

# Westside Marsh Emergency Overflow Channel Monitoring and Maintenance Plan (the “Plan”)

## 1) Background

The Principles of Understanding Between Blue Circle Canada Inc. and the Municipality of Clarington on the Implementation of the Recommendations of the Waterfront Regeneration Trust Report on Westside Marsh outlines the arrangements for the diversion of the Westside Creek, the Westside Marsh (the “Marsh”) and extraction limits, and the Marsh emergency overflow channel. Schedule “A” from the Principles is provided for reference. The Principles also included a Maintenance and Monitoring Agreement for the various works including the emergency overflow channel. The Agreement describes the roles of the Municipality of Clarington, the Central Lake Ontario Conservation Authority (“CLOCA”) and Blue Circle Canada Inc. to “...keep the work in good and substantial state of repair...”, but is not explicit in the requirements on monitoring and maintenance for the emergency overflow channel. The following Plan is intended to provide additional detail to enable monitoring and maintenance work specific to the emergency overflow channel, and to address issues that have arisen because of the current unprecedented high Lake Ontario (the “Lake”) water levels. Blue Circle Canada Inc. is now St. Marys Cement Inc. (Canada), and will be referenced as “St. Marys” in this Plan.

## 2) Westside Marsh and Lake Ontario

The Westside Marsh is a 45 hectare barrier beach coastal wetland. Common to Lake Ontario coastal wetlands, a barrier beach will build up during periods of Lake wave activity, isolating in-land wetlands that drain into the Lake. Although the wetland water level will generally follow the Lake levels, the barrier beach allows the wetland water levels to increase as stream flow drains into them and are then unable to flow out of the built-up beach to the Lake. At some point, natural processes will result in the build-up of water in these wetlands exerting sufficient force on the barrier beach to breach the beach, and the wetlands will drain back down to the Lake water elevation. This process is a natural phenomenon and is important to maintain the health of the wetlands, including the Westside Marsh.

## 3) Emergency Overflow Channel Function and Features

The licensed aggregate extraction by St. Marys has resulted in the approved removal of a significant portion of the Westside Marsh wetland. During the planning and engineering of the wetland removal, a Report on Hydrotechnical Analysis of Modifications to West Side Creek and Marsh Associated with Future Operations of Blue Circle Cement (Marshall Macklin Monaghan, April 1998) was produced, referred to in this Plan as the “Hydrotechnical Analysis Report”. This Hydrotechnical Analysis Report recognized the relationship between the inflow of water from the Westside Creek, the volume of flood storage in the Marsh, the outflow of water through the barrier beach, and the associated flood water elevation within the wetland.

In 1998, it was recognised that the planned expansion of the aggregate extraction area and reduction of the marsh flood storage volume could, if not properly engineered, increase the outflow from the Marsh, with impacts on the then-existing flooding conditions at Cedar Crest Beach Road. Cedar Crest Beach Road has historically and is currently located in an area mapped by CLOCA as a flood plain. As such, there has always been a risk of flooding from both the Westside Creek to the north and Lake Ontario to the south. The CLOCA Flood Risk Assessment report (CLOCA 2017) identified this community as continuing to have both high vulnerability to flooding and high potential frequency of flooding.

The Hydrotechnical Analysis Report proposed the preservation of the natural outlet, the primary channel that releases water from the Marsh, and the creation of a secondary emergency overflow channel to maintain the existing flooding conditions of the Marsh, both of which run from the Marsh to Lake Ontario. The intention behind the secondary channel was to provide additional outlet capacity to compensate for the reduction in Marsh floodwater storage, and maintain the existing flooding conditions between Westside Creek inflow to the Marsh and the flood elevation within the wetland. It was never intended to bring the natural flooding to an end and prevent flooding from occurring thereafter; the intention was simply to substantially maintain the existing flooding conditions. The two outlets from the Marsh can be described as follows:

- a. The primary outflow channel, on the east side of the Marsh, is owned by the Municipality of Clarington. It is a natural outlet and the main conduit for water to flow to Lake Ontario from the Westside Marsh. The mouth of the primary channel at Lake Ontario is a barrier beach outlet, in that wave activity of Lake Ontario deposits sand and cobble at the mouth of the channel, often blocking the outflow of water from the Marsh. At intervals, the accumulation of water in the Marsh exerts sufficient force on the barrier beach to breach the beach, so the Marsh drains back down to the Lake water elevation; and
- b. The secondary emergency overflow channel, which is the subject of this Plan, most of which would be (and is) owned by St. Marys. St. Mary was to (and does) maintain the portion of the channel it owns under CLOCA's direction. All references herein to St. Marys' obligations with respect to the secondary emergency overflow channel only relate to that portion of that channel owned by St. Marys. This secondary channel is engineered to become operational (i.e. contain water flow) when the amount of water in the Marsh exceeds the ability of the primary channel to drain into Lake Ontario, which can occur when there are flooding conditions. Generally the secondary emergency overflow channel is dry. The Hydrotechnical Analysis Report provided the design for the emergency overflow channel, described as a trapezoidal channel running about 300 metres north of the Lake Ontario shoreline with a 12 meter wide bottom width. The emergency overflow channel was also designed to have vegetation appropriate to stabilize the channel side slopes, and vegetation in the channel bottom. At the north limit of the overflow channel, a rock weir (design elevation 75.68 metres) establishes the elevation at which water will spill into the channel. The rock weir is located on property owned by CLOCA and does not form part of the portion of the emergency overflow channel owned by St. Marys and to which St. Marys has obligations hereunder. The Hydrotechnical Analysis Report and detailed design of the

