

The City of Calgary and the Alberta Low Impact Development Partnership proudly present the 15th Annual **Stormwater Management Courses**

# Designing for Tomorrow

# 2015

March 17 to 20  
Carriage House Inn, Calgary

stormwater training  
and certification for  
Alberta's  
professionals



Intro to Erosion and Sediment Control  
Drainage Bylaw - What you should know  
ECO Plans - What you should know  
Evaluating Stormwater Control Measures  
Pond Performance  
Achieving Stormwater Design Brilliance  
Financing Municipal Stormwater  
Stream Bioengineering - Theory  
Stream Bioengineering - Practice  
Certified Professional in Erosion and Sediment Control  
Can-Certified Inspector of Sediment and Erosion Control



# DESIGNING FOR TOMORROW 2015

The 15<sup>th</sup> Annual Stormwater Management Courses

Presented by The City of Calgary in partnership with the Alberta Low Impact Development Partnership

Carriage House Inn, Calgary

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THE CITY OF  
**CALGARY**

## Program At-a-Glance

		Victoria/Surrey Rooms				Clarence/Phaeton Rooms			
		Tues March 17	Wed March 18	Thurs March 19	Fri March 20	Tues March 17	Wed March 18	Thurs March 19	Fri March 20
a.m.	<b>Introduction to Erosion and Sediment Control</b>  INSTRUCTOR: James Kay	<b>CPESC Review Course</b>  INSTRUCTOR: Deighen Blakely (tentative)	<b>Can-CISEC Course</b>  INSTRUCTOR: Rob Wills	<b>Can-CISEC course cont'd</b>  INSTRUCTOR: Rob Wills	<b>Monitoring and Evaluating the Effectiveness of Stormwater Control Measures</b>  INSTRUCTOR: Andrew Erickson and guests	<b>Understanding and Improving Stormwater Detention and Retention Facility Performance</b>  INSTRUCTORS: Bert van Duin + Geri de la Mare and guests	<b>Approaches to Financing Municipal Stormwater</b>  INSTRUCTOR: Michael Gregory  With case-study guests from City of Saskatoon and City of Victoria	<b>Theory: Bioengineering in a Stream Environment – City of Calgary Guidelines</b>  INSTRUCTOR: Pierre Raymond	<b>Practice: Bioengineering in a Stream Environment – Lessons Learned in 2014</b>  INSTRUCTORS: Rene Letourneau, Frank Frigo, George Roman, Tim Walls
	<b>Getting it Right: What you should know about The City of Calgary's Drainage Bylaw</b>  INSTRUCTOR: The City of Calgary TBD								
p.m.	<b>Getting it Right: What you should know about The City of Calgary's ECO Plan Program</b>  INSTRUCTOR: Lisa Sutherland								

Tuesday, March 17<sup>th</sup>

VICTORIA/SURREY ROOMS

8:00 a.m. to noon

\$200 incl. GST and lunch

**ESC1-INT:**

## **Introduction to Erosion and Sediment Control**

*Presented by*

***James Kay***

Are you new to the erosion and sediment control field or want a taste of what it is all about? Then this class is for you! This half-day course will walk you through the basics of erosion and sediment control, outlining some of the main products and practices, including their advantages and disadvantages. Upon completion of this course, you will understand the factors affecting erosion and sedimentation on construction sites in urban environments and will be on your way to designing, implementing and inspecting effective practices to reduce erosion and control sedimentation.

**James Kay**, P.Eng., CPESC, CPSWQ, LEED AP, is the Manager, Municipal Infrastructure for British Columbia, for WSP Canada. He is a Professor in Civil Engineering Technology at Okanagan College and has been an instructor in Erosion and Sediment Control for both Vancouver Island University and the Association of Professional Engineers and Geoscientists of British Columbia. Since 2010 he has been a guest and sessional instructor for the University of British Columbia in Project Management and Construction Management. He is a Past-President of the Pacific Northwest Chapter of the International Erosion Control Association and a Director of the Urban Development Institute Okanagan Chapter. He is one of the five founders of the Erosion and Sediment Control Association of British Columbia.

