requires PV to have a documented risk management plan for its drinking water supplies and to implement and review these plans. Each risk management plan is to specifically include the following components:

- identification of hazards and risks to public health
- measures taken to manage hazards and risks
- features of a supply system which manage risks
- methods of verifying effectiveness of these measures and features
- procedures and management system
- emergency management arrangements and procedures
- contact lists of persons responsible for responding to incidents and managing hazards.

### Need for quality assurance and verification

The SDW Act requires water quality monitoring tests to be undertaken through NATA-accredited laboratories, and risk management plans to be audited by an approved independent auditor at periods declared by DH.

## 1.2 Australian Drinking Water Guidelines

The National Water Quality Management Strategy publishes the *Australian Drinking Water Guidelines* (ADWGs). Although not legally binding, it is the leading resource for drinking water management in Australia providing scientifically based health and aesthetic guideline values (limits) for drinking water.

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

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associated with the acceptability of water to the consumer, such as appearance, taste, and odour.

The ADWGs set the framework for management of drinking water quality, known as the '12 elements'. Parks Victoria has adopted the 12 elements approach in managing its drinking water system. The 12 elements include the following:

1. Commitment to drinking water quality management (by the organisation)
2. Assessment of the drinking water supply system
3. Preventive measures for drinking water quality management
4. Ensuring operational procedures and process controls are in place
5. Verification of drinking water quality
6. Management of incidents and emergencies
7. Employee awareness and training
8. Community involvement and awareness
9. Research and development
10. Documentation and reporting
11. Evaluation and audit
12. Review and continual improvement.

## **1.3 Commitment to pro-active management of risk and maintenance of drinking water quality standards**

Parks Victoria is committed to minimising risk to public health by providing a reliable and safe supply of potable drinking water at Tidal River Campground in Wilsons Promontory National Park, and the Twelve Apostles Visitor Facility in Port Campbell National Park, in accordance with the SDW Act and SDW Regulations.

Each water supply system is operated under its respective Safe Drinking Water Risk Management Plan as required under the SDW Act. The risk management plan is a living document and drives continuous improvement through regular audit and risk assessment processes.

Where a safe standard of drinking water cannot be guaranteed at visitor sites across Victoria, PV is committed to signing points of supply as not meeting requirements for drinking water.

Parks Victoria's commitments are implemented through:

- complying with Victoria's SDW Act and SDW Regulations
- protecting drinking water catchments and waterways
- ensuring that PV and its contractors are trained in the day-to-day implementation of safe drinking water requirements and activities and are equipped to anticipate and manage public health risks
- working collaboratively between staff and contractors to implement risk management plans to mitigate hazards to drinking water quality
- upgrading water treatment infrastructure to meet industry standard

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- continually assessing, evaluating, and improving performance and infrastructure to address risk
- remaining abreast of treatment technologies and small system management and operation
- managing risks in accordance with PV's internal policy and procedure framework.

## 1.4 Overview

Parks Victoria has two drinking water sites that operate under the safe drinking water regulatory framework.

### 1.4.1 Tidal River Campground – Wilsons Promontory National Park

Wilsons Promontory National Park is one of Victoria's oldest and best-loved national parks. The park receives an estimated 450,000 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.

Like the rest of Victoria, the Tidal River Campground continued to experience periods of reduced patronage from July to October 2021 due to periodic lockdown of metropolitan Melbourne, and at times, the entire state. Since the lifting of lockdown restrictions, visitor numbers have returned and Tidal River Campground continues to be a popular destination.

Parks Victoria manage 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*. This includes routine and operational monitoring and assessment of the system against set operational and compliance criteria to ensure that the system is running to specification and is meeting compliance obligations.

The Tidal River WTP receives and treats raw water direct from a small weir in Tidal River. Once treated, water from the Tidal River WTP is stored and distributed to the Tidal River Campground, facilities and operational areas for park visitors, staff, volunteers, and contractors. A map of the location of the Tidal River Campground in the Wilsons Promontory National Park is shown in Figure 1-2.



