

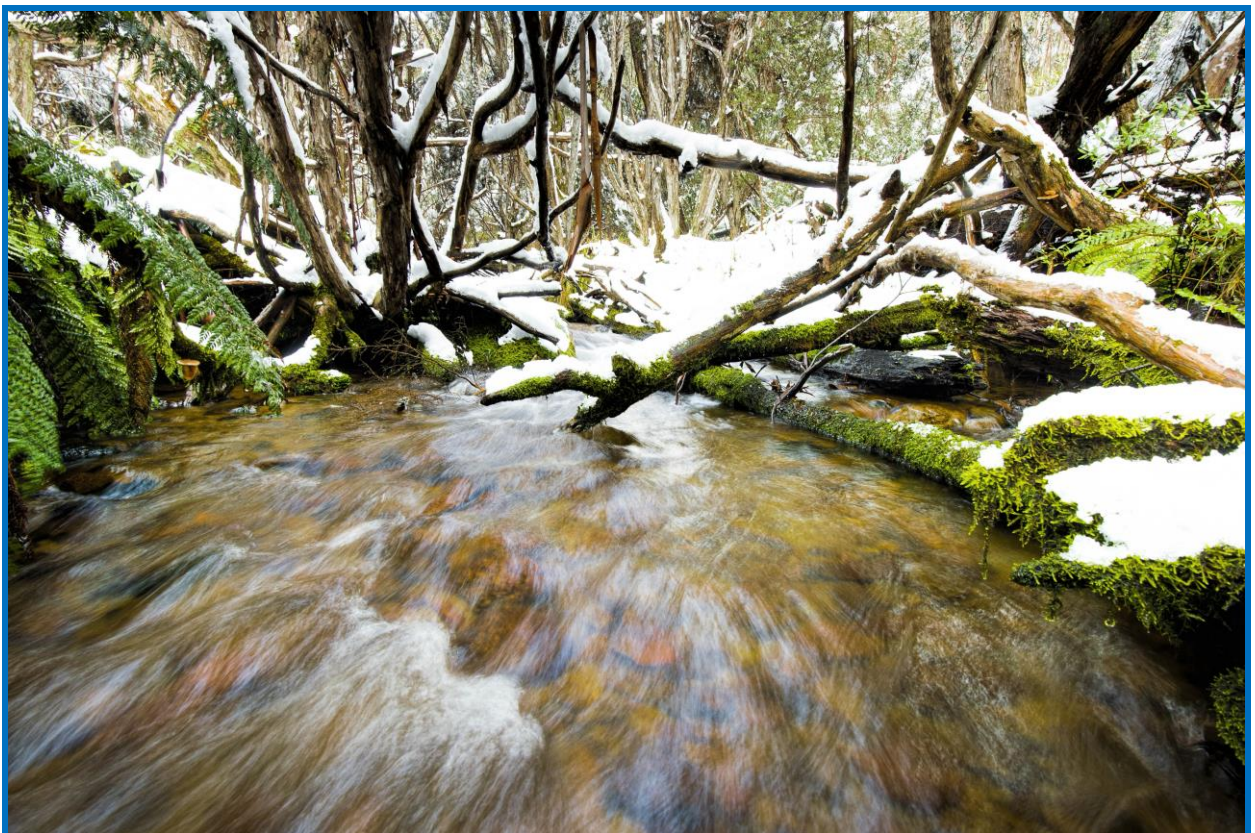


ANNUAL REPORT 2016-2017

(July 1 2016 – June 30 2017)

DRINKING WATER SUPPLY

**MT BULLER AND
MT STIRLING ALPINE RESORTS**





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Overview

This is the 2016-2017 Drinking Water Quality Annual Report by the Mt Buller and Mt Stirling Alpine Resort Management Board (RMB). It has been prepared in accordance with Section 26 of the *Safe Drinking Water Act 2003* (the Act); the Safe Drinking Water Regulations 2015 (the Regulations), and the Department of Health & Human Services Water Quality Annual Report Guidance 2016-2017.

The aim of the report is to provide information on the quality of drinking water provided by the Mt Buller and Mt Stirling Alpine Resort Management Board. The report is provided to the Secretary to the Department of Health & Human Services and is available to the public via the RMB website www.rmb.mtbuller.com.au.

Mt Buller and Mt Stirling Alpine Resorts

The RMB is a State Government Entity established in accordance with the *Alpine Resorts (Management) Act 1998* and is responsible for the management of the Mt Buller and Mt Stirling Alpine Resorts. The RMB is responsible for providing a wide range of services to the resorts including drinking water. The RMB is prescribed as a water supplier under the Act and aims to provide a high quality and safe drinking water supply.

The Mt Buller Alpine Resort is located approximately 220km from Melbourne and centred on Mt Buller. Within the resort is the Mt Buller Alpine Village, positioned at 1,500m elevation (snow line is approximately 1,200m) and with a bed capacity of 7,800 bed spaces. During the snow season (Queen's Birthday long weekend in June to the first weekend in October), there is a base population within the village of approximately 1,600. Average visitation to the resort during the snow season is in the order of 500,000 visitor days*. Peak visitation during the snow season occurs during school holidays and on weekends. The maximum number of people within the resort during any one day is in the order of 17,000 people.

In contrast, the non-snow season population of Mt Buller is low. There are approximately 100 - 150 people who work in the Village during summer, these are made up of RMB and lift company staff, builders and construction workers and a small base of truly permanent residents (approximately 30). There are a number of activities held during the summer months that attract visitors. Generally there are approximately 123,000 visitor days during the non-snow season.

