



Resort Municipality of Whistler

Hazard, Risk & Vulnerability Assessment

JUNE, 2012

EXECUTIVE SUMMARY

A Hazard, Risk, and Vulnerability Assessment (HRVA) examines the hazards that may impact a community and the risk that each hazard event poses to the community as a whole and to vulnerable elements of the community. A HRVA is a requirement mandated by the Local Authority Emergency Management Regulation of the B.C. Emergency Program Act [see Appendix A] and the Resort Municipality of Whistler *Emergency Measures Bylaw NO. 1593, 2002* [see Appendix B]. This document represents that assessment, as completed by a committee of Municipal staff (the HRVA advisory committee).

No municipality has unlimited resources allowing them to plan for every hazard event possible, therefore some form of ranking is required when deciding which hazards are most important to plan for.

The information presented in this assessment should be used by the Resort Municipality of Whistler to:

1. Meet the requirement mandated by the B.C. Emergency Program Act and the Resort Municipality of Whistler *Emergency Measures Bylaw NO. 1593, 2002*;
2. Update the 2005 Resort Municipality of Whistler Emergency Plan, the 2004 Resort Municipality of Whistler Evacuation Plan and other emergency response plans, policies and procedures; and
3. Prepare strategies for cost-effective, on-going emergency planning.

This HRVA advisory committee used qualitative methods to determine risk ratings for various hazards. The committee identified 32 hazards that could affect the Resort Municipality of Whistler. Based on the information obtained in the course of this assessment, the HRVA advisory committee has assigned each hazard with a rating of very high, high, moderate or low. The HRVA advisory committee used the Provincial Emergency Program HRVA Toolkit to provide the most accurate assessment possible.

The risk rating chart on the following page shows the relative ranking of all hazards analyzed. These rankings were determined using the criteria from the Provincial Emergency Program HRVA Toolkit and therefore may not be identical to risks assigned using other methods or criteria.

Risk Rating Chart

Hazard	Risk Rating			
	Low	Medium	High	Very High
Aircraft Crash		X		
Avalanche	X			
Civil Disorder / Riot		X		
Debris Flow/Debris Flood		X		
Drought		X		
Earthquake			X	
Epidemic/Pandemic		X		
Flood		X		
Geotechnical Event		X		
Hazardous Materials Accident		X		
Hazardous Materials Accident - Rail		X		
Heat wave		X		
Ice Storm (Major)		X		
Ice Storm (Minor)		X		
Industrial Accident		X		
Interface Fire			X	
Interruption to Water Supply			X	
Landfill Gas Emergency	X			
Multiple Casualty Incident – Event Related		X		
Multiple Casualty Incident - Motor Vehicle		X		
Natural Gas Distribution System Failure		X		
Power Outage		X		
Rock Fall		X		
Sanitary Sewer Failure	X			
Ski-Lift (Mountain Incident)		X		
Snowstorm (Major)		X		
Snowstorm (Minor)			X	
Structure Fire		X		
Terrorism		X		
Volcano			X	
Volcanic Ash Fallout		X		
Windstorm	X			

Whistler's Emergency History

The RMOW has experienced many emergency events, some recent and some prior to resort development. Listed below are the emergencies that have occurred within, or directly impacted, the Resort Municipality of Whistler.

EVENT	DATE	DESCRIPTION
Blackcomb Mountain Wildfire	July 30, 2009	30 hectare Blackcomb Mountain wildfire; led to an evacuation of the north side of Blackcomb Mountain.
Porteau Cove Rockslide	July 30, 2008	A large rockslide 1 kilometer north of Porteau Cove blocked Highway 99 for 5 days. (Hayward, 2008).
Gondola Tower Collapse, Blackcomb Mountain	December 16, 2008	Tower 4 of the Excalibur Gondola partially collapsed causing the line to sag and 3 cabins to hit the ground. The lower line of the Excalibur Gondola was evacuated. 10 injured; 0 fatalities.
Snowstorm	December 14 -15, 2005	Whistler area recorded approximately 58 cm of snow in 24 hours. At approximately 4 p.m. on December 14 th , Highway 99 vehicle traffic was blocked south of Whistler. Hundreds of motorists were stranded overnight, some for as long as 14 hours.
Fitzsimmons Slip	November 2004 - January 2005	Sometime between November 2004 and January 2005, a large mass of earth sitting about 2 km above Whistler slipped almost 1 meter. The slip generally moves a few centimeters each year but occasionally accelerates and moves several meters. Following this event, Whistler constructed a debris barrier to mitigate the debris hazard from future slips.
Rain on Snow Event	October 18, 2003	During a 5-day period from October 16 th to 20 th , Whistler received over 220mm of rain. The unusually heavy rain produced record rain-on-snow peak flows. Floodwaters destroyed the Rutherford Creek Bridge, linking Whistler and Pemberton on Highway 99, resulting in the deaths of 5 people. In addition, floodwaters along the Cheakamus River near Cheakamus Canyon took out 200m of pavement from Highway 99. Whistler was cut-off both to the north and south.

EVENT	DATE	DESCRIPTION
Floatplane Collision	August 12, 2000	Upon take-off in Green Lake a floatplane collided with the water. All 5 occupants escaped with minor injuries. The floatplane was substantially damaged. (Transportation Safety Board of Canada, 2001).
Quicksilver Chairlift Incident	December 23, 1995	4 chairs fell from the Quicksilver chairlift line on Whistler Mountain. 1 fatality; 10 injured. (Nixon, 2004).
Flood, Fitzsimmons Creek	August 30, 1991	Whistler Valley received 150mm of rain in 5 days, with 76.2mm of rain (return period of 20 years) on August 30th. Consequently, the Fitzsimmons Creek basin contributed runoff generating high flows with significant debris. As a result, there was significant damage to bridges, a water intake structure, and utility crossing and deposited 128 000 m ³ of bed load in the lower reaches of Fitzsimmons Creek. (Sigma Engineering Ltd., 1991)
Rain on Snow Event	November 9 - 12, 1990	Over a 4 day period Whistler received approximately 200mm of rain. The storm was a high-intensity, long-duration rain-on-snow event and exceeded the 25-year records at Whistler. Flooding was reported in several low-lying areas of Whistler.
Lions Bay Rockslide	October 20, 1990	An estimated 10,000 m ³ of rock and debris came down on Highway 99 north of Lions Bay. The slide left thousands of Vancouver residents attending the weekend Oktoberfest festivities stranded at Whistler. Highway 99 was also blocked to the north due to an unrelated political issue, effectively cutting off Squamish, Whistler and Pemberton to communities to the north and south.
Train Derailment	February 3, 1986	A rockslide 16 km north of Whistler derailed a northbound B.C. Rail train. 4 locomotives derailed but remained upright, blocking the rail line.
Thanksgiving Day Flood	October 8, 1984	Whistler received 127mm of rain in 3 days causing major flooding in Whistler. Flood damage in Whistler included: Severe erosion of the Cheakamus River approximately 250 meters above the municipal sewage treatment facility, resulting in migration of the

EVENT	DATE	DESCRIPTION
		Cheakamus River channel and loss of about 1 hectare of land. Large logjams completely blocked the Cheakamus River in its canyon section downstream of the treatment facility. In addition, debris flows in Fitzsimmons Creek washed-out two footbridges and minor accumulations of logs and debris were scattered over the reach from the Blackcomb Way Bridge to the Nancy Green Drive Bridge. Creek overflows were reported to have entered the day parking area. Damage was estimated at \$100 000.
Rain on Snow Event	December 23-27, 1980	Between December 25 th and 27 th , Whistler experienced heavy precipitation and unusually high seasonal temperatures. The freezing level rose to approximately 2000 meters. Snowmelt combined with more than 100 mm of rain triggered debris flows in many torrents, such as Nineteen-Mile, Twenty-one mile and Fitzsimmons Creek. Some damage was done to roads and bridges in the valley. (Eisbacher 1983).
Mt. Meager Volcano Eruption	2350 Before Present	Mt. Meager's eruption is the youngest explosive eruption in Canada. It was similar to that of Mt. St. Helens in 1980. The explosive phase of Mt. Meager's eruption generated an ash plume that covered most of southern B.C. and extended into southern Alberta and its pyroclastic flows extended down the Lillooet River a distance of 7 km. (Geological Survey of Canada, 2005).

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1.0 INTRODUCTION

This Hazard, Risk, and Vulnerability Assessment (herein referred to as HRVA) was conducted by a committee of staff selected for their experience in public works, emergency response, policing and emergency operations centre experience. This staff committee is referred to as the HRVA advisory committee.

1.1 HRVA Advisory Committee

The HRVA advisory committee was initiated by the Municipal Emergency Program Coordinator to update the Resort Municipality of Whistler's (herein referred to as the Municipality or the RMOW) HRVA. Committee members included representatives from various RMOW departments including Environmental Services and Community Life. Other RMOW departments, external agencies and subject matter experts contributed their expertise, time and input into this assessment.

1.2 Hazard, Risk, and Vulnerability Assessment

Considering **hazards** alone may lead to a skewed set of priorities for action. It is equally important to consider the **severity** of possible impacts from the hazard as well as the frequency or **likelihood** of a hazard event occurring. The combination of severity and likelihood is termed the **level of risk** (Provincial Emergency Program, 2004).

In determining the **severity** of a hazard event, a community's **vulnerability** must be examined. Vulnerability is defined as people, property, infrastructure, industry and resources, or environments that are particularly exposed to adverse impact from a hazard event (Provincial Emergency Program, 2004).

Likelihood reflects the frequency of occurrence for a particular hazard event and can range from rare events occurring every 200 years to more frequent events, which usually have a high number of recorded incidents or anecdotal evidence (Ministry of Public Safety and Solicitor General, 2004).

A HRVA examines the hazards that may impact a community and the risk that each hazard event poses to the community as a whole and to vulnerable elements of the community.

1.3 Scope

This HRVA is designed to provide an assessment of the hazards that may present risks to the RMOW.

The objective of the HRVA is to:

- 1. Investigate potential natural and human-caused hazards that pose a risk to the RMOW;**
- 2. Identify potential hazards that may require a non-routine emergency response and as a result require the activation of the 2005 RMOW Emergency Plan and/or other RMOW emergency response plans and policies; and**
- 3. Recommend measures that can be taken to mitigate the impact of the hazards identified in the HRVA.**

In addition to meeting a Provincial mandate and Municipal Bylaw, the intent of this HRVA is to provide a basis from which the Emergency Program Coordinator, the Emergency Planning Committee, municipal staff and council, and responders can update the 2005 RMOW Emergency Plan and other emergency response plans and policies, and prepare strategies for cost-effective, on-going emergency planning.

This assessment is based on both primary and secondary sources, and at times relies on anecdotal evidence. Qualitative methods are used to determine hazard ratings for the area of interest. The HRVA advisory committee used the Provincial Emergency Program (PEP) HRVA Toolkit to provide the most accurate assessment possible, taking into consideration that the assessment – because it is qualitative – includes subjective components. Duplication of this assessment by third parties may not yield exactly the same results.

The HRVA advisory committee has identified 32 hazards that could affect the Municipality. In selecting these events for consideration, the HRVA advisory committee acknowledges the potential that other hazards might exist. However, the hazards identified in this assessment are considered more likely to impact the Municipality than others.

For the purpose of this analysis, emergency is defined as a present or imminent event in the RMOW that requires non-routine and prompt coordination of actions concerning persons or property to protect the health, safety or welfare of people, or to limit damage to property or the environment and for which the RMOW has the primary responsibility for dealing with the emergency. To ensure clarity, a routine emergency response is one that is managed at the site level and does not require the activation of the RMOW 2005 Emergency Plan. Ninety-eight percent of the Municipality's emergency events are considered routine.

1.4 Methodology

In this analysis, consultation with subject matter experts was cross-referenced with background and historical research, as well as observational data. This information was then considered in the context of the seven impact criteria utilized by the PEP HRVA Toolkit. The impact criteria were individually ranked on an ascending scale from zero to four, zero being no impact, four being the most severe. The sum of these scores was taken to create an overall consequence score, the score was then contrasted against a likelihood rating of one to six, one being the least likely and six being most likely. Each hazard was given an aggregate score that combined impact consequence and likelihood (i.e. 16/4). This aggregate score provided the basis for a risk ranking of low, moderate, high or very high.

