



## Integrated Rainwater Management: Municipalities Can Achieve More With Less

ISMP Course Correction: Capital Region's Bowker Creek Blueprint  
Informs Metro Vancouver Initiative

**Convening for Action in BC:**  
Visualize What We Want Our Regions to Look Like in 50 years

**Create a Legacy:  
Settlement Change in Balance with Ecology**

1. *Influence choices by individuals and organizations*
2. *Use the term "sustainability" as a lens for considering approaches that influence choices*

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## Preface

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*On April 7, Metro Vancouver will host the 2011 Water Balance Model Partners Forum. This is an opportunity for local governments to learn from each other, and reflect on what can be accomplished through alignment and collaboration. The Water Balance Model is an outcome of collaboration.*

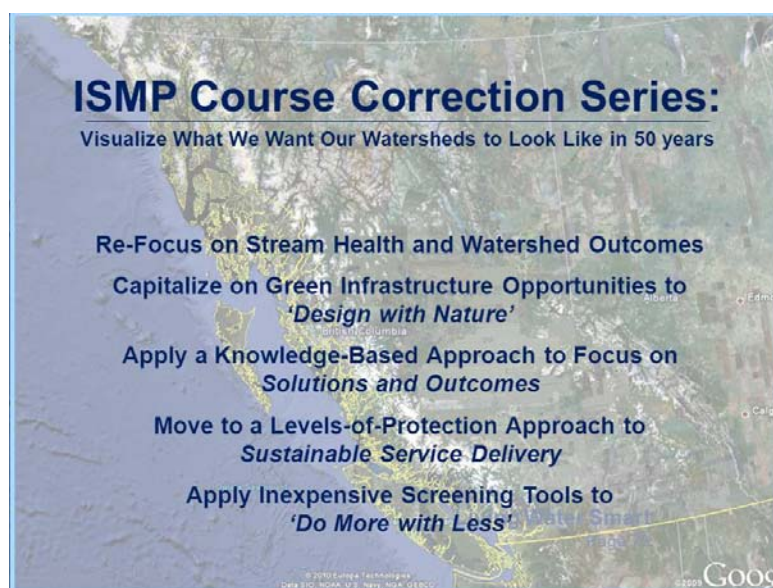
*The Partners Forum is part of the continuing rollout of 'Beyond the Guidebook 2010: Implementing a New Culture for Urban Watershed Protection and Restoration in British Columbia'. Town-hall sharing segments will address three topics. These are listed in the Draft Agenda (included on the page opposite).*

*This article is the fourth in a series that foreshadow the information-transfer that will take place at the Forum. The focus is on the **ISMP Course Correction** and the regulatory implications. The objective is to inform local governments and others about the paradigm-shift to landscape-based 'rainwater' from pipe-and-convey 'stormwater'.*

*The article describes the drivers for doing business differently; provides an overview of how the times have changed; and introduces the precedent-setting Bowker Creek Blueprint. The accompanying Table 1 summarizes five themes addressed by the **ISMP Course Correction Series**.*

*The time is now right to make the vocabulary change to IRMP from ISMP, where IRMP is the acronym for Integrated Rainwater Management Plan. This re-branding would help facilitate the current paradigm-shift in the local government setting.*

*Kim A. Stephens, MEng, PEng, Executive Director  
Partnership for Water Sustainability in British Columbia  
March 2011*



## 2011 Water Balance Model Partners Forum

Hosted by Metro Vancouver on April 7<sup>th</sup> from 9am until noon  
10<sup>th</sup> Floor Conference Centre, 5945 Kathleen Street, Burnaby  
(around the corner from the main Metro Vancouver tower Kingsway entrance)