Mt Stirling Alpine Resort has a common boundary (the Delatite River) with the Mt Buller Alpine Resort and is located to the northeast of the Mt Buller Alpine Resort. The resorts share Mirimbah as a common entrance point. In contrast to the Mt Buller Alpine Resort, the Mt Stirling Alpine Resort is a nature based resort and has no permanent population or accommodation. Development on Mt Stirling consists of a small office space for RMB staff, a cross country ski outlet, one small food premises, a small industrial shed, several shelters / toilet blocks and three huts, two of which are privately owned but are accessible and used by the public. Visitation to Mt Stirling Alpine Resort is generally by people seeking a nature based experience. During the snow season, visitors cross country ski and/or snow camp. Organised visits by school groups are common. Visitation is in the order of 9,500 visitor days during the snow season. During the non-snow season, particularly during the December to February period, there are a significant number of visitors who pass through the Mt Stirling Alpine Resort in four wheel drive vehicles to access the nearby attractions, 'Craig's Hut', neighbouring state forests or the Alpine National Park. Camping within the resort is common. Traffic counts of vehicles entering the resort indicate that approximately 50,000 vehicles enter the resort during the non-snow season.

* A visitor day is the number of days a visitor stays within the resort. One visitor staying two days is two visitor days.



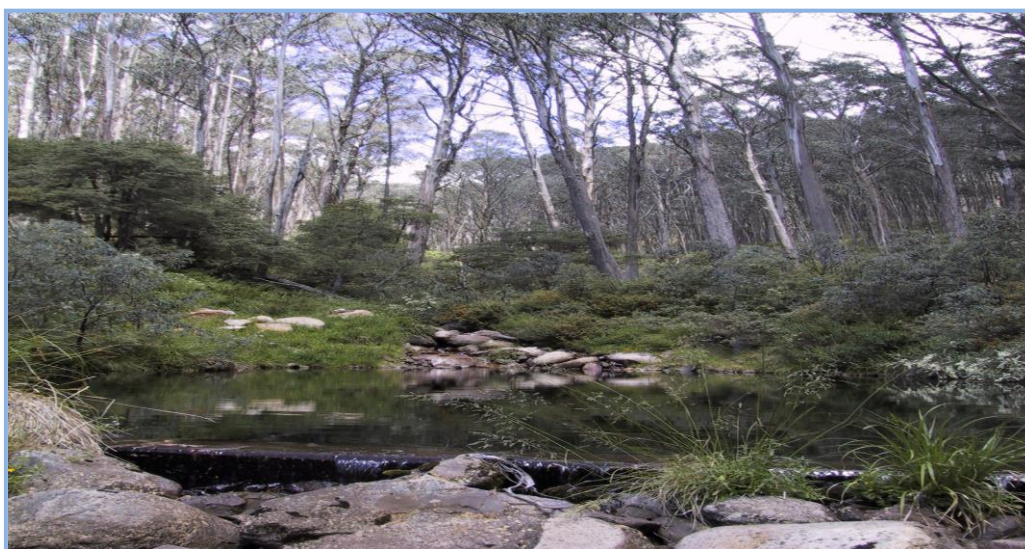
Water supply systems

The RMB provides drinking water at 3 separate locations. They are as follows:

1. Mt Buller Village and associated areas;
2. The Mirimbah picnic area, traffic control and store;
3. The Mt Stirling Ski Patrol and store known as Telephone Box Junction (TBJ).

Mt Buller High and Low Level Systems

Water for the Mt Buller Alpine Village reticulation system is drawn from up to 3 sources, Boggy Creek, the 'Headwaters' and the 'Catchment Weirs'. The RMB has a licence to draw up to 700ML of water per year. Water is drawn from the Boggy Creek catchment (see schematic below). The Boggy Creek catchment is the northeast aspect of Mt Buller and is bounded by two spur lines running north (McLaughlan's Shoulder and Burnt Hut Spur). The catchment is above 1,250m elevation and is mainly covered in snow during the snow season. During the snow season, the water sourced from the catchment is either snowmelt, or groundwater. During summer the majority of water is groundwater.



Boggy Creek Catchment

The above picture gives a good indication of the nature of the catchment from which the Mt Buller Alpine Village drinking water is sourced. The topography is steep and vegetated. The catchment lies in montane, sub alpine and alpine areas. There are few weeds or other exotic flora. Fauna consists of a range of species including deer, wombat, wallabies and varied bird species. The catchment is relatively inaccessible and is an area where vehicle access is controlled. There are several walking paths through the catchment, and camping is not permitted.

Headwaters. The Headwaters are sourced from a side hill aqueduct across the northeast aspect of Mt Buller. The aqueduct is approximately 60m long and at an elevation of approximately 1,780m. The aqueduct collects water that has originated from alpine bogs.

Catchment Weirs. There are a number of small gullies within the vicinity of the catchment. These have small weirs across them and water is taken off to the reticulation system.



Source Water

The Headwaters provide source water at a higher elevation than Boggy Creek and are used when appropriate to minimise pumping costs. However the capacity is significantly less than Boggy Creek. If there is sufficient capacity and source water quality (primarily turbidity) is appropriate, the Headwaters are used preferentially to Boggy Creek.

Mirimbah

The water supply for Mirimbah comes from Buller Creek approximately 300m upstream from the junction with the Delatite River, at an elevation approximately 620m (below the snow line). Buller Creek is perennial and considered reliable.

Mt Stirling

The water supply for Mt Stirling comes from Baldy Creek approximately 10m from the TBJ building. The Creek is perennial and considered reliable.

