Alpine Resorts Victoria

Drinking Water Quality Annual Report 2024-25

29 October 2025

Alpine Resorts Victoria

Acknowledgement of Traditional Owners

We recognise Aboriginal and Torres Strait Islander peoples as the First Peoples of this nation. Their lore, traditions and customs nurture the land and water, creating wellbeing for all. ARV operates on the lands of the Gunaikurnai, Taungurung and Wurundjeri Woi Wurrung and we respectfully acknowledge them as the Traditional Owners of the land.

We recognise their ongoing connection to land, water and community and pay respect to their tribal Elders. We celebrate their continuing culture and respect the memory of their ancestors. We are committed to honouring Australian Aboriginal and Torres Strait Islander peoples' unique cultural and spiritual connections to land and water. They have managed water and land sustainably over thousands of generations, and we value their rich contribution to society and our region's future.

Foreword

Alpine Resorts Victoria (ARV) is a statutory authority bringing a sector wide focus and strategic leadership to the management of Victoria's alpine resorts. Each resort provides a unique experience of Victoria's beautiful and remote alpine landscapes. Together they play an important role in supporting regional communities by attracting 1.4 million visitors a year who support over 12,000 jobs and sustain an industry worth $2.14 billion in total economic impact.

Prior to ARV's formation in October 2022, the Resort Management Boards performed the function of designated water suppliers under the Safe Drinking Water Act 2003. This responsibility is now centralised with management of drinking water supply part of the broader ARV portfolio.

At the core of its purpose, ARV provides essential services to business operators, visitors and the local alpine communities, while also developing, promoting, and using each resort in a sustainable manner, recognising the seasonal variations and ecological significance of the Victorian alpine areas. ARV continues to focus on delivering essential services for our people and community, including the provision of high-quality safe drinking water.

Water supply at our locations is a combination of high-altitude aquifers, extracted via groundwater bores or via surface water reservoirs and weirs.

Throughout the 2024-25 period, the quality of water provided by all resorts to its constituents was generally excellent, with demonstrated improvement across all resorts. We are now focussed on the requirements of the new Safe Drinking Water Regulations (2025), which strengthen Victoria's drinking water safety framework and enhance alignment with the Australian Drinking Water Guidelines (ADWG).

We remain committed to providing the highest possible risk management standards to ensure the ongoing safety of our water supply and ultimately the health of our consumers.

We thank the Victorian State Government and ARV Board members for their support, and our committed staff for their contribution to our organisation and the provision of an exemplary water supply service.

Amber Gardner

Chief Executive Officer, Alpine Resorts Victoria

COVER IMAGE: Falls Creek, photographed by Aiden Haynes16 September 2024

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1 Introduction

This water quality annual report has been prepared in accordance with Section 26 of the *Safe Drinking Water Act 2003* (SDWA) and Regulation 16 of the Safe Drinking Water Regulations 2015 (SDWR). It provides an overview of the quality of drinking water and regulated water supplied by Alpine Resorts Victoria (ARV) during the reporting period.

Section 26 of the Act requires water suppliers and water storage managers to provide to the Secretary of the Department of Health (DH) an annual report each financial year. ARV is the water supplier for these previously established alpine resorts:

- Falls Creek Alpine Resort (FCAR)
- Mt Hotham Alpine Resort (MHAR)
- Mt Buller & Mt Stirling Alpine Resort (MBMSAR)
- Mt Baw Baw Alpine Resort (MBBAR)
- Lake Mountain Alpine Resort (LMAR) – *Regulated Supply*

Information to be included in the annual report is specified by regulation 16 of the Safe Drinking Water Regulations 2015 (Regulations), which were the regulations in force for the defined period. This report outlines drinking water quality achieved for the 2024-25 financial year across the Victorian alpine resorts and has been prepared to comply with the annual reporting requirements under Section 26 of the Act and to provide ARV customers with the results of the water quality monitoring programs, as required by Section 23. ARV Drinking water quality annual reports are made available to the public via the ARV website, where interested readers can also find further information and contact details for the water supplier. The report covers the nature of the supply, describes ARVs risk management practices, and includes any water quality issues which arose over the reporting period and proactive actions taken to protect water quality from catchment-to-tap.

ARV's obligations under the Act include:

- To prepare, implement and review a risk management plan (RMP) in relation to drinking water,
- To have the risk management plan audited by approved auditors,
- To ensure that the drinking water meets quality standards specified by the regulations,
- To disclose to the public information concerning the quality of drinking water, and
- To report known or suspected contamination of drinking water to the Secretary of the Department of Health.

At the time of writing, ARV is consolidating Resort RMP's from each of its five resort areas (Falls Creek, Mt Hotham, Mt Buller & Mt Stirling, Mt Baw Baw, and the Lake Mountain regulated supply) and updating the RMP to include requirements from the recently promulgated Safe Drinking Water Regulations 2025 (Regulations).

ARV is a statutory authority established by the Alpine Resorts (Management) Act 1997 and Alpine Resorts (Management) Regulations 2020, which set out the objectives for the management of Victoria's alpine resorts. The resorts are set aside for alpine recreation and tourism. The village areas support a range of administrative, retail and commercial business, and a variety of accommodation. The development, promotion, management and use of the resorts is to be undertaken in a manner which is compatible with the alpine environment having regard to economic, environmental, and cultural considerations.

ARV reports to the Minister for Environment and has clearly defined functions. These include the provision of a range of utility services including the supply of drinking water. ARV is committed to producing safe and aesthetically pleasing drinking water, as detailed in the Drinking Water Quality Policy, shown in Figure 1[1].

Since November 2023, MBBAR has engaged Goulburn Valley Water (GVW) for water and wastewater treatment operations and support. Throughout 2024/25 MBMSAR engaged GVW for water and wastewater treatment operations at Mt Buller and support at Mt Baw Baw and monitoring of the water treatment at Mt Stirling and Mirimbah. GVW has dedicated staff along with operators that rotate through a roster, ensuring the services are performed by suitably qualified and experienced personnel.

[1] This Policy remained in place for FY 24/25 and is being updated to reflect Safe Drinking Water Regulations (2025)

DRINKING WATER QUALITY POLICY

Alpine Resorts Victoria

1. Statement

Alpine Resorts Victoria (ARV) is committed to providing customers with high quality drinking water that meets the requirements of the *Safe Drinking Water Act 2003* (the Act) and *Safe Drinking Water Regulations 2015* (the Regulations) for the Mt Buller-Mt Stirling, Mt Hotham, Falls Creek and Mt Baw Baw Alpine Resorts. Note that Lake Mountain Alpine Resort currently has regulated (non-potable) water.

2. Scope

ARV is required to deliver safe drinking water by implementing and maintaining a drinking water quality management system consistent with the *Australian Drinking Water Guidelines 2022*.

ARV will supply its customers with drinking water that satisfies the requirements of the Act and Regulations and seek to meet our customer expectations for drinking water quality.

The drinking water quality objectives are:

- To comply with standards for drinking water quality, regulated water quality and customer service, at all times;
- To manage risk responsibly;
- To ensure informed decision making based on reliable available data;
- To support growth and development in our visitor base;
- To ensure the environment is protected.

3. Requirements

As a gazetted Victorian Water Supplier, ARV is committed to ensuring all the Alpine Resorts' drinking water quality is compliant with the Act.

To achieve this, ARV will provide sufficient resources and support to:

1. comply with legislative requirements with regard to the Act and any associated Regulations;
2. put in place systems to identify and manage the risks associated with ARV water supply operations;
3. provide high quality water to all Alpine Resorts;
4. protect employees, stakeholders and visitors from harm;
5. consult with relevant ARV managers and employees about water quality;
6. train ARV employees to improve water supply operations;
7. invest in, and continually improve, the ARV's water supply infrastructure and operations; and
8. review this policy at least every 3 years.

4. Responsibilities

All ARV employees are responsible for compliance with this policy.

The General Manager, Assets, Land Management and Strategic Development is the responsible custodian of this policy.

The Head of Asset Portfolio Management is responsible for establishing the appropriate risk management framework in accordance with the Act, and for completion of the annual drinking water quality report.

The Heads of Assets and Operations at each resort are responsible for operational delivery of compliant water supply, including notification and investigation of non-conformances.

5. Legislation

Safe Drinking Water Act (2003)

Safe Drinking Water Regulations (2015)

Australian Drinking Water Guidelines (updated September 2022)

6. Related documents

Drinking Water Risk Management Plans for ARV Drinking

Water Annual Reports for ARV

Alpine Resorts Victoria Corporate Plan

Version Number v1	
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Comments: First revision	

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VICTORIA State Government

Figure 1: ARV Drinking Water Quality Policy

1.1 Water Supply Systems

Alpine Resorts Victoria delivers essential water and wastewater services to five alpine resorts, one visitor centre, and regulated water to a sixth alpine resort. The population and visitor numbers at these locations is very seasonal and varied across the sites. The total population in the resorts can be as low as 550 residents in the summer. Whereas, in winter, up to 18,500 people live, work in, or visit Victoria's 6 Alpine Resorts. And peak visitation days can see an additional 20,000 day-visitors across the resorts.

Within the ARV service area, the water for the purpose of drinking is obtained from surface water sources such as creeks and reservoirs, as well as ground water aquifers, and stored in tanks and reservoirs to ensure supply.

Geographically, our supply is fed by high-altitude catchments surrounded by national park or state forest, which do not include any habitation, grazing, cropping, or industrial activities, so the likelihood of contamination and pollution is low. Microbiological sampling of raw water is carried out to verify that E. coli levels continue to be relatively low, and that the treatment processes are more than adequate to deliver safe drinking water.

Treatment of surface water is necessary to remove fine particulates, algae, organic compounds and harmful micro - organisms (pathogens) that may be present. At Falls Creek, water is obtained from ground water aquifers. Groundwater is usually free of fine particulates and organic matter but needs to be monitored for heavy metals and salinity and treated for pathogens.

The raw water is processed through water treatment plants to ensure that aesthetically pleasing, safe drinking water is supplied to customers at Falls Creek, Mt Hotham, Mt Buller, Mt Stirling, Mirimbah and Mt Baw Baw. The water treatment often involves various processes, including pre-treatment filtration, UV disinfection, chlorine dosing and pH correction. There is also a declared regulated water (non-drinking water) supply, which is not fit for human consumption, at Lake Mountain. Details of ARV's area of operation and sources of raw water are contained in **Error! Reference source not found.** and in Table 1.

Assessment, optimisation, and scheduled maintenance of water treatment facilities are conducted on a regular basis by experienced water treatment operators. Preventative maintenance and monitoring of critical process equipment ensures the optimum performance of our treatment processes and facilities. The water operators at each resort are responsible for the monitoring of water quality instrumentation and SCADA (Supervisory Control and Data Acquisition) status and alarm information.

Diagrams of the supply system at each locality are included in Figure 3 to Figure 8.

