Municipality of Lakeshore

2023 FLOOD RAPID RESPONSE PLAN

LAKESHORE #FLOODAWARE

BE PREPARED.
BE AWARE.
WORKING TOGETHER.

Lakeshore
OUR COMMUNITIES. OUR HOME.

Table of Contents

Acronyms / Abbreviations iii

1 Introduction 1
1.1 Purpose 1
1.2 Background 2
1.3 Types of Flooding 3
1.4 How Flooding Occurs 5

2 Plan Outline 6

3 Flood Alert Levels 7
3.1 Development of Alert Levels 7
3.1.1 Alert Level 1 – Enhanced Monitoring – Low Risk 10
3.1.2 Alert Level 2 – Active Flooding Event – Medium Risk 10
3.1.3 Alert Level 3 – Severe Flooding Event – High Risk 11
3.1.4 Alert Level 4 - Activation of Municipal Emergency Response Plan (MERP) - Critical 12

4 Flood Response Team Management 15
4.1 Flood Mitigation Office (FMO) 15
4.2 Team Organization 16
4.3 Roles and Responsibilities 16
Council & Chief Administrative Officer (CAO) 18
Media & IT Support 18
Public Inquiry & Call Management 19
Flood Data & System Monitoring 20
Field Management & Operations 23

5 Flood Mitigation Activities 25
5.1 Pre-Event Mitigation Activities 25
5.2 Flood Event Mitigation Activities 27
5.2.1 Information Monitored and Displayed During the Flood Event 27
5.2.2 Field Activities 28
5.2.3 Information Collection 30
5.3 Post Event Mitigation Activities 31
5.4 RACI Matrices 33

6 Communication Plan 39
6.1 Internal Communication 39
6.1.1 Council & CAO 39
6.1.2 Flood Response Team 40
6.2 Public (External) Communication 41
6.2.1 Incoming Communication 41
Alert Level 1 – Enhanced Monitoring 42
Alert Level 2 – Active Flood Event Management 42
Alert Level 3 – Severe Flooding Event 43
Alert Level 4 – Activation of the MERP 43
6.2.2 Outgoing Communication 44
6.3 Other Applicable Agency Communications 44
6.3.1 Conservation Authorities 44
6.3.2 County Neighbouring Municipalities and Emergency Services 45

7 Closing 49

List of Figures

Figure 3.1 Rainfall Intensity Duration Curves 9
Figure 3.2 Lakeshore Rainfall Gauge Locations 13
Figure 3.3 Flooding Alert Levels 14
Figure 4.1 Flooding Response Organizational Chart 17
Figure 5.3 RACI Matrix – Pre-Event 34
Figure 5.4 RACI Matrix – Alert Level 1 – Enhanced Monitoring 35
Figure 5.5 RACI Matrix – Alert Level 2 – Active Flooding Event Management 36
Figure 5.6 RACI Matrix – Alert Level 3 – High Flood Event Management 37
Figure 5.7 RACI Matrix – Post Event 38
Figure 6.1 Alert Communication Plan 46
Figure 6.2 Internal Communication Plan 47
Figure 6.3 Public Engagement Plan 48

List of Tables

Table 3.1 Rainfall Intensity Duration Frequency 8

Acronyms / Abbreviations

FMD	Flood Monitoring Database
FMPF	Flood Mitigation and Protection Framework
FRRP	Flood Rapid Response Plan
OCWA	Ontario Clean Water Agency
DSP WPCP	Denis St. Pierre Water Pollution Control Plant
EOC	Emergency Operation Centre
ERCA	Essex Region Conservation Authority
IDF	Intensity Duration Frequency
LTVCA	Lower Thames Valley Conservation Authority
MECG	Municipal Emergency Control Group
MERP	Municipal Emergency Response Plan
MTO	Ministry of Transportation
PTO	Power Take Off
SCADA	Supervisory Control and Data Acquisition
SPS	Sewage Pumping Station

Revision Log

Date	Revision/Update	Author	Re-evaluated
May 1, 2023	Final Report Issued	Corporate Leader - Operations	

1 Introduction

1.1 Purpose

At a Regular Meeting of Council held on August 12, 2021, Council adopted Lakeshore's Flood Mitigation and Protection Framework (FMPF). The FMPF was established based on a significant rainfall event that occurred in the Municipality of Lakeshore (Lakeshore) in July of 2021. This event, which spanned 3 days, resulted in considerable flooding along the more northern part of Lakeshore. Further in this plan, it is identified that this event would have been categorized at an Alert Level 3, herein as a high-risk level of alert.

As part of this adopted framework, Council directed Administration to develop and formalize a Flood Rapid Response Plan (FRRP).

The FRRP was developed to assist with the management and deployment of resources in a consistent and organized manner during extreme rainfall/runoff events where flooding occurs within Lakeshore.

The intent is that before each flood event occurs, awareness, monitoring and pre-planning is undertaken.

In addition, the FRRP further outlines the expectations and clearly defines the roles and responsibilities of the staff and external partners when responding to a flooding event. This includes providing effective and clear communication before, during, and after a flood event.

After each flood event (within Alert Level 3), a post-mortem will be conducted to assist with future revisions and updates of the FRRP based on the Lessons Learned from the event. This will allow for continuous improvement of the FRRP.

Lakeshore's FRRP will be led by the Operations Department.

Larger scale emergencies and disasters beyond (or in addition to) the detailed events outlined in the attached are to be managed using the Lakeshore's Municipal Emergency Response Plan (MERP) which is led by the Municipal Emergency Control Group (MECG) and are not intended to be managed under this Plan. The MERP would be activated accordingly for the need of any emergency response during these extreme situations.

LAKESHORE #FLOODAWARE

BE PREPARED. BE AWARE. WORKING TOGETHER.

1.2 Background

Lakeshore is located in Essex County, bordered by Lake St. Clair to the north, Chatham Kent in the east, Leamington, Essex, and Kingsville to the south, and Tecumseh to the west. Lakeshore comprises the communities of Belle River, Comber, Rochester, Deerbrook, Elmstead, Emeryville, Haycroft, Lighthouse Cove, North Woodslee, Pike Creek, Pleasant Park, Puce, Ruscom Station, South Woodslee, St. Joachim, and Stoney Point/Pointe-aux-Roches.

The topography is flat and the terrain slopes very gently from the southern border of Lakeshore on County Road 8, with an average elevation of 188 m, to the shore of Lake St. Clair at 176 m. The highest land is in the southwestern corner of the Municipality, near the Town of Essex, at an elevation of 193 m. Lakeshore contains approximately 33 kilometers of shoreline along the north.

The surface drainage is through a series of slow-moving rivers and creeks, all of which flow northward into Lake St. Clair: from west to east, these are Pike Creek, the Puce River, Belle River, the Ruscom River, and finally Big Creek and Baptiste Creek, which form the northeastern border of Lakeshore at the junction with the Thames River. In addition, due to the flat topography, the land areas can be slow to drain with little to no flood storage within the rivers and drains.

Due to the reliance on a number of slow-moving rivers and creeks and considering the relatively flat topography, areas within Lakeshore are subject to significant flooding when sudden weather events occur, such as high intensity rainfall.

Lakeshore has experienced considerable flood events in the past, (as recently as 2021), and therefore recognized the need for a formal FRRP to coordinate flood preparedness and response actions.

1.3 Types of Flooding

Lakeshore experiences several types of flooding. These include:

1. **Flooding due to rainfall/runoff from storms and snow melting events**

   This type of flooding occurs when a significant rainfall/snow melting event results in significant areas of ponding/flooding and:

   - the ground/soil cannot absorb any more water during heavy rainfall/snow melting;
   - either hard soils or frozen ground conditions prevent water from soaking into the ground (infiltrating); and
   - there are flat/low lying areas with a shallow water table.

Lilydale Avenue experiencing low lying area flooding after event that occurred on Saturday July 17, 2021

2. **Flooding caused by localized storm and/or sanitary sewer back ups**

   This type of flooding occurs when significant rainfall event/snow melting event results in

   - the sewer system (storm) becoming overwhelmed and not being able to handle the additional volume of flow from the continuous rainfall, sudden storms, and/or rapid melting of snow and ice; and
   - inflow and infiltration occur whereby the incoming flows are exceeding the sewer capacity (sanitary) and the sewer systems back up or surcharge.

Old Tecumseh Road, Sanitary Manhole overflow of system surcharged, July 2021

3. Shoreline Flooding

This type of flooding occurs when lake levels (Lake St. Clair) are already high and:

- an extreme rainfall event occurs, whereby the additional contribution of water may cause overflow onto the shoreline from the already high water levels;
- an extreme storm occurs with high winds, whereby the wind forces the water over the shoreline (sometimes even when protection measures are in place); and
- lakes, streams, and river channels take on a sudden influx of water larger than they can contain.

Caille Avenue after shoreline flooding occurred in September 2021

1.4 How Flooding Occurs

Municipal and natural stormwater systems convey rainfall and runoff through either minor or major systems.

Minor systems are composed of lot drainage, ditches, backyard swales, roof leaders, foundation drains, gutters, catch basins, storm sewers, stormwater storage facilities and stormwater pumping stations.

Major systems include natural streams, valleys, swales, artificial channels, roadways, stream crossings and ponds.

The Windsor/Essex Region Stormwater Management Standards Manual (prepared by ERCA in 2018) notes that the minor system should have a design capacity equivalent to a 1 in 5-year storm and the major system has a design capacity equivalent to a 1 in 100-year storm.

For clarity, a 5-year storm is an event with a 1:5-year return period or 20% probability of occurrence in any given year and a 100-year storm is an event that has a 1 in 100 chance (1% probability) of being equaled or exceeded in any given year. The July 2021 event (two significant back-to-back events was roughly equivalent to a 1:25 year storm event (i.e. 4% chance of occurrence in a given year) and a 1:50 year event (i.e. 2% chance of occurrence in a given year).

This means that, in most cases, the minor system will become overwhelmed and/or surcharged when the rainfall intensity is greater than a 5-year storm. A storm with an intensity of greater than a 100-year storm may overwhelm the major system creating wider surface flooding.

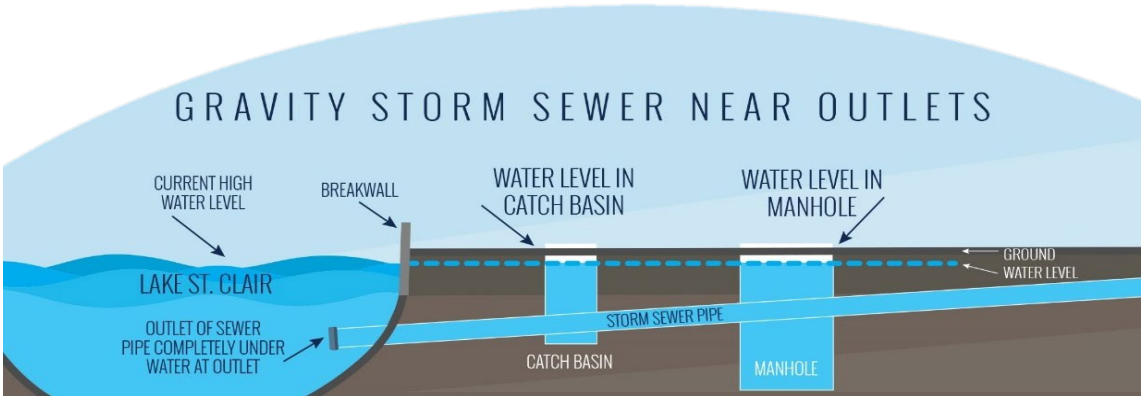
However, most of the existing trunk storm sewers and drain infrastructure in Lakeshore are older systems and were sized according to pre-2018 standards (1 in 2-year storm or less). These systems are undersized compared to current design standards (and events) and may become more overwhelmed during less frequent storm events than identified above.

The sanitary sewage system is also affected by rainfall runoff due to inflow and infiltration (I & I) into the sanitary system through leaks in the sanitary sewers, cross connections, foundation drainage and inflows through manholes and other leaks in the system, causing an increase in flow within the sanitary sewer and treatment system.

In addition, roadways, ditches, and drains can become overwhelmed and exceed capacity due to high intensity (localized) rainfall events when flows greater than design capacity occurs. Many of the existing roadways, ditches and drains that were sized according to previous design standards are also undersized compared to current design standards.

During a flood event, basements can be flooded from overland flow entering the building as well as storm and sanitary sewer backups.

Although shoreline flooding is also considered in this report, it is less common, however combined with other types of flooding, can result in a greater impact to the community and property.



Gravity storm sewers near outlet locations, whereby sewers are full

2 Plan Outline

The remaining sections of the FRRP will focus on the following four (4) elements:

1. **Flood Alert Levels**

   The Flood Alert Levels will set clear guidelines on the level of risk of the event and further outline specific criteria including alert level triggers, actions required to be taken under each level and communication protocol based on the established level.

2. **Flood Response Team Management**

   The Flood Response Team Management will provide specifics related to the location and operation of the Flood Management Office (FMO), confirms reporting structure and role categories, includes an Organizational Chart for quick reference, and confirms the responsibility of each role required to support the FRRP.

3. **Flood Mitigation Activities**

Flood Mitigation Activities lay out pre-flood event activities, flood event activities and post event activities including a post-mortem and lessons learned designed to reflect on opportunities to improve the response plan for future flooding events. A series of matrices (RACI) have been included in this section to help with these activities and outline which staff are expected to be Responsible, Accountable, Consulted, and Informed (RACI).

4. **Communication Plan**

   The Communication Plan outlines responsibilities and expectations on the timing of communication and what form of communication can be expected during Flood Alert Levels based on the severity of the event. This will include an escalated communication flow and how the Media & Public Engagement Support and Public Inquiry & Call Management team assists the Flood Response Leader with communication during flood events.

3 Flood Alert Levels

As identified, a series of Flood Alert Levels were determined to assist with clarifying the severity of the event, the impact on resourcing requirements and to set clear expectations during each of the alert levels.

These levels and triggers should be revisited as part of the Lessons Learned Activities after each flood event.

3.1 Development of Alert Levels

The Flood Alert Levels were developed based on a graduated system identified below:

- the intensity and duration of rainfall or coastal event (from the shoreline);
- the impact the event has on the infrastructure's ability to convey flows (water levels in roadways, sewer systems, streams and rivers, etc.); and
- the impact the event has on the community, the residents, and property.

