

ADDENDUM

to the

West Branch DuPage River Watershed Plan

December 14, 2010



Prepared by:

Engineering Resource Associates, Inc
35701 West Avenue
Suite 150
Warrenville, IL 60555
(630) 393-3060

Prepared for:

DuPage County Division of Stormwater Management
421 N. County Farm Road
Wheaton, IL 60187
(630) 407-6700

TABLE OF CONTENTS

LIST OF ABBREVIATIONS AND ACRONYMS

EXECUTIVE SUMMARY

| | |
|---|----|
| 1.0 INTRODUCTION..... | 1 |
| 1.1 Background | 1 |
| 1.2 Purpose and Objectives | 1 |
| 1.3 Relationship to the Watershed Plan | 2 |
| 2.0 WATERSHED CHARACTERISTICS..... | 3 |
| 2.1 West Branch DuPage River | 3 |
| 2.2 Study Limits..... | 3 |
| 3.0 HYDROLOGIC AND HYDRAULIC ANALYSIS | 6 |
| 3.1 Previous Studies..... | 6 |
| 3.2 Hydrologic and Hydraulic Methods | 7 |
| 3.2.1 Hydrologic Model..... | 7 |
| 3.2.2 Hydraulic Model..... | 7 |
| 3.3 Watershed Model Updates..... | 8 |
| 3.3.1 Baseline Model | 9 |
| 3.3.2 Model Verification | 10 |
| 3.3.3 Alternatives Analysis..... | 11 |
| 4.0 ECONOMIC ANALYSIS..... | 12 |
| 5.0 Identification of Significant Watershed Problems..... | 14 |
| 5.1 Sources of identification | 14 |
| 5.1.1 Public Input | 15 |
| 5.1.2 Modeling..... | 15 |
| 5.2 Location and Description of Flooding..... | 16 |
| 6.0 ALTERNATIVES DEVELOPMENT AND EVALUATION | 19 |
| 7.0 RECOMMENDATION | 24 |

LIST OF APPENDICES

| | |
|------------|---|
| Appendix A | Baseline Model FEQ Input |
| Appendix B | Preferred Alternative Model FEQ Input |
| Appendix C | Verification Model FEQ Input |
| Appendix D | Baseline Economic Model – <i>Residential</i> |
| Appendix E | Preferred Alternative Economic Model – <i>Residential</i> |
| Appendix F | Baseline Economic Model – <i>Commercial</i> |
| Appendix G | Preferred Alternative Economic Model - <i>Commercial</i> |
| Appendix H | City of Warrenville Review Letter and Main St – Manning Ave Project |
| Appendix I | September 7, 2010 Presentation to Committee |
| Appendix J | Electronic Files of FEQ Models on CD |

LIST OF TABLES

| | |
|-----------|--|
| Table 2-1 | FIS Flow Rates at Roosevelt Road FIS Flow Rates Upstream of Fawell Dam |
| Table 2-2 | Land Use Comparison Table of 1990 vs. 2003 |
| Table 3-1 | Watershed Plans and Addendums within the West Branch DuPage River Watershed |
| Table 3-2 | Time Series Files |
| Table 3-3 | Baseline Model Modifications |
| Table 3-4 | Verification Model Modifications |
| Table 3-5 | High Water Marks Table |
| Table 7-1 | Economic Model Results Comparison |
| Table 7-2 | Economic Model Cost of Damages Comparison |
| Table 7-3 | Flood Risk Properties Comparison |
| Table 7-4 | Preliminary Funding Analysis |

LIST OF FIGURES

| | |
|-------------|---|
| Figure ES-1 | Overall Watershed Exhibit |
| Figure ES-2 | Overall Existing Conditions Flood Prone Areas |
| Figure ES-3 | Alternative 5 Improvements |
| Figure 2-1 | Flood Insurance Study Profiles |
| Figure 3-1 | FEQ Schematic |
| Figure 3-2 | Isohyetal Map |
| Figure 3-3 | Thiessen Polygon Map |
| Figure 3-4 | High Water Mark Locations |
| Figure 3-5 | Flow and Stage Hydrographs |
| Figure 5-1 | Reach 1 Flood Prone Areas |
| Figure 5-2 | Reach 2 Flood Prone Areas |
| Figure 5-3 | Reach 3 Flood Prone Areas |
| Figure 5-4 | Reach 4 Flood Prone Areas |
| Figure 5-5 | Reach 5 Flood Prone Areas |
| Figure 6-1 | Flood Control Storage Facility |
| Figure 6-2 | Bower Elementary Berm Improvements |
| Figure 6-3 | River Road Profile Reconstruction |
| Figure 6-4 | Warrenville Road Bridge Reconstruction |
| Figure 6-5 | Williams Road & Protective Berm Improvements |
| Figure 6-6 | Water Quality & River Restoration Improvements |
| Figure 7-1 | September 1987 Baseline vs. Alternative 5 Flood Profile |

