



Bella Coola Emergency Response Plan

HAZARD ANNEX – Flood Response Plan

Central Coast Regional District

*Updated by Frontier Resource Management Ltd
December 9, 2017*

HAZARD ANNEX - FLOOD RESPONSE



Table of Contents

1	<i>Flood Response Call-Out</i>	4
1.1	Potential Flood Conditions Forecasted	4
1.2	Flooding Conditions Imminent or Occurring.....	5
2	<i>Flood Alert Procedures</i>	5
2.1	Possible sources of alert.....	5
2.2	Flood Advisory Condition	5
2.3	Flood Alert Condition.....	6
2.4	Flood Emergency Response.....	6
3	<i>Flood Hazard Area</i>	8
3.1	Recognized Areas of Concern	8
3.2	Potential Isolation Areas	9
4	<i>Flood Emergency Evacuation Plans</i>	10
4.1	Recognized Area of Concern Evacuation Plans.....	10
4.1.1	Grant Road North	10
4.1.2	Lower Bella Coola Town Site	10
4.1.3	Lower Saloompt Road	10
5	<i>Flood Emergency Immediate Response</i>	11
5.1	Flood Event Damage Potential.....	11
5.2	Pre-Event Response and Preparedness.....	12
5.2.1	Potential Flood Advisory Triggers.....	12
5.2.2	Advance Call-Out and River Monitoring Procedures	12
5.2.3	Flood Level Parameters.....	13
5.2.4	Recognized Area of Concern Preparedness.....	13
5.2.5	Heavy Equipment Distribution.....	14
5.3	Flood Emergency Response Procedures	14
6	<i>Extended Response</i>	14
6.1	Critical Infrastructure Repair	14
6.2	Essential Services Evaluation.....	15
6.3	Records and Accounting.....	15
6.4	Volunteer Management.....	15
6.5	Security	16
7	<i>Recovery</i>	16

7.1 Essential Services Restoration..... 16
7.2 Business Continuation 16
7.3 Reporting and Follow-Up..... 16
8 Flood Hazard Map..... 16

1 Flood Response Call-Out

Given availability of modern weather forecasts, in most cases, flood events can be expected to be foreseen. Consequently, the Flood Call-Out Procedure is a stepped approach.

1.1 Potential Flood Conditions Forecasted

The following persons/organizations are to be notified when there is a potential risk of flooding to occur:

Flood Emergency Response Team Notification:

Emergency Executive Committee

- Coordinator
- CCRD Rep
- Secretary
- Nuxalk Rep

Emergency Response Core Team

- RCMP
- Ambulance Service
- BC General Hospital
 - o Head Nurse
 - o Emergency Rep
- School District 49
- Public Information Officer
- Communication Officer
- ESS Officer
- All Fire Halls

Flood Response Specific Contacts

- Highways
- Interior Roads
- Snootli Hatchery Water Rescue Leader
- SAR Leader

1.2 ***Flooding Conditions Imminent or Occurring***

Flooding Alert or Flooding emergency - In addition to the persons and organizations already notified above, the following persons/organizations are to be notified when flooding is imminent or occurring:

- EMBC
- Airport
- West Coast Helicopters
- BC Hydro
- Telus

2 **Flood Alert Procedures**

2.1 ***Possible sources of alert***

- EMBC
- Environment Canada
- MOTI / Interior Roads Services
- Knowledgeable community member

2.2 ***Flood Advisory Condition***

➤ **Notifications**

- EEC
- Emergency response core team
- Recognized high risk area contacts
- River watch committee members
- Potential EOC location administrators

➤ **Actions**

- Monitor weather forecasts
- Monitor hydrometric station data
- Alert MoTI rep to monitor mountain-top weather stations
- Prepare EOC equipment

