



2015

DUPAGE COUNTY  
STORMWATER MANAGEMENT

PROGRAM  
ASSESSMENT &  
FINANCIAL  
ANALYSIS



INTRODUCTION	1
WATERSHED MANAGEMENT	4
WATER QUALITY	10
FLOODPLAIN MAPPING	16
REGULATORY	21
OPERATION & MAINTENANCE	26
FINANCIAL SUMMARY	31
APPENDIX	33

# INTRODUCTION

DuPage County has had its Stormwater Management program in place for 26 years. Since its inception, DuPage County Stormwater Management has created and implemented the long-standing DuPage County Countywide Stormwater and Flood Plain Ordinance, which has helped mitigate the effects rapid development throughout the County has had on stormwater runoff. Throughout this time, Stormwater Management has also constructed 16 regional flood control facilities countywide to protect existing structures from the effects of overbank flooding. In addition to the regulatory services, watershed management and operations, DuPage County has developed robust water quality and floodplain mapping programs. While this past work has greatly improved the quality of life for those affected or potentially affected by flooding, there is still work to be done under a changing landscape. For this reason, DuPage County Stormwater Management decided to conduct a comprehensive review of its program.

DuPage County Stormwater Management has compiled the resulting program assessment as a means of evaluating the program in accordance to the objectives outlined in the DuPage County Stormwater Management Plan (Plan) of 1989. The six objectives in the Plan are:

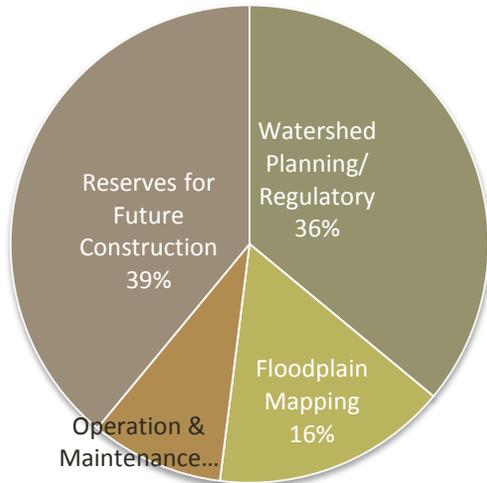
- Reducing the existing potential for stormwater damage to public health, safety, life and property;
- Controlling future increases in stormwater damage;
- Protecting and enhancing the quality, quantity and availability of water resources;
- Preserving and restoring existing aquatic and riparian environments;
- Controlling sediment and erosion near drainage ways, developments and construction sites; and
- Promoting equitable, acceptable and legal measures for stormwater management.

In 1992, a 10-year Stormwater Management funding plan was created based on the Plan. It showed DuPage County Stormwater Management requiring an operating budget of an average of \$12.4 million over the 10-year period, which equates to approximately \$18.1 million today. Today’s five-year funding outlook shows Stormwater Management with an operating budget of an average of \$7.6 million over five years, which creates approximately a \$2 million deficit each year. This projection shows Stormwater Management going into a deficit of \$1 million in fiscal year 2018 (see below).

<b>Stormwater Management Account</b>	<b>FY14</b>	<b>FY15</b>	<b>FY16</b>	<b>FY17</b>	<b>FY18</b>	<b>FY19</b>
Fund Initial Balance	\$ 10.3	\$ 8.0	\$ 4.6	\$ 2.8	\$ 0.8	\$ (1.1)
Total Income (Taxes, Corp Fund, Fees)	\$ 12.7	\$ 12.7	\$ 12.7	\$ 12.7	\$ 12.8	\$ 12.8
Total Operational Expenses (Oper, Bond Debt Service)	\$ 15.1	\$ 16.1	\$ 14.5	\$ 14.8	\$ 14.7	\$ 14.5
<b>Projected Op. Ending Cash Balance</b>	<b>\$ 8.0</b>	<b>\$ 4.6</b>	<b>\$ 2.8</b>	<b>\$ 0.8</b>	<b>\$ (1.1)</b>	<b>\$ (2.8)</b>

# 1992

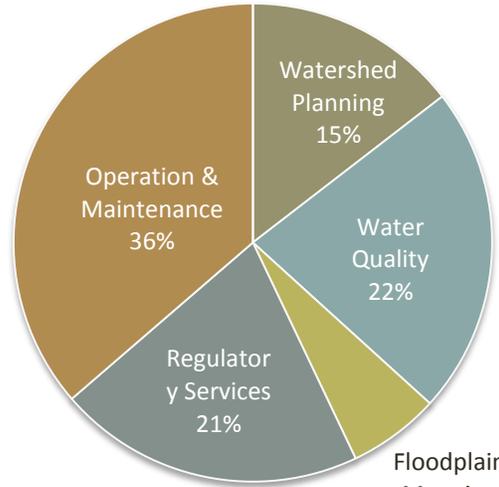
Does not include \$3.8 million bond payment.



Operating Budget - \$9,273,000  
Net Present Value -

# 2014

Does not include \$7.4 million bond payment.



Operating Budget - \$7,430,000

Figure 1 A comparison between program areas in the 1992 and 2014 budgets.

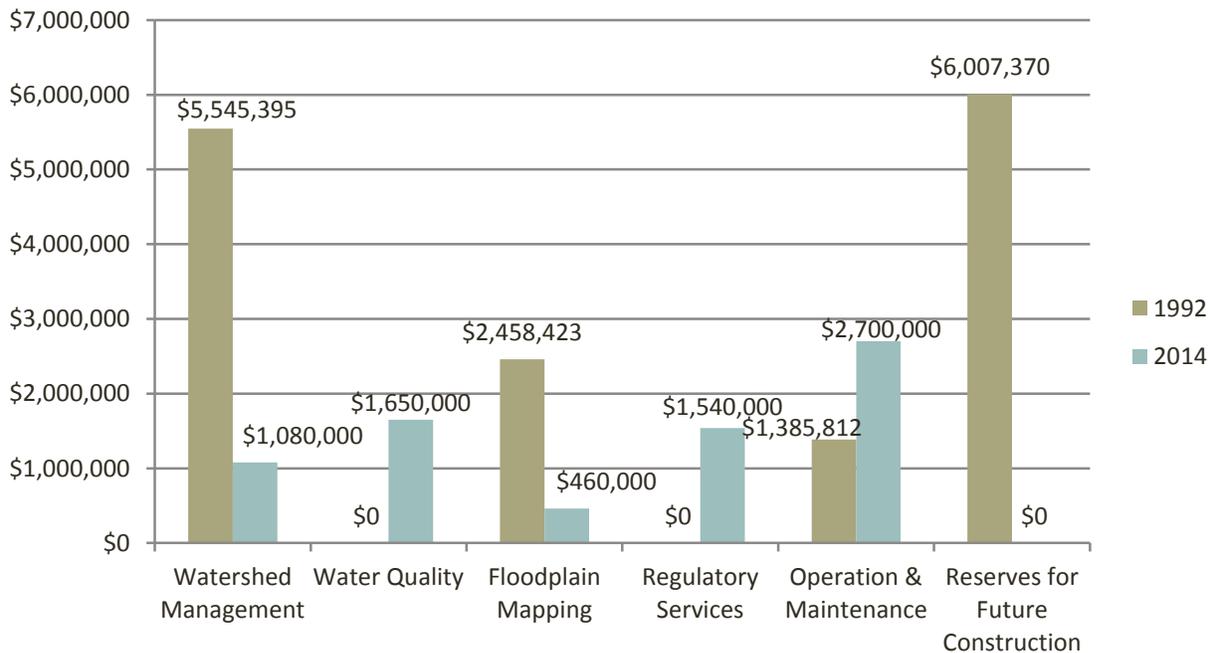


Figure 2 Comparison between operating budget in 2014 and 1992 (NPV)

The program assessment evaluates at the current level of regional stormwater management service the County is providing, while assessing where the program should be to be most effective and helpful. Each of Stormwater Management's five program areas were evaluated based on existing service and funding, as well as future needs as determined by both the County and critical stakeholders. The goal of this plan is to determine a desired level of service countywide, and then the County would assess what additional resources—if any—would be required to achieve this agreed-upon level of service.

The program assessment addresses watershed management, water quality, floodplain mapping, regulatory services and operations and maintenance. The assessment describes each of the program areas, including an overview and services within each one. Additionally, it discusses the ongoing needs and goals of the program within three tiers of services:

- Level 1 – This level involves services that were identified by the County and municipalities and the Forest Preserve as being high priorities.
- Level 2 – This level involves services that were identified by the County, municipalities and Forest Preserve as being priorities, these are shown in addition to the Level 1 goals and the levels are compounding.
- Level 3 – This level involves services either broadly supported or rated as a high priority among certain groups but not the majority of respondents. In some instances, additional education or outreach may be necessary before fully implementing Level 3 potential initiatives.

Based on the results of the Program Assessment, DuPage County Stormwater Management has conducted a Financial Impact Analysis of Levels 1, 2 and 3.

# WATERSHED MANAGEMENT

## OVERVIEW

DuPage County has six main watershed planning areas: Salt Creek, East Branch DuPage River, West Branch DuPage River, Sawmill Creek, Des Plaines River Tributaries and Fox River Tributaries. Stormwater Management uses these watershed plans to:

- Identify potential improvement projects to alleviate current and anticipated flooding problems;
- Index significant natural areas;
- Address water quality and impaired waterways, storage areas and wetlands; and
- Revise floodplain maps.

In addition to watershed planning, the watershed management group oversees flood prone property buyouts and regional project design and construction. Day-to-day, the group also assesses the eligibility of properties for the Voluntary Flood Prone Property Buyout Program, identifies special regulatory needs, provides support to the permit review staff and assists DuPage County communities and the public with watershed planning issues (Figure 3).

Within the municipal survey, the majority of respondents found the watershed management program to be sufficient in its current service offerings. However, both the FPDDC and municipal respondents indicated the program needed additional services, specifically pertaining to funding for projects and buyouts in order to alleviate flooding.

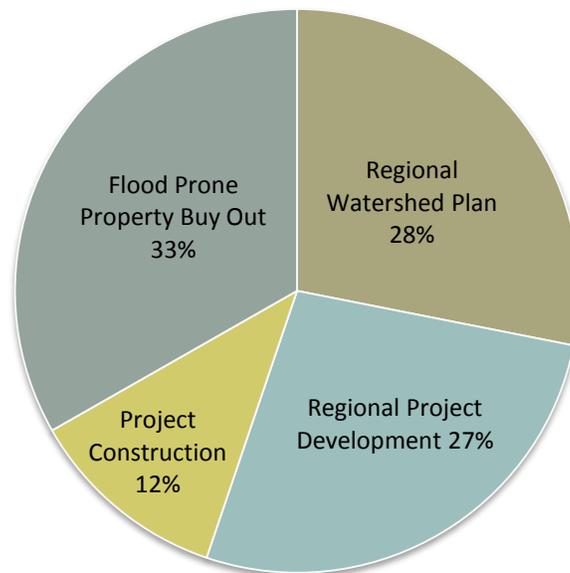


Figure 3 A breakdown of the watershed management group functions.

## PROGRAMS

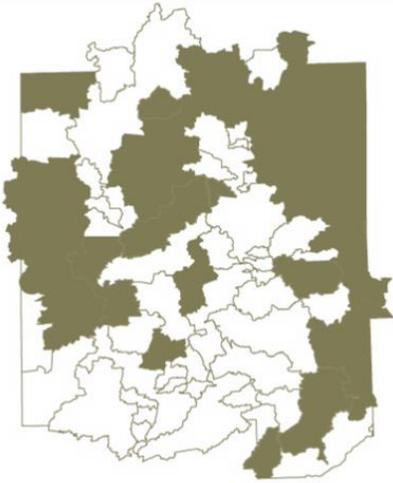


Figure 4 Shaded areas have been studied.

