



STORMWATER MANAGEMENT COMMISSION

We hope to see [hear] you at the next TAC meeting on **Thursday, May 21, 2020** at 9:00 AM.

Meeting Topics:

- WDO amendments

Meeting Information:

To comply with social distancing requirements and Governor Pritzker's stay-at-home order, this meeting will be shared on the internet with the following connection information.

Join Zoom Meeting

<https://us02web.zoom.us/j/140394333>

Meeting ID: 140 394 333

Password: 636771

One tap mobile

+13126266799,, 140394333#

Dial-in

+1 312 626 6799

Public comments are welcomed and encouraged. Public comments received by 8:30 a.m., Thursday, May 21, 2020 will be read at the beginning of the meeting under Public Comment. Any comments received during the meeting will be held until the end of the meeting. Public comment is limited to three minutes per person. This meeting will be recorded.

PUBLIC COMMENTS should be emailed to stormwater@lakecountyil.gov and contain the following information:

- * Name
- * Street Address (Optional)
- * City, State
- * Phone (Optional)
- * Organization, agency, etc. being represented. (If representing yourself, put "Self")
- * Topic or Agenda Item Number followed by Public Comment.

Public with no access to email may leave a message with Stormwater Management at 847-377-7700.



STORMWATER MANAGEMENT COMMISSION
TECHNICAL ADVISORY COMMITTEE
AGENDA
May 21, 2020
9:00 AM – 12:00 PM

<https://zoom.us/j/140394333>



- 1.0 CALL TO ORDER
- 2.0 ADDITIONS TO THE AGENDA
- 3.0 PUBLIC COMMENT
- 4.0 STAFF REPORT
- 5.0 APPROVAL OF THE MINUTES
 - 5.1 April 16, 2020 Minutes
Action Requested: Approval
- 6.0 OLD BUSINESS
 - 6.1 WDO Amendment #8 – 401.05 Updated Hydric Soil Classification
Action Requested: Approval
 - 6.2 WDO Amendment #24 – 1000.02.E. Methodology for Floristic Quality Assessment Determination
Action Requested: Approval
 - 6.3 WDO Amendment #25 – Appendix L, Section L: High-Quality Aquatic Resources
Action Requested: Approval
- 7.0 NEW BUSINESS
 - 7.1 WDO Amendment #33 – Re-insert wetland mitigation for Corps impacts
Action Requested: Approval
 - 7.2 WDO Amendment #34 – Updated Appendix K
Action Requested: Approval
- 8.0 ADJOURNMENT

Technical Advisory Committee

<p>James Anderson (Term Expires May 2020) Director of Natural Resources LC Forest Preserve District 1899 W. Winchester Rd. Libertyville, IL 60048 Phone: 847-968-3282 Fax: 847-367-6649 Email: janderson@lcfpd.org</p>	<p><u>Alternates</u> John Nelson Director of Operations & Infrastructure LC Forest Preserve Dist. 19808 W. Grand Avenue. Lindenhurst, IL 60046 Phone: 847-968-3407 Fax: 847-367-6649 Email: jnelson@lcfpd.org</p> <p>Ken Klick Restoration Ecologist LC Forest Preserve Dist. 1899 W. Winchester Rd. Libertyville, IL 60048 Phone: 847-968-3284 Fax: 847-367-6649 Email: kklick@lcfpd.org</p>	<p>Tom Polzin (Vice Chairman) (Term Expires May 2020) Hey & Assoc., Inc. 26575 W. Commerce Dr., Ste. 601 Volo, IL 60073 Phone: 847-740-0888 Fax: 847-740-2888 Email: tpolzin@heyassoc.com</p>	<p><u>Alternate</u> Vince Mosca Hey & Assoc., Inc. 26575 W. Commerce Dr., Ste. 601 Volo, IL 60073 Phone: 847-740-0888 Fax: 847-740-2888 Email: vmosca@heyassoc.com</p>
<p>Mike Zemaitis (Term Expires May 2020) Engineer of Design LC Division. of Transportation 600 Winchester Rd. Libertyville, IL 60048 Phone: 847-377-7400 Fax: 847-362-5290 Email: mzemaitis@lakecountyil.gov</p>	<p><u>Alternate</u> AI Giertych Assist. County Engineer LC Division of Transportation 600 Winchester Rd. Libertyville, IL 60048 Phone: 847-377-7400 Fax: 847-362-5290 Email: agiertych@lakecountyil.gov</p>	<p>Pat Bleck (Term Expires May 2020) Bleck Engineering Co., Inc. 1375 Western Ave. Lake Forest, IL 60045 Phone: 847-295-5200 Fax: 847-295-7081 Email: pbleck@bleckeng.com</p>	<p><u>Alternate</u> Joy Corona Bleck Engineering Co., Inc. 1375 Western Ave. Lake Forest, IL 60045 Phone: 847-295-5200 Fax: 847-295-7081 Email: jcorona@bleckeng.com</p>
<p>Patrick Glenn (Term Expires May 2020) Senior Engineer Gewalt Hamilton Assoc. Inc. 625 Forest Edge Dr. Vernon Hills, IL 60061 Phone: 847-478-9700 Fax: 847-478-9701 Email: pglenn@gha-engineers.com</p>	<p><u>Alternate</u> Mei Zhu Senior Engineer Gewalt Hamilton Assoc. Inc. 625 Forest Edge Dr. Vernon Hills, IL 60061 Phone: 847-478-9700 Fax: 847-478-9701 Email: mzhu@gha-engineers.com</p>	<p>Bill Heinz (Term Expires May 2020) Village of Grayslake 585 Berry Ave. Grayslake, IL 60030 Phone: 847-223-2323 Fax: 847-223-4821 Email: wheinz@villageofgrayslake.com</p>	<p><u>Alternate</u> Kurt Baumann Baxter & Woodman 442 N. Cedar Lake Rd. Round Lake, IL 60073 Phone: 815-444-3313 Email: baumann@baxterwoodman.com</p>
<p>Kathy Chernich (Term Expires May 2020) U.S. Army Corp. of Engineers 231 LaSalle St., Ste. 1500 Chicago, IL 60604 Phone: 312-846-5531 Fax: 312-353-4110 Email: Kathy.G.Chernich@usace.army.mil</p>	<p><u>Alternate</u> Kaitlyn Pascus U.S. Army Corp. of Engineers 231 LaSalle St., Ste. 1500 Chicago, IL 60604 Phone: 312-846-5533 Fax: 312-353-4110 Email: kaitlyn.a.pascus@usace.army.mil</p>	<p>Peter Manhard (Term Expires May 2020) Manhard Consulting One Overlook Point, Suite 290, Lincolnshire, IL 60069 Phone: 847-634-5550 Fax: 847-634-0095 Email: pmanhard@manhard.com</p>	<p><u>Alternate</u> Bill Hupperich Manhard Consulting, Ltd. One Overlook Point, Suite 290, Lincolnshire, IL 60069 Phone: 847-634-5550 Fax: 847-634-0095 Email: whupperich@manhard.com</p>

