

BC Wildlife Federation – Wetland Workshop for Municipalities

Presentation on November 19, 2013

# **Wetland Conservation in a Watershed Health Context:**

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***Watershed Blueprints Will Help Municipalities  
Integrate & Better Deliver on Regulatory Compliance***

Kim A Stephens, M.Eng., P.Eng., Executive Director



# A decade ago at UBCM, BC politicians embraced Water Balance thinking and “design with nature”

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“In 2002, the Province provided clear direction for land development:

- *“Mimic the natural Water Balance”*

"It's taken a decade long sojourn to really demonstrate how 'designing with nature' has achieved this goal".

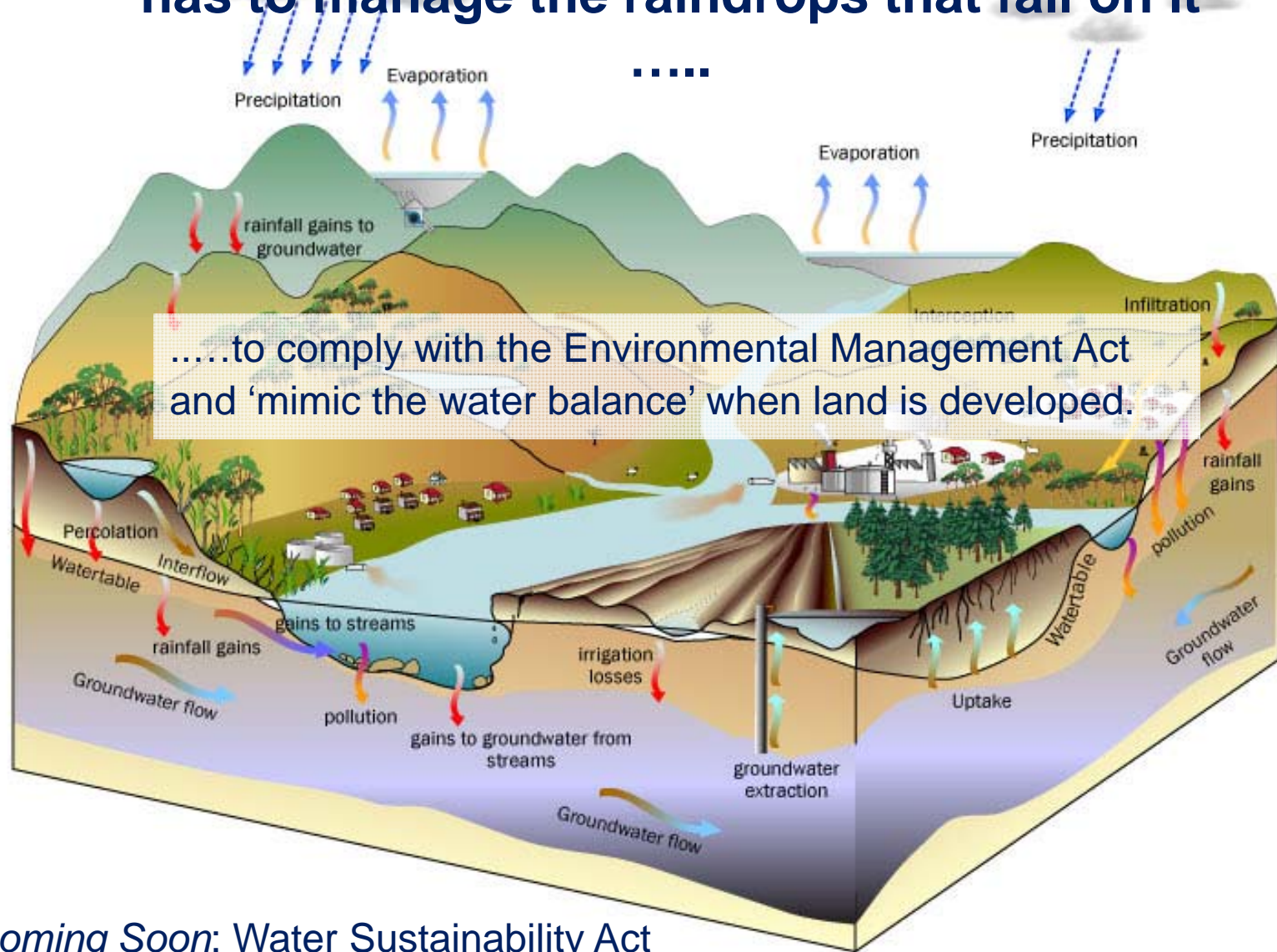


Barry Janyk, Town of Gibsons  
Mayor (1999 – 2011)