### ***Watershed Planning***

In order to remove the constraint of municipal boundaries, DuPage County studies watersheds on a regional basis to identify potential flood control and water quality projects. During the plan process and project formation, the watershed management group works closely with floodplain mapping to develop models that predict stream flow and flood height under various land use and storm conditions. In addition, local communities, organizations and residents often form a watershed stakeholder group to provide input. When projects are identified in watershed plans, they are more likely to be eligible to federal and state grants. Since 1996, the County has secured approximately \$48.6 million in grants, with an estimated \$35 million in progress, for flood mitigation projects.

However, only an approximate 40 percent of the watersheds (Figure 4) in DuPage County have been studied and a watershed plan produced. Creating watershed plans for the remaining 60 percent of the County is estimated to cost \$3.7 million.

The watershed management group is also responsible for the maintenance of existing watershed models and plans. However, this function has been deferred because of budgetary constraints, and updates currently only occur in conjunction with permitting or mapping at stream crossings.

An overwhelming majority of municipal survey respondents, as well as the FPDDC, identified watershed planning efforts as being a high to very high priority for them, specifically completing watershed plans for unstudied areas.

### ***Regional Project Design & Construction***

The County considers regional stormwater management projects for funding if a problem area meets the regional criteria—meaning the source or the solution to flooding involves multiple jurisdictions. Watershed models assist staff in analyzing possible alternatives, which are then presented to the Stormwater Management Planning Committee and County Board in the form of a watershed plan. The Committee directs staff to develop alternative solutions to address all reported and projected flood damages, including capital improvements, voluntary buyouts and flood proofing. Generally, the Stormwater Management Planning Committee and County Board choose the alternative with the most favorable cost to benefit ratio.

Once a recommended alternative for a watershed plan is adopted and funding is available, watershed management staff will design, permit and construct the individual projects making up the recommended alternative (Figure 5). Stormwater Management frequently partners with outside engineering

consultants to develop design plans and specifications and to obtain the required permits for the project.

Throughout the life of the Stormwater Management Department, DuPage County has constructed 17 regional flood control facilities (including one substantially complete in 2014 and one under construction), in addition to numerous flood mitigation projects. Of the 17 flood control facilities DuPage County operates, four larger facilities have mechanical equipment allowing staff to control them according to a predetermined operating plan. The remaining facilities protect the surrounding areas from flooding without human intervention using fixed weirs and natural drainage systems. In total, the facilities have a floodwater storage capacity of nearly four billion gallons.

While the success of larger facilities constructed in the past have in many instances reduced the need for large-scale projects, such as the Elmhurst Quarry Flood Control Facility, the need for regional projects still exists. Other projects – \$10 million and under – have been identified within watershed plans, approximately \$20 million of which are estimated to be “shovel-ready.” However, following a 2010 County bond for West Branch DuPage River projects, the regional projects program is currently only grant-funded.

Nearly 80 percent of municipal survey respondents, as well as the FPDDC, identified project construction as being a high to very high priority for them.

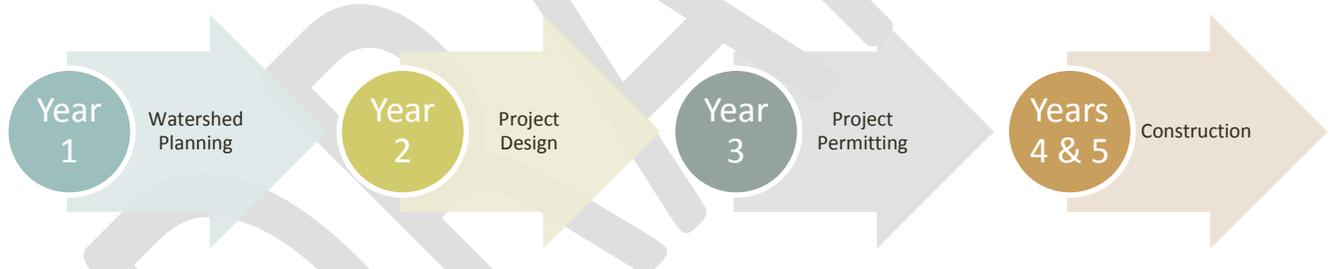


Figure 5 Regional projects often have a 5-year sun-setting project life before they are completed or become obsolete.

### **Voluntary Flood Prone Property Buyouts**

The watershed management group manages the Voluntary Flood Prone Property Buyout Program. The purpose of this program is to buy out properties within the regulatory floodplain that meet certain criteria set by the County. Properties eligible for this program have been identified during the watershed planning process. A property becomes eligible for buyout when flood proofing and other alternatives are shown to be economically infeasible.

Through 2014, the County has purchased 101 properties and returned them to green space. Based on average flood damages, an estimated \$26.4 million in property damage was avoided in the past five major flood events. In addition, the County is working to secure an additional 32 properties with federal funds following the April 2013 flood.

In the past, funding for this program was included in Stormwater Management’s budget. However, for the past 10 years, the County has relied heavily on federal funds to purchase homes. In general, federal funding does not allow the properties to be used in projects, which is a deterrent to completing strategic buyouts. The County currently has 223 properties eligible for buyout list, and each property requires an approximate total of \$300,000 to acquire, demolish and restore the property.

The bulk of municipal survey respondents, as well as the FPDDC, identified flood-prone property buyouts as being a high to very high priority for them.

## RECOMMENDED PROGRAM COMPONENTS

### Level 1 {\$862,000}

This level involves services that were identified by the County and municipalities as being high priorities. Overall, watershed management services within the municipal survey were answered favorably. Of the four overall potential services receiving unanimous support, two were within watershed management. They are detailed below under watershed planning and regional project design & construction. Note that these services are enhancements to the current program components detailed in the previous section.

**\*Note new program components are bolded as they are added to each level.**

**\*\*Continuing programs may require an increased effort in higher levels to keep up with program component demand.**

#### ***Watershed Planning***

- **Partner with communities in local watershed planning efforts. {\$447,000}**

#### ***Regional Project Design & Construction***

- **Offer a municipal flood control project grant program. {\$200,000}**
- Continue to identify and apply for federal funding for flood mitigation projects. **{\$15,000}**

#### ***Voluntary Flood Prone Property Buyouts***

- Continue with a \$200,000 allocation for match shares when federal funding becomes available for buyouts. **{\$200,000}**

### LEVEL 2 {\$2,574,000}

This level involves services that were identified by the County and municipalities as being priorities. In addition, Level 1 goals are shown (not bold).

### ***Watershed Planning***

- Partner with communities in local watershed planning efforts. **{\$532,000}**
- **Complete all watershed plans to allow for more grant opportunities. {\$497,500}**
- **Update older watershed plans to include water quality projects. {\$87,500}**
- **Surveying work for watershed planning, project design and floodplain mapping will be an in-house service to meet greater demand. {\$37,500}**

### ***Regional Project Design & Construction***

- Offer a municipal flood control project grant program. **{\$300,000}**
- Continue to identify and apply for federal funding for flood mitigation projects. **{\$27,500}**
- **Increase the number of projects designed to ensure projects identified in watershed plans to prolong the amount of time before they become outdated. {\$592,000}**

### ***Flood Prone Property Buyouts***

- **Increase annual allocations to allow for the option of the County to purchase either one property or use the increased funds for federal match shares. {\$500,000}**

## **LEVEL 3 {3,702,500}**

This level involves services that were either broadly supported by both the County and municipalities and/or rated as a high priority among certain groups. In some instances, additional education or outreach may be necessary before fully implementing Level 3 potential initiatives. In addition, Level 1 and 2 goals are shown.

### ***Watershed Planning***

- Partner with communities in local watershed planning efforts. **{\$597,500}**
- **Complete all watershed plans to allow for more grant opportunities. {\$497,500}**
- **Update older watershed plans to include water quality projects. {\$110,000}**
- **Surveying work for watershed planning, project design and floodplain mapping will be an in-house service to meet greater demand. {\$37,500}**

### ***Regional Project Design & Construction***

- Offer a municipal flood control project grant program. **{\$400,000}**
- Continue to identify and apply for federal funding for flood mitigation projects. **{\$37,500}**
- **Increase the number of projects both designed and constructed to ensure projects identified in watershed plans do not become outdated. {\$822,500}**

### ***Flood Prone Property Buyouts***

- Establish stable in-house funding to allocate for the buyout program.
- **Increase annual allocations to allow for the option of the County to purchase either multiple properties in-house or use the increased funds for federal match shares. {\$800,000}**
- **Target watershed-specific buyouts for greater effectiveness. {\$400,000}**

	Level 1	Level 2	Level 3
<b><i>Watershed Planning</i></b>			
▪ Partner with Communities with local watershed planning efforts	\$447,000	\$532,000	\$597,500
▪ Complete all watershed plans to allow for more grant opportunities		\$497,500	\$497,500
▪ Update older watershed plans to include water quality projects		\$87,500	\$110,000
▪ Surveying work for watershed planning, project design, and floodplain mapping (in-house service to meet greater demand)		\$37,500	\$37,500
<b><i>Regional Project Design &amp; Construction</i></b>			
▪ Offer a municipal flood control grant program	\$200,000	\$300,000	\$400,000
▪ Continue to identify and apply for federal funding for flood mitigation projects	\$15,000	\$27,500	\$37,500
▪ Increase the number of projects designed and/or constructed to ensure projects identified in watershed plans do not become outdated		\$592,000	\$822,500
<b><i>Voluntary Flood Prone Property Buy Outs</i></b>			
▪ Establish stable in-house funding to allocate for the buyout program	\$200,000		
▪ Increase annual allocation to allow for the option of the County to purchase either multiple properties in-house or use the increased funds for federal match shares		\$500,000	\$800,000
▪ Detention pond inspection program.			
▪ Target watershed specific buyouts for greater effectiveness.			\$400,000
<b>Total</b>	<b>\$ 862,000</b>	<b>\$ 2,574,000</b>	<b>\$ 3,702,500</b>
<b>Headcount</b>	<b>6</b>	<b>7.5</b>	<b>8</b>

# WATER QUALITY

## OVERVIEW

DuPage County Stormwater Management initiated a comprehensive water quality program in 1989 to comply with Clean Water Act requirements. As municipalities within DuPage County meet the Clean Water Act objectives, Stormwater Management has also taken a lead in enacting a regional plan to address water quality issues. A regional water quality program allows for a consistent program across municipal boundaries and provides monetary savings by eliminating the need for redundant programs in each community.

In addition to further adhere to federal requirements, DuPage County's watershed planning efforts also include projects to improve the quality of the County's streams and rivers. Annually, the water quality group also runs the County's Water Quality Improvement Program, which allocates funding to outside organizations or individuals for projects that elicit a regional water quality benefit. A breakdown of water quality staff time can be found in Figure 6.

Within the municipal survey, the majority of respondents found the water quality program to be sufficient in its current service offerings. However, there was strong support from both the FPDDC and several of municipal respondents indicating the program needed additional services, specifically pertaining to funding for projects and grants and education on water quality impacts.

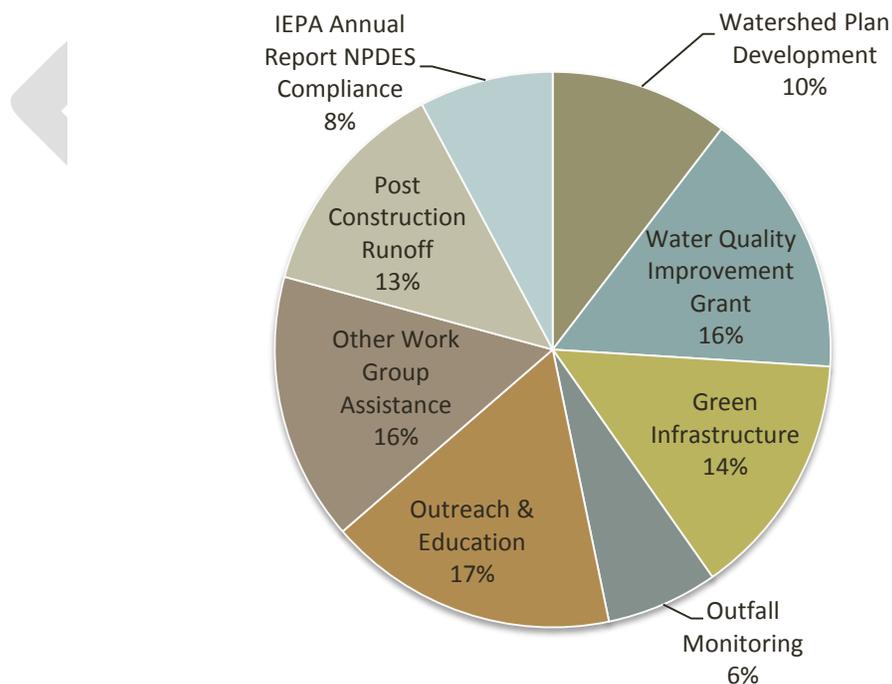


Figure 6 A breakdown of the water quality group functions.

