



OCEAN FALLS EMERGENCY RESPONSE PLAN

ANNEX C: HAZARD RISK & VULNERABILITY ANALYSIS

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**Updated by:
Frontier Resource Management Ltd**

Ocean Falls Hazard Risk & Vulnerability Analysis

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1 Introduction

The hazard potential for Ocean Falls was assessed using Emergency Management BC's web based Hazard, Risk and Vulnerability Analysis (HRVA) tool (V January, 2007) for each of the hazards having potential to cause emergencies of the scale necessary to invoke the Emergency Plan. Input data for the analysis was acquired from the previous emergency plan, from local residents, various studies and the author's own experience living in the Central Coast. For each hazard a risk index is generated based on the severity potential and estimated frequency. The input data for each hazard are provided in Appendix 1. The results of this analysis form the Hazard Profile for the Ocean Falls community.

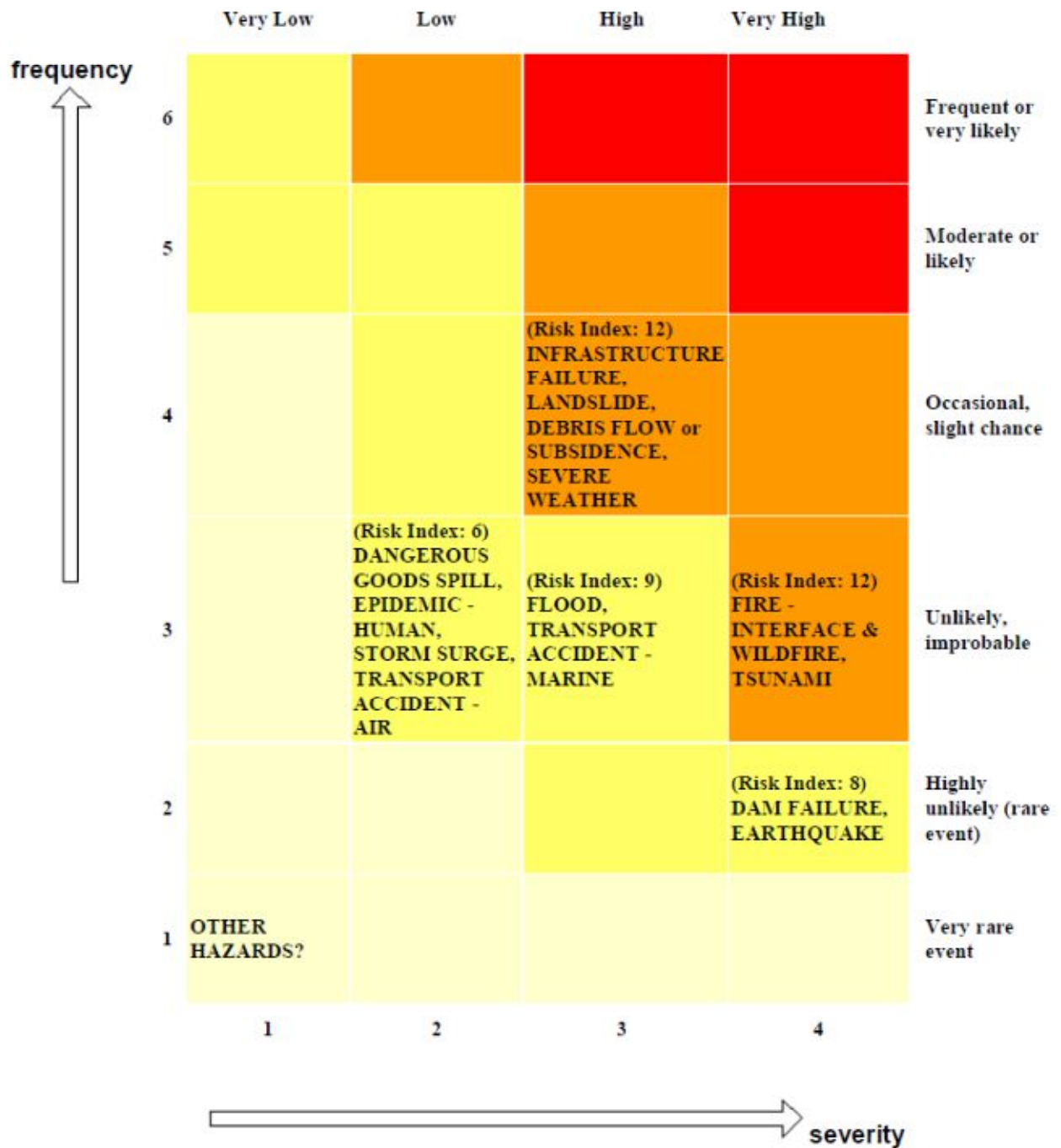
It should be noted that this hazard evaluation system is done using a Provincial scale and therefore a severity potential ranking of 'low' may be actually be very high at the local level on a relative basis.