### ~ DRAFT AGENDA ~

#### “ISMP Course Correction: Municipalities Can Achieve More With Less”

Hr.	Theme	Scope of Discussion
#1	<b>The Plan for the Future:</b> <i>Are You Curious About the Water Balance Model Enhancement Program?</i>	<ul style="list-style-type: none"> <li>Explain formation of the society as the legal entity for the WBM</li> <li>Summarize the plan that was released in November 2009</li> <li>Introduce the federal/provincial program that is funding the plan</li> <li>Explain the platform conversion and introduce the new modules</li> </ul> <p><b>Desired Outcome:</b> Participants will understand what has been accomplished since the 2008 Partners Forum, and what is coming.</p>
#2	<b>Water Balance Model Express for Homeowners:</b> <i>How Would This Tool Help Your Municipality Influence Rainwater Management and Water Conservation Practices?</i>	<ul style="list-style-type: none"> <li>Tell the story of the Central Saanich bylaw as a catalyst for action</li> <li>Introduce the project vision for influencing choices and decisions</li> <li>Identify the range of educational opportunities to be tapped</li> <li>Describe the pilot work underway in North Van District</li> </ul> <p><b>Desired Outcome:</b> Participants will understand the potential for showing landowners how to make changes to the way the land processes rain and water</p>
#3	<b>Watershed-Based Planning:</b> <i>North Vancouver District Demonstrates How to Implement the “ISMP Course Correction”</i>	<ul style="list-style-type: none"> <li>Introduce Hastings Creek &amp; Lynn Valley Town Centre case study</li> <li>Describe the 3-way collaboration: District, UBC and the Partnership</li> <li>Describe application of the WBM to establish performance targets</li> <li>Explain how the District’s approach will fulfill its ISMP commitments</li> </ul> <p><b>Desired Outcome:</b> Participants will understand how to ‘achieve more with less’ by sharing experiences, pooling resources, and applying a knowledge-based approach to focus on solutions and outcomes.</p>

**TOWN-HALL FORMAT:** The Water Balance Model Partners Forum will be conducted as an interactive sharing, learning and consultation session. The Forum is structured in three hourly segments. At the start of each hour, the WBM team will present information that provides context and sets the scene for the town-hall conversation that will follow. Our ‘convening for action’ experience is that this approach is effective in engaging an audience.

The Partners Forum is an opportunity for local governments to learn from each other, and reflect on what can be accomplished through alignment and collaboration. The Water Balance Model is an outcome of collaboration.

**THE WATER BALANCE MODEL** is a tool to assess green infrastructure effectiveness. The Stream Health Methodology embedded in the Water Balance Model represents the next step in the ongoing evolution of the *DRAFT DFO Urban Stormwater Guidelines*, originally released in 2000.

The user can correlate runoff volume management strategies with stream erosion and water quality outcomes. This process allows the delivery of watershed-specific and outcome-oriented plans that are specifically applicable to the municipality, watershed and stream. The Water Balance Model differs from other drainage modelling tools in three fundamental ways:

1. It is web-based
2. Model evolution is driven by the community of users
3. Use of the tool can help local governments create a vision of the future watershed

The Water Balance Model is powered by the QUALHYMO calculation engine, developed by Dr. Charles Rowney in the 1980s with funding from the Ontario Ministry of Environment. Dr. Rowney is the WBM Scientific Authority.

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**Table 1 – An Overview of the ISMP\* Course Correction Series**

