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Memo to Board of Directors for June Board Meeting

RE: Proposed Changes to Flood Hazard Policies – Discussion for Pre-Meeting Workshop

In light of recent flooding, Board Hearings and proposed Conservation Authority Act updates staff have reviewed our policies specific to flood hazards. In part the objectives of each CA regulation are:

1. To minimize the potential for loss of life and property damage;
2. To reduce the necessity for public and private expenditures for emergency operations, evacuation and restoration or properties subject to flooding;
3. To regulate flood plain development that could limit channel capacity and increase flood flow, leading to emergency and protective measures.

While our current policies meet these objectives at a basic standard there is a strong recommendation from staff that our current flood hazard policies be amended to revert back to our original policies in place prior to 2014. From 2006-2013 the CVCA upheld policies that prohibited new development in a flood hazard. Existing structures could be maintained and rebuilt in specific circumstances but no new development would be permitted and as such no new impacts, however minuscule, would be had on the control of flooding. In 2014 after a review of adjacent CA policies the flood hazard policies were amended to permit development in the flood hazard under certain circumstances and provided specific conditions and tests were met. Conditions that included size restrictions, flood proofing standards, no increased susceptibility to natural hazards, that the control of flooding would not be affected.

On an individual property basis a proponent may be able to demonstrate that their development would meet the tests and not have in impact on flood storage capacity or flood flows on their property. However, the cumulative effect of multiple properties developing in the flood hazard cannot be proven to uphold the tests and certainly have an impact overall. While we look at individual applications we must be cognitive of the cumulative effect of our decisions and currently we are falling short of our objectives.

By allowing development in the flood hazard, especially habitable space, we have increased the risk of damage to people and property simply permitting a structure to occupy space within that hazard. We have permitted the potential for additional resources required to protect a property and/or to restore a property.

From an economic standpoint development is a good thing. Increased community populations and property values are an attractive and marketable feature and the bylaws and zoning principles that are in place at individual municipalities do an excellent job of upholding the tenants of good planning. Development in a hazard however can be a costly economic pitfall for municipalities and taxpayers. Numerous articles (attached) that were published during the spring floods this year speak to that explicitly.

Climate change is a factor that cannot be ignored when discussing policies to regulate development in hazard prone areas. Extreme weather events are anticipated to occur more frequently and possibly with more severity and with that in mind we should not be permitting development in areas that are vulnerable.

The Conservation Authorities Act is the legislation in the Province of Ontario that is responsible for regulating development in hazards. We have the ability and the responsibility to minimize risk and damage and our policies should reflect this. A simple way to effectively ensure no risk and no damage from a hazard is to prohibit development in that hazard. Given that our current policies are permissive it may seem like a step backwards to revert back to policies that are prohibitive, however after administering the "new" policies for three years, staff are of the opinion that the "old" policies are more appropriate.

We have proposed the following changes to the flood hazard policy section. Sections have been removed to meet the standards of the original policies while making concessions for existing structures to be rebuilt or moved. The previous policies did not permit reconstruction of a dwelling unless it had been destroyed by an "act of God, other than flooding" however staff have left the policies that permit reconstruction in place with specific conditions to be met. The implications of approving a return to our original policies may, from a municipal standpoint, appear negative however from a CA perspective it is the right and responsible thing to do. As stated in the attached article by Rob Wesseling "Once aware of the risk, it is up to decision makers to base policies, planning and regulatory decisions around adaptation to extreme weather and natural disasters. This will require the courage to make sometimes unpopular, yet necessary, decision surrounding land use and development."

Staff look forward to discussing these suggested changes with the Board. In the proposed changes below the proposed new text is indicated in red. Text that has been struckthough is proposed to be removed. In some cases the text of a section is not included as is it proposed to be removed in its entirety so the section heading alone is shown with a strikethough.

Proposed Major Changes to Policy Manual – June 2017

New Section 3.8.5 (to be moved to 3.8.3, subsequent policies will be renumbered accordingly)

Prohibited Development, Interference and Alterations

3.8.5 That notwithstanding Sections 3.8.1 and 3.8.2, development will not be permitted within the flood or erosion hazard of valley and stream corridors, erosion or dynamic beach hazard, a wetland, or hazardous lands, where:

- *The application for development is in the Regulatory flood plain and is for uses other than those listed under Section 5.0 inclusive.*
- *The application is for development that cannot be flood proofed in accordance with the minimum standards for flood proofing as outlined in Appendix C hereto;*
- *Approval of the application would have the likely effect of increasing flood damages for the subject property or other properties, pollution in the watershed or be otherwise contrary to the objectives of the Authority*
- *Approval of the application would adversely affect the conservation of land in consideration of wetlands, dynamic beaches, areas of natural or scientific interest, or other ecologically or geologically sensitive areas.*

And/or where the use is:

a) an institutional use including but not limited to those associated with a hospital, pre-school, school nurseries, day care and schools, where there is a threat to the safe evacuation of the sick, the elderly , persons with disabilities or the young;

b) an essential emergency service such as that provided by fire, police, and ambulance stations, and electrical substations; or

c) associated with the disposal, manufacture, treatment, or storage of hazardous substances.

Amended Section 3.8.7 (number of policy will be changed accordingly if required)

Development Setbacks

3.8.7 That notwithstanding supplementary policies or stand-alone policies as specified in Sections 4.0 through to and including 7.0, development within a regulated area shall be set back from the greater of the following:

a) Valley and Stream Corridors: *6* metres from the long term stable top of slope, stable toe of slope, meander belt and any contiguous natural features and areas that contribute to the conservation of land;

b) *Natural Hazards: 6* metres from the extent of a hazard;

c) Waterbodies and Watercourses where the Flood Hazard is unknown: 15m from the high water mark.*

d) Wetlands: 30 metres from provincially significant wetlands and wetlands greater than 2 ha and 15 metres for all other wetlands; and

e) Setbacks based upon the results of a comprehensive environmental study or technical report completed to the satisfaction of the CVCA.

**If a site assessment determines the extent of the flood hazard can be established (ie: high granite bank), a minimum of 6m is applied from that point. In cases of a dispute over the extent of the flood hazard it is the responsibility of the proponent to bring forward documentation such as an engineering analysis or professional survey of the flood hazard in support of their position.*

5.3 Specific Policies for Flooding Hazards

The policies in this section are to be applied in conjunction with the General Policies in Section 3.8. As per Policy 3.8.1, development will not be permitted within the regulated area associated with a flooding hazard, except in accordance with the policies contained in Section 4.2 and this section.

