Nottawasaga Valley Conservation Authority

Flood Contingency Plan 2023

A guide for municipalities, emergency services and other partners

Nottawasaga Valley
Conservation Authority

8195 8th Line
Utopia, ON, L0M 1T0

Tel: 705-424-1479

Fax: 705-424-2115

Email: admin@nvca.on.ca

Web: www.nvca.on.ca

Alternative Formats - If you require this document in a different format please contact NVCA at 705-424-1479 or admin@nvca.on.ca.

Contents

1.0 Introduction

The responsibility for dealing with flood contingency planning in Ontario is shared by municipalities, conservation authorities and the Ministry of Natural Resources of Forestry (MNRF) on behalf of the province. As with all emergencies, municipalities have the primary responsibility for the welfare of residents, and should incorporate flood emergency response into municipal emergency planning. The MNRF and the conservation authorities are primarily responsible for operating a forecasting and warning system, and the province may coordinate a response in support of municipal action.

The conservation authorities of the Greater Toronto Area (GTA) have developed a coordinated Flood Forecasting and Warning Service for the municipalities and residents within their collective Watersheds and the shoreline of Lake Ontario and Georgian Bay. The purpose of this service is to reduce risk to life and damage to property by providing local agencies and the public with notice, information and advice so that they can respond to potential flooding and flood emergencies.

Conservation authorities in the GTA include Conservation Halton (CH), Credit Valley Conservation (CVC), the Toronto and Region Conservation Authority (TRCA), the Lake Simcoe Region Conservation Authority (LSRCA), the Central Lake Ontario Conservation Authority (CLOCA), the Ganaraska Region Conservation Authority (GRCA), Kawartha Conservation (KRCA) and the Nottawasaga Valley Conservation Authority (NVCA).

Figure 1: Local Conservation Authorities

This Flood Contingency Plan is intended for all public officials and agency staff likely to play a role in flood warning, mitigation, or emergency relief. This version of the Flood Contingency Plan provides general information on the NVCA Flood Warning System, as well as specific information and contacts for all watershed municipalities.

2.0 Roles and Responsibilities of Agencies

2.1 Municipal Role

Municipalities have the primary responsibility and authority for response to flooding and flood emergencies, and also for the welfare of residents and protection of property. In order to fulfill this responsibility, municipalities should ensure that emergency plans are kept current and tested on a regular basis.

Upon receiving a Watershed Conditions Statement, Flood Watch or Flood Warning municipalities shall:

1. Notify appropriate municipal officials, departments and agencies in accordance with their municipal emergency plan.
2. Determine the appropriate response to a flood threat and, if warranted, deploy municipal resources to protect life and property.
3. If required, declare a flood emergency and implement their Emergency Procedures Plan.
4. Request provincial assistance under the *Emergency Management & Civil Protection Act* (2006) if municipal resources are inadequate to respond to the emergency.
5. Maintain liaison with conservation authority flood coordinators.

2.2 Conservation Authority Role

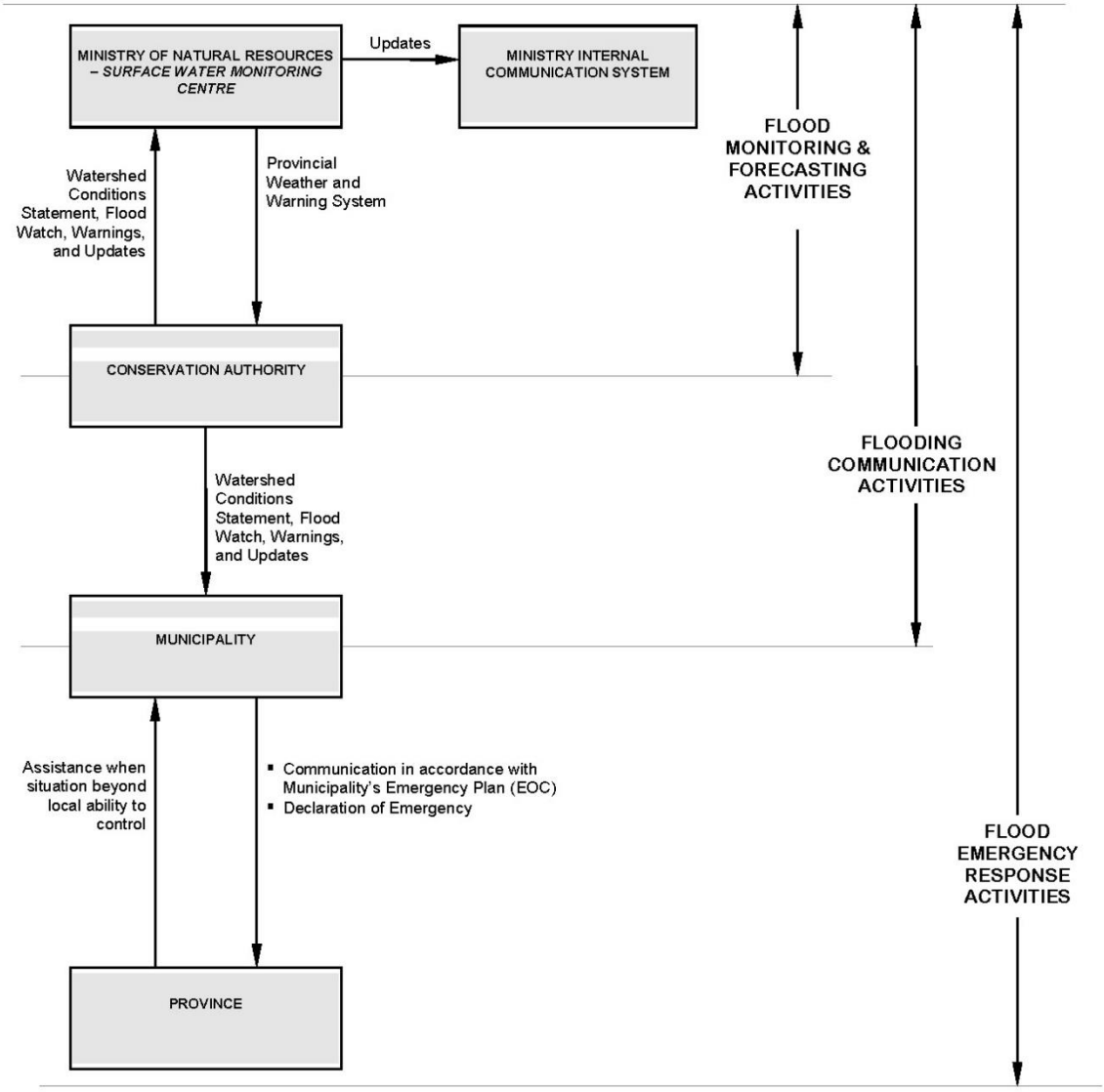
Conservation authorities have several areas of responsibility for flooding and flood emergencies:

1. Monitor watershed and weather conditions and operate a flood forecasting system in order to provide warning of anticipated or actual flood conditions.
2. Issue Watershed Conditions Statement, Flood Watch and Flood Warning bulletins to municipalities and other appropriate agencies to advise of potential flooding.
3. Operate conservation authority dams and flood control structures to reduce the effects of flooding.
4. Provide advice to municipalities in preventing or reducing the effects of flooding.
5. Maintain communications with municipalities and the Surface Water Monitoring Centre of the MNRF during a flood.

2.3 Provincial Role (Surface Water Monitoring Centre)

1. Operate and maintain a Provincial Warning System to alert conservation authorities of potential meteorological events that could create a flood hazard.
2. Maintain communications with MNRF’s district offices regarding the status of flood situations

2.4 Interaction of Agencies – Overview



3.0 Flood Bulletins

A flood is defined as a situation where water levels in a watercourse exceed the channel banks.