Based on the above, four (4) Alert Levels with the associated rationale and sequential triggers have been identified below and further summarized in Figure 3.3.

Willowwood Drive after significant rain event hit Lakeshore in July 2021

One major component used in the development of the Flood Alert Levels is the rainfall intensity, which is a function of the design criteria used to determine the size of the stormwater drainage infrastructure. The Rainfall Intensity Duration Frequency (IDF) curves for the Municipality of Lakeshore (as taken from the Windsor Airport) are summarized below in Table 3.1 and are also shown graphically in Figure 3.1. The cell colours in Table 3.1 relate to the Alert Levels in Figure 3.1. This information is useful in understanding when the major and minor systems will become overwhelmed based on an expected event.

The Flood Response Manager and System (Storm and Sanitary) Analyst will review the average rainfall data from the Tempest system rain gauges installed around the Municipality (these locations can be found in Figure 3.2) and will use this to calculate the rainfall intensity in mm/hr. In addition, other major weather rainfall radar predicting programs have various intensities noted as colour coded bands which can also be used to determine the length of the storm to identify the intensity.

These systems would be used to determine the Flood Alert Level.

Further Tempest system locations may be added over time when areas are determined to require further data.

The rainfall intensities shown below in Table 3.1 are based on the maximum rainfall depth over the duration of the event (time).

It should be noted that various degrees of high intensity rainfall events can impact Alert Levels in different ways and fluctuate the call of the Alert Level.

Table 3.1 Rainfall Intensity Duration Frequency

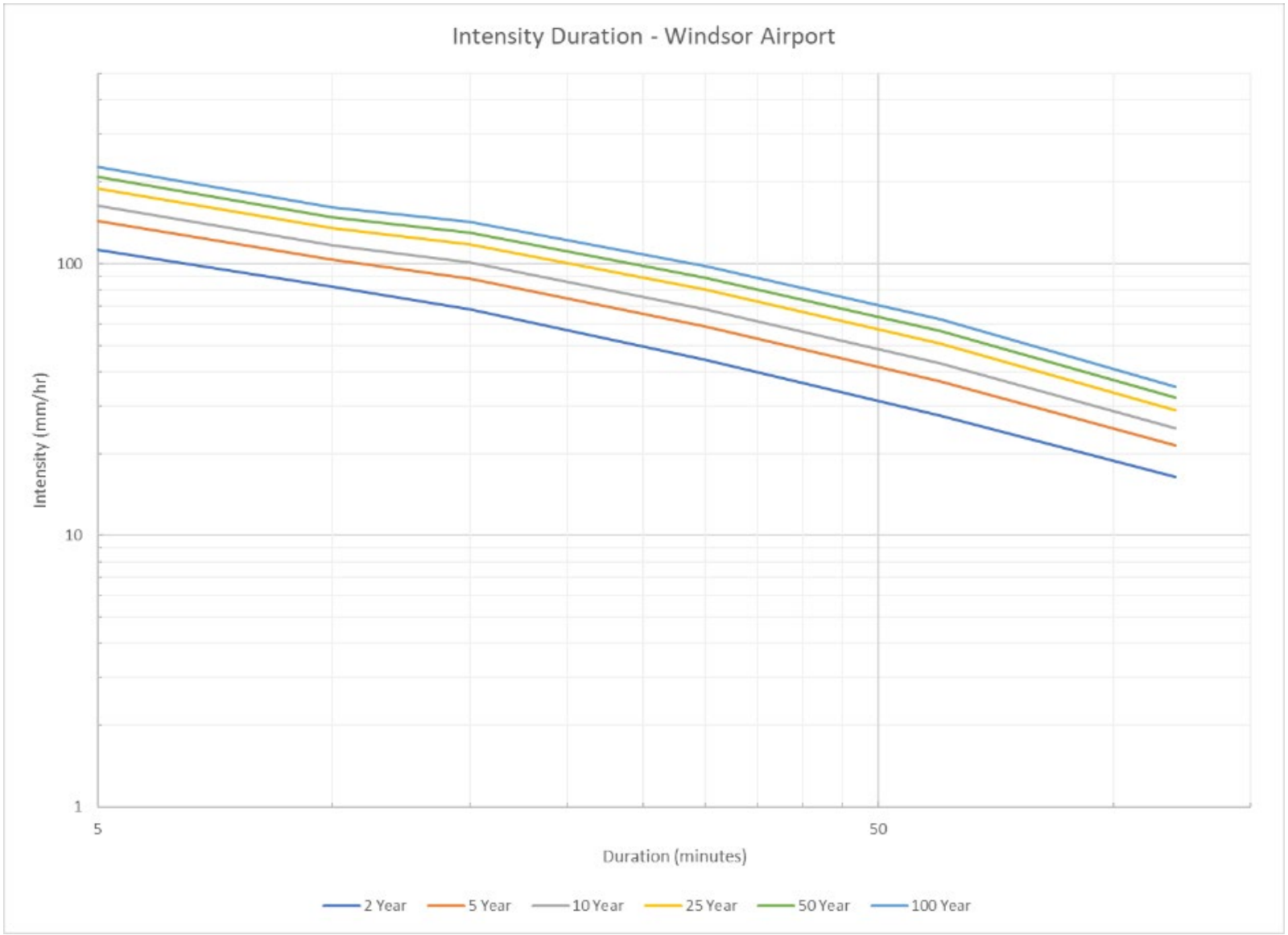
Duration	Intensity (mm/hr)					
	5 min	10 min	15 min	30 min	1 hr.	2 hrs.
2-yr	**112.5**	**82.3**	**68**	**44.4**	**27.5**	**16.4**
5-yr	**143.3**	**103.3**	**87.9**	**58.7**	**36.9**	**21.5**
10-yr	**163.5**	**117.3**	**101.1**	**68.2**	**43.1**	**24.8**
25-yr	**189.2**	**134.8**	**117.8**	**80.2**	**50.9**	**29**
50-yr	**208.2**	**147.9**	**130.2**	**89.1**	**56.7**	**32.2**
100-yr	**227.1**	**160.8**	**142.5**	**98.0**	**62.5**	**35.3**

Alert Level 1 Alert Level 2 Alert Level 3

From the Table 3.1 and Figure 3.1, short duration storms are not as impactful as longer duration storms, as the longer the rainfall happens, the less available storage there will be in the system to convey the rainwater, increasing the amount of surface flooding.

When storage becomes limited and surface flooding occurs, the stormwater conveyance systems are unable to manage any additional rainfall. This can lead to significant overland flooding which can contribute to basement flooding. Once significant overland flooding occurs, Operations generally see a rise in the calls and complaints from residents due to flooding observations in the major and minor systems or in their basements. Therefore, the number and extent of severity of the concerns are also considered in determining the alert level and the Municipal response level to a flooding event.

Figure 3.1 Rainfall Intensity Duration Curves



Further, already saturated ground conditions from a previous event in addition to a subsequent event (within a short period of time) can lead to alert levels being bypassed quickly or potentially skipping an alert level in its entirety. The July 2021 event would have escalated from Alert Level 1 to an Alert Level 3, bypassing Alert Level 2 (Medium Risk).

Alert Levels Defined

From the above, four (4) Flood Alert Levels were determined which include associated triggers, actions that are required to be undertaken when the alert level is called and the expected communication level. These levels have been further summarized in a chart in Figure 2.1, for ease of use during flood events.

3.1.1 Alert Level 1 – Enhanced Monitoring – Low Risk

Alert Level 1 remains internal to only a few members of the Operations team. This level is triggered frequently during some wetter seasons and these events are expected to be short in duration. Alert Level 1 is considered low risk, as systems are draining (may becoming full) and surface ponding is limited to low lying expected areas. Little to no resident calls are received and if so, are limited to reports of drainage systems being full.

The response to Alert Level 1 is limited to minor monitoring efforts, general field observations are undertaken, and inspections are documented.

No communication is expected to occur during this level and/or is limited to addressing a few resident calls/concerns.

3.1.2 Alert Level 2 – Active Flooding Event – Medium Risk

Alert Level 2 is a more active event with a longer duration (expected to be over 3 hours). It should be noted that this level may not be triggered by longer storms with a less intense but more steady rainfall, as these may have little risk of impact to the community and both minor and major systems may be able to keep up.

Alert Level 2 typically sees steady call volumes and may require some local road closures or areas to be blocked off for safety. Basement flooding may be occurring in some localized areas however the increase in areas of basement flooding will predict the level of risk and may contribute to a higher level of concern (Alert Level 3).

The Flood Response Lead, Flood Response Manager and the Flood Field Manager are coordinating efforts and the plan is being discussed with the flood team. Council and CAO will be made aware of the event and level at this time.

Public calls are being monitored and there is evidence that areas of flooding may be more widespread.

Once Alert Level 2 is expected to continue or there is evidence that Alert Level 3 is likely to be triggered, communication will be sent identifying that the risk is present and potentially a high-risk event is imminent.

This will be at the discretion of the Flood Response Lead in consultation with the Flood Response Manager and the Flood Field Manager.

3.1.3 Alert Level 3 – Severe Flooding Event – High Risk

Alert Level 3 is considered a severe event and will require adequate resources to be in place to manage the event appropriately, which will trigger full activation of the plan and all roles will be required.

This event is considered high risk as past events have shown that this level would include significant surface ponding in several areas across the northern part of Lakeshore, systems full and overwhelmed with no reprieve and several areas experiencing basement flooding.

This level could also be limited to extensive shoreline flooding in one or more areas. Communication to Emergency Response may be required into Alert Level 3 for purposes of response.

Incoming calls are expected to be high (300 +) and results from the online survey would likely confirm several areas of the Municipality being of concern.

This Alert Level will see an increased level of communication to Council & CAO and will include similar updates and more frequent communication to the public as the situation changes and information becomes available.

Frequent reviews will be undertaken to determine whether there is any risk that Alert Level 4 may be activated.

Patillo Road when flooding occurred on September 29, 2016

3.1.4 Alert Level 4 - Activation of Municipal Emergency Response Plan (MERP) - Critical

For extremely long duration storms, staff working hours may be exceeded and extensive impact to municipal infrastructure or property has or may have occurred.

This, in **addition** to other factors (power outages, extensive shoreline flooding, significant road closures that impede emergency service ability, etc.), would likely trigger the activation of the Lakeshore's Municipal Emergency Response Plan (MERP). In those cases, the Emergency Operation Centre (EOC), in Council Chambers, would take over managing the response at a higher level of risk (Critical).

It should be noted that the FRRP would still remain in effect with role changes implemented (i.e., the Flood Response Leader will be redirected to the Response Manager/Field Manager Support) to ensure Operations can also support the MERP as required.

The EOC serves as the base of operations for the Municipal Emergency Control Group (MECG) and the following levels of emergency response may be triggered:

Standby Activation

- Implemented when a situation requires the municipal emergency response organization to be on standby;
- Lakeshore Fire Chief will notify the full emergency response organization to remain available; and
- The MECG will assemble at the EOC to monitor the situation.

Full Activation

- Implemented when a situation requires the municipal emergency response organization to be fully activated;
- Lakeshore Fire Chief will notify the full emergency response organization to report to their places of duty and fully activate their own Emergency Response Plans; and
- The MECG will assemble at the EOC to coordinate the emergency response.

For further details, refer to Lakeshore's MERP.

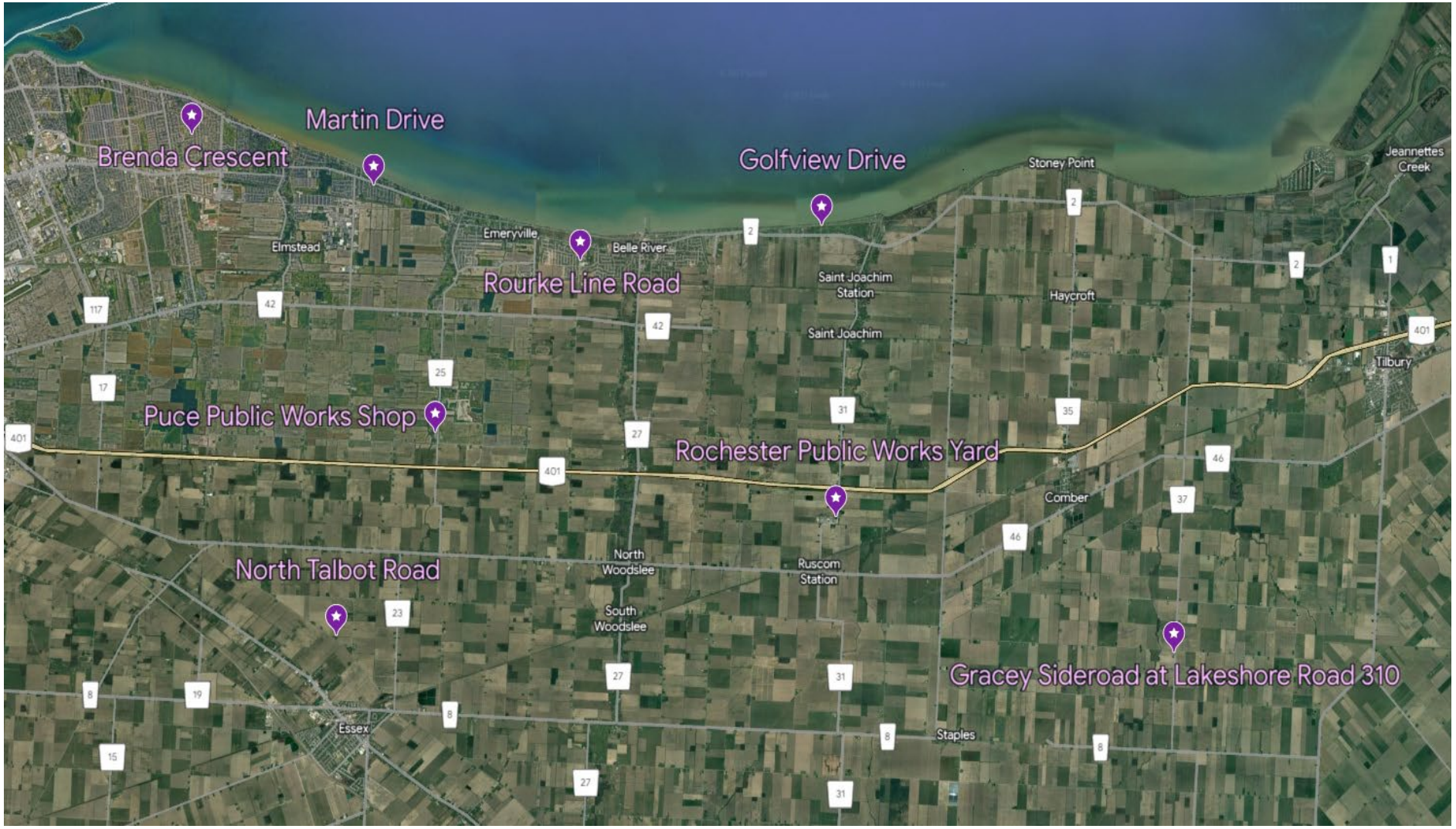


Figure 3.2 Lakeshore Rainfall Gauge Locations

FIGURE 3.3 - FLOOD ALERT LEVELS

OPERATIONS CENTER ← → **EOC/TOWN HALL**

ALERT LEVEL 1

ENHANCED MONITORING

LOW RISK

LEVEL TRIGGER

- 2 to 5-year storm event or a higher intensity storm with duration of more than 5 to 10 minutes *(See Table 2.1)*.
- Forecast indicates that storm event will continue with a duration of no more than 2 hours.
- Little to no resident calls are being received.
- Stormwater infrastructure can manage the flows with little to no surface flooding in roadways.