2 Hazard Profile for Ocean Falls

Table 1 summarizes the main hazards facing Ocean Falls and its relative risk priority using the HRVA tool.

PRIORITY	HAZARD & RISK INDEX
1	(Risk Index: 12) FIRE – INTERFACE & WILDFIRE, TSUNAMI
2	(Risk Index: 12) INFRASTRUCTURE FAILURE, LANDSLIDE/DEBRIS FLOW, SEVERE WEATHER
3	(Risk Index: 9) FLOOD, TRANSPORT ACCIDENT - MARINE
4	(Risk Index: 8) DAM FAILURE, EARTHQUAKE
5	(Risk Index: 6) DANGEROUS GOOD SPILL, EPIDEMIC – HUMAN, STORM SURGE, TRANSPORT ACCIDENT – AIR.

Ocean Falls Hazard Risk Profile



3 Fire – Interface & Wildfire



Risk Index: 12

Severity Potential: Very High

Frequency: Unlikely, improbable (return period every 30-100 years)

Wildfire and Interface fire (homes and businesses built among trees) is a potential emergency threat that the Ocean Falls community faces. Fires can start without warning and, under the right conditions, can spread very quickly to affect large areas. Ocean Falls is located in the heart of the coastal rainforest and as such, the risk of wildfire is low compared to other parts of the Province. However, there is growing concern within the community, and recent fire occurrences confirm, that wildfire is a threat to communities in this part of the Province. With global climate change, the risk of forest fires may be changing. Accordingly, prevention is paramount and the implementation of a 'Firesmart' community program is recommended to help reduce the hazard.

Fire risk is highest in summer months from June through September although hot, dry weather conditions in April and October also give cause for alarm. Recently, a forest fire started along the power line from Ocean Falls to Bella Bella in January, demonstrating that fires can be an issue during any drying trend. In this area of the coast, most forest fires are associated with logging slash or slash from land clearings. Human activities, like grass or slash burning, smoking, camp fires and garbage dump burning, pose the highest risk for initiating a fire, although lightning also poses a potential threat.

Power and telephone disruptions may be expected as power lines are suspended on wooden poles. Roads may become impassable due to fallen trees or intense smoke and heat. Evacuation may be required and homes and infrastructure may be lost. Restoration and clean up efforts can be sizeable and prolonged.

The Martin valley residential area is closer to the forest and has more interspersed tree cover than the Ocean Falls townsite and so this neighborhood, where most people live, is at higher risk.

The local volunteer fire department has some capacity to control structural fires before they spread to the forest. Resources in terms of equipment, expertise and labour from outside the region will be necessary in order to fight anything but the smallest interface fire.

3.1 Community Wildfire Protection Plan

A comprehensive Community Wildfire Protection Plan (CWPP) for the Ocean Falls community was completed in August, 2006. The document forms an integral part of emergency planning for the region but should be updated to current conditions.

3.2 Hazard Reduction Strategies

There are a number of initiatives available to help the community prevent and prepare for wildland or interface fire:

- Firesmart Program (see EMBC and BC Wildfire websites)
- Public education.
- Implement Community Wildfire Protection Plan and regularly review and update it
- Training opportunities through EMBC, The Justice Institute, ESS or other public or private education providers.
- Research funding opportunities to obtain more and better fire fighting equipment.

4 Tsunami

Risk Index: 12

Severity Potential: Very high

Frequency: Unlikely, improbable (every 30 - 100 years)

Tsunamis, or tidal waves, are unusually big waves generated from a disturbance in the ocean. Typically caused by an earthquake on the ocean floor, tsunamis can also be caused by near shore land slides or even meteorites from space. Bella Bella/Denny Island communities are specifically from ocean generated waves. By monitoring earthquake activity, EMBC is a participant in the WEST Coast and AlaskaTsunami Warning Centre for the coast of North America.

Depending on the type of initiating event, the alert time for a tsunami can range from a number of hours to no forewarning at all. Wave travel time from likely tsunami sources in the ocean is estimated at five – six hours. However, a near- shore subduction earthquake or a massive land slide occurring in Dean Channel, Fisher Channel or Cousins Inlet would provide no time for evacuation alert. Therefore, if people experience a hard shaking earthquake for more than 15-20 seconds, they should immediately head for high ground at least 20 m elevation above sea level.

The west coast of BC is overdue for a large earthquake, so the hazard likelihood has been upgraded for this analysis. Due to the outer islands and geography of the inlets, Ocean Falls is somewhat protected from the full brunt of an ocean generated tsunami, but no tsunami modeling has been done for Cousins Inlet, so default safety zone is > 20 m elevation.

The most at-risk areas for damage from a tsunami are shoreline installations. In the Ocean Falls area this include critical infrastructure facilities such as the Boralex Power station, Marine Harvest hatchery, ferry dock and marina, fuel storage tanks, post office, and a number of private homes.