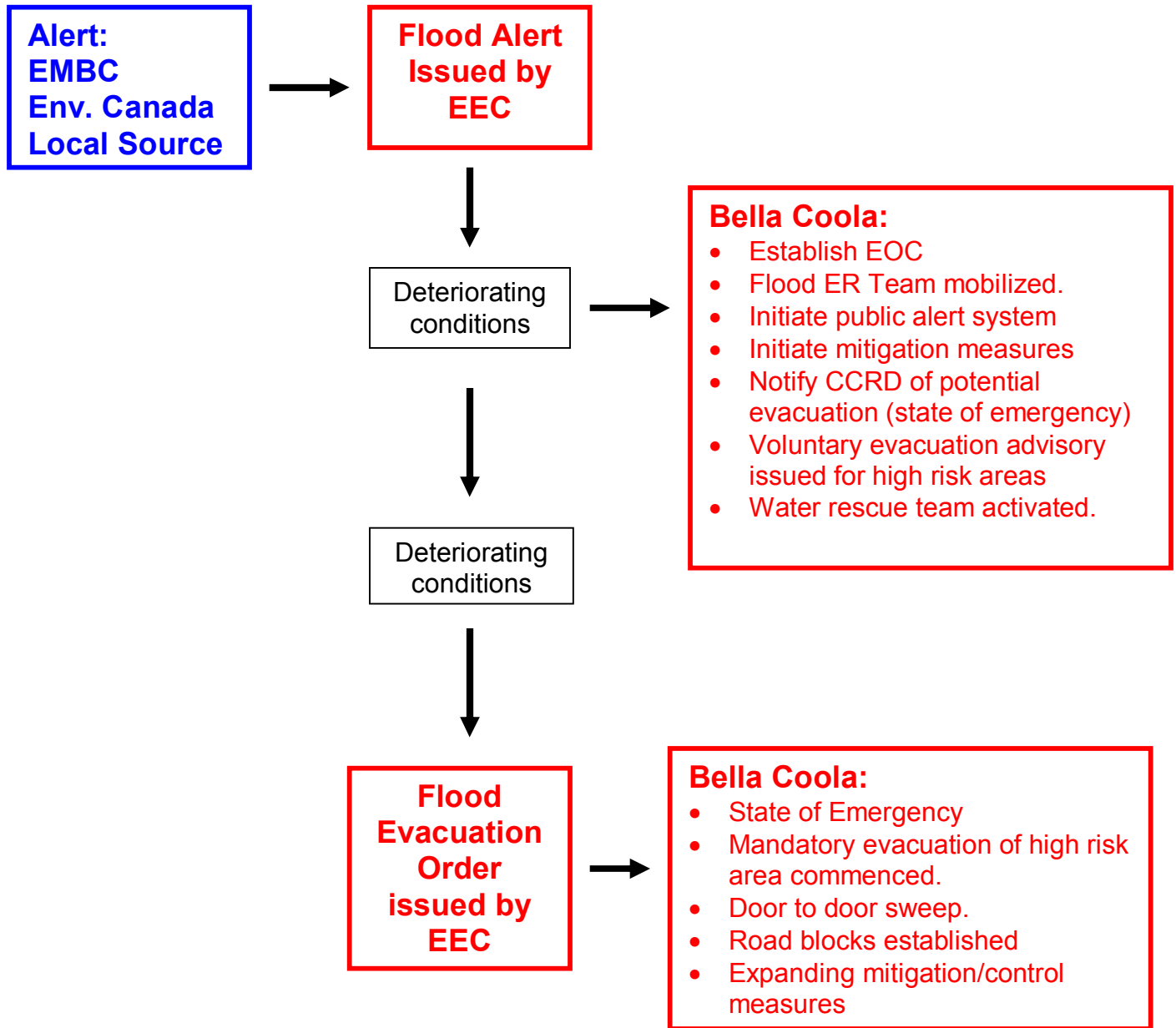
2.3 ***Flood Alert Condition***

- Establish EOC
- Contact EMBC to request PREOC establishment
- Initiate public alerting system
- Begin operational activities
 - Consult with MoTI and IRS rep re distribution of heavy equipment
 - Initiate sandbag supply activities
 - Activate water rescue team
- Advise CCRD Chair of potential Emergency Declaration

2.4 ***Flood Emergency Response***

- Advise CCRD Chair to declare state of emergency
- Advise all schools to suspend regular classes
- Initiate evacuations of high risk areas
- Commence airport protection activities
- Commence ESS activities as required

Flood Alert Response Chart



3 Flood Hazard Area

The Emergency Base Map (Annex D) indicates the historical flood plain of the Bella Coola River.