Technical Advisory Committee

<p>Don Dressel (Chairman) <i>(Term Expires May 2020)</i> Christopher Burke Engineering 9575 W. Higgins Rd., Ste. 600 Rosemont, IL 60018-4920 Phone: 847-823-0500 Fax: 847-823-0520 Email: Ddressel@cbbel.com</p>	<p><u>Alternates</u> Kay Whitlock Christopher Burke Engineering 9575 W. Higgins Rd., Ste. 600 Rosemont, IL 60018-4920 Phone: 847-823-0500 Fax: 847-823-0520 Email: kwhitlock@cbbel.com</p> <p>Scott Griffith Christopher Burke Engineering 9575 W. Higgins Rd., Ste. 600 Rosemont, IL 60018-4920 Phone: 847-823-0500 Fax: 847-823-0520 Email: sgriffith@cbbel.com</p>	<p>Ramesh Kanapareddy <i>(Term Expires May 2020)</i> City of Highland Park 1150 Half Day Rd. Highland Park, IL 60035 Phone: 847-432-9907 Fax: 847-432-0807 Email: rkanapareddy@cityhpil.com</p>	<p><u>Alternate</u> Manny Gomez City of Highland Park 1150 Half Day Rd. Highland Park, IL 60035 Phone: 847-432-1186 Fax: 847-432-0807 Email: egomez@cityhpil.com</p>
<p>Eric Steffen <i>(Term Expires May 2020)</i> Operations Manager Lake County Planning Building & Development 500 W. Winchester Rd. Libertyville, IL 60048 Phone: 847-377-2109 Fax: 847-984-5853 Email: esteffen@lakecountyil.gov</p>	<p><u>Alternates</u> Brian Frank Principal Engineer Lake County Planning, Building & Development 500 W. Winchester Rd. Libertyville, IL 60048 Phone: 847-377-2086 Fax: 847-984-5853 Email: bfrank@lakecountyil.gov</p> <p>Joel Krause Senior Engineer Lake County Planning, Building & Development 500 W. Winchester Rd. Libertyville, IL 60048 Phone: Fax: 847-984-5853 Email: jkrause@lakecountyil.gov</p>	<p>Heather Galan <i>(Term Expires May 2020)</i> Village Engineer Village of Gurnee 325 N. O'Plaine Rd. Gurnee, IL 60031 Phone: 847-599-7582 Fax: 847-623-9475 Email: hgalan@village.gurnee.il.us</p>	<p><u>Alternates</u> Nicholas Leach Village of Gurnee 325 N. O'Plaine Rd. Gurnee, IL 60031 Phone: 847-599-7586 Fax: 847-623-9475 Email: nleach@village.gurnee.il.us</p> <p>Dave Ziegler Director of Community Development Village of Gurnee 325 N. O'Plaine Rd. Gurnee, IL 60031 Phone: 847-599-7550 Fax: 847-623-9475 Email: davidz@village.gurnee.il.us</p>
<p>Steve Zimmerman <i>(Term Expires 2024)</i> Senior Ecologist Applied Ecological Service, Inc. 120 West Main St. West Dundee, IL 60118 Phone: 847-844-9385 Email: stevez@appliedeco.com</p>			

TECHNICAL ADVISORY COMMITTEE
MEETING MINUTES
April 16, 2020
Lake County Stormwater Management Commission
MEETING HELD VIRTUALLY [ZOOM]

1. CALL TO ORDER 9:06 AM

TAC Members & Alternates	Staff Present	General Public
Steve Zimmerman	Glenn Westman	Heather Lis
Tom Polzin	Kurt Woolford	Jacob Wellbank
Brian Frank	Kelcey Traynoff	Adrian Marquez
Heather Galan	Juli Crane	Ron Milanese
Don Dressel	Mike Warner	Scott Griffith
Kathy Chernich		Kaitlyn Pascus
Kurt Baumann		Val Jakobi
Joy Corona		
Mei Zhu		
Ramesh Kanapareddy		

2. ADDITIONS TO THE AGENDA - None

3. PUBLIC COMMENT- None

4. STAFF REPORT

4.1. Kurt Woolford gave an update on the COVID-19 situation in the County, how SMC is continuing with mission essential functions, and proceeding with regular business as best as possible.