Figure 2: ARV's area of operation

Table 1: ARV raw water sources and localities serviced

Water sampling locality	Source Water	Off-Stream Water Storage	Water Treatment Plant (WTP)	Population Serviced
Falls Creek	Groundwater Aquifer	10 kl Closed accumulation tank	Falls Creek UV Disinfection Plant	35 low season - 5000 peak season
		2 x 1.5 ML Closed storage tanks		
	Rocky Valley Lake Dam (backup supply)	*2 x 0.6ML Closed settling tanks*		
Mt Hotham	Upper Swindlers Creek	Mt Higginbotham 4.2ML tank storage	Mt Higgi UV1 or UV2	200 low season - 5000 peak season
	(Blue Ribbon back up supply)			
Mt Buller	Boggy Creek Catchment	100ML Boggy Creek Reservoir		
		4.2 ML Burnt Hut Reservoir	Low Level (Burnt Hut Spur) WTP	150 low-season - 5000 peak-season
		1ML Baldy Reservoir (tank)	High Level (Baldy) WTP	Up to 3000 peak-season
Mt Stirling	Baldy Creek	Settling tank and 5kl header tank	Telephone Box Junction WTP	Population 0
Mirimbah	Buller Creek	Settling tank and 22.8 kl header tank	Mirimbah WTP	Population 0 (5 Seasonal staff)
Mt Baw Baw	Dam Valley Catchment	2 x 0.2ML Concrete storage tanks	Mt Baw Baw WTP	Up to 770 peak-season
	Big Hill (backup supply)			
**Regulated Supply: Lake Mountain*	*Upper Taggerty River*	*3 x concrete tanks (800kl)*	*NA*	*Up to 60 Seasonal staff*

