

Grant Application Form



*Prepared For
Local Government*



MN DNR WATERS

*Please return application and supporting materials to your DNR Waters
Area Hydrologist.*

**FLOOD DAMAGE REDUCTION PROGRAMS
HAZARD MITIGATION GRANT APPLICATION**

Application Date: 8/21/2015

Local Unit of Government Applicant: Bassett Creek Watershed Management Commission (BCWMC)

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Project Funding Breakout

Total Estimated Project Cost	\$230,000
Amount Requested From DNR Waters	\$158,000 maximum (see Section IV)
Amount from other state agencies	N/A
Total share of all local government sources	N/A (Staff time only)
Estimated in-kind match	\$103,000 minimum (see Section IV)
Federal share	N/A
Private share	N/A

Check the following types of flood damage reduction activities included in project along with a quantity (if applicable) and cost or percentage of total project costs.

	Activity	Quantity		Cost or Percentage
	Acquisition		Number of Homes	
	Levee		Miles	
	Levee Improvement		Lineal Feet	
	Floodwall		Lineal Feet	
	Ring Dike		Number of Ring Dikes	
	Ring Dike Improvement		Number of Ring Dikes	
	Flood Storage Easement		Acres	
	Impoundment		Acre Feet	
	Impoundment Improvement			
	Flood Warning System			
	Feasibility Study			
	Flood Insurance Study			
	Floodplain Mapping			
	Geographic Information System			
X	Hydrology / Hydraulic Study	N/A		
	Other			

Project Narrative

(Please attach resolutions authorizing application and signature, a map of the site, highlighting area(s) damaged and the location of the proposed project.)

I. a.) Briefly describe and itemize the damage(s):

This application is for a hydrologic and hydraulic study of the Bassett Creek watershed. There are no damages associated with this project specifically.

See response under b) below regarding past and current flooding.

b.) Describe the repetitive nature of the flooding:

In the late 1990's the U.S. Army Corps of Engineers (ACOE), the Minnesota Department of Natural Resources and the Bassett Creek Watershed Management Commission (BCWMC) partnered to complete the Bassett Creek Flood Control Project. The project significantly reduced the risk of flooding in the watershed since it was completed. However, there are remaining at-risk properties in the floodplain of the Main Stem of Bassett Creek. Golden Valley recently identified the following at-risk properties along the Main Stem:

- three homes at high risk of flooding (no protective measures taken to date),
- 23 homes at medium risk of flooding (12 have ring berms and are vulnerable to pumps failing, around 10 have low openings within 1 foot of 1% chance flood),
- many more homes at low risk of flooding (property is in the floodplain, but home is likely outside of floodplain, based on TP 40)
- approximately three businesses at risk of flooding during 1% annual chance event (mostly loading docks with water against foundation only)
- Three streets closed due to flooding from creek during large precipitation events, and during 1% annual chance event, which results in at least six driveways blocked during flooding. The resultant road closures can last for long periods of times (days or more).

Also, Golden Valley identified a sewer lift station at risk of flooding along the Sweeney Branch.

Other properties outside of Golden Valley (e.g., Medicine Lake, Plymouth), but within the BCWMC, are also currently at risk of flooding.

In 2013 the National Oceanic and Atmospheric Administration completed a review of the last 50 years of climatological data and, based on that data, published new precipitation frequency estimates (Atlas 14) that significantly increased expected rainfall amounts for rare (i.e., <10% occurrence) events. The BCWMC determined that the watershed needs to be remodeled to assess how the level of protection provided by the Bassett Creek Flood Control Project has been affected by these revised rainfall amounts. The more detailed modeling will provide the cities in the watershed with a more current picture of the flooding risk in the watershed, which will likely affect how the cities respond to future rainfall events.

Project Narrative

II. **Describe the proposed project and its objective:**

(Please include project location, a list of funding sources, how local funding will be obtained and identify implementing parties and their roles.)

The goal of this project is to refine and update an existing hydrologic and hydraulic model to help quantify flood risk in the BCWMC.

The BCWMC developed HEC-1/HEC-2 models in the 1980's which were revised in the 1990's after the construction of the BCWMC flood control project. Because the ACOE's Hydrologic Engineering Center no longer supports the hydrologic models that were used to model Bassett Creek, the BCWMC converted the HEC-1/HEC-2 models to an XP-SWMM model in 2012.

