

# City of Guelph Stormwater Management Dry Pond Retrofit

Kelly Goorts

Amanda Kellett

Alison MacLennan

Laurie McDougald

## Problem Definition:

- ★ Dry pond located at Eramosa Rd. and Speedvale Ave. E.
- ★ Manages stormwater runoff from Lakeview Village
- ★ Pond discharges to Speed River - Level 1 stream
- ★ 20 years without maintenance
- ★ City of Guelph wishes to investigate pond's performance based on current guidelines

## Objectives:

The objectives of the design procedure are:

- ★ Model and analyze the performance of the dry pond using PC-SWMM
- ★ Consider both water quantity and quality control
- ★ Retrofit dry pond to meet current stormwater management guidelines (MOEE & New York State)
- ★ Emphasis on removal of suspended solids, nutrients and metals

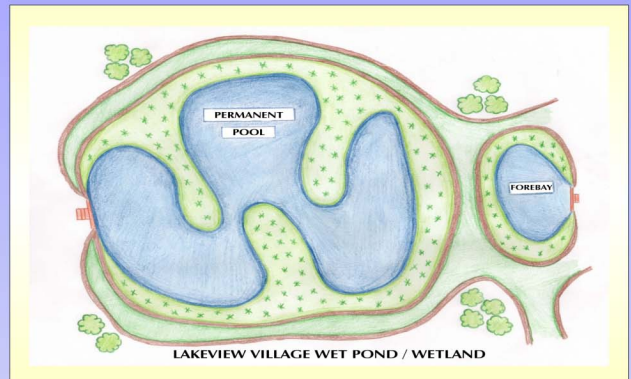
## Dry Pond Assessment:

The results of the analysis indicated:

- ★ Dry pond failed to adequately manage water quantity
- ★ Water quality management not addressed
- ★ Retrofit required to meet objectives

## Selected Design: Wet Pond/Wetland

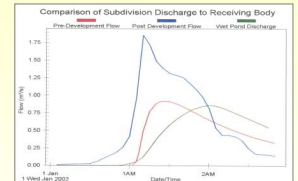
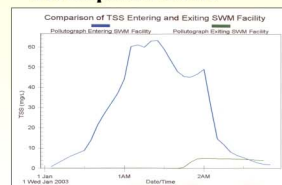
- ★ Non-submerged inlet
- ★ Forebay to reduce velocity and promote settling of suspended solids
- ★ Submerged earthen berm between forebay and pond
- ★ Permanent pool for extended water detention
- ★ Water quantity storage holds runoff from the 10-yr storm
- ★ 24-hour detention time for water quality storage
- ★ Orifice outlets designed to control channel protection, water quality and water quantity volumes
- ★ Ability to convey 100-yr storm via emergency spillway
- ★ Berms positioned throughout the pond to prevent 'short-circuiting'
- ★ Wetland plants used to mitigate temperature fluctuations and maximize pollutant uptake
- ★ Plant species chosen based on nutrient uptake ability and resilience in cold climates
- ★ Reduced required pond area from 1 ha to 0.24 ha



## Results:

For water quantity:

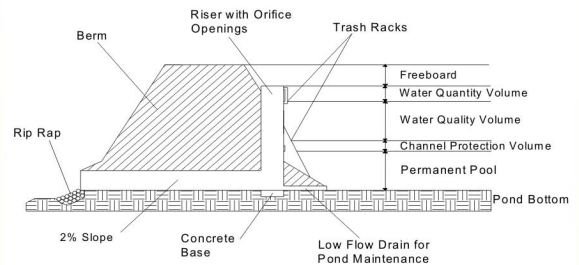
- ★ PC-SWMM verified peak outflow from pond did not exceed pre-development flows



For water quality:

- ★ PC-SWMM verified 92% suspended solids removal

## Pond Storage and Outlet Characteristics



## Conclusions and Recommendations:

- ★ Integrated wet pond/wetland meets design objectives
- ★ Projected capital cost of \$150,000
- ★ Program of regular maintenance implemented
- ★ Wet pond performance monitored over time
- ★ Use of improved modeling process for water quality analysis