3.1 ***Recognized Areas of Concern***

Further to the historical flood plain designations, there exist a number of recognized areas of concern that commonly experience flood activity in the first stages of high water and that can be seriously impacted during events of extreme high water. These areas deserve special consideration and steps have been taken to identify the residents affected and establish special alerting systems in these neighbourhoods. These include local area call-out lists and spokespersons. The affected residents will be given advance warning of potential flood conditions and will be advised to prepare for potential evacuation by moving vehicles to high ground and gathering important belongings. They will receive early attention at the onset of actual flood conditions and may be issued mandatory evacuation orders in extreme situations.

Grant Road North

As many as 10 homes in this area traditionally experience flooding during high water events affecting the Bella Coola River. A condition has been recognized by residents whereby the River has been changing course towards this subdivision and the potential for high velocity flow impact may exist. A list of potentially affected residences has been compiled and a specific neighbourhood call-out list, including an area spokesperson, is included in the 'Flood Response Contact List'.

Lower Bella Coola Townsite

Several homes in the lower Bella Coola Townsite are particularly vulnerable to high water event affecting the Bella Coola River. While considerable warning time may be provided to these residents, they are included in the 'Flood Response Contact List'

Lower Saloompt Road

Several homes in the lower Saloompt Road area are vulnerable to flooding during high water events affecting the Saloompt River and many others are subject to isolation. The homes potentially affected by flood events are included in the 'Flood Response Contact List'.

3.2 **Potential Isolation Areas**

The potential for highway disruption exists in many areas of the valley as a result of bridges being damaged, roadways flooded or landslides blocking the roadways. These sections may contain infrastructure or resources essential to the valley as a whole. For example, the wharf is located west of an avalanche zone and the hospital is west of two bridged creeks, one of which (Thorsen Creek) is a dyked channel subject to potential washout or localized flooding.

Table 1 identifies the most likely areas of isolation and lists the important facilities located within them as well as the populations they contain. These are shown accumulating from West to East from the dryland log sort to the base of 'The hill'.

Figure 1 Isolation Area Critical Infrastructure Inventory

Area Reference	Description	Isolation causes	Important Infrastructure	Approx population
IA 1	West end Hwy 20	- Landslide or Avalanche - Tsunami - Fire - Accident - Weather storms	- Log sort - BC Hydro Gen. Stn. - Harbour facility - Fuel depot	10
IA 2	Tatsquan Creek west	- Bridge	- Hospital - RCMP Detachment - BCE School - Fire Hall (2) - Belco Service Station - Credit Union - Whole Good Stores (2) - Potential EOCs (3)	500
IA 3	Thorsen Creek west	- Bridge	- BC Hydro Diesel Plant - Fire Hall - Awcsaltca School - Potential EOC (1)	600
IA 4	Snootli Creek west	- Bridge	- Nygaard Gravel Pit - Lobelco Hall - Snootli Hatchery (water) - SDA Academy	150
IA 5	Klonnick Creek west	- Bridge	- Airport - Ambulance Station - Hagensborg Water Dist	150

			- Fire Hall - Potential EOCs (2)	
IA 6	Nusatsum Bridge west	- Bridge	Items listed above plus... - Whole Good Store - Mecham's Service - Hwys mtce facility - Schools (2) - Potential EOC (1)	300
IA 7	Concrete Bridge west	- Bridge		100
IA 8	Burnt Bridge Creek west	- Bridge		50
IA 9	Hill west	- Bridges/slides	- Tweedsmuir Lodge	75

4 Flood Emergency Evacuation Plans

Evacuations due to flooding are expected to be primarily conducted in recognized areas of concern. However, there is potential for infrastructure damage to warrant evacuations of other areas and these evacuations will be conducted as required following the procedures contained within the Annex E – Evacuation and Shelter In Place Guidelines. It is considered that such evacuations will be level 2 and lower and as such contained within the valley area.

4.1 *Recognized Area of Concern Evacuation Plans*

4.1.1 Grant Road North

In the event that residents need to be evacuated from Grant Road North the Water Rescue Team will be deployed to assist persons to cross the slough area as required. It is assumed that residents will have previously moved vehicles across the gully but transportation will be provided to those who require it. ESS personnel will ensure accommodations are available and assist anyone requiring such.