5. APPROVAL OF THE MINUTES

5.1. Mr. Tom Polzin moved to approve the March 19, 2020 TAC minutes, seconded by Mr. Ramesh Kanapareddy.
Vote: Approved 8-0-2 (abstain: Zhu and Corona)

6. OLD BUSINESS

6.1 Mr. Kurt Woolford presented and discussed the cleaned-up version of WDO Amendment #3 – 509.04 Fee-In-Lieu Option for Storage above 50-year, 24-hour Detention Volume. At the request of TAC during March’s meeting, the presented document was cross-checked for consistency with the FIL50 program’s Policies and Procedures. Ms. Joy Corona moved to approve this amendment, seconded by Ms. Mei Zhu.
Vote: Approved 10-0-0 (unanimous)

6.2 Mr. Kurt Woolford opened the discussion on WDO Amendment #8 – 401.05 Updated Hydric Soil Classification. SMC staff member Glenn Westman provided background information on the Hydric Soil Classification section of the WDO. The document from 1999 regarding the original section language was looked at, as requested by TAC during the October 2019 meeting. SMC Director Mike Warner suggested that SMC do a GIS exercise to determine the percentage of flood damaged structures that are currently on hydric soil. Mr. Tom Polzin also suggested to remove the last sentence of the section that relates to exempted development. A second suggestion made by Mr. Polzin was to make the section more general, relate it back to flooding/flood damaged structures on hydric soils, and to strongly recommend a geotechnical investigation. Mr. Kurt Woolford proposed tabling this amendment so SMC staff could work on and bring back the hydric soil GIS product. Ms. Joy Corona moved to table this amendment, seconded by Mr. Ramesh Kanapareddy. Vote: Approved to table 10-0-0 (unanimous)

7. NEW BUSINESS

7.1 WDO Amendment #20 – Appendix A: DECI Definition was presented and discussed. Mr. Ramesh Kanapareddy moved to approve this amendment as modified, seconded by Mr. Brian Frank.
Vote: Approved 6-4-0 (nay: Dressel, Zimmerman, Chernich, Corona)

7.2 WDO Amendment #21 – 1000.02. C.2. Lake County Wetland Inventory Map was presented and briefly discussed. Mr. Tom Polzin moved to approve this amendment, seconded by Mr. Brian Frank.
Vote: Approved 10-0-0 (unanimous)

- 7.3 WDO Amendment #22 – 1000.02.C.5. Hydrologic Atlas was presented and briefly discussed. Mr. Kurt Baumann moved to approve the amendment, seconded by Mr. Tom Polzin.
Vote: Approved 10-0-0 (unanimous)
- 7.4 WDO Amendment #23 – 1000.02.D. USACE Data Sheets was presented and briefly discussed. Ms. Joy Corona moved to approve the amendment, seconded by Mr. Tom Polzin.
Vote: Approved 10-0-0 (unanimous)
- 7.5 WDO Amendment #24 – 1000.02. E. Methodology for Floristic Quality Assessment Determination was presented and discussed. Kathy Chernich from USACE stated she would follow up with her office on the growing season dates they use. During the meeting, Ms. Chernich was able to provide the approximate dates for typical growing season. For the USACE Chicago District, the approximate growing season is April 15th to October 15th. TAC members requested to keep this amendment tabled so they could discuss the growing season dates with their colleagues. Mr. Tom Polzin moved to table this amendment, seconded by Mr. Kurt Baumann. Vote: Approved to table 10-0-0 (unanimous)
- 7.6 WDO Amendment #25 – Appendix L, Section L: High-Quality Aquatic Resources was presented and discussed. SMC (Juli Crane) to follow up with USACE (Kathy Chernich) on previous email discussing this section. Mr. Steve Zimmerman moved to table this amendment, seconded by Ms. Kathy Chernich.
Vote: Approved to table 10-0-0 (unanimous)
- 7.7 WDO Amendment #26 – Appendix M, Section S: Species Composition was presented and discussed. Ms. Joy Corona moved to approve the amendment, seconded by Mr. Brian Frank.
Vote: Approved 8-1-1 (nay: Zimmerman, abstain: Baumann)
- 7.8 WDO Amendment #27 – Appendix N, Section H.2.a.: Floristic Quality was presented and discussed. Mr. Tom Polzin moved to approve the amendment, seconded by Mr. Steve Zimmerman.
Vote: Approved 10-0-0 (unanimous)
- 7.9 WDO Amendment #28 – Appendix N, Section H. 2.b.: Mean Wetness Coefficient was presented and discussed. Mr. Brian Frank moved to approve the amendment, seconded by Mr. Steve Zimmerman.
Vote: Approved 10-0-0 (unanimous)
- 7.10 WDO Amendment #29 – Appendix N, Section H.3.a.: Floristic Quality was presented and discussed. Mr. Tom Polzin moved to approve the amendment as modified, seconded by Mr. Steve Zimmerman.
Vote: 10-0-0 (unanimous)
- 7.11 WDO Amendment #30 – Appendix A, Isolated Waters of Lake County Definition was presented and discussed. Mr. Tom Polzin moved to approve the amendment, seconded by Ms. Mei Zhu.
Vote: Approved 9-0-1 (abstain: Chernich)
- 7.12 WDO Amendment #31 – 1005.01.E. HQAR Documentation was presented and discussed. Mr. Tom Polzin moved to approve the amendment, seconded by Ms. Joy Corona.
Vote: Approved 10-0-0 (unanimous)
- 7.13 WDO Amendment #32 – 1006.01 Wetland Hydrology for Isolated Waters of Lake County was presented and discussed. SMC to review this amendment along with other 80-150 provisions and spreadsheet. Ms. Joy Corona moved to table the amendment, seconded by Ms. Mei Zhu.
Vote: Approved to table 10-0-0 (unanimous)

8.0 ADJOURNMENT

Motion to end discussion and adjourn by Ms. Joy Corona, seconded by Ms. Heather Galan. Meeting adjourned at 11:34 AM. Vote: Approved 10-0-0 (unanimous).