President, AVICC (2010 & 2011)

Moderator, SmartStorm Forums  
(1999- 2001)

# Every municipality in Metro Vancouver has to manage the raindrops that fall on it



*Coming Soon: Water Sustainability Act*

# Look at Rainfall Differently

*BC was the 1<sup>st</sup> jurisdiction in North America to adopt the 'Water Balance Methodology'*

Released in 2002, the Guidebook is embedded in Liquid Waste Management Plan requirements

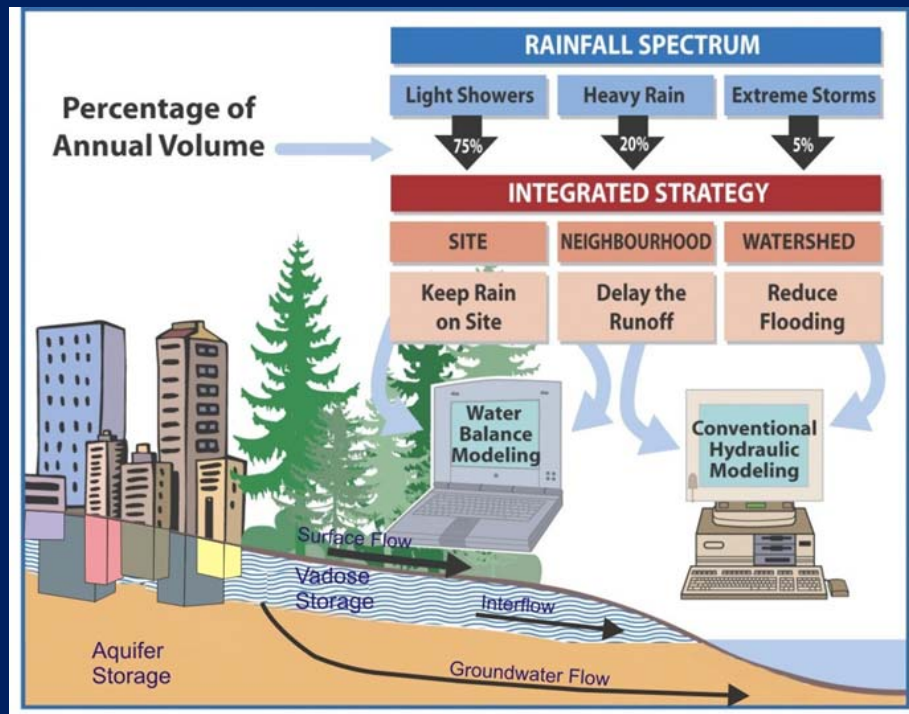


## Stormwater Planning

- ❑ Translated Science-Based Understanding
- ❑ Introduced the Rainfall Spectrum
- ❑ Introduced “Retain, Detain, Convey” Strategy
- ❑ Formalized Performance Target Approach
- ❑ Established Adaptive Management Precedent
- ❑ Initiated Paradigm-Shift to Rainwater Mgmt

# Components of the Water Balance

We start with an understanding of the basics



- Precipitation
- Evaporation loss
- Transpiration uptake
- Infiltration into ground
- Storage in the ground
- Flow in streams

## **PLUS:**

- **Surface Runoff**  
(minutes to hours)
- **Interflow**  
(days to seasons)
- **Deep Groundwater**  
(years to centuries)



A photograph of a forest with a stream, overlaid with a green semi-transparent rectangle containing text.

# Wetland Conservation in a Watershed Health Context

1. **WHY:** Frame the Regulatory Context
2. **WHAT:** Describe the Collaborative Model
3. **SO WHAT:** Elaborate on How Everyone Benefits
4. **THEN WHAT:** Implement Watershed Targets



# The Province is going down a pathway that integrates regulatory compliance and collaboration

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“Regulatory requirements provide a driver for local governments to protect and/or restore watershed health over time. We also recognize that solutions will be achieved through partnerships, collaboration and regional alignment of efforts.”

