

Executive Summary

Background

The Metropolitan Water Reclamation District of Greater Chicago (District) has authority for regional stormwater management within Cook County as granted by the Illinois General Assembly in Public Act 93-1049 (the Act). The Act requires the District to develop watershed plans for six Cook County watersheds, which include the North Branch of the Chicago River, Lower Des Plaines River, Calumet-Sag Channel, Little Calumet River, Poplar Creek, and Upper Salt Creek. The District published the *Cook County Stormwater Management Plan* (CCSMP) in February 2007 to identify stormwater management goals and to outline the District's approach to watershed planning. Chapter 6 of the CCSMP defines the District's approach and standards for Detailed Watershed Plans (DWPs), which address regional stormwater problems in Cook County. The six major watersheds for which DWPs are being developed cover approximately 730 square miles in Cook County. The primary goals of the DWPs are as follows:

- Document stormwater problem areas.
- Evaluate existing watershed conditions using hydrologic and hydraulic (H&H) models.
- Produce flow, stage, frequency, and duration information about flood events along regional waterways.
- Estimate damages associated with regional stormwater problems.
- Evaluate potential solutions to regional stormwater problems.

The Little Calumet River DWP was developed to meet the goals for the Little Calumet River Watershed as described in the CCSMP. The Act required the formation of Watershed Planning Councils (WPCs) to advise the District during development of its countywide stormwater management program; therefore, the DWPs were developed in coordination with the WPCs. Membership of the WPCs consists of the chief elected official of each municipality and township in each watershed, or their designees. Many municipalities and townships were represented by engineers, elected officials, or public works directors. WPC meetings were also open to the public. Frequent coordination with WPCs was performed to ensure that local knowledge is integrated into the DWP and the DWP reflects the communities' understanding of watershed issues as well as the practicability of proposed solutions.

Detailed Watershed Plan Scope

The scope of the Little Calumet River DWP includes the development of stormwater improvement projects to address regional problem areas along open waterways. Regional problems are defined as problems associated with waterways whose watersheds encompass multiple jurisdictions and drain an area greater than 0.5

square miles. Problems arising from capacity issues on local systems, such as storm sewer systems and minor open channel ditches, even if they drain more than one municipality, were considered local and beyond the scope of this study. Erosion problems addressed in this plan were limited to active erosion along regional waterways that pose an imminent risk to structures or critical infrastructure. Interstate highways, U.S. highways, state routes, county roads with four or more lanes, and smaller roads providing critical access that are impacted by overbank flooding of regional waterways at depths exceeding 0.5 feet were also considered regional problems.

Assistance with developing the Little Calumet River DWP was provided by a team of consulting firms led by CDM, including the following companies:

- AECOM
- FluidClarity
- Molly O'Toole and Associates
- EDI
- Terra Engineering
- Kabbes Engineering

Watershed Overview

The Little Calumet River Watershed is located predominantly in the southeast portion of Cook County and has a total area of 264.6 square miles: 159.6 square miles lie in Cook County, 61.4 square miles in Will County, and 43.6 square miles in Lake County, Indiana. The watershed is bound on the north by Blue Island, on the south by Monee, on the west by Tinley Park, and on the east by Gary, Indiana. See **Figure ES.1**.