ACTIONS TAKEN

- Flood Response Leader and the Flood Field Manager are made aware of the event by the Flood Response Manager.
- Monitoring of stormwater pumping stations and drains by field staff.
- Monitor pumping station alarms by OCWA/ Security 1.
- Documentation of event occurs.

COMMUNICATION

- Communication is limited to internal communications to Operations during Alert Level 1.
- Communication occurs between the Flooding Response Leader, Flooding Response Manager and Flood Field Manager, with the relative field staff support, as required.

ALERT LEVEL 2

ACTIVE FLOODING EVENT

MEDIUM RISK

LEVEL TRIGGER

- Greater than 5-year storm event, up to a 10-year storm event with duration > 1 hour *(See Table 2.1)*.
- Forecast indicates that storm event will continue +3 hours.
- Calls are being received from the public regarding surface/overland flooding in some areas.
- Stormwater infrastructure not able to manage flows appropriately.

ACTIONS TAKEN

- Flood Response Leader is being updated on severity and intensity of the storm.
- Flood Response Manager is monitoring for start of areas of overland flooding.
- Continuous monitoring of pump stations and any high-level alarms under the direction of the Flood Field Manager, including road closures, if required.
- Administration Manager starts to work with Administrative staff to monitor public calls, commence with flooding survey (when prompted).
- Documenting flooding severity and effectiveness of system and response of plan

COMMUNICATION

- Initial email goes to Council and CAO identifying Alert Level 2, prompting Media & Public Engagement Support to commence with public notifications.
- Flood Team is provided updates related to the event.

ALERT LEVEL 3

SEVERE FLOODING EVENT

HIGH RISK

LEVEL TRIGGER

- Greater than a 10-year storm event with duration > 1 hour *(See Table 2.1)*.
- Forecast indicates that storm event will continue +6 hours.
- Receiving calls from the public regarding various areas experiencing overland flooding.
- Localized to more wide-spread basement flooding is occurring.
- More that 5 local road closures or at least one major road closure due to flooding.
- Portable pumps are required in several locations.
- Most staff are required to be deployed for assistance.

ACTIONS TAKEN

- Continuous monitoring of continues.
- Debris cleaning in ditches and drains
- Portable pumps and tractor PTO's deployed
- Administration Manager working closely with Administrative Staff and Public Service Unit based on significant calls being received.
- Closing and monitoring of flooded areas

COMMUNICATION

- Updates are provided to both Council and CAO more frequently, followed by public notifications.
- Flood Team is communicating as per the Communication Plan (Figure 6.3 – Internal Communication).

ALERT LEVEL 4

ACTIVATION OF MERP

CRITICAL

LEVEL TRIGGER

- Storm duration and FRRP Activation for more than +24 hours.
- Staff working hours exceeded.
- Extensive areas of basement flooding.
- Significant major road closures have occurred.
- Power outage areas are occurring across Lakeshore.
- Major failures of multiple pumping stations.
- Other concerns identified (i.e. emergency response concerns, access, etc.).

ACTIONS TAKEN

- Municipal Emergency Response Plan (MERP) is activated.
- Flooding event is ongoing, still being managed under the FRRP, however is now being managed in conjunction with the Municipal Emergency Control Group (MECG).

COMMUNICATION

- Follows MERP protocol and communication through Emergency Information Officer (EIO).

4 Flood Response Team Management

This section of the FRRP discusses the organization of the Municipality's response to a flood event including the location of the Flood Mitigation Office (FMO), the organization of the Team and the roles and responsibilities of the responders.

4.1 Flood Mitigation Office (FMO)

Operations Center (FMO), Rourke Line

The flood mitigation response will be coordinated through the Flood Mitigation Office (FMO) which is located at:

Municipality of Lakeshore
Operations Centre
304 Rourke Line,
Belle River, Ontario N0R 1A0

The FMO will be the central communication hub between the office-based staff, field-based staff and the supporting staff. It also contains all the required materials, equipment, monitors, data and design information needed to respond to flood events. This includes an Incident Map (electronic) identifying the flood prone areas of the Municipality as well as engineering information related to storm sewers, stormwater pumps, municipal drains, sanitary sewers, and sewage pumping stations. This map will be updated during events to show the flooding extents based on reports from the public, the survey and field.

This office will be equipped with screen displays so information is available electronically for ease of operation during the more significant events.

Further, back up power generation is recommended to be installed as soon as possible at the FMO office to be able to effectively support this plan during events that may involve power outage in the area that may impact the FMO.

4.2 Team Organization

The response to a flood event will be managed by Operations through the Flood Response Leader, applying a team approach. The deployment of the team noted in the following section of this FRRP will be based on the Alert Levels. An Organizational Chart outlining the roles and reporting structure of all involved in the response is included as Figure 4.1.

The Flood Response Leader will be the Corporate Leader of Operations with support from the remainder of the Operations Department and other staff as identified in the chart. The response Team is organized in terms of functional activities including:

- Media & Public Engagement Support;
- IT support;
- Public Inquiry & Call Management;
- Flood Data and System Monitoring; and
- Field Management and Operations.

The organizational chart or roles may be modified at the discretion of the Flood Response Leader and as required during events based on the following:

- to provide coverage for key roles that may be unavailable at the time of an event;
- to provide coverage for key roles that require relief, pending the length of the event and previous hours worked;
- to include the use of third-party contractors if additional support is required when the Municipal staff are overwhelmed or unavailable; and
- Alert Level 4 is triggered and MERP is activated. Some roles may be modified to continue to support the event when the MERP is activated.

4.3 Roles and Responsibilities

Understanding the roles and responsibilities of the team is an important component of the FRRP.

The individual roles and responsibilities for the staff responding to a flood event have been summarized in the following organizational chart and further defined within the report.

Further, RACI Matrices have been developed to outline which roles will be Responsible, Accountable, Consulted, and Informed for the key tasks that are required to be undertaken prior to an event, during an event (at each Alert Level) and after a flood event. The RACI matrices are included as Figures 5.1 to 5.5 later in the plan where specific tasks are outlined.

FIGURE 4.1 - ORGANIZATIONAL CHART

Council and CAO
Assists and supports public and community awareness, is kept up to date on status and level of alert related to flooding event. Participates in media and communication to the public as required.

Media & Public Engagement Support
Team Lead - Civic Engagement
Assist Flood Response Leader with updates and Communications to the Public during events including social media. Monitors and communicates areas of concern from the public.

Flood Response Leader
Corporate Leader - Operations
Overall Flooding Response Lead responsible for confirmation of Flood Alert Level(s), manages communications related to flooding events, including direct communication with Council & CAO, acts as the media spokesperson, and provides direction to Management Staff on all relative activities associated with flooding event.

IT Support
Division Leader - Digital Transformation & Cloud Services
Assist Flood Response Leader if IT service support is required through flooding event.

PUBLIC INQUIRY & CALL MANAGEMENT

Administration Manager
Division Leader - Drainage & Superintendent
Manages Administrative staff and assists Flood Response Leader with updates and communications to the Public with respect to community call volumes. Communicates areas of Community concern. Manages Public Service support, as required, based on Flood Response Alert Levels.

Administrative Assistants/Project Coordinator
Water Management, Public Works, Capital Projects, Engineering & Infrastructure
Takes calls, logs, and communicates to the Administration Manager feedback being received. Assists and directs the public to the online survey, as required.

Public Service Unit Administrative Support
Team Leader - Public Service & Public Service Representatives
Assists during flooding event to support Administrative Staff and call volume, supports the training of staff to support the FRRP. Assists the public with the online survey, as required.

Flooding Survey Support
DTCS - Business Application Specialist
Assist with online survey monitoring and operation. Supports post event reports, as required.

FLOOD DATA & SYSTEM MONITORING

Flood Response Manager
Division Leader - Engineering & Infrastructure
Monitors rainfall event and ensures this is being communicated to Flood Field Manager and Flood Response Leader. Monitors storm and sanitary system operations during event. Provides support to the Flood Response Leader on event and oversees and directs staff to monitor sanitary system. Ensures proper data is being documented.

System (Storm & Sanitary) Analyst
Team Lead - Storm & Sanitary
Assists Flood Response Manager with monitoring, analyzing systems and recording data for future recommendations on enhancements of systems.

Field Support Data Collection
Engineering Technologist - Storm & Sanitary
Monitors systems and collects data in the field during an event (if required), reports information and post-event assessments are undertaken.

Development Monitoring & Inspection
Engineering Technologist - Development
Assists with both collection of data and coordinates and/or assists with new home construction inspections.

Building Support
Division Leader - Building & CBO
Supports field inspections and investigations during Response Alert Levels, when required. Provides post event report, and takes required actions based on results (enforcement as required).

Sanitary Field Monitor
Division Leader - Water Management
Manages and monitors sanitary system operations. Reports areas of concern, treatment by-pass and reports spills.

Sanitary Field Inspector
Team Lead - Water Management
*Understands areas of concerns, reviews field conditions during events, and reports to sanitary. Acts as a field monitor on the sanitary system. If a spill were to occur, **Water Compliance** to assist.*

Sanitary Operation Support
Ontario Clean Water Agency (OCWA)
Reports pump operations and any treatment bypass to Sanitary Field Monitor/Sanitary Field Inspector.

By-Law Support
Division Leader - By-Law
Supports field investigations during Response Alert Levels, as required.

Response Manager/Field Manager Support
Division Leader - Capital Projects
Assists to fill gaps during events. Assess & reports adequacy and effectiveness of the plan. Assist with field and data communication to Flood Response Leader during peak event.

Field Support
Engineering Technologist - Capital Projects
Assists and provides back up to staff as needed to fill gaps during event.

FIELD MANAGEMENT & OPERATIONS

Flood Field Manager
Division Leader - Public Works
Manages flood events in the field, calling staff resources as required based on alert level, reporting back concerns and issues for communication on key areas impacted.

Road Closure Lead
Team Leader - Parks
Monitors and assists the Flood Field Manager with areas of concern related to roadway flooding and closures. Provides field support and ensures roadways are closed safely by support staff.

Road Support
Engineering Technologist - Roads & Utilities
Communicates with Administrative staff and assists with any road closure and power outages, monitors call for hydro concerns and area of power outages that may require action.

Sanitary Operation Support
Sanitary Operator - Water Management
Provides field assistance to the Sanitary Field Inspector, obtains field data during event as required.

Stormwater & Pump Lead
Team Leader - Roads & Fleet
Directs the field staff and ensures proper deployment of staff resources and equipment.

Stormwater Support
Lead Hand(s) - Roads & Fleet
Is provided communication for the Team Leader on areas of calls and significant concerns.

Municipal Storm Drainage Support
Assistant Drainage Superintendent
Collects data in the field during event and assists with addressing drainage concerns, specific to Municipal Drainage systems, reports back.

Stormwater Support
Road Operators - Roads
Supports Stormwater & Pump Lead under the direction of the Stormwater Inspectors.

Road & Stormwater Support
Park Operators - Parks
Water Operators, Water Management (Distribution), Water Management (Treatment)
Supports stormwater management operations and road closures, as needed.

Council & Chief Administrative Officer (CAO)

Council & Chief Administrative Officer (CAO)

Council and the CAO will support public and community awareness during an event, will be kept up to date on status and Flood Alert Levels related to flooding events so they may communicate to residents, and they may also be asked to participate in any media and formal communication to the public, if required. Media interviews will require the support and briefing from the Flood Response Leader and the Public Engagement Support.

Flood Response Leader

Corporate Leader – Operations

The Flood Response Leader manages the entirety of FRRP and reports to Council & CAO with respect to the Municipal response to a flooding event. This role ensures that staffing support and resourcing is adequate and remains in contact with key management roles to deliver the plan. Overall, the Flooding Response Leader is responsible for confirmation of Flood Alert Level(s), manages communications related to flooding events, including direct communication with Council, responds to media interview requests (spokesperson) and provides direction to Management Staff on all relative activities associated with flooding events.

Media & IT Support

Media & Public Engagement Support

Team Leader – Civic Engagement

The Media & Public Engagement Support assists the Flood Response Leader with updates and communications to the Public during events, including updates to Lakeshore's website and through social media channels. This role also monitors and communicates areas of concern from the public who may be reporting this through social media channels.

IT Support

Division Leader – Digital Transformation & Cloud Services

The IT Support helps with monitoring plans and programs that may need to be set up in advance to support the FRRP and may be required to provide support related to the plans and programs through flooding events.

Public Inquiry & Call Management

Administration Manager

Division Leader, Drainage Superintendent

The Administration Manager oversees all Administrative staff during an event and assists the Flood Response Leader with updates and communications to the Public with respect to community call volumes and what we have heard from the public. This role also communicates areas of community concern, and coordinates with the Public Service Unit (as required), all based on Flood Alert Levels.

