Mt. Washington Alpine Resort Water System Annual Report 2025

Table of Contents

1.Introduction

The following report describes the Mt. Washington Alpine Resort (MWAR) Water System and summarizes the water quality and production data for the year 2025. This report also includes a summary of any inquiries/complaints, repairs, maintenance, treatment protocols/results, cross connection control, and annual water usage. It provides a detailed account of the utility's ongoing efforts to deliver potable drinking water through continuous management, operation, evaluation, and maintenance of the water system. This report demonstrates the utility's commitment to meeting or exceeding all regulations and identifies areas for potential improvement to enhance efficiency and consumer confidence.

A copy of this report will be submitted to the Island Health Authority and posted on the MWAR website here:

https://mountwashington.ca/the-mountain/about/sustainability.html

2. Mt. Washington Alpine Resort Water System

The MWAR Water System was established in 1979 when the ski resort was first developed. As the resort has expanded, so has the water distribution system. Additional sources have been licensed, new reservoirs constructed, and extensions made to the distribution system to support new developments. Over time, regulatory changes have emphasized the increasing importance of water quality. Mt. Washington continuously adapts to meeting the evolving needs and expectations of the community as well as its regulatory bodies.

MWAR's water supply, treatment, and distribution are entirely self-contained, independent of any external water utility. This autonomy presents unique operational challenges due to the remote nature of the resort.

The water supply originates from three springs on the southwest face of Mt. Washington, all within the resort's legal tenure. Water from each spring is collected and directed to two open reservoirs, the Middle and East Spring reservoirs. From these reservoirs, the water flows by gravity to the Water Treatment Facility, where it undergoes UV disinfection and chlorination before being pumped into a covered, insulated storage tank. From there, water is distributed via gravity throughout the system. In 2025, the MWAR Water System added 6 new buildings in Beaufort totaling 246 residential buildings servicing 604 individual residences and 17 resort connections for a total of 623 metered connections. A backup generator ensures immediate power supply during outages.

Provincial water withdrawal licensing allows MWAR to divert water from five different sources, though only three are actively used. Daily withdrawal volumes generally remain below permitted limits, except for specific instances when a source is taken offline for maintenance or during emergency situations such as fire or drought events.

Mt. Washington's Water System is currently comprised of three full-time operators who have met the criteria set upon them by the Environmental Operators Certificate Program (EOCP), who are the governing body for both public and private water systems in BC. The EOCP audits each system annually. They then classify it from 1-4 (for both Water Treatment and Water

Distribution) and ensure each system has the appropriately certified operators.

3. Water Sampling & Testing Program

Routine water sampling and testing ensure compliance with health and safety standards:

Frequency	Location	Tests Conducted
Daily	Water Treatment Facility	Turbidity, Chlorine Residual
Daily	Raven Lodge	Chlorine Residual
Bi-weekly	Raw Water Sources	Total Coliform, E. Coli, Turbidity, pH
Bi-weekly	Potable Water	Total Coliform, E. Coli, Turbidity, pH, Chlorine Residual
Every 5yr	Raw & Potable Water	Full Metal/Chemical Analysis
Every 5yr	Potable Water	THM's/HAA's

Results for all of Mt. Washingtons drinking water tests can be found on Island Health's website at:

https://inspections.myhealthdepartment.com/island-health/water-sample-history/?permitID=5AFAC845-ADC2-4792-A44B-694C23AA3267

Events of note

During 2025 Mt. Washington recorded 3 tests where there was a total coliform greater than 1 and 0 positive results for E.coli.

Coliforms are a group of bacteria that include organisms found in naturally occurring soil and vegetation as well as in the intestines of warm-blooded animals. For this reason, results that indicate coliform is present are tested to ensure these are from organic sources and not from that of warm-blooded animals. The most common reason for elevated levels of coliform is large rain and melt events. These are typical in seasonal areas like Mt. Washington.