4.1 Tsunami Hazard Reduction

- Up to date Emergency Response Plan.
- Public education.
- Coordinated Alerting and Evacuation Procedures.
- Post signs for evacuation routes to safe areas.
- Develop protocol to use fire alarm system for tsunami warning as well. Test regularly.
- Training opportunities through EMBC, The Justice Institute, ESS or other public or private education providers.

5 Infrastructure Failure

Risk Index: 12

Severity Potential: High

Frequency: Occasional, slight chance (every 10 – 30 years)

The main concern is a major breakdown in the Boralex power generating plant and associated powerlines through storms, fire or tsunami. Winter is the main time for concern of prolonged power failure as furnaces, well pumps and sump pumps rely on electric power. Many homes have wood as primary or back up heat but there are a number of dwellings that do not. Food refrigeration would be a problem as there are no stores to purchase goods from so everyone needs a number of weeks/months of food supplies, which could go bad during prolonged power outage. Cooking could also pose a problem for many as electric stoves and ovens are the norm.

Telephone is connected to the outside world via microwave radio transmission and if this one point of contact goes down, then this would leave the community with very limited opportunity to contact the outside world. Internet is connected via satellite so there is opportunity to communicate via social media, skype and email. There are still radio communication available through the Coast Guard marine distress network, but day to day business and services would be severely impacted without phone service.

5.1 Hazard Reduction Strategies

Hazard reduction from power outages is primarily through public education and promotion of safe home-based backup systems:

- Power supplies (small generators, batteries)

- Wood furnace
- Gas/propane cooking stoves (camping stoves)

Development of back-up phone system would address concerns of land line connections.

- Support development of cell service along coastal transport corridor.

6 Landslide and Debris Flows

Risk Index: 12

Severity Potential: High

Frequency: Occasional, slight chance (every 10-30 years)

Steep mountainsides mean there is always a potential for snow or land (soil or rock) slides. These will have adverse effects on the areas they fall on, ranging from destruction of life and property to disruption of power and telephone lines and roads. Several avalanche chutes exist between the community centre and the Martin River area with one directly above the Martin Valley settlement.

Avalanches, land slides and debris flows are usually associated with heavy snow and/or rain events; however, they may also be triggered by earth tremors.

In 1965 a severe avalanche occurred near the townsite and resulted in 7 deaths along with destruction of several structures.

6.1 Landslide Hazard Reduction Strategy

There is a significant risk that a prolonged rain-on-snow event could bring down rock and debris on the highway link between the townsite and Martin Valley subdivision. It is prudent that emergency officials monitor weather conditions for heavy rains and warming trends following heavy snowfall events. Precautions that can be taken include the following:

- ✓ Locate heavy equipment in both communities to assist with potential debris clearing efforts.
- ✓ Place watch persons in safe vantage areas to monitor water & potential debris flows.
- ✓ Advise residents to avoid travel through recognized hazard areas and, in extreme situations, restrict travel along the Martin Valley corridor.

7 Severe Weather/Storm Surge

Risk Index: 12

Severity Potential: High

Frequency: Occasional, slight chance (every 10-30 years)

Storms can occur at any time of year, however the more severe storms typically occur in winter every 5-10 years or so. Hazards include heavy snowfalls, high winds and unusually cold temperatures. Much of the region is forested and there may be extensive wind throw of trees knocking down power and telephone lines as well as blocking roads. Falling trees also pose a significant danger to people and structures. It may take days or more than a week to restore power to all parts of the area, so if this occurs in winter it may place many people in peril.

Storms often initiate other problems like flooding, avalanches, lightning caused fires, landslides and storm surges thus compounding the emergency. Problems may include damage to water, power and telecommunications lines, interruption of road and air traffic, and possible isolation of all or parts of the community. There may be loss of life for anyone caught out on the roads or at sea, and hardship for people isolated in their homes without adequate food, heat, or water. Fortunately, people in the community tend to be self-reliant, and most have at least some wood backup for heat.

Storm Surges have potential for serious damage to harbour structures, particularly if they occur during high tides. Residents have few options to protect infrastructure in such cases.

7.1 Hazard Reduction Strategies

Hazard reduction of damage from weather storms is primarily through public preparedness education (see section 1.5). Promote installation of:

- Household emergency kits.
- Safe alternate heating and cooking amenities.
- Battery powered radio.
- Encourage educational opportunities through PEP, The Justice Institute and other training providers.

Other mitigative measures are to conduct a regular program of pre-emptive brush, limb and tree clearing in vicinity of power and telephone lines, which is already being done by the public utility provider.

8 Flooding

Risk Index: 9

Severity Potential: High

Frequency: Unlikely, improbable (every 30 – 100 years)

Although flooding of the Martin River is possible there are few residences directly affected by high water in this area. Of greatest concern is the potential for damage to the bridge leading west to Roscoe Bay, a road link to the outer coast that is valuable for use in evacuations or when strong winds make it all but impossible to access Cousins Inlet. The water tower and pump house would likely also be affected by a flooding Martin river.