The Surface Water Monitoring Centre (SWMC) of the MNRF provides continual weather monitoring and forecasting, which is made available to conservation authorities as part of their flood monitoring system. The Centre also maintains the Provincial Warning System to alert conservation authorities of potential meteorological events that could create a flood hazard.

Each conservation authority monitors, on an ongoing basis, weather forecasts and watershed conditions, and uses this information to assess the potential for flooding. When spring melt or severe storms are anticipated, the conservation authority estimates the severity, location, and timing of possible flooding, and provides these forecasts to local agencies.

When conditions warrant, conservation authorities will communicate with local agencies using one of the following types of messages (Appendices A and B provide additional details).

3.1 Watershed Conditions Statement

A Watershed Conditions Statement is a general notice of weather conditions that could pose a risk to personal safety or which have the potential to lead to flooding. There are two types of Watershed Conditions Statements:

a. **Water Safety** - high flows, unsafe banks, melting ice or other factors could be dangerous for recreational users; flooding not expected.

b. **Flood Outlook** - early notice of the potential for flooding based on weather forecast of heavy rain, snowmelt, high wind or other conditions that could lead to high runoff, ice jams, shoreline flooding or erosion.

3.2 Flood Watch

A Flood Watch is defined as a notice of the potential for flooding to occur in specific watercourses and municipalities in the near future.

The Flood Watch is based upon information received by the conservation authority's weather monitoring systems, and is intended to provide notice to municipalities and emergency services that stream conditions and forecasted weather are expected to produce flooding. Municipalities should take measures to prepare for a possible emergency. Flood bulletins may be updated depending upon weather and runoff conditions, and will be followed by a notice of cancellation once the potential for flooding has passed.

The standard content of a Flood Watch includes:

- the date and time of issuance;
- identification of sender (conservation authority and person);
- recipient list;
- summary of weather forecast;
- description of potential flood magnitude (see Appendix A) and a general assessment of flooding implications, including specific sites and issues (e.g., ice jamming), if relevant;
- date and time of next update; and
- conservation authority contact for additional information (including adjacent conservation authorities when applicable).

3.3 Flood Warning

A Flood Warning is defined as a notice that flooding which could be damaging to human lives or property is imminent or occurring in specific watercourses or municipalities.

The Flood Warning is based upon information received by the conservation authority's weather monitoring systems, and is intended to provide notice to municipalities and emergency services that action is required on their part. Flood Warnings may be updated depending upon weather and runoff conditions, and will be followed by a notice of cancellation once the potential for flooding has passed.

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The standard content of a Flood Warning includes:

- the date and time of issuance;
- identification of sender (conservation authority and person);
- recipient list;
- summary of weather forecast;
- description of potential flood magnitude (see Appendix A) and a general assessment of flooding implications;
- specific information regarding the magnitude and timing of the forecasted flooding, and the locations of anticipated problem areas;
- date and time of next update; and
- conservation authority contact for additional information (including adjacent conservation authorities when applicable).

3.4 Lake Ontario & Georgian Bay Shoreline Hazard Warning

A Lake Ontario & Georgian Bay Shoreline Hazard Warning is defined as a notice that critical high-water levels and waves are imminent and/or occurring, which could result in shoreline flooding and/or erosion. This warning shall be issued to the municipalities and emergency services. The following table outlines the criteria used to determine critical high-water levels and wave heights.

Table 1: Critical Water Levels and Wave Heights for Lake Ontario & Georgian Bay

Section	Critical Water Levels (cm above chart datum, IGLD, 1985)	Wave height (metres)
Niagara Region – Stoney Creek	**160 cm**	**>1.5 m**
Stoney Creek – Burlington	**130 cm**	**>2.0 m**
Oakville – Port Credit	**170 cm**	**>2.0 m**
Whitby – Bowmanville	**170 cm**	**>2.0 m**
Port Hope	**160 cm**	**>2.0 m**
Port Hope – Presqu'ile	**170 cm**	**>2.0 m**
Prince Edward County	**170 cm**	**>2.0 m**
Georgian Bay –Collingwood / Wasaga Beach	**130 cm**	**>1.0m**

Notes:

- Shoreline Hazard Warnings for the Hamilton/Burlington Beach strip of Lake Ontario are issued if either critical water levels or wave criteria are met.
- Wave criteria apply only when Lake Ontario's calm water level is 90 cm above chart datum, IGLD 1985.
- IGLD (International Great Lakes Datum) is the elevation reference system used to define water levels within the Great Lakes - St. Lawrence River system because of movement of the earth's crust. The reference system is adjusted every 25-35 years.

Forecasted wind velocities are also used to predict potential shoreline flooding/erosion problems. The following chart displays the various terminologies and units usually used to describe wind velocity.

Table 2: Wind Velocity Descriptions

Wind Speed	knots (kts)	miles/hour (mph)	kilometres/hour (km/h)
Light	1-14	1-16	1-26
Moderate	15-19	17-22	28-35
Strong	20-33	34-47	39-54
Gale	34-47	39-54	63-87
Storm	48-63	55-73	89-117

The following terms are also used when describing wind velocities and their influence on critical wave heights.

- **Wind Direction** - the direction from which the wind is blowing
- **Wind Setup** - the vertical rise above normal water level on the leeward site of a body of water caused by wind stresses on the surface of the water
- **Leeward** - the direction toward which the wind is blowing, the direction toward which waves are travelling
- **Wave Height** - the amplitude measured from wave trough to wave crest, for offshore areas, outside the breaker line

3.5 Coordinating Issuance of Flood Bulletins

Flood bulletins are issued by phone, fax, or electronic transmission to designated individuals within municipalities and other local agencies. These individuals, in turn, are responsible for relaying the bulletin to other relevant individuals and departments within their organizations, and activating their role as defined by this Flood Contingency Plan and their organization's Emergency Response Plan.

To streamline and coordinate communication with local agencies, a principle conservation authority has been assigned for each municipality. The principle conservation authority is responsible for issuing Watershed Conditions Statements, Flood Watches and Flood Warnings. Watershed specific information will be issued by the local conservation authority having actual jurisdiction over an affected area.

Municipalities, local agencies, and residents requiring information or assistance should contact the local conservation authority having jurisdiction for the area of interest. See Appendix C for a list of the principal conservation authorities for each municipality in the GTA.

4.0 Flood Response Procedures

During an actual flood, the primary responsibility for the welfare of residents and protection of property rests with the municipality. Upon receiving a flood message, municipalities should monitor their local conditions and determine the appropriate action.

During a flood, conservation authorities will continue to provide updated information as well as technical advice on flood mitigation.

During significant floods, municipalities should implement their Emergency Plan.

Where a flood emergency is beyond the capacity of a municipality, provincial assistance can be requested in accordance with the municipality's Emergency Plan.

During the emergency, the conservation authority representative will continue to advise the Surface Water Monitoring Centre of the MNRF of the status of the situation. The Centre will be responsible for updating and relaying information related to the emergency to the Ministry's district offices.

4.1 Procedures for Communications and Operations Related to Regional/Municipal Emergency Operation Centres

Through its *Emergency Plans Act* legislation, the Province of Ontario requires all municipalities (as the lead agency defined in terms of responding to an emergency) to have valid emergency plans and procedures in place. To accomplish this, each municipality will have plans, procedures and staffing dedicated to this activity. One component of this requirement is the need to have a defined Emergency Operations Centre (EOC) where municipal activities can be undertaken in the event of an emergency. Within most municipalities, the risk of flooding has or will be defined as one of the types of risks that would likely occur. As such, there is a need to define how conservation authorities will continue to provide advice and information to municipalities to allow for effective emergency management during flooding events.