James' passion for sustainable land development will keep you engaged as you explore the fundamentals of erosion and sediment control.



Tuesday, March 17<sup>th</sup> VICTORIA/SURREY ROOMS 1:30 p.m. to 2:30 p.m. \$50 incl. GST

**ESC5-BYL:** **Getting it Right:**  
**What you should know about The City of Calgary's Drainage Bylaw**

*Presented by* **The City of Calgary Water Quality Services Staff**

**NEW**

This presentation will build awareness of The City of Calgary's Drainage Bylaw 37M2005 by summarizing the expectations set out in this bylaw which relate to erosion and sediment control and stormwater pollution prevention. The consequences for non-compliance with the Bylaw will be explained and suggestions for explaining these consequences to clients will be provided. Examples of strategies and best management practices that will help project teams remain in compliance throughout all phases of construction will be explored. The City knows you want to 'get it right', so attend this session for an update on the latest knowledge and experience, which will help put you on the path to success.

Speaker TBD, Monitoring & Compliance team representative from The City of Calgary Water Resources, Water Quality Services.

Tuesday, March 17<sup>th</sup> VICTORIA/SURREY ROOMS 3:00 p.m. to 4:00 p.m. \$50 incl. GST

**ESM5-ECO:** **Getting it Right:**  
**What you should know about The City of Calgary's ECO Plan Program**

*Presented by* **Lisa Sutherland**

**NEW**

With The City of Calgary growing at an unprecedented rate, demand is high for projects for new and upgraded roads, transportation services, storm and sanitary infrastructure, and many other City facilities. These projects have the potential to directly and significantly impact the environment. To address these impacts, contractors performing services on behalf of The City of Calgary are required to prepare an environmental construction operations plan (ECO Plan). An ECO plan consists of written procedures on the protection measures that the contractor will follow to protect the environment. It also demonstrates how the contractor will comply with all applicable legislation, regulations and approvals during the project. The ECO plan is intended to answer these questions:

- What are the potential environmental issues on site?
- Who is responsible for dealing with these issues?
- What control measures are in place to minimize impacts and meet environmental requirements?

In this presentation the key elements of an ECO Plan will be addressed and you will have the opportunity for Q&A.

**Lisa Sutherland** has worked for The City of Calgary for the last 20 years. She spent seven years in bylaw before moving to Environmental & Safety Management where her primary duty is to oversee and manage all capital construction projects requiring ECO (Environmental Construction Operations) Plans for The City of Calgary. Her area of work currently consists of policy and procedural development and construction practice review to assist with environmental due diligence on City of Calgary construction projects. Yearly, with the collaboration of key partners from the City of Edmonton and Alberta Transportation, she is responsible for the ECO Plan Framework document which serves as the key guidance document for contractors to follow when developing an ECO Plan.

LID5-MTR:

## Monitoring and Evaluating the Effectiveness of Stormwater Control Measures

Presented by

**Andy Erickson and guests****NEW**

Developing and operating an effective maintenance program for stormwater control measures should be based on actual performance and historical maintenance efforts and costs. Proven procedures and methods are necessary for the credible evaluation of the performance of stormwater treatment practices. What approaches and tools are available to meet this challenge?

This course will largely be based on the handbook *Optimizing Stormwater Treatment Practices: A Handbook of Assessment and Maintenance*. It will begin by briefly reviewing the impacts and composition of urban stormwater and highlighting the physical, chemical and biological treatment processes that are potentially at work across a range of treatment measures. The performance of treatment measures will then be discussed under the categories of sedimentation, filtration, infiltration and biologically enhanced practices. The assessment strategies of visual inspection, capacity testing, synthetic runoff testing, and monitoring will be explored and a standard protocol will be proposed.