Flooding is of greater concern when caused by avalanche or landslides blocking the river at a higher elevation and then letting go causing a torrent debris flow. This hazard is identified in other sections.

8.1 Hazard Reduction Strategy

People in the Martin valley residential area should have extra water storage tanks that should be filled prior to major rain events that may lead to flood conditions.

9 Transport Accidents - Marine

Risk Index: 9 (marine)

Severity Potential: High

Frequency: Unlikely, improbable (every 30 – 100 years)

If a large vessel such as the Ferry were to run into trouble near Ocean Falls, all local resources will be called on to help with rescue. Once ashore, passengers, if injured, would place serious demands on the community at large; if healthy, they would require temporary accommodation and basic supplies, both in scarce commodity. Other more complicated scenarios are imaginable: for example, a large vessel (or fuel barge) might collide with the dock and start a fire. Storms may endanger fishing fleets or multiple recreational boaters thereby straining search and rescue resources. A large number of pleasure craft tourists, coupled with enhanced ferry schedule, make the summer months more susceptible to marine accidents.

9.1 Hazard Reduction Strategy

Hazard reduction strategies for accidents is primarily the responsibility of the various transportation service providers and associated agencies. However, community initiatives that will help reduce hazard are:

- Build capacity to handle marine accidents, transportation and care of multiple victims involved in accidents.
- Support efforts to establish a marine accident response center in the Bella Bella area.

- Training opportunities through EMBC, The Justice Institute, ESS or other public or private education providers.
- Conduct table top response training sessions.

10 Dam Failure

Risk index: 8

Severity Potential: Very high

Frequency: Highly unlikely, rare event (every 100 – 200 years)

The Boralex Power generation facility is located directly below the Ocean Falls dam, as are most of the community’s commercial buildings. The dam holds back Link Lake, a large body of water that would be released onto the facilities below should the dam structure fail for any reason.

Workers in the immediate area below the dam would be at high risk of harm as would the bridge and docking facilities, leaving the community temporarily cut-off from marine transport. The loss of the generation facility and the fish farming operation next to it would be a devastating blow to the community and it is very possible that the hydro operation would not be rebuilt.

The residential settlement of Martin Valley is considered far enough away from the dam that no major loss of life is expected at this area.

There is little mitigation available for such an incident caused by natural forces such as a major earthquake. In the event of a terrorist threat, the use of police or military support would be requested.

10.1 Hazard Reduction Strategy

- Regular inspection of the dam to ensure integrity

11 Earthquake

Risk Index: 8

Severity Potential: Very High

Frequency: Highly unlikely, rare event (every 100 – 200 years)



There have been two quakes of magnitude 3.0 to 4.9 in the Kimsquit area, north east of Ocean Falls, in the last thirty years. The Queen Charlotte fault, located out in the Pacific Ocean, is the nearest active fault line posing the greatest threat to the central coast.

Tremors from distant earthquakes have been felt in the Bella Coola region. Canada's largest earthquake (magnitude 8.1 Richter) took place in the Queen Charlotte Islands in 1949, and was felt widely over western North America. A magnitude 7.3 quake happened in Central Vancouver Island in 1946 and caused extensive damage along eastern Vancouver Island. An earthquake capable of structural damage (greater than 5 on the Richter scale) can be expected to strike somewhere in southwestern British Columbia once every ten years, and there are predictions that a very serious (8 to 9) earthquake is overdue for the Lower Mainland - Vancouver Island region. Such a quake would likely cause some problems in Ocean Falls in terms of structural shake damage and disruption of power, communication and supply lines. The biggest concern would be the potential failure of the hydroelectric dam. Earthquakes can also trigger fires, however, the greatest threat of damage from earthquake in Ocean Falls would likely result from an associated tsunami or landslide.

Earthquakes are unpredictable. They provide no warning and their effects are immediate. An earthquake lasts from 30 seconds to 2 minutes, and there may be aftershocks intermittently for days. Possible effects include damage to buildings, roads and runways, power and telephone lines, fuel lines, water lines and sewage systems; diversion of stream channels, and blockage of streams with subsequent flooding. Damage may be minor or nearly total, local or regional. Debris removal and cleanup will be a concern after the event.

11.1.1.1 Hazard Reduction Strategies

Hazard reduction from earthquakes is primarily addressed through tsunami hazard reduction strategies.

- Public education that teaches "The ground is the warning" is intended to have residents move to high ground (20 M) immediately following a large (20 seconds or more) earthquake.

12 Dangerous Good Spill

Risk Index: 6

Severity Potential: Low

Frequency: Unlikely, improbable (every 30 – 100 years).

Although Ocean Falls is not located directly along the inside passage marine transport corridor that is used by cargo vessels to move large quantities of products to the North Coast and Alaska, there is still off-shoot traffic going up the Dean Channel and to Ocean Falls. As much of the community's populations are situated near the shoreline they are vulnerable to hazardous materials spills. Hazards from any spill will include contamination of the environment, toxic exposure to humans and animals, and explosion and fire. There may also be temporary disruption of travel, and interruption of

phone and power lines. Containment of the hazard will be a priority, and evacuation may be necessary. Multiple injuries can overwhelm local health services.