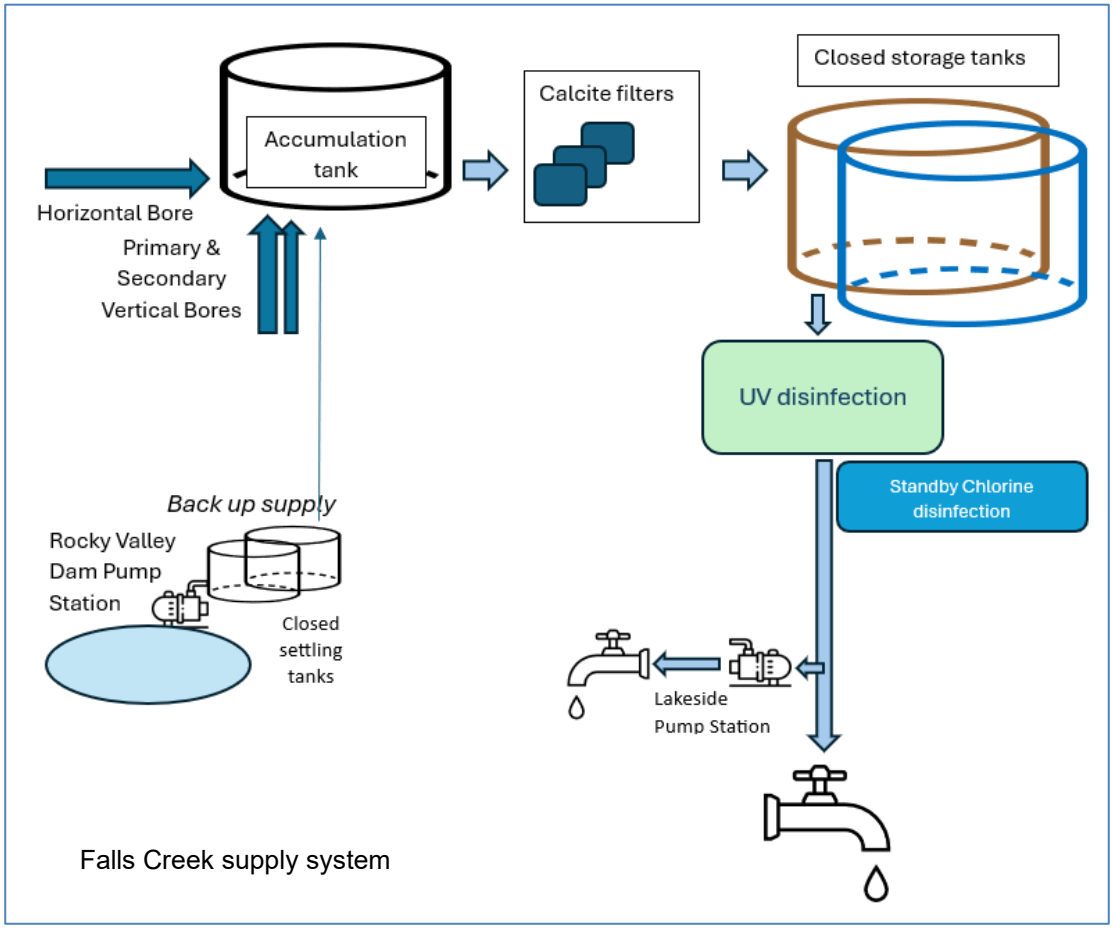

Figure 3: Falls Creek Drinking Water Supply System

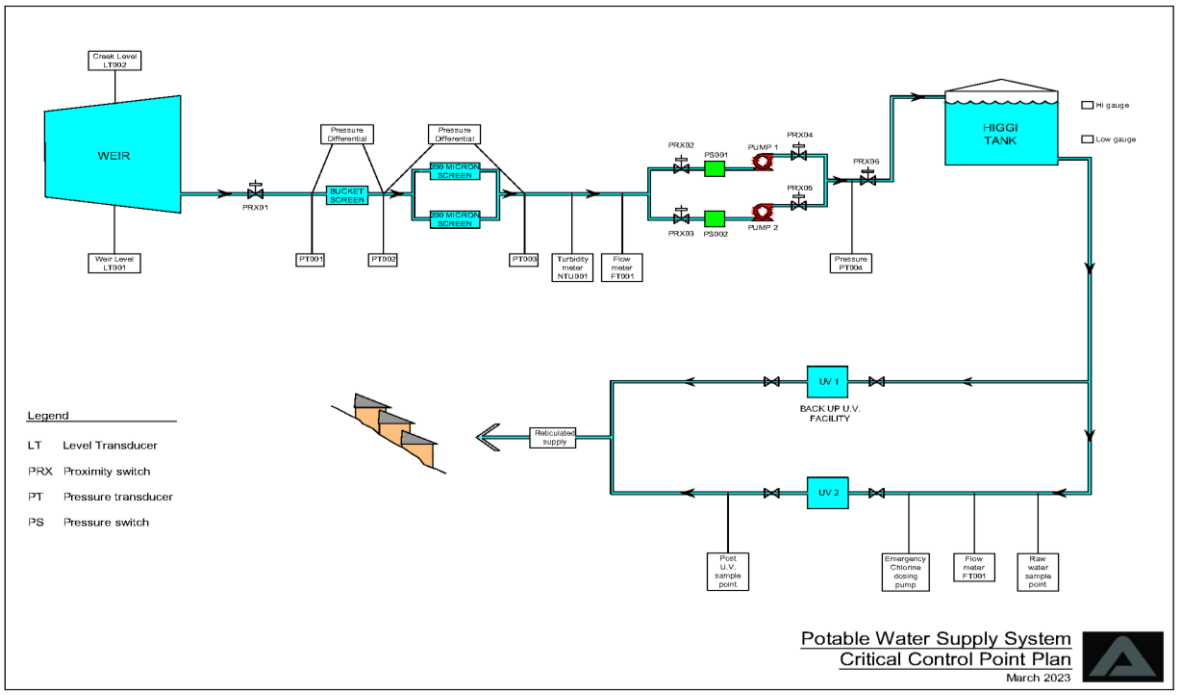

Figure 4: Mt Hotham Drinking Water Supply System

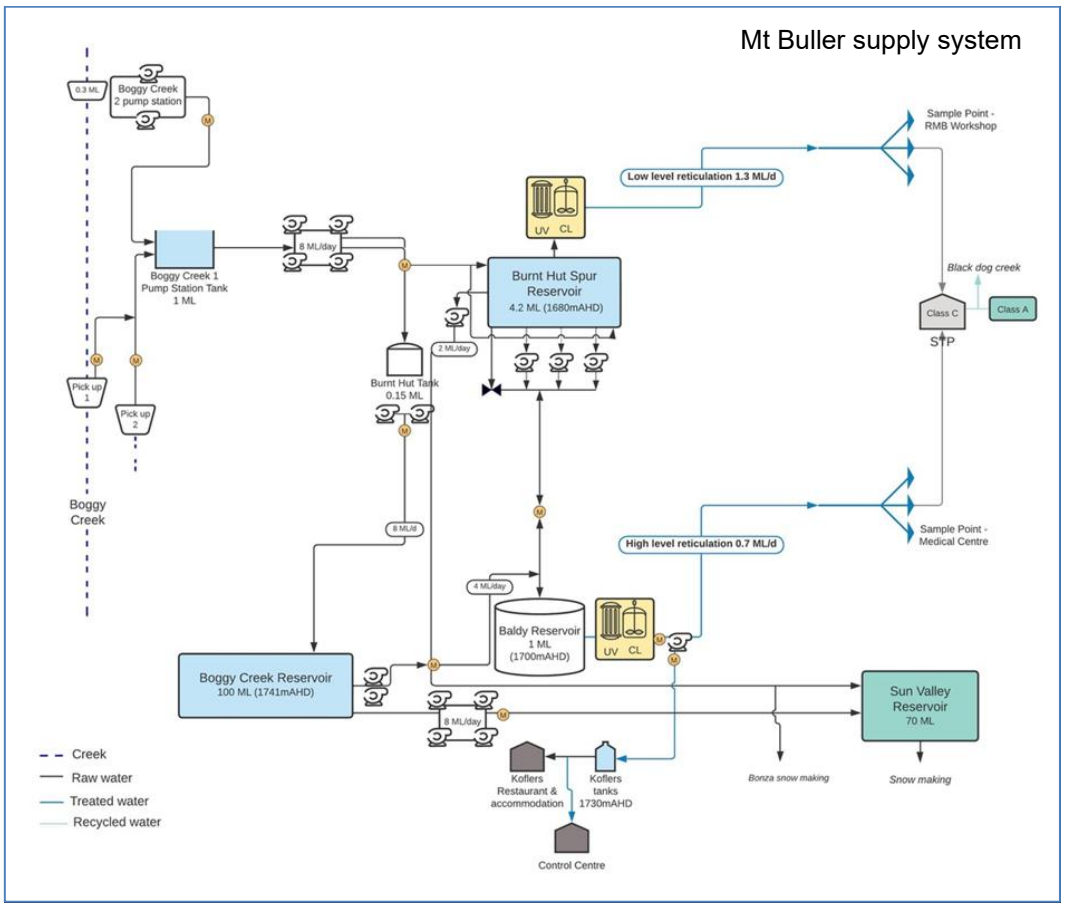

Figure 5: Mt Buller Drinking Water Supply System

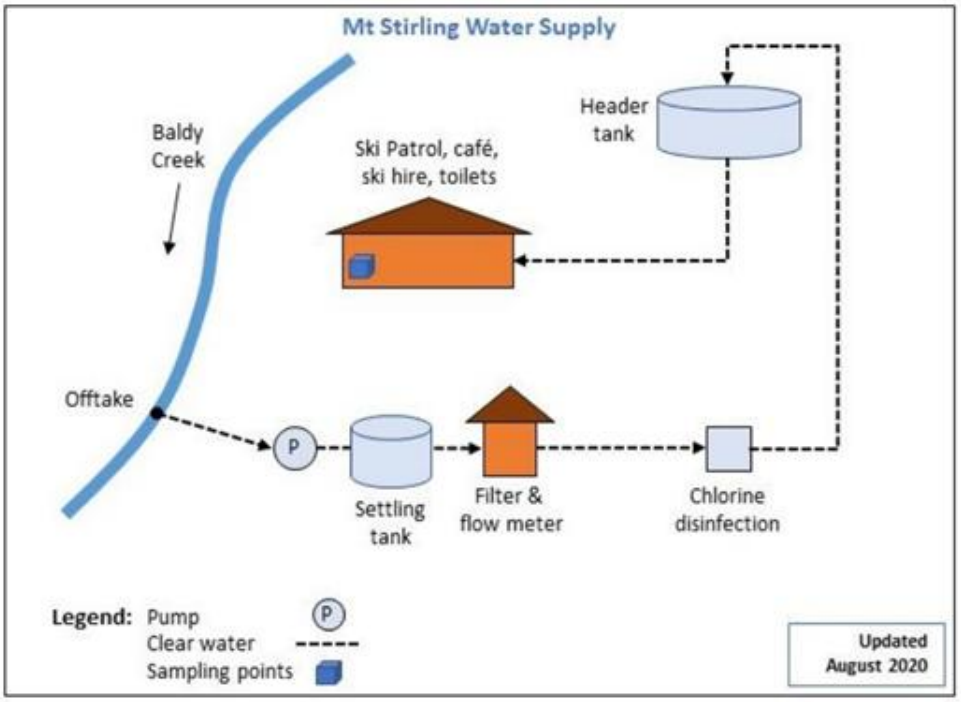

Figure 6: Mt Stirling Water Supply System

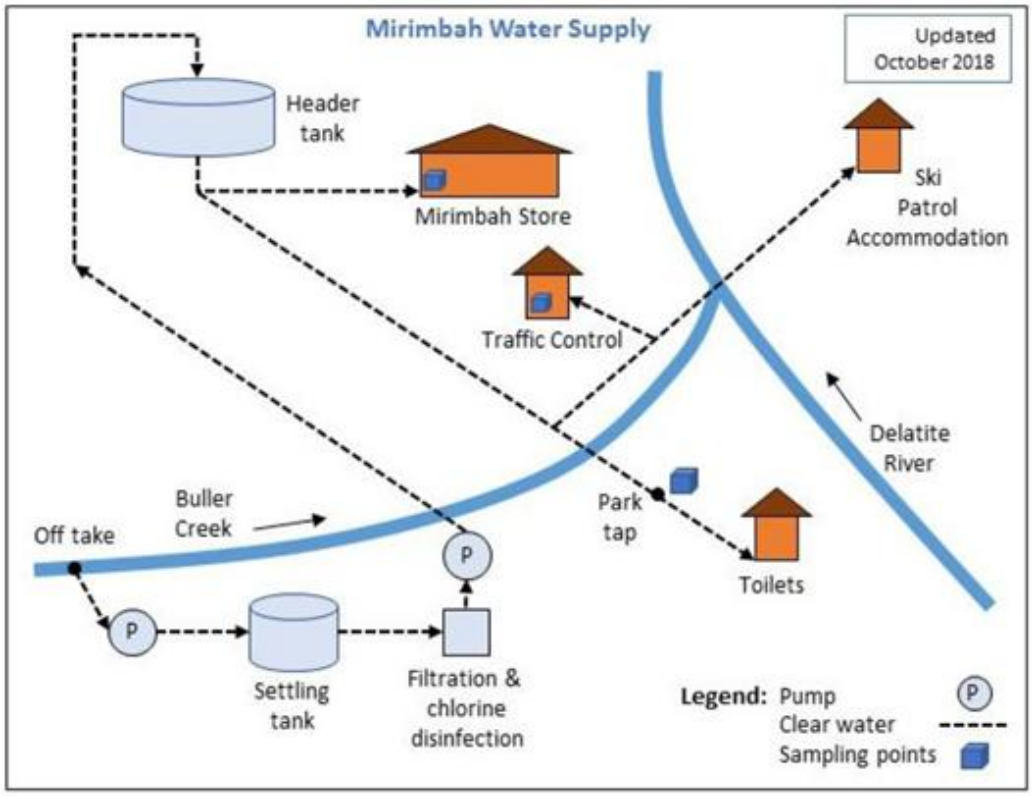

Figure 7: Mirimbah Water Supply System

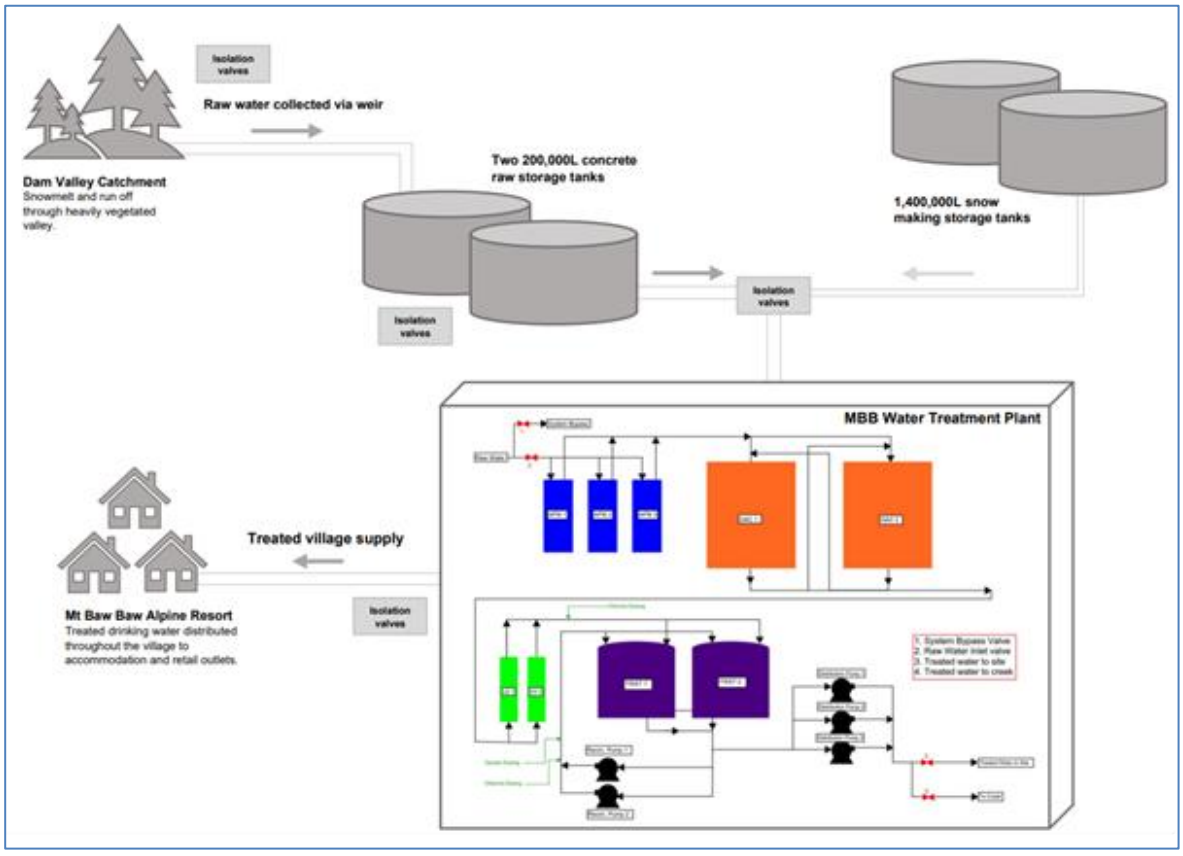

Figure 8: Mt Baw Baw Water Supply System

1.2 Source Water Protection

Sanitary Surveys have been carried out to identify microbial, physical and chemical risks that could pose a risk to human health in drinking water without appropriate treatment, which has informed our raw water monitoring programs and treatment processes. Raw (source) water represents the beginning of the catchment to tap cycle and is located upstream to any treatment plant. Raw water monitoring occurs in the inlet weirs, raw water storage tank or prior to disinfection at the treatment plants

A description of the source water for each locality follows.

Falls Creek.

Rocky Valley Dam and the Production Bores and the Horizontal Bore may be characterised as pristine catchments. They are within the boundaries of the Falls Creek Alpine Resort and surrounded by the Alpine National Park. These areas do not include any habitation, grazing, cropping, or other human industrial activities. They are at a higher altitude than the Falls Creek Village, meaning that the likelihood of contamination and pollution is low. There are negligible sources of protozoan pathogens in the recharge areas.

The **Production Bores and the Horizontal Bore** are well sealed to prevent ingress of surface run-off water. Groundwater analyses conducted to date, show no microbial contamination and very low concentrations of dissolved solids. No sudden rises in water level or sudden falls in turbidity have been observed after rain events confirming no surface water ingress. However, given the fractured nature of the geology, it should be assumed the groundwater can be infiltrated by surface water and a precautionary view is taken. The water from the bore is tested weekly by a NATA accredited laboratory, so any changes in water quality will be identified immediately.

The groundwater sample results indicate a high quality, but very soft and unbuffered water source. It is not uncommon to have no E. coli detections on a regular basis. The composition of water from the Horizontal Bores is very similar to the composition of the Production Bore, indicating similar sources. The Horizontal Bores, however, have slightly lower pH, Suspended Solids and Turbidity. Potential contaminants investigated in these groundwater sources included heavy metals, organics including pesticides, and radiological parameters. All analytes were found to be lower than Health Guideline Values in Australian Drinking Water Guidelines 2011 (ADWG).

The catchment area for the **Rocky Valley Dam back-up water supply** is a well vegetated, high-altitude location. There is limited recreational access to the catchment areas with skiing activities in winter and hiking and sailing activities in summer.

There have been no recorded incidences of algal growth in the Rocky Valley Dam supply. The likely reason for this is that inflows are low in nutrients and the low temperature of the lake water, which generally lies in a range between 0˚C and 16˚C.

When the surface water supply is in use, water from the lake is pumped to a pair of enclosed 0.6 ML Settling Tanks by three pumps (duty/stand-by/back-up, total capacity of 30 L/S). Residence time in the Settling Tanks is in the range 10 - 24 hours, depending on demand. There is no telemetry to the Pumping Station or the Settling Tanks, but these infrastructure elements are inspected daily when the system is operational. Water flows under gravity from the settling tanks to the Brown and Blue Storage Tanks, which are monitored with telemetry and alarmed for a level below 80 % of capacity.