The 3 events of note were:

March 25th- Large rain event coupled with accelerated melting snowpack.
June 24th- Slight elevation in coliform due to rain.
Aug 27th- An event known as "The First Flush Effect". Typically, at the end of summer when the first big rain flushes dust, debris and organics into the raw water supply.

4. Water Quality – Source Water and Distribution System

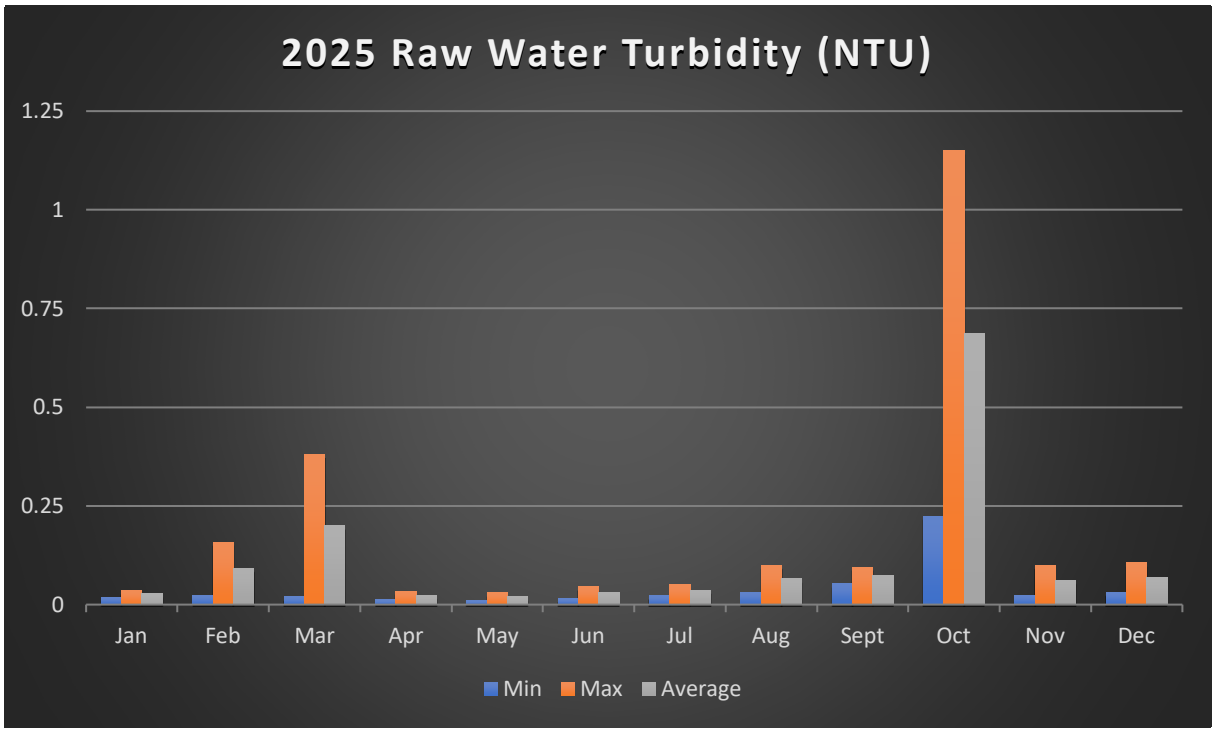
A. Source Water & Distribution System

NTU

Up to date water quality reports and lab data are always available from the Utilities Department. The most important parameters tested are turbidity and chlorine residuals at the beginning and end of the distribution system.

Turbidity is a measurement of the cloudiness of water. Reported in nephelometric turbidity units (NTU), it is an optical measurement of water's ability to scatter and absorb light rather than transmit it in straight lines. Turbidity is caused by fine suspended particles of clay, silt, organic and inorganic matter, plankton, and other microscopic organisms that are picked up by water as it passes through a watershed. It is an important water quality indicator because contaminants such as bacteria and viruses can attach themselves to the suspended particles in turbid water. These particles can interfere with disinfection.