Administration Assistants/Project Coordinator

Administrative Assistants, Water Management/Public Works/Capital Projects/Engineering & Infrastructure & Project Coordinator, Capital Projects

The Administration Assistants/Project Coordinator will report into the Administration Manager during flooding events. These roles will take calls, log calls and communicate feedback to the Administration Manager during flooding events. The Administrative Assistants will assist and direct the public to the online Flooding Survey (if not done by the PSU), answer general flooding concerns by providing updates based on the internal Operations communication or will transfer calls to appropriate Operations members, as required.

Public Service Unit (PSU) Administrative Support

Team Leader – Public Service & Public Service Representatives

The Team Leader, Public Service Unit will support staff training plans and provide support during flooding events, as needed. The Public Service Unit Representatives will participate in training of staff to support the FRRP and support administrative staff with call volumes during flooding events. The PSU will also assist the public with the online Flooding Survey and transfer calls from the public to the Administrative Assistants for further information, as required.

Flooding Survey Support

Business Application Specialist – Digital Transformation & Cloud Services

The Flooding Survey Support assists with any improvements related to the online survey, ensures operation of the survey as required during events, and provides support in updating the flood mapping on the municipal interactive mapping service. Flooding Survey Support also assists with post-event reports based on the survey results, as required.

Flood Data & System Monitoring

Flood Response Manager

Division Leader – Engineering & Infrastructure

The Flood Response Manager provides support to the Flood Response Leader and ensures monitoring systems are functional and that rainfall events are being monitored in advance and appropriately through the events. This role also provides direction to staff related to the monitoring of systems, the collection of field data during the event and ensures the data collected is in line with the current Flooding and Flood Mitigation efforts and for future FRRP updates, as required. This role will be crucial in the post-assessment of data to recommend improvements based on the operation of systems during these events.

System (Storm & Sanitary) Analyst

Team Leader – Storm & Sanitary

The System (Storm & Sanitary) Analyst will primarily assist the Flood Response Manager with monitoring data and analysis of both the sanitary and stormwater systems and how these systems are operating under significant events. This role will also identify areas that require additional resources and staffing based on pump station data, rain gauge data, or the flood survey results. This role will review and assess models, system monitors and drawings to determine areas of impact and will assist with making recommendations related to future system enhancements in conjunction with the Flood Response Manager.

Field Support Data Collection

Engineering Technologist – Storm & Sanitary

The Field Support Data Collection role will primarily focus on system monitoring and obtaining field data (if required) once an Alert Level has been designated and the FRRP is activated. This role will review data post events and report into the System Analyst any information gathered during events in the field for additional assessment and recommendation for improvements. This role will also provide support for field monitoring, as required.

Development Monitoring & Inspection

Engineering Technologist – Development

The Development Monitoring & Inspection will monitor and oversee any ongoing developments during an event. The role will also coordinate with Building Support and By-Law Support with identifying areas of concern with respect to any ongoing developments that may impact the Municipal systems during these events. This role will also accompany and support the Field Support Data Collection role, as required.

Building Support

Division Leader – Building & CBO

The Building Support role will assist by undertaking field inspections and investigations during relative Alert Levels, when required as coordinated by the Development Monitoring and Inspection role. This role will also provide post-event reports related to flood impacts on buildings and housing under construction at the time of the event and take required actions based on results.

By-Law Support

Division Leader – By-Law

The By-Law Support role will assist with any enforcement of findings during and/or after relative Alert Levels, when required as coordinated by the Development Monitoring and Inspection role. This role will also provide post-event reports related to flood impacts on private properties at the time of the event and take required actions based on results and enforcement of any by-laws. This role works closely with Building Support.

Sanitary Field Monitor

Division Leader – Water Management

The Sanitary Field Monitor works closely with OCWA to monitor the sanitary sewage pumping station levels and to assist with conveying technical information to the field staff as necessary to assist with sanitary flood mitigation and identify any areas of potential reportable spills. This role will log and review all high-level alarms and ensure the System Analyst is kept up to date on the areas of surcharging. This role will ensure any sanitary treatment by-pass events are communicated to the Public via the website as required by Ministry of the Environment, Conservation and Parks (MECP).

Sanitary Field Inspector

Team Leader – Water Management

The Sanitary Field Inspector works closely with the Sanitary Field Monitor and OCWA to assist with monitoring the sanitary sewage pumping stations, with providing technical information to the field staff as necessary to assist with the flood mitigations. This role also reports area of concerns to the System Analyst, communicates treatment by-pass and completes the field work to related to reporting sanitary spills during flood events.

Sanitary Operation Support

Ontario Clean Water Agency (OCWA)

The Sanitary Operation support is OCWA (as the system operator). This role communicates any concerns on the onset and provides data related to high level alarms, and duration. This data will be collected and later analyzed to determine areas that can be further mitigated through system enhancements, if possible. This role will also contact Spills Action Center (SAC) in the event that the treatment plant goes into bypass. This role will notify the Sanitary Field Monitor so the bypass can be reported to the public, as required.

Sanitary Field Support

Sanitary Operator, Water Management

The Sanitary Field Support will be in the field reviewing conditions through the duration of the storm. This role reports any visible surcharge conditions, overflows, and flooding events associated with sanitary sewage pumping stations and wastewater treatment systems to the Sanitary Field Monitor/Inspector.

Response Manager/Field Manager Support

Division Leader – Capital Projects

The Response Manager/Field Manager Support aids the Flood Response Manager and Flood Field Manager to fill any gaps for coverage during an event including a back up to step in and assume the role of the Flood Response Leader, the Flood Response Manager or the Flood Field Manager if they are not available or require relief. This role also assesses and reports response plan effectiveness and assists with field communication to the Flood Response Leader during peak event.

Field Support

Engineering Technologist – Capital Projects

The Field Support aids the Response Manager/Field Manager Support to fill any gaps for coverage during an event including a back up to step in and assume the various roles as required and as directed. This role also helps with the assessment on the plan effectiveness, including looking for areas of improvement during the event for later reporting.

Field Management & Operations

Wallace Line Drain outlet under high water level conditions

Flood Field Manager

Division Leader – Public Works

This Flood Field Manager manages the field crews through the Stormwater & Pump Lead (from the PMO) who are managing the flood mitigation activities related to stormwater systems and road closures. This role is primarily focused on deploying and coordinating the field staff and equipment to mitigate the flooding impacts in the field.

Stormwater & Pump Lead

Team Leader – Roads & Fleet

The Stormwater & Pump Lead directly coordinates the field crews monitoring the stormwater pumping stations, deploying, and operating portable pumps and debris cleaning. A secondary part of this role is to provide information to the System Analyst so that they can document the flood event and the effectiveness of the response, system behaviour and areas of improvement related to system enhancements.

The Road Closure Lead aids as backup to this role.

Stormwater Inspectors

Lead Hand(s), Roads & Fleet

The Stormwater Inspectors will be divided into two teams (East and West). There will be staff from the East Yard and the West Yard who will monitor and operate the stormwater pumping stations and provide portable pumps in each area, respectively. These roles may be reassigned if one area is not impacted by the event.

Stormwater Field Support

Road Operators, Road & Fleet

The Stormwater Field Support will be divided into two teams (East and West). There will be staff from both the East Yard and the West Yard who will monitor and operate the stormwater pumping stations in the relative areas and assist with the deployment and operation of portable pumps, as required.

Municipal Storm Drainage Support

Assistant Drainage Superintendent, Drainage

This Municipal Storm Drainage Support will inspect and collect data in the field during events and assist addressing drainage concerns specifically related to Municipal Drainage systems, reports back to Stormwater Pump Lead during events but will also confirm data to the System Analyst for future consideration of improvements with the Drainage Superintendent.

Road Closure Lead

Team Leader – Parks

The Road Closure Lead will coordinate the field crews who are closing the roads and setting up warning signs as well as s support in clearing debris from catch basins, ditches, and drains as necessary. An Alert Level 2 is called when overland flood is starting and there may be localized road closures. During an Alert Level 3, there will be active road closures, whereby this support will be required.

Road Support

Engineering Technologist – Roads & Utilities

The Road Support will communicate with Administrative staff to assists with communication and helps support notices related to road closures or power outages and monitors calls for Hydro One concerns and areas of power outages during an event. This role will assist with communication to the Stormwater Pump Lead areas of known power outages, timing and whether deployment or relocation of back up pumping systems may be required.

Road & Stormwater Support

Park Operators, Water Distribution Operators, Water Treatment Operators

Road Support will be primarily focused on closing and maintaining the road closures as well as installing flooded road hazard and closure signage. These roles will be focused on assisting the road crews who are performing road closures and debris cleaning by conducting patrols to assess the situation in the field and advising field crews of where their activities are most effective.

During Alert Level 1, it is anticipated that overland flooding will not have yet occurred. During Alert Level 2, overland flooding is starting to occur and overland flooding is occurring during an Alert Level 3. Thus, this role will be focused on activities during Alert Level 3 events and may need to support the Stormwater Pump Lead, as required.

5 Flood Mitigation Activities

5.1 Pre-Event Mitigation Activities

In preparation of a flood event, the Municipality will undertake the following activities:

Operations Center (FMO) equipment and vehicle storage area

- ✓ Provide training to all staff identified in the plan and conduct dry runs of the FRRP annually and/or as required with key staff. This is the responsibility of the Flood Response Leader.
- ✓ Ensure that a flooding equipment list is developed, maintained and ready for use, as well as identify and procure any additional equipment, if required. This is the responsibility of the Flood Field Manager.
- ✓ Maintain a list of third-party Contractors and Electricians who can respond quickly to issues during a flood event, if necessary. This is the responsibility of the Flood Field Manager.
- ✓ Set up and complete regular checks on required systems for monitoring weather reports and watersheds, weather radar and Tempest rainfall stations, as well as confirmation on who and how ERCA and LTVCA flooding information is received and shared. This is the responsibility of the Flood Response Manager.
- ✓ Keep an up-to-date map in Operations (Incident Map) related to past flooding event information, critical infrastructure, maintenance concerns, etc. available for use during events. This is the responsibility of the System (Storm & Sanitary) Analyst.
- ✓ Ensure that the on-line flooding survey is active, operational and implement any changes or upgrades, as required. Support the training for the Public Inquiry & Call Management team. This is the responsibility of the Administration Manager.
- ✓ Setup and develop the flooding survey on the Municipal website to address any updates or changes. This is the responsibility of the Flooding Survey Support.
- ✓ Ensure all maintenance is undertaken in a timely manner on stormwater pumping stations, ensure standby generators are operational, have sufficient fuel and that regular cleaning is being done on trash racks. This is the responsibility of the Stormwater & Pump Lead.

- ✓ Frequently review and monitor the status of the stormwater pumping stations and municipal drains and inform senior members of the Flooding Response Team (Flood Response Leader, Flood Response Manager, Flood Field Manager) of any potential equipment under maintenance or out of service. This is the responsibility of the Stormwater & Pump Lead.
- ✓ Monitor SCADA system for stormwater pump stations (where applicable). This is the responsibility of the System (Storm & Sanitary) Analyst.
- ✓ Complete any open Service Requests and Works Orders within City Works that would impact Flood Mitigation and Protection. This is the responsibility of the Stormwater & Pump Lead.
- ✓ Implement engineering improvements for future flooding event. This is the responsibility of the Flood Response Manager.
- ✓ Manage flood mitigation service requests and work orders. This is the responsibility of the Flood Field Manager.
- ✓ Review and monitor staffing and contacts, shift rotations for field staff. This is the responsibility of Flood Field Manager.
- ✓ Review and monitor staffing and shift rotations for Administrative Assistants. This is the responsibility of the Administration Manager.
- ✓ Coordinate the inspection all the stormwater pumping stations immediately in advance of an event if possible. This is the responsibility of the Stormwater & Pump Lead.
- ✓ Identify vehicles and trailers than can be used (and set up in advance, if possible) to physically close roads. Remove the lawn mowing equipment from the tractors if a significant event is imminent. This is the responsibility of the Road Closure Lead and Road Support.
- ✓ Monitor Security 1 alarms for the sanitary pumping stations and set up consistent and frequent notifications from OCWA for any failures or upgrades at the sewage pumping stations. This is the responsibility of the Sanitary Field Monitor.
- ✓ Coordinate with Building Support to develop a plan for on-going development inspections to minimize the effects of events on municipal infrastructure and treatment facilities. This is the responsibility of the Development Monitoring & Inspection.

Wallace Line Drain under upstream pumping conditions

- ✓ Maintain a list of on-going developments for issued building permits. This is the responsibility of Building Support.
- ✓ Enforce by-laws regularly and as needed, to minimize flooding when significant rainfall/runoff events occur. This is the responsibility of By-Law Support.

5.2 Flood Event Mitigation Activities

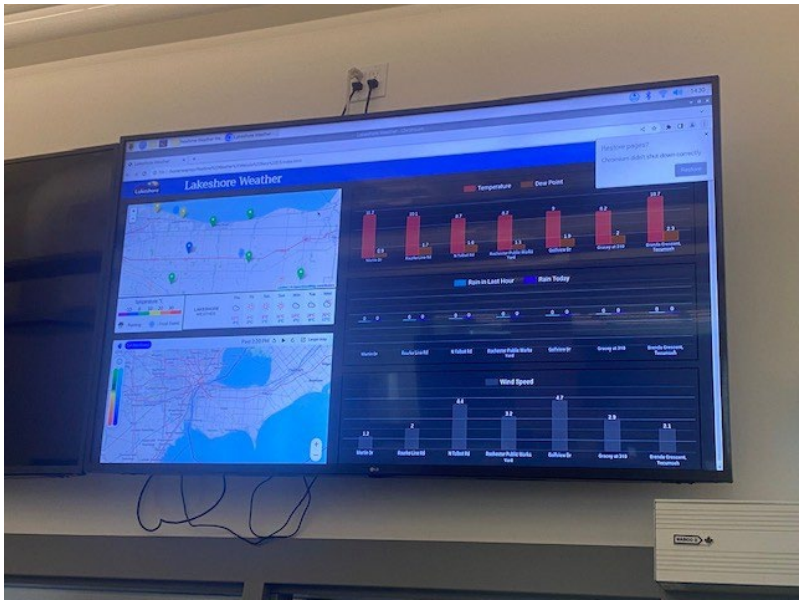
During a flood event the following activities will be undertaken under the direction of the Flood Response Leader. These activities align with the roles and responsibilities identified herein:

5.2.1 Information Monitored and Displayed During the Flood Event

While the FRRP is in place, the following will be monitored, and the required information displayed on the larger monitors in the Operations Centre. These are the responsibilities of the Flood Response Manager.