The most likely chemical spills in the Ocean Falls area will be fuel (gasoline, diesel, or propane). The main fuel storage sites are at, or near the harbour. Fuel spills are most likely to occur during transport and fuel is brought in by barge to the community. Materials used at the salmon farm, or the accidental release of salmon fry, may cause undesirable effects on the immediate or surrounding environment.

12.1 Hazard Reduction Strategies

Hazard reduction strategies for harmful materials spills is primarily the responsibility of the material storage or handling vendor and associated agencies. Central Coast Power maintains a kit which contains emergency fuel spill control and clean up material (booms, soaker pads, etc). Vendors should be encouraged to advise the CCRD of any situation requiring the potential involvement of emergency personnel (eg exceptionally large fuel transfers or construction projects relating to fuel storage).

Community initiatives that will help reduce hazard are:

- Promotion of safe storage and handling practices
- Build capacity to handle spill control and clean up.
- Support establishment of marine accident emergency response center at Bella Bella.
- Establish system for vendors to notify CCRD of the transport of hazardous material that are unusual for the area and particularly dangerous to population (ie chlorine or ammonia gas).
- Encourage training opportunities through PEP, The Justice Institute, ESS or other public or private education providers.

13 Epidemics - Human

Risk Index: 6

Severity Potential: Low

Frequency: Unlikely, improbable (every 30 -100 years)

The World Health Organization and the US Centre for Disease Control both state that the threat of impending global pandemic is very real. British Columbia is recognized as being vulnerable to the spread of pandemic diseases due to the large volumes of travellers and merchant traders that make the populated areas of the province their destination.

The fact that Ocean Falls is positioned in isolation has both positive and negative benefits in relation to disease and epidemics. Because it is not a heavily populated area with large numbers of people traveling through it, the community is not as exposed to disease originating from distant shores. On the other hand, because it is a close knit community, infectious disease can spread very quickly to affect a significant number of residents, thus potentially disabling the community's ability to provide essential services. Of benefit are the facts that the community has no children and few very old senior citizens.

The community's isolation and limited points of entry may provide some defence against a pandemic threat affecting British Columbia, but if this was to occur, the community would have to limit outside access and provide much of its food and other supply needs locally. House quarantine or other forms of confinement may be a requirement in severe cases. In the event of a pandemic, Ocean Falls should not expect much help from the outside as larger populations at risk would receive priority with regards to medical, or other, assistance. As the community has no dedicated health facility it can be expected that severely ill patients will need to be transferred to Bella Bella or Bella Coola Hospitals in order to receive treatment. In addition, the small human resource base in Ocean Falls would likely see a relatively high number of personnel out of commission making it difficult to maintain operations of infrastructure and services. Boralex Power and Marine Harvest should be encouraged to engage in business continuity planning to help avoid costly shut-downs due to lack of capable personnel.

13.1 Hazard Reduction Strategies

Local health services are responsible **for** addressing disease issues through their emergency plans. The Ocean Falls Emergency Program needs to maintain communication with the Vancouver Coastal Health Authority, through the Bella Coola and Bella Bella General Hospitals. In addition, the district health nurse should be made aware of persons-at-risk and be consulted at the outset of any serious outbreak.

A pandemic outbreak would require the community to be self reliant for an extended period of time and this would require stocking up of non-perishable foods and rationing of essential supplies. All residents of the community must also be encouraged to obtain flu vaccinations each year and the health authority must be supported in its efforts to receive sufficient vaccine supply.

It is essential that provisions are made to protect essential services providers at the outset of an epidemic/pandemic emergency.

14 Storm Surge

Risk Index: 6

Severity Potential: Low

Frequency: Unlikely, improbable (every 30 -100 years)

Storm surges are unusually high ocean water levels associated with storms combined with high tides. They affect low lying areas near the ocean shoreline. There will also be large swells and cresting waves that will pound shoreline installations. Marinas, ferry terminals and buildings near the shoreline can easily be damaged.

Given modern weather forecasting, warnings of storm surges should allow for evacuation of potentially affected areas and storm proofing. Emergency response is similar as for tsunami, except that there should be more time to prepare ahead of the event.

14.1 Hazard Reduction Strategy

- Public education.
- Coordinated Alerting and Evacuation Procedures.
- Post signs for evacuation routes to safe areas.
- Training opportunities through EMBC, The Justice Institute, ESS or other public or private education providers.

15 Transport Accident – Air

Risk Index: 6

Severity Potential: Low

Frequency: Unlikely, improbable (every 30 – 100 years)

The effects of an air-crash may vary tremendously, depending on the size of the aircraft and where it comes down. Problems may include severe injury or death for passengers and/or persons on the ground, and destruction of property, by impact or by subsequent fire. Difficult search and rescue may be required, and multiple casualties will strain the local emergency system.