Five Themes	Synopsis of Key Messages
<b>1 Re-Focus on Stream Health and Watershed Outcomes</b>	Provides regulatory and historical context, introduces guiding principles for implementing change on the ground, explains what <b>outcome-oriented</b> means, and sets the stage for the four stories that follow.
<b>2 Capitalize on Green Infrastructure Opportunities to ‘Design with Nature’</b>	Explains why ‘designing with nature’ is key to climate change adaptation; identifies what municipalities will need to do to protect or restore stream health; and introduces principles upon which a <b>Regional Team Approach</b> to green infrastructure implementation is founded.
<b>3 Apply a Knowledge-Based Approach to Focus on Solutions and Outcomes</b>	Clarifies the objectives in making the change to IRMP from ISMP, introduces the knowledge-based approach to making decisions, and highlights the ‘learnings’ by those who are demonstrating leadership in establishing outcome-oriented precedents for watershed protection through green infrastructure: Establish the vision, set the target, and then implement.
<b>4 Move to a Levels-of-Protection Approach to Sustainable Service Delivery</b>	Introduces the ‘infrastructure deficit’ / ‘infrastructure liability’ as a driver for the ‘course correction’, connects the dots to the Green Communities Initiative, views the <b>Levels-of-Service</b> concept through the land use planning and environmental lenses, and provides three examples to illustrate how local government leaders are moving forward with Sustainable Service Delivery.
<b>5 Apply Inexpensive Screening Tools and ‘Do More with Less’</b>	<p>Is built around City of Surrey case study experience. Now in its fifth decade of continuous implementation experience, the City continues to evolve and adapt a watershed-based approach that incorporates lessons learned in getting green infrastructure right.</p> <p>The notion of ‘<b>shared responsibility</b>’ is a foundation piece for collaboration, alignment and integration. When these are in place, innovation will follow. Shared responsibility is a unifying theme for two case studies described herein. They illustrate the value of looking outside the pipe.</p>

\* Where “ISMP” is the acronym for Integrated Stormwater Management Plan



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## ISMP Course Correction

A decade ago, local governments were venturing into uncharted waters when undertaking ISMPs, the acronym for *Integrated Stormwater Management Plans*. Now, the experience of the Bowker Creek Initiative (in the Capital Region) serves as a guide for the "ISMP Course Correction" in the Metro Vancouver region.

The need for a 'course correction' was identified by the Metro Vancouver Liquid Waste Management Reference Panel in its Final Report to the Metro Vancouver Board, released in July 2009: *"Re-focus Integrated RAINwater/Stormwater Management Plans on watershed targets and outcomes so that there are clear linkages with the land use planning and development approval process."*

## Regulatory Commitments

During the period November-December 2010, the Water Sustainability Action Plan for British Columbia released a 5-part series about considerations driving a course correction in the way ISMPs are undertaken. Release of the **Summary Report for ISMP Course Correction Series** followed in February 2011.

"The purpose of the Summary Report is to guide those about to embark upon an ISMP process. The Partners Forum provides a platform for launching an educational program that will support implementation of the ISMP Course Correction in Metro Vancouver. This will help municipalities fulfil their regulatory commitments under the region's **Integrated Liquid Waste and Resource Management Plan**," states Ted van der Gulik, Chair of the Water Balance Model Partnership.



"Each document in the ISMP Course Correction Series corresponds to an action. Taken together, the five actions comprise a recommended framework for a watershed-based planning process."

## Why the Course Correction

"There are two main drivers for the ISMP Course Correction," continues Richard Boase, Partnership Co-Chair. "First, we had observed that too many stakeholders were either unaware or had lost sight of the original purpose in developing an ISMP – which is to protect stream health. They had also lost sight of what integration means. The second significant driver is the 'unfunded infrastructure liability'. Local governments are hard-pressed financially. Communities cannot afford the cost of traditional 'pipe-and-convey' drainage infrastructure. We are being asked to do more with less."



"Local governments in British Columbia are faced with this challenge: the initial capital cost of infrastructure is about 20% of the life-cycle cost; the other 80% largely represents a future unfunded liability. Fiscal constraints provide a powerful impetus for doing business differently to 'achieve more with less'."

## A Powerful Tool

"An ISMP is a potentially powerful tool. It can influence other municipal processes for the better. It can generate the blueprint for integrated and coordinated action at a watershed scale," adds Richard Boase. "This is the significance of the Bowker Creek Blueprint in the Capital Regional District. The four partner local governments --- Capital Regional District, Victoria, Saanich and Oak Bay --- now have a game plan for watershed redevelopment over the next 100 years."