This graph illustrates turbidity levels throughout the year 2025



Due to the remote nature of the environment and the quality of the water from our springs, we have consistently low turbidity levels. Occasional high readings are observed, which typically coincide with heavy rain events, storms or rapid spring melts. As shown in the graph above, average values are generally well below 1.00 NTU. It should be noted that large spikes in the NTU graph can be attributed to cleaning of the turbidity meter as well.

Elevated Turbidity Events and Boil Water Advisories

When turbidity remains elevated above 1NTU in its raw water supply for more than 24hrs, Mt. Washington is required to issue an official Boil Water Advisory through Island Health and

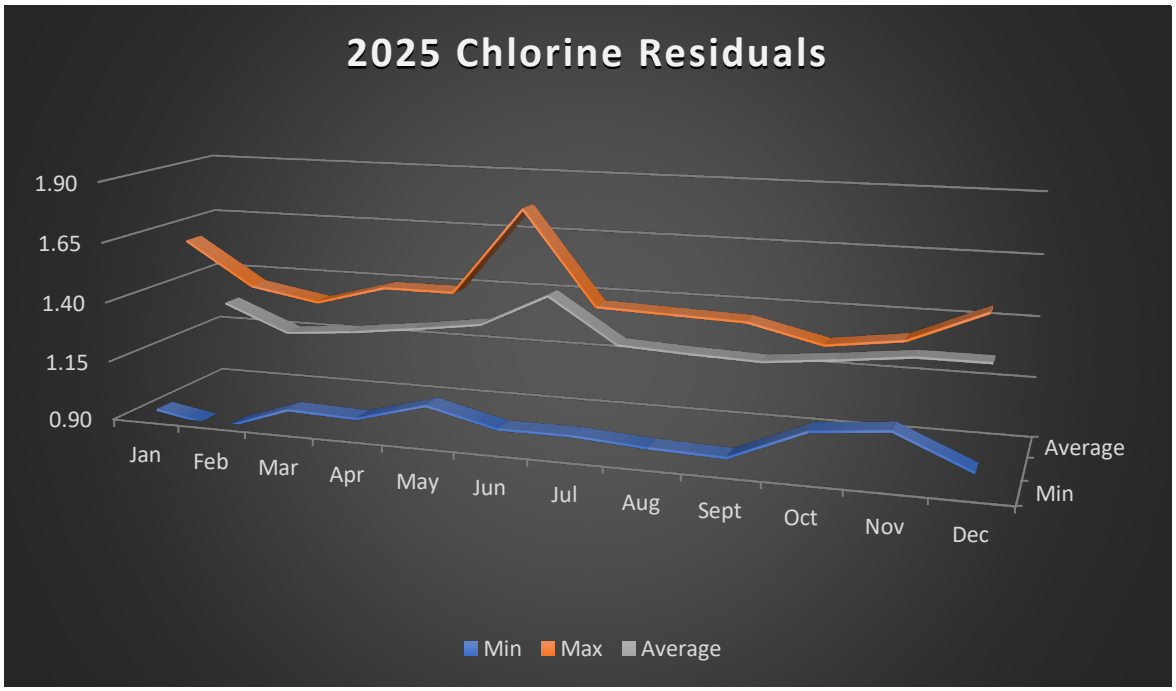
send in 2 consecutive clear samples before having it lifted. As illustrated on the graph above, on the evening of October 1st, a large rain event elevated turbidity levels beyond 1NTU for 24 hrs. and a boil water notice was issued on Oct 3rd. It remained in place until Oct 14th when we were advised all samples came back satisfactory by our Drinking Water Officer.

Disinfection

Chlorine is one of the most widely used disinfectants for drinking water and is highly effective in the deactivation of pathogenic microorganisms. We use sodium hypochlorite in liquid form as our primary disinfectant. Relative to larger city operations, our raw drinking water is of excellent quality, so a smaller amount of chlorine is needed to disinfect.