## PROGRAMS

### ***NPDES Permit Compliance***

Following federal mandates over the past decade and in an effort to meet the goals of the Clean Water Act, the Environmental Protection Agency (EPA) implemented controls for stormwater management under the National Pollutant Discharge Elimination System (NPDES) permit for discharging stormwater into Waters of the State. DuPage County applied for coverage under the permit in 2003 and renewed in 2009. The permit contains six minimum control measures to ensure pollutants carried by stormwater runoff are treated to the maximum extent practicable with green infrastructure improvements and best management practices. The measures and how DuPage County adheres to them include:

- 1. *Public Outreach & Education:*** Regional public outreach campaigns address utilization of best management practices for the control of pollutants associated with stormwater. The County streamlines this effort.
- 2. *Public Involvement & Participation:*** Includes the organization and oversight of public meetings, stakeholder groups and watershed programs, such as the County's Adopt-a-Stream program.
- 3. *Illicit Discharge Detection & Elimination (IDDE):*** The enactment of an IDDE ordinance is required to prohibit any non-exempt discharge other than stormwater into the storm sewer system in unincorporated DuPage County. Additionally, the County entered into intergovernmental agreements with nearly all incorporated municipalities to conduct and coordinate mandated monitoring for illicit discharges on a regional basis.
- 4. *Construction Site Stormwater Runoff Control:*** Construction site inspections in unincorporated areas to ensure erosion and sediment control is done by the County's regulatory group.
- 5. *Post-Construction Runoff Control:*** Ensures best management practices are installed with new development and redevelopment in unincorporated areas. Managed by the regulatory group through the Ordinance, which was adopted by 37 municipalities.
- 6. *Pollution Prevention & Good Housekeeping:*** The County engages in maintenance and inspection of installed best management practices. In addition, the group provides technical pollution prevention trainings several times a year for municipalities.

Noted above, the public education and outreach and IDDE programs are both regional, which saves taxpayers an estimated \$4.5 million annually. Expanded regional NPDES programs could result in greater savings for municipalities and taxpayers. In addition, it could protect municipalities from becoming out of compliance, which could result in fines of up to \$25,000 per day per violation enforced by the EPA.

More than 46 percent of survey respondents were interested in expanding NPDES offerings through the County in order to remain in compliance with evolving federal regulations.

### ***Water Quality Projects***

Water quality projects have often been found within watershed plans, such as streambank stabilization work in conjunction with flood control projects. To keep up with new guidelines from the EPA, DuPage

County is actively incorporating water quality projects into new and existing watershed plans. In order to qualify for federal funding, these projects must meet nine elements set forth by the EPA, including:

1. Identify causes and sources of pollution that need to be controlled.
2. Determine load reductions needed.
3. Develop management measures to achieve goals.
4. Develop implementation schedule.
5. Develop interim milestones to track implementation of management measures.
6. Develop criteria to measure progress toward meeting watershed goals.
7. Develop monitoring component.
8. Develop information/education component.
9. Identify technical and financial assistance needed to implement plan.

In the past, DuPage County has been very successful in securing federal grants for water quality projects, including \$1.7 million for the Churchill Woods Dam Removal and a total \$11.37 million for improvements along the West Branch DuPage River. In addition, the projects have resulted in measurably improved waters. In fact, the Churchill Woods project was able to bring that stretch of the West Branch out of impairment. However, water quality projects have traditionally only been funded through grants.

The majority of municipal survey respondents, as well as the FPDDC, signified that updating watershed plans to include robust water quality projects was a high to very high priority for them. In addition, more than half indicated expanded water quality project design and construction was a high to very high priority for them.

#### ***Water Quality Improvement Grant Program***

The Water Quality Improvement Program awards partial grant funding of up to \$300,000 annually to projects exhibiting a regional approach to water quality improvements, including streambank stabilizations, habitat improvements and green infrastructure to reduce or filter stormwater runoff. Local governments, nonprofit organizations, businesses, homeowners' associations and landholders may apply for funding of up to 25 percent for portions of the project relating to water quality. In addition, grant recipients may use the funds to satisfy half of the local match requirement for federal and/or state grants.

Since 2003, the County has awarded 52 projects. Fiscal year 2014 was the biggest application year to date with more than a \$1.7 million in funds requested.

The majority of municipal survey respondents, as well as the FPDDC, signified that sustaining the Water Quality Improvement Grant Program was a high to very high priority for them.

## RECOMMENDED PROGRAM COMPONENTS

### LEVEL 1 {\$1,097,500}

This level involves services that were identified by the County as being high priorities. In addition, municipal and FPDDC overall water quality input is included within Level 1 as it describes pressing needs within the water quality program. All of the potential water quality services received broad support within the municipal survey and are noted in following levels. Note that these services are enhancements to the current program components detailed in the previous section.

**\*Note new program components are bolded as they are added to each level.**

**\*\*Continuing programs may require an increased effort in higher levels to keep up with program component demand.**

#### *NPDES Permit Compliance*

- Enhance regional education efforts on water quality impacts. **{\$263,000}**
- Ensure NPDES efforts remain in compliance with changing federal mandates. **{\$114,500}**

#### *Water Quality Projects*

- Increase involvement in water quality project implementation – both in and outside of the County. **{\$120,000}**
- Enhance the plan for regional water quality project, design and construction to ensure projects remain updated and are in accordance with flood mitigation projects. **{\$300,000}**

#### *Water Quality Improvement Program*

- Continue supporting the program with a \$300,000 annual allocation to award up to 25 percent of applicable projects. **{\$300,000}**

### LEVEL 2 {\$2,078,000}

This level involves services that were identified by the County and municipalities as being priorities. In addition, Level 1 goals are shown (not bold).

#### *NPDES Permit Compliance*

- Enhance regional education efforts on water quality impacts. **{\$332,000}**
- Enhance water quality education activities, both general and technical training. **{\$173,000}**
- **Enhanced outfall monitoring program to effectively monitor each outfall every year, which would require an estimated 10 to 20 outfalls to be screened each day. {\$128,000}**

#### *Water Quality Projects*

- Increase involvement in water quality project implementation – both in and outside of the County. **{\$120,000}**
- Enhance the plan for regional water quality project, design and construction to ensure projects remain updated and are in accordance with flood mitigation projects. **{\$500,000}**
- **Identify water quality projects in each major watershed. {\$83,000}**

#### ***Water Quality Improvement Program***

- **Continue supporting the program with an enhanced annual allocation to award up to 25 percent of applicable projects. {\$500,000}**
- **Measure the success of projects in terms of how they will minimize pollutants reaching waterways through enhanced maintenance and monitoring. {\$242,000}**

### **LEVEL 3 {3,872,000}**

This level involves services that were either broadly supported by both the County and municipalities and/or rated as a high priority among certain groups. In some instances, additional education or outreach may be necessary before fully implementing Level 3 potential initiatives. In addition, Level 1 and 2 goals are shown.

#### ***NPDES Permit Compliance***

- Enhance regional education efforts on water quality impacts. **{\$443,000}**
- Enhance water quality education activities, both general and technical training. **{\$173,000}**
- Enhanced outfall monitoring program to effectively monitor each outfall every year, which would require an estimated 10 to 20 outfalls to be screened each day. **{\$132,000}**
- **Create a completely regional program for NPDES requirements. {\$120,000}**
- **Create a GIS database for storm sewers across municipal boundaries. {\$21,000}**

#### ***Water Quality Projects***

- Increase involvement in water quality project implementation – both in and outside of the County. **{\$120,000}**
- Enhance the plan for regional water quality project, design and construction to ensure projects remain updated and are in accordance with flood mitigation projects. **{\$1,200,000}**
- Identify water quality projects in each major watershed. **{\$83,000}**
- **Offer County assistance with community-based green infrastructure projects. {\$104,000}**

#### ***Water Quality Improvement Program***

- **Continue supporting the program with an enhanced annual allocation. {\$500,000}**
- Measure the success of projects in terms of how they will minimize pollutants reaching waterways through enhanced maintenance and monitoring. **{\$476,000}**
- **Enhance award percentage and/or County assistance based on merits of proposed project. {\$500,000}**

	Level 1	Level 2	Level 3
<b>NPDES Permit Compliance</b>			
▪ Enhance regional education efforts on water quality	\$263,000	\$332,000	\$443,000
▪ Enhance water quality education activities, both general and technical training		\$173,000	\$173,000
▪ Enhance outfall monitoring program to effectively monitor each outfall every year		\$128,000	\$132,000
▪ Create a regional program for the NPDES permit requirement (6 measures)			\$120,000
▪ Create a GIS database for storm sewers across municipal boundaries			\$21,000
<b>Water Quality Projects</b>			
▪ Increase involvement in water quality project implementation-both in and outside of the County	\$120,000	\$120,000	\$120,000
▪ Enhance the plan for regional water quality projects design and construction to ensure projects remain updated and are in accordance with flood mitigation projects	\$300,000	\$500,000	\$1,200,000
▪ Identify water quality projects within each major watershed		\$83,000	\$83,000
▪ Offer County assistance with community-based green infrastructure projects			\$104,000
<b>Water Quality Improvement Program</b>			
▪ Continue supporting program (Enhanced allocation-Level 2 & 3)	\$300,000	\$500,000	\$500,000
▪ Measure the success of the projects in terms of how the minimize pollutants reaching waterwats through enhances maintenance & monitoring		\$242,000	\$476,000
▪ Enhance award percentage and/or County Assistance based on merits of proposed project			\$500,000
<b>Total</b>	<b>\$983,000</b>	<b>\$2,078,000</b>	<b>\$3,872,000</b>
<b>Headcount</b>	<b>3.5</b>	<b>6</b>	<b>8</b>

# FLOODPLAIN MANAGEMENT

## OVERVIEW

DuPage County has been a leader in floodplain management for over two decades in the State of Illinois. When countywide stormwater management responsibility was taken on in the late 1980s, DuPage County Stormwater Management assumed responsibility for managing and maintaining the floodplain models and maps of all the regulated stream reaches in the County. Accurate maps are needed as a source of information for property owners, regulators and developers to reduce and prevent future flood damages. DuPage County Stormwater Management is creating updated maps based upon the County’s watershed planning models that have been and will be developed. The new maps will reflect changes in land use, topography, hydraulic structures, and modeling technology since the original development dates.

In addition to floodplain mapping, the County provides a variety of services to the public under this program area, including floodplain determinations, map revisions and assistance when submitting a Letter of Map Revision (LOMR), a Letter of Map Amendment (LOMA), a Conditional Letter of Map Amendment (CLOMA) and similar floodplain modification documents to the Federal Emergency Management Agency (FEMA) (Figure 7).

Within the municipal survey, the greater part of municipal respondents, as well as the FPDDC, found the floodplain mapping program to be sufficient or comprehensive in its current service offerings. However, a significant number of municipal respondents indicated the program needed additional services, specifically pertaining to accurate floodplain maps.

