

**Showcasing Water Innovation  
Elm Drive  
December 2012/January 2013 Monitoring Update**

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**Monitoring Progress**

Water quantity (flow) monitoring started in July 2011. A weir and a continuous water flow logger were installed in the manhole downstream of the LID infrastructure and set to record water level at 10 minute intervals. The logger has been operating continuously since it was installed.

In May 2012 an automatic sampler was installed in the same manhole to collect water quality samples during storm events. To date, samples from 12 storm events have been collected.

Prior to November 2012, a City of Mississauga precipitation gauge located approximately 1 kilometer away from the Elm Drive site provided precipitation data for this project. In November 2012 CVC staff installed a new rain gauge and air temperature logger on the roof of the Elm Drive Adult Education Centre. They are set to record precipitation and air temperature at 10 minute intervals to match the flow logger time steps. Going forward, data from this new gauge will be used for the Elm Drive monitoring program.

Since August 2011, for rain events up to 14 mm, no outflows have been observed leaving the LID infrastructure. In other words, roughly 56% of all rain events are being filtered and cleaned before entering Lake Ontario. Between August 2011 and September 2012, 1.9 million litres of stormwater has been stored and infiltrated at the Elm Drive site, this amount of water can fill 1.3 Olympic sized swimming pools.

- **Landscaping** - The construction contractor has completed the final weeding and plant replacement, and the City has now assumed the bioretention planters. A landscape design and installation contractor has added decorative fencing as well as trees and shrubs that will bring more colour, year round interest and vertical height to the planter boxes.

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December 2012/January 2013 Monitoring Update**

**Seasonal photos of the Elm Drive rain garden planters**



**Summer 2012**



**Winter 2013** – The first photo shows a snow dump from plowing the parking lot

- **Maintenance** – As the LID site is next to an adult education school, litter continues to be a significant maintenance issue. The improved landscaping and educational signage will help to bring attention to the issue of litter and the purpose of these practices. Also, CVC will engage the City in developing a maintenance strategy for the site. Weeding and litter removal were performed by CVC's Conservation Youth Corps in August 2012. As can be seen in the pictures, the plants have died back for the winter. A large snowfall event at the end of December resulted in snow being plowed from the parking lot into the two most up-stream cells of the site.

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Elm Drive  
December 2012/January 2013 Monitoring Update**

- **Water Levels** - Initial results from the observation well level loggers have shown that the rain garden is operating properly. Monitoring of flows from the site has found that in 1 year, 1.9 million litres of stormwater (1.3 Olympic size pools) has been stored and infiltrated by the rain garden planters. For rain events up to 13 mm, no outflow from the rain garden planters was measured.

Flow was recorded on January 13, 2013 for a 36 mm event including snowmelt from a previous snowfall event (~5 cm). This was the largest winter event to date that recorded flow at Elm Drive (Table 1).

The largest precipitation event recorded to date was during Hurricane Sandy at the end of October, with a total of 50 mm over several days (October 27 – November 1, 2012).

**Precipitation Events from September 2012 to January 2013**

Table 1. Recorded precipitation events resulting in flow at Elm Drive compared to Lakeview control, grass swale and LID sites. “X” indicates that flow was recorded at that monitoring station during the applicable event.

Date	Total Rainfall	SWI				
		Elm	Lakeview			
			Control	Swale	LID South	LID North
04-Sep-12	23.6	X	X	N/A		
06-Sep-12	2.2					
08-Sep-12	42.9	X	X	X	X	
14-Sep-12	9.8		X	X		
18-Sep-12	18.8		X	X		
21-Sep-12	18.6	X	X	X		
05-Oct-12	8.8		X			
13-Oct-12	18.6	X	X	X		
17-Oct-12	17		X	X		
18-Oct-12	10.2		X	X		
19-Oct-12	4		X	X		
23-Oct-12	29.4	X	X	X	X	
27-Oct-12	21.2	X	X	X	X	
29-Oct-12	50	X	X	X	X	
12-Nov-12	8.4		X	X		
02-Dec-12	12		X	X		
04-Dec-12	4		X			
08-Dec-12	3		X			
09-Dec-12	5.4		X	X		
16-Dec-12	4		X			
20-Dec-12	11		X	X		
11 Jan-13	6		X			
13-Jan-13	36	X	X	X	X	X

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December 2012/January 2013 Monitoring Update**

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**Number of Sampling Events at each SWI Site**

Table 2. Number of precipitation events sampled per monitoring site and the number remaining in the SWI commitment.

