

Day Two - Track One

Thursday, March 22nd, 2018

1:30 p.m. – 2:00 p.m.

How Cool are Cooling Trenches? Cooling Trench Performance Monitoring and Results in KW

Presenter: Trevor Fraser, Stantec

Biography



Trevor graduated from the University of Guelph in 2011 with a Bachelor of Engineering degree in Water Resources Engineering. He is a Licensed Professional Engineer in the Province of Ontario and Northwest Territories/Nunavut who specializes in Surface Water Resources Engineering in the Stantec office in Waterloo. He has mainly focused on hydraulic and hydrologic modeling studies, floodplain analysis, design of stormwater management facilities, drainage designs for roadways, and field monitoring and inspection programs.

Abstract

Elevated temperature is a villain in the world of SWM. The warm water threat is particularly acute in urban watersheds where impervious surfaces such as parking lots, roads and roofs bake in the sun. When rain contacts these surfaces, stormwater heats up and runs off into rivers and streams. Runoff temperatures can increase as much as 5°C from the inlet to outlet in a typical wet SWM facility. This is a lethal problem for downstream fauna since many species survive in a narrow range of water temperature. When this warm discharge from commonly employed wet ponds or wetlands blasts the natural environment following a rainfall event, the fauna may stress and often die. There has been a long-standing desire among regulatory agencies to cool urban runoff before it reaches natural watercourses; however, despite this objective, an end-of-pipe best management practice (BMP) has yet to emerge and the performances of many candidate solutions remain unproven. Stantec has been implementing cooling trenches in SWM facilities for clients over the past 15 years and has been monitoring their effectiveness for almost a decade. The results of this monitoring have allowed Stantec to improve the cooling trench design to fit a variety of site conditions as well as paint an accurate picture of construction costs associated with each. Analysis of all collected data has allowed Stantec to determine the best cooling trench designs based on thermal mitigation performance and cost effectiveness.

Learning Objectives

1. Understand the basic theory behind cooling trenches and the design;
2. What critical factors contribute to the success of a cooling trench; and
3. Gain a better understanding of how SWM facilities can affect development and the downstream aquatic ecosystem through increased temperatures.