WDO PROPOSED AMENDMENTS – May 2020

WDO Amendment #8

§ 401.15 Updated Hydric Soil Classification

If the soil mapping submitted for the [development](#) indicates the presence of **soils classified as a [hydric soil](#) (USDA/NRCS Soil Classification) in its very poorly drained condition the soils listed in this subsection**, then the [applicant](#) shall provide site-specific soil mapping performed by a certified soil classifier **or geotechnical investigation** for the development. No [buildings](#) shall be constructed on these soils unless appropriate building methods, such as pilings, caissons, or removal and replacement of unsuitable soils, as approved by the [Enforcement Officer](#), are used to provide and protect a suitable building foundation.

~~Soils classified as a [hydric soil](#) (USDA/NRCS Soil Classification) in its very poorly drained condition or the following three soil classification in any condition:~~

- ~~A. Houghton Muck (W103)~~
- ~~B. Houghton Peat (W97)~~
- ~~C. Peotone Silty Clay Loam (W330)~~

Development that is exempted from this requirement is any development activity not resulting in the construction of a building.

Purpose: Capture all current poorly drained hydric soils per 2005 Lake County Soil Survey e.g., Houghton Peat (W97) does not exist, while many others are included.

10/17/19 TAC Vote: Tabled. TAC members made minor revisions but requested additional historical information before approving this amendment.

4/16/20 TAC Vote: Tabled. Staff to provide GIS comparison of flood problem areas vs. hydric soils.

SMC Staff Response: GIS analysis performed. 552 countywide Flood Problem Areas. 398 or 72% of Flood Problem Areas contain HYDRIC soils.

WDO Amendment #24

§ 1000.02 Wetland Determination Report

- E. A written description of the [wetland](#)(s) that includes a Floristic Quality Assessment as determined **using the Chicago Region Floristic Quality Assessment Calculator (U.S. Army Corps of Engineers, Chicago District, most recent version)**, by methodology contained in Swink, F. and G. Wilhelm's Plants of the Chicago Region (1994, 4th Edition, **Wilhelm, G. and L. Rericha's Flora of the Chicago Region, 2017**, Indianapolis: Indiana Academy of Science). Floristic quality assessments shall generally be conducted between May 15 and October 1, which approximates the growing season. Non-growing season assessments may require additional sampling during the growing season to satisfy this requirement;

Purpose: Update to current methodology for floristic quality assessment determinations.

4/16/20 TAC Vote: Motion to Table by Mr. Polzin, seconded by Mr. Baumann (unanimous)
USACE – Chicago District approximate growing season April 15 – October 15.

SMC Staff Response: Staff does not advocate changing the date range to earlier-later. This provision with the May 15-Oct. 1 *approximate* growing season period has been in the WDO since 2001. TAC unanimously approved that provision on June 29, 2001, when the wetland provisions were originally included in the WDO. It is caveated such that we may validate FQAs done outside the May 15-Oct. 1 period and gives us the flexibility to allow earlier or later FQAs each year depending on seasonal conditions. We have had little negative feedback on this provision from the wetland consultants over the years. For reference, other local County Ordinances growing season period: McHenry - May 15-Oct. 1, Cook & DuPage - NO specified date range (though DuPage as a general protocol has used April 15 through October 15th), Kane - May 1-Oct. 15 (further south county).

WDO Amendment #25

§ Appendix L, Section. L: High-Quality Aquatic Resources

- L. Wetlands with a native mean coefficient of conservatism value (native mean C value) of greater than or equal to 3.5 or a native floristic quality index value (FQI) of greater than or equal to 20 as determined using the Chicago Region Floristic Quality Assessment Calculator (U.S. Army Corps of Engineers, Chicago District, most recent version). Floristic Quality Index of 20 or greater or a mean C value of 3.5 or greater: Reference Plants of the Chicago Region (F. Swink and G. Wilhelm, 4th Edition, Indianapolis: Indiana Academy of Science, 1994) ~~Wilhelm, G. and L. Rericha's Flora of the Chicago Region, 2017, Indianapolis: Indiana Academy of Science. Mean C-Values, and the total number of species used to calculate the FQI, should be calculated for native plants only, as described in Plants of the Chicago Region (F. Swink and G. Wilhelm, 4th Edition, Indianapolis: Indiana Academy of Science, 1994). In Swink and Wilhelm, introduced plants have *no* C-value, rather than a C-value of 0.~~

Purpose: Update for new reference for plant classification (native vs. adventive) and consistency with definition in Corps-Chicago District Regional Permit Program Appendix A – High Quality Aquatic Resources (as revised 1-10-2020).

4/16/20 TAC Vote: Motion to table by Mr. Zimmerman, seconded by Ms. Chernich (unanimous). Juli will find old email and check with Kathy. Possibly modify “native” language consistent with Amendment #27.