The Reticulation Systems

Mt Buller High and Low Level Systems

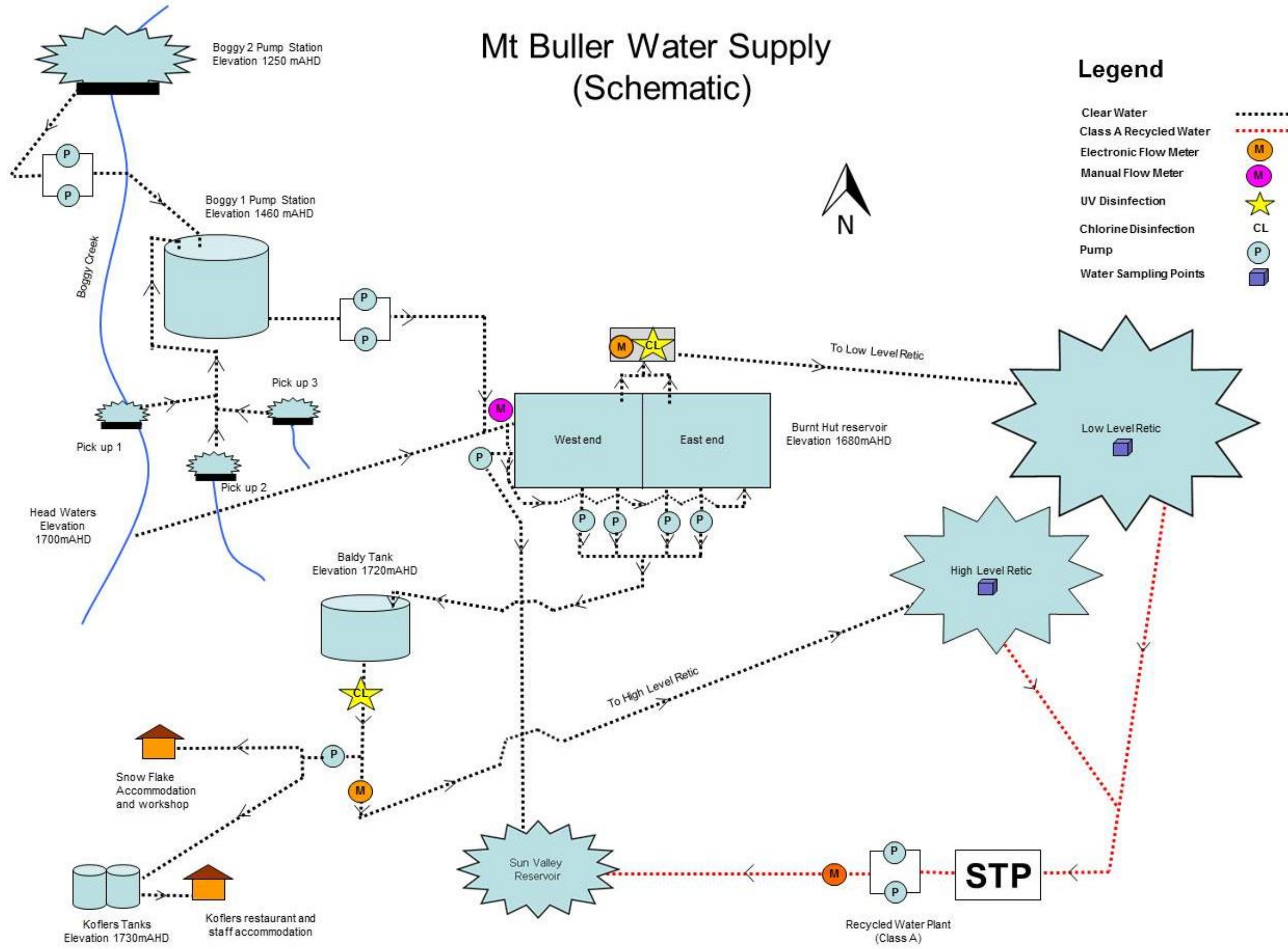
The key factor that has influenced the development of the Mt Buller Alpine Village drinking water reticulation system is the elevation variation (approximately 100m) within the Mt Buller Alpine Village. This change in elevation means that the reticulation within the village must be divided into two, and fed from reservoirs at different levels in order to keep the maximum water pressure within the reticulation below 1,000KPa.

Source water is drawn from a weir on Boggy Creek and pumped (Boggy 2 pump station) to an open holding tank. Source water from the Catchment Weirs is gravity fed into the same tank. The source water is then pumped (Boggy 1 pump station) into an open reservoir known as 'Burnt Hut Spur' reservoir. Water from the Headwaters is also gravity fed into the Burnt Hut Spur reservoir. This reservoir serves the low level reticulation within the Mt Buller Alpine Village. Water is drawn from the reservoir, irradiated with UV radiation and dosed with hypochlorite before being reticulated throughout the lower two thirds of the village.

Water is pumped from Burnt Hut Spur reservoir to an underground concrete tank reservoir known as 'Baldy reservoir'. Water from this reservoir is irradiated with UV radiation and dosed with hypochlorite, distributed (gravity fed) to the upper third of the Mt Buller Alpine Village, to Buller Ski Lifts Ltd (BSL) work shop facilities, to a public toilet located near the Sun Valley snow making dam and to 'Kofler's Hutte', a food premise located in the ski field. The workshops are served by a rising main while Kofler's Hutte is served through a rising main to two storage tanks then gravity fed to the Hutte.



