



Resort Municipality of Whistler

COMMUNITY WILDFIRE DEFENCE PLAN

Final Report: January 2024

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PREFACE

This document serves as the Resort Municipality of Whistler Community Wildfire Defence Plan Report. The primary motivation for developing this document is to provide the Resort Municipality of Whistler (RMOW) with an implementation strategy to address recommendations made in the Community Wildfire Resiliency Plan (CWRP) 2022 related to policy, emergency planning and training.

ACKNOWLEDGEMENTS

Behr would like to acknowledge the leadership of the Wildfire Internal Collaboration Group. Their diligent, pursuit and focus on continuous improvement is most noteworthy. The 2023 wildfire season in British Columbia underscores the need for communities to be diligent, well prepared, and capable to manage wildfires which have the potential for catastrophic consequences. This group recognizes the risk and is committed to ensure that the Resort Municipality of Whistler has established the best possible mitigation, preparedness, and response strategies.

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ACRONYMS

AOI	Area of Interest	NPSH	National Pipe Straight Hose Thread (1.5")
BC	British Columbia	OCP	Official Community Plan
BCFSC	BC FireSmart Committee	POC	Paid-On-Call
BCWS	British Columbia Wildfire Service	PRV	Pressure Reducing Valve
BEC	Biogeoclimatic Ecosystem Classification	PSTA	Provincial Strategic Threat Assessment
CEMP	Comprehensive Emergency Management Plan	RCMP	Royal Canadian Mounted Police
CFRC	Community FireSmart Resiliency Committee	RMOW	Resort Municipality of Whistler
CI	Critical infrastructure	SDP	Structural Defence Plan
CRI	Community Resiliency Investment	SLRD	Squamish-Lillooet Regional District
CWH	Coastal Western Hemlock Zone	SLS	Sewage Lift Station
CWRP	Community Wildfire Resiliency Plan	SPC	Structure Protection Crew
DPA	Development Permit Area	SPS	Structure Protection Specialist
EOC	Emergency Operations Center	SPU	Structure Protection Unit
FCABC	Fire Chiefs' Association of BC	TFL	Task Force Leader
FD	Fire Department	UBCM	Union of British Columbia Municipalities
FUS	Fire Underwriters Survey	UTV	Utility Terrain Vehicle
GHT	Garden Hose Thread	WBC	Whistler Blackcomb
GIS	Geographic Information Systems	WFP	Whistler FireSmart Program
HP	Horsepower	WFRS	Whistler Fire Rescue Service
MOTI	Ministry of Transportation and Infrastructure	WUI	Wildland Urban Interface
NFPA	National Fire Protection Association		

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EXECUTIVE SUMMARY

Introduction

As a result of the recommendations from the Community Wildfire Resiliency Plan (CWRP 2022), the Resort Municipality of Whistler (RMOW) has been actively working to reduce the risks of wildfire in the community. Initiatives to date include conducting wildfire fuel thinning projects on Crown and municipal lands, established FireSmart Program inclusive of FireSmart Home Ignition Assessments, FireSmart Critical Infrastructure Assessments, chipping programs and FireSmart Education campaigns.

The purpose of this project is to develop a Community Wildfire Defence Plan for the RMOW with the primary goal to provide the RMOW with an implementation strategy that addresses the recommendations in the Community Wildfire Resiliency Plan (CWRP) 2022 related to policy, emergency planning, and training. The primary goal of the Community Wildfire Defence Plan is to provide the RMOW with an implementation strategy that addresses recommendations in the CWRP related to policy, emergency planning and training.

Project Scope

The scope of this project is to provide RMOW with the following objectives:

Policy

- Review and provide recommendations for amendments to the Wildfire Development Permit Area Guidelines.
- Advise the RMOW on the development of a policy to ensure property owners are notified and take action to mitigate fire hazards on private land.

Emergency Planning

- Review, engage and pre-plan emergency community water delivery systems with water stakeholders including but not limited to the RMOW, Vail Resorts, Squamish-Lillooet Regional District (SLRD), Lil'wat and Squamish First Nation, regarding water delivery rates, reservoir recover capacity, natural water supply locations and back-up power.
- Review the ability to connect major natural water sources with interface neighbourhoods, for the purpose of facilitating the deployment of a structural protection system.
- Review historical climatic data with regards to rainfall and average monthly temperatures by month.
- Develop Structure Defence Plans for all areas in the Resort Municipality of Whistler in collaboration with emergency response team.
- Identify safety zone locations for ground crews.
- Identify hazards such as weight restrictions on bridges and the location of hazardous materials.

- Evaluate whether current Whistler Fire Rescue Services (WFRS) wildfire/structure protection equipment is adequate to protect an entire interface neighbourhood (e.g., up to 100 homes) during a wildfire event and provide recommendations on enhancing WFRS wildfire/structure protection equipment.
- Provide a resource list of wildfire equipment (heavy equipment, portable equipment, large fire pumps and delivery systems) and how to acquire these resources.
- Evaluate the suitability of WFRS off-road equipment and recommend improvements.
- Advise on the development, operations, and maintenance of a rooftop sprinkler program for interface neighbourhoods.
- Develop Sprinkler protection triaging for critical infrastructure including recommendations for FireSmart initiatives.
- Assess wildfire hazards along primary neighbourhood access routes including all highway exits and provide recommendations for mitigation based on priority areas.
- Assess secondary emergency vehicle access throughout the RMOW neighbourhoods, categorizing access features by type of vehicle appropriate for the road/trail and provide recommendations on upgrades, thinning as required to serve WFRS emergency vehicle access/egress that improve safe anchor points for firefighting efforts.
- Assess and provide recommendations on improving FireSmart Education communication plans.
- Assess GIS mapping related to wildfire and provide recommendations on improvements.
- Provide a community threat rating based on risk of wildfire.

Training

- Assess and advise on improved cross-training between WFRS, BC Wildfire Service (BCWS), Whistler/Blackcomb (Vail Resorts) and mutual aid partners.
- Provide recommendations for the expansion of internal wildfire training for WFRS and RMOW staff.

Project Approach and Outcomes

To gain a good understanding of the challenges surrounding a community wildfire defence plan for the RMOW, a total of 24 interviews were conducted. This included RMOW staff, SLRD, BCWS, First Nations, RCMP Whistler Detachment, Fonterra, and Whistler Blackcomb. Follow up consultation and emails provided additional details and clarity for specific factors related to the development of the wildfire defence plan. Key aspects of this project also included:

- Completing a community overview and risk assessments for wildfire and structural protection and defence
- Review of RMOW FireSmart program
- Assessment of the WFRS wildfire response capability,
- Confirmation of RMOW critical infrastructure, and

- Conducting an extensive literature review of standards, references, relevant studies, and regulations

The outcome of the RMOW Community Wildfire Defence Plan report contains 29 observations and 53 recommendations that focus on the following strategic objectives:

- Enhanced public education for residents and visitors to the RMOW about FireSmart principles and wildfire prevention,
- Changes to municipal legislation and community planning to increase wildfire preparedness and resiliency in the RMOW.
- Increasing interagency cooperation within the RMOW and between external stakeholders including interoperability for all wildfire resiliency measures throughout the municipality.
- Increasing WFRS wildfire response capabilities including equipment apparatus and cross-training between all wildfire and response agencies within the region.
- Establishing a higher level of wildfire emergency preparedness within the municipality
- Continuing strategic vegetation management efforts at the community level, while ensuring the continued management of multiple forest values.

Community Overview

The RMOW is located on Highway 99 in a relatively narrow valley that straddles a mountain pass, with steep terrain on both the east and west side. The RMOW is home to almost 14,000 permanent residents and is visited by more than 3 million guests annually.

The hillsides are rich in mature conifer stands with some deciduous species mixed within. Above the forested areas are open alpine meadows and rock escarpment. There are numerous creeks throughout the RMOW, feeding into four lakes within the community. The village centre and older neighbourhoods are situated on the valley floor adjacent to Highway 99. However, most of the community has been developed on the hillside with steep, windy roadways with one way in and one way out.

Community and Wildfire Risk Assessments

The overall footprint, topography, transportation infrastructure, water sources, access, and egress routes and the neighbourhood areas within the municipality were the focus of the community and interface assessment. Touring the community provided an opportunity to an overall impression as to the extent of the wildland interface and/or intermix challenges.

Each area of the RMOW was evaluated during a second community tour, conducted by structural protection specialists as part of the community wildfire risk assessment. The RMOW FireSmart coordinator, WFRS Deputy Fire Chief and platoon captains accompanied the structural protection specialists during these assessments.

Numerous risk factors and physical features were identified in this assessment such as topography, transportation system (roads, bridges, trails etc.), evacuation routes, water sources, critical infrastructure, safe zones, FireSmart areas, interface, and intermix profiles.

Wildfire Risk Assessment and Interface Risk Map

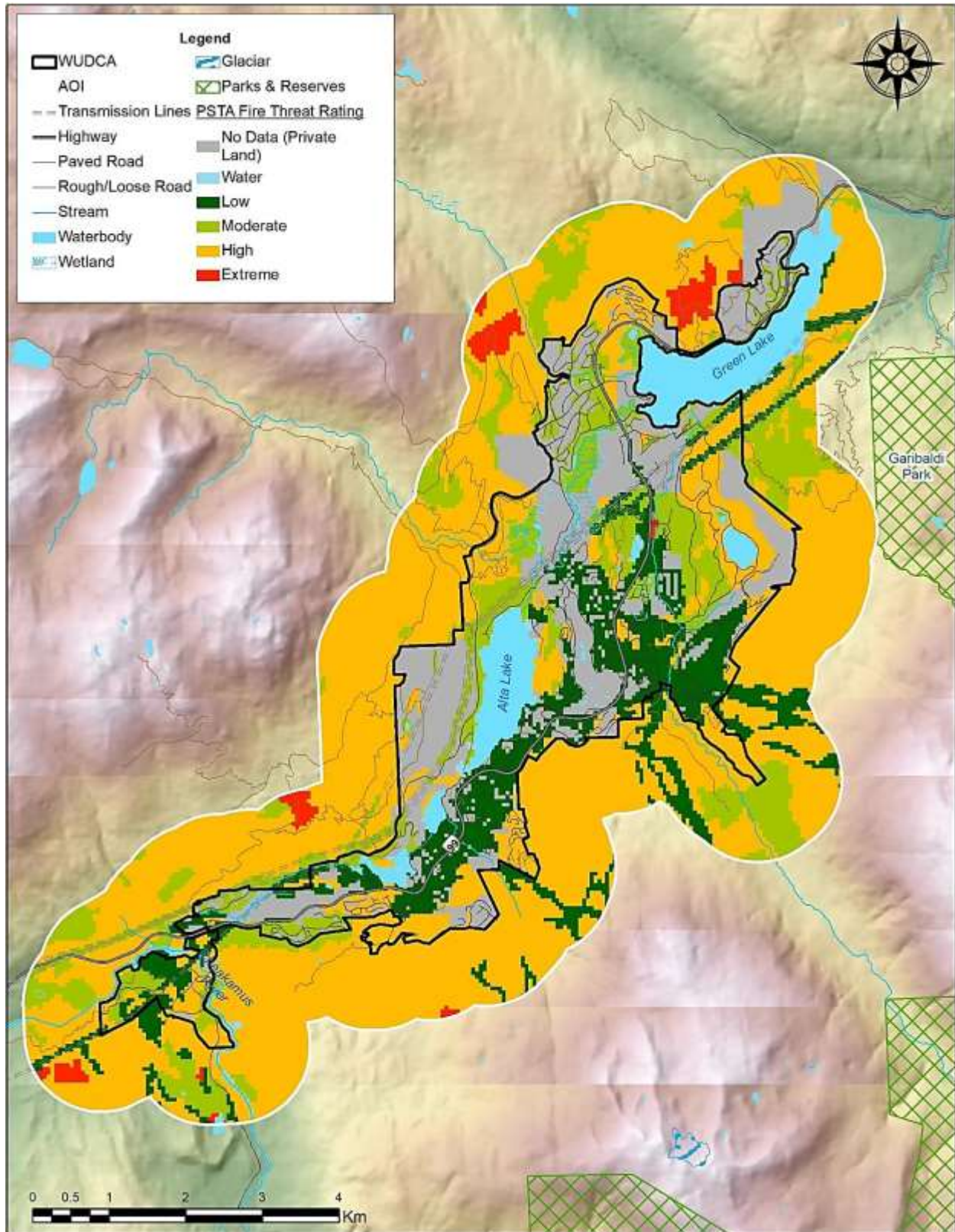
Data currently available in British Columbia (BC) only supports a fire threat analysis for provincial Crown land, leaving large tracts of private land within the Wildland Urban Interface (WUI) for which limited data is available. Since it is important to consider how much private land is presented in the WUI to complete a risk analysis, the buffer zone was expanded to 2.75 kilometres for structure classes with a density of more than 25 structures per hectare.

Five risk classification ratings were applied to the WUI polygons, with '1' being the highest relative risk and '5' being the lowest relative risk. The application of relative risk does not imply "no risk" since the goal is to identify areas where there is higher risk. Currently, the RMOW is at Risk Category 2 (RC2).

Wildfire interface class maps are intended to provide a strategic-level analysis of many different factors which contribute to wildfire threats. It is not intended to represent absolute, site-specific values. These maps were created at a provincial level, so users need to confirm that the initial wildfire-threat rating assigned to a given area is accurate by having a qualified professional validate that rating at the forest stand level.

The wildland fuel fire threat is shaded with colours numbered from 1 (low) to 10 (extreme) to identify the level of wildfire risk.

Wildfire Risk Assessment Map



Community Wildfire Hazard Rating and Assessment

The Community Wildfire Hazard Rating assesses homes and critical infrastructure as a fuel type. Using a provincial assessment with multiple-choice answers generates a score ranging from *Low to Extreme* for the potential consequences if a wildfire enters the community. This assessment examines specific information related to 'Community Design' and 'Community Challenges.'

Experienced BCWS Structure Protection Specialists (SPU) developed this community rating system to categorize communities into one of four Wildfire Hazard Rate levels. It's important to note this assessment provides a generalized summary for categorizing communities. The RMOW falls into the High-Risk category for Wildfire Hazard Rate.

Calculating Your Wildfire Hazard Rating		
Community Design Rating	Community Challenges Rating	Total
8	60	68
Low Fire Risk:	Overall Wildfire Hazard Rating = 0-25 points The chances of your community’s critical infrastructure surviving a wildfire are GOOD . Little is needed to improve your situation. Keep up the good work!	
Moderate Fire Risk:	Overall Wildfire Hazard Rating = 26-59 points The chances of your community’s critical infrastructure surviving wildfire are FAIR . Some minor improvements will make the identified structures more fire resistant. Check the categories on the form where you scored poorly.	
High Fire Risk:	Overall Wildfire Hazard Rating = 60-119 points The chances of your community’s critical infrastructure surviving a wildfire are NOT GOOD . Improvements in structure and site hazards are necessary.	
Extreme Fire Risk:	Overall Wildfire Hazard Rating = 120 or more points Your community’s critical infrastructure MAY NOT SURVIVE if a wildfire passes through the area. Take a serious look at your community and make improvements. If you don’t, you could be facing disaster. You’ll find that even small changes could make the difference between losing or saving your home.	
Notes:		
<div>a. Some neighbourhoods are one way in and out.</div> <div>b. Whistler is somewhat unique in that most neighbourhoods are classified as “Interface” but because of the wildland and ornamental fuel load between the residential structures, there are many characteristics of an “intermix” community thus scoring very high in this category.</div> <div>c. In areas where wildland fuel mitigation has not been conducted there is a great deal of dead fuel load.</div>		

Structure Protection Plans (SPP) and Structure Defence Plans (SPD)

A response to a fire that immediately threatens the community will be very tactical in response and be developed as a defence plan. Whereas a structure protection plan is strategic where resources such as water tanks and tenders, pumps, sprinklers are proactively pre-positioned or deployed to areas deemed to be at risk before a wildfire event.

When there is an established wildfire, where the threat to the RMOW has been determined, the BCWS will deploy an incident management team to coordinate the response which will include the respective fire service and resources. Fire officers and supervisors would hastily triage neighbourhoods to determine if the area is safe for crews to work in and which tactics would be employed to combat the impending fire. A Structure Defence Plan and Structure Protection Plan will detail the number of staff and resources that are required to execute the plan.

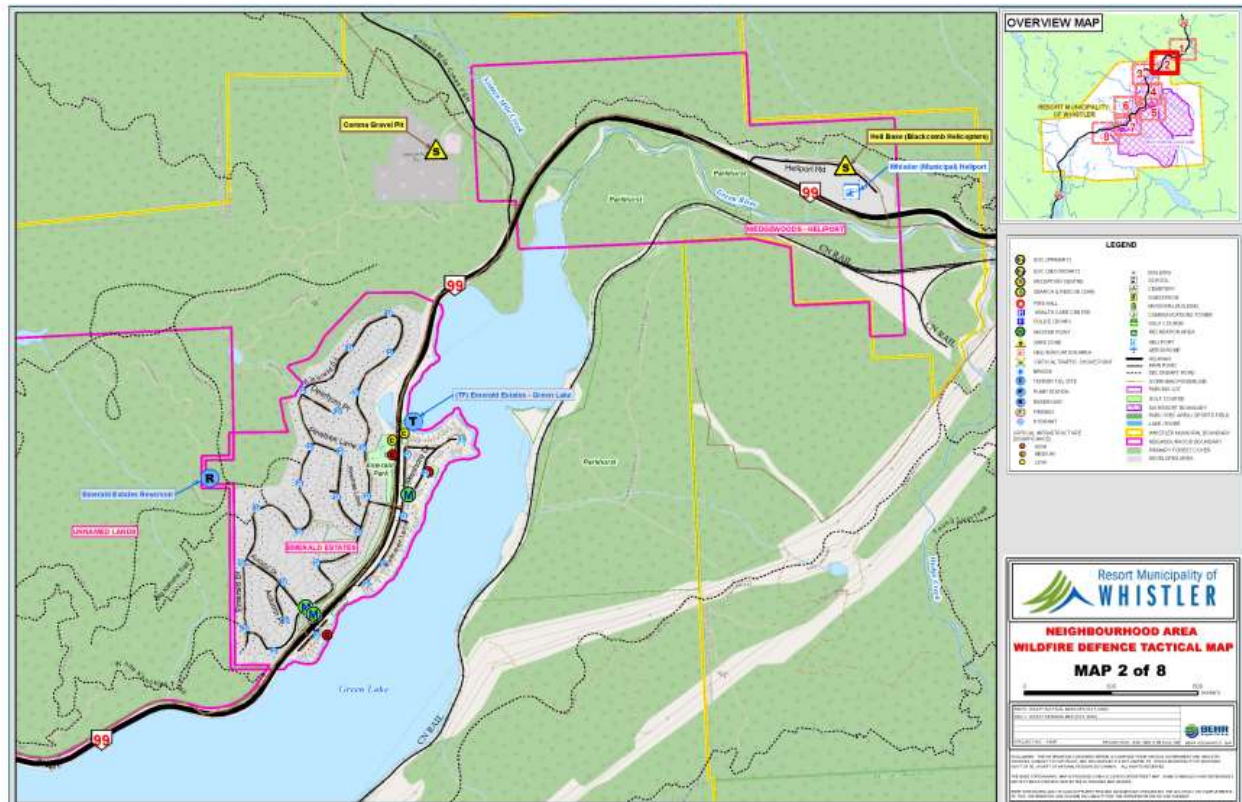
The tactical defence sheet below is one of nineteen developed for the RMOW and is provided as an example of a structure defence/protection plan that details tactical actions, resources, safe zone locations, and other factors to support structural defence or protection activities.

Primary Values	Location: Street / Unit #	Intermix / Interface	Viable Safe Zone Present under fire conditions and characteristics of the area/ neighborhood	Tactical Actions	Structure Defence Resources: i.e.: 3E = Type 3 Engine 2T = Type 2 Tender	Water Source	Comments
Location: Alpine Meadows North SDP							
<input checked="" type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industry <input type="checkbox"/> Farm <input type="checkbox"/> Other (~170)	Alpine Meadows (North)	Interface	Viable Safe Zone present: Meadow Park Rec Center Safe Zone 1.5 Kms	<input type="checkbox"/> Check & Go <input type="checkbox"/> Prep & Go <input checked="" type="checkbox"/> Prep & Defend <input checked="" type="checkbox"/> Fire Front Following <input checked="" type="checkbox"/> Bump & Run <input type="checkbox"/> Anchor & Hold <input type="checkbox"/> Tactical Patrol	1E x14 5E x5 2T x5 TFL x5	Hydrants Creek Water Tanks Bladders	This neighborhood has less elevation gain than most other neighbourhoods. Two means of egress to HWY 99. Lookouts are imperative as the vegetation, topography and narrow windy streets make it difficult to maintain perspective on fire conditions. Maintaining situational awareness and monitoring egress routes is paramount for crew safety. Structure Protection requires an additional: <ul style="list-style-type: none"> • SPCs x5 • 1T x5 • SPS x2

Spatial Representation of Wildfire Defence & Protection Features

The RMOW is divided into eight wildfire response zone maps for the purpose of providing spatial representation of the various wildfire defence and protection features. This includes water sources, safe zones, evacuation and muster points, and other key features. During a wildfire event, these maps will be essential in developing a protection strategies or defence tactics.

Sample Wildfire Response Zone map



Sample of a neighbour area tactical sheet

Pumps-Reservoirs-Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
TF - Emerald Estates - Green Lake	Corona Gravel Pit			Emerald Estates First Entrance from the West	Emerald Estates Reservoir	Medium		Emerald Park	Emerald Estates
Emerald Estates Reservoir	Heli Base (Blackcomb Helicopters)			Emerald Estates	Emerald Wells 1-3 & C12 Building (BUI10207)	High		Green Lake Launch	Unnamed Lands
				Intersection of Emerald and Autumn	Emerald Lake SLS	High		Green Lake Park	Wedgewoods - Heliport
					Emerald Estates SLS	High		Green Space(s)	
					Whistler (Municipal) Heliport	n/a			

Summary of Observations and Recommendations

The following recommendations are drawn from observations presented throughout the report. A summary table of recommendations that is grouped into three categories: policy, training, and emergency planning is provided below. The complete observations and recommendations are presented in numeric sequence as they appear in the report following the summary table.

A timeframe within 1 – 60 months (1 – 5 years) has been assigned to each recommendation, recognizing that the start and completion of any recommendation is based on annual corporate priorities and council approved budget allocations.

1 High	2 Medium	3 Low
1 -24 months	24 - 48 months	48 - 60 months

Cost neutral' refers to the use of internal staff through a normal work schedule. This would include support from volunteers and other internal departments that may or may not require additional resources (costs) to complete. Undertaking of these cost neutral recommendations are also contingent upon staff availability.

Progress on the implementation of recommendations should be monitored and potentially adjusted to reflect available funding and administrative capacity that may go beyond the five years identified.

Summary of Recommendations Table: Policy, Training, and Emergency Planning

#	Recommendation	Category	Recommended Completion	Priority	Source	Est. Cost	Comments
Policy Recommendations							
1	Review the wildfire protection guidelines and consider updating all areas beyond fire department 10-minute response time as High Risk.	Policy	12-24	1		Cost Neutral, staff time	
2	Amend zoning and parking Bylaw No. 303 to remove the blanket exemption for detached dwellings, duplex dwellings and auxiliary buildings ancillary of a detached dwelling or duplex dwelling from being exempt from obtaining a development permit for Wildfire Protection.	Policy	12-24	1		Cost Neutral, staff time	
3	Amend the DPA wildfire protection guidelines to align with FireSmart guidelines for safer construction methods.	Policy	24-48	1		Cost Neutral, staff time	
14	Clarify or establish the protocol with the province regarding the authority having jurisdiction for the closure or evacuation of Whistler.	Policy	24	1		Cost Neutral, staff time	
8	Amend the Fire and Life Safety bylaw 2201 to include specific conditions identified in the FireSmart Manual.	Policy	36-48	2		Cost Neutral, staff time	

#	Recommendation	Category	Recommended Completion	Priority	Source	Est. Cost	Comments
Policy Recommendations							
4	Transfer the FireSmart and Mitigation program to the Whistler Fire Rescue Service from the Protective Services Division as an integral component of the Fire Prevention Branch.	Policy	12-24	3		Cost Neutral, staff time	
7	The RMOW initiate the FireSmart Rebate Program, and other risk reduction incentives for residents and homeowners in high-risk areas.	Policy	18-24	3		To be determined through CRI rebate program	
9	Transfer the application and management of high-risk construction exemption regulations to the Whistler FireSmart Program team.	Policy	24-48	3		Cost Neutral, staff time	
39	Enhance the fee-for-service agreement with the SLRD to include wildfire response.	Policy	12-24	3		Cost Neutral, staff time	
Emergency Planning Recommendations							
5	Establish a FireSmart crew as part of the WFRS initial response assignment for confirmed structural fires and all reported wildfires during the wildfire season. Furthermore, train the FireSmart crew to the S185 Fire Entrapment and Avoidance and Safety, and equip with appropriate personal protective equipment and clothing.	Emergency Planning	6-12	1	Operating budget	\$20,000 for training and PPE	

#	Recommendation	Category	Recommended Completion	Priority	Source	Est. Cost	Comments
Emergency Planning Recommendations							
16	Develop as part of the emergency response plan, an emergency communications plan that includes a network of key external agencies and community partners.	Emergency Planning	24	1		Cost Neutral, staff time	
19	As an interim measure, remove the current pump and tank on the wildland truck at Station 1 and retrofit it with the pre-built wildland skid pack that was intended to be mounted on a UTV with skid unit.	Emergency Planning	Immediate	1	Operating budget	\$1,000	
21	Equip each wildland truck with a 1500-gallon bladder so water tenders can deliver water, dump, and return to refill.	Emergency Planning	24-48	1	Operating budget	\$7,500	
23	Mount the Wildland Fire Boss sprinkler equipment on the wildland response units.	Emergency Planning	12-18	1		Cost Neutral, staff time	
24	Increase the current inventory of forestry hose to include a reserve of 500' of 1- ½" hose and 500' of ¾" hose.	Emergency Planning	12-18	1	Operating budget	\$6,000	
28	Purchase a Type 2 Structure Protection Unit.	Emergency Planning	12-18	1	Capital budget	\$170,000 - \$200,000 range	

#	Recommendation	Category	Recommended Completion	Priority	Source	Est. Cost	Comments
Emergency Planning Recommendations							
34	Determine if the Whistler Blackcomb S-100 qualified staff can be identified as resource and if need be, deployed to support BCWS and WFRS wildfire operations.	Emergency Planning	12	1		Cost Neutral, staff time	
37	Staff Fire Stations 2 and 3 each with a rapid response team of two fulltime firefighters 24/7.	Emergency Planning	12-48	1	Operating budget	\$1.6M per station for 2 members 24/7. \$3.2M Total	Staffing timelines: Fire Station 2: 48 months Fire Station 3: 12 months
40	Establish QR codes for all RMOW emergency response maps.	Emergency Planning	12-24	1		Cost Neutral, staff time	
43	Complete the assessment of the community's water delivery (municipal and natural) for each neighbourhood and develop a wildfire water management plan.	Emergency Planning	48-60	1	Operating budget	TBD	3 rd party contractor to complete the assessment may be the preferred approach
47	Establish a cache of WFRS supplemental firefighting equipment.	Emergency Planning	12-18	1	Operating budget	\$15,000	
48	Confirm the waste transfer facility has the required fire flow and install an above ground 20,000-gallon tank for additional water availability during the summer months.	Emergency Planning	12-18	1	Capital budget	Cost of storage tank \$17,000	
50	Upgrade the storage tanks, drafting points, and pipelines.	Emergency Planning	12-18	1	Operating budget	\$5,000	

#	Recommendation	Category	Recommended Completion	Priority	Source	Est. Cost	Comments
Emergency Planning Recommendations							
10	Incentivise external sprinkler systems for residential applications in high risk and wildland neighbourhood areas that are FireSmart recognized.	Emergency Planning	36-60	2	Operating budget	Based upon purchase of 50 units: \$12,500	
18	Replace the type 7 engines with type 5 engines capable of carrying 400 gallons of water and equipment.	Emergency Planning	Based upon life cycle of current units	2	Capital budget	\$220,000 per unit	
25	Purchase three progressive hose packs for the WFRS wildland trucks.	Emergency Planning	12-18	2	Operating budget	\$500	
29	Establish a list of local contractors and heavy equipment that can be contracted by the RMOW in the event of a wildfire that is impinging upon the community.	Emergency Planning	12-18	2		Cost Neutral, staff time	
35	The RMOW should consider training all municipal outside workers to the S-100 and S-185 wildfire qualifications.	Emergency Planning	18	2		Cost Neutral, staff time and BCWS provides courses free	
41	Determine the best approach to provide backup power for all water reservoir pump stations to have continuous water supply for fire protection.	Emergency Planning	12-24	2		Contingent upon preferred approach	

#	Recommendation	Category	Recommended Completion	Priority	Source	Est. Cost	Comments
Emergency Planning Recommendations							
45	Obtain two large-volume water tanks to support SPU and external sprinkler system operations.	Emergency Planning	24-36	2	Operating or capital budget depending preferred option	\$35,000 for purchase \$5,500/day rental	
52	Install an external manual emergency alert system.	Emergency Planning	24-48	2	Operating budget	Rough order estimate: \$10-20K	Depending upon preferred system
53	Continue to research technologies that detect unstable materials that can create transfer and landfill facility fires.	Emergency Planning	recurring	2		Cost Neutral, staff time	
6	Expand the Sea-to-Sky Community FireSmart Resiliency Committee's terms of reference to include wildfire defence and protection strategies and tactics.	Emergency Planning	6-12	3		Cost Neutral, staff time	
11	Develop a FireSmart strategic plan that integrates the CWRP public education recommendations.	Emergency Planning	24-48	3		Cost Neutral, staff time	
12	Establish a list of non-government external agencies and community partners as EOC liaison officers within the revised CEMP.	Emergency Planning	12	3		Cost Neutral, staff time	
15	Establish a 'shelter-in-place' plan that designates facilities within the RMOW as suitable and safe for evacuees.	Emergency Planning	24	3		Cost Neutral, staff time	

#	Recommendation	Category	Recommended Completion	Priority	Source	Est. Cost	Comments
Emergency Planning Recommendations							
17	Procure electronic fire danger signs to increase public awareness and communications during emergencies.	Emergency Planning	24	3	Capital budget	\$16,000 per unit, \$64,000 to replace all	
20	Modify the wildland trucks to accommodate 150–200-foot pre-connected wildland fire hose for quicker deployment of attack lines.	Emergency Planning	12-24	3	Operating budget	\$5,000	
22	Replace the sport model UTV with a heavy-duty work type UTV that has more carrying and tow capacity.	Emergency Planning	36-48	3	Capital budget	\$40,000	
26	Purchase a Type 2 tactical tender.	Emergency Planning	24-48	3	Capital budget	\$150,000 each	
27	Provide all WFRS staff with NFPA 1977 compliant personal protective equipment.	Emergency Planning	12-18	3	Operating budget	\$15,000	
38	Expand the Whistler FireSmart team to 9 staff (two crews of four and the FireSmart Supervisor) and the program to twelve months a year.	Emergency Planning	12-24	3	Operating budget	\$250,000	
42	Confirm that the power supplier(s) have initiated power pole protection should a wildfire be encroaching the power grid and infrastructure.	Emergency Planning	Contingent upon active wildfire risk assessment	3		Cost Neutral, staff time	

#	Recommendation	Category	Recommended Completion	Priority	Source	Est. Cost	Comments
Emergency Planning Recommendations							
49	Establish an on-site water transport from the storage tanks to supplement or refill the firefighting tote.	Emergency Planning	12-18	3	Capital budget	\$25,000	
Training Recommendations							
13	Conduct annual wildfire training exercises or workshops that include external agencies and community partners such as such as First Nations, SLRD, Chamber of Commerce, Tourism Whistler, Whistler Blackcomb, BCWS Coastal Fire Center and Pemberton Fire Zone and regional fire departments.	Training	1-12 months and recurring annually	2	Operating budget	\$5,000 annually	
30	WFRS continue to use the BCWS Wildland Firefighter 1 as their standard training and host the BCWS Engine Boss training for all fire officers in the region. Furthermore, continue the Task Force Leader training for those officers and senior firefighters who did not attend previous training.	Training	12-48	2	Operating budget	BCWS doesn't charge for courses. Minor costs for host departments.	
31	Enhance the interoperability with the BCWS Coastal Fire Center and the Pemberton Fire Zone at the senior and operational levels.	Training	12 and recurring	2		Cost Neutral, staff time	

#	Recommendation	Category	Recommended Completion	Priority	Source	Est. Cost	Comments
Training Recommendations							
33	Deploy WFRS staff provincially to gain task force leader experience and knowledge.	Training	Annually and based on provincial requests	2	Operating budget	Dependent upon deployment requirements	
46	Increase the interoperability between WFRS and Whistler Blackcomb wildfire internal committee through regularly scheduled practice sessions.	Training	Recurring annually	2		Cost Neutral, staff time	
32	Conduct an annual spring wildfire training weekend with mutual aid partners Squamish FD, Pemberton FD and the BCWS Pemberton Zone staff.	Training	12 months and recurring annually	3	Operating budget	\$15,000 per year	
36	Whistler Blackcomb and RMOW senior staff conduct one tabletop wildfire exercise per year.	Training	12-24	3		Cost Neutral, staff time	
44	Conduct annual spring training to ensure WFRS and Whistler Blackcomb staff are well versed in the operations of utilizing snow making infrastructure for wildfire operations (tender fill and bladders).	Training	Recurring annually	3		Cost Neutral, staff time	
51	Conduct, as a minimum, annual site orientation and operational response familiarization sessions with WFRS and Utilities staff.	Training	6 months and recurring	3		Cost Neutral, staff time	
Total estimated operating budget, not including undetermined costs					\$3,577,500		
Total estimated capital budget, not including undetermined costs					\$751,000		

Observation #1: As detailed in the RMOW's Official Community Plan (OCP), the probability of a structure fire extending into a wildfire is equal to or greater than the converse. The three distinct wildfire protection guidelines of moderate, high, and wildland areas are based off the Provincial Wildland Urban Interface (WUI) rating which are primarily based on vegetation and do not reflect community design and community hazards such as fire department resource capabilities and response time. The wildfire risk increases greatly in areas where Fire Department response time is beyond 10 minutes.

Reference: Section 2.12 Development Permit Areas Wildfire Protection Guidelines, Page 27

Policy Recommendation #1: Review the wildfire protection guidelines and consider updating all areas beyond fire department 10-minute response time as High Risk.

Recommended Completion: 12-24 months

Estimated Cost: Cost neutral, staff time

Rationale: Structure fires that progress beyond ten minutes have the greatest potential to become fully involved and extend beyond the building of origin to adjacent exposures such as structures or forested areas.

Observation #2: The RMOW's development permit area wildfire protection guidelines have determined that all lands designated as 'High Risk', 'Moderate Risk' or 'Wildland' are designated as a Development Permit Area for the protection of development from wildfire. The zoning and parking Bylaw No. 303 provides a development permit exemption for detached dwellings and duplexes:

28. Development Permit Exemptions for Detached and Duplex Dwellings (Bylaw No. 2071)

1. *Development within the following categories is exempt from the requirement to obtain a development permit:*
 - a. *detached dwelling;*
 - b. *duplex dwelling;*
 - c. *auxiliary buildings ancillary to a detached dwelling or duplex dwelling.*
 - d. *subdivision to create parcels on which the only types of development permitted by this Bylaw are detached or duplex dwellings.*
2. *The exemption described in subsection 28 (1) does not apply if any part of the parcel of land that is the subject of the proposed development is:*
 - a. *within a development permit area for the protection of the environment, or for the protection of the environment, its ecosystems and biological diversity, and within 30 metres of the high-water mark of a stream; or*
 - b. *within the RI1 Residential Infill One zone.*

This exemption does not align with the FireSmart principles and the development permit areas wildfire protection guidelines.

Reference: Section 2.12 Development Permit Areas Wildfire Protection Guidelines, Page 27

Policy Recommendation #2: Amend zoning and parking Bylaw No. 303 to remove the blanket exemption for detached dwellings, duplex dwellings and auxiliary buildings ancillary of a detached dwelling or duplex dwelling from being exempt from obtaining a development permit for Wildfire Protection.

Recommended Completion: 12-24 months

Estimated Cost: Cost Neutral, staff time

Rationale: The RMOW's wildfire structural risk assessment is deemed to be extreme and as such development in all areas should follow the RMOW's guidelines. During an interface fire, homes usually burn down because of embers landing on and igniting the roof. Alternatively, embers land on or in a nearby bush, tree, or woodpile and, if the resulting fire is near the home, the walls of the home will ignite through radiant heat. Small fires in the yard can also spread towards the home and beneath porches or under homes. Therefore, the building material and construction techniques are a paramount concern for homes in the WUI.

Observation #3: The CWRP identified the need to amend the wildfire Development Permit Area (DPA) guidelines to strengthen certain aspects such as rated shake roofing. Other aspects such as rated glass and door assemblies, chimney spark arrestor, standard and slotted deck surfaces, and restricting retardant coatings that are deemed to be not durable would enhance structural resiliency for wildfire.

Reference: Section 2.12 Development Permit Areas Wildfire Protection Guidelines, Page 27

Policy Recommendation #3: Amend the DPA wildfire protection guidelines to align with FireSmart guidelines for safer construction methods.

Recommended Completion: 24-48 months

Estimated Cost: Cost neutral, staff time

Rationale: The FireSmart manual provides guidelines for safer construction methods. These include materials, building techniques and maintenance. The following is a summary of these construction and landscaping specifications that should be incorporated into the design guidelines for building on site:

Roofs

- Use only fire-retardant material (Class A materials) on roofs.
- Keep roofs clean of all combustible material.

Wood Chimneys

- All chimneys should have approved spark arrestors (securely attached and made of 12-gauge welded or woven wire mesh screen with mesh opening of less than 12 mm).
- Chimney outlets should have at least 3 meters clearance from all vegetation and obstructions.

- Chimney outlets should be 0.6 m higher than any part of the roof within 3 meters.

Siding

- Siding should be predominantly fire-resistant material.
- Siding should extend from the ground level to the roofline.

Windows and Door Glazing; Eaves, Vents and Openings

- Remove vegetation from within 10 meters of glazed openings unless there are solid shutters to cover the glazing.
- All eaves, attics, and underfloor openings need solid, non-flammable protective covers.
- Laminated glass and 20-minute rated door assemblies should be used on building surfaces facing the forest interface.

Balcony, Decks and Porches

- Deck surface material should be made of predominantly non-combustible or fire-resistant materials such as wood composite products.
- Slotted deck surface allows needle litter to accumulate beneath the deck.
- Provide access to this space to allow for removal of this debris.

Observation #4: Throughout British Columbia the typical approach to deliver the FireSmart program resides with the local fire department and within the legislated fire prevention program requirements. The primary focus of every fire department is fire prevention, and this includes inside and outside homes and structures. All seven principles of the FireSmart program are components of the WFRS fire prevention program.

Reference: Section 3.1.1 FireSmart Organization and Overview, Page 37

Policy Recommendation #4: Transfer the FireSmart and Mitigation program to the Whistler Fire Rescue Service from the Protective Services Division as an integral component of the Fire Prevention Branch.

Recommended Completion: 12-24 months

Estimated Cost: Cost neutral, staff time

Rationale: Fire prevention and education is part of the daily duties of the WFRS crews. Establishing a holistic approach to fire safety and education that includes FireSmart will reduce duplication and create several efficiencies and program effectiveness. This includes enhanced coordination for aspects such as: comprehensive public education program (inside and outside), planning and development reviews, building standards review and/or development, interoperability with internal and external agencies and enforcement. WFRS is currently involved in all these aspects and has the organizational capacity to support FireSmart Supervisor and crew.

Observation #5: WFRS has a minimum staffing of four career/fulltime firefighters and relies on fulltime call-back and Paid-on-Call (POC) members to augment their response. This staffing level and response capacity has a very limited critical task capability to mitigate a wildfire in the early stages. This is discussed in more detail at section 4.3 (Effective Response Force Assessment Wildfire Response Staffing Analysis).

Reference: Section 3.1.1 FireSmart Organization and Overview, Page 37

Emergency Planning Recommendation #5: Establish a FireSmart crew as part of the WFRS initial response assignment for confirmed structural fires and all reported wildfires during the wildfire season. Furthermore, train the FireSmart crew to the S185 Fire Entrapment and Avoidance and Safety, and equip with appropriate personal protective equipment and clothing.

Recommended Completion: 6-12 months

Estimated Cost: \$20,000 for training and PPE

Rationale: The wildfire risk within the RMOW is extreme and an initial response must be capable to perform the critical tasks before a small event becomes an established wildfire. The FireSmart crew can provide an enhanced initial response during normal workdays. This includes structural fires to monitor ember fallout into wildland fuels.

The FireSmart crew consists of fuel mitigation specialists, arborists and danger tree assessors and fallers that are trained to the basic fire suppression and safety (S-100) as recognized by the BC Wildfire Service.

Observation #6: There are two committees that focus on wildfire risk reduction and FireSmart. The RMOW internal committee is the Wildfire Internal Coordination Group. This committee includes lead members of all stakeholder groups: GM of Corporate Services and Public Safety, Planning, Parks, Infrastructure Services, WFRS, FireSmart, Climate and Environment, Emergency Planning, Bylaw, Legislative Services, Communications, and hired forestry consultants. The committee's focus is on planning, coordination of initiatives and progress tracking for all wildfire risk reduction strategies. The second group is the Sea-to-Sky CFRC group that focuses largely on FireSmart with some fuel and vegetation modification. This group includes representatives from the District of Squamish, Village of Pemberton, SLRD and the RMOW.

Reference: Section 3.1.1 FireSmart Organization and Overview, Page 37

Emergency Planning Recommendation #6: Expand the Sea-to-Sky Community FireSmart Resiliency Committee's terms of reference to include wildfire defence and protection strategies and tactics.

Recommended Completion: 6-12 months

Estimated Cost: Cost Neutral, staff time

Rationale: The CFRC scope is to evaluate, review and/or develop procedures, guidelines, best practices and promote the FireSmart program resources and information through education and public relations. To pool resources shared information and conduct training at the regional level the scope of the CFRC needs to include wildfire structural defence and protection strategies and tactics.

Observation #7: The CWRP includes other recommendations regarding the implementation of the FireSmart Rebate Program and incentives for residents to mitigate wildfire risks on their property such as a RMOW led tree replacement program. The CWRP identified 2023 to formally initiate these programs.

Reference: Section 3.2.1 Risk Reduction, Page 40

Policy Recommendation #7: The RMOW initiate the FireSmart Rebate Program, and other risk reduction incentives for residents and homeowners in high-risk areas.

Recommended Completion: 18-24 months

Estimated Cost: To be determined through CRI rebate program

Rationale: Effective risk reduction of the FireSmart principles provides the best defence to preserve lives and property in the event of a wildfire. The Community Resiliency Investment Program administered through the UBCM provides rebates for mitigation reduction to homeowners up to \$5,000.

Observation #8: The Fire and Life Safety bylaw 2201, empowers the fire chief to require an owner or occupier to undertake any actions the fire chief considers necessary for the purpose of removing or reducing anything or condition the fire chief considers is a fire hazard or increases the danger of fire.

Reference: Section 3.2.2 Enforcement Strategies, Page 43

Policy Recommendation #8: Amend the Fire and Life Safety bylaw 2201 to include specific conditions identified in the FireSmart Manual.

Recommended Completion: 36-48 months

Estimated Cost: Cost neutral staff time

Rationale: To retain the effectiveness of community wildfire resiliency specific enforceable conditions should be a regulation in the Fire and life Safety bylaw. The powers of the fire chief included in the fire and life safety bylaw are general in nature and interpretation can be challenged should enforcement action be conducted. Including specific conditions that are identified in the FireSmart manual provides clarity and establishes justifiable and credible regulation.

Observation #9: The WFRS manages the interface construction and maintenance regulation that includes high-risk construction restrictions and exemption regulations. These regulations are intended to ensure that sources of ignition are eliminated and/or mitigation measures are put in place to reduce the risk of wildfires during fire danger ratings of high and extreme. Furthermore, high-risk construction exemptions are only permitted to be used during water conservation stages 1, 2 and 3 as a water conservation regulation. Stage 4 water conservation construction activities are prohibited to avoid the possibility of compromising the municipal water system. The effectiveness and efficiency of the high-risk construction exemption regulations could be significantly enhanced under the WFP portfolio.

Reference: Section 3.2.2 Enforcement Strategies, Page 43

Policy Recommendation #9: Transfer the application and management of high-risk construction exemption regulations to the Whistler FireSmart Program team.

Recommended Completion: 24-48 months

Estimated Cost: Cost neutral, staff time

Rationale: The intention of the high-risk construction exemption regulation is directly applicable to the mandate of the WFP and wildfire interface. The WFP team are working in the community performing FireSmart requirements which increases their awareness of construction activities throughout the community. The application and compliance of these regulations can be enhanced because of their awareness.