SMC Staff Response: Revised language now consistent with TAC-approved Amendment #27 and definition in Corps-Chicago District Regional Permit Program Appendix A – High Quality Aquatic Resources (as revised 1-10-2020).

WDO Amendment #27

§ Appendix N: WDO Mitigation Requirements and Guidelines for Isolated Waters of Lake County Impacts

H.2.a. Floristic Quality: By the end of the performance period, a native mean coefficient of conservatism value (native mean C value) of greater than or equal to 3.5 and a native floristic quality index value (FQI) of greater than or equal to 20 shall be achieved for each wetland community **as determined using the Chicago Region Floristic Quality Assessment Calculator (U.S. Army Corps of Engineers, Chicago District, most recent version)**. ~~Native plant species coefficients of conservatism and the methods for calculating the native mean C value and FQI are included in Swink, Floyd and Gerould Wilhelm, Plants of the Chicago Region (Indianapolis: Indiana Academy of Science, 4th Edition, 1994).~~

Purpose: Update to current reference for floristic quality assessment determinations. **Provided as reference for Amendment #25. No additional action requested.**

4/16/20 TAC Vote: Motion to Approve by Mr. Polzin, seconded by Mr. Zimmerman (unanimous)

WDO Amendment #33**§ Mitigation Hierarchy****1007.03 Space intentionally left blank.**~~4007.03~~ **1009.01 Mitigation Hierarchy for Isolated Waters of Lake County**

A. Size Requirements

1. If the required [mitigation](#) acreage is less than one and one-half (1.5) acres, mitigation requirements shall follow the mitigation hierarchy in ~~4007.03~~ **1009.01.B.2** through ~~4007.03~~ **1009.01.B.4**. If on-site mitigation increases an existing on-site [wetland](#) size to greater than or equal to one and one-half (1.5) acres, the [applicant](#) may use the mitigation hierarchy in ~~4007.03~~ **1009.01.B.1**.
2. If the required [mitigation](#) acreage is one and one-half (1.5) acres or greater, mitigation requirements shall follow the mitigation hierarchy in ~~4007.03~~ **1009.01.B.1** through ~~4007.03~~ **1009.01.B.4**.

B. Hierarchy

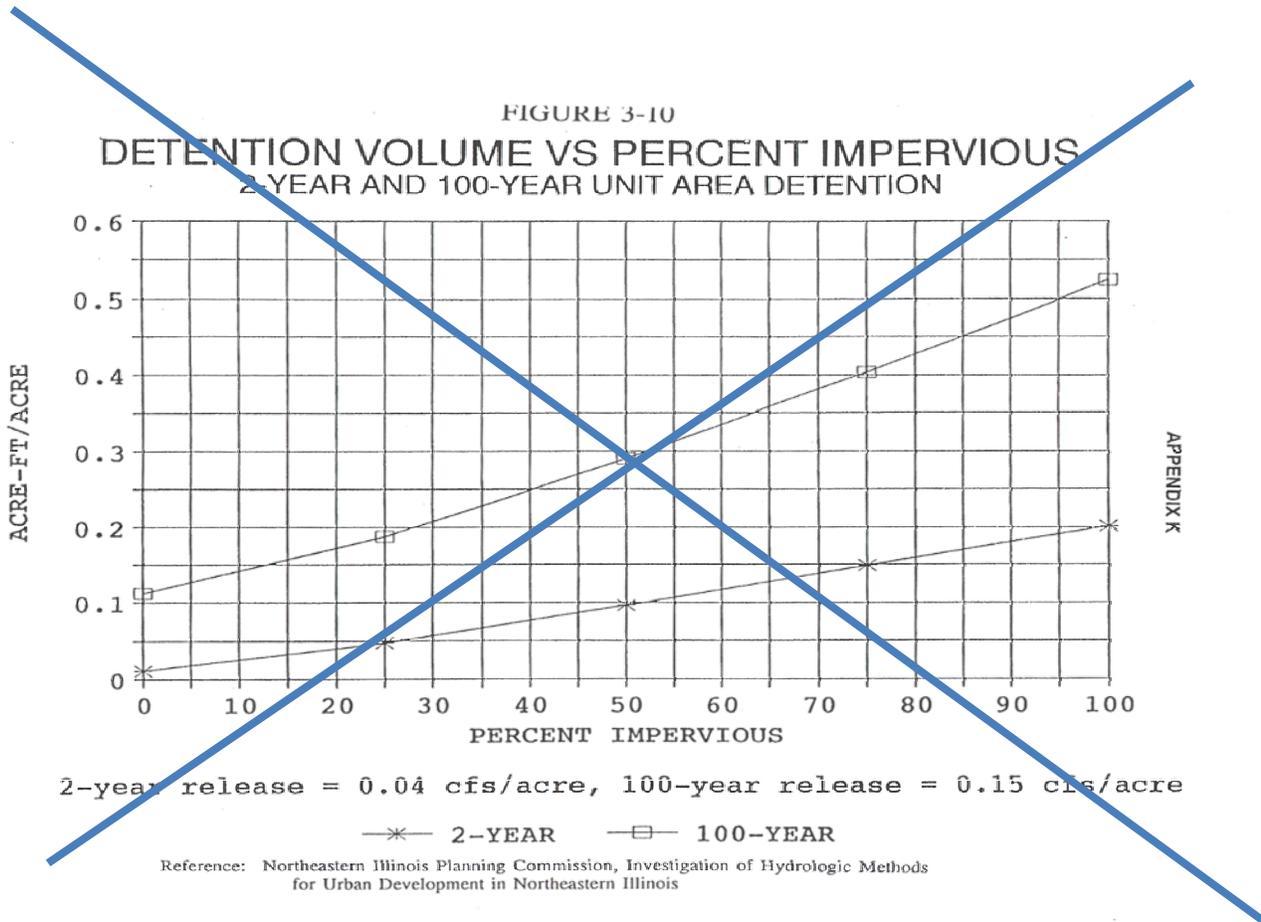
All [mitigation](#) shall occur in Lake County. Mitigation shall use the following hierarchy. Allowance to the next lower step is permitted only when justified through sequencing specified in 1005.01L and 1005.01M or when the higher step is not available or as specified in ~~4007.03~~ **1009.01.B.4**:

1. On-site [wetland mitigation](#) meeting the requirements of the project mitigation document.
2. In the same [watershed](#) as [wetland impact](#): A U.S. Army Corps of Engineers Approved Wetland Mitigation Bank; or a SMC Approved Wetland Mitigation Bank; or off-site [wetland mitigation](#) meeting the requirements of the project mitigation document.
3. Outside of the [watershed](#) (at double the required [mitigation](#) acreage): A U.S. Army Corps of Engineers Approved Wetland Mitigation Bank; or a SMC Approved Wetland Mitigation Bank; or off-site [wetland](#) mitigation meeting the requirements of the project mitigation document.
4. [SMC Wetland Restoration Fund](#). This [mitigation](#) option may only be used for [wetland impacts](#) where there are no available mitigation credits within the [watershed](#) and the corresponding fees and mitigation ratios shall be charged at the 'in-watershed' rate.

Purpose: Re-insert Mitigation Hierarchy per pre-WDO reformatting. This section was erroneously reformatted to incorrectly include only IWLC. The original formatting was applicable for both IWLC and WOUS.

TAC Vote:

Appendix K: Detention Volume Versus Curve Number Percent Impervious



Refer to Joy Corona's Memo.

Purpose: Support new Fee-in-Lieu program. Update 2-, and 100-year curves to use Curve Numbers instead of percent impervious. Add 50-year curve.

TAC Vote:

Memo

May 18, 2020

To: Kurt Woolford
From: Joy Corona
Re: WDO Appendix K, TAC Discussion

Per your request, I have evaluated potential revisions to Appendix K. The current Appendix is from the 1991 NIPC publication Investigation of Hydrologic Design Methods for Urban Development in Northeastern Illinois. The unit area detention curves were created using a calibrated continuous simulation (40 year record) HSPF model at 5 different data points. The curves were presented in a percent impervious versus unit area detention format. Per the study, the resultant "unit area detention volume had a nearly identical 100-yr, 24-hr rainfall depth as Bulletin 70."

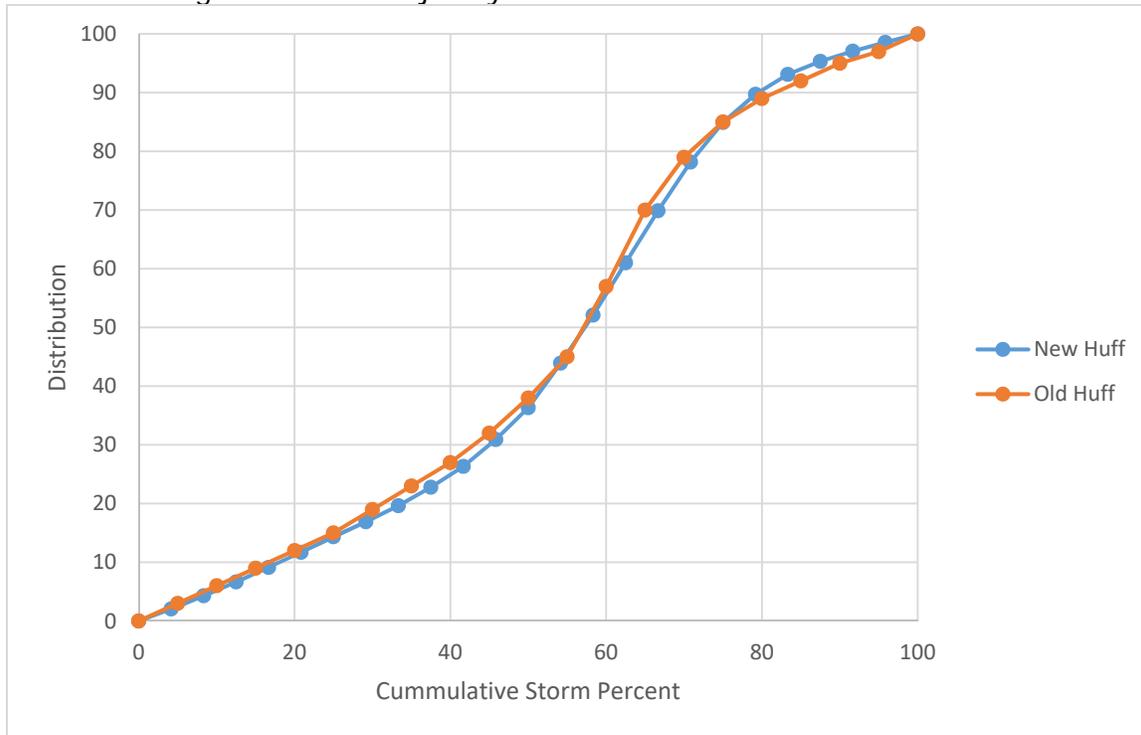
In 2019 the impact of the new rainfall values on the detention volume required was computed using HEC-1. Since that analysis was completed updates to the Huff Distribution have been issued. I started off this 2020 work by expanding the 2019 analysis with the updated distribution at various CN values. Once this was completed it was compared with the effective Appendix K curve.