Mt Buller Water Supply (Schematic)



Legend

- Clear Water
- Class A Recycled Water
- Electronic Flow Meter ● (M)
- Manual Flow Meter ● (M)
- UV Disinfection ★
- Chlorine Disinfection CL
- Pump ● (P)
- Water Sampling Points ■

Updated
 August 2017



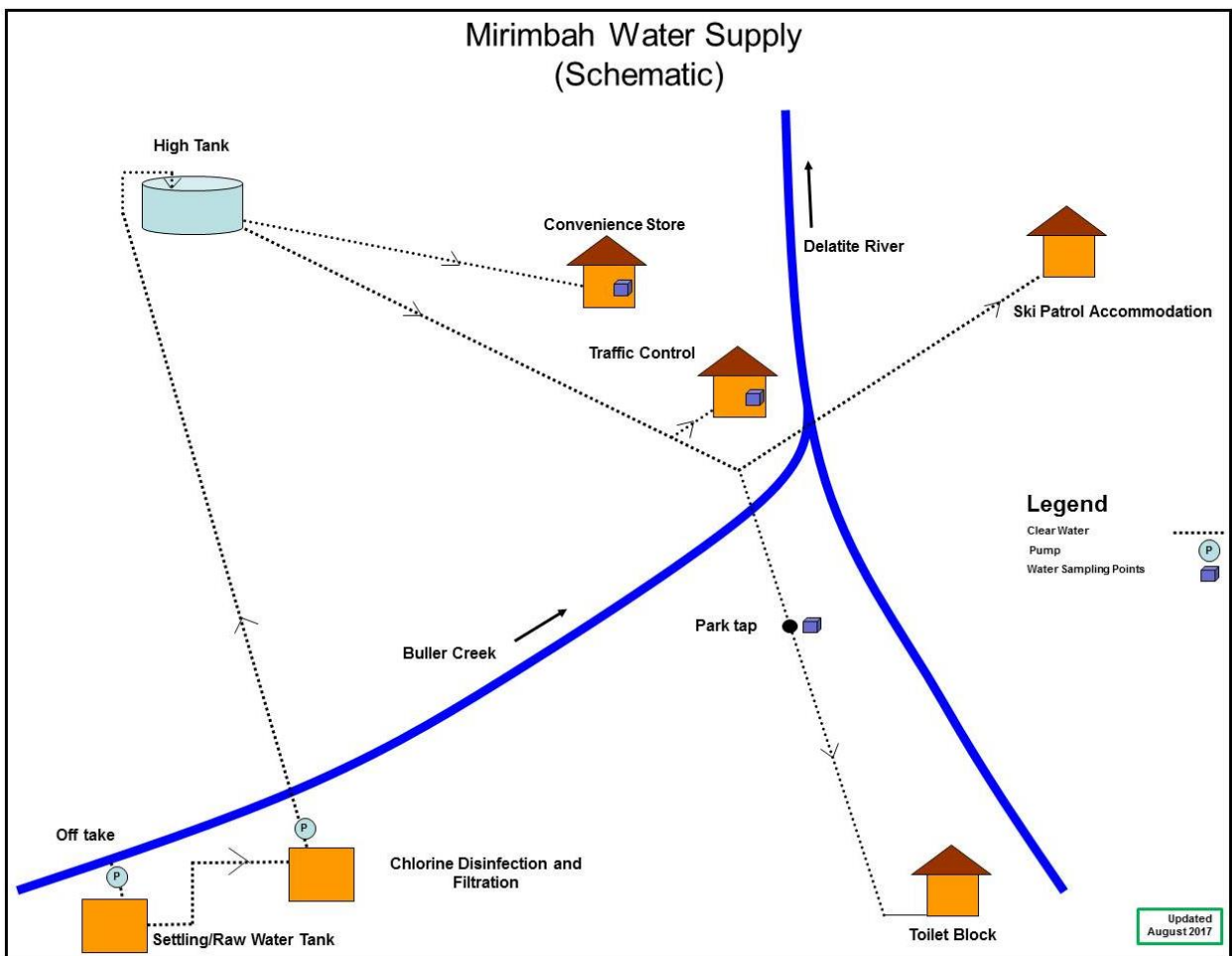
Mirimbah

The RMB reticulates water sourced from Buller Creek near Mirimbah Park to a toilet block located within the park, the Traffic Control (ticket office) building, a small general store that provides food and other sundries that may be required by people visiting Mt Buller and Mt Stirling and to an accommodation building used by Mt Stirling Ski Patrol staff.

Water is collected from the river using a small diversion channel and pumped up to a settling water storage tank.

The water is then filtered through cartridge filters and dosed with Sodium Hypochlorite.

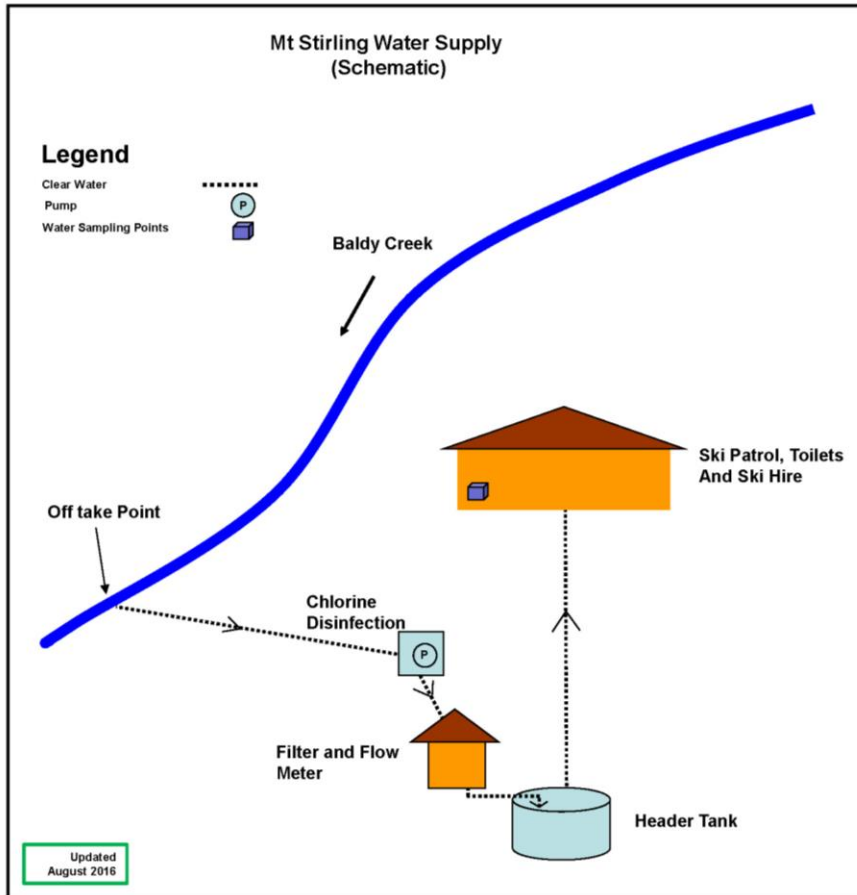
After treatment the water is pumped to an elevated holding tank (approximately 60m higher than the Creek). Water is then gravity fed to the ski patrol accommodation (under the old bridge over the Delatite River), the RMB traffic control building, Mirimbah public toilet block and park, Bus Depot and Convenience Store.