2.0 RESORT MUNICIPALITY OF WHISTLER

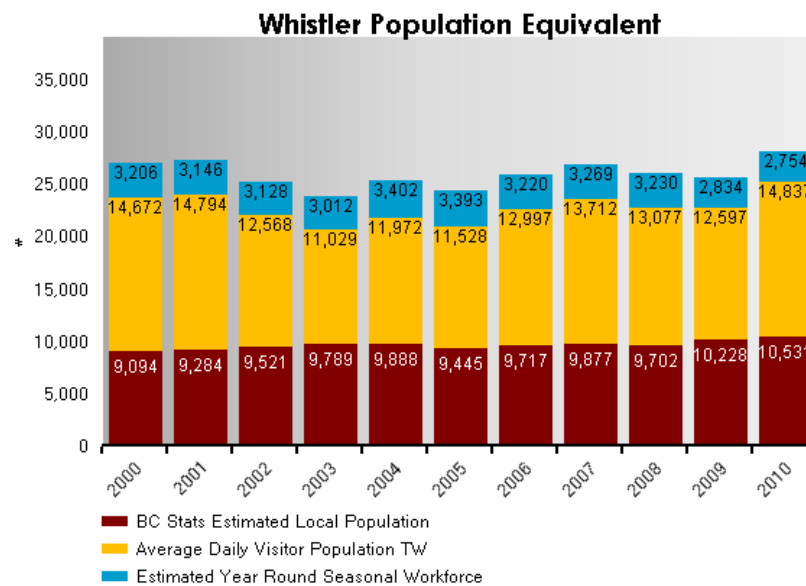
2.1 Geographic Setting

The RMOW is located on Highway 99 (Sea to Sky Highway) 57 kilometers north of Squamish and 34 kilometers south of Pemberton. It consists of a total land area of 240.40 square kilometers. Whistler is a four-season resort community, a tourist destination and was the home of the 2010 Winter Olympic and Paralympic Games. The community boasts an array of sporting activities, music festivals and special cultural events. At the centre of all this activity is Whistler Village which is renowned for its dining and shopping experiences. Part of Whistler’s uniqueness is also what can make it vulnerable to emergencies. Large and diverse transient populations, seasonal population influxes, a single-access transportation system, and multifaceted geographical landscape add complexities to emergency events.

2.2 Population

As of 2011, Whistler’s permanent population was estimated to be 9,824. Population growth is an annual average rate of 1.3% per year (Census Canada, 2011; Whistler 2020 Explorer, 2010).

The RMOW is a popular tourist destination which means that the number of people in Whistler on any given day is greater than the population counts provided by Canada Census. As a result, in an effort to calculate more accurate population numbers, the total population equivalent is calculated. The total population equivalent is an estimate of the total number of people in Whistler on average at one time. The following figure provides an estimate of the total population equivalent in Whistler from 2000 to 2010. (Ibid, 2010).



(Source: Whistler 2020 Explorer, 2010)

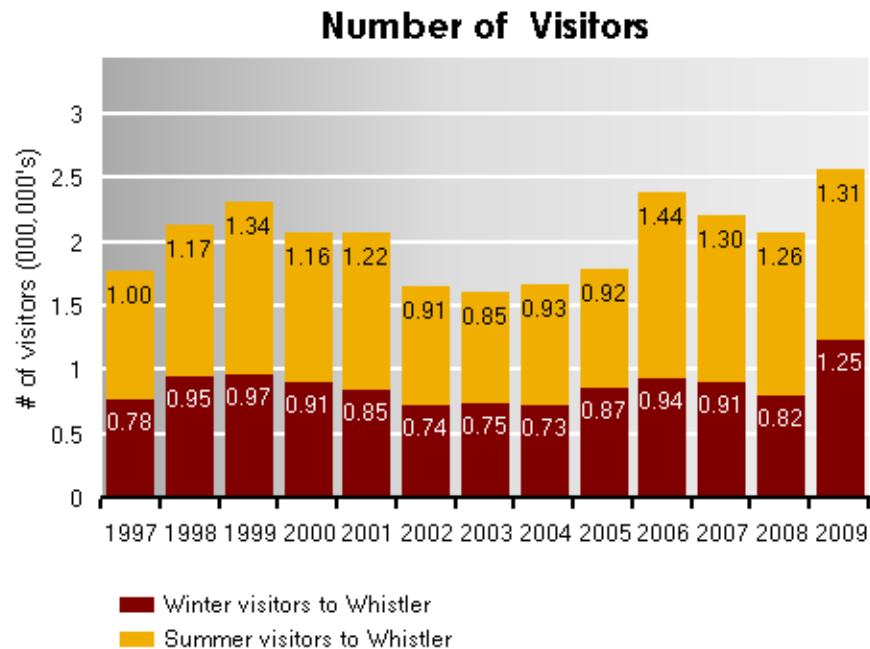
In 2010, the estimated number of people in Whistler overnight per day averaged 28,122; this number is almost 2.5 times greater than the permanent resident population of 9,824. In addition, approximately 3,672 employees commuted into Whistler on a daily basis, primarily from the neighboring communities of Pemberton and Squamish; this increased the yearly daily average population equivalent to 31,794. (Ibid, 2010).

2.2.1 Family & Household Characteristics

Whistler’s family and household characteristics are different from those in the province of British Columbia (B.C.) overall with a large percentage of single individuals, one-person households and households comprised of non-family members and a smaller percentage of family households with children. One-person households and households comprised of non-family members represent 54.2% of all households; 26% are households with couples without children. Nineteen percent of Whistler households are made up of couples with children compared to 26% for B.C. The average household size is 2.3 persons per household. (Census Canada, 2007; Whistler 2020 Explorer 2010).

2.3 Economy

Designed as a destination resort community centered around a pedestrian friendly village and at the foot of two world-class ski mountains, Whistler’s economy is largely based on tourism. Whistler receives approximately 2.1 million overnight and non-overnight visitors each year (approximately 48 per cent in winter and 52 per cent in summer). (Resort Municipality of Whistler, 2011).



Eighty-eight percent of Whistler's workforce was employed in the tourism-related service sector in 2006. Almost half of all employment was comprised of accommodation, food services, arts and recreation services. The second greatest concentration of labor force activity was in business services (17%) followed by retail trade (10%). Only a small percentage of Whistler's workforce is employed in goods production (12%), with the majority being employed in manufacturing and construction (11%). Whistler has very little employment in resource-based industries (1% of total). (Whistler 2020 Explorer, 2010).

3.0 VULNERABILITY

3.1 Social Vulnerability

This HRVA considers certain aspects of social vulnerability and their role in contributing to the risk from hazards.

The term social vulnerabilities reflects "...the degree to which societies or socio-economic groups are affected by stresses and hazards, whether brought about by external forces or intrinsic factors – internal and external – that negatively impacts the social cohesion of a municipality" (United Nations Development Programme, 2000).

For the purpose of this report, vulnerability is defined as the ability of an individual within a household to recover from a natural hazard impact. Numerous hazards such as floods, interface fires, earthquakes and human health emergencies can have serious impacts on vulnerable populations (e.g. the very old, the very young, transient populations); just as certain types of emergencies can have a tremendous impact on the housing market and local economy.

3.1.1 Language Groups

The majority (84.4%) of residents of the RMOW reported English as their mother tongue in 2006; another 14.9% of residents do not speak English at home but are fluent. 0.7% of the permanent resident population (65 persons) does not speak English and may require special arrangements in a response to an emergency. (Statistics Canada, 2007). As noted in previous sections, Whistler is a popular international tourist resort with visitors from around the world. Because visitors do not necessarily speak English, the issue of communicating emergency-related information in an efficient and effective way becomes particularly relevant. Due to these tourist-related language issues emergency planners and officials may need to customize preparedness materials and /or official advisories so that both English speaking and non-English speaking residents and visitors may understand them. (World Tourism Organization, 1998).

3.1.2 Age Groups

The age distribution of Whistler residents is less balanced than is typical for the province of B.C. as a whole, with fewer children, youth and seniors, and a larger percentage of young adults. Whistler's age distribution is centered on a median age of 32.2 years, almost ten years younger than the provincial median age of 41.9 years. Fifty-seven percent of Whistler's population is between 20 and 44 and people aged 65 and over make up less than 4% of the population. (Statistics Canada, 2007 & 2011).

3.2 Economic Vulnerability

As mentioned in previous sections, Whistler's economy is largely dependent on tourism. This makes Whistler's economy especially vulnerable to the effects of an emergency. Disaster literature indicates that the loss of a major industry or employer as the result of an emergency can lead to a reduced population, increase in foreclosed homes, and reduced tax revenue in the effected community. Loss of property tax base associated with damaged and destroyed housing and commercial real estate can have a longer term impact on operating budgets. Closure or relocation of major employers – and the loss of jobs with that employer and with related/dependent businesses - directly affects the confidence of a community to rebuild. (Wemple, 2008).

3.3 Physical Vulnerability

3.3.1 Critical Facilities

Within this HRVA, critical facilities are defined as facilities that are essential in order for the RMOW to carry out emergency response activities. In addition, there are numerous critical facilities outside of the Municipality that are essential in order for the Province to support the RMOW in an emergency (e.g. the Provincial Regional Emergency Operations Centre, the Provincial fire control centre and the Provincial Emergency Coordination Centre). The primary critical facility for coordination of non-routine emergencies is the Municipality's Emergency Operations Centre (EOC), located in the Public Safety Building. Before, during, and after a hazard event, the EOC is essential for site support, including the coordination of special resources, information, multiple departments and external agencies. For more information on the RMOW EOC please refer to the 2005 Emergency Operations Centre Plan. In addition to the EOC, first response facilities are of critical importance to carrying out emergency response activities. These include police, fire and emergency health care centers, along with pre-selected congregate shelter facilities including:

- | | |
|--------------------------------------|-------------------------|
| 1. EOC – Public Safety Building/RCMP | 4315 Blackcomb Way |
| 2. Municipal Hall | 4325 Blackcomb Way |
| 3. Firehall #1 | 4400 Village Gate |
| 4. Firehall #2 | 8900 HWY 99 |
| 5. Firehall #3 | 1505 Spring Creek Drive |
| 6. B.C. Ambulance Service | 7192 Lorimer Road |
| 7. Whistler Health Care Centre | 4380 Lorimer Road |
| 8. Municipal Public Works Yard | 8001 HWY 99 |
| 9. Spring Creek Community Centre | 1509 Spring Creek Drive |
| 10. Whistler Secondary School | 8000 Alpine Way |
| 11. Myrtle Phillip Community Centre | 6195 Lorimer Road |
| 12. Spruce Grove Field House | 7328 Kirkpatrick Way |

3.3.2 Critical Infrastructure

Through the HRVA process, the HRVA advisory committee has identified nine sectors of critical infrastructure that, if disrupted or destroyed, would have a serious negative impact on the health and safety of the RMOW or the effective functioning of the government. Critical infrastructure spans nine sectors:

1. Energy and Fuel
 2. Communications and Information Technology
 3. Finance
 4. Health Care
 5. Food
 6. Water
 7. Transportation
 8. Safety
 9. Government
- (Public Safety and Emergency Preparedness Canada, 2005)

3.3.2.1 Energy and Fuel

Energy (electrical power), natural gas and fuel (diesel, gasoline) are essential to day-to-day operations within the RMOW to heat homes and businesses, cook and preserve food, communicate through e-mail and charge cellular phones, bathe and flush toilets, and fuel equipment and vehicles. Without electrical power, natural gas and fuel many of the services on which the community depends are compromised.

Energy related infrastructure within the RMOW includes a network of electrical power transmission lines and facilities. The Whistler electrical power supply system is fed from two substations – Function Junction substation (located in Function Junction) and the Rainbow Substation (located in the Nesters/Mons area) and consists of overhead or underground distribution lines, usually located within roadways. Larger transmission infrastructure traverses the community generally in a north-south direction, with direct connections to the local supply system at Rainbow Substation and the Function Junction Substation.

Fortis B.C. (formally Terasen Gas) provides natural gas to the RMOW via a single pipeline along the Highway 99 corridor, extending northward from Squamish. The pipeline connects into a pressure reducing station at Function Junction. Gas is distributed within the RMOW via underground plastic pipes, mostly located beneath roadways.

The District Energy System at the Wastewater Treatment Plant uses a low-temperature heat pump technology to extract heat from the Wastewater Treatment Plant. The heat from this system services the Cheakamus Crossing neighborhood.

Access to fuel, both gasoline and diesel, are considered essential in day-to-day and post-emergency situations. Fuel is vital for emergency response and heavy equipment vehicles, generators, and for members of the community needing to fuel personal vehicles to abide evacuation orders. As a result, fuel is in high-demand post-emergency. There are four fuel distribution and storage facilities in Whistler. These include:

- Gasoline & Diesel Storage, Sabre Group, 8021 Mons Road;
- Gasoline & Diesel Storage, Public Works Yard, 8000 Alpine Way;
- Gasoline & Diesel Storage, Husky Market, 2101 Lakeplacid Road;
- Bus Depot, Hydrogen, Gasoline & Diesel Storage.

