Watershed Management Ordinance (WMO)

IAFSM
March 10, 2016

Presented by:
Dan Feltes, P.E., CFM
WMO Update Agenda

- Brief WMO Development Background
- Permit Applicability
- Permit Compliance Resources and Website
- Permit Time
- How to Calculate Volume Control
- Flood Protection Elevation
- WMO Stormwater Volume Results from 2015
- WMO Forthcoming Developments
Summary of MWRD Facilities:
7 Water Reclamation Plants
  (including one of the world's largest)
~ 554 Miles of Interceptors
~ 109 Miles of Tunnels
~ 10.6 Billion Gallons of CSO Storage
Thornton Composite Reservoir

- 7.9 BG CSO Reservoir
- Largest in the World
- 83 Acres
- 2,480 Ft X 1,580 Ft
- 300 Feet Deep
District Responsibilities

Wastewater Treatment
- 7 Wastewater Treatment Plants
- Stickney 1.2 billion gallons per day

Stormwater Management
- Public Act 093-1049
- Public Act 098-0625
WMO Objective

Establish uniform, minimum, and comprehensive countywide stormwater management regulations

Enabling Legislation

Watershed Management Ordinance

Stormwater management in Cook County shall be under the general supervision of the Metropolitan Water Reclamation District of Greater Chicago.

The District may prescribe by ordinance reasonable rules and regulations for floodplain and stormwater management in Cook County.

Public Act 093-1049
### Sewer Permit Ordinance

- **Sanitary Sewers**
- **Stormwater Detention**
  - TP-40 Rainfall Data
  - Modified Rational Method

### Watershed Management Ordinance

- **Sanitary Sewers**
- **Stormwater Detention**
  - Bulletin-70 Rainfall Data
- **Flat Release Rate**
- **Hydrograph Method**
- **Volume Control**
- **Erosion & Sediment**
- **Flood Protection Areas**
  - Floodplain
  - Floodway
  - Isolated Wetlands
  - Riparian Areas
Watershed Management Ordinance
Effective
May 1, 2014
As amended
July 10, 2014


August 2015

- Ordinance
- Technical Guidance Manual
- Permit Forms
- Flow Charts
- Checklists
MWP 306-2.11 – Sewer and Stormwater Integration

*See definition of qualified sewer construction in Appendix A of the WMO.*
Permit Applicability

§201, Table 1

Development
> 0.5 Disturbed Area

Flood Protection Areas
Floodplain, Wetlands, Riparian etc.

Qualified Sewer Construction

Stormwater Requirements
Article 5, Table 2
Ownership

District Impacts

Color Code:
• Cook County
• Chicago
• District Corporate Limits
• Chicago
• Cook County including Chicago

TARP / Interceptors
Waterway Outfalls
Lake Michigan
District Property
<table>
<thead>
<tr>
<th>Development Type (See Appendix A for definitions)</th>
<th>§502 Runoff Requirements</th>
<th>§503 Volume Control Requirements</th>
<th>§504 Detention Requirements</th>
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<tr>
<td>Single-Family Home</td>
<td>Exempt</td>
<td>Exempt</td>
<td>Exempt</td>
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<tr>
<td>Residential Subdivision</td>
<td>Parcels ≥ 1 acre</td>
<td>Parcels ≥ 1 acre</td>
<td>Parcels ≥ 5 acres</td>
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<tr>
<td>Multi-Family Residential</td>
<td>Parcels ≥ 0.5 acre</td>
<td>Parcels ≥ 0.5 acre</td>
<td>Parcels ≥ 3 acres †</td>
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<tr>
<td>Non-Residential</td>
<td>Parcels ≥ 0.5 acre</td>
<td>Parcels ≥ 0.5 acre</td>
<td>Parcels ≥ 3 acres †</td>
</tr>
<tr>
<td>Right-of-Way</td>
<td>New Impervious Area ≥ 1 acre</td>
<td>New Impervious Area ≥ 1 acre †</td>
<td>New Impervious Area ≥ 1 acre †</td>
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<tr>
<td>Open Space</td>
<td>Parcels ≥ 0.5 acre</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
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</table>

1 Site stormwater management requirements are not required for maintenance activities as defined in Appendix A.

2 Requirements are applicable when a Watershed Management Permit is required under §201 of this Ordinance.

† Where practicable.

† Starting the effective date of this Ordinance, any new development on the parcel that totals either individually or in the aggregate to more than one-half (0.5) of an acre.
Watershed Management Ordinance

The Watershed Management Ordinance (WMO) establishes uniform, minimum, countywide stormwater management regulations throughout Cook County. Components which are regulated under the WMO include control, floodplain management, isolated wetland protection, riparian environment protection, and soil erosion and sediment control. The WMO went into effect on May 1, 2014 and the District's Board of Commissioners approved a new version on July 10, 2014. The WMO is accessible through the link below.