"The 4-stage process developed by the City of Surrey is presented in the *Summary Report for the ISMP Course Correction Series*. This summary of lessons learned by those who have developed watershed-based plans can help those about to embark on an ISMP process. The notion of 'shared responsibility' is a foundation piece for collaboration, alignment and integration," concludes Richard Boase.

Table 2 is included at the end of this document.

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## City of Surrey Framework

The City of Surrey has a guiding philosophy which is summarized below. These four principles establish expectations:

- Recognize that each watershed area is unique, and its needs are unique.
- Integrate drainage planning with land use, environment, parks, and other infrastructure/community needs.
- Model the drainage system after there is some concept of overall direction – do not model just to model.
- Have short, medium and long term goals / visions for the ISMP area, complete with integration of opportunities.

An *Integrated Rainwater Management Plan (IRMP)* should provide a clear picture of how local governments can apply land use planning tools to create a future watershed condition desired by all. This approach contrasts with a conventional ISMP approach where the primary emphasis is on data collection, computer modeling and pipe analyses; and results in an enhanced Master Drainage Plan.

## Quotable Quotes:

- **Water Bucket publishes excerpts from "Beyond the Guidebook 2010" about why and how to re-focus ISMPs on outcomes ---** "Outcome-oriented planning is a problem-solving PROCESS. It is not a procedure. It is not a matter of applying a regulation or a checklist. Participants have to be committed to the outcome," states Tim Pringle, President of the Partnership for Water Sustainability in British Columbia.



- **Application of the "DFO Urban Stormwater Guidelines" has evolved over the past decade to protect stream health ---** "The objective of protecting stream health is broader than how much volume one can infiltrate on a particular development," emphasizes Corino Salomi, Area Manager, Oceans, Habitat & Enhancement Branch, Lower Fraser Area.



## Planning Framework

### Understanding the Watershed

✓ "What do we have?"

### Watershed Levels-of-Protection

✓ "What do we want?"

### Integrated Plan

✓ "How do we get there?"

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## What We Have Learned After a Decade

"The genesis for ISMPs was a desire to integrate the community, engineering, planning and environmental perspectives. The implicit goal was to build and/or rebuild communities in balance with ecology. Local governments knew they had to do business differently in order to protect and/or restore watershed health," states Robert Hicks, Senior Engineer in the Policy & Planning Division at Metro Vancouver. He has been involved in the ISMP process from the beginning.



"Now, the 'unfunded infrastructure liability' is a driver for local governments to consider longevity, focus on what happens after developers hand-off municipal infrastructure, get it right at the front-end, and prepare for the future," continues Glen Brown, Executive Director with the Ministry of Community, Sport and Cultural Development. His responsibilities encompass local government infrastructure and finance.



## Sustainable Service Delivery

"Tackling the unfunded infrastructure liability requires a life-cycle way of thinking about infrastructure needs, in particular how to pay for those needs over time. This holistic approach is described as Sustainable Service Delivery," states Wally Wells, Coordinator for Asset Management BC.



"The paradigm-shift starts with land use planning. Connecting the dots between watershed health and infrastructure type is emerging as an important piece in 'sustainable drainage infrastructure', both fiscally and ecologically," emphasizes Kim Fowler, Director of Sustainability with the City of Victoria (and a member of the Local Government Asset Management Working Group).



"The financial burden and environmental impacts associated with 'pipe-and-convey' infrastructure contrast with the benefits of 'green' infrastructure at a watershed scale: *natural landscape-based assets reduce runoff volumes, have lower life-cycle costs, decrease stresses applied to creeks, and enhance urban liveability,*" continues Ray Fung, Chair of the Green Infrastructure Partnership.



"Level-of-service is the integrator for everything that local governments do. Everyone will have to make level-of-service choices. Thus, a guiding principle for a watershed-based plan could be framed this way: *Establish the level-of-service that is fiscally sustainable AND protects watershed health,*" concludes John McMahon, Chair of Metro Vancouver's Stormwater Interagency Liaison Group.