LIST OF ABBREVIATIONS AND ACRONYMS

| | |
|-----------------|---|
| 2006 Plan | West Branch DuPage River Watershed Plan |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act (Superfund) |
| Committee | DuPage County Stormwater Management Planning Committee |
| County | DuPage County |
| CFS | Cubic feet per second |
| DEC | DuPage County Department of Environmental Concerns |
| DEC-2 | Flood Damage Cost Analysis Computer Program |
| DFIRM | Digital Flood Insurance Rate Map |
| DPCSFPO | DuPage County Countywide Stormwater and Flood Plain Ordinance |
| ES-# | Executive Summary Page Number |
| FAC | Rainfall Factor Development |
| FEMA | Federal Emergency Management Agency |
| FEQ | Full Equations Model for One-Dimensional Unsteady Flow in Open Channels |
| FEQUTL | Full Equations Utility computer program |
| FIS | Flood Insurance Study |
| Forest Preserve | Forest Preserve District of DuPage County |
| GIS | Geographic Information System |
| HSPF | Hydrologic Simulation Program, FORTRAN |
| IEPA | Illinois Environmental Protection Agency |
| MIBI | Macroinvertebrate Index of Biotic Integrity |
| SMD | Stormwater Management Division of DEC |
| TSF | Time Series File |
| USGS | United States Geological Survey |

Background

The *West Branch DuPage River Watershed Plan* (2006 Plan) was approved by the DuPage County Stormwater Management Planning Committee (Committee) and adopted by the DuPage County Board in February 2006. The 2006 Plan was prepared in accordance with the standards and criteria established by the Committee in the *DuPage County Stormwater Management Plan*, adopted September 1989 and the *DuPage County Countywide Stormwater and Flood Plain Ordinance* (DPCSFPO), adopted October 1991 (last revised March 2008). The stated goal of the adopted watershed plan is to integrate flood control programs with aquatic restoration to provide a comprehensive plan for the management and protection of the water resources in the West Branch DuPage River Watershed.

The focus of the 2006 Plan was to outline engineering/environmental projects that could be incorporated into the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) cleanup that allowed the County and its partner agencies to significantly improve the West Branch DuPage River Watershed through the implementation of specific restoration and enhancement projects. Some benefits of the 2006 Plan projects, constructed in conjunction with the CERCLA cleanup, include improved water quality, expanded natural areas, and introduction and restoration of wildlife habitat for a four-mile stretch of stream extending from the Garys Mill Road bridge crossing downstream to the Warrenville Road bridge crossing. The 2006 Plan was not intended to address any flooding issues along the main stem or any of the tributaries of the West Branch DuPage River. As such, flood control projects addressing flooding issues along the West Branch DuPage River and its tributaries have been included into separate watershed plans. This addendum represents an addition to the 2006 Plan with the purpose of incorporating flood control projects, with water quality enhancements extending an additional three miles from the 2006 Plan's scope along the West Branch DuPage River main stem.

Objectives

Recent storm events, including the September 2008 event, caused widespread flooding in areas where County flood control facilities did not exist. These flood events resulted in damages to properties in several communities within the West Branch DuPage River Watershed, including the City of Warrenville, whose residents suffered extensive damages during the September 2008 storm. Overbank flooding along the West Branch DuPage River main stem damaged residential and commercial structures and resulted in a significant amount of structural and content damage. As a result of overbank flooding, roadways were directly impacted with major delays in emergency response time, travel time and damage to the roadway itself. Indirect damages such as public services (e.g. police, public works, and fire department) and public health (e.g. sanitary sewer backups, flooded septic fields, water quality degradation) were also incurred. The objective of this addendum is to identify proposed improvements along the West Branch DuPage River between Roosevelt Road to just upstream of Fawell Dam that will reduce the impacts of future overbank flooding in a manner that is consistent with the adopted goal of the 2006 Plan.