Under normal flooding operations where there is not a defined need to enact the municipal emergency response process, each conservation authority will provide information as requested by their local municipalities. However, in the event of a major flooding event, which would create the situation where the municipal emergency plans would require activation, the conservation authorities have recognized an issue related to providing adequate staff support to this process. To address this issue, the following procedure has been defined. (To ensure the effectiveness of this procedure, each conservation authority should develop a working relationship with the municipal emergency response officials for each area where they are the lead authority.)

Under the protocols related to principal conservation authorities as defined within this document (Appendix C), a key role of the lead conservation authority relates to providing staff to co-ordinate flood related information and advice to municipal and/or regional EOCs to facilitate their flood response activities.

As several conservation authorities may manage watercourses within the jurisdiction of an individual municipal and/or regional government, the lead conservation authority staff assigned to attend the EOC will be required to provide advice on watersheds which would not be within their normal watershed area. To ensure that this system of information co-ordination and sharing proceeds in a seamless manor, the following procedures are to be in effect during those occurrences.

1. The lead conservation authority will be responsible to co-ordinate communications with their assigned municipal and/or regional emergency preparedness staff. They will discuss the need to begin the emergency response process and whether a need exists for the municipal and/or regional EOC group to assemble. The decision to assemble the Emergency Control Group is determined by the municipal and/or regional emergency preparedness staff, and will be based upon the degree of flood threat that may be affecting the municipality and/or region.
2. The lead conservation authority will assemble and forward of all appropriate conservation authority (both principal and secondary) communications (flood messages) to municipal and/or regional emergency staff and when opened, to the municipal and/or regional EOC.
3. The lead conservation authority will co-ordinate with surrounding secondary conservation authorities to develop and schedule telephone conferences or discussions to ascertain specific flood related information as well as updated weather forecast information.
4. The lead conservation authority will consolidate flooding and weather information into a briefing note which will be forwarded to their representative at the municipal and/or regional EOC.
5. If, because of the extent of the flood event, the regional EOC is opened, the lead conservation authority staff will participate at the regional EOC and through it assist in communicating to the municipal EOCs. Assigned staff from other conservation authorities may, depending on staff resources, still participate at the municipal EOCs.
6. All conservation authorities will ensure that their internal operations manuals and procedures reflect the requirements outlined above.

4.2 Sources for Sandbags

The NVCA does not warrant or guarantee the services of these suppliers. The unit prices quoted were valid April 2020.

Company	Product	Availability
Burtex Inc. 66 Bartor Road Weston, ON M9M 2G5 Telephone: (416) 745-2711 1-800-268-0908 www.burtexburlap.com	Burlap: $1.11/bag (18x30 inch) 1000 per bundle Poly: 58¢/bag (14x26 inch w/ tie) Poly: 63¢/bag (20x30 inch) 1000 per bundle	Daytime After Hours Contact: Art Saunders Cell: 416-315-2396 Shipping Extra
Lloyd Bag Co. Ltd. 114 St. Clair St., P.O. Box 208 Chatham, Ontario, N7M 5K3 Telephone: (519) 352-9300 1-800-549-2247 Fax: 1-519-352-3413 www.lloydbag.com	Burlap: ?/bag 1000 per bundle Poly: 38.1¢/bag 1000 per bundle Under 1000 bags = 40¢/bag	After Hours – Leave Message Minimum order to ship is 1000 Burlap bags must be manufactured, contact mark@lloydbag.com or lauren@lloydbag.com to order Shipping Extra
Polytarp Product 350 Wildcat Road North York, Ontario, M3J 2N5 Telephone: (416) 633-2231 1-800-606-2231 www.polytarp.com	Poly: 24.64¢/bag (17x28 inch, black) 250 per bundle Poly: 31¢/bag (20x30 inch, black) 200 per bundle	Daytime Prearranged Number for after hours Free Delivery on 25 bundles (1 skid), 1 skid min. order Same day shipping
GX Packaging PO Box #60 4159 Breen Rd. Putnam, Ontario, N0L 2B0 Tel: (519) 686-1669 Toll Free: (866) 857-7143 Fax: (519) 686-1676 Email: inquiries@gxpackaging.ca Gxpackaging.ca	Standard (uv treated, smaller) construction sandbag: 35¢/bag/1000 bundle Flood sandbags (18x27 inch, non uv treated) 24¢/bag/1000 bundle	Ramon Metz ramon@gxpackaging.ca After hours cell: 519-635-1728 Shipping Extra, free pickup

4.3 Using Sandbags for Temporary Flood Protection

Temporary Flood Protection Using Sandbag Dikes and Walls
A guide by the Nottawasaga Valley Conservation Authority

The efficiency of undertaking temporary flood protection can be increased by avoiding misunderstandings about the process. You may think sandbagging is a mindless process, but it requires planning and organization to be effective. Time, weather conditions, hours of darkness, and your available resources can all impact your success.

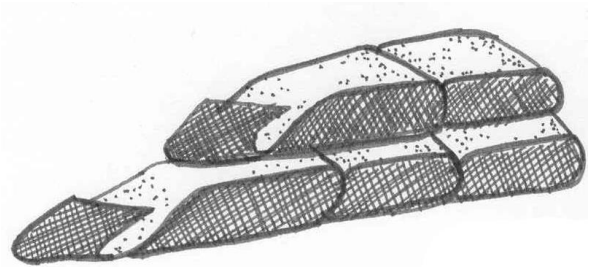
Properly filled and placed, sandbags can act as a barrier to divert moving water around structures, divert flow, hold back rising water and shore up permanent protection systems.

How to Fill and Lap Sandbags

Sandbags for this purpose are a specific size: 13” x 34”. This small size economizes on sand and makes the bags easier to handle and put in place.

To fil and lap sandbags:

- Clean off all snow, ice and debris and try to strip sod before placing bottom layer.
- Dig a “key” trench 1 sack deep by 2 sacks wide.
- Fill bags ½ to 2/3 full (no more than 30lbs).
- When filling, you should work in pairs with one person holding the bag while the other shovels (wearing safety equipment such as glasses and steel-toed boots is preferable).
- Tying of bags is not recommended.
- Loosely fold back the open end; the bag on top will seal the opening. This also allows the sand to settle for best results.
- Face the “butt” of the bag upstream.
- Tamp bags in place to prevent holes and to prepare a flat surface for the next bags.
- Stagger the bags so that the joints alternate like bricks.
- Alternate the directions of the bags “bottom layer lengthwise, next layer crosswise (for dikes).
- Complete each layer before starting the next.



Fill bags half to two-thirds full

Site Selection

Select the location for the wall or dike by taking advantage of natural land features that keep it short and as low as possible. Avoid obstructions that would weaken the dike. Do not build against a building wall. Leave room (6 to 8 feet or more) between the dike and any buildings for maneuvering and for pumping out any water that leaks through the wall.

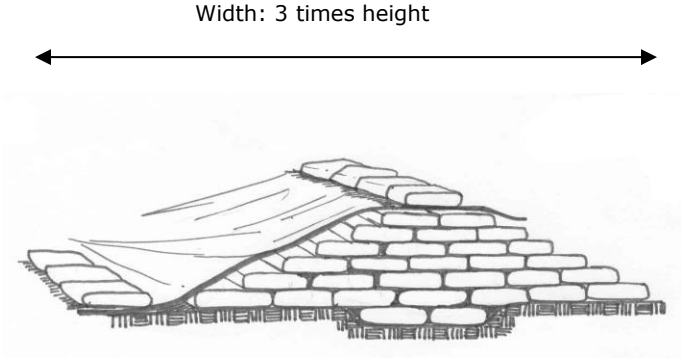
Before each flood event, have a practice run, plan your strategy, find your resources and test your construction.

Short Sandbag Walls

- For walls four bags high or less, a simple vertical stack can work. Support the wall with "clusters" of bags every 5 feet.

