

STEEP CREEK HAZARD ASSESSMENT UPDATE – THREE SISTERS VILLAGE

Report prepared by BGC Engineering Inc., June 2020



Overview

In 2014, BGC Engineering Inc. assessed debris-flood hazards and risks to development and infrastructure on the Three Sisters Creek fan. The study demonstrated that the eastern portion of the Three Sisters Creek fan is substantially more susceptible to debris flooding due to the lower elevation in comparison to the western portion.

An updated Steep Creek Hazard Assessment for Three Sisters Creek has now been completed. This was done in accordance with the Town of Canmore's Mountain Creek Hazard Mitigation Program (Town of Canmore, 2016).

Purpose

The Steep Creek Hazard Assessment was updated to help TSMV undertake conceptual and development work. It updates the hazard assessment to include climate change impacts and recent advances in science related to steep creek hazards. Findings from this updated report are being used to identify mitigation options and the necessary setback distances for TSMV to minimize hazard and risk to individuals and infrastructure.

The assessment will also help the Town of Canmore Council and Administration make policy decisions related to existing and future land use in areas potentially affected by debris floods, flooding and bank erosion.

What's new since the 2014 assessment?

BGC revisited and updated the 2014 debris-flood hazard assessment with a specific focus on three elements.

- » Potential for bank erosion
- » Effects of sediment build-up
- » Impacts from climate change

To update the assessment, BGC conducted three separate analyses.

- 1 Estimated and mapped potential bank erosion for all return period debris floods.
- 2 Evaluated the effects of sediment build-up in the channel on the debris flood extents.
- 3 Estimated the effects of climate change on debris flood magnitude.

Findings

The results from the Steep Creek Hazard Assessment Update confirmed that the undeveloped portion of land on the west side of Three Sisters Creek has a much lower likelihood of being inundated by water and debris than the eastern side because it is topographically higher.

The update re-emphasizes the need to protect the currently developed areas on the eastern side of the creek from debris flooding in a comprehensive mitigation strategy.

The Town and TSMV are working together to select a suite of mitigation measures for both the east and west sides of the creek that will work together as a comprehensive system.

The mitigation strategy at Three Sisters Creek includes a wide corridor to allow the channel to migrate, and includes protective structures that could be blended in with the natural landscape on either side.

What does this mean for the proposed development?

The Steep Creek Assessment Update is being used to inform planning considerations, including:

- » Three Sisters property on the eastern side of Three Sisters Creek, south of Hubman Landing, is currently proposed to remain as recreational greenspace. No occupied residential structures are planned to be constructed in this area
- » Minor buildings such as bathrooms or trailhead facilities may be constructed in the future, along with recreational amenities, pathways or parking lots near Three Sisters Boulevard
- » Proposed development is limited to the western side of Three Sisters Creek
- » Development includes a combination of residential and retail buildings, including detached and multi-unit buildings
- » The Town of Canmore and TSMV are working jointly to determine mitigation measures for the benefit of the existing development on the east side of Three Sisters Creek, and the proposed development, so the work can be jointly undertaken.