It is necessary to note that if Highway 99 is closed, and fuel supply routes are interrupted, there is a limited amount of fuel available in Whistler. Husky Market, the only public-access fuel station, has an average 12-14 hour supply of fuel during normal-use periods. However, it has been Husky Market's experience that fuel supplies are quickly drained during an emergency due to increased demand. During the 2008 Porteau Cove rockslide which closed Highway 99 to the South the gasoline tank at the Husky Station was drained in less than 3 hours (Personal communication with Husky Market, 2011). The RMOW Public Works Yard has, on average, a 4-5 day stock (3000-4000 liters) of both biodiesel and gasoline. Again, increased demand during an emergency could mean the supply is drained quickly depending on the fuel needs of RMOW vehicles and equipment (Personal communication with RMOW personnel, 2011). The United Petroleum Products gasoline and diesel storage at the Sabre Group, have an approximate 2-day supply of gasoline and 5-day supply of diesel during normal-use periods. United Petroleum Products estimates that the intense demand for fuel during an emergency could see this supply expended in as little as 24 hours (Personal communication with United Petroleum Products personnel, 2011).

3.3.2.2 Communications and Information Technology

Television and radio broadcasting, as well as cellular and land line telephones, are considered essential in emergency operations. Communications infrastructure is essential for the EOC, broadcasting systems, and front-line responders in communities in the aftermath of an emergency. Communication is necessary for: assessing damage and need; collecting information on supplies and other resources; coordinating rescue and relief activities; accounting for missing people; and motivating public, political, and institutional responses. It is important that communication infrastructure in a hazard prone area be resilient with built-in redundancy.

The majority of household telephone service continues to be using conventional land-line technology although most of Whistler's transient population relies on cellular phones. The current landline telephone providers in Whistler are TELUS and Shaw. The infrastructure is, in most cases, by overhead lines or buried wires. Landline telephones will continue to operate during an extended power outage, assuming the telephone lines are not damaged. Cordless phones will not work

without electrical power so residents and businesses without a cord phone will not have landline telephone capabilities in a power outage.

There are currently numerous wireless and cellular providers in the Municipality; their stations are usually at remote, elevated sites and are typically reinforced with backup power supplies that will continue service for extended periods of power supply interruption. Cellular towers are generally equipped with back-up power that will last 4-8 hours depending on usage. Despite this built-in redundancy cellular phone failure in emergencies is not uncommon. Most often, these failures are caused by the extraordinary demands placed on cellular networks. Even if communication infrastructure is not damaged by the event, the emergency provokes greater communication from the general public; the result is often a denial-of-service for all, including emergency personnel. (National Research Council, 2002). Wireless Priority Service (WPS) is one method that can be used to mitigate the risk of system overload by customers. WPS ensures priority access to wireless networks by providing qualified subscribers with the next available wireless channel on an antenna tower. WPD Dialing is available to essential personnel responsible for public safety, emergency preparedness, continuity of government and other critical services.

Whistler does not have a radio station broadcast but several stations re-broadcast in Whistler. Mountain FM (102.1) is broadcasted in Squamish and re-broadcasted in Whistler; Mountain FM can be utilized as a medium to communicate critical information to the public during emergencies. There are several other Vancouver stations that re-broadcast in Whistler including CFTW 88.7FM (tourism radio), CFMI 90.7FM (classic rock), CFOX 92.3FM (hard rock), Jack 96.9FM (adult hits), 100.1FM CB.C. Radio (news/information), CISW 102.1.

Note: With the purchase of specialized equipment (audio switches, access decoders and voice lines), the RMOW would have the ability to broadcast emergency information to listeners over these radio channels (Telecommunications site agreement between CORUS Entertainment Company and the RMOW, 2004).

The Municipality has an inventory of emergency radio equipment and one trained and certified emergency radio operator. Section 5.4 below discusses the role of emergency radio in emergency communications.

Many Whistler agencies, both municipal and non-municipal use radios to communicate during day-to-day operations. The Municipality has a Combined Events Radio Channel that can be used simultaneously by RCMP, Whistler Fire Rescue Service and B.C. Ambulance during an emergency. This is a simplex channel and therefore is only effective when the users are in close proximity to one another. Some municipal departments and external agencies are able to access each other's channels for communication during an emergency; however this type of interoperability is difficult as it involves municipal and emergency personnel switching back and forth amongst various channels to communicate. This puts emergency personnel and responders at risk, as they may not hear notifications

and warnings while communicating on a different channel. Radio communications between the various municipal departments and emergency services is currently fragmented which can negatively impact response efforts during emergencies when multiple agencies are required to work together. The RMOW EOC is equipped with satellite phones that are tested on a monthly basis.

3.3.2.3 Finance

Several banking institutions (including credit unions) serve the community of Whistler. It is essential that these institutions will continue to be open, provide services, and disperse funds in an emergency. Banking services are in great demand in emergencies; individuals, families, businesses, and governments need access to financial services during crisis situations. It is recommended that all financial institutions in Whistler have sufficient business continuity plans in order to ensure that banking services are available to Whistler businesses, residents and visitors in an emergency.

3.3.2.4 Health Care

Health facilities and health services are an essential community lifeline in normal times, and this is especially true during emergencies. The RMOW is serviced by Vancouver Coastal Health. The Whistler Health Care Centre is Whistler's only emergency medical centre with onsite radiology, CT scanner and laboratory services. Facilities that may be able to play a local support role include Northlands Medical Clinic, 4359 Main Street #101 and the Town Plaza Medical Clinic, 4314 Main Street.

Pharmaceutical supplies are essential to the treatment of chronic medical conditions, acute injuries, environmental exposures, and infectious diseases during emergencies. In post-emergency situations, high demands are placed on medical relief pharmaceutical supplies. Medicines are needed for the treatment of injuries and diseases as a result of the emergency, as well as medicines for chronic illness that are often worsened by post-emergency conditions. (Jhung, M., 2007). Whistler pharmacies include Nesters Pharmacy, 7019 Nesters Rd; Shoppers Drug Mart, 4295 Blackcomb Way; and 2 Rexall Pharmacies, 4212 Village Square and 103-4360 Lorimer Road.

3.3.2.5 Food

Access to safe food is necessary for sustaining life. Emergencies can disrupt food supply and delivery and result in food shortages. The supermarket food supply in Whistler is approximately 1-2 days for non-perishables (milk, bread, etc.) and up to one week for perishables (dry-goods) under normal consumption (Personal Communication with supermarket store manager, 2011). Restaurant and household food supplies may increase available food for some visitors and residents and emergency rationing may make the limited supply last longer. However, the small stock of food and lack of easy transportation to and from Whistler during an emergency to replenish this makes food supply a critical issue in

the event of a large-impact emergency.

3.3.2.6 Water

Safe and accessible water for drinking and sanitation is imperative to the health and well-being of the residents and visitors within the RMOW.

The RMOW's current water supply consists of both municipal and private water sources. The Community Water System is managed under three separate systems: the major system extending from Cheakamus Crossing in the south to Alpine Meadows, the Emerald Estates Water System, a stand-alone independent water system, and the Van West system in Function Junction that is privately owned and operated. The RMOW Community system includes both surface water (21 Mile Creek and Blackcomb Creek) and groundwater sources located throughout the Municipality. The Emerald system is supplied by groundwater supply source located within the Emerald Estates neighborhood area.

The design parameters used for development of the municipal water supply system is to deliver Maximum Daily Demand (MDD) volumes in a 25-year drought condition concurrently with a design fire event. In other words, the system is designed in a way that when the water surface supplies are at their lowest levels, the municipal water supply can supply the maximum foreseeable daily demand of 700 liters per person per day while at the same time putting out a major structural fire. In addition, all major water supply sources have emergency backup power supplies.

3.3.2.7 Transportation

During and after an emergency, transportation is an essential component for effective emergency response and recovery. Access to the RMOW is limited to road, rail and air transport. Whistler's transportation routes are vulnerable to various hazards including, but not limited to, floods, interface fires, earthquakes, rockslides and transportation accidents.

The RMOW Environmental Services Department is responsible for the operation, maintenance and capital construction of the Municipality's roads. Roadway transportation to and from the Municipality is available by Highway 99 only. A major disaster may cut-off access and egress to and from Whistler to the south or the north or both. This limited surface transportation makes Whistler especially vulnerable to certain hazards as access to safe evacuation routes, food, energy and fuel could be limited for an extended period. The B.C. Provincial Government, specifically the Ministry of Highways, is responsible for the operation and maintenance of Highway 99.

Railway transportation runs through Whistler on the B.C. Rail Line. This line is used for both tourism and commodity transportation. While the rail line is vulnerable to many of the same hazards as road, a disaster that cut-off the rail line would not have a severe negative impact on the Municipality as few, if any, commodities arrive in Whistler by rail.

Air transport is via helicopter (weather dependent) or floatplane (seasonal). The Whistler Heliport is located at 9960 Heliport Road and is maintained and operated by the Whistler Heliport Society. Helicopters transporting medical patients use the helipad at the Whistler Health Care Centre, at 4280 Lorimer Road, which is operated and maintained by Vancouver Coastal Health. Whistler Air operates a float plane business out of Green Lake, offering regular flights to Vancouver.

There are several commercial carriers that offer full transport service to and from Whistler, both to the north and south. The Municipality is also serviced by four Taxi carriers. Greyhound also maintains regularly scheduled service throughout the corridor.

3.3.2.8 Safety

There are several organizations that work to provide safety to residents and visitors within the RMOW. Whistler Fire Rescue Service (WFRS), Whistler Royal Canadian Mounted Police (RCMP), B.C. Ambulance, Search and Rescue and several other organizations are critical to the safety of the RMOW in day to day operations and in emergency situations. A more detailed description of each organization is provided in section 5, Response Capabilities.

3.3.2.9 Government

Emergency situations can have a catastrophic impact on a government's day-to-day business operations. Governments deliver critical services including protection of persons and property, local transportation, utilities, information, networks and assets, and more. Governments must ensure that these essential functions can continue during and after an emergency. In an emergency, the RMOW will establish an EOC to help support the site and coordinate the response. Provincial and Federal Governments also establish emergency operations centers', on an as-needed basis, to support local government EOC's. In addition to emergency and EOC planning, the RMOW should develop Business Continuity Plans to ensure that essential business functions within the Municipality are continuously delivered without interruption, or are re-instated post-emergency, as soon as possible.

4.0 RESPONSE CAPABILITIES

This section provides a summary of the Municipality's response capabilities that are considered when assessing the Municipality's overall risk to the hazards discussed in section 6.0.

4.1 Whistler Fire Rescue Service

The WFRS consists of 24 full-time staff and 51 paid on-call firefighters. The full-time staffs include a Fire Chief, two Assistant Fire Chiefs, and 21 Firefighter/Inspectors. The WFRS offer a range of services including: fire suppression, fire investigation, fire prevention, fire safety inspections, by-law enforcement (as it relates to the B.C. Fire Code and the Fire Protection and Fireworks Bylaw 1956, 2010), a full spectrum of fire & rescue training, public education, First Responder Medical Services and comprehensive rescue services. The WFRS is limited in its ability to provide adequate service to multiple incidents at one time. WFRS have the capacity to deal effectively with two structure fires (single family homes or small multi-family dwellings), assuming that 75% of paid on-call staff are available and off-duty career firefighters can provide reinforcement if required. A single incident in a high-rise building would require a significant amount of WFRS resources.

The WFRS has established Mutual Aid Agreements with Squamish, Garibaldi Fire Department and the Village of Pemberton. Mutual Aid response is limited to the release of one piece of apparatus and a crew of 4 firefighters, assuming this does not reduce the ability of WFRS to respond to incidents within RMOW boundaries. The RMOW can expect to receive the same reciprocal resource allocation from its Mutual Aid partners.



Fire Hall 1

4.2 Police

Municipal policing is provided by the RCMP Whistler Municipal Detachment located at 4125 Blackcomb Way. As a result of an area-wide amalgamation in 2006, the Whistler RCMP Detachment falls under the umbrella of the Sea-to-Sky Regional RCMP Services. The RCMP Detachments along the Sea to Sky corridor are commanded by one Officer-In-Charge and supported by a leadership team of senior staff in each jurisdiction. Whistler RCMP provides the people of the RMOW with a 24/7 police service made of four General Duty Watches, and complimented with a plainclothes Unit, Municipal Traffic Services and a Community Policing Unit. The Detachment has access to additional support in the way of additional resources and/or equipment if required from neighboring Detachments in the corridor (Squamish RCMP, Pemberton RCMP & Tribal Police).