Figure ES.1

LITTLE CALUMET RIVER WATERSHED OVERVIEW MAP

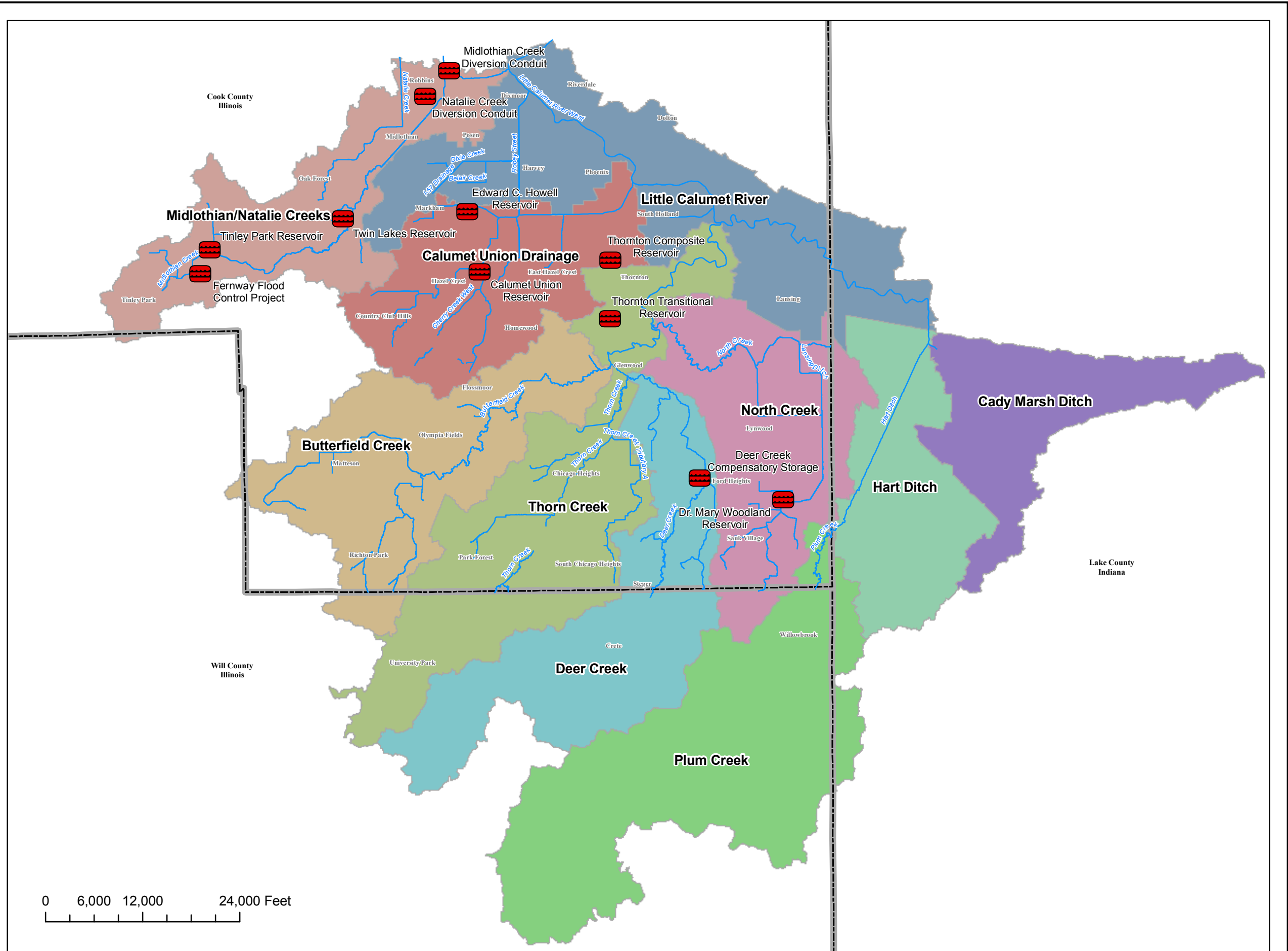
Little Calumet River DWP

December, 2009

- Stream Centerlines
- Flood Control Facilities
- County Boundaries
- Sub-Watersheds**
 - Butterfield Creek
 - Cady Marsh Ditch
 - Calumet Union Drainage
 - Deer Creek
 - Hart Ditch
 - Little Calumet River
 - Midlothian/Natalie Creeks
 - North Creek
 - Plum Creek
 - Thorn Creek



1 inch = 12,000 feet



The watershed is delineated in nine (9) subwatersheds: Butterfield Creek, Cady Marsh Ditch, Calumet Union Drainage Ditch, Deer Creek, Little Calumet River, Midlothian Creek, North Creek, Plum Creek/Hart Ditch, and Thorn Creek. These subwatersheds are:

Butterfield Creek Subwatershed: The Butterfield Creek subwatershed drains approximately 26 square miles (24.35 in Cook County and 1.5 in Will County) from the headwaters near the intersection of Ridgeland Avenue and Lincoln Highway in Unincorporated Cook County and extends to the confluence with Thorn Creek, located near the Chicago Heights Glenwood Road and 187th Street intersection in Glenwood. Butterfield Creek is approximately 25 stream miles in length with 10 tributaries. There are no major regional flood control facilities within the Butterfield Creek subwatershed.

Cady Marsh Ditch Subwatershed: The Cady Marsh Ditch subwatershed is located in Indiana and drains approximately 16 square miles from the headwaters near north of 45th Avenue and east of Cleveland Street in Gary, Indiana to its confluence with Hart Ditch at West of US Route 41 and south of Ridge Road in Munster, Indiana. Cady Marsh Ditch is 6.8 stream miles in length and has one flood control facility.