Mt Stirling

The RMB reticulates water to a toilet block, small ski hire and bistro and the RMB ski patrol base. The ski hire, bistro and RMB ski patrol base are only utilised during the snow season.



Water is pumped from Baldy Creek, and then disinfected with sodium hypochlorite through a cartridge filter prior to being stored in a Header Tank. The water is then gravity fed through the small reticulation system.

Water sampling locality	Population supplied	Source Water	Raw Water Storage	Treated Water Storage	Treatment plant
Mount Buller Low Level System	Seasonal (50 – 5000)	Boggy Creek	Burnt Hut Res Concrete Lined Open Storage (4.2ML)		Low Level
Mount Buller High Level System	Seasonal (10 -3000)	Boggy Creek via Burnt Hut	Baldy Covered Concrete Tank (1ML)		High Level
Mirimbah	No permanent population. <5 Seasonal Staff	Buller Creek	Raw water settling tank (22,750L Plastic Tank)	Mirimbah Head Tank (22,750L Plastic Tank)	Mirimbah
Mount Stirling	No permanent population or accommodation	Baldy Creek		5000L Plastic Tank	Mt Stirling

Table 1 – Water Supply Systems



Drinking Water Treatment Process

Water treatment

	Treatment process													Added substances								
	Clarification		Filtration			Disinfection				Other												
	Coagulation and flocculation	Sedimentation or clarification	Dissolved air flotation	Granular Media Filter	Membrane	Cartridge Filter	Chlorine gas	Sodium hypochlorite	Chlorine dioxide	Ultraviolet (UV)	Ozone	Activated carbon (PAC/GAC)	Ion exchange	Reverse osmosis	Sludge-handling (mechanical with chemical addition)	Lime/Soda ash/Caustic soda/Carbon dioxide/Sulphuric acid	Aluminium-based coagulants	Iron-based coagulants	Polymers	Chlorine	Ammonia	Flouride
Mirimbah						✓	✓													✓		
Mount Buller Low Level System							✓		✓											✓		
Mount Buller High Level System							✓		✓											✓		
Mount Stirling						✓	✓													✓		

Table 2a - Treatment Processes (order by treatment)

Water sampling locality	Treatment plant	Population supplied	Treatment process	Added substance(s)
Mount Buller Low Level System	Low Level	Seasonal (50 – 5000)	UV and Hypochlorite	Chlorine
Mount Buller High Level System	High Level	Seasonal (10 - 3000)	UV and Hypochlorite	Chlorine
Mirimbah	Mirimbah	No permanent population. <5 Seasonal Staff	Cartridge Filter and Hypochlorite	Chlorine
Mount Stirling	Mt Stirling	No permanent population or accommodation	Cartridge Filter and Hypochlorite	Chlorine

Table 2b - Treatment Processes (site specific)

Mirimbah and Mt Stirling

The Mirimbah and Mt Stirling water supply systems are filtered and dosed with chlorine prior to entering the storage tanks.

Improvements

The water treatment plant was upgraded at Mirimbah in the summer of 2017. The water treatment process remains the same, however all the treatment equipment has been replaced. The big



improvements with the system include; a new raw water (settling) tank, new automated chlorine dosing system, remote monitoring and control to all parts of the process.



Upgrade Mirimbah Water Treatment Plant

As part of the system upgrade the balance tank that sat between the Mirimbah head tank and the Mirimbah store has been removed. The balance tank was a contributing factor to an *E.coli* detection in the Mirimbah system and as a result not meeting the *E.coli* water quality standard. More detailed information on this issue is discussed under the Emergency Incident and Event management section of the report.

Mt Buller

The source water for Mt Buller drinking supply is of good quality and is monitored as part of the RMB's water sampling program. Retention in the Burnt Hut Reservoir and Baldy tank provides an opportunity for suspended solids to settle out of the water before use. Online turbidity meters and loggers monitor the turbidity of the water prior to treatment. Turbidity can affect the disinfection process, however the increased levels we see during wet weather and peak demand events impact more on the aesthetics rather than disinfection.

The Mt Buller Alpine Village drinking water supply is treated primarily using UV disinfection and a secondary disinfection process using chlorine. Both low and high level treatment plants' UV and chlorine systems are serviced annually and monitored constantly via a telemetry based system.

Improvements

The High Level Water Treatment Plant was upgraded during the 2017 summer period. The treatment process has not changed, but the equipment, pipework, and fittings have all been upgraded.

Some of the improvements are; A new purpose built building to house the HL WTP, a new UV disinfection system, correct spacing between equipment to allow for adequate mixing/measuring of free chlorine and laminar flows, new Variable Frequency Drive controlled pump for Koflers and Flakeside duties.



**New High Level Water
Treatment Plant Building**



**Interior of High Level Water
Treatment Plant Building**

During the 2016/17 period the following maintenance and upgrades of the water supply system were completed to improve quality and reliability of water supply:

- Boggy Pump refurbishments
- Boggy 1 scour pipe and valve upgrade
- Assorted control and monitoring upgrades on the SCADA system.
- Reticulation flushing.
- Burnt Hut Spur Reservoir clean.