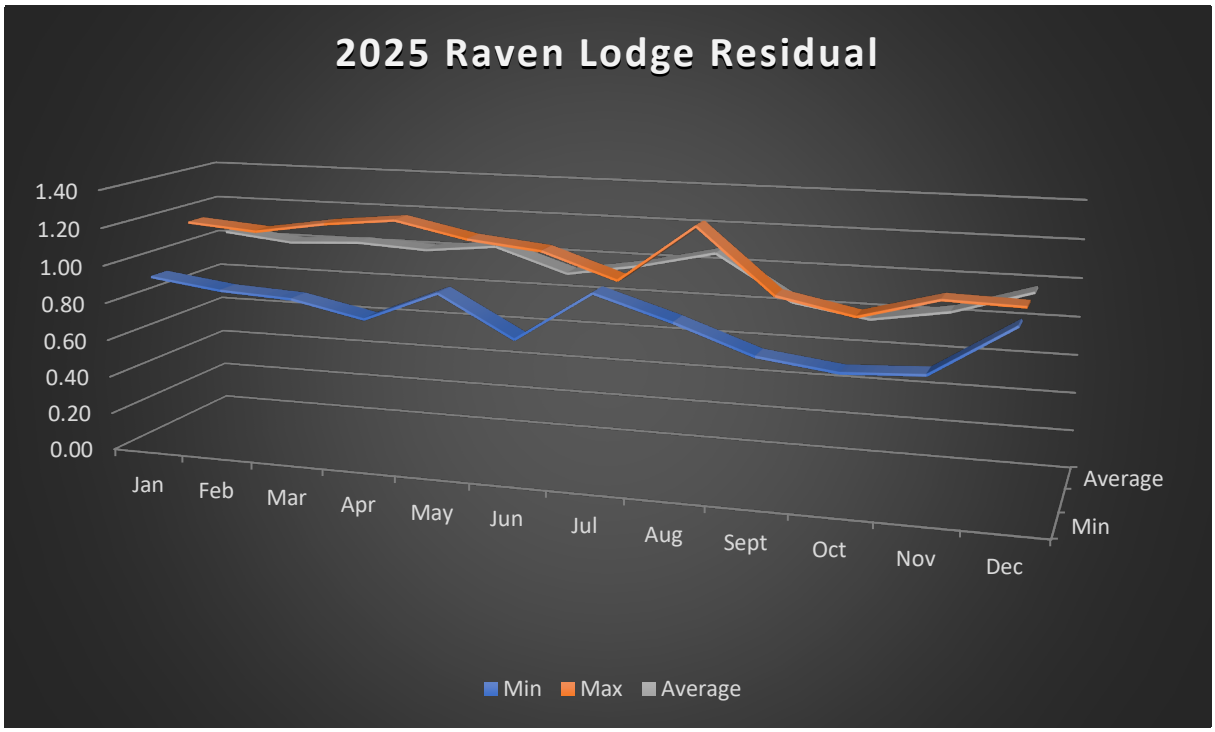
Sodium hypochlorite is injected into the raw water as it is pumped up to the treated water storage tank. Allowing the solution to mix thoroughly in this tank provides sufficient contact time between the disinfectant and the water. Some of the chlorine is used up in the disinfection process. The residual chlorine is measured continuously by an online analyzer at the water treatment facility, the first tap on the distribution system. Our goal is to meet the 4-3-2-1 guidelines set out by Island Health. Mt. Washington Utilities aims to hold the systems chlorine residual between 1.5 and 0.90 ppm.

This graph illustrates Chlorine Residuals throughout 2025



As chlorinated water travels through the distribution system, the chlorine available for disinfection will decrease. It is either used up by any organics or contaminants found in the distribution system, or it dissipates in areas where the water is more stagnant. It is important that potable water maintains a measurable chlorine residual throughout the entire system.