Calumet Union Drainage Ditch Subwatershed: The Calumet Union Drainage Ditch subwatershed drains approximately 20 square miles and has 15 tributaries with headwaters starting near 161st Street and Central Park Avenue in Markham. The subwatershed discharges to the Little Calumet River just east of State Street in South Holland. The Calumet-Union Drainage Ditch is approximately 31 stream miles in length. There are two flood control facilities within this subwatershed.

Deer Creek Subwatershed: The Deer Creek subwatershed drains approximately 26 square miles (8.8 in Cook County and 17.5 in Will County) from the headwaters at Steger Road, 1.5 miles west of Illinois Route 394 (Calumet Expressway) and flows to the confluence with Thorn Creek within the Cook County Forest Preserve, 0.25 miles southwest of the intersection of State Street and Main Street in Glenwood. Deer Creek is approximately 15 stream miles in length. There is one flood control facility within this subwatershed, located within Ford Heights.

Little Calumet River Subwatershed: The Little Calumet River subwatershed includes the main stem of the Little Calumet River, with major tributaries including Midlothian Creek, Calumet Union Drainage Ditch, Thorn Creek, and Plum Creek. The subwatershed drainage area, not including the tributaries, is approximately 33 square miles (27.66 in Cook County and 4.86 in Lake County, IN) from the headwaters near west of Highway 41 at Hammond to its confluence with the Calumet-Sag Channel at Calumet Park. The length of the Little Calumet River within the Cook County is approximately 14 stream miles. There is one regional flood control facility within the Cook County portion of the subwatershed and one flood control facility on the Indiana portion of the subwatershed.

Midlothian Creek Subwatershed: The Midlothian Creek subwatershed drains approximately 21 square miles (20.57 in Cook County and 0.09 in Will County) from

the headwaters near west of 84th Avenue and 175th Street extending to the confluence with the Little Calumet River. Midlothian Creek is approximately 23 stream miles in length with seven tributaries. There are five major flood control facilities within the subwatershed.

North Creek Subwatershed: The North Creek subwatershed drains approximately 23 square miles (19.46 in Cook County, 1.33 in Will County and 2.16 in Lake County, IN). There are seven tributaries within the subwatershed, including North Creek main tributary, totaling over 23 stream miles. The headwater starts near east of Wentworth Avenue in Lansing to the confluence with Thorn Creek in Thornton. There is one major flood control facility within the subwatershed.

Plum Creek/Hart Ditch Subwatershed: The Plum Creek/Hart Ditch subwatershed drains approximately 54 square miles (33.03 in Will County, 1.07 in Cook County and 19.82 in Lake County, IN) from the headwaters at south of Church Road and east of Western Avenue in Unincorporated Will County. The creek is named Plum Creek in Will and Cook Counties and Hart Ditch in Indiana. It flows northeasterly and crosses into Unincorporated Cook County at Steger Road (231st Street) east of Burnham Avenue, continues approximately 3 miles northeast through the Plum Creek Forest Preserve, and crosses into Indiana near Forest Park Drive in Dyer, Indiana. The creek continues as Hart Ditch for approximately 6 miles to its confluence with the Little Calumet River, approximately 0.5 miles southwest of Interstate 80 and US Route 41 in Munster, Indiana. There are no major flood control facilities within the subwatershed.

Thorn Creek Subwatershed: The Thorn Creek subwatershed includes the main stem of the Thorn Creek, with major tributaries including Butterfield Creek, Deer Creek and North Creek. The subwatershed drainage area, not including the major tributaries, is approximately 32 square miles (22.86 in Cook County and 8.92 in Will County) from the headwaters near Steger Road and Western Avenue at the boundary between Cook and Will counties in Park Forest to the confluence with the Little Calumet River 0.5 miles north of 170th Street in South Holland. Thorn Creek is approximately 27 stream miles in length and currently has two major flood control facilities: the Thornton Transitional Reservoir and Sauk Trail Lake. The Thornton Composite (CUP) Reservoir is planned to replace the Thornton Transitional Reservoir, estimated to be completed by 2014.