Some of the takeaways from this day will include a discussion of more accurate methods for flow measurement in conveyance systems, advanced sampling methodologies that will minimize typical sources of bias, maintenance schedules and recommendations for appropriate action, data analyses, and standardized visual inspection checklists.

BONUS: Don't miss this opportunity to also hear about some significant contributions to the stormwater-treatment toolbox developed at St. Anthony Falls Laboratory, including the *SAFL Baffle* for sediment removal, and successes with iron-enhanced sand filters for dissolved phosphorus management.

Minnesota isn't far away, but in order to bring this subject even closer to home, some Alberta experiences with inspection and monitoring will also be presented.

**Andrew (Andy) J. Erickson**, M.S., P.E., is a research fellow at St. Anthony Falls Laboratory at the University of Minnesota, and a registered professional engineer working with Professor John Gulliver on projects related to assessment and maintenance of stormwater treatment practices, developing new stormwater treatment technologies, and modeling stormwater treatment practices. Mr. Erickson is lead author for the book, "[Optimizing Stormwater Treatment Practices: A Handbook of Assessment and Maintenance](#)," and is an editor and contributing author for the online manual, "[Stormwater Treatment: Assessment and Maintenance](#)." He also maintains the St. Anthony Falls Laboratory stormwater research websites (<http://stormwater.safl.umn.edu>). Mr. Erickson is the editor of the University of Minnesota stormwater newsletter, *UPDATES*, and has co-authored several journal articles, conference proceedings, and project reports. He also provides consulting engineering services for TMDLs, lake management plans, watershed district projects and regulations, and water quality modeling.



Wednesday, March 18<sup>th</sup>

VICTORIA/SURREY ROOMS

8:30 a.m. to 4:30 p.m.

\$475 incl. GST, lunch &  
textbook

ESC16-CPE:

## Certified Professional in Erosion and Sediment Control (CPESC) Review Course

Presented by

*Deighen Blakely (tentative)*

Are you interested in becoming a Certified Professional in Erosion and Sediment Control (CPESC)? A CPESC designation establishes and expands your credibility as an ESC practitioner. It sets you apart as a certified professional who can provide expertise to design and evaluate erosion and sediment control plans, to influence public policy and land-use planning decisions, and to educate others in sound approaches for preventing off-site impacts from land development activities.



What will be covered in the review course? The table of contents of the exam review book can be viewed at <http://www.envirocertintl.org/cc-products/wkbk-toc.asp>.

Anyone may attend the review course. There is no requirement for review-course participants to take the exam or, conversely, for exam candidates to take the review course.

Calculator required. Fees for the review course include the CPESC exam review book (a \$110 value). For more information, please visit <http://www.cpesc.org/>.

Speaker TBD

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**The CPESC Examination** will be scheduled the day after the review course, on March 19<sup>th</sup>, at a venue to be determined. **Exam candidates are advised to contact the CPESC administrative office as soon as possible** to begin the process to obtain approval to write or re-write this exam, which normally takes at least 45 days. An approved calculator is required to complete the exam. Information and required forms are available at <http://www.cpesc.org/>. Please direct your application to Mr. James Kay at [esc@escac.ca](mailto:esc@escac.ca).

There are two levels of certification: the CPESC-IT and the full CPESC. Five hours are allowed for the full exam. Please reserve your exam spot by paying the seating fee of \$50 on the Eventbrite course-registration page. This fee is in addition to any fees collected by EnviroCert, and does not constitute approval to write the exam, only space to do so. Please do not wait to receive your approval before reserving your seat. Candidates who have not received approval to write the exam within ten days of the exam date will have their seating fee refunded.