Observation #10: There are several manufactures of exterior sprinkler systems. A number of these systems can easily be installed by homeowners and are not cost prohibitive. As previously identified, the use of these systems should be a supplement to already proven FireSmart strategies. The WFP could be enhanced to obtain an inventory of these systems and though the various public education programs and FireSmart activities demonstrate the installation and use to encourage homeowners to procure exterior sprinkler systems.

Reference: Section 3.3.1 External Sprinklers, Page 47

Emergency Planning Recommendation #10: Incentivise external sprinkler systems for residential applications in high risk and wildland neighbourhood areas that are FireSmart recognized.

Recommended Completion: 36-60 months

Estimated Cost: Based upon purchase of 50 units: \$12,500.

Rationale: High-risk and wildland neighbourhood areas in the RMOW that have been FireSmart designated provides the environment to use exterior sprinkler system to supplement mitigation measures already completed. RMOW purchase and use as an incentive to get homeowners to comply with FireSmart principles.

Observation #11: The Community Wildfire Resiliency Plan dated February 2022 included a comprehensive list of recommendations regarding the enhancement of the WFP public education program:

- Create a strategic communications plan that identifies key goals, objectives, and metrics to educate RMOW residents and tourists on wildfire risk and general FireSmart principles.
- Keep the Whistler FireSmart website up to date.
- Promote the FireSmart program via social media.
- Continue to host FireSmart workshops.
- Continue to present the FireSmart Education Box in local schools.
- Continue distribution of the Whistler FireSmart brochure and FireSmart handouts (e.g., Homeowner's Manual, Landscaping Guide, many available as QR Codes).
- Continue radio, signage, and in-person patrolling presence regarding wildfire risk and fire bans.
- Communicate the steps that the RMOW is taking to mitigate wildfire risk within the municipality.
- Provide educational signage in historic and current fuel treatment areas (e.g., Lost Lake, Nesters, Cheakamus Road).
- Promote program activities and include maps and statistics on the RMOW website; Consider distributing a semi-annual FireSmart newsletter.
- Assess and retrofit municipal critical infrastructure (i.e., communications, power, water, and sewer infrastructure) to FireSmart standards and provide educational signage. Track assessments, sites and work completed in a database linked to the RMOW GIS.
- Establish and promote a FireSmart rebate program for residents prioritized to high-risk neighbourhoods.
- Work with local nurseries and landscape companies to highlight FireSmart preferred vegetation, as per the FireSmart Canada Landscaping Guide.
- Display and promote the Landscaping Guide.

Through the FireSmart BC Plant Tagging Program or internal avenues, display and promote the landscaping guide. Tag preferred and high-risk vegetation; investigate discounts on preferred vegetation.

Reference: Section 3.4 Public Education, Page 50

Emergency Planning Recommendation #11: Develop a FireSmart strategic plan that integrates the CWRP public education recommendations.

Recommended Completion: 24-48 months

Estimated Cost: Cost neutral, staff time

Rationale: Based upon our review of the Whistler FireSmart Program (WFP) Strategic Plan 2023 – 2025 and the CWRP, a comprehensive, coordinated, and realistic strategic plan, that establishes priorities is required for the WFP. This should identify programs that are deemed highly effective by the public and provide enhanced FireSmart communication.

Observation #12: During the consultations and interviews, several observations related to the Comprehensive Emergency Management Plan (CEMP) emerged:

- The CEMP needs to be updated and is already in progress
- Since the 2010 Winter Olympics, there has not been consistent recurring training, including tabletop exercises and workshops
- Need to maintain interoperability and coordination with external agencies, such as First Nations, SLRD, Chamber of Commerce, Tourism Whistler, and Whistler Blackcomb
- During a wildfire, the procedure for closing down the resort or initiating a full evacuation when the province holds jurisdiction over Whistler Blackcomb
- Concern about the accuracy of the Sea to Sky multimodal evacuations plan (2019) modelling, which estimates that a no-notice mass evacuation of Whistler on a peak day will take approximately 15 hours (12.5 hours with traffic control based on 21,064 vehicles.
- Over 8,400 people within Whistler who do not have access to a vehicle, this includes resort staff, guests, and service sector workers.

Reference: Section 4.1 RMOW Emergency Response Plan, Page 53

Emergency Planning Recommendation #12: Establish a list of non-government external agencies and community partners as EOC liaison officers within the revised CEMP.

Reference: Section 4.1 RMOW Emergency Response Plan, Page 53

Recommended Completion: 12 months

Estimated Cost: Cost Neutral, staff time

Rationale: There are several external agencies or community partners that should be part of the EOC network. Many of these have resources or interests within the RMOW. In particular, the First Nations that have economic interests and culturally sensitive areas within the RMOW. Tourism Whistler has a broad reach in the RMOW and may have resources such as accommodations to support Emergency Operations Center (EOC) requirements.

Training Recommendation #13: Conduct annual wildfire training exercises or workshops that include external agencies and community partners such as First Nations, SLRD, Chamber of Commerce, Tourism Whistler, Whistler Blackcomb, BCWS Coastal Fire Center and Pemberton Fire Zone and regional fire departments.

Reference: Section 4.1 RMOW Emergency Response Plan, Page 53

Recommended Completion: 1-12 months and recurring annually.

Estimated Cost: \$5,000.00 annually

Rationale: Conducting wildfire response training with external agencies and community partners will result in a more inclusive, coordinated, and effective response.

Policy Recommendation #14: Clarify or establish the protocol with the province regarding the authority having jurisdiction for the closure or evacuation of Whistler.

Reference: Section 4.1 RMOW Emergency Response Plan, Page 53

Recommended Completion: 24 months

Estimated Cost: Cost Neutral, staff time

Rationale: The area encompassing the RMOW is multi-jurisdictional and includes Whistler Blackcomb and the province. Establishing an appropriate protocol will ensure coordination and communication occurs during significant emergency events.

Emergency Planning Recommendation #15: Establish a 'shelter-in-place' plan that designates facilities within the RMOW as suitable and safe for evacuees.

Reference: Section 4.1 RMOW Emergency Response Plan, Page 53

Recommended Completion: 24 months

Estimated Cost: Cost Neutral, staff time

Rationale: It is preferential to totally evacuate the public from an area being threatened by wildfire. This allows the safe movement and operations of emergency response vehicles and equipment and removes the public away from smoke inundation. Further, this approach is problematic with essentially one road in and one road out of Whistler. Shelter in place should be utilized in extreme situations and should be part of a temporary measure within a full evacuation.

Working with the Chamber of Commerce and Whistler hotels, particularly in the non-interface village area a modified shelter in place concept could be developed that allows evacuees into hotel and/or conference rooms. This would also assist evacuation phasing.

Observation #13: The CEMP has a section that identifies the various communication mediums used in the EOC such as radios, cell phones, internal EOC directory or satellite phones. During the onset of an emergency, it is essential that key external agencies and community partners are alerted. A leading practice in this regard is an emergency communications plan.

Reference: Section 4.1.1 Emergency Communications Plan, Page 55

Emergency Planning Recommendation #16: Develop as part of the emergency response plan, an emergency communications plan that includes a network of key external agencies and community partners.

Recommended Completion: 24 months

Estimated Cost: Cost Neutral, staff time

Rationale: The CEMP identifies several government and external agencies that capabilities to support EOC activations. Having a system that provides immediate alerts to these agencies and others such as the SLRD, First Nations, Whistler Blackcomb and other key community organizations will better prepare the community to react to a major emergency. An emergency communications plan is a strategic, step-by-step process that specifies when, how, and with whom the RMOW will communicate when an emergency occurs. The plan should be broad enough to apply to most emergency situations but specific enough for the RMOW response departments to follow.

Observation #14: There are four forest fire hazard index signs (pictured right) that are located throughout the RMOW. There is one just past the heliport on Highway 99, one on Fire Station 1, one on Highway 99 at the Alta Vista yard entrance and one on highway 99 at the Function Junction intersection. These signs are intended to advise the public and create awareness on current conditions as they relate to the wildfire threat. The current signs are not prominent to provide optimum public awareness and need to be manually adjusted as the conditions dictate.



Reference: Section 4.1.1 Emergency Communications Plan, Page 55

Emergency Planning Recommendation #17: Procure electronic fire danger signs to increase public awareness and communications during emergencies.

Recommended Completion: 24 months

Estimated Cost: \$16,000 per unit or \$64,000 to replace all the signs.

Rationale: In addition to displaying fire danger ratings, the signs can be used to support phased evacuations, closures, or other emergency messaging.



Observation #15: The WFRS has three wildland trucks that would qualify as a Type 7 Engine by the Inter-Agency Agreement. Each truck is a 3/4-ton single axle rear wheel drive flat deck with aluminum cabinets equipped with 50-gallon water tank and a 100 GPM pump. Equipment on the trucks includes various nozzles and hose appliances, about 400 feet of 1-1/2" hose and 500 feet of 3/4" Econo hose. The portable pump on the rear deck is piped in to a 50-gallon water tank and not ideally located to connect and deploy attack lines. There is no easy means to draft with this pump without disconnecting from the tank and there is no portable bladder or tank available to draft from. With the current pump configuration, there would be 30 seconds of water available to extinguish a fire before supplemental water is required. In the interim, WFRS is encouraged to weigh the three wildland trucks to ensure they are not overweight with a full crew of firefighters and explore the ability to carry more water.

Reference: Section 4.3.1 WFRS Apparatus and Equipment, Page 117

Emergency Planning Recommendation #18: Replace the type 7 engines with type 5 engines capable of carrying 400 gallons of water and equipment.

Recommended Completion: based upon life cycle of current units

Estimated Cost: \$220,000 per unit

Rationale: Type 7 engines are very light weight for their purpose and if feasible be repurposed within the municipality's fleet and replaced with a minimum 1-ton crew cabs that would qualify the unit as a Type 5 Engine by wildfire standards and capable of carrying 400 gallons of water and equipment. A complete wildland skid pack with a 50-gpm pump, water tank, foam tank and piping to easily pump from the tank, draft from an external water source, or fill the water tank from a hydrant is preferred.

Emergency Planning Recommendation #19: As an interim measure, remove the current pump and tank on the wildland truck at Station 1 and retrofit it with the pre-built wildland skid pack that was intended to be mounted on a UTV with skid unit.

Reference: Section 4.3.1 WFRS Apparatus and Equipment, Page 117

Recommended Completion: Immediate

Estimated Cost: \$1,000.00

Rationale: The WFRS has a prebuilt wildland skid pack (75-gallon tank, pump, and plumbing) that was intended to mount on their UTV, but it is currently stored and not in use as it is too heavy for the UTVs carrying capacity.

Emergency Planning Recommendation #20: Modify the wildland trucks to accommodate 150–200-foot pre-connected wildland fire hose for quicker deployment of attack lines.

Reference: Section 4.3.1 WFRS Apparatus and Equipment, Page 117

Recommended Completion: 12-24 months

Estimated Cost: \$5,000.00

Rationale: All the wildland attack hose is stored in rolls in cabinets and cannot be easily or quickly deployed for rapid use at a wildfire.

Emergency Planning Recommendation #21: Equip each wildland truck with a 1500-gallon bladder so water tenders can deliver water, dump, and return to refill.

Reference: Section 4.3.1 WFRS Apparatus and Equipment, Page 117

Recommended Completion: 24-48 months

Estimated Cost: \$7,500.00

Rationale: To sustain an adequate water supply to support WUI operations and the wildland units water tenders can deliver water to the bladders, dump and return to refill.

Observation #16: WFRS has a 2-seat sport style UTV. It is currently set up with a patient transport and attendant skid pack for responding off road to injured or ill patients. As previously identified a wildland skid pack was purchased for this UTV unit, but it is too heavy for the UTVs carrying capacity. A small trailer was acquired to transport the skid unit but was determined to be too top heavy and without trailer suspension.

Reference: Section 4.3.1 WFRS Apparatus and Equipment, Page 117

Emergency Planning Recommendation #22: Replace the sport model UTV with a heavy-duty work type UTV that has more carrying and tow capacity.

Recommended Completion: 36-48 months

Estimated Cost: \$40,000.00

Rationale: A UTV that is designed to support medical responses and capable to also support WUI operations for off road and incidents enhances the rapid deployment of WFRS resources and response capabilities. An operational needs analysis should be conducted to determine the types of responses or events a new UTV would attend and include consultation with manufacturers to ensure operational requirements are identified. This should include transporting trailer, wildland skid pack, patient carrying skid and supporting equipment.

Emergency Planning Recommendation #23: Mount the Wildland Fire Boss sprinkler equipment on the wildland response units.

Reference: Section 4.3.1 WFRS Apparatus and Equipment, Page 117

Recommended Completion: 12-18 months

Estimated Cost: Cost Neutral, staff time

Rationale: The Wildland Fire Boss sprinklers are currently stored in the equipment cache in the fire station making it onerous to deploy. Mounting them on the wildland truck will ensure these sprinklers are more readily available when needed.

Emergency Planning Recommendation #24: Increase the current inventory of forestry hose to include a reserve of 500' of 1- ½" hose and 500' of ¾" hose.

Reference: Section 4.3.1 WFRS Apparatus and Equipment, Page 117

Recommended Completion: 12-18 months

Estimated Cost: \$6,000.00

Rationale: WFRS has the complement of forestry hose on their wildland trucks. An additional inventory stored at the fire station would support replacement, repairs, and maintenance.

Emergency Planning Recommendation #25: Purchase three progressive hose packs for the WFRS wildland trucks.

Reference: Section 4.3.1 WFRS Apparatus and Equipment, Page 117

Recommended Completion: 12-18 months

Estimated Cost: \$500.00 – pack only.

Rationale: Progressive hose packs are a common piece of wildland gear that enables crews to easily and quickly advance hose along the flank of a fire or extend a hose stretched from the apparatus. These hose packs would require 200' of 1.5" single jacket hose, spanners, hose strangler, 3-way valves and thieves for easy hose deployment and eliminate crews having to return to the truck for additional equipment.

Observation #17: WFRS currently relies on municipal dump trucks equipped with water tanks to respond to fires and deliver water when hydrants are not available. There are several operational issues with this practice:

- The availability public works staff to respond with water at any time,
- WFRS staff are not trained or familiar with the municipal dump trucks operation.
- The tanks cannot be filled completely due to no baffles inside the tanks to keep the water from sloshing during transport.
- The dump trucks do not carry water bladders and need to remain on site to nurse other apparatus until they are empty.

Reference: Section 4.3.1 WFRS Apparatus and Equipment, Page 117

Emergency Planning Recommendation #26: Purchase a Type 2 tactical tender.

Recommended Completion: 24-48 months

Estimated Cost: \$150,000.00 each

Rationale: The addition of this unit would eliminate the need to use dump trucks and water tanks as makeshift water tenders. A Type 2 tactical tender with a minimum 1500-gallon tank, 2000-gallon bladder and the ability to pump and roll with a bumper mounted remote-control nozzle and include all components and equipment to qualify it as a Type 2 apparatus by Inter Agency Agreement Standards.

Observation #18: WFRS provides cotton coveralls, work hardhats, leather station boots and leather gloves to all career staff working at wildland fire incidents. Additional hardhats are stored on the wildland trucks for the POC staff that respond from home.

Reference: Section 4.3.1 WFRS Apparatus and Equipment, Page 117

Emergency Planning Recommendation #27: Provide all WFRS staff with NFPA 1977 compliant personal protective equipment.

Recommended Completion: 12-18 months

Estimated Cost: \$15,000

Rationale: WorkSafe BC regulations for firefighters requires appropriate personal protective equipment for the services provided. NFPA 1977 compliant personal protective equipment includes cotton or Nomex coveralls or long sleeve shirt and pants that comply with NFPA standards. Each member should also have their own hardhat, leather gloves and 8" boots to ensure they are properly protected on responses.

Observation #19: As previously indicated, the RMOW is located within a wildland interface/intermix area that is assessed as at a high risk for wildfire. For WFRS to have the capability to protect an entire interface neighbourhood (e.g., up to 100 homes) a Type 2 SPU is required.

Reference: Section 4.3.1 WFRS Apparatus and Equipment, Page 117

Emergency Planning Recommendation #28: Purchase a Type 2 Structure Protection Unit.

Recommended Completion: 12-18 months

Estimated Cost: \$170,000-200,000 range

Rationale: A Type 2 SPU combined with the WFRS apparatus and equipment recommendations identified in this report provides the minimum resources to attempt the protection of 100 homes in a Whistler neighbourhood area. The unpredictability of wildfire particularity in a high-risk area makes it impossible to guarantee the sustainability of a neighbourhood in a wildfire.

Observation #20: The BCWS maintains an inventory of wildfire equipment such as tanks, pumps, and SPU trailers. This includes:

- 40- Type 2 SPU trailers, (located with contractors and fire departments and are established if they meet inventory specs and inspection requirements), and
- 7 - Type 1 trailers and 2-Type 2 trailers.

Heavy equipment such as dozers, excavator, bunchers etc. are contracted locally by BCWS if they have the correct insurance and WorkSafe BC certifications.

Reference: Section 4.3.1 WFRS Apparatus and Equipment, Page 117

Emergency Planning Recommendation #29: Establish a list of local contractors and heavy equipment that can be contracted by the RMOW in the event of a wildfire that is impinging upon the community.

Recommended Completion: 12-18 months

Estimated Cost: Cost neutral staff time

Rationale: Depending upon the wildfire season and active fires in BC, inventories of equipment may not be readily available from BCWS. Having a list of local resources to draw upon will enhance the operational effectiveness in the event of a wildfire.

Observation #21: The WFRS practices the current standard for career and POC staff wildland training. All suppression staff have completed the BCWS WSPP-WFF1 as their foundational wildland training. This course is based on the National Fire Protection Association Standard 1051: Standard for Wildland Firefighting Personnel Professional Qualifications and is designed enhanced specifically for the structural firefighter. All career and paid on call firefighters also have the BCWS WSPP-115 Structure Protection Sprinkler course. Most Company Officers have completed the BCWS Task Force Leader course. This course is based off the BCWS S330 Course for Task Force Leader and was modified for structural firefighting in the wildland urban environment. This course is for structure defence supervisors who manage 5-7 fire apparatus and crews during an emergency.

Reference: Section 4.4.1 WFRS Wildland Training, Page 124

Training Recommendation #30: WFRS continue to use the BCWS Wildland Firefighter 1 as their standard training and host the BCWS Engine Boss training for all fire officers in the region. Furthermore, continue the Task Force Leader training for those officers and senior firefighters who did not attend previous training.

Recommended Completion: 12-48 months

Estimated Cost: BCWS doesn't charge for courses. Minor costs for host departments

Rationale: The BCWS Engine Boss course is based off the National Wildland Coordination Group standard S231 course and designed for structural fire officers to manage a single resource structural or wildland engine and water tender with crew. The BCWS Task Force Leader is based off the National Wildland Coordination Group S330 as intended for supervisors who manage 5-7 crew bosses and their crews.

Training Recommendation #31: Enhance the interoperability with the BCWS Coastal Fire Center and the Pemberton Fire Zone at the senior and operational levels.

Reference: Section 4.4.1 WFRS Wildland Training, Page 124

Recommended Completion: 12 months and recurring

Estimated Cost: Cost Neutral, staff time

Rationale: Developing a close working relationship with the BCWS Coastal Fire Center and the Pemberton Fire Zone will significantly enhance interoperability between these agencies. Recurring collaborative meetings with senior leaders to gain insight on respective working procedures including defensive strategies and operational tactics if an established wildfire is threatening the Whistler community. Frontline operational responders from all three agencies need to be provided the opportunity to practice and develop working relationships. Effective inter-agency collaboration will increase response capabilities, coordination, and firefighter safety.

Training Recommendation #32: Conduct an annual spring wildfire training weekend with mutual aid partners Squamish FD, Pemberton FD and the BCWS Pemberton Zone staff.

Reference: Section 4.4.1 WFRS Wildland Training, Page 124

Recommended Completion: 12 months and recurring annually

Estimated Cost: \$15,000 per year

Rationale: Joint training should include fundamental wildland initial attack operations, sprinkler deployment tabletop exercises, safe work area reconnaissance and other wildfire leading practices. Rotational hosting and collaborative development of training curriculum would be an effective approach.

Training Recommendation #33: Deploy WFRS staff provincially to gain task force leader experience and knowledge.

Reference: Section 4.4.1 WFRS Wildland Training, Page 124

Recommended Completion: Annually and based upon provincial requests

Estimated Cost: dependent upon deployment requirements

Rationale: WFRS should enhance the practice of deploying staff provincially due to staffing challenges. Officers who have taken the Task Force Leader course be encouraged to deploy provincially as a single resource to be mentored in the field to gain valuable experience that will enhance WFRS wildfire fighting capabilities.

Observation #22: Discussion with Whistler Blackcomb revealed that the resort has 100-150 staff members that are S-100 wildfire qualified. The resort has maintained good working relationships with BCWS and the RMOW at the operational level. The pre-Olympic build up included several exercises including tabletop and evacuations.

Reference: Section 4.4.1 WFRS Wildland Training, Page 124

Emergency Planning Recommendation #34: Determine if the Whistler Blackcomb S-100 qualified staff can be identified as resource and if need be, deployed to support BCWS and WFRS wildfire operations.

Recommended Completion: 12 months

Estimated Cost: Cost Neutral, staff time

Rationale: Additional trained S-100 qualified staff could supplement WFRS response to a wildfire.

Observation #23: To enhance an initial response within the RMOW, all municipal outside workers should be trained to the S-100 and S-185 levels for wildfires. This would include Parks and Recreation and Public Works staff.

Reference: Section 4.4.1 WFRS Wildland Training, Page 124

Emergency Planning Recommendation #35: The RMOW should consider training all municipal outside workers to the S-100 and S-185 wildfire qualifications.

Recommended Completion: 18 months

Estimated Cost: Cost Neutral, Staff time and BCWS provides courses free

Rationale: The wildfire risk hazard potential emphasizes the need for an aggressive and timely initial response to prevent a small fire from developing into a fully established wildfire. Having the RMOW's outside staff trained to respond along with WFRS and the WFP team enhances the initial response capabilities.

Training Recommendation #36: Whistler Blackcomb and RMOW senior staff conduct one tabletop wildfire exercise per year.

Reference: Section 4.4.1 WFRS Wildland Training, Page 124

Recommended Completion: 12-24 months

Estimated Cost: Cost neutral, staff time

Rationale: The resort is a major community partner in the RMOW with significant resources to support the BCWS and the WFRS in the event of an established wildfire that threatens the community. It is essential that these agencies have coordinated responses as part of the structural defence plan.

Observation #24: During the consultation process and discussions with the Fire Chief and WFRS staff, the initial response capabilities were identified as a shortfall. The review of WFRS's initial wildfire response capabilities considered the following factors:

- Risk of a wildfire occurring in the RMOW is assessed as high and is more likely from a probability perspective to originate within the RMOW in comparison to a wildfire that encroaches on the community. The latter may provide some advance time to stage wildfire response resources and is complexly contingent upon the conditions at the time. A wildfire occurring within the RMOW must be under control before becoming an established or crown event.
- Consequences of an established wildfire within the RMOW would be catastrophic with potential for loss of life and property, environmental damage, degradation of Whistler's profile and global reputation.

- Population fluctuates depending on the season and day of the week. While the resident population is approximately 14,000, there can be upwards of approximately 60,000 people in Whistler on a peak day. Whistler sees an average of 3 million visitors per year with about 40 per cent of visitation in winter and 60 per cent in summer during the wildfire season.
- Increases in population exacerbates the limitations of transportation infrastructure including the provincial highway and RMOW roadways and thereby creating timely response challenges for the WFRS.
- Increase demands of service from the WFRS occurring during the peak population periods.
- Limited initial critical task capability of the WFRS combined with the limitations of the POC staffing must be addressed.

Reference: Section 4.5 Wildfire Response Staffing Capabilities, Page 127

Emergency Planning Recommendation #37: Staff Fire Stations 2 and 3 each with a rapid response team of two fulltime firefighters 24/7.

Recommended Completion: Station 3: 12-24 months, Station 2: 24-48 months

Estimated Cost: 1.6M per station for 2 members 24/7 total cost 3.2M

Rationale: The community wildfire assessment indicates that the RMOW is at a high-risk rating. This combined with the other factors such a fluctuating population, increase call volume, transportation infrastructure limitations and the current initial critical task capability of WFRS impedes a rapid response to a wildfire originating within the RMOW. Staffing stations 2 and 3 provides rapid response capabilities in the south and north zones.

Emergency Planning Recommendation #38: Expand the Whistler FireSmart team to 9 staff (two crews of four and the FireSmart Supervisor) and the program to twelve months a year.

Reference: Section 4.5 Wildfire Response Staffing Capabilities, Page 127

Recommended Completion: 12-24 months

Estimated Cost: \$250,000

Rationale: To implement the various FireSmart public community and education program a year-round program would be more effective. Wildfire assessments and fuel modification activities would be conducted during the summer months with planning, training, public education, and communication focussed during the winter. Furthermore, having two FireSmart teams of four working throughout the municipality bolsters the WFRS initial response capability for wildfire event within the RMOW. During the consultation phase it was identified that the retention of qualified seasonal workers was creating program delivery challenges. Full time positions may alleviate this occurrence.

Observation #25: The RMOW and SLRD fee for service agreement to provide fire protection to Wedgewoods Estates that excludes wildland interface fires that is not strictly for the purpose of structural protection related activities unless WFRS is exclusively and solely tasked by BCWS. A wildfire that is encroaching on Wedgewoods Estates or originates within the community poses a threat to the RMOW and as such must include rapid intervention before becoming an established wildfire.

Reference: Section 4.5 Wildfire Response Staffing Capabilities, Page 127

Policy Recommendation #39: Enhance the fee-for-service agreement with the SLRD to include wildfire response.

Recommended Completion: 12-24 months

Estimated Cost: Cost Neutral, staff time

Rationale: The recommended rapid response team at Station 2 provides the capability to intervene a wildfire at Wedgewoods Estates before progressing into a major event or impeding fire spread. While dependent upon the specific conditions of the wildfire, WFRS can in most cases respond before the BCWS mobilizes.

Observation #26: The RMOW was segregated into eight structural protection/defence zones for tactical and response and defence planning operations. Rapid access to this spatial data is essential for the senior structure protection specialists who will manage both the structure defence and structure protection operations.

Reference: Section 4.6 GIS Spatial Data Analysis, Page 130

Emergency Planning Recommendation #40: Establish QR codes for all RMOW emergency response maps.

Recommended Completion: 12-24 months

Estimated Cost: Cost neutral staff time

Rationale: QR codes will provide timely access to the structural protection or defence data in the EOC, neighbourhood area, or at a wildfire scene. This will enhance wildfire operations, planning, and responder safety.

Observation #27: Discussions with the Utilities Manager, review of the 2014 Fire Underwriters Survey (FUS) and the 2022 CWRP identified the following factors:

- Since 2014, the water supply systems have basically remained the same with only minor upgrades,
- During power outages the water systems may be affected as there is no backup power source. A rough order magnitude cost estimate to have all the pump stations equipped with backup power is not available and is deemed “several million dollars” given the number of sites that would need backup power.

- Assessing the community's water delivery (municipal and natural) for each neighbourhood to develop and test specific neighbourhood capabilities is recommended by the CWRP. Recovery rates will determine how the volume of water that can be discharged and for how long before the system's water volume is operationally compromised, and
- Whistler Blackcomb has 3 reservoirs that total 54 million gallons of water that is available with over 950 hydrants in the ski run and village areas. There are over 360 snow guns some of which, could be utilized during a wildfire event. Discussions with Whistler Blackcomb staff indicate that the water system would only access a very few structures to support sprinkler systems. Using the Whistler Blackcomb water system would be effective to fill bladders or tenders at the base of the ski-run. The water pressure in the system is well over 1000 psi and a pressure reducing valve must be used for wildfire operations. There was conflicting information regarding WFRS and Whistler Blackcomb staff training on utilization of this water system.
- Trials conducted by Vail resorts indicate that snow guns are not as effective as SPUs or external sprinkler systems.

Reference: Section 5.2.2 Static Water Fill Sites, Page 141

Emergency Planning Recommendation #41: Determine the best approach to provide backup power for all water reservoir pump stations to have continuous water supply for fire protection.

Recommended Completion: 12-24 months

Estimated Cost: Contingent upon preferred approach.

Rationale: Emergencies such as wildfire can impact the power grid. Often, power distribution in the local area is interrupted by wildfires. This may include burned transmission lines or power poles. Underground power is less at risk, however substations and large transmission corridors may be threatened or impacted. If the permanent installation of backup power sources for the RMOW water distribution system is cost prohibited, alternative strategies such as a standing offer rental agreement for portable industrial generators should be established.

Emergency Planning Recommendation #42: Confirm that the power supplier(s) have initiated power pole protection should a wildfire be encroaching the power grid and infrastructure.

Reference: Section 5.2.2 Static Water Fill Sites, Page 141

Recommended Completion: Contingent upon active wildfire risk assessment

Estimated Cost: Cost Neutral, staff time

Rationale: The Whistler EOC protocols include a confirmation check that the power supplier (Fortis/ BC Hydro) crews have applied a fire resistive gel on wooden power poles to reduce the damage and loss to fire.

Emergency Planning Recommendation #43: Complete the assessment of the community's water delivery (municipal and natural) for each neighbourhood and develop a wildfire water management plan.

Reference: Section 5.2.2 Static Water Fill Sites, Page 141

Recommended Completion: 48-60 months

Estimated Cost: TBD

Rationale: Structure Protection Specialists will need to ensure that there is ample water available to defend and protect structures against an impending wildfire and will need to collaborate with water utility staff to understand the reservoirs and water systems that supply hydrant water. It is imperative that Structure Protection Specialists know if the water system has back up power, how much water is available on each system and what the refill rates are so they can plan how sprinkler systems are built out and the duration of their operation considering how much the water system can replenish itself. If conditions allow, large tanks (20K-40K litres) can be strategically placed in advance of the fire to enhance the run time of sprinklers and reserve water for fire trucks. A leading practice is to develop a water management plan for fire protection.

Training Recommendation #44: Conduct annual spring training to ensure WFRS and Whistler Blackcomb staff are well versed in the operations of utilizing snow making infrastructure for wildfire operations (tender fill and bladders).

Reference: Section 5.2.2 Static Water Fill Sites, Page 141

Recommended Completion: recurring annually

Estimated Cost: Cost Neutral, staff time

Rationale: The Whistler Blackcomb water system is a viable resource and part of the community's wildfire defence plan. The snow making infrastructure and equipment requires knowledge and experience to operate properly and safely. It is essential that the joint training has the Whistler Blackcomb staff performing and monitoring all connections and equipment used to deliver water from the high-pressure snow making system to wildfire defence resources. Standard Operating Guidelines/ Procedures must be collaboratively created to ensure safe effective operations.

Emergency Planning Recommendation #45: Obtain two large-volume water tanks to support SPU and external sprinkler system operations.

Reference: Section 5.2.2 Static Water Fill Sites, Page 141

Recommended Completion: 24-36 months

Estimated Cost: \$35,000 for purchase or \$5,500 per day rental

Rationale: Large volume portable tanks are extensively used in wildfire operations. These tanks would be deployed in RMOW high and extreme rated interface/intermix neighborhood areas to support the water supply, SPUs, or external residential sprinklers and to protect any critical infrastructure. Based upon the desired capacity to protect two neighbourhood areas (approximately 100 homes) two tanks could be purchased or rented. The latter does not confirm necessarily availability when required compared to owning these tanks. Precise locations would be tactical and based upon the specifics of the situation.

Emergency Planning Recommendation #46: Increase the interoperability between WFRS and Whistler Blackcomb wildfire internal committee through regularly scheduled practice sessions.

Reference: Section 5.2.2 Static Water Fill Sites, Page 141

Recommended Completion: recurring annually

Estimated Cost: Cost Neutral, staff time

Rationale: Whistler Blackcomb has an internal wildfire committee that practices every two weeks similar to a “fire brigade”. They provide initial action on a fire that occurs at their workplace (typically wildfire). There has been joint response where WFRS has responded however, because fire events do not occur often, there is an opportunity to improve the coordinated response to fires or other emergencies through training and practice sessions. Tabletop and practical exercises would enhance coordinated responses and operational effectiveness.

Emergency Planning Recommendation #47: Establish a cache of WFRS supplemental firefighting equipment.

Reference: Section 5.2.2 Static Water Fill Sites, Page 141

Recommended Completion: 12-18 months

Estimated Cost: \$15,000

Rationale: Whistler Blackcomb has considerable infrastructure at the top of Whistler and Blackcomb Mountains that are critical to their ongoing operation. These include the gondola lift buildings, restaurants, and day lodges. Any joint response from WFRS would be via the dirt road from the village up to the mountain top or via the public gondola. In either case, equipment would have to be transported and delivered with the firefighters. To enhance the rapid deployment of equipment and control a wildfire or structure fire in the early stages WFRS would require a designated building for storing critical firefighting equipment including:

- 800’ of 1.5” single jacket wildland firehose. 200’ of this hose in a progressive hose pack.
- 3 Hanson nozzles
- (4) 3-way valves

- (5) 1.5" to .5" water thieves
- 600' of ½" econo hose
- (3) ½" Brass nozzles
- Hose strangler
- basic structural firefighting equipment.

Observation #28: The waste transfer station is one of the largest critical infrastructure facilities and is located at the south end of the community. As detailed in the RMOW Official Community Plan (OCP):

- Because wildfire can be triggered from structure fires and human activity, the probability of a structure fire in Whistler spreading to the surrounding forest is equal to, or greater than, the probability of a wildfire spreading from the forest into the community.

Since 2018, there has been seven fires at this facility. While not conclusive, a potential cause origin of these fires may be from unstable refuse such as lithium batteries or other self-igniting materials. As such this facility is considered as a high risk to contribute to wildfire. The only available firefighting water comes from a 5 gallon per minute well and stored in underground tanks for a total of 46,000 gallons (two tanks: 20,000 & 26,000). There are no other viable static water sources, and the closest hydrant is over 7 kilometers away at Function Junction. It is also recommended that the waste management facility purchase and install an above ground 20000-gallon tank for additional water availability during the summer months.

Reference: Section 5.3 Waste Transfer Facility, Page 145

Emergency Planning Recommendation #48: Confirm the waste transfer facility has the required fire flow and install an above ground 20,000-gallon tank for additional water availability during the summer months.

Recommended Completion: 12-18 months

Estimated Cost: Cost of storage tank \$17,000

Rationale: Transfer facilities with buildings, employing staff during operating hours, the water for fire protection should be provided in accordance with the Water Supply for Public Fire Protection — A Guide to Recommended Practice, as available through the Insurers Advisory Organization¹.

¹ <https://www2.gov.bc.ca/assets/gov/environment/waste-management/garbage/guidelinesestablishingtransferstationsmunicipalsolidwaste.pdf>

Observation #29: Should a fire begin within the wood chip piles or is caused indirectly by wind-borne embers the facility staff must be able to quickly transport the firefighting tote to a safe location where they can begin extinguishing the fire. They must also be able to transport more water from their reserve water to supplement or refill the firefighting tote. The firefighting response plan for the facility is to have one or two municipal dump trucks equipped with 1500-gallon tanks respond to support with water delivery. The facility staff have no means of transporting water on site other than the 300-gallon tote mentioned above.

Reference: Section 5.3 Waste Transfer Facility, Page 145

Emergency Planning Recommendation #49: Establish an on-site water transport from the storage tanks to supplement or refill the firefighting tote.

Recommended Completion: 12-18 months

Estimated Cost: \$25,000.00

Rationale: If a response from the WFRS and/or the municipal dump trucks was delayed or unavailable it would be difficult for the facility staff to manage the fire. Ideally, the facility should have a 1,000-gallon water tender for this purpose but a 500–1,000-gallon water tank being trailered or carried by heavy equipment may be a viable substitute. This tank would enable staff to transport water from the storage tanks to the mobile firefighting tote while WFRS is en route.

Emergency Planning Recommendation #50: Upgrade the storage tanks, drafting points, and pipelines.

Reference: Section 5.3 Waste Transfer Facility, Page 145

Recommended Completion: 12-18 months

Estimated Cost: \$5,000.00

Rationale: The two water storage tanks on site are equipped with PVC piping for drafting purposes. This PVC piping should be replaced with steel or aluminum piping to ensure durability and longevity. The northeast tank has two drafting points. One of which has piping that has been installed above an overhead door and is located against a building. This piping should be moved to drop from the tank and over the block retaining wall for a shorter draft and to create distance from the structure.

Training Recommendation #51: Conduct, as a minimum, annual site orientation and operational response familiarization sessions with WFRS and Utilities staff.

Reference: Section 5.3 Waste Transfer Facility, Page 145

Recommended Completion: 6 months and recurring

Estimated Cost: Cost Neutral, staff time

Rationale: The fire risk at this facility is highly probable and as such a rapid and coordinated response by both WFRS and Utilities staff is essential. There have been joint sessions conducted previously however annual initial response action by Utilities staff and full response by WFRS sessions are emphasized. This includes firefighting tote and drafting operations.

Emergency Planning Recommendation #52: Install an external manual emergency alert system.

Reference: Section 5.3 Waste Transfer Facility, Page 145

Recommended Completion: 24-48 months

Estimated Cost: Depending upon preferred system, rough order estimate: \$10,000-20,000

Rationale: There is no detection system outside of the facility buildings so reliance is on visual detection. Therefore, an external alert signal in safe and central location that is available to alert all staff on site enhances safety and rapid response. An air horn or other audible device would notify staff to assemble in muster locations, commence firefighting operations or to evacuate.

Emergency Planning Recommendation #53: Continue to research technologies that detect unstable materials that can create transfer and landfill facility fires.

Reference: Section 5.3 Waste Transfer Facility, Page 145

Recommended Completion: recurring

Estimated Cost: Cost Neutral, staff time

Rationale: Since 2018, seven fires have occurred at this facility, potentially linked to unstable materials like lithium batteries or other self-igniting substances. Although not definitive, this pattern designates the facility as a high-risk contributor to wildfire incidents.

Conclusion

The primary goal of the Community Wildfire Defence Plan is to provide the RMOW with an implementation strategy that addresses recommendations in the CWRP related to policy, emergency planning and training. The RMOW has been actively working to reduce the risks of wildfire in the community and has taken a leading role in the development of a community wildfire defence plan.

The typical method for wildfire defence and protection plans is to react when a wildfire puts the community at risk. Developing structure defence or protection plans is usually done hastily, where the identification of risks, response strategies and tactics, critical infrastructure, and coordination of resources becomes a major challenge. Taking a more strategic approach, the RMOW has significantly enhanced preparedness, mitigation, response, and resiliency when faced with an impinging wildfire.

The RMOW has an exemplary wildland interface program with initiatives that include conducting wildfire fuel thinning projects on Crown and municipal lands, an established FireSmart Program inclusive of FireSmart Home Ignition Assessments, FireSmart Critical Infrastructure Assessments, chipping programs, and FireSmart Education campaigns.

Key recommendations contained in this report include:

- Amend zoning and parking Bylaw no. 303 to remove the blanket exemption for detached dwellings, duplex dwellings and auxiliary buildings ancillary to a detached dwelling or duplex dwelling from being exempt from obtaining a development permit for Wildfire Protection
- Review the wildfire protection guidelines and consider updating all areas beyond the fire department's 10-minute response time as High Risk and align the guidelines with FireSmart principles.
- Enhance response capabilities with increased initial response from the FireSmart crew, WFRS and municipal staff. This includes staffing increases for the FireSmart crew and WFRS.
- Additional response vehicles and equipment to support the defence or protection capabilities.
- Development of a FireSmart strategic plan that integrates the CWRP public education recommendations.
- Complete the updating of the Comprehensive Emergency Management Plan to include:
 - A list of non-governmental external agencies and community partners as EOC liaison officers
 - Conduct annual wildfire training exercises or workshops that include external agencies and community partners such as First Nations, SLRD, Chamber of Commerce, Tourism Whistler, Whistler Blackcomb, BCWS Coastal Fire Center and Pemberton Fire Zone and regional fire departments.

- Clarify or establish the protocol with the province regarding the authority having jurisdiction for the closure or evacuation of Whistler.
- Enhanced training, coordination, and interoperability with internal and external response agencies
- Determine the best approach to provide backup power for all water reservoir pump stations to have continuous water supply for fire protection and complete the assessment of the community's water delivery (municipal and natural) for each neighbourhood and develop a wildfire water management plan.

The 2023 wildfire season in British Columbia underscores the need for communities to be diligent, well prepared, and capable of managing wildfires, which have the potential for catastrophic consequences. The Resort Municipality of Whistler has taken an aggressive approach to wildland urban interface risks by developing a community wildfire defence plan report that has identified leading practices for mitigation, preparedness, and response strategies.

SECTION 1 INTRODUCTION

1.1 Background and Significance

As a result of the recommendations from the Community Wildfire Resiliency Plan (CWRP 2022), the RMOW has been actively working to reduce the risks of wildfire in the community. Initiatives to date include conducting wildfire fuel thinning projects on Crown and municipal lands, established FireSmart Program inclusive of FireSmart Home Ignition Assessments, FireSmart Critical Infrastructure Assessments, chipping programs and FireSmart Education campaigns.

1.2 Purpose

The purpose of this project is to develop a Community Wildfire Defence Plan for the RMOW with the primary goal to provide the RMOW with an implementation strategy that addresses the recommendations in the Community Wildfire Resiliency Plan (CWRP) 2022 related to policy, emergency planning, and training.

1.3 Goals and Objectives

The primary goal of the Community Wildfire Defence Plan is to provide the RMOW with an implementation strategy that addresses recommendations in the CWRP related to policy, emergency planning and training.

1.4 Project Scope

The scope of this project is to develop a Community Wildfire Defence Plan for the RMOW with the following objectives:

Policy

- Review and provide recommendations for amendments to the Wildfire Development Permit Area Guidelines.
- Advise the RMOW on the development of a policy to ensure property owners are notified and take action to mitigate fire hazards on private land.

Emergency Planning

- Review, engage and pre-plan emergency community water delivery systems with water stakeholders including but not limited to the RMOW, Vail Resorts, Squamish-Lillooet Regional District, Lil'wat and Squamish First Nation, regarding water delivery rates, reservoir recover capacity, natural water supply locations and back-up power. Review the ability to connect major natural water sources with interface neighbourhoods, for the purpose of facilitating the deployment of a structural protection system.
- Review historical climatic data with regards to rainfall and average monthly temperatures by month.
- Develop Structure Defence Plans for all areas in the Resort Municipality of Whistler in collaboration with emergency response team.

- Identify safety zone locations for ground crews.
- Identify hazards such as weight restrictions on bridges and the location of hazardous materials.
- Evaluate whether current Whistler Fire Rescue Services (WFRS) wildfire/structure protection equipment is adequate to protect an entire interface neighbourhood (e.g., up to 100 homes) during a wildfire event and provide recommendations on enhancing WFRS wildfire/structure protection equipment.
- Provide a resource list of wildfire equipment (heavy equipment, portable equipment, large fire pumps and delivery systems) and how to acquire these resources.
- Evaluate the suitability of WFRS off-road equipment and recommend improvements.
- Advise on the development, operations, and maintenance of a rooftop sprinkler program for interface neighbourhoods.
- Develop Sprinkler protection triaging for critical infrastructure including recommendations for FireSmart initiatives.
- Assess wildfire hazards along primary neighbourhood access routes including all highway exits and provide recommendations for mitigation based on priority areas.
- Assess secondary emergency vehicle access throughout the RMOW neighbourhoods, categorizing access features by type of vehicle appropriate for the road/trail and provide recommendations on upgrades, thinning as required to serve WFRS emergency vehicle access/egress that improve safe anchor points for firefighting efforts.
- Assess and provide recommendations on improving FireSmart Education communication plans.
- Assess GIS mapping related to wildfire and provide recommendations on improvements.
- Provide a community threat rating based on risk of wildfire.

Training

- Assess and advise on improved cross-training between WFRS, BC Wildfire Service, Whistler/Blackcomb (Vail Resorts) and mutual aid partners.
- Provide recommendations for the expansion of internal wildfire training for WFRS and RMOW staff.

1.5 Standards and References

This plan considers the following references and standards:

RMOW Resources

- Community Wildfire Resiliency Plan (CWRP) 2022
- Whistler OCP: Wildfire Development Permit Area Guidelines
- Comprehensive Assessment of Wildfire Threat in the Whistler Valley prepared by Frontera Forest Solutions 2023
- All fuel management prescriptions, plans and GIS shape files.

- All FireSmart mitigation project locations completed and proposed.
- All fuel thinning project locations completed and proposed.
 - RMOW Fire and Fuels Strategic Plan revised Sep 2023
- Previous fire risk and fuel type mapping data prepared.
- Water infrastructure plans.
- Transportation and evacuation plans

Provincial Reference and Standards

- Wildfire Act B.C. Reg. 83/2022
- Wildfire Regulation B.C. Reg. 83/2022
- Emergency Program Act [RSBC 1996] CHAPTER 111
- Emergency Management Program Regulation B.C. Reg. 200/98
- FLNRORD standard for developing tactical plans for wildfire risk reduction

1.6 Community and Wildfire Risk Assessment

The overall footprint, topography, transportation infrastructure, water sources, access, and egress routes and the neighbourhood areas within the municipality were the focus of the community and interface assessment. Touring the community provided an opportunity to an overall impression as to the extent of the wildland interface and/or intermix challenges.