- ✓ Weather information is being monitored and/or displayed clearly including Weather Radar Systems and Tempest rainfall gauges.
- ✓ SCADA information is being monitored and/or displayed regarding the status of the sewage pumping stations (as they become available). This includes the System (Storm & Sanitary) Analyst continuously reviewing and identifying areas of concern.
- ✓ A Flood Incident map will be posted and updated (from both field reports and resident calls) to assist with Flood Mitigation activities, including:
    - Areas where there is surface flooding and/or areas of road closures;
    - Areas experiencing basement flooding from stormwater or sewage backups;
    - Locations where portable pumps and PTO tractors are being used;
    - Issues, if any, with respect to Stormwater and/or Sewage Pumping Stations (high level alarms (Security One and/or OCWA), system outages, etc.); and
    - Status of the Storm Drain gates (open/closed).
- ✓ Report information received from the field, primarily from the Flood Field Lead, Stormwater Pump Lead, Sanitary Field Monitor and Sanitary Field Inspector.

- ✓ Any areas under maintenance/service and/or open Service Requests and Work Orders from the City Works System.
- ✓ Geotab information regarding the location of Municipal forces.
- ✓ GIS drawings of the storm and sanitary sewer network, municipal drains and stormwater pumping stations;
- ✓ Any relative Public Call Log information; and
- ✓ Live Flooding Survey Information.



Operations Center, FMO – Information Display Monitors

5.2.2 Field Activities

The activities of the Municipal staff mitigating the Flood event in the field are summarized below:

- ✓ Management of field teams and coordinate deployment of field resources in impacted areas from flooding.
- ✓ The stormwater pumping stations will be observed/maintained during an event under the supervision of the Stormwater Pump Lead. This will be based on East and West Teams operating in a circuit. The stormwater pumping station maintenance will include:
    - Responding to and addressing any triggered alarm notifications;
    - monitoring the operation and attending to operational issues including calling in electricians if needed for emergency repairs;
    - cleaning trash grates;
    - opening stormwater drain gates;
    - reporting into the Flood Field Manager any issues or concerns with the stormwater pumps; and
    - deploying the PTO tractors when necessary.

- ✓ Portable pumps will be deployed if necessary to supplement the fixed stormwater pumping stations and operated by the Stormwater Inspectors and/or Stormwater Field Support. In the winter months the pumps will be stored at the operations centre and during the rest of the year there will be one at the East yard and one at the West Yard. The operation of the stormwater pumps will normally include an operator(s) at the pumps or in proximity during operation. It should be noted that this may be for extended periods of time and may required support from other areas.

Portable Pump for deployment during flooding events

- ✓ Drains, ditches, and trash racks will have debris removed as necessary to assist with stormwater conveyance.
- ✓ Flooded roads will be closed using barricades, truck, and trailers as necessary by the Road Closure Lead. Staff may be required to be physically present to try to enforce road closures. Water On Road signs can also be deployed if conditions warrant.
- ✓ Municipal drains will be monitored, maintained to ensure proper operation and address any concerns related to municipal drainage systems.
- ✓ Sanitary manhole incidents will be reported and responded to as they occur in the field.
- ✓ Sewage pumping stations will be monitored and coordinated with OCWA for appropriate action as required.
- ✓ Additional support to be provided for any field inspections and investigations during events as required.

5.2.3 Information Collection

It should be noted that these activities will be the most enhanced through the development of this plan. Data collection was occurring in the past but in a more uncontrolled manner. This information will be crucial in recommendation of improvements based on the observed system function and operation during extreme events.

Data collection including the extent and severity of the flood as well as the Municipal response activities is important to assist with future Flood Mitigation Planning as well as to document the situation in the field for potential claims form the Public. The plan for information collection includes:

- ✓ Maintaining the Public Call Logs and Flooding Survey comments by the Administrative Assistants
- ✓ Recording rainfall data (intensity, time, and duration) from the Tempest Rainfall gauges and possible the Windsor Airport gauges and Lake St. Clair Level – Field Support Data Collection
- ✓ Qualitatively documenting the flooding that occurred as to the problem areas and extent of flooding and apparent capacity of the drains and ditches – Stormwater Support.
- ✓ Documenting where roads were closed and potable pumps deployed, as well as the effectiveness of the stormwater and portable pumps in mitigating the flooding – Stormwater Support and Road Support.
- ✓ Documenting locations experiencing basement flooding from stormwater and sewage backups via phone calls and Flooding Survey results –Administrative Assistants
- ✓ Identifying drains which carried significant debris – Stormwater Support.
- ✓ Documenting any issues with the stormwater pumping stations and sanitary sewage pumping stations – Stormwater Support Lead using Security 1 calls and Sanitary Monitoring Lead with support from OCWA.

River Ridge Stormwater Management Pond

5.3 Post Event Mitigation Activities

The purpose of the post event exercises is to complete a review of the Flood event response to improve the Flood Rapid Response Plan and to clean up and prepare for the next event. These activities include:

- ✓ Follow up calls with the Public who requested a follow up by applicable Flood Team Members (to be assigned post event).
- ✓ Complete any clean up and coordinate garbage pickup activities in the field if necessary.
- ✓ Prepare Council and Public Reports with respect to the Flood event and the Municipal response.
- ✓ Finalize the documentation of the recent Flood event with the information collected during the event.
- ✓ Clean, maintain and store the portable pumps, flood mitigation equipment and Road Closure Signs and Equipment.
- ✓ Maintain the stormwater pumping stations including any debris clean up, refuelling or repairs that are needed.
- ✓ Review and update Flood Alert Levels.
- ✓ Update GIS and storm and sanitary infrastructure drawings if needed.
- ✓ Provide staff training including health and safety measures, as necessary.
- ✓ Identify any building or by-law updates that would reduce future property damage during a Flood event.
- ✓ Update and/or improvements to the webpage, online flooding survey, call Log, and Incident Map. This is the responsibility of the Flooding Survey Support. Updates to the Municipal Flooding webpage is the responsibility of the Media and Public Engagement Support.
- ✓ Initiate any Capital Works that were identified either during or after the event that would assist in reducing property damage during future flood events.
- ✓ The Flood Rapid Response Plan should be reviewed and updated every five (5) years, or as needed through Lessons Learned
- ✓ After the flood event has concluded, the effects of the event and the municipal response shall be reviewed to determine what went well and improvements that could be made for the next event. The data collected during the event as noted in Section 5.2.3 shall be summarized for evaluation and reporting.
- ✓ The items to be reviewed and or questions asked during the Lessons Learned exercise.
- ✓ Outreach and Education to the residents pertaining to Flood Mitigation and Protection and Flood Readiness after the event including severity of event, impact of the storm and public calls and feedback. This will include any reminders related to Flood Mitigation and Protection measures.

FLOOD MITIGATION AND PROTECTION

WORKING TOGETHER TO PROTECT YOUR HOME

Under the Flood Mitigation and Protection Framework, Lakeshore has taken a number of steps to protect local homes and support property owners in flood protection.

Stay #FloodAware!

During high-wind and rainfall events, local updates on flood risks and problem areas can be found on Essex Region Conservation Authority's and Lower Thames Valley Conservation Authority's flood advisory web pages. Access those resources and learn more at:

Lakeshore.ca/Flooding

Before a flood

- Determine whether your home, school, or work is in an area that is likely to flood. Learn which roadways may flood and plan an alternative route to avoid them.
- Create a communications plan so your family will know how to connect during an emergency.
- Assemble an emergency kit and prepare for possible evacuation. Charge essential electronics.
- Be proactive! Leave before the flooding starts to avoid being stranded.

BE PREPARED. BE AWARE. WORKING TOGETHER.

Lakeshore
OUR COMMUNITIES. OUR HOME.

BE FLOOD READY.

BE PREPARED. BE AWARE. WORKING TOGETHER.

Flooding types

- Rainfall/runoff from storms and snow melt.
- Shoreline flooding from high levels.
- Localized sanitary or storm sewer backups.

Protecting your property

- Grade your property so it slopes away from your home.
- Ensure downspouts extend at least 1.6 metres away from your home.
- Install a clay/bentonite plug, which is placed in the trench surrounding storm and sanitary sewer pipes around your home. This will help prevent water from backing up through the trench and moving towards the house
- Install a sump pump. Battery back-ups or water-powered systems can also ensure continued operation during power outages.
- Ensure caps for storm and sanitary cleanouts are on properly and not cracked or damaged.

Flood protection subsidies

The Municipality of Lakeshore offers the following subsidies to its residents:

- **Mini camera inspections** (one free/property)
- **Backwater valves** (80% or $750).
- **Sump pump overflows** (Up to $225).
- **Downspout disconnection** ($75 subsidy).

During flood events

Residents in flood-prone areas throughout the municipality should:

- Ensure sump pumps are operating normally.
- Clear debris and leaves from yard catch basins to improve drainage around your property.
- Monitor your backwater valve and stop using water if it is closed.
- Avoid using water, when possible, to reduce pressure on the municipal system, including flushing toilets.
- Avoid driving on flooded roads.

If your basement is flooding:

- Pump stormwater out of basements and away from the home. Floor drains, laundry tubs, or other fixtures should not be used.
- If water starts to reach electrical outlets, baseboards heaters or furnace, or is near the electrical panel, call HydroOne to have your power disconnected.

To report flooding:

- Call Lakeshore or use the online Flooding Survey Tool. Submissions will be used by staff to monitor problem areas and prioritize response efforts.

519-728-2700
Lakeshore.ca/Flooding

BE PREPARED. BE AWARE. WORKING TOGETHER.

Lakeshore
OUR COMMUNITIES. OUR HOME.

5.4 RACI Matrices

A RACI Matrix clearly assigns roles for each team member of the Flood Response Team during a flooding event which includes the pre-event, event, and post-event. The RACI Matrix ensures that all team members of the FRRP understand their required level of participation. This also helps support the communication plan within the FRRP.

Below are the definitions that refer to a RACI Matrix:

Responsible (R)

Team members who have the responsibility of an activity are obligated to get the activity completed. The responsible team members are directly assigned to an individual or group of individuals to ensure the activities get completed and reported. Every task needs at least one Responsible member but can be given to multiple members in certain circumstances.

Accountable (A)

Team members that are required to ensure that any work or activity is being completed is the Accountable person. The Accountable person typically have many tasks that they are required to ensure are completed with the appropriate team members assigned to assist with getting these done under their direction. The Accountable team member delegates and also performs any reviews of the work or activity to ensure it is completed on time and thoroughly. It is standard in a RACI matrix that every task has a single Accountable member to oversee each task or deliverable.

Consulted (C)

Consulted members are team members that are expected to provide input and feedback on specific activities. Consulted team members have an interest in the outcome of certain activities that may impact their current or future work and activities.

Informed (I)

Team members that are to be provided information and are being updated regularly regarding specific activities. Informed team members are not consulted on every activity and only should be kept in the loop on information and what is occurring. They are not making final decisions for certain activities.

Flood Mitigation Activities, including pre and post activities, have been summarized and clarified in the below Figures 5.1, 5.2, 5.3, and 5.4.

Figure 5.1 RACI Matrix - Pre-Event

Activity	Flood Response Leader Corporate Leader, Operations	Flood Response Manager Division Leader, Engineering & Infrastructure	Flood Field Manager Division Leader, Public Works	Response Manager/Field Manager Support Division Leader, Capital Projects	Media & Public Engagement Support Team Leader, Civic Engagement	Administration Manager Division Leader, Drainage & Superintendent	Sanitary Field Monitor Division Leader, Water Management	Sanitary Field Inspector Team Leader, Water Management	Sanitary Operation Support OCWA, Sanitary Operator, Water Management	System (Storm & Sanitary) Analyst Team Leader, Storm & Sanitary	Field Support Data Collection Engineering Technologist, Storm & Sanitary	Development Monitoring & Inspection Engineering Technologist, Development	Building Support Division Leader, Building & CBO	Field Support Engineering Technologist, Capital Projects	Stormwater & Pump Lead Team Leader, Roads & Fleet	Stormwater Support Lead Hand(s) Road Operators, Roads & Fleet	Municipal Storm Drainage Support Assistant Drainage Superintendent	Road Closure Lead Team Leader, Parks	Road Support Engineering Technologist, Roads & Utilities	Road and Stormwater Support Park Operators, Water Operators	Administrative Assistants/ Project Coordinator Water Management, Public Works, Capital Projects, Engineering & Infrastructure	Public Service Unit Administrative Support Team Leader, Public Service Rep	Flooding Survey Support Business Application Specialist
Pre-Event Activities																							
Initiates FRRP training and dry runs	R	C	I	I						A													
Implement engineering improvements for future flooding event	A	R	C	C			C	I		I	I			I	I								
Manages flood mitigation service requests and works orders	I	A	R	I			C			I	I			I	C								
Complete any flood mitigation service requests and works orders	I	R	A	I			C			I	I			I	R	R							
Coordinate the inspection and ensure all maintenance is being conducted of all the stormwater pump stations in advance of any event if possible.	I	C	A	I			I			I	I			I	R								
Identify any vehicles and trailers for use for road closures. Remove lawn equipment from tractors.	I	A	I	I						I	I			I	C			R					
Monitor watershed and flooding potential	A	R	C	I		C	I			R	C			C									
Monitor weather and alerts	A	R	C	I		C	I			R	C			C									
Inventory and maintenance of Flooding Equipment	I	I	R	I		C	C			C					C			C					
Monitor information from ERCA and LTVCA	A	R	I	I			I			R	I												
Review and monitor staffing and contacts, shift rotations for field staff.	A	I	C	I		R	C	R		I					R			R					
Review and monitor staffing and shift rotations for administrative staff.	A	C	R	I		R	I	R		I					I			I					
Monitor SCADA for Stormwater PSs	I	C	I	I		C	I			R	C			C	C								
Monitor Security One alarms for sanitary pump stations and setup frequent notifications from OCWA for any failures or upgrades at the sewage pumping stations.	I	C	I	I		C	R			A	C			C	C								
Ensure Storm PS are operating - flag equipment out of service and/or on maintenance such as cleaning trash racks and any generators.	I	C	A	I		C	I			C	I			C	R	R							
Review and monitor the status of the stormwater pump stations and municpal drains and inform senior members of the Flood Response Team	I	C	A	I				I		C					R								
Maintain a list of 3rd Party Contractors for flooding events	I	A	R	I			C			C	I				C								
Maintain updated Incident map in Operations related to past flooding event information, critical infrastructure, maintenance concerns, etc. available during events	C	A	C	I						R	C												R
Ensure flooding survey is active, operational and implement and updates as required	I	C	I	I	C	R				I	I												R
Setup and develop the flooding survey on the Municipal website to address any updates or changes	C	C	I	I	C	A				I	I												R
Coordinate with Building Support to develop a plan for on-going development inspections to minimize the effects of storm events on Municipal infrastructure	C	A	I	I						I		R	C										
Maintain a list for on-going developments for issued building permits	I	A	I	I						I		R	C										
Enforce by-laws regularly and as needed, to minimize flooding when significant rainfall/runoff events occur.	C	C	I	I						I		A	R										