The Rocky Valley Dam is managed and operated by AGL Hydro and is used for water supply to Falls Creek Alpine Resort and for the generation of hydroelectricity. Its capacity of 28,000 ML provides substantial residence time to allow removal of sediment.

Rocky Valley Dam has a history of temperature stratification around mid-summer, usually mid- to late-January and to a lesser extent in mid-winter depending on ice build-up on the surface. During the summer lake stratification events, elevated levels of iron (Fe) and manganese (Mn) may be observed. These contaminants are released by anoxic reactions of vegetative sediment at the bottom of the lake, especially ash-laden sediment inflows after bushfires. They create the appearance of dirty water and absorb UV light. Previous options available to Falls Creek to manage these contaminants are aeration of the dam or utilising alternate off-takes (from an aqueduct which runs above the village and into the lake, or from the snow making water supply drawn from a floating pontoon at the deepest part of the lake). Falls Creek now avoid the use of the dam during the summer stratification periods as the bore supply has sufficient capacity to cope with demand.

The water storage consists of **two 1.5ML storage tanks**. These tanks store 300% of current daily maximum demand and provide a buffer in the event of infrastructure failure. These tanks have locked roof hatches and access locations near the base. They are externally inspected on a weekly basis and are bi-annually drained to permit a detailed internal inspection (one tank per year, alternating each year).

The current Alpine National Park Management Plan for the Bogong Unit specifically nominates water supply and catchment protection as one of the three primary Park management objectives. Further, as a management objective, the plan stipulates protection of water catchments as the highest priority.

Within the National Park, there are no dwellings or human habitation of any kind, no farming or agricultural activity of any kind and no other industrial or mining activity. To ensure that these protections are maintained, Parks Victoria have a range of compliance and enforcement powers. FCAR also exercises significant controls over land use and visitor activity within the resort area.

Mt Hotham

The source of the village water supply is the upper reaches of Swindlers Creek. The upper Swindlers Creek watershed is a protected catchment fed by snow melt and precipitation within a 177 hectares area (Foresight Engineering, 2011) between 1800m asl and 1450m asl. Several small tributaries deliver reliable flows to Swindlers Creek for most of the year and flows are significantly augmented during rain events. There is limited development within the catchment with winter ski field activity and no regular human habitation or sewerage discharge. Cold water temperatures in Swindlers Creek and approximate 3 megalitres of instream storage capacity in the weir that increases detention time, help to reduce pathogen occurrence.

A 200-micron screen filter, and a turbidity meter, incorporated into the Supervisory Control and Data Acquisition (SCADA) monitoring system provides continuous monitoring of raw water turbidity. It has a high limit interlock of 5 NTU which prevents pumps from operating and conveying turbid water to the raw water storage tanks.

Regular raw water monitoring provides operational staff an early warning indicator of potential issues within the catchment to inform overall catchment health. An annual catchment survey is undertaken to monitor and record any changes within the catchment that may impact on source water quality.

The results from monthly raw water monitoring collected for over 12 years, with sampling points at the on-stream storage weir and immediately prior to disinfection within the UV 2 facility, highlight that it is not uncommon for no E. coli and coliform detections.

Mt Buller

Water for the Mt Buller Village comes from 3 sources - Boggy Creek, the ‘Headwaters’ and the ‘Catchment Weirs’. Mt Buller’s main source of water is the Boggy Creek catchment, which is above 1,250m and usually covered in snow during the snow season (early June to late September). The topography of the catchment is steep and vegetated. The catchment lies in montane, sub alpine and alpine areas, and there are few weeds or other exotic flora. There is a low risk of contamination to this supply source due to its pristine catchment, and limited access by vehicles and humans.

The source water is monitored via a water sampling program. Retention in Burnt Hut Reservoir and Baldy Tank allows suspended solids to settle before use. Online meters and loggers are

used to monitor turbidity prior to treatment. Higher turbidity can occasionally occur in source water during wet weather and result in a slight water discoloration of drinking water. The UV and chlorine systems are serviced regularly and monitored via a telemetry-based SCADA system. A cyclic maintenance program includes cleaning of boggy 1 and Baldy tanks every two years, emptying and removing silt from Burnt Hut Reservoir and the flushing the reticulation system at least twice a year to remove biofilm build-ups.

Mt Stirling

Mt Stirling Resort has a common boundary with the Mt Buller Resort (the Delatite River), and Mirimbah is the entrance point for both. Mt Stirling has no permanent population or accommodation. It has a small building used by ARV staff, cross country ski hire and cafe, a small shed, several shelters / toilet blocks and three huts. There are typically 8,000 visitors in the snow season who mostly cross-country ski or snow camp, and school groups are common. Approximately 30,000 people visit outside the snow season, particularly during December to February period when a significant number of visitors pass through the resort to access Craig's Hut. Camping within the resort is common.

The Mt Stirling water supply comes from the perennial and reliable Baldy Creek which runs adjacent to the building at Telephone Box Junction. Water is pumped from the creek to a settling tank, passed through carbon and cartridge filters, dosed with sodium hypochlorite, pumped to a header tank, and then gravity fed through the reticulation system.

Mirimbah

The Mirimbah water supply comes from the perennial and reliable Buller Creek, approximately 300m upstream from the junction with the Delatite River at an elevation of 620m. Water is collected through a small diversion channel, pumped to a settling tank, passed through cartridge filters, dosed with hypochlorite, and then pumped to an elevated tank approximately 60m higher than the creek. Water is then gravity fed to the Mirimbah Store, resort entry building, public toilets, and to the ski patrol accommodation on the north side of the Delatite River. Recently a low voltage chlorine analyser has been installed at the header tank which is viewed via SCADA and alarmed if chlorine levels drop below target range. This alarm is via a SMS message to GVW operators and their control centre.

Mt Baw Baw

The Resort is located on the south-west face of the Baw Baw Plateau, two and a half hours' drive east of the Melbourne CBD. Mt Baw Baw has a summit elevation of 1,565 metres and gently sloping terrain with gradients of 15% to 25%. It consists of and is surrounded by a rich variety of diverse alpine and sub-alpine native vegetation. The resort is surrounded by Crown land with the Baw Baw National Park on the northern and eastern boundaries and Tanjil State

Forest towards the western and southern sides. Whilst the resort covers 355 hectares, just 37 hectares have been developed for the village, skiing, ski lifts and tobogganing, plus cross-country ski, mountain biking and hiking trails.

The water used throughout the Resort is supplied by the 'Dam Valley' catchment, a protected valley slightly elevated above the village. Runoff in the catchment is collected by a minor tributary of the headwaters of the Tanjil River – Eastern Branch. The runoff, a mixture of rainfall and snowmelt, flows through sphagnum moss which provides a minor form of natural filtration for suspended particulate matter. A weir constructed in the stream below Dam Valley captures and directs water to a draw off pipe supplying 2 x 200,000 litre concrete storage tanks to service the village.

The catchment is heavily vegetated by shrubs and trees, with the exclusion of a single access trail through the north-western side of the catchment, the environment is in pristine condition. There is limited recreational access to the catchment area, primarily used by cross country skiers in winter and bushwalkers and mountain bikers in summer. Clear signage is located at both ends of the trail advising users of the importance of catchment preservation, to remain on track and prevent contamination.

Raw water sampling is conducted in the catchment area monthly to monitor the raw water quality including monitoring for parameters such as turbidity and organic chemicals. The catchment is inspected monthly. Visual inspections are conducted to assess the condition of management features (e.g. signage, access track, drainage boards and the weir). Catchment condition is assessed to identify any potential contaminants, signs of pollutants and any other reportable items (e.g. significant snow cover). These assessments allow for constant understanding of catchment health and assist to identify the source of potential raw water contamination.

Raw water supply is contained within two 200,000 litre concrete storage tanks at the southwestern end of the catchment. Water is fed by gravity from the weir and connected by a 150mm ductile iron, concrete lined (DICL) pipe to the village treatment, distribution, and reticulation network. Overflow from the supply tanks, as untreated water, is discharged back into the headwaters of the Tanjil River – Eastern Branch before any treatment occurs. This overflow runs most of the time, indicating that the flow through the weir currently exceeds the village demand.

Regular weekly monitoring of raw water in the supply tanks is undertaken to understand any potential contamination which may be hindering quality. Results obtained from raw water quality sampling are utilised to assist with identification of potential issues prior to final treatment of water and supply to the village reticulation network.

1.3 Improvements To Water Supply and Treatment

At Mt Hotham, Stage 2 of the raw water rising main replacement has been a unique and challenging multi-year project that began in 2018 (Stage 1, a lower section, was carried out in 2009/10). Due to the steep terrain, replacement of the aging pipeline with Sintokote steel pipe, had to be done in sections, in seasons when the weather conditions allowed. The final $90K section of the (approx.) $2M project was completed in December 2024 (figure 9).

Smaller projects to optimise our processes and improve our infrastructure included:

- $20,000 vent house was constructed for the concrete raw water storage tank at Mt Hotham.

Figure 9: Final Section of Raw Water Rising Main Replacement Project

1.4 Changes to Water Sampling Localities

There were no changes to sampling localities for the period of this report.

Mt Buller installed two new sample taps at existing locations. One at high level and one at low level reticulation entry points (Goods shed and Mid-station).

2 Water Treatment and Quality Management Systems

ARV's water treatment processes are described in the following section. An overview of the treatment processes and chemicals is shown in Table 2 and 3.

Table 2: ARV treatment processes

Water Treatment Plant (WTP)	Filtration				Disinfection		
Locality	Amorphous alumino-silicate (AMF)	Granular Activated Carbon (GAC)	Calcite Filter (Calcium Carbonate)	Membrane filter	UV	Sodium hypochlorite	pH correction
Falls Creek			o		o	*	
Mt Hotham				o	o	*	
Mt Buller High					o	o	
Mt Buller Low					o	o	
Mt Stirling		o		o		o	
Mirimbah				o		o	
Mt Baw Baw	o	o			o	o	o

** Back-up Sodium Hypochlorite on UV failure/cleaning*

Table 3: Water treatment chemicals

Locality	Alkalis	Disinfectants
Falls Creek	Calcium Carbonate	Sodium hypochlorite*
Mt Hotham		Sodium hypochlorite*
Mt Buller		Sodium hypochlorite
Mt Stirling		Sodium hypochlorite
Mirrimbah		Sodium hypochlorite
Mt Baw Baw	Caustic (Sodium Hydroxide)	Sodium hypochlorite

** Back-up Sodium Hypochlorite on UV failure/cleaning*

2.1 Water Treatment

Raw water from rivers, streams, reservoirs and aquifers needs to be processed through a water treatment plant to produce water that is always safe to drink. ARV Water treatment may involve a number of filtration and disinfection methods, plus pH correction at Mt Baw Baw to decrease the likelihood of corrosion to pipework and equipment by acidic water.

ARV has followed the Australian Drinking Water Guidelines (ADWG) to quantify the microbial risks within the source waters and the extent that the treatment processes remove or reduce pathogenic microorganisms from the water.