The predominant land use in the watershed (Cook and Will Counties, Illinois) is classified as residential (35%). Approximately 20% of the watershed is undeveloped land (agriculture and vacant land) and 28% is classified as open space (parks, cemeteries, golf courses, wetlands, etc.). The remaining land is mostly classified as commercial, industrial, and institutional, as shown in the following table.

**Table ES.1: Little Calumet River Watershed - Land Use Status by Category
(Only for Cook County)**

Land Use	Area (acres)	Percentage of Watershed (%)
Residential	38,996	30.7
Forest/Open Land	22,815	29.5
Commercial/Industrial	11,482	4.6
Water/Wetland	1,997	1.7
Agricultural	9,151	30.9
Transportation/Utility	4,469	1.3
Institutional	4,048	1.2
TOTAL	92,958	100

Existing Conditions Evaluation

Locations with historic flooding and stream bank erosion problems on regional waterways exist throughout the watershed. Information on existing problem areas was solicited from WPC members as well as federal and state agencies and other stakeholders during the data collection and evaluation phase of DWP development, which also included the collection of data regarding the watershed and evaluation of the data's acceptability for use. The reported stormwater problems are summarized in **Section 2** and also discussed in each tributary subsection. Responses from stakeholders were used to help identify locations of concern, and where field assessment or surveys were needed to support hydrologic and hydraulic modeling.

Hydrologic models were developed to represent runoff generated by rainfall throughout the Little Calumet River Watershed. The runoff was then routed through hydraulic models, which were created for the major open channel waterways within the watershed. Design rainfall events were simulated for the 2-, 5-, 10-, 25-, 50-, 100-, and 500-year recurrence interval events based upon Bulletin 71 rainfall data (ISWS, 1992). The simulated water surface profiles were overlaid upon a ground elevation model of the study area to identify structures at risk of flooding.

Property damages due to flooding were estimated using a methodology consistent with the U.S. Army Corps of Engineers (USACE) Flood Damage Assessment program. Estimated flood damage resulting from a storm was considered in combination with the probability of the event occurring to estimate an expected annual damage. Erosion damages were assessed for structures or infrastructure at risk of loss due to actively eroding stream banks. Damages reported within this document refer to economic damages estimated over a 50-year period of analysis that results from regional overbank flooding or erosion of a regional waterway. The total property and transportation damages are estimated at \$75,000,000. Additional damages throughout the watershed exist, including damages due to flooding from local waterways and storm sewer systems, and also damages not easily quantified in financial terms such as water quality, wetland, riparian, and habitat impact, loss of

emergency access, and loss of business or operations due to limited transportation access.

Figure ES.2 summarizes the distribution of existing condition damages within the Little Calumet River Watershed over a planning period of analysis of 50 years.