In addition, Whistler RCMP is able to rely on the assistance of additional support services and Integrated Teams at the District (Metro Vancouver) and Divisional (Provincial) level. Such teams would include, but are not be limited to Integrated Traffic Units, Dive Teams, Marine Sections, and others.

It should be noted that in the event of a major event, Whistler RCMP would have the capacity and capability to respond accordingly and deal effectively with the situation, and is well prepared to reach-out for additional support beyond the Sea to Sky corridor if required, to enhance the level of response depending on the scale of the event.



4.2.1 Whistler Victim Services

The Whistler Victim Services team is positioned within the RCMP umbrella and operates out of the RCMP office. Victim Services works with the RCMP to provide emotional support, information and referrals to victims of crime and trauma. Staff and volunteers provide emotional support in person and over the phone to victims, witnesses and their family members. Although they do not provide counseling, they can make appropriate referrals to counseling services in the community. One full-time staff member, one part-time staff member (20 hours per week) and approximately 10 volunteers work with the Whistler Victim Services Team.

4.3 British Columbia Ambulance Service

Emergency medical service is provided to the Municipality by the B.C. Ambulance Service (B.C.A.S.) which is dispatched by the regional 9-1-1 system. BCAS in the RMOW employs 4 full-time paramedics and 25 part-time paramedics. In Whistler, from 0700 to 1800 hours there is one full-time ambulance unit and one call out unit available. From 1800 to 0700 hours there are two call-out units available. From December 16th to the end of April an additional unit is available between 1200 and 2300 hours. The units are based at the ambulance station located at 7192 Lorimer Road, Whistler. The Municipality is cross-covered by the stations in Pemberton and Squamish.

Critical Care Transport (CCT) is provincially coordinated through the British Columbia Air Ambulance Service. The Whistler Health Care Centre (WHCC) located at 4380 Lorimer Road, is equipped with a helicopter landing area (operated and maintained by Vancouver Coastal Health) to accommodate the British Columbia Air Ambulance Service. Due to Transport Canada restrictions only double-engine aircraft are permitted to land at the WHCC. This limits the number of eligible aircraft as many of the helicopters in Whistler are single-engine machines. When an aircraft is unable to land at the WHCC patients requiring critical care will be transported to the Municipal heliport and then transferred to WHCC by ground ambulance. It is also worth noting that CCT is dependent on both helicopter availability and weather and in all cases the decision to land is at the discretion of the pilot. (Personal Communication with BCAS, 2011).



4.4 Search and Rescue

Whistler Search and Rescue (WSAR) provide search and rescue services to the Municipality and in outlying areas. WSAR can be activated by RCMP, BCAS and Ministry of Forests although WSAR is most commonly activated through Whistler RCMP in the search for missing persons.

WSAR consists of 24 volunteer members certified in several wilderness SAR disciplines including ground search, air search, and mountain search including high-angle rescue.

WSAR is not certified for Swift Water Response. Pemberton SAR has a Swift Water Rescue Team that has verbally agreed to aid Whistler in a response if necessary and available. Historically Whistler has had nine incidences requiring a Swift Water Rescue response including three cars submerged in rivers and six stranded kayakers.



Whistler Search and Rescue

4.5 Hazardous Materials (HAZMAT)

There are hazardous materials located at various locations throughout the RMOW. The primary responsibility for on-site response to hazardous materials accidents rests with the spiller. However, local governments with their emergency services (fire, police, and ambulance) are responsible for operational support to the extent that expertise and resources are available and to the extent that the response functions are within their mandate. If needed or requested, the province will provide technical assistance to industry, local government and/or both. The B.C. Ministry of Environment is the lead provincial agency for responding to a hazardous material incident in cooperation with other responding jurisdictions and/or industry.

For additional information concerning HAZMAT emergency response, the RMOW can contact the Canadian Transport Emergency Centre (CANUTEC); operated by Transport Canada. CANUTEC is staffed by professional scientists specialized in HAZMAT emergency response and experienced in interpreting technical information and providing advice. CANUTEC does not respond on-site but offers communication and data support on chemicals that are manufactured, stored and transported in Canada. CANUTEC can assist in the activation of industry emergency response plans such as TEAP, the Transportation Emergency Assistance Plan, operated by the Canadian Chemical Producers' Association or on-site assistance from other industry or government specialists (Transport Canada, 2005).

Currently, the WFRS responds to the majority of hazardous materials' incidents within the RMOW at an awareness level. WFRS will help identify the product, contact CANUTEC, establish a perimeter and assist with any evacuations that may be necessary.

The WFRS will respond to a HAZMAT incident, at an operational level, to product specific sites operated and owned by the RMOW. WFRS will respond to ammonia leaks at the Whistler Sliding Centre and Meadow Park Ice Arena, and to chlorine leaks at the Meadow Park Sports Centre and the Waste Water Treatment Plant, and for chlorine issues related to drinking water chlorination sites around the valley.

5.0 EMERGENCY SUPPORT AND PREPAREDNESS ORGANIZATIONS

In B.C., local governments are responsible for providing the initial response to emergencies occurring within their boundaries, assuming it falls within their mandate. (Emergency Program Act, 2004). On request, the provincial government will provide material support, advice, expertise and other assistance.

The B.C. Emergency Program Act sets out responsibilities for emergency management within the province. Section 6(1) states, “a local authority is at all times responsible for the direction and control of the local authority's emergency response [if the local authority has the primary responsibility and mandate for dealing with the specific type of emergency]” Section 6 (2) of the Act states that: “A local authority must prepare, or cause to be prepared, local emergency plans respecting preparation for, response to and recovery from emergencies and disasters.” In addition to primary response organizations (police, fire, ambulance), the RMOW utilizes a number of organizations and programs to prepare for and support response and recovery in the case of an emergency. These include the Municipality's Emergency Program and other municipal departments, Whistler Emergency Social Services, Whistler Emergency Radio, Vancouver Coastal Health and many Provincial Ministries and Crown Corporations.

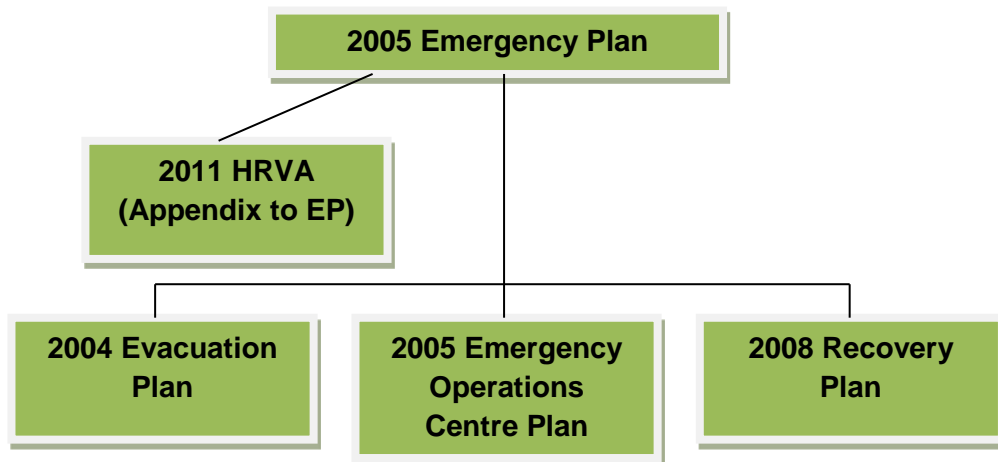
5.1 Whistler Emergency Program

The RMOW Emergency Program is responsible for coordinating the systems and processes for mitigating against, preparing for, responding to and recovering from emergencies. The Whistler Emergency Program portfolio includes plan administration, staff training and exercises, public education, EOC coordination and the Emergency Planning Committee.

The RMOW Emergency Program Coordinator is responsible for the management and coordination of the emergency program. This is a part-time municipal staff position (16 hours per week); this is a casual position. The Emergency Program Coordinator reports to the Manager of Community Planning.

5.1.1 Plan Administration

Emergency response plans are developed and maintained to provide guidance and direction to RMOW municipal departments and external support organizations regarding their primary emergency role. The RMOW has several plans including the 1999 Evacuation Plan, the 2005 Emergency Plan, the 2005 Emergency Operations Centre Plan, the 2008 Recovery Plan and several department specific plans.



As indicated in the above diagram, the HRVA will be added as an Appendix to the 2005 Emergency Plan. Although the Evacuation Plan, the EOC Plan and the Recovery Plan are all separate documents they are used in addition to the Emergency Plan in an emergency.

Note: All of the plans listed above require updating, most urgently the 2005 Emergency Plan and the 2004 Evacuation Plan. Emergency response plans should be updated every 3-4 years and resource and staff-callout lists should be updated annually.

5.1.2 Staff Training and Exercises

During and after an emergency, Municipal staff will be expected to assist with the response efforts. A series of courses and workshops are offered to Municipal staff and volunteers to assist them in their emergency roles and responsibilities. Exercises are developed and conducted to test emergency plans, familiarize staff with one another's roles, practice emergency procedures and build confidence in the RMOW's ability to respond to and recover from emergency events.

5.1.3 Public Education

Public education is a method of ensuring that the community of Whistler is prepared for an emergency. Public education includes the distribution of educational pamphlets on relevant hazards to Whistler, and hosting presentations and training workshops. Emergency Preparedness Week is an annual Canada-wide event held the first week of May; Emergency Program staff and volunteers organize a series of community events to highlight the importance of being prepared for emergencies.

5.1.4 EOC Activities

The Municipal EOC is located at the Public Safety Building. Before, during, and after an emergency event, the EOC is essential for coordinating resources, information, multiple departments and external agencies. In order for the EOC to operate effectively, personnel from various departments must be trained in EOC operations. In addition, the EOC should be activated in a simulated emergency in order to test current practices, reinforce procedures, and identify shortfalls or problems.

A successful EOC requires large numbers of trained personnel. Personnel from each municipal department should be trained in EOC operations and should participate in simulation exercises. Each EOC position requires trained alternates to provide relief during lengthy EOC activations. This also provides an alternate should the primary person be unable to attend. EOC personnel should be selected based on experience and skill-set, as opposed to being deemed qualified based on their usual municipal position. Additionally, a permanent Emergency Program Coordinator is required in order to ensure that appropriate numbers and types of staff are adequately trained and available in the event of an emergency.

5.1.5 Emergency Planning Committee

The role of the Emergency Planning Committee is to provide policy direction and guidance to the Emergency Program and ensure that legislative requirements are fulfilled. The duties and responsibilities of the RMOW Emergency Planning Committee are described in detail in the “Emergency Measures Bylaw NO. 1593, 2002”. Members of the Committee include the Mayor, a Councilor, the Chief Executive Officer, the Emergency Program Coordinator, General Managers, the Emergency Social Services Director and others as required (RCMP, BCAS, School District #48, WSAR, Whistler Blackcomb).

5.2 Emergency Social Services

The Municipality's Emergency Social Services (ESS) team has approximately 40 volunteers who are trained to provide short-term assistance to people who are forced to evacuate their homes due to an emergency. In an emergency where people are evacuated, a reception centre will be established at the Myrtle Phillip Community School, the Spruce Grove Field House or Spring Creek Community Centre.

The ESS team is under the direction of the Recreation Department. However, in the event of an emergency, the ESS Director will be working in the EOC under the direction of the Operations Section Chief. An eight-hour per week casual municipal staff position is responsible for the coordination of the Whistler ESS team.



Whistler ESS and the Community Preparedness Booth

5.3 Emergency Radio

The Whistler Emergency Radio Coordinator provides alternate emergency communications to the RMOW. An inventory of emergency radio equipment is stored in the Public Safety Building. In addition to backup communications within the Municipality, the Emergency Radio Coordinator can provide communications links to Provincial Regional Emergency Operations Centres (PREOCs) and to other municipalities (e.g. to request mutual aid or share critical information) when other forms of communication are unavailable.

Note: At this time there is no deputy Emergency Radio Coordinator. As a result, if the Emergency Radio Coordinator is unavailable this capability is non-existent as this person is the only member certified to operate the equipment.

5.4 Environmental Services

The RMOW Environmental Services department is responsible for the operation, maintenance and capital construction of the Municipality's roads (with the exception of Highway 99 which is the responsibility of the Ministry of Highways), solid waste, water, sewer, drainage, flood protection systems, snow clearing, and numerous environmental projects. Operational staff and specifically trained crews are available to provide technical expertise and support at the emergency site. In addition, municipal staff have strong relationships with both private consulting professionals and Provincial/Federal agencies and personnel. The Logistics Section of the EOC can request the assistance of the private sector, when required, to mobilize equipment and machinery in an emergency.