Sandbag Levees

- For protection from water deeper than 2 feet, the stack should form a levee or pyramidal shape.
- Do not use sandbags as the sole erosion protection or where they would be subject to wave attack.
- The base of the levee should be three times as wide as the dike will be high.
- If possible, do not construct bearing directly against a home, leave room for working and for pumping out leakage.
- To increase the height of a levee, add bags to the inside and the top.
- A plastic membrane (e.g., 6 mil plastic) on the water-side can be used to reduce leakage. It should be loosely placed so the weight of the water does not rip it, and can be anchored into a trench, sealed with sandbags or lapped under the dike. (Do not walk on or puncture after it is in place.)
- Use a continuous roll, or leave plenty of overlap between rolls.
- Use drain tile or other suitable piping to direct downspouts over the wall and not into the area between the wall and the building.



Bags Required for 100 Lineal Feet of Dike

- 600-800 bags for 1-foot dike (10-13 cubic yards sand)
- 2,000 bags for 2-foot dike (23-33 cubic yards sand)
- 3,400 bags for 3-foot dike (37-57 cubic yards sand)
- 10,000 bags for 6-foot dike (167 cubic yards sand)

Large Scale Operations

- For large scale operations, filling and transporting of bags can be expedited by bag holding racks, funnels, or high-speed sandbagging equipment, however this type of specialized equipment is not always available during an emergency.

Safety

- Work safely, lift correctly and set up a "line" for passing bags.
- Avoid twisting your back while filling bags.
- Wear safety glasses and boots. (Slicing off a toe would add to your emergency situation!)
- Have plenty of fresh water on hand. Bottled water is suggested if using well water, as your well supply might become contaminated during the flood event.

Have an evacuation plan. Decide in advance when you will abandon a flood fight.

This guide to using sandbags was prepared by the Nottawasaga Valley Conservation Authority. For further information contact Engineering and Technical Services at NVCA at (705) 424-1479 or www.nvca.on.ca

The guide was adapted from the following sources: Essex Region Conservation Authority, Manitoba Emergency Measures Organization, Safety Central, North Dakota State University of Agriculture and Applied Science, Emergency Management Branch – City of Kansas, US Army Corp of Engineers, Sacramento County Department of Water Resources, LSU AgCenter.

Disclaimer: This document provides only basic information about temporary flood protection. Sandbags do not guarantee protection or water-tightness and other measures may also be required as backup in case of failure, or for protection from other threats such as sewer backup.

Appendix A: Flood and Weather Terminology

A.1 Standardized Descriptions of Flood Magnitude

In order to improve the understanding of flood messages sent by the various conservation authorities, all Watershed Conditions Statements, Flood Watches and Flood Warnings should include the following terminology to describe the magnitude of anticipated flooding.

- **No Flooding**
  Water levels remain within channel banks.
- **Nuisance Flooding**
  Flooding of low-lying lands. However, road access remains available and no structures will be flooded.
- **Minor Flooding**
  Potential for some structural flooding and sections of road access may be impassable. No evacuation is required.
- **Major Flooding**
  Potential for significant basement flooding, some first-floor flooding, and significant road access cuts. Evacuation possibly required.
- **Severe Flooding**
  Potential for many structures to be flooded, major disruption of roads and services. Evacuation is required due to risk to life and major damages to residential, industrial, commercial and/or agricultural sites. The event may produce negative environmental impacts caused by spills of hazardous substances such as sewage, oils, chemicals, etc., that pose a threat to public safety and/or to the eco-system.

A.2 Weather Forecast Terminology and Definitions

A key component of conservation authorities' flood forecasting systems is the ability to interpret weather forecasts. To facilitate this, a report has been compiled containing explanations of the most commonly used weather forecasting terms.

Since the flood warning systems operator is primarily concerned with flooding, this section will only cover those terms relating to precipitation.

Terms such as *drizzle*, *rain*, or *snow* are used to indicate the occurrence of precipitation. The various forms of precipitation are defined as follows:

- **Drizzle**
  Fairly uniform precipitation composed exclusively of fine drops with diameters of less than 0.5 mm, falling very close together. Drizzle appears to flow while following air currents.
- **Rain**
  Precipitation, in the form of drops larger than 0.5 mm.
- **Snow**
  Precipitation of snow crystals, predominantly in the form of six-pointed stars.

These terms may be accompanied by qualifying words and numbers to provide further detail regarding the intensity, amount and proximity of the precipitation. Qualifiers may be used in various combinations to describe weather phenomena.

The intensity qualifiers that are used are: *light*, *moderate*, or *heavy*, in accordance with the following charts.

Table A.1: Intensity of Rain Based on Rate of Fall

Intensity	Criteria
Light	**Up to 2.5 mm per hour; maximum 0.25 mm in 6 minutes.**
Moderate	**2.6 mm to 7.5 mm per hour; more than 0.75 mm in 6 minutes.**
Heavy	**More than 7.6 mm per hour; more than 0.75 mm in 6 minutes.**

Table A.2: Estimating Intensity of Rain

Intensity	Criteria
Light	**From scattered drops that, regardless of duration, do not completely wet an exposed surface, up to a condition where individual drops are easily seen.**
Moderate	**Individual drops are not clearly identifiable; spray is observable just above pavements and other hard surfaces.**
Heavy	**Rain seemingly falls in sheets; individual drops are not identifiable; heavy spray to heights of several inches is observed over hard surfaces.**

It is often difficult to accurately forecast the amount of rain expected, due to the subjective nature of computer model interpretation, and the large areas for which computer models are applied.

The actual amounts of precipitation received are dependent on how the system reacts to the conditions and topography as it crosses your specific location. The presence of water bodies in particular will cause the weather to differ over relatively short distances.

For example, when a forecaster predicts that south central Ontario will receive 25 mm today, this ***does not*** mean that your specific area will receive exactly 25 mm, or even a maximum quantity of 25 mm. What this ***does*** mean is that, generally, over the area of south central Ontario, and given that current conditions remain the same, 25 mm are *likely* to fall over your location.

When a range is given, such as 10-20 mm, this implies a degree of uncertainty on the part of the forecasters with respect to the exact tracking of a system. The various computer models used may not be in agreement with regards to the estimated rainfall. Therefore, the forecaster is covering each possibility by using a range.

The terms *showers* and *thunderstorms* are used to further qualify the type of precipitation and weather phenomena that are expected.

- **Showers**
  Precipitation that stops and starts again abruptly, changes intensity rapidly, and is usually accompanied by rapid changes in the appearance of the sky.
- **Thunderstorm**
  A local storm produced by cumulonimbus clouds, and is accompanied by lightning and/or thunder.

The *probability of precipitation* is another qualifier frequently used in forecasts. The probability of precipitation represents the likelihood of the occurrence of measurable precipitation at any point in the region. Thus, a probability of 30 per cent means that out of 100 similar situations, precipitation should occur 30 times.

Rain, snow, periods of rain, or intermittent rain or snow will normally appear with probabilities of 90 or 100 per cent, and indicate that a major weather system will affect the region. The amount of precipitation may vary.

The terms *showers*, *flurries* or *occasional rain* (or snow) imply that the precipitation will not be continuous, and any point in the region is likely to get a measurable amount. These terms are normally combined with probabilities in the 60 to 80 per cent range.

The term *scattered* is used to qualify the terms showers and flurries when only a portion of the region is expected to get measurable precipitation. The probabilities associated with *scattered showers* are in the 30 to 50 per cent range.

When *isolated thunderstorms* are forecast, a probability of precipitation of 10 or 20 per cent is normally applied. Only a small part of the region is likely to get rain, but those areas that do are likely to get intense heavy rain for short periods. Thunderstorms may occur during a continuous rain event. Hail, strong winds, and even tornadoes can result from severe thunderstorms.