This graph illustrates chlorine residual levels at the Raven Lodge throughout 2025



The Raven Lodge is the last connection on the distribution system. Mt. Washington utilities test the chlorine residual at Raven using a Chlorometer regularly. The Chlorometer is used to measure the degree of coloring, and correlates that to a measurement of chlorine residual in mg/L or ppm.

Our goal is to maintain a minimum chlorine residual of 0.2mg/L at the Raven Lodge consistently. Occasionally, during the off-season months, there is very little flow at the end of the distribution system, since the Raven Lodge and many other buildings in the area are closed. If the chlorine residual measured falls below the target of 0.2mg/L, we will briefly flush a hydrant in the area to pull fresher water into the end of the system. This typically happens once in June and again in October or November, as shown in the above graph.

B. Filtration Deferral and UV Disinfection

In 2015, Mt. Washington expanded its treatment building to include UV disinfection to align itself with the provinces '4 Log, 4-3-2-1' drinking water quality initiative. All water systems that use surface water sources are required to maintain the following treatment specifications:

- 4 log removal/inactivation of viruses
- 3 log removal/inactivation of Giardia cysts and Cryptosporidium oocysts
- 2 treatment processes, usually filtration and disinfection
- 1 NTU maximum turbidity in finished water

Most systems require a form of disinfection AND filtration, but the resort qualifies for a filtration deferral in which we must adhere strictly to 4 main objectives:

1) Maintain 2 forms of disinfection that inactivate pathogens such as Giardia and Cryptosporidium. Mt. Washington does this via it's chlorine protocols as well as by the operation of 10 UV units within our Water Treatment Facility (WTF).

2) The amount of E. coli in raw water does not exceed 20/100mL in at least 90% of the weekly samples from the previous 6 months. To accomplish this Mt. Washington tests our raw water once per month. We have zero instances of going above this concentration within the 2025 calendar year to report.

3) Daily average source water turbidity of 1 NTU or less 95% of the time and not above 5 NTU for more than 2 days in a 12-month period. Turbidity must not be sustained above 1 NTU for more than 24hrs. As seen above, the resort monitors its turbidity in real time using an in-line turbidity unit connected to an alarm that contacts an operator 24hrs a day.

4) Finally, the resort is mandated to maintain a watershed control program that minimizes the potential for fecal contamination. We accomplish this in several ways. The sources are protected by fencing year-round to minimize animal interaction with sources. The remote nature of the sources is surrounded by steep terrain and is not impacted by known animal corridors. This makes interaction between people and animals much less likely.

5. Water Quality Inquiries and Complaints

We received no complaints regarding water quality during 2025. There were several complaints lodged with our accounting department regarding high water bills. Upon investigation of the source of the high-water bills we found that plumbing issues or running toilets within the units were responsible for the high-water usage. Once a year, we include a list of reminders with utility bills. Checking for leaky toilets or faucets is always on this list.

Throughout the year we have received calls from customers who have found water pooling on the ground and are concerned that a water main has been broken. These calls typically happen in spring and early summer, and this year was no exception. As snow melts, water follows the path of least resistance and often collects in unusual areas, dammed by snowbanks and ice jams. We always investigate these calls to confirm that the water does not originate from our distribution system, usually by testing for a chlorine residual.

6. Water Leaks and Repairs

During the 2025 season, Mt. Washington Utilities repaired **5** leaks within the distribution side of the system. These are leaks on the curb-stop side of the system prior to being considered the owner's responsibility. Please refer to the current Water Tariff for further clarification.

1. Feb 12th- For several weeks prior, Utilities were aware of a leak in the system but was unsuccessful in locating it. A call from the owner at Chalet 21 on Fosters Place confirmed the leak we had been searching for. It is instances like this that we encourage homeowners to contact utilities about any suspicious water around their units. A new line and curb stop were installed. The owners then decided to hire a plumber to replace the line from the curb-stop to the chalet.