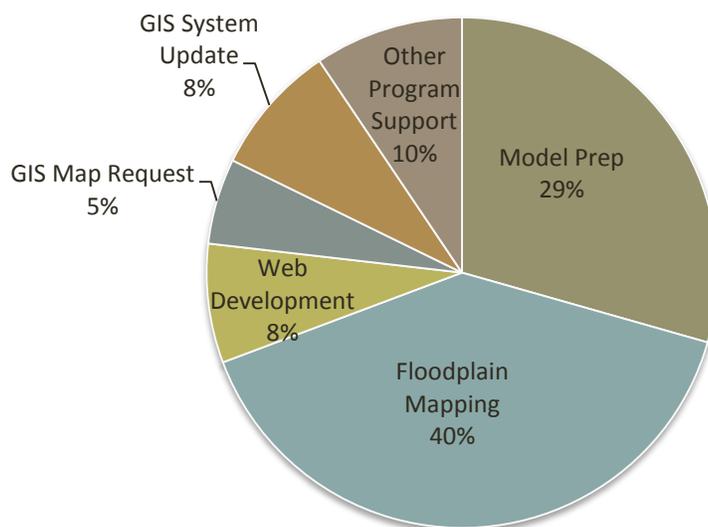


Figure 7 Breakdown of floodplain mapping group's functions.

## PROGRAMS

### ***Floodplain Mapping***

The County entered into a Cooperating Technical Community (CTC) Agreement with FEMA in 1998 to re-delineate the existing floodplains on the County's 2-foot topographic maps. The County completed the conversion of the existing FEMA Flood Insurance Rate Maps (FIRM) to Digital Flood Insurance Rate Maps (DFIRM) for the entire county in 2003. This process included the transfer of all current regulatory flood elevation information to a new base map, the re-delineation of the floodplain boundaries, as well as the correction of all known error and omissions to the maps. This new countywide map was approved by FEMA for regulatory purposes and flood insurance purposes in 2004. Any new floodplain information based on the watershed plan models will replace outdated floodplain information.

In September 2008, DuPage County received \$2,050,000 in funding under the FEMA's Fiscal year 2008 Map Maintenance initiative. The grant money has been supporting engineering studies, floodplain mapping activities and community coordination activities that are being conducted in collaboration with FEMA and the Illinois State Water Survey, another CTP. Revised floodplain mapping will be completed for 25 separate watersheds throughout DuPage County, including the Salt Creek Mainstem and seven of its tributaries; the East Branch DuPage River Mainstem and eleven of its tributaries; three tributary watersheds to the West Branch DuPage River Watershed; and Sawmill Creek and Wards Creek.

These mapping updates also contribute to savings under FEMA's Community Rating System (CRS). It's estimated the County's floodplain mapping activities save CRS communities a total of more than \$1 million annually in flood insurance premiums.

However, the mapping cycle takes 20 years to complete. For this reason, a large portion of the County still needs to be studied. The majority of the municipal survey respondents signified that expediting the floodplain mapping cycle was a high to very high priority for them. In addition, 80 percent, as well as the FPDDC, indicated completing the floodplain maps for each watershed was a high to very high priority for them.

### ***Floodplain Map Maintenance***

In addition to creating new floodplain maps, DuPage County is responsible for maintaining and updating existing maps to account to new storm events, flood mitigation projects and changes in land use. A key to maintaining accurate maps is the maintenance of the hydrologic, hydraulic, and water quality models that have been developed for the County's waterways over the years.

Currently, the maps only receive update attention when a stormwater permit is applied for or when a stream crossing is modified. However, nearly 80 percent of municipal survey respondents indicated that map maintenance was a high to very high priority for them.

### ***Floodplain Determinations & Technical Support***

The floodplain mapping group also provides technical support to both individuals and communities and may assist with floodplain elevation, GIS map requests and support when working with FEMA. In addition, as FEMA updates its National Flood Insurance Program (NFIP), the group may have increased requests for support, especially from CRS communities. Within the municipal survey, input collected highlighted how important these services are to residents and businesses who may be trying to assess their risk or reduce flood insurance premiums.

## **RECOMMENDED PROGRAM COMPONENTS**

For this needs assessment, there are three levels of service that are being considered as described below:

- Minimum level or basic level of service assumes existing staff levels, perform all tasks in-house and cycle through floodplain map updates every 20 years;
- Intermediate level of service assumes some increase in staff or the use of outside consultants in order to cycle through floodplain map updates every 15 years; and
- Comprehensive level of service assumes having enough in-house and outside consulting services to cycle through floodplain map updates every 10 years.

### **LEVEL 1 {\$502,350}**

This level involves services that were identified by the County as being high priorities. In addition, overall floodplain mapping input from the survey is included within Level 1 as it describes pressing needs within the program. Overall, potential improvements to the floodplain mapping program were favored by municipalities. Note that these services are enhancements to the current program components detailed in the previous section.

**\*Note new program components are bolded as they are added to each level.**

**\*\*Continuing programs may require an increased effort in higher levels to keep up with program component demand.**

#### ***Floodplain Mapping***

- **To keep up with demands of the watershed plans, an effort will need to be made to reduce the floodplain mapping cycle within each level. {\$389,450}**

#### ***Floodplain Map Maintenance***

- **Resolve any discrepancies in existing maps. {\$53,000}**

#### ***Floodplain Determinations & Technical Support***

- **Enhance digital accessibility of floodplain maps. {\$42,400}**

- **Increase communication efforts and community involvement. {\$17,500}**

## **LEVEL 2 {\$667,965}**

This level involves services that were identified by the County and municipalities as being priorities. In addition, Level 1 goals are shown (not bold)

### ***Floodplain Mapping***

- To keep up with demands of the watershed plans, an effort will need to be made to reduce the floodplain mapping cycle within each level. **{\$484,515}**

### ***Floodplain Map Maintenance***

- Resolve any discrepancies in existing maps. **{\$53,000}**
- **Implement a regular map maintenance program. {\$46,800}**
- **Assist communities with LOMR updates. {\$10,000}**
- **Maintain and update hydrological, hydraulic and water quality models. {\$13,750}**

### ***Floodplain Determinations & Technical Support***

- Enhance digital accessibility of floodplain maps. **{\$42,400}**
- Increase communication efforts and community involvement. **{\$17,500}**

## **LEVEL 3 {\$962,350}**

This level involves services that were either broadly supported by both the County and municipalities and/or rated as a high priority among certain groups. In some instances, additional education or outreach may be necessary before fully implementing Level 3 potential initiatives. In addition, Level 1 and 2 goals have been included.

### ***Floodplain Mapping***

- **Reduce the floodplain mapping cycle to 10 years. {\$778,900}**

### ***Floodplain Map Maintenance***

- Resolve any discrepancies in existing maps. **{\$53,000}**
- Implement a regular map maintenance program. **{\$46,800}**
- Assist communities with LOMR updates. **{\$10,000}**
- Maintain and update hydrological, hydraulic and water quality models. **{\$13,750}**

### ***Floodplain Determinations & Technical Support***

- Enhance digital accessibility of floodplain maps. **{\$42,400}**
- Increase communication efforts and community involvement. **{\$17,500}**

	Level 1	Level 2	Level 3
<b><i>Floodplain Mapping</i></b>			
▪ Reduce Floodplain Mapping Cycle	\$389,450	\$484,515	\$778,900
<b><i>Floodplain Map Maintenance</i></b>			
▪ Resolve any discrepancies in existing maps	\$53,000	\$53,000	\$53,000
▪ Implement regular map maintenance program		\$46,800	\$46,800
▪ Assist communities with LOMR updates		\$10,000	\$10,000
▪ Maintain and update hydrological, hydraulic and water quality model		\$13,750	\$13,750
<b><i>Floodplain Determinations &amp; Technical Support</i></b>			
▪ Enhance digital accessibility of floodplain maps	\$42,400	\$42,400	\$42,400
▪ Increase communication efforts and community involvement	\$17,500	\$17,500	\$17,500
<b>Total</b>	<b>\$502,350</b>	<b>\$667,965</b>	<b>\$962,350</b>
<b>Headcount</b>	<b>5</b>	<b>5.5</b>	<b>6.5</b>

DRAFT

# REGULATORY SERVICES

## OVERVIEW

DuPage County Stormwater Management’s regulatory and permitting group is tasked with protecting property and natural resources and minimizing stormwater damage in DuPage County. This is accomplished by permitting, regulating and monitoring of any new development or redevelopment through enforcement of the DuPage County Countywide Stormwater and Floodplain Ordinance (Ordinance). This promotes effective, equitable, acceptable and legal stormwater management measures in DuPage County. Currently, staff performs review and inspection for engineering, environmental, and drainage aspects of the Ordinance; wetland banking administration; overall permitting administration; staff, technical support, and training for municipalities and the development community; public outreach; natural areas management and monitoring; and countywide wetland mapping (Figure 8).

Within the municipal survey, approximately 80 percent of respondents found the regulatory services program to be sufficient or comprehensive in its current service offerings. However, a significant portion of municipal respondents, as well as the FPDDC, indicated the program needed additional services.

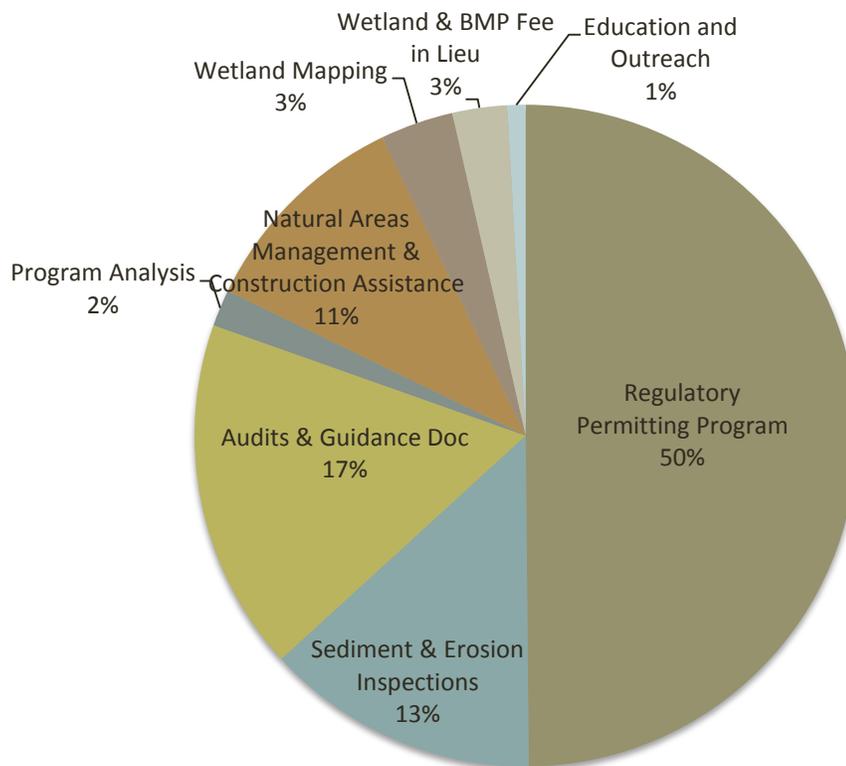


Figure 8 Breakdown of services within the regulatory services group.

## PROGRAMS

### ***Ordinance Enforcement & Updates***

When the DuPage County Board elected to create the DuPage County Stormwater Management Planning Committee in 1988, municipalities within County boundaries were given the option to enter into DuPage County's Stormwater Management program or neighboring regional jurisdiction, if applicable. Those municipalities who opted in were then given the option of adopting the County's Ordinance and implementing it fully in house (complete waiver), having limited authority to implement the ordinance (partial waiver), or allowing the County to do all of the Ordinance-required permitting (non-waiver). The implementation of the Ordinance requires a variety of support activities including; plan review, permit application review, inspection, enforcement, auditing of delegated programs and providing technical guidance for new development and redevelopment in the County.

Last updated in April 2012, the County's Ordinance has seen several revisions since it was adopted in 1991. However, the Technical Guidance Manual was not updated during the last revision. This helps communities adhere to the Ordinance's guidelines, and approximately 82 percent of municipalities rated the manual update as a high to very high priority in the survey.

### ***Permit Review Services***

DuPage County performs approximately 350 new developments reviews annually. These reviews result in approximately 100 new permits per year. Most of the 100 permits require a second inspection due to failures on the first. The County uses a permit tracking package (GOVERN) to manage its permits and permit status. However, the program has its limitations and does not currently have the functionality necessary to be used for managing complex permits.

The current permit review process takes 20 to 40 days, but many municipalities expressed an interest in reducing this turnaround time. The majority of municipal respondents and the FPDDC signified that a quicker permit review process was a high to very high priority for them. Many also signified that increased access to staff was important during this process, but realized the need for updated permit software to increase efficiencies.