Although air traffic is light at Ocean Falls, air travel is an important service for this isolated community. The main regular service provider is Wilderness Seaplanes which service Ocean Falls with a three passenger Beaver or nine passenger Goose. Summer months are the busiest.

In the event of an air accident in the vicinity of Ocean Falls, local residents would likely be the first responders. There are very few resources available to assist with air accidents so outside resources would need to be flown in via helicopter.

15.1 Hazard Reduction Strategies

Hazard reduction strategies for accidents is primarily the responsibility of the various transportation service providers and associated agencies. However, community initiatives that will help reduce hazard are:

- Build capacity to handle transportation and care of multiple victims involved in accidents.
- Training opportunities through EMBC, The Justice Institute, ESS or other public or private education providers.

Appendix 1 – Ocean Falls Hazard Risk Vulnerability Analysis Data

Appendix 1 - Hazard Risk and Vulnerability Analysis - Web tool data

CCRD Emergency Management Planning

Ocean Falls

November, 2017

HAZARD		CONSEQUENCE			LIKELIHOOD		RISK PRIORITY	
	Description	Vulnerability & Impact	Description	Assessment	Rank	Rating	Description	
Dam Failure	Link lake dam	Vulnerable populations	Elderly, children, handicapped	Yes	Very high	Highly unlikely, rare event	Every 100-200 years	4
		Vulnerable areas close to hazard	Infrastructure, buildings	Yes				
		Inadequate alert or evac plans	Boralex plan	No				
		Limited capability to respond or recover	Equipment availability?	Yes				
		Dated risk analysis, response recovery plans	Check with Boralex	Not sure				
		Inadequate hazard specific contingency plans	Check with Boralex	Not sure				
		Potential extent of deaths	0-4	Very low				
		Potential extent of injury	4-50	Low				
		Potential extend of damage or loss to critical infrastructure	Not much in way of infrastructure like hospital, police stations etc at OF	Low				
		Potential extend of damage or loss to lifelines	Permanent power loss	Very high				
		Potential extend of property damage or loss	Localized & severe	High				
		Potential extend of damage or loss to environment	Localized damage	Low				
Potential extend of economic or social impact	Permanent impacts	Very high						
Flood	Martin river is main concern	Vulnerable populations	Elderly, children & poor people exposed	Yes	High	Unlikely, improbable	Every 30 -100 years	3
		Vulnerable areas close to hazard	Infrastructure exposed, pump house, bridge	Yes				
		Inadequate alert or evac plans	10 years old, inadequate personnel to alert	Yes				
		Limited capability to respond or recover		Yes				
		Dated risk analysis, response recovery plans	Over 10 years old	Yes				
		Inadequate hazard specific contingency plans	Need updated flood mapping	Yes				
		Potential extent of deaths	0-4	Very low				
		Potential extent of injury	4-50	Low				
		Potential extend of damage or loss to critical infrastructure		Very low				
		Potential extend of damage or loss to lifelines	Pump house, bridge	High				
		Potential extend of property damage or loss	Some homes	High				
		Potential extend of damage or loss to environment		Low				
Potential extend of economic or social impact	Temporary & widespread	Low						

HAZARD		CONSEQUENCE				LIKELYHOOD		RISK PRIORITY
Description	Vulnerability & Impact	Description	Assessment	Rank	Rating	Description		
Critical Facility Failure	Not any critical facilities like hospital, RCMP station, schools	Vulnerable populations	Elderly, children & poor people exposed					
		Vulnerable areas close to hazard						
		Inadequate alert or evac plans						
		Limited capability to respond or recover						
		Dated risk analysis, response recovery plans						
		Inadequate hazard specific contingency plans						
		Potential extent of deaths						
		Potential extent of injury						
		Potential extend of damage or loss to critical infrastructure						
		Potential extend of damage or loss to lifelines						
		Potential extend of property damage or loss						
		Potential extend of damage or loss to environment						
Potential extend of economic or social impact								
Dangerous Good Spill	Primary dangerous goods is fuel in moderate sized tanks.	Vulnerable populations	Elderly, children & poor people exposed	No	Low	Unlikely, improbable	Every 30 -100 years	5
		Vulnerable areas close to hazard	Shoreline installations	Yes				
		Inadequate alert or evac plans		Yes				
		Limited capability to respond or recover		Yes				
		Dated risk analysis, response recovery plans		Yes				
		Inadequate hazard specific contingency plans		Yes				
		Potential extent of deaths	0-4	Very low				
		Potential extent of injury	0-4	Very low				
		Potential extend of damage or loss to critical infrastructure		Very low				
		Potential extend of damage or loss to lifelines		Very low				
		Potential extend of property damage or loss		Low				
		Potential extend of damage or loss to environment		Low				
Potential extend of economic or social impact	Temporary	Very low						