A.3 Weather Terminology in Flood Bulletins

When issuing a flood message, the conservation authority issuing the message cannot reasonably expect the client to remember all these definitions or expect the client to locate these definitions quickly in an emergency situation.

Therefore, it is important to use enough detail in the flood messages to make any technical terms self-explanatory. For example, the term “heavy rainfall” should be accompanied by the estimated quantity as well as the estimated duration (i.e., over the next 12 hours). A sufficient number of qualifiers should be used to make the message clear to the intended reader.

Appendix B: Sample Flood Messages

B.1 Sample Watershed Conditions Statements

Nottawasaga Valley Conservation Authority (NVCA)
8195 8th Line, Utopia, Ontario, L0M 1T0
Tel: 705-424-1479 – Fax: 705-424-2115 - www.nvca.on.ca

Watershed Condition Statement: Water Safety

Flood Potential: Low

Ice Jam Potential: Moderate

Issued to: local municipalities and school boards, local conservation authorities, emergency response agencies, health unit, media

Date: February 19, 2016 (2:00 PM)

The Nottawasaga Valley Conservation Authority advises that warm temperatures and rain over the next 24 hours will cause our snowpack to melt and increase flows in area watercourses. The public and especially children are advised to stay away from all area water bodies as unstable ice cover, slippery banks and fast flowing watercourses will result in dangerous conditions.

Current weather forecasts are calling for rain accumulation of 10 mm to 15 mm and above freezing temperatures from Friday into Sunday. Melting snow and runoff may result in increases in stream flows. No major flooding is anticipated, however local conditions may vary. At this time of year there is always the potential for localized flooding and ice jams.

The Nottawasaga Valley Conservation Authority continues to monitor river and stream conditions and will issue additional messages as conditions warrant. This statement will be in effect until Monday, February 22, 2016.

For additional information, please call 705-424-1479 and select option "1" for the flood information line or check our website at: www.nvca.on.ca

Sheri Steiginga
Flood Duty Officer

A **Watershed Condition Statement** is a general notice of weather conditions that could pose a risk to personal safety or which have the potential to lead to flooding. A **Water Safety** message indicates that high flows, unsafe banks, melting ice or other factors could be dangerous for recreational users such as anglers, canoeists, hikers, children, pets, etc. Flooding is not expected.

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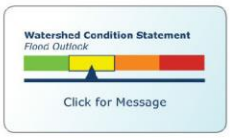
8195 8th Line, Utopia, Ontario, L0M 1T0
Tel: 705-424-1479 – Fax: 705-424-2115 - www.nvca.on.ca

Watershed Condition Statement: Flood Outlook



Flood Potential: Moderate

Ice Jam Potential: High

Issued to: local municipalities and school boards, local conservation authorities, emergency response agencies, health unit, media

Date: March 20, 2015 (11:00 AM)

The Nottawasaga Valley Conservation Authority advises that the Water Safety Statement issued Tuesday, March 17, 2015, is upgraded to a Flood Outlook Statement for the Nottawasaga Valley watershed.

Today's temperature is forecasted to reach 9 degrees Celsius, and remain above zero overnight. This warm weather will cause significant snowmelt runoff. Additionally, ice cover will continue to weaken and break up. Our rivers and streams are expected to rise to near bank-full water levels, and ice jams and localized flooding may occur. No major flooding is anticipated.

Hazardous conditions exist around all waterbodies, as there is a high risk of life-threatening injury if a person falls into the extremely cold water. The public and especially children are advised to stay away from all waterbodies.

The Nottawasaga Valley Conservation Authority continues to monitor river and stream conditions and will issue additional messages as conditions warrant. This Flood Outlook Statement will be in effect until 4:30 p.m., Tuesday, March 24, 2015.

For additional information, please call 705-424-1479 and select option "1" for the flood information line or check our website at: *www.nvca.on.ca*

Stephanie Durocher
Flood Program Coordinator

A **Watershed Condition Statement** is a general notice of weather conditions that could pose a risk to personal safety or which have the potential to lead to flooding. A **Flood Outlook** message is an early notice of the potential for flooding based on weather forecasts calling for heavy rain, snow melt, high wind or conditions that could lead to high runoff, cause ice jams, lakeshore flooding or erosion.

B.2 Sample Flood Watch Statement

Nottawasaga Valley Conservation Authority (NVCA)
8195 8th Line, Utopia, Ontario, L0M 1T0
Tel: 705-424-1479 – Fax: 705-424-2115 - www.nvca.on.ca

Flood Watch

Flood Potential: Low

Ice Jam Potential: Low

Issued to: local municipalities and school boards, local conservation authorities, emergency response agencies, health unit, media

Date: April 28, 2014 (3:00 PM)

The Nottawasaga Valley Conservation Authority advises that the Flood Watch issued April 3, 2014 is being continued.

Current weather forecasts for tonight are predicting 10-20 mm of rainfall and daily highs above freezing all week. This rain combined with already high flows and remaining snow could cause water levels to exceed bank full conditions and result in minor flooding. The river/lake ice is softening and the risk of ice break up and ice jamming is high. Major flooding is not anticipated.

Municipalities, emergency services and individual landowners in flood-prone areas should be on alert.

Unstable ice, high water levels and cold, fast flowing water in rivers and streams will create dangerous conditions. The public and especially children are advised to stay away from all area water bodies including ice covered lakes and rivers.

The Nottawasaga Valley Conservation Authority continues to monitor river and stream conditions and will issue additional messages as conditions warrant. This Flood Watch will be in effect until 4:30 PM April 30, 2014.

For additional information, please call 705-424-1479 and select option "1" for the flood information line or check our website at: www.nvca.on.ca

Stephanie Durocher

Flood Warning Coordinator

A **Flood Watch** is a notice that the potential for flooding in the near future exists in specific watercourses and municipalities. Flood watches may be issued when stream conditions and weather are expected to produce flooding.

B.3 Sample Flood Warning

Nottawasaga Valley Conservation Authority (NVCA)
8195 8th Line, Utopia, Ontario, L0M 1T0
Tel: 705-424-1479 – Fax: 705-424-2115 - www.nvca.on.ca

Flood Warning

Flood Potential: Low

Ice Jam Potential: Low

Issued to: local municipalities and school boards, local conservation authorities, emergency response agencies, health unit, media

Date: April 28, 2014 (3:00 PM)

The Nottawasaga Valley Conservation Authority advises....

Stream flows remain high, and hazardous conditions still exist around all watercourses. Flooding in low-lying and flood prone areas could occur. The public and especially children are advised to stay away from all water bodies.

The forecast calls for 20-30 mm of rain over the next 5 days. All watercourses are still running high, and the forecasted rain will cause unsafe conditions to continue. The public and especially children are advised to stay away from all area water bodies. Flooding in low-lying and flood prone areas is possible, however no major flooding is anticipated.

The Nottawasaga Valley Conservation Authority continues to monitor river and stream conditions and will issue additional messages as conditions warrant. This Water Safety Statement will be in effect until 4:30 p.m., Monday, May 5, 2014.

For additional information, please call 705-424-1479 and select option "1" for the flood information line or check our website at: *www.nvca.on.ca*

Stephanie Durocher
Flood Program Coordinator

A **Flood Warning** is a notice that flooding which could be damaging to human lives or property is imminent or occurring in specific watercourses or municipalities.