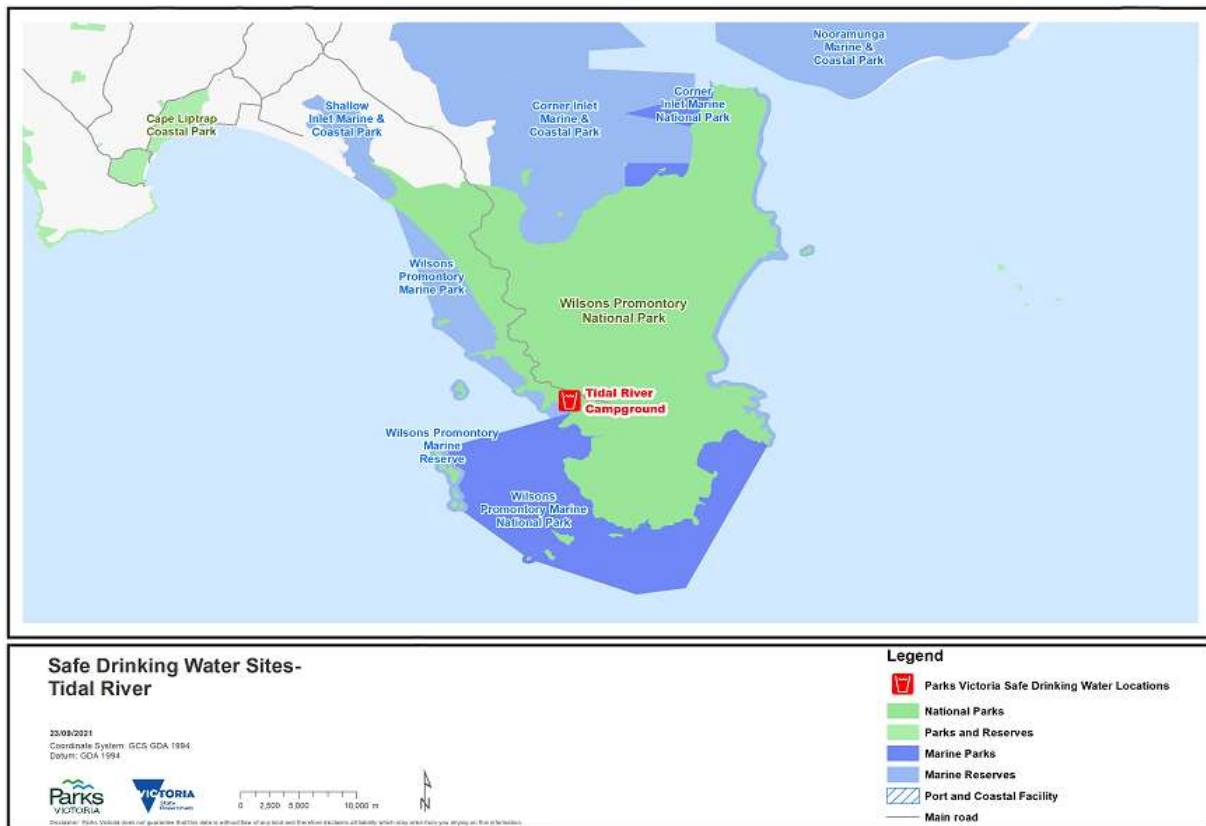


Figure 1-2: Location of Tidal River Campground, Wilsons Promontory National Park

### 1.4.2 Twelve Apostles Visitor Facility – Port Campbell National Park

The Twelve Apostles are located within Port Campbell National Park and receive an estimated 1.9 million day-visitors annually. While remaining open throughout the year, the number of visitors to the site from July to October 2021 continued to be impacted by periodic lockdown of metropolitan Melbourne, and at times, statewide lockdown. The site also continued to experience a reduced number of international and domestic visitors as per the previous reporting period and while restrictions have eased, visitor numbers experienced at the Twelve Apostles Visitor Facility prior to the coronavirus pandemic response are yet to return.

In typical years, the Twelve Apostles Visitor Facility is Parks Victoria’s most visited tourist attraction. The Twelve Apostles Visitor Facility is the main facility at the Twelve Apostles and is located adjacent to the Port Campbell National Park. The visitor centre provides car parking facilities, a kiosk, and amenities for the visitors to the Park.

Whilst PV has overarching responsibility and control of the site, PV contract Wannon Water as a service provider to operate and maintain the Twelve Apostles water supply system in accordance with the *Twelve Apostles Safe Drinking Water Risk Management Plan*. Responsibilities include collection of operational and regulatory samples, asset maintenance, and responding to water quality events. A map of the location of the Twelve Apostles Visitor Facility is shown in Figure 1-3.



Figure 1-3: Location of Twelve Apostles Visitor Facility, Port Campbell National Park

### 1.5 Water supply systems

A summary of each of the drinking water supply systems is summarised in Table 1-1 below. There were no changes to the water supply system or source water supply at the Tidal River Campground during the reporting period.

At Twelve Apostles Visitor Facility, following the commissioning of the mains water pipeline from Wannon Water’s Port Campbell drinking water locality to the Twelve Apostles Visitor Facility in December 2020, Parks Victoria implemented a water upgrade project in June 2022. This project included installation of new pumps and a water pressure management system, decommissioning and removal of redundant water storage tanks and booster pumps, decommissioning and removal of the secondary disinfection treatment system, and installation of a backflow prevention device.

The secondary disinfection treatment system was removed as it was no longer required with the commissioning of the mains water pipeline and elimination of the water carting activity. Its removal was supported by a water quality risk assessment which indicated secondary treatment was no longer necessary and that the safety of the water supplied could be ensured without secondary treatment.