4.1.2 Lower Bella Coola Town Site

Residents in this area will be assisted with evacuation if necessary although their proximity to high ground precludes the need for a formal escape plan. ESS personnel will ensure accommodations are available and assist anyone requiring such.

4.1.3 Lower Saloompt Road

In the event that residents need to be evacuated from Lower Saloompt Road the Water Rescue Team will be deployed to assist

persons to cross the flooded area as required. Transportation will be provided as necessary and ESS personnel will ensure accommodations are available and assist anyone requiring such.

If high water is anticipated, residents will be notified to allow time to obtain supplies or evacuate if they desire.

5 Flood Emergency Immediate Response

5.1 Flood Event Damage Potential

Flooding of the Bella Coola River and/or its tributaries and side creeks can create a serious threat to people and infrastructure throughout the Bella Coola Valley. (See Emergency Base Map).

Human Populations at Risk

- Residents of low lying areas particularly those living in the Recognized High-Risk Areas.
- All residents who are required to travel on area roads.
- School children waiting for bus transportation near roadside ditches or other waterways.
- Customers of the Hagensborg Water District as this system is prone to contamination or interruption during high water events.
- All residents whose water supply or sewer systems may be adversely affected by high water.

Critical Infrastructure at Risk

- Dykes along the Bella Coola River and side creeks.
- All highway and roadway bridges. Thorsen Creek bridge is recognized as most vulnerable due to being a dyked channel that migrates large gravel deposits downstream creating minimum freeboard at the highway crossing.
- Highway 20 in areas east of Canoe Crossing that are exposed to the river.
- Highway 20 at 'The Hill'.
- Bella Coola Airport.
- Water delivery systems, Hagensborg Water District in particular.

Essential Services at Risk

- Food and whole goods delivery.
- Medical Evacuations.

5.2 **Pre-Event Response and Preparedness**

5.2.1 **Potential Flood Advisory Triggers**

Advance warning of potential flood conditions may come from several sources including the following:

- EMBC issued warnings.
- Environment Canada issued weather warnings.
- Advice from locally recognized individuals having experience with past weather/river/snow-pack conditions.
- MOTI/ IRS

While the conditions that generally lead to flooding events are usually formed over a period of several days, the possibility of an extreme weather event leading to flooding does exist. For this reason, potential flood alert activities should be executed in a timely fashion to ensure that response efforts are properly prepared.

5.2.2 **Advance Call-Out and River Monitoring Procedures**

Once a flood advisory has been issued a pre-warning advisory is issued to potential responders and high-risk area contacts according to the Flood Alert Call-Out List.

Local conditions are then monitored using the following tools/options:

- Environment Canada Weather reports issued through local and national media or on-line at www.weatheroffice.ec.gc.ca/city/pages/bc-18_metric_e.html
- Environment Canada Hydrometric sites are located on the Bella Coola River above Burnt Bridge Creek (08FB007), the Atnarko River near the base of the hill (08FB006) and the Saloompt River (08FB004). These sites measure primary water levels of the respective rivers and the information readings are available on-line at https://wateroffice.ec.gc.ca/mainmenu/real_time_data_index_e.html
- The Ministry of Transportation and Highways maintain 2 mountain-top weather stations, one near Heckman Pass and the other near Mt. Fougner, above the South Bentinck Arm. Data from these stations is available on-line but accessible only by Ministry personnel. Contact the local Highways representative to obtain information on snowpack,

temperature, precipitation and other trends from these sites.

- Qualified personnel can be dispatched to monitor localized conditions and advise of changing trends or of historically similar events.

5.2.3 Flood Level Parameters

While it must be recognized that flood conditions may exist on side creeks or isolated sections of the Bella Coola River at any time, Hydrometric flow readings from recent high water events can give an indication of water levels that affect high risk areas along the Bella Coola River. However, these must be used as basic guidelines only as snowpack and rainfall conditions in the lower Bella Coola system can cause high water events that are not recorded at the Burnt Bridge Hydrometric station.

High water affect on the Grant Road North Recognized High-Risk Area as compared to Hydrometric readings from station 08FB007 above Burnt Bridge Creek.