5.3.1 Structures

5.3.1.1 *Construction, erection or placing of new buildings or structures of any kind or the making of an addition or alteration to a building or structure that has the effect of increasing the size or usability thereof will not be permitted in a flood hazard regardless of previous approvals under the Planning Act or other regulatory process (e.g. Building Code Act).*

5.3.2 Residential Development

~~**New Residential Development**~~
~~**Minor Residential Additions**~~

Residential Replacement/Reconstruction

5.3.2.1 Reconstruction of residential dwellings located within a flooding will be permitted provided it can be demonstrated that:

- the dwelling to be replaced is relocated outside the flooding hazard where feasible;
- there is no increase in the number of dwelling units;
- the new dwelling is the same size or smaller than the previous dwelling;
- the use of the new dwelling is the same as the previous dwelling;
- the dwelling will be floodproofed to an elevation of 0.3 metre above the regulatory flood elevation, as per floodproofing standards identified in Appendix C – Floodproofing Guidelines;
- safe access (ingress/egress) is present;
- no basement is proposed and any crawl space is designed to facilitate service only;
- there is no risk of structural failure due to potential hydrostatic/dynamic pressures;

- the proposed development will not prevent access for emergency works, maintenance, and evacuation;
- the potential for surficial erosion has been addressed through the submission of proper drainage, erosion and sediment control and site stabilization/restoration plans;
- natural features and/or ecological functions associated with conservation of land are protected, pollution is prevented and erosion hazards have been adequately addressed ; and,
- the plan has been carried out by a qualified professional with recognized expertise in the appropriate discipline and must be prepared using established procedures and recognized methodologies to the satisfaction of the CVCA.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures must be submitted.

~~**5.3.1.6** Replacement of residential dwellings within a flooding hazard that would result in an increase in dwelling size will be permitted provided it can be demonstrated that the conditions for Minor Residential Additions (Policies 5.3.1.3, 5.3.1.4) can be satisfied, and safe access is present.~~

Internal Residential Renovation

5.3.2.2 Internal renovations to existing residential buildings or structures located within a flooding hazard which change the use or potential use of the building or structure but provide for no additional dwelling units will be permitted provided it can be demonstrated that:

- the internal renovation does not result in a new use prohibited by the General Policies – Prohibited Uses 3.8.5 and,
- floodproofing is undertaken to the extent practical, in accordance with floodproofing standards identified in the Appendix C - Floodproofing Guidelines.

Residential Relocation

5.3.2.3 Relocation of existing residential dwellings located within a flooding hazard will be permitted provided it can be demonstrated that:

- the dwelling is relocated outside of the flooding hazard, or where this is not feasible, the dwelling is relocated to an area within the existing lot where the risk of flooding and property damage is reduced to the greatest extent possible;
- that the dwelling is floodproofed to an elevation of 0.3 metre above the regulatory flood, as per floodproofing standards identified in Appendix C – Floodproofing Guidelines;
- *the size and use of the dwelling does not change;*
- the proposed development will not prevent access for emergency works, maintenance, and evacuation;
- the potential for surficial erosion has been addressed through the submission of proper drainage, erosion and sediment control and site stabilization/restoration plans;
- natural features and/or ecological functions associated with conservation of land are protected, pollution is prevented and erosion hazards have been adequately addressed ; and,
- the plan has been carried out by a qualified professional with recognized expertise in the appropriate discipline and must be prepared using established procedures and recognized methodologies to the satisfaction of the CVCA.

~~**5.3.1.9** Additions to a dwelling being relocated per Policy 5.3.1.8 that are greater than the size provision identified in 5.3.1.3 above would be considered Single Residential Development and therefore subject to Policy 5.3.1.2.~~

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures must be submitted.

5.3.3 Agricultural Development

~~**New Agricultural Development**~~
~~**Minor Agricultural Additions**~~

Agricultural Replacement/Reconstruction

5.3.3.1 Replacement of agricultural buildings or structures located within a flooding hazard that have been damaged or destroyed by causes other than flooding will be permitted provided it can be demonstrated that:

- there is no feasible alternative site outside of the flooding hazard;
- design modifications and lot modifications (e.g., balanced cut and fill operation in accordance with Policy 5.3.13 will reduce the risk of flooding and property damage to the greatest extent, wherever possible;
- the new building or structure is the same size or smaller than the previous building or structure;
- the new building or structure is securely anchored to either a concrete pad or footings;
- the risk of property damage and pollution is minimized through site and facility design to ensure that the development will not result in a pollution hazard (e.g., release of a biohazard substance, nutrients, pesticides or other chemicals during a flood event);
- no basement is proposed and any crawl space is designed to facilitate service only; and,
- where dry floodproofing cannot be achieved, wet floodproofing is undertaken in accordance with floodproofing standards identified in Appendix C – Floodproofing Guidelines.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures must be submitted.

~~**5.3.2.5** Replacement of agricultural buildings or structures located within a flooding hazard that would result in an increase in building or structure size will be permitted provided it can be demonstrated that the conditions for Minor Agricultural Additions (Policies 5.3.2.2 and 5.3.2.3) can be satisfied.~~

Agricultural Relocation

5.3.3.2 Relocation of existing agricultural buildings and structures located within a flooding hazard will be permitted provided it can be demonstrated that the building or structure does not change in size or use and is relocated outside of the flooding hazard, or where this is not feasible, the building or structure is relocated to an area where the risk of flooding and property damage is reduced to the greatest extent possible, and where dry floodproofing cannot be achieved, wet floodproofing is undertaken in accordance with floodproofing standards identified in Appendix C – Floodproofing Guidelines.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures must be submitted.

5.3.4 Commercial, Industrial and Institutional Development

~~**New Commercial, Industrial or Institutional Development**~~
~~**Minor Commercial or Industrial Additions**~~
Commercial, Industrial or Institutional Replacements/Reconstructions and Renovations

5.3.4.1 Replacement of commercial, industrial, institutional buildings or structures located within a flooding hazard that have been damaged or destroyed by causes other than flooding will be permitted provided it can be demonstrated that:

- there is no feasible alternative site outside of the flooding hazard;

- design modifications and lot modifications (e.g. balanced cut and fill operation in accordance with Policy 5.3.13 will reduce the risk of flooding and property damage to the greatest extent, wherever possible;
- the number of dwelling units is the same or less;
- the new building or structure is the same size or smaller than the previous dwelling;
- the building or structure is floodproofed to an elevation of 0.3 metres above the regulatory flood elevation, as per floodproofing standards identified in Appendix C – Floodproofing Guidelines;
- Safe access (ingress/egress) is present;
- no basement is proposed and any crawl space is designed to facilitate service only;
- the proposed development will not prevent access for emergency works, maintenance, and evacuation;
- the potential for surficial erosion has been addressed through the submission of proper drainage, erosion and sediment control and site stabilization/restoration plans;
- natural features and/or ecological functions associated with conservation of land are protected, pollution is prevented and erosion hazards have been adequately addressed ; and,
- the plan has been carried out by a qualified professional with recognized expertise in the appropriate discipline and must be prepared using established procedures and recognized methodologies to the satisfaction of the CVCA.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures must be submitted.