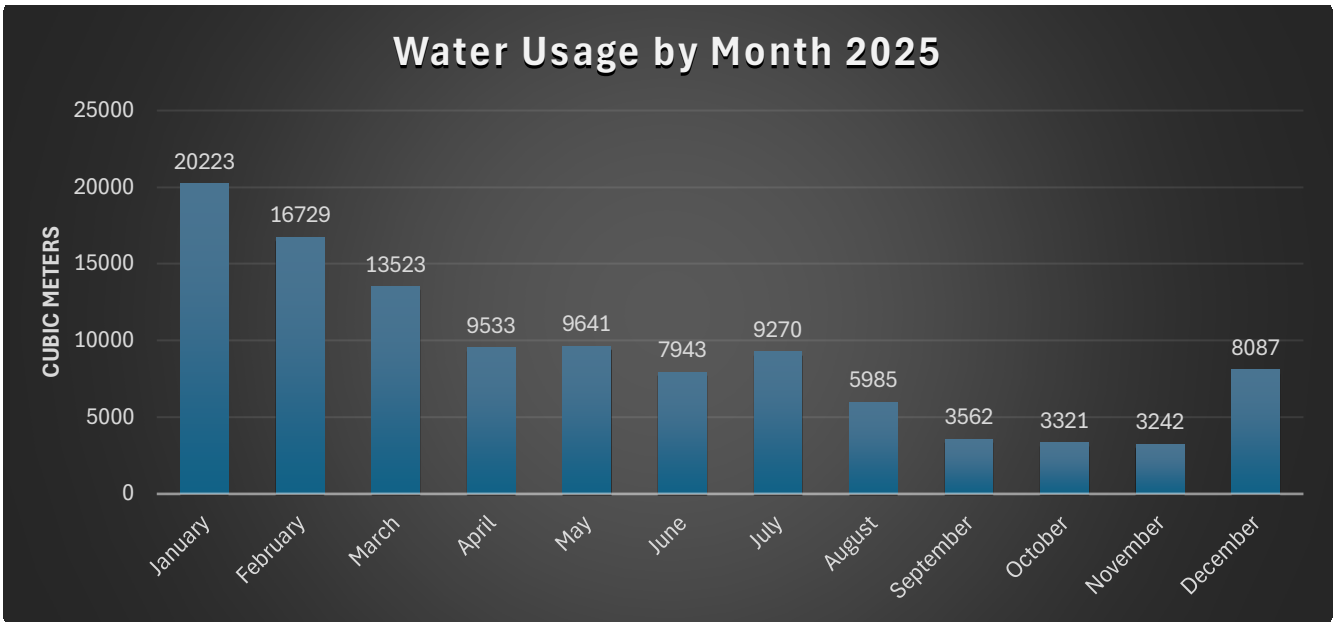
2. July 24th- Likely due to the constant vibration of re-paving Nordic Road, an air relief ruptured between Henry Road and Raven Lodge. Water was shut off to Raven until parts came in on August 1st and the new air relief was installed.

3. Aug 11th- Leak at Condo 29. After discovering this line was still made of old poly B, we replaced the entire service line with new 2" pex municipal water line.

4. Aug 12th- Significant water loss in the middle of the night. Came up and shut water off to condo 89. As the leak was on the owner's side, we informed the building manager, and a plumber fixed the leak over the next several days.

5. Oct 20th- An operator doing road work hit the raw water transmission line and air relief valve leading from west to middle spring. A new air relief was installed along with a 12' length of 6" brute.

7. This graph illustrates total water consumption throughout 2025



8. Maintenance Program

Inspections of the springs, reservoirs, chlorination equipment and pumps are conducted daily. This is done to decrease the risk of equipment failure and contamination of the water, and to ensure the consistent application of chlorine for disinfection.