Issues

There were occasional trips of the old HL UV system when a power failure occurred however this was addressed with installation of the new HL WTP. During those periods secondary chlorine disinfection was operational.

Emergency Incident and Event Management

On Thursday 24/11/16 Resort Management received both a call and later an email from our external laboratory contractor advising that *E.coli* (1 org/100ml) was detected in sample collected on Tuesday 22/11/16 from a reticulation sample in Mirimbah (specifically the Mirimbah Store). The incident was reported immediately to the Department of Health and Human Services as required under Section 22 of the Act. RMB began an investigation to determine the source of the *E.coli* detection.

The investigation identified the following;

- Low chlorine dose at plant
 - original sample collected at store gave a residual free chlorine of 0.14ppm
- warm temperatures over the weekend of 19/11/16
- Dramatic drop off of water usage (Mirimbah reticulation as a whole as well as locally at Mirimbah store)



- low usage resulting in chlorine decay. I.e. low chlorine residuals
- Mirimbah Store buffer tank
 - Its inspection hole is permanently uncovered, exposing treated water to environmental conditions
 - Chlorine consumed through oxidation of metals in tank
 - A possible contamination of biological activity in the tank
 - Further decay of chlorine with minimal draw at the store over the past few weeks.



Redundant Mirimbah Store Buffer Tank

Remedying actions

On 22/11/16, the system (Mirimbah reticulation as well as store internal piping was flushed and replenished with treated/chlorinated water.

Internal testing showed a free chlorine residual of 0.54 PPM in the reticulation and 0.19 at the Store on Thursday 24/11/16.

Following the flushing of the reticulation system and replenishing with fresh chlorinated water, a sample was taken at 1245 on Friday 25/11/16 for external testing. At the time of testing a free chlorine test was conducted and gave a reading of 0.37 PPM. The results confirmed that the reticulation came back within the guidelines (no *E.Coli* per 100 millilitres of drinking water).

During the summer the WTP was upgraded (see pages 12-13) and the Mirimbah Store buffer tank was eliminated/bypassed.

The investigation into the detection of *E.coli* in the Mirimbah water sampling locality concluded that the water sample did not meet the *E.coli* water quality standard. This non-compliance was reported under Section 18 of the Act.

Drinking water quality standards r. 16(f), 16(g) & 16(h)

Monitoring

Drinking water quality is monitored to ensure the supply of safe, high quality drinking water to consumers and to meet regulatory compliance. Weekly drinking water samples are collected and analysed for *E. Coli* and turbidity. Monthly drinking water samples are collected and analysed for disinfection by-products. All results are compared with the water quality standards for each parameter in Schedule 2 of the Regulations and health guideline values stated in the Australian Drinking Water Guidelines (ADWG).

Escherichia Coli

Water quality standard for *E. Coli* - all samples of drinking water collected are to contain no *E. Coli* per 100 millilitres of drinking water (with the exception of any false positive sample).



Water sampling locality	Sampling Frequency of Sampling	Number of Samples	Maximum detected (org/100mL)	Number of detections and investigations conducted (s. 22)	Number of samples where standard was not met (s. 18)
Mirimbah	Weekly	52	1	1	1
Mount Buller Low Level System	Weekly	52	0	0	0
Mount Buller High Level System	Weekly	52	0	0	0
Mount Stirling	Weekly	52	0	0	0

Table 3a: *Escherichia coli*

Year	14/15	15/16	16/17
Mirimbah	98.1%	100%	98.1%
Mount Buller Low Level System	100%	100%	100%
Mount Buller High Level System	100%	100%	100%
Mount Stirling	100%	100%	100%

Table 3b - 3 Year *Escherichia Coli* Results

The *E coli* results for the Mt Buller and Mt Stirling systems over the last three years have been very good. The exception is two *E.coli* detections at Mirimbah, one in 2014/15 and one 2016/17. The catchments supplying the water for the resorts are of very high quality. They are located at the top of the regional catchment, at high altitude and vegetated with relatively intact indigenous flora. The quality of the source water is high which coupled with dual disinfection processes (chlorine and ultraviolet) at Mt Buller Village results in consistently high water quality being provided to the Village. Resort Management inspect and maintain the systems on a daily basis and have an annual maintenance program for all of the drinking water systems.

Trihalomethanes

Water sampling locality	Frequency of Sampling	Number of samples	Drinking water quality standard (mg/L)	Maximum (mg/L)	Average (mg/L)	Number pf samples where standard was not met (s. 18)
Mirimbah	Monthly	12	0.25	0.06	0.04	0
Mount Buller Low Level System	Monthly	12	0.25	0.13	0.07	0
Mount Buller High Level System	Monthly	12	0.25	0.12	0.06	0
Mount Stirling	Monthly	12	0.25	0.18	0.10	0

Table 4a – Trihalomethanes



Year	14/15	15/16	16/17	Drinking Water Quality standard (mg/L)
Mirimbah	0.08	0.05	0.06	0.25
Mount Buller Low Level System	0.13	0.15	0.13	0.25
Mount Buller High Level System	0.08	0.10	0.12	0.25
Mount Stirling	0.17	0.12	0.18	0.25

Table 4b – 3 Year trihalomethanes acid results
(maximum recorded value for period)

All of the water sampling localities at RMB have met with the water quality standards for Trihalomethanes for the last 3 reporting periods. This can be partially attributed to the high quality raw water used by Resort Management.

Turbidity

Water quality standard for turbidity - requires the 95th percentile of results for samples in any 12 month period must be less than or equal to 5.0 NTU.