Watershed Characteristics

The West Branch DuPage River Watershed is located in approximately the western third of DuPage County and is part of the Des Plaines River Watershed (Figure ES-1). The headwaters originate in Cook County where the waterway flows generally north to south into and through DuPage County. Overall, the West Branch DuPage River Watershed encompasses approximately 128 square miles at the confluence with the East Branch DuPage River (confluence near Bolingbrook in Will County). The main channel of the West Branch DuPage River has a total length of 32 miles and an average slope of approximately 0.06%.

This addendum to the 2006 Plan focuses on a seven (7) mile reach from Roosevelt Road to just upstream of Fawell Dam (Figure ES-1). The primary municipal and governmental agency stakeholders within the study limits are unincorporated DuPage County, City of Warrenville, Forest Preserve District of DuPage County (Forest Preserve), City of Naperville and City of West Chicago. The total reach length for the study area is seven (7) miles with an average slope of approximately 0.075%. Approximately 100 square miles contribute runoff to the West Branch DuPage River at the downstream end of the study limits near Fawell Dam. There are eight (8) major bridge crossings within the study limits including: Garys Mill Road, Mack Road, Williams Road, Butterfield Road, Warrenville Road, Ferry Road, I-88 Tollway and Diehl Road. There are ten (10) tributaries contributing flow to the West Branch DuPage River main stem located upstream of Fawell Dam: Klein Creek, Winfield Creek, Kress Creek, Ferry Creek, Spring Brook #1 and Tributaries #1-5. The base flow within the study limits is approximately 75 cfs. The 100-year (1% annual chance) regulatory peak discharge taken from the current FEMA Flood Insurance Study varies from 2,700 cfs at Roosevelt Road (upstream limit of study) to 4,600 cfs immediately upstream of Fawell Dam (downstream limit of study).

In the hydrologic and hydraulic model used for this study, land use and land cover for the West Branch DuPage River Watershed have been updated from the 1990 land use conditions to the land use conditions that prevailed in 2003. The table below summarizes the change in the land cover characteristics that occurred over this 13-year period for the entire West Branch DuPage River Watershed.

| LAND COVER CATEGORY | 1990 LAND USE | | 2003 LAND USE (supplemented in 2006) | |
|-----------------------|---------------|-------------|---|-------------|
| | Square Miles | % Watershed | Square Miles | % Watershed |
| Impervious Cover | 25.43 | 20.1% | 28.14 | 22.0% |
| Grass, Flat Slope | 28.53 | 22.5% | 40.40 | 31.6% |
| Grass, Moderate Slope | 26.71 | 21.1% | 22.10 | 17.3% |
| Grass, Steep Slope | 10.06 | 7.9% | 13.77 | 10.8% |
| Forest | 14.04 | 11.1% | 13.51 | 10.6% |
| Agricultural | 21.94 | 17.3% | 9.87 | 7.7% |
| TOTAL | 126.71 | | 127.79 | |

Table ES-1: Land Use Summary

Within the study limits, the majority of the watershed is comprised of residential development. In addition, there is a large concentration of commercial development along I-88 with smaller commercial land uses areas along other major arterial roads. There is a significant area of open space owned by the Forest Preserve throughout the studied reach.

Identification of Significant Watershed Problems

There were three main sources from which the identification of flooding problem areas was collected. One source was from public input of those who experienced or witnessed the September 2008 flooding. This was collected through the Illinois Emergency Management Agency's Damage Assessment provided by the City of Warrenville. The second source came from DuPage County and City of Warrenville staff accounts and records of the September 2008 flood event. Their eyewitness accounts and surveyed water surface elevations helped verify reported damages from residents along with identifying additional areas of concern. The third source was through the hydrologic and hydraulic Full Equations (FEQ) Model for One-Dimensional Unsteady Flow in Open Channels developed by DuPage County and used to develop watershed plans and flood plain mapping. This model was used to help verify both the public input and County and City records. This addendum focuses on solutions that minimize the impact of overbank flooding.

