# STORMWATER MANAGEMENT REPORT
## TERMS OF REFERENCE

### Stormwater Management Report

Updated: March 2010

| Description | To identify the quality and quantity impacts of the change in stormwater runoff on existing infrastructure and watercourses due to a proposed development.  
|            | To determine improvements to municipal servicing infrastructure required to support the proposed level of development, where applicable  
|            | To determine mitigation measures to minimize any negative impacts on the drainage system.  
|            | To identify opportunities for enhancement of stormwater management facilities and features in redevelopment sites. |

### When Required

A Stormwater Management Report is required for the following application types:

- Zoning By-law Applications
- Plans of Subdivision
- Plans of Condominium
- Consent to Sever
- Site Plan Control applications

### Rationale

Objective

The objective of a Stormwater Management Report is to evaluate the effects of a proposed development on the stormwater and drainage system, and to recommend how to manage rainwater/snowmelt for the proposed development, consistent with the City’s Wet Weather Flow Management Policy and while also meeting TRCA, provincial and federal regulations.

Format

A Stormwater Management Report is prepared by a Registered Professional Engineer qualified in municipal engineering/stormwater management, and must include all appropriate reports, plans, computer modeling results and design calculations relating to how storm run-off is to be managed.

*Regardless of the size or nature of the proposed development, the consultant is responsible for providing a SWM report that strictly complies with the requirements of the WWFM Guidelines. If the consultant feels that a specific development should be exempt from any or all SWM requirements based on the type/size of development as provided for in the WWFM Guidelines, he/she must still submit a report (in some cases a letter report is acceptable) clearly referencing the relevant section(s) in the WWFM Guidelines and how they apply to the proposed development.*

Process

A Stormwater Management Report is to be submitted in conjunction with the development application. The applicant is encouraged to discuss the need, scope and the proposed stormwater management concepts and design assumptions with City staff prior to preparing the report. The report is to be submitted in two stages. For complex Site Plan Control applications, the Stage 1 and Stage 2 reports are to be submitted in conjunction with the development application and must be accepted prior to Site Plan approval.

**Stage 1** - The Stage 1 Report outlines the design assumptions and conceptual engineering schemes to manage both quantity and quality of run-off. The Stage 1 Report is to be submitted when the application is initiated and must be accepted prior to draft plan approval of a Plan of Subdivision or a prior to the acceptance of a Rezoning application if it is being submitted in conjunction with a site plan application.
## Stormwater Management Report

**Stage 2** - The Stage 2 Report provides the detailed calculations and the design of the stormwater management facilities and drainage systems based on the accepted principles in the Preliminary Report, and must be accepted prior to, or in conjunction with, the final acceptance of the engineering drawings.

For Site Plan Control applications, the Stage 2 Report is to be submitted in conjunction with the development application and must be accepted prior to site plan approval.

An Environmental Impact Study may be required to address the impact of development on water resources features or functions on and off site that may not be included in a Natural Heritage Impact Study (see EIS Terms of Reference).

**An Environmental Impact Study may also be required to address the impact of development on water resources features or functions on and off site.**

### Principles

A Stormwater Management Report must be based on:
- established stormwater management principles,
- best management practices,
- the Ministry of the Environment Policies and design guidelines
- the Wet Weather Flow (WWF) Management Policy and

The use of the rational method shall be used as per the WWF Guideline. Further analysis may be required for areas basement flooding and high infiltration as per the WWF Policy: [http://www.toronto.ca/water/protecting_quality/wwf samp:guidelines/index.htm](http://www.toronto.ca/water/protecting_quality/wwf samp:guidelines/index.htm)

The authority to require this work is provided by the *Planning Act*, the Provincial Policy Statement, the Official Plan, the Wet Weather Flow Management Policy and Chapter 681 of the Municipal Code – Sewer.

### Required Contents

The level of detail for the Stormwater Management Report depends on the type and scope of application, the size of the development and the types of stormwater management schemes proposed. For example, a report for a Plan of Subdivision will typically be more complex than a report in support of a Site Plan Control application.

A Stormwater Management Report must include the basic quantity and quality assumptions upon which the report is based, and all appropriate functional plans of infrastructure elements for major and minor flow, which could have an impact on the layout of the Plan of Subdivision or site and building design.

These infrastructure elements may include stormwater management facilities, all water resources features and functions (i.e., watercourses, riparian areas, recharge/discharge areas), existing overland flow routes, surface features (i.e., top of bank of valleys) and existing infrastructure (i.e., water and wastewater infrastructure and underground utilities).

Where a development proposal may impact a water resources features or function, the Stormwater Management Report must incorporate into the design the recommendations from the separate Environmental Impact Study referenced above.
The **Stage 1** Report must provide sufficient engineering information to allow for the necessary review and acceptance of the proposed stormwater management schemes in principle. This report should address the following:

- Identify existing stormwater management requirements that apply specifically to the site.
- Identify constraints and potential opportunities – quantitative, qualitative, erosion sensitivity and environmental concerns related to water resources for both interim and ultimate development conditions, both on and off site.
- Identify the inlets (from upstream) and outlet (to downstream) for the minor and major systems, including overland flow routes.
- Identify all internal and external drainage areas under existing and future development conditions for minor and major flows.
- Demonstrate that the proposal has maximized source control measures to reduce runoff from the site and maximized conveyance control measures to infiltrate and/or treat run-off as appropriate consistent with water quantity and quality objectives and targets under the Wet Weather Flow Management Policy.
- Indicate if off-site land or works are required to implement the stormwater management proposals and comment to what extent (e.g. easements, dedication, land acquisition, etc.)
- Indicate the interim measures required for erosion, pond siltation and sedimentation, downstream works, riparian flow considerations, during the construction phase.
- Indicate if other agencies are required to grant approvals or issue permits (such as TRCA if the project is within their jurisdiction) and provide proof of approvals.
- Submit plans and calculations to support the proposals.