- WMO (As amended on July 10, 2014 meeting) (7.2 MB)
- WMO Comparison Documents (Compares changes from May 1, 2014 WMO to July 10, 2014 latest amendments) (6.06 MB)
- Article 8: Infiltration / Inflow Control Program (Incorporated into WMO on July 10, 2014) (54.3 KB)

The District developed a Technical Guidance Manual (TGM), which will serve as a technical reference to the WMO. The TGM documents are accessible through the link below.

- Technical Guidance Manual (TGM) (Updated September 2015)
- Appendix C: Standard Details & Notes (Updated July 2015)

The District will conduct training for stakeholders to ease the transition from the Sewer Permit Ordinance to the WMO.

- Training Schedule

Permit Resources:

- Information Pamphlets for Developers and Homeowners
- Watershed Management Permit Flow Charts, Checklist and Forms
- Minimum Permit Submittal Checklist (184 KB)
- WMO Design Calculators
- WMO Model Templates
- Authorized Municipalities and Multi-County Municipalities

Other Resources:

- Watershed Management Ordinance: Short Summary
- Permit Inquiries (Request Copies of Past Issued Permits)
- Permit Revision Information
- Existing Development Plans List
- Frequently Asked Questions (FAQs)
Managing Stormwater

The WMO aims to protect public health, safety, and welfare, and Cook County homes and businesses from flood damage by managing and mitigating the effects of development and redevelopment on stormwater drainage. It provides uniform minimum stormwater management regulations for Cook County that are consistent with the region.

The WMO replaces the MWRED's repealed Sewer Permit Ordinance (SPO). WMO permit requirements are more comprehensive than those of the SPO.

How it Works

The WMO establishes rules and guidelines for development to ensure that flooding problems are not exacerbated. Permits are required prior to the start of construction for new projects as described inside.

Single Family Homes

The WMO was not intended to regulate most single family homes. When a new development is located in or near a Flood Protection Area, a permit may be required. See "WMO: A Quick Guide for Homeowners" and the WMO.

WMO: A Quick Guide for Developers

This pamphlet is an introduction for developers to the requirements and permit compliance process of the Metropolitan Water Reclamation District of Greater Chicago's Watershed Management Ordinance.

For More Information

please visit wmo.mwr.org
or contact the MWRED at 312.753.3255
or WMOinbox@mwrdb.org

WMO Informational Brochure
Managing Stormwater
The WMO aims to protect public health, safety, and welfare, and Cook County homes and businesses from flood damage by managing and mitigating the effects of development and redevelopment on stormwater drainage. It provides uniform minimum stormwater management regulations for Cook County that are consistent with the region.

The WMO replaces the MWRO’s repealed Sewer Permit Ordinance (SPO). WMO permit requirements are more comprehensive than those of the SPO.

Single Family Homes
The WMO is not intended to regulate most single family homes. A permit is generally only required for single family home development that involves a Flood Protection Area or requires an extension of a public sewer to serve the parcel. These types of development are regulated under the WMO because they can have a significant potential for loss of property from flood drainage.

Unlike residential subdivisions, single family home developments are exempt from the stormwater provisions of the WMO.

The WMO defines a “single family home” as a residential parcel containing less than 3 dwelling units. This does not include single family home parcels subdivided after May 1, 2014.

WMO: A Quick Guide for Homeowners
This pamphlet is an introduction for homeowners to the requirements and permit compliance process of the Metropolitan Water Reclamation District of Greater Chicago’s Watershed Management Ordinance.

For More Information
please visit wmo.mwrd.org
or contact the MWRO at 312.751.3255
or WMOinbox@mwrd.org

Watershed Management Ordinance
Metropolitan Water Reclamation
District of Greater Chicago

Board of Commissioners
Marylyne T. Spyropoulos
President
Barbara J. McDowen
Vice President
Frank Avila
Chairman of Finance
Michael A. Alvarez
Timothy Bradford
Cynthia M. Santos
Debra Shore
Kari K. Steele
David J. Walsh
David St. Pierre
Executive Director

mwd.org
When to Apply
Past contractor expectations:

Design Project  Mobilize  Substantial Completion  Apply for MWRD Permit  MWRD Inspect  Obtain Permit  Occupancy

$$
When to Apply
Early coordination needed with new regulations

- Design Project
- Apply for MWRD Permit
- Obtain Permit
- Mobilize MWRD Erosion Inspection
- Sewer Work MWRD Inspect
- Substantial Completion MWRD Inspect
- Occupancy

$$16$$

When to Apply
Early coordination needed with new regulations

- Design Project
- Apply for MWRD Permit
- Obtain Permit
- Mobilize MWRD Erosion Inspection
- Sewer Work MWRD Inspect
- Substantial Completion MWRD Inspect
- Occupancy

$$16$$
Permit Review Time

Per Ordinance § 1401:2
- 15 working days outside FPA
- 30 working days inside FPA
- 10 working days for resubmittal

3 year approved permit life
- 1 year to start construction
- Extensions to construction start may be granted upon request
- 3 years total to finish

Stagnant permits now canceled quarterly
- Applications cannot remain open indefinitely
- 90 days no resubmittal = 30 day deadline to respond with schedule
- MWRD is reasonable, but be certain to respond in a letter
Green Infrastructure (GI) = Volume Control (VC) (in WMO)
Root Systems of Prairie Plants

The fundamental issue for encouraging use of native plant species for improved soil erosion control in streams and stormwater facilities lies in the fact that native plants have extensive root systems which improve the ability of the soil to infiltrate water and withstand wet or erode conditions. Native plant species, like those listed in this guide, often have greater biomass below the surface. In this illustration, note the Kentucky Bluegrass shown on the far left, which, when compared to native grass and forbs species, exhibits a shallow root system. Illustration provided by Helali Natural of the Conservation Research Institute.
# Appendix C. Standard Details & Notes (29 MB) (Updated July 2015)

## Volume Control Details

<table>
<thead>
<tr>
<th>Feature</th>
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<td>Bioretention Facility</td>
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<td>Bioswale (Must be used with Check Dam)</td>
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<tr>
<td>Bioswale Check Dam</td>
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<tr>
<td>Constructed Wetlands</td>
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<td>Drywell</td>
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<td>Green Roof</td>
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<td>Infiltration Trench</td>
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<td>Lake Michigan Outfall Water Quality Device</td>
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<td>Observation Well</td>
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<td>Permeable Pavers</td>
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<td>Rain Cistern/Water Reuse System</td>
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<td>Removable Hood for Catch Basin and Water Quality Structures</td>
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<td>Sediment Forebay/Pretreatment Basin</td>
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<td>Signage for Permeable Pavement</td>
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<td>Storage Below Outlet of Detention Basin</td>
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<td>Vegetated Filter Strip (Flow-Through)</td>
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<td>Volume Control Pretreatment Measures</td>
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<td>Volume Control Storage Matrix</td>
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## Stormwater and Floodplain Details

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<td>Emergency Overflow Weir</td>
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<td>Floodplain Garage</td>
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<td>Outlet Control Structure (Plate)</td>
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<td>Outlet Control Structure (Wall)</td>
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<td>Parking Lot Detention</td>
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<td>Signage for Parking Lot Detention</td>
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<td>Vortex Restrictor</td>
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## Sanitary Sewer Details

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<td>Concrete Encasement</td>
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<td>Dog House Manhole</td>
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<td>Drop Manhole Connection</td>
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<td>Rigid And Flexible Pipe Installation</td>
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<td>Forecmain Discharge to Gravity Manhole</td>
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<td>Large Grease Basin</td>
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<td>Methods for Connecting to MWRD Manholes</td>
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## General Notes and Exhibits

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<td>Example Drainage Exhibit</td>
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<td>Example Exhibit R</td>
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<tr>
<td>Example Routing Exhibit</td>
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VEGETATED FILTER STRIP/OTHER BMPS (SEE NOTE 9)

20% MAX. SLOPE

12" DEPTH MAXIMUM DRAINS IN 24-48 HOURS

18" SOIL MEDIA MIX, 50% SAND 30% COMPOST 20% TOPSOIL (OR DISTRICT MIX)

WOVEN GEOTEXILE FABRIC, NOT TO COVER ENTIRE BOTTOM OF EXCAVATION (OR CHOKING STONE PER ENGINEER APPROVAL)

SEASONALLY HIGH GROUNDWATER LEVEL (___ NAVD 88)

CA-7 COARSE AGGREGATE STORAGE BED WITH 4" UNDERDRAIN PERFORATED PIPE (SEE NOTE 6)

2" TO 12" STONE BEDDING (SEE NOTE 7)

OBSERVATION WELL, 6" PVC PIPE WITH OVERFLOW GRATE. NON PERFORATED ABOVE SOIL MEDIA MIX 6" - 12" ABOVE GROUND.

SHREDDED HARDWOOD MULCH LAYER (3") (SEE NOTE 8)

VEGETATED FILTER STRIP/OTHER BMPS (SEE NOTE 9)

PERFORATED 6" PVC PIPE WITH NYLON SOCK.