~~**5.3.3.6** Replacement of commercial and industrial buildings located within a flooding hazard that would result in an increase in building or structure size will only be permitted where it can be demonstrated that the conditions for Minor Commercial, Industrial or Institutional Additions can be satisfied and that safe access (ingress/egress) is present.~~

Commercial, Industrial or Institutional Relocation

5.3.4.2 Relocation of existing commercial/industrial/institutional buildings or structures located within a flooding hazard will be permitted provided it can be demonstrated that:

- the building or structure is relocated outside of the flooding hazard, or where this is not feasible, the building or structure is relocated to an area where the risk of flooding and property damage is reduced to the greatest extent possible;
- that the building or structure is floodproofed to an elevation of 0.3 metre above the regulatory flood, as per floodproofing standards identified in Appendix C – Floodproofing Guidelines;
- *the size of the building or structure does not change;*
- the proposed development will not prevent access for emergency works, maintenance, and evacuation;
- the potential for surficial erosion has been addressed through the submission of proper drainage, erosion and sediment control and site stabilization/restoration plans;
- natural features and/or ecological functions associated with conservation of land are protected, pollution is prevented and erosion hazards have been adequately addressed ; and,
- the plan has been carried out by a qualified professional with recognized expertise in the appropriate discipline and must be prepared using established procedures and recognized methodologies to the satisfaction of the CVCA.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures must be submitted.

5.3.5 Accessory Buildings and Structures

~~**Accessory Buildings or Structures**~~
~~**Additions to Accessory Buildings or Structures**~~

Replacement/Reconstruction of Accessory Buildings or Structures

5.3.5.1 Replacement or reconstruction of existing accessory buildings or structures that have been damaged or destroyed by causes other than flooding will be permitted provided it can be demonstrated that:

- there is no feasible alternative site outside the flooding hazard;
- the building or structure to be replaced is relocated to an area within the existing lot where the risk of flooding and property damage is reduced to the greatest extent, wherever possible;
- the new building or structure is the same size or smaller than the previous building or structure ~~(Note: replacements to accessory buildings or structures located within a flooding hazard that would result in an increase in building or structure size are subject to the provisions of Policy 5.3.4.2);~~
- there is no habitable floor space associated with the building or structure and no opportunity for conversion to habitable floor space in the future;
- no basement is proposed and any crawl space is designed to facilitate service only;
- where dry floodproofing cannot be achieved, wet floodproofing is undertaken in accordance with floodproofing standards identified in Appendix C – Floodproofing Guidelines;
- the proposed development will not prevent access for emergency works, maintenance, and evacuation;
- the potential for surficial erosion has been addressed through the submission of proper drainage, erosion and sediment control and site stabilization/restoration plans;
- natural features and/or ecological functions associated with conservation of land are protected, pollution is prevented and erosion hazards have been adequately addressed ; and,
- the plan has been carried out by a qualified professional with recognized expertise in the appropriate discipline and must be prepared using established procedures and recognized methodologies to the satisfaction of the CVCA.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures must be submitted.

Relocation of Existing Accessory Buildings or Structures

5.3.5.2 Relocation of an existing accessory building or structure located within a flooding hazard will be permitted provided it can be demonstrated that the building or structure is relocated outside of the flooding hazard, or where this is not feasible, the building or structure is relocated to an area where the risk of flooding and property damage is reduced to the greatest extent possible, and where dry floodproofing cannot be achieved, wet floodproofing is undertaken in accordance with floodproofing standards identified in Appendix C – Floodproofing Guidelines. It must also be demonstrated that:

- the size of the building or structure will not change;
- the proposed development will not prevent access for emergency works, maintenance, and evacuation;
- the potential for surficial erosion has been addressed through the submission of proper drainage, erosion and sediment control and site stabilization/restoration plans;
- natural features and/or ecological functions associated with conservation of land are protected, pollution is prevented and erosion hazards have been adequately addressed ; and,
- the plan has been carried out by a qualified professional with recognized expertise in the appropriate discipline and must be prepared using established procedures and recognized methodologies to the satisfaction of the CVCA.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures must be submitted.

5.3.6 Boathouses

~~**New On-Shore Boathouses**~~

5.3.6.1 New on-shore boathouses will not be permitted.

Repair/Reconstruction of Existing Boathouses

5.3.6.2 Replacement or reconstruction of existing on-shore boathouses may be permitted provided it can be demonstrated that: ~~in addition to all of the provisions in Policy 5.3.5.1*:~~

- the new building or structure is the same size or smaller than the previous building or structure
- the structure is designed to store a boat
- if the boathouse is to be replaced is relocated to an area within the existing lot where the risk of flooding and property damage is reduced to the greatest extent, wherever possible;
- the structure is constructed as a single storey with a peaked roof and that there is no habitable floor space associated with the boathouse and there is no opportunity for conversion into habitable floor space in the future. The boathouse shall contain no services other than electricity*;
- the structure is securely anchored to either a concrete pad or footings;
- the structure will be located within existing impacted or open areas, wherever possible;
- the structure will be constructed in a manner to minimize impacts to the natural grade of the shoreline and riparian vegetation;
- the structure will not restrict safe access;

- the proposed development will not prevent access for emergency works, maintenance, and evacuation;
- the potential for surficial erosion has been addressed through the submission of proper drainage, erosion and sediment control and site stabilization/restoration plans;
- natural features and/or ecological functions associated with conservation of land are protected, pollution is prevented and erosion hazards have been adequately addressed ;
- where dry floodproofing cannot be achieved, wet floodproofing will be undertaken in accordance with floodproofing standards identified in Appendix C – Floodproofing Guidelines; and
- the plan has been carried out by a qualified professional with recognized expertise in the appropriate discipline and must be prepared using established procedures and recognized methodologies to the satisfaction of the CVCA.

~~(Note: replacements to existing boathouses located within a flooding hazard that would result in an increase in building or structure size are subject to the size restrictions of Policy 5.3.5.1).~~

*Exceptions will be made for boathouses where the original structure did not meet this condition for example a boathouse with an existing flat roof may be permitted to be reconstructed with the same design.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures must be submitted.

*NB. For In-Water Boathouses please refer to Policies 6.4.1.8 and 6.4.1.9

5.3.7 Swimming Pools

5.3.7.1 Below ground swimming pools will be permitted within a flooding hazard provided it can be demonstrated that:

- there is no feasible alternative site outside of the flooding hazard;
- floodproofing is undertaken to the extent practical, in accordance with floodproofing standards identified in Appendix C – Floodproofing Guidelines; and,
- all excavated fill is removed from the flooding hazard.

