

Implementation Challenges with the Current Policy

Policy C542 defines the crest, or top of bank, as “the dividing line between the slope and its Upland Area.” The location of this dividing line, while not contentious in confined systems where the watercourse is located in a well-defined valley corridor, becomes difficult to establish in unconfined systems, where the watercourse is located within a poorly-defined valley with limited or no discernible break in slope. Examples of unconfined systems include the flatter, gentler upper reaches of tributaries to the North Saskatchewan River, including Mill Creek, Whitemud Creek, Blackmud Creek, Fulton Creek, and Horsehills Creek. The location of the top of bank line is also difficult to establish in portions of the ravine system containing terrace features. As the delineation of neighbourhood planning boundaries and development setbacks currently depends on the establishment of the top of bank line, debates about its location have resulted in inconsistent application of the policy and in delays in the land development process.

While Policy C542 provides direction for establishing a development setback that protects urban development from geotechnical hazards, it does not provide technical criteria by which to identify buffer lands abutting the ravine system that are required to achieve additional functions and meet other established planning goals and objectives. In particular, it does not provide guidance for identifying lands that may be required to:

- protect development from flooding and wildfire;
- accomodate natural long-term stream dynamics, such as stream migration and erosion;
- achieve a geotechnical factor of safety beyond minimum technical requirements;
- support biodiversity and provide ecological connectivity;
- protect the North Saskatchewan River and its tributaries from pollution;
- provide sufficient access for emergency and parks operational access;
- and,
- provide the general public with sufficient trail access to the River Valley and Ravine System.

Historically, it was assumed that ecological, parkland, and water quality objectives could be achieved within lands lying below the top of bank and designated as environmental reserve. However, existing practices associated with the implementation of the Policy are insufficient to ensure that the goals and intent of the policy, the River Valley Area Redevelopment Plan, and the Municipal Development Plan are met.

Attachment 3

In recent greenfield residential developments, limited City resources have precluded the securement of buffer lands abutting the river valley and ravine system that are not at risk of flooding or geotechnical instability, but that are required to meet other planning objectives. As a result, the ability of new neighbourhoods to provide connectivity and access to the river valley and ravine system for park users, protect the river valley and ravine system from pollution, and support the City's ecological network is often limited. Furthermore, limited consideration for erosion due to natural stream processes, such as stream migration, or to increased stormwater inputs from upstream development has resulted in damage to infrastructure such as trails, bridges, and culverts.

The City routinely incurs large costs to repair damaged infrastructure or reinforce ravine slopes that have been destabilized by erosional processes. Recent capital expenditures of over \$4.5 million have been allocated to the repair or maintenance of damaged trail infrastructure in the river valley and ravine system. These expenditures reflect high priority trail repair or maintenance projects only, and do not reflect all recommended work on capital infrastructure damaged by erosion, insufficient stormwater management, and long-term geotechnical instability. In addition, costs may be incurred by homeowners where private property is damaged from flooding and/or slope failure.

In newer developments, Policy C542 has allowed the City to base geotechnical hazard setbacks on slope stability analysis and long-term factor of safety guidelines. However, there is currently no clear direction within Policy C542 that requires the completion of long-term technical studies that would consider natural stream dynamics, the effects of climate change on erosion and flood risk, and the effects of urbanization on stream and slope conditions.