As part of its previous discussions, TAC recommended that the revised Appendix K curves be presented based on CN as opposed to percent impervious (format of the existing Appendix K). CN computations in NIPC's HSPF analysis were based on a pervious soil CN of 68 and hydrologically connected impervious surfaces. In order to present a comparison percent impervious values were correlated with an approximate CN.

% Imp	0	10	20	30	40	50	60	70	80	90	100
CN	68	71.1	74.2	77.3	80.4	83.5	86.6	89.7	92.8	95.9	99
100-yr factor	0.11	0.14	0.175	0.21	0.25	0.295	0.335	0.38	0.425	0.475	0.52
2-yr factor	0.01	0.025	0.04	0.055	0.075	0.097	0.117	0.14	0.16	0.18	0.2

A comparison between the effective Appendix K and the updated HEC-1 modeling did not reflect the expected new curve. The HEC-1 data was then also compared with MWRD's calculator <https://mwrdd.org/wmo-design-calculators>. Their tool includes a Nomograph based on CN (using 2019 rainfall data) that produces a required detention volume, based on the old Huff Distribution. Again the HEC-1 data did not seem to appropriately reflect the expected curve. HEC-1 input information was reviewed and no errors/omissions were identified.

It is observed that the distribution was not significantly modified for the 3rd quartile, thus this change alone did not justify the results observed.



Therefore, the analysis was recreated using both HEC-HMS and WIN-TR20. HEC-HMS is the model used by MWRD, for their design calculator and also requires the distribution to be in a 24hr format (like the new distribution). In order to compare results with the MWRD design calculator, models were run using both old and new distributions.

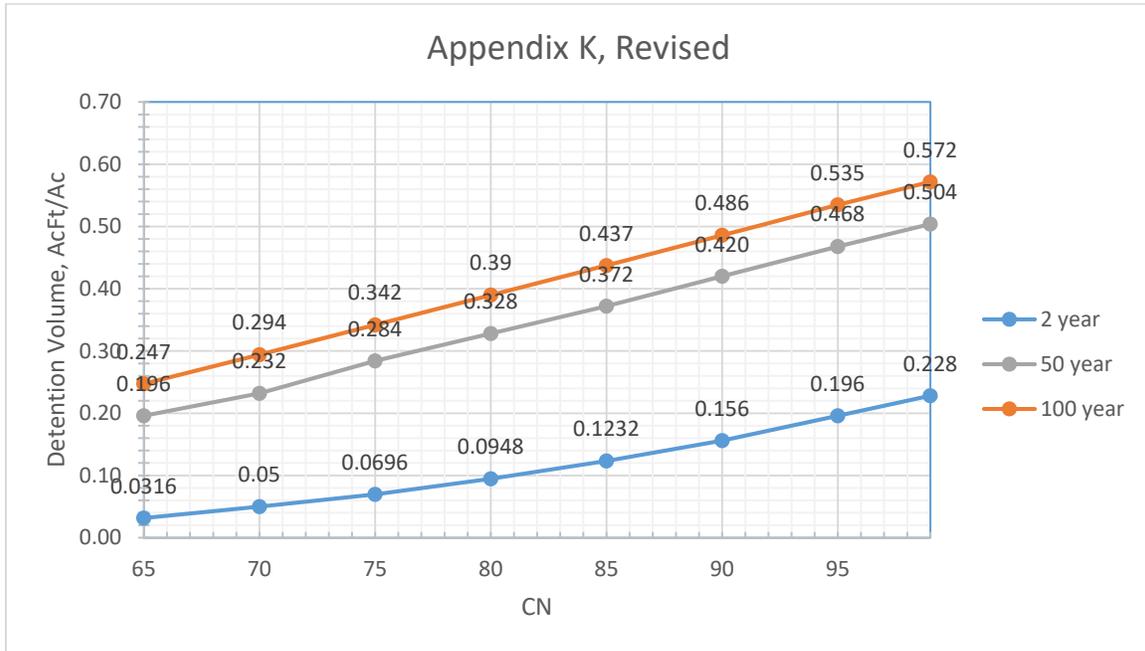
CN 65	2-yr	50-yr¹	100-yr
HEC-1 New Distrib	0.01	0.127	0.165
HEC-HMS Old Distrib	0.029	0.180	0.229
HEC-HMS New Distrib	0.032	0.196	0.247
WinTR-20 New Distrib	0.032	0.207	0.247
NIPC	0.008		0.095
MWRD			0.228