5.3.8 Infrastructure

5.3.8.1 Public infrastructure (e.g., roads, sewers, flood and/or erosion control works, water supply, municipal stormwater management facilities required to alleviate a flood problem associated with existing development) and private infrastructure (e.g., ~~roads,~~ gas and electrical transmission pipelines/corridors, etc.) will be permitted to be constructed, realigned and/or upgraded within a flooding hazard when the location is supported through an approved Environmental Assessment and/or in the case of private infrastructure, it has been demonstrated through a comprehensive plan that there is no feasible alternative site outside the flooding hazard, provided it can be demonstrated that:

- risk of flood damage to upstream or downstream properties is not increased or is minimized through site design;
- the risk of pollution is minimized through site design to ensure that the development will not result in a pollution hazard (e.g., release of a biohazard substance, nutrients, pesticides or other chemicals during a flood event);
- where applicable, floodproofing measures are incorporated into the design in accordance with floodproofing standards identified in Appendix C – Floodproofing guidelines;
- where applicable, safe access (ingress/egress) is present; site, facility, and/or landscape design and appropriate best management practices will be employed to:
  - maintain stage-storage relationships to the floodplain;
  - control sediment and erosion; and,
  - minimize impervious surfaces and loss of natural vegetation.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades must be submitted.

5.3.8.2 Parking lots and driveways ~~access routes (e.g., driveways, private access roads and entrance ways)~~ associated with existing residential, agricultural, commercial, industrial or institutional uses will be permitted within a flooding hazard provided it can be demonstrated that:

- the risk of flooding and property damage is minimized through site design;
- drainage of parking lots will take place within 1 hour following the cessation of the rainfall event, and does not result in depth of flooding that would exceed 30 centimetres; and,
- Safe access (ingress/egress) is present.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades must be submitted.

5.3.9 Stormwater Management Facilities

New Stormwater Management Facilities

5.3.9.1 New stormwater management facilities will not be permitted within a flooding hazard with the exception of municipal stormwater management facilities required to alleviate a non-regulatory flood problem associated with existing development:

- there is no feasible alternative outside of the hazard;
- natural erosion and sedimentation processes within the receiving watercourse are not impacted;
- where unavoidable, intrusions on hydrologic functions are minimized;
- best management practices including site and facility design and appropriate remedial measures will mitigate disturbance to hydrologic functions;
- facilities are excavated with minimal berming, and all excavated material is removed from the flooding hazard and/or erosion hazard; and,
- design and maintenance performance requirements as determined by CVCA for the receiving watercourse are met and the effect of the floodplain flow regime on the intended function of the facility is incorporated into the siting and design.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades must be submitted.

Retrofitting *Existing* Stormwater Management Facilities

5.3.9.2 Retrofitting of *existing* stormwater management facilities will be permitted within a flooding hazard where there is no feasible alternative site to locate the facility outside the flooding hazard provided it can be demonstrated that:

- natural erosion and sedimentation processes within the receiving watercourse are not impacted;
- where unavoidable, intrusions on hydrologic functions are minimized;
- best management practices including site and facility design and appropriate remedial measures will mitigate disturbance to hydrologic functions;
- facilities are excavated with minimal berming, and all excavated material is removed from the flooding hazard and/or erosion hazard; and,
- design and maintenance performance requirements as determined by CVCA for the receiving watercourse are met and the effect of the floodplain flow regime on the intended function of the facility is incorporated into the siting and design.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades must be submitted.

5.3.10 Ponds

5.3.10.1 New dug-out or isolated ponds will be permitted in a flooding hazard where there is no feasible alternative site to locate the pond outside the flooding hazard provided it can be demonstrated that:

- all dredged material is removed from the flooding hazard;
- finished side slopes are stable;
- where unavoidable, intrusions on hydrologic functions are minimized;
- any grading around the pond will not change the elevation of the land and will not compromise the stability of the existing shoreline;
- safe ingress and egress is maintained on the property;
- best management practices including site and pond design and appropriate remedial measures will mitigate disturbance to hydrologic functions; and,
- the risk of pollution and sedimentation during construction is minimized.

5.3.10.2 Enlargement of an existing dug-out or isolated pond located within a flooding hazard will be permitted provided it can be demonstrated that the enlargement can satisfy Policy 5.3.10.1 and will not further encroach on the flooding hazard.

5.3.11 Low Intensity Recreational Uses

5.3.11.1 Low intensity recreational uses, such as parks, trail systems and watercourse access points will be permitted within a flooding hazard provided it can be demonstrated that:

- there is no feasible alternative site outside the flooding hazard;
- where unavoidable, intrusions on hydrologic functions are minimized;
- best management practices including site, facility, and/or landscape design and appropriate remedial measures will mitigate disturbance to hydrologic functions; and,
- the risk of property damage is minimized through site, facility, and/or landscape design and flood emergency plans.

5.3.12 Marinas

5.3.12.1 Marina facilities will be permitted within a flooding hazard provided it can be demonstrated that:

- all associated permanent, closed structures (e.g., clubhouses, washrooms with septic systems and maintenance buildings) are located outside of the flooding hazard;
- all boat storage facilities will be constructed on shore and all proposed permanent docks can satisfy policies outlined in Policy 6.4.1 – Structures;
- facilities will be located within existing impacted or open areas, wherever possible;
- facilities will be constructed in a manner to minimize impacts to the natural grade of the shoreline;
- where unavoidable, intrusions on hydrologic functions are minimized;
- best management practices including site, facility, and/or landscape design and appropriate remedial measures will mitigate disturbance to hydrologic functions;
- where dry floodproofing cannot be achieved, wet floodproofing will be undertaken in accordance with floodproofing standards identified in Appendix C – Floodproofing Guidelines; and,
- the risk of property damage is minimized through site, facility and/or landscape design.

A site plan prepared by a qualified professional illustrating the elevations of existing and proposed grades and lowest openings of existing and proposed buildings/structures must be submitted.

5.3.13 Golf Courses

Golf Courses

5.3.13.1 Golf courses or golf course expansions will be permitted within a flooding hazard provided it can be demonstrated that:

- all associated permanent, closed structures (e.g., clubhouses, washrooms with septic systems and maintenance buildings) will be located outside of the flooding hazard;
- watercourse crossings are minimized and designed in accordance with the policies that pertain to structures; and,
- where unavoidable, intrusions on hydrologic functions are minimized.

5.3.14 Fill Placement, Excavation and/or Grade Modifications

5.3.14.1 Fill placement and or excavation for the purpose of changing the grade on a property within the flood hazard for the purpose of permitting development will not be permitted.