In addition, the **Stage 1** report must include the following information:

1. Location map of the subject property
2. Property description
3. Present owner contact
4. An external drainage plan including all upstream lands and any diversion of drainage routes
5. An internal drainage plan including flood and fill lines and overland flow routes
6. Schematic layout of existing and proposed sanitary and storm sewer networks
7. Schematic layout of the sub watershed showing the main watercourse, tributaries and trunk sewers
8. Provide descriptions of pre-development and post-development conditions, statistics and respective storm release rates.
9. Any supporting calculations, reports and drawings, such as:
   - Calculation of surface run-off, the ponding elevation water elevations corresponding to the required level of controls
   - Calculation of existing run-off coefficient and release rates
   - Calculation of permissible release rate and required on site storage
   - Methods of run-off attenuation and on site storage
   - Measures to maintain or improve water quality
   - Measures to minimize impact of run-off downstream including on erosion, flooding etc.
10. Ontario Ministry of the Environment Certificate of Approval and related documents if applicable
11. Geotechnical Reports and Hydro-geological Studies where applicable (see terms of reference for these studies)

The **Stage 2** Report must include detailed analyses (computer modeling results and calculations) and design of the major and minor systems and proposed stormwater management facilities.
**Stormwater Management Report**

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Based on the proposed design concepts and parameters accepted in the Preliminary Report.

**Contents**

The Stormwater Management Report (Stage 2) must also include the following contents where applicable:

- Separate site servicing and grading drawings
- Storm and surface water drainage directions, major overland and emergency overland flow routes, site ponding limits with corresponding storage volumes and control facilities
- Proposed roof control devices location, type, control release rates and corresponding storage volumes for flat roof portions
- Storage volume calculation provided for all non-residential developments, residential developments greater than 0.5 hectares
- Run-off co-efficient calculation for pre-development conditions for all non-residential developments, residential developments greater than 0.5 hectares upon request
- Waster Harvesting process and all supporting calculations

**Swales, Ditches, Channels, Inlet and Outlet Structures**

- Calculation and/or summary information to support erosive protection provided
- Hydraulic calculations on sketches for proposed sections
- Calculation of storage volumes for the required level of controls for surface and roof ponding areas
- In-situ percolation rate test results for proposed infiltration/exfiltration facilities done at the proposed facility location

**Subdivision Applications**

*Residential*

- Calculations for all high water level for all overland flow routes
- Where traffic calming devices are proposed, calculations showing proposed high water levels for minor and major storms every 5m minimum up-stream of the device

*Industrial / Commercial / Mixed Use*

- Allowable discharge rates per site

**Site Plan Applications**

- Schematic layout of roof drain controls and ponding volumes and corresponding level of controls when roof top controls are proposed
- Report from qualified engineer on the flood proofing of reverse driveways

**Drawings**

Specific drawing requirements for stormwater management reports include:

- Separate pre-development and post-development drainage area for all sites over 5 hectares
- Separate pre-development and post-development drainage areas when a change to the drainage areas has been proposed
- Major overland flow route (s)
- Emergency overland flow routes for storm events beyond the specified major storm and in case of blockage or failure of the drainage system
### Stormwater Management Report

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- Location of all flow controls, type of control, manufacturer, model number, sizing, number of weirs (where applicable), release rates and any other information specific to the control device(s)
- High water elevations corresponding to the required level of controls

#### Swales, Ditches and Channels
- Typical cross sections
- Top of slope, bottom of slope, top of bank, flood limits for major storms
- Spot elevations every 20m (We are using a 6m spacing on grading plans?) or as required for top of slope, bottom of slope, top of bank, flood limits, inverts and intermediate grades where applicable
- Material specifications

#### SWM Facilities
- Separate servicing and grading drawings
- Maximum ponding elevations for major, minor and other relevant storms with respective storage volumes
- Cross-sections of outlet channels where applicable
- Cross-section(s) of facility
- Details of erosion controls both temporary and permanent
- Minimum 5m wide (excluding shoulders) access route for maintenance
- Fencing, signage details
- Landscaping plans and details
- Schematic of water harvesting process

#### Site Plan Applications
- General grading information including clearly discernible existing and proposed elevations at 6m intervals along property lines, driveways, sidewalks, walkways and trees to be preserved
- Separate servicing and grading drawings *except* for single family residential units
- Proposed elevations at 6m intervals along all building and structure perimeters and building entrances
- Quality and quantity control devices including manufacturer, model number, size and release rates
- Building finished floor elevations and door sill elevations
- Ground surface and roof top ponding area limits and elevations for major and minor storms with respective storage volume provided
- Water harvesting collection and inlet capacity

#### Subdivision Applications
- External drainage area with inlet and outlet locations
- Separate erosion control plans for construction and permanent conditions
- Building finished floor elevations and door sill elevations
- Separate drawings for pre-development and post-development drainage areas
- Storm drainage area for minor and major flows
- General grading directions including minor and major overland flow routes
- Emergency overland flow routes for storm events beyond the specified major storm and in case of blockage or failure of the drainage system
| **Comments** | The level of detail for the Stormwater Management Report depends on the type of application, the size of the development and the types of stormwater management schemes proposed. |