

## Planning for Extreme Precipitation Assessing Alternatives for Stormwater Infrastructure Resiliency

### Abstract

The City of Welland, Ontario, with assistance from Amec Foster Wheeler, assessed the resiliency of the City's stormwater/combined sewer systems and the wastewater treatment plant, in 2012, to potential climate change impacts using the Public Infrastructure Engineering Vulnerability Committee (PIEVC) vulnerability assessment protocol. The outcomes of that assessment have been supporting City staff to better manage infrastructure risks, by increasing the understanding of uncertainty related to infrastructure planning and design.

The City has used outcomes from the PIEVC assessment to examine options related to updating storm sewer design criteria, modifying design performance levels and evaluating the potential impacts to future capital expenditures. This detailed review was founded on an analytical assessment using traditional stormwater sewer design approaches for two existing residential developments in Welland. The analyses concluded that projected climate change impacts will have direct consequences to infrastructure performance. Further, adaptation decisions may differ for various stormwater infrastructure and adaptation need not be financially prohibitive.

This presentation focuses on the next phase of the climate change impact assessment which is founded on dynamic modelling of the major/minor stormwater systems contributing to a stormwater management facility in the City which is presently experiencing performance issues. The objective of the modelling is to investigate how changing precipitation patterns in the future may exacerbate current problems, and specifically identify if more frequent surcharging events will manifest as more frequent at ground or on street flooding. This assessment examines various infrastructure adaptation considerations, notably to either "offset" the projected rainfall increases or to convey more runoff, in a framework of risk and uncertainty.

### Peter Nimmrichter



Peter Nimmrichter is a Professional Engineer and an Associate & Climate Change Specialist in Water Resources for Amec Foster Wheeler Environment & Infrastructure. Peter has over 30 years of experience in surface water resources engineering including experiences with development of master drainage plans, stormwater management plans, dam safety assessments and flood risk assessments for the public and private sector. Peter has also been involved in climate change since about 2005 and has been involved with numerous vulnerability and adaptation planning assessments in the public and private sectors and facilitation of training programs for government decision makers and practicing engineers in risk based design. Peter is a strong advocate of moving beyond the approaches that engineers we have always used for design by integrating climate change information to better manage risks through increased understanding of climate change uncertainty related to infrastructure planning and design.

### Marvin Ingebrigtsen



Marvin Ingebrigtsen is a Professional Engineer and holds a Bachelor of Science in Engineering from the University of Guelph, specializing in Water Resource Engineering. Marvin spent the first eleven years of his career in the private Consulting Engineering field involved primarily with the design and construction of municipal drainage, capital and private development projects.

In 2005 Marvin joined the Municipal field and has been employed by the City of Welland since. From 2005 to 2010 Marvin held the position of Construction Services Supervisor and now currently holds the position of Infrastructure Planning & Development Supervisor, responsible for the development & asset management of the City's infrastructure. Marvin was the City of Welland's Project Manager for the "Assessment of Climate Change Risk to Storm Water & Wastewater Infrastructure" study, utilizing the PIEVC protocol, and continues to lead the implementation of the study recommendations within the City's Engineering Division.

**[CLICK HERE TO REGISTER!](#)**



### Presenters

**Peter Nimmrichter**, Associate & Climate Change Specialist in Water Resources with Amec Foster Wheeler

**Marvin Ingebrigtsen**  
Infrastructure Planning & Development Supervisor with the City of Welland, ON

### Date

Wednesday, March 22, 2017

### Time

1:00pm-2:00pm ET\*  
*Please note your timezone*

### Cost

FREE!



### For more information, please contact:

Suzanne Perdeaux, Climate Change Researcher, OCCAR  
[sperdeaux@mirarco.org](mailto:sperdeaux@mirarco.org)

This webinar was made possible with federal funding support through Natural Resources Canada's Regional Adaptation Collaboratives Program.  
[www.ClimateOntario.ca](http://www.ClimateOntario.ca)