5.3.14.2 Fill placement, excavation, and/or grade modifications: associated with existing access roads and driveways; required for the purpose of floodproofing existing and/or proposed structures; required for erosion control; and/or, to facilitate the installation of geothermal, and water and/or sewage treatment systems will be permitted within a flooding hazard provided it can be demonstrated that:

- stage-storage and stage-discharge characteristics of the floodplain will be maintained by means of an incrementally balanced cut and fill operation to ensure that there will be no adverse hydraulic or fluvial impacts on rivers, creeks, streams or watercourses. This cut and fill operation must be designed in 0.3 metre vertical increments. Engineered hydraulic analyses may be required, at the discretion of CVCA, to demonstrate that the latter condition has been met and the proposed placement of fill will not have a detrimental effect on upstream water levels or local stream flow velocities;
- flood flows will not be impeded;
- *the fill will not be susceptible to erosion by ice and/or water; and*
- inert fill material will be used. The proponent may be required to provide proof of the origin and quality of the fill material to ensure the control of pollution and the conservation of land is not impacted;

OR where stage-storage and stage-discharge characteristics of the floodplain cannot be maintained by a balanced cut and fill operation:

~~• fill placement, excavation, and/or grade modifications required for floodproofing purposes will not exceed the minimum amount required to floodproof the structure in accordance with floodproofing guidelines in Appendix C – Floodproofing Guidelines and it must be demonstrated to the satisfaction of CVCA that the control of flooding, erosion pollution or the conservation of land will not be affected;~~

- fill placement, excavation, and/or grade modifications required for sediment and/or erosion control or shoreline stabilization be in accordance with Shoreline Excavation, and Erosion Protection, Shoreline/Bank Stabilization and Sediment Control policies (Policy 6.4.4.4 and Policy 6.4.4.5) and it must be demonstrated to the satisfaction of CVCA that the control of flooding, erosion pollution or the conservation of land will not be affected;
- fill placement, excavation, and/or grade modifications required for the replacement *or upgrading* of water and/or septic treatment systems *servicing an existing dwelling* may be permitted provided the ~~bed of the~~ treatment system will be located outside the flooding hazard, or where this is not feasible, it is raised, and the amount of fill is limited to the required area and depths as specified by the approval agency. Drainage patterns must be maintained on the property and cannot impact neighbours. The system should be located in the area of lowest risk and it must be demonstrated to the satisfaction of CVCA that the control of flooding, erosion pollution or the conservation of land will not be affected.

It must also be demonstrated for any project that:

- no impacts on the hydraulic or fluvial functions of the river, creek, stream or watercourse will occur and upstream and downstream flow velocities related to increased flood risk or damage are unaffected. An engineered hydraulic analysis may be required, at the discretion of CVCA, to ensure that these matters have been addressed;
- flood flows are not impeded;
- *the fill will not be susceptible to erosion by ice and/or water; and*
- inert fill material will be used. The proponent may be required to provide proof of the origin and quality of the fill material to ensure the control of pollution and the conservation of land is not impacted.

A site plan prepared by a qualified professional illustrating the elevations of existing grades and the proposed grades after development must be submitted.

N.B.: Permitted fill placement, excavation and/or grade modifications may be seasonally restricted and subject to a specified time frame to enable stabilization/re-vegetation of the disturbed area.

5.3.14.2 Notwithstanding Policy 5.3.14.1 development associated with the construction of a driveway or access way through the Regulatory floodplain in order to provide access to lands outside of the Regulatory floodplain may be permitted subject to *the conditions of Policy 5.3.14.2*, the provision of safe access as identified in Section 3.3 and if it has been demonstrated to the satisfaction of CVCA that there is no viable alternative outside of the regulated area and that the control of flooding, erosion, pollution, or the conservation of land will not be affected;

5.3.14.3 Notwithstanding Policy 5.3.14.1 parking areas may be permitted within the Regulatory floodplain if it has been demonstrated to the satisfaction of CVCA that the control of flooding, erosion, pollution or the conservation of land will not be affected, and that safe pedestrian and vehicular access is achieved.

A site plan prepared by a qualified professional illustrating the elevations of existing grades and the proposed grades after development must be submitted.

N.B.: Permitted fill placement, excavation and/or grade modifications may be seasonally restricted and subject to a specified time frame to enable stabilization/re-vegetation of the disturbed area.

Public safety, not costs, the top priority in fighting floods, Goodale says

Federal government delivers more troops, sandbags in an 'all-of-Canada' approach to emergency

By Kathleen Harris, CBC News Posted: May 08, 2017 11:01 AM ET Last Updated: May 08, 2017 9:07 PM ET

Public safety, not figuring out who pays for what, is the top priority in the government's "all-of-Canada" approach to fighting massive floods, says federal Public Safety Minister Ralph Goodale.

Goodale provided an update today on the federal response to the emergency, including 250,000 more sandbags from the Canadian Armed Forces stockpile for Ontario and more military personnel for Quebec.

Asked who will ultimately foot the bill, Goodale said that in some cases there are cost-sharing arrangements, and sometimes the military absorbs the costs. In the end, he said a fair and amicable solution will be worked out.

"We have not in the last number of days had any focus at all upon the cost issues because the important thing right up front is public safety. Get the job done," Goodale said.

Ontario requested the supplies, but has not asked for any military personnel.

About 1,650 Forces members (1,500 troops in the field and another 150 support staff) have been deployed to help local civilian authorities in southern Quebec.

Marine vessels, a dozen helicopters and a Hercules transport are also on standby if needed, he said.

- **Frustration grows among flooding evacuees**
- **Montreal declares state of emergency**
- **Cross-border commuters told to stay home**

The federal government is also keeping close watch on the situation in New Brunswick, the Gaspé and along the North Shore of the St. Lawrence, where the wet weather system remains, and on dangerous water conditions in the B.C. Interior.

Some residents forced to flee their homes have expressed frustration that local officials did not prepare better for the flooding and do more to mitigate the devastation. According to jurisdictional protocol, the federal government must wait for a formal request from a province to assist in an emergency.

Goodale said local and provincial officials are in the best position to determine when they require assistance, and that the situation was evolving rapidly on the ground. The federal government responded within 30 seconds to say "yes" once the request was made.

Goodale expects the topic of protocol will be on the agenda when he meets with his provincial and territorial counterparts in coming weeks.

"That review is already underway, but it is important to recognize that jurisdictional authorities need to be respected," he said. "We will examine whether the present procedure and protocols [are] appropriate in all circumstances."

'All-of-Canada' approach

In his statement, Goodale outlined the role of various departments in dealing with the weather emergency:

- The Canada Border Services Agency has offered its training centre in Rigaud, Que., to house evacuees.
- Environment and Climate Change Canada is providing weather and water flow forecasting, and scientific expertise for the effective management of reservoirs.
- Natural Resources Canada offers geomatic services and satellite imagery to better understand the scope of rising water levels.
- Transport Canada will provide air surveillance and instructs ships using the Saint Lawrence Seaway to avoid activity that would cause more damage to the shoreline.
- Innovation, Science and Economic Development Canada is working with telecommunications providers to ensure reliable services are maintained.
- Public Health Agency of Canada is working with the Red Cross to accumulate stockpiles of supplies to help people evacuated from homes.
- Global Affairs Canada is in contact with U.S. officials and agencies such as the International Joint Commission that have common interest in cross-border water flows.

"This is an all-of-Canada approach to maximize the support we can all offer together to other Canadians in distress, just as we did exactly one year ago when a beast of a wildfire was ravaging Fort McMurray in Alberta," Goodale said in a commentary released earlier today.