Overall, the project delivered on improved pressurisation of the water supply system, enabling continued supply of water across the facility during peak periods. It also provided for a simplified water network.

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Table 1-1: Summary of Parks Victoria drinking water supply systems

Water sampling locality	Population supplied (estimated)	Source water	Raw-water storages	Treatment Plant	Treated water storages
Tidal River Campground	~450,000 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 undergoes coagulation, flocculation, clarification, filtration, and disinfection.	Treated water is held in a clearwater storage tank (1.1ML) before being pumped to two elevated storage tanks (0.6ML combined). Total storage capacity of 1.7ML has capacity for 5-7 days water supply in peak season. Water is gravity-fed through Tidal River via a reticulated system.
Twelve Apostles Visitor Facility	~1.9 million day-visitors annually *	Wannon Water supplied drinking water. Water is supplied by 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 and staff tea room.

\*These figures represent supplied population in years not affected by COVID-19 restrictions or recovery.

\*\* Post-storage UV-disinfection of treated water was in place until June 2022. The UV treatment system was decommissioned and removed as part of the second stage of the water upgrade project.

## 1.6 Source Water

### 1.6.1 Tidal River Campground, Wilsons Promontory National Park

The catchment at Tidal River consists of an approximate 2,000 hectare conservation zone within the Wilsons Promontory National Park (Figure 1-4). 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. Raw water sampling is conducted to monitor catchment conditions, microbial quality, and the source water categorisation. Results in the reporting period demonstrate no major catchment changes and consistency with the Health Based Target Assessment.

