

INTERPRETATION BULLETIN
ONTARIO MINISTRY OF ENVIRONMENT AND CLIMATE CHANGE
EXPECTATIONS RE: STORMWATER MANAGEMENT
February 2015

INTRODUCTION

The environmental health of many watersheds continues to decline as urbanization increases. Conventional (pipe and pond) stormwater management practices that focus on controlling peak flow rate and removal of total suspended solids are not fully achieving the desired protection of the watershed ecosystem. This is due to increased volume of stormwater and resultant sustained flows from end-of-pipe stormwater management facilities and may be exacerbated by more intense storms resulting from climate change. Conventional management practices are not always effective at mitigating in-stream erosion or fully protecting water quality, fish and wildlife habitat, and other aquatic resources from stormwater runoff and contaminants that are not removed by settling.

The purpose of this interpretation bulletin is to clarify the ministry's expectations regarding stormwater management. Specifically, the bulletin clarifies that the ministry's existing policies and guidance emphasize an approach to stormwater management that mimics a site's natural hydrology as the landscape is developed. The main tenet of this approach is to control precipitation as close as possible to where it falls by employing lot level and conveyance controls otherwise known as Low

Impact Development (LID), often as part of a treatment train approach. Also, existing policies and guidance emphasize the need to use watershed/subwatershed plans to guide site-specific stormwater management performance criteria.

Currently, preservation of the natural hydrology is not sufficiently reflected in the Environmental Compliance Approval (ECA) applications submitted to the ministry for stormwater management systems. To improve on this, and to facilitate the uptake of LID stormwater management practices, the ministry is taking a two-step approach. The first step is this interpretation bulletin, which clarifies the ministry's existing requirements and guidance on stormwater management.

The natural hydrologic cycle should be maintained to the greatest extent possible. The ministry's existing acts, regulations, policies and guidelines emphasize the need for this approach to stormwater management.

Too often, preservation of the natural hydrologic cycle is not sufficiently addressed in stormwater management plans submitted to the ministry for an ECA.

The second step is to produce a LID stormwater management guidance document. This document will further support low impact stormwater management by, among other things, specifying the ministry's expectations on water balance, acceptable tools to assess and validate water balance and other calculations, monitoring and maintenance of stormwater facilities (including on private property given the decentralized nature of LID), and the role of low impact development within a treatment train approach. This guidance document will be developed in consultation with stakeholders and will be posted on the Environmental Registry for broader consultation. The guidance document is expected to be released in late 2016.

Low impact development stormwater management is relevant to all forms of development, including new development, redevelopment, infill, and retrofit development. Compact urban development and urban intensification helps to prevent sprawl and thus protect farmland, wetlands, and green spaces, and also provides for efficient use of land, water and energy resources and existing infrastructure. Employing LID facilities to the greatest extent possible, when undertaking intensifying urban development, will add to these benefits.

Low impact development stormwater management is relevant to all forms of development, including urban intensification and retrofit.

Urban stormwater runoff management systems are usually designed to meet performance standards based on historical climate data. As a result of climate change, stormwater management facilities constructed today will be expected to perform under climatic conditions that may be significantly different than the recent past. Projected Intensity Duration Frequency (IDF) curves have been made publicly available at Ontario Climate Change Data Portal (Ontario CCDP, see below). LID systems can mitigate impacts from increased precipitation by increasing infiltration; reducing runoff volumes; and, delaying the runoff peak.

WHAT ARE THE MINISTRY OF THE ENVIRONMENT AND CLIMATE CHANGE REQUIREMENTS AND GUIDANCE FOR STORMWATER MANAGEMENT?

Maintaining natural hydrology and controlling precipitation as close as possible to where it falls is not a new requirement of the ministry. These principles are outlined in acts, regulations, policies and guidelines, along with protecting water quality. For example:

Ontario Environmental Protection Act: Provides for the protection and conservation of the natural environment.

Ontario Water Resources Act: Provides for the conservation, protection and management of Ontario's waters and for their efficient and sustainable use to promote Ontario's long-term environmental, social and economic well-being. Under section 53,

the act specifies that no person shall use, operate, establish, alter, extend or replace new or existing sewage works except under and in accordance with an ECA. The Act includes stormwater in the definition of sewage. (Note: some stormwater facilities are exempted from the ECA requirement by Ontario Regulation 525/98.)