	SWI					
	Elm	Lakeview			IMAX	Public Lands
		Control	Swale	LID		
<b>Commitment</b>						
Surface Water	20	20	20	20	20	0
Groundwater	0	0	0	0	4	0
Soil	0	0	0	0	1	1
Rain Tank	0	0	0	0	0	0
<b>Taken to Date</b>						
Surface Water	12	20	8	5	0	0
Groundwater	0	0	0	0	1	0
Soil	0	0	0	0	1	1
Rain Tank	0	0	0	0	0	0
<b>Remaining</b>						
Surface Water	-8	0	-12	-15	-20	
Groundwater					-3	
Soil					0	0
Rain Tank						

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**December 2012/January 2013 Monitoring Update**

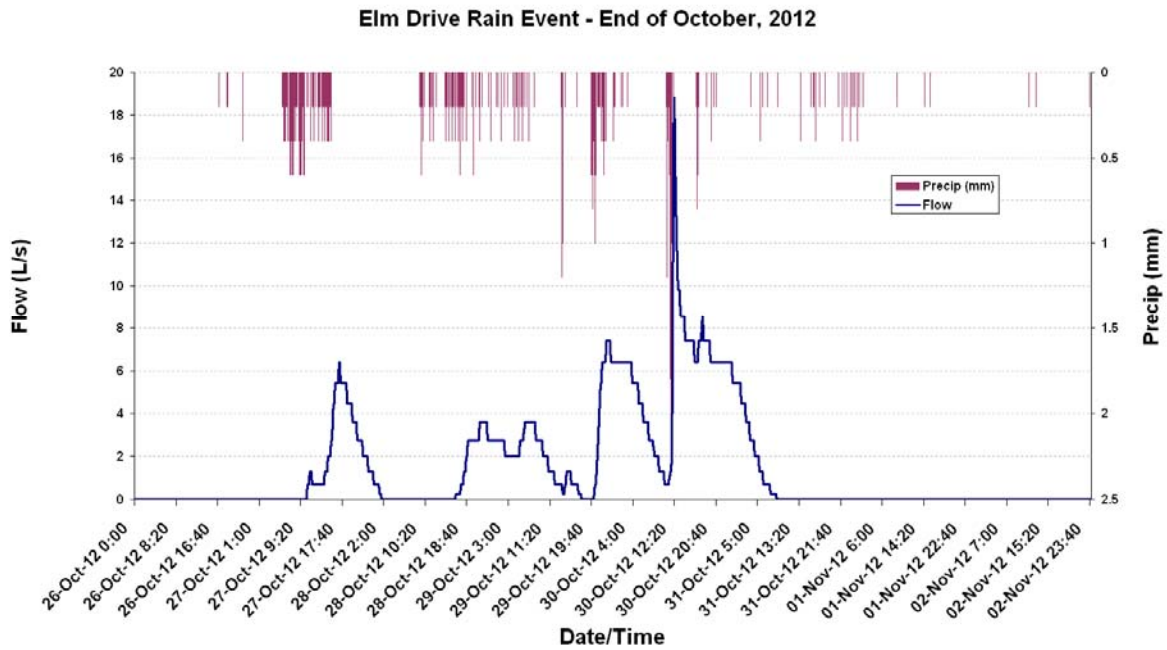


Figure 1. Hydrograph showing water flows from the Elm Drive LID site and precipitation from the large storm events at the end of October 2012