Each area of the RMOW was evaluated during a second community tour, conducted by structural protection specialists as part of the community wildfire risk assessment. The RMOW FireSmart coordinator, WFRS Deputy Fire Chief and platoon captains accompanied the structural protection specialists during these assessments.

Numerous risk factors and physical features were identified in this assessment such as topography, transportation system (roads, bridges, trails etc.), evacuation routes, water sources, critical infrastructure, safe zones, FireSmart areas, interface, and intermix profiles. The results of this community wildfire risk assessment are included in section 2.7.

1.7 Targeted Interviews

Targeted interviews were part of the data and information collection process. Participants were asked questions related to their areas of purview and expertise. The interview itself was used to promote an open discussion about the community, risks, general concerns related to the community and municipal operations. The following table is the list of interviews that were conducted. A summary of the input is provided at section 2.2.

No.	Name	Job Title
1	Lindsay Debou	Protective Services Manager
2	Bob Manson	Emergency Program Coordinator
3	Pauline Lysaght	Corporate Officer
4	Mike Kirkegaard	Director of Planning
5	Chris Wike	Manager of Utilities
6	Louisa Berhenne	Manager of Climate and Environment
7	Jennifer Smith	Corporate Communications
8	Vanessa Pocock	GIS
9	Thomas Doherty	Fire Chief
10	Nick Soverel	Frontera Solutions
11	Scott Rogers	FireSmart Supervisor
12	Mitch Hunter and Dave Evans	Deputy Fire Chief and Fire Captain
13	Ted Battison	GM Corporate Services and Public Safety
14	David Harrison	Senior Manager, Emergency Planning and Response Squamish Nation
15	Troy Bikadi	Community and Workplace Health and Safety Officer Lil'wat Nation
16	Maude Lussier	Wildfire Mitigation Lead Squamish Lillooet Regional District
17	Ken Roberts	Senior Manager Building Maintenance Whistler Blackcomb (Vail Resorts)
18	Bob Andrea	Manager Village Animation & Events
19	Georgina Sutton	Fire Rescue Services Coordinator
20	Sacha Banks	OIC Whistler RCMP
21	Andrew Tucker & Tim Nassar	Manager Transport and Waste
22	Derek Jazic	Manager Resort Operations
23	Marc Simpson	BC Wildfire Service
24	Dave McPhee Bjorn Pelisser	OH&S and Snowmaking & Off-Season Trail Maintenance Manager Whistler Blackcomb, Vail Resorts

1.8 Study Considerations

As identified in the RMOW Community Wildfire Resiliency Plan (CWRP) the Community Wildfire Development Permit (CWDP) has aligned with the following overarching strategies:

- Educating residents and visitors to the RMOW about FireSmart principles and wildfire prevention, resulting in behavior change and preventative action on properties.
- Adapting legislation and community plans as they relate to wildfire preparedness in the RMOW.
- Increasing interagency cooperation within the RMOW and between external stakeholders which includes integrating planning for all wildfire resiliency measures throughout the municipality.
- Increasing cross-training between members of the Whistler Fire Rescue Service (WFRS), BC Wildfire Service (BCWS), RMOW staff, and external emergency management personnel.
- Enhancing emergency preparedness within the municipality; focusing on major access/egress corridors and neighbourhood protection level.
- Continuing strategic vegetation management efforts at the community level, while ensuring the continued management of multiple forest values. These principles can be applied to address forest resiliency at the landscape level.

SECTION 2 COMMUNITY OVERVIEW

2.1 Resort Municipality of Whistler Overview

The Resort Municipality of Whistler (RMOW) was incorporated on September 6, 1975. At the time of incorporation, fewer than 1,000 people lived in Whistler. The newly elected mayor and council, along with municipal staff, residents, and the provincial government, started planning for the development of what would eventually become Whistler Village. Today, Whistler is home to almost 14,000 permanent residents and is visited by more than 3 million guests annually.

Nestled in the Coast Mountains between the District of Squamish and the Village of Pemberton, Whistler is known worldwide as an outdoor recreation destination. With an ever-growing demand for tourism, recreation, and an immersion in nature comes a growing need to protect the magnificent landscapes which makes Whistler famous.

The RMOW is located on Highway 99 in a relatively narrow valley that straddles a mountain pass, with steep terrain to both the east and west. The hillsides are rich in mature conifer stands with some deciduous species mixed within. Above the forested areas are open alpine meadows and rock escarpment. There are numerous creeks throughout the RMOW, feeding into four lakes within the community. The village centre and older neighbourhoods are situated on the valley floor adjacent to Highway 99, however, most of the community has been developed on the hillside with steep, windy roadways with two or more exit routes. Only a few have one way in and one way out.

Typically, a wildland urban environment in a well-developed community can be characterized as being “interface” meaning that subdivisions are built with paved roads, hydrant service and abut the wildland fuels where there is a definitive line between developed areas and the forest. Other more rural communities can be characterized as “intermix” where homes may be scattered throughout the forested area; typically, larger lots and limited services such as hydrants. Whistler is a mixture of both types of wildland urban environments. There is a definitive line where the subdivisions back on to forested areas but with larger lot sizes and the desire to maintain the forested esthetics. Many homes are surrounded by wildland and ornamental fuels.

There are some forest service roads that offer access to sections of the back country areas. The valley trail extends the entire length of the community which can accommodate UTVs and some areas that can accommodate pick-up truck access to adjacent forested areas.

2.2 Interviews and Consultations Summary

To gain a good understanding of the challenges surrounding a community wildfire defence plan for the RMOW, a total of 24 interviews were conducted. This included RMOW staff, SLRD, BCWS, First Nations, RCMP Whistler Detachment, Fonterra, and Whistler Blackcomb. Follow up consultation and emails provided additional details and clarity for specific factors related to the development of the wildfire defence plan. The following is a summary of key findings from the interviews and consultations.

Agency	Key Findings
Squamish Nation Lil'wat Nation	<ul style="list-style-type: none"> Shared territory, with RMOW, Squamish and Lil'wat and would need to be consulted or involved with any wildfire event. Tree farm licences economic impact loss, sensitive areas such as cultural and burial sites are only known by the band(s) Own much of the timber in the Pemberton valley
RMOW	<ul style="list-style-type: none"> ERP is dated 2015 and needs to be updated. Full evacuation of the RMOW is a big issue. Estimated 8,400 people without vehicles will be a serious complexity. Shelter in place concept may or may not be feasible. Only one roadway out. Not realistic shutting down the northbound lane for evacuation MOTI. Traffic control in village using public works RCMP, and RCMP. Fridays, weekends, and holidays with day trippers causes major traffic volume, Province designates roadway as evacuation route. Need to be upgraded to handle volume for traffic. Enforcement of fire resistive construction, and FireSmart principles to compel owners to mitigate wildfire risk on their property, including fixed sprinklers. Emergency communication system needs enhancing. Whistler Blackcomb (Vail) needs to be fully integrated in defence plan resources. The council is prepared to take the necessary action. FireSmart may be deemed excessive by some residents' perspectives. Fully supporting FireSmart during renovations or occupancy changes Landscaping guidelines, what are the standards, how do they interface with environmental stewardship? New developments or major renovations will enforce wildfire hazard DP OCP requirements. Water systems must have backup generators. External sprinklers would need to be assessed by each neighborhood as they are all on separate systems. Calculation based upon rate of flow, reservoir capacity and well recovery. The construction exemption permit system is not working effectively. No enforcement

Agency	Key Findings
RCMP	<ul style="list-style-type: none"> • Recurring challenges highway volume. • Can support tactical evacuation otherwise 48 hours to mobilize lower mainland district to support full evacuation. High value properties will require security for evacuated areas. • The authority having jurisdiction to close the highway and resort is the province as experienced during COVID. • Very limited response resources outside the RMOW. • BCWS Coastal Fire takes time to mobilize. • If residents seek refuge on the lakes during a wildfire, no water rescue for houses on lakes. RCMP boat is in Squamish. • Corridor wide fire ban with municipalities not only BCWS crown lands
Whistler Blackcomb	<ul style="list-style-type: none"> • Relationship with RMOW needs to be re-established with annual wildfire exercises. • RMOW and our operational level staff are working well together e.g., FireSmart programs, Senior management relationships need to be enhanced • Primary relationship is with the province as resort is on crown lands. • COO, CAO are in conversation with the province. Lot of discussion around DPAs and development. • Some coordination with RMOW FireSmart and Resort through contractors • Snow making is 1000psi. Snowmakers meet with WFRS annually. Pressure reducing manifolds made to utilize our system however their capability and utilization is in question. • Sprinklers are more effective than snow guns. We have fire response on the mountain with 100-150 staff trained to S-100 • Wildfire internal committee every two weeks practice need to include RMOW. • Our team needs to be involved, and we can fill water tenders. • 3 large restaurants 2 accessible by gondola for shelter in place of our staff. • Backup generations are available. • We have our own reservoirs; non-potable would contaminate RMOW systems. • Training is required for all first responders and the resort

Agency	Key Findings
SLRD	<ul style="list-style-type: none">• CRI funded FireSmart program• Difficult to enforce anything within SLRD as most of district is crown lands.• Critical need for a regional wildfire defence committee.• Worked effectively with RMOW, Activated EOC in July and is still active.• RMOW Liaison Officer would be required in SLRD EOC for coordination.• Increase training coordination with other fire departments in the region.• SLRD is purchasing a sprinkler protection unit.

2.3 Historical Temperature

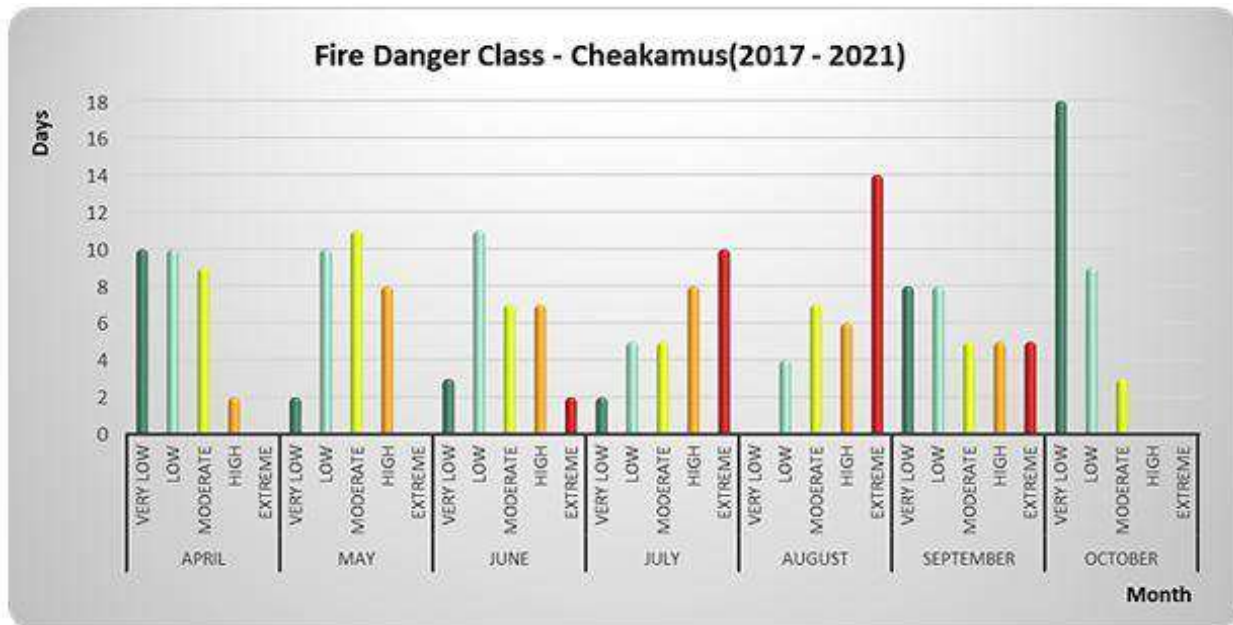
Whistler, BC, located in the Coast Mountains of British Columbia, has a maritime-mountain climate that experiences relatively mild winters and cool summers compared to the interior of the province.

Season	Average High	Average Low	Comments
Winter (December – February)	-1°C to 3°C	-6°C to -3°C	Snow is typical in the winter, making Whistler a popular ski destination.
Spring (March – May)	4°C to 14°C	-3°C to 3°C	As the season progresses, snow begins to melt, and temperatures start to rise.
Summer (June – August)	18°C to 22°C	8°C to 10°C	Summers are relatively cool and can be wet and rainy.
Fall (September – November)	8°C to 15°C	2°C to 7°C	Precipitation increases in the fall, with snow returning usually by late November. These are general averages and can vary year to year.

The following historical and projected climatic data/analysis is an excerpt from the CWRP:

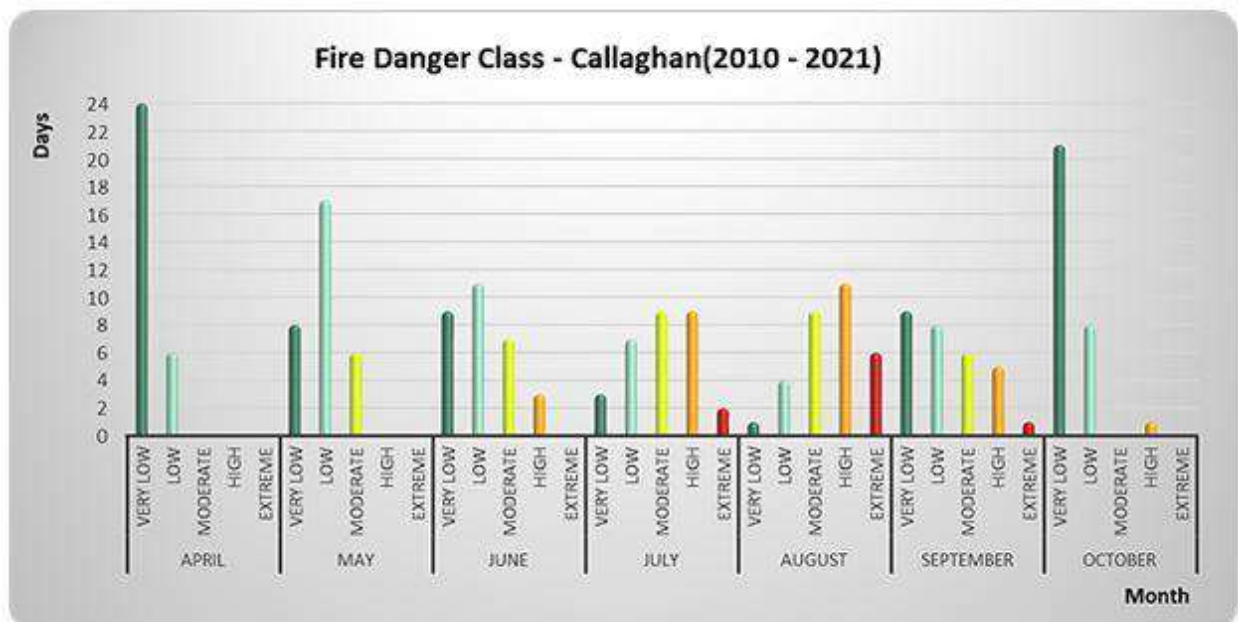
The BC Wildfire Service operates two weather stations within the RMOW, which capture important fire weather data throughout the fire season. The Callaghan station is over 6-kilometers from the AOI and at a significantly higher elevation than much of the developed valley (869m), while the Cheakamus station is within the AOI and at a valley-bottom elevation (595m). As the Cheakamus station was only established in 2017, Callaghan can be used to show longer-term trends in fire weather (Figure 10) while Cheakamus provides a representative look at present-day fire weather indices in the WUDCA (Figure 11).

Figure 1: Average number of danger class days during the core fire season for the Cheakamus weather station.



This represents a smaller sample size than Callaghan but in a more representative location (595m) for the developed portion of the RMOW.

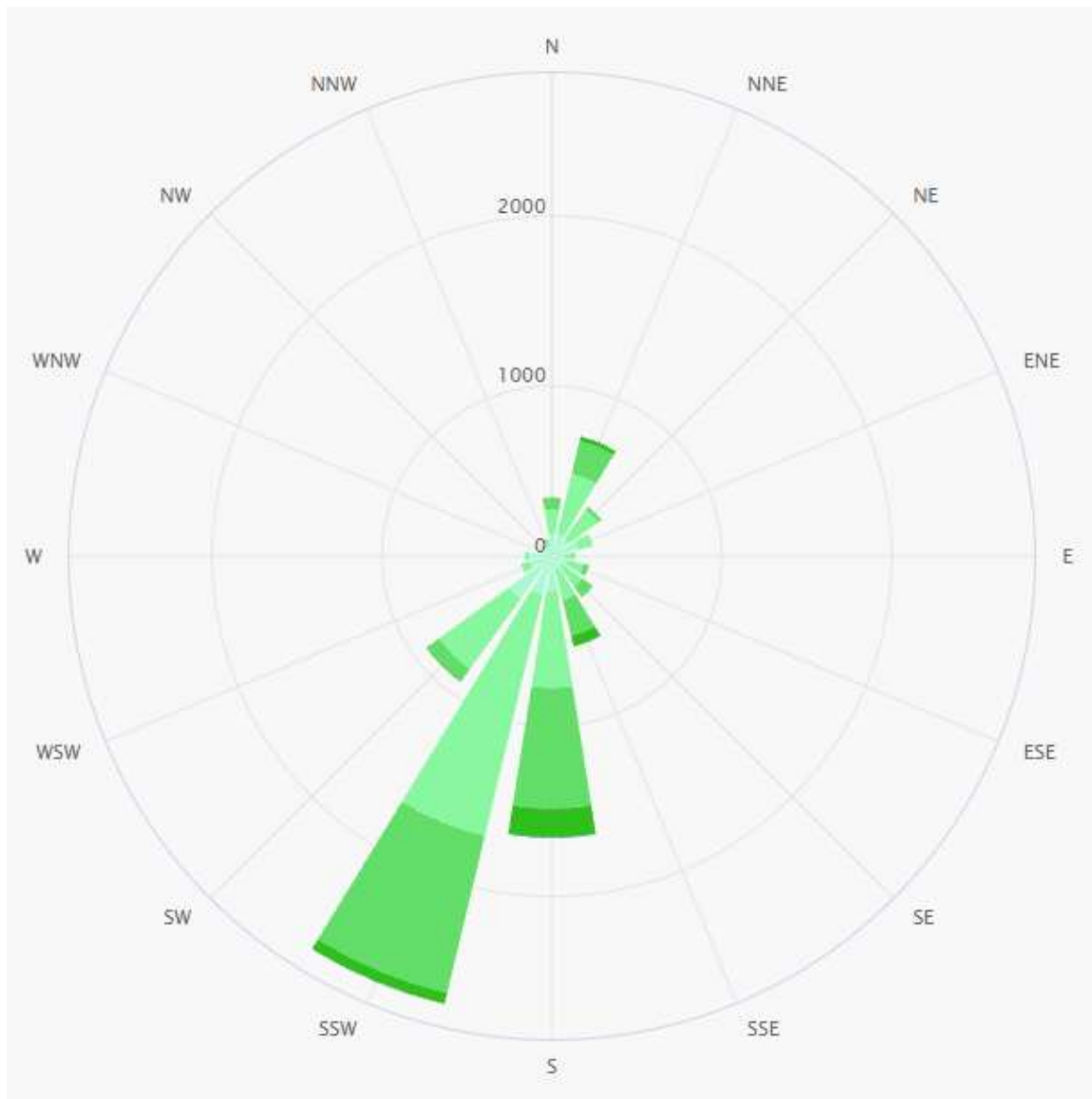
Figure 2: Average number of danger class days during the core fire season for the Callaghan weather station.



This represents a longer-term average than Cheakamus but in a less comparable location (869m elevation).

In addition to annual fire weather conditions, arguably the most significant factor for wildfire growth is the prevailing wind direction. While the mountainous topography surrounding Whistler can locally influence wind conditions, weather models show a consistent prevailing wind from the south-southwest. This aligns with the broad-scale topography of the valley and has implications for wildfires that start upwind and spread toward any value at risk.

Figure 3: Frequency of wind counts by direction for Whistler (714m). (Source: Meteoblue weather)



2.4 Climate Projections

Through the RMOW's 2020 Climate Action Big Moves Strategy (preceded by the Community Energy Climate Action Plan [CECAP]), Whistler acknowledges the predicted effects that climate change will have on the municipality. Climate modelling within the CECAP shows that the Sea-to-Sky corridor will experience longer, hotter, and drier summers in coming years. The following statistics are from the Pacific Climate Impacts Consortium regarding climate projections for Whistler, through 2050:

- Milder winters, with 60-70% reductions in snowpack at low elevations;
- A 171% increase in the total number of summer days over 25°C;
- Decrease in summer precipitation by an average of 17%;
- Longer dry spells by an average of 15%;

While the forest types and BEC zones within the RMOW suggest a low-frequency yet high-severity fire regime, these climate projections may provide for an increase in fire frequency and severity within the RMOW. Halofsky, J.E., Peterson, D.L. & Harvey, B.J (2020) discuss how there may be only a small increase in fire frequency and severity in moist coniferous forests in the Pacific Northwest (PNW), but confidently project a large increase in frequency, extent, and severity in dry coniferous forests. This provides important information for the transitional climate of the RMOW as it shifts increasingly more away from coastal conditions and toward interior conditions. Halofsky (2020) also discusses how increased concentrations of carbon dioxide in the atmosphere may lead to more persistent high pressure blocking ridges across the PNW, which exacerbate drought conditions and the potential for fire.

Pritchard et al. (2021)²⁴ discuss how across multiple forest types in western North America, the frequency and extent of high-severity fire over the past few decades is outside the historic range of variability. These high-severity fires often accelerate vegetation change and forest conversion and leave irreplaceable native habitats vulnerable to disturbance. Through the Official Community Plan (OCP), the RMOW has made clear they understand the growing risk of wildfire due to a lengthier and more pronounced fire season.²

2.5 Biogeoclimatic Zone

A biogeoclimatic zone is an area defined by a relatively similar climate and a certain mix of vegetation that makes up a larger ecosystem. The Biogeoclimatic Ecosystem Classification (BEC) system was developed by V.J. Krajina and his students in the 1960's and the 1970's. It was adopted by the BC Ministry of Forests in 1976 and is widely used today for forest, range, and wildlife management. Refinement and expansion of the classification system is ongoing.

² Retrieved from: https://www.pacificclimate.org/sites/default/files/publications/WhistlerMemo_Final.pdf

The BEC is a hierarchical classification system that uses climax vegetation communities to infer the combined ecological effects of climate and soil. At the highest level, the regional level, the province is divided into 14 biogeoclimatic zones. These zones are large geographic areas with relatively uniform climate, i.e., similar regional or macroclimate. Zones are usually named after one, two or three of the dominant climax species. The names can also include another general distinguishing feature of the area such as geographic location (interior, coastal,) or climate (subboreal, boreal, and montane).

Whistler, British Columbia, is situated within the Coastal Western Hemlock Zone (CWH). This biogeoclimatic zone is one of the largest and most ecologically diverse zones in British Columbia. The CWH zone is further divided into subzones based on variations in climate, specifically precipitation and temperature. These subzones are differentiated by moisture regimes and temperature. The precise subzone Whistler belongs to can vary depending on the elevation and specific location, but a substantial portion of the Whistler area falls into the montane variant of the CWH (CWHmm). As you move to higher elevations, the biogeoclimatic zone can transition into the Mountain Hemlock Zone (MH).

The names can be written in full or abbreviated for example: Coastal Western Hemlock Zone or CWH zone.

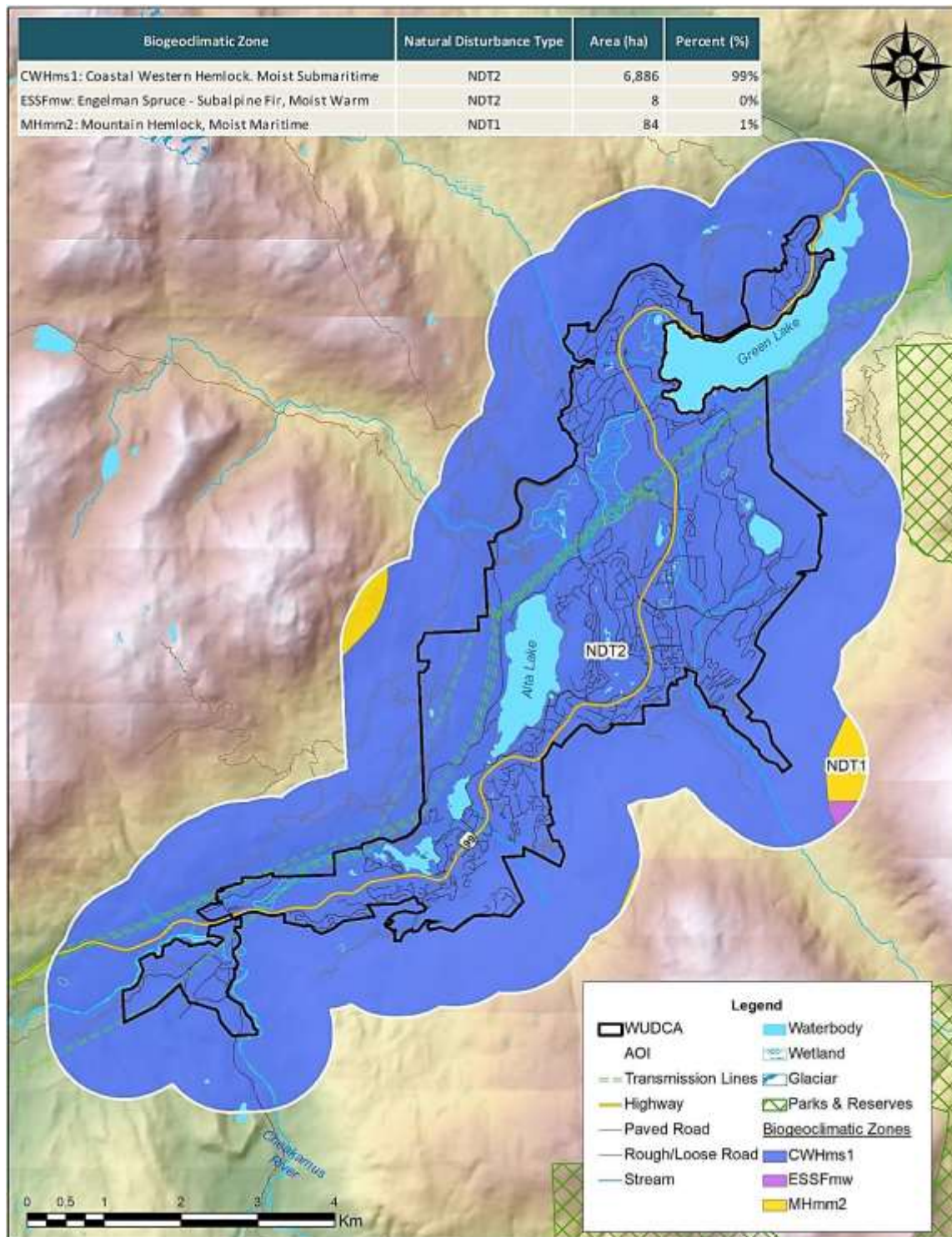
Three of these zones are found in Whistler:

- Coastal Western Hemlock Zone,
- Mountain Hemlock Zone, and the
- Alpine Tundra Zone.

The CWHms1 has a climate transitional between the coast and interior, characterized by moist, cool winters, and cool but relatively dry summers. Historically, dry summers have resulted in stand replacing wildfires, which have contributed to the abundance of Douglas-fir in this variant. Snowfall is relatively heavy, particularly in the upper elevational ranges of the variant.

Highly productive and structural complex coniferous forests are characteristic in this wet and mild climate. Wind is the common form of natural disturbance and compared to fire, generally only affects single trees or small patches of forest. As a result, most of the forests are old.

Map 1: CWRP Excerpt biogeoclimatic zones



Source: "Ecosystems of British Columbia." BC Ministry of Forests. 1991. Edited by D. Meidinger and J. Pojar. This is a comprehensive reference about the biogeoclimatic zones of British Columbia, including the Coastal Western Hemlock Zone.

2.6 Wildland Urban Interface Risk Classification

The Abbott-Chapman report on the 2017 wildfire and freshet seasons (Addressing the New Normal: 21st Century Disaster Management in British Columbia, (April 30, 2018) recommended the provincial government identify risk management strategies to guide and prioritize funding for wildfire mitigation activities, based on risks to communities. In 2018, and later updated in 2021, the BC Wildfire Service developed the Wildland Urban Interface (WUI) Risk Classification Framework to support initiatives related to wildfire risk reduction.

Whistler BC is a notable example of a community located in a WUI. Situated within the coastal mountain forests, Whistler is surrounded by dense woodlands and as such, at a heightened risk for wildfires, especially during drier conditions or periods of drought. Most of Whistler's developed and planned urban areas are in or near the wildfire urban interface. Forested areas surrounding Whistler are also at risk because these areas are popular for outdoor recreation and resource extraction uses³.

2.6.1 Wildfire Risk Framework

A risk-based framework considers two main components when determining the measure of risk. The two components are:

- Likelihood or probability of a wildfire event occurring (not a matter of "if" but "when" and wildfire will threaten the RMOW).
- Consequence for communities in terms of the damage or loss of high value resources and assets

Risk is measured as the product of likelihood and consequence. Multiple inputs are required to effectively quantify risk (including severity, type of value, and vulnerability to wildfire)

- $\text{Likelihood} \times \text{Consequences} = \text{Risk}$

By identifying risk levels, wildfire threat mitigation priorities and opportunities to increase community resiliency are both enhanced. Differing risk levels require tailored risk management to minimize the negative impacts of wildfires on communities and high-value resources and assets (HVRAs). The intent is to enable the development of cost-effective wildfire risk reduction strategies for communities and HVRAs at two different scales – local and provincial.

³ <https://www.whistler.ca/ocp/wildfire-protection/>

Radeloff, V.C., et al. (2018). Rapid growth of the US wildland-urban interface raises wildfire risk. *Proceedings of the National Academy of Sciences*, 115(13), 3314-3319.

"Living with Fire in the Wildland-Urban Interface." FireSmart Canada. [<https://www.firesmartcanada.ca/>].

2.7 Wildfire Risk Assessment

In British Columbia, structure density (the number of buildings located within a given area) is used to define the boundaries of the WUI for the purposes of wildfire and risk management planning purposes. The WUI also identifies transition zones between unoccupied land and human development. A two-kilometre-wide buffer zone was applied from the edge of structures located in the WUI to indicate the distance embers from a wildfire could reasonably be expected to be carried by the wind and potentially ignite a structure.

Data currently available in B.C. only supports a fire threat analysis for provincial Crown land, leaving large tracts of private land within the WUI for which limited data is available. Since it is important to consider how much private land is present in the WUI when completing a risk analysis, the buffer zone was expanded to 2.75 kilometres for structure classes with a density of more than 25 structures per hectare.

The spatial WUI attributes were combined with the Provincial Strategic Threat Analysis (PSTA) wildfire threat layer (for Crown land) to identify at-risk areas at a strategic scale. The level of risk (“risk class”) reflects the analysis of weighted PSTA threat components within the individual WUI risk class polygons. Five risk classification ratings were applied to the WUI polygons, with ‘1’ being a high relative risk and ‘5’ being the lowest relative risk. The application of relative risk does not imply “no risk” since the goal is to identify areas where there is higher risk. Currently, Whistler is at RC2.

2.8 Wildland Urban Interface Risk Class Maps

The Wildland Urban Interface Risk Class maps do not provide an assessment of wildfire threats on private land parcels since these are best determined through a site-level assessment such as FireSmart™. Wildland Urban Interface Risk Class maps are designed to assess the forested land base, while the FireSmart hazard assessment takes into consideration individual structural components (e.g., roofing and siding), fences, exotic plants, and vegetation 10 metres and beyond from the structure — key aspects linked to the spread of fire in a community. The WUI component of the Wildland Urban Interface Risk Class maps does not take this information into consideration.

The resulting WUI risk class map highlights patterns and trends in the WUI in a format that is easy to understand. WUI risk class polygon ratings represent structures on the land base, not administrative boundaries. This means that a WUI area may include multiple jurisdictions (e.g., regional district, municipality, Treaty Settlement lands and/or First Nations reserves). This high-level analysis supports the initial identification of at-risk areas.

In addition, planning fuel management treatment data polygons (from 2012 to current) are added to the WUI risk class maps. This information will help determine the most effective risk control options, including the development or updating of a community wildfire resiliency plan or Crown Land Wildfire Risk Reduction fuel management tactical plan that includes an assessment of local threat conditions and wildfire risk reduction priorities.

In cases where local assessments provide evidence of a higher wildfire risk than is indicated by the WUI risk class, that information should be used to guide risk reduction activities. The information presented within the Wildland Urban Interface Risk Class Maps is derived from datasets and models that represent a provincial-level assessment of approximate relative wildfire threat across the land base.

It is intended to provide a strategic-level analysis of many different factors which contribute to wildfire threats, but it is not intended to represent absolute, site-specific values. The Wildland Urban Interface Risk Class Maps were created at a provincial scale, so users of this product need to confirm that the initial wildfire-threat rating assigned to a given area is accurate by having a qualified professional validate that rating at the forest stand level.

Any limitations of the Wildland Urban Interface Risk Class Maps are related, but not limited to the accuracy of the:

- Vegetation Resources Inventory (VRI)
- 17 fuel types identified under the Canadian Forest Fire Behaviour Prediction (FBP) System
- historical fire data
- assumptions associated with the development of the head fire intensity and spotting impact data layers.

Any components within the data derived from structure-related information are intended to provide a strategic-level analysis, but they are not intended to represent absolute, site-specific values. Any limitations of this wildland urban interface data are related, but not limited to the accuracy of:

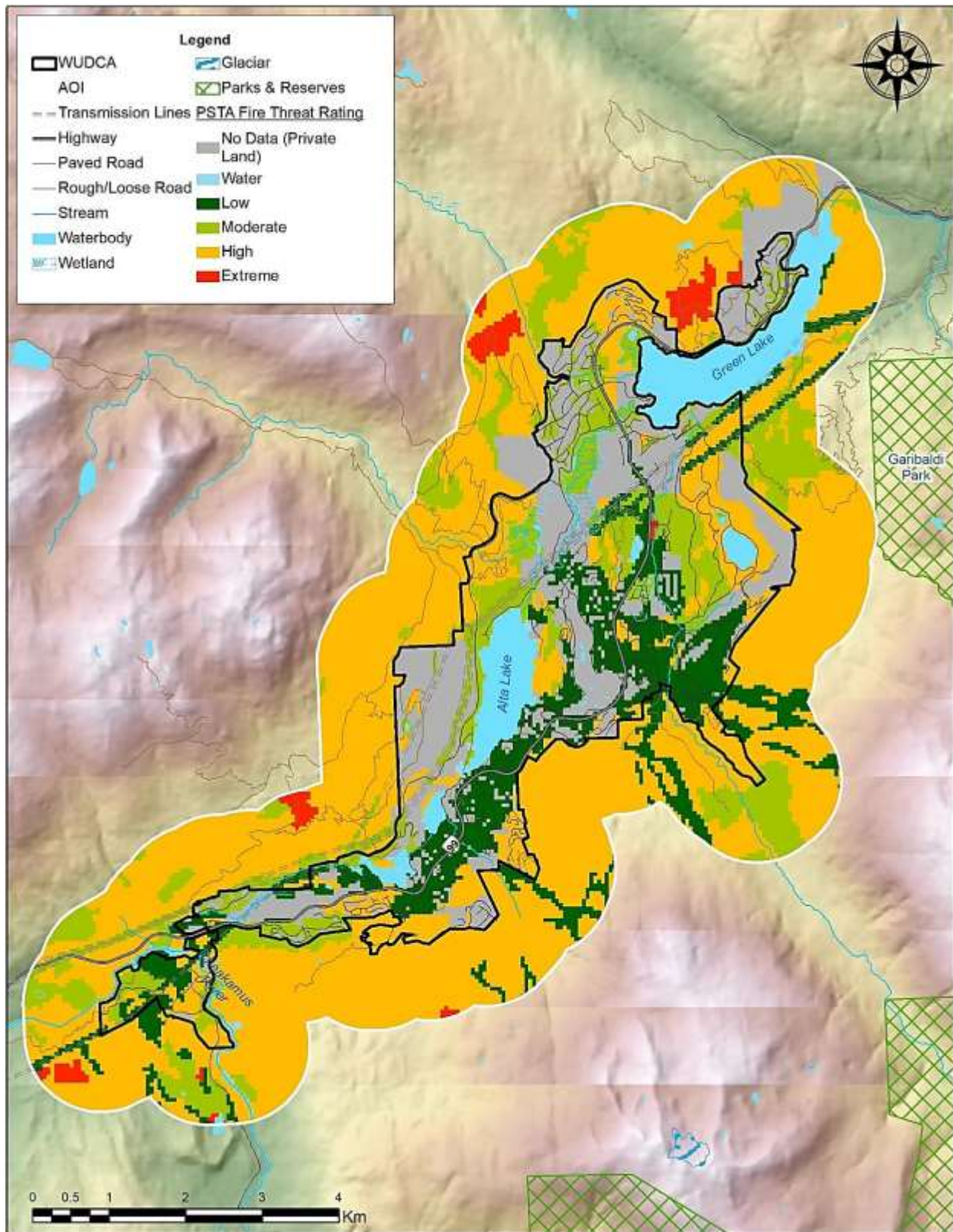
- the Terrain Resource Inventory Management (TRIM) data
- the Integrated Cadastral Information Society (ICI Society) Address BC data
- BC Assessment data
- other local datasets

It is the responsibility of users to determine the suitability of this data for their projects. The BC Wildfire Service makes no warranties or guarantees either expressed or implied as to the completeness, accuracy, or correctness of the data, nor accept any liability arising from any incorrect, incomplete, or misleading information contained therein.

All data and databases are provided “as is” with no warranty, expressed or implied, including, but not limited to, fitness for a particular purpose. By accessing the Wildland Urban Interface Risk Class Maps data, PDF files, KML files or any product derived from the data, the BC Wildfire Service, its staff, and contractors are hereby released from all responsibility and liability associated with their use.

The wildland fuel fire threat is shaded with colours numbered from 1 (low) to 10 (extreme) to identify the level of wildfire risk.

Map 2: Fire threat map of the AOI. Source: Provincial Strategic Threat Analysis data.



2.9 Community Wildfire Hazard Rating

The Community Wildfire Hazard Rating assesses homes and critical infrastructure as a fuel type. Using a provincial assessment with multiple-choice answers, it generates a score ranging from Low to Extreme for the potential consequences if a wildfire enters the community. This assessment examines specific information related to “Community Design” and “Community Challenges.”

2.10 Community Wildfire Hazard Assessment

The need for Community Assessments was identified by the Fire Chiefs Association of BC, and the BC Wildfire Service due to the challenge of protecting urban and rural development expanding into wildland areas with little consideration for potential wildfire events. Experienced BCWS Structure Protection Specialists developed this community rating system to categorize communities into one of four Wildfire Hazard Rate levels. It's important to note this assessment provides a generalized summary for categorizing communities. Whistler falls into the High-Risk category for Wildfire Hazard Rate.