HAZARD		CONSEQUENCE				LIKELYHOOD		RISK PRIORITY
	Description	Vulnerability & Impact	Description	Assessment	Rank	Rating	Description	
Earthquake	No records of large earthquake in this area. Fault lines are further out in ocean.	Vulnerable populations	Elderly, children & poor people exposed	Yes	Very high	Highly unlikely, rare event	Every 100 - 200 years	4
		Vulnerable areas close to hazard		Yes				
		Inadequate alert or evac plans		Yes				
		Limited capability to respond or recover		Yes				
		Dated risk analysis, response recovery plans		Yes				
		Inadequate hazard specific contingency plans		Yes				
		Potential extent of deaths	4-10	Low				
		Potential extent of injury	4-50	Low				
		Potential extend of damage or loss to critical infrastructure		Very low				
		Potential extend of damage or loss to lifelines	Dam failure, potential permanent loss	Very high				
		Potential extend of property damage or loss	Localized & severe	High				
		Potential extend of damage or loss to environment		Low				
Potential extend of economic or social impact	Dam failure potentially permanent	Very high						
Fire - Interface & Wildfire	Lower risk of occurrence in wet climate,	Vulnerable populations	Elderly, children & poor people exposed	Yes	Very high	Unlikely, improbable	Every 30 -100 years	1
		Vulnerable areas close to hazard		Yes				
		Inadequate alert or evac plans		Yes				
		Limited capability to respond or recover		Yes				
		Dated risk analysis, response recovery plans		Yes				
		Inadequate hazard specific contingency plans		Yes				
		Potential extent of deaths	0-4	Very low				
		Potential extent of injury	0-4	Very low				
		Potential extend of damage or loss to critical infrastructure		Very low				
		Potential extend of damage or loss to lifelines	1 week	High				
		Potential extend of property damage or loss	Localized & severe	High				
		Potential extend of damage or loss to environment		High				
Potential extend of economic or social impact	Potential permanent impacts	Very high						

HAZARD		CONSEQUENCE				LIKELYHOOD		RISK PRIORITY
Description	Vulnerability & Impact	Description	Assessment	Rank	Rating	Description		
Epidemic - Human	Isolated community provides opportunity to control outside access in event of epidemic in outside world and also for quarantying.	Vulnerable populations	Elderly, children & poor people exposed	Yes	Low	Unlikely, improbable	Every 30 -100 years	5
		Vulnerable areas close to hazard		Yes				
		Inadequate alert or evac plans		Yes				
		Limited capability to respond or recover		Yes				
		Dated risk analysis, response recovery plans		Yes				
		Inadequate hazard specific contingency plans		Yes				
		Potential extent of deaths	4-10	Low				
		Potential extent of injury	4-50	Low				
		Potential extend of damage or loss to critical infrastructure		Very low				
		Potential extend of damage or loss to lifelines		Very low				
		Potential extend of property damage or loss		Very low				
		Potential extend of damage or loss to environment		Very low				
		Potential extend of economic or social impact	Temporary & widespread	Low				
Explosion or Emissions	No significant source	Vulnerable populations	Elderly, children & poor people exposed					
		Vulnerable areas close to hazard						
		Inadequate alert or evac plans						
		Limited capability to respond or recover						
		Dated risk analysis, response recovery plans						
		Inadequate hazard specific contingency plans						
		Potential extent of deaths						
		Potential extent of injury						
		Potential extend of damage or loss to critical infrastructure						
		Potential extend of damage or loss to lifelines						
		Potential extend of property damage or loss						
		Potential extend of damage or loss to environment						
		Potential extend of economic or social impact						

HAZARD		CONSEQUENCE				LIKELYHOOD		RISK PRIORITY
Description	Vulnerability & Impact	Description	Assessment	Rank	Rating	Description		
Infrastructure Failure	Hydro power plant, fish hatchery	Vulnerable populations	Elderly, children & poor people exposed	Yes	High	Occasional, slight chance	Every 10 - 30 years	2
		Vulnerable areas close to hazard		Yes				
		Inadequate alert or evac plans	Boralex & Marine Harvest plans	No				
		Limited capability to respond or recover		Yes				
		Dated risk analysis, response recovery plans		Yes				
		Inadequate hazard specific contingency plans		Yes				
		Potential extent of deaths	0-4	Very low				
		Potential extent of injury	0-4	Very low				
		Potential extent of damage or loss to critical infrastructure		Very low				
		Potential extent of damage or loss to lifelines		High				
		Potential extent of property damage or loss		Low				
		Potential extent of damage or loss to environment		Low				
Potential extent of economic or social impact	Temporary	Very low						
Landslide or Debris Flow	Martin river settlement and access road exposed to hazard	Vulnerable populations	Elderly, children & poor people exposed	Yes	High	Occasional, slight chance	Every 10 - 30 years	2
		Vulnerable areas close to hazard		Yes				
		Inadequate alert or evac plans		Yes				
		Limited capability to respond or recover		Yes				
		Dated risk analysis, response recovery plans		Yes				
		Inadequate hazard specific contingency plans		Yes				
		Potential extent of deaths	0-4	Very low				
		Potential extent of injury	4-50	Low				
		Potential extent of damage or loss to critical infrastructure	1 week	High				
		Potential extent of damage or loss to lifelines	Local & severe	High				
		Potential extent of property damage or loss	Local & severe	High				
		Potential extent of damage or loss to environment	Local & severe	High				
Potential extent of economic or social impact	Extensive & widespread	High						