Raw water and pre-treatment settling and filtration

Raw water may be filtered and/or stored in settling tanks prior to the disinfection process. As previously detailed each resort extracts their source water based on the catchment topography and demand requirements.

The respective treatments are reflective of the pristine nature of the source water.

Disinfection

ARV water treatment plants use Ultraviolet (UV) disinfection and/or chlorine dosing (with sodium hypochlorite) for effective and continuous disinfection to ensure that the water is always safe to drink prior to entering the reticulation. Ultraviolet (UV) disinfection is the use of shortwave light (UV-C) that alters the DNA in the cells of microorganisms which inactivates or kills the organisms.

Clear water storage and reticulation (supply to customers' taps)

ARV undertakes regular preventative maintenance and mains flushing programs on all distribution systems to ensure all mains remain clean. Treated water storage tanks are also inspected on a documented maintenance schedule and cleaned as required.

2.2 Changes to Water Treatment Processes and Chemicals

There were no major water treatment process changes in the 2024-25 reporting period.

3 Quality of Drinking Water

ARV collected and analysed samples of water at pre-determined frequencies for the parameters identified in the Risk Management Plans. Sample results have been assessed against water quality standards in schedule 2 of the SDWR and the relevant health and or aesthetic guideline values described in the Australian Drinking Water Guidelines 2011. A summary of compliance with the water quality standards for 2024-25, is presented below. A comparison of compliance with water quality standards for this reporting period against the 2023-24 and 2022-23 reporting periods is included.

The water sample results presented in this report are those issued by a NATA accredited, independent laboratory for ARV's documented water monitoring program. The tables do not include sample results from investigations, confirmatory testing or re-sampling following incidents or non-compliances.

The Safe Drinking Water Regulations 2015 requires water suppliers to incorporate a water sampling program into their risk management plan. ARV's water sampling program is reviewed routinely. There were no changes to the drinking water sampling program for this report.

3.1 Escherichia coli

Escherichia coli (*E. coli*) is the name of a specific bacterial species belonging to the coliforms group. *E. coli* is found naturally only in the digestive tracts of warm-blooded animals. The presence of *E. coli* in water is an indicator of faecal contamination.

Table **4** and* Additional samples relate to testing following E.Coli detections

Table 5 show the *E. coli* results for each water sampling locality.

At Mt Hotham, one sample (March 2025) resulted in an *E. coli* detection and S22 report:

> Two factors lead to the non-compliance. The occurrence of an unusually high *E.coli* presence in the raw water supply from the localized presence of a dead animal adjacent to the raw water supply point; and a failure in the UV treatment system caused by a build-up of film on the sleeves internally on the UV unit. Both issues were resolved.

At Mt Buller, two E. Coli detections resulted in S22 reports:

> The first detection (9 July 2024) was the result of biofilm growth within the pipe and/or sample tap between the UV system and the chlorine disinfection. This sample point was determined a false positive and not representative of the water supplied in the reticulation as chlorine disinfection occurred after the sample point and sampling in the

network showed negative results. The system between the UV unit and chlorine dosing was completely cleaned.

The second S22 (14 January 2025) was raised due to an E. coli detection that was determined a false positive and not representative of the water being supplied to the localities.

At Mt Buller, a third S22 (4 May 2025) was raised following a power outage to the chlorine dosing system, where the backup generator failed. No *E.coli* detections resulted from this temporary outage.

Section 22 reports were raised for all E. Coli detections and investigated by ARV. The Department of Health reviewed the investigations and supported the conclusions.

Refer to Table 15 for comparison across the last three financial years.

Table 4: Escherichia coli in drinking water

Water Quality Parameter:	**Escherichia coli (E.coli)**
Water Quality Standard:	No E.coli per 100mL of drinking water, with the exception of any false positive samples.

Water sampling locality	Frequency of sampling	Number of samples	Maximum Result	Number of non-complying samples	Number of detections and investigation conducted (s.22)	Number of samples where the Standard was not met (s.18)
Falls Creek	Weekly	52	0	0	0	0
Mt Hotham	Weekly	55*	2	1	1	0
Mt Buller - High Level Reticulation	Weekly	52	0	0	0	0
Mt Buller - Low Level Reticulation	Weekly	54*	2	0	2	2
Mt Stirling	Weekly	52	0	0	0	0
Mirimbah	Weekly	52	0	0	0	0
Mt Baw Baw	Weekly	52	0	0	0	0

* Additional samples relate to testing following E.Coli detections

Table 5: Escherichia coli in clear water storages

Water Quality Parameter:	**Escherichia coli (E.coli)**
Water Quality Standard:	No E.coli per 100mL of clear water storage water, with the exception of any false positive samples.

Water sampling locality	Frequency of sampling	Number of samples	Maximum Result	Number of non-complying samples	Number of detections and investigation conducted (s.22)	Number of samples where the Standard was not met (s.18)

Mt Stirling	Weekly	52	0	0	0	0

Mirimbah drinking water sample points are located within the reticulation. The other localities do not have clear water storage. Drinking water enters the reticulation directly from the WTPs.

3.2 Turbidity

Turbidity is a measure of the presence of fine suspended particles in drinking water. The Safe Drinking Water Regulations 2015 specifies the water quality standard that 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). 2024-25 results for all sampling localities are compared to the turbidity water quality standard in Table 6. All localities met the drinking water quality standards during the 2024-25 reporting period.

Refer to Table 15 for comparison across the last three financial years.

Table 6: Turbidity in drinking water

Water Quality Parameter:	**Turbidity**
Water Quality Standard:	For drinking water supplies, the 95th percentile of results for samples in any 12-month period must be ≤5.0 NTU

Water sampling locality	Frequency of sampling	Number of samples	Maximum result (NTU)	Maximum 95th Percentile	Number of non-complying samples	Compliant with Standard
Falls Creek	Weekly	52	3.3	0.8	0	Y
Mt Hotham	Weekly	52	0.4	0.2	0	Y
Mt Buller High	Weekly	53	3.3	1.6	0	Y
Mt Buller Low	Weekly	52	3.2	1.4	0	Y
Mt Stirling	Weekly	52	0.8	0.6	0	Y
Mirimbah	Weekly	52	0.6	0.5	0	Y
Mt Baw Baw	Weekly	52	1.6	0.5	0	Y

3.3 Trihalomethanes

Trihalomethanes are a group of compounds that include chloroform, dibromochloromethane, bromodichloromethane and bromoform.

Results for Trihalomethanes from the ARV water sampling localities are shown in Table 7. All samples collected and analysed met the trihalomethane drinking water quality standards during the 2024-25 reporting period.

Refer to Table 15 for comparison across the last three financial years.

Table 7: Trihalomethanes in drinking water

Water Quality Parameter: **Trihalomethanes**

Water Quality Standard: For drinking water supplies treated with chlorine-based chemicals, no results to exceed 0.25 mg/L

Water sampling locality	Frequency of sampling	Number of samples	Average (mg/L)	Maximum (mg/L)	Number of non-complying Samples	Compliant with Standard
Falls Creek	Monthly	12	<0.001	0.001	0	Y
Mt Hotham	Monthly	12	0.018	0.024	0	Y
Mt Buller High	Monthly	12	0.054	0.085	0	Y
Mt Buller Low	Monthly	12	0.06	0.09	0	Y
Mt Stirling	Monthly	12	0.064	0.089	0	Y
Mirimbah	Monthly	12	0.046	0.076	0	Y
Mt Baw Baw	Monthly	12	0.109	0.18	0	Y

3.4 Chlorine Based Disinfection By-Product Chemicals

Chlorine-based disinfection by-products (DBP) may be produced from reactions between chlorine and organic or inorganic matter in water. Excessive levels of disinfection by-products are not desirable in drinking water as long-term exposure may pose a health risk. Although there are potentially numerous DBP formed, those of most significance include haloacetic acids and trihalomethanes. Trihalomethanes are a group of compounds that include chloroform, dibromochloromethane, bromodichloromethane and bromoform. Haloacetic acids are a group of compounds that includes chloroacetic acid, dichloroacetic acid and trichloroacetic acid.

Results for these parameters from the ARV water sampling localities are shown in Table 8 to Table 10. All samples collected and analysed met the trihalomethane and haloacetic acid drinking water quality standards during the 2024-25 reporting period, except for two trichloroacetic acid detections each at Mt Baw Baw and Mt Stirling. Action to reduce chloroacetic acid, dichloroacetic acid and trichloroacetic acid is encouraged but must not compromise disinfection, as non-disinfected water poses significantly greater risks to health.

Table 8: Chlorine based disinfection by-product chemicals – Chloroacetic Acid

Water Quality Parameter: **Chloroacetic acid**

Water Quality Standard: Should not exceed 0.15 mg/L *

Water sampling locality	Frequency of sampling	Number of samples	Average (mg/L)	Maximum (mg/L)	Number of non-complying samples

Mt Buller High	Monthly	12	<0.005	<0.005	0
Mt Buller Low	Monthly	12	<0.005	<0.005	0
Mt Stirling	Monthly	12	<0.005	<0.005	0
Mirimbah	Monthly	12	<0.005	<0.005	0
Mt Baw Baw	Monthly	12	<0.005	0.005	0

Table 9: Chlorine based disinfection by-product chemicals – Dichloroacetic Acid

Water Quality Parameter: **Dichloroacetic acid**

Water Quality Standard: Should not exceed 0.1 mg/L *

Water sampling locality	Frequency of sampling	Number of samples	Average (mg/L)	Maximum (mg/L)	Number of non-complying samples
Mt Buller High	Monthly	12	0.017	0.036	0
Mt Buller Low	Monthly	12	0.02	0.03	0
Mt Stirling	Monthly	12	0.048	0.072	0
Mirimbah	Monthly	12	0.02	0.04	0
Mt Baw Baw	Monthly	12	0.053	0.087	0

Table 10: Chlorine based disinfection by-product chemicals – Trichloroacetic Acid

Water Quality Parameter: **Trichloroacetic acid**

Water Quality Standard: Should not exceed 0.1 mg/L *

Water sampling locality	Frequency of sampling	Number of samples	Average (mg/L)	Maximum (mg/L)	Number of non-complying samples
Mt Buller High	Monthly	12	0.022	0.033	0
Mt Buller Low	Monthly	12	0.02	0.03	0
Mt Stirling	Monthly	12	0.073	0.14	3
Mirimbah	Monthly	12	0.046	0.076	0
Mt Baw Baw	Monthly	12	0.08	0.11	2

3.5 Other Chemicals That May Pose A Risk To Public Health

Algae toxins may be produced by Cyanobacteria (Blue-Green Algae) under extreme circumstances. FCAR and MBMSAR undertakes routine raw water algae sampling. There have been no detections of note. Whilst there has been a slight increase in Algal biovolumes within the raw water storages there has not been BGA or HAB experienced that would hinder safe water production.

Total Chlorine is a measure used to verify effective disinfection. The following testing correlates with respective SCADA trending for free chlorine residual results and demonstrates effective disinfection maintained across the localities.