Table 1: Community Design

Community Design (note: scores have been averaged)	Rating	
Access		
Two or more primary roads in and out.	0	0
One primary and one secondary access.	3	
One road in and out (entrance and exit are the same).	5	
Bridges (Please note construction type and GVW)		
No bridges or bridges with no weight and/or width restrictions.	0	0
Low weight bridges restricting emergency vehicle access.	5	
Primary Road Width (main access/egress routes)		
At least 7m wide.	0	0
Less than 7m wide.	4	
Secondary Road Characteristics		
Majority of structures on primary access road.	0	4
Majority of structures on secondary access roads with some primary road access.	1	
Majority of structures on secondary roads.	2	
Majority of structures located on secondary roads with some dead-end roads.	4	
Dead end road systems that limit emergency crews to remain in the area under certain fire conditions due to lack of egress.	5	

Community Design (note: scores have been averaged)	Rating	
Evacuation Plan		
Updated plan in place, community is aware (evacuation alert, order, shelter in place)	0	3
Plan in place not implemented, community is unaware.	3	
No plan.	5	
Fire Department		
Career/ POC FD more then 25 members.	1	1
Volunteer FD more then 20 less then 25.	3	
Volunteer FD less then 20.	5	
Fire Smart		
Community has FireSmart certified representative, and strategies are in place.	0	0
Community has started a FireSmart program, strategies not in place.	3	
Community presently has no FireSmart initiatives.	5	
Mutual Aid/Automatic Aid		
Fire department has a mutual aid/auto aid agreement in place.	0	0
Fire Department has no aid agreements.	5	
Total Community Design Rating		8

Table 2: Community Challenges

The overall rating is based on the community’s ability to withstand fire front contact to critical infrastructure.		
Community Challenges (note: scores have been averaged)		Rating
Utilities		
All utilities are underground.	0	3
Some utilities are underground.	3	
No utilities are underground.	5	
Access To Critical Infrastructure (example: Pump house and reservoir)		
Access more than 4m wide with hammerhead turnaround and access for fire apparatus.	0	0
Driveway less than 4m wide no turnaround has access for fire apparatus.	3	
No access for fire apparatus.	5	
No obstructions or overhead branches below 5m.	0	0
Obstructions or overhead branches below 5m.	5	
No bridges or bridges with no weight and/or width restrictions.	0	0
Low weight bridges restricting emergency vehicle access.	5	
Driveway slope less than 10%.	0	1
Driveway slope greater than 10% present.	5	
No gate/non-locking gate.	0	3
Locked gate/restricted access.	5	
Most Addresses clearly visible from road.	0	2
Most Addresses not visible from road.	5	
Dominant Trees (take an average of what’s around the community)		
Deciduous (Hardwoods).	1	8
Mixed (Hardwoods and Conifers) 50/50.	5	
Conifers (Pine and/or Fir).	10	
Home Ignition Zones (take an average of what’s around the community)		
10% of structures are in the interface with very light conifer fuel loads.	0	6
90% of structures are in the interface with moderate/ heavy conifer fuel loads.	7	
35% of structures are in the intermix with moderate conifer fuel loads.	3	
65% of structures are in the intermix with moderate/ heavy conifer fuel loads and heavy brush.	6	

The overall rating is based on the community's ability to withstand fire front contact to critical infrastructure.		
Community Challenges (note: scores have been averaged)		Rating
Ladder Fuels (take an average of what's around the community)		
No conifers or conifer branches up at least 2.5m.	0	3
Conifer branches close to ground.	5	
Type Of Ground Cover (Majority or Type surrounding the community)		
Grass up to 15cm tall, pine needles, hardwood leaves.	3	10
Tall grass, 15-30 cm.	5	
Grass more than 30cm tall.	8	
Shrubs with leaves.	8	
Deciduous plants, shrubs, duff with needles and litter.	10	
Moderate to heavy slash.	15	
Slope Of Community		
Much of the community is flat (0-5%)	0	2
Most of the community is on a moderate slope (6-20%).	2	
Community is located on a steep slope not accessible to fire apparatus.	4	
(more than 20%).		
Fuel Storage (includes propane tanks, firewood, elevated tidy tanks)		
None.	0	3
Located more than 10m from structure and has a proper fuel break established.	1	
Located 1.5-10m from structure and has a partial fuel break established.	3	
Located less than 1.5 m from structure no fuel break established.	5	
Critical Infrastructure Response Plan (wildfire mitigative tactics)		
Community has a critical infrastructure response plan in place.	0	1
Community has no critical infrastructure response plan in place.	3	
Fire Department Training		
FD members trained to Playbook Exterior + S-100-S185 or WSPP-115 & WFF 1.	0	0
FD members trained to Playbook Exterior with some wildfire training/ knowledge.	1	
FD members trained to Playbook Exterior.	3	
FD members not trained to Playbook no wildfire knowledge.	5	
Fire Department Engine/Tender		
Fire Department has minimum 1 engine and 1 tender with wildland equipment.	0	0
Fire Department has minimum 1 engine and 1 tender.	3	
Fire Department has no tender and no wildland equipment.	5	

The overall rating is based on the community's ability to withstand fire front contact to critical infrastructure.		
Community Challenges (note: scores have been averaged)		Rating
Fire Control Water Supply		
Pressurized hydrants with minimum 1800 lpm spaced less than 300m apart.	0	1
Pressurized hydrants with less than 1800 lpm or more than 300m apart.	2	
Hydrants fed by a generating system (requires power).	3	
Dry hydrant/standpipe available.	5	
River/Creeks/Cisterns that are accessible for drafting.	7	
No water sources.	15	
Helicopter Dip Sites (min 1.5 m water depth year-round 45' obstruction clear)		
Under 2-minute turnaround (< 1 kilometer).	0	0
Within 4-minute turnaround (1-3 Kilometers).	2	
Within 6-minute turnaround (3-6 Kilometers).	3	
Beyond 6-minute turnaround (greater then 6 k) or unavailable.	5	
Community Maps		
There are updated maps available.	0	0
There are no maps available.	5	
Community Population (summer seasonal including visitor estimate)		
Less than 1,000 summer residents	3	7
1,001 to 5,000 summer residents	4	
5,001 to 10,000 summer residents	5	
10,001 to 20,000 summer residents	6	
Greater than 20,000 Summer population	7	
Community Values at Risk (besides critical infrastructure)		
Civic properties (sports complexes, urban wildland parks / nature preserves)	3	5
Private or Co-op residential: Predominantly single-family dwellings	4	
Private or Co-op residential: Mixed single-family and multi-family dwellings	5	
Private or Co-op residential: Predominantly multi-family residential	6	
Community's Economic Impact		
Diverse economic community (community focused multiple employers, businesses, industry)	3	5
Single primary economic industry (lumber mill, mine, ski resort, tourism driven, industrial)	5	
Total Community Challenges		60

Table 3: Calculating your Wildfire Hazard Rating

Calculating Your Wildfire Hazard Rating		
Community Design Rating	Community Challenges Rating	Total
8	60	68
Low Fire Risk:	Overall Wildfire Hazard Rating = 0-25 points The chances of your community’s critical infrastructure surviving a wildfire are GOOD . Little is needed to improve your situation. Keep up the good work!	
Moderate Fire Risk:	Overall Wildfire Hazard Rating = 26-59 points The chances of your community’s critical infrastructure surviving wildfire are FAIR . Some minor improvements will make the identified structures more fire resistant. Check the categories on the form where you scored poorly.	
High Fire Risk:	Overall Wildfire Hazard Rating = 60-119 points The chances of your community’s critical infrastructure surviving a wildfire are NOT GOOD . Improvements in structure and site hazards are necessary.	
Extreme Fire Risk:	Overall Wildfire Hazard Rating = 120 or more points Your community’s critical infrastructure MAY NOT SURVIVE if a wildfire passes through the area. Take a serious look at your community and make improvements. If you don’t, you could be facing disaster. You’ll find that even small changes could make the difference between losing or saving your home.	
Notes:		
<div>a. Some neighbourhoods are one way in and out.</div> <div>b. Whistler is somewhat unique in that most neighbourhoods are classified as “Interface” but because of the wildland and ornamental fuel load between the residential structures, there are many characteristics of an “intermix” community thus scoring very high in this category.</div> <div>c. In areas where wildland fuel mitigation has not been conducted there is a great deal of dead fuel load.</div>		

2.11 Estimated Number of Structures and Private Dwellings

The following table is based upon addressed locations within the respective neighbourhood areas:

Neighbourhood	Predominantly Residential	Number of Buildings
Alpine Meadows North	Yes	202
Alpine Meadows South	Yes	462
Alta Lake Station	Yes	11
Alta Vista	Yes	203
Bayshores & Millar's Pond	Yes	239
Blackcomb Benchlands North	Yes	87
Blackcomb Benchlands South	Yes	61
Blueberry Hill	Yes	176
Brio & Sunridge Plateau	Yes	167
Cheakamus Crossing	Yes	117
Emerald Estates	Yes	358
Function Junction	Yes	68
Kadenwood	Yes	64
Lost Lake Park North	No	1
Lost Lake Park South	No	0
Nature Reserve	No	3
Nesters Crossing	Yes	19
Nesters, White Gold, & Spruce Grove	Yes	404
Nicklaus North	Yes	182
Nita Lake Estates	Yes	46
Rainbow & Baxter Creek	Yes	247
Rainbow Park	Yes	49
River Of Golden Dreams	No	2
Spring Creek	Yes	120
Stonebridge	Yes	35
Twin Lakes	Yes	20
Unnamed Lands	No	0
Village	Yes	59
Village North	Yes	183
Wedge Park	Yes	11
Wedgewoods	Yes	115
Wedgewoods - Heliport	No	6
Whistler Cay Estates & Tapley's Farm	Yes	249
Whistler Cay Heights	Yes	315
Whistler Creek & Wayside	Yes	195
Whistler Creek North	Yes	272
Whistler Creek South	Yes	179
Total		4927

2.12 Development Permit Areas Wildfire Protection Guidelines

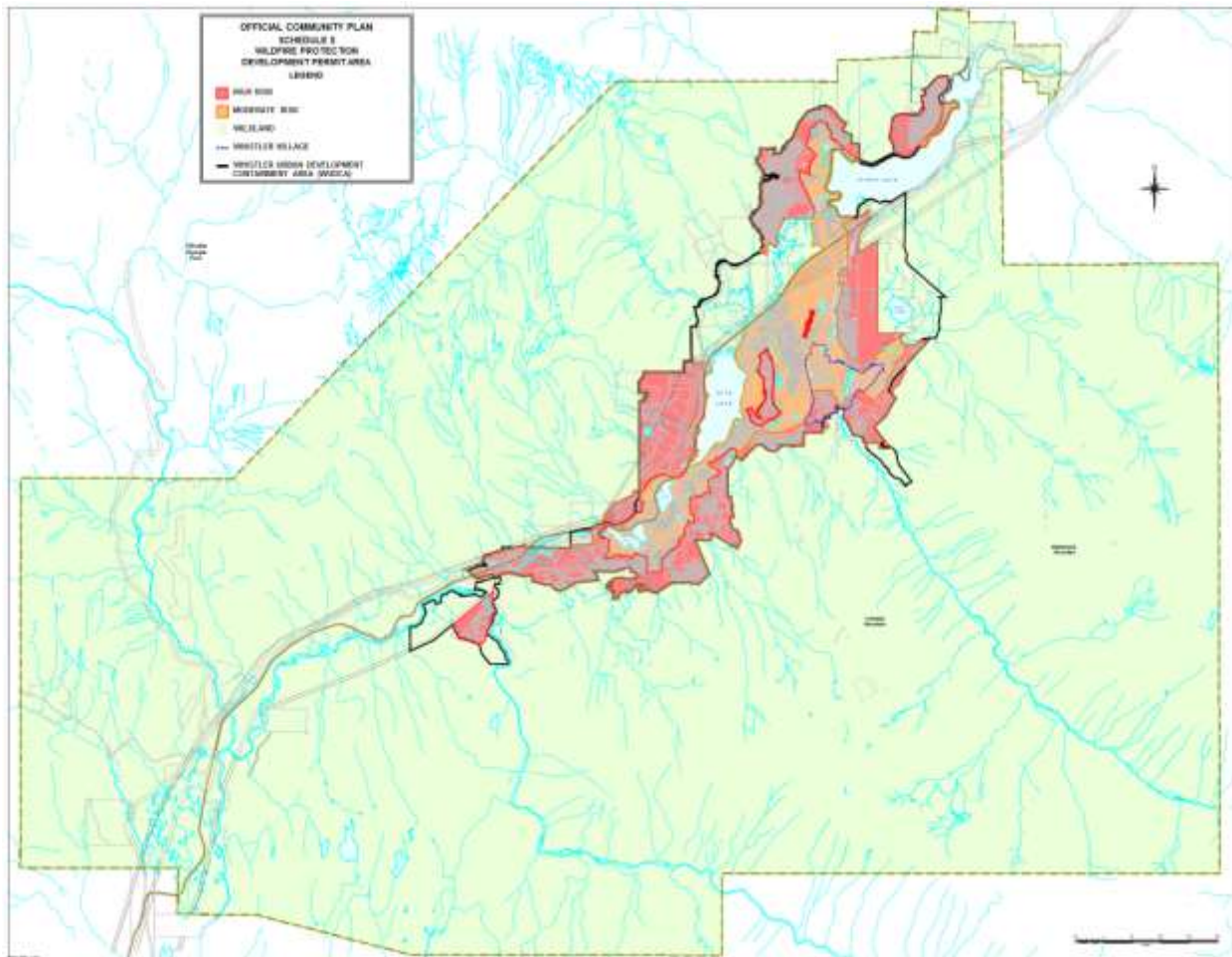
The following is an excerpt from the RMOW's OCP Chapter 13, Wildfire Protection guidelines⁴:

Forested areas surrounding Whistler are also at risk because these areas are popular for outdoor recreation and resource extraction uses. Because wildfire can be triggered from structure fires and human activity, the probability of a structure fire in Whistler spreading to the surrounding forest is equal to, or greater than, the probability of a wildfire spreading from the forest into the community. Applying wildfire development permit guidelines to new development will mitigate the likelihood and consequences of all wildfire scenarios. There are three distinct areas where these guidelines will be applied to reduce the risk and impacts of wildfire:

- **Moderate Risk Areas:** These areas are typically developed areas that are not adjacent to or surrounded by forests. In these areas, key building and landscape features in the areas immediately surrounding principal buildings may be required.
- **High Risk Areas:** These areas are typically developed areas or developable land near or adjacent to forest. In these areas, several building features, landscaping, site clearing, and tree thinning may be required.
- **Wildland Areas:** These areas are predominantly undeveloped forested areas. Urban development is not typically planned or located in these areas. However, when new development is proposed in these areas, FireSmart® Assessments may be required. This requirement also extends to resource extraction and outdoor recreation uses, but only when occupied structures (e.g., cooking/warming huts or cabins) are proposed.

⁴ <https://www.whistler.ca/ocp/wildfire-protection/>

Map 3: Schedule S Wildfire Protection Development Permit Area



Observation #1: As detailed in the RMOW's Official Community Plan (OCP), the probability of a structure fire extending into a wildfire is equal to or greater than the converse. The three distinct wildfire protection guidelines of moderate, high, and wildland areas are based off the Provincial Wildland Urban Interface (WUI) rating which are primarily based on vegetation and do not reflect community design and community hazards such as fire department resource capabilities and response time. The wildfire risk increases greatly in areas where Fire Department response time is beyond 10 minutes.

Policy Recommendation #1: *Review the wildfire protection guidelines and consider updating all areas beyond fire department 10-minute response time as High Risk.*

Recommended Completion: 12-24 months

Estimated Cost: Cost neutral, staff time

Rationale: Structure fires that progress beyond ten minutes have the greatest potential to become fully involved and extend beyond the building of origin to adjacent exposures such as structures or forested areas.

The following guidelines apply within the Wildfire Protection DPA:

All Areas

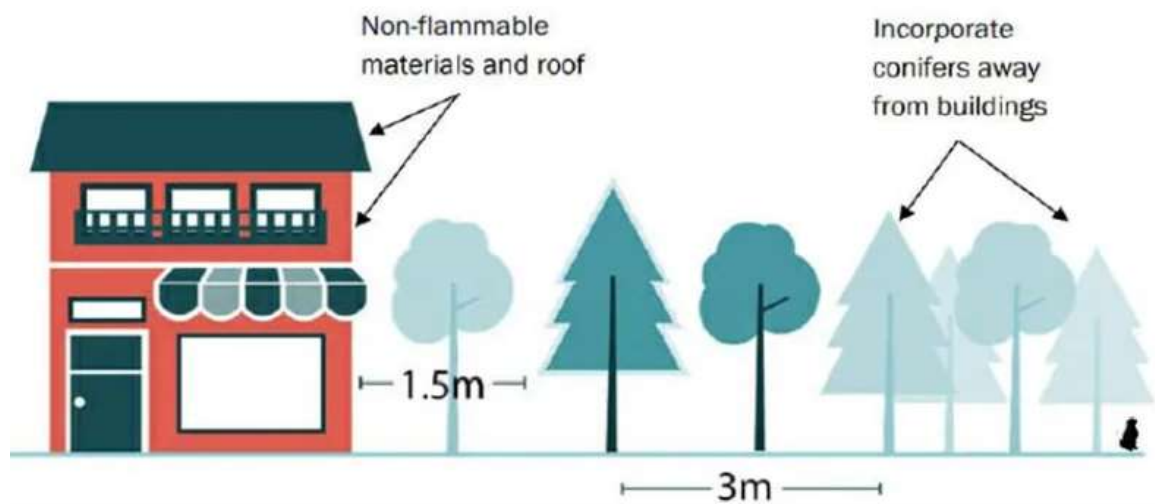
- a. Where a distance is specified by these guidelines for the purpose of establishing an area that should be cleared or remain free of vegetation, the distance should be measured from the outermost part of the building to:
 - i. the distance specified in the guideline;
 - ii. the property line, unless permission has been granted by the adjacent property owner; or
 - iii. the boundary of an environmentally sensitive area unless clearing is carried out in accordance with the recommendations of a QEP and approved in writing by the municipality's Manager of Environmental Stewardship, whichever is closer.
- b. Where the municipality receives a FireSmart® Assessment in respect of a property which is the subject of an application for a development permit under this section, the municipality may choose to apply, as permit conditions, the recommendations of the report instead of, or in addition to, the guidelines in this section.
- c. Where these guidelines warrant tree removal preference should be given to:
 - i. retaining the largest and healthiest trees;
 - ii. removing coniferous vegetation located closest to principal buildings; and
 - iii. retaining deciduous trees and vegetation.

Moderate Risk Areas

- a. All areas within 1.5 metres of principal buildings should be free of coniferous vegetation. This can be achieved by:
 - i. planting/removing conifers to create a trunk to building spacing of at least 3 metres; or
 - ii. limbing mature trees, selecting species with narrow canopies or applying similar landscaping techniques to obtain a 1.5 metre vertical and horizontal separation between tree canopies and principal buildings (see graphic below).

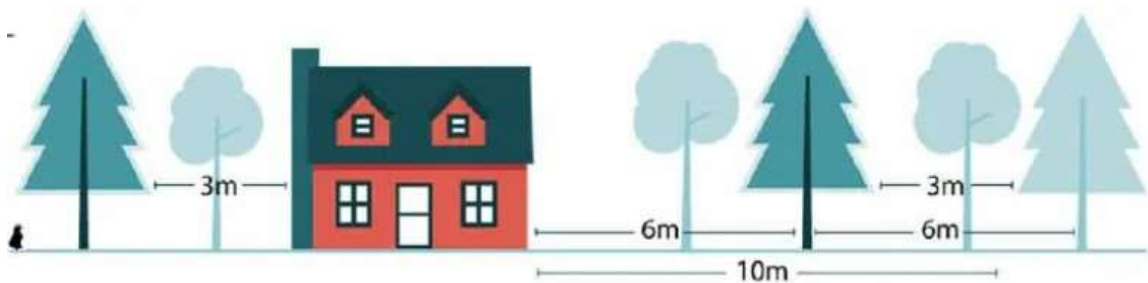


- b. Dead branches and twigs should be cleared within 20 metres of principal buildings. Standing dead trees with a caliper of 17 centimetres or more should be topped at 3 metres and cleared of all branches. Where dead branches are attached to logs greater than 17 centimeters wide or to trees, they should be trimmed to the trunk of the tree or log and in the case of trees, to a height of 2 metres.
- c. Planting native deciduous trees and shrubs is encouraged especially in cases where coniferous vegetation has been removed.
- d. Roof structures should be comprised of fire-resistant roofing. Metal, clay tile, asphalt shingle and similar roofing materials should be used wherever possible. Where wood shakes are used, only treated wood shakes are acceptable.
- e. Gutters should be made of metal.
- f. Cladding should be separated from the ground with a minimum of 15 centimeters of non-combustible ground to siding clearance.
- g. Notwithstanding guideline (a), in areas shown as “Moderate Risk” within Whistler Village, the following guidelines will also apply:
 - i. Individual coniferous trees may be located within 1.5 metres of a building, provided:
 - 1) no other conifers are within 3 metres (measured from trunk to trunk) of the conifer;
 - 2) exterior portions of the building fronting the tree’s existing and eventual canopy are clad in non-flammable materials such as stone, metal, concrete, masonry, or fiber-cement; and
 - 3) building roofing is comprised of metal, clay tile, fibre-cement, or similar material; wood shakes of any kind are not acceptable.
 - ii. To preserve coniferous landscaping in Whistler Village, landscaped areas, especially landscaped areas beyond 1.5 metres from a building, should incorporate coniferous trees and vegetation so as to achieve an overall mix of coniferous and deciduous trees. Clusters of mature coniferous trees should be spiral pruned.



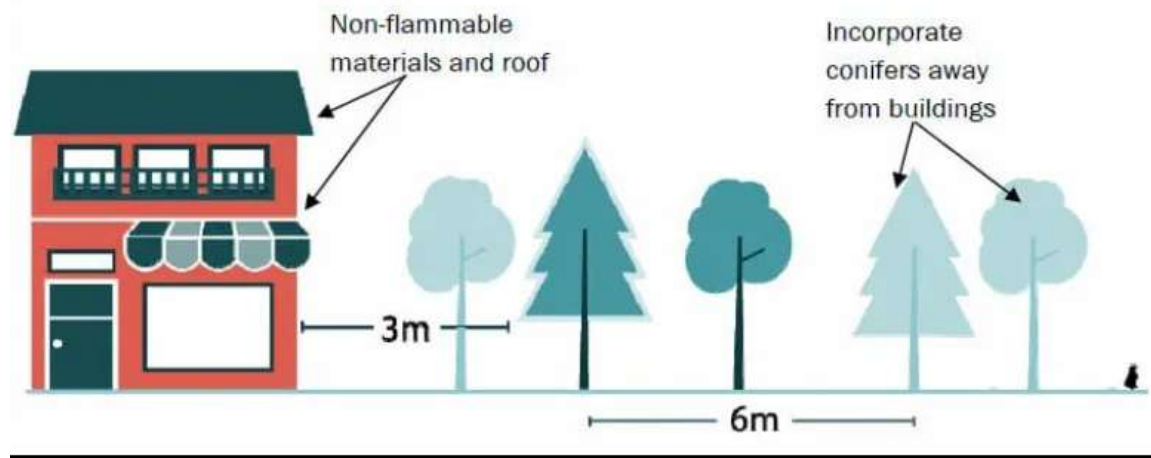
High Risk Areas

- a. New and existing coniferous vegetation within 10 metres and where practical 20 metres of principal buildings should maintain a typical spacing between tree canopies and between tree canopies and principal buildings of at least 3 metres. This can be achieved by:
 - 1) planting/removing conifers to achieve a trunk to trunk or trunk to building spacing of 6 metres or more; or
 - 2) limbing mature trees, selecting species with narrow canopies or applying similar landscaping techniques to obtain a minimum 3 metre vertical and horizontal separation between tree canopies and between tree canopies and principal buildings.



- b. Dead branches and twigs should be cleared within 20 metres of principal buildings. Standing dead trees with a caliper of 17 centimetres or more should be topped at 3 metres and cleared of all branches. Where dead branches are attached to logs greater than 17 centimetres wide or trees they should be trimmed to the trunk of the tree or log and in the case of trees, to a height of 2 metres.
- c. Planting native deciduous trees and shrubs is encouraged especially in cases where coniferous vegetation has been removed.
- d. Notwithstanding guideline (a) in areas shown as “High Risk” within Whistler Village, the following guidelines will also apply:
 - i. Individual coniferous trees may be located within 3 metres of a building, provided:
 - 1) no other conifers are within 6 metres (measured from trunk to trunk) of the conifer;
 - 2) exterior portions of the building fronting the tree’s existing and eventual canopy are clad in non-flammable materials such as stone, metal, concrete, masonry, or fiber-cement; and
 - 3) building roofing is comprised of metal, clay tile, fibre-cement, asphalt shingle or similar material; wood shakes of any kind are not acceptable.

- ii. To preserve coniferous landscaping in Whistler Village, landscaped areas, especially landscaped areas beyond 3 metres from a building, should incorporate coniferous trees and vegetation so as to achieve an overall mix of coniferous to deciduous trees. Clusters of mature coniferous trees should be spiral pruned.



- e. The use of bark mulch and similar organic ground cover in landscaped areas within 10 metres of buildings is discouraged.
- f. Exterior building surfaces, including deck surfacing, roofing, and cladding, that is situated under, or within 6 metres of, coniferous vegetation should be non-flammable materials such as stone, metal, concrete, masonry, or fiber-cement.
- g. Fire-resistant or non-flammable cladding that is consistent with mountain character (e.g., fiber-cement siding, stone, logs, or heavy timbers) is encouraged. Stucco and vinyl siding are discouraged.
- h. Windows and doors should utilize double-paned or triple-paned glass; tempered glass is ideal, and single pane glass is discouraged.
- i. Eaves should be closed, and vents screened with 3-millimetre wire mesh.
- j. The undersides of balconies, decks or open foundations should be sheathed with fire-resistant materials.
- k. Auxiliary buildings and fuel tanks should be located as far away from principal buildings as possible. A distance of 15 metres or more is ideal. Where a distance of 15 metres or more is impractical, guidelines in this section that apply to principal buildings should be applied to accessory buildings.
- l. Chimneys for wood burning fireplaces should have spark arrestors.
- m. Gutters should be made of metal.
- n. Cladding should be free of gaps and holes and separated from the ground with a minimum of 15 centimeters of non-combustible ground to siding clearance.

WILDLAND AREAS

- a. For new developments, a FireSmart® Assessment indicating that the proposed development has a hazard score of “Low” or “Moderate” is required, and a development permit may require that the development be carried out in accordance with any recommendations of the report including:
 - i. recommendations related to areas of the land that should be cleared or remain clear of vegetation;
 - ii. recommendations related to landscaping, including locations of plantings, surface treatments, plant, and tree species, thinning and maintenance;
 - iii. recommendations for particular building materials and features; and
 - iv. recommendations pertaining to the location of structures in relation to other structures, or topographical or natural features that are wildfire hazards.

Observation #2: The RMOW’s development permit area wildfire protection guidelines have determined that all lands designated as ‘High Risk’, ‘Moderate Risk’ or ‘Wildland’ are designated as a Development Permit Area for the protection of development from wildfire. The zoning and parking Bylaw No. 303 provides a development permit exemption for detached dwellings and duplexes:

28. Development Permit Exemptions for Detached and Duplex Dwellings (Bylaw No. 2071)

3. *Development within the following categories is exempt from the requirement to obtain a development permit:*
 - e. *detached dwelling;*
 - f. *duplex dwelling;*
 - g. *auxiliary buildings ancillary to a detached dwelling or duplex dwelling.*
 - h. *subdivision to create parcels on which the only types of development permitted by this Bylaw are detached or duplex dwellings.*
4. *The exemption described in subsection 28 (1) does not apply if any part of the parcel of land that is the subject of the proposed development is:*
 - c. *within a development permit area for the protection of the environment, or for the protection of the environment, its ecosystems and biological diversity, and within 30 metres of the high-water mark of a stream; or*
 - d. *within the R11 Residential Infill One zone.*

This exemption does not align with the FireSmart principles and the development permit areas wildfire protection guidelines.

Policy Recommendation #2: Amend zoning and parking Bylaw No. 303 to remove the blanket exemption for detached dwellings, duplex dwellings and auxiliary buildings ancillary of a detached dwelling or duplex dwelling from being exempt from obtaining a development permit for Wildfire Protection.

Recommended Completion: 12-24 months

Estimated Cost: Cost Neutral, staff time

Rationale: The RMOW's wildfire structural risk assessment is deemed to be extreme and as such development in all areas should follow the RMOW's guidelines. During an interface fire, homes usually burn down because of embers landing on and igniting the roof. Alternatively, embers land on or in a nearby bush, tree, or woodpile and, if the resulting fire is near the home, the walls of the home will ignite through radiant heat. Small fires in the yard can also spread towards the home and beneath porches or under homes. Therefore, the building material and construction techniques are a paramount concern for homes in the WUI.

Observation #3: The CWRP identified the need to amend the wildfire Development Permit Area (DPA) guidelines to strengthen certain aspects such as rated shake roofing. Other aspects such as rated glass and door assemblies, chimney spark arrestor, standard and slotted deck surfaces, and restricting retardant coatings that are deemed to be not durable would enhance structural resiliency for wildfire.

Policy Recommendation #3: Amend the DPA wildfire protection guidelines to align with FireSmart guidelines for safer construction methods.

Recommended Completion: 24-48 months

Estimated Cost: Cost neutral, staff time

Rationale: The FireSmart manual provides guidelines for safer construction methods. These include materials, building techniques and maintenance. The following is a summary of these construction and landscaping specifications that should be incorporated into the design guidelines for building on site:

Roofs

- Use only fire-retardant material (Class A materials) on roofs.
- Keep roofs clean of all combustible material.

Wood Chimneys

- All chimneys should have approved spark arrestors (securely attached and made of 12-gauge welded or woven wire mesh screen with mesh opening of less than 12 mm).
- Chimney outlets should have at least 3 meters clearance from all vegetation and obstructions.

- Chimney outlets should be 0.6 m higher than any part of the roof within 3 meters.

Siding

- Siding should be predominantly fire-resistant material.
- Siding should extend from the ground level to the roofline.

Windows and Door Glazing; Eaves, Vents and Openings

- Remove vegetation from within 10 meters of glazed openings unless there are solid shutters to cover the glazing.
- All eaves, attics, and underfloor openings need solid, non-flammable protective covers.
- Laminated glass and 20-minute rated door assemblies should be used on building surfaces facing the forest interface.

Balcony, Decks and Porches

- Deck surface material should be made of predominantly non-combustible or fire-resistant materials such as wood composite products.
- Slotted deck surface allows needle litter to accumulate beneath the deck.
- Provide access to this space to allow for removal of this debris.

SECTION 3

FIRESMART PROGRAM ASSESSMENT AND ENFORCEMENT

3.1 FireSmart and Wildland Fuel Mitigation

The FireSmart program in BC is directed by the BC FireSmart Committee (BCFSC), a group composed of the BC Wildfire Service (BCWS), Office of the Fire Commissioner (OFC), Union of BC Municipalities (UBCM), Fire Chiefs' Association of BC (FCABC), Emergency Management and Climate Readiness (EMCR), Forest Enhancement Society of BC (FESBC), First Nations' Emergency Services Society of BC (FNESS), Indigenous Services Canada (ISC), BC Parks, Parks Canada and Ministry of Forests- Regional Operations.

The BCFSC's goal is to collaboratively maintain and improve the delivery of the FireSmart BC program to better support wildfire preparedness, prevention, and mitigation in BC. They do this by ensuring alignment with the seven FireSmart disciplines:

- Education
- Emergency Planning
- Vegetation Management
- Legislation
- Development
- Interagency Cooperation
- Cross Training

In meeting their purpose, the BCFSC the commit to aligning with FireSmart Canada, developing an annual work plan and budget, and providing stakeholders and interested parties with one governing organization for FireSmart in BC.

The RMOW is a municipal leader with it's exemplary FireSmart program. The Whistler FireSmart Program (WFP) was initiated in 2016 as a project funded through the Union of British Columbia Municipalities (UBCM) Strategic Wildfire Prevention Initiative (SWPI). The WFP has evolved over the years and in 2022 includes a total of 11 staff and a budget of \$400,000. The WFP utilizes one heavy duty dump truck, two pickups and a small inventory of forestry/arborist equipment.

Funding sources for the WFP include:

- RMOW operating budget contribution
- Resort Municipality Initiative (RMI)
- UBCM Community Resiliency Investment (CRI)
- Ministry of Transportation and Infrastructure (MOTI), and the
- Municipal Insurance Association; Insurance Bureau of Canada

The WFP strategic plan 2023-2025 indicates the budget for 2023 is approximately \$500,000 and includes an estimated \$230,000 from provincial sources. Discussions with the FireSmart Supervisor indicates that the funding sources appear to be secure and anticipates that the program goals will continue as identified in the WFP strategic plan.

Of note are the numerous programs, initiatives, and goals that the WFP has accomplished since 2016. During the interviews and consultation process conducted in the development of this CWDP there was a prevalent theme that the RMOW community has a very high level of awareness for wildfire risk and reduction activities. Part of this awareness in our opinion has been the results of the WFP.

3.1.1 FireSmart Organization and Overview

Working within the Protective Services Division a full-time FireSmart Supervisor leads a seasonal crew of 5 staff. This crew conducts public education on FireSmart practices to groups ranging from school children to seniors, community organizations and strata councils.

The FireSmart crew performs site assessments for property owners and guides residents with neighbourhood projects to harden their own homes against wildfire. The FireSmart Supervisor works closely with staff from the Climate and Environment Division to strike a balance between a fire safe community while retaining a rich natural forested community. This balance begins during the early stages of construction where the FireSmart Supervisor has direct consultation and collaboration with developers and strata councils.

The FireSmart crew performs fuel mitigation work on municipal forested areas around public infrastructure and private lands adjacent to infrastructure. Due to the steep topography and mix of forested areas and rock cliffs, wildland fuel mitigation is typically done in small (< 1-hectare) plots of public lands. This mitigation will include some juvenile tree spacing and clearing underbrush to limit fire spread through the forest understory. They work with the Facilities Division to upgrade the standard for building materials for critical infrastructure sites. The FireSmart Supervisor has worked to document the location of critical infrastructure sites and the fuel mitigation work to be completed. To date 43 installations/sites have been assessed with 13 treated with mitigation measures.

Observation #4: Throughout British Columbia the typical approach to deliver the FireSmart program resides with the local fire department and within the legislated fire prevention program requirements. The primary focus of every fire department is fire prevention, and this includes inside and outside homes and structures. All seven principles of the FireSmart program are components of the WFRS fire prevention program.

Policy Recommendation #4: Transfer the FireSmart and Mitigation program to the Whistler Fire Rescue Service from the Protective Services Division as an integral component of the Fire Prevention Branch.

Recommended Completion: 12-24 months

Estimated Cost: Cost neutral, staff time

Rationale: Fire prevention and education is part of the daily duties of the WFRS crews. Establishing a holistic approach to fire safety and education that includes FireSmart will reduce duplication and create several efficiencies and program effectiveness. This includes enhanced coordination for aspects such as: comprehensive public education program (inside and outside), planning and development reviews, building standards review and/or development, interoperability with internal and external agencies and enforcement. WFRS is currently involved in all these aspects and has the organizational capacity to support FireSmart Supervisor and crew.

Observation #5: WFRS has a minimum staffing of four career/fulltime firefighters and relies on fulltime call-back and Paid-on-Call (POC) members to augment their response. This staffing level and response capacity has a very limited critical task capability to mitigate a wildfire in the early stages. This is discussed in more detail at section 4.3 (Effective Response Force Assessment Wildfire Response Staffing Analysis).

Emergency Planning Recommendation #5: Establish a FireSmart crew as part of the WFRS initial response assignment for confirmed structural fires and all reported wildfires during the wildfire season. Furthermore, train the FireSmart crew to the S185 Fire Entrapment and Avoidance and Safety, and equip with appropriate personal protective equipment and clothing.

Recommended Completion: 6-12 months

Estimated Cost: \$20,000 for training and PPE

Rationale: The wildfire risk within the RMOW is extreme and an initial response must be capable to perform the critical tasks before a small event becomes an established wildfire. The FireSmart crew can provide an enhanced initial response during normal workdays. This includes structural fires to monitor ember fallout into wildland fuels.

The FireSmart crew consists of fuel mitigation specialists, arborists and danger tree assessors and fallers that are trained to the basic fire suppression and safety (S-100) as recognized by the BC Wildfire Service.

Observation #6: There are two committees that focus on wildfire risk reduction and FireSmart. The RMOW internal committee is the Wildfire Internal Coordination Group. This committee includes lead members of all stakeholder groups: GM of Corporate Services and Public Safety, Planning, Parks, Infrastructure Services, WFRS, FireSmart, Climate and Environment, Emergency Planning, Bylaw, Legislative Services, Communications, and hired forestry consultants. The committee's focus is on planning, coordination of initiatives and progress tracking for all wildfire risk reduction strategies. The second group is the Sea-to-Sky CFRC group that focuses largely on FireSmart with some fuel and vegetation modification. This group includes representatives from the District of Squamish, Village of Pemberton, SLRD and the RMOW.

Emergency Planning Recommendation #6: Expand the Sea-to-Sky Community FireSmart Resiliency Committee's terms of reference to include wildfire defence and protection strategies and tactics.

Recommended Completion: 6-12 months

Estimated Cost: Cost Neutral, staff time

Rationale: The CFRC scope is to evaluate, review and/or develop procedures, guidelines, best practices and promote the FireSmart program resources and information through education and public relations. To pool resources shared information and conduct training at the regional level the scope of the CFRC needs to include wildfire structural defence and protection strategies and tactics.

3.2 Risk Reduction and Enforcement Strategies for Property Owners

3.2.1 Risk Reduction

As detailed in the CWRP, to date, the RMOW has worked with forestry contractors and the Cheakamus Community Forest to treat approximately 300 hectares of their wildland-urban interface. The Mountain Resorts Branch has treated approximately 74 hectares to-date on Whistler Blackcomb.

The RMOW FSP in addition to reducing fuel on portions of municipal land has provided the support that facilitates individual homeowners and neighbourhoods to proactively mitigate their risk to wildfire. Some general actions taken by communities within the WUI to mitigate wildfire risks include:

- **Vegetation Management:** Clearing brush, thinning trees, and removing dead vegetation.
- **Utilizing fire-resistant building materials:** This can mean using materials that don't ignite easily for roofing, siding, etc.
- **Community education:** Informing residents about creating defensible spaces and safe practices.
- **Infrastructure Improvements:** Ensuring roads and water sources can support firefighting and evacuation efforts.

A well-developed wildland urban environment community can be characterized as being “interface” meaning that subdivisions are built with paved roads, hydrant service and abut the wildland fuels where there is a definitive line (transition zone) between developed areas and the forest. Other more rural communities can be characterized as “intermix” where homes may be scattered throughout the forested area; typically, larger lots and limited services such as hydrants. Whistler is a mixture of both wildland urban environments where there is a definitive line where the subdivisions back on to forested areas but with larger lot sizes and the desire to maintain the forested esthetics, homes are surrounded by wildland and ornamental fuels.

The images below depict the contrast between what a FireSmart home should look like, and a likeness of the typical Whistler intermix neighbourhood.

Image 1: Tips to FireSmart your Home – BC and Whistler Intermix



Image 2: Typical wildland interface within the RMOW



The RMOW WFP has a principle focus on public education as a method to increase wildfire risk awareness and take appropriate action to reduce the risks on private property and in neighbourhood areas with Whistler. Two very successful programs conducted by the WFP team are the FireSmart workday projects and the community woodchipper service.

There are additional programs offered by the FireSmart BC and Canada. This includes the FireSmart Canada Neighbourhood Recognition Program where residents work together to apply FireSmart principles towards a more resilient neighbourhood where the risk of property loss during a wildfire is decreased. With the support of the WFP team 21 neighbourhood areas in Whistler have received the FireSmart Canada recognition designation:

- Alpine Meadows: 1. 19 Mile Townhomes, 2. Fissile/Idylwood,
- Whistler Cay Heights: 3. Smoketree Village, 4. Sunrise, 5. Eagle Ridge,
- Benchlands/Upper Village: 6. Gables, 7. Woods,
- Brio: 8. Suncrest,
- Alta Vista: 9. Alta Vista II, 10. Alta Vista Pointe
- Nordic: 11. Castle Estates, 12. The Bluffs, 13. Nordic Vistas
- Creekside: 14. Highpointe
- Twin Lakes: 15. Tamarisk
- Spring Creek: 16. Bear Ridge, 17. Glades
- Cheakamus Crossing: 18. Whitewater, 19. Heights

Observation #7: The CWRP includes other recommendations regarding the implementation of the FireSmart Rebate Program and incentives for residents to mitigate wildfire risks on their property such as a RMOW led tree replacement program. The CWRP identified 2023 to formally initiate these programs.

Policy Recommendation #7: The RMOW initiate the FireSmart Rebate Program, and other risk reduction incentives for residents and homeowners in high-risk areas.

Recommended Completion: 18-24 months

Estimated Cost: To be determined through CRI rebate program

Rationale: Effective risk reduction of the FireSmart principles provides the best defence to preserve lives and property in the event of a wildfire. The Community Resiliency Investment Program administered through the UBCM provides rebates for mitigation reduction to homeowners up to \$5,000.

3.2.2 Enforcement Strategies

Within the scope of work for this project is to advise the RMOW on the development of a policy to ensure that property owners are notified of and taking action to mitigate fire hazards on private land. During the consultation phase of this project the subject of enforcement was identified as an area to explore in terms of establishing a policy that compels residents/owners to mitigate fire hazards on private land.

Research conducted by Behr in this regard determined in both Canada and the United States, the risk of wildfires in certain regions has led to the development of various bylaws, statutes, and regulations compelling property owners to undertake fire mitigation measures. These rules often form part of broader wildfire protection and land management strategies.

Canada

British Columbia: In BC, some municipalities have bylaws requiring property owners to manage vegetation and remove fire hazards. The FireSmart program provides guidelines for reducing wildfire risks, and local governments can enact bylaws to compel compliance.

Alberta: Alberta's Forest and Prairie Protection Act provides guidelines for fire protection and prevention, which can include obligations for property owners in fire-prone areas.

United States

Like FireSmart, the US equivalent is that of the Firewise USA Program. This program encourages local solutions for safety by involving homeowners in taking individual responsibility for preparing their homes from the risk of wildfire.

California: California is known for strict building codes and regulations regarding fire safety, particularly in Wildland-Urban Interface (WUI) zones. The California Public Resources Code Sections 4290-4299 and 4291 require property owners to maintain a certain level of "defensible space" around structures.

Colorado: Colorado has a variety of local ordinances regarding wildfire mitigation, including regulations related to building materials, vegetation management, and defensible space. Local fire districts and counties may have specific requirements for property owners.

Oregon: Like California, Oregon has specific regulations for properties in Wildland-Urban Interface zones, including vegetation management requirements.

Local governments often have the authority to enact bylaws or ordinances related to fire safety, so the rules can vary widely depending on the municipality or jurisdiction. It is common for these rules to be tied to building codes, land-use zoning, and vegetation management. They may also be integrated into broader community wildfire protection plans.

- Property owners in fire-prone areas are usually encouraged or required to adhere to principles like:
- Creating and maintaining defensible space by managing vegetation.

- Using fire-resistant building materials.
- Providing access for emergency vehicles.
- Installing spark arrestors in chimneys and stovepipes.
- Enforcement can include inspections, fines, and other legal measures. Collaboration between municipal fire departments, forestry agencies, and other stakeholders is often essential for effective enforcement.

Table 4: Enforcement strategies research

Community	Enforcement	Source
RMOW	Whistler's vision and OCP Chapter 13 Development Permit Areas Wildfire protection. All lands shown as "High Risk", "Moderate Risk" or "Wildland" are designated as a Development Permit Area for the protection of development from wildfire. Applying wildfire development permit guidelines to new development will mitigate the likelihood and consequences of all wildfire scenarios.	https://www.whistler.ca/ocp/wildfire-protection/
RMOW	FIRE AND LIFE SAFETY BYLAW 2201, 2019 Powers of the Fire Chief: Take measures considered necessary to prevent and suppress fires, including the demolition of Buildings and other structures to prevent the spreading of fires. (e) require an Owner or Occupier to undertake any actions the Fire Chief considers necessary for the purpose of removing or reducing any thing or condition the Fire Chief considers is a Fire Hazard or increases the danger of fire	https://www.whistler.ca/municipal-gov/bylaws-and-regulations/bylaw/fire-and-life-safety-bylaw/
City of Nelson, British Columbia	A bylaw stipulating that all new home construction, must make use of fire-resistant materials in the construction of homes within a certain distance from the forest's edge. Further requirements include prohibiting the planting of new coniferous plants within 1.5 metres of a structure for every property in the city.	https://changingclimate.ca/case-study/wildfire-by-laws-to-regulate-new-home-construction-and-community-landscaping/
Town of Swan Hills, Alberta	Implemented municipal development bylaws based on the FireSmart principles to help reduce the town's vulnerability to forest fires.	https://changingclimate.ca/case-study/municipal-land-use-bylaws-and-firesmart-provisions/ https://www.iclr.org/wp-content/uploads/2021/04/4_cities_adapt_wildfire_swan_hills.pdf

Community	Enforcement	Source
District of Squamish	Wildfire Landscaping Management Bylaw: is intended to help Squamish residents make smarter, fire-resistant landscaping choices when it comes to planting new trees and shrubs within 10 meters of buildings or structures on their property. The goal of this Bylaw is to ensure all Squamish residents are aware of the significant risk associated with having fire-prone vegetation within proximity to one's home or building.	https://squamish.civicweb.net/document/211681/ https://squamish.ca/youngovernment/news/proposed-wildfire-hazard-regulations-designed-to-reduce-the-risk-to-public-safety-property-and-local-forests/
Village of Lytton	Lytton Council attempted to approve a bylaw that integrated the FireSmart principles: <ul style="list-style-type: none"> • Bylaw to Provide for Wildland/Urban Interface Fire Protection for Buildings and Accessibility for Life Safety • Not supported by the residents of Lytton 	https://globalnews.ca/news/9039729/bc-wildfires-lytton-recovery/ https://www.washingtonpost.com/climate-environment/2022/12/15/lytton-fire-canada-climate-change/ https://firesmartbc.ca/learnings-from-lytton/

Observation #8: The Fire and Life Safety bylaw 2201, empowers the fire chief to require an owner or occupier to undertake any actions the fire chief considers necessary for the purpose of removing or reducing anything or condition the fire chief considers is a fire hazard or increases the danger of fire.

Policy Recommendation #8: Amend the Fire and Life Safety bylaw 2201 to include specific conditions identified in the FireSmart Manual.

Recommended Completion: 36-48 months

Estimated Cost: Cost neutral staff time

Rationale: To retain the effectiveness of community wildfire resiliency specific enforceable conditions should be a regulation in the Fire and life Safety bylaw. The powers of the fire chief included in the fire and life safety bylaw are general in nature and interpretation can be challenged should enforcement action be conducted. Including specific conditions that are identified in the FireSmart manual provides clarity and establishes justifiable and credible regulation.

Observation #9: The WFRS manages the interface construction and maintenance regulation that includes high-risk construction restrictions and exemption regulations. These regulations are intended to ensure that sources of ignition are eliminated and/or mitigation measures are put in place to reduce the risk of wildfires during fire danger ratings of high and extreme. Furthermore, high-risk construction exemptions are only permitted to be used during water conservation stages 1, 2 and 3 as a water conservation regulation. Stage 4 water conservation construction activities are prohibited to avoid the possibility of compromising the municipal water system. The effectiveness and efficiency of the high-risk construction exemption regulations could be significantly enhanced under the WFP portfolio.

Policy Recommendation #9: *Transfer the application and management of high-risk construction exemption regulations to the Whistler FireSmart Program team.*

Recommended Completion: 24-48 months

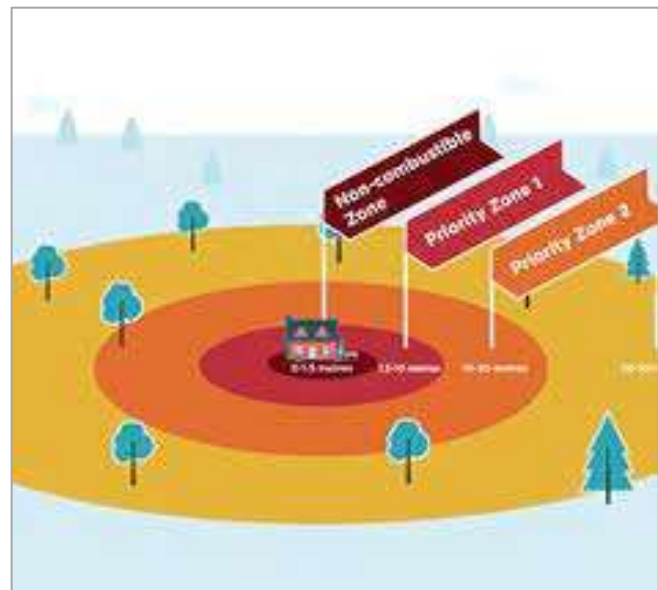
Estimated Cost: Cost neutral, staff time

Rationale: *The intention of the high-risk construction exemption regulation is directly applicable to the mandate of the WFP and wildfire interface. The WFP team are working in the community performing FireSmart requirements which increases their awareness of construction activities throughout the community. The application and compliance of these regulations can be enhanced because of their awareness.*

3.3 External Sprinklers for Interface Neighborhoods

3.3.1 External Sprinklers

Wildfire sprinklers have been proven to be a valuable tool in providing additional protection of structures during wildfire events when deployed in advance of an impending fire. The principal behind the deployment of sprinklers is to increase the humidity (often up to 40%) in a certain location and to action the fire when it isn't safe for firefighters to remain on site.



In the intermix areas such as acreages or farms interspersed throughout the wildland, sprinklers can be deployed on structures and are typically supplied by a static water source such as a pond, creek, or bladder. The idea is to create a humidity bubble around the structure and pre-wet vegetation in the immediate area or zone 1A (see picture). As embers from the approaching wildfire enter the humidity bubble and land on wet surfaces, there is much less chance of that ember sustaining the heat to ignite an object. Of course, it is most beneficial when coupled with proper FireSmart principles to reduce the risk to the structure.

In the interface areas such as subdivisions that back on to forested areas, a humidity moat can be created by deploying sprinklers to the structures that are immediately threatened backing onto the wildland interface. The humidity moat is created to again reduce the chance that an ember will sustain enough heat to ignite the structure or adjacent vegetation. This in turn will reduce the chance of structure-to-structure ignition which will drastically decrease the threat to the entire neighborhood.

Garden type sprinklers and roof-watering systems should not be considered an alternative to the application of FireSmart principles and guidelines. The function of an exterior sprinkler system is to minimize the opportunity for ignition by wetting the home and surrounding property. Exterior sprinkler systems should be able to protect a structure against wind-blown embers, radiant heat, and direct flame contact.

Exterior sprinklers systems can be mounted in one or more locations, including the roof, under the eave at the edge of the roof or on the property, in which case the sprinklers are directed at the home from multiple locations surrounding it.