Conservative public safety critic Tony Clement said the government has responded appropriately with assistance for the emergency so far. But he expects the "bickering" over money will come later, and said he will watch closely to see if the government comes through with adequate federal disaster relief funds.

"It will be interesting to see if the federal government makes that easy for the provinces and individuals, or tough," he said.

NDP public safety critic Matthew Dubé said the government responded quickly and adequately to requests for assistance, but he also expressed concern that financial and physical support could thin out after the cameras turn away. He said that in 2011 military personnel were withdrawn quickly and the removal of sandbags was left largely up to volunteers.

"We hope the help that is being offered is maintained," he said.

Federal buildings across the river from Ottawa in Gatineau, Que., are closed Monday and employees who commute across the bridges were told to stay home.

Red Cross appeal

The Canadian Red Cross has launched a Spring Floods Appeal — donors can direct their dollars specifically at helping in Quebec, or can earmark their money wherever help is needed most across the country. Funds will help people once they return home to pay for necessities such as cleanup, rebuilding and furniture.

Donations can be made online at www.redcross.ca or by phone at 1-800-418-1111.

On Sunday, Prime Minister Justin Trudeau visited Terrasse-Vaudreuil, Que., to observe flood damage and offer support to those working on the ground.

Trudeau also made what the Prime Minister's Office called a "spontaneous stop" to meet with affected people and thank the first responders, volunteers and neighbours.

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(2)

One way to battle future flooding: stop building on flood plains, say experts

Goodale says building on land prone to flooding will be brought up with provincial counterparts at May meeting

By Peter Zimonjic, Karina Roman, Katie Simpson, CBC News Posted: May 09, 2017 8:50 PM ET Last Updated: May 09, 2017 9:11 PM ET

As the battle to protect homes from flooding continues across the country, questions are being asked about whether it's time to reconsider regulations that allow developers to build on flood plains.

Jason Thistlethwaite, an assistant professor at the University of Waterloo's faculty of environment, says the problem is that municipalities set zoning regulations and collect property tax revenue but do not pay for rebuilding costs after natural disasters.

"The municipality really doesn't have an incentive to go in and use land-use planning and building codes and communications strategies to tell people that they are at risk of flooding, particularly given that most of the revenue comes from development, it comes from property taxes." Thistlethwaite said. "So they face a real conflict of interest.

"Poor land-use planning at the local level basically goes unpunished and in fact gets rewarded with additional disaster assistance from the province, from the federal government."

- **Federal government to pay to deploy military to flood zones**
- **Public safety, not costs, top priority in fighting floods: Goodale**
- **Quebec pledges $500K for flood victims as water levels drop**

Last February, the Parliamentary Budget Office released a report estimating that over the next five years the federal government will dole out an estimated $902 million a year in disaster-related relief to provinces and territories.

Of that, $673 million a year will be spent on rebuilding after flooding — about 75 per cent of the annual spend.

The money comes from Public Safety Canada through the Disaster Financial Assistance Arrangements, or DFAA, created in 1970 to reimburse provinces for expenses related to damage from disasters natural or man-made.

The report also notes that in the ten years from 2005 to 2014 (which included the 2013 Calgary floods) 82 per cent of all DFAA funding went to Manitoba, Saskatchewan and Alberta, almost all of which was a result of flooding.

Thistlethwaite says his research shows 75 percent of people who live in high-risk flood areas don't even know they are at risk.

He says the government needs to advise people of at-risk areas and then produce flood-risk maps to guide future developments instead of relying on current maps, which he says are outdated.

An issue of zoning

It is an approach that the Insurance Bureau of Canada's Craig Stewart says should be addressed, as the impacts of climate change continue to deliver variable weather patterns.

"It makes no sense now to be building homes in harm's way," Stewart said.

Public Safety Minister Ralph Goodale says the federal government expects an increasing number of natural disasters to occur more quickly and for them to be larger and more costly in the coming years.

He said the issue of building on land prone to flooding is an issue that has bedevilled municipal and provincial governments since "time immemorial."

"Sometimes in normal, dry conditions these are very attractive premium locations, and then something like this happens," Goodale said. "It boils down to zoning issues and it's something that governments are going to have to examine very closely: how they protect people who choose voluntarily to build in areas that are vulnerable to these kinds of problems.

"This is one of the issues that will be discussed among federal, provincial and territorial ministers and the end of the month at our emergency management meeting," Goodale said.

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Insurers must do more to educate Canadians about flood risk

ROB WESSELING
President and CEO of the Co-operators, a national insurance and financial services organization

In the wake of widespread spring flooding, heavy rains and high water levels now threaten more of the same in communities across the country. And while floodwaters inevitably recede, the financial and emotional fallout will continue to make waves.

In the past decade, insured losses from natural disasters, of which floods are the most common example, have more than doubled. In this new reality, our role as insurers continues to be put to the test and rightly so. Today, in the context of a rapidly changing climate, we have a much larger role to play. Insurers and all levels of government must do more to prepare Canadians for the new normal of risk in this country, while ensuring they are well-equipped to adapt to a changing climate.

With respect to floods, the data points to an alarming trend: Costs now exceed a staggering average of $1-billion a year. Once-in-a-century floods are occurring with greater frequency and severity and current responses to this trend, by insurers and governments alike, are falling short.

Until 2015, Canada was the only G7 country without available residential insurance protection for overland flooding. This unmet need led my company to develop a comprehensive flood product that covers all clients, regardless of their risk. With this coverage now in Ontario and Alberta, we have much further to go to make it available to all Canadians.

In 2014, the Co-operators hosted a multistakeholder roundtable that identified three "winning conditions" as precursors for flood resilience:

› 1. That Canadians understand the risk flooding presents to their homes, businesses and communities.

A recent study by Partners for Action and the University of Waterloo found that 94 per cent of Canadians living in flood zones are unaware of their risk. This is in stark contrast to the knowledge held by insurers and government. As insurers, we share the responsibility to educate, prepare and equip Canadians to adapt;

› 2. That Canadian decision makers use their understanding of flood risk to make sound adaptation decisions.

Once aware of the risk, it is up to decision makers to base policies, planning and regulatory decisions around adaptation to extreme weather and natural disasters. This will require the courage to make sometimes unpopular, yet necessary, decisions surrounding land use and development;

› 3. After they have engaged in adaptation, Canadians must have access to means to transfer the remaining risks associated with flood damage.

All Canadians must have products available to them that appropriately transfer the risk to insurers and government. In some cases, premiums will be high; pricing risk appropriately is necessary to send a clear, monetary signal to clients, municipalities and governments that more needs to be done.

The success of these three conditions hinges on collaboration across sectors and party lines, from governments to insurers to individuals living in flood zones.

First, as insurers, we are accountable. We challenge our industry to raise awareness of the issues, equip Canadians to adapt to flood risk and actively engage with all levels of government. Further, we must innovate and adapt products to ensure all Canadians are eligible for insurance at prices that reflect the risk they are exposed to.