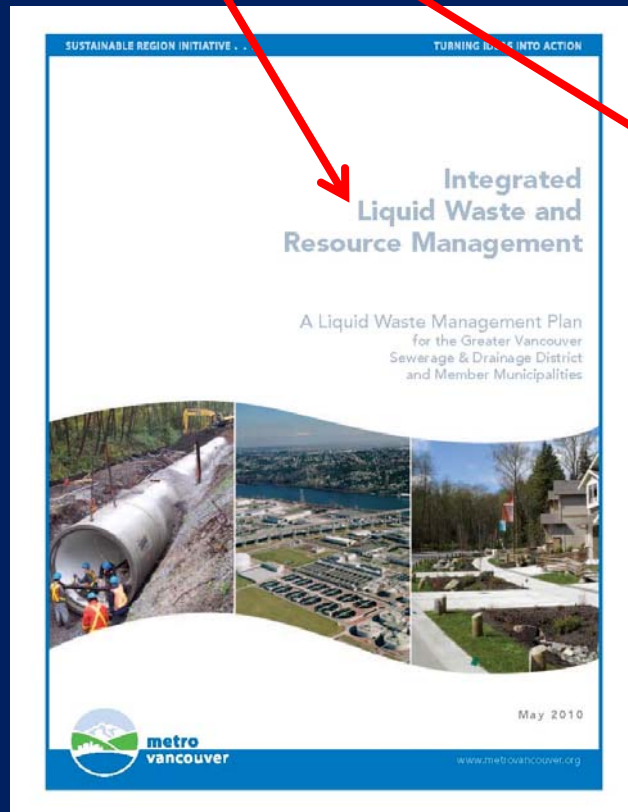
October 2011

**Avtar Sundher**

Government and Compliance Section Head  
Environmental Protection Division, South Coast  
Ministry of Environment

## Metro Vancouver and municipalities will:

*Integrated Plan spells out actions for “on-site rainwater management” that will protect and/or restore “watershed health”*



1.1.12 - Facilitate region-wide strategies and actions

1.1.20 - Update bylaws

1.1.21 - Update neighbourhood design guidelines

3.4.7 - Develop & implement ISMPs

*NOTE: use of the term “watershed blueprint” helps to create a picture (mind-map) of how to achieve the vision (desired future condition)*

3.5.9 - Report out annually to MOE



When land surface is developed and hardened,  
below-ground flow paths to streams are eliminated ....

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*With financial liability and sustainability consequences*



### **TOO MUCH WATER:**

*Erosion, instability and movement  
of gravel and contaminants*

### **TOO LITTLE WATER:**

*Creeks go dry ...  
(and fish will not survive)*

If we reduce our 'water footprint', and if we ensure the integrity of groundwater flow, we can then protect watershed & stream health







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the partnership  
for water sustainability in bc

- A not-for-profit society.....we are volunteers!
  - Majority of Metro Van members are charter members
  - Legal entity for Water Balance Model
- Bridging role between Province, local government and community:
  - Foster alignment of regional and local actions with provincial goals
  - Facilitate inter-regional collaboration in local government setting
- We are building on the 'collaborative model' to implement *Living Water Smart* and *Green Communities*:
  - Deliver *Water Sustainability Action Plan* through partnerships
  - Stewards of *Stormwater Planning: A Guidebook for BC*
  - Hub for "convening for action" network in local government setting

Who we are

What we do



# ***WHAT IS:*** Water Sustainability Action Plan for BC

*We develop tools. We develop talent. We focus on outcomes.*



# Georgia Basin Inter-Regional Collaboration

*“Through sharing & learning, ensure that where we are going is indeed the right way”*



## VISION:

Move beyond the rhetoric and into the substance of watershed health and how to effectively monitor it

## DELIVERABLE:

“Towards a Watershed Health Legacy: Elements of An Adaptive Management Framework”

## TURNING VISION INTO ACTION:

Community development activities and alteration of the Built Environment will result in cumulative benefits, not impacts





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Core content for Inter-Regional Collaboration  
is founded on the experience of those  
who are leading change, in particular...