Collaboration, a 'Design with Nature' approach, and re-use of resources are keys to mitigation of unfunded infrastructure liability and adaptation to climate change

To achieve higher levels of stream, wetland and marine environment protection:

- Protect and restore urban 'green' space
- Strive for a lighter 'water footprint'
- Re-use and recycle water, energy & nutrients from liquid wastes
- Develop compact, complete communities





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### About the Bowker Creek Blueprint

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"The *Bowker Creek Initiative* is a unique multi-jurisdictional effort. Four local governments, community groups, post-secondary institutions and private citizens are collaborating to improve the health of Bowker Creek and its watershed," reports Jody Watson, Harbours and Watersheds Coordinator with the CRD. She is the Chair of the Bowker Creek Initiative.



"The BCI developed the Bowker Creek Blueprint through a knowledge-based approach. The regional team convened as an inter-disciplinary roundtable to synthesize their individual areas of knowledge. Drainage, land use, environmental and social information was compiled and assessed in an holistic way that enabled team members to apply their collective best judgment, reach-by-reach."

"We now have a 100-Year Action Plan to guide watershed and creek restoration as the various neighbourhoods redevelop over time. Having an Action Plan in place will ensure that positive changes can happen incrementally, and that opportunities for major improvements can be realized as they arise," concludes Jody Watson.

### Achieve More With Less

"The elephant in the room is always money. Municipalities have lots of competing interests for spending money; lots of projects to keep staff busy; and finite financial resources. We are all challenged to do more with less and get it done," stated Anne Topp, District of Saanich Manager of Community Planning, at the 2010 Bowker Creek Forum.



"We all have heard the quote *'if you don't know where you are going, it doesn't matter what road you take'*. With completion of the Blueprint, the Bowker Creek Initiative knows where it wants to go. Integrating with and using other plans to advance the Blueprint will be ongoing."

"The 100-year Action Plan gives us time. This plan is not just about water. It is about how this community wants to live and connect to the environment. We don't have to do the \$20 million, \$40 million ISMP approach. Keeping the pieces small and creating bite-sized pieces should allow the slow and steady approach," concludes Anne Topp.

### Transferability to Metro Vancouver

"The District of North Vancouver is adapting the Bowker Creek Initiative's outcome-oriented approach and applying the City of Surrey's framework to develop our first ISMP. We are learning from both," states Richard Boase. He is the District's project manager. "The Bowker Creek Blueprint has demonstrated the payback in applying a knowledge-based approach to focus on solutions and outcomes. Surrey has more ISMP experience than any other jurisdiction in BC. We are blending our vision for restoring the rainfall capacity of the District of North Vancouver's watershed, one property at a time, into the ISMP mix."

"The District's Official Community Plan Update is our opportunity to address the link between densification of single family lands and the health of the municipality's streams. The proposed Lynn Valley Town Centre makes this tangible. We are drawing on our in-house resources to demonstrate what an inter-departmental approach can accomplish. To supplement our in-house capabilities, the District is collaborating with the University of British Columbia and the Partnership for Water Sustainability."

"At the Partners Forum, I will elaborate on how the District of North Vancouver is already achieving more with less. Collaboration will save the District a lot of money, inform our vision for embedding a *Watershed Landscape Restoration Strategy* in the Official Community Plan Update, and fulfil our ISMP regulatory commitments."



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### *Quotable Quotes:*

- **The Bowker Creek Blueprint demonstrates what can be accomplished through a vision, alignment and collaboration** --- "Based on my experience over the past 30-plus years, the Bowker Creek Blueprint has gone well beyond any other plan in terms of how it has achieved consensus and galvanized commitment to move from planning to action on the ground," states Kim Stephens, Executive Director of the Partnership for Water Sustainability.