Appendix C: Principal Conservation Authorities

Key to chart below

Key	Description
P	**Principal conservation authority contact for alert/advisory messages and contact list updates**
Pc	**Principal Conservation Authority Contact for Contact List Updates**
Pa	**Principal Conservation Authority Contact for Alert/Advisory Messages**
S	**Conservation Authority which shares a portion of a Municipality**
CH	**Conservation Halton**
CLOCA	**Central Lake Ontario Conservation Authority**
CVC	**Credit Valley Conservation**
GRCA	**Ganaraska Region Conservation Authority**
LSRCA	**Lake Simcoe Region Conservation Authority**
NVCA	**Nottawasaga Valley Conservation Authority**
TRCA	**Toronto and Region Conservation Authority**

Conservation Authorities - Municipal Contact List

Municipality	CH	NVCA	CVC	TRCA	LSRCA	CLOCA	GRCA
DUFFERIN COUNTY			P				
Town of Orangeville			P				
Township of East Garafraxa			P				
Township of Mono		P	S	S			
Township of Mulmur		P					
Township of Melancthon		P					
Township of Amaranth		P					
Town of Shelburne		P					
GREY COUNTY							
Municipality of Grey-Highlands		P					
Town of the Blue Mountains		P					
DURHAM REGION				S	S	P	S
Town of Pickering				P		S	
Town of Ajax				P		S	
Township of Brock					P		
Township of Uxbridge				S	P	S	
Township of Scugog					P	S	
Town of Whitby						P	

Municipality	CH	NVCA	CVC	TRCA	LSRCA	CLOCA	GRCA
City of Oshawa						P	
Municipality of Clarington						P	S
HALTON REGION	P		S				
City of Burlington	P						
Town of Halton Hills	S		P				
Town of Milton	P		S				
Town of Oakville	P						
CITY OF HAMILTON	P						
NORTHUMBERLAND COUNTY							P
Township of Hope							P
Town of Port Hope							P
Town of Cobourg							P
Township of Hamilton							P
Township of Haldimand							P
Township of Millbrook North Monaghan							P
PEEL REGION			P	S			
City of Mississauga	S		P	S			
City of Brampton			P	S			
Town of Caledon			P	S	S		
SIMCOE COUNTY		S			P		
Township of Adjala-Tosorontio		P		S			
Town of Innisfil		S			P		
Town of New Tecumseth		P			S		
Town of Bradford West Gwillimbury		S			P		
Township of Oro-Medonte		P			S		
Township of Ramara					P		
Township of Springwater		P					
Township of Clearview		P					
Town of Wasaga Beach		P					
Town of Collingwood		P					
Township of Essa		P					
CITY OF BARRIE		S			P		

Municipality	CH	NVCA	CVC	TRCA	LSRCA	CLOCA	GRCA
CITY OF TORONTO				P			
CITY OF KAWARTHA LAKES					P		
WELLINGTON COUNTY	S		P				
Township of Puslinch	P						
Town of Erin			P				
YORK REGION				P	S		
Town of Markham				P			
City of Vaughan				P			
Town of Richmond Hill				P	S		
Town of Whitechurch/Stouffville				P	S		
Town of Georgina					P		
Township of King				S	P		
Town of Aurora					P		
Town of Newmarket					P		
Town of East Gwillimbury					P		

Appendix D: Contact Lists

<u>Note:</u> Residential numbers listed in Appendix D are CONFIDENTIAL and should only be used in an emergency. Please contact the Flood Warning Coordinators for non-emergency flood reporting and enquiries.

D.1 Conservation Authorities

D.1.1 Nottawasaga Valley Conservation Authority

This section provides a brief outline of the contacts within NVCA who have designated responsibilities in the event of a flood or flood emergency.

Contact Name	Title	Phone	Cellular	Residence
Mark Hartley mhartley@nvca.on.ca	Flood Warning Coordinator #1	(705) 424-1479 Ext 247	(705) 796-7548	
Taryn Arsenault tarsenault@nvca.on.ca	Flood Warning Coordinator #2	(705) 424-1479 Ext 267	705-333-9939	705-333-5314
Chris Hibberd c.hibberd@nvca.on.ca	Flood Warning Coordinator #3	(705) 424-1479 Ext 229	(705) 309-0410	(705) 792-0985

The NVCA Flood Forecast Emergency Operation Centre is located at:

Tiffin Centre for Conservation

8195 Line 8, Essa Township

Utopia, Ontario, L0M 1T0

Please note - The contact lists in Appendix D are removed from the web version of this document for confidentiality reasons. For flooding emergencies, call 911. For non-urgent flooding concerns, call your municipality.

Flood Warning Staff Responsibilities

Flood Warning Coordinator's Responsibilities

During a flood emergency, the flood warning coordinator will set up a base of operation at the Tiffin Centre for Conservation. The flood warning coordinator will direct the operation from the Utopia office during flooding emergencies and will liaise with the following:

- the local response coordinators at the district office of the MNRF,
- the CAO of the NVCA,
- the Chair and/ or Vice Chair of the NVCA,
- the flood emergency coordinator of each municipality,
- NVCA flood patrol officers,
- news media

The flood warning coordinator will advise the local response coordinator, when municipal resources have been fully committed, of the need for additional resources and matters related to the declaration of provincial emergency. The flood warning coordinator will be assisted by staff flood patrol officers and a designated telephone operator.

Flood Patrol Officers' Responsibilities

During an emergency situation, supervisory and technical staff members having a detailed knowledge of certain watercourses will be assigned to specific areas to assess flood situations and will report problems or possible problem areas to the base of operation by two-way radio or telephone.

Observation and water level measurement using pre-established benchmarks of known flood vulnerable areas will be of prime importance.

Each patrol will report to the base of operation at half-hour intervals.

Each patrol will obtain and relay other observations and information as required.

Note: Each patrol vehicle shall be equipped with a flood patrol kit (amber light, flashlight, spare batteries, spotlight, notebook, survey marking paint, flares, safety vest, NVCA provided camera, throw rope, phone (sign out), lifejacket, weighted measuring tape, flood patrol area map and patrol instructions). This equipment will be available from the EOC at the Tiffin Centre.

Telephone Operator's Responsibilities

One operator will be required to:

- Assist the flood warning coordinator in contacting the municipalities in the watershed during a flood warning situation.
- The operator will receive calls from municipal departments, police units, and the general public regarding individual problem areas. This information is to be directed to the flood warning coordinator and logged. Dates and times of incoming and outgoing calls are to be logged.
- Direct incoming calls from the news media to the designated communications staff member.

Appendix E: Distribution List

The following municipalities and agencies receive copies of the Flood Contingency Plan. The plan is circulated electronically as a pdf. Alternative formats are available from the NVCA.

- Simcoe, County of (Manager of Emergency Services)
- Dufferin, County of
- Grey, County of
- Adjala-Tosorontio
- Amaranth, Township of
- Bradford West Gwillimbury, Town of
- Blue Mountains, Town of
- Barrie, City of
- Collingwood, Town of
- Clearview, Township of
- Essa, Township of
- Grey Highlands, Municipality of
- Innisfil, Town of
- Mulmur, Township of
- Mono, Town of
- Melancthon, Township of
- New Tecumseth, Town of
- Oro-Medonte, Township of
- Shelburne, Town of
- Springwater, Township of
- Wasaga Beach, Town of
- Provincial Emergency Response Coordinator
- EMO Community Officer
- MNR District Office, Midhurst
- MNR SWMC, Peterborough
- OPP, Beeton
- County of Simcoe Paramedic Services

Appendix F: Flood Damage Centres

Flood Damage Centres are those areas within the watershed that are known to be susceptible to damages during flood situations. As a result, these areas are observed on a continuous basis to evaluate the extent of damage that occurs under various degrees of flooding.