emergency overflow channel was approved by multiple agencies including CLOCA, Ontario Ministry of Natural Resources and the federal Department of Fisheries and Oceans. The emergency overflow channel was constructed in accordance with the approved designs under the direction of St. Marys, and remains in its ownership. The attached sketch shows the emergency overflow channel in relationship to the Westside Marsh and Lake Ontario, and the ownership of the various parcels.

#### 4) Lake Ontario Shoreline and Record Lake Levels

During the spring of 2017, Lake Ontario water levels rose to unprecedented levels. On May 29<sup>th</sup>, the Lake Ontario water level was reported as 75.88 metres above sea level. The International Lake Ontario - St. Lawrence River Board (ILOSLRB) reported that “months of high precipitation produced the highest recorded waters level on Lake Ontario since reliable records began in 1918.” (ILOSLRB, May 26, 2017) This level exceeds the historical maximum recorded Lake Ontario water level by about 15 centimetres. On multiple occasions, the Municipality of Clarington responded to flooding concerns of residents on Cedar Crest Beach Road. Southerly winds created wave and surge conditions that brought Lake water into the residential lots and caused flooded basements/crawl spaces. On other occasions, significant rainfall in the Westside Creek watershed flowed into the already flooded Westside Marsh, and water began to flood Cedar Crest Beach Road and adjacent lots.

These unprecedented Lake levels impacted the ability of the Marsh water to break through the barrier beach. Due to the high water levels of the Lake, the difference in water levels between the north and south sides was not enough to breach the barrier that was built-up on the beach. The Cedar Crest Beach Road area has always been susceptible to flooding during the high Lake level period due to its location and elevation, and is classified as a flood damage centre by CLOCA. Efforts to minimize flooding during the unprecedented Lake levels included breaking the barrier beach at the mouth of the primary channel to maximize outflow from the Marsh. Similarly, beach build-up at the mouth of the emergency overflow channel was cleared on several occasions to maximize the outflow.

Concern has also been expressed by residents in the Cedar Crest Beach Road community, regarding the build-up of beach material at the mouths of both the primary and secondary channels, and the extent of vegetation within the emergency overflow channel that may restrict the flow of water to the Lake.

This Plan is provided to address these concerns that have arisen during the period of record high Lake Ontario levels, and to provide clear direction for management of the emergency overflow channel for all parties.

#### 5) Annual Monitoring

The Principles provide for the ability of CLOCA to inspect the emergency overflow channel. CLOCA will contact St. Marys prior to entering the emergency overflow channel. Inspections will occur annually, as required, or on a complaint basis. During the site investigation, the following items will be documented:

- Any indications of slope failure

- Accumulation of sediment or other blockages in the channel or culverts
- Vegetation conditions
  - Adequate cover for erosion protection
  - Excessive or over-mature vegetation presenting an obstruction of flow
- Accumulation of beach debris
- Any conditions that raise a concern with the function of the channel

After assessment of the monitoring results, CLOCA staff will recommend maintenance works, as necessary to address identified issues. The recommendations will also include reasonable timelines for recommended actions. The monitoring results and recommendations for the emergency overflow channel will be provided to St. Marys, and St. Marys will make reasonable commercial efforts to complete the actions within the specified time frame and will keep CLOCA informed of any delays.

## 6) Maintenance

Maintenance of the emergency overflow channel is the responsibility of St Marys. CLOCA is responsible for directing St. Marys as to what maintenance is required and when the maintenance should be carried out. It is not anticipated that maintenance will be regularly required in the channel, although during extreme conditions (i.e. extreme Lake levels), greater maintenance may be requested.

CLOCA may request St. Marys conduct maintenance to address the results of its investigations (see Section 5). For clarity, maintenance related to vegetation conditions may include removal of shrub vegetation after a period of years, to prevent large diameter vegetation from becoming established. Soft vegetation (cattails, and small diameter shrubs) are not considered to be a significant obstruction to flood flow, and were intended to be present to provide soil stability, and fish and wildlife habitats.