SWM5-PND:

## Understanding and Improving Stormwater Pond Performance

Presented by

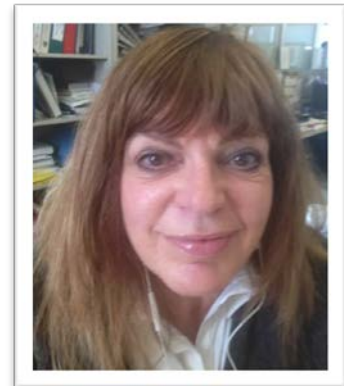
**Bert van Duin, Geri De La Mare and guests****NEW**

Over the last couple of years, the City of Calgary Water Resources and Services have expended considerable effort to better understand how our stormwater ponds operate. In this course, we will share the lessons learned from the Pond Triage project, aimed at eliminating the backlog in CCC and FAC applications, as well as the various storm pond monitoring projects that have taken place over the last few years. In addition, we will discuss what this means for the future design of storm ponds as well as the expectations at the time of CCC and FAC including geotechnical requirements, the need for bathymetric surveys, and monitoring during the maintenance period.

**Bert van Duin**, Drainage Technical Lead at the City of Calgary Water Resources, received his M.Sc. in Civil Engineering from Delft University of Technology in The Netherlands in the late 1980s. Working first in Toronto and soon heading west, he spent more than two decades in consulting on the analysis, planning, design and management of urban drainage, stormwater management and watershed management projects. Since joining the City of Calgary in 2009, he has been responsible for the evolution of Calgary's stormwater design practice, guiding the practical implementation of source control practices, having authored the Source Control Practices Handbook for the City some years prior. He is a founding member and past-President of the Alberta Low Impact Development Partnership Society.



**Geri De La Mare** provides engineering support for the operation and maintenance of stormwater management facilities for The City of Calgary. Geri has taken the lead to initiate pilot projects for the storm utility in order to gain knowledge about various types of instrumentation and processes that could be adopted in Field Services, which could then be developed into a *level of service* protocol. Geri has also been responsible for gauging sediment volumes within the City's storm facilities and for their removal and management, in order to prevent negative impacts from occurring, such as system blockages and flooding. Prior to issuance of CCC's and FAC's to developers by the City, Geri participates in inspecting facilities with City field crews to ensure and confirm their operability and maintainability.



Wednesday, March 18<sup>th</sup>

CLARENCE/PHAETON ROOMS 1:00 p.m. to 4:30 p.m.

\$180 incl. GST

**SWM3-DES:**

## **Achieving Stormwater Design Brilliance**

*Presented by*

***Bert van Duin, Natalya Sapova and guests***

This course, which has become a staple of our annual week of courses, will once again cover a wide range of topics associated with the planning, analysis, design, review and approval of stormwater management infrastructure in Calgary. In 2015, specific attention will be paid to sewer hydraulics (e.g., hydraulic grade line calculations, manhole losses, energy dissipation, etc.) and the practical implementation of the recently released interim stormwater targets. We will also provide a sneak preview on some of the issues that Water Resources is working on.

**Bert van Duin**, Drainage Technical Lead at the City of Calgary Water Resources, received his M.Sc. in Civil Engineering from Delft University of Technology in The Netherlands in the late 1980s. Working first in Toronto and soon heading west, he spent more than two decades in consulting on the analysis, planning, design and management of urban drainage, stormwater management and watershed management projects. Since joining the City of Calgary in 2009, he has been responsible for the evolution of Calgary's stormwater design practice, guiding the practical implementation of source control practices, having authored the Source Control Practices Handbook for the City some years prior. He is a founding member and past-President of the Alberta Low Impact Development Partnership Society.



**Natalya Sapova**, PhD, recently joined the Asset Planning team in The City of Calgary Water Resources –Infrastructure Planning after close to 10 years in consulting. Prior to that, she was Associate Professor at the Moscow State University of Technology. Natalya will assist in further developing Water Resources' understanding of drainage including research, water quality monitoring, modelling and updating our standards and specifications.