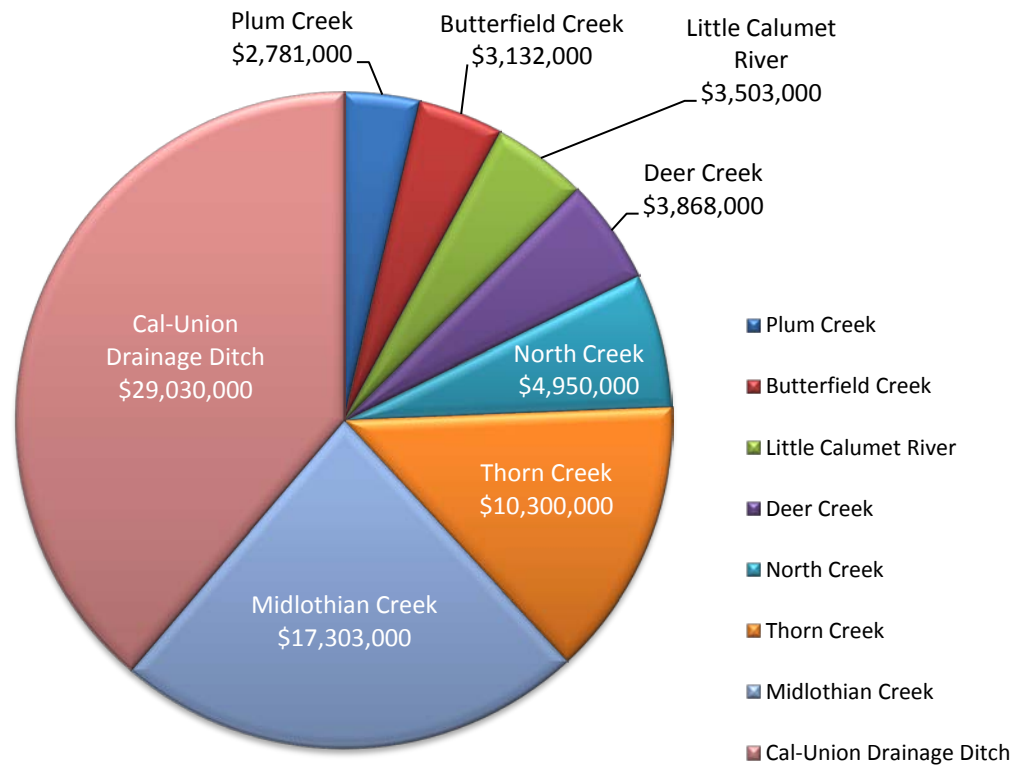


Figure ES.2: Distribution of Existing Condition Damages within the Little Calumet River Watershed

Existing condition damages within the Cal-Union Drainage Ditch subwatershed are significantly higher than that predicted within other subwatersheds. Due to relatively large areas of shallow flooding created by low topography, there are significantly larger numbers of impacted structures (over 1,250), and multiple impacted roadways. Damages predicted for other subwatersheds range according to the number of impacted structures and roadways, and the severity of the associated flooding.

The estimated damages summarized in **Figure ES.2** include calculated regional damages related to overbank flooding and erosion problems on regional waterways that threaten structures only and transportation damages. Localized problems, such as storm sewer capacity related problems, are not included in this estimate. Reported problems classified as local are presented in **Table 2.2.1** in **Section 2.2.1**. Also provided in **Table 2.2.1** is the reasoning behind classifying the problems as local or regional.

Evaluation of Alternatives

Stormwater improvements, or alternatives, were developed to address regional stormwater problems along intercommunity waterways. WPC members participated in the alternative development process by providing input on possible solutions and candidate sites for new stormwater infrastructure. It should be noted that the alternatives presented in the DWP are developed at a conceptual level of feasibility.

Hydrologic and hydraulic models were used to determine the benefit of stormwater improvement alternatives. Models were run and damages were calculated for the existing conditions evaluation. Benefits were calculated for each project as the difference between existing and alternative condition damages. Only regional financial benefits (e.g., relief of flooding due to a regional problem as defined above) were considered. Local benefits (e.g., improved sewer drainage due to reduced outlet elevation) and non-economic benefits (e.g., improved emergency access, improved wetland, riparian, habitat, and improved access to businesses) are not included. The stormwater improvement alternatives may have significant local and non-economic benefits. Local benefits are not reported in the DWP, which focuses on regional benefits.

Conceptual level cost estimates were produced to represent the estimated costs for design, construction, and maintenance of a specific alternative over a 50-year period of analysis. The cost estimates were developed using standard unit cost items located within a District database and were used for all six watershed plans. In addition, standard markups on the estimated capital costs, such as utility relocation, design and engineering costs, profit and contingency were included.

A benefit-to-cost (B/C) ratio was developed for each alternative, which represents the ratio of estimated benefits to costs. The B/C ratios calculated may be used to rank the alternatives in a relative manner as the District's Board of Commissioners prioritizes the implementation of recommended stormwater improvement projects. Only regional financial benefits were considered in determination of the B/C ratios. The B/C ratios do not include local and non-economic benefits and should not be interpreted to be the sole measure of justification of an alternative. In addition to the B/C ratio, noneconomic criteria such as water-quality impact, number of structures protected, and impact on wetland and riparian areas were noted for each alternative. These criteria may also be considered along with the calculated B/C ratios as the District's Board of Commissioners prioritizes the implementation of recommended stormwater improvement projects.

Recommendations

Alternatives were recommended based upon consideration of their ability to reduce stormwater damages and to address problems reported by communities. **Table ES.2** lists the recommended alternatives, their costs, and regional financial benefits. Note that additional benefits to the local systems and non-economic benefits will result from the recommended alternative projects.

The Little Calumet River DWP integrated stormwater data from a large number of sources in order to identify and prioritize solutions to existing stormwater problems. An extensive data collection effort undertaken for the DWP development included surveying of streams, bridges, and culverts throughout the entire watershed. Field reconnaissance was performed throughout the watershed to understand conditions unique to the watershed. This compilation of current, accurate data was used by the District to document and identify existing stormwater problems throughout the study area.