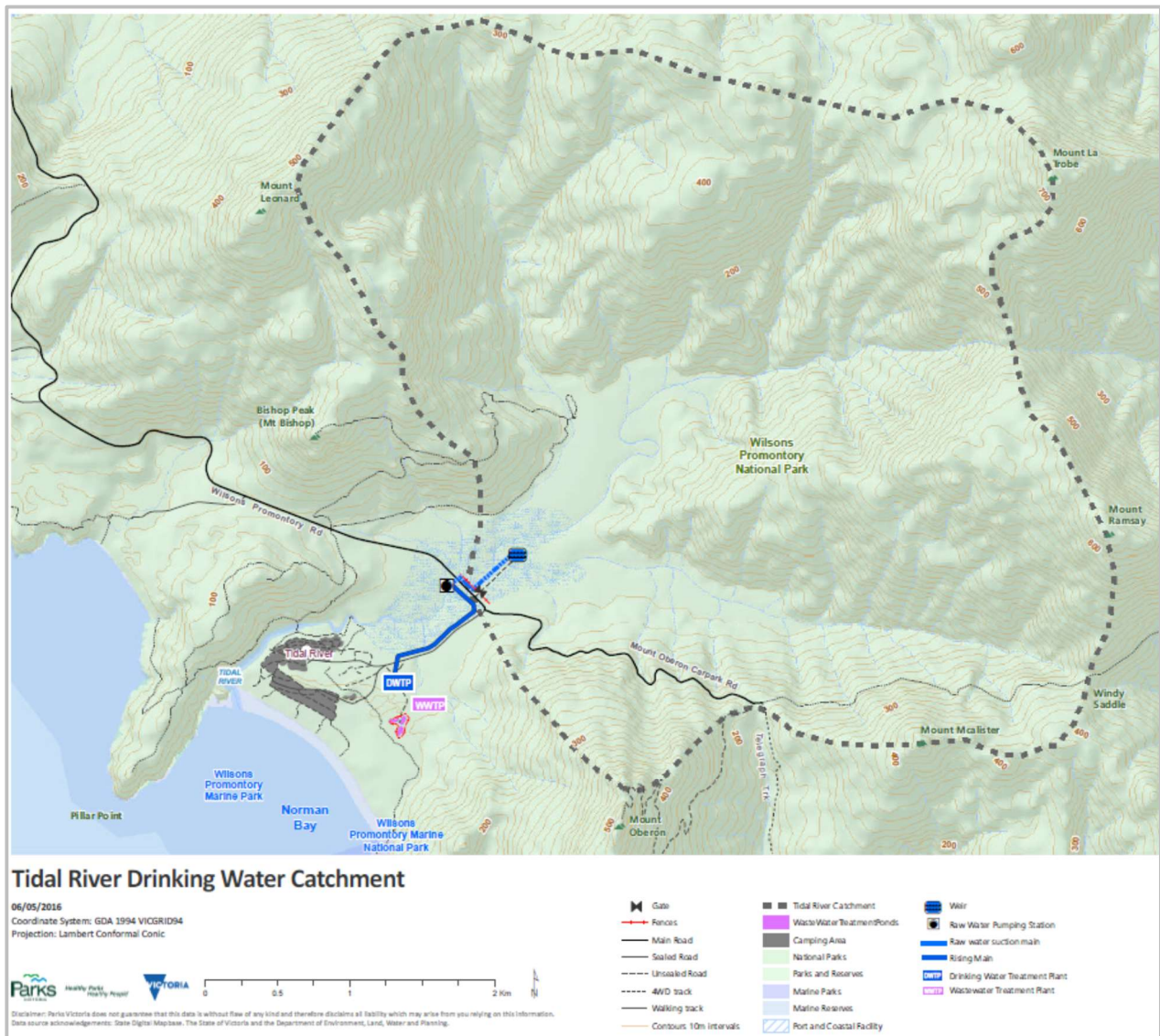


Figure 1-4: Tidal River Campground drinking water catchment

**1.6.2 Twelve Apostles Visitor Facility, Port Campbell National Park**

The Twelve Apostles Visitor Facility is supplied with water already treated to a drinking water quality standard by Wannon Water’s Port Campbell drinking water locality network, as outlined in Table 1-2. The water is supplied via a mains pipeline in accordance with a drinking water metered supply agreement.

Wannon Water treats water to a drinking water standard, monitors water quality, and has procedures and processes in place to ensure that drinking water quality is maintained from their Port Campbell Water Treatment Plant and across their network. The source risks are therefore managed by Wannon Water, and Parks Victoria manage any potential re-contamination risks associated with the storage and supply of water to the consumer taps within the Twelve Apostles drinking water locality.

Information on treated water quality is shared as required and in the event of a water quality issue, with no occurrence of the later occurring in this reporting period. Wannon Water’s Water Quality Annual Report provides further source water and treatment information.



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Table 1-2: Wannon Water WTP supplying the Twelve Apostles Visitor Facility

Water Treatment Plant	Source Water	Treatment Details
Port Campbell	Dilwyn aquifer	Aeration, Filtration, Disinfection

*N.B. The Port Campbell locality has a sealed reticulation network.*

## 2 DRINKING WATER TREATMENT PROCESSES

Table 2-1 outlines the drinking water treatment processes applied to water at the two Parks Victoria water sampling localities and the added substances associated with the treatment process as required under *Regulation 16(e)* of the SDW Regulations.

No changes to the treatment processes occurred in the reporting period at Tidal River. For the Twelve Apostles Visitor Facility, the secondary disinfection system was decommissioned and removed in June 2022. This occurred as a second stage water upgrade project and was a subsequent step to the commissioning of the mains pipeline to the site and elimination of the water carting activity. With the elimination of the water carting activity, this process step was no longer required. The removal of the secondary treatment system was supported by a water quality risk assessment which indicated secondary treatment was no longer necessary and that the safety of the water supplied could be ensured without secondary treatment. There is no longer any water treatment at the Twelve Apostles Visitor Facility.

Table 2-1: 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
	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



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Water sampling locality	Treatment process	Process description	Added substances(s)
Twelve Apostles Visitor Facility	Disinfection	Treated water supplied by Wannon Water is stored at site in two storage tanks. For the majority of the reporting period, a UV disinfection unit was in place and treated water was passed through the UV disinfection unit prior to distribution to the reticulation network. This UV disinfection unit was decommissioned and removed in June 2022. At the end of the reporting period, no treatment was in place at the locality.	None

No issues associated with the application of treatment processes occurred at either location during the reporting period.

## 3 EMERGENCY, INCIDENT & EVENT MANAGEMENT

### 3.1 Incident management

No Section 18 or Section 22 (SDW Act) notification events occurred at the Twelve Apostles Visitor Facility in the 2021/22 reporting year whereby the quality of drinking water was affected.

Tidal River Campground had two Section 22 (SDW Act) notification events during the reporting period where *E.coli* was detected in routine samples of treated drinking water. Section 18 (SDW Act) notifications were subsequently required for each of these events. These events are summarised below.

In addition to the above, a missed sample event occurred at Twelve Apostles. This event is summarised below. No emergencies occurred at either of the localities

#### **Tidal River Campground, 9 August 2021, Section 22 and 18 notification event**

*E. coli* was detected at 1 org/100ml in a drinking water distribution sample collected from the treated water storage tanks (known as the elevated storage). The sample was collected on 9 August 2021 and was reported to Parks Victoria by the NATA-accredited laboratory on 11 August 2021. *E. coli* was not detected in other drinking water samples collected as part of the sample round, including the upstream treatment sample and downstream consumer sample.

The Department of Health was immediately notified of the event. An investigation into the possible cause of the detection and an event response was initiated. The investigation assessed treatment plant performance and reviewed water storages, reticulation system integrity, sample points, and other water quality data from the sample round. No integrity or contamination indicators were observed. Follow up samples were collected on 11 and 12 August 2021, and the distribution network was flushed as a precaution.

A rapid risk assessment was conducted and discussed with DH as part of the initial event response. The assessment concluded that there was no risk to public health and no need to issue public health advice. This was supported by DH and later validated by results from the follow up sample rounds, which showed no *E. coli* detections in any drinking water samples.