Table 11: Health related parameters – Total Chlorine in drinking water

Water Quality Parameter: **Chlorine, Total**

Water Quality Standard: Should not exceed 5 mg/L

Water sampling locality	Frequency of sampling	Number of samples	Average result (mg/L)	Maximum result (mg/L)	Compliant with standard
Mt Buller High	Weekly	52	1.00	2.78	Y
Mt Buller Low	Weekly	52	0.77	1.6	Y
Mt Stirling	Weekly	52	1.00	2.72	Y
Mirimbah	Weekly	52	1.26	2.20	Y

Falls Creek's Risk Management Plan has identified other chemicals which may pose a risk to human health may be present in either the water supplied to customers or in the source water. The monitoring program has been designed to provide confidence that water supplied to customers is safe and free of any other harmful chemicals. Monitoring frequencies for each selected parameter are determined utilising a risk-based approach. Other parameters monitored by Falls Creek that may pose a risk to health include heavy metals and radioactive materials. Radiological compounds are tested every second year and were not tested during the reporting period.

Table 12 shows the results against the health-related water quality standards for each identified chemical of concern in the Falls creek source water, alongside aesthetic parameters.

Table 12: Health and aesthetic related parameters – Falls Creek

Water Sampling Locality: **Falls Creek**

Chemical tested	unit	Frequency of sampling	Number of samples	Maximum result	Health guideline	Aesthetic guideline	Number of non complying samples	Compliant with Standard
Alkalinity	as CaCO3	6 Monthly	2	12			0	Y
Arsenic	as As	6 Monthly	2	<0.001	0.010		0	Y
Cadmium	as Cd	6 Monthly	2	<0.0002	0.002		0	Y
Calcium	as Ca	6 Monthly	2	1.5			0	Y
Chloride	as Cl	6 Monthly	2	1	N/A	250	0	Y

Chromium	as Cr	6 Monthly	2	<0.001	0.05		0	Y
Copper	as Cu	6 Monthly	2	0.02	2	1	0	Y
EC 25C	MicroS/cm	6 Monthly	2	24		1000	0	Y
Hardness	as CaCO3	6 Monthly	2	7	N/A	200	0	Y
Iron	as Fe	6 Monthly	2	0.61		0.3	1	N
Lead	as Pb	6 Monthly	2	<0.001	0.01		0	Y
Magnesium	as Mg	6 Monthly	2	2			0	Y
Manganese	as Mn	6 Monthly	2	0.1	0.5	0.1	0	Y
Mercury	as Hg	6 Monthly	2	<0.001	0.001		0	Y
Nickel	as Ni	6 Monthly	2	<0.001	0.02		0	Y
Potassium	as K	6 Monthly	2	0.3			0	Y
Selenium	as Se	6 Monthly	2	<0.001	0.010		0	Y
Silica	as SiO2	6 Monthly	2	7.4			0	Y
Sodium	as Na	6 Monthly	2	1.5	N/A	180	0	Y
Sulphur	as SO4	6 Monthly	2	<0.5	500	250	0	Y
TDS	mg/L	6 Monthly	2	35			0	Y
Zinc	as Zn	6 Monthly	2	0.01		3.000	0	Y

3.6 Aesthetics

Aesthetic parameters help to describe the appearance, taste and odour of drinking water. ARV regularly monitors some localities for certain aesthetic parameters. The majority of drinking water sampling localities met the aesthetic guideline values for the specific parameters tested at each locality. The following is a summary of those localities and the specific aesthetic parameters tested at each.

Falls Creek water is regularly tested for conductivity, hardness, alkalinity, iron and manganese. These are included in Table 12 above. Only one sample of Iron was outside the ADWG aesthetic-related guideline value. All other results at Falls Creek were within the guideline parameters.

Electrical conductivity is proportional to the concentration of dissolved salts in the water. It is commonly used as a surrogate measure for total dissolved solids. The palatability of drinking water diminishes with increasing levels of dissolved salts.

Hardness generally indicates the level of dissolved calcium and magnesium salts in the water. It makes soap difficult to lather and can result in scaling in hot water services and plumbing. Modern dishwashers and other appliances often require settings based upon the hardness of the water. Falls Creek's water is soft.

Alkalinity is a measure of the buffering capacity of water with respect to pH change. Although there are no drinking water guidelines for alkalinity, it can be important for chemical treatment and industrial processes.

Iron and manganese occur naturally in waters from contact with soils and rock. Excessive iron and/or manganese in water may result in discolouration, an objectionable taste, the staining of laundry, and the staining of plumbing fixtures.

pH

pH is a measure of the water's hydrogen ion concentration. It is an important operational parameter and has a significant effect on the efficiency of disinfection. To minimise the potential for corrosion of pipes or mineral scale formation, the guideline limits for pH are 6.5 to 8.5. Mt Buller, Mt Stirling, Mirimbah and Baw Baw's drinking water supply are monitored regularly for pH and a summary of the results are in Table 13.

The ADWG aesthetic guideline values for pH is 6.5 and 8.5 with a tolerable limit of 9.2. Mt Buller did not meet the aesthetic guidelines on one occasion when a 9.5 was recorded.

Table 13: Aesthetic related parameters – pH

Water Quality Parameter: **pH**

Aesthetic Guideline: Should be between 6.5 and 8.5 pH units (tolerable upper limit of 9.2†)

Water sampling locality	Frequency of sampling	Number of samples	Minimum result	Average result	Maximum result	Number of non-complying samples	Met aesthetic guideline
Mt Buller High	Weekly	52	7.40	7.99	8.91	0	Y
Mt Buller Low	Weekly	54#	7.80	8.56	9.50	1	N
Mt Stirling	Weekly	52	7.107	7.20	8.49	0	Y
Mirimbah	Weekly	52	6.72	7.29	8.30	0	Y
Mt Baw Baw	Weekly	52	6.60	7.40	8.90	0	Y

*Monitoring Program updated to improve verification of results by increasing frequency of testing
Additional samples taken following high reading

True colour

True colour is a measure of the intensity of the yellow-brown hue that is naturally imparted into some surface waters. Dissolved organic matter, especially humic and fulvic acids, and dissolved

inorganic matter, especially iron and manganese, impart colour into water. Colour is regularly tested at Mt Baw Baw and Table 14 is a summary of results.

Table 14: Aesthetic related parameters – True colour in drinking water

Water Quality Parameter:	True Colour
Aesthetic Guideline:	Should not exceed 15 Hazen Units (HU)

Water sampling locality	Frequency of sampling	Number of samples	Maximum result (HU)	Number of non-complying samples	Met aesthetic guideline
Mt Baw Baw	Weekly	52	20	6	N

3.7 Analysis of Results

Table 15 shows a comparison of compliance against water quality standards for the past three reporting periods.

Table 15: Summary of compliance with Water Quality Standards - Schedule 2 (SDWR 2015)

Water Quality Standard (2015 Regulations)	No E.coli per 100ml, with the exception of any false positive samples	THMs Total Trihalomethanes must be ≤ 0.25 mg/L	95th percentile in 12 month period must be ≤5.0 NTU
2022-23 Samples Compliant	99%	100%	100%
2023-24 Samples Compliant	100%	100%	100%
2024-25 Samples Compliant	99.6%	100%	100%

E.coli and comparison with previous years

In 2024-25, Mt Hotham had one positive E.coli reading. All water sampling localities met the *E.coli* standard in 2023-24; and in 2022-23, Falls Creek, Mt Stirling and Mirimbah all had one positive E.coli reading. See the 2022-23 report for more information regarding actions taken following those results.

Turbidity and comparison with previous years

All water sampling localities met the turbidity standard for the last three reporting periods.

Total Trihalomethanes and comparison with previous years

All water sampling localities met the trihalomethane standard for the last three reporting periods.

4 Emergency and Incident Management

The *Safe Drinking Water Act 2003* requires water agencies to immediately report to the Department of Health (DoH) any incident or situation relating to a drinking water supply that may pose a risk to human health or cause widespread public complaint. It also requires notification of detection of parameters that breach the Australian Drinking Water Guideline health limits.

ARV's risk management and quality management systems serve to minimise the incidence of serious incidents and incorporate continuous improvement strategies to reduce risk to drinking water.

When incidents do occur, ARV's monitoring programs are designed to identify problems as soon as possible, avoiding or minimising adverse impacts to customers. Procedures are implemented to respond to these incidents appropriately to mitigate risks to public health.

4.1 Known or Suspected Contamination

There were four reports made under Section 22 of the *Safe Drinking Water Act 2003* to the Department of Health.

Over the course of the year three Section 22 notifications were made for the presence of low count E.coli detections and one Section 22 notification was raised for a power outage.

The circumstances of each Section 22 notification are reported in Table 16.

4.2 Section 22 Notifications

The following reports were made to the water unit of the Department of Health under Section 22 of the SDWA within the required timeframes.

Table 16: Section 22 Notifications

Date and Location	Issue	Details	Corrective Actions
17/03/2025 Mt Hotham	E.coli 2 cfu/100ml	A routine weekly sample detected E.coli at the lunchroom in the RMB building within Hotham village (site (024E06 UV Plant no. 2. after UV).	ARV undertook a rapid risk assessment identifying two factors that lead to the non-compliance. The occurrence of an unusually high *E.coli* presence in the raw water supply was attributed to the localized presence of a dead animal adjacent to the raw water supply point; and a failure in the UV treatment system caused by a build-up

			of film on the sleeves internally on the UV unit. Both issues were resolved by removing the dead animal and cleaning.
09/07/2024 Mt Buller Low Level Zone	E.coli 2 cfu/100ml	A routine weekly sample detected E.coli at the Mt Buller Low Level Zone post UV and pre chlorine disinfection.	ARV undertook a rapid risk assessment identifying the detection was a result of biofilm growth within the pipe and/or sample tap between the UV system and the chlorine disinfection. This sample point was not representative of the water supplied in the reticulation as chlorine disinfection occurred after the sample point and sampling in the network showed negative results. The system between the UV unit and chlorine dosing was completely cleaned. The result was reported as a false positive and not representative of the water being supplied to the localities.
14/01/2025 Mt Buller Low Level Zone	E.Coli 2 cfu/100ml	A routine weekly sample detected E.coli at the Low Level Reticulation Workshop site at Mt Buller.	ARV undertook a rapid risk assessment where a site inspection established no indication of a performance issue or barrier failure that would have contributed to the positive E.coli result. Resampling results taken on 15 January 2025 showed no E.coli growth in any of the 3 samples. The result was reported as a false positive and not representative of the water being supplied to the localities.
04/05/2025 Mt Buller Low Level Zone	Power outage to the chlorine dosing unit where the backup generator temporarily failed.	No *E.coli* detections resulted from this 90-min power outage.	ARV undertook a rapid risk assessment where failure of the back-up generator was attributed to a fault in the generator battery, which was immediately fixed. Resampling results taken on 5 May 2025 showed no E.coli detections.