Maintenance works must also consider approvals, associated timing windows, and impacts such as migratory birds nesting, fish habitats, and species at risk. These approvals may limit the time of year available for non-emergency maintenance works. Prior to commencement of maintenance works, erosion and sediment controls shall be proposed to the satisfaction of CLOCA, and shall be implemented at the start of works, remain in good repair during the works, and removed at the completion of works. All disturbed areas will be stabilized to the satisfaction of CLOCA at the conclusion of the work.

The accumulation of debris at the Lake Ontario beach may not be an obstruction in years with normal Lake levels.

## 7) Flood Conditions

CLOCA issues messages when watershed conditions and weather forecasts indicate the potential for a flood event, and issues Flood Safety Bulletins, Flood Watches, and Flood Warnings. CLOCA will include St. Marys on its circulation list for these messages.

For the purpose of the following, the parties note as follows:

- The elevation of Cedar Crest Beach Road is, on average, 76 m, but as low as 75.8 m in certain places.
- The design elevation of the weir is 75.68 m.

The actual elevation of the weir appears to be closer to 75.48 m, based on a recent survey. St. Marys has installed a water level gauging system with remote communication abilities (the “remote system”) in the west portion of the Marsh, owned by CLOCA, that is close to the northern portion of the emergency overflow channel. St. Marys has donated the remote system to CLOCA, and will reimburse CLOCA annually for operating and maintenance costs. CLOCA will seek approval from St. Marys before spending any amount that would result in more than \$10,000 in the aggregate being spent on operating and/or maintenance of the remote system in one calendar year. St. Marys, CLOCA, and a staff member at the Town of Clarington will all receive email alerts from the remote system when the water elevation at the location of the remote system in the Marsh reaches a certain elevation, to be determined periodically by CLOCA (the “preset elevation”) as a warning of high Marsh water levels. This remote system will be twinned with a manual staff gauge closer to Cedar Crest Beach Road (the “northerly staff gauge”), located in the Marsh (which will act as back-up for the remote system). A second manual staff gauge (the “southerly staff gauge”) will be installed by St. Marys in the southern portion of the emergency overflow channel, close to the barrier beach by the Lake, to measure the height of any built-up barrier.

St. Marys will install the two manual staff gauges when conditions permit, at precise locations and depths to be determined by CLOCA, and will survey them once they have been installed. After the survey has been completed, a sketch showing the locations of the remote system and the two staff gauges will be appended hereto. St. Marys shall be responsible for commercially reasonable general upkeep of the southerly staff gauge and CLOCA shall be responsible for commercially reasonable general upkeep of the remote system and the northerly staff gauge.

The primary outflow for the Marsh will also be assessed by CLOCA during period of high water and flood concern. The primary channel will be open, or be in the process of being opened, (either naturally or manually) during events where the overflow channel is activated. St Marys has no responsibility for the primary outflow channel.

The following considerations shall guide CLOCA’s decision as to whether or not to ask St. Marys to manually open the emergency overflow channel in the event of flooding conditions at Cedar Crest Beach Road:

- a. Water levels in the Marsh
  - i. Preset elevation is reached and remote system sends email to St. Marys, CLOCA, and the Town of Clarington; and levels continue to increase
  - ii. Weather forecast of significant rainfall
- b. Beach barrier of the emergency overflow channel poses an impediment to flow in the overflow channel (ie: barrier approaching elevation of the weir level, from a review by St. Marys of the southerly staff gauge, at CLOCA’s request;

- c. relevant water and land elevation levels (for example, there could be a situation where the lake elevation is higher than the build-up); and
- d. Timing (for example, if there are flood conditions but there is no rain or no flow from the Marsh and the barrier can be built up again in hours by wave action, then there is little value in breaking the barrier until the appropriate time).

CLOCA will keep St. Marys apprised of the relevant activities of which it is aware in the area during the time in which flooding conditions exist for the Cedar Crest Beach Road area.

Unless works are permitted to be completed on a flood emergency basis without liability accruing to the party completing or directing the works, approval agencies will be contacted for approval prior to work on the beach.

#### 8) General

- a. Notwithstanding anything to the contrary, whenever any party in this Plan is required to: (i) do any act; (ii) formulate an opinion; (iii) incur any cost, fee, charge or other expense or make any other payment for which the other party may be wholly or partially responsible; (iv) be satisfied with respect to any matter; (v) make any estimate; or (vi) make any determination or judgment, then the same shall be made on a reasonable basis. For clarity, notwithstanding the foregoing, the exercise of discretion may be made on an unfettered basis and without applying a reasonableness standard.
- b. Each of the parties will, in discharging its obligations under this Plan, comply with all provisions of laws, statutes, ordinances, regulations, by-laws, directions, orders, rules, requirements, policies and enforceable guidelines, judge made laws or common law and any order of a court or all federal, provincial, municipal and other governmental authorities, departments, boards and agencies having jurisdiction (the “**Law**”), and neither party shall ask the other party to act except in compliance with the Law. In the event either party asks the other party to act in a manner that is not in compliance with the Law, the party so requested need not comply with the request.

# Ownership Sketch