### ***Compliance Inspections***

The regulatory group is responsible for Ordinance permitting and drainage reviews and inspections in several non-waiver communities, including unincorporated DuPage County. For the municipalities that chose to be waiver communities, the County is also required by the Ordinance to review the implementation and enforcement of each waiver community's stormwater program (a community audit) on a schedule as adopted by the Stormwater Management Committee.

These stormwater inspections also satisfy NPDES requirements in order to avoid strict fines and cleanup costs resulting from non-compliance. As noted within the water quality program, a regional NPDES program could result in saved resources for municipalities, and several of municipal respondents indicated enhanced NPDES compliance services would alleviate some burden.

### ***Wetland Services***

The regulatory group is also responsible for managing the wetland banking program for the County. The wetland banking program was adopted by the Stormwater Management Planning Committee and County Board in 1993 to give the development community the option of offsite wetland replacement while keeping the significant benefits of wetlands in the same watershed as the impact. The wetland banking program is self-supporting based on permitted impact fees. In 1995, the U.S. Army Corps of Engineers issued a general permit to DuPage County delegating the authority to review on their behalf wetland impacts regulated by Section 404 of the Clean Water Act. DuPage County is the only county in the United States with this authority.

Currently, wetland determinations require 10 to 14 workdays to complete. However, numerous municipal respondents and the FPDDC indicated quicker turnaround times is a high to very high priority for them.

In addition, this group is responsible for modernizing existing wetland maps. This will allow the County to provide information that is more accurate to residents, developers and businesses. The group also assists with management and monitoring of DuPage County construction projects.

## **RECOMMENDED PROGRAM COMPONENTS**

### **LEVEL 1 {\$1,471,900}**

This level involves services that were identified by the County as being high priorities. In addition, overall regulatory services input from the survey is included within Level 1 as it describes pressing needs within the program. Note that these services are enhancements to the current program components detailed in the previous section.

**\*Note new program components are bolded as they are added to each level.**

**\*\*Continuing programs may require an increased effort in higher levels to keep up with program component demand.**

#### ***Ordinance Enforcement & Updates {\$342,600}***

- **Update the Technical Guidance Document. {\$342,600}**

#### ***Permit Review Services {\$983,300}***

- **Improve upon the 20 to 40 day permit review cycle. {\$667,000}**
- **Increase access of staff during the permit review process. {\$316,300}**

#### ***Compliance Inspections {\$97,900}***

- **Allow for enhanced random and complaint-based inspections. {\$75,400}**

- Provide soil inspections for infiltration practices in order to meet increased federal and state environmental requirements. {\$22,500}

***Wetland Services {\$48,100}***

- Improve upon the 10 to 14 workday wetland determination schedule. {\$48,100}

**LEVEL 2 {\$1,918,300}**

This level involves services that were identified by the County and municipalities as being priorities. In addition, Level 1 goals are shown (not bold).

***Ordinance Enforcement & Updates {\$369,200}***

- Update the Technical Guidance Document. {\$342,600}
- Create specialized annual training for municipal staff. {\$26,600}

***Permit Review Services {\$1,387,500}***

- Decrease permit review turnaround time. {\$870,000}
- Increase access of staff during the permit review process. {\$316,300}
- Develop an electronic permit submittal program. {\$201,200}

***Compliance Inspections {\$97,900}***

- Allow for enhanced random and complaint-based inspections. {\$75,400}
- Provide soil inspections for infiltration practices in order to meet increased federal and state environmental requirements. {\$22,500}

***Wetland Services {\$63,700}***

- Improve upon the 10 to 14 workday wetland determination schedule. {\$48,100}
- Update and maintain wetland maps. {\$15,600}

**LEVEL 3 {\$2,461,500}**

This level involves services that were either broadly supported by both the County and municipalities and/or rated as a high priority among certain groups. In some instances, additional education or outreach may be necessary before fully implementing Level 3 potential initiatives. In addition, Level 1 and 2 goals have been included.

***Ordinance Enforcement & Updates {\$439,200}***

- Update the Technical Guidance Document. {\$342,600}
- Create specialized annual training for municipal staff. {\$26,600}
- Create a regular cycle for community audits. {\$70,000}

***Permit Review Services {\$1,594,800}***

- Decrease permit review turnaround time. {\$928,000}
- Increase access of staff during the permit review process. {\$316,300}

- Develop an electronic permit submittal program. {\$201,200}
- **Update permit tracking software. {\$120,000}**
- **Expand NPDES permit compliance services. {\$19,000}**
- **Specialized annual or biennial training for realtors, consultants, builders, developers, and municipalities for Ordinance, property screening, permit process, design requirements, and permit as-built requirements. {\$10,300}**

***Compliance Inspections {\$159,700}***

- Allow for enhanced random and complaint-based inspections. {75,400}
- Provide soil inspections for infiltration practices in order to meet increased federal and state environmental requirements. {\$22,500}
- **Create detention pond inspection program. {\$61,800}**

***Wetland Services {\$267,800}***

- Improve upon the 10 to 14 workday wetland determination schedule. {\$48,100}
- Update and maintain wetland maps. {\$15,600}
- **Create a Certified Wetland Specialist program and professional education series. {\$29,100}**
- **Institute a wetland properties buyout program. {\$175,000}**

	Level 1	Level 2	Level 3
<b>Ordinance Enforcement &amp; Updates</b>	<b>\$342,600</b>	<b>\$369,200</b>	<b>\$439,200</b>
<b>Permit Review Services</b>	<b>\$983,300</b>	<b>\$1,387,500</b>	<b>\$1,594,800</b>
<b>Compliance Inspections</b>	<b>\$97,900</b>	<b>\$97,900</b>	<b>\$159,700</b>
<b>Wetland Services</b>	<b>\$48,100</b>	<b>\$63,700</b>	<b>\$267,800</b>
<b>total</b>	<b>\$1,471,900</b>	<b>\$1,918,300</b>	<b>\$2,461,500</b>
<b>headcount</b>	<b>13</b>	<b>16</b>	<b>18</b>

# FLOOD OPERATIONS & MAINTENANCE

## OVERVIEW

Once construction of a flood control facility is complete, Stormwater Management implements an operations and maintenance schedule. Operations and maintenance for many of the County's facilities are assigned to other entities through Intergovernmental Agreements (IGAs). These IGAs typically define the ownership, access, liabilities and operational and maintenance responsibilities associated with each project or facility. However, the County maintains control of the larger regional flood control facilities that operate with mechanical equipment, including the Elmhurst Quarry Flood Control Facility, Wood Dale-Itasca Reservoir, Spring Creek Reservoir and Fawell Dam.

In addition to routine maintenance and operation during flood events, this group is responsible for prepping for a flood through the flood forecasting program helps predict the severity of events and the stream maintenance program that clears stream obstructions that may cause flooding. Figure 9 shows a breakdown of services within the flood operations and maintenance group.

Within the municipal survey, the majority of respondents found the flood operations and maintenance program to be sufficient or comprehensive in its current service offerings. However, a significant portion of municipal respondents, as well as the FPDDC, indicated the program needed additional services.

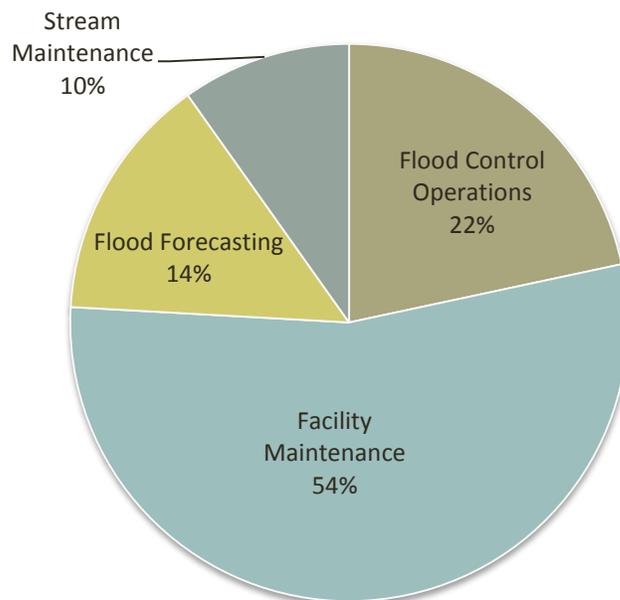


Figure 9 The breakdown of functions within the flood operations & maintenance group.

## PROGRAMS

### ***Operation of Flood Control Facilities***

Operating the various flood control facilities is typically the responsibility of Stormwater Management. Most of the facilities are designed to operate without human intervention. These facilities have fixed intake weirs or control structures and gravity drained outlets. However, a few of the larger regional facilities—including the Elmhurst Quarry Flood Control Facility, Wood Dale-Itasca Reservoir, Spring Creek Reservoir and Fawell Dam—have moveable sluice gates and other mechanical equipment. These allow for greater flexibility of operation as floodwater can be diverted into reservoirs at varying elevations.

The County operates a Supervisory Control and Data Acquisition (SCADA) system and a remote operation network to support it. The network facilities that are monitored or controlled by this system include pumps, gates and reservoirs throughout the County. The entire network of facilities that are on the system can be controlled from any of four remote locations or from the County Government Center.

### ***Facility Maintenance***

The maintenance of flood control facilities is primarily subcontracted to the Public Works Department, although Stormwater Management staff performs some limited maintenance. The physical features of the larger facilities that require operation and maintenance services include gates, pumps and intake weirs. Staff performs routine checks and minor maintenance at these stormwater facilities weekly. The Spring Creek facility is checked twice weekly.

In larger regional facilities, maintenance also includes routine grounds maintenance, facility operation and maintenance, and capital repair and replacement. Generally, grounds maintenance is the responsibility of a public entity, such as a municipality, park district or forest preserve. It often includes mowing and burning vegetation, seeding and mulching of eroded areas, painting and debris and litter removal. Stormwater Management is then responsible for the facility maintenance, including utilities, control buildings and all control equipment required to operate the facility. Stormwater Management is also responsible for any major capital repairs and replacement, including sluice gates, spillways, control structures and pumps.

The County's flood control facilities require both annual maintenance and long-term replacement and repair (Figure 10). By 2024, the County estimates capital improvement projects will cost \$11,183,091, which is currently unfunded.

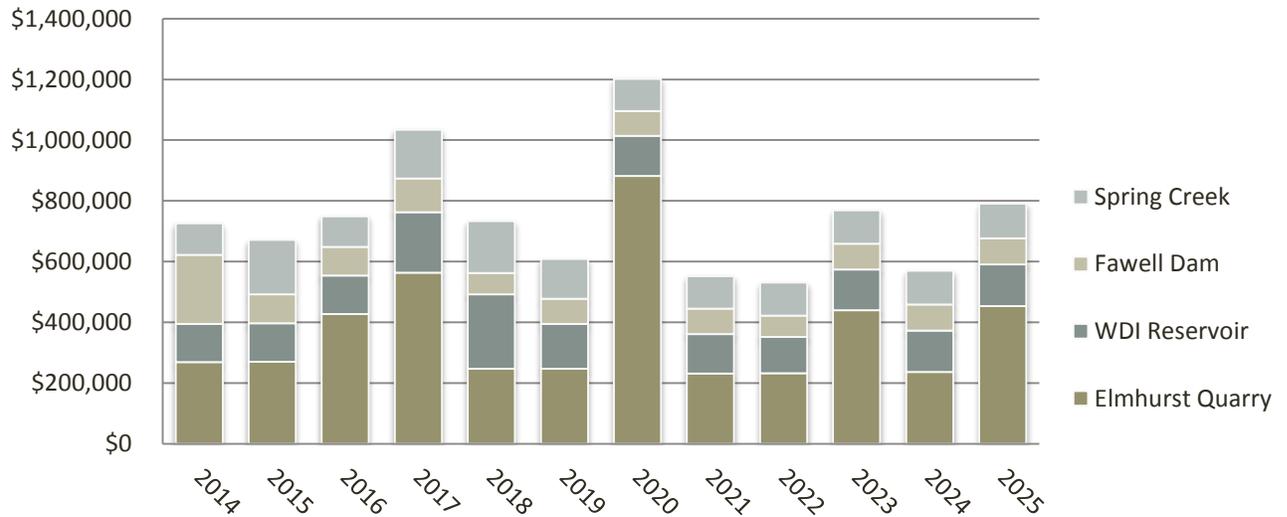


Figure 10 The anticipated annual costs for the countywide flood control facilities.