¹ Interpolated value based on resultant HWL and stage-storage rating curve

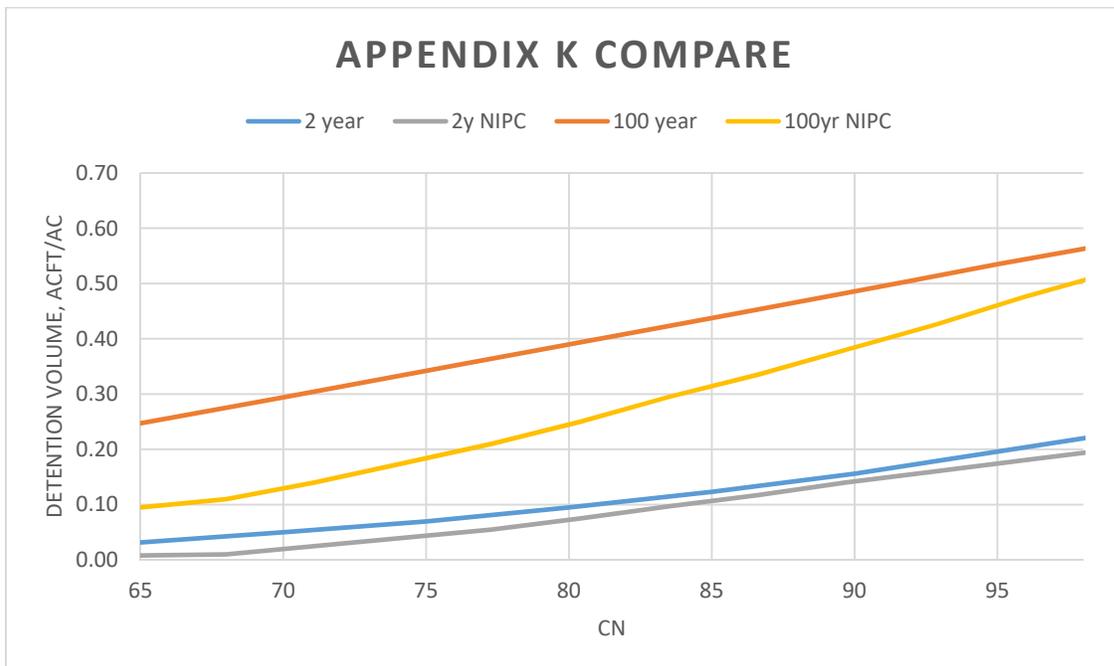
Several items became evident.

- MWRD calculator was replicated (0.228 vs. 0.229).
- HEC-HMS and WinTR20 produce substantially consistent results.
- The new distribution produces higher detention volume required.
- HEC-1 significantly underestimates the detention volume required when the new distribution is utilized. This may be a result of the decimals and the older DOS based format of the model.

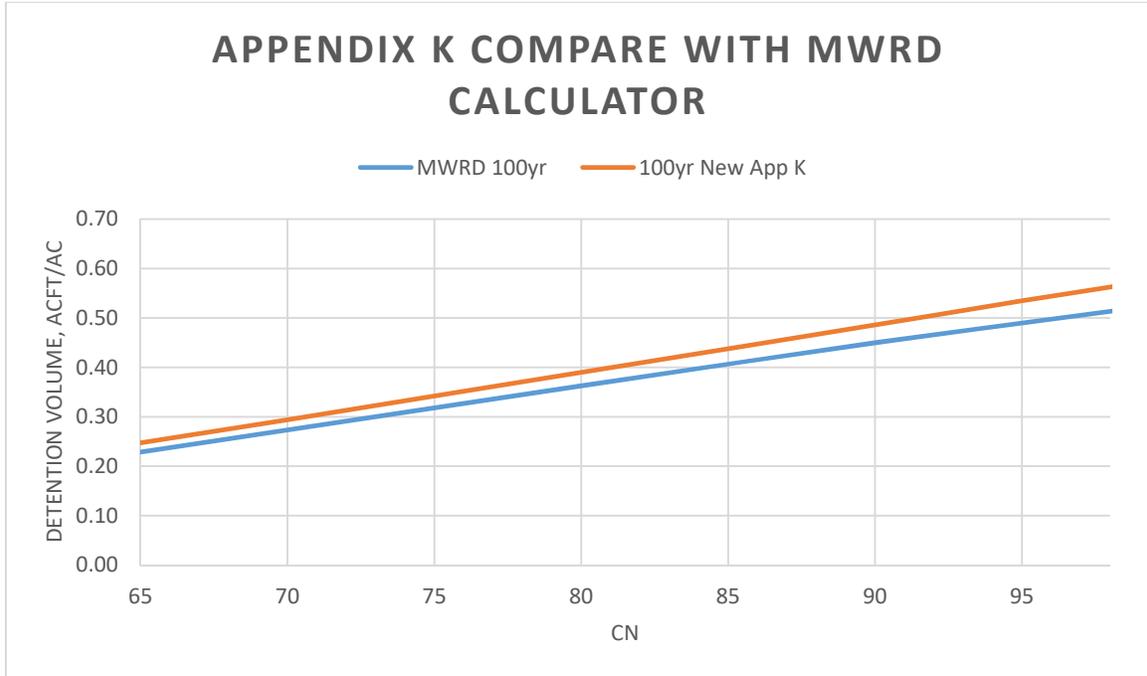
As a result, the analysis was completed using HEC-HMS. A total of 8 models were created at CN 65, 70, 75, 80, 85, 90, 95 and 99 including the 2-yr, 50-yr and 100-yr events. The volume required for the 50-yr event was interpolated based on model's resultant HWL and the stage-storage rating curve.



The final values were again compared with the current Appendix K.



Lastly, this final curve was compared with the MWRD calculator. The difference between the two (2) curves reflects the updated distribution.



Modeling efforts took into consideration 5 different size sites (5-, 10-, 15-, 20- and 25-acres) as well as varying Tc values. Both the site size and Tc values had an insignificant effect on the factors. CN/Tc values used in the final curve are presented below.

CN	Tc (min)
65	30
70	30
75	25
80	20
85	15
90	10
95	10
98	10