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- City of Surrey

- District of North Vancouver

*Hastings Creek Blueprint is the demonstration application for:*

1. *WBM Express for Landowners*
2. *Drainage Infrastructure Screening Tool*

- City of Coquitlam

Because local governments are at different points of understanding along the “Watershed Health Continuum”....

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Inter-regional collaboration will help everyone go farther, more efficiently and effectively, to:

- ☐ design with nature
- ☐ implement green infrastructure
- ☐ mimic the water balance

*So that local governments can:*

- ☐ reduce risk
- ☐ restore stream / watershed health
- ☐ comply with regulatory objectives



METRO VANCOUVER 2013  
**Action Plan**



**metrovanancouver**

SERVICES AND SOLUTIONS FOR A LIVABLE REGION

The vision for a regional  
Green Infrastructure Network  
aligns with the Province's  
regulatory objectives for  
Watershed-Based Plans  
that will result in restoration  
of Watershed Heath over time





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# What is the Water Balance Model?

*A web-based scenario comparison tool that. Users can quantify the impacts of land use changes on the Water Footprint and hence Stream Health*

## THREE SCALES

- watershed
- development
- site

Now, three user  
**LEVELS:**

- engineering
- planning
- **landowner**





# WBM Express for Landowners

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*THE GOAL: "Lighten the Water Footprint"*



What is on the property now

What is the planned change

How runoff volume will  
increase

How the increase will be  
reduced

# WBM Express for Landowners

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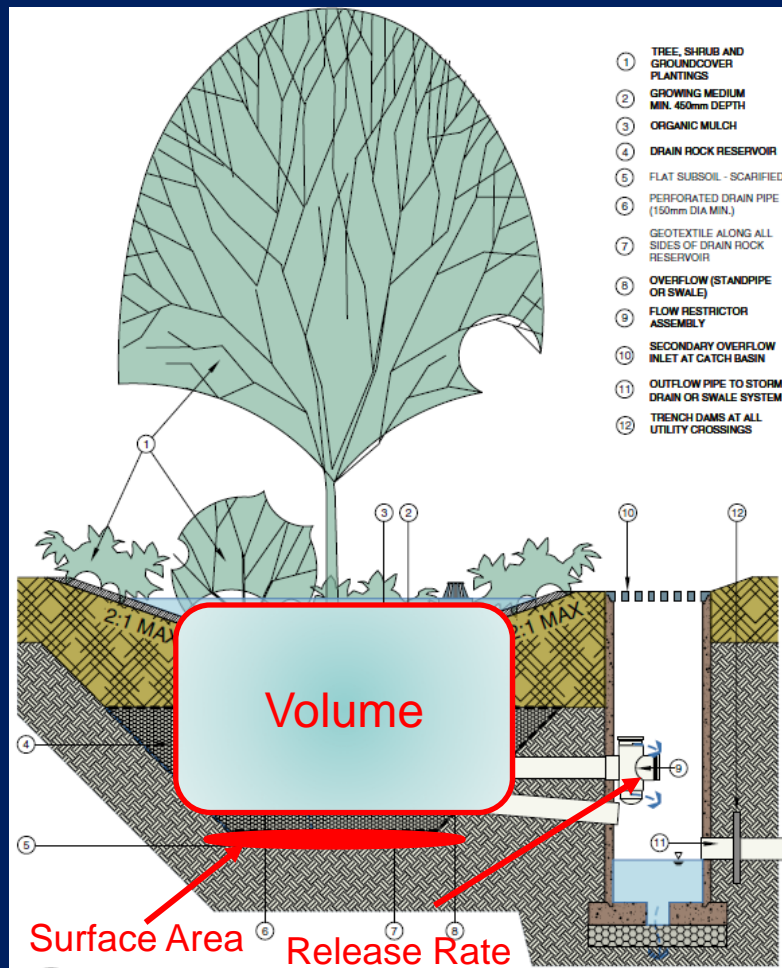
*APPROACH: Focus the User on Solutions*

“The Express solves the vast majority of common problems faced by a property owner ... without requiring the use of tools designed for more complex situations.”