 # E.coli reportable units are based on differing NATA approved methods for detection.

All E.coli investigations were carried out in accordance with Schedule 2, (a), (b) and (c) of the Safe Drinking Water Regulations 2015. The Department of Health supported all findings.

4.3 Section 18 Notifications

The following reports were made to the water unit of the Department of Health under Section 18 of the SDWA when identified in the preparation of this report.

Table 17: Section 18 Notifications

Date and Location	Issue	Details	Corrective Actions
16/09/2024 Mt Stirling	HAA's - Trichloroacetic Acid 0.14 mg/l	A routine monthly sample detected a chlorine byproduct above the limit of 0.1 mg/l	Based on an investigation, ARV has determined the root cause of the elevated TCA levels was an underestimation of chlorine residual levels, hence high chlorine dosing, due to the use of plastic test vials in lieu of glass. Controls to ensure this will not be repeated have been identified and implemented by ARV.
21/10/2024 Mt Stirling	HAA's - Trichloroacetic Acid 0.13 mg/l	A routine monthly sample detected a chlorine byproduct above the limit of 0.1 mg/l	The chlorine by-product suite of analytes including trihalomethanes and halo acetic acids are taken concurrently on a monthly basis and as all other analyte parameters were compliant this was not identified as an exceedance.
17/02/2025 Mt Stirling	HAA's - Trichloroacetic Acid 0.11 mg/l	A routine monthly sample detected a chlorine byproduct above the limit of 0.1 mg/l	The chlorine by-product suite of analytes including trihalomethanes and halo acetic acids are taken concurrently on a monthly basis and as all other analyte parameters were compliant this was not identified as an exceedance.
03/12/2024 Mt Baw Baw	HAA's - Trichloroacetic Acid 0.11 mg/l	A routine monthly sample detected a chlorine byproduct above the limit of 0.1 mg/l	The chlorine by-product suite of analytes including trihalomethanes and halo acetic acids are taken concurrently on a monthly basis and as all other analyte parameters were compliant this was not identified as an exceedance.

09/07/2024 Mt Buller Low Level Zone	E.Coli 2 cfu/100ml	A routine weekly sample detected E.coli at the Mt Buller Low Level Zone post UV and pre chlorine disinfection.	ARV undertook a rapid risk assessment identifying the detection was a result of biofilm growth within the pipe and/or sample tap between the UV system and the chlorine disinfection. This sample point was not representative of the water supplied in the reticulation as chlorine disinfection occurred after the sample point and sampling in the network showed negative results. The system between the UV unit and chlorine dosing was completely cleaned. The result was reported as a false positive and not representative of the water being supplied to the localities.
14/01/2025 Mt Buller Low Level Zone	E.Coli 2 cfu/100ml	A routine weekly sample detected E.coli at the Low Level Reticulation Workshop site at Mt Buller.	ARV undertook a rapid risk assessment where a site inspection established no indication of a performance issue or barrier failure that would have contributed to the positive E.coli result. Resampling results taken on 15 January 2025 showed no E.coli growth in any of the 3 samples. The result was reported as a false positive and not representative of the water being supplied to the localities.

N.B. All Trichloroacetic Acid detections were only slightly above the reportable limits and ARV are cognisant of the triggers that can lead to exceedances including testing method, colour, chlorine dosage and chemical age that can lead to elevated levels. ARV continues to work on opportunities for improvement associated with chlorine byproduct management.

Excessive levels of chlorine by-products are not desirable in drinking water as long-term exposure may pose a health risk. Action to reduce Halo Acetic Acids are encouraged but must not compromise disinfection, as non-disinfected water poses significantly greater risk than trichloroacetic acid.

ARV undertook a root cause investigation of treatment processes to identify opportunities to mitigate the re-occurrences of chlorine by-product detections.

The investigation included a review of the current Standard Operating Procedure (SOP) and the “on-ground” steps operations staff take to ensure they are in line with the SOP. The investigation also included a review of field test chlorine residuals taken at the clear water storage tank.

The following points were identified during the investigation:

- The carbon filter had been serviced in June as per the maintenance schedule.
- Plastic vials had been used for chlorine residual sampling.
- The last date of cleaning out the raw water storage tank could not be determined.

It was determined that the root cause of the elevated TCA level was the use of the plastic vials to test for chlorine residual levels in the clear water storage tank. Plastic, rather than glass, in this particular field test, can significantly impact the sample results. It was found that the chlorine residual sample results were 2-3 times lower than actual chlorine residuals.

The underestimating of chlorine residual levels resulted in higher chlorine dosing and therefore elevated chlorine byproducts (TCA).

5 Complaints Relating to Water Quality

ARV Customers can report water quality issues in a number of ways:

- Via the customer feedback service on our website, www.alpineresorts.vic.gov.au/contact-us
- Via the email address listed on the same web page
- Directly or via telephone to our staff at any of our offices or operational centres;
- Via social media.

ARV aims to ensure that any customer complaints received will be dealt with promptly, investigated appropriately and follow-up contact to advise the customer of our actions and to monitor satisfaction levels. All customer complaints are to be recorded so their status can be tracked and so that any issues that could affect drinking water safety identified and resolved quickly and efficiently.

ARV received no customer complaints in relation to drinking water in the reporting period.

Customer engagement is important for ARV in so far that customers can make enquiries and complaints, and readily be informed in an event that resulted in a service interruptions or the provision of non-compliant drinking water. ARV has a variety of traditional and digital communication methods with which to inform customers about our activities:

- text messages to customers about water quality events like supply interruptions.
- multiple social media channels can be used to provide information to customers as well as educate and raise awareness about the treatment, safety and quality of drinking water supplies.
- Stakeholder newsletter
- Visitor information offices at each resort.
- During peak season, on site visitor information teams are on the ground to provide information to residents and customers.

6 Findings of the Most Recent Risk Management Plan Audit

The Department of Health requires ARV to undertake an independent audit of their risk management plan. All non-compliances highlighted in the 2023-24 Audit have been addressed. At time of writing this report, all (former) Resort RMP's (Falls Creek, Mt Hotham, Mt Buller & Mt Stirling, Mt Baw Baw and Lake Mountain) have been comprehensively evaluated and are in the final process of consolidation into a single framework, titled the ARV RMP. An important element of this process is the inclusion of the recently promulgated (6 July 2025) Safe Drinking Water Regulations (2025) requirements. The next independent audit of the ARV RMP will occur in FY 25-26.

Table 18: Major Non-compliances

Locality	Ref to Act and Reg	Audit Finding Summary	Status
		All Major Non-Compliances completed in FY 2023-24	

Table 19: Minor Non-compliances

Locality	Ref to Act and Reg	Audit Finding Summary	Activity	Status
MBBAR	s. 7(1)(d), s. 8(1)(d)	Risk assessment did not address residual risks and overstates some risks. Requires a comprehensive review and update.		COMPLETED

Table 20: Other OFIs

Locality	Item	Identified OFI	Activity	Status
FCAR	1	Review the risk ratings in Appendix 5 of RMP with new knowledge	Broad risk management plan review for ARV portfolio to be undertaken. FCAR Risk Rating review scheduled to begin in Oct 2024.	COMPLETED
MHAR	OFI- 2018 - 3	The project to replace the rising main is a high priority. It is very important to budget for proactive replacement.	The rising main replacement was a very unique and challenging multi-year project due to the environment and steep terrain. Replacement of the pipeline was made in stages since 2018, with wet Summers causing delays. The final stage of the project was completed in Summer 2024/25.	COMPLETED

MHAR	OFI - 2022 - 2	An opportunity for improvement exists, in relation to s. 9(1)(d), to disconnect the raw water pipeline bypass of the disinfection treatment process that connects directly to the drinking water reticulation. A failure of the raw water bypass pipeline valve or accidental operation may present a drinking water quality risk without implementation of further preventative strategies.	Alterations to the existing raw water bypass pipework are proposed for the 2025-26 Summer works program, following the finalisation of maintenance budgets and works programs. These alterations will ensure there is no possibility of undisinfected water entering the drinking water reticulation network and compromising quality. Estimated Completion May 2026	OPEN
MHAR	OFI - 2023 - 5	An opportunity for improvement exists, in relation to s. 9(1)(d), to complete the identification of the existing backflow prevention devices within the MHAR drinking water reticulation (auditing of premises) and establish a register to monitor inspection and compliance obligations.	MHAR has commenced preliminary investigations to identify existing backflow prevention devices on premises at Mt Hotham. Estimated Completion April 2026	OPEN
MHAR	OFI - 2023 - 8	An opportunity for improvement exists, in relation to r. 8(1)(g), to verify the effectiveness of the chlorine disinfection process to achieve a chlorine Ct of > 15mg.min/L (at the first customer tap supplied) to meet the pathogen reduction requirements for the category 1 source water treated i.e., a LRV for bacteria of 4 (WSAA, 2015).	MHAR proposes to undertake a full review of the chlorine disinfection as part of proposed upgrades to water treatment facilities currently in planning for implementation as funding becomes available. Estimated Completion May 2027 (pending budget approvals)	OPEN
MBMSAR	1	A suggestion for your Mt Buller site is to upgrade your Burnt Hut Reservoir. Possible options could include upgrading into new sealed tanks, underground tanks, and/or large sealed bags. Also, consider both raw water and post disinfection tanks at this site. Suggest prompt implementation – need to consider that the new large open reservoir may not necessarily be suitable as replacement raw water storage for potable use but would supply the snowmaking water requirement.· An upgrade to your Burnt Hut Reservoir tank(s) would help to reduce the estimated water loss of one litre per second.	The intention is to decommission Burnt Hut Reservoir as part of upgrading the plant for treating water from the Boggy Creek Reservoir. Detailed design is complete. Construction works are expected to commence in early January 2026 and be completed by December 2027.	OPEN
MBMSAR	4	The Buller system only has UV and chlorine disinfection. Stirling and Mirimbah Chlorine disinfection.	During long-term planning consider additional barriers. Currently in design & construct phase of a treatment plant upgrade for Mt Buller. Initial stage works estimated completion by December 2026, with full plant upgrade + clear water storage completion estimated June 2029.	OPEN

			Additional barriers for Mirimbah & Stirling being assessed in conjunction with GVW. Mirimbah estimated completion December 2025.	
MBMSAR	6	In the event of a major water ring main failure, there is an opportunity for water to backflow into the network. All new developments are required to install backflow prevention devices.	Consider additional safeguards to alarm out in the event of negative pressure in the network. Initial discussions with GVW regarding pressure sensors installed in the high and low level retic systems connected to SCADA. This work will be completed as part of the Burnt Hut decommissioning/WTP upgrade project commencing Jan 2026 and completed by June 2026.	OPEN
MBBAR	OFI-23-001	The MBB risk management plan must include details of the methodology used to quantify microbial hazards in raw water and the extent that the treatment process removes or reduces them.	Update RMP justification for category 2 under the WSAA guidelines. Estimated completion October 2025.	OPEN
MBBAR	OFI-23-002	In the MBB risk management plan, update Table 3 to more accurately reflect the risk assessment register.	Update RMP in October 2025	OPEN
LMAR	OFI-23-003	In the LM risk register consider more explicitly assessing the risk of showering in regulated water. Having a separate hazardous event for it may identify alternative controls	Create separate hazardous event to address showering in regulated water.	COMPLETED
LMAR	OFI-23-005	Control limits should be considered at LM to ensure that water used in the regulated supply is suitable for primary contact	Review appropriate control limits for regulated water. Estimated completion November 2025.	OPEN
MBBAR	OFI-23-014	Consider stopping the monthly catchment sampling and test the Village samples monthly for metals.	Cease catchment samples. Add village metal samples. Estimated completion March 2026.	OPEN
MBBAR	OFI-23-015	Consult with DH on the need to test for chlorate.	Consultation required. Estimated completion March 2026.	OPEN
MBBAR	OFI-23-020	The methodology for the quantification of microbial hazards must be identified for the MBB scheme and undertaken to assess the extent that pathogenic microorganisms are in the source water and that the treatment processes reduce or remove them.	To be completed in conjunction with OFI-23-001. Estimated completion March 2026.	OPEN
MBBAR	OFI-23-021	Consider developing a policy for the types and locations of recreational activities in the MBB drinking water catchment.	Review recreational activities undertaken in the catchment and confirm if policy is required. Update in RMP. Estimated completion November 2025	OPEN

7 Undertakings Under Section 30, Variations Under Section 19 and Exemptions Under Section 20 Of SDWA

No undertakings, variations or exemptions were in place during the 2024-25 reporting period.