Date	Reading	Local Affect
Nov 9/04	4.5m	Homes isolated, strong flow through Grant Rd slough
Jan 24/05	2.8m	Grant Rd slough flowing, small vehicles stranded on south side

5.2.4 Recognized Area of Concern Preparedness

Residents of high-risk flood areas are advised to take measures to protect property and prepare for possible evacuations. Information Bulletins from both federal and provincial emergency organizations are available to inform homeowners regarding flood preparedness.

Preparation measures may include the following:

- Move vehicles to high ground preferably outside of the potential flood area.
- Plan a safe evacuation route to high ground.
- Remove valuables from basements and low areas to upper floors of structures.
- Prepare appliances as recommended by info bulletins.
- Sandbag lower areas as may be effective against rising waters.
- Prepare children, pets and important documents for possible evacuation.
- Monitor water levels closely and leave the area immediately upon noticing rapid changes to conditions.

5.2.5 Heavy Equipment Distribution

Due to the likelihood of operations requiring heavy duty equipment to protect and/or repair critical infrastructure the following steps should be initiated:

- Contact local equipment owners to determine the status and location of their equipment. (Refer to Heavy Duty Equipment Call List).
- Consult with the MoTI representative and IRS Road Maintenance Foreman regarding positioning of equipment throughout the potential valley Isolation Areas.
- Arrange for equipment moves as required.

5.3 Flood Emergency Response Procedures

- Establish EOC
- Contact EMBC to request PREOC establishment
- Initiate public alerting system
- Begin operational activities
- Initiate sandbag supply
- Activate Water Rescue Team
- Advise CCRD Chair of potential Emergency Declaration

Flood Response

- Advise CCRD Chair to declare state of emergency
- Advise all schools to suspend regular classes
- Initiate evacuations of high risk areas
- Commence airport protection activities
- Commence ESS activities as required

6 Extended Response

After flood conditions are confirmed as declining the repair of critical infrastructure and restoration of essential services are underway.

6.1 Critical Infrastructure Repair

It is assumed that the responsibility for most infrastructure repairs will be borne by the provincial government through EMBC, the Ministry of Transportation and Highways, BC Hydro and their contractors. The EOC will undertake any activity required to initiate infrastructure repairs using local contractors if immediate activation is deemed necessary to repair:

- Dykes

- Bridges
- Highway
- Airport
- Communications

6.2 ***Essential Services Evaluation***

Many essential services may be disrupted and require extraordinary efforts to maintain or restore function. Potentially affected services and alternative delivery systems are listed:

- Food supply
 - Shuttle vehicle from Heckman Pass to Tweedsmuir
 - Airlift from Heckman Pass to Tweedsmuir
 - Barge/Ferry link from Pt. Hardy/Bella Bella
- Fuel supply
 - Airlift from wharf to isolated areas
- Potable water supply
 - Hagensborg Mercantile reverse osmosis facility
 - Snootli Hatchery well and tanker truck
 - Fire service stores (as available)
- Domestic water/sewer
 - To be determined
- Medical facilities
 - ESS consideration

6.3 ***Records and Accounting***

Recording and accounting of repair activities will be an involved project and one that should be taken on by a competent book-keeper or accounting firm.

6.4 ***Volunteer Management***

As many volunteers may be required and a large number expected, the EOC will arrange for a volunteer coordinator to organize the activities of these persons to ensure an organized and effective response. This activity should take place outside of the EOC as the activity generated may be disrupting to operations.

6.5 **Security**

The RCMP are responsible for the security of evacuated areas.

The Rangers may be deployed to provide security to the EOC and/or the hospital in conjunction with the operating plans of these facilities.

7 **Recovery**

7.1 **Essential Services Restoration**

Assistance will be solicited to assist all agencies responsible for essential services. Alternate delivery systems to be established according to predicted timelines of normal system interruptions.

7.2 **Business Continuation**

See Business Continuation Section of Annex D - ESS Plan.

7.3 **Reporting and Follow-Up**

Subsequent to the event, debriefing exercises should be carried out within a reasonable timeline to assess the performance of responders and effectiveness of the response plan.

8 **Flood Hazard Map**

See the Emergency Base Map in Bella Coola ERP Annex D for information on flood hazard areas.