The significant flooding problems within the studied area have been identified and described in the following Damage Description list. For simplicity, the study limits have been broken down into five (5) manageable reaches. This is not an exhaustive list of every area that has been impacted by flooding, but represents those areas that have been identified as particularly vulnerable to the flooding events that occurred in the past. The listed areas are those that have been repeatedly impacted by flood waters and can be helped by implementing flood control and water quality projects along the West Branch DuPage River main stem.

Damage Descriptions

For reference, please refer to Figure ES-2. Flooding descriptions are based on the September 2008 storm event.

REACH 1 – Upstream of Fawell Dam to Ferry Road

1. **1A: Ferry Road near River Road** – Ferry Road flooded near River Road causing the closure of Ferry Road. Flood waters from the West Branch DuPage River backed up onto Ferry Road through a tollway pond located north of I-88 adjacent to the west banks of the river.

REACH 2 – Ferry Road to Warrenville Road

1. **2A: Bower Elementary School** – Bower Elementary School flooded due to the overtopping of the protective berm located along the west bank of the West Branch DuPage River and the absence of backflow preventers on the interior drainage system. The design elevation for the berm was approximately 692.50'. The low point of the

Executive Summary

protective berm has settled to an elevation of 690.89' or approximately 1.1' below the current base flood elevation.

2. **2B: River Road at Forest View Avenue** – Approximately 35 single family homes were spared from flood damages due to the City of Warrenville staff's sandbagging efforts at this location. Flood waters were reported to be 0.5' above the overtopping elevation on Forest View Avenue.
3. **2C: River Road at Rogers Avenue** – Approximately 35 single family homes were spared from flood damages due to the City of Warrenville's sandbagging efforts at this location. (Please note that the 35 homes mentioned in 2C are the same homes listed in 2B, rather than additional homes.) Flood waters were reported to be greater than two (2) feet above the overtopping elevation just north of Rogers Avenue.
4. **2D: River Road near Warrenville Road** – Overbank flooding damaged three (3) buildings and impacted four (4) properties. For two (2) of the structures, flooding occurred because of their relatively low elevations and lack of flood protection. The third was impacted by the extremely high flood elevations.
5. **General Reach Flooding** – A significant portion of River Road was overtopped by flood waters. This caused structural damage to three (3) homes along River Road and the closure of River Road, which prevented complete emergency access to 10 properties. In addition, the sandy/gravelly soils in the area were easily infiltrated by the flood waters causing basement flooding to numerous buildings outside of the apparent flood zones.

REACH 3 – Warrenville Road to Butterfield Road

1. **3A: Warrenville Road Corridor** – The Warrenville Road Bridge appears to be restrictive for large flood flows. There is approximately one foot of head loss through the bridge. A combination of the restrictive bridge and channel capacity at this location impacts four (4) businesses on three (3) properties. The western bridge approach section overtopped, causing the closure of Warrenville Road.
2. **3B: 2nd Street Corridor** – Five (5) properties experienced flooding due to the high flood waters. The backwater due to approximately one (1) foot head loss at the Warrenville Road Bridge extends through this stretch where the impact is an approximate 0.9' increase in water surface elevation at Main Street.
3. **3C: Main Street and Batavia Road** – Five (5) properties experienced structural flooding due to high flood waters. The backwater due to approximately one (1) foot head loss at the Warrenville Road Bridge extends through this stretch where the impact is an approximate 0.9' increase in water surface elevation at Main Street.
4. **3D: Riverview Drive Corridor** – Five (5) properties experienced structural flooding due to the high flood waters. Residential and emergency access was completely cut off to

Executive Summary

five (5) residences due to the closing of Riverview Drive. The backwater, due to approximately one (1) foot head loss at the Warrenville Road Bridge, extends through this stretch where the impact is an approximate 0.5' increase in water surface elevation at this location.