R	Responsible
A	Accountable
C	Consulted
I	Informed

Figure 5.2 RACI Matrix - Alert Level 1 - Enhanced Monitoring

Activity	Flood Response Leader Corporate Leader, Operations	Flood Response Manager Division Leader, Engineering & Infrastructure	Flood Field Manager Division Leader, Public Works	Response Manager/Field Manager Support Division Leader, Capital Projects	Media & Public Engagement Support Team Leader, Civic Engagement	Administration Manager Division Leader, Drainage & Superintendent	Sanitary Field Monitor Division Leader, Water Management	Sanitary Field Inspector Team Leader, Water Management	Sanitary Operation Support OCWA, Sanitary Operator, Water Management	System (Storm & Sanitary) Analyst Team Leader, Storm & Sanitary	Field Support Data Collection Engineering Technologist, Storm & Sanitary	Development Monitoring & Inspection Engineering Technologist, Development	Building Support Division Leader, Building & CBO	Field Support Engineering Technologist, Capital Projects	Stormwater & Pump Lead Team Leader, Roads & Fleet	Stormwater Support Lead Hand(s), Road Operators, Roads & Fleet	Municipal Storm Drainage Support Assistant Drainage Superintendent	Road Closure Lead Team Leader, Parks	Road Support Engineering Technologist, Roads & Utilities	Road and Stormwater Support Park Operators, Water Operators	Administrative Assistants/ Project Coordinator Water Management, Public Works, Capital Projects, Engineering & Infrastructure	Public Service Unit Administrative Support Team Leader, Public Service Rep	Flooding Survey Support Business Application Specialist
Active Event																							
Communication Plan																							
Monitor calls from public and Flooding Survey submissions as required		A			I	R															C	C	I
Event Response																							
Management of field teams and coordinate deployment of field resources	C	I	A	C	I	I	R	R		C	I			I	R	I		R	I	I	I		
Update Flood Incident Map	I	R	C	C	I	I	C	I		C	C	I		C	C	I	I	C	I	I			
Coordinate field resources monitoring the situation	C	C	C	C	I	I	I	C	I	A					R	I	I	I	I	I	I		
Review and monitor weather reports and rainfall data including weather radar systems and Tempest rainfall gauges.	I	A	I	I	I	I	I	I	I	R	C	I		I	I	I	I	I	I	I	I		
Review and monitor SCADA information	I	A	I	I	I	I	I	I	I	R	C	I		I	I	I	I	I	I	I	I		
Review effectiveness of flood mitigation activities	C	C	A	C	I	C	C	I		R	C			C	C	I	I	C	I	I	I		
Document and report information from field activities.	C	A	C	C	I	I	C	I		R	C	I		C	C	I	I	C	I	I	C		
Coordinate with OCWA and Monitor Sewage Pumping Stations	I	I	C	C	I	I	A	C	R	C	I	I	I	C	I	I	I	I	I	I	I		
Monitor Stormwater Pumping Stations	I	C	A	C	I	I	I	C	I	I	I	I	I	C	R	R	C	I	I	R	I		
Monitor Municipal Drains	I	C	C	C	I	I	I	C	I	I	I	I	I	C	C	C	R	I	I	I	I		
Stormwater pumping stations being observed/maintained during an event.	I	I	C	I	I	I	I	C	I	C					A	R	C	I	I	R	I		
Supports field inspections and investigations during events	I	I	C	C			C	R	R	I	R	R	C	I	A	C	R				I		
Remove debris from ditches, catch basins and municipal drains	I	C	A	C	I	I	I	I	I	C	C	I		C	A	C	C	C	C	R	I		

R	Responsible
A	Accountable
C	Consulted
I	Informed

Figure 5.3 RACI Matrix - Alert Level 2 - Active Flooding Event Management

Activity	Flood Response Leader Corporate Leader, Operations	Flood Response Manager Division Leader, Engineering & Infrastructure	Flood Field Manager Division Leader, Public Works	Response Manager/Field Manager Support Division Leader, Capital Projects	Media & Public Engagement Support Team Leader, Civic Engagement	Administration Manager Division Leader, Drainage & Superintendent	Sanitary Field Monitor Division Leader, Water Management	Sanitary Field Inspector Team Leader, Water Management	Sanitary Operation Support OCWA, Sanitary Operator, Water Management	System (Storm & Sanitary) Analyst Team Leader, Storm & Sanitary	Field Support Data Collection Engineering Technologist, Storm & Sanitary	Development Monitoring & Inspection Engineering Technologist, Development	Building Support Division Leader, Building & CBO	Field Support Engineering Technologist, Capital Projects	Stormwater & Pump Lead Team Leader, Roads & Fleet	Stormwater Support Lead Hand(s), Road Operators, Roads & Fleet	Municipal Storm Drainage Support Assistant Drainage Superintendent	Road Closure Lead Team Leader, Parks	Road Support Engineering Technologist, Roads & Utilities	Road and Stormwater Support Park Operators, Water Operators	Administrative Assistants/ Project Coordinator Water Management, Public Works, Capital Projects, Engineering & Infrastructure	Public Service Unit Administrative Support Team Leader, Public Service Rep	Flooding Survey Support Business Application Specialist
Active Event																							
Communication Plan																							
Council, Senior Municipal Staff	R	C	C	C	I	I	I			I	I			I									
ERCA, LTVCA	R	C	C	C	I	A	I			I	I			I	I			I	I				
Monitor Responses in Flooding Survey Form	C	R	C	C		C	I			R	C			I						C	I	I	
Monitor Call Log	C	C	C	C		R														C	C	I	
Receive/Log calls from public	I	C	C	C		A	I	I		C					I			I		R	R		
Prepare and Issue Social Media Posts and update Website	A	C	C	C	R	I	C	I	I	I													
Event Response																							
Management of field teams and coordinate deployment of field resources	C	I	A	C	I	I	I	I		C	I			I	R	C		I	I	C	I		
Update Flood Incident Map	I	R	C	C	I	I	C	I		C	C	I		C	C	C		C	I	C			
Assess extent of flooding	C	C	A	C	I	C	C	I		R	C			C	I	I		I	I	I	I		
Review and monitor weather reports and rainfall data including weather radar systems and Tempest rainfall gauges.	I	A	I	I	I	I	I	I	I	R	C	I		I	I	I	I	I	I	I	I		
Review and monitor SCADA information	I	A	I	I	I	I	I	I	I	R	C	I		I	I	I	I	I	I	I	I		
Identify areas that required flood mitigation supports	C	A	R	C	I	C	C	I		C	C			C	I	I		I	I	I	I		
Review effectiveness of flood mitigation activities	C	C	A	C	I	C	C	I		R	C			C	C	I		C	I	I	I		
Document Flood Mitigation Activities	C	A	C	C	I	I	C	I		R	C	I		C	C	I		C	I	I	C		
Coordinate with OCWA and Monitor Sewage Pumping Stations	C	C	C	C	I	I	R	C	R	C	I	I	I	C	I	I		I	I	I	I		
Monitor/Operate Stormwater Pumping Stations	I	C	A	C	I	I	I	C	I	I	I	I	I	C	R	R	C	I	I	R	I		
Monitor/Operate Municipal Drains	I	C	C	C	I	I	I	C	I	I	I	I	I	C	C	C	R	I	I	C	I		
Stormwater pumping stations being observed/maintained during an event.	I	I	C	I	I	I	I	C	I	C					A	R	C	I	I	R	I		
Supports field inspections and investigations during events	I	I	C	C			C	R	R	I	R	R		I	A	C	R			C			
Remove debris from ditches, catch basins and municipal drains	I	I	A	C			C	I	I	I	I	I		I	R	C	R			C	I		
Deploy road closure signs and flooded area warning signs (If Required)	I	C	A	C	I	I	I	I	I	C	C	I		C	R	R	C	I	I	I	I		
Report information received from the field	C	R	C	I	I	I	I	C	I	A	I			I	C	I	C	I	I	R	I		
Observe any areas under maintenance/service and/or open Service Requests and Work Orders from City Works	C	C	A	C	I	I	I	C	I	C	I	I	I	I	R	C	C	I	I	C	I		
Monitor Geotab information regarding location of Municipal forces	I	I	A	I	I	I	I	C	I	C	I	I	I	I	R	C	C	I	I	C	I		
Review GIS drawings of the storm and sanitary networks and municpal drains	I	A	I	I	I	I	I	C	I	C	R	I	I	I	I	I	R	I	I	C	I		

R	Responsible
A	Accountable
C	Consulted
I	Informed

Figure 5.4 RACI Matrix - Alert Level 3 - High Flood Event Management

Activity	Flood Response Leader Corporate Leader, Operations	Flood Response Manager Division Leader, Engineering & Infrastructure	Flood Field Manager Division Leader, Public Works	Response Manager/Field Manager Support Division Leader, Capital Projects	Media & Public Engagement Support Team Leader, Civic Engagement	Administration Manager Division Leader, Drainage & Superintendent	Sanitary Field Monitor Division Leader, Water Management	Sanitary Field Inspector Team Leader, Water Management	Sanitary Operation Support OCWA, Sanitary Operator, Water Management	System (Storm & Sanitary) Analyst Team Leader, Storm & Sanitary	Field Support Data Collecton Engineering Technologist, Storm & Sanitary	Development Monitoring & Inspecton Engineering Technologist, Development	Building Support Division Leader, Building & CBO	Field Support Engineering Technologist, Capital Projects	Stormwater & Pump Lead Team Leader, Roads & Fleet	Stormwater Support Lead Hand(s), Road Operators, Roads & Fleet	Municipal Storm Drainage Support Assistant Drainage Superintendent	Road Closure Lead Team Leader, Parks	Road Support Engineering Technologist, Roads & Utilities	Road and Stormwater Support Park Operators, Water Operators	Administrative Assistants/ Project Coordinator Water Management, Public Works, Capital Projects, Engineering & Infrastructure	Public Service Unit Administrative Support Team Leader, Public Service Rep	Flooding Survey Support Business Application Specialist
Active Event																							
Communication Plan																							
Council, Senior Municipal Staff	R	C	C	C	I	I	I			I	I			I									
ERCA, LTVCA	R	C	C	C	I	A	I			I	I			I	I			I	I				
County, Neighboring Municipalities	R	C	C	C	I	A																	
Monitor Responses in Flooding Survey Form	C	R	C	C		C	I			R	C			I							C	I	I
Monitor Call Log	C	C	C	C		R															C	C	I
Receive/Log calls from public	I	C	C	C		A	I	I		C					I			I			R	R	
Prepare and Issue Social Media Posts and update Website	A	C	C	C	R	I	C	I	I	I													
Issue Press Releases/Update Media Outlets	A	C	C	C	R	I	I			I	I			I	I			I	I		I		
Contact Emergency Services	A	R	C	C	I	A	C			C	I			I	C			C			I		
Event Response																							
Management of field teams and coordinate deployment of field resources	C	I	A	C	I	I	I	I		C	I			I	R	C		I	I	C	I		
Update Flood Incident Map	I	R	C	C	I	I	C	I		C	C	I		C	C	C		C	I	C			
Assess extent of flooding	C	C	A	C	I	C	C	I		R	C			C	I	I		I	I	I	I		
Review and monitor weather reports and rainfall data including weather radar systems and Tempest rainfall gauges.	I	A	I	I	I	I	I	I	I	R	C	I		I	I	I	I	I	I	I	I		
Review and monitor SCADA information	I	A	I	I	I	I	I	I	I	R	C	I		I	I	I	I	I	I	I	I		
Identify areas that required flood mitigation supports	C	A	R	C	I	C	C	I		C	C			C	I	I		I	I	I	I		
Review effectiveness of flood mitigation activities	C	C	A	C	I	C	C	I		R	C			C	C	I		C	I	I	I		
Document Flood Mitigation Activities	C	A	C	C	I	I	C	I		R	C	I		C	C	I		C	I	I	C		
Coordinate with OCWA and Monitor Sewage Pumping Stations	C	C	C	C	I	I	R	C	R	C	I	I	I	C	I	I		I	I	I	I		
Monitor/Operate Stormwater Pumping Stations	I	C	A	C	I	I	I	C	I	I	I	I	I	C	R	R	C	I	I	R	I		
Monitor/Operate Municipal Drains	I	C	C	C	I	I	I	C	I	I	I	I	I	C	C	C	R	I	I	C	I		
Stormwater pumping stations being observed/maintained during an event.	I	I	C	I	I	I	I	C	I	C					A	R	C	I	I	R	I		
Monitor Sanitary Manhole Incidents	I	C	I	C	I	I	A	A	R	I	C			I	I	C		I	I		I		
Deploy and operate portable pumps	I	I	A	C	I	I	I	C	C	C	I			I	A	R	C	I	I	R	I		
Remove debris from ditches, catch basins and municipal drains	I	I	A	C			C	I	I	I	I	I		I	R	C	R	C	C	C	I		
Supports field inspections and investigations during events	I	I	C	C			C	R	R	I	R	R	C	I	A	C	R			C			
Deploy road closure signs and flooded area warning signs	I	C	A	C	I	I	I	I	I	C	C	I		C	C	C	C	R	R	R	I		
Report information received from the field	C	R	C	I	I	I	I	C	I	A	I			I	C	I	C	I	I	R	I		
Observe any areas under maintenance/service and/or open Service Requests and Work Orders from City Works	C	C	A	C	I	I	I	C	I	C	I	I	I	I	R	C	C	I	I	C	I		
Monitor Geotab information regarding location of Municipal forces	I	I	A	I	I	I	I	C	I	C	I	I	I	I	R	C	C	I	I	C	I		
Review GIS drawings of the storm and sanitary networks and municpal drains	I	A	I	I	I	I	I	C	I	C	R	I	I	I	I	I	R	I	I	C	I		