Although the scale of the modeling was similar to the original HEC-1/HEC-2 models, the watershed divides were revised based on current digital topographic and storm sewer data, modifications to the hydrologic inputs, and enhancement of detail along the creeks by using updated channel geometry and current bridge and culvert information. However, during the conversion to XP-SWMM, the scope did not include subdividing watersheds or incorporating additional watershed storage upstream of the Bassett Creek system.

Although the XP-SWMM model was calibrated to flow monitoring data along the creek, the calibration was limited by the coarse resolution (simplification) of the upper watersheds in the model (e.g. large watersheds and limited storage included upstream of the creek). Because of this, the calibration required unrealistic changes to model parameters to achieve accurate calibration.

As a result, the BCWMC is refining and updating the XP-SWMM model by further subdividing the watersheds, incorporating upstream storage in the many water quality storage ponds that were constructed after the completion of the flood control project, along with many of the smaller stormwater storage areas that were not included in the original model, and the storm sewer conveyance between the storage areas. In addition, the revised model will incorporate Atlas 14 precipitation depths and the resultant new NRCS storm distributions, incorporate updated SSURGO soils data, update vertical datums for consistency, and use flow monitoring data to aid in model calibration.

The BCWMC budgeted for the XP-SWMM model updates to occur over the 2015 and 2016 BCWMC fiscal years. The BCWMC Engineer (Barr Engineering) is performing the model revisions. The member cities will provide information (such as pond outlet and storm sewer data/record drawings) for the updates (as requested) and will also be involved in review of the modeling results through the BCWMC Technical Advisory Committee (TAC) and BCWMC meetings.

Project Narrative

III. a.) Summarize the alternative flood mitigation measures that were considered to achieve the desired benefits.

N/A

b.) Is the proposed project the least environmentally damaging alternative that is feasible and prudent? Why?

N/A

(If project requires a mandatory environmental review)

c.) Has an environmental review been completed for the proposed project? If not, is an environmental review part of the application proposal?

N/A

Project Narrative

IV. Describe and itemize the costs (including environmental and natural resource costs) associated with the project:

(Please include a budget/cost schedule. If the project will be completed in phases, please include a phasing schedule for the project.)

Environmental costs do not need to be quantified in terms in money.

Below is the budget breakdown for the project over the two-year schedule.

Year	Study Area	Budget	Approximate Time to Complete
2015 (through January 31, 2016)	Detailed Modeling, Plymouth Creek Watershed	\$54,000	Six Months
	Flow Monitoring, Plymouth Creek	\$0	Completed
	Detailed Modeling, Medicine Lake Direct Watershed	\$40,000	Four Months
	Three Months Flow Monitoring, North Branch Bassett Creek	\$9,000	Three Months
2015 Total		\$103,000	
2016 (through January 31, 2017)	Detailed Modeling, North Branch Bassett Creek	\$39,000	Four Months
	Detailed Modeling, Bassett Creek Main Stem – Medicine Lake to Confluence with North Branch	\$54,000	Five Months
	Detailed Modeling, Bassett Creek Main Stem – Downstream of the Confluence with North Branch (Including Sweeney Branch)	\$49,000	Four Months
	Final Modeling Methodology Report	\$16,000	Three Months
2016 Total		\$158,000	
Phase 2 – Total		\$261,000	

The BCWMC is currently performing the flow monitoring on the North Branch of Bassett Creek and the detailed modeling of the Plymouth Creek and Medicine Lake direct watersheds. This phase of the work is anticipated to be completed by January 31, 2016 (end of the BCWMC fiscal year).

As noted in the above table and the “Project Funding Breakout” section, the remaining work during the BCWMC 2016 fiscal year (February 1, 2016 – January 31, 2017) is expected to total \$158,000. Although the BCWMC’s request is for the full 2016 costs of \$158,000, the BCWMC is willing to accept a smaller grant amount. For example, if grant funds are limited, the BCWMC requests that the MDNR consider funding one or more of the 2016 work phases listed in the table above.

Project Narrative

V. Describe and itemize the benefits (including environmental and natural resource costs) associated with this project:

(Please describe the anticipated results of this project.)

Environmental benefits do not need to be quantified in terms of money.

The XP-SWMM model will provide a tool that can assess and quantify flood risk in the BCWMC resulting from Atlas 14 precipitation events (using higher precipitation depths than past evaluation efforts). These efforts will help the BCWMC and member cities identify structures that are at-risk of flooding along the creek and in upstream areas. The model will also be a tool that will allow the BCWMC to evaluate potential modifications to the existing flood control project features.

By refining the level of detail in