All the gate valves in the distribution system are exercised once per year to ensure they will function properly in an emergency. Water main flushing and hydrant pressure testing is also done during the summer months.

An operator is always on-call 24 hours a day to respond to any emergencies.

Tyler Belsito- Chief Operator 250 792 0005/ Keith Parlee- Operator 250 2075600

9. Water Operator Projects and Non-Leak Related Repairs

2025 Completed Projects

Mt. Washington Utilities is constantly striving to keep the distribution system and associated appurtenances in the best condition to achieve the highest quality of water delivered to its customers.

The following is a list of regular maintenance and upgrades for 2025;

- After 2 instances of low raw water supply in the summer of 2023 and winter of 2024, Mt. Washington worked closely with Island Health in developing a procedure to protect residents in instances of future low water supply. We added Rick's Reservoir to our regular testing program to ensure it remains a safe supply for water and installed 2 supplementary distribution lines from Ricks Reservoir to East Spring. This system will assist us by creating the ability to supplement East Spring with higher volumes in instances of low water. The new SOP's can be found in our Emergency Response Plan.
- Beginning in December 2024, Mt. Washingtons Utilities and Electrical Departments started working with PBX Engineering to develop a new SCADA (Supervisory Control and Data Acquisition) interface for the systems monitoring program. Installed on June 17th, utilities now have an increased ability to remotely monitor and operate the system.
- Installed new quartz sleeves, bulbs, sensors and ballasts on our UV units at the Water Treatment Facility (WTF).
- Installed an upgraded Cl2 injection pump at the WTF giving operators the ability to adjust rates remotely.
- Removed foliage around all springs to reduce concentration of organics making into the raw water supply.
- Contracted a team of specialized divers to clean and inspect the Treated Water Storage Tank from Sept 9-12th. We are currently doing this every 2 years.
- Replaced the blue polyethylene line at Condo 89. Along with the replacement of the service line at condo 29, we believe we have completed the replacement of all poly B lines servicing larger building in the network. It seems the aging lines of these buildings were causing significant water loss over time. The Utility has recovered roughly 80m3/day after completing these repairs.
- Continued with servicing, repairing, and replacing water meters, displays and readers that do not seem to be functioning properly. If you are a homeowner who is reading this report and have missing or malfunctioning water meters, please contact the utility so we can fix it at our expense.

10. Emergency Response Plan

As all Utilities must, Mt. Washington has an Emergency Response Plan (ERP) that contains procedures and contact information to efficiently respond to water system emergencies such as contamination of water supply, loss of supply, pump failures etc. The ERP is reviewed and updated every year. Copies are available in the Water Reclamation Facility,

the Water Treatment Facility, and on the company's internal computer network where it can be viewed upon request.

11. Cross Connection Control

A Cross Connection Control (CCC) Program was initiated in 2011 and is still ongoing. This is now performed by the contractor Caledonia Fire Protection Ltd for all resort buildings and fire suppression systems.

The requirement for backflow prevention devices is mandatory for all buildings at Mt. Washington Alpine Resort as per our current water tariff.

Please contact the utility for a copy of the current water tariff.

12. Dam Safety and Maintenance Program

The Dam Safety Auditor visited us in the fall of 2018 to review the requirements of the necessary Dam Safety and Maintenance program and the changes made to the program. Operators on staff completed a Dam Safety course put on by the Ministry of Forests, Lands, Natural Resource Operations and Rural Development in the late fall of 2019.

The southern side of the snow-making reservoir is the dam that we maintain here at Mt. Washington. We visually inspect the dam daily, annually we do the tree trimming and clearing of other vegetation out of the spill way and maintain it in good working condition.

13. Closing Remarks

The annual report for 2025 is publicly available on Mt. Washingtons website and hard copies can be obtained upon request by contacting the utility by email at utilities@mountwashington.ca.

A copy is also sent to Island Health for their records and are publicly available.