Day Two - Track Two
Thursday, March 23rd, 2017
11:30 a.m. – 12:00 p.m.

When Creek Meets Valley Wall: Prioritizing Erosion Mitigation alongside the Oshawa Landfill

Presenters: Robin McKillop, Palmer Environmental Consulting Group and
Cassie Scobie, Regional Municipality of Durham

Biography

Robin McKillop is a Partner and Senior Geomorphologist with Palmer Environmental Consulting Group, a team of environmental professionals with offices in Toronto, Bracebridge and Vancouver. Robin has 15 years of nationwide experience developing innovative and practical strategies for addressing environmental challenges faced by municipalities, land developers and resource industries. Robin's focus on applications of fluvial geomorphology in southern Ontario has greatly benefited from his complementary expertise in hillslope processes and glacial landforms.

Cassie Scobie is a Waste Management Technician for the Region of Durham, currently responsible for the perpetual care of many of the Region's landfills. Cassie has extensive background in waste management, including regulatory compliance and environmental monitoring, and has 24 years of experience working for Ontario municipalities.

Abstract

The Regional Municipality of Durham (the Region) is responsible for monitoring and maintaining the Oshawa Landfill since its closure in 1979 in order to ensure continued protection of the surrounding natural environment. Through its own monitoring efforts and consultation with the Central Lake Ontario Conservation Authority (CLOCA), the Region has identified local instabilities along the valley walls of Oshawa Creek and a tributary, above which the landfill is situated. An integrated fluvial geomorphological and slope erosion assessment alongside the Oshawa Landfill was completed as a

basis for characterizing, prioritizing and mitigating erosion sites determined to pose a long-term risk to the integrity of the landfill perimeter. Our team identified and evaluated 16 erosion sites, based on field investigations and desktop analysis, representing three distinct forms of instability related to fluvial and/or slope processes: creek cut-banks, slope-toe failures and gullies. Principal drivers of instability include channel down-cutting and migration, groundwater seepage and piping of fine sediments, and/or uncontrolled surface runoff. Of these 16 erosion sites, five were prioritized for mitigation based on the proximity to the refuse limit, severity of slope erosion, and valley wall cross-sectional geometry. Several alternative concepts for erosion mitigation were developed for each of the prioritized sites, in addition to the 'do nothing' option. Site-specific detailed designs were prepared for the concepts preferred by the Region and CLOCA. This paper presents one such design as an example to demonstrate how both fluvial and slope erosion processes can be addressed without compromising local ecological functions.

Learning Objectives

1. To explain how valley wall erosion is accelerated by interactions among channel down-cutting and migration, groundwater seepage and piping, and concentrated surface runoff;
2. To outline a systematic approach for identifying, characterizing and prioritizing mitigation for erosion sites at contacts between creeks and valley walls; and
3. To understand the unique considerations required to mitigate erosion of a valley wall resulting from a combination of fluvial and slope processes.