### **Flood Forecasting Program**

During storm events, Stormwater Management staff monitors rain gages and stream elevation gages. Flood forecasting models then help staff determine when to operate as engineers can estimate the effects of diverting stream flow in and out of the flood control facilities. By utilizing this data—along with the information received from the gages, Internet and local radar—staff is able to efficiently operate the flood control facilities.

There is a cost share program in place with the United States Geological Survey (USGS) for the operation of the rain and stream gauges within the County. This network, in conjunction with the Next Generation Doppler Radar (NEXRAD) and the County’s model, has allowed the creation of a real time storm event simulation and a flood forecasting program for the County.

### **Stream Maintenance Program**

The County once had a stream and streambank maintenance program. On average, the County maintained between 30 and 33 miles of stream annually. The maintenance typically involves the removal of trees, debris and trash to maintain conveyance and prevent local flooding during storms. At the current time, the program does not include streambank stabilization projects unless a public stream crossing is in jeopardy. If the crossing is in jeopardy riprap may be applied to the streambank. Historically, the County has offered grants up to 20 percent of the total cost of a streambank restoration project. The cost share is oftentimes in-kind services. The program is currently reactive and costs the County \$200,000 per year.

## RECOMMENDED PROGRAM COMPONENTS

### LEVEL 1 **{\$2,750,000}**

This level involves services that were identified by the County as being high priorities. In addition, municipal and FPDDC overall operations and maintenance input is included within Level 1 as it describes pressing needs within the water quality program. Note that these services are enhancements to the current program components detailed in the previous section.

**\*Note new program components are bolded as they are added to each level.**

**\*\*Continuing programs may require an increased effort in higher levels to keep up with program component demand.**

#### ***Operation of Flood Control Facilities***

- Continue to operate flood control facilities **{\$1,500,000}**
- **Re-establish a capital program for new projects {\$200,000}**

#### ***Facility Maintenance***

- **Re-establish a capital program for flood control facilities {\$500,000}**

#### ***Flood Forecasting Program***

- Continue flood forecasting program **{\$350,000}**

#### ***Stream Maintenance Program***

- Continue the stream obstruction-clearing program. **{\$200,000}**

### LEVEL 2 **{\$2,977,500}**

This level involves services that were identified by the County and municipalities as being priorities. In addition, Level 1 goals are shown (not bold).

#### ***Operation of Flood Control Facilities***

- Continue to operate flood control facilities **{\$1,50,000}**
- **Re-establish a capital program for new projects {\$200,000}**

#### ***Facility Maintenance***

- **Re-establish a capital program for flood control facilities {\$500,000}**

#### ***Flood Forecasting Program***

- Continue flood forecasting program **{\$350,000}**

#### ***Stream Maintenance Program***

- **Enhance the stream obstruction-clearing program. {\$300,000}**

- **Create a streambank stabilization program. {\$127,000}**

### **LEVEL 3 {\$3,220,500}**

This level involves services that were either broadly supported by both the County and municipalities and/or rated as a high priority among certain groups. In some instances, additional education or outreach may be necessary before fully implementing Level 3 potential initiatives. In addition, Level 1 and 2 goals have been included.

#### ***Operation of Flood Control Facilities***

- Continue to operate flood control facilities **{\$1,500,000}**
- Re-establish a capital program for new projects **{\$200,000}**

#### ***Facility Maintenance***

- Re-establish a capital program for flood control facilities **{\$500,000}**
- **Create detention pond inspection program {\$20,000}**
- **Create a detention pond maintenance program {\$28,000}**
- **Provide storm sewer televising. {\$29,500}**
- **Provide storm sewer cleaning/jetting. {\$66,000}**
- **Provide detention pond outlet cleaning. {\$28,500}**

#### ***Flood Forecasting Program***

- Continue flood forecasting program **{\$350,000}**

#### ***Stream Maintenance Program***

- Enhance the stream obstruction-clearing program. **{\$350,000}**
- Create a streambank stabilization program. **{\$148,500}**

# FINANCIAL SUMMARY

Current Budget	\$652,279	\$1,144,645	\$475,582	\$1,578,537	\$2,714,816	\$6,565,859
	Watershed Planning	Water Quality	Floodplain Management	Regulatory Services	Operations & Maintenance	Sub Total
Level 1	\$ 862,000	\$983,000	\$502,350	\$1,271,900	\$ 2,750,000	\$6,369,250
Level 2	\$ 2,574,000	\$2,078,000	\$667,965	\$1,718,300	\$ 2,977,500	\$10,015,765
Level 3	\$ 3,702,500	\$3,872,000	\$962,350	\$2,276,500	\$ 3,220,500	\$14,033,850

Sub Total	\$6,369,250	\$10,015,765	\$14,033,850
Annual Bond Payment	\$7,365,000	\$7,365,000	\$7,365,000
Grand Total	\$13,734,250	\$17,380,765	\$21,398,850
headcount	30.5	39	47.5

Watershed Planning	Level 1	Level 2	Level 3
<b>Watershed Planning</b>			
▪ Partner with Communities with local watershed planning efforts	\$447,000	\$532,000	\$597,500
▪ Complete all watershed plans to allow for more grant opportunities		\$497,500	\$497,500
▪ Update older watershed plans to include water quality projects		\$87,500	\$110,000
▪ Surveying work for watershed planning, project design, and floodplain mapping (in-house service to meet greater demand)		\$37,500	\$37,500
<b>Regional Project Design &amp; Construction</b>			
▪ Offer a municipal flood control grant program	\$200,000	\$300,000	\$400,000
▪ Continue to identify and apply for federal funding for flood mitigation projects	\$15,000	\$27,500	\$37,500
▪ Increase the number of projects designed and/or constructed to ensure projects identified in watershed plans do not become outdated		\$592,000	\$822,500
<b>Voluntary Flood Prone Property Buy Outs</b>			
▪ Establish stable in-house funding to allocate for the buyout program	\$200,000		
▪ Increase annual allocation to allow for the option of the County to purchase either multiple properties in-house or use the increased funds for federal match shares		\$500,000	\$800,000
▪ Detention pond inspection program.			\$400,000
▪ Target watershed specific buyouts for greater effectiveness.			
<b>Total</b>	<b>\$ 862,000</b>	<b>\$ 2,574,000</b>	<b>\$ 3,702,500</b>
<b>Headcount</b>	<b>6</b>	<b>7.5</b>	<b>8</b>

Water Quality	Level 1	Level 2	Level 3
<b>NPDES Permit Compliance</b>			
▪ Enhance regional education efforts on water quality	\$263,000	\$332,000	\$443,000
▪ Enhance water quality education activities, both general and technical training		\$173,000	\$173,000
▪ Enhance outfall monitoring program to effectively monitor each outfall every year		\$128,000	\$132,000
▪ Create a regional program for the NPDES permit requirement (6 measures)			\$120,000
▪ Create a GIS database for storm sewers across municipal boundaries			\$21,000
<b>Water Quality Projects</b>			
▪ Increase involvement in water quality project implementation-both in and outside of the County	\$120,000	\$120,000	\$120,000
▪ Enhance the plan for regional water quality projects design and construction to ensure projects remain updated and are in accordance with flood mitigation projects	\$300,000	\$500,000	\$1,200,000
▪ Identify water quality projects within each major watershed		\$83,000	\$83,000
▪ Offer County assistance with community-based green infrastructure projects			\$104,000
<b>Water Quality Improvement Program</b>			
▪ Continue supporting program (Enhanced allocation-Level 2 & 3)	\$300,000	\$500,000	\$500,000
▪ Measure the success of the projects in terms of how the minimize pollutants reaching waterways through enhanced maintenance & monitoring		\$242,000	\$476,000
▪ Enhance award percentage and/or County Assistance based on merits of proposed project			\$500,000
<b>Total</b>	<b>\$983,000</b>	<b>\$2,078,000</b>	<b>\$3,872,000</b>
<b>Headcount</b>	<b>3.5</b>	<b>6</b>	<b>8</b>

Floodplain Management	Level 1	Level 2	Level 3
<b>Floodplain Mapping</b>			
▪ Reduce Floodplain Mapping Cycle	\$389,450	\$484,515	\$778,900
<b>Floodplain Map Maintenance</b>			
▪ Resolve any discrepancies in existing maps	\$53,000	\$53,000	\$53,000
▪ Implement regular map maintenance program		\$46,800	\$46,800
▪ Assist communities with LOMR updates		\$10,000	\$10,000
▪ Maintain and update hydrological, hydraulic and water quality model		\$13,750	\$13,750
<b>Floodplain Determinations &amp; Technical Support</b>			
▪ Enhance digital accessibility of floodplain maps	\$42,400	\$42,400	\$42,400
▪ Increase communication efforts and community involvement	\$17,500	\$17,500	\$17,500
<b>Total</b>	<b>\$502,350</b>	<b>\$667,965</b>	<b>\$962,350</b>
<b>Headcount</b>	<b>5</b>	<b>5.5</b>	<b>6.5</b>

<b>Regulatory Services</b>	<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>
<b>Staff Increase</b>	<b>13</b>	<b>16</b>	<b>18</b>
Update the Technical Guidance Document.	\$5,200	\$5,200	\$5,200
Create specialized annual training for municipal staff.		\$465	\$465
Create a regular cycle for community audits.	\$700	\$700	\$1,905
	\$292,600	\$319,200	\$389,200
<b>Total Cost of Ordinance Enforcement &amp; Updates</b>	<b>\$292,600</b>	<b>\$319,200</b>	<b>\$389,200</b>
<b>Permit Review Services</b>			
Decrease permit review turnaround time.	\$11,500	\$15,000	\$16,000
Increase access of staff during the permit review process.	\$5,450	\$5,450	\$5,450
Develop an electronic permit submittal program.		\$1,030	\$1,030
e-submittal software		\$100,000	\$100,000
e-submittal equipment		\$40,000	\$40,000
Update permit tracking software. (proportional share of software)			\$120,000
Expand NPDES permit compliance services.			\$500
Specialized annual or biennial training			\$120
	\$883,300	\$1,287,500	\$1,494,800
<b>Total Cost of Permit Review Services</b>	<b>\$883,300</b>	<b>\$1,287,500</b>	<b>\$1,494,800</b>
<b>Compliance Inspections</b>			
Allow for enhanced random and complaint-based inspections.	\$1,300	\$1,300	\$1,300
Provide soil inspections for infiltration practices	\$388		\$388
Create detention pond inspection program.			\$1,065
	\$62,900	\$61,700	\$124,700
<b>Total Cost of Compliance Inspections</b>	<b>\$62,900</b>	<b>\$62,900</b>	<b>\$124,700</b>
<b>Wetland Services</b>			
Improve upon the 10 to 14 workday wetland determination schedule.	\$830	\$830	\$830
Update and maintain wetland maps.		\$270	\$270
Create a Certified Wetland Specialist program and professional education series.			\$500
Institute a wetland properties buyout program.			\$175,000
	\$33,100	\$48,700	\$85,300
<b>Total Cost of Wetland Services</b>	<b>\$33,100</b>	<b>\$48,700</b>	<b>\$267,800</b>
<b>TOTAL COST OF REGULATORY SERVICES</b>	<b>\$1,271,900</b>	<b>\$1,718,300</b>	<b>\$2,276,500</b>
<b>Operation &amp; Maintenance</b>	<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>
<b>Operation of Flood Control Facilities</b>			
▪ Continue to Operate Flood Control Facilities	\$1,500,000	\$1,500,000	\$1,500,000
▪ Re-establish a capital program for new projects	\$200,000	\$200,000	\$200,000
<b>Facility Maintenance</b>			
▪ Re-establish a capital program for flood control facilities	\$500,000	\$500,000	\$500,000
▪ Create detention pond inspection program			\$20,000
▪ Create detention pond maintenance program			\$28,000
▪ Provide stormsewer televising			\$29,500
▪ Provide stormsewer cleaning/jetting			\$66,000
▪ Provide detention pond outlet cleaning			\$28,500
<b>Flood Forecasting Program</b>			
▪ Continue flood forecasting program	\$350,000	\$350,000	\$350,000
<b>Stream Maintenance</b>			
▪ Continue/Enhance the stream obstruction clearing program	\$200,000	\$300,000	\$350,000
▪ Create a streambank stabilization program		\$127,500	\$148,500
<b>Total</b>	<b>\$ 2,750,000</b>	<b>\$ 2,977,500</b>	<b>\$ 3,220,500</b>
<b>Headcount</b>	<b>3</b>	<b>4</b>	<b>7</b>