5.5 Vancouver Coastal Health

The RMOW is serviced by Vancouver Coastal Health (VCH). VCH is the administrative organization responsible for providing all publicly funded health services to the people of the Lower Mainland and Sea to Sky Communities. The Whistler Health Care Centre provides urgent and emergency health care services to people living in and visiting Whistler.

VCH executes the duties of the Drinking Water Officer pursuant to the Drinking Water Protection Act, which regulates the potable water supply activities of the RMOW, and the implementation of emergency responses.

The Whistler Health Care Centre is equipped with onsite radiology, CT scanner and laboratory services. Facilities that may be able to provide additional medical support in an emergency include Northlands Medical Clinic, 4359 Main Street #101, Whistler and the Town Plaza Medical Clinic, 4314 Main Street, Whistler.

5.6 Emergency Management British Columbia

Emergency Management British Columbia (EMBC), formally the Provincial Emergency Program, is a division of the Ministry of Public Safety and Solicitor General and is administered under the B.C. Emergency Program Act. EMBC coordinates the provincial response to emergencies and provides specialized technology resources to support local government emergency response activities. On a day-to-day basis, EMBC is available to respond to local government and agency calls through the PREOC that is staffed 24/7 and provides training to municipal staff and volunteers.

5.7 Provincial Ministries & Crown Corporations

The Government of B.C. is made up of ministries and Crown Corporations. The B.C. Emergency Program Act (2004) identifies the responsibilities of each of these Ministries and Crown Corporations; responsibilities are listed on the next page [responsibilities that have no direct relation to emergency events have been omitted].

5.7.1 Provincial Ministries

Provincial Ministry	Description of Responsibilities
Ministry of Children and Family Development	Responsible for the care of children who are not accompanied by a guardian or custodian.
Ministry of Environment	Responsible for environmental monitoring and emergency response (ensuring the proper disposal of hazardous wastes and pollutants) and assessment and monitoring of air quality
Ministry of Forests, Lands and Natural Resource Operations	Responsible for wildfire management and pests/disease/invasive plants and species. Ministry of Forests Wildfire Protection Branch will provide personnel, equipment, supplies, telecommunications equipment, aviation support and weather information to assist in emergency response operations. In addition, this ministry is now responsible for flood forecasts and bulletins (through the River Forecast Centre), flood assessment, technical services and planning staff at government EOC's in the case of floods, flood management (flood safety and drought management, and the Office of the Inspector of Dikes), dam safety and inspection services, and water protection and water sustainability policy.
Ministry of Health	The majority of responsibility for local health services has been delegated to VCH which consist of: BCAS including triage, treatment, transportation and care of casualties; the continuity of care for persons evacuated from hospitals or other health institutions and for medically dependent persons from other care facilities; provide standard medical units consisting of emergency hospitals, advanced treatment centers, casualty collection units and blood donor packs; inspect and monitor potable water supplies; inspect and regulate food quality with the assistance of the Minister of Agriculture, Fisheries and Food; provide critical incident stress debriefing and counseling services; and provide support and supervision services for physically challenged or medically disabled persons affected by an emergency.
Ministry of Public Safety and Solicitor General	Oversee EMBC, the B.C. Coroners Service, the Office of the Fire Commissioner, Police and Correctional Services and the Victim Services Division.
Ministry of Transportation and Infrastructure	Responsible for transportation planning and policy, provincial highway construction, maintenance and repair, BC Transit, and BC Rail.

5.7.2 Crown Corporations

Crown Corporation	Description of Responsibilities
B.C. Hydro and Power Authority	Responsible for: coordinating the restoration of electric facilities, taking into account domestic, commercial, industrial and government requirements; interrupting hydro services when they pose a threat to life or property; and conducting safety measures in respect to B.C. Hydro dams, including initiating warnings in the event of dam failures. During and after an emergency, B.C. Hydro will establish an EOC to communicate with local and provincial government EOC's providing up-to-date information on the severity and location of damage and an estimate for repairs.
BC Transit	Coordinates the delivery of public transportation throughout B.C. and in most communities, including the RMOW, works in partnership with local governments to supply transit. During and after an emergency B.C. Transit is responsible for coordinating requirements for public transportation, including school and privately owned buses.
BC Rail	Provides priority movement of emergency personnel, equipment and supplies, assistance at railway crashes, derailments in the conduct of rescue operations, removal of debris and the cleanup of hazardous material (in cooperation with Transport Canada), provide railcars for emergency facilities, and provide specialized equipment in an emergency.
BC Housing	Develops, manages and administers a wide range of subsidized housing options. B.C. Housing maintains a stockpile of emergency lodging supplies (cots and blankets) and provides Building Assessment Damage Training to governments and businesses. Following an emergency B.C. Housing will support communities in addressing their emergency accommodation needs and will acquire accommodation for provincial emergency responders should it be required.

5.8 Non-Government Resources

5.8.1 Whistler Blackcomb

Whistler Blackcomb (WB) is a ski resort located in the RMOW. WB maintains emergency plans and procedures for the safety of staff and visitors who work and recreate on the ski mountain. WB has many specialized resources that could be used to respond to emergency events both on the mountain and in the RMOW. WB resources include: trucks, snow cats, snowmobiles, radios, temporary fencing materials,

fuel and diesel, first aid supplies and cooking facilities. WB has many staff trained in first aid, search and rescue, rope rescue, firefighting, and avalanche searches.

Upon request, and assuming WB staff is available, the WB will provide a representative to the RMOW's EOC to help coordinate emergency activities between the WB and the RMOW.

5.8.2 Subject Matter Experts & Heavy Equipment Operators

In some emergency situations, the RMOW may need to access subject matter experts such as Geotechnical specialists or special equipment and equipment operators. In many cases, the RMOW has already built relationships with these specialists and equipment companies. In the event that external people and equipment are required the RMOW EOC can make a request for resources through the PREOC.

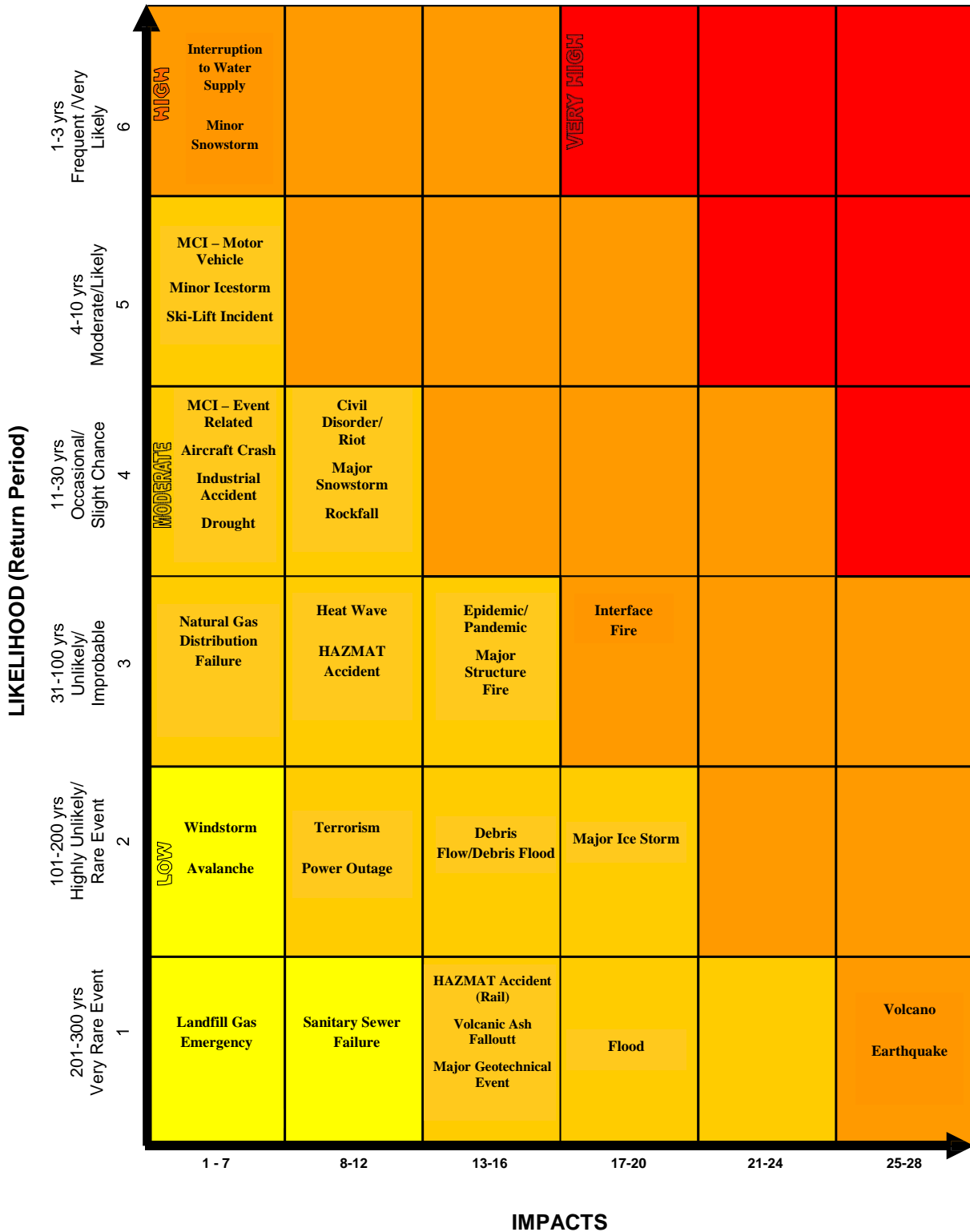
6.0 RESULTS

The results of this analysis are presented in the risk matrix below. The risk matrix graphically displays the relationship between the hazards in terms of risk. The x-axis represents the ranges of impact scores and the y-axis represents the likelihood scores of the hazards. The factors which determined the impact score were the number of expected deaths, injuries, expected damages and losses to critical facilities and infrastructure, expected damages to environment and property, and the expected economic or social losses. The factors which determined the likelihood score was the predicted frequency of occurrence. (See Appendix C for a detailed scoring spreadsheet.)

Using this criterion, each hazard was given an aggregate score that combined impact consequence and likelihood; the aggregate score for each hazard was plotted on the risk matrix, assigning each hazard a rating of very high, high, moderate or low. The risk rating assigned to each hazard directly reflects the seriousness of each risk as described on the following page.

RATING	DESCRIPTION
VERY HIGH	Very-high risk hazards are those that are both frequent and high impact. These hazards require immediate mitigation and the development of hazard specific emergency plans [assuming plans of this nature are not already complete] to strengthen response capabilities until mitigation projects are completed.
HIGH	High-risk hazards are those that have vast impacts but are unlikely; have serious impacts but are infrequent; or have minor impacts but are likely. High-risk hazards require the development of hazard specific emergency plans [assuming plans of this nature are not already complete] to strengthen response capacity of the first responders, the Municipality and the community. High-rated hazards should be evaluated to determine if mitigation is necessary and would successfully lessen the risk.
MODERATE	Moderate-risk hazards indicate the risk is reduced, but not completely removed. These hazards range from low impact and likely to moderate impact and very rare. Moderate-risk hazards are serious enough to be included in emergency plans, although hazard specific plans for each moderate-rated hazard may not be necessary. Moderate-rated hazards should be evaluated to determine if mitigation would lessen the risk; assuming very-high and high level risks are the priority for mitigation.
LOW	Low-risk hazards are both low impact and low probability. Low-risk hazards should be considered in emergency plans but hazard specific plans are likely unnecessary.

RISK MATRIX



Municipality of Whistler Risk Matrix. The risk increases from low to very high in the direction of the arrow, from bottom-left to top-right. The low hazards are infrequent and have a relatively low impact while the very high hazards are frequent and have a very high impact.

6.1 High-Rated Hazards

The results of this HRVA reveal that not all hazards in the Municipality have an equal risk. Therefore, hazard prioritization is required to help the Municipality determine which hazards should be considered for planning and mitigation first. Ultimately, the Municipality should aim to reduce the impacts of, and be prepared to respond to, all hazards that could affect the RMOW. However, because resources are limited, the most serious hazards must be considered for planning and mitigation first.