Water Management Policies, Guidelines, Provincial Water Quality Objectives (PWQO) of the Ministry of the Environment and Climate Change (also referred to as the 'Blue Book'): Gives direction on how to manage the quality and quantity of both surface and ground waters.

With respect to surface water quality, the goal stated in this document is to ensure water quality satisfactory for aquatic life and recreation. Direction is provided on how to deal with situations where water quality of the receiving body is not meeting the PWQO. For example, water quality not meeting the PWQO shall not be degraded further and all reasonable and practical measures shall be taken to upgrade the water quality to meet the objectives.

The 'Blue Book' also requires the preservation of ground water quality to a quality protective of the greatest number of beneficial uses, and that surface and ground-water quantity is managed to ensure a fair sharing among users, water conservation, and sustainability of the resource.

Guidance Documents: Specifically, the *Stormwater Management Planning and Design Manual*, March 2003:

The ministry's March 2003 *Stormwater Management Planning and Design Manual* (2003 Manual) states that performance criteria for stormwater works should reflect watershed, sub-watershed, and environmental management plans developed in consultation with the local conservation authority and municipality. This Manual conveys that meeting the set of criteria addressing all water resource concerns typically requires a combination of stormwater management practices as part of a treatment train approach. Lot level and conveyance controls, specifically infiltration-based controls, are required to maintain the natural hydrologic cycle to the greatest extent possible.

Infiltration of stormwater is needed to maintain ground water sources of drinking water, and to maintain stream base flows. At the same time, ground water quality must be protected from contamination, requiring the appropriate selection of LID measures, which would be determined by the hydrogeology of an area. Assessment reports under the Clean Water Act can provide local and watershed based hydrogeological information, including the delineation of 'vulnerable areas', to support this analysis.

In addition to ministry guidance on stormwater management, practitioners of stormwater management need to consider other stormwater management requirements of other entities most notably the Ministries of Natural Resources, Transportation, Municipal Affairs and Housing, and Agriculture and Food; conservation authorities; municipalities; and the Federal Departments of Environment Canada and Fisheries and Oceans Canada.

WHAT AREAS OF THE MINISTRY'S GUIDANCE ON LID CAN BE IMPROVED?

There are gaps in ministry support for implementing LID that the ministry plans to address through the forthcoming LID stormwater management guidance document. Gaps include inconsistencies in the 2003 Stormwater Manual. For example, Section 4.9 of the 2003 Stormwater Manual presupposes that lot level and conveyance controls cannot, on their own, satisfy all of the stormwater management criteria (flooding, erosion, water balance, and water quality), and that in all cases end-of-pipe facilities will be required. However, it has been demonstrated that LID installations, when properly sited, designed and maintained, can meet all of the requirements and no end-of-pipe controls are required.

Another example is the minimum infiltration rates currently specified in the manual. The 2003 Stormwater Manual contains guidance for a number of lot level and conveyance controls but specifies that the application of a number of management practices may not be suitable if the native soil has a percolation rate less than 15 mm/hr (see for example Pg. 4-6: Table 4.1: Physical Constraints for SWMP Types - infiltration trenches, reduced lot grading, soakaway pits, rear yard ponding, and pervious pipes). This has contributed to the limited application of these measures as many of the soils within Ontario do not meet this criterion. The infiltration rate has an obvious effect on the speed with which a facility will be emptied between rainfall events. Thus, LID facilities should be sized for optimum control of water quantity. Area-wide quantity criteria may be achieved through the use of multiple smaller LID facilities distributed over a large area. For example, stormwater management practices such as bioretention and biofiltration use multiple treatment mechanisms including retention, filtration, evaporation and transpiration as well as infiltration. If the lot level and conveyance facilities can be sized such that they empty between events, or will be installed in areas where quantity control is not a primary concern (areas draining directly to a large surface water body like Lake Ontario, for example), LID facilities can be used where the infiltration rate is less than 15 mm/hr to achieve water balance and water quality (including thermal impacts) through retention, filtration, evaporation and transpiration. Thus, the soil infiltration capacity guidance in the manual should not be interpreted as a prohibition. Rather, it should be interpreted as a caution that controls relying primarily on infiltration may not be as effective on soils with low infiltration rates as they would be on soils with higher rates of infiltration.