REACH 4 – Butterfield Road to Mack Road

1. **4A: Butterfield Road** – West Branch DuPage River flood waters overtopped the eastern approach section of Butterfield Road, obstructing an important emergency access route.
2. **4B: Williams Road Bridge** – The Williams Road Bridge appears to be restrictive for moderate and large flood flows. Head losses are approximately 1.5' during moderate flows and 0.3' for large flood flows. A combination of the restrictive bridge and channel capacity at this location increases flood elevations upstream, impacting two (2) properties. The approach to the bridge on the north side of the river was overtopped, causing the closure of Williams Road.
3. **4C: Emerald Green Corridor** – Flood waters came to within two (2) inches of flooding 10 multifamily structures (approximately 30 individual units). The impact of the restriction at the Williams Road Bridge extends through this stretch resulting in an approximate 0.2' increase in water surface elevation at this location.
4. **4D: Iroquois Court** – Twelve (12) homes sustained flood damages and approximately 20 homes were completely cut off from residential and emergency access due to the high flood waters. The impact of the constriction at the Williams Road Bridge extends through this stretch and causes an approximate 0.2' increase in water surface elevation at this location.
5. **4E: Forestview Drive** – Approximately nine (9) homes sustained flood damages and approximately 17 residences were completely cut off from residential and emergency access due to the high flood waters. The backwater, due to the Williams Road Bridge, extends through this stretch and causes an approximate 0.15' increase in water surface elevations.

REACH 5 – Mack Road to Roosevelt Road

1. **5A: Mack Road** – West Branch DuPage River flood waters overtopped the western approach section of Mack Road, causing the closure of Mack Road. One (1) structure was flooded due to the high water elevations.

Alternatives Evaluation

The alternatives were evaluated through the use of the West Branch DuPage River Watershed Planning FEQ model and runoff generated through the use of HSPF. Included in the evaluation, an economic evaluation was performed using DEC-2 which relates flood elevations generated using FEQ to specific residential and commercial structure elevation data in order to compute dollar damages. The objective of this addendum is to identify proposed improvements along the main stem of the West Branch DuPage River between Roosevelt Road to just upstream of Fawell Dam to reduce the impacts of future overbank flooding in a manner that is consistent with the adopted goals of the 2006 Plan. Tables ES-3 and ES-4 include the economic model summary of benefits and damages. The following five alternatives were evaluated:

Alternative 1: No Action

Take no action beyond what is already planned and in the permitting process.

Alternative 2: Buyouts/Flood Proofing

Buy out damaged residential structures that meet the County's voluntary buyout criteria, and flood proof other residential and commercial structures to the fullest extent possible. It is assumed that DuPage County will be responsible for buying out residential structures and individual property owners will be responsible for constructing flood proofing improvements, with the County assisting in the design of flood proofing measures.

Alternative 3: Upstream Storage

Reduce peak flood flows in the West Branch DuPage River by constructing a flood control facility upstream of the identified flood prone areas. The reduction in peak flows would lower water surface elevations throughout the study area and therefore reduce flood damages. Buy out remaining damaged residential structures that continue to meet the County's buyout criteria and encourage property owners to flood proof remaining residential and commercial structures at the owners' expense.

Alternative 4: Conveyance/Flood Protection

Improve conveyance capacity in the West Branch DuPage River by constructing structural improvements to reduce water surface elevations and flood damages within the identified flood prone areas. Increase the level of protection for structures located within or near the identified flood prone areas by constructing flood protection improvements (e.g., flood control berms). Any increase in downstream flows or water surface elevations due to proposed improvements will be mitigated within the project reach. The remaining damaged residential structures that continue to meet the County's buyout criteria will be bought out, while the remaining residential and commercial structures will be flood proofed at the owners' expense. The following is a list and description of structural and flood protection improvements included in Alternative 4.

1. **Bower Elementary Berm Improvements** – Flood protection for identified flooding area 2A. Raise the Bower Elementary School Berm approximately 2.0-ft above the floodplain elevation to 694.00-ft. The 2.0-ft elevation was chosen to allow for berm settlement

Executive Summary

and a reasonable factor of safety for freeboard. In addition to the re-constructed berm, it is advised that the school district reinstall the flap gates in the interior drainage system. These were not present during the 2008 floods, which added to the damages experienced by the school. Without the presence of the flap gates, the berm construction will not protect the school. An aggressive maintenance schedule for the flap gates should be developed and adhered to by the school district to prevent failure during future flooding events.