APPENDIX F: NVCA Flood Patrol Stations

South West (Amaranth/Mono/Adjala Tosorontio/Shelburne)

	Site	Lot	Conc	Municipality	Watercourse	Nearest Road or Intersection	Description	Measure Level	Comments
SW1	Rosie Trailer Park	26	6	Adjala-Tos	Sheldon Creek	Hwy 50 South of 30th Sideroad	Campground floods		
SW2	Concession 5	22	3	Adjala-Tos	Nottawasaga	Concession Road 5 South of 25th Sideroad	Campground	YES	From bridge deck
SW3	River Road	22	3	Adjala-Tos	Nottawasaga	Small Lane - Concession Road 4 (South of 25th Sideroad)		YES	From bridge deck
SW4	Concession 2	15	2	Adjala-Tos	Nottawasaga	Concession Road 2 North of Hockley Road	Cottages, roads		
SW5	Village of Hockley	14	1	Adjala-Tos	Nottawasaga	Mono-Adjala Townline North of Hockley Rd	Stream gauge		May be req'd to check gauge
SW6	County Road 18 (Airport Road)	12	7	Mono	Nottawasaga	County Road 18 at Hockley Road	Cottages		
SW7	Glen Cross	10	9	Mono	Nottawasaga	3rd Line EHS at Hockley Road	1st bridge north of Hockley Road		
SW8	Mono Centre Office	16	2	Mono	Nottawasaga	County Road 8 between 1st Line and 2nd Line	Weather Station		Mounted to public works bld
SW9	Besley Drain	32	2	Shelburne	Besley Drain	Main Street west of Simon Street	Municipal drain		
SW10	Shelburne	2	2	Shelburne	Nottawasaga	Owen Sound Street North of Susan Street	Town of Shelburne waterways		

North Central (Clearview/Springwater/Wasaga Beach/Stayner)

	Site	Lot	Conc	Municipality	Watercourse	Nearest Road or Intersection	Description	Measure Level	Comments
NC1	Sturgeon Creek	10	22	Wasaga Beach	Sturgeon Creek	Deerbrook Drive (West of Wydunas Court)	Upstream of mouth		Low Lying Homes
NC2	Edenvale	21	1	Springwater	Nottawasaga	Highway 26 (West of Glengarry Landing Rd S)	Widespread flooding	YES	From bridge deck
NC3	Clearview	2	23	Clearview	Nottawasaga	Don Ross Drive	Homes		Low lying homes, road floods

	Site	Lot	Conc	Municipality	Watercourse	Nearest Road or Intersection	Description	Measure Level	Comments
NC4	New Lowell Dam	10	4	Clearview	Coates Creek	Hogback Road (South of County Road 9)	New Lowell Dam	YES	
NC5	County Road 9	1	4	Clearview	Coates Creek	County Road 9 (West of 3/4 Sideroad)	Homes	YES	Low Lying Homes
NC6	Stayner	24	3	Clearview	King St Drain	Brock Street east of Elm St. & County Road 42 south of Quebec Street	ice jams		Ice and grate plugging
NC7	Stayner	25	2	Clearview	Lamont Creek	Scott Street north of Highway 26	Homes		Low Lying Homes
NC8	Trillium Creek	32	2	Wasaga Beach	Trillium Creek	Ramblewood Drive	Various locations		Low Lying Homes
NC9	Wasaga Beach	34	3	Wasaga Beach		Cedar Grove Park along Hwy 26	ditch along Hwy 26 at Cedar Grove Park		
NC10	Shoreline			Wasaga Beach	Georgian Bay		Waves, storm surges		
NC11	Wasaga Beach	4	16	Wasaga Beach	Nottawasaga	River Road			
NC12	Wasaga Beach	3	15	Wasaga Beach	Nottawasaga	Oxbow Park Drive	Visual levels at public access point to the South of #686 Oxbow Park Drive and #208		Low Lying Homes, ice jam location
NC13	Wasaga Beach	4	15	Wasaga Beach	Nottawasaga	Knox Street E	Homes		Low Lying Homes
NC14	Wasaga Beach	9	16	Wasaga Beach	Nottawasaga	Klondike Park Road (South of Powerline Rd)	Klondike Park Bridge, through deck drain	YES	From bridge deck
NC15	Wasaga Beach	9	16	Wasaga Beach	Nottawasaga	Mosley-between 4th and 5th	Nancy Island Area and Mouth of the River		Ice Jam Location
NC16	Lamont Creek, Stayner	26	2	Clearview	Lamont Creek	Highway 26, South of North Street			Flooding of Vinegar Plant, houses

	Site	Lot	Conc	Municipality	Watercourse	Nearest Road or Intersection	Description	Measure Level	Comments
NC17	Clearview near Minesing	22	2	Clearview	Mad River / Nottawasaga R.	McKinnon Road / Concession 2 Sunnidale			Road, properties flood

North East (Oro-Medonte/Springwater)

	Site	Lot	Conc	Municipality	Watercourse	Nearest Road or Intersection	Description	Measure Level	Comments
NE1	Coldwater River - Moonstone Rd.	15	10	Oro-Medonte	Coldwater	Moonstone Road East of the 400 - Between Line 9 & 10	Road overtopping	YES	Chronic problem - 6" over road
NE2	Bass Lake - East/South Shore	2	14	Oro-Medonte	North	Horseshoe Valley Road / Line 13 North		YES	Shoreline Property
NE3	Coulson Tributary of Coldwater River	3	7	Oro-Medonte		Mill Pond Rd. east of Line 6			
NE4	Willow Creek - St. Vincent Street	15	3	Springwater	Willow Creek	St. Vincent		YES	Staff Gauge on East Side of Bridge
NE5	Willow Creek - Con 7 & 8	7	7	Springwater	Willow Creek	Wilson Drive (North of Highway 26)		YES	measuring location
NE6	Willow Creek at County Road 28	10	9	Springwater	Willow Creek	George Johnston Road	Wide floodplain		
NE7	Wye River in Elmvale	6	8	Springwater	Wye River	Highway 92 - Heritage Park		YES	From bridge deck
NE8	Springwater Waste Water Treatment Plant	4	10	Springwater	Wye River	Flos Road 10E	East of CR-27		
NE9	Orr Lake - East and North Shore	66	1	Springwater	Wye River	Penetanguishene Road			Shoreline property
NE10	Sturgeon River - Line 3 North	15	4	Oro-Medonte	Sturgeon	Line 3 North / Moonstone Road West		YES	Low lying homes
NE11	Wye River, Elmvale	6	9	Springwater	Wye River	Amelia Street / William Street, Elmvale			Road, yards, houses flood
NE12	Wye River, Elmvale			Springwater	Wye River	Flos Road 11E	East of CR-27		Field near house & barn floods

South Central East (New Tecumseth/Essa)

	Site	Lot	Conc	Municipality	Watercourse	Nearest Road or Intersection	Description	Measure Level	Comments
SCE1	Angus	18	1	Essa	Mad River	County Road 10	D/S side, top of rail to water	YES	Road closures
SCE2	Angus	31	3	Essa	Pine River	End of Water Street			Low lying homes, road floods
SCE3	Angus	31	3	Essa	Nottawasaga	Centre Street - 30th Sideroad	From deck to water level at the gauge pole	YES	
SCE4	Angus	32	4	Essa	Nottawasaga	County Rd 90			
SCE5	Utopia Dam	29	6	Essa		6th Line - 30th Sideroad	NVCA Dam & Reservoir	YES	
SCE6	Duffers Dugout	32	9	Essa	Bear Creek	Hwy 90			Low lying homes
SCE7	Nottawasaga River	18	6	Essa	Nottawasaga	Trillium Lane, east of County Rd. 56, north of County Rd. 21			
SCE8	Baxter Gauge	16	5	Essa	Nottawasaga	County Rd 21 (West of 6th Line)	Water Survey Canada Gauge Station 02ED003	ONLY IF REQUESTED	May need manual reading from tape
SCE9	Nottawasaga River	6	5	Essa	Nottawasaga	6th Line / 5th Sideroad			
SCE10	Alliston	3	1	New Tecumseth	Wilson Drain	Boyne Street		YES	
SCE11	Alliston	14	2	New Tecumseth	Spring Creek	Centre Street	U/S railway		
SCE12	Alliston	1	7	New Tecumseth	Boyne River	King St. just north of Victoria St.	Box culvert downstream of King St. @ townhouse complex	YES	
SCE13	Alliston	1	2	New Tecumseth	Boyne River	Sir Frederick Banting Rd			Sewage Treatment Plant
SCE14	Nicholson Dam	1	5	Essa	Nottawasaga	Highway 89	Private Dam		Ice Jam location, dam