HAZARD		CONSEQUENCE				LIKELYHOOD		RISK PRIORITY
Description	Vulnerability & Impact	Description	Assessment	Rank	Rating	Description		
Severe Weather	Hurricane force winds, extreme rain, heavy wet snow, extended cold outflow conditions	Vulnerable populations	Elderly, children & poor people exposed	Yes	High	Occasional, slight chance	Every 10 - 30 years	2
		Vulnerable areas close to hazard		Yes				
		Inadequate alert or evac plans		Yes				
		Limited capability to respond or recover		Yes				
		Dated risk analysis, response recovery plans		Yes				
		Inadequate hazard specific contingency plans		Yes				
		Potential extent of deaths	0-4	Very low				
		Potential extent of injury	4-50	Low				
		Potential extent of damage or loss to critical infrastructure		Very low				
		Potential extent of damage or loss to lifelines	1 week	High				
		Potential extent of property damage or loss	Localized	Low				
		Potential extent of damage or loss to environment		Very low				
		Potential extent of economic or social impact	Temporary	Low				
Transport Accident - Air		Vulnerable populations	Elderly, children & poor people exposed	Yes	Low	Unlikely, improbable	Every 30 - 100 years	5
		Vulnerable areas close to hazard		No				
		Inadequate alert or evac plans		Yes				
		Limited capability to respond or recover		Yes				
		Dated risk analysis, response recovery plans		Yes				
		Inadequate hazard specific contingency plans		Yes				
		Potential extent of deaths	4-10	Low				
		Potential extent of injury	4-50	Low				
		Potential extent of damage or loss to critical infrastructure		Very low				
		Potential extent of damage or loss to lifelines		Very low				
		Potential extent of property damage or loss		Very low				
		Potential extent of damage or loss to environment		Very low				
		Potential extent of economic or social impact		Very low				

HAZARD		CONSEQUENCE				LIKELYHOOD		RISK PRIORITY
Description	Vulnerability & Impact	Description	Assessment	Rank	Rating	Description		
Transport Accident - Road	Very little traffic	Vulnerable populations	Elderly, children & poor people exposed					
		Vulnerable areas close to hazard						
		Inadequate alert or evac plans						
		Limited capability to respond or recover						
		Dated risk analysis, response recovery plans						
		Inadequate hazard specific contingency plans						
		Potential extent of deaths						
		Potential extent of injury						
		Potential extend of damage or loss to critical infrastructure						
		Potential extend of damage or loss to lifelines						
		Potential extend of property damage or loss						
		Potential extend of amage or loss to environment						
Potential extend of economic or social impact								
Transport Accident - Marine	Ferry, barge, fish fleet, recreational boaters	Vulnerable populations	Elderly, children & poor people exposed	Yes	High	Unlikely, improbable	Every 30 - 100 years	3
		Vulnerable areas close to hazard		No				
		Inadequate alert or evac plans		Yes				
		Limited capability to respond or recover		Yes				
		Dated risk analysis, response recovery plans		Yes				
		Inadequate hazard specific contingency plans		Yes				
		Potential extent of deaths	4-10	Low				
		Potential extent of injury	4-50	Low				
		Potential extend of damage or loss to critical infrastructure		Very low				
		Potential extend of damage or loss to lifelines		Very low				
		Potential extend of property damage or loss		Very low				
		Potential extend of amage or loss to environment	Localized & severe	High				
Potential extend of economic or social impact	Temporary	Very low						

HAZARD		CONSEQUENCE				LIKELYHOOD		RISK PRIORITY
Description	Vulnerability & Impact	Description	Assessment	Rank	Rating	Description		
Tsunami	Large earthquake over due	Vulnerable populations	Elderly, children & poor people exposed	Yes	Very high	Unlikely, improbable	Every 30 -100 years	1
		Vulnerable areas close to hazard		Yes				
		Inadequate alert or evac plans		Yes				
		Limited capability to respond or recover		Yes				
		Dated risk analysis, response recovery plans		Yes				
		Inadequate hazard specific contingency plans		Yes				
		Potential extent of deaths	4-10	Low				
		Potential extent of injury	4-50	Low				
		Potential extend of damage or loss to critical infrastructure		Very low				
		Potential extend of damage or loss to lifelines	Permanent	Very high				
		Potential extend of property damage or loss	Widespread & severe	Very high				
		Potential extend of amage or loss to environment	Localized & severe	High				
		Potential extend of economic or social impact	Permanent	Very high				