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Investigations concluded that a sampling contamination issue may have contributed to the *E. coli* detection and identified that a series of water treatment plant turbidity alarms were triggered in the month prior to the *E. coli* detection. A potential issue with instrument calibration and a potential sensor issue was identified. In accordance with Schedule 2 of the SDW Regulations, a 'false positive' could not be claimed for this event due to these findings, and Parks Victoria submitted a Section 18 notification to DH concluding that the water quality standard had not been met.

Actions to improve equipment calibration scheduling were implemented. Further investigations, post submission of the investigation report identified that the plant was operating as it should have been and triggering shut downs as required, and that a faulty sensor was contributing to the turbidity alarms being triggered. This has since been rectified.

## **Tidal River Campground, 28 February 2022, Section 22 and 18 notification event**

*E. coli* was detected at 36 orgs/100ml in a drinking water sample collected from a consumer tap. The sample was collected on the 28 February 2022 and was reported to Parks Victoria by the NATA-accredited laboratory on 2 March 2022. *E. coli* was not detected in other samples collected as part of the sample round including the upstream treatment and distribution drinking water samples.

The Department of Health was immediately notified of the event. An investigation into the possible cause of the detection and an event response was initiated. The investigation assessed treatment plant performance, reviewed treated water storages, reticulation system integrity, sample points, and other water quality data from the sample round. No integrity or contamination indicators were observed. Follow up samples were collected on 3 and 4 March 2022 and the distribution network was flushed as a precaution.

A rapid risk assessment was conducted and discussed with DH as part of the initial event response. The assessment concluded that there was no risk to public health and no need to issue public health advice. This was supported by DH and later validated by results from the follow up sample rounds, which showed no *E. coli* detections in any drinking water samples.

Investigations concluded that a sampling issue may have contributed to the *E. coli* detection. As a result, Parks Victoria reviewed their sample collection procedure to ensure consistent sample collection and implementation of appropriate hygiene practices, and reviewed all sampling points for potential sources of contamination with an action plan developed to address improvements where required.

In accordance with Schedule 2 of the SDW Regulations, a 'false positive' could not be claimed for this event as samples collected on 3 March could not be analysed in accordance with NATA requirements due to logistical issues. Samples collected on 4 March were analysed in accordance with NATA requirements. Parks Victoria submitted a Section 18 notification to DH concluding that the water quality standard had not been met.

## **Twelve Apostles Visitor Facility, 27 December 2021, missed sample event**

A customer tap drinking water sample was not collected from the Twelve Apostles Visitor Facility for the

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week starting 27 December 2021. The source water tank sample was collected as part of the sample round and returned a result of no *E. coli*, but the customer tap was missed. The missed sample was identified on 5 January 2022, the following week, and a re-sample event could not occur to meet compliance requirements.

On 6 January 2022, Parks Victoria notified DH that the requirements under Section 13.1 of the SDW Regulations to collect a drinking water sample in accordance with the sampling program set out in our risk management plan, had not been met. Subsequently, *E. coli* and turbidity were not analysed at the frequency of one drinking water sample per week as required under Schedule 2 of the SDW Regulations.

Investigations identified that a scheduling error had led to sample bottles for the customer tap drinking water sample arriving in a separate esky. The sampling operator on the day of collection was a different operator than the routine operator and did not notice the missing bottles. Additionally, the NATA-accredited laboratory did not notify of the missing sample which is routine process. This missed notification was due to a reduced workforce and different laboratory staff working over the holiday period.

Actions were implemented to correct the sampling schedule so that all sample bottles arrived in one esky, sampling requirements were re-communicated with sampling operators and the NATA-accredited laboratory undertook communications reconfirming notification protocols for samples expected but not received. The actions have been effective and no missed sample events have occurred since. In addition, the laboratory service provider was changed in April 2022.

## 3.2 COVID-19 management

Reduced visitor numbers and park closures as a result of the global coronavirus pandemic and associated orders from the Victorian Chief Health Officer continued this reporting period, mainly in July through to October 2021. During this time periodic lockdowns of metropolitan Melbourne and regional Victoria occurred. Since the easing of restrictions, visitor numbers have returned at Tidal River Campground, however Twelve Apostles Visitor Facility continues to experience reduced visitor numbers and a lower water demand.

The global coronavirus pandemic did not have impacts on the quality of drinking water at either of Parks Victoria's localities. Parks Victoria's operational management of drinking water supplies continues to adapt to the current environment.

## 4 DRINKING WATER QUALITY STANDARDS

For the reporting period, the water quality standards under the SDW Act and SDW Regulations applied. Regulation 16(f) states that water supplier annual reports must contain information relating to compliance with Regulations 12, 13 and Schedule 2.

A summary of the water quality parameters and frequency of monitoring at Tidal River Campground and

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Twelve Apostles Visitor Facility is included in Table 4-1. For this reporting period, the weekly sampling frequency resulted in 52 weekly sample rounds at both sites.