As reflected in the risk matrix, the Municipality has no hazards with a rating of very-high. It is normal for few, if any, very-high risk hazards to be present in a populated geographic area. If such hazards once existed, the population affected will usually leave the area or employ mitigation measures to reduce the risk. For example, in 2009, the RMOW constructed a debris barrier spanning Fitzsimons Creek to protect the RMOW in the event of a 1:500 year debris flood event. This mitigation project significantly reduced the Municipality's debris flood risk.

This HRVA is designed to provide an assessment of the hazards that may present risks to the RMOW. In selecting these events for consideration, the HRVA advisory committee acknowledges the potential, however small, that other types of emergencies may demand site support in the future. Following a thorough examination of the hazards the HRVA Committee has identified 32 hazards that could affect the RMOW.

The HRVA has identified five hazards with a rating of high. These include: interface fire, earthquake, volcano, interruption to water supply and snow storm. A thorough description of the top-five rated hazards is provided in this section.

6.1.1 Interface Fire

Hot, dry weather and excessive fuel loading often make forest areas particularly vulnerable to lightning strikes and human carelessness. Whistler has many forested areas in and around the Municipality and a fire in one of these areas has the potential to negatively impact economic stability and environmental quality. (RMOW Wildfire Risk Management System, 2004). Aside from the environmental and economic impact, wildfires become particularly devastating when they encroach on human settlements and critical infrastructure. Wildfires burning in urban areas are referred to as interface fires.

Interface fires can result in significant economic costs, much of which are allocated to fire fighting. However, the total cost of forest fires can far exceed the costs of suppression, and include damage to public and private infrastructure and property, transportation networks, environmental damage, and costs associated with disruption of business in affected communities (Natural Resources Canada, 2008). For example, during the summer of 2003, the region of Kelowna in B.C. experienced an unusually severe interface fire that required evacuation of over 26,000 people, destroyed 238 private homes, caused a major disruption of the region's main tourism season, and destroyed several major tourism attractions. The interruption of the tourism season

had a substantial impact on employment and business operations, with average decreases in business revenues between 30% and 40%. Because the fire impacted Kelowna during the height of the summer tourist season, this resulted in many businesses losing a major portion of their annual business revenues. (Hystad & Keller, 2006).

The WFRS has responsibility for all interface fires within the Municipality's boundaries. In the event of an interface fire, WFRS would establish Unified Command with the Wildfire Management Branch (WMB) of the Ministry of Forests, Lands and Natural Resource Operations (MoFLNRO); this cooperation provides WFRS access to MoFLNRO resources and expertise. Should an incident be of significant magnitude, WFRS could expect assistance from a MoFLNRO initial response team within approximately 10-15 minutes via helicopter; should the incident be less significant in nature, anticipated response time for an MoFLNRO initial response team would be approximately 30-40 minutes via road. All response times are dependent on the location and availability of those resources and the requirements of neighboring communities at the same time.

Note: The Municipality's current Evacuation plan is dated 2004.

6.1.2 Earthquake

Earthquakes may cause a number of phenomena, including ground motion, surface faulting, ground failure, and liquefaction. An earthquake's magnitude reflects an earthquake's strength. Damage to buildings generally begins to occur at magnitude six, while an earthquake above magnitude seven may be a major disaster if it occurs near a populated area.

Seismic zoning maps for Canada are derived from the analysis of past earthquakes, and from advancing knowledge of Canada's tectonic and geological structure. Depending on the expected seismic hazard and intensity of ground shaking, the territory of Canada is divided into 7 seismic zones i.e. zones 0 to 6. Zone 0 is characterized with a very low seismic hazard, whereas zone 6 is characterized with the highest seismic hazard in Canada. According to the National Building Code of Canada (NBBC) 1990, the Municipality of Whistler is located within Seismic Zone four , meaning Whistler is considered at high-risk from earthquake damage. Fortunately, the majority of the structures in Whistler are wood frame and reinforced concrete which are considered reasonably stable buildings in an earthquake due to the flexibility of these materials.

Although a rare occurrence, if a large earthquake were to occur, vulnerable infrastructure and populations would be greatly impacted and aid from neighboring communities would be limited or non-existent as they deal with their own earthquake damage. In addition to direct damage from an earthquake, the Municipality may be indirectly affected by earthquake damage in other provincial zones. Suppliers from outside the Municipality may be unable to offer services forcing the local community to face delays in receiving basic supplies such as food, medication, fuel and clothing

coming from affected areas.

Earthquakes have the potential to damage or destroy much of the infrastructure communities rely on. Power failures are typical in post-earthquake environments and interruptions to service may last days or weeks. B.C. Hydro expects some degree of damage and anchorage failure in its affected substations. This can cause serious problems for buildings and infrastructure that require a continuous power source such as hospitals, communication systems and response facilities. In addition to damage to electrical infrastructure, an earthquake could affect the integrity of underground natural gas pipelines. The effects of natural gas supply interruptions to the RMOW include leakage of contaminants into soil or groundwater, explosion, fire and injury or death caused by toxic fumes. Fire following an earthquake is very common in post-disaster environments. Contaminated water is also a concern post-earthquake. Water can become contaminated with microorganisms, such as bacteria, sewage, industrial waste, chemicals, and other substances. It is difficult to predict what damage will occur to roads throughout the Municipality. Slumping and cracking are not uncommon during an earthquake, nor are rock falls, landslides and liquefaction. Highway 99 which connects Whistler to the north and south is a vital transportation route for both emergency access and evacuation purposes.

6.1.3 Volcano

“Volcanic eruptions in Canada are a rare event. Though infrequent, volcanoes can be catastrophic enough to warrant serious attention (Institute for Catastrophic Loss Reduction, 2010)”. A volcano is a vent in the crust of the Earth’s surface through which molten rock (magma) is extruded onto the surface of the earth as lava and volcanic debris flows, and also into the Earth’s atmosphere as volcanic gases and rock fragments. The Municipality of Whistler sits within the Garibaldi Volcanic belt, part of the Pacific Ring of Fire. (Hickson, Mulder & Stasiuk, 2004). The Garibaldi Volcanic belt includes Mt. Garibaldi, Mt. Price, Black Tusk, Mt. Meager, Mt. Cayley, Mt. Fee and Mt. Silverthorne.

Volcanoes are one of the few hazards that typically exhibit clear precursor activity. (Hickson, Mulder & Stasiuk, 2004). Should a volcano erupt in the Whistler area, this precursor activity would give the RMOW time to plan an emergency response, limiting the amount of injury and loss of life. However, an erupting volcano threatens infrastructure such as highways, roads, and railways. Ash can pollute water supplies and collapse buildings, especially when it falls wet. Airborne ash clouds can adversely affect aircraft corridors and the routing of flights. Heavy ash fall may reduce sunlight, causing a sudden demand and possibly brownouts of electrical power. Ash can clog water systems, sewage plants, and all kinds of machinery, cause roofs to collapse and electrical short circuits. Fine ash is extremely slippery, hampering driving and walking. Ash can also damage the lungs of small infants, elderly, and those having respiratory problems. (Institute for Catastrophic Loss Reduction, 2010).

6.1.4 Interruption to Water Supply

An interruption to Whistler's water supply is rated as high due to the relatively high likelihood of this scenario; the impacts however, are minimal. As noted in Section 3.3.2.6 the Municipality's water supply consists of three separate water systems. Taking into consideration the different water systems, it is far-fetched to suggest that an emergency would threaten the water supply of the entire Municipality. It is feasible, that certain areas may experience a water supply disruption due to an increase in the demand for water for firefighting purposes, damage to a sub-division water main, or other reasons. However, one-off water shortages through the Municipality could be managed through the provision of portable potable water to residents. To respond to water supply emergencies, the Municipality has a Water System Emergency Response Plan (2008).

6.1.5 Snow Storm (Minor)

A minor snowstorm is rated as high due to the relatively high likelihood of this scenario; the impacts however, are minimal. In the event of a minor snowstorm, transportation to and within the Municipality may be delayed due to snow accumulation and/or low visibility. The resulting driving conditions will increase the risk of motor vehicle accidents. Disruption to air transportation including air ambulance transportation services may also be caused. These incidents combined may be sufficient to tax local response agencies such as fire, police, ambulance and public works however serious consequences are unlikely as the Municipality is accustomed to dealing with these storms.

7.0 RECOMMENDATIONS

This HRVA has identified the hazards that may present risk to the RMOW. In order to mitigate the impact of the hazards identified in the HRVA, it is recommended that the RMOW take the measures listed below. Recommendations have been separated into sub-categories and an estimate of required resources has been included.

Sub-Category	Recommendations	Resources Required
<p style="text-align: center;">Plans</p>	<p>1. Update the 2005 RMOW Emergency Plan and all supporting plans including the 2004 Evacuation Plan, the 2005 Emergency Operations Centre Plan and the 2008 Recovery Plan. Ensure the updated plans consider the following:</p> <ul style="list-style-type: none"> • The Whistler population equivalent and not merely the permanent resident population in the development of policies and procedures; • The needs of people with disabilities in an emergency; • The development of hazard specific emergency plans for all hazards identified as high-risk and medium-risk to strengthen the Municipality’s capacity to respond; and • The development of a section focusing on RMOW Business Continuity detailing how RMOW departments will continue to offer critical municipal services post-emergency. 	<p>Staff time.</p>
	<p>2. Review the written emergency procedures for all municipal facilities and work areas. Ensure municipal personnel are adequately trained in emergency procedures applicable to their workplace. These measures will confirm RMOW compliance with WorkSafeBC Occupational Health and Safety Regulation 4.14 and 4.16.</p>	<p>Staff time.</p>

Sub-Category	Recommendations	Resources Required
Community Preparedness	3. Consider changing the recommended time that residents should be prepared to survive without basic services from 72 hours to 7 days. This is based upon the limited amount of resources available in Whistler.	Staff time.
	4. Educate hotels and other service providers to make them aware of what is available within the municipality and what their roles and responsibilities are with respect to incident mitigation and recovery.	Staff time.
	5. In conjunction with the Whistler Chamber of Commerce, educate the Whistler business community on the importance of business continuity planning.	Staff time.
Training and Exercises	6. Instruct the Emergency Program Coordinator to review the training levels received by existing staff and communicate the predicted Emergency Operations Centre (EOC) staff deficiencies, if any, to the Senior Management Team for corrective action.	Staff time.
	7. Instruct the Senior Management Team to evaluate the staffing needs for the Emergency Operations Centre with a goal to match the skill sets and experience of available individuals with the specific needs of the EOC positions during emergency conditions.	

Sub-Category	Recommendations	Resources Required
Communications	8. Organize a campaign to recruit additional Emergency Radio Operators to strengthen the capacity of emergency communications in Whistler. Train recruited volunteers.	Training Scheduled. Cost will be absorbed in 2012 Emergency Program budget.
	9. Expand public education and emergency messaging materials into additional languages to better service resort clientele before, during and after an emergency.	Staff time. Transcribing fees \$800.
	10. Establish Wireless Priority Service for vital emergency staff.	Monthly Fee of \$10 per phone. Sign-up fee of \$30 per phone.
	11. Investigate the need and the associated costs of purchasing equipment to broadcast emergency information to listeners over local radio channels. This is subject to approval by the Canadian Radio-Television and Telecommunications Commission.	Staff time. [Additional costs may be incurred should the decision to upgrade equipment be necessary. Decision to upgrade at the discretion of the Emergency Planning Committee.]
	12. Reestablish relationships with radio broadcasters to be able to rely on their facilities during emergencies.	Staff time.
	13. Study the feasibility of upgrading the RMOW and stakeholder radio system to ensure proper and seamless interoperability.	Staff time to complete the study. [Additional costs may be incurred should the decision to upgrade equipment be necessary. Decision to upgrade at the discretion of the Emergency Planning Committee.]

Sub-Category	Recommendations	Resources Required
Critical Facilities	14. Assess all critical facilities for their anticipated survivability based on the hazards present within the community.	Staff time.
	15. Develop a priority list of RMOW facilities that require access to municipal generators in an extended power outage and ensure this complies with the number of generators owned by, or available to, the RMOW.	Staff time. [Additional costs may be incurred should the decision to purchase additional generators be necessary. Decision to purchase will be at the discretion of the Emergency Planning Committee.]
	16. Develop a priority list of RMOW facilities to be re-energized by BC Hydro following a power outage. This should be developed in conjunction with BC Hydro.	Staff time.
Critical Infrastructure	17. Complete a review of the current RMOW Emergency Operations Centre facility to determine if the current Emergency Operations Centre location is acceptable.	Staff time.
	18. Complete a review of the secondary RMOW Emergency Operations Centre facility to determine if the location is viable.	Staff time.
	19. Assess the fuel needs of the RMOW in conjunction with fuel availability in the RMOW.	Staff time.
	20. If required, establish <i>working</i> agreements with fuel providers to ensure stocks are available to the RMOW during an emergency.	Staff time.
	21. In conjunction with local pharmacies, assess the availability of pharmaceutical supplies in Whistler in the event that supply chains are interrupted.	Staff time.
	22. Conduct a thorough investigation of food supply in Whistler including restaurants and food supply companies. Determine methods to augment the current food supply levels or improve the robustness of food supply to Whistler in an emergency.	Staff time.