# APPENDIX

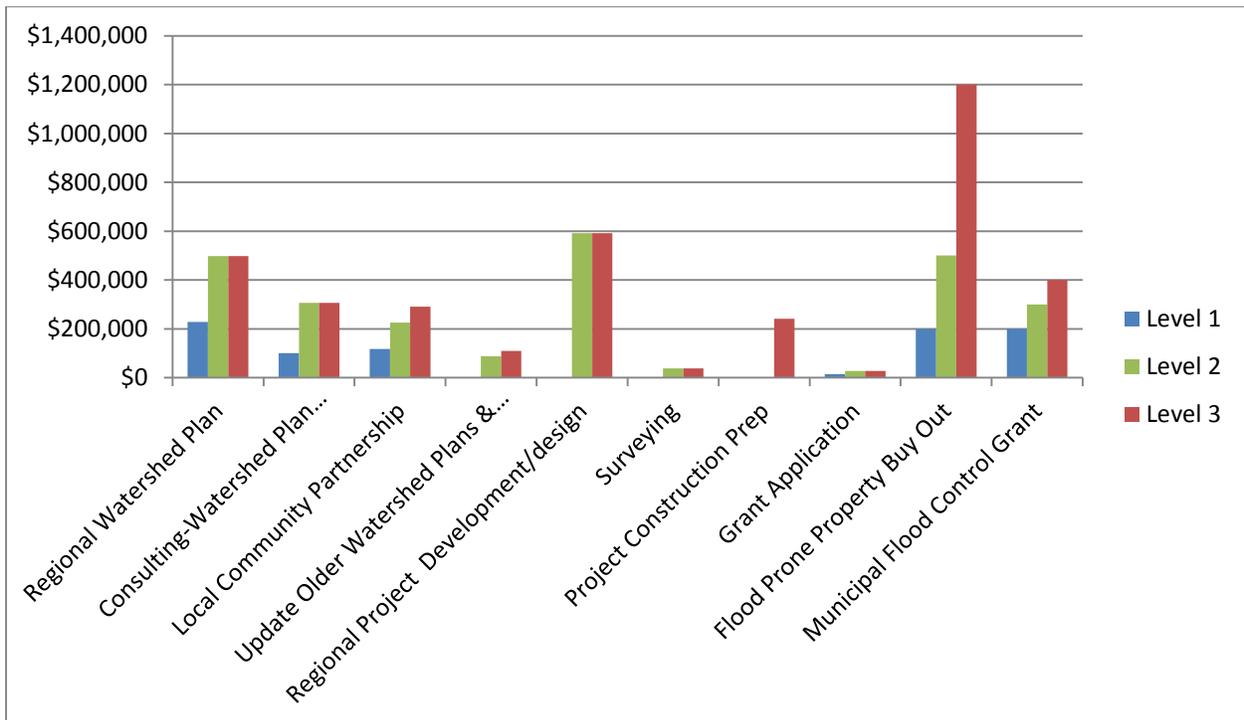
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## Watershed Management Cost Development (Cont.)

	Level 1		Level 2		Level 3	
	Staff Hrs	Total Cost	Staff Hrs	Total Cost	Staff Hrs	Total Cost
<b>Regional Watershed Plan</b>	4085	\$228,760	8,385	\$497,405	8,385	\$497,405
<b>Consulting-Watershed Plan Development</b>		\$100,000		\$306,000		\$306,000
<b>Local Community Partnership</b>	950	\$118,200	1,360	\$225,860	1,370	\$290,420
<b>Update Older Watershed Plans &amp; Incorporate Water Quality</b>			1,562	\$87,472	1,960	\$109,760
<b>Regional Project Development/design</b>			5215	\$592,040	5215	\$592,040
<b>Surveying</b>				\$37,500		\$37,500
<b>Project Construction Prep</b>					1280	\$241,680
<b>Grant Application</b>	283	\$14,999	520	\$27,560	520	\$27,560
<b>Flood Prone Property Buy Out</b>		\$200,000		\$500,000		\$1,200,000
<b>Municipal Flood Control Grant</b>		\$200,000		\$300,000		400000
<b>Total Cost</b>		<b>\$861,959</b>		<b>\$2,573,837</b>		<b>\$3,702,365</b>

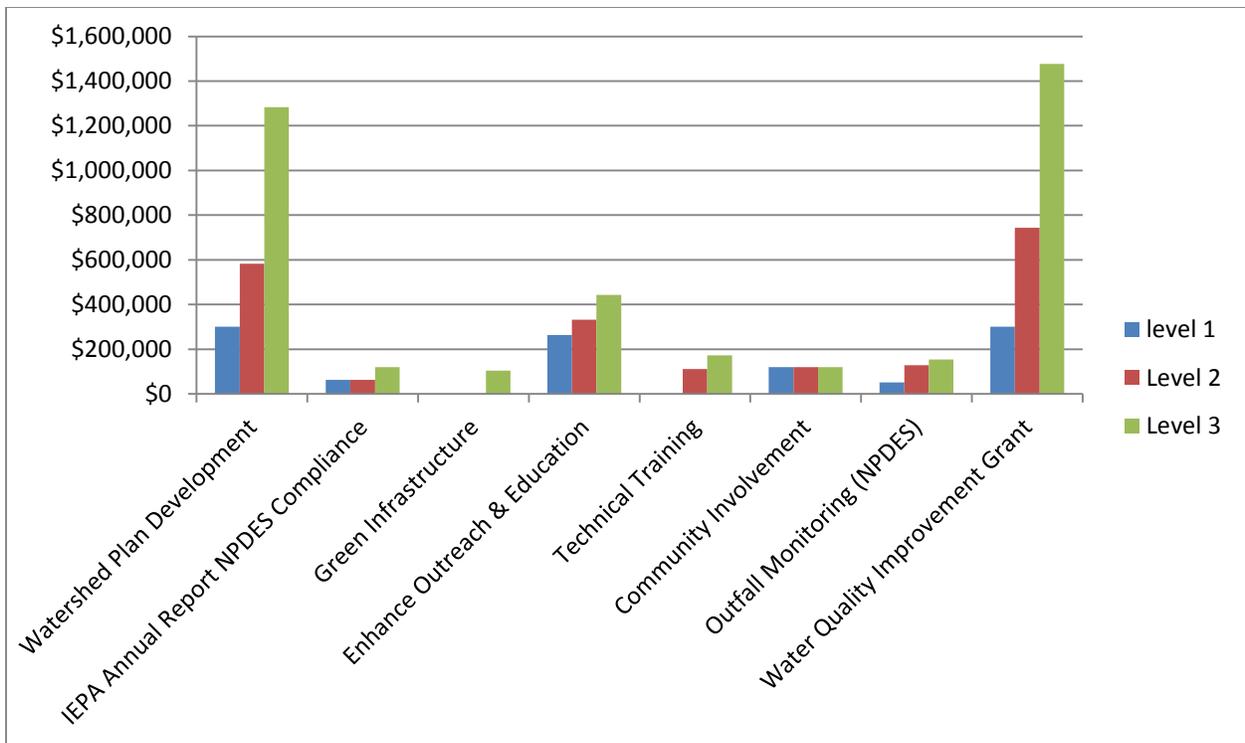


## Water Quality Cost Development

Water Quality						
Level of Service	Level 1		Level 2		Level 3	
		Staff Increase		Staff Increase		Staff Increase
				2.5		2
<b>Watershed Plan Development</b>						
Consulting	\$25,000	240	\$25,000	240	\$25,000	235
Water Quality Design	\$110,000	1,100	\$120,000	1,200	\$220,000	1,290
Project Constuction	87,500	130	\$350,000	215	\$930,000	510
<b>IEPA Annual Report NPDES Compliance</b>		660		660		
Consulting	\$10,000		\$10,000			
Post Construction Monitoring		330		330		
Regional Program Development					\$40,000	1,500
<b>Green Infrastructure</b>						75
consulting contract					\$25,000	
New Construction implimenation					\$75,000	
<b>Outreach &amp; Education</b>		440		680		720
Consulting	\$163,000	425	\$205,000	450	\$300,000	500
PSA	\$42,500	220	\$55,000	230	\$65,000	250
<b>Technical Training</b>			\$90,000	390	\$135,000	710
<b>Community Involvement</b>		1,320		1,320		1,320
Programatic Document & Outreach	\$50,000		\$50,000		\$50,000	
<b>Outfall Monitoring (NPDES)</b>		545		1,250		1,335
Temp Work	\$8,000		\$32,000		\$32,000	
WQ Tracing & Testing	\$15,000		\$30,000		\$30,000	
GIS Database					\$10,000	210
<b>Water Quality Improvement Grant</b>				3,450		6,350
WQ Tracing & Testing			\$60,000		\$140,000	
Contract	\$300,000		\$500,000		\$1,000,000	

### Water Quality Cost Development (Cont.)

Water Quality	hrs	Cost	hrs	Cost	hrs	Cost
<b>Watershed Plan Development</b>	1,470	\$300,410	1,655	\$582,715	2,035	\$1,282,855
<b>IEPA Annual Report NPDES Compliance</b>	990	\$62,470	990	\$62,470	1,500	\$119,500
<b>Green Infrastructure</b>					75	\$103,975
<b>Enhance Outreach &amp; Education</b>	1,085	\$263,005	1,360	\$332,080	1,470	\$442,910
<b>Technical Training</b>			390	\$110,670	710	\$172,630
<b>Community Involvement</b>	1,320	\$119,960	1,320	\$119,960	1,320	\$119,960
<b>Outfall Monitoring (NPDES)</b>	545	\$51,885	1,250	\$128,250	1,545	\$153,885
<b>Water Quality Improvement Grant</b>		\$300,000	3,450	\$742,850	6,350	\$1,476,550
<b>Total Cost</b>		\$1,097,730		\$2,078,995		\$3,872,265