Water sampling locality	Sampling Frequency	Number of Samples	Maximum turbidity in a sample (NTU)	Maximum 95 th percentile of turbidity results in any 12 months	Number of 95 th percentile of results in any 12 months above standard (s. 18)
Mirimbah	Weekly	52	1.8	0.6	0
Mount Buller Low Level System	Weekly	52	2.5	1.1	0
Mount Buller High Level System	Weekly	52	0.5	0.4	0
Mount Stirling	Weekly	52	1.6	1.1	0

Table 5a – Turbidity

The raw water supplied to the Mt Buller and Mt Stirling treatment systems is of very high quality. This is due to it being sourced from high altitude at the head of the catchments. Under normal flow conditions the turbidity is extremely low. However, after rainfall events vegetation humus and other matter is flushed into the system in combination with high water demands (potable and snow making) creating a short lived spike in turbidity. This spike is an explanation for the higher maximum turbidity results within the distribution system. (Low level reticulation).



Year	14/15	15/16	16/17
Mirimbah	0.5	0.5	1.8
Mount Buller Low Level System	0.8	0.8	2.5
Mount Buller High Level System	0.5	0.3	0.5
Mount Stirling	0.7	0.5	1.6

Table 5b - 3 Year Turbidity Results
(maximum recorded value for period)

All water sampling localities have met the turbidity water quality standard for the last three reporting periods. Mt Buller and Mt Stirling are in the position of having a very good quality source water. This can be attributed to being in an Alpine Area at the head of the catchment where conditions and environment allow for a high quality raw water source. This leads to very low sedimentation and movement of material into the water catchment. The Boggy Creek Catchment is very high quality and very carefully managed. Historic monitoring of source water has identified that background microbiological life within the source water is virtually zero during the snow season. During winter the source water is sourced from snow melt and it is thought that the freeze thaw cycle provides a measure of protection from the build-up of microbial life. Ambient temperatures (commonly subzero) also inhibits the growth of microbiological life within the water. These two factors contribute to the low background microbial levels within the source water. During summer, the background microbial levels increase particularly during extended dry periods.

Other water quality standards r. 12(b) (algal toxin, pathogen, chemical or substance that may pose a risk to human health)

Algae

During the summer of 2014-15 RMB identified small algal blooms as a risk in Burnt Hut reservoir. It was a minor disinfection risk but in full public viewing also having a public perception risk.

A dosing system operates in summer at Burnt Hut Reservoir to dose low concentrations of chlorine to inhibit and reduce algal growth in the source water. This was installed in response to algal growth that occurred during the hotter months of summer. Since it's installation in the summer of 2015, this approach seems to have worked well and will continue to be implemented in the summer months.

Ozone Based disinfection by-product chemicals

Ozone disinfection is not used at Mt Buller and Mt Stirling ARMB; therefore ozone disinfection by-products are not monitored.

Aluminium

Aluminium based compounds ('Alum') are not used in the drinking water treatment process at Mt Buller and Mt Stirling ARMB, therefore acid soluble aluminium is not monitored.



Chlorine Based disinfection by-product chemicals

Water sampling locality	Parameter	Frequency of sampling	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)	Comments
Mount Buller Low Level System	Chloroacetic acid	Monthly	12	0.15	<0.005	<0.005	0	
	Dichloroacetic acid	Monthly	12	0.1	0.1	0.0	0	
	Trichloroacetic acid	Monthly	12	0.1	0.1	0.0	0	
Mount Buller High Level System	Chloroacetic acid	Monthly	12	0.15	<0.005	<0.005	0	
	Dichloroacetic acid	Monthly	12	0.1	0.0	0.0	0	
	Trichloroacetic acid	Monthly	12	0.1	0.0	0.0	0	
Mirimbah	Chloroacetic acid	Monthly	12	0.15	<0.005	<0.005	0	
	Dichloroacetic acid	Monthly	12	0.1	0.0	0.0	0	
	Trichloroacetic acid	Monthly	12	0.1	0.1	0.0	0	
Mount Stirling	Chloroacetic acid	Monthly	12	0.15	<0.005	<0.005	0	
	Dichloroacetic acid	Monthly	12	0.1	0.12	0.1	1	S.18 as detailed below
	Trichloroacetic acid	Monthly	12	0.1	0.21	0.1	4	S.18's as detailed below

Table 6 – Drinking water quality standards reporting format

Drinking water quality standard not met and actions taken

In total there were five occasions where the water quality standards for disinfection by products were not met.

Wet weather events increase the turbidity and natural organic material in the source water for short periods of time. Where water with elevated levels of natural organic material is disinfected with chlorine and sits for extended periods of time in a storage tank, the chlorine dosed reacts with the natural organic material in the water, resulting in the formation of disinfection by-products. The time of year where elevated levels of disinfection by-products were detected at Mt Stirling, was when the water usage was very low, due to small visitor numbers. This combination of low water usage and wet weather events is the likely root cause for the elevated disinfection by-products detected in Mt Stirling water supply system during parts of the reporting period.

January 2017 Trichloroacetic acid (TCA) was picked up at the time of receiving results and as such the tank and system was flushed and replenished with treated water. This exceedance was notified to the department under Section 18 of the *Act* within the required timeframe.

The remaining 4 exceedances (Dichloroacetic Acid (DCA) in January 2017, TCA's in October and November 2016 and April 2017) were not identified at the time results were received due to human error. The exceedances were only realised with the preparation of the Annual Water Report Drinking Water Quality 2016-17. There were no corrective actions undertaken in response to these exceedances, except for the DCA in January 2017 which subsequently occurred at the same time as the TCA exceedance. In response to the January exceedance the system was flushed and replenished with freshly treated drinking water. As the 4 exceedances were not identified at the time results received by Mt Buller Mt Stirling ARM they were not notified to the department under Section 18 of the *Act* within the required timeframe, breaching Section 18 of the *Act*.