SUPPORT FOR LID IN ONTARIO

Property owners, stormwater practitioners, and approving authorities are beginning to gain confidence in making more use of LID. In part as a result of the number of useful guidance documents on selecting and designing LID facilities (see for example *Low Impact Development Stormwater Management Planning And Design Guide*, TRCA and CVCA, 2010; *Minnesota Stormwater Manual*, 2008; and, *Low Impact Development Manual for Michigan*, SEMCOG 2008) and because of the support of some conservation authorities in Ontario. Ontario's Great Lakes Strategy commits the government to actions in support of reducing stormwater impacts including developing guidance for source control measures, enhancing the province's approach to stormwater approvals, and seeking environmental considerations such as LID early in municipal planning decisions. Planning authorities are encouraged to promote low impact development.

LID facilities, like end-of-pipe facilities, require periodic maintenance. The Credit Valley Conservation Authority identified maintenance solutions for LID facilities reflective of their decentralized character, and in some cases location on private property (Survey of Municipal Policies and Administrative Approaches for Overcoming Institutional Barriers to Low Impact Development, CVCA, 2010).

CONCLUSION –WHAT ECA APPLICANTS CAN EXPECT FROM THE ECA REVIEW PROCESS

LID techniques can be applied to reduce the volume of runoff from urban areas and help maintain the hydrologic cycle. It is expected that low impact development and other source control practices that better mimic the hydrologic cycle, will be reflected in the ministry's ECA process. The ministry encourages ECA applicants to arrange a pre-consultation meeting with the ministry and other various relevant parties such as the approving municipality or other planning approval authority, and the local conservation authority. It is critical that options and opportunities for the incorporation of LID practices be considered during the watershed and subwatershed planning process, and early in the development planning process and not left to the preparation of the detailed stormwater management plan submission.

LID can be less costly than conventional stormwater management practices. A 2007 US EPA report summarizes 17 case studies of developments that include LID practices and concludes that applying LID techniques can reduce project costs and improve environmental performance (USEPA, 2007).

Going forward, the Ministry expects that stormwater management plans will reflect the findings of watershed, sub-watershed, and environmental management plans, and will employ LID in order to maintain the natural hydrologic cycle to the greatest extent possible.

References and Sources:

Stormwater Management Planning and Design Manual, MOE, March 2003
Understanding Stormwater Management: An Introduction to Stormwater Management Planning and Design, MOE, 2003
Stormwater Pollution Prevention Handbook, MOE, 2001
Stormwater Management Practices Planning and Design Manual, MOE, June 1994
Interim Stormwater Quality Control Guidelines for New Development, MOE, May 1991
Minnesota Stormwater Manual, 2008
Low Impact Development Manual for Michigan, SEMCOG 2008
Low Impact Development Stormwater Management Planning And Design Guide, TRCA and CVCA, 2010
Survey of Municipal Policies and Administrative Approaches for Overcoming Institutional Barriers to Low Impact Development, CVCA, 2010
Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, United States Environmental Protection Agency, December 2007
Integrated Surface and Groundwater Model Review and Technical Guide, 2011, Prepared by AquaResource Inc. for the Ministry of Natural Resources
Water Budget Reference Manual, 2013, Prepared by Aqua Resource for the Ministry of Natural Resources
Integrated Watershed Management, Navigating Ontario's Future; A Water Budget Overview, Conservation Ontario

Helpful websites with LID Resources for Ontario:

www.sustainabletechnologies.ca

www.creditvalleyca.ca/low-impact-development/

Ministry of Natural Resources at www.waterbudget.ca

[http://www.conservation-](http://www.conservation-ontario.on.ca/media/IWM_WaterBudgetOverview_Final_Jun2.pdf)

[ontario.on.ca/media/IWM_WaterBudgetOverview_Final_Jun2.pdf](http://www.conservation-ontario.on.ca/media/IWM_WaterBudgetOverview_Final_Jun2.pdf)

<http://www.conservation-ontario.on.ca/what-we-do/what-is-watershed-management/integrated-watershed-management>

<http://www.ontariocdp.ca/>

MOECC Contact Information

For comments or questions concerning this Interpretation Bulletin, please contact your [local office of the Ministry of the Environment and Climate Change](#) at <https://www.ontario.ca/environment-and-energy/ministry-environment-regional-and-district-offices>

For information about an ECA application package, or to apply for an ECA amendment, please see list below, or contact the Environmental Approvals Access and Service Integration Branch

Email: EAABGen@ontario.ca

General Inquiry:	416-314-8001
Toll Free:	800-461-6290

Environmental Compliance Approvals

<https://www.ontario.ca/environment-and-energy/guide-applying-environmental-compliance-approval>