Table 4-1: Water quality monitoring parameters pursuant to Regulation 12

Parameter	Tidal River	Twelve Apostles
<i>Escherichia coli</i>	Weekly	Weekly
Turbidity	Weekly	Weekly
Trihalomethane	Monthly	Monthly
Chloroacetic acid	Monthly	Not applicable
Dichloroacetic acid	Monthly	
Trichloroacetic acid	Monthly	

## 4.1 Compliance with Regulation 12(a)

Regulation 12(a) requires that drinking water suppliers test drinking water for *Escherichia coli* (*E. coli*), trihalomethanes and turbidity. Results for these are summarised below.

### 4.1.1 *Escherichia coli*

Schedule 2 of the SDW Regulations requires all samples of drinking water to contain no *E. coli* per 100 millilitres of drinking water, with the exception of any false positive sample.

All samples at the Twelve Apostles Visitor Facility were compliant for *E. coli* in the reporting period.

Two samples for Tidal River Campground reported *E. coli* detections during the reporting period. The first *E. coli* detection was from a sample collected on 9 August 2021 and reported a result of 1 orgs/100ml. This sample was collected from the treated water storage tanks and is considered a distribution drinking water sample. The second *E. coli* detection was from a sample collected on 28 February 2022 and reported a result of 36 orgs/100ml. This sample was collected from a consumer tap and is considered a customer drinking water sample. A description of these events is summarised in section 3.1.

A summary of results is included in

Table 4-2.

Table 4-2: 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*	36	2	2
Twelve Apostles	Weekly	51**	0	0	0

\* Number of samples representative of treated water samples from the WTP (52), treated water storage tank (52) and weekly

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*rotating customer tap samples at the point of supply (52).*

*\*\* A missed sample event occurred at the Twelve Apostles Visitor Facility – refer to Section 3.1 for further information*

In the reporting period, at Tidal River Campground, two events occurred where *E. coli* samples collected were not analysed within the recommended sample holding time by the NATA-accredited laboratory. Regulation 14(2) of the SDW Regulations requires all samples to be analysed by an accredited laboratory in accordance with the water suppliers risk management plan.

## **Tidal River Campground, 13 January 2022, holding time exceedance on *E. coli* analysis**

On 10 January 2022, weekly samples were collected in accordance with the risk management plan. Samples were transported to the local Traralgon NATA-accredited laboratory and as per routine process, samples requiring microbial analysis were couriered by the laboratory to their supporting laboratory in Shepparton. Couriering samples for microbial analysis between laboratories was required at the time, because the Traralgon laboratory did not hold the required NATA-accreditation to analyse microbial samples, while their supporting SGS Shepparton laboratory had the accreditation.

On 11 January, Parks Victoria was informed that courier delays had been experienced and that the 24-hour recommended holding time for *E. coli* analysis for all samples in the round was exceeded by 1 hour and 15 minutes. A re-sample event occurred on 13 January with the objective of meeting holding time compliance requirements. Delays with courier logistic delays were experienced again. Recommended holding time for *E. coli* analysis for the raw water and treated water sample was exceeded by 15 minutes, but was met for the distribution and consumer samples.

## **Tidal River Campground, 31 January 2022, holding time exceedance on *E. coli* analysis**

On 31 January 2022, weekly samples were collected in accordance with the risk management plan and samples were transported and couriered as per the process described above. On 1 February, Parks Victoria was informed that courier delays had been experienced and that the 24-hour recommended holding time for *E. coli* analysis on the raw water, treated water and distribution samples was exceeded by 20 minutes, but was met for the consumer sample.

An investigation into both events was conducted and identified that increased courier delays were being experienced, associated with COVID pressures on the logistics systems. This was leading to samples arriving at the receiving laboratory later than they previously arrived. To ensure future sampling events met recommended holding time, Parks Victoria delayed sampling time to accommodate the potential for a later courier arrival and the local Traralgon NATA-accredited laboratory continued to pursue its accreditation for microbial analysis. This accreditation was received in March 2022 and has since eliminated the need to courier microbial samples between laboratories and delay sampling times. No further holding time exceedances have occurred at Tidal River Campground since this change.

It is noted that while holding times were exceeded for these events, the NATA-accredited laboratory advised that the integrity and results of the samples analysed on 13 and 31 January 2022 were not impacted by the extra holding time. All results showed no *E. coli*.



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## 4.1.2 Total trihalomethanes

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 both sites, were compliant for trihalomethanes in the reporting period. A summary of results is included in Table 4-3.

Table 4-3: Results summary for THM

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	0.20	0.13	0
Twelve Apostles	Monthly	12	0.25	0.04	0.03	0

## 4.1.3 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 both sites, were compliant for turbidity in the reporting period. A summary of results is included in Table 4-4.