Post-fire assessments have shown exterior sprinkler systems can be effective in helping a home survive a wildfire, but potential issues exist with their use. These issues include:

- The water supply should be adequate to deliver water, when needed, for the time embers could threaten a home. This period could be up to 8 hours.
- The effectiveness of a sprinkler system is questionable when a neighboring home is burning since this would result in an extended radiant heat and/or contact exposure to the home.
- These systems can be activated manually or by an automated device, such as a sensor that detects heat or flame, or by an SMS-enabled cell phone. The ability of these systems to activate based strictly on an ember exposure has not been determined. Since wind-blown embers can be transported over a kilometre from the flame front of a wildfire, this may be a limitation.



- The most threatening wildfires occur during high-wind events and the homeowner should consider how the distribution/transport of water droplets may be influenced by elevated wind speeds.
- Sprinklers may not function due to loss of power and/or water supply.

Observation #10: There are several manufactures of exterior sprinkler systems. A number of these systems can easily be installed by homeowners and are not cost prohibitive. As previously identified, the use of these systems should be a supplement to already proven FireSmart strategies. The WFP could be enhanced to obtain an inventory of these systems and though the various public education programs and FireSmart activities demonstrate the installation and use to encourage homeowners to procure exterior sprinkler systems.

Emergency Planning Recommendation #10: *Incentivise external sprinkler systems for residential applications in high risk and wildland neighbourhood areas that are FireSmart recognized.*

Recommended Completion: 36-60 months

Estimated Cost: Based upon purchase of 50 units: \$12,500.

Rationale: *High-risk and wildland neighbourhood areas in the RMOW that have been FireSmart designated provides the environment to use exterior sprinkler system to supplement mitigation measures already completed. RMOW purchase and use as an incentive to get homeowners to comply with FireSmart principles.*

3.3.2 Structure Protection Units

Structure Protection Units (SPUs) are one of the tools a community can use to help protect homes during interface fires. SPUs are often deployed as a precautionary measure to dampen roofs and areas around structures. They are more effective if used in conjunction with properties that have applied FireSmart standards.

The Province of BC owns two types of SPUs that range in size and protection capabilities:

- Type 1 trailers are 48 feet long and capable of protecting 50 structures or more. The Province of BC has six of these trailers.
- Type 2 trailers are 22 feet long and capable of protecting up to 50 structures.

The SPU program is operated and managed by the BC Wildfire Service to prioritize the deployment of Type 1 and Type 2 SPUs to wildfires, along with trained structure protection crews and a structure protection specialist. Some local and Indigenous governments have purchased and maintain their own structure protection resources to be used when a wildfire becomes an interface fire. For example, the SLRD is in the process of purchasing a type 2 unit.

The procurement and deployment of the SPUs is discussed in more detail at Section 4.3 and the WFRS Wildfire Vehicles & Equipment Assessment

3.4 Public Education

The 2023 wildfire season is officially the most expensive and most destructive on record. According to the B.C. Wildfire Service (BCWS), a total of 2,217 fires have been detected this year, burning almost 25,000 square kilometres of trees, bush, and grassland⁵. Public awareness regarding the risk of wildfire has drastically increased as the result of this devastating wildfire season. The RMOW has an exemplary FireSmart program that includes an extensive public education component. While there has been some FireSmart apathy within Whistler given the significance that the RMOW has placed on community resiliency, a renewed interest may very well be prevalent in the following wildfire seasons.

As previously identified during the consultation phase two very successful programs conducted by the WFP team are the FireSmart workday projects, and the community woodchipper service. Significant metrics of success captured to date for 2023 include:

- FireSmart Workdays (neighbourhood projects that WFP supports with staff, guidance, tools, bins, chipper, and truck): 27
- FireSmart Community Chipper Service days: 23 days, 225 properties
- Home Partners Program (HPP) assessments: 78
- Neighbourhood assessments: 8

⁵ <https://www.cbc.ca/news/canada/british-columbia/wildfire-danger-reducing-1.6980041#:~:text=The%202023%20wildfire%20season%20is,of%20trees%2C%20bush%20and%20grassland.>

Observation #11: The Community Wildfire Resiliency Plan dated February 2022 included a comprehensive list of recommendations regarding the enhancement of the WFP public education program:

- Create a strategic communications plan that identifies key goals, objectives, and metrics to educate RMOW residents and tourists on wildfire risk and general FireSmart principles.
- Keep the Whistler FireSmart website up to date.
- Promote the FireSmart program via social media.
- Continue to host FireSmart workshops.
- Continue to present the FireSmart Education Box in local schools.
- Continue distribution of the Whistler FireSmart brochure and FireSmart handouts (e.g., Homeowner's Manual, Landscaping Guide, many available as QR Codes).
- Continue radio, signage, and in-person patrolling presence regarding wildfire risk and fire bans.
- Communicate the steps that the RMOW is taking to mitigate wildfire risk within the municipality.
- Provide educational signage in historic and current fuel treatment areas (e.g., Lost Lake, Nesters, Cheakamus Road).
- Promote program activities and include maps and statistics on the RMOW website; Consider distributing a semi-annual FireSmart newsletter.
- Assess and retrofit municipal critical infrastructure (i.e., communications, power, water, and sewer infrastructure) to FireSmart standards and provide educational signage. Track assessments, sites and work completed in a database linked to the RMOW GIS.
- Establish and promote a FireSmart rebate program for residents prioritized to high-risk neighbourhoods.
- Work with local nurseries and landscape companies to highlight FireSmart preferred vegetation, as per the FireSmart Canada Landscaping Guide.
- Display and promote the Landscaping Guide.

Through the FireSmart BC Plant Tagging Program or internal avenues, display and promote the landscaping guide. Tag preferred and high-risk vegetation; investigate discounts on preferred vegetation.

Emergency Planning Recommendation #11: Develop a FireSmart strategic plan that integrates the CWRP public education recommendations.

Recommended Completion: 24-48 months

Estimated Cost: Cost neutral, staff time

Rationale: Based upon our review of the Whistler FireSmart Program (WFP) Strategic Plan 2023 – 2025 and the CWRP, a comprehensive, coordinated, and realistic strategic plan, that establishes priorities is required for the WFP. This should identify programs that are deemed highly effective by the public and provide enhanced FireSmart communication.

3.5 Potential Grants and Funding Opportunities

Research conducted by Behr did not yield additional grants and funding opportunities. As a result of the catastrophic 2023 wildfires in BC, the Province is initiating a wildfire taskforce the results of which may be additional funding for community wildfire mitigation, preparedness, and response.

Applying for grants and other funding can be highly competitive and often involves a detailed application process. Understanding the requirements, deadlines, and utilizing professional assistance where possible could greatly increase the chances of success. Regular collaboration with neighboring municipalities, government bodies, and experts in the field can also keep the RMOW in the loop about new opportunities as they arise.

The RMOW current funding sources for the wildfire risk reduction programs include:

- RMOW operating budget contribution
- Resort Municipality Initiative (RMI)
- UBCM Community Resiliency Investment (CRI)
- Ministry of Transportation and Infrastructure (MOTI), and the
- Municipal Insurance Association; Insurance Bureau of Canada
- Infrastructure Canada Disaster Mitigation and Adaptation Fund
- Mountain Resort Branch (MRB), Ministry of Tourism, Arts, Culture and Sport

SECTION 4

RESPONSE CAPABILITY

4.1 RMOW Emergency Response Plan

While the probability of wildfires in RMOW is lower compared to some BC interior communities, the potential consequences are significant. Whistler's global reputation as a top destination makes it vulnerable to substantial economic, social, and environmental losses in the event of a wildfire, which could harm its worldwide image. Because wildfires can be triggered by structure fires and human activity, the likelihood of a structure fire in Whistler spreading to the surrounding forest is equal to or greater than the probability of a wildfire moving from the forest into the community, especially in the north and south areas of the community where response times are longer. Adding to the concerns, Whistler is projected to experience hotter and drier summers due to climate change, intensifying wildfire risks and consequences.

Effective emergency planning involves preparedness, risk assessment, plan development, and training, including practice. To this end, RMOW has developed a Comprehensive Emergency Management Plan (CEMP, 2015) to guide emergency response. The CEMP outlines Incident Command Post (ICP) locations, Emergency Operations Center (EOC) organization and locations, resource requests, and partnerships with the BCWS. Overall, the CEMP is a well-structured plan that aligns with the Incident Command System (ICS) and British Columbia Emergency Management and Climate Readiness (EMCR) requirements.

Observation #12: During the consultations and interviews, several observations related to the Comprehensive Emergency Management Plan (CEMP) emerged:

- The CEMP needs to be updated and is already in progress
- Since the 2010 Winter Olympics, there has not been consistent recurring training, including tabletop exercises and workshops
- Need to maintain interoperability and coordination with external agencies, such as First Nations, SLRD, Chamber of Commerce, Tourism Whistler, and Whistler Blackcomb
- During a wildfire, the procedure for closing down the resort or initiating a full evacuation when the province holds jurisdiction over Whistler Blackcomb
- Concern about the accuracy of the Sea to Sky multimodal evacuations plan (2019) modelling, which estimates that a no-notice mass evacuation of Whistler on a peak day will take approximately 15 hours (12.5 hours with traffic control based on 21,064 vehicles).
- Over 8,400 people within Whistler who do not have access to a vehicle, this includes resort staff, guests, and service sector workers.

Emergency Planning Recommendation #12: Establish a list of non-government external agencies and community partners as EOC liaison officers within the revised CEMP.

Recommended Completion: 12 months

Estimated Cost: Cost Neutral, staff time

Rationale: There are several external agencies or community partners that should be part of the EOC network. Many of these have resources or interests within the RMOW. In particular, the First Nations that have economic interests and culturally sensitive areas within the RMOW. Tourism Whistler has a broad reach in the RMOW and may have resources such as accommodations to support Emergency Operations Center (EOC) requirements.

Training Recommendation #13: Conduct annual wildfire training exercises or workshops that include external agencies and community partners such as First Nations, SLRD, Chamber of Commerce, Tourism Whistler, Whistler Blackcomb, BCWS Coastal Fire Center and Pemberton Fire Zone and regional fire departments.

Recommended Completion: 1-12 months and recurring annually.

Estimated Cost: \$5,000.00 annually

Rationale: Conducting wildfire response training with external agencies and community partners will result in a more inclusive, coordinated, and effective response.

Policy Recommendation #14: Clarify or establish the protocol with the province regarding the authority having jurisdiction for the closure or evacuation of Whistler.

Recommended Completion: 24 months

Estimated Cost: Cost Neutral, staff time

Rationale: The area encompassing the RMOW is multi-jurisdictional and includes Whistler Blackcomb and the province. Establishing an appropriate protocol will ensure coordination and communication occurs during significant emergency events.

Emergency Planning Recommendation #15: Establish a 'shelter-in-place' plan that designates facilities within the RMOW as suitable and safe for evacuees.

Recommended Completion: 24 months

Estimated Cost: Cost Neutral, staff time

Rationale: It is preferential to totally evacuate the public from an area being threatened by wildfire. This allows the safe movement and operations of emergency response vehicles and equipment and removes the public away from smoke inundation. Further, this approach is problematic with essentially one road in and one road out of Whistler. Shelter in place should be utilized in extreme situations and should be part of a temporary measure within a full evacuation.

Working with the Chamber of Commerce and Whistler hotels, particularly in the non-interface village area a modified shelter in place concept could be developed that allows evacuees into hotel and/or conference rooms. This would also assist evacuation phasing.

4.1.1 Emergency Communications Plan

The RMOW has an extensive external communication capability with the community and public, as outlined by the Communications Manager:

Whistler Alerts: The telephone-based alert system currently reaches almost 8,000 people. The number varies as individuals can opt in or out, including visitors with short-term stays. It has proven highly effective, with consistent media coverage helping us grow the list. Last August, we had 6,400 subscribers.

Facebook (@RMWhistler): Whistler's news-specific channel with 9,400 fans. (biggest post this year is 25,000).

Instagram (@RMWhistler): 4,350 fans with strong reel potential. The top reel hit 20,000 this year, making it a valuable platform for crafting viral content.

Twitter/X (@RMWhistler): Googleable option, while it holds (the brand is in a bit of a tailspin)

Whistler Today: RMOW newsletter, with 2,700 subscribers

Website: In August, during the fire season, the RMOW website received 209,000 hits. Can be used to send alerts and change the homepage banner immediately.

Public Relations: The most effective medium for reaching the community. Whenever Pique Whistler newsmagazine features the RMOW, a significant increase in web traffic is experienced.

Media Outreach:

- **Press Releases:** These get limited attention, but they are still expected to be well-read
- **Media Advisories:** Calling a press conference
- **Media Pitches:** Offering interviews is a very effective strategy

Community Channels:

- Whistler Blackcomb's FB/Instagram stories hit 20,000 viewers, primarily within the geographical region; the RMOW always ask them to share our important stories, and place the news on both their operational Twitter feed and brand Twitter account
- Whistler Winter/Whistler Summer is a community page worth leveraging with a simple message to follow the RMOW's channels for updates – this would be the RMOW's fastest route to own the dialogue
- Tourism Whistler primarily speaks to the tourist audience: Support messaging designed specifically for those in the community on short-term stays (Facebook/Instagram, Twitter)

Observation #13: The CEMP has a section that identifies the various communication mediums used in the EOC such as radios, cell phones, internal EOC directory or satellite phones. During the onset of an emergency, it is essential that key external agencies and community partners are alerted. A leading practice in this regard is an emergency communications plan.

Emergency Planning Recommendation #16: *Develop as part of the emergency response plan, an emergency communications plan that includes a network of key external agencies and community partners.*

Recommended Completion: 24 months

Estimated Cost: Cost Neutral, staff time

Rationale: *The CEMP identifies several government and external agencies that capabilities to support EOC activations. Having a system that provides immediate alerts to these agencies and others such as the SLRD, First Nations, Whistler Blackcomb and other key community organizations will better prepare the community to react to a major emergency. An emergency communications plan is a strategic, step-by-step process that specifies when, how, and with whom the RMOW will communicate when an emergency occurs. The plan should be broad enough to apply to most emergency situations but specific enough for the RMOW response departments to follow.*

Observation #14: There are four forest fire hazard index signs (pictured right) that are located throughout the RMOW. There is one just past the heliport on Highway 99, one on Fire Station 1, one on Highway 99 at the Alta Vista yard entrance and one on highway 99 at the Function Junction intersection. These signs are intended to advise the public and create awareness on current conditions as they relate to the wildfire threat. The current signs are not prominent to provide optimum public awareness and need to be manually adjusted as the conditions dictate.



Emergency Planning Recommendation #17: Procure electronic fire danger signs to increase public awareness and communications during emergencies.

Recommended Completion: 24 months

Estimated Cost: \$16,000 per unit or \$64,000 to replace all the signs.

Rationale: In addition to displaying fire danger ratings, the signs can be used to support phased evacuations, closures, or other emergency messaging.



4.2 RMOW Structural Defence and Protection Plan

4.2.1 Preparing for a Threatening Fire

The response to a significant wildland fire that threatens the community of Whistler would include several agencies: provincial, regional, private sector, and municipal. Where a threatening fire is hours or days away from the community, more time can be dedicated to a strategic approach with a planned response and pre-deployment of resources. The RMOW community wildfire defence plan provides a pre-incident guide and preparedness plan to assist responders before and in the event of a threatening wildfire. It must be understood that this plan is a guide. The availability of resources, the time and location of a wildfire event, climatic conditions, are all variables that need due consideration at the wildfire.

Since 2016, several significant wildfire events have occurred, resulting in catastrophic loss and/or the evacuation of entire communities. Examples include Fort McMurray, Joe Rich, Williams Lake, Lytton (total loss), Monty Lake, Yellowknife, West Kelowna, and the Columbia Shuswap Regional District. **It cannot be overstated that the recommended strategies and tactics in this report should serve as a guide.** The unpredictability of the wildfires mentioned above underscores the need to assess each event based on specific conditions, such as climate, weather, fuel load, topography, terrain, fire behavior, and community profile. Responders will determine precise strategies and tactics at the time of the incident. Nevertheless, planning will adhere to the methodology outlined in this defence plan report.

4.2.2 Structure Defence Plan

When there is an established wildfire, where the threat to the RMOW has been determined, the BCWS will deploy an incident management team on site to coordinate the response which will include the respective fire service and resources. A response to a fire that immediately threatens the community will be very tactical in response. Fire Officers/Supervisors would hastily triage neighbourhoods to determine if the area is safe for crews to work in and which tactics would be employed to combat the impending fire.

The fire services will be led by a Senior Structure Protection Specialist who will manage both the Structure Defence and Structure Protection Groups. The Structure Protection Specialist working with the BCWS Operations Section Chief will collaborate on a holistic approach to mitigate the risk to life and property. A Structure Defence Plan and Structure Protection Plan will detail the number of staff and resources that are required to implement the plan.

The primary focus for sprinkler protection is the community's critical infrastructure. A community is much better prepared for post-fire recovery if its primary infrastructure remains operable after a fire. This includes water intake pumps and chlorination stations, wastewater treatment facilities, and municipal/provincial government buildings and assets. The FireSmart and Mitigation Manager has compiled a list of all community critical infrastructure and has been implementing FireSmart principles for these infrastructures and their surroundings (Section 5). This serves as an example to residents on how to mitigate wildfire risks to their own property.

The secondary priorities for Structure Protection Specialists are privately owned properties, with an emphasis on prioritizing those most at risk from an impending wildfire and those that are most likely to be saved through mitigation efforts. In rare cases, properties may be too derelict, overgrown, or cluttered with household items, requiring more mitigation than the available resources can provide.

To determine what the necessary resources would be for a significant fire in the Whistler community, the tactics that can be employed during a firefight, under favourable conditions, must be assessed:

- **Check and Go:** this tactic is the most appropriate action when no safe zone is available for firefighters to tactically move to. The fire front impact is imminent, and the fire behavior ranking is too extreme to stay in the area. Crews will conduct a rapid evaluation to check for occupants and evaluate for follow up actions.
- **Prep and Go:** the structure preparation (FireSmarting) can be safely completed prior to the fire front impact. Potential fire activity is too dangerous to remain due to rank of fire and /or there is no safe zone present.
- **Prep and Defend:** this tactic is appropriate when a safe zone is present and adequate time exists to prepare the structure for Defence prior to the fire front impact. The fire is a lower rank (1-3) that permits crews to stay on site knowing their safe zone is in close proximity.
- **Fire Front Following:** This is a follow up tactic after the fire front has passed through an area or neighborhood. It involves actioning hot spots, structures partially involved in fire, ember control and controlling the perimeter spread.
- **Anchor and Hold:** Resources connect to hydrants and use large volume fire streams to extinguish structure fires, stop structure to structure ignitions, protect exposures and control embers. An adequate safe zone must be available.
- **Bump and Run:** Resources move ahead and on the flank of the fire front extinguishing spot fires and defending structures. An adequate safe zone must be available.

4.2.3 Wildfire Safe Zones

A safe zone in a wildland setting allows firefighters to withdraw and stay safe when fire activity becomes untenable. Safe Zones must be preplanned to ensure it will accommodate the crews, and that the drive to the site must be timed so that crews are familiar with the directions and time required to withdraw. The rule of thumb for a safe zone in the pure wildland environment is 8 times the vegetation height as the distance for crews. For example, if the trees are 20 feet tall then firefighters need a fuel free space of 160 feet to the closest vegetation. In an urban environment where there are more open spaces, clear breaks in the continuity of the forest canopy, buildings, bodies of water and advantageous topography there may not be a need for such great distances from the vegetation. The RMOW tactical maps contain in this defence plan have identified safe zones for their specific attributes and must be evaluated in person during an actual event to ensure these sites are still viable as a safe zone.

4.2.4 Structure Defence Plan Resources

The Structure Defence Plan is a foundation of planning for what fire defence resources may be required during a wildfire event. During an actual event the plan will be reviewed with the BCWS Incident Command Team and the WFRS Chief Officers to determine what will be requested through the Provincial Wildland Coordination Center and the Structure Protection Coordination Officer.

The Structure Defence Plan encompasses the fire apparatus of various types, initially responding from mutual aid partners and, if the situation demands, from across the province as directed by the Structural Protection Specialist on site. The response from structural fire departments adheres to the Inter-Agency Agreement between the BC Wildfire Service and the Fire Chiefs Association of BC, which outlines the requirements for the responding agency and compensation for their response.

A general guideline for the number and types of fire apparatus required for a structure defence plan is:

- (1) Type 3 Engine per home within the intermix
- (1) Type 1 Engine per 2-3 homes within the interface when hydrants are present and working.
- (1) Type 1 Tender to support 3 water bladders or 2 Engines
- (1) Type 2 Tender to support 2 Engines in areas without hydrants
- Type 4-6 Engines (Bush Truck) as require supporting tactical patrols in the Incident Action Plan.

It must be emphasized that there aren't sufficient fire department resources within the entire province to cover all 20 Tactical Neighborhood Structure Defence Plans in this defence plan. The compiled resource list below assumes that two neighbourhoods might be threatened by wildfire simultaneously. Many of Whistler's neighbourhoods allow for Anchor and Hold tactics performed by Type 1 Engines with smaller Type 4-6 Engines bumping and running throughout the neighbourhood, combating spot fires. Hydrants are available for Engine refilling if consultation and coordination has occurred with RMOW utilities. It's crucial to monitor reservoir volume and refill rates during wildfires to ensure a continuous water supply. If conditions become untenable, crews must withdraw to pre-established safe zones before re-engaging in Fire Front Follow.

While most areas in the community have hydrant service coverage, Water Tenders may be required to fill bladders if hydrant service becomes unavailable.

The crews operating the wildfire apparatus require a qualified supervisor deemed to be the Task Force or Strike Team Leader. This is to maintain a manageable span of control in the field. Task Force/Strike Team Leaders, in turn, are supervised by Division or Group Supervisors under a Structure Branch Director. The organizational chart at section 4.2.6 depicts this structure.

Several other factors must be considered when drafting a wildfire defence plan for an area under threat. These factors may include, but are not limited to the following:

- Expected fire behavior and weather forecast.
- Type, volume, distribution, and proximity of natural fuels surrounding the improved areas and local infrastructure.
- Availability of outside resources.
- Access and egress in and around properties in the interface and intermix areas.

- Volume and distribution of properties and improved values in the area.
- Water sources.
- Availability of adequate Safe Zones.
- Time required to deploy provincial resources.

It must be noted that this defence plan depicts a hypothetical response to a wildland fire in the Whistler community involving two neighbourhoods. From this perspective the structure defence response to a wildland fire may look like:

Defence Force	Number of Personnel
Branch Director	1
1 Deputy Branch Director	1
2 Division / Group Supervisors	2
2 Incident Safety Officers	2
2 Staging Managers	2
11 Task Force/ Strike Team Leaders	11
35 Type 1 Engines	140
20 Type 5-6 Engines	60
10 Type 1 Tenders	20
16 Type 2 Tactical Tenders	32
Structure Defence Staff Total	251

4.2.5 Structure Protection Plan

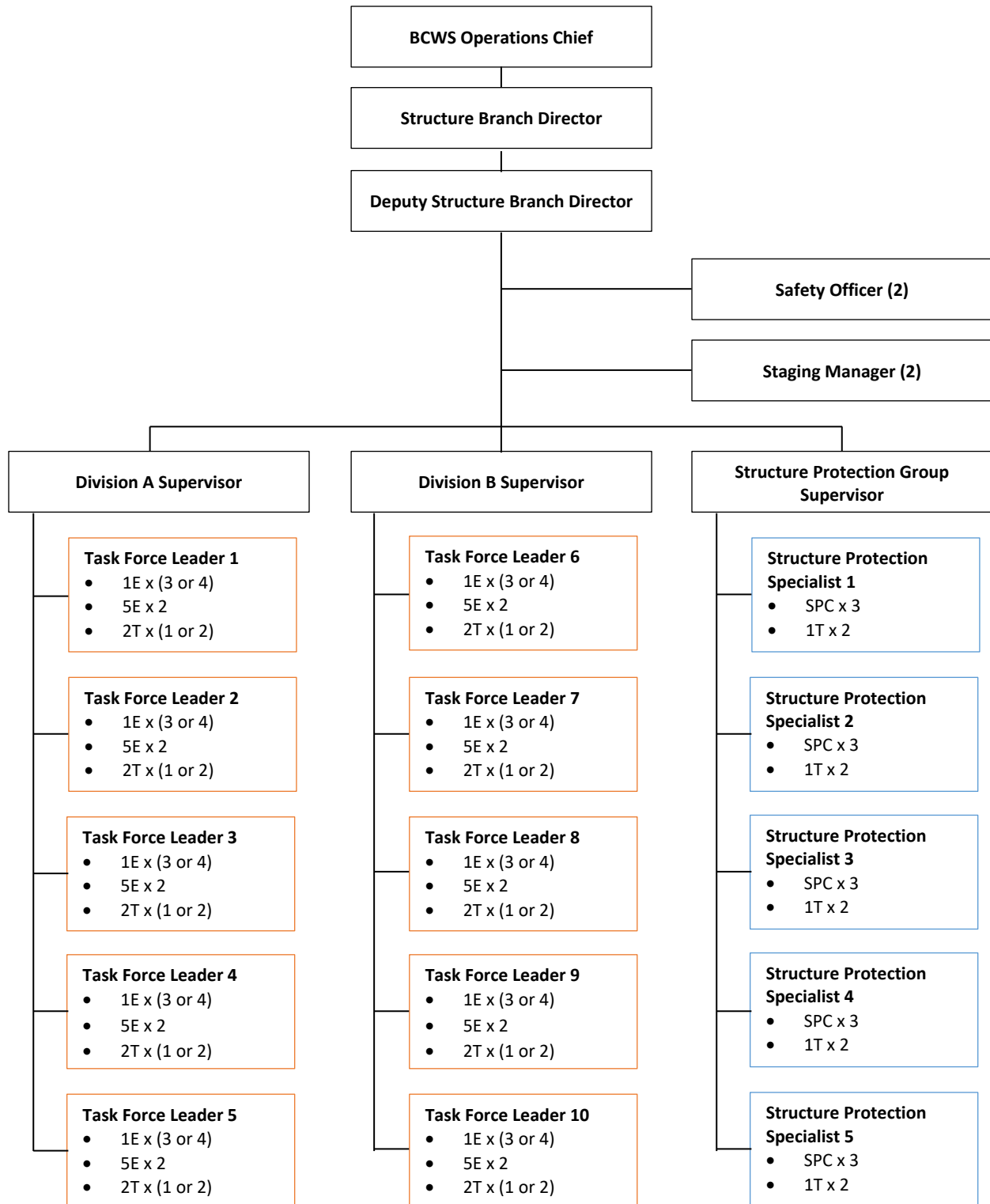
Wildfire sprinklers have proven to be effective in safeguarding structures during wildfire events when deployed ahead of an approaching fire. The core concept behind using sprinklers is to raise the humidity, often up to 40%, in a specific area to mitigate the threat when it's unsafe for firefighters to be on-site.

In situations where it's unsafe for firefighters to remain on-site due to a lack of a safe zone, sprinklers become a last-resort option to protect structures. In Whistler's interface neighbourhoods, the objective is to create a humidity moat by deploying sprinklers to homes directly interfacing with wildland fuels. This presents a significant challenge due to the size of structures and challenging topography, including cliffs. Large tanks and pumps would be deployed in critical locations to be filled by hydrants, supplying a large hose deployment and dozens of sprinklers on each set, some as large as 75+ sprinklers. The large tanks are deployed and filled via hydrants or water tenders in advance of the fire to allow reservoirs to refill. A select few hydrants will be designated for filling and topping off the water tanks, while most will be dedicated to filling fire trucks during the firefight.

It must be noted that this defence plan depicts a hypothetical structure protection plan response to a wildland fire in the Whistler community and from this perspective a structure protection response to a wildland fire may look like:

Protection Force	Number of Personnel
2 Division/ Group Supervisors	2
6 Structure Protection Specialists	6
15 Structure Protection Crews	75
8 Type 2 Structure Protection Trailers	
2 Type 1 Structure Protection Trailers	
1 Type 1 Urban Structure Protection Unit	
2 Mass Water hose and sprinkler systems	4
12 large water tanks 10-20,000 gallons	
Total Structure Protection Staff	87

4.2.6 Organizational Chart



SPC = Structure Protection Crew

1E = Type 1 Engine

5E = Type 5 Engine

1T = Type 1 Tender

2T = Type 2 Tender

4.2.7 Tactical Defence Sheets

The following 19 tables are the tactical defence sheets that include tactical actions, resources, safe zone locations, and other factors to support structural defence or protection activities:

Tactical Defence Sheet #1 – Alpine Meadows North SDP

Primary Values	Location: Street / Unit #	Intermix / Interface	Viable Safe Zone Present under fire conditions and characteristics of the area/ neighborhood	Tactical Actions	Structure Defence Resources: i.e.: 3E = Type 3 Engine 2T = Type 2 Tender	Water Source	Comments
Location: Alpine Meadows North SDP							
<input checked="" type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industry <input type="checkbox"/> Farm <input type="checkbox"/> Other (~170)	Alpine Meadows (North)	Interface	Viable Safe Zone present: Meadow Park Rec Center Safe Zone 1.5 Kms	<input type="checkbox"/> Check & Go <input type="checkbox"/> Prep & Go <input checked="" type="checkbox"/> Prep & Defend <input checked="" type="checkbox"/> Fire Front Following <input checked="" type="checkbox"/> Bump & Run <input type="checkbox"/> Anchor & Hold <input type="checkbox"/> Tactical Patrol	1E x14 5E x5 2T x5 TFL x5	Hydrants Creek Water Tanks Bladders	This neighborhood has less elevation gain than most other neighbourhoods. Two means of egress to HWY 99. Lookouts are imperative as the vegetation, topography and narrow windy streets make it difficult to maintain perspective on fire conditions. Maintaining situational awareness and monitoring egress routes is paramount for crew safety. Structure Protection requires an additional: <ul style="list-style-type: none"> • SPCs x5 • 1T x5 • SPS x2

Tactical Defence Sheet #2 – Alpine Meadows South SDP

Primary Values	Location: Street / Unit #	Intermix / Interface	Viable Safe Zone Present under fire conditions and characteristics of the area/ neighborhood	Tactical Actions	Structure Defence Resources: i.e.: 3E = Type 3 Engine 2T = Type 2 Tender	Water Source	Comments
Location: Alpine Meadows South SDP							
<input checked="" type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industry <input type="checkbox"/> Farm <input type="checkbox"/> Other (~380)	Alpine Meadows (South)	Interface	Viable Safe Zone present: Meadow Park Rec Center Safe Zone 1 Kms	<input type="checkbox"/> Check & Go <input type="checkbox"/> Prep & Go <input checked="" type="checkbox"/> Prep & Defend <input checked="" type="checkbox"/> Fire Front Following <input checked="" type="checkbox"/> Bump & Run <input type="checkbox"/> Anchor & Hold <input type="checkbox"/> Tactical Patrol	1E x18 5E x7 2T x8 TFL x6	Hydrants, Creek, Water Tanks and Bladders	<p>This neighborhood has less elevation gain than most other neighbourhoods. Two means of egress to HWY 99. Lookouts are imperative as the vegetation, topography and narrow windy streets make it difficult to maintain perspective on fire conditions. Maintaining situational awareness and monitoring egress routes is paramount for crew safety.</p> <p>Structure Protection requires an additional:</p> <ul style="list-style-type: none"> • SPCs x7 • 1T x8 • SPS x3

Tactical Defence Sheet #3 – Blackcomb Benchlands South

Primary Values	Location: Street / Unit #	Intermix / Interface	Viable Safe Zone Present under fire conditions and characteristics of the area/ neighborhood	Tactical Actions	Structure Defence Resources: i.e.: 3E = Type 3 Engine 2T = Type 2 Tender	Water Source	Comments
Location: Blackcomb Benchlands South							
<input checked="" type="checkbox"/> Residential (Multi and Single Family) <input checked="" type="checkbox"/> Commercial (Ski Resort) <input type="checkbox"/> Industry <input type="checkbox"/> Farm <input type="checkbox"/> Other (~60)	Blackcomb Benchlands South	Interface	Viable Safe Zones present: Village and above the residential area in the ski resort parking lots	<input type="checkbox"/> Check & Go <input type="checkbox"/> Prep & Go <input checked="" type="checkbox"/> Prep & Defend <input type="checkbox"/> Fire Front Following <input checked="" type="checkbox"/> Bump & Run (in upper village) <input type="checkbox"/> Anchor & Hold <input type="checkbox"/> Tactical Patrol	1E x12 5E x6 2T x4 TFL x5	Hydrants, Water Tanks and Bladders	<p>The neighborhood is primarily multi family residential within a heavily forested area making structure protection difficult but allows for defensible tactics of Prep and Defend and Bump and Run. The Ski Resort has multiple structures in this area that are critical for their operation.</p> <p>Lookouts are imperative as the vegetation, topography and narrow windy streets make it difficult to maintain perspective on fire conditions. Maintaining situational awareness and monitoring egress routes is paramount for crew safety.</p> <p>Structure Protection resources:</p> <ul style="list-style-type: none"> • SPCs x6 • 1T x4 • SPS x2

Tactical Defence Sheet #4 – Emerald Estates SDP

Primary Values	Location: Street / Unit #	Intermix / Interface	Viable Safe Zone Present under fire conditions and characteristics of the area/ neighborhood	Tactical Actions	Structure Defence Resources: i.e.: 3E = Type 3 Engine 2T = Type 2 Tender	Water Source	Comments
Location: Emerald Estates SDP							
<input checked="" type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industry <input type="checkbox"/> Farm <input type="checkbox"/> Other (~290)	Emerald Estates	Interface	No viable Safe Zone present: (upper streets) Viable Safe Zone present: (lower streets near HWY 99) Corona Gravel Pit Safe Zone 2 Kms	<input type="checkbox"/> Check & Go <input checked="" type="checkbox"/> Prep & Go (upper streets) <input type="checkbox"/> Prep & Defend <input checked="" type="checkbox"/> Fire Front Following (upper and lower streets) <input checked="" type="checkbox"/> Bump & Run (lower streets) <input type="checkbox"/> Anchor & Hold <input type="checkbox"/> Tactical Patrol	1E x15 5E x8 2T x6 TFL x6	Hydrants, Lake, Water Tanks and Bladders	Lookouts are imperative as the vegetation, topography and narrow windy streets make it difficult to maintain perspective on fire conditions. Maintaining situational awareness and monitoring egress routes is paramount for crew safety. Structure Protection requires an additional: <ul style="list-style-type: none"> • 5SPCs • 1Tx4 • SPS x2

Tactical Defence Sheet #5 – Function Junction and Cheakamus Crossing SDP

Primary Values	Location: Street / Unit #	Intermix / Interface	Viable Safe Zone Present under fire conditions and characteristics of the area/ neighborhood	Tactical Actions	Structure Defence Resources: i.e.: 3E = Type 3 Engine 2T = Type 2 Tender	Water Source	Comments
Location: Function Junction and Cheakamus Crossing SDP							
<input checked="" type="checkbox"/> Residential <input checked="" type="checkbox"/> Commercial <input checked="" type="checkbox"/> Industry <input type="checkbox"/> Farm <input type="checkbox"/> Other (~150)	Function Junction Cheakamus Crossing	Interface	Viable Safe Zone present: Safe Zones at Cement Plant, Wastewater Treatment Plant and Check Amy's	<input type="checkbox"/> Check & Go <input type="checkbox"/> Prep & Go <input checked="" type="checkbox"/> Prep & Defend <input checked="" type="checkbox"/> Fire Front Following <input checked="" type="checkbox"/> Bump & Run <input checked="" type="checkbox"/> Anchor & Hold <input type="checkbox"/> Tactical Patrol	1E x18 5E x 7 2T x 5 TFL x4	Hydrants, Water Tank, Bladders	This neighborhood is relatively flat with a nearby Safe Zone allowing for tactics under optimal fire behavior. Lookouts are imperative as the vegetation, topography and narrow windy streets make it difficult to maintain perspective on fire conditions. Maintaining situational awareness and monitoring egress routes is paramount for crew safety. Structure Protection resources: <ul style="list-style-type: none"> • SPCs x6 • 1T x4 • SPS x3

Tactical Defence Sheet #6 – Nesters SDP

Primary Values	Location: Street / Unit #	Intermix / Interface	Viable Safe Zone Present under fire conditions and characteristics of the area/ neighborhood	Tactical Actions	Structure Defence Resources: i.e.: 3E = Type 3 Engine 2T = Type 2 Tender	Water Source	Comments
Location: Nesters SDP							
<input checked="" type="checkbox"/> Residential <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industry <input type="checkbox"/> Farm <input type="checkbox"/> Other (~80)	Nesters	Interface	Viable Safe Zone present: Meadow Park Rec Center Safe Zone 1 Kms Spruce Grove Safe Zone 1 Km Cypress Place TRA	<input type="checkbox"/> Check & Go <input type="checkbox"/> Prep & Go <input checked="" type="checkbox"/> Prep & Defend <input checked="" type="checkbox"/> Fire Front Following <input checked="" type="checkbox"/> Bump & Run <input type="checkbox"/> Anchor & Hold <input type="checkbox"/> Tactical Patrol	1E x8 5E x5 2T x5 TFL x4	Hydrants, Creek, Water Tanks and Bladders	This neighborhood has less elevation gain than most other neighbourhoods. Lookouts are imperative as the vegetation, topography and narrow windy streets make it difficult to maintain perspective on fire conditions. Maintaining situational awareness and monitoring egress routes is paramount for crew safety. Structure Protection requires an additional: <ul style="list-style-type: none"> • SPCs x3 • 1T x2 • SPS x2

Tactical Defence Sheet #7 – Nicklaus North SDP

Primary Values	Location: Street / Unit #	Intermix / Interface	Viable Safe Zone Present under fire conditions and characteristics of the area/ neighborhood	Tactical Actions	Structure Defence Resources: i.e.: 3E = Type 3 Engine 2T = Type 2 Tender	Water Source	Comments
Location: Nicklaus North SDP							
<input checked="" type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industry <input type="checkbox"/> Farm <input type="checkbox"/> Other (~205)	Nicklaus North	Interface	Viable Safe Zone present: Meadow Park Rec Center Safe Zone 1 Kms Cypress Place TRA	<input type="checkbox"/> Check & Go <input type="checkbox"/> Prep & Go <input checked="" type="checkbox"/> Prep & Defend <input checked="" type="checkbox"/> Fire Front Following <input checked="" type="checkbox"/> Bump & Run <input type="checkbox"/> Anchor & Hold <input type="checkbox"/> Tactical Patrol	1E x8 5E x4 2T x3 TFL x3	Hydrants, Creek, Water Tanks and Bladders	This neighborhood has less elevation gain than most other neighbourhoods. Structure Protection requires an additional: <ul style="list-style-type: none"> • SPCs x4 • 1T x2 • SPS x2

Tactical Defence Sheet #8 – Rainbow SDP

Primary Values	Location: Street / Unit #	Intermix / Interface	Viable Safe Zone Present under fire conditions and characteristics of the area/ neighborhood	Tactical Actions	Structure Defence Resources: i.e.: 3E = Type 3 Engine 2T = Type 2 Tender	Water Source	Comments
Location: Rainbow SDP							
<input checked="" type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industry <input type="checkbox"/> Farm <input type="checkbox"/> Other (~250)	Rainbow	Interface	No viable Safe Zone present: (upper streets) Viable Safe Zone present: (lower streets near HWY 99) Meadow Park Rec Center Safe Zone 2 Kms	<input type="checkbox"/> Check & Go <input checked="" type="checkbox"/> Prep & Go (upper streets) <input type="checkbox"/> Prep & Defend <input checked="" type="checkbox"/> Fire Front Following (upper and lower streets) <input checked="" type="checkbox"/> Bump & Run (lower streets) <input type="checkbox"/> Anchor & Hold <input type="checkbox"/> Tactical Patrol	1E x12 5E x8 2T x3 TFL x5	Hydrants, Lake, Water Tanks and Bladders	Lookouts are imperative as the vegetation, topography and narrow windy streets make it difficult to maintain perspective on fire conditions. Maintaining situational awareness and monitoring egress routes is paramount for crew safety. Structure Protection requires an additional: <ul style="list-style-type: none"> • SPCs x5 • 1T x5 • SPS x2

Tactical Defence Sheet #9 – Spring Creek SDP

Primary Values	Location: Street / Unit #	Intermix / Interface	Viable Safe Zone Present under fire conditions and characteristics of the area/ neighborhood	Tactical Actions	Structure Defence Resources: i.e.: 3E = Type 3 Engine 2T = Type 2 Tender	Water Source	Comments
Location: Spring Creek SDP							
<input checked="" type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industry <input type="checkbox"/> Farm <input type="checkbox"/> Other (~150)	Spring Creek	Interface	Viable Safe Zone present: Fire Station/ School Safe Zone 2 Km	<input type="checkbox"/> Check & Go <input type="checkbox"/> Prep & Go <input checked="" type="checkbox"/> Prep & Defend <input checked="" type="checkbox"/> Fire Front Following <input checked="" type="checkbox"/> Bump & Run <input checked="" type="checkbox"/> Anchor & Hold <input type="checkbox"/> Tactical Patrol	1E x10 5E x 7 2T x 5 TFL x4	Hydrants, Water Tank, Bladders	This neighborhood is relatively flat with a nearby Safe Zone allowing for Defensible tactics under optimal fire behavior. Lookouts are imperative as the vegetation, topography and narrow windy streets make it difficult to maintain perspective on fire conditions. Maintaining situational awareness and monitoring egress routes is paramount for crew safety. Structure Protection requires an additional: <ul style="list-style-type: none"> • SPCs x4 • 1T x4 • SPS x3

Tactical Defence Sheet #10 – Spruce Grove / White Gold SDP

Primary Values	Location: Street / Unit #	Intermix / Interface	Viable Safe Zone Present under fire conditions and characteristics of the area/ neighborhood	Tactical Actions	Structure Defence Resources: i.e.: 3E = Type 3 Engine 2T = Type 2 Tender	Water Source	Comments
Location: Spruce Grove / White Gold SDP							
<input checked="" type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industry <input type="checkbox"/> Farm <input type="checkbox"/> Other (~140)	Spruce Grove/ White Gold	Interface	Viable Safe Zone present: Meadow Park Rec Center Safe Zone 1 Kms	<input type="checkbox"/> Check & Go <input type="checkbox"/> Prep & Go <input checked="" type="checkbox"/> Prep & Defend <input checked="" type="checkbox"/> Fire Front Following <input checked="" type="checkbox"/> Bump & Run <input type="checkbox"/> Anchor & Hold <input type="checkbox"/> Tactical Patrol	1E x12 5E x5 2T x5 TFL x4	Hydrants, Creek, Water Tanks and Bladders	This neighborhood has less elevation gain than most other neighbourhoods. Two means of egress to HWY 99. Lookouts are imperative as the vegetation, topography and narrow windy streets make it difficult to maintain perspective on fire conditions. Maintaining situational awareness and monitoring egress routes is paramount for crew safety. Structure Protection requires an additional: <ul style="list-style-type: none"> • SPCs x5 • 1T x3 • SPS x2

Tactical Defence Sheet #11 – Stonebridge SDP

Primary Values	Location: Street / Unit #	Intermix / Interface	Viable Safe Zone Present under fire conditions and characteristics of the area/ neighborhood	Tactical Actions	Structure Defence Resources: i.e.: 3E = Type 3 Engine 2T = Type 2 Tender	Water Source	Comments
Location: Stonebridge SDP							
<input checked="" type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industry <input type="checkbox"/> Farm <input type="checkbox"/> Other (~25)	Stonebridge	Interface	No viable Safe Zones: Large Properties with windy roadways with a long travel distance for egress Fire Station 3/ School Safe Zone 6 Kms	<input type="checkbox"/> Check & Go <input checked="" type="checkbox"/> Prep & Go <input type="checkbox"/> Prep & Defend <input checked="" type="checkbox"/> Fire Front Following <input type="checkbox"/> Bump & Run <input type="checkbox"/> Anchor & Hold <input type="checkbox"/> Tactical Patrol	1E x8 5E x8 2Tx5 TFL x4	Hydrants, Portable Water Tanks, Bladders	Lookouts are imperative as the vegetation, topography and narrow windy streets make it difficult to maintain perspective on fire conditions. Maintaining situational awareness and monitoring egress routes is paramount for crew safety. Structure Protection requires an additional: <ul style="list-style-type: none"> • SPCs x3 • 1T x4 • SPS x2