Dr. Charles Rowney  
Scientific Authority  
Water Balance Model Partnership



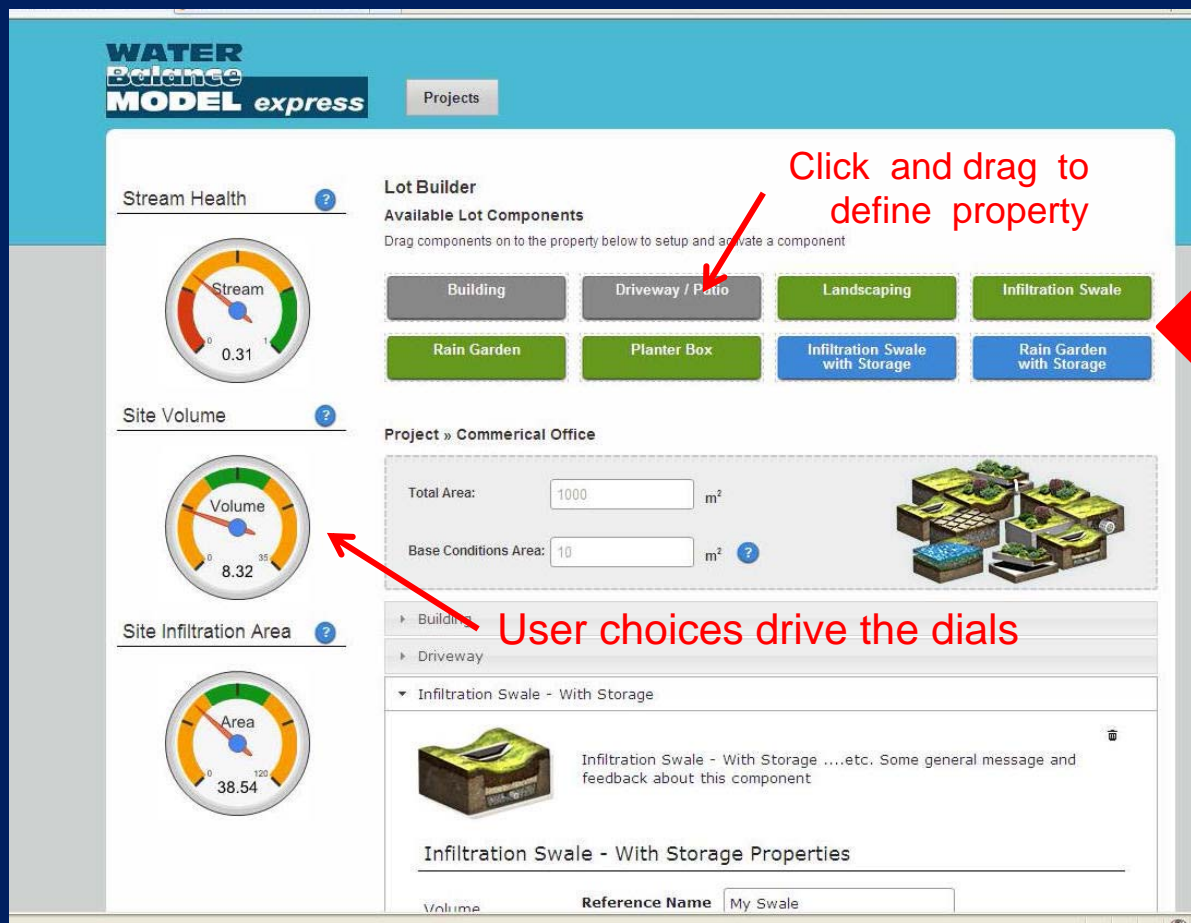
# WBM Express integrates and balances three watershed-based targets.....



- **Volume** for Interflow Storage
- **Release** to Sustain Duration of Interflow
- **Area** to Allow Infiltration to Groundwater



# Interface is no more complex than the dash board of a car....




**Gray** = hard  
& produce runoff

**Green** = absorbent  
& self-mitigating



**Blue** = storage areas  
& receive runoff

# Instantaneous testing of choices!

Infiltration Swale - With Storage | My Swale

 An infiltration swale with storage is typically a dished landscaped area where water may pond temporarily on the ground surface.