Table 4-4: 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*	0.5	0.3	0
Twelve Apostles	Weekly	51**	0.26	0.25	0

\* Number of samples representative of treated water samples taken from treated water storage tank (52) and weekly rotating customer tap samples at the point of supply (52).

\*\* A missed sample event occurred at the Twelve Apostles Visitor Facility – refer to Section 3.1 for further information

In the reporting period, at Twelve Apostles Visitor Facility, one event occurred where turbidity samples collected were not analysed within the recommended holding time by the NATA-accredited laboratory. Regulation 14(2) of the SDW Regulations requires all samples to be analysed by an accredited laboratory in accordance with the water suppliers risk management plan.

### Twelve Apostles Visitor Facility, 1 November 2021, holding time exceedance on turbidity

On 1 November 2021, weekly samples were collected in accordance with the risk management plan. Samples were couriered to the NATA-accredited laboratory as per routine process and on time. On 30 November 2021, Parks Victoria were notified that although samples arrived in time, they were not analysed for turbidity within the recommended 2 day holding period, they were analysed in just under 3 days, resulting in a turbidity holding time exceedance of less than a day. The turbidity result was compliant.

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An investigation was conducted and identified that the samples were received at the NATA-accredited laboratory the day before a public holiday and that the NATA-accredited laboratory had deferred all analysis except for microbial analysis to the day after the public holiday. The samples had failed to be

Prioritised for processing on return. To ensure future sampling met holding time requirements and notification protocols were followed, the NATA-accredited laboratory recommunicated expectations and protocols.

It is noted that while holding time was exceeded, the NATA-accredited laboratory advised that the integrity of the sample and result was not impacted by the extra holding time.

## 4.2 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.

### 4.2.1 Chloroacetic acid

The ADWG health limit for chloroacetic acid in drinking water is 0.15mg/L.

All samples were compliant for chloroacetic acid in the reporting period. A summary of results is included as Table 4-5: Results summary of chloroacetic acid

Table 4-5: 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	Monthly	12	0.15	0.01*	0.01*	0

\* All samples <0.01 mg/L

### 4.2.2 Dichloroacetic acid

ADWG health limit for dichloroacetic acid in drinking water is 0.1mg/L.

All samples were compliant for dichloroacetic acid in the reporting period. A summary of results is included as Table 4-6: Results summary of dichloroacetic acid.

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Table 4-6: 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	Monthly	12	0.1	0.02	0.01	0

### 4.2.3 Trichloroacetic acid

The ADWG health limit for trichloroacetic acid in drinking water should not exceed 0.1 mg/L.

All samples were compliant for trichloroacetic acid in the reporting period. A summary of results is included in Table 4-7: Results summary of trichloroacetic acid.

Table 4-7: 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	Monthly	12	0.1	0.02	0.01	0

### 4.2.4 Other parameters

Cryptosporidium, Giardia and blue-green algae testing is carried out periodically on source water at the Tidal River Campground (in high risk seasonal periods) to assess source water risks. All results were either less than the detection limits or at levels which presented no risk. The 5-yearly radionuclide testing on source water was not required this reporting period.

## 5 AESTHETIC CHARACTERISTICS

A summary of the schedule for aesthetic parameter testing and frequency of monitoring is included in Table 5-1. Where parameters have been identified for monitoring, the corresponding aesthetic limit in the ADWG has been listed for comparison with results.

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Table 5-1: Aesthetic characteristics monitoring schedule for PV

Parameter	Tidal River	Twelve Apostles
pH	Weekly/Monthly*	Monthly
Colour	Monthly	Not applicable**
Aluminium	Monthly	
Alkalinity	Monthly	

\* 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.

## 5.1 pH

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

One sample at Tidal River Campground was non-compliant for pH during the reporting period. A summary of results is included in

Table 5-2. All samples at Twelve Apostles Visitor Facility were compliant for pH.

Table 5-2: 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	7.5	8.8
Twelve Apostles	Monthly	12	6.5 – 8.5	7.7	8.1

\* Number of samples representative of treated water samples taken weekly from treated water storage tank (52) and monthly from rotating customer tap samples at the point of supply (12).

### Tidal River Campground, 9 August 2021, pH non-compliance

On 9 August 2021, weekly samples were collected in accordance with the risk management plan. A consumer tap sample reported a pH result of 8.8, exceeding the upper aesthetic limit of 8.5. The non-compliant result was reported from the same sample round of the August 2021 *E. coli* detection. The results were not from the same sample point and were assessed to be unrelated.

Investigations into the pH non-compliance could not identify a cause. All operational and NATA-accredited pH results leading up to, and at the time of sample collection, were compliant and no activities took place that could lead to an increased pH. Parks Victoria monitored pH on notification of the non-compliance and in the following days with no issues detected. The result is considered an anomaly.

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## 5.2 Colour

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

All samples were compliant for colour during the reporting period. A summary of results is included in Table 5-3.

Table 5-3: Results summary of colour

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

\* All samples reported as <5. Where reported as <5, a value of 5 was utilised.