Tactical Defence Sheet #12 – Upper Village and Blackcomb Benchlands North SDP

Primary Values	Location: Street / Unit #	Intermix / Interface	Viable Safe Zone Present under fire conditions and characteristics of the area/ neighborhood	Tactical Actions	Structure Defence Resources: i.e.: 3E = Type 3 Engine 2T = Type 2 Tender	Water Source	Comments
Location: Upper Village and Blackcomb Benchlands North SDP							
<input checked="" type="checkbox"/> Residential (Multi and Single Family) <input type="checkbox"/> Commercial <input type="checkbox"/> Industry <input type="checkbox"/> Farm <input type="checkbox"/> Other (~130)	Upper Village and Blackcomb Benchlands North	Interface	Viable Safe Zones: Upper Village No viable Safe Zones: upper streets further from the village center	<input type="checkbox"/> Check & Go <input checked="" type="checkbox"/> Prep & Go <input checked="" type="checkbox"/> Prep & Defend <input checked="" type="checkbox"/> Fire Front Following <input checked="" type="checkbox"/> Bump & Run <input type="checkbox"/> Anchor & Hold <input type="checkbox"/> Tactical Patrol Pre and Defend, Bump and Run in the Upper Village Prep and Go and Fire Front Follow on streets above the Upper Village	1E x15 5E x8 2T x4 TFL x6	Hydrants, Water Tanks and Bladders	The Upper Village is primarily multi family residential within a heavily forested area making structure protection difficult but allows for defensible tactics of Prep and Defend and Bump and Run. The Blackcomb Benchlands North area with windy roadways and elevation gain makes it more difficult to defend so tactics are more likely to be Prep and Go and Fire Front Follow when able. Lookouts are imperative as the vegetation, topography and narrow windy streets make it difficult to maintain perspective on fire conditions. Maintaining situational awareness and monitoring egress routes is paramount for crew safety. Structure Protection resources: <ul style="list-style-type: none"> • SPCs x5 • 1T x4 • SPS x2

Tactical Defence Sheet #13 – Wedgewoods SDP

Primary Values	Location: Street / Unit #	Intermix / Interface	Viable Safe Zone Present under fire conditions and characteristics of the area/ neighborhood	Tactical Actions	Structure Defence Resources: i.e.: 3E = Type 3 Engine 2T = Type 2 Tender	Water Source	Comments
Location: Wedgewoods SDP							
<input checked="" type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industry <input type="checkbox"/> Farm <input type="checkbox"/> Other (~104)	Wedgewoods	Interface	No viable Safe Zone: (> 6.5 Km to Heli Port Temporary Refuge Area (390m x 110m) The Heli Port is not large enough to accommodate all resources required for Wedgewoods and must be considered as a Temporary Refuge Area not a true Safe Zone	<input type="checkbox"/> Check & Go <input checked="" type="checkbox"/> Prep & Go <input type="checkbox"/> Prep & Defend <input checked="" type="checkbox"/> Fire Front Following <input type="checkbox"/> Bump & Run <input type="checkbox"/> Anchor & Hold <input type="checkbox"/> Tactical Patrol	1Ex10 5Ex6 2Tx2 TFL x4	Hydrants, Portable Water Tanks, Bladders	Lookouts are imperative as the vegetation, topography and narrow windy streets make it difficult to maintain perspective on fire conditions. Maintaining situational awareness and monitoring egress routes is paramount for crew safety. Structure Protection requires an additional: <ul style="list-style-type: none"> • SPCs x4 • 1T x4 • SPS x2

Tactical Defence Sheet #14 – Whistler Cay Estates and Tapley’s Farm SDP

Primary Values	Location: Street / Unit #	Intermix / Interface	Viable Safe Zone Present under fire conditions and characteristics of the area/ neighborhood	Tactical Actions	Structure Defence Resources: i.e.: 3E = Type 3 Engine 2T = Type 2 Tender	Water Source	Comments
Location: Whistler Cay Estates and Tapley’s Farm SDP							
<input checked="" type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industry <input type="checkbox"/> Farm <input type="checkbox"/> Other (~300)	Whistler Cay Estates and Tapley’s Farm	Interface	Viable Safe Zones: Transit/ Municipal Yard and Spruce Grove Safe Zone 3.0 Kms Village Day Parking Safe Zone 1.5 Km Sports Plex Safe Zone 1.5 Km	<input type="checkbox"/> Check & Go <input type="checkbox"/> Prep & Go <input checked="" type="checkbox"/> Prep & Defend <input checked="" type="checkbox"/> Fire Front Following <input checked="" type="checkbox"/> Bump & Run <input type="checkbox"/> Anchor & Hold <input type="checkbox"/> Tactical Patrol	1E x12 5E x8 2T x5 TFL x5	Hydrants, Water Tanks and Bladders	Lookouts are imperative as the vegetation, topography and narrow windy streets make it difficult to maintain perspective on fire conditions. Maintaining situational awareness and monitoring egress routes is paramount for crew safety. Structure Protection requires an additional: <ul style="list-style-type: none"> • SPCs x6 • 1T x4 • SPS x2

Tactical Defence Sheet #15 – Whistler Cay Heights SDP

Primary Values	Location: Street / Unit #	Intermix / Interface	Viable Safe Zone Present under fire conditions and characteristics of the area/ neighborhood	Tactical Actions	Structure Defence Resources: i.e.: 3E = Type 3 Engine 2T = Type 2 Tender	Water Source	Comments
Location: Whistler Cay Heights SDP							
<input checked="" type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industry <input type="checkbox"/> Farm <input type="checkbox"/> Other (~280)	Whistler Cay Heights	Interface	Viable Safe Zones: Transit/ Municipal Yard and Spruce Grove Safe Zone 2.5 Kms Village Day Parking Safe Zone 1.2 Km Sports Plex Safe Zone 1 Km	<input type="checkbox"/> Check & Go <input type="checkbox"/> Prep & Go <input checked="" type="checkbox"/> Prep & Defend <input checked="" type="checkbox"/> Fire Front Following <input checked="" type="checkbox"/> Bump & Run <input type="checkbox"/> Anchor & Hold <input type="checkbox"/> Tactical Patrol	1E x15 5E x5 2T x5 TFL x5	Hydrants, Water Tanks and Bladders	This neighborhood has less elevation gain than most other neighbourhoods. Three means of egress to HWY 99. Lookouts are imperative as the vegetation, topography and narrow windy streets make it difficult to maintain perspective on fire conditions. Maintaining situational awareness and monitoring egress routes is paramount for crew safety. Structure Protection requires an additional: <ul style="list-style-type: none"> • SPCs x6 • 1T x5 • SPS x2

Tactical Defence Sheet #16 – Whistler Creek North SDP

Primary Values	Location: Street / Unit #	Intermix / Interface	Viable Safe Zone Present under fire conditions and characteristics of the area/ neighborhood	Tactical Actions	Structure Defence Resources: i.e.: 3E = Type 3 Engine 2T = Type 2 Tender	Water Source	Comments
Location: Whistler Creek North SDP							
<input checked="" type="checkbox"/> Residential (Multi Family) <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industry <input type="checkbox"/> Farm <input type="checkbox"/> Other (~360)	Whistler Creek North	Interface	Viable Safe Zones: Village Day Parking Safe Zone 4+ Km Sports Plex Safe Zone 2.4 Km Fire Station 3/ School Safe Zone 3 Km	<input type="checkbox"/> Check & Go <input type="checkbox"/> Prep & Go <input checked="" type="checkbox"/> Prep & Defend <input checked="" type="checkbox"/> Fire Front Following <input checked="" type="checkbox"/> Bump & Run <input type="checkbox"/> Anchor & Hold <input type="checkbox"/> Tactical Patrol Areas further away from the HWY 99 corridor may be Prep and Go and Fire Front Following tactics	1E x20 5E x10 2T x10 TFL x8	Hydrants, Water Tanks and Bladders	Streets further from Hwy 99 that gain elevation with windy roadways require more time for egress. Lookouts are imperative as the vegetation, topography and narrow windy streets make it difficult to maintain perspective on fire conditions. Maintaining situational awareness and monitoring egress routes is paramount for crew safety. Resources are for Structure Defence. Structure Protection requires an additional: <ul style="list-style-type: none"> • SPCs x8 • 1T x4 • SPS x3

Tactical Defence Sheet #17 – Whistler Creek South, Bay Shores, Millar’s Pond SDP

Primary Values	Location: Street / Unit #	Intermix / Interface	Viable Safe Zone Present under fire conditions and characteristics of the area/ neighborhood	Tactical Actions	Structure Defence Resources: i.e.: 3E = Type 3 Engine 2T = Type 2 Tender	Water Source	Comments
Location: Whistler Creek South, Bay Shores, Millar’s Pond SDP							
<input checked="" type="checkbox"/> Residential (Multi Family) <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industry <input type="checkbox"/> Farm <input type="checkbox"/> Other (~240)	Whistler Creek South, Bay Shores, Millar’s Pond	Interface	Viable Safe Zone Present for most areas. Village Day Parking Safe Zone 5+ Km Sports Plex Safe Zone 5 Km Fire Station 3/ School Safe Zone 3 Km	<input type="checkbox"/> Check & Go <input type="checkbox"/> Prep & Go <input checked="" type="checkbox"/> Prep & Defend <input checked="" type="checkbox"/> Fire Front Following <input checked="" type="checkbox"/> Bump & Run <input checked="" type="checkbox"/> Anchor & Hold <input type="checkbox"/> Tactical Patrol Anchor and Hold along HWY 99	1E x20 5E x8 2T x10 TFL x8	Hydrants, Water Tanks and Bladders	Streets further from Hwy 99 that gain elevation with windy roadways require more time for egress. Lookouts are imperative as the vegetation, topography and narrow windy streets make it difficult to maintain perspective on fire conditions. Maintaining situational awareness and monitoring egress routes is paramount for crew safety. Structure Protection requires an additional: <ul style="list-style-type: none"> • SPCs x8 • 1T x4 • SPS x3

Tactical Defence Sheet #18 – Whistler Creek, Wayside, Nita Lake Estates, Rainbow Park SDP

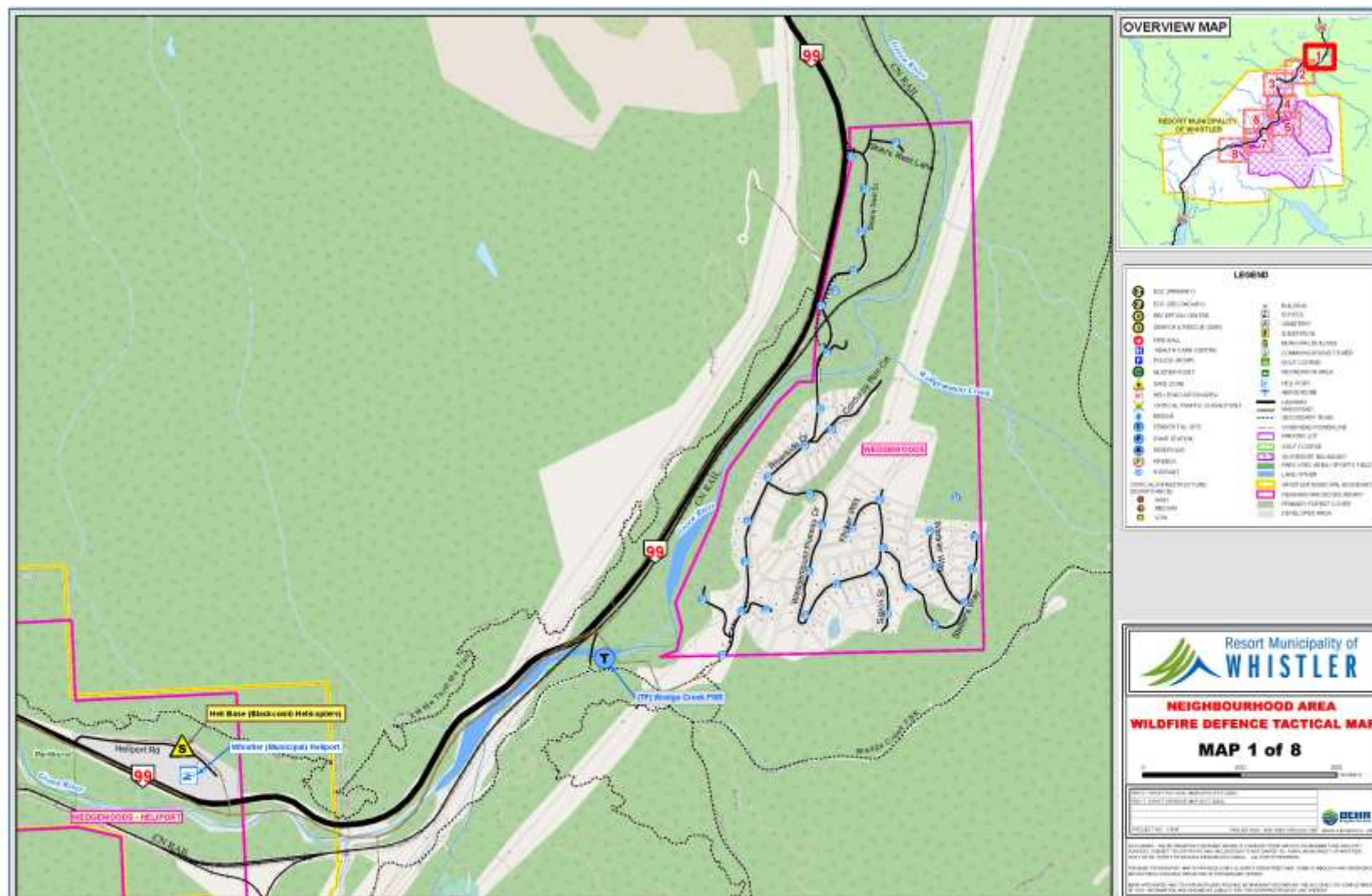
Primary Values	Location: Street / Unit #	Intermix / Interface	Viable Safe Zone Present under fire conditions and characteristics of the area/ neighborhood	Tactical Actions	Structure Defence Resources: i.e.: 3E = Type 3 Engine 2T = Type 2 Tender	Water Source	Comments
Location: Whistler Creek, Wayside, Nita Lake Estates, Rainbow Park SDP							
<input checked="" type="checkbox"/> Residential (Multi Family) <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industry <input type="checkbox"/> Farm <input type="checkbox"/> Other (~225)	Whistler Creek, Wayside, Nita Lake Estates, Rainbow Park	Interface	Viable Safe Zones available Village Day Parking Safe Zone 4+ Km Sports Plex Safe Zone 2Km Fire Station 3/ School Safe Zone 6 Km Rainbow Park does not have viable safe zones under more wildfire conditions	<input type="checkbox"/> Check & Go <input checked="" type="checkbox"/> Prep & Go <input checked="" type="checkbox"/> Prep & Defend <input checked="" type="checkbox"/> Fire Front Following <input checked="" type="checkbox"/> Bump & Run <input type="checkbox"/> Anchor & Hold <input type="checkbox"/> Tactical Patrol Whistler Creek, Wayside, Nita Lake Estates: Prep and Defend, Bump and Run, Fire Front Following Rainbow Park: Prep and Go, Fire Front Following	1E x18 5E x10 2T x10 TFL x8	Hydrants, Water Tanks and Bladders	This is a large geographical area with limited viable Safe Zones. Lookouts are imperative as the vegetation, topography and narrow windy streets make it difficult to maintain perspective on fire conditions. Maintaining situational awareness and monitoring egress routes is paramount for crew safety. Resources are for Structure Defence. Structure Protection requires an additional: <ul style="list-style-type: none"> • SPCs x8 • 1T x4 • SPS x3

Tactical Defence Sheet #19 – Whistler Village SDP

Primary Values	Location: Street / Unit #	Intermix / Interface	Viable Safe Zone Present under fire conditions and characteristics of the area/ neighborhood	Tactical Actions	Structure Defence Resources: i.e.: 3E = Type 3 Engine 2T = Type 2 Tender	Water Source	Comments
Location: Whistler Village SDP							
<input checked="" type="checkbox"/> Residential (Multi and Single Family) <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Industry <input type="checkbox"/> Farm <input type="checkbox"/> Other	Main Village/ Village North	Interface Urban	Day use parking lots are readily available	<input type="checkbox"/> Check & Go <input type="checkbox"/> Prep & Go <input checked="" type="checkbox"/> Prep & Defend <input checked="" type="checkbox"/> Fire Front Following <input checked="" type="checkbox"/> Bump & Run <input checked="" type="checkbox"/> Anchor & Hold <input type="checkbox"/> Tactical Patrol	1E x 25 5E x 15 2T x12 TFL x10 Div Sup 1	Hydrants, Creek	The Village area would be primarily a Defence operation with few opportunities for sprinkler protection applications other than the fringe areas that abut the wildland perimeter. Safe Zones are most plentiful in the urban center and Day Parking lots are available for staging areas/ safe zones. Structure Protection Resources: <ul style="list-style-type: none"> • SPCs x5 • 1T x 5 • SPS x 2

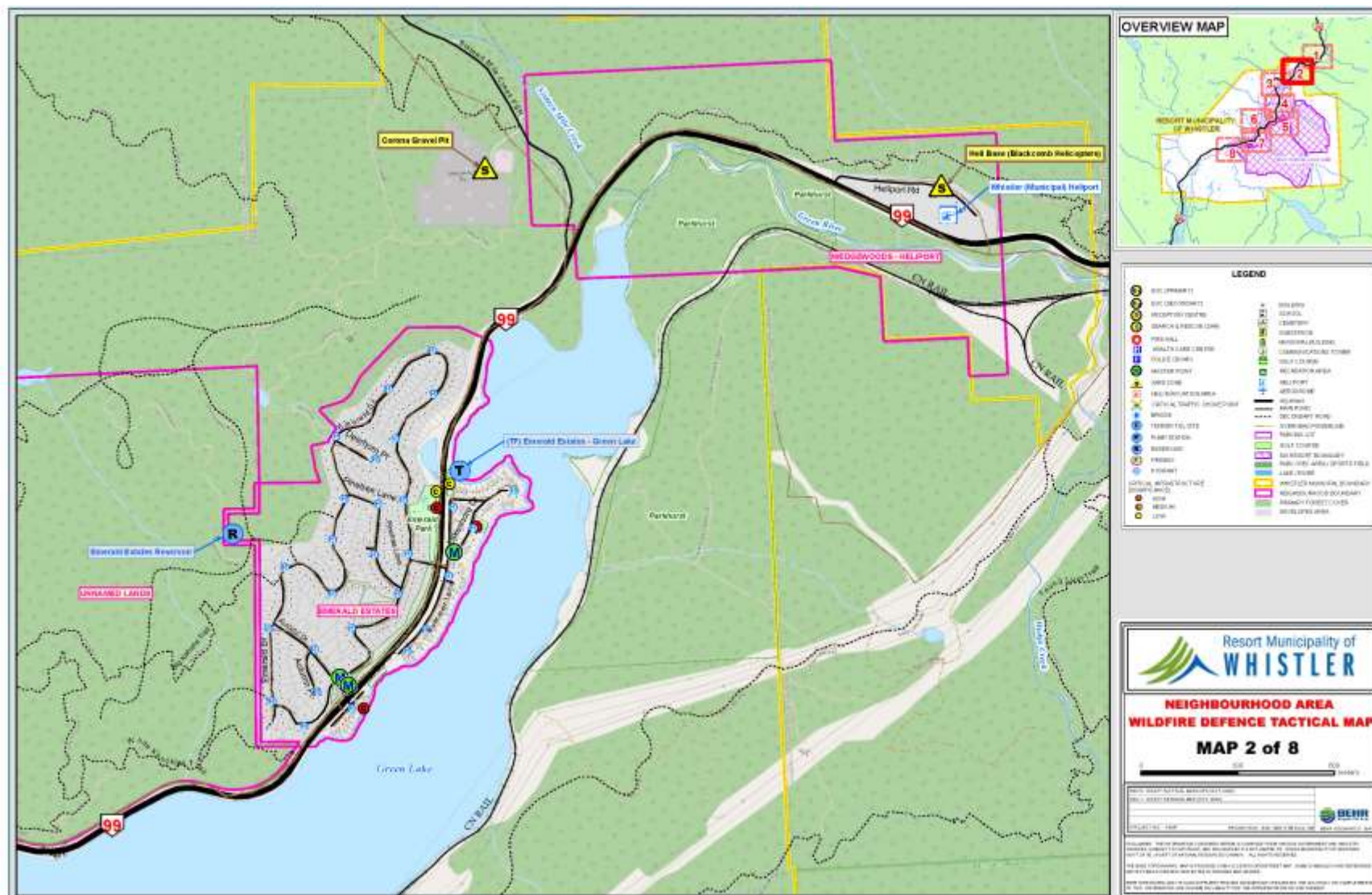
The following 8 maps and tables provide spatial representation of wildfire defence and protection features within the RMOW.

Tactical Map 1: Wedgewoods



Pumps-Reservoirs-Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
TF-Wedge Creek FSR	Heli Base (Blackcomb Helicopters)				Whistler (Municipal) Heliport	n/a		Parkhurst	Wedgewoods

Tactical Map 2: Emerald Estates, Unnamed Lands, Wedgewoods - Heliport



Pumps-Reservoirs-Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
TF - Emerald Estates - Green Lake	Corona Gravel Pit			Emerald Estates First Entrance from the West	Emerald Estates Reservoir	Medium		Emerald Park	Emerald Estates
Emerald Estates Reservoir	Heli Base (Blackcomb Helicopters)			Emerald Estates	Emerald Wells 1-3 & C12 Building (BUI10207)	High		Green Lake Launch	Unnamed Lands
				Intersection of Emerald and Autumn	Emerald Lake SLS	High		Green Lake Park	Wedgewoods - Heliport
					Emerald Estates SLS	High		Green Space(s)	
					Whistler (Municipal) Heliport	n/a			

Tactical Map 3: Alpine Meadows North, Alpine Meadows South, Emerald Estates, Lost Lake Park North, Nature Reserve, Nesters Crossing, Nicklaus North, Rainbow & Baxter Creek, River of Golden Dreams, Unnamed Lands, Wedge Park



Pumps-Reservoirs-Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
TF-Alpine Meadows	Cypress Place TRA	13 - Meadow Park - Alpine Meadows South	ESS Reception Centre - Whistler Secondary School	various throughout	Alpine South Sanitary Lift Station (BUI10208)	High	Whistler Secondary	Baseball Diamond - Meadow Park	Alpine Meadows North
Emerald Estates Reservoir	Meadow Park Rec Centre	14 - Nicklaus N.G.C @ Fitzsimmons Fan Park	Fire Hall 2		19 Mile VT Bridge	High		Soccer Field - Whistler Sec. School	Alpine Meadows South
Mountain View PRV and Pump (BUI10197)					Alpine South Reservoirs A&B	Medium		Tennis Court - Meadow Park	Emerald Estates
Rainbow Reservoir					Alpine Way over 19 Mile Creek- WSS	High		Nicklaus North Golf Course	Lost Lake Park North
Alpine South Reservoirs A&B					Alpine Well #1	High		Chateau Whistler Golf Club	Nature Reserve
Mountain View Drive Reservoir					Alpine Well #2 (aka High School well)	Medium		Alpenglow Park	Nesters Crossing
					Alpine Zone Valve Kiosk	High		Boulder Park	Nicklaus North
					Arena/Pool SLS	Low		Dream River Park	Rainbow & Baxter Creek

Pumps-Reservoirs-Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
					Baxter Creek PRV	Low		Fitzsimmons Fan Park	River of Golden Dreams
					Disk Golf Bridge at Mons	Low		Golden Dreams Conservation Area	Unnamed Lands
					Emerald Estates Reservoir	Medium		Lost Lake Park	Wedge Park
					Fire Hall #2 SLS	Low		Meadow Park	
					Firehall 2 Alpine	High		Wedge Park	
					Highway 99 at 19 Mile Creek	Low		Whistler Secondary Fields	
					Highway 99 at River of Golden Dreams	Low			
					Hwy 99 over 19 Mile Creek	High			
					Lost Lake North Bridge (Mons Bridge)	High			
					Meadow Park Recreation Centre	Low			
					Meadow Park Well (aka Alpine Well #3)	Medium			
					Mons Overpass	Low			
					Mountain View PRV and Pump (BUI10197)	High			

Pumps-Reservoirs-Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
					Mountain View Drive Reservoir	Medium			
					Nickalus North Boardwalk 1	Medium			
					Nickalus North Boardwalk 2	Medium			
					Nicklaus North PRV	High			
					Nicklaus North SLS (BUI10211)	High			
					Rainbow Reservoir	Medium			
					Rainbow SLS	Medium			
					Rainbow Subdivision Bridge	Low			
					ROGD Bridge at Dream River Park	Medium			
					ROGD Bridge Meadow Park to Nic North	Medium			
					Valley Drive over 19 Mile Creek	Medium			
					Whistler Secondary School	Medium			
					Whistler/Green Lake Water Aerodrome	n/a			

Map 4 of 8: Neighbourhood Area Wildfire Defence Tactical Map

This map provides a detailed view of the Whistler neighbourhood area, highlighting key locations for wildfire defence. Key features include:

- Emergency Services:** EOC Secondary, EOC Primary, Fire Hall 1, and Whistler Health Care Centre.
- Residential Zones:** Whistler Canyon, Lost Lake, and various other residential areas.
- Geographical Features:** Whistler Lake, Lost Lake, and surrounding mountains.
- Infrastructure:** Roads, trails, and public facilities.
- Legend:** A comprehensive legend explaining the symbols and colors used on the map.
- Overview Map:** A small map in the top right corner showing the location of the neighbourhood area within the larger Whistler region.
- Scale Bar:** A scale bar indicating distances in meters and kilometers.

Pumps-Reservoirs-Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
Lost Lake Pump Station	Spruce Grove Safe Zone	6 - Chateau Whistler GC	ESS Rec. Centre - Myrtle Philip School	various throughout	Whistler (Hospital) Heliport	n/a	Myrtle Philip Community School	Tennis Court - Whistler Cay Heights	Alpine Meadows South
Community Booster Pump & PRV (BUI10198; BUI10199)	Transit And Municipal Yards	7 - Myrtle Philip Fields - WC Heights	EOC Primary - Public Safety Bldg.		Whistler Health Care Centre	n/a	Whistler Waldorf School	Tennis Court - White Gold Park	Blackcomb Benchlands North
Blackcomb Reservoir Control & Chlorination Room (BUI10205)		10 - Spruce Grove Fields - Spruce Grove	Fire Hall 1		Balsam Way PRV	Low		Whistler Racquet Club - Village North	Blackcomb Benchlands South
Lost Lake Reservoir & Booster Pump		11 - Whistler Golf Club (Hole #)	SAR (Nesters)		Blackcomb Creek Bridge (Cedar Way Lost Lake)	High		Tennis Court - Crabapple	Blueberry Hill
TF - Ambassador Crew		12 - Alta Lake @ Whistler Cay Estates	EC Secondary - Public Works Yard		Blackcomb Reservoir Control & Chlorination Room (BUI10205)	High		Tennis Court - Balsam Park	Lost Lake Park North
TF - Spruce Grove			Critical Choke Pt. - Hwy 99 @ Village Gate Blvd.		Blackcomb Way & Sundial Crescent	Low		Blackcomb Tennis Centre - Upper Village	Lost Lake Park South

Pumps-Reservoirs-Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
			Whistler Health Care Centre		Blackcomb Way Pedestrian Underpass-Benchlands	Low		Baseball Diamond - Meadow Park	Nature Reserve
					Blackcomb Way PRV	Low		Baseball Diamond - Spruce Grove Park	Nesters Crossing
					Blueberry Satellite SLS	Low		Jump Track - Fitzsimmons Bike Park	Nesters, White Gold, & Spruce Grove
					Community Booster Pump & PRV (BUI10198; BUI10199)	High		Playground - Myrtle Philips Community*	Nicklaus North
					Community Wells 1-3	Medium		Pump Track - Fitzsimmons Skills Park	River of Golden Dreams
					Covered Bridge to Blackcomb	High		Skate Park - Skate Park	Village
					Crabapple Bridge on Valley Trail to Rainbow Park	High		Skate Park Bowl - Skate Park	Village North
					Crabapple Bridge on VT near Beaver Lane	Medium		Skate Park Pathway - Skate Park	Whistler Cay Estates & Tapley's Farm
					Crabapple Drive PRV	Low		Skills Area - Fitzsimmons Bike Park	Whistler Cay Heights

Pumps-Reservoirs-Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
					Crabapple Sanitary Lift Station (BUI10209)	High		Soccer Field - Balsam Park	
					Elephant Bridge (Lost Lake Old Mill Road)	Medium		Soccer Field - Myrtle Philips Community Centre	
					Fitzsimons Spruce Grove at Mons Road	Low		Tennis Court - Balsam	
					Horstmann Creek Bridge (Cedar Way Lost Lake)	High		Tennis Court - Blackcomb Way	
					Lorimer Road & Blackcomb Way - Village	Low		Tennis Court - Crabapple	
					Lorimer Road over Fitzsimmons Creek (SLCC)	High		Tennis Court - Eagle Ridge	
					Lorimer Road PRV (BUI10201)	Low		Tennis Court - Fairmont Chateau	
					Lost Lake Beach Cut Bridge 1	Medium		Tennis Court - Whistler Racquet Club	
					Lost Lake Beach Cut Bridge 2	Medium		Tennis Court - White Gold	

Pumps-Reservoirs-Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
					Lost Lake Bridge Meadows (Blackcomb Creek near Passivhaus)	Medium		Blackcomb Mountain Ski Resort	
					Lost Lake Park Bridge (Passivhaus)	High		Whistler Golf Club	
					Lost Lake Park SLS	Low		Nicklaus North Golf Course	
					Lost Lake Pump Station	High		Chateau Whistler Golf Club	
					Lost Lake Reservoir & Booster Pump	High		Balsam Park	
					Main Street by village Park (near Library)	Low		Blueberry Park	
					Maury Young Arts Centre	Low		Emerald Forest Conservation Area	
					Mons Overpass	Low		Fitzsimmons Creek Park	
					Municipal Hall Trailer (REX)	Low		Florence Petersen Park	
					Municipal Hall	High		Golden Dreams Conservation Area	
					Myrtle Phillip Community School	Medium		Lost Lake Park	

Pumps-Reservoirs-Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
					Nancy Green PRV	Medium		Myrtle Philip Fields	
					NE Sector - SLS	High		Natural Area	
					Nester's Road PRV	Low		Peace Park	
					Northlands Boulevard PRV	Low		Rainbow Park	
					Painted Cliff (Spearhead) PRV	Low		Rebagliati Park	
					Passive Haus	Low		Snowflake Park	
					Public Safety Building/Firehall 1/Cabin	High		Spruce Grove Park	
					Public Works Yard	High		Village Park East	
					PWY Parking Lot SLS	Medium		Village Park West	
					ROGD Bridge at Lorimer Rd	High		Whistler Olympic Plaza	
					ROGD Bridge at Valley Trail to Rainbow Park (Bridge at Weir)	High		White Gold Park	
					Spruce Grove Field House	Low			
					Spruce Grove Park SLS	Low			

Pumps-Reservoirs-Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
					Spruce Grove PRV (NE Sector - PRV)	High			
					Spruce Grove Way over Fitzsimmons Cr	High			
					Tapley's Farm SLS	Medium			
					Uncovered Bridge to Blackcomb	High			
					Utilities Shop @ PWY SLS	Low			
					Village gate Blvd Pedestrian Overpass-Village	Low			
					Village Gate Boulevard and Northlands Boulevard - Village	Low			
					Village Gate Boulevard PRV	Low			
					Village Well (aka Community Well #4)	Medium			

Pumps-Reservoirs-Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
					Waste Transfer Station - Nesters	Low			
					Whistler Animals Galore	Low			
					Whistler Community Services (new)	Low			
					Whistler Conference Centre	Low			
					Whistler Public Library	Low			
					Whistler Transit Facility	Low			
					White Gold/Nancy Greene Dr over Fitzsimmons Cr	High			

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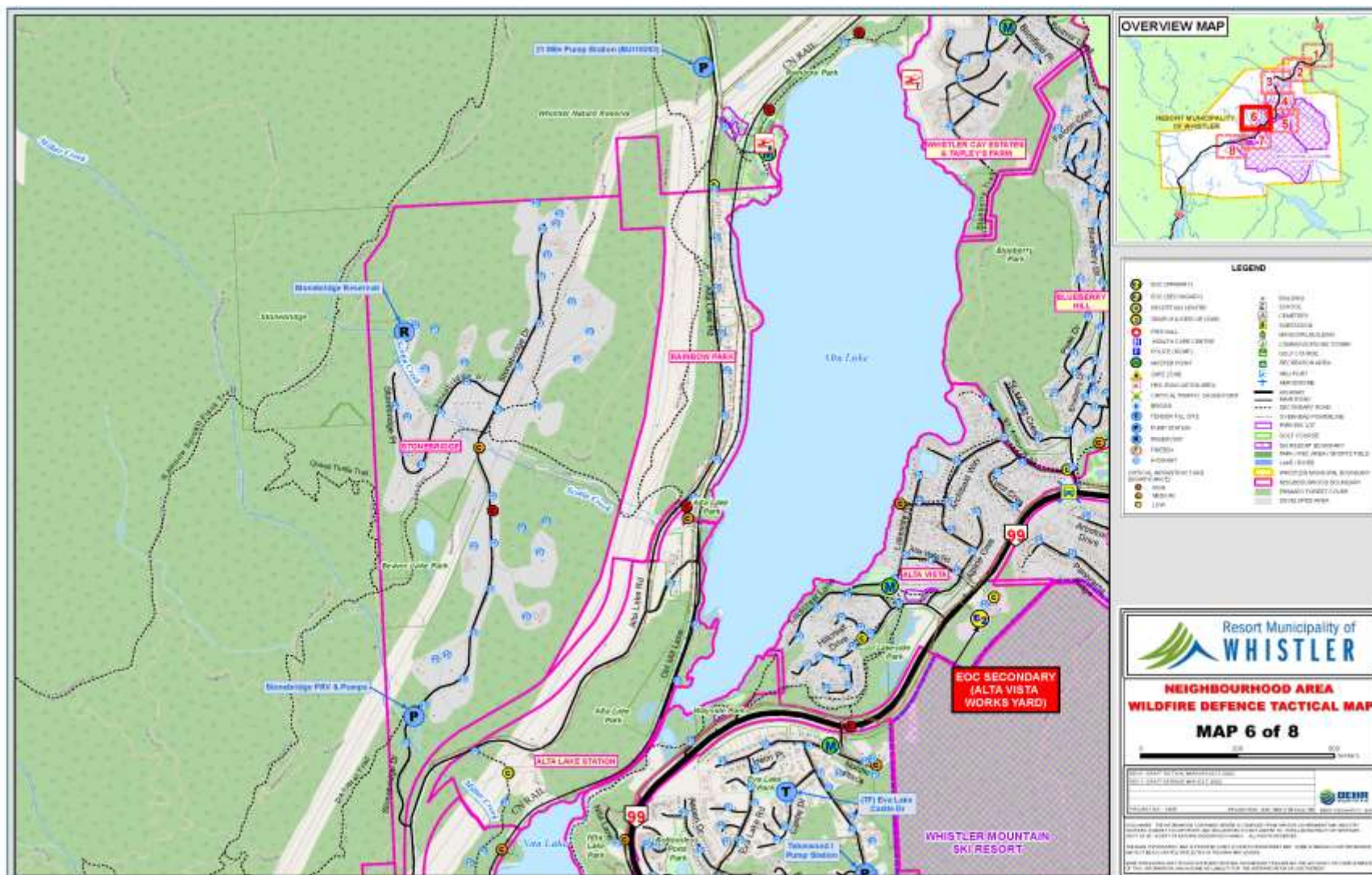
Pumps-Reservoirs-Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
FireBox 1 (Blackcomb) - C-Landing 3.0 km Blackcomb Main		5 - Whistler Gold Club (Clubhouse)	EOC Primary - Public Safety Building	various throughout	Blackcomb Reservoir Control & Chlorination Room (BUI10205)	High		Tennis Court - Whistler Cay Heights	Alta Vista
FireBox 4 (Whistler) - 1.4 km Whistler Main		6 - Whistler Golf Club (Hole #)	Fire Hall 1		Blackcomb Way & Sundial Crescent	Low		Tennis Court - Brio Park	Blackcomb Benchlands North
FireBox 5 (Whistler) - Top of Oly Carpet 2.7 km Whistler Main		9 - Parking Lot #6 @ Glacier Dr (Blackcomb Bench S)	Critical Choke Pt. - Hwy 99 @ Blueberry Dr		Blackcomb Way over Fitzsimmons creek (by Gondola Transit Ex)	Low		Jump Track - Fitzsimmons Bike Park	Blackcomb Benchlands South
Community Booster Pump & PRV (BUI10198; BUI10199)			Critical Choke Pt. - Hwy 99 @ Village Gate Blvd.		Blackcomb Way Pedestrian Underpass-Benchlands	Low		Pump Track - Fitzsimmons Skills Park	Blueberry Hill
Singing Pass Reservoir					Blueberry Satellite SLS	Low		Skate Park - Skate Park	Brio & Sunridge Plateau
Blackcomb Reservoir Control & Chlorination Room (BUI10205)					Blueberry SLS	Medium		Skate Park Bowl - Skate Park	Village

Pumps-Reservoirs-Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
Sunridge Pump Station					Community Booster Pump & PRV (BUI10198; BUI10199)	High		Skate Park Pathway - Skate Park	Village North
Sunridge Plateau Reservoir					Community Wells 1-3	Medium		Skills Area - Fitzsimmons Bike Park	Whistler Cay Heights
TF - Golf Course					Covered Bridge to Blackcomb	High		Tennis Court - Brio	
					Glacier Drive PRV	Low		Tennis Court - Eagle Ridge	
					Gondola Transit Exchange	n/a		Tennis Court - Fairmont Chateau	
					Hwy 99 near Whistler Golf Course	Low		Tennis Court - Timberlodge	
					Lorimer Road over Fitzsimmons Creek (SLCC)	High		Blackcomb Mountain Ski Resort	
					Lorimer Road PRV (BUI10201)	Low		Whistler Mountain Ski Resort	
					Main Street by village Park (near Library)	Low		Whistler Golf Club	
					Maury Young arts Centre	Low		Blueberry Park	

Pumps-Reservoirs-Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
					Municipal Hall Trailer (REX)	Low		Fitzsimmons Creek Park	
					Municipal Hall	High		Florence Petersen Park	
					Painted Cliff (Spearhead) PRV	Low		Lost Lake Park	
					Public Safety Building/Firehall 1/Cabin	High		Peace Park	
					Saint Anton PRV	Low		Rebagliati Park	
					Singing Pass Reservoir	Medium		Village Park East	
					Snowy Creek Check & Surge Valve Station	Low		Village Park West	
					Sunridge Plateau Reservoir	Medium			
					Sunridge Pump Station	High			
					Uncovered Bridge to Blackcomb	High			
					Village gate Blvd Pedestrian Overpass-Village	Low			

Pumps-Reservoirs-Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
					Village Gate Boulevard and Northlands Boulevard - Village	Low			
					Village Gate Boulevard PRV	Low			
					Village Well (aka Community Well #4)	Medium			
					Whistler Conference Centre	Low			
					Whistler Public Library	Low			

Tactical Map 6: Alta Lake Station, Alta Vista, Blueberry Hill, Brio & Sunridge Plateau, Nita Lake Estates, Rainbow Park, Stonebridge, Whistler Cay Estates & Tapley's Farm, Whistler Creek & Wayside, Whistler Creek North



Pumps-Reservoirs-Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
21 Mile Pump Station (BUI10293)		7 - Alta Lake @ Whistler Cay Estates	EOC Secondary - Alta Vista Works Yard @ Hwy 99	various throughout	Alta Lk. Rd. PRV #2	High		Tennis Court - Crabapple	Alta Lake Station
Stonebridge Reservoir		8 - Rainbow Park @ Alta Lake	Critical Choke Pt. - Hwy 99 @ Blueberry Dr		Club Cabins SLS	Medium		Volleyball Court - Rainbow Park	Alta Vista
Stonebridge PRV & Pumps					21 Mile Pump Station (BUI10293)	High		Whistler Mountain Ski Resort	Blueberry Hill
TF - Eva Lake Castle Dr					21 Mile Well #1	High		Whistler Golf Club	Brio & Sunridge Plateau
					21 Mile Well #2	High		Alta Lake Former Hostel	Nita Lake Estates
					Alpine 68 SL	Medium		Alta Lake Park	Rainbow Park
					Alta Lake Park Bridge	Medium		Beaver Lake Park	Stonebridge
					Alta Lake Road PRV#1 NiS	Low		Blueberry Park	Whistler Cay Estates & Tapley's Farm
					Blueberry SLS	Medium		Bottomless Pond Park	Whistler Creek & Wayside
					Lakecrest PRV	Low		Eva Lake Park	Whistler Creek North
					Lakeside SLS	Medium		Lakeside Park	
					Nita Lake PRV	Low		Lakeside Park Pond	

Pumps-Reservoirs-Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
					Nordic pedestrian Overpass	High		Rainbow Park	
					RMOW (Capilano) Works Yard	Low		Stonebridge Park	
					Saint Anton PRV	Low		Wayside Park	
					Stonebridge Drive over Gerbert Creek-5406 Stonebridge Drive	Medium		Whistler Nature Reserve	
					Stonebridge Drive over Scotia Creek-5440 Stonebridge Drive	Medium			
					Stonebridge Place over Scotia Creek-5460 Stonebridge Place	Medium			
					Stonebridge PRV	High			
					Stonebridge PRV & Pumps	High			

Pumps- Reservoirs- Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
					Stonebridge Reservoir	Medium			
					Whistler Creek Bridge (Nita Lake Park)	Medium			

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Pumps-Reservoirs-Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
FireBox 8 (Whistler) - Creekside, Timing Flats		3 - Alpha Lake Park, Whistler Creek South	Critical Choke Point - Hwy 99 - North of Taylor Way	various throughout	Club Cabins SLS	Medium		Tennis Court - Millar's Pond Park	Alta Lake Station
Alpha Crk. Rsvr. & Controls		4 - Nordic Dr @ Whistler Ski Area			Alpha Crk. Rsvr. & Controls	Medium		Tennis Court - Taluswood Park	Bayshores & Millar's Pond
Taluswood II Reservoir					Alpha Lake Park Bridge (Jordan Creek)	Medium		Tennis Court - Alpha Lake Park	Kadenwood
Baxters Reservoir					Alpha Lake Park SLS	Low		Basketball Court - Alpha Lake Park	Nita Lake Estates
Taluswood II (BUI10202)					Alpine 68 SL	Medium		Dog Park - Alpha Lake Park	Spring Creek
Taluswood I Reservoir					Alta Lake Road over 21-Mile Creek- Tamarisk	Low		Tennis Court - Alpha Lake Park	Stonebridge
Taluswood I Pump Station					Baxters Reservoir	Medium		Tennis Court - Millar's Pond Park	Twin Lakes
TF - Cathleen Cr and Drew Dr					Gondola SLS (BUI10210)	High		Tennis Court - Taluswood Park	Whistler Creek & Wayside
TF - Creekside					Highland Control Valve	Low		Tennis Court - Tamarisk	Whistler Creek North
TF - Eva Lake Castle Dr					Highway 99 @ Creekside (in front of Tim Hortons)	Low		Tennis Court - Timber Ridge	Whistler Creek South
					Karen Crescent PRV	Low		Tennis Court - Twin Lakes	

Pumps-Reservoirs-Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
					Lake Placid PRV	Low		Volleyball Court - Alpha Lake Park	
					London Lane over Whistler Creek-Creepside	Low		Whistler Mountain Ski Resort	
					Millar's Pond PRV	Low		Pine Point Park	
					Millar's Pond Siphon Tank	Low		Rocky Knoll Park	
					Millar's Pond SLS	Medium		Snowridge Site	
					Nita Lake PRV	Low		Sproatt Creek	
					Spring Creek Bridge	High		Taluswood Park	
					Spring Creek PRV	Medium			
					Spring Creek SLS (BUI10214)	Low			
					Taluswood I Pump Station	High			
					Taluswood I Reservoir	Medium			
					Taluswood II (BUI10202)	High			
					Taluswood II Reservoir	Medium			

Pumps-Reservoirs-Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
					Taylor Way SLS	Medium			
					Vehicle Bridge on Karen Crescent- 2400 Dave Murray Place	Low			
					Whistler Creek Bridge (Nita Lake Park)	Medium			
					Wolverine PRV	Medium			

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Pumps-Reservoirs-Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
Cheakamus Crossing Reservoir	Cement Plant	1 - Bayly Pak, Cheakamus Crossing	ESS Reception Centre - Spring Creek School	various throughout	Alpha Lake Road Over Millar Creek- Function Junction	Low	Ecole la Passerelle	Tennis Court - Bayly Park	Cheakamus Crossing
WWTP PRV/BFP/Meter Kiosk	Check Amy's	2 - Spring Creek Fields, Spring Creek	Fire Hall 3		Alta Lake Road over 21-Mile Creek- Tamarisk	Low	Spring Creek Community School	Basketball Court - Bayly Park	Function Junction
Cheakamus Crossing P/S	Cheakamus Gravel Pit		Critical Choke Point - Hwy 99 - Heading South past Function Junction/Cheakamus Crossing		Building 44A - Primary Treatment Building	High		Dog Park - Bayly Park	Spring Creek
TF - Cheakamus (River) Crossing	Spring Creek				Building 44B - Bio Reactor Four Cell	High		Pump Track - Bayly Park	Twin Lakes
	Waste Water Treatment Plant				Building 44C - District Energy Sys & Blower Bldg.	High		Soccer Field - Balsam Park	
					Building 44D - Clarifiers, Control and Pumphouse	High		Soccer Field - Bayly Park	
					Building 44E - Old Chemical Feed Building	Medium		Soccer Field - Spring Creek Elementary	
					Building 44E - UV Channel/DES Bldg.	High		Volleyball Court - Bayly Park	
					Building 44H - DAF Centrifuge Bldg.	Medium		Whistler Mountain Ski Resort	

Pumps-Reservoirs-Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
					Building 44I - ATAD Bldg.	High		Bayly Park	
					Building 44J - Fermenter Pump House Bldg.	Low		Cheakamus Common	
					Building 44K - Maintenance Bldg.	Medium		Marmot Park	
					Building 44L - Administration Bldg.	High		Millar Creek	
					Building 44M - Old Control Bldg.	Medium		Rocky Knoll Park	
					Building 44N - Genset Bldg.	High		Spring Creek Fields	
					Building 44O - Tarp Covered Storage Bldg.	Low		Sproatt Creek	
					Building 44P - Transformer Shelter	Low			
					Cheakamus Crossing Groundwater Pump Station	Low			
					Cheakamus Crossing P/S	High			
					Cheakamus Crossing PRV	Low			

Pumps-Reservoirs-Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
					Cheakamus Crossing Reservoir	Medium			
					Cheakamus Crossing Sanitation Siphon	Low			
					Cheakamus Crossing Well	Medium			
					Cheakamus Lake FSR	Low			
					Cheakamus X-ing Sani Siphon	Low			
					Firehall 3 Spring Creek	High			
					Function Junction	High			
					Function Junction SLS	Medium			
					Function Junction Wells #1&2 (BU10143)	High			
					Function Recycle Centre Yard	Low			
					Landfill Leachate Lift Stn.	Low			
					LFG Flare Condensate Lift	Low			

Pumps-Reservoirs-Tender Fills	Safe Zones	Heli Evac	Emergency Operations	Muster Points	Critical Infrastructure	CI Priority	Schools	Parks/Recreation	Neighbourhoods
					LFG Flare Includes Condensate PS	Low			
					Spring Creek Community School	Medium			
					Spring Creek PRV	Medium			
					Spring Creek SLS (BUI10214)	Low			
					Train Wreck Suspension Bridge	High			
					Walter Zebrowski Memorial Bridge (Cheakamus)	High			
					Wastewater treatment Plant	High			
					WWTP PRV/BFP/Meter Kiosk	Low			

4.3 WFRS Wildfire Vehicles & Equipment Assessment

4.3.1 WFRS Apparatus and Equipment

The Inter-agency agreement between the BC Fire Chiefs' Association and BCWS establishes minimum fire engine requirements and equipment inventory. Behr conducted a complete review of the WFRS WUI apparatus and equipment.