2. **River Road Improvements** – Flood protection for identified flooding areas 2B and 2C. Reconstruct 2,000 feet of River Road to protect 55 at-risk properties. The River Road profile - from approximately Forestview Drive past Rogers Avenue - will be raised approximately one (1) foot above the September 2008 flood elevation to 694.00-ft. The one (1) foot elevation was chosen to allow for a reasonable factor of safety.
3. **Warrenville Road Bridge Reconstruction** – Flood protection for identified flooding areas 3A-D. Reconstruct the Warrenville Road Bridge to eliminate the upstream increase in water surface elevation due to the current head loss and channel restrictions. The reconstructed bridge will have an approximate 225-ft span and the low chord is proposed to be raised approximately 1.25-ft. Also included in the improvement is to expand and realign the channel to more effectively convey floodwaters. Included in this option are the buyout of two (2) commercial properties, the reconfiguration of the channel approach and overbanks to reduce the energy loss at the bridge, and flood proofing measures to protect two (2) remaining commercial properties at the Warrenville Road–Batavia Road intersection.
4. **Williams Road Bridge Reconstruction** – Flood protection for identified flooding areas 4A-E. The City of Warrenville is currently in the design phase to replace the Williams Road Bridge which will include raising the low chord elevation by approximately 4.25-ft and an increase in the span of the bridge by approximately 10-ft. The design will significantly reduce the 1.5’ and 0.3’ head loss through the bridge for moderate and large flow rates, respectively. Deviation from the bridge as proposed at the time of writing this addendum will require the model to be revised and analyzed for any potential increases to flows and elevations.
5. **Reach 4 Protective Berm Improvements**
 - a. Emerald Green Flood Control Berm – Flood protection for identified flooding area 4C. Construct an approximate 1.5’ flood control berm in the rear yards of multifamily homes to an elevation of two (2) feet above the 2008 flood elevation. The berm will be approximately 2,300’ in length beginning 600’ upstream of Williams Road and extending in the upstream direction. The two (2) feet elevation was chosen to allow for berm settlement and a reasonable factor of safety. In addition to berm construction, an interior drainage system will be constructed that provides a positive outlet to the West Branch DuPage River.

Executive Summary

Backflow preventers will be incorporated into the system to prevent flood waters from backing into the properties.

- b. Iroquois Court Flood Control Berm – Flood protection for identified flooding area 4D. Construct an approximate 3.0' flood control berm in the rear yards of single family homes to an elevation of two (2) feet above the 2008 flood elevation. The berm will be approximately 1,800' in length beginning 500' upstream of Williams Road and extending in the upstream direction. The two (2) feet elevation was chosen to allow for berm settlement and a reasonable factor of safety. In addition to berm construction, an interior drainage system will be constructed that provides a positive outlet to the West Branch DuPage River. Backflow preventers will be incorporated into the system to prevent flood waters from backing into the properties.
- c. Forestview Drive Flood Control Berm – Flood protection for identified flooding area 4E. Construct an approximate three (3) feet flood control berm in the rear yards of single family homes to an elevation two (2) feet above the 2008 flood elevation. The berm will be approximately 2,000' in length beginning 3,000' upstream of Williams Road and extending in the upstream direction. The two (2) feet elevation was chosen to allow for berm settlement and a reasonable factor of safety. In addition to berm construction, an interior drainage system will be constructed that provides a positive outlet to the West Branch DuPage River. Backflow preventers will be incorporated into the system to prevent flood waters from backing into the properties.

Alternative 5: Conveyance/Flood Protection with Water Quality and River Restoration

Alternative 5 includes all the improvements found in Alternative 4 (Figure ES-3), and includes the City of Warrenville's Main Street – Manning Avenue Storm Sewer System Control Structure Project. The design and permitting of this project is currently underway by the City. The project is a local storm sewer system improvement involving a shut-off valve and pumping operation. The costs of this project are anticipated as part of the City of Warrenville's costs. The additional improvements proposed in Alternative 5 are in keeping with the West Branch DuPage River Watershed Plan's goal of improving the water quality of the main stem. These improvements include riparian enhancement of the overbanks and substrate, removal of invasive species, vegetation management, and streambank stabilization.