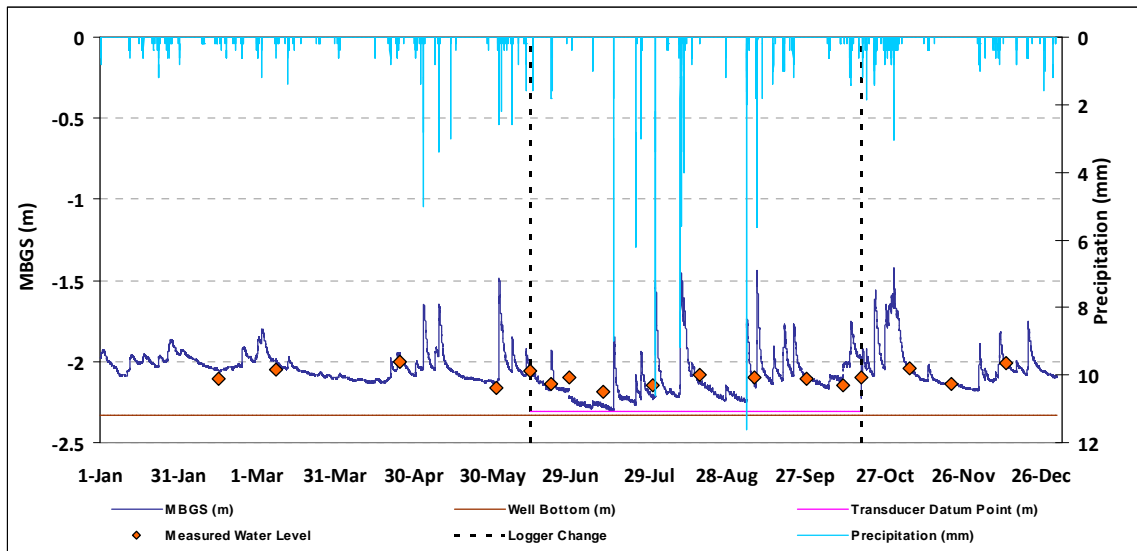


Figure 2. Elm Drive Water Level and Precipitation at Observation Point 2 from January to December 2012

**Showcasing Water Innovation  
Elm Drive  
December 2012/January 2013 Monitoring Update**

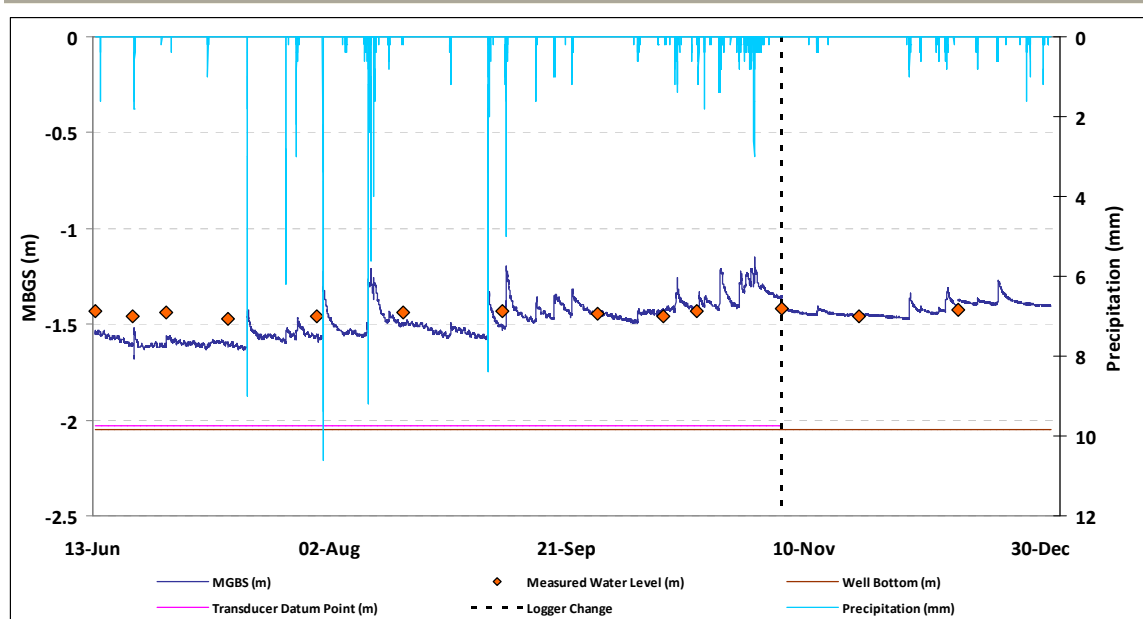


Figure 3. Elm Drive Water Level and Precipitation at Observation Point 3 from June to December 2012

**Photos of Monitoring Equipment at the Elm Drive LID Site**



October 24, 2012 – Storm Event Samples

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Elm Drive  
December 2012/January 2013 Monitoring Update**



November 13, 2012 – Monitoring manhole



November 6, 2012 – Newly installed precipitation gauge on the roof of the Elm Drive Adult Education Centre