The RMB have reviewed its water quality data receipt process and have adopted changes and corrective actions to prevent this occurring again.

Chloroacetic acid

Year	14/15	15/16	16/17	Drinking Water Quality standard (mg/L)
Mirimbah	<0.005	<0.005	<0.005	0.15
Mount Buller Low Level System	<0.005	<0.005	<0.005	0.15
Mount Buller High Level System	<0.005	<0.005	<0.005	0.15
Mount Stirling	<0.005	<0.005	<0.005	0.15

Table 7 – 3 Year Chloroacetic acid results
(maximum recorded value for period)

Dichloroacetic acid

Year	14/15	15/16	16/17	Drinking Water Quality standard (mg/L)
Mirimbah	0.0	0.0	0.0	0.1
Mount Buller Low Level System	0.0	0.0	0.1	0.1
Mount Buller High Level System	0.1	0.0	0.0	0.1
Mount Stirling	0.1	0.1	0.12	0.1

Table 8 – 3 Year Dichloroacetic acid results
(maximum recorded value for period)

Trichloroacetic acid

Year	14/15	15/16	16/17	Drinking Water Quality standard (mg/L)
Mirimbah	0.1	0.0	0.1	0.1
Mount Buller Low Level System	0.0	0.0	0.1	0.1
Mount Buller High Level System	0.0	0.0	0.0	0.1
Mount Stirling	0.2	0.2	0.2	0.1

Table 9 – 3 Year Trichloroacetic acid results
(maximum recorded value for period)



Aesthetic Characteristics

pH

Water sampling locality	Sampling Frequency	No. of Samples	Average	Min	Max
Mirimbah	Weekly	43*	6.89	5.93	8.11
Mount Buller Low Level System	Weekly	52	8.13	6.25	9.45
Mount Buller High Level System	Weekly	52	8.23	4.85	10.16
Mount Stirling	Weekly	43*	6.94	5.93	8.55

Table 10 - pH results

* Weekly sampling started during 2016-17 for Mirimbah and Mt. Stirling and as such only 43 samples were taken.

There were no taste or odour issues identified or reported to RMB. This is due to the Mt Buller and Mt Stirling's pristine catchment area, high quality source water, which do not require high levels of disinfection chemicals to be added to the treatment processes. Although pH was towards the higher target value (target is between 6.5-8.5) it was within maximum and minimum aesthetic limits ($4 < \text{pH} < 11$) and can be attributed to the low alkalinity in the raw water and the effect Ductile Iron Cement Lined (DACL) lines have on raising the pH.

In the events where pH is out of operational specification (usually high), operators will flush the system until it comes back within limits.

Water Quality Complaints

Type of complaints	Number of Complaints			Comparison with previous reporting periods	Comments
	16/17	15/16	14/15		
Alleged illness	0	0	0		
Dirty Water	0	0	0		
Taste or odour	0	4	0	Decrease of complaints from previous reporting period	
White water	0	0	0		
Other (pressure)	1	0	0		Reticulation interruption

Table 11a – Types of complaints compared to previous reporting periods



Water sampling locality	Type of complaint					Total complaints
	Alleged illness	Dirty Water	Taste or odour	White water	Other	
Mirimbah	0	0	0	0	1	1
Mount Buller Low Level System	0	0	0	0	0	0
Mount Buller High Level System	0	0	0	0	0	0
Mount Stirling	0	0	0	0	0	0

Table 11b – Types of complaints by water sampling locality

Due to the high quality raw water at Mt. Buller and surrounds and in combination with relatively low consumers, complaints were very low to non-existent for this period. The RMB implement scheduled maintenance programs and projects to ensure that the water being supplied is safe and aesthetically pleasing. These preventative actions are to ensure that no unwanted complaints are received.

The one complaint was received for the interruption to the Mirimbah reticulation. This has not reoccurred since the upgrade of the WTP and subsequent monitoring listed above (pg. 13) no further complaints from Mirimbah have been received.

Risk Management Plan Audit Results

Mt Buller and Mt Stirling RMB drinking water Risk Management Plan was not required to be audited during this reporting period.

Below is a summary of the risk management plan audit findings from the June 2016 audit detailing the OFI's and RMB's Actions.

Opportunities for Improvement (OFI)	Actions
The Mt Buller Mt Stirling Resort Management MBMSRM should comprehensively edit the Risk Management Plan (RMP) to remove marginally relevant material and summarise key sections, and update the RMP to include the maintenance and monitoring issues that have been identified in the May and June 2015 incidents.	The RMP was reviewed by the Water Operations Manager, Senior Administration Officer – Resort Operations and a Water Consultant on 10 th August 2017. The RMP is being updated and this should be completed by December 2017.
A water quality mock exercise should be carried out in due course.	A water quality Desktop Exercise will be conducted in October 2017
Water analyses for radiological parameters should be obtained at least every five years to ensure that there are no radiological hazards.	The RMB has now started a schedule of testing source water for radiological hazards.



A major update of the risk assessment should be undertaken.	As part of the RMP update RMB will undertake a review session on 26th October 2017.
Preventive measures, controls, monitoring measures, and assessments of effectiveness should be collected and summarised in the Site Specific RMPs.	As part of the RMP update RMB will undertake a review session on 26th October 2017
Details of CCPs, critical limits, operational monitoring and corrective actions should be collected and summarised in an appropriate section of the SS RMPs.	This will be undertaken as part of the RMP update.

Undertakings

Mt Buller and Mt Stirling RMB do not have any undertakings in place with the Department of Health & Human Services.

Further Information

Section 23 of the *Safe Drinking Water Act 2003* requires that the Mt Buller and Mt Stirling Alpine Resort Management Board 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 the Mt Buller and Mt Stirling Alpine Resort Management Board on the details provided on page 2.