Welcome!

Hosted by
Village of Island Lake
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Detention Basin Inventory

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Chicago Metropolitan Agency for Planning

9 Lakes TMDL Implementation Planning
June 26, 2013
Looking for Water Quality Treatment Storage: Stormwater Basins & Retrofit Opportunities

• Types of Detention Basins
• Design Elements
• Problems & Retrofit Opportunities
• 9 Lakes Planning Area Detention Basin Inventory
  – Detention Basin Inventory Form (D-BIF)

Detention Basin Types

Detention Basin – definition: constructed depression with discharge sufficiently restricted to store stormwater and gradually release it the downstream drainage system

• Wet
• Dry
• Wet with Extended Dry Detention
• Constructed Wetland
Wet Detention Basin

- designed with a permanent pool of water over the bottom of the basin that is typically 6 – 10 feet deep
- effective at reducing pollutant loads in stormwater runoff
- may include a shallow safety shelf vegetated with wetland plants → additional water quality benefits

Dry Detention Basin

- intended to completely drain and retain no water after storms
- relatively poor pollutant removal effectiveness
- questionable viability with low release rates
- multiple uses (recreational space)
Wet with Extended Dry Detention

- designed with a permanent pool of water over a portion of the basin (typically near the outlet structure) as well as a more upland area intended to completely drain and retain no water after storms

Wetland Detention Basin

- includes a shallow marsh that retains water and is vegetated with wetland plants; may also include an extended dry detention area
Design Elements – All Basins

- Release Rate
  - 0.04 cfs/acre for 2-yr, 24-hr event
    - minimize streambank erosion
    - provide adequate detention time for pollutant removal
  - 0.15 cfs/acre for 100-yr, 24 hr event
    - flood prevention
- Active Storage Volume
  - used for sizing detention basins
- Outlet Control Structure
  - numerous types to achieve two-stage release
- Outlet protection

Outlet Control Structures

Restrictor Plate
Outlet Control Structures

Two Stage Restrictor

Outlet Control Structures

Perforated Riser
Outlet Control Structures

Trash Rack

Design Elements – Wet Basins

• Permanent Pool
  – Most of area 4-6 feet deep, ≥ 25% 10 ft deep, minimize area >10 ft deep
  – Volume = runoff volume for 2-yr, 24-hr event

• Side Slopes
  – At shoreline, no steeper than 5H:1V; flatter (6:1 to 10:1) for more natural appearance and to improve plant habitat for wetland fringe
  – Away from shoreline, no steeper than 4H:1V
Design Elements – Wet Basins

• Safety Shelf
  – Flat or nearly flat, 5-10 feet wide, 1 ft below NWL

• Bank Erosion Protection
  – Native wetland and wet prairie vegetation
  – Shallow water entry angles
  – If must use turf grass, use riprap over filter fabric or other measures to protect the shoreline

Design Elements – Wetland Basins

• Inlet Control
  – dissipate velocity, trap sediment
    • stilling basin, sediment trap

• Side Slopes
  – At shoreline, 5H:1V or flatter
  – Elsewhere, 4H:1V or flatter
Retrofit Opportunities

• Dry basin that doesn’t dry out after storms: convert to wet or wetland basin

Retrofit Opportunities

• Dry basin that doesn’t receive runoff from small rain events: install masonry control weirs in several manholes to divert initial and low flows into basin
Retrofit Opportunities

• Dry basin with paved or other types of low flow channels or bypass pipes connecting inlets to outlets: remove paved channel and bypass pipes; reconfigure basin bottom to allow flow to spread out and be filtered

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Retrofit Opportunities

• Short circuiting: install low berm or other measures to increase flow path
Retrofit Opportunities

• Stabilize eroding shorelines (may include regrading to flatter slope if possible), and revegetate with deep-rooted native vegetation where possible
• Improve/expand buffers around basins using native vegetation

Retrofit Opportunities

• Convert turf grass to native vegetation wherever possible
• Install settling basins at inlets in dry basins and wetland basins
• Install or repair level spreaders at inlets in wet basins, and at outfalls for all basins where applicable
• Modify outlet structure to increase detention times
9 Lakes Planning Area Detention Basins

- Cotton-Mutton Creek Subwatershed
- Direct Drainage to Fox River
- Slocum Lake Drain-Fiddle Creek Subwatershed
- Tower Lake Drain Subwatershed
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*Detention basins identified from previously acquired data and aerial photography

**Unknown detention basins have been previously identified and classified as “ponds” in LCSMC data dating to 2002. These features may currently be serving as detention basins, and therefore they should be considered and assessed in closer detail.

Village of Island Lake
Detention Basins

Cotton-Mutton Creek Subwatershed Delineation

Slocum Lake- Fiddle Creek Subwatershed Delineation

Village of Island Lake Municipal Delineation

Direct Drainage to Fox River Area Delineation
VIL_Q:
This symbol represents features in the landscape that have been previously classified as “ponds”. Currently, these features may be serving as detention basins, and should be assessed on the ground.

Field Map:
Known* Detention Basins

*Detention basins identified from previously acquired data and aerial photography
**VIL_Q1 & VIL_Q2: “Westridge Ponds”**

These “Ponds” may currently be functioning as detention basins and their current function should be assessed from the field.
This symbol represents features in the landscape that have been previously classified as "ponds". Currently, these features may be serving as detention basins, and should be assessed in the field.

Field Map:
Village of Wauconda
Known* Detention Basin

*Detention basins identified from previously acquired data and aerial photography.
Field Map:
Village of Wauconda
Unknown**
Detention Basin

**VW_Q1: “LCFPD Pond”**
This feature has previously been classified as “pond”, yet it may currently be serving as a detention basin. This should be assessed on the in the field to determine its current function.

Village of Port Barrington
Detention Basins

Direct Drainage to Fox River Area Delineation
Port Barrington Municipal Delineation
County Line
This symbol represents features in the landscape that have been previously classified as "ponds". Currently, these features may be serving as detention basins, and their current function should be assessed in greater detail.

Field Map:
Village of Port Barrington
Known* Detention Basin

*Detention basins identified from previously acquired data and aerial photography
Field Map:
Village of Port Barrington
Unknown** Detention Basin

**VPB_Q3: “LCFPD Pond”
This feature has previously been classified as “pond”, yet it may currently be serving as a detention basin. This should be assessed in the field to determine its current function.

VPB_Q3
Village of Port Barrington
Unknown Basin #3

Photo credit: “Gr1nreaper”, Selected for Google Earth ID: 83849776
This symbol represents features in the landscape that have been previously classified as “ponds”. Currently, these features may be serving as detention basins, and their current function should be assessed in greater detail.
Field Map: Village of Tower Lakes
Known* Detention Basin

*Detention basins identified from previously acquired data and aerial photography

Field Map: Village of Tower Lakes
Unknown** Detention Basin

**VTL_Q2: “Gordon Lewis Park Pond”

This feature has previously been classified as “pond”, yet it may currently be serving as a detention basin. This feature should be assessed in the field to determine its current function.
Opportunity for integrating functional detention basins within communities, within residential urban and suburban areas.
Questions and Comments

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Project Webpage
Fox River Ecosystem Partnership
www.foxriverecosystem.org/9Lakes.htm