We challenge municipalities to publicize flood maps to ensure citizens have the ability to make informed decisions, restrict development in known flood-prone areas and to put in place regulations, such as building codes that promote and incentivize permeable landscaping or the installation of backwater valves, to adapt to risk.

We challenge provincial and federal governments to more proactively manage risks that Canadians and their communities are exposed to, communicate clear, national guidelines about which flood losses are covered and, together with municipalities, support the creation of more detailed flood maps and continued investment in resilient infrastructure.

Finally, for Canadian consumers: Ask your insurer and government representatives how they are responding to these challenges. Take steps to understand and adapt to your own flood risk and inquire about the risk or history of flooding when purchasing a home. Seek out local flood maps and look into what insurance is available to protect your financial security. Collectively, it's time we meet these headwaters head-on.

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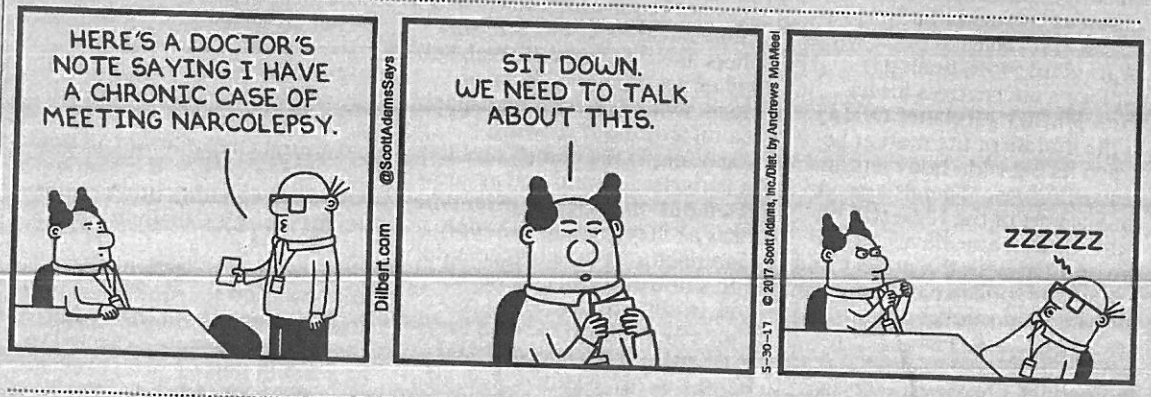

4

It's time we stopped paying for your river view

Flooding is predictable and increasingly common, and the government needs to halt its huge bailouts of oblivious homeowners

Scott Gilmore

May 10, 2017 Macleans

Canadian soldiers inspect a flooded residential area in Gatineau, Quebec, Canada, May 7, 2017. (Chris Wattie/Reuters)

Imagine you are house hunting, and you find one that meets your needs perfectly. It's beautiful. It's affordable. There are even good schools nearby. But there is only one problem: directly above the house, perched on a cliff, is a giant teetering boulder. The realtor tells you not to worry; it will only fall once, sometime in the next 100 years. Who in their right mind would take those odds? Apparently, millions of you.

According to the Insurance Bureau of Canada, there are 1.8 million households in this situation, homes built on floodplains or in other areas where they are at "very high risk" of flood damage. In British Columbia, Ontario, Quebec and New Brunswick thousands of homeowners are discovering this is not a theoretical risk, as a "one in a hundred year" floods submerged entire neighbourhoods this week.

If you're like me, your first instinct is sympathetic. It must be heartbreaking to have your home ruined, filled with refuse and sewage, furniture and mementoes wrecked. My sympathy begins to dissipate almost instantly, however, when I begin to read about how the federal government is going to cover the cost of sending in the military, and how the homeowners are anxious to move back in and rebuild.

Here's the problem. The huge river running next to their property was not a secret when they bought it. The instinctive Canadian response, of course, is to blame someone else, usually the government. "No one warned them it could flood." Well, let's clear that point up for everyone: rivers rise. If you have a house in a low-lying area, eventually it is going to flood. If you genuinely didn't understand that before, consider yourself informed.

COUNTERPOINT: Floodplain living isn't a luxury. It's a reality we have to deal with.

But, perhaps there is a reason to blame government, at least at the municipal level. City councils across this country have been zoning flood plains as residential for decades now. And why wouldn't they? Riverside lots are beautiful and they generate more tax dollars. When that once-in-a-century flood comes along, it's typically the province and the federal government who chip in to pay the costs. Or, more accurately, it's taxpayers from across the country who foot the bill.

That is what is happening right now. Again. Federal and provincial politicians are promising assistance, of all kinds, to our fellow citizens who were unaware of the giant river next door. The Prime Minister, our empathizer-in-chief, warmed our cockles by assuring everyone, "When Canadians are facing natural disasters or serious issues, we pull together. That's who we are."

And this is true. One of the social compacts in this country is that when there is a natural disaster, we spread the risk amongst all of us. This time-honoured contract was based on the idea that a) disaster strikes rarely enough that the costs are sustainable, and b) they can't be predicted. Neither of those assumptions are still valid.

A new study from the Munk School's Institute on Municipal Finance and Governance at the University of Toronto reports that in recent years the federal government's spending to reimburse provinces for a portion of their disaster relief and recovery costs more than doubled to $280 million a year and will likely triple again. Across the country, the last two decades have seen a dramatic increase in urban flood damage. Backed up sewers and extreme rainfall accounted for $20 billion alone in costs. The 2013 flood in Calgary cost $5 billion, making it the single most costly natural disaster in Canadian history. The reason is simple. Climate change is creating more extreme weather events, leading to more flooding, which is costing more and more money. And scientists predict it is only going to get worse.

And when it does, it should not be a surprise for anyone. There was extensive nation-wide flood plain mapping several decades ago, which unfortunately was not widely distributed and is hard to come by. But with modern satellite imaging and online mapping services, any homeowner or municipal official can determine if an area is at risk of flooding in a matter of minutes. There is almost no excuse for cities to not be taking preventatives measures, and for buyers to claim they had no idea there was a huge river next door.

Nonetheless, after the floodwaters recede this week all of those homeowners will most likely move back in. Cities will continue to develop more flood-prone lots. And federal and provincial taxpayers will continue to honour our archaic social contract and foot the bill.

Unless we make a few changes. First, let's begin to cut or even phase out the federal government's provincial disaster assistance funding for floods. Cities will never spend the money to build flood barriers if someone else is always going to bail them out. Provinces should also require municipalities to carry mandatory flood insurance. City councils in turn should require homeowners to do the same. If you want to drive a car, you need car insurance. If you want to own a house, you should need flood insurance. And, if you discover your insurance company is going to charge you tens of thousands of extra dollars for that river view bungalow, you may pause before buying it. Finally, realtors should be forced to disclose previous flood damage and future flood risk, and be held liable if they do not.

