Introduction

As part of the Poplar Creek Watershed DWP development, inundation mapping was produced based on hydrologic and hydraulic modeling. Tables 1 and 2 include a comparison of the inundation mapping created for this DWP to the effective FEMA floodplain mapping, revised August 19, 2008 as part of the FEMA Map Modernization program. Only detailed study Zone AE and limited detail study Zone A special flood hazard areas (SFHA) are included in the comparison. Caution should be exercised when evaluating the numbers in both tables, as some differences in inundation area may result from differences in the extent of detailed hydraulic modeling.

In some locations, other discrepancies exist between this DWP inundation area maps and the FEMA floodplain maps, which may be attributed to differences in hydrologic and hydraulic modeling, as described in more detail in the following paragraphs.

Hydrologic Modeling Methodology

Hydrologic modeling methodologies utilized for the District's DWP are fundamentally different than those performed for DFIRM mapping, thus estimated peak flow rates may be significantly different. DFIRM hydrology was primarily based on regression equations and older hydrologic models (HEC-1, etc.) while this DWP utilized a current hydrologic model (HEC-HMS). Consequently, different approaches to channel and reservoir routing may have been taken, which may result in magnitude and timing differences.

Parameters of each hydrologic model may be quite different. This DWP computed NRCS Curve Numbers based on the latest CMAP land use maps and NRCS soil maps. Contrarily, hydrologic methods, utilized by the DFIRM mapping, likely referenced older land use and soil data. Additionally, different methodologies may have been used to calculate subbasin times of concentration.

This DWP utilized current ISWS Bulletin 71 rainfall data while previous hydrologic studies used for DFIRM mapping may have used older Technical Paper-40 rainfall data. Bulletin 71 rainfall data generally yields higher rainfall depths than Technical Paper-40. For example, Technical Paper-40 specifies a 100-year, 24-hour duration rainfall depth of approximately 6.0 inches while Bulletin 71 specifies a corresponding rainfall depth of approximately 7.60 inches.

Subbasin delineation is likely different between this DWP and the DFIRM mapping, as this DWP utilized the latest Cook County LiDAR data for topographic information to support subbasin delineation.

Differences in hydrologic modeling approaches may yield different flow rates, which will likely yield different flood surface profiles in the hydraulic model results.

Hydraulic Modeling Methodology

Hydraulic modeling methodologies utilized for this DWP are fundamentally different than those performed for DFIRM mapping, thus their associated flood surface profiles may be

significantly different. Steady-state hydraulic modeling was generally performed in support of DFIRM mapping. This DWP utilized dynamic unsteady flow simulation. The difference in approaches between steady and unsteady hydraulic modeling may contribute to discrepancies between flood surface profiles.

Channel cross sections in the hydraulic models differ between this DWP and previous modeling. Cross sections developed under this DWP were generally obtained from field surveys. In a few cases, recent hydraulic models were available and modified under this DWP. Hydraulic models produced in support of DFIRM mapping used different cross section data, which may reflect outdated channel geometries. Likewise, bridge section geometries also vary from previous modeling. Differences in model cross sections may contribute to discrepancies between flood surface profiles.

Hydraulic model calibration may also contribute to discrepancies in flood surface profiles between this DWP and DFIRM mapping. This DWP was calibrated to recent storm events that have occurred since the development of DFIRM modeling. The calibration may contribute to discrepancies between flood surface profiles.

DWP and FEMA Floodplain Area Comparison

Table 1 below lists for comparison the floodplain area within each subwatershed as determined by the Poplar Creek DWP and the DFIRM mapping (for both FEMA Zone AE, and FEMA Zone A).

TABLE 1
Comparison of DWP Inundation Area and FEMA Floodplain by Subwatershed

Subwatershed	DWP Floodplain Area (acres)	FEMA Zone AE Area (acres)	FEMA Zone A Area (acres)
Flint Creek	582.4	22.7	731.6
Spring Creek	1385.7		1258.1
West Branch DuPage River	161.4	125.6	
Poplar Creek Mainstem	1565.6	944.9	257.2
Poplar Creek Tributary A	90.1	28.5	92.6
Poplar Creek East Branch	281.5	103.2	138.8
Poplar Creek Schaumburg Branch	186.6	174.6	11.4
Poplar Creek Railroad Branch	92.4	1.0	9.4
Poplar Creek South Branch	212.5	125.1	4.1
Lord's Park Tributary	289.1	98.4	18.2
Brewster Creek	190.8		210.3
Total	**5038.2**	**1623.9**	**2731.7**

Table 2 below lists for comparison the floodplain area within each community within the Poplar Creek Study Area as determined by the Poplar Creek DWP and the DFIRM mapping (for both FEMA Zone AE, and FEMA Zone A).

TABLE 2
Comparison of DWP Inundation Area and FEMA Floodplain by Community

Community	DWP Floodplain Area (acres)	FEMA Zone AE Area (acres)	FEMA Zone A Area (acres)
Village of Barrington	143.5	4.7	159.4
Village of Barrington Hills	1509.7	0.6	1467.4
Village of Bartlett	132.2		113.2
City of Elgin	660.3	269.7	83.3
Village of Hanover Park	40.5	28.2	
Village of Hoffman Estates	855.9	561.3	153.5
Village of Inverness	252.6	68.1	243.4
Village of Schaumburg	90.8	90.2	82.6
Village of South Barrington	418.1	166.2	164.6
Village of Streamwood	239.9	117.5	4.1
Barrington Township [b]	77.8	20.8	57.7
Hanover Township [b]	109.6	25.7	38.7
Palatine Township [b]	0.1	0.4	0.1
Schaumburg Township [b]	63.2	32.5	2.2
FPDCC [c]	443.9	237.9	161.5
Total	**5038.1**	**1623.9**	**2731.6**

a Communities with no DWP inundation area mapping were omitted from the table, although some did have FEMA Zone A area.
b Only unincoporated areas of townships are included.
c Only areas of FPDCC not within municipal borders.