Infiltration Swale - With Storage ?

Volume  Infiltration Area 

Reference Name

Percentage Lot:  Small Large

Swale Depth:  Shallow Deep

Soil Type:  Worst Best

Soil Depth:  Shallow Deep

Base Material:  Worst Best

Base Material Depth:  Shallow Deep

Device Connections ?

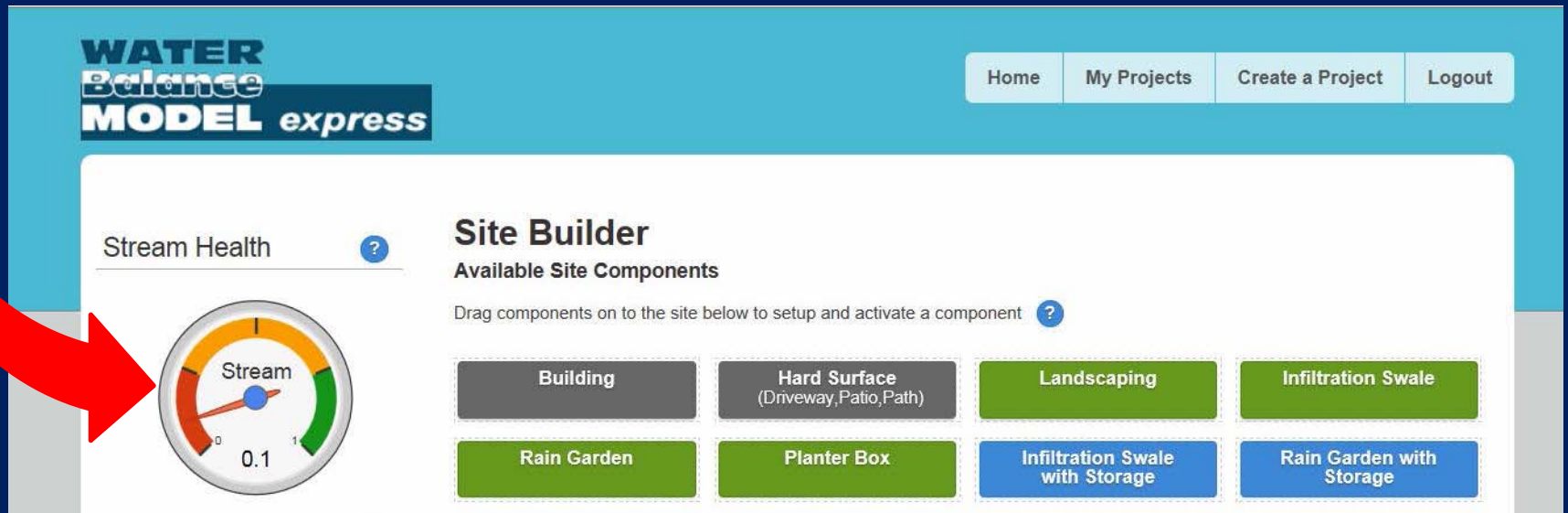
- ☐ None
- ☒ Replacement House
- ☐ 2-Car Wide + Path Around House
- ☐ Backyard Patio

Parameters for  
storage devices

User choices drive  
performance dials



# How well are you doing?



Calculator engine provides a weighted score on how well the site achieves watershed targets

## WBM Express for Landowners

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*Application of the Water Balance Methodology  
is a Three-Step Process because.....*

**STEP ONE:** Complete watershed-scale analysis to establish watershed-specific target values for the three Water Balance parameters



**STEP TWO:** Customize interface to be Partner-specific; and populate Express with target values

**STEP THREE:** Align roles and responsibilities within the Land Development Process and implement





In closing.....

the Province is looking at grant applications through a  
“Sustainable Service Delivery” lens which means....

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“Looking for innovative and practical solutions with how we use nature (and natural resources) and provide community services can potentially lead to improved levels of service (both at a nature and community level) at a reduced cost.”

Glen Brown

Executive Director,

Local Government Infrastructure & Finance Division, Ministry of  
Community, Sport & Cultural Development  
and Deputy Inspector of Municipalities

November 2013