## 5.3 Aluminium

Aluminium 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.

All samples were compliant for aluminium in the reporting period. A summary of results is included in Table 5-4: Results summary of aluminium (acid soluble).

Table 5-4: 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	0.02	0.01

## 5.4 Alkalinity

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

All samples were compliant for alkalinity in the reporting period. A summary of results is included in Table 5-5: Results summary of alkalinity.

Table 5-5: 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	54	25



## 6 ANALYSIS OF WATER QUALITY RESULTS

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 6-1.

Table 6-1: 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		
		2019-20	2020-21	2021-22
Tidal River	<i>Escherichia coli</i>	100 %	99.4 %*	98.7**
	Turbidity	100 %	100 %	100 %
	Trihalomethanes (THM)	100 %	100 %	100 %
	Chloroacetic acid	100 %	100 %	100 %
	Dichloroacetic acid	100 %	100 %	100 %
	Trichloroacetic acid	100 %	100 %	100 %
	pH	100%	100 %	98.4%***
	Colour	100%	100 %	100 %
	Aluminium	100 %	100 %	100 %
	Alkalinity	100 %	100 %	100 %
Twelve Apostles	<i>Escherichia coli</i>	100 %	100 %	100 %
	Turbidity	100 %	100 %	100 %
	Trihalomethanes (THM)	100 %	100 %	100 %

\* One *E. coli* detection that could not be attributed to a false positive; one sample from 156 samples

\*\* Two *E. coli* detections that could not be attributed to a false positive; two samples from 156 samples

\*\*\* One pH non-compliance; one sample from 64 samples

The analysis shows compliance with drinking water standards decreased slightly at Tidal River Campground for the reporting period. This was attributed to two *E. coli* detections and one pH non-compliance. The analysis shows that compliance with drinking water standards at the Twelve Apostles Visitor Facility continues to be maintained this reporting period in alignment with previous reporting periods.

### 6.1 Water quality complaints

No water quality complaints were received in the reporting period. This is consistent with the last two reporting periods as outlined in Table 6-2.

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Table 6-2: Complaints comparison for three reporting periods

Water sampling locality	Number of complaints			Comparison with previous reporting periods
	Current reporting period	2020/21	2019/20	
Tidal River	0	0	0	No change
Twelve Apostles	0	0	0	No change

## 7 RISK MANAGEMENT PLAN AUDIT RESULTS

The SDW Act requires water suppliers to prepare, implement, review and revise risk management plans for the supply of drinking water. The requirement for audit did not fall in this reporting period.

The previous audit conducted in March-April 2020 identified one opportunity for improvement. This is outlined in Table 7-1. Parks Victoria has implemented action to address the opportunity for improvement.

Table 7-1: Risk Management Plan audit: Summary of opportunities for improvement

Item N <sup>o</sup> .	Opportunity for Improvement	Status
1	Develop a schedule for annual or biennial scenario testing of emergency procedures.	Closed. Scenario testing of water related emergency response procedures has been integrated into risk management plans. The requirement is to undertake annual scenario testing via actual incident response or planned scenarios. The testing is to be recorded in the sites Emergency Management Plan and outcomes and learnings are required to be documented.

## 8 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.

## 9 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.

## **10 SECTION 20 EXEMPTIONS**

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.

## **11 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.

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Parks Victoria complies with s23 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 by calling 13 19 63.

A copy of the Parks Victoria Water Quality Annual Report 2021/22 can be found at [www.parks.vic.gov.au](http://www.parks.vic.gov.au).

## 12 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.
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.
Mineral water	Waters originating from groundwater that either re-surfaces via natural groundwater pressure or is pumped. Mineral water contains dissolved compounds from the underlying geology that may include salts, carbonates and metals that provide the water with distinct flavours.
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 2020 to 30 June 2021 and includes results from sample rounds and events that occurred within the time period.
Sample standard / drinking water quality standard	The SDW Regulations <i>Schedule 2</i> sets three drinking water quality standards, as summarised below: <ul style="list-style-type: none"> <li>• <i>E. coli</i> – All samples of drinking water collected are found to contain no <i>Escherichia coli</i> organisms per 100 mL of drinking water, with the exception of any false positive sample</li> <li>• Total Trihalomethanes – less than or equal to 0.25 mg/L of drinking water</li> <li>• Turbidity – the 95<sup>th</sup> percentile of results for samples in any 12-month period must be less than or equal to 5.0 Nephelometric Turbidity Units (NTU)</li> </ul>
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 writine when the: <ul style="list-style-type: none"> <li>• water may be the cause of an illness</li> <li>• level of a water quality standard is such that it may pose a risk to human health</li> <li>• water may cause widespread complaints.</li> </ul>
Soda Ash	Sodium carbonate. pH corrector raising pH to near-neutral.
Sodium hypochlorite	Used in the chlorination/disinfection of drinking water.



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