Table 5: Engine Minimum Requirements

Engine Type	Staff/Crew	Tank Size USG	Pump USGPM	Pump PSI	Pump & Roll	Ladders	Master Stream	2.5" hose	1.5" hose	¾" hose
Type 1 (structure)	4	300	1000	150	No	Yes, per NFPA 1901	Yes	1200' BAT	500' NPSH or QC	200' GHT
Type 2 (structure)	4	300	500	150	No	Yes, per NFPA 1901	No	1000' BAT	500' NPSH or QC	200' GHT
Type 3 (wildland)	3	500	150	250	Yes	No	No	No	1000' NPSH or QC	500' GHT
Type 4 (wildland)	3	750	50	100	Yes	No	No	No	300' NPSH or QC	300' GHT
Type 5 (wildland)	3	400	50	100	Yes	No	No	No	300' NPSH or QC	300' GHT
Type 6 (wildland)	3	150	50	100	Yes	No	No	No	300' NPSH or QC	300' GHT
Type 7 (wildland)	2	50	10	100	Yes	No	No	No	No	200' GHT

Table 6: Engine Equipment Minimum Inventory

Equipment	Engine Type						
	1	2	3	4	5	6	7
Adjustable Hydrant Wrench	1	1	1	1	1	1	0
3 way wye – 1 1/2" ¼ turn	2	2	2	2	2	2	2
3 way wye – Econoflow ¾"	3	3	3	3	3	3	3
Backpack Pumps	2	2	2	2	2	2	2
Chain File	1	1	1	1	1	1	1
Chainsaw (minimum 18" Bar)	1	1	1	1	1	1	1
Chaps	1	1	1	1	1	1	1
Double Female, 1.5" FNPSH	1	1	1	1	1	1	0

The following observations and recommendations are the result of the apparatus and equipment assessment:

Observation #15: The WFRS has three wildland trucks that would qualify as a Type 7 Engine by the Inter-Agency Agreement. Each truck is a 3/4-ton single axle rear wheel drive flat deck with aluminum cabinets equipped with 50-gallon water tank and a 100 GPM pump. Equipment on the trucks includes various nozzles and hose appliances, about 400 feet of 1-1/2" hose and 500 feet of 3/4" Econo hose. The portable pump on the rear deck is piped in to a 50-gallon water tank and not ideally located to connect and deploy attack lines. There is no easy means to draft with this pump without disconnecting from the tank and there is no portable bladder or tank available to draft from. With the current pump configuration, there would be 30 seconds of water available to extinguish a fire before supplemental water is required. In the interim, WFRS is encouraged to weigh the three wildland trucks to ensure they are not overweight with a full crew of firefighters and explore the ability to carry more water.

Emergency Planning Recommendation #18: Replace the type 7 engines with type 5 engines capable of carrying 400 gallons of water and equipment.

Recommended Completion: based upon life cycle of current units

Estimated Cost: \$220,000 per unit

Rationale: Type 7 engines are very light weight for their purpose and if feasible be repurposed within the municipality's fleet and replaced with a minimum 1-ton crew cabs that would qualify the unit as a Type 5 Engine by wildfire standards and capable of carrying 400 gallons of water and equipment. A complete wildland skid pack with a 50-gpm pump, water tank, foam tank and piping to easily pump from the tank, draft from an external water source, or fill the water tank from a hydrant is preferred.

Emergency Planning Recommendation #19: As an interim measure, remove the current pump and tank on the wildland truck at Station 1 and retrofit it with the pre-built wildland skid pack that was intended to be mounted on a UTV with skid unit.

Recommended Completion: Immediate

Estimated Cost: \$1000.00

Rationale: The WFRS has a prebuilt wildland skid pack (75-gallon tank, pump, and plumbing) that was intended to mount on their UTV, but it is currently stored and not in use as it is too heavy for the UTVs carrying capacity.

Emergency Planning Recommendation #20: Modify the wildland trucks to accommodate 150–200-foot pre-connected wildland fire hose for quicker deployment of attack lines.

Recommended Completion: 12-24 months

Estimated Cost: \$5,000.00

Rationale: All the wildland attack hose is stored in rolls in cabinets and cannot be easily or quickly deployed for rapid use at a wildfire.

Emergency Planning Recommendation #21: Equip each wildland truck with a 1500-gallon bladder so water tenders can deliver water, dump, and return to refill.

Recommended Completion: 24-48 months

Estimated Cost: \$7,500.00

Rationale: To sustain an adequate water supply to support WUI operations and the wildland units water tenders can deliver water to the bladders, dump and return to refill.

Observation #16: WFRS has a 2-seat sport style UTV. It is currently set up with a patient transport and attendant skid pack for responding off road to injured or ill patients. As previously identified a wildland skid pack was purchased for this UTV unit, but it is too heavy for the UTVs carrying capacity. A small trailer was acquired to transport the skid unit but was determined to be too top heavy and without trailer suspension.

Emergency Planning Recommendation #22: Replace the sport model UTV with a heavy-duty work type UTV that has more carrying and tow capacity.

Recommended Completion: 36-48 months

Estimated Cost: \$40,000.00

Rationale: A UTV that is designed to support medical responses and capable to also support WUI operations for off road and incidents enhances the rapid deployment of WFRS resources and response capabilities. An operational needs analysis should be conducted to determine the types of responses or events a new UTV would attend and include consultation with manufacturers to ensure operational requirements are identified. This should include transporting trailer, wildland skid pack, patient carrying skid and supporting equipment.

Emergency Planning Recommendation #23: Mount the Wildland Fire Boss sprinkler equipment on the wildland response units.

Recommended Completion: 12-18 months

Estimated Cost: Cost Neutral, staff time

Rationale: The Wildland Fire Boss sprinklers are currently stored in the equipment cache in the fire station making it onerous to deploy. Mounting them on the wildland truck will ensure these sprinklers are more readily available when needed.

Emergency Planning Recommendation #24: Increase the current inventory of forestry hose to include a reserve of 500' of 1- ½" hose and 500' of ¾" hose.

Recommended Completion: 12-18 months

Estimated Cost: \$6,000.00

Rationale: WFRS has the complement of forestry hose on their wildland trucks. An additional inventory stored at the fire station would support replacement, repairs, and maintenance.

Emergency Planning Recommendation #25: Purchase three progressive hose packs for the WFRS wildland trucks.***Recommended Completion:*** 12-18 months***Estimated Cost:*** \$500.00 – pack only.

Rationale: Progressive hose packs are a common piece of wildland gear that enables crews to easily and quickly advance hose along the flank of a fire or extend a hose stretched from the apparatus. These hose packs would require 200' of 1.5" single jacket hose, spanners, hose strangler, 3-way valves and thieves for easy hose deployment and eliminate crews having to return to the truck for additional equipment.

Observation #17: WFRS currently relies on municipal dump trucks equipped with water tanks to respond to fires and deliver water when hydrants are not available. There are several operational issues with this practice:

- The availability public works staff to respond with water at any time,
- WFRS staff are not trained or familiar with the municipal dump trucks operation.
- The tanks cannot be filled completely due to no baffles inside the tanks to keep the water from sloshing during transport.
- The dump trucks do not carry water bladders and need to remain on site to nurse other apparatus until they are empty.

Emergency Planning Recommendation #26: Purchase a Type 2 tactical tender.***Recommended Completion:*** 24-48 months***Estimated Cost:*** \$150,000.00 each

Rationale: The addition of this unit would eliminate the need to use dump trucks and water tanks as makeshift water tenders. A Type 2 tactical tender with a minimum 1500-gallon tank, 2000-gallon bladder and the ability to pump and roll with a bumper mounted remote-control nozzle and include all components and equipment to qualify it as a Type 2 apparatus by Inter Agency Agreement Standards.

Observation #18: WFRS provides cotton coveralls, work hardhats, leather station boots and leather gloves to all career staff working at wildland fire incidents. Additional hardhats are stored on the wildland trucks for the POC staff that respond from home.

Emergency Planning Recommendation #27: Provide all WFRS staff with NFPA 1977 compliant personal protective equipment.

Recommended Completion: 12-18 months

Estimated Cost: \$15,000

Rationale: WorkSafe BC regulations for firefighters requires appropriate personal protective equipment for the services provided. NFPA 1977 compliant personal protective equipment includes cotton or Nomex coveralls or long sleeve shirt and pants that comply with NFPA standards. Each member should also have their own hardhat, leather gloves and 8" boots to ensure they are properly protected on responses.

Observation #19: As previously indicated, the RMOW is located within a wildland interface/intermix area that is assessed as at a high risk for wildfire. For WFRS to have the capability to protect an entire interface neighbourhood (e.g., up to 100 homes) a Type 2 SPU is required.

Emergency Planning Recommendation #28: Purchase a Type 2 Structure Protection Unit.

Recommended Completion: 12-18 months

Estimated Cost: \$170,000-200,000 range

Rationale: A Type 2 SPU combined with the WFRS apparatus and equipment recommendations identified in this report provides the minimum resources to attempt the protection of 100 homes in a Whistler neighbourhood area. The unpredictability of wildfire particularity in a high-risk area makes it impossible to guarantee the sustainability of a neighbourhood in a wildfire.

Observation #20: The BCWS maintains an inventory of wildfire equipment such as tanks, pumps, and SPU trailers. This includes:

- 40- Type 2 SPU trailers, (located with contractors and fire departments and are established if they meet inventory specs and inspection requirements), and
- 7 - Type 1 trailers and 2-Type 2 trailers.

Heavy equipment such as dozers, excavator, bunchers etc. are contracted locally by BCWS if they have the correct insurance and WorkSafe BC certifications.

Emergency Planning Recommendation #29: Establish a list of local contractors and heavy equipment that can be contracted by the RMOW in the event of a wildfire that is impinging upon the community.

Recommended Completion: 12-18 months

Estimated Cost: Cost neutral staff time

Rationale: Depending upon the wildfire season and active fires in BC, inventories of equipment may not be readily available from BCWS. Having a list of local resources to draw upon will enhance the operational effectiveness in the event of a wildfire.

4.4 Training and Multi-Agency Interoperability

4.4.1 WFRS Wildland Training

Observation #21: The WFRS practices the current standard for career and POC staff wildland training. All suppression staff have completed the BCWS WSPP-WFF1 as their foundational wildland training. This course is based on the National Fire Protection Association Standard 1051: Standard for Wildland Firefighting Personnel Professional Qualifications and is designed enhanced specifically for the structural firefighter. All career and paid on call firefighters also have the BCWS WSPP-115 Structure Protection Sprinkler course. Most Company Officers have completed the BCWS Task Force Leader course. This course is based off the BCWS S330 Course for Task Force Leader and was modified for structural firefighting in the wildland urban environment. This course is for structure defence supervisors who manage 5-7 fire apparatus and crews during an emergency.

Training Recommendation #30: *WFRS continue to use the BCWS Wildland Firefighter 1 as their standard training and host the BCWS Engine Boss training for all fire officers in the region. Furthermore, continue the Task Force Leader training for those officers and senior firefighters who did not attend previous training.*

Recommended Completion: 12-48 months

Estimated Cost: BCWS doesn't charge for courses. Minor costs for host departments

Rationale: *The BCWS Engine Boss course is based off the National Wildland Coordination Group standard S231 course and designed for structural fire officers to manage a single resource structural or wildland engine and water tender with crew. The BCWS Task Force Leader is based off the National Wildland Coordination Group S330 as intended for supervisors who manage 5-7 crew bosses and their crews.*

Training Recommendation #31: Enhance the interoperability with the BCWS Coastal Fire Center and the Pemberton Fire Zone at the senior and operational levels.***Recommended Completion:*** 12 months and recurring***Estimated Cost:*** Cost Neutral, staff time

Rationale: Developing a close working relationship with the BCWS Coastal Fire Center and the Pemberton Fire Zone will significantly enhance interoperability between these agencies. Recurring collaborative meetings with senior leaders to gain insight on respective working procedures including defensive strategies and operational tactics if an established wildfire is threatening the Whistler community. Frontline operational responders from all three agencies need to be provided the opportunity to practice and develop working relationships. Effective inter-agency collaboration will increase response capabilities, coordination, and firefighter safety.

Training Recommendation #32: Conduct an annual spring wildfire training weekend with mutual aid partners Squamish FD, Pemberton FD and the BCWS Pemberton Zone staff.***Recommended Completion:*** 12 months and recurring annually***Estimated Cost:*** \$15,000 per year

Rationale: Joint training should include fundamental wildland initial attack operations, sprinkler deployment tabletop exercises, safe work area reconnaissance and other wildfire leading practices. Rotational hosting and collaborative development of training curriculum would be an effective approach.

Training Recommendation #33: Deploy WFRS staff provincially to gain task force leader experience and knowledge.***Recommended Completion:*** Annually and based upon provincial requests***Estimated Cost:*** dependent upon deployment requirements

Rationale: WFRS should enhance the practice of deploying staff provincially due to staffing challenges. Officers who have taken the Task Force Leader course be encouraged to deploy provincially as a single resource to be mentored in the field to gain valuable experience that will enhance WFRS wildfire fighting capabilities.

Observation #22: Discussion with Whistler Blackcomb revealed that the resort has 100-150 staff members that are S-100 wildfire qualified. The resort has maintained good working relationships with BCWS and the RMOW at the operational level. The pre-Olympic build up included several exercises including tabletop and evacuations.

Emergency Planning Recommendation #34: *Determine if the Whistler Blackcomb S-100 qualified staff can be identified as resource and if need be, deployed to support BCWS and WFRS wildfire operations.*

Recommended Completion: 12 months

Estimated Cost: Cost Neutral, staff time

Rationale: *Additional trained S-100 qualified staff could supplement WFRS response to a wildfire.*

Observation #23: To enhance an initial response within the RMOW, all municipal outside workers should be trained to the S-100 and S-185 levels for wildfires. This would include Parks and Recreation and Public Works staff.

Emergency Planning Recommendation #35: *The RMOW should consider training all municipal outside workers to the S-100 and S-185 wildfire qualifications.*

Recommended Completion: 18 months

Estimated Cost: Cost Neutral, Staff time and BCWS provides courses free

Rationale: *The wildfire risk hazard potential emphasizes the need for an aggressive and timely initial response to prevent a small fire from developing into a fully established wildfire. Having the RMOW's outside staff trained to respond along with WFRS and the WFP team enhances the initial response capabilities.*

Training Recommendation #36: *Whistler Blackcomb and RMOW senior staff conduct one tabletop wildfire exercise per year.*

Recommended Completion: 12-24 months

Estimated Cost: Cost neutral, staff time

Rationale: *The resort is a major community partner in the RMOW with significant resources to support the BCWS and the WFRS in the event of an established wildfire that threatens the community. It is essential that these agencies have coordinated responses as part of the structural defence plan.*

4.5 Wildfire Response Staffing Capabilities

WFRS is a composite fire department that utilizes full time and Paid-On-Call (POC) firefighters. The department operates out of three fire stations: one main fire station staffed by both fulltime and POC firefighters, and two additional fire stations staffed by POC staff. Station 1 is staffed 24 hours with a Minimum Duty Strength (MDS) of four (4) full-time firefighters supported by a contingent of paid-on-call (POC) firefighters. WFRS provides fire, rescue, and medical services within the RMOW and along a stretch of Highway 99 outside of municipal boundaries. WFRS also provides mutual aid response to several neighboring communities. WFRS currently has mutual aid agreements:

- The Village of Pemberton,
- The District of Squamish and,
- The Squamish Lillooet Regional District (Garibaldi) for fire prevention and suppression related services, as needed by each community.

In addition, WFRS has a fee for service agreement with the Squamish Lillooet Regional District for Wedgewoods Estates and fire protection services.

Specific to wildfire the BCWS Coastal Region operates a fire centre at Parksville on Vancouver Island that provides provincial level resources to all areas of BC during wildfire events. BCWS also maintains a Zone Office in Pemberton to support the local region.

Sections 4.3 and 4.4 of this report identifies increases in training and equipment for the RMOW and WFRS to conduct structural defence operations for 100 homes or 2 neighbourhood areas.

Observation #24: During the consultation process and discussions with the Fire Chief and WFRS staff, the initial response capabilities were identified as a shortfall. The review of WFRS's initial wildfire response capabilities considered the following factors:

- Risk of a wildfire occurring in the RMOW is assessed as high and is more likely from a probability perspective to originate within the RMOW in comparison to a wildfire that encroaches on the community. The latter may provide some advance time to stage wildfire response resources and is complexly contingent upon the conditions at the time. A wildfire occurring within the RMOW must be under control before becoming an established or crown event.
- Consequences of an established wildfire within the RMOW would be catastrophic with potential for loss of life and property, environmental damage, degradation of Whistler's profile and global reputation.
- Population fluctuates depending on the season and day of the week. While the resident population is approximately 14,000, there can be upwards of approximately 60,000 people in Whistler on a peak day. Whistler sees an average of 3 million visitors per year with about 40 per cent of visitation in winter and 60 per cent in summer during the wildfire season.
- Increases in population exacerbates the limitations of transportation infrastructure including the provincial highway and RMOW roadways and thereby creating timely response challenges for the WFRS.
- Increase demands of service from the WFRS occurring during the peak population periods.
- Limited initial critical task capability of the WFRS combined with the limitations of the POC staffing must be addressed.

Emergency Planning Recommendation #37: Staff Fire Stations 2 and 3 each with a rapid response team of two fulltime firefighters 24/7.

Recommended Completion: Station 3: 12-24 months, Station 2: 24-48 months

Estimated Cost: 1.6M per station for 2 members 24/7 total cost 3.2M

Rationale: The community wildfire assessment indicates that the RMOW is at a high-risk rating. This combined with the other factors such a fluctuating population, increase call volume, transportation infrastructure limitations and the current initial critical task capability of WFRS impedes a rapid response to a wildfire originating within the RMOW. Staffing stations 2 and 3 provides rapid response capabilities in the south and north zones.

Emergency Planning Recommendation #38: Expand the Whistler FireSmart team to 9 staff (two crews of four and the FireSmart Supervisor) and the program to twelve months a year.

Recommended Completion: 12-24 months

Estimated Cost: \$250,000

Rationale: To implement the various FireSmart public community and education program a year-round program would be more effective. Wildfire assessments and fuel modification activities would be conducted during the summer months with planning, training, public education, and communication focussed during the winter. Furthermore, having two FireSmart teams of four working throughout the municipality bolsters the WFRS initial response capability for wildfire event within the RMOW. During the consultation phase it was identified that the retention of qualified seasonal workers was creating program delivery challenges. Full time positions may alleviate this occurrence.

Observation #25: The RMOW and SLRD fee for service agreement to provide fire protection to Wedgewoods Estates that excludes wildland interface fires that is not strictly for the purpose of structural protection related activities unless WFRS is exclusively and solely tasked by BCWS. A wildfire that is encroaching on Wedgewoods Estates or originates within the community poses a threat to the RMOW and as such must include rapid intervention before becoming an established wildfire.

Policy Recommendation #39: Enhance the fee-for-service agreement with the SLRD to include wildfire response.

Recommended Completion: 12-24 months

Estimated Cost: Cost Neutral, staff time

Rationale: The recommended rapid response team at Station 2 provides the capability to intervene a wildfire at Wedgewoods Estates before progressing into a major event or impeding fire spread. While dependent upon the specific conditions of the wildfire, WFRS can in most cases respond before the BCWS mobilizes.

4.6 GIS Spatial Data Analysis

The Geomatics department at Behr Integrated was responsible for sourcing and compiling data sources to assist in preparing maps for the RMOW community wildfire defence plan. Neighbourhood transect maps were compiled at 1:10,000 scale to provide adequate spatial coverage of adjacent neighbourhoods and to allow for clear identification of critical infrastructure and safe zones within each map area. Data Sources included the:

- RMOW's GIS Department,
- Whistler Blackcomb's GIS,
- BC Government Spatial Data Warehouse,
- BC Ministry of Forestry (Wildfire Service),
- © ESRI Map Imagery Data for Terrain and Open Street base maps,
- © meteoblue weather simulation data, and
- Behr Integrated field data collection.

Neighbourhood transect maps were compiled at 1:10,000 scale to provide adequate spatial coverage of adjacent neighbourhoods to allow for clear identification of critical infrastructure, fill sites and water sources, access and egress routes, helicopter pads and safe zones.

Observation #26: The RMOW was segregated into eight structural protection/defence zones for tactical and response and defence planning operations. Rapid access to this spatial data is essential for the senior structure protection specialists who will manage both the structure defence and structure protection operations.

Emergency Planning Recommendation #40: Establish QR codes for all RMOW emergency response maps.

Recommended Completion: 12-24 months

Estimated Cost: Cost neutral staff time

Rationale: QR codes will provide timely access to the structural protection or defence data in the EOC, neighbourhood area, or at a wildfire scene. This will enhance wildfire operations, planning, and responder safety.

SECTION 5 CRITICAL INFRASTRUCTURE

5.1 Identification/Confirmation of Critical Infrastructure and Facilities

As previously identified the RMOW FireSmart program is exemplary and a leading practice for other municipalities to emulate. Attached, as appendix C, is the comprehensive list of the RMOW's Critical infrastructure (CI) and GIS map.

The primary strategy to be considered for sprinkler protection is the community's critical infrastructure. A community is much better prepared for post fire recovery if the primary infrastructure is operable after a fire. This would include water intake pump and chlorination stations, wastewater treatment facilities, hydroelectric facilities and municipal/ provincial government buildings and assets. The FireSmart manager has listed all community critical infrastructure and has been implementing FireSmart principals to CIs and their surroundings. Sprinkler protection triaging for CIs in a municipality the size of the RMOW becomes a tactical consideration that would be deployed at the time of a wildfire. These are facilities are typically standalone buildings that are in the interface/intermix areas. The recommend SPU's and other wildfire equipment identified in this report provides an enhanced capability to protect the RMOW's CI sites when at risk from a wildfire.

Below are the 2022 CI sites that were assessed in 2022 and the FireSmart Critical Infrastructure Mitigated in 2023 sites that receive mitigation measures in 2023:

Table 7: List of 50 Critical Infrastructure Assets to FireSmart in 2022

Number	Site Name	Notes	Civic Address
1	Spruce Grove Way over Fitzsimmons Cr	Municipal Bridges - water/hydro supply, egress	Spruce Grove Way
2	White Gold/Nancy Greene Dr over Fitzsimmons Cr	Municipal Bridges - water/hydro supply, egress	Nancy Greene Drive
3	21 Mile Flank Bridge	Trail Bridges - access to CI, emergency response route	Above Whistler Cemetery
4	Covered Bridge to Blackcomb	Valley Trail Bridges - egress	Valley Trail Village to Upper Village
5	Nordic pedestrian Overpass	Valley Trail Bridges - highway 99 impact	Nordic Way/Hwy 99
6	Spring Creek Bridge	Valley Trail Bridges - egress	Bayshores to Spring Creek Valley Trail
7	Building 44A—Primary Treatment Building	Waste Water Treatment Plant	1135 Cheakamus Lake Road
8	Building 44B—Bio Reactor Four Cell	Waste Water Treatment Plant	1135 Cheakamus Lake Road
9	Building 44C—District Energy Sys & Blower Bldg.	Waste Water Treatment Plant	1135 Cheakamus Lake Road

Number	Site Name	Notes	Civic Address
10	Building 44D—Clarifiers, Control and Pumphouse	Waste Water Treatment Plant	1135 Cheakamus Lake Road
11	Building 44F—UV Channel/ DES Bldg.	Waste Water Treatment Plant	1135 Cheakamus Lake Road
12	Building 44I—ATAD Bldg.	Waste Water Treatment Plant	1135 Cheakamus Lake Road
13	Building 44L—Administration Bldg.	Waste Water Treatment Plant	1135 Cheakamus Lake Road
14	Building 44N —Genset Bldg.	Waste Water Treatment Plant	1135 Cheakamus Lake Road
15	Alpine South Sanitary Lift Station (BUI10208)	Water Supply Waste Water Collection	8330 Rainbow Drive
16	Crabapple Sanitary Lift Station (BUI10209)	Water Supply Waste Water Collection	6671 Crabapple Drive
17	Gondola SLS (BUI10210)	Water Supply Waste Water Collection	2149 Lake Placid Road
18	Emerald Lake SLS	Water Supply Waste Water Collection	9033 Summer Lane
19	Nicklaus North SLS (BUI10211)	Water Supply Waste Water Collection	8407 Golden Bear Plc.
20	NE Sector - SLS	Water Supply Waste Water Collection	7314 Blackcomb Way
21	Emerald Estates SLS	Water Supply Waste Water Collection	9925 Lakeshore Drive
22	Mountain View PRV and Pump (BUI10197)	Water Supply Waste Water Collection	8319 Mountain View
23	Community Booster Pump & PRV (BUI10198; BUI10199)	Water Supply Waste Water Collection	4290 Blackcomb Way
24	Taluswood I Pump Station	Water Supply Waste Water Collection	2642 Whistler Rd
25	Sunridge Pump Station	Water Supply Waste Water Collection	3840 Sunridge Drive
26	Nicklaus North PRV	Water Supply Waste Water Collection	8407 Golden Bear Plc.
27	Spruce Grove PRV (NE Sector - PRV)	Water Supply Waste Water Collection	7314 Blackcomb Way (NE Sector - PRV)
28	Taluswood II (BUI10202)	Water Supply Waste Water Collection	2400 Taluswood Pl
29	Stonebridge PRV & Pumps	Water Supply Waste Water Collection	5406 Stonebridge Dr.

Number	Site Name	Notes	Civic Address
30	Stonebridge PRV	Water Supply Waste Water Collection	5438 Stonebridge Dr.
31	Cheakamus Crossing P/S	Water Supply Waste Water Collection	1135 Cheakamus Lake Road
32	21 Mile Pump Station (BUI10293)	Water Supply Waste Water Collection	5785 Alta Lake Road
33	21 Mile UV Facility	Water Supply Waste Water Collection	5825 Alta Lake Rd.
34	Alta Lake Rd. PRV #2	Water Supply Waste Water Collection	5590 Alta Lake Rd.
35	Lost Lake Pump Station	Water Supply Waste Water Collection	4701 Blackcomb Way
36	Function Junction	Water Supply Waste Water Collection	1005 Lynham Road
37	21 Mile Creek Intake (BUI10204)	Water Supply Waste Water Collection	21 Mile Creek (above RMOW Cemetery)
38	Blackcomb Creek Intake & Screen Room NiS	Water Supply Waste Water Collection	Blackcomb Creek
39	Blackcomb Reservoir Control & Chlorination Room (BUI10205)	Water Supply Waste Water Collection	Blackcomb Reservoir
40	Lost Lake Reservoir & Booster Pump	Water Supply Waste Water Collection	4701 Blackcomb Way
41	Emerald Wells 1-3 & C12 Building (BUI10207)	Water Supply Waste Water Collection	9225 Hwy 99 (Emerald Park)
42	Alpine Well #1	Water Supply Waste Water Collection	8801 HWY 99
43	Function Junction Wells #1&2 (BUI10143)	Water Supply Waste Water Collection	1005 Lynham Road
44	21 Mile Well #1	Water Supply Waste Water Collection	Valley Trail Rainbow Pk. <-> Lorimer Rd.
45	Public Works Yard	EOC, fuel, machinery	8020 Nesters Road
46	Public Safety Building/Firehall 1/Cabin		4315 Blackcomb Way
47	Alta Vista Works Yard	EOC	3000 Highway 99
48	Firehall 2 Alpine	Firehall	8900 Highway 99
49	Firehall 3 Spring Creek	Firehall	1505 Spring Creek Drive
50	Municipal Hall	EOC	4325 Blackcomb Way

Table 8: FireSmart Critical Infrastructure Mitigated in 2023

No.	Completed	Site Name	Notes	Civic Address	Veg	Comments	Building	Comments
1	Yes	Spruce Grove Way over Fitzsimmons Cr	Municipal Bridges - water/ hydro supply, egress	Spruce Grove Way	Yes??	30 pts on score card - review and treat as needed	No	
2	Yes	White Gold/Nancy Greene Dr over Fitzsimmons Cr	Municipal Bridges - water/ hydro supply, egress	Nancy Greene Drive	Yes	Remove some brush	No	
3	No	21 Mile Flank Bridge	Trail Bridges - access to CI, emergency response route	Above Whistler Cemetery	No		No	
4	Yes	Covered Bridge to Blackcomb	Valley Trail Bridges - egress	Valley Trail Village to Upper Village	No		No	
5	Yes	Nordic pedestrian Overpass	Valley Trail Bridges - highway 99 impact	Nordic Way/Hwy 99	No		No	
6	Yes	Spring Creek Bridge	Valley Trail Bridges - egress	Bayshores to Spring Creek Valley Trail	Yes	Lower limbs and a few trees. Wood railings are vulnerable. Riparian	No	
7	Yes	Building 44A—Primary Treatment Building	Waste Water Treatment Plant	1135 Cheakamus Lake Road	No		No	
8	Yes	Building 44B—Bio Reactor Four Cell	Waste Water Treatment Plant	1135 Cheakamus Lake Road	No		No	
9	Yes	Building 44C—District Energy Sys & Blower Bldg.	Waste Water Treatment Plant	1135 Cheakamus Lake Road	No		No	
10	Yes	Building 44D—Clarifiers, Control and Pumphouse	Waste Water Treatment Plant	1135 Cheakamus Lake Road	No		No	
11	Yes	Building 44F—UV Channel/ DES Bldg.	Waste Water Treatment Plant	1135 Cheakamus Lake Road	No		No	
12	Yes	Building 44I—ATAD Bldg.	Waste Water Treatment Plant	1135 Cheakamus Lake Road	No		No	
13	Yes	Building 44L—Administration Bldg.	Waste Water Treatment Plant	1135 Cheakamus Lake Road	No		No	
14	Yes	Building 44N —Genset Bldg.	Waste Water Treatment Plant	1135 Cheakamus Lake Road	No		No	

No.	Completed	Site Name	Notes	Civic Address	Veg	Comments	Building	Comments
15	Yes	Alpine South Sanitary Lift Station (BUI10208)	Water Supply Waste Water Collection	8330 Rainbow Drive	Yes	Neighbour's trees encroaching	Yes	Gutters need cleaning, protect bottom of wood wall (flashing or fibre-cement board, bottom 15cm critical), metal drip edge for fascia board from roof edge to below gutter
16	Yes	Crabapple Sanitary Lift Station (BUI10209)	Water Supply Waste Water Collection	6671 Crabapple Drive	Yes	Trees on backside need trimming or removal	Yes	Loose landscape timbers to be removed
17	Yes	Gondola SLS (BUI10210)	Water Supply Waste Water Collection	2149 Lake Placid Road	Yes	Needs fine fuel management. Limb removal	Yes	Open eaves - enclose with boards, bottom of wall to protect
18	Yes	Emerald Lake SLS	Water Supply Waste Water Collection	9033 Summer Lane	No		No	
19	Yes	Nicklaus North SLS (BUI10211)	Water Supply Waste Water Collection	8407 Golden Bear Plc.	Yes	Limb removal. Potential Tree removal	No	
20	Yes	NE Sector - SLS	Water Supply Waste Water Collection	7314 Blackcomb Way (Spruce Grove)	No		Yes	Gutters need maintenance - drip edge to protect fascia boards
21	Yes	Emerald Estates SLS	Water Supply Waste Water Collection	9925 Lakeshore Drive	Yes	Fine fuels and limb removal	No	
22	Yes	Mountain View PRV and Pump (BUI10197)	Water Supply Waste Water Collection	8319 Mountain View	No		No	
23	No	Community Booster Pump & PRV (BUI10198; BUI10199)	Water Supply Waste Water Collection	4290 Blackcomb Way	Yes	Potential limb removal.	Yes	Clear roof of debris - protect bottom of walls - replace "roof" covering on top of electrical box with metal or asphalt shingle, protect boards on top of box on side of bldg.
24	Yes	Taluswood I Pump Station	Water Supply Waste Water Collection	2642 Whistler Rd	Yes	Ladder fuels need removal	Yes	Wood shake roof/Replace, protect bottom of walls

No.	Completed	Site Name	Notes	Civic Address	Veg	Comments	Building	Comments
25	Yes	Sunridge Pump Station	Water Supply Waste Water Collection	3840 Sunridge Drive	Yes	Vegetation should be cut back. On steep slope that should needs to be mitigated.	No	
26	Yes	Nicklaus North PRV	Water Supply Waste Water Collection	8407 Golden Bear Plc.	Yes	deciduous can be cut back	Yes	Open eaves - protect bottom of walls
27	Yes	Spruce Grove PRV (NE Sec- tor - PRV)	Water Supply Waste Water Collection	7314 Blackcomb Way (NE Sector - PRV) Spruce grove	No		Yes	Gutters need maintenance - protect fascia board, protect bottom of wall
28	Yes	Taluswood II (BUI10202)	Water Supply Waste Water Collection	2400 Taluswood Pl	Yes	Remove limbs and stems from NCZ	Yes	Wood shake roof / replace - protect bottom of walls
29	Yes	Stonebridge PRV & Pumps	Water Supply Waste Water Collection	5406 Stonebridge Dr.	Yes	Potential juvenile stem removal/ riparian	No	
30	Yes	Stonebridge PRV	Water Supply Waste Water Collection	5438 Stonebridge Dr.	Yes	limbs look raised can be raised more. potential stem removal.	No	
31	Yes	Cheakamus Crossing P/S	Water Supply Waste Water Collection	1135 Cheakamus Lake Road	No		No	
32	Yes	21 Mile Pump Station (BUI10293)	Water Supply Waste Water Collection	5785 Alta Lake Road	No		No	
33	Yes	21 Mile UV Facility	Water Supply Waste Water Collection	5825 Alta Lake Rd.	No		No	
34	Yes	Alta Lk. Rd. PRV #2	Water Supply Waste Water Collection	5590 Alta Lake Rd.	Yes	Brush needs to be maintained to 10cm or less including power pole near by providing power	No	
35	Yes	Lost Lake Pump Station	Water Supply Waste Water Collection	4701 Blackcomb Way	No		No	
36	Yes	Function Junction	Water Supply Waste Water Collection	1005 Lynham Road	No		No	
37	No	21 Mile Creek Intake (BUI10204)	Water Supply Waste Water Collection	21 Mile Creek (above RMOW Cemetery)	No		No	

No.	Completed	Site Name	Notes	Civic Address	Veg	Comments	Building	Comments
38	No	Blackcomb Creek Intake & Screen Room NIS	Water Supply Waste Water Collection	Blackcomb Creek	No		No	
39	No	Blackcomb Reservoir Control & Chlorination Room (BUI10205)	Water Supply Waste Water Collection	Blackcomb Reservoir	No		No	
40	Yes	Lost Lake Reservoir & Booster Pump	Water Supply Waste Water Collection	4701 Blackcomb Way	No		No	
41	Yes	Emerald Wells 1-3 & C12 Building (BUI10207)	Water Supply Waste Water Collection	9225 Hwy 99 (Emerald Park)	No		No	
42	No	Alpine Well #1	Water Supply Waste Water Collection	8801 HWY 99	No		No	
43	Yes	Function Junction Wells #1&2 (BUI10143)	Water Supply Waste Water Collection	1005 Lynham Road	Yes	Trees in close proximity have limbs raised. Look to raise more or remove trees	No	
44	No	21 Mile Well #1	Water Supply Waste Water Collection	Valley Trail Rainbow Pk. <-> Lorimer Rd.	No		No	
45	Yes	Public Works Yard	EOC, fuel, machinery	8020 Nesters Road	No		No	
46	Yes	Public Safety Building/Fire- hall 1/Cabin		4315 Blackcomb Way	No		No	
47	Yes	Alta Vista Works Yard	EOC	3000 Highway 99	No		No	
48	Yes	Firehall 2 Alpine	Firehall	8900 Highway 99	No		Yes	
49	Yes	Firehall 3 Spring Creek	Firehall	1505 Spring Creek Drive	No		No	
50	Yes	Municipal Hall	EOC	4325 Blackcomb Way	No		No	

5.2 Fire Protection Water Supply

The 2014 Fire Underwriters Survey (FUS) graded the RMOW water system for fire insurance rates. The FUS assessed that the system does not suffer from an inconsistent level of water delivery with regards to water supplies for public fire protections. As a result, the level of fire protection that can be provided is consistent throughout the resort municipality.

The 2022 CWRP recommendations included the need to pre-plan emergency water delivery systems to connect major natural water sources with interface neighbourhoods to facilitate deployment of structural fire protection systems. The RMOW has five large lakes to draw water from in the event of a wildfire. Shuttling or drafting water from these sources to fill tanks and bladders may be planned to include tender access points, traffic control, permanent and large-volume pumps, and piping.

There are 10 reservoirs and 7 separate water service areas in the RMOW that provide domestic water to the community. All commercial and residential areas have hydrants that have ample volume of over 1,000 gallons per minute and pressure of over 120 psi for structural firefighting.

There are several creeks within the community, however not all of them are conducive to drafting operations due to the topography and the speed of the water.

The scope for the community wildfire defence plan included a review, engagement, and pre-plan emergency community water delivery systems with key stakeholders on water delivery rates, reservoir recover capacity, natural water supply locations and back-up power. Further the ability to connect major natural water sources with interface neighbourhoods, to facilitate deployment of a structural protection system was researched. Consultations with the RMOW Utilities Department revealed the following:

RMOW has a very complicated and dynamic water system making it very difficult to provide water delivery rates and reservoir recover capacity. Reservoir recovery times are totally dependent on the water demand and the available raw water supply at a specific time. Factors that will affect this could be.

- Location of the reservoir and demand - Some reservoirs are fed from multiple sources of supply depending on the water system configuration at that time. For example, R229 can be feed from more than 3 different water sources: 21 mile Creek, P247 day lot wells, and the wells in Rainbow Park. Alternatively, R226 Cheakamus reservoir has only 1 source of supply.
- Weather- Rain creating turbidity in 21mile creek can restrict the use of that source and water system capacity. 21 mile creek can produce around half the water that is available for the village.

- Time of year- During the Spring thaw, the 21mile creek is usually offline and this continues into the start of the summer irrigation periods. Summer demand can be double the winter demand. The system has the capacity to be increased during the winter months only. This means that the fill rate curve of certain reservoirs can be almost flat just maintaining level. It can take all day for the village reservoirs to recover from a single night's worth of irrigation.
- Size of emergency. 21 mile creek could support a large interface however this would affect water quality. This would need the approval of the Vancouver Coastal Health Drinking Water Officer and a Water Advisory or Boil Water alert depending on the water quality.

Table 9: Raw Water Sources for the RMOW and their flow rates.

Site ID	Supply Type	Well Location	Associated Reservoirs	Max Production Flow Rate Cubic Meters Per minute	Notes
W201-1	Well	Emerald	R238	0.8	
W201-2	Well	Emerald	R238	0.6	
W201-3	Well	Emerald	R238	1.6	
W202	Well	Alpine	R222, R237	1.3	
W210	Well	Alpine	R222, R237	0.8	
W213	Well	Alpine	R222, R237	0.7	
W205-1	Well	Village Day Lots	R222, R233, R234, R229, R237, R228	0.4	Depending on the water system valving we can send water to multiple reservoirs or just a few.
W205-2	Well	Village Day Lots	R222, R233, R234, R229, R237, R228	1.2	Depending on the water system valving we can send water to multiple reservoirs or just a few.
W205-3	Well	Village Day Lots	R222, R233, R234, R229, R237, R228	0.8	Depending on the water system valving we can send water to multiple reservoirs or just a few.
W211	Well	Village Day Lots	R222, R233, R234, R229, R237, R228	0.7	Depending on the water system valving we can send water to multiple reservoirs or just a few.
W212	Well	Function Junction	R228		
W217	Well	Cheakamus	R226	2.2	
W218	Well	Rainbow Park	R222, R233, R234, R229, R237, R228	4.5	Depending on the water system valving we can send water to multiple reservoirs or just a few.
W219	Well	Rainbow Park	R222, R233, R234, R229, R237, R228	3.5	Depending on the water system valving we can send water to multiple reservoirs or just a few.
R231	21 Mike Creek	21 Mike Creek	R222, R233, R234, R229, R237, R228	max 9	Depending on the water system valving we can send water to multiple reservoirs or just a few.

5.2.2 Static Water Fill Sites

Pumping to support sprinklers from a static water source in most cases will guarantee continuous protection for structures. Static water supply sites are identified for this report as a means of water supply that isn't dependent on domestic/ hydrant water and electricity for pump stations. Water Tenders filling from these sites will also reduce the amount of domestic hydrant water used. Static water sources that can be used for drafting operations have been noted on the tactical maps as Tender Fill (TF) sites.

Observation #27: Discussions with the Utilities Manager, review of the 2014 Fire Underwriters Survey (FUS) and the 2022 CWRP identified the following factors:

- Since 2014, the water supply systems have basically remained the same with only minor upgrades,
- During power outages the water systems may be affected as there is no backup power source. A rough order magnitude cost estimate to have all the pump stations equipped with backup power is not available and is deemed "several million dollars" given the number of sites that would need backup power.
- Assessing the community's water delivery (municipal and natural) for each neighbourhood to develop and test specific neighbourhood capabilities is recommended by the CWRP. Recovery rates will determine how the volume of water that can be discharged and for how long before the system's water volume is operationally compromised, and
- Whistler Blackcomb has 3 reservoirs that total 54 million gallons of water that is available with over 950 hydrants in the ski run and village areas. There are over 360 snow guns some of which, could be utilized during a wildfire event. Discussions with Whistler Blackcomb staff indicate that the water system would only access a very few structures to support sprinkler systems. Using the Whistler Blackcomb water system would be effective to fill bladders or tenders at the base of the ski-run. The water pressure in the system is well over 1000 psi and a pressure reducing valve must be used for wildfire operations. There was conflicting information regarding WFRS and Whistler Blackcomb staff training on utilization of this water system.
- Trials conducted by Vail resorts indicate that snow guns are not as effective as SPUs or external sprinkler systems.

Emergency Planning Recommendation #41: Determine the best approach to provide backup power for all water reservoir pump stations to have continuous water supply for fire protection.

Recommended Completion: 12-24 months

Estimated Cost: Contingent upon preferred approach.

Rationale: Emergencies such as wildfire can impact the power grid. Often, power distribution in the local area is interrupted by wildfires. This may include burned transmission lines or power poles. Underground power is less at risk, however substations and large transmission corridors may be threatened or impacted. If the permanent installation of backup power sources for the RMOW water distribution system is cost prohibited, alternative strategies such as a standing offer rental agreement for portable industrial generators should be established.

Emergency Planning Recommendation #42: Confirm that the power supplier(s) have initiated power pole protection should a wildfire be encroaching the power grid and infrastructure.

Recommended Completion: Contingent upon active wildfire risk assessment

Estimated Cost: Cost Neutral, staff time

Rationale: The Whistler EOC protocols include a confirmation check that the power supplier (Fortis/ BC Hydro) crews have applied a fire resistive gel on wooden power poles to reduce the damage and loss to fire.