A number of alternatives were developed and evaluated for their effectiveness in reducing regional damages within the Little Calumet River Watershed. The alternatives listed in **Table ES.2** were identified as the most effective improvements for reducing expected damages due to flooding within the watershed. Greater opportunities to reduce regional flooding were identified in some tributaries. Factors such as the lack of availability of land and location of structures relative to stream channels limited the practicality of alternatives to eliminate all flooding damages for all design storms evaluated.

The data provided in the Little Calumet River DWP will be used by the District, along with consistently developed data in the DWPs for the other five major Cook County watersheds, to prioritize the implementation of stormwater improvement projects.

Table ES.3 summarizes the extent to which recommended alternatives address existing regional financial damages within each tributary, ordered by increasing existing condition damages.

Table ES.2: Recommended Alternatives Summary for the Little Calumet River Watershed

ID	Category	Description	B/C Ratio	Total Benefits (\$)	Total Project Cost (\$)	Probable Construction Cost (\$)	Cumulative Structures & Roadways Protected	Community Involvement
DRCR-G1	Channel Improvements/Detention	Increase channel capacity north of US 30 Highway and excavate existing reservoir to provide additional 24 ac-ft storage	0.49	\$3,801,000	\$8,331,000	\$6,881,000	270 Structures	Ford Heights
DRCR-G2	Channel Improvements	Channel improvements for 1,800 LF upstream of Sauk Trail Road	< 0.01	\$55,000	\$14,312,000	\$10,671,000	2 Structures	Steger
LDET-G1	Conveyance Improvements	Replace existing crossing on Katz Corner Road	0.29	\$82,000	\$287,000	\$191,000	9 Structures, 1 Roadway	Sauk Village
NCLD-G1	Conveyance/Detention	Construct 700 ac-ft detention facility and replace crossings at 198 th Street and downstream private drives	0.03	\$2,364,000	\$69,500,000	\$52,247,000	49 Structures/ 10 Roadways	Lansing, Lynwood
NCLD-G2	Conveyance	Replace Bridge Street and Linda Lane and relocate mobile homes	< 0.01	\$1,000	\$357,000	\$201,000	2 Structures, 1 Roadway	Bloom Township
NCLD-G3	Conveyance	Replace Torrence Avenue and Sauk Trail Road	< 0.01	\$10,000	\$2,180,000	\$1,201,000	12 Structures, 1 Roadway	Sauk Village
NOCR-G1	Conveyance/Detention	Replace culvert from Wenworth Avenue and Grand Truck Railroad and construct a 12 ac-ft detention facility	0.05	\$388,000	\$7,126,000	\$4,605,000	14 Structures, 4 Roadways	Lansing
PLCR-G1	Levee/Detention	Construct a levee with a compensatory storage	0.73	\$2,781,000	\$3,803,000	\$2,540,000	1 Structure, 1 Roadway	Will County, Dyer, IN
THCR-G1	Detention/Levee/Diversion Conduit	Channel capacity improvements along Thorn Creel Tributary B, levees along Thorn Creek, a diversion conduit and modifications to Sauk Lake Dam	0.02	\$717,000	\$37,660,000	\$25,880,000	51 Structures, 3 Roadways	Chicago Heights, Glenwood, South Chicago Heights

Table ES.2: Recommended Alternatives Summary for the Little Calumet River Watershed