R	Responsible
A	Accountable
C	Consulted
I	Informed

Figure 5.5 RACI Matrix - Post Event

Activity	Flood Response Leader Corporate Leader, Operations	Flood Response Manager Division Leader, Engineering & Infrastructure	Flood Field Manager Division Leader, Public Works	Response Manager/Field Manager Support Division Leader, Capital Projects	Media & Public Engagement Support Team Leader, Civic Engagement	Administration Manager Division Leader, Drainage & Superintendent	Sanitary Field Monitor Division Leader, Water Management	Sanitary Field Inspector Team Leader, Water Management	Sanitary Operation Support OCWA, Sanitary Operator, Water Management	System (Storm & Sanitary) Analyst Team Leader, Storm & Sanitary	Field Support Data Collection Engineering Technologist, Storm & Sanitary	Development Monitoring & Inspection Engineering Technologist, Development	Building Support Division Leader, Building & CBO	Field Support Engineering Technologist, Capital Projects	Stormwater & Pump Lead Team Leader, Roads & Fleet	Stormwater Support Lead Hand(s), Road Operators, Roads & Fleet	Municipal Storm Drainage Support Assistant Drainage Superintendent	Road Closure Lead Team Leader, Parks	Road Support Engineering Technologist, Roads & Utilities	Road and Stormwater Support Park Operators, Water Operators	Administrative Assistants/ Project Coordinator Water Management, Public Works, Capital Projects, Engineering & Infrastructure	Public Service Unit Administrative Support Team Leader, Public Service Rep	Flooding Survey Support Business Application Specialist
Post Event																							
Document Event Response and Severity with collected information	I	I	C	C	C	C	C	C	C	A	R	C	C	C	C	C	C	C	C	C	C	I	I
Clean and Prepare Equipment for Next Event	I	C	A	I			I	I	I	I	I				R	R	C	R	I	C			
Maintain stormwater pump stations	I	C	A	C	I	I	I	C	I	I	I	I	I	C	R	R	C	I	I	R	I		
Complete any clean-up and coordinate garbage pickup activities in the field if necessary.	I	I	A	I			I	I	I	I	I				R	R	C	R	I	C			
Review Performance of Stormwater Pumps and Drains	I	C	A	I						C	C				R	R	C	I	I	C			
Review and update Flood Alert Levels	C	A	C	C	C	C	C	C	I	R	C	C	C	C	C	C	C	C	C	C	C	I	C
Update GIS for Storm and sanitary infrstruacture if needed.	I	A	C	I	I	I	I	I	I	C	I	C			I							I	I
Follow-up calls with the Public that have requested	C	A	I	I	C	C	I	I		A	I	C	C	I	C		I	C	I		R	C	C
Prepare any Council or Public Reports	R	R	C	I	I	I	C	I		R			I	I	I	I	I	I	I				
Provide staff training	A	R	R	C	C	R	C	C	I	C	C	C	C	C	C	C	C	C	C	C	C	I	C
Identify any building or by-law updates that would reduce future property damage during an event	I	I	I							I		A	R										
Initiate any Capital Works that were identifies during or after the event to assist in reducing property damage in future eevents.	I	C	I	A						R				I									
Participate In Lessons Learned Exercise (Appendix C) and/or meetings	A	R	C	C	C	C	C	C	I	C	C	C	C	C	C	C	C	C	C	C	C	I	C
Update and/or improvements to Website, Online Survey, Call Log, or Incident Maps	C	A	C	C	R	C	I	I	I													I	R
Flood Rapid Response Plan should be reviewed every 5 years or as needed through Lessons Learned	A	R	C	C	C	C	C	C	I	C	C	C	C	C	C	C	C	C	C	C	C	I	C

R	Responsible
A	Accountable
C	Consulted
I	Informed

6 Communication Plan

The following section outlines the communication processes and procedures during a flood event to ensure that communication is managed and coordinated appropriately and to not overwhelm the Municipal staff responding to the event.

The Communications Plan is shown graphically in Figures 6.1 through 6.3 and further discussed below.

The Flood Response Leader is accountable for the overall management of communications, assisted by the Administration Manager and Media & Public Engagement Support.

This communication plan uses a field and office collaboration approach to ensure timely and accurate information is provided to Council & CAO and to the Public.

6.1 Internal Communication

6.1.1 Council & CAO

The Flood Response Leader will issue communications directly to the Council and CAO via e-mail. It is expected that there will be direct communication to Council & CAO, during active Flood Alert Levels consisting of the following:

1. Notification will **NOT** be provided during **Alert Level 1** (unless there is understanding that a significant event is imminent and/or certainty that Alert Level 3 will be reached quickly);
2. Notification during **Alert Level 2,** an event has started, and a significant event is imminent, and that the Flood Response Team is responding to the event. This will likely happen when the risk is well into the Medium Risk Level;
3. Notification that an event is at an **Alert Level 3**. This communication will include a brief update on the expected event, call volumes, impact, etc.;
4. Any further required updates during the event (**Alert Level 3** only) including the extent of flooding and the response to mitigate the effects of the flooding on the residents if the event is longer in duration;
5. Update when the event is about to end or has ended; and
6. **Alert Level 4** communication (if required) will be the initiation of the MECG.

The Flood Response Leader will also provide a post update to Council after every **Alert Level 3** event including the overall response to the event, the extent of damages any required additional clean up activities (additional garbage pick up as previously done in the past) and any Lessons Learned from the event through FMPF updates and/or a FRRP update, pending the impact of the event.

6.1.2 Flood Response Team

The Flood Response Leader will communicate directly with the Managers – Flood Response Manager, Administration Manager, the Flood Field Manager and the Response Manager/Field Manager Support.

The Public Inquiry & Call Management of the Flood Response Team consists of the Administration Manager who receives feedback from the Administrative Assistants/Project Coordinators. The Public Service Unit Administrative Support and Flooding Survey Support keep the Administrative Staff updated with public inquiries and Flooding Survey results.

The Flood Data department of the Flood Response Team consists of the System (Storm & Sanitary) Analyst and Field Support Data Collection role maintaining contact with the Flood Response Manager with respect to flood data observations via cell phone.

The Sanitary Monitoring of the Flood Response Team consists of the Sanitary Field Monitor and Sanitary Field Inspector receiving pump and treatment operation data from the Sanitary Operation Supports. Sanitary Field Monitor and Sanitary Field Inspector maintain contact with the Flood Response Manager with respect to system monitoring observations via cell phone.

The Flood Response Manager will maintain contact with the Flood Field Manager to coordinate the response in the field. These communications will be made via cell phone and text.

The Field Management and Operations of the Flood Response Team consists of the Flood Field Manager, the Stormwater and Pump Station Lead and the Road Closure Lead maintaining contact with the support forces in the field responding to the event. The communication with Municipal field staff will be via the municipal radio system and individual cell phones.

During a flood event, the primary method of communication between office staff and field staff is via the two-way radio base to ensure direct and immediate communication is available between the FMO and Field Support Staff.

The use of municipal cell phones will be another primary point of contact between staff who have a readily available municipal cell phone as part of their role. This includes the relative field staff and Engineering Technologists. In addition, the field support staff and Engineering Technologists have the option of using a tablet for documentation in the field that may be used for communication purposes to relay information back to the FMO.

It is noted that Field Staff should refrain from communicating with any members of the public and should refer the Public to Lakeshore's Website (https://www.lakeshore.ca/en/living-here/flooding.aspx) and the Flooding Survey for updates on the situation.

The Flood Response Manager will keep the Flood Response Leader updated with respect to the Flood Mitigation activities and their effectiveness.

Internal communications between the office staff will be via a group text.

If required, depending upon the severity of the event, the Flood Field Manager in consultation with the Flood Response Leader will contact Third Party Contractors to supplement the Municipal response or for emergency repairs to equipment or pumping stations.

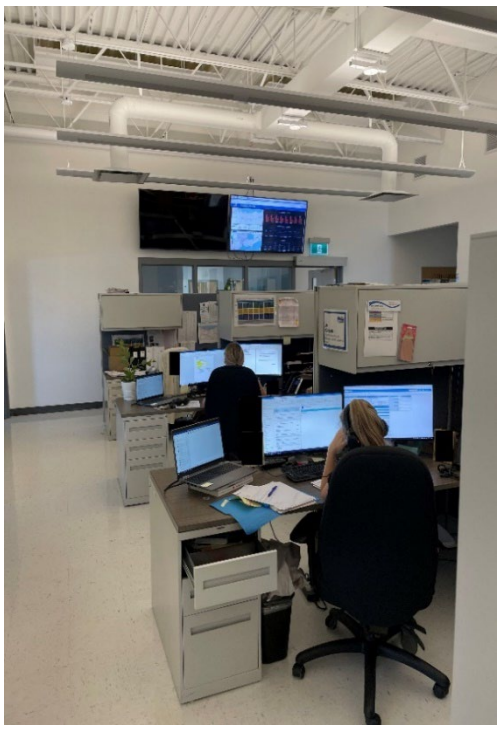
If required, road closure notices will be provided to Emergency Services (fire and ambulance) identifying levels roadways may be unpassable. This level will be set in collaboration with Emergency Services as part of this plan and updated as required.

Further, based on the Flooding Mitigation and Protection Framework (FMPF) (adopted by Council) updates will also be provided to Council throughout the year. These updates can include lessons learned and any required changes to the FRRP.

Important web links:
www.Lakeshore.ca/Flooding
www.Lakeshore.ca/Subscribe
www.Lakeshore.ca/News
www.Lakeshore.ca/Contacts

Social media:
Facebook: @MunicipalityOfLakeshore
Twitter: @TweetLakeshore
#FLOODAWARE

6.2 Public (External) Communication



Operations Center (FMO), Administrative call area

6.2.1 Incoming Communication

When the FRRP has been initiated, incoming calls from the Public during office hours will be answered initially by the Public Service Unit (PSU). The PSU will encourage the residents to use the Flood Survey Tool on the Municipality's Website to post any issues regarding flood impacts. Sample messaging for the PSU to utilize during a flood event will be part of the training plan for the FRRP.

The Flooding Survey Tool can be found at the following link: Municipality of Lakeshore Flooding Survey (arcgis.com).

As the severity of the event increases and the Alert Levels escalate it is anticipated that the volume of calls will increase.

Figure 6.1 shows how calls from the Public will be escalated and managed during an event.

Further information is provided based on the alert levels and expectations of communication.

Alert Level 1 – Enhanced Monitoring

During an Alert Level 1, surface flooding is expected to be minimal and as such the volume of calls from the Public should be relatively low. The PSU will route calls to the Operations department, as per normal practice under this Alert Level.

The Administrative Assistants will monitor the website and provide any concerns to the Administration Manager.

The Administrative Assistants will record calls in the Call Log and transfer the call to the appropriate Operations/Flood Team member, if required.

Alert Level 2 – Active Flood Event Management

During an Alert Level 2 minor surface flooding could be starting to occur, but little to no damage to Public Property such as basement flooding is expected.

There is expected to be a higher volume of calls during an Alert Level 2 event than from an Alert Level 1 event.

The calls will be first routed to the Public Service Unit who will either:

- Continue to transfer calls to the Operations Department; OR
- Encourage the callers to provide their questions or comments on the Flooding Survey website, if applicable and direction was provided.

The Administrative Manager will confirm with the PSU and Administrative Staff when the Flood Survey will be initiated in Alert Level 2, pending direction from the Flood Response Leader.

The Administrative Assistants will monitor email and the website and provide the comments to the Administration Manager for logging.

If the Public insists on speaking with someone, the PSU will route the calls to the Operations department.

The Administrative Assistants record calls in the Call Log and transfer the call to the appropriate Operations member. If this Operations member is not available to take a call, the Administrative Assistant will take a message so the Operations member can later follow up with the caller during or after the event has concluded (as time permits).

The Flood Response Leader assisted by the Flood Response Manager will determine the appropriate Operations member to follow up with the Public during and/or after the event.

Alert Level 3 – Severe Flooding Event

During an Alert Level 3, surface flooding will be occurring, roads will be closed and damage to private property such as basement flooding will be occurring and a high number of calls from the Public are expected.

At this Alert Level the Operations staff may not be able to keep up with call volumes and/or speak to the Public directly, as staff will be busy mitigating the flooding. However, information can be left on voicemail for a return call when activities cease to a level where staff can be available to provide updates and/or discuss the public concerns.

The calls will be first routed to the PSU who will encourage the callers to provide their questions or comments on the Flooding Survey website. The PSU may also become overwhelmed with call volumes and may require modification to the Interactive Voice Response (IVR) to provide additional options to the caller.

The Administrative Assistants will monitor email and the website and provide the comments to the Administration Manager for logging.

If the Public insists on speaking with someone, the Public Service Unit will route the calls to the Administrative Assistants. The Administrative Assistants will record calls in the Call Log and take a message, noting that the Municipality is actively managing the flooding and that someone will get back them once the flooding has subsided.

The Call Logs will be regularly updated and used by the Flood Response Manager to assess the current situation and prioritize resources and the response.

The Flood Response Leader assisted by the Flood Response Manager will determine the appropriate Operations member to follow up with the Public during and/or after the event.

Alert Level 4 – Activation of the MERP

Communication protocol (beyond the FRRP) and in this case will be as directed under the MERP and is not included in this plan.

6.2.2 Outgoing Communication

Minimal calls will be outgoing during activation of the FRRP. The outgoing communication will be limited to the below, based on Alert Levels.