Thursday March 19<sup>th</sup> and  
Friday March 20<sup>th</sup>

VICTORIA/SURREY ROOMS

8:30 a.m. to 4:30 p.m. Thurs.  
and 8:30 to noon Friday

Register through TRCA

ESC36-CIS:

## Canadian Certified Inspector in Sediment and Erosion Control (Can-CISEC) Training Course

Presented by

**Robert Wills**

This 1.5-day training course covers roles and responsibilities, background information, inspecting best management practices, regulations and compliance, and conducting construction site inspections. Participants will have the opportunity to take part in classroom exercises reviewing ESC plans and reports. A brochure about the course is available at <http://www.kortright.org/dotAsset/119432.pdf>.



Can-CISEC is a certification program offered by the Toronto and Region Conservation Authority (TRCA) and CISEC, Inc. Launched in 2005, the CISEC program is the leading certification program of its kind in the U.S. and, in May 2011, TRCA launched the CISEC-Canada program.

Registration and more details are available at <https://www.thelivingcitycampus.com/workshop/certified-inspector-sediment-and-erosion-control-calgary-march-2015>. The training course fee is \$500 (applicable taxes are extra).

**The Can-CISEC examination** will be offered in the afternoon of Friday, March 20<sup>th</sup>, in the same location as the training course, from 1:00 p.m. to 4:30 p.m. The non-refundable Exam Fee is \$250 (applicable taxes are extra). Anyone is welcome to attend the training course; however, if you intend to write the certification exam you will need to fill out an application form and submit your three references to TRCA by **February 23<sup>rd</sup>, 2015**. Please submit your complete exam application package to [adelaney@trca.on.ca](mailto:adelaney@trca.on.ca), and register for the exam along with the training course at the registration link noted above.

SWM5-UTL:

**Approaches to Financing Municipal Stormwater**

Presented by

**Michael Gregory and guests****NEW**

Municipal stormwater management programs represent significant public investments that are largely funded through property taxes in Canada. For municipalities to achieve their stormwater goals it is necessary to obtain adequate and sustainable funding and resources. Stormwater revenue drawn from taxes must compete with many other municipal services and is often inadequate to provide an acceptable level of service demanded by the community. In addition to meeting current needs, municipalities must also finance future program revenue requirements (e.g., to renew/replace aging infrastructure, comply with new stormwater regulations, or to operate/maintain additional facilities due to new development). Competing demands for limited tax funds will continue to force municipalities to pursue alternative financing mechanisms in order to provide a financially sustainable and self-supporting stormwater program.

A stormwater rate (also known as a stormwater utility) is an alternative financing mechanism that is administered as a user fee in a similar fashion as water and wastewater rates. The allocation of stormwater-related costs to property owners is based on the measured area of impervious ground cover (e.g., rooftops, driveways, and parking lots). This approach quantifies the relative contribution of stormwater runoff from each property to the municipal stormwater system, since runoff is a function of the land use practices and surface treatment decisions of property owners. Stormwater rate revenue is generated in a more fair and equitable manner than property tax, which is based on assessed property value, and development charges, which are based on total number of dwelling units or land area. Stormwater rates are a relatively new concept in Canada, but have been successfully implemented in hundreds of municipalities throughout the United States.

This course is intended for municipal employees, regulatory agency staff, and consultants who are interested in innovative funding mechanisms that can be used to support local government stormwater management programs. This seminar will present the range of options available for funding a municipal stormwater management program and the current financing mechanisms that have been successfully implemented throughout North America to fully support and sustain this traditionally underfunded municipal service. Stormwater rate financing details will be given, along with lessons learned from stormwater financing studies that have recently been completed in Ontario, British Columbia and the prairies. Municipal staff from Saskatoon and Victoria will also present implementation case studies from their respective cities and will be on hand to lend their perspectives to the day.

**Michael Gregory**, P.Eng., is a Senior Water Resources Engineer with AECOM. Mr. Gregory has 24 years of experience in stormwater management, including planning, analysis, design and program financing throughout North America. He has undertaken 13 stormwater financing studies in Ontario, Alberta, and British Columbia, including Canada's first implementation of a stormwater utility based on measured impervious area (City of Kitchener). Mike was a chapter author and peer reviewer for the 2013 Water Environment Federation publication "User-Fee-Funded Stormwater Programs, Second Edition". He has given many presentations on this subject at local and international conferences and has also facilitated stormwater financing workshops and information sessions for over 45 municipalities and agencies across Canada since 2005.