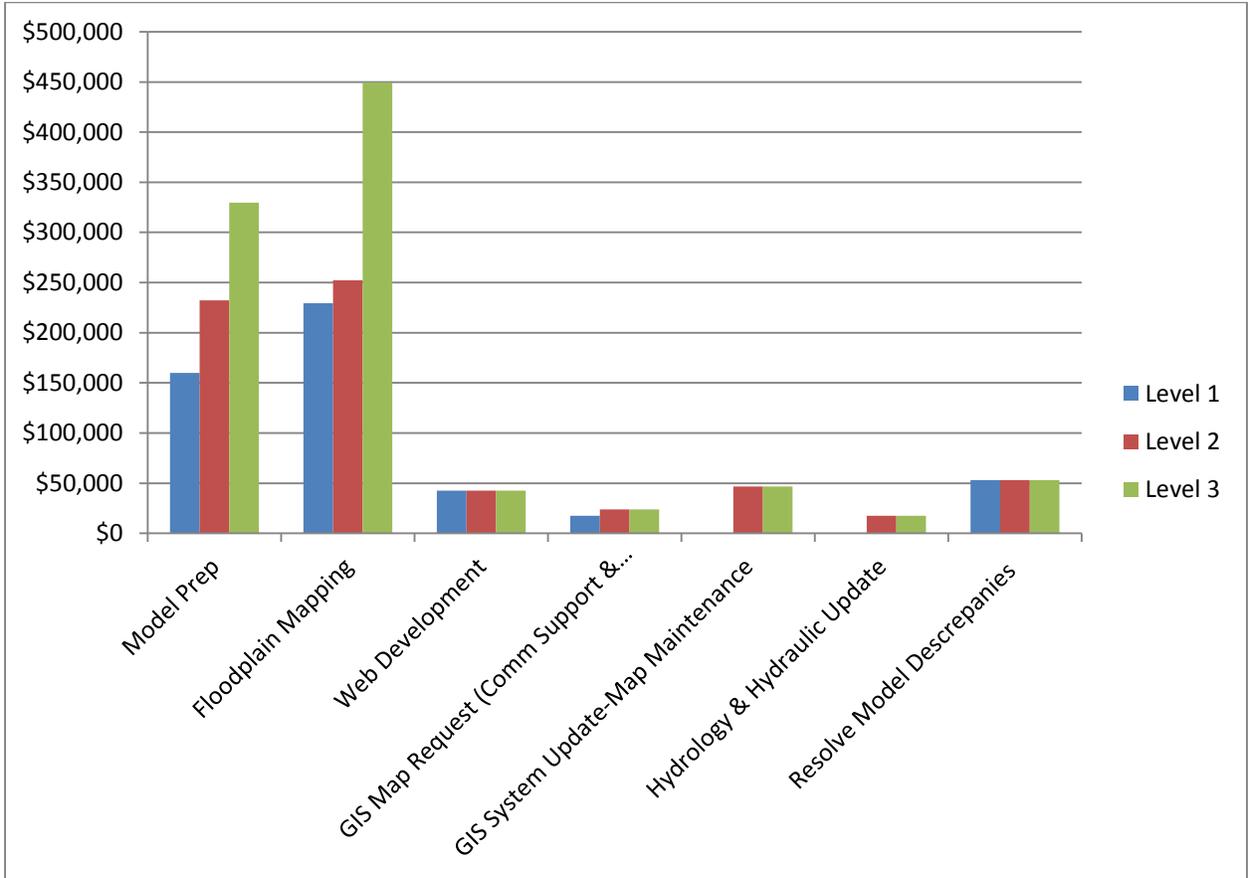


## Floodplain Management Cost Development

Floodplain Mapping					
<b>Services</b>			<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>
Staff Increase				1	2
					1/2 Vehicle
<b>Model Prep</b>					
	<b>Total Hours</b>		2301	3155	4613
New Survey			95	145	190
Transect manager inclusion			95	125	190
Update landcover			95	100	190
Structure Coding (FEQUTL)			92	145	185
Process New X-Sections (FEQUTL)			88	145	176
Run FEQ (TSFLONG)			88	145	176
Calibration			175	210	360
TSFBIG			85	145	170
PVSTATS			82	100	164
Floodway			82	145	164
Hydrologic Database updates (HSPF)			100	100	200
Project Management			355	525	710
App Support & Dev			780	1000	1560
Precip Totals from Rainfall			89	125	178
Consulting Contract			\$45,000	\$65,000	\$85,000
<b>Total Cost of Watershed Model Prep</b>			<b>\$166,953</b>	<b>\$232,215</b>	<b>\$329,489</b>
<b>Floodplain Mapping</b>					
	<b>Total Hours</b>		3480	4100	6970
Application dev			900	950	1800
Database Maint			600	650	1210
Transect Manager			450	575	900
GIS Mapping			190	275	380
QA/QC Review & Revisions			190	275	380
FIS Update & Support Tasks			700	850	1400
Community Outreach			450	525	900
Consulting			\$45,000	\$35,000	\$80,000
<b>Total Cost of Watershed Plan (Watershed Mapped)</b>			<b>\$229,440</b>	<b>\$252,300</b>	<b>\$449,410</b>
<b>Web Development</b>					
Database Access			400	400	400
Mapping/Web Server			400	400	400
<b>GIS Map Request</b>					
FEQ request assist					
10 day turn around			155		
5 day turn around				200	200
48 hr turn around					
Outside map requests			175		
Services for Partial Waiver				248	248
Sevices Countywide					
<b>GIS System Update</b>					
Database update			350	350	350
Staff System Update			250	250	250
Added Layers				95	95
Consulting for Map Maintenance			\$15,000	\$ 10,000	\$ 10,000
Other Program Support			1000	1000	1000
*assumes outside contract for survey data (~10K/yr/plan)					

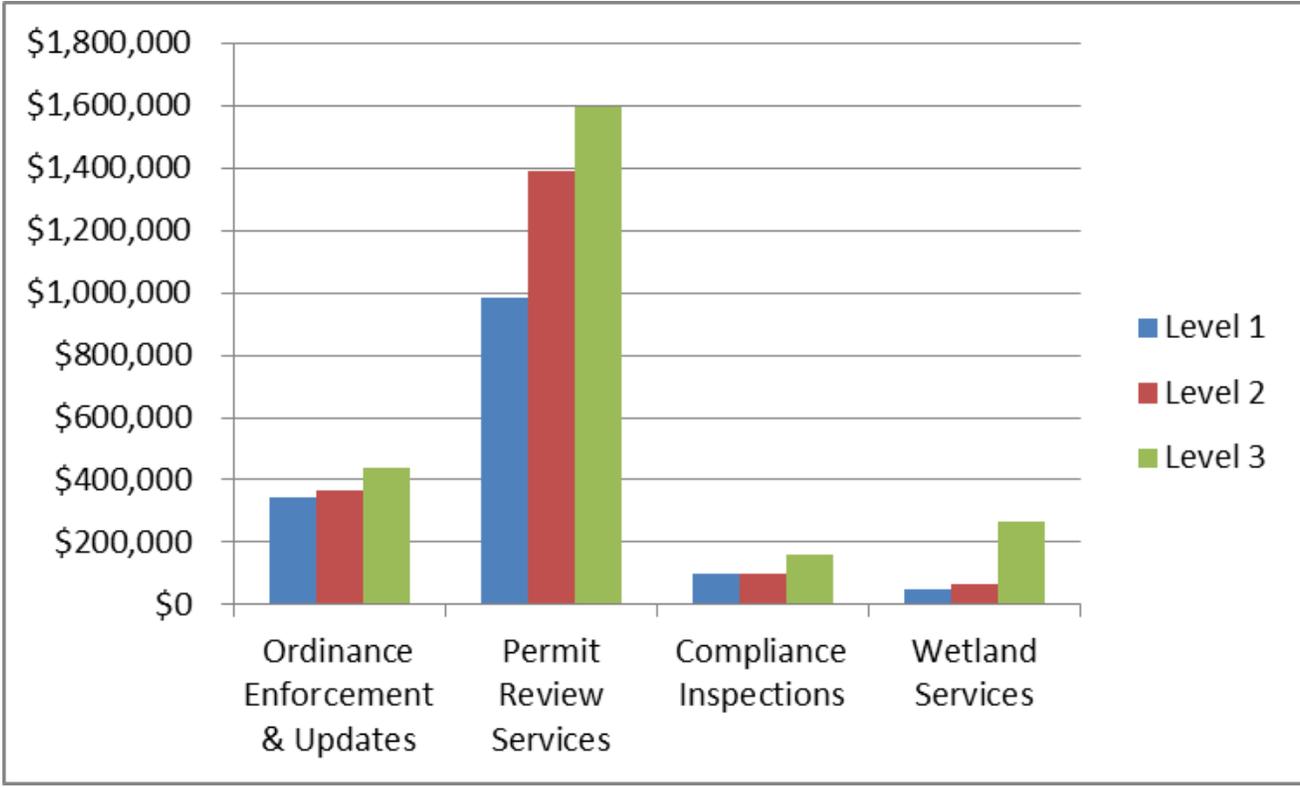
### Floodplain Management Cost Development (Cont.)

	Level 1		Level 2		Level 3	
	hrs	cost	hrs	cost	hrs	cost
<b>Model Prep</b>	2301	\$160,050	3155	\$232,215	4613	\$329,489
<b>Floodplain Mapping</b>	3480	\$229,440	4100	\$252,300	6970	\$449,410
<b>Web Development</b>	800	\$42,400	800	\$42,400	800	\$42,400
<b>GIS Map Request (Comm Support &amp; Communication)</b>	330	\$17,490	448	\$23,744	448	\$23,744
<b>GIS System Update-Map Maintenance</b>			695	\$46,809	694.5	\$46,809
<b>Hydrology &amp; Hydraulic Update</b>				\$17,500		\$17,500
<b>Resolve Model Discrepanies</b>	1000	\$53,000	1000	\$53,000	1000	\$53,000
<b>Total Cost</b>		<b>\$502,380</b>		<b>\$667,968</b>		<b>\$962,352</b>



## Regulatory Services

Regulatory Services					
Services			Level 1	Level 2	Level 3
Staff Increase			0	3	5
vehicles				2	2
<b>Ordinance Enforcement &amp; Updates</b>					
	Total Hours				
Update the Technical Guidance Document.			5,200	5,200	5,200
Create specialized annual training for municipal staff.				465	465
Create a regular cycle for community audits.			700	700	1,905
<b>Total Cost of Ordinance Enforcement &amp; Updates</b>			<b>\$342,600</b>	<b>\$369,200</b>	<b>\$439,200</b>
<b>Permit Review Services</b>					
	Total Hours				
Decrease permit review turnaround time.			11,500	15,000	16,000
Increase access of staff during the permit review process.			5,450	5,450	5,450
Develop an electronic permit submittal program.				1,030	1,030
e-submittal software				\$100,000	\$100,000
e-submittal equipment				\$40,000	\$40,000
Update permit tracking software. (proportional share of software)					\$120,000
Expand NPDES permit compliance services.					500
Specialized annual or biennial training					120
<b>Total Cost of Permit Review Services</b>			<b>\$983,300</b>	<b>\$1,387,500</b>	<b>\$1,594,800</b>
<b>Compliance Inspections</b>					
	Total Hours				
Allow for enhanced random and complaint-based inspections.			1,300	1,300	1,300
Provide soil inspections for infiltration practices			388	388	388
Create detention pond inspection program.					1,065
<b>Total Cost of Compliance Inspections</b>			<b>\$97,900</b>	<b>\$97,900</b>	<b>\$159,700</b>
<b>Wetland Services</b>					
	Total Hours				
Improve upon the 10 to 14 workday wetland determination schedule.			830	830	830
Update and maintain wetland maps.				270	270
Create a Certified Wetland Specialist program and professional education series.					500
Institute a wetland properties buyout program.					\$175,000
<b>Total Cost of Wetland Services</b>			<b>\$48,100</b>	<b>\$63,700</b>	<b>\$267,800</b>
<b>TOTAL COST OF REGULATORY SERVICES</b>			<b>\$1,471,900</b>	<b>\$1,918,300</b>	<b>\$2,461,500</b>



## Operation & Maint Cost Development

		Operations & Maintenance					
		Level 1	(\$)	Level 2	(\$)	Level 3	(\$)
<b>Services</b>							
Staff Increase		3		4		7	
Vehicle increase from base equip				1 vehicle		2 vehicle	
Continue with Flood Control Operations*		\$1,500,000		\$1,500,000		\$1,500,000	
*from existing Ops Budget							
Reestablish Capital Program for new projects		\$200,000		\$200,000		\$200,000	
<b>Facility Inspection/ Maintenance</b>							
Reestablish Capital Program for flood facilities		\$500,000		\$500,000		\$500,000	
Stream restoration (10 stream mi/yr)				\$127,050	3630	\$148,500	4500
Detention Pond Inspection						\$19,760	520
Facility Maintenance & Repairs (2 man crew)						\$26,400	800
Stormsewer Televising 800ft/day (8000ft)						\$29,450	775
Vactor cleaning and/or jetting (40000ft)						\$66,500	1750
Pond Maintenance & Repairs (2 man crew)						\$28,350	810
<b>Additional Services</b>							
Flood Forecasting Program		\$350,000		\$350,000		\$350,000	
Stream Maintenance		\$200,000		\$300,000		\$350,000	
Re-Create a stream stabilization program							
		\$2,750,000		\$2,977,050		\$3,218,960	