ID	Category	Description	B/C Ratio	Total Benefits (\$)	Total Project Cost (\$)	Probable Construction Cost (\$)	Cumulative Structures & Roadways Protected	Community Involvement
THCR-G2	Conveyance	Modify the roadway profile of Sauk Trail Road	0.63	\$1,600,000	\$2,543,000	\$1,878,000	1 Roadway	Cook County FPD
TCTA-G1	Conveyance/Detention	Replace culvert from 26 th Street and Stewart Avenue to State Street and 22 nd Street	0.02	\$1,415,000	\$89,000,000	\$65,426,000	51 Structures	Chicago Heights, South Chicago Heights, Steger
TCTB-G1	Conveyance	Channel improvements along Thorn Creek Tributary B	< 0.01	\$8,000	\$6,900,000	\$3,825,000	4 Structures, 3 Roadways	Chicago Heights
TCTD-G1	Detention/Conveyance	Construct 530 ac-ft detention facility and replace culverts at Lakewood Boulevard and East of Gold Street and East Rocket Circle	0.08	\$5,500,000	\$65,442,000	\$48,905,000	22 Structures, 1 Roadway	Park Forest
MTCR-G1	Levee	Construct a 700 LF levee along Overhill Avenue and Oleander Avenue	0.08	\$134,000	\$1,710,000	\$1,118,000	25 Structures	Tinley Park
MTCR-G2	Streambank Stabilization	Streambank stabilization at Oak Park Avenue and 172 nd Street and Hickory Street and 66 th Court	0.71	\$1,110,000	\$1,569,000	\$926,000	4 Structures	Tinley Park
MTCR-G3	Conveyance/Channel Improvements	Replace 160 th and 159 th Street culverts and channel improvements between 160 th and Oak Avenue	0.01	\$37,000	\$3,455,000	\$1,814,000	23 Structures, 2 Roadways	Oak Forest
MTCR-G4	Conveyance/Levee	Replace 155 th Street and Kilpatrick Avenue culverts and construct a 700 LF floodwall along north bank downstream of Kilpatrick Avenue and construct a 350 LF floodwall on both banks upstream of Waverly Avenue	0.04	\$1,143,000	\$27,700,000	\$15,996,000	12 Structures, 2 Roadways	Oak Forest

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ID	Category	Description	B/C Ratio	Total Benefits (\$)	Total Project Cost (\$)	Probable Construction Cost (\$)	Cumulative Structures & Roadways Protected	Community Involvement
MTCR-G5	Detention/Conveyance/Channel improvements	Construct a 25 ac-ft detention at Kilbourn Avenue and Waverly Avenue, channel improvements from 151 st Street to Pulaski Road and between Kenton Avenue and Kilbourn Avenue	< 0.01	\$58,000	\$21,000,000	\$12,673,000	25 Structures	Oak Forest
MTCR-G6	Channel Improvements	Channel improvements between 137 th and 139 th Street	0.23	\$110,000	\$479,000	\$400,000	25 Structures	Robbins
NTCR-G1	Detention/Conveyance/Diversion Conduit	Construct a 210 ac-ft detention facility at Leclaire Avenue and 153 rd Street and a 6,600 LF diversion conduit from Kilpatrick to Keystone Avenue	0.24	\$14,700,000	\$61,940,000	\$42,390,000	132 Structures	Oak Forest and Midlothian
BTCR-G1	Conveyance/Detention	Replace 206 th Street culvert and construct new 65 ac-ft detention facility	0.18	\$1,495,000	\$8,494,000	\$6,363,000	18 Structures	Unincorporated Cook County
BCEB-G1	Conveyance/Detention/Levee	Replace Sauk Trail Road culvert, construct 130 ac-ft detention facility and a levee along Governor's Highway	0.02	\$515,000	\$28,079,000	\$19,462,000	6 Structures, 2 Roadways	Matteson
BTCR-G2	Levee	Construct a 700 LF levee along Greenwood Drive	<0.01	\$13,000	\$9,556,000	\$5,567,000	4 Structures	Olympia Fields
BTCR-G3	Channel Improvements/Floodwall	Channel improvements near Laurel Avenue and construct a floodwall on west bank from Cambridge Avenue to Dixie Avenue	0.04	\$1,109,000	\$29,876,000	\$17,572,000	12 Structures, 2 Roadways	Flossmoor

Table ES.2: Recommended Alternatives Summary for the Little Calumet River Watershed