Sub-Category		Recommendations	Resources Required
Emergency Planning Committee		23. Reinstate a meeting schedule for the Emergency Planning Committee and the 4 sub-committees. Consider appointing a new committee to deal specifically with Business Continuity.	Staff time.
		24. Continue to have an Emergency Program Coordinator within the RMOW.	Staff time.
		25. Appoint a Deputy Emergency Program Coordinator within the RMOW to ensure there is adequate coverage when the Emergency Program Coordinator is unavailable.	Staff time. [A current staff member could be appointed].
		26. Perform a needs assessment on the Emergency Social Services system to ensure resources are adequate.	Staff time.
Hazard Specific Recommendations	Earthquake	27. Conduct further study on the recurrence frequency of a significant earthquake event in Whistler.	Staff time.
		28. Conduct an RMOW building inventory and create a map of high-risk structures.	Staff time.
		29. Ensure an adequate number of Municipal Staff are trained in Rapid Damage Assessment.	Staff time and Rapid Damage Assessment for Professionals Course \$1800 to train 30 staff members.
	Snowstorm	30. Conduct an annual municipal-wide snow event tabletop exercise to ensure staff is familiar with roles and responsibilities during extreme snowfall events. This should be conducted in the fall so that the Protocol is fresh in the minds of staff.	Staff time.
Volcano	31. Examine other municipalities in close proximity to Volcanoes to determine what measures they have taken to mitigate hazards associated with Volcanoes.	Staff time.	

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APPENDICES

Appendix A

B.C. Reg. 380/95
O.C. 1075/95

Deposited September 8, 1995

Emergency Program Act LOCAL AUTHORITY EMERGENCY MANAGEMENT REGULATION

Interpretation

1 In this regulation "**Act**" means the EMERGENCY PROGRAM ACT.

Local emergency plans

- 2** (1) A local authority must reflect in the local emergency plan prepared by it under section 6 (2) of the Act
- (a) the potential emergencies and disasters that could affect all or any part of the jurisdictional area for which the local authority has responsibility, and
 - (b) the local authority's assessment of the relative risk of occurrence and the potential impact on people and property of the emergencies or disasters referred to under paragraph (a).
- (2) Each municipal council and each board of a regional district that qualifies as a local authority under section 1 (1) of the Act must reflect in its local emergency plan, unless it is documented elsewhere,
- (a) the commitment of the local authority to provide policy guidance and direction to the emergency management organization established by that local authority under section 6 (3) of the Act, and
 - (b) the procedures by which that guidance and direction is to be provided.
- (3) A local authority must, as part of the local emergency plan prepared by it under section 6 (2) of the Act,
- (a) require a periodic review and updating of the local emergency plan and establish a procedure for that review and revision,
 - (b) establish and maintain for all emergency response staff to whom responsibilities are assigned in the plan,
 - (i) a program of emergency response exercises, and
 - (ii) a training program,
 - (c) identify the procedures by which emergency resources, including, without limitation, personnel, equipment, facilities and financial resources, may be

- obtained from sources within or outside of the jurisdictional area for which the local authority has responsibility,
- (d) establish the procedures by which the plan is to be implemented,
 - (e) establish procedures by which those persons who may be harmed or who may suffer loss are notified of an emergency or impending disaster,
 - (f) coordinate the provision of food, clothing, shelter, transportation and medical services to victims of emergencies and disasters, whether that provision is made from within or outside of the local authority,
 - (g) establish the priorities for restoring essential services provided by the local authority that are interrupted during an emergency or disaster, and
 - (h) recommend to service providers the priorities for restoring essential services not provided by the local authority that are interrupted during an emergency or disaster.
- (4) A local authority may incorporate into its local emergency plan any confirmed, potential or anticipated assistance and resources of other levels of government or other non-government bodies.

Powers of a local authority

- 3** Nothing in this regulation or the Act prevents a local authority from
- (a) entering into mutual aid agreements with one or more local authorities for emergency resources of all types and subsequent cost recovery,
 - (b) entering into agreements with non-government organizations for emergency resources of all types and subsequent cost recovery, and
 - (c) providing emergency training to and conducting emergency exercises with persons residing or carrying on business in the jurisdictional area for which the local authority has jurisdiction.

Duties of a local authority

- 4** Each municipal council and each board of a regional district that qualifies as a local authority under section 1 (1) of the Act must, on the request of and within the time required by the minister, submit to the minister
- (a) the local emergency plan as prepared under section 6 (2) of the Act and updated under section 2 (3) (a) of this regulation,
 - (b) the schedule and content of any emergency training or exercise program, and
 - (c) any other emergency prevention, preparedness, response or recovery information that the minister considers necessary to assist the minister in preparing or establishing procedures required for the prompt and efficient implementation of plans and programs to meet emergencies and disasters.

[Provisions of the EMERGENCY PROGRAM ACT, R.S.B.C. 1996, c. 111, relevant to the enactment of this regulation: section 28]

Appendix B

RESORT MUNICIPALITY OF WHISTLER

A Bylaw to authorize the Resort Municipality of Whistler to plan for dealing with emergencies and disasters including declaring a local state of emergency.

WHEREAS:

- A. The Council of the Resort Municipality of Whistler must establish and maintain an emergency management organization to develop and implement emergency plans;
- B. The Council of the Resort Municipality of Whistler wishes to provide a comprehensive management program to prepare for, respond to and recover from emergencies and disasters;

NOW THEREFORE the Council of the Resort Municipality of Whistler, in open meeting assembled, ENACTS AS FOLLOWS:

SECTION 1 – CITATION

1.1 This Bylaw shall be cited as the “Emergency Measures Bylaw No. 1593, 2002.”

SECTION 2 – INTERPRETATION

- 2.1 In this bylaw unless the context otherwise requires:
- a) “ACT” means the Emergency Program Act;
 - b) “COUNCIL” means the Council of the Resort Municipality of Whistler;
 - c) “DECLARATION OF A STATE OF LOCAL EMERGENCY” means a declaration of Council or the Mayor that an emergency exists or is imminent in the municipality;
 - d) “DISASTER” means a calamity that:
 - i) is caused by accident, fire, explosion or technical failure or by the forces of nature, and
 - ii) has resulted in serious harm to the health, safety or welfare of people, or in widespread damage to property;
 - e) “EMERGENCY” means a present or imminent event that:
 - i) is caused by accident, fire, explosion or technical failure or by the forces of nature, and
 - ii) requires prompt coordination of action or special regulation of persons or property, to protect the health, safety or welfare of people or to limit damage to property;
 - f) “EMERGENCY COORDINATOR” means the person appointed under Section 3.3 as head of the Resort Municipality of Whistler Emergency Management Organization;

- g) "MAYOR" means that member of Council who is head and chief executive officer of the municipality;
- h) "MINISTER" means that member of the Executive council charged by order of the Lieutenant Governor in Council with the administration of the Act;
- i) "MUNICIPALITY" means all of the area within the boundaries of the Resort Municipality of Whistler;
- j) "RESORT MUNICIPALITY OF WHISTLER EMERGENCY MANAGEMENT ORGANIZATION" means the Emergency Planning Committee, Emergency Coordinator and such other persons appointed and functional groups established and which are charged with emergency preparedness, response and recovery measures.

This Bylaw shall be construed in accordance with the principals contained in, and subject to, the Emergency Program Act, RSBC 1996 Chapter 111, and all regulations made thereunder.

SECTION 3 – ADMINISTRATION

- 3.1 The Emergency Planning Committee shall be composed of:
 - a) Mayor and one Councilor member appointed by Council;
 - b) Administrator,
 - c) Emergency Coordinator,
 - d) General Managers, Department Heads, Emergency Social Services Director or their designates and,
 - e) Such other members that the Council may determine.
- 3.2 Subject to the approval of the Council, the Emergency Planning Committee may:
 - a) make and amend its terms of reference, policies and procedures;
 - i) enter into agreements with regional districts or other municipalities for the purpose of emergency assistance or the formulation of coordinated emergency preparedness, response or recovery; and
 - ii) enter into agreements with individuals, bodies, corporations or other non-government agencies for the provision of goods or services.
- 3.3 The Council shall appoint an Emergency Coordinator to facilitate emergency preparedness, response and recovery measures.

SECTION 4 – DUTIES AND RESPONSIBILITIES OF THE COUNCIL

- 4.1 The Resort Municipality of Whistler Emergency Planning Committee shall prepare and present to the Council for annual review and approval:
 - a) a list of hazards to which the Municipality is subject and which also indicates the relative risk of occurrence;
 - b) plans respecting the preparation for, response to and recovery from emergencies and disasters, which include:
 - i) a periodic review and updating of plans and procedures for that review;
 - ii) a program of emergency response exercises;

- iii) a training program;
- iv) procedures by which physical and financial emergency resources or assistance may be obtained;
- v) procedures by which emergency plans are to be implemented;
- vi) warning procedures to those persons who may be harmed or suffer loss in an emergency or impending disaster;
- vii) procedures to coordinate the provision of food, clothing, shelter, transportation and medical service to victims of emergencies and disasters, whether that provision is made from within or outside of the municipality, and;
- viii) procedures to establish the priorities for restoring essential services provided by the municipality, or recommend priorities to other service providers, that are interrupted during an emergency or disaster.

SECTION 5 – POWERS OF THE COUNCIL

- 5.1 The Council or the Mayor or the Emergency Coordinator or other person as designated in the emergency plan may, whether or not a state of local emergency has been declared, cause the emergency plan to be implemented.
- 5.2 The Council by bylaw or resolution, or the Mayor by order, may declare a state of local emergency to effectively deal with an emergency or disaster in any part of the Municipality.
- 5.3 Upon a declaration of a state of local emergency being made, Council or the Mayor shall:
- a) forward a copy of the declaration to the Minister, and
 - b) cause the details of the declaration to be published by a means of communication that the Council or Mayor considers most likely to make the contents of the declaration known to the majority of the population of the affected area.
- 5.4 After a declaration of a state of local emergency is made under section 5.2 in respect of all or any part of the Municipality, and for the duration of the state of local emergency, the Council or Mayor may do any or all acts considered necessary and implement procedures that the Council or Mayor considers necessary to prevent, respond to or alleviate the effects of an emergency or a disaster, including any or all of the following:
- a) acquire or use any real or personal property considered necessary to prevent, respond to or alleviate the effects of an emergency or disaster;
 - b) authorize or require any person to render assistance of a type that the person is qualified to provide or that otherwise is or may be required to prevent, respond to or alleviate the effects of an emergency or disaster;
 - c) control or prohibit travel to or from any part of the municipality;
 - d) provide for the restoration of essential facilities and the distribution of essential supplies and provide, maintain and coordinate emergency medical, welfare and other essential services in the municipality;

- e) cause the evacuation of persons and animals and personal property from any part of the municipality that is or may be affected by an emergency or a disaster and make arrangements for the adequate care and protection of those persons, animals and personal property;
- f) authorize the entry into any building or on any land, without warrant, by any person in the course of implementing an emergency plan or program or if otherwise considered by the Council or Mayor to be necessary to prevent, respond to or alleviate the effects of an emergency or disaster;
- g) cause the demolition or removal of any trees, structures or brush if the demolition or removal is considered by the Council or Mayor to be necessary or appropriate in order to prevent, respond to or alleviate the effects of an emergency or disaster;
- h) construct works considered by the Council or Mayor to be necessary or appropriate to prevent, respond to or alleviate the effects of an emergency or disaster;
- i) procure, fix prices for or ration food, clothing, fuel, equipment, medical supplies or other essential supplies and the use of any property, services, resources or equipment within any part of the municipality for the duration of the State of Local Emergency; and
- j) authorize the Emergency Coordinator or other designated person to exercise, in any part of the municipality affected by a declaration of a state of local emergency, those specific powers enabled in Section 5.4 and assumed by the Council or Mayor.

5.5 The Council or Mayor must, when of the opinion that an emergency no longer exists in the Municipality to which a declaration of state of local emergency was made:

- a) cancel the declaration of state of local emergency in relation to that part
 - i) by bylaw or resolution, if cancellation is effected by the Council, or
 - ii) by order, if the cancellation is effected by the Mayor, and
- b) promptly notify the Minister of the cancellation of the declaration of a state of local emergency.