**This course is generously sponsored by the Insurance Bureau of Canada & supported by the Alberta Urban Municipalities Association**

Friday, March 20<sup>th</sup>

CLARENCE/PHAETON ROOMS

8:30 a.m. to noon

\$200 incl. GST and lunch

**SWM5-BIT:**

## **Bioengineering in a Stream Environment: Theory** **City of Calgary Design Guidelines for Erosion and Flood Control Projects for Streambank and Riparian Stability Restoration**

*Presented by*

***Pierre Raymond***

**NEW**

Soil Bioengineering is the use of live plant materials, often combined with conventional engineering structures such as rock, geogrids, and large woody debris. It is designed to perform an engineering function such as surface slope stabilization, streambank protection, soil erosion and seepage control, reduction of sediment delivery and habitat enhancement. In this course you will explore techniques and options involved in restoration, reclamation and stabilization of streambanks using a combination of structural materials, vegetative cuttings, plantings, and other specialized techniques, including how to approach difficult-access sites by minimizing disturbance and using specialized equipment. Maintenance will also be discussed. Gain local design context, and learn how local soil, hydrology, construction specifications/ tendering and planting factors can be key to the success of streambank rehabilitation projects. This is a condensed ½-day version of the course introduced in 2014. The guidelines can be downloaded at [http://www.calgary.ca/UEP/Water/Documents/Water-Documents/Design\\_Guidelines\\_For\\_Streambank\\_Stability\\_and\\_Riparian\\_Restoration.pdf](http://www.calgary.ca/UEP/Water/Documents/Water-Documents/Design_Guidelines_For_Streambank_Stability_and_Riparian_Restoration.pdf)

Since founding Terra Erosion Control Ltd. in 1996, **Pierre Raymond** has focused on soil bioengineering, biotechnical slope stabilization, erosion control and riparian habitat restoration. His expertise has taken him to projects in Peru, Nepal, and France. Closer to home, Pierre has been involved in the development of The City of Calgary's streambank restoration guidelines and in the design and implementation of multiple applications of vegetated riprap for streambank and stormwater outfall protection for the City of Edmonton. Pierre's experience includes biotechnical stabilization prescriptions, implementation, maintenance and monitoring. He has a strong background in supervision of construction machinery, road deactivation practices and implementation of riparian habitat restoration and mining reclamation.



Friday, March 20<sup>th</sup>

CLARENCE/PHAETON ROOMS

1:00 p.m. to 4:30 p.m.

\$180 incl. GST

**SWM5-BIP:**

## **Bioengineering in a Stream Environment: Practice** **Tools, Challenges, Lessons Learned and Future Directions in Calgary**

*Presented by*

***The City of Calgary Water Resources and Parks Staff***

**NEW**

Well vegetated, healthy riparian areas help control erosion, improve water quality, support fish and wildlife, and provide many aesthetic and social benefits to Calgarians. In this session, City staff will update you on their recent activities and experiences related to streambank and riparian management and restoration within The City of Calgary.

The 2013 flood created numerous riverbank erosion sites that were identified and prioritized for protection and restoration. Of these sites, eighteen were ranked as 'high' priority (the next level below 'critical'). Five of these high-priority projects were completed (or nearly completed) in 2014. This course will review the challenges, successes and failures, and lessons learned from undertaking these projects, and will also include the perspectives and observations of Parks staff on projects they have been involved with. Future projects and directions will be shared.

In addition to construction projects, this course will include a brief review of the *Riparian Decision Support Matrix*, which is a tool to ensure bioengineering practices are applied to the maximum extent feasible within The City; and a substantial overview of the *River Morphology* study that is currently underway with the River Engineering group.

END