	Site	Lot	Conc	Municipality	Watercourse	Nearest Road or Intersection	Description	Measure Level	Comments
SCE15	Briar Hill	9	13	New Tecumseth	Nottawasaga	14th Line, west of Tottenham Road		YES	From bridge deck
SCE16	Innisfil Creek	9	12	New Tecumseth	Innisfil Creek & Upper Nottawasaga convergence	13th Line, west of 10th Sideroad	potential flood site accessed only through private drive just before west side of bridge		
SCE17	Tottenham Road	6	12	New Tecumseth	Nottawasaga	County Rd 10		YES	Municipal Water well
SCE18	Innisfil Gauge	13	12	New Tecumseth	Innisfil Creek	12th Line, east of Sideroad 10	Water Survey Canada Gauge Station 02ED029	ONLY IF REQUESTED	May need manual reading from tape
SCE19	Beeton Creek	15	10	New Tecumseth	Beeton Creek	West of 11th Line to Sideroad 15	Beeton Cr. & Bailey Cr. Converge into Innisfil Cr.		
SCE20	Village of Beeton	10	9	New Tecumseth	Beeton Creek	9th Line		YES	
SCE21	Village of Beeton	10	8	New Tecumseth	Hendrie Drain	9th Line to Stewart St.			Low lying homes
SCE22	Vienneau Dam	6	5	New Tecumseth	Beeton Creek Tributary	Tecumseth Heights Dr., off 6th Line east of Tottenham Rd.	Ice control structure		
SCE23	Beeton Gauge	7	5	New Tecumseth	Beeton Creek	6th Line, East of Tottenham Road	Water Survey Canada Gauge Station 02ED100	ONLY IF REQUESTED	
SCE24	Tottenham Dam	5	3	New Tecumseth	Beeton Creek	4th Line	NVCA Dam & Reservoir	Staff Gauge	Check reservoir water level to spillway elevation
SCE25	Beeton Creek	16	11	New Tecumseth	Beeton Creek	Sideroad 15			Field floods
SCE26	Thornton	1	7	Essa	Thornton Creek	Thornton Avenue			Yards flood

North West (Clearview/Blue Mountain/Collingwood/Grey Highlands)

	Site	Lot	Conc	Municipality	Watercourse	Nearest Road or Intersection	Description	Measure Level	Comments
NW1	Shoreline Flooding			Collingwood	Georgian Bay				Shoreline property
NW2	Ice Diversion Structure	43	7	Collingwood	Pretty River	Oliver Crescent	Ice diversion structure		Homes cut off from standard emergency assistance
NW3	Pretty River	43	7	Collingwood	Pretty River	Hume St	NVCA Dyke		Overtopping emergency
NW4	Batteaux River	39	6	Collingwood	Batteaux River	Beachwood Rd (Old Highway 26)			Ice jam location, low lying homes
NW5	Village of Nottawa	37	8	Clearview	Pretty River	County Rd 124 - 36/37 Sideroad		YES	Upstream of damage centre in Collingwood
NW6	Village of Nottawa	34	9	Clearview	Pretty River	County Rd 124 - 33/34 Sideroad		YES	Low Lying Homes, ice jam location
NW7	Glen Huron (Devil's Glen Ski)	16	8	Clearview	Mad River	Conc 8- Station St			
NW8	Collingwood	42	10	Collingwood	Black Ash	Sixth Street (West of High Street)			Low lying homes to northwest
NW9	Silver Creek	49	12	Collingwood	Silver Creek	Highway 26		YES	From bridge deck
NW10	Collingwood	44	10	Collingwood	Black Ash	Mountain Road		YES	
NW11	Collingwood	45	9	Collingwood	Black Ash	Highway 26		YES	
NW12	Collingwood	49	12	Collingwood	Silver Creek	Forest Drive			Spill across rail trail onto road

Central West (Mulmur/Melancthon/Adjala -Tosorontio/Creemore/Avening)

	Site	Lot	Conc	Municipality	Watercourse	Nearest Road or Intersection	Description	Measure Level	Comments
CW1	Websterville	9	6	Clearview	Mad River	County Rd. 9-Riverside Dr.-Con. 6 South Nottawasaga			Ice jam, low lying homes
CW2	Creemore	9	5	Clearview	Mad River	Caroline Street			Ice jam location

	Site	Lot	Conc	Municipality	Watercourse	Nearest Road or Intersection	Description	Measure Level	Comments
CW3	Creemore	8	4	Clearview	Mad River	Mary Street	WWTP		Ice jam location
CW4	Creemore	6	4	Clearview	Mad River	Cottage Drive - 6/7 Sideroad	D/S of WWTP		Ice jam location
CW5	Avening	4	2	Clearview	Mad River	County Rd. 42 - 3/4 Sideroad Nottawasaga			Ice jam location
CW6	Lisle			Tosorontio	Lisle Creek	County Rd 13 / 12			Low lying homes, roads
CW7	Tosorontio School	17	4	Tosorontio	Pine River	County Rd 13	U/S of Borden		
CW8	Earl Rowe	2	6	Tosorontio	Boyne River	Con. Road 7	D/S of Provincial Park		Campground floods
CW9	Earl Rowe	4	5	Tosorontio	Boyne River	Con. Road 6	U/S of Provincial Park		Gauge site, campgrounds
CW10	Boyne	7	6	Mulmur	Boyne River	Mulmur-Tosorontio Townline, South of CR-5	Headwater crossings		
CW11	Mansfield	19	6	Mulmur	Pine River	5th Line South of 20th Sideroad			
CW12	Dunedin	6	9	Clearview	Noisy River	County Rd. 9-Lavender Hill	U/S Cottages		
CW13	Mansfield	8	6	Mulmur	Boyne River	5th Line South of 10th Sideroad	Two tributaries of Boyne River		Road crossing floods yearly

South East (Innisfil/Bradford/West-Gwillimbury/Barrie/Springwater/Oro-Medonte)

	Site	Lot	Conc	Municipality	Watercourse	Nearest Road or Intersection	Description	Measure Level	Comments
SE1	Barrie	6	1	Barrie	Little Lake	Duckworth Street	Trailer Park		
SE2	Willow Creek - Penetanguishene Road	8	1	Oro-Medonte	Willow Creek	Hwy 93		YES	Low lying homes
SE3	Willow Creek - Off Highway 11, Line 2 S	21	3	Oro-Medonte	Willow Creek	Hwy 11 / Line 2			Commercial Flooding
SE4	Willow Creek @ Line 1	D	1	Oro-Medonte	Willow Creek	Line 1, North of Gore Rd.			
SE5	Barrie- Bear Creek Wetland	32	11	Barrie	Bear Creek	County Rd 27 - Highway 90			Road closures

	Site	Lot	Conc	Municipality	Watercourse	Nearest Road or Intersection	Description	Measure Level	Comments
SE6	Innisfil Creek near Highway 400	7	1	Innisfil	Innisfil Creek	Reive Boulevard, North of Highway 89			Flooding U/S of Highway 400
SE7	Innisfil Creek	5	1	Innisfil	Innisfil Creek	Highway 89		YES	Widespread Flooding U/s & D/S
SE8	Innisfil Creek	24	12	BWG	Innisfil Creek	Highway 27		YES	Low lying properties
SE9	Cookstown	1	11	Innisfil	Cookstown Creek	Highway 89/Queen - 11th Line		YES	