ID	Category	Description	B/C Ratio	Total Benefits (\$)	Total Project Cost (\$)	Probable Construction Cost (\$)	Cumulative Structures & Roadways Protected	Community Involvement
PKCR-G1	Detention/Conveyance/Levee	Construct a 200 ac-ft detention facility, implement channel and conveyance improvements from Kedzie Avenue to I-57 and 1,000 LF levee between Kedzie Avenue and I-57	0.26	\$5,187,000	\$20,327,000	\$15,819,000	53 Structures	Markham
BLCR-G1	Levee/Detention/Diversion Conduit	Construct a levee along Belaire Creek from Albany Avenue to Afton Drive, a new 125 ac-ft storage area and diversion conduit	0.17	\$2,293,000	\$13,842,000	\$10,600,000	15 Structures	Markham
CHEB-G3	Conveyance/Channel	Replace Governors Highway, Braemer Road Crossings and channel improvements	3.37	\$7,680,000	\$2,282,000	\$849,000	9 Structures, 2 Roadways	Homewood
CHEB-G1	Conveyance/Channel/ Detention	Replace Governors Highway and 175 th Street Crossings, channel improvements from Ravisloe Country Club to 175 th Street and provide overbank storage at Hillcrest Park	0.05	\$170,000	\$3,300,000	\$2,140,000	16 Structures, 2 Roadways	Homewood, Hazel Crest
CUTS-G1	Levee	Construct a 945 LF levee along Baker Avenue	0.02	\$63,000	\$2,917,000	\$1,666,000	10 Structures, 2 Roadways	Country Club Hills
CUSW-G2	Conveyance	Construct a 860 LF diversion conduit parallel to Kedzie Avenue	<0.01	\$6,000	\$1,206,000	\$735,000	1 Roadway	Hazel Crest
CUSW-G1	Conveyance	Replace California Avenue culvert	0.03	\$15,000	\$536,000	\$328,000	1 Roadway	Hazel Crest
CUDD-G3	Floodwall/Conveyance/ Streambank Stabilization	Construct a floodwall from Hamlin to Central Park Avenue and streambank stabilization from Sunset to Central Park Avenue	0.40	\$1,144,000	\$2,852,000	\$1,537,000	60 Structures	Markham

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ID	Category	Description	B/C Ratio	Total Benefits (\$)	Total Project Cost (\$)	Probable Construction Cost (\$)	Cumulative Structures & Roadways Protected	Community Involvement
CUDD-G2	Conveyance/Detention	Construct a 450 ac-ft detention facility and a new diversion conduit from Tri-State Tollway	0.07	\$3,377,000	\$50,406,000	\$39,733,000	20 Structures	Markham, Harvey, Unincorporated Cook
CUDD-G1	Conveyance/Detention	Expansion and improvements to Calumet Union Reservoir and upsizing the Robey Street Diversion Conduit	0.03	\$5,782,000	\$165,318,000	\$119,593,000	1,065 Structures	Markham, Harvey, Hazel Crest
LCRW-G1	Floodwall	Construct a 600 LF floodwall near Sibley Boulevard	< 0.01	\$16,000	\$3,412,000	\$1,925,000	4 Structures	Harvey
LCRW-G2	Levee/Floodwall	Construct a 1,900 LF levee/floodwall near 158 th Place and 159 th Street	0.03	\$148,000	\$5,752,000	\$3,102,000	6 Structures	South Holland
LCRW-G3	Floodwall	Construct a 850 LF floodwall near 158th Street and Chicago Avenue	< 0.01	\$4,000	\$4,332,000	\$2,151,000	2 Structures	South Holland
LCRW-G4	Floodwall	Construct a 825 LF floodwall near Parkside Avenue and School Street	< 0.01	\$3,000	\$3,427,000	\$1,913,000	1 Structures	South Holland
LCRW-G5	Levee/Floodwall	Construct a 930 LF levee/floodwall near 158 th Street and Church Drive	2.21	\$2,494,000	\$1,126,000	\$480,000	6 Structures	South Holland
LCRW-G6	Floodwall	Construct a 1,285 LF floodwall near Blouin Drive	0.03	\$60,000	\$2,401,000	\$644,000	2 Structures	Dolton
LCRW-G7	Levee	Construct a 785 LF floodwall near 158 th Street	0.01	\$21,000	\$3,040,000	\$1,518,000	2 Structures	South Holland
LCRW-G8	Conveyance/Levee	Modify existing berm to act as a levee parallel to 158 th Street near Greenwood Drive and Madison Avenue	0.30	\$702,000	\$2,373,000	\$1,389,000	8 Structures	South Holland

Table ES.3: Little Calumet River Watershed Alternative Summary

Tributary	Existing Conditions Damages (\$)	Benefits (\$)	Percent Damages Addressed (%)	Benefit Cost Ratio
Calumet Union Drainage Ditch	\$29,030,000	\$29,029,900	100	0.110
Midlothian Creek	\$17,303,000	\$17,291,500	100	0.140
Thorn Creek	\$10,300,000	\$9,240,000	90	0.046
North Creek	\$4,950,000	\$2,845,000	57	0.036
Deer Creek	\$3,868,000	\$3,856,000	100	0.170
Little Calumet River	\$3,503,000	\$3,448,000	98	0.133
Butterfield Creek	\$3,132,000	\$3,132,000	100	0.041
Plum Creek	\$2,781,000	\$2,781,000	100	0.731