Recommendation

Each of the alternatives developed for the West Branch DuPage River were evaluated using the economic data generated using the DEC-2 program and the following factors:

- Conformance with the 2006 Plan
- Conformance with the requirements established in the DuPage County Stormwater Management Plan
- Conformance with local, state and federal regulations
- Level of flood protection provided
- Environmental impacts (wetlands and habitat considerations)
- Water quality enhancement opportunities
- Comments from the public
- Capital cost

The alternatives analysis was presented to the Committee on September 7, 2010, and the Committee approved Alternative 5 as the preferred alternative. Alternative 5 maximizes benefits while reducing costs to individual stakeholders through cost sharing opportunities. Watershed benefits include a reduction in flood damages and an improvement of the main stem West Branch DuPage River through stream enhancements such as stabilization and the establishment of native vegetation. Watershed improvements are made in a holistic manner by including river restoration in an effort to improve water quality as part of a larger conveyance and flood protection project. The inclusion of these water quality improvements will also provide partnership opportunities with the Forest Preserve and other public entities so that the improvements can be performed over a larger scale and at a reduced cost. Various grant opportunities are available through the state and federal government to cost share on the proposed Alternative 5 enhancements to the waterway. (Copies of the September 7 presentation and the full draft addendum were posted on the County’s website for review during the 30-day public comment period.)

The benefits computed by the economic model of the preferred alternative (Alternative 5) are shown in Table ES-2 below. For example, there are 47 residential structures that experience structural flooding in the baseline condition. The preferred alternative reduces the number of residential structures that are damaged from 47 to 3.

| ECONOMIC MODEL RESULTS COMPARISON | | | | |
|--|--|--|--|---|
| Model | Total # of Residential Structures Damaged¹ | # of Residential Structures Eligible for Buyout | # of Residential Associated Damage Only | Total # of Commercial Structures Damaged |
| <i>Baseline</i> | 47 | 25 | 35 | 6 |
| <i>Preferred Alternative</i> | 3 | 3 | 2 | 0 |

Table ES-2: Economic Model Results Comparison

¹Excludes Properties with Associated Only Damages.

Executive Summary

Below in Table ES-3 is a summary of the calculated damages from the economic model for the baseline and preferred alternative conditions.

| ECONOMIC MODEL COST OF DAMAGES COMPARISON | | | | |
|--|----------------------|--------------------------------|------------------------------|---------------------------------|
| Model | Total Damages | Total Structural Damage | Total Contents Damage | Total Associated Damages |
| <i>Baseline</i> | \$ 7,035,980 | \$ 3,207,688 | \$ 2,326,097 | \$ 1,502,194 |
| <i>Preferred Alternative</i> | \$ 189,079 | \$ 9,244 | \$ 3,721 | \$ 176,114 |

Table ES-3: Economic Model Cost of Damages Comparison

A summary of the total cost for each alternative with a breakdown of the responsible agency for the cost is found in Table ES-4 below.

| PRELIMINARY FUNDING ANALYSIS | | | | | |
|---|----------------------------|--------------------------|--|--------------------------|---|
| Alternative | TOTAL COST ESTIMATE | County Stormwater | County Division of Transportation | City of Warrenton | Government Grant/Private Partnership |
| Alternative 1: No Action | \$0 | -- | -- | -- | -- |
| Alternative 2: Buyouts ¹ / Flood proofing | \$5,350,000 | \$5,350,000 | -- | -- | -- |
| Alternative 3: Upstream Storage | \$150,000,000 | \$150,000,000 | -- | -- | -- |
| Alternative 4: Conveyance/ Flood Protection | \$13,220,175 | \$6,775,000 ² | \$3,915,175 | \$2,530,000 ³ | -- |
| Alternative 5: Conveyance/ Flood Protection with Water Quality and River Restoration | \$18,335,175 | \$6,490,000 ² | \$3,915,175 | \$2,530,000 ³ | \$5,400,000 |

Table ES-4: Preliminary Funding Analysis

¹Cost of buyouts includes purchase price only; excludes cost of appraisal, survey, closing costs, demolition, land restoration or other related costs.

²Cost increased since draft plan addendum dated October 5, 2010, due to requests during public comment period by residents to extend the flood control berms. Total cost estimate for Alternate 4 was \$12.9 million and total cost estimate for Alternate 5 was \$17.9 million.

³Cost does not include City of Warrenton's Main Street – Manning Avenue Storm Sewer System Drainage Control Structure Project.