8 Regulated Water

Lake Mountain Alpine Resort is a Regulated Water System as defined under the Safe Drinking Water Act 2003 ('the Act'). The storage and supply of water to the Resort is untreated as declared and gazetted by the Minister for Health on the 23rd of October 2005. 'Regulated Water' is defined in Section 6 of the Act as, water that is not intended for drinking but could be reasonably mistaken as drinking water.

ARV is required to include regulated water supplies as part of its risk management plan. All reasonable steps are taken to ensure that the intended recipients of regulated water are made aware of the nature of that water and the health risks that may arise from the use of that water. All regulated water customers are advised that the water is not suitable for human consumption, which includes drinking or food preparation. The water is generally suitable for other domestic purposes. ARV also notifies customers if any change to the water supplied could alter the intended use.

Overview

Lake Mountain Alpine Resort is located approximately 120km northeast of Melbourne, the closest alpine resort to Melbourne, and a popular snow play destination. Located adjacent to the Yarra Ranges National Park, the resort covers an area of 465 hectares with the summit elevation at 1,433m. The Resort comprises of toboggan slopes, cross-country ski trails, the visitor centre and administration building, all situated at an elevation of approximately 1,400m. Lake Mountain Alpine Resort offers 37km of groomed cross country ski trails providing access to over 2,400 hectares of skiable terrain in the National Park. During the green season Lake Mountain is an event venue, hosts guided walking tours, mountain biking, road cycling and provides several nature-based adventure activities.

Lake Mountain Alpine Resort is the sole water (regulated) supplier to the following facilities.
Day Visitor Centre which includes;

- Public space
- Public amenities
- Food outlet
- Ski patrol/ first aid
- Resort ticketing outlet
- Retail outlet

Resort Administration Centre which includes;

- Snow sports centre

- Rental department
- Public space
- Administrative offices
- Workshop shed
- Snowy Hill amenities building
- Snow making system

Water source, storage, and distribution

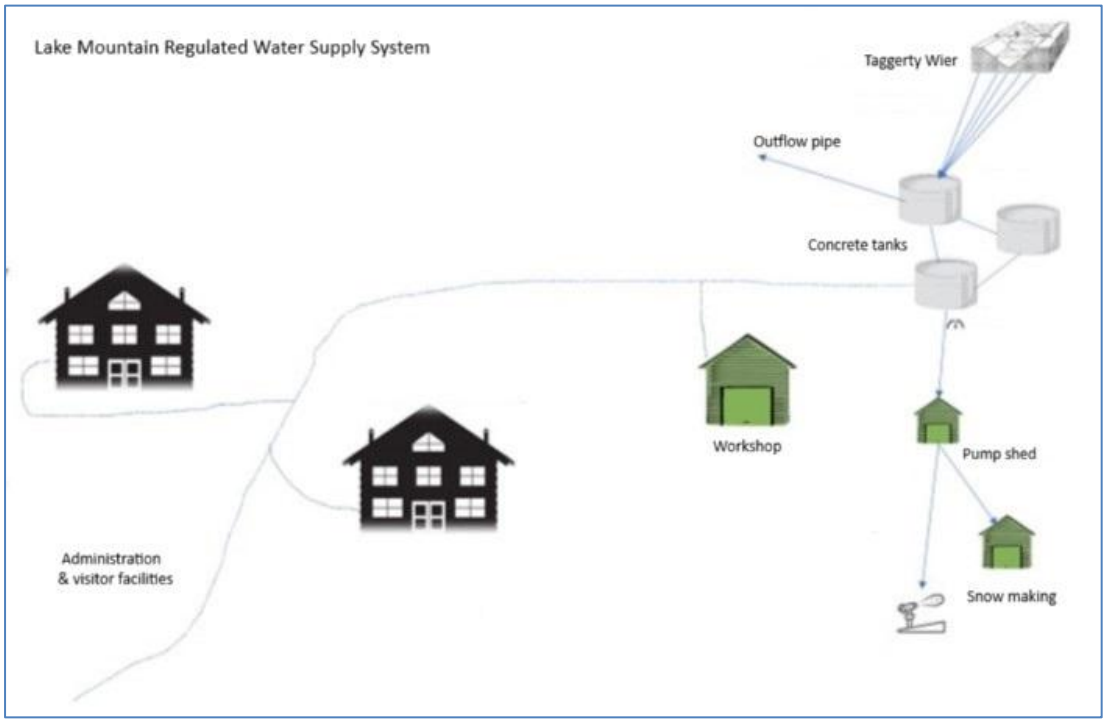

Figure 10: Lake Mountain regulated water supply system

Gerraty's

Gerraty's is the resort's village centre. Water is sourced from the Upper Taggerty River. This small stream is fed by the bog and heath catchment area of Echo Flat. This plateau is within the Yarra Ranges National Park and considered a pristine environment, the only possible human contact is from some of the cross-country ski trail network that borders the catchment area, or from people camping where there are no toilets, which is limited.

Source water, Echo Flat

The main water supply system for Gerraty's consists of a small concrete weir directing water from the Taggerty River via a series of 50mm poly pipes, under a gravity/syphons process, to 3 enclosed concrete tanks. The combined storage capacity of these tanks is 800kl. The storage tanks supply water to resort's facilities via a 100mm ductile iron pipe.

Snowy Hill

Water is sourced from the storage and distribution system at Gerraty's. The delivery line works on gravity process via 50mm HDPE line that supplies the Snowy Hill toilet amenities.

Arnold Gap

The Arnold Gap facility has been permanently closed and is not accessible by the public.

Cascades

Water is sourced from a small tributary and stored in a 2270 litre polyethylene tank. The supply and delivery lines for systems work on gravity/syphons process via 50mm polythene lines which in turn supplies water to the amenities building located at Cascades. In addition, a water tank was installed in 2020, which is roof fed and services the staff toilet at the ticket box.

Quality Management Systems

There is unvalidated domestic filtration treatment applied to the water supply at Lake Mountain. Resort management has taken steps to minimise the possibility of potential health risks by raising public awareness through the placement of "Do Not Drink" signage above all resort water outlets, advising resort visitors that the water is not treated, nor is it suitable for consumption. Water that feeds into the food preparation outlets is filtered with both multiple 20-micron and 5-micron cartridge units.

As part of the management of the water supply system water quality monitoring is undertaken. Testing occurs offsite by ALS Water on a fortnightly basis to analyse turbidity, E.coli, Coliforms and Plate Counts. Catchment and associated water delivery and storage infrastructure inspections are conducted to minimise any potential for supply failure and contaminants which may affect water quality and impact the water supply system. The management of the storage and water diversion infrastructure includes the purging of the reticulation system coupled with the cleaning of the storage tanks, which is undertaken on a twice-yearly basis.

Regulated Water Risk Management Activities

The management activities that have been implemented in relation to regulated water supply, in particular those that pertain to Section 25 of the Safe Drinking Water Act 2003, warning to be given if regulated water supplied are described as follows:

- A blanket signage program for all water outlets on the resort has been completed and maintenance schedule that is monitored through the resort Water Supply Risk Management

Plan. All water outlets have been signed warning visitors to Lake Mountain that water is untreated and of the health risks that may arise from its use.

Figure 11: Signage displayed at all water outlets

- User groups of the mountain through public forums and stakeholder meetings are advised of the issues pertaining to the non-treatment of the resorts water supply and of the health risks that may arise from its use.

- All managers and staff working within the commercial operations on the resort are briefed on issues pertaining to the non-treatment of the resorts water supply and the health risks that may arise from its use.

- As a part of the resort staff induction information sessions, the non-treatment and health risks that may arise from the use of water on the resort are covered both verbally and as inclusion in the resort employee handbook, which all employees receive prior to commencement of employment.

- To minimise risk to employees the resort management have installed bottled water coolers to supply potable water for consumption.

Future of Water Supply

An Integrated Water Management Plan has been developed to guide the future of water supply management at Lake Mountain Alpine Resort. This plan has evaluated all aspects of the water cycle to enable innovative management solutions for the Resort as it develops.

9 Further Information

Section 23 of the *Safe Drinking Water Act 2003* requires that ARV make available for inspection by the public the results of any water quality monitoring program that is conducted on any drinking water supplied by us.

Customers and members of the public may access drinking water quality data by contacting Alpine Resorts Victoria on the details provided below.

Website: https://www.alpineresorts.vic.gov.au/contact-us

ARV Stakeholder Newsletter: Communications@alpineresorts.vic.gov.au

Alpine Resorts Victoria
19 Highett Street, Mansfield VIC 3722
info@alpineresorts.vic.gov.au

Falls Creek Alpine Resort
1 Slalom Street Falls Creek VIC 3699 Australia
03 5758 1200
info.fallscreek@alpineresorts.vic.gov.au

Mt Hotham Alpine Resort
28 Great Alpine Road, Hotham Heights, VIC 3741
Mail: PO Box 188, Bright VIC 3741
(03) 5759 3550
info.mthotham@alpineresorts.vic.gov.au

Mt Buller Alpine Resort
10 Summit Rd, Mt Buller, VIC, 3723
(03) 5777 6077
info.mtbuller@alpineresorts.vic.gov.au

Mt Stirling Alpine Resort
Telephone Box Junction, Mt Stirling, VIC
(03) 5777 6532
info.mtstirling@alpineresorts.vic.gov.au

Mt Baw Baw Alpine Resort
32 Currawong Rd, Baw Baw Village VIC 3833
Mail: PO Box 117, Rawson VIC 3825
(03) 5165 1136
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