- **A crucially important message in Beyond the Guidebook 2010: "We now have the tools and experience to design with nature"** --- "So many in local government are searching for the magical 'silver bullet' to resolve watershed issues and challenges. Yet soil, vegetation and trees can do more for our watersheds than decades of planning, consulting and complicated engineering design will ever achieve," concludes Richard Boase.



## The Bowker Creek Blueprint is all about a new form of governance:

- First the Vision
- Then Community Involvement
- Then Support from Municipal Decision Makers
- Then Apply 'Design with Nature' as a Consistent Future Approach

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**Table 2 – City of Surrey Framework for an Holistic and Balanced ISMP**

(Page 1 of 2)

## Guiding Philosophy

- Recognize that each watershed area is unique, and its needs are unique.
- Integrate drainage planning with land use, environment, parks, and other infrastructure and community needs.
- Model the drainage system after there is some concept of overall direction – do not model just to model.
- Have short, medium and long term goals / visions for the plan area, complete with integration of opportunities.

## The Process

Stage 1 – “What Do We Have?”

Stage 2 – “What Do We Want?”

Stage 3 – “How Do We Put This Into Action?”

Stage 4 – “How Do We Stay On Target?”

## Balanced Goals

As part of defining “what we want”, the City identified these balanced goals:

- Protect and enhance the overall health and natural resources of the watershed;
- Promote participation from all stakeholders to achieve a common future vision of the watershed;
- Minimize risk of life and property damages associated with flooding and provide strategies to attenuate peak flows;
- Protect and enhance watercourses and aquatic life;
- Prevent pollution and maintain / improve water quality;
- Prepare an inventory of watercourses and wildlife for the watershed;
- Protect the environment, wildlife, and habitat corridors;
- Identify areas of existing and future agricultural, residential, commercial, and recreational land uses;
- Develop a cost effective and enforceable implementation plan; and,
- Establish a monitoring and assessment strategy to ensure goals are achieved, maintained, and enforced.

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Table 2 – City of Surrey Framework (page 2 of 2)

## Scope of the Four Stages

### **Stage 1: "What Do We Have?" Review Existing Information and Data Collection**

1. A review of existing information;
2. Watershed field reconnaissance and data collection;
3. Definition of hydrologic and hydraulic conditions; and
4. A public open house to begin dialogue on community objectives.

### **Stage 2: "What Do We Want?" Vision for Future Development**

To achieve the goals, the requirements for developing a vision encompass:

5. Land use plans which will be developed to identify future land use types, stream setbacks, wildlife corridors, potential pond locations and any other opportunities or constraints for development
6. Stakeholder involvement through a public open house meeting.
7. Hydrogeological assessments;
8. Environmental assessments for habitat protection and enhancement;
9. Innovative Low Impact Development (LID) techniques and rainwater Best Management Practices (BMP) to mitigate against impacts to the lowland areas, reduce runoff volume through source controls, decrease stream velocity, protect water quality, provide erosion protection, and maintain baseflows to streams; and
10. Sound, proven numerical hydrologic and hydraulic modelling techniques.

### **Stage 3: "How do we put this into action?" Implementation Plan, Funding Strategies, and Enforcement Strategies**

11. A review of the existing Design Criteria to assess which are appropriate for this ISMP and what should be added or modified;
12. A long-range capital works plan;
13. Cost analysis;
14. A project approvals procedure;
15. A funding strategy;
16. A by-law enforcement strategy which identifies existing and missing bylaws; and
17. A list of action items with time scales.

### **Stage 4: "How do we stay on target?" Monitoring and Assessment Plan**

18. Creation of a strategic plan for monitoring and assessing that includes an explanation of why data needs to be collected and assessed in a monitoring program and how to interpret the collected data.
19. Provision of a summary of key performance indicators (KPIs), both qualitative and quantitative with a sensitivity analysis to indicate the relative magnitude of flexibility that resides in each identified KPI.
20. Summary of the type, duration, and frequency of monitoring associated with each KPI.