It's a new world. Our old social compacts need to be adjusted. If flooding is going to continue to get worse, and if homeowners and cities are aware of this in advance, there is no reason the rest of should continue to "pull together" and pick up your bill. You are free to pretend that teetering boulder isn't going to eventually crash down on your house, but the rest of us won't.

Scott Gilmore is a member of the Conservative Party, and married to a Liberal Cabinet member

(5)

Floodplain living isn't a luxury. It's a reality we have to deal with.

An Albertan who worked on flood recovery efforts in 2013 explains the problem with criticizing home owners for their 'river views'

Emma May

May 15, 2017 Macleans

The Bow River over flows its banks into the downtown core and residential areas in Calgary, Alberta June 22, 2013.

The heaviest floods in decades shut down the Canadian oil capital of Calgary on Friday, forcing the evacuations of tens of thousands of residents and shutting the Alberta city's downtown core. Some 1,300 troops were deployed to help with rescues and the mandatory evacuations that forced 100,000 people from their homes in Calgary and thousands more in the small towns surrounding the city. (Andy Clark / Reuters)

By the middle of July, in 2013, I had had enough of watching my friends and neighbours struggling to recover from a huge flood that affected people living near the Bow and Elbow Rivers. Families were displaced, emergency funds were running low, homes had been destroyed, and the government didn't seem to understand that people expected a plan that was more detailed than throwing a few dollars at folks.

I sent an email to this effect to my neighbours, and it went viral in my community; a week later, I was hosting a hot and muggy town hall with more than 800 flood victims. At that meeting, we formed the Calgary Rivers Community Action Group (CRCAG), and in true Alberta fashion, we decided we needed to manage our own recovery and figure out how it was we could stop our city from being devastated again. Our advocacy is ongoing: I wound up working in Jim Prentice's Premier's Office as a result, and the work has produced positive outcomes for many—outcomes that will save all of us a lot of money and a lot of grief.

So it's with dismay that I read Scott Gilmore's column "It it time we stopped paying for your river view," which repeats an offensive narrative that those of us who have lived through the flooding of our entire city centre have heard over and over again. *We don't want to pay for your pretty river view. You people who live by the river should know better.*

This narrative blames regular families across the country for the centuries-old development of some of our major centres, poor collective planning decisions, a lack of overland flood insurance in Canada, and a failure by multiple levels of government to address necessary mitigation measures. It also assumes people are fine being flooded and just want a government payout here and there.

This is wrong. And to publish this at a time when so many Canadians are traumatized is heartless.

Our homes were flooded in 2013, but they weren't all that was affected: at the same time, Calgary City Hall, the Saddledome, our underground transit system, the zoo, a large portion of the downtown core—they were all hit by the floods. You see, back in the late 1800s, Calgary was founded at the confluence of the Bow and the Elbow. Like most major cities around the world, the river was the lifeblood of the Calgary community; for well over 100 years, we built the city out from this river junction, though the heart of the commercial core of Calgary, and many of the city's historical neighbourhoods, was built on a floodplain.

Albertans aren't keen on asking for handouts: We look after each other, and we pull ourselves up by our bootstraps. Calgarians banded together and set about rebuilding, and only a handful of homeowners were offered buyouts. For many, there was not nearly enough, if any, insurance coverage; disaster relief paid pennies to the dollar. Everything people have worked for is often tied up in their home—it is an investment, your shelter, your community and your heart. It's been four years since that huge flood, but people here are still, in a way, in recovery mode.

At CRCAG we set about learning more about our flood risk, insurance (or lack thereof), disaster recovery programs and what could be done to prevent flooding. We didn't want to repeat the cycle of flood, repair, repeat. We want to make sure people are safe in their homes and protected from flooding where possible, or treated fairly if it isn't possible and are not blamed for flooding events.

What we learned scared and inspired us.

The risks were greater than what we had been led to believe. The insurance coverage available was minimal or prohibitively expensive—insurance is a business, and overland flood insurance was not even available to homeowners when the 2013 flood happened. When it was available, it was for commercial policies, not residential. That has changed, but companies are now offering residents coverage at tens of thousands of dollars a year. For many, it is an impossible expense.

Of course, one of the criteria for applying for Disaster Relief Funds is that insurance was not available. Is something that is technically available but beyond the reach of most homeowners actually really "available?" Or do you leave those who need help the most in the lurch?

Our research showed us that governments had known for decades what the risks of flooding to major centres were, but periods of drought and lack of interest in spending on preventative mitigation projects had left entire communities and cities at risk. We have old rotting infrastructure in many of our cities and towns across this country and sewage systems that can't handle the pressure they are under. It has been suggested that this situation exists because federal disaster relief offers cities an excuse not to build flood barriers, but we haven't actually seen enough of these incidents to make that assumption—and that is actually deeply cynical.

Yes, bad infrastructure and sewage systems are expensive, and are a huge problem. So we need to spend money on prevention.

We've learned that mitigation for both older and newer communities is possible—especially communities smack in the middle of the downtown core of one of Canada's economic engines. There is loud but limited opposition to proposed projects such as the Springbank Offstream Diversion Project, and while we wait for regulatory approvals, we hope that this year the snow melts slowly and the torrential rains don't come. We learned from places such as the

Netherlands and Winnipeg: You can build sustainable flood mitigation projects that will protect time and again and save billions in recovery. But it takes government will, and years of regulatory processes.

Different solutions are warranted for different situations. In undeveloped areas that are subject to flood risk, there should be no development. But that's no longer possible for communities where the fateful decision to locate to what we now understand to be high-risk areas was made, in many cases, a century or more ago. In those areas, it is better to build a big off-stream reservoir to protect an entire downtown core rather than spend tens of billions of dollars to move downtown. We can build berms and dykes to protect smaller communities. We can rethink how we protect and live with our watersheds to prevent further erosion, and how we manage all future development with a mind to flooding and water table issues.

Infrastructure is built for the benefit of whole communities. Roads, transit, bridges, tunnels, schools, hospitals, and major sporting and entertainment venues: we all pay for these things, and at times in our lives we use some of them more than others. It is time that we make the necessary investments in protecting our cities from flooding—and that has nothing to do with fantasies of wealthy folks sipping mint juleps, taking in their river view.

Ottawa, Montreal, Toronto and Calgary aren't going to be moved away from the water, and the damage to public property itself justifies the case for the mitigation measures. Although homeowners have an obligation to obtain adequate insurance, our experience has been that overland flood insurance is not widely available in Canada for a reasonable price. Imposing prohibitive costs on homeowners who already live in the heart of our largest cities is akin to de facto expropriation.

No one wants their home to flood or for their workplaces to be shuttered for months. No one wants to take disaster money. They just want it to not happen again. Stoking a divisive narrative that shames and blames Canadians for our collective poor planning is unfair and cruel.

Emma May is a director of the Calgary River Communities Action Group and the co-founder of Charles Real Estate.