VOLUME TYPE | POROSITY | MEDIA VOLUME | STORAGE VOLUME | VOLUME PROVIDED
---|---|---|---|---
SURFACE STORAGE | 1.00 | $V_A$ | 1.00 x $V_A$ | 
SOIL MEDIA MIX | 0.25 | $V_B$ | 0.5 x 0.25 x $V_B$ | 
COARSE AGG. (ABOVE INVERT) | 0.36 | $V_C$ | 0.5 x 0.36 x $V_C$ | 
COARSE AGG. (BELOW INVERT) | 0.36 | $V_D$ | 0.36 x $V_D$ | 
TOTAL | | | | |
**Diagram Description:**

- **Vegetated Filter Strip/Others BMPS (See Note 9):**

- **18" Soil Media Mix:** 50% Sand, 30% Compost, 20% Topsoil (or District Mix)

- **Woven Geotextile Fabric:** Not to cover entire bottom of excavation (or Choking Stone per Engineer Approval)

- **Observation Well:** 6" PVC pipe with overflow grate. Non perforated above soil media mix 6" - 12" above ground.

- **Shredded Hardwood Mulch Layer (3"):** (See Note 8)

- **20% Max Slope:**

- **Perforated 6" PVC Pipe with Nylon Sock:**

- **2'-3.5' Offset:**

- **Seasonally High Groundwater Level:** (_______NAVD 88)

- **CA-7 Coarse Aggregate Storage Bed:** With 4" Underdrain Perforated Pipe (See Note 6)

- **2" to 12" Stone Bedding:** (See Note 7)

**Table: Volume Calculation**

<table>
<thead>
<tr>
<th>Volume Type</th>
<th>Porosity</th>
<th>Media Volume</th>
<th>Storage Volume</th>
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<td>Surface Storage</td>
<td>1.00</td>
<td>$V_A$</td>
<td>$1.00 \times V_A$</td>
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<td>$V_B$</td>
<td>$0.5 \times 0.25 \times V_B$</td>
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<tr>
<td>Coarse Agg. (Above Invert)</td>
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<td>$0.5 \times 0.36 \times V_C$</td>
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<tr>
<td>Coarse Agg. (Below Invert)</td>
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<tr>
<td><strong>Total</strong></td>
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<tr>
<td>VOLUME TYPE</td>
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<tr>
<td>SURFACE STORAGE</td>
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<tr>
<td>SOIL MEDIA MIX</td>
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<td>$V_B$</td>
<td>$0.5 \times 0.25 \times V_B$</td>
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<tr>
<td>COARSE AGG. (ABOVE INVERT)</td>
<td>0.36</td>
<td>$V_C$</td>
<td>$0.5 \times 0.36 \times V_C$</td>
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<tr>
<td>COARSE AGG. (BELOW INVERT)</td>
<td>0.36</td>
<td>$V_D$</td>
<td>$0.36 \times V_D$</td>
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<tr>
<td><strong>TOTAL</strong></td>
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</table>
Does an existing conventional wet pond satisfy Volume Control for new Development?

Short answer: No

- Is there a new stormwater benefit created?

- Existing systems can be planned for retrofit, permitted, and improved to serve new areas
Volume Control
Detention Retrofit

Figure 8: Schematic showing conversion of a dry pond to a shallow marsh
Figure 1: Five strategies to retrofit a pond
Floodplain

Flood Protection Elevation

\[ \text{FPE} = \text{BFE} + 2 \text{ feet} \]
7.9 MG of Required Volume Control = 90 Miles of Rain Barrels Chicago to Milwaukee

102 MG of Required Detention = 1,200 Miles of Rain Barrels Chicago to Disney World

30.5 MG of Required Compensatory Storage = 350 Miles of Rain Barrels Chicago to Cleveland

2015 WMO Volume Results

Typical 55 gallon rain barrel
How Large is the Thornton Composite Reservoir?

The TCR will be able to store 7.9 billion gallons of CSO or the equivalent to 144 million rain barrels – enough to circle the earth 3.64 times when laid end to end!
WMO Prospective Schedule 2016

- Ongoing Advisory Committee Meetings
  Discuss further permitting improvements

- Watershed Specific Release Rate Study
  - Contracted with Illinois State Water Survey
  - Ongoing QA/QC of DWP Models
  - Phase 1 Results, end of 2016
    Pilot Areas: Uppers Salt and Stony Creek

- Improve and shorten permit forms and paperwork
  - 2 copies of permits
Thank you
Questions

Dan Feltes, P.E., CFM
Daniel.Feltes@mwrd.org

Metropolitan Water Reclamation District of Greater Chicago
100 E. Erie Street
Chicago, Illinois