SECTION 6 – LIABILITY

6.1 No person, including, without limitation, the Council, the Mayor, members of the Resort Municipality of Whistler Emergency Management Organization, employees of the Resort Municipality of Whistler, a volunteer and any other persons appointed, authorized or requested to carry out measures relating to emergencies or disasters, is liable for any loss, cost, expense, damages or injury to persons or property that results from:

- a) the person in good faith doing or omitting to do any act that the person is appointed, authorized or required to do under this bylaw, unless, in doing or omitting to do the act, the person was grossly negligent, or
- b) any acts done or omitted to be done by one or more of the persons who were, under this bylaw, appointed, authorized or required by the person to do the acts, unless in appointing, authorizing or requiring those persons to do the acts, the person was not acting in good faith.

SECTION 7 – BYLAW REPEALED

Bylaw No.1134, 1995, cited as the “Resort Municipality of Whistler Emergency Program Bylaw”, is hereby repealed.

GIVEN FIRST, SECOND AND THIRD READING this _ day of _____, 2002.

ADOPTED by the Council this _____ day of _____, 2002.

Hugh O’Reilly

Mayor

Brenda Sims

Municipal Clerk

I HEREBY CERTIFY that this is
A true copy of “Emergency Measures
Bylaw No. 1593, 2002.”

Brenda Sims

Municipal Clerk

Appendix C HAZARD TABLE

HAZARD	SCENARIO	Impact Criteria							Total Impact Score (Max. 28)	Likelihood	AGGREGATE SCORE (Max. 28/6)
		Potential Extent of Death	Potential Extent of Injury	Potential Damages or Losses to Critical Facilities	Potential Extent of Damages or Losses to Critical Infrastructure	Potential Extent of Damages or Losses to Property	Potential Extent of Damages or Losses to Environment	Potential Extent of Economic or Social Losses		1 (Very Rare) 2 (Highly Unlikely) 3 (Unlikely) 4 (Slight Chance) 5 (Moderate/Likely) 6 (Very Likely)	
Aircraft Crash	Aircraft issue on take-off resulting in temporary highway closure.	1 (0-4 ppl) 2 (4-10 ppl) 3 (10-50 ppl) 4 (50 + ppl)	1 (0-4 ppl) 2 (4-50 ppl) 3 (50-2000 ppl) 4 (2000 + ppl)	1 (Temporary Relocation) 2 (Closure for a few days) 3 (Loss of 50% Capability) 4 (Permanent Loss)	1 (Temporary Interruption) 2 (Interruption of a few days) 3 (Interruption of one week) 4 (Permanent Loss)	1 (Minimal Damage) 2 (Low Localized Damage) 3 (Localized & Severe) 4 (Widespread & Severe)	1 (Minimal Damage) 2 (Localized Damage) 3 (Localized & Severe) 4 (Widespread & Severe)	1 (Temporary Impact) 2 (Temporary & Widespread) 3 (Extended & Widespread) 4 (Permanent Impact)	6	4	6/4
Avalanche	Avalanche in older (30+ years) neighborhood; Takes out a few houses. Note: There is no evidence of this hazard in developed areas.	1	2	0	0	2	0	0	5	2	5/2
Civil Disorder/Riot	Similar situation to Vancouver June 2011.	1	3	1	1	2	0	2	10	4	10/4
Debris Flow/Debris Flood	Mirrors the 1990's Fitzs. Creek event with concurrent flood exceeding the 200 year clearwater event.	1	1	3	3	2	2	3	15	1	15/1

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Drought	Based on 25 year drought. Lowest stream condition in a 25 year period.	1 (0-4 ppl) 2 (4-10 ppl) 3 (10-50 ppl) 4 (50 + ppl)	1 (0-4 ppl) 2 (4-50 ppl) 3 (50-2000 ppl) 4 (2000 + ppl)	1 (Temporary Relocation) 2 (Closure for a few days) 3 (Loss of 50% Capability) 4 (Permanent Loss)	1 (Temporary Interruption) 2 (Interruption of a few days) 3 (Interruption of one week) 4 (Permanent Loss)	1 (Minimal Damage) 2 (Low Localized Damage) 3 (Localized & Severe) 4 (Widespread & Severe)	1 (Minimal Damage) 2 (Localized & Severe) 3 (Localized & Severe) 4 (Widespread & Severe)	1 (Minimal Damage) 2 (Localized & Severe) 3 (Localized & Severe) 4 (Widespread & Severe)	1 (Temporary Impact) 2 (Temporary & Widespread) 3 (Extended & Widespread) 4 (Permanent Impact)	4	4	4/4
Earthquake	7+ in magnitude resulting in structural damage.	4	3	4	4	4	3	4	2 6	1	26/ 1	
Epidemic Pandemic	Canada-wide epidemic affecting over 15% population in Whistler.	4	4	3	0	0	0	3	14	3	14/3	
Flood	Clearwater flood event exceeding the 200 year level.	0	1	3	4	4	2	4	1 8	1	18/ 1	
Interface Fire	Rank 4 or 5 Fire; scenario 50 year event.	1	2	3	4	3	2	2	1 7	3	17/ 3	
Geotechnical Event	Major geotechnical event in region (not necessarily within RMOW boundaries).	4	3	0	2	2	1	1	1 3	1	13/ 1	

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HAZMAT	Rail or tanker truck leaking environmentally damaging substance.	0	1	0	1	2	3	2	9	3	9/3
HAZMAT (Rail)	Derailment of train causing a leak of poisonous gas.	4	3	0	2	2	2	2	15	1	15/1
Heat Wave	Heat wave with power failure; sustained for 5 days.	1	2	2	2	2	0	1	10	3	10/3
Ice Storm (Major)	Several days of ice rain resulting in 1 week power outage/ roof collapse.	1	3	3	3	3	1	3	17	2	17/2
Ice Storm (Minor)	Minor interruption to power. Not overnight.	0	2	1	1	1	1	1	7	5	7/5
Industrial Accident	Many mitigation measures in place. Scenario based on an explosion at a local industrial site.	1	1	0	0	1	1	0	4	4	4/4

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		Potential Extent of Death	Potential Extent of Injury	Potential Damages or Losses to Critical Facilities	Potential Extent of Damages or Losses to Critical Infrastructure	Potential Extent of Damages or Losses to Property	Potential Extent of Damages or Losses to Environment	Potential Extent of Economic or Social Losses		1 (Very Rare) 2 (Highly Unlikely) 3 (Unlikely) 4 (Slight Chance) 5 (Moderate/Likely) 6 (Very Likely)		
Interruption to Water Supply	A non-system-wide interruption in a neighborhood in Whistler.	1 (0-4 ppl) 2 (4-10 ppl) 3 (10-50 ppl) 4 (50 + ppl)	1 (0-4 ppl) 2 (4-50 ppl) 3 (50-2000 ppl) 4 (2000 + ppl)	1 (Temporary Relocation) 2 (Closure for a few days) 3 (Loss of 50% Capability) 4 (Permanent Loss)	1 (Temporary Interruption) 2 (Interruption of a few days) 3 (Interruption of one week) 4 (Permanent Loss)	1 (Minimal Damage) 2 (Low Localized Damage) 3 (Localized & Severe) 4 (Widespread & Severe)	1 (Minimal Damage) 2 (Localized Damage) 3 (Localized & Severe) 4 (Widespread & Severe)	1 (Minimal Damage) 2 (Localized Damage) 3 (Localized & Severe) 4 (Widespread & Severe)	1 (Temporary Impact) 2 (Temporary & Widespread) 3 (Extended & Widespread) 4 (Permanent Impact)	2	6	2/6
Landfill Gas Emergency	Many mitigation measures in place. Scenario based on an explosion.	1	1	0	0	0	0	0	1	3	1	3/1
Multiple Casualty Event – Event Related	Stage/bleachers structure failure or collapse during an event.	1	2	0	0	1	0	0	1	5	4	5/4
Multiple Casualty Event – Motor Vehicle Accident	Motor vehicle accident on highway resulting in several injuries.	2	2	0	1	0	1	1	1	7	5	7/5
Natural Gas Distribution Failure/Interruption	Natural Gas Line is severed/ damaged causing an interruption in the supply of natural gas to Whistler.	0	0	1	1	0	0	0	1	3	3	3/3

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		Potential Extent of Death 1 (0-4 ppl) 2 (4-10 ppl) 3 (10-50 ppl) 4 (50 + ppl)	Potential Extent of Injury 1 (0-4 ppl) 2 (4-50 ppl) 3 (50-2000 ppl) 4 (2000 + ppl)	Potential Damages or Losses to Critical Facilities 1 (Temporary Relocation) 2 (Closure for a few days) 3 (Loss of 50% Capability) 4 (Permanent Loss)	Potential Extent of Damages or Losses to Critical Infrastructure 1 (Temporary Interruption) 2 (Interruption of a few days) 3 (Interruption of one week) 4 (Permanent Loss)	Potential Extent of Damages or Losses to Property 1 (Minimal Damage) 2 (Low Localized Damage) 3 (Localized & Severe) 4 (Widespread & Severe)	Potential Extent of Damages or Losses to Environment 1 (Minimal Damage) 2 (Localized Damage) 3 (Localized & Severe) 4 (Widespread & Severe)	Potential Extent of Economic or Social Losses 1 (Temporary Impact) 2 (Temporary & Widespread) 3 (Extended & Widespread) 4 (Permanent Impact)		1 (Very Rare) 2 (Highly Unlikely) 3 (Unlikely) 4 (Slight Chance) 5 (Moderate/Likely) 6 (Very Likely)	
Power Outage	Catastrophic event interrupting power supply to Whistler. Similar event to the 2005 Blackout in East US.	0	0	3	3	0	0	3	9	2	9/2
Rock Fall	Rock fall damaging a home, also spilling onto Highway 99 causing a closure.	1	1	0	3	2	0	2	9	4	9/4
Sanitary Sewer System Failure	Catastrophic failure that releases wastewater into the environment; specifically a	0	0	3	3	1	3	2	12	1	12/1
Ski-Lift Incident	Scenario based on the incidents that have occurred in Whistler in the last 20 years.	1	2	0	0	1	0	1	5	5	5/5
Snowstorm (Major)	Heavy continuous snowfall – resulting in an extended interruption to transportation.	1	2	2	2	2	0	1	10	4	10/4

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		Potential Extent of Death	Potential Extent of Injury	Potential Damages or Losses to Critical Facilities	Potential Extent of Damages or Losses to Critical Infrastructure	Potential Extent of Damages or Losses to Property	Potential Extent of Damages or Losses to Environment	Potential Extent of Economic or Social Losses		1 (Very Rare) 2 (Highly Unlikely) 3 (Unlikely) 4 (Slight Chance) 5 (Moderate/Likely) 6 (Very Likely)		
Snowstorm (Minor)	Heavy continuous snowfall – no interruption to transportation as a result.	1 (0-4 ppl) 2 (4-10 ppl) 3 (10-50 ppl) 4 (50 + ppl)	1 (0-4 ppl) 2 (4-50 ppl) 3 (50-2000 ppl) 4 (2000 + ppl)	1 (Temporary Relocation) 2 (Closure for a few days) 3 (Loss of 50% Capability) 4 (Permanent Loss)	1 (Temporary Interruption) 2 (Interruption of a few days) 3 (Interruption of one week) 4 (Permanent Loss)	1 (Minimal Damage) 2 (Low Localized Damage) 3 (Localized & Severe) 4 (Widespread & Severe)	1 (Minimal Damage) 2 (Localized & Severe) 3 (Localized & Severe) 4 (Widespread & Severe)	1 (Minimal Damage) 2 (Localized & Severe) 3 (Localized & Severe) 4 (Widespread & Severe)	1 (Temporary Impact) 2 (Temporary & Widespread) 3 (Extended & Widespread) 4 (Permanent Impact)	2	6	2/6
Structure Fire	Structure fire that exceeds design capacity of Municipal water supply.	3	3	0	1	3	2	1	13	3	13/3	
Terrorism	One person detonates a device in crowd.	3	3	1	1	2	0	2	12	2	12/2	
Volcano	Volcano erupts in close vicinity to Whistler resulting in full evacuation and major interruption and damage to critical infrastructure.	4	4	3	4	4	4	4	27	1	27/1	
Volcanic Ash Fallout	Volcano erupts in B.C. and ash fallout reached Whistler.	1	1	1	2	3	3	2	13	1	13/1	
Windstorm	Heavy winds with trees down on power lines.	0	1	1	1	2	0	2	7	2	7/2	