During Alert Level 1 events, no Public Notices will be prepared.

During Alert Level 2 and 3 events, Public Notices will be posted on the Municipality's Website and social media by the Media & Public Engagement Support. The notices will be reviewed and approved by the Flood Response Leader. Public Notices/Updates will be prepared at appropriate intervals during the flood event.

If necessary, the Media & Public Engagement Support will prepare any necessary news releases to be approved by the Flood Response Leader.

The Flood Response Manager will monitor the Flooding Survey Tool and provide information collected to the Flood Field Manager. The Flooding Survey webpages should be reviewed at a minimum of once per hour. The information received from the Flooding Survey will be summarised in a log and provided to the Administration Manager for distribution.

The After-Hours Phone service will manage all after hours calls and the callers will be directed to post their questions or comments on the Flooding Survey website. Any messages left will then be forwarded to the Flood Response Manager.

If an Alert Level 3 Flood Event stretches to after hours, the Flood Response Leader will determine if the calls remain routed to the Administrative Support and/or the PSU or if the After-Hours Call Service will manage the calls pending Alert Level status and consideration of existing conditions.

IT support will be required in the event of any modification to standard call hours.

6.3 Other Applicable Agency Communications

6.3.1 Conservation Authorities

Prior to an event, the System (Storm & Sanitary) Analyst and Field Support Data Collection will monitor the weather and notices from ERCA and LTVCA with respect to the potential for a flood event occurring. They will keep the Flood Response Leader and the Flood Response Manager informed of any potential events that are forthcoming and assist with planning and preparing for an imminent event.

Both ERCA and LTVCA issue watershed condition outlooks and statements that will be used as guidance during the implementation of the FRRP and will assist in understanding the watershed conditions for the region. Any flood alerts or watershed condition statements issued by ERCA and LTVCA will be posted on the Municipality's social media outlets.

During a flood event, the Flood Response Leader will be in contact with ERCA and LTVCA (as required) to update them on the Municipal response and situation. Typically, this contact occurs at three points; once a flood event has started; mid way through the response and, when the event is ending (likely only in Alert Level 3).

The System (Storm & Sanitary) Analyst may also be in contact with ERCA and LTVCA with respect to water levels and rainfall data they may have. It is expected that this information will be polled on an hourly basis.

6.3.2 County Neighbouring Municipalities and Emergency Services

The Flood Response Leader will be in contact with other agencies including the County, Neighbouring Municipalities, OPP, and Fire Department on an as needed basis if warranted by the extent and severity of the event. When possible, any road closures and updates will be communicated with the Municipal 511 website for notification purposes.

FIGURE 6.1 - ALERT LEVEL COMMUNICATION PLAN

This plan is based on the expected communication only during Alert Level 2 and 3. Notifications will NOT be provided during Alert Level 1 (unless there is understanding that a significant event is imminent and/or certainty that Alert Level 3 will be reached quickly).

Alert Level 4 is directed to MERP.

Start of Event

Flood Response Manager notifies ***Flood Response Leader & Flood Field Leader*** of Flood Event via Email, Chat or Phone

Alert Level called by ***Flood Response Leader*** and an email is sent to ***Council & CAO*** *and* ***Flood Alert Level Distrubution List***

Flood Response Leader works with ***Media & Public Engagement Support*** to prepare Public Notifications based on the associated Alert Level.

Media & Public Engagement Support sends out public notfication via Press Release, Social Media Engagement and Lakeshore Website (as approved by Flood Response Leader)

During an Event

Email Notfication update by ***Flood Response Leader*** sent to ***Council & CAO*** *(and Flood Alert Level Distribution List)*

Media & Public Engagement Support sends out updates via Press Release, Social Media Engagement and Lakeshore Website in conjunction with the ***Flood Response Leader***

Post Event

Email Notfication of End of Event by ***Flood Response Leader*** sent to ***Council & CAO*** *(and Flood Alert Level Distribution List).*

Media & Public Engagement Support sends out public End of Event notfication via Press Release, Social Media Engagement and Lakeshore Website

Flood Alert Level Email Distribution List

- Administrative Manager
- Flood Response Manager
- Flood Field Manager
- Response Manager/Field Manager Support
- System (Storm & Sanitary) Analyst
- Sanitary Field Monitor
- Stormwater Pump Lead
- Road Closure Lead
- Media & Public Engagement Support
- Administrative Assistant & Public Service Unit Support

FIGURE 6.2 - INTERNAL COMMUNICATION PLAN

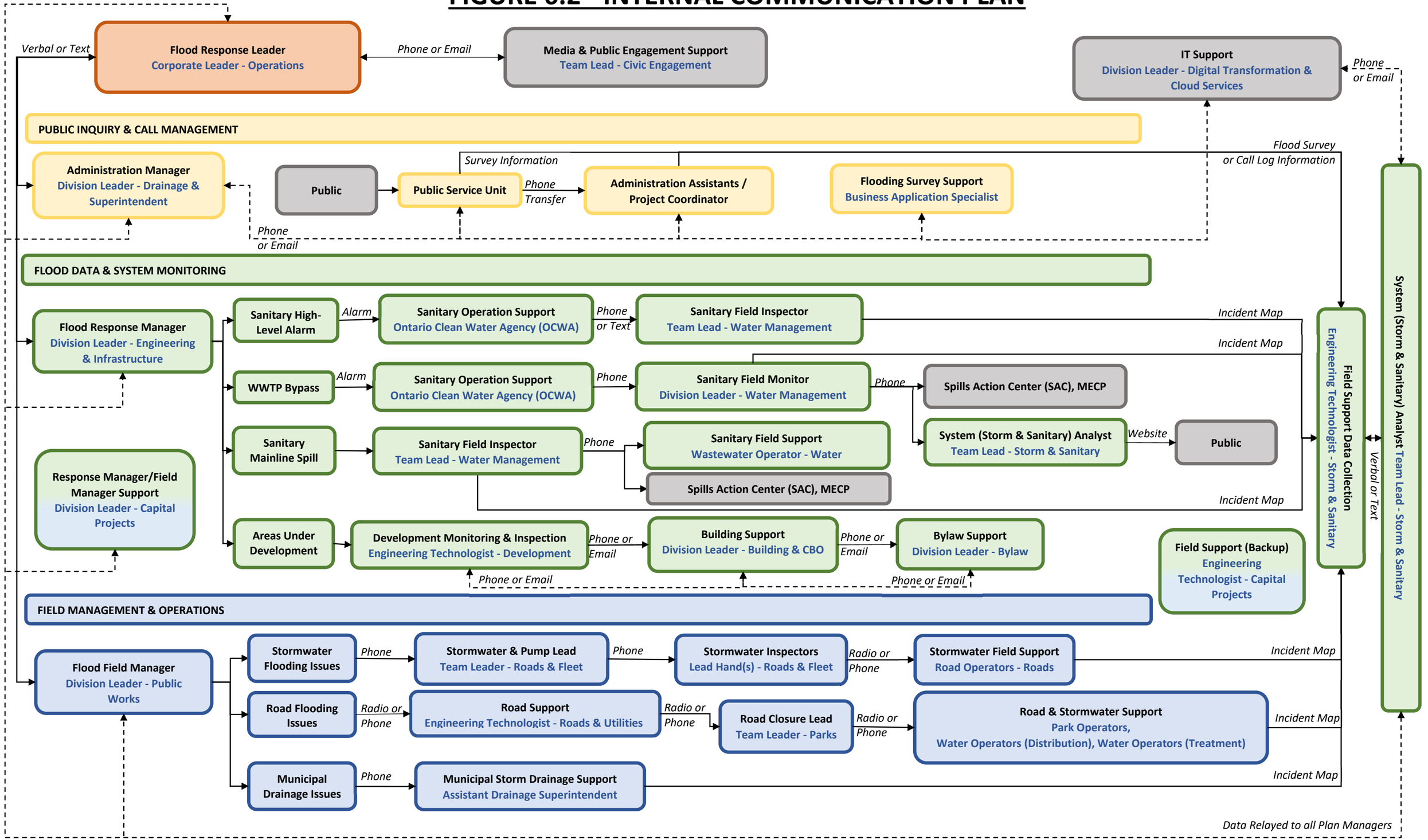


FIGURE 6.3 - PUBLIC COMMUNICATION PLAN

Public Concern(s) Recieved via Flooding Survey/Website or via Call through PSU	PSU assists the caller with the input of information into the survey	Survey volumes are being monitored by the Adminstrative Manager	Survey Results being monitored by Flood Response Manager	Survey Results being managed by System Analyst (reviewed in field if required)	Information shared with, Flood Field Lead and Storwater Pump Lead	Communicate to Field Support Staff, as required for action	No return calls will occur during this time to those residents that provide Flooding Survey input. Report on the results will be posted after the event.
Public Via Phone/Email During Office Hours	PSU receives call and resident wishes to speak to someone directly	PSU transfers call to Adminstrative Assistant	Administration Assistant speaks with resident to direct call (or emails)	Call log volumes being monitored by Adminstrative Manager	Flood Response Leader/Flood Response Manager takes resident call, if available	Call log being managed by System Analyst (follow up if required)	Field Support Data Collection to review any concerns in the field (as required)	Where the Public insists on speaking with someone, calls may be required to be followed up after the event has concluded, pending resourcing/ storm severity.
Public Concerns Received After Hours Calls via Service Provider (Kelcom)	After hour pump alarms (Security One)	Extend Administrative staff hours, as required (pending volume of pages)	Stormwater Inspectors, Flood Field Lead and Stormwater Pump Lead receive page notifications	Notifications communicated to Field Support Staff, as required for action	After hours alarms, public concerns, and on-line survey being monitored by Flood Response Manager	Alarms, public concerns, and on-line survey being managed by System Analyst	Monitoring will still be completed based on the after-hours pages (resident concerns and high-level alarms). Resident calls may not be able to be returned during this time based on limited resources.
Public contacts a Council Member via phone or email	Council Memeber sends request via email to the Flood Response Leader	Flood Response Leader addresses concern or forwards to Team Member to address/log concern	Follow up post event with the council member on the status of the resident, if required.				
Media & Public Engagement Support provides notifications of Alert Levels via website and through social media	Updates are provided to the public on road closures via website and through social media	Media & Public Engagement Support updates at End of Event via website and through social media	After the event (Alert Level 2 and 3) an update will be provided on the storm, call volumes and survey results will be shared.				
Flood Response Leader contacts Conservation Authorities, County & Neighbouring Municipalities, as required	Email/Phone updates on event status, road closures and possible request for assistance/ support	Flood Response Leader sends email at End of Event	The County of Essex will be contacted for any road closures related to County Roads. Municipal 511 website to be updated, where required.				

BE PREPARED. BE AWARE. WORKING TOGETHER.

LAKESHORE #FLOODAWARE

7 Closing

The FRPP has been developed and adopted to put resources in place to assist with these events and continuous assessments on how Municipal responses can improve to assist during these events.

Leffler Drain, under full flow conditions after an event

It should be noted that some factors may exist that will adversely affect the municipality's ability to respond to flood events and/or the ability to respond to a flood event in a controlled manner such as:

- Availability of staff during an evening, pending time and duration of event;
- Loss of hydro or other impacts caused by third party utilities;
- Communication failure or disruption (cell phone, internet, radio, television, etc.); and
- Traffic disruptions (road or bridge closures).
- In certain situations, it may be difficult in attaining and delivering emergency services (police, fire, paramedic services) during flooding events and/or the response times may be longer if roads become impassable due to significant depths of flooding.

As part of the FRRP, and for purposes of shoreline flooding, the Municipality where possible, will provide sandbags and sand to residents when adequate supplies are available. Depots will be set up accordingly and as required (locations and timing will be communicated through the Municipality's website and social media). No municipal personnel will be deployed for purposes of assistance with the protection and placement of sandbags on private property.

The FRRP should be formally updated every 3 years. This includes a comprehensive review of the plan and any information compiled from the Flood Monitoring Database (FMD).

In addition, system training will be provided to all staff identified in the FRRP for the initial implementation once complete. Subsequent training will incorporate dry runs of the FRRP annually and/or as required by key staff. Training plans and opportunities will also be developed from the review of the Lessons Learned from past flooding events. Health and safety initiatives will be incorporated as part of the training plans for the FRRP to ensure the safety of all members of the flood response team while implementing the plan. This includes proper safeguards to be provided for staff to ensure their safety during a flooding event.

The Communication Plan uses a field and office collaboration approach to ensure timely and accurate information for internal and public engagement. This plan will be updated accordingly from any identified improvements from the Lessons Learned.

The FRRP, although considered a formal response plan, will likely see more informal modifications and updates based on specific events and changing circumstances during events that cannot be predicted or controlled.

Further, there are still systems that are required to be developed and put in place to effectively manage this plan. The below are some of the outstanding items that will require implementation in the near future:

- Incident map development with ARCGIS software similar to flooding survey tool to track all flooding incidents during an event, which includes:
    - Field Observations with respect to stormwater and/or sewage systems
    - Pumping Station Issues (high water level, alarm notifications, etc)
    - Gate status at storm and drain outlets (open/closed)
    - Flooding calls and survey
    - Basement flooding locations
    - Road Closures and surface flooding
- Inventory and inspection checklists of all flood mitigation equipment via electronic documentation;
- Development of a Flood Monitoring Database (FMD) that will house information collected by past and current events, which includes:
    - Rainfall Guage Data
    - SCADA Data
    - Data from Appendices: Field Observations, Call Logs
    - Flooding Survey Data
    - Third Party Contact List
- Electronic forms as shown in the Appendices for easy use and live submission of field forms;
- Training plans along with health and safety plans;
- Communication system (such as Microsoft Teams) for advance notification of flood alert levels between the flood data/system monitoring team and the field staff to initiate FRRP awareness and routine inspections.
- Development of a Lessons Learned Exercise to review all data and have the necessary participation and input from all staff involved in the FRRP.
- Generation power at the FMO to support the plan.

We will be working in conjunction with IT Support to implement the above noted systems.

In closing, the FRRP outlines the assistance that will be provided to the municipality and its residents during flood events. The Municipality will be working in collaboration with ERCA, LTVCA, stakeholders and other authorities with the implementation of this plan.