Emergency Planning Recommendation #43: Complete the assessment of the community's water delivery (municipal and natural) for each neighbourhood and develop a wildfire water management plan.

Recommended Completion: 48-60 months

Estimated Cost: TBD

Rationale: Structure Protection Specialists will need to ensure that there is ample water available to defend and protect structures against an impending wildfire and will need to collaborate with water utility staff to understand the reservoirs and water systems that supply hydrant water. It is imperative that Structure Protection Specialists know if the water system has back up power, how much water is available on each system and what the refill rates are so they can plan how sprinkler systems are built out and the duration of their operation considering how much the water system can replenish itself. If conditions allow, large tanks (20K-40K litres) can be strategically placed in advance of the fire to enhance the run time of sprinklers and reserve water for fire trucks. A leading practice is to develop a water management plan for fire protection.

Training Recommendation #44: Conduct annual spring training to ensure WFRS and Whistler Blackcomb staff are well versed in the operations of utilizing snow making infrastructure for wildfire operations (tender fill and bladders).

Recommended Completion: recurring annually

Estimated Cost: Cost Neutral, staff time

Rationale: The Whistler Blackcomb water system is a viable resource and part of the community's wildfire defence plan. The snow making infrastructure and equipment requires knowledge and experience to operate properly and safely. It is essential that the joint training has the Whistler Blackcomb staff performing and monitoring all connections and equipment used to deliver water from the high-pressure snow making system to wildfire defence resources. Standard Operating Guidelines/ Procedures must be collaboratively created to ensure safe effective operations.

Emergency Planning Recommendation #45: Obtain two large-volume water tanks to support SPU and external sprinkler system operations.

Recommended Completion: 24-36 months

Estimated Cost: \$35,000 for purchase or \$5,500 per day rental

Rationale: Large volume portable tanks are extensively used in wildfire operations. These tanks would be deployed in RMOW high and extreme rated interface/intermix neighborhood areas to support the water supply, SPUs, or external residential sprinklers and to protect any critical infrastructure. Based upon the desired capacity to protect two neighbourhood areas (approximately 100 homes) two tanks could be purchased or rented. The latter does not confirm necessarily availability when required compared to owning these tanks. Precise locations would be tactical and based upon the specifics of the situation.

Emergency Planning Recommendation #46: Increase the interoperability between WFRS and Whistler Blackcomb wildfire internal committee through regularly scheduled practice sessions.

Recommended Completion: recurring annually

Estimated Cost: Cost Neutral, staff time

Rationale: Whistler Blackcomb has an internal wildfire committee that practices every two weeks similar to a “fire brigade”. They provide initial action on a fire that occurs at their workplace (typically wildfire). There has been joint response where WFRS has responded however, because fire events do not occur often, there is an opportunity to improve the coordinated response to fires or other emergencies through training and practice sessions. Tabletop and practical exercises would enhance coordinated responses and operational effectiveness.

Emergency Planning Recommendation #47: Establish a cache of WFRS supplemental firefighting equipment.

Recommended Completion: 12-18 months

Estimated Cost: \$15,000

Rationale: Whistler Blackcomb has considerable infrastructure at the top of Whistler and Blackcomb Mountains that are critical to their ongoing operation. These include the gondola lift buildings, restaurants, and day lodges. Any joint response from WFRS would be via the dirt road from the village up to the mountain top or via the public gondola. In either case, equipment would have to be transported and delivered with the firefighters. To enhance the rapid deployment of equipment and control a wildfire or structure fire in the early stages WFRS would require a designated building for storing critical firefighting equipment including:

- 800’ of 1.5” single jacket wildland firehose. 200’ of this hose in a progressive hose pack.
- 3 Hanson nozzles
- (4) 3-way valves
- (5) 1.5” to .5” water thieves
- 600’ of ½” econo hose
- (3) ½” Brass nozzles
- Hose strangler
- basic structural firefighting equipment.

5.3 Waste Transfer Facility

This facility receives all refuse from the community including household and commercial garbage, yard waste and building materials for recycle. Once materials have been sorted and processed, it is trucked out of the facility to a larger landfill processing site in another community. The facility takes yard waste and chips it, mixes it with solid waste to produce a fertile bark mulch product. At any given time, there is about .5 hectare of chip yard waste on site. There has been fuel and vegetation management conducted by the WFP team approximately 2 years ago to reduce the wildfire threat at the facility.

The facility is located a short distance off Highway 99 in a heavily forested area. The facility is fenced off to reduce wildlife and unmanaged public access. The well that provides domestic water to the site has a minimal output of only 22.5 litres per minute. For this reason, there are two reservoirs on site for domestic use and firefighting totaling 207,000 litres in underground tanks that have hard suction stored on site. There is also a 22,500 litre above ground tank equipped with a pump and hose ready for immediate action in the Quonset area where household garbage is dropped. The facility has a firefighting skid complete with a 1350-litre tote piped into a pump with hose for conducting “hot works” such as welding.

Observation #28: The waste transfer station is one of the largest critical infrastructure facilities and is located at the south end of the community. As detailed in the RMOW Official Community Plan (OCP):

- Because wildfire can be triggered from structure fires and human activity, the probability of a structure fire in Whistler spreading to the surrounding forest is equal to, or greater than, the probability of a wildfire spreading from the forest into the community.

Since 2018, there has been seven fires at this facility. While not conclusive, a potential cause origin of these fires may be from unstable refuse such as lithium batteries or other self-igniting materials. As such this facility is considered as a high risk to contribute to wildfire. The only available firefighting water comes from a 5 gallon per minute well and stored in underground tanks for a total of 46,000 gallons (two tanks: 20,000 & 26,000). There are no other viable static water sources, and the closest hydrant is over 7 kilometers away at Function Junction. It is also recommended that the waste management facility purchase and install an above ground 20000-gallon tank for additional water availability during the summer months.

Emergency Planning Recommendation #48: *Confirm the waste transfer facility has the required fire flow and install an above ground 20,000-gallon tank for additional water availability during the summer months.*

Recommended Completion: 12-18 months

Estimated Cost: Cost of storage tank \$17,000

Rationale: Transfer facilities with buildings, employing staff during operating hours, the water for fire protection should be provided in accordance with the Water Supply for Public Fire Protection — A Guide to Recommended Practice, as available through the Insurers Advisory Organization⁶.

Observation #29: Should a fire begin within the wood chip piles or is caused indirectly by wind-borne embers the facility staff must be able to quickly transport the firefighting tote to a safe location where they can begin extinguishing the fire. They must also be able to transport more water from their reserve water to supplement or refill the firefighting tote. The firefighting response plan for the facility is to have one or two municipal dump trucks equipped with 1500-gallon tanks respond to support with water delivery. The facility staff have no means of transporting water on site other than the 300-gallon tote mentioned above.

Emergency Planning Recommendation #49: Establish an on-site water transport from the storage tanks to supplement or refill the firefighting tote.

Recommended Completion: 12-18 months

Estimated Cost: \$25,000.00

Rationale: If a response from the WFRS and/or the municipal dump trucks was delayed or unavailable it would be difficult for the facility staff to manage the fire. Ideally, the facility should have a 1,000-gallon water tender for this purpose but a 500–1,000-gallon water tank being trailered or carried by heavy equipment may be a viable substitute. This tank would enable staff to transport water from the storage tanks to the mobile firefighting tote while WFRS is en route.

Emergency Planning Recommendation #50: Upgrade the storage tanks, drafting points, and pipelines.

Recommended Completion: 12-18 months

Estimated Cost: \$5,000.00

Rationale: The two water storage tanks on site are equipped with PVC piping for drafting purposes. This PVC piping should be replaced with steel or aluminum piping to ensure durability and longevity. The northeast tank has two drafting points. One of which has piping that has been installed above an overhead door and is located against a building. This piping should be moved to drop from the tank and over the block retaining wall for a shorter draft and to create distance from the structure.

⁶ <https://www2.gov.bc.ca/assets/gov/environment/waste-management/garbage/guidelinesestablishingtransferstationsmunicipalsolidwaste.pdf>

Training Recommendation #51: Conduct, as a minimum, annual site orientation and operational response familiarization sessions with WFRS and Utilities staff.

Recommended Completion: 6 months and recurring

Estimated Cost: Cost Neutral, staff time

Rationale: The fire risk at this facility is highly probable and as such a rapid and coordinated response by both WFRS and Utilities staff is essential. There have been joint sessions conducted previously however annual initial response action by Utilities staff and full response by WFRS sessions are emphasized. This includes firefighting tote and drafting operations.

Emergency Planning Recommendation #52: Install an external manual emergency alert system.

Recommended Completion: 24-48 months

Estimated Cost: Depending upon preferred system, rough order estimate: \$10,000-20,000

Rationale: There is no detection system outside of the facility buildings so reliance is on visual detection. Therefore, an external alert signal in safe and central location that is available to alert all staff on site enhances safety and rapid response. An air horn or other audible device would notify staff to assemble in muster locations, commence firefighting operations or to evacuate.

Emergency Planning Recommendation #53: Continue to research technologies that detect unstable materials that can create transfer and landfill facility fires.

Recommended Completion: recurring

Estimated Cost: Cost Neutral, staff time

Rationale: Since 2018, seven fires have occurred at this facility, potentially linked to unstable materials like lithium batteries or other self-igniting substances. Although not definitive, this pattern designates the facility as a high-risk contributor to wildfire incidents.

APPENDICES

Appendix A: Glossary of Terms

Anchor Point:	A safe location, such as a river or road, that is a barrier to fire spread and from where crews should start building a fire break or line. Anchor points should prohibit fire from establishing itself on the other side of an unsuspecting crew.
Community:	An area or place considered together with its inhabitants, whether or not the community represents an official jurisdiction.
Drafting:	The use of suction to move water from a vessel or body of water below the intake of a suction pump
Drafting Site:	An area with water source that is suitable for the access and positioning of firefighting equipment (portable pump, tankers, brush trucks, and/or engines) to engage in drafting.
Escape Routes:	Predetermined routes out of the hazard zone that leads back to the safety zone. Crews should always have two escape routes that are marked, walkable, clear of debris, and allow for expedient emergency egress.
Fill Site:	A pressurized water source where fire apparatus can fill their tanks without drafting. Examples include hydrants, raised reservoirs, or pumps.
Fire Smart:	A national program designed to reduce interface fire risk to communities. In BC, the program is administered by the Ministry of Forests, Lands and Natural Resource Operations Wildfire Management Branch.
Fuel Management:	Generally associated with the reduction of surface and ladder fuels through mechanical removal, biological methods, or prescribed burns.
Lookout:	Person who has the responsibility of watching fire behaviour and relating the situation to their supervisor. Should be located in an advantageous position for wildfire observation.
Risk Management:	The continuous process of identifying, analyzing, and evaluating risks and resources; and weighing these factors against operational objectives. Risk management at WUI events must prioritize the life safety of first responders.
Safety Zone:	An area devoid of combustibles and fuels, that provides a separation distance for firefighters and their apparatus that is four times the anticipated flame lengths.

Situational Awareness:	The perception of environmental elements with respect to time and/or space, the comprehension of their meaning, and the projection of their status as variables (time, weather, resources, tactics, etc.) change.
Structure Triage:	The process of inspecting and classifying structures according to the defensibility or non-defensibility based on numerous factors including the establishment of a safety zone, fire behavior, location, construction, and adjacent fuels.
Threatened Defensible:	Structure Triage Category where Safety Zone and TRA are present with adequate water supply with structure Defence tactics and conditions supporting firefighters remaining during fire front contact.
Threatened Non-Defensible:	Structure Triage Category where Safety Zone or TRA or water supply is inadequate, and structure has challenges that do not allow firefighters to safely commit to stay.
Value:	A generalized term used by responding emergency officials to identify structures (private and public) whether commercial, industrial, public infrastructure or residential.

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Appendix C: List of Utilities Buildings for FireSmart Vegetation Treatment

Building Number	Building Name	Building Location or Name	Function	Notes, Description, Pump Capacity
Pump Stations and PRVs				
P252	Highland Control Valve	2101 Whistler Road (Highland Control Valve)	Control Valve	
P255		4873 Painted Cliff PRV	PRV	Feeds Benchlands north
P256		4700 Glacier Drive PRV	PRV	Feeds Benchlands south
P266	Nick North PRV	8407 Golden Bear Plc. (Nicklaus North PRV)	PRV	
P267		7314 Blackcomb Way (NE Sector – PRV)	PRV	
P268	Lorimer Road PRV	4100 Lorimer Road (PRV & Check valve)	PRV & Check Valve	Feeds Village zone
P269	Nancy Green PRV	7114 Nancy Green	PRV	
P271	Wolverine PRV	2649 Wolverine Cres	PRV	
P273	Spring Creek PRV	1559 Spring Creek Drive (Spring Creek PRV)	PRV	
P275	Stonebridge PRV	5438 Stonebridge Dr. (Stonebridge PRV)	PRV	
P276	Nita Lake PRV	5310 Alta Lake Rd. (Nita Lake PRV)	PRV	
P277	Lakecrest PRV	3025 Hillcrest Dr. (Lakecrest PRV)	PRV	
P278	Cheakamus Crossing PRV	1010 Janes Lake Rd. (Cheakamus Crossing PRV)	PRV	
P282	Alta Lk. Rd. PRV #2	5590 Alta Lake Rd. (Alta Lk. Rd. PRV #2)	PRV	
P283	Mclvor Drive	Baxters Creek PRV – 8522 Ashleigh Mclvor Drive	PRV	
P245	Mountain View PRV & Pump	8319 Mountain View (Mountain View PRV & Pump)	Pump & PRV	
P247	Community Booster Pump & PRV	4290 Blackcomb Way (Community Booster Pump & PRV)	Pump & PRV	
P264	PRV & Booster Pump	Whistler Road at Nordic (PRV & Booster Pump)	Pump & PRV	

Building Number	Building Name	Building Location or Name	Function	Notes, Description, Pump Capacity
Pump Stations and PRVs				
P265	PRV & Booster Pump	3840 Sunridge Drive (PRV & Booster Pump)	Pump & PRV	
P270	Taluswood II PRV & Pump	2400 Taluswood Place (Taluswood II PRV & Pump)	Pump & PRV	
P274	Stonebridge PRV & Pumps	5406 Stonebridge Dr. (Stonebridge PRV & Pumps)	Pump & PRV	
P279	Cheakamus Crossing P/S	1135 Cheakamus Lake Rd. (Cheakamus Crossing P/S)	Pump & PRV	
P280	21 Mile Pump Stn.	5785 Alta Lake Rd. (21 Mile Pump Stn.)	Pump & PRV	
P281	21 Mile UV Facility	5825 Alta Lake Rd. (21 Mile UV Facility)	UV	
P282	Alta Lk. Rd. PRV #2	5590 Alta Lake Rd. (Alta Lk. Rd. PRV #2)	PRV	
P283	Mclvor Drive	Baxters Creek PRV – 8522 Ashleigh Mclvor Drive	PRV	
P285	Cheakamus Crossing PRV	1135 Cheakamus Lake Rd, Cheakamus Crossing PRV	PRV	
P286	Lost Lake Pump Station	4701 Blackcomb Way (Lost Lake Pump Station)	Pump	
P287	Function Junction	1005 Lynham Road (W212 Function Junction Well Site)	PRV	
P289	Alpine Zone Valve Kiosk	8407 Golden Bear Plc., Nick North	Zone Valve	
Reservoirs and Intakes				
R222	Alpine South Reservoirs A&B	8286 Alpine Way (Alpine South Reservoirs A&B)	Reservoir	
R224	Alpha Crk. Rsvr. & Controls	2719 Millars Pond Cres. (Alpha Crk. Rsvr. & Controls)	Reservoir	
R226	Cheakamus Crossing Rsvr.	Above 1100 Cheakamus Lk. Rd. (Cheakamus Crossing Rsvr.)	Reservoir	
R227	Rainbow Reservoir	8440 Mountain View Dr. (Rainbow Reservoir)	Reservoir	
R228	Baxter's Reservoir	Top of Gondola Way (Baxter's Reservoir)	Reservoir	

Building Number	Building Name	Building Location or Name	Function	Notes, Description, Pump Capacity
Reservoirs and Intakes				
R229	Singing Pass Reservoir	On Singing Pass Trail above Olympic Reservoir	Reservoir	
R231	above RMOW Cemetery	21 Mile Creek Intake (above RMOW Cemetery)	Intake	
R232	Blackcomb Creek Intake	Blackcomb Creek Intake	Intake	
R233	Blackcomb Reservoir	Blackcomb Reservoir	Reservoir	
R234	Lost Lake Reservoir	4701 Blackcomb Way (Lost Lake Reservoir)	Reservoir	
R235	Taluswood Reservoir	2400 Taluswood Place (Taluswood Reservoir)	Reservoir	
R236	@ 913 m. elev.	Taluswood II Reservoir (@ 913 m. elev.)	Reservoir	
R237	Enter from top of Valley Dr.	Mountain View Dr. Res. (enter from top of Valley Dr.)	Reservoir	
R238	Emerald Estates Reservoir	9525 Emerald Dr. (Emerald Estates Reservoir)	Reservoir	
R239	Sunridge Plateau Reservoir	3890 Sunridge Drive (Sunridge Plateau Reservoir)	Reservoir	
R240	Stonebridge Reservoir	5483 Stonebridge Place (Stonebridge Reservoir)	Reservoir	
Sanitary Lift and Siphon Stations				
S136	Cheakamus Crossing Sani Siphon	1010 Janes Lake Rd. (Cheakamus Crossing Sani Siphon)	Siphon	Other – siphon tank & controls
S122	Millar's Pond Siphon Tank	Behind 2809 Clifftop Ln. (Millar's Pond Siphon Tank)	Siphon Tank	Other – siphon (tank internally bypassed)
S101	Alpine SLS	8330 Rainbow Drive (Alpine SLS)	SLS	Large – 100 HP – 199 HP
S103	Crabapple SLS	6671 Crabapple Road (Crabapple SLS)	SLS	Large – 100 HP – 199 HP
S104	Lakeside SLS	3333 Carleton Way (Lakeside SLS)	SLS	Small – 10 – 39 HP
S105	Alpine 68 SLS	2008 Nita Lane (Alpine 68 SLS)	SLS	Small – 10 – 39 HP
S106	Gondola SLS	2149 Lake Placid Road (Gondola SLS)	SLS	Medium – 40 – 99 HP

Building Number	Building Name	Building Location or Name	Function	Notes, Description, Pump Capacity
Sanitary Lift and Siphon Stations				
S107	Function Junction SLS	1092 Miller Creek Road (Function Junction SLS)	SLS	Small – 10 – 39 HP
S111	Emerald Lake SLS	9033 Summer Lane (Emerald Lake SLS)	SLS	Micro – <10 HP
S112	Tapley's Farm SLS	6427 Balsam Way (Tapley's Farm SLS)	SLS	Small – 10 – 39 HP
S113	Club Cabins SLS	2003 Garibaldi Way/Nordic Place (Club Cabins SLS)	SLS	Micro – <10 HP
S114	Taylor Way SLS	2200 Taylor Way (Taylor Way SLS)	SLS	Micro – <10 HP
S115	Blueberry SLS	3030 Blueberry Drive (Blueberry SLS)	SLS	Small – 10 – 39 HP
S116	Blueberry Satellite SLS	3465 Heron Place (Blueberry Satellite SLS)	SLS	Micro – <10 HP
S118	Arena/Pool SLS	8107 Camino (Arena/Pool SLS)	SLS	Micro – <10 HP
S120	@ PWY Parking Lot SLS	8001 HWY 99 (@ PWY Parking Lot SLS)	SLS	Small – 10 – 39 HP
S121	Millar's Pond SLS	2773 Cheakamus Way (Millar's Pond SLS)	SLS	Micro – <10 HP
S123	Nicklaus North SLS	8407 Golden Bear Plc. (Nicklaus North SLS)	SLS	Large – 100 HP – 199 HP
S125	Utilities Shop @PWY SLS	8001 Hwy. 99 (Utilities Shop @PWY SLS)	SLS	Micro – <10 HP
S126	NE Sector SLS	7314 Blackcomb Way (NE Sector SLS)	SLS	Extra Large – 200 or greater
S127	Spruce Grove Park SLS	7328 Kirpatrick Way (Spruce Grove Park SLS)	SLS	Micro – <10 HP
S128	Lost Lake Park SLS	4700 Lost Lake Road (Lost Lake Park SLS)	SLS	Micro – <10 HP
S131	Emerald Estates SLS	9925 Lakeshore Drive (Emerald Estates SLS)	SLS	Large – 100 HP – 199 HP
S132	Spring Creek SLS	1559 Spring Creek Drive (Spring Creek SLS)	SLS	Small – 10 – 39 HP
S133	Alpha Lake Park SLS	2155 Lake Placid Rd (Alpha Lake Park SLS)	SLS	Micro – <10 HP
S134	Fire Hall #2 SLS	8901 Hwy. 99 (Fire Hall #2 SLS)	SLS	Micro – <10 HP

Building Number	Building Name	Building Location or Name	Function	Notes, Description, Pump Capacity
Sanitary Lift and Siphon Stations				
S135	Landfill Leachate Lift Station	1145 Whistler Quarry Rd. (Landfill Leachate Lift Station)	SLS	Micro SLS
S137	Rainbow SLS	8925 Hwy. 99 (Rainbow SLS)	SLS	Large – 100 HP – 199 HP
S138	LFG Flare Condensate Lift Station	1030 Jane Lakes Rd (LFG Flare Condensate Lift Station)	SLS	Micro SLS
S139	Cheakamus Crossing Groundwater Pump Station	1080 Legacy Way (Cheakamus Crossing Groundwater pump station)	SLS	Other – Micro SLS
Flare				
B786–	LFG Flare incl's condensate PS	1025 Janes Lake Road (LFG Flare incl's condensate PS)	Building	
Parks Irrigation Wells				
PW401	Rainbow Park Well	Rainbow Park Well	Well – Irrigation	
PW402	Spruce Grove Park Well	Spruce Grove Park Well	Well – Irrigation	
Water Wells				
W201	Emerald Wells 1–3 and CI2 Bldg.	9225 Hwy 99 (Emerald Wells 1–3 and CI2 Bldg.)	Well – Water	
W202	Parkwood Dr/Hwy 99)	8801 HWY 99 (Parkwood Dr/Hwy 99))	Well – Water	
W205	Community Wells 1–3	4490 Blackcomb Way (Community Wells 1–3)	Well – Water	
W210	High School Well	8010 Alpine Way (High School Well)	Well – Water	
W211	Village Well	4330 Blackcomb Way (Village Well)	Well – Water	
W212	Function Junction Well 1&2	1005 Lynham Road (Function Junction Well 1&2)	Well – Water	
W213	Meadow Park Well	8107 Camino Dr. (Meadow Park Well)	Well – Water	
W217	N. of Treatment Plant	Cheakamus Crossing Well (N. of Treatment Plant)	Well – Water	

Building Number	Building Name	Building Location or Name	Function	Notes, Description, Pump Capacity
Water Wells				
W218	Rainbow Park Well	21 Mile Well (Valley Trail Rainbow Pk. <> Lorimer Rd.)	Well – Water	
W219	21 Mile Well	21 Mile Well	Well – Water	To be commissioned (2015)

[illegible]

Critical Infrastructure			
1. Site		2. Location	
1.1. Site Name	1.2. Site Address	2.1. Country	2.2. State/Province
1.3. Site Description	1.4. Site History	2.3. City/Town/Village	2.4. District/County
1.5. Site Status	1.6. Site Contact	2.5. Latitude/Longitude	2.6. Elevation
1.7. Site Notes	1.8. Site Map	2.7. Time Zone	2.8. Local Time
1.9. Site Photo	1.10. Site Diagram	2.9. Population	2.10. Area
1.11. Site Plan	1.12. Site Layout	2.11. Climate	2.12. Vegetation
1.13. Site Design	1.14. Site Construction	2.13. Water	2.14. Soil
1.15. Site Operation	1.16. Site Maintenance	2.15. Air Quality	2.16. Noise
1.17. Site Security	1.18. Site Safety	2.17. Seismicity	2.18. Hazards
1.19. Site Health	1.20. Site Environment	2.19. Biodiversity	2.20. Land Use
1.21. Site Community	1.22. Site Culture	2.21. Religion	2.22. Language
1.23. Site Religion	1.24. Site Language	2.23. Ethnicity	2.24. Gender
1.25. Site Age	1.26. Site Education	2.25. Employment	2.26. Income
1.27. Site Wealth	1.28. Site Power	2.27. Influence	2.28. Reputation
1.29. Site Credibility	1.30. Site Trustworthiness	2.29. Reliability	2.30. Consistency
1.31. Site Predictability	1.32. Site Stability	2.31. Durability	2.32. Longevity
1.33. Site Permanence	1.34. Site Endurance	2.33. Resilience	2.34. Adaptability
1.35. Site Flexibility	1.36. Site Versatility	2.35. Multifunctionality	2.36. Interactivity
1.37. Site Reliability	1.38. Site Consistency	2.37. Durability	2.38. Longevity
1.39. Site Permanence	1.40. Site Endurance	2.39. Resilience	2.40. Adaptability
1.41. Site Flexibility	1.42. Site Versatility	2.41. Multifunctionality	2.42. Interactivity
1.43. Site Reliability	1.44. Site Consistency	2.43. Durability	2.44. Longevity
1.45. Site Permanence	1.46. Site Endurance	2.45. Resilience	2.46. Adaptability
1.47. Site Flexibility	1.48. Site Versatility	2.47. Multifunctionality	2.48. Interactivity
1.49. Site Reliability	1.50. Site Consistency	2.49. Durability	2.50. Longevity
1.51. Site Permanence	1.52. Site Endurance	2.51. Resilience	2.52. Adaptability
1.53. Site Flexibility	1.54. Site Versatility	2.53. Multifunctionality	2.54. Interactivity
1.55. Site Reliability	1.56. Site Consistency	2.55. Durability	2.56. Longevity
1.57. Site Permanence	1.58. Site Endurance	2.57. Resilience	2.58. Adaptability
1.59. Site Flexibility	1.60. Site Versatility	2.59. Multifunctionality	2.60. Interactivity
1.61. Site Reliability	1.62. Site Consistency	2.61. Durability	2.62. Longevity
1.63. Site Permanence	1.64. Site Endurance	2.63. Resilience	2.64. Adaptability
1.65. Site Flexibility	1.66. Site Versatility	2.65. Multifunctionality	2.66. Interactivity
1.67. Site Reliability	1.68. Site Consistency	2.67. Durability	2.68. Longevity
1.69. Site Permanence	1.70. Site Endurance	2.69. Resilience	2.70. Adaptability
1.71. Site Flexibility	1.72. Site Versatility	2.71. Multifunctionality	2.72. Interactivity
1.73. Site Reliability	1.74. Site Consistency	2.73. Durability	2.74. Longevity
1.75. Site Permanence	1.76. Site Endurance	2.75. Resilience	2.76. Adaptability
1.77. Site Flexibility	1.78. Site Versatility	2.77. Multifunctionality	2.78. Interactivity
1.79. Site Reliability	1.80. Site Consistency	2.79. Durability	2.80. Longevity
1.81. Site Permanence	1.82. Site Endurance	2.81. Resilience	2.82. Adaptability
1.83. Site Flexibility	1.84. Site Versatility	2.83. Multifunctionality	2.84. Interactivity
1.85. Site Reliability	1.86. Site Consistency	2.85. Durability	2.86. Longevity
1.87. Site Permanence	1.88. Site Endurance	2.87. Resilience	2.88. Adaptability
1.89. Site Flexibility	1.90. Site Versatility	2.89. Multifunctionality	2.90. Interactivity
1.91. Site Reliability	1.92. Site Consistency	2.91. Durability	2.92. Longevity
1.93. Site Permanence	1.94. Site Endurance	2.93. Resilience	2.94. Adaptability
1.95. Site Flexibility	1.96. Site Versatility	2.95. Multifunctionality	2.96. Interactivity
1.97. Site Reliability	1.98. Site Consistency	2.97. Durability	2.98. Longevity
1.99. Site Permanence	1.100. Site Endurance	2.99. Resilience	3.00. Adaptability
1.101. Site Flexibility	1.102. Site Versatility	3.01. Multifunctionality	3.02. Interactivity
1.103. Site Reliability	1.104. Site Consistency	3.03. Durability	3.04. Longevity
1.105. Site Permanence	1.106. Site Endurance	3.05. Resilience	3.06. Adaptability
1.107. Site Flexibility	1.108. Site Versatility	3.07. Multifunctionality	3.08. Interactivity
1.109. Site Reliability	1.110. Site Consistency	3.09. Durability	3.10. Longevity
1.111. Site Permanence	1.112. Site Endurance	3.11. Resilience	3.12. Adaptability
1.113. Site Flexibility	1.114. Site Versatility	3.13. Multifunctionality	3.14. Interactivity
1.115. Site Reliability	1.116. Site Consistency	3.15. Durability	3.16. Longevity
1.117. Site Permanence	1.118. Site Endurance	3.17. Resilience	3.18. Adaptability
1.119. Site Flexibility	1.120. Site Versatility	3.19. Multifunctionality	3.20. Interactivity
1.121. Site Reliability	1.122. Site Consistency	3.21. Durability	3.22. Longevity
1.123. Site Permanence	1.124. Site Endurance	3.23. Resilience	3.24. Adaptability
1.125. Site Flexibility	1.126. Site Versatility	3.25. Multifunctionality	3.26. Interactivity
1.127. Site Reliability	1.128. Site Consistency	3.27. Durability	3.28. Longevity
1.129. Site Permanence	1.130. Site Endurance	3.29. Resilience	3.30. Adaptability
1.131. Site Flexibility	1.132. Site Versatility	3.31. Multifunctionality	3.32. Interactivity
1.133. Site Reliability	1.134. Site Consistency	3.33. Durability	3.34. Longevity
1.135. Site Permanence	1.136. Site Endurance	3.35. Resilience	3.36. Adaptability
1.137. Site Flexibility	1.138. Site Versatility	3.37. Multifunctionality	3.38. Interactivity
1.139. Site Reliability	1.140. Site Consistency	3.39. Durability	3.40. Longevity
1.141. Site Permanence	1.142. Site Endurance	3.41. Resilience	3.42. Adaptability
1.143. Site Flexibility	1.144. Site Versatility	3.43. Multifunctionality	3.44. Interactivity
1.145. Site Reliability	1.146. Site Consistency	3.45. Durability	3.46. Longevity
1.147. Site Permanence	1.148. Site Endurance	3.47. Resilience	3.48. Adaptability
1.149. Site Flexibility	1.150. Site Versatility	3.49. Multifunctionality	3.50. Interactivity
1.151. Site Reliability	1.152. Site Consistency	3.51. Durability	3.52. Longevity
1.153. Site Permanence	1.154. Site Endurance	3.53. Resilience	3.54. Adaptability
1.155. Site Flexibility	1.156. Site Versatility	3.55. Multifunctionality	3.56. Interactivity
1.157. Site Reliability	1.158. Site Consistency	3.57. Durability	3.58. Longevity
1.159. Site Permanence	1.160. Site Endurance	3.59. Resilience	3.60. Adaptability
1.161. Site Flexibility	1.162. Site Versatility	3.61. Multifunctionality	3.62. Interactivity
1.163. Site Reliability	1.164. Site Consistency	3.63. Durability	3.64. Longevity
1.165. Site Permanence	1.166. Site Endurance	3.65. Resilience	3.66. Adaptability
1.167. Site Flexibility	1.168. Site Versatility	3.67. Multifunctionality	3.68. Interactivity
1.169. Site Reliability	1.170. Site Consistency	3.69. Durability	3.70. Longevity
1.171. Site Permanence	1.172. Site Endurance	3.71. Resilience	3.72. Adaptability
1.173. Site Flexibility	1.174. Site Versatility	3.73. Multifunctionality	3.74. Interactivity
1.175. Site Reliability	1.176. Site Consistency	3.75. Durability	3.76. Longevity
1.177. Site Permanence	1.178. Site Endurance	3.77. Resilience	3.78. Adaptability
1.179. Site Flexibility	1.180. Site Versatility	3.79. Multifunctionality	3.80. Interactivity
1.181. Site Reliability	1.182. Site Consistency	3.81. Durability	3.82. Longevity
1.183. Site Permanence	1.184. Site Endurance	3.83. Resilience	3.84. Adaptability
1.185. Site Flexibility	1.186. Site Versatility	3.85. Multifunctionality	3.86. Interactivity
1.187. Site Reliability	1.188. Site Consistency	3.87. Durability	3.88. Longevity
1.189. Site Permanence	1.190. Site Endurance	3.89. Resilience	3.90. Adaptability
1.191. Site Flexibility	1.192. Site Versatility	3.91. Multifunctionality	3.92. Interactivity
1.193. Site Reliability	1.194. Site Consistency	3.93. Durability	3.94. Longevity
1.195. Site Permanence	1.196. Site Endurance	3.95. Resilience	3.96. Adaptability
1.197. Site Flexibility	1.198. Site Versatility	3.97. Multifunctionality	3.98. Interactivity
1.199. Site Reliability	1.200. Site Consistency	3.99. Durability	3.100. Longevity
1.201. Site Permanence	1.202. Site Endurance	4.01. Resilience	4.02. Adaptability
1.203. Site Flexibility	1.204. Site Versatility	4.03. Multifunctionality	4.04. Interactivity
1.205. Site Reliability	1.206. Site Consistency	4.05. Durability	4.06. Longevity
1.207. Site Permanence	1.208. Site Endurance	4.07. Resilience	4.08. Adaptability
1.209. Site Flexibility	1.210. Site Versatility	4.09. Multifunctionality	4.10. Interactivity
1.211. Site Reliability	1.212. Site Consistency	4.11. Durability	4.12. Longevity
1.213. Site Permanence	1.214. Site Endurance	4.13. Resilience	4.14. Adaptability
1.215. Site Flexibility	1.216. Site Versatility	4.15. Multifunctionality	4.16. Interactivity
1.217. Site Reliability	1.218. Site Consistency	4.17. Durability	4.18. Longevity
1.219. Site Permanence	1.220. Site Endurance	4.19. Resilience	4.20. Adaptability
1.221. Site Flexibility	1.222. Site Versatility	4.21. Multifunctionality	4.22. Interactivity
1.223. Site Reliability	1.224. Site Consistency	4.23. Durability	4.24. Longevity
1.225. Site Permanence	1.226. Site Endurance	4.25. Resilience	4.26. Adaptability
1.227. Site Flexibility	1.228. Site Versatility	4.27. Multifunctionality	4.28. Interactivity
1.229. Site Reliability	1.230. Site Consistency	4.29. Durability	4.30. Longevity
1.231. Site Permanence	1.232. Site Endurance	4.31. Resilience	4.32. Adaptability
1.233. Site Flexibility	1.234. Site Versatility	4.33. Multifunctionality	4.34. Interactivity
1.235. Site Reliability	1.236. Site Consistency	4.35. Durability	4.36. Longevity
1.237. Site Permanence	1.238. Site Endurance	4.37. Resilience	4.38. Adaptability
1.239. Site Flexibility	1.240. Site Versatility	4.39. Multifunctionality	4.40. Interactivity
1.241. Site Reliability	1.242. Site Consistency	4.41. Durability	4.42. Longevity
1.243. Site Permanence	1.244. Site Endurance	4.43. Resilience	4.44. Adaptability
1.245. Site Flexibility	1.246. Site Versatility	4.45. Multifunctionality	4.46. Interactivity
1.247. Site Reliability	1.248. Site Consistency	4.47. Durability	4.48. Longevity
1.249. Site Permanence	1.250. Site Endurance	4.49. Resilience	4.50. Adaptability
1.251. Site Flexibility	1.252. Site Versatility	4.51. Multifunctionality	4.52. Interactivity
1.253. Site Reliability	1.254. Site Consistency	4.53. Durability	4.54. Longevity
1.255. Site Permanence	1.256. Site Endurance	4.55. Resilience	4.56. Adaptability
1.257. Site Flexibility	1.258. Site Versatility	4.57. Multifunctionality	4.58. Interactivity
1.259. Site Reliability	1.260. Site Consistency	4.59. Durability	4.60. Longevity
1.261. Site Permanence	1.262. Site Endurance	4.61. Resilience	4.62. Adaptability
1.263. Site Flexibility	1.264. Site Versatility	4.63. Multifunctionality	4.64. Interactivity
1.265. Site Reliability	1.266. Site Consistency	4.65. Durability	4.66. Longevity
1.267. Site Permanence	1.268. Site Endurance	4.67. Resilience	4.68. Adaptability
1.269. Site Flexibility	1.270. Site Versatility	4.69. Multifunctionality	4.70. Interactivity
1.271. Site Reliability	1.272. Site Consistency	4.71. Durability	4.72. Longevity
1.273. Site Permanence	1.274. Site Endurance	4.73. Resilience	4.74. Adaptability
1.275. Site Flexibility	1.276. Site Versatility	4.75. Multifunctionality	4.76. Interactivity
1.277. Site Reliability	1.278. Site Consistency	4.77. Durability	4.78. Longevity
1.279. Site Permanence	1.280. Site Endurance	4.79. Resilience	4.80. Adaptability
1.281. Site Flexibility	1.282. Site Versatility	4.81. Multifunctionality	4.82. Interactivity
1.283. Site Reliability	1.284. Site Consistency	4.83. Durability	4.84. Longevity
1.285. Site Permanence	1.286. Site Endurance	4.85. Resilience	4.86. Adaptability
1.287. Site Flexibility	1.288. Site Versatility	4.87. Multifunctionality	4.88. Interactivity
1.289. Site Reliability	1.290. Site Consistency	4.89. Durability	4.90. Longevity
1.291. Site Permanence	1.292. Site Endurance	4.91. Resilience	4.92. Adaptability
1.293. Site Flexibility	1.294. Site Versatility	4.93. Multifunctionality	4.94. Interactivity
1.295. Site Reliability	1.296. Site Consistency	4.95. Durability	4.96. Longevity
1.297. Site Permanence	1.298. Site Endurance	4.97. Resilience	4.98. Adaptability
1.299. Site Flexibility	1.300. Site Versatility	4.99. Multifunctionality	5.00. Interactivity
1.301. Site Reliability	1.302. Site Consistency	5.01. Durability	5.02. Longevity
1.303. Site Permanence	1.304. Site Endurance	5.03. Resilience	5.04. Adaptability
1.305. Site Flexibility	1.306. Site Versatility	5.05. Multifunctionality	5.06. Interactivity
1.307. Site Reliability	1.308. Site Consistency	5.07. Durability	5.08. Longevity
1.309. Site Permanence	1.310. Site Endurance	5.09. Resilience	5.10. Adaptability
1.311. Site Flexibility	1.312. Site Versatility	5.11. Multifunctionality	5.12. Interactivity
1.313. Site Reliability	1.314. Site Consistency	5.13. Durability	5.14. Longevity
1.315. Site Permanence	1.316. Site Endurance	5.15. Resilience	5.16. Adaptability
1.317. Site Flexibility	1.318. Site Versatility	5.17. Multifunctionality	5.18. Interactivity
1.319. Site Reliability	1.320. Site Consistency	5.19. Durability	5.20. Longevity
1.321. Site Permanence	1.322. Site Endurance	5.21. Resilience	5.22. Adaptability
1.323. Site Flexibility	1.324. Site Versatility	5.23. Multifunctionality	5.24. Interactivity
1.325. Site Reliability	1.326. Site Consistency	5.25. Durability	5.26. Longevity
1.327. Site Permanence	1.328. Site Endurance	5.27. Resilience	5.28. Adaptability
1.329. Site Flexibility	1.330. Site Versatility	5.29. Multifunctionality	5.30. Interactivity
1.331. Site Reliability	1.332. Site Consistency	5.31. Durability	5.32. Longevity
1.333. Site Permanence	1.334. Site Endurance	5.33. Resilience	5.34. Adaptability
1.335. Site Flexibility	1.336. Site Versatility	5.35. Multifunctionality	5.36. Interactivity
1.337. Site Reliability	1.338. Site Consistency	5.37. Durability	5.38. Longevity
1.339. Site Permanence	1.340. Site Endurance	5.39. Resilience	5.40. Adaptability
1.341. Site Flexibility	1.342. Site Versatility	5.41. Multifunctionality	5.42. Interactivity
1.343. Site Reliability	1.344. Site Consistency	5.43. Durability	5.44. Longevity
1.345. Site Permanence	1.346. Site Endurance	5.45. Resilience	5.46. Adaptability
1.347. Site Flexibility	1.348. Site Versatility	5.47. Multifunctionality	5.48. Interactivity
1.349. Site Reliability	1.350. Site Consistency	5.49. Durability	5.50. Longevity
1.351. Site Permanence	1.352. Site Endurance	5.51. Resilience	5.52. Adaptability
1.353. Site Flexibility	1.354. Site Versatility	5.53. Multifunctionality	5.54. Interactivity
1.355. Site Reliability	1.356. Site Consistency	5.55. Durability	5.56. Longevity
1.357. Site Permanence	1.358. Site Endurance	5.57. Resilience	5.58. Adaptability
1.359. Site Flexibility	1.360. Site Versatility	5.59. Multifunctionality	5.60. Interactivity
1.361. Site Reliability	1.362. Site Consistency	5.61. Durability	5.62. Longevity
1.363. Site Permanence	1.364. Site Endurance	5.63. Resilience	5.64. Adaptability
1.365. Site Flexibility	1.366. Site Versatility	5.65. Multifunctionality	5.66. Interactivity
1.367. Site Reliability	1.368. Site Consistency	5.67. Durability	5.68. Longevity
1.369. Site Permanence	1.370. Site Endurance	5.69. Resilience	5.70. Adaptability
1.371. Site Flexibility	1.372. Site Versatility	5.71. Multifunctionality	5.72. Interactivity
1.373. Site Reliability	1.374. Site Consistency	5.73. Durability	5.74. Longevity
1.375. Site Permanence	1.376. Site Endurance	5.75. Resilience	5.76. Adaptability
1.377. Site Flexibility	1.378. Site Versatility	5.77. Multifunctionality	5.78. Interactivity
1.379. Site Reliability	1.380. Site Consistency	5.79. Durability	5.80. Longevity
1.381. Site Permanence	1.382. Site Endurance	5.81. Resilience	5.82. Adaptability
1.383. Site Flexibility	1.384. Site Versatility	5.83. Multifunctionality	5.84. Interactivity
1.385. Site Reliability	1.386. Site Consistency	5.85. Durability	5.86. Longevity
1.387. Site Permanence	1.388. Site Endurance	5.87. Resilience	5.88. Adaptability
1.389. Site Flexibility	1.390. Site Versatility	5.89. Multifunctionality	5.90. Interactivity
1.391. Site Reliability	1.392. Site Consistency	5.91. Durability	5.92. Longevity
1.393. Site Permanence	1.394. Site Endurance	5.93. Resilience	5.94. Adaptability
1.395. Site Flexibility	1.396. Site Versatility	5.95. Multifunctionality	5.96. Interactivity
1.397. Site Reliability	1.398. Site Consistency	5.97. Durability	5.98. Longevity
1.399. Site Permanence	1.400. Site Endurance	5.99. Resilience	6.00. Adaptability
1.401. Site Flexibility	1.402. Site Versatility	6.01. Multifunctionality	6.02. Interactivity
1.403. Site Reliability	1.404. Site Consistency	6.03. Durability	6.04. Longevity
1.405. Site Permanence	1.406. Site Endurance	6.05. Resilience	6.06. Adaptability
1.407. Site Flexibility	1.408. Site Versatility	6.07. Multifunctionality	6.08. Interactivity
1.409. Site Reliability	1.410. Site Consistency	6.09. Durability	6.10. Longevity
1.411. Site Permanence	1.412. Site Endurance	6.11. Resilience	6.12. Adaptability
1.413. Site Flexibility	1.414. Site Versatility	6.13. Multifunctionality	6.14. Interactivity
1.415. Site Reliability	1.416. Site Consistency	6.15. Durability	6.16. Longevity
1.417. Site Permanence	1.418. Site Endurance	6.17. Resilience	6.18. Adaptability
1.419. Site Flexibility	1.420. Site Versatility	6.19. Multifunctionality	6.20. Interactivity
1.421. Site Reliability	1.422. Site Consistency	6.21. Durability	6.22. Longevity
1.423. Site Permanence	1.424. Site Endurance	6.23. Resilience	6.24. Adaptability
1.425. Site Flexibility	1.426. Site Versatility	6.25. Multifunctionality	6.26. Interactivity
1.427. Site Reliability	1.428. Site Consistency	6.27. Durability	6.28. Longevity
1.429. Site Permanence	1.430. Site Endurance	6.29. Resilience	6.30. Adaptability
1.431. Site Flexibility	1.432. Site Versatility	6.31. Multifunctionality	6.32. Interactivity
1.433. Site Reliability	1.434. Site Consistency	6.33. Durability	6.34. Longevity
1.435. Site Permanence	1.436. Site Endurance	6.35. Resilience	6.36. Adaptability
1.437. Site Flexibility	1.438. Site Versatility	6.37. Multifunctionality	6.38. Interactivity
1.439. Site Reliability	1.440. Site Consistency	6.39. Durability	6.40. Longevity
1.441. Site Permanence	1.442. Site Endurance	6.41.	

Appendix E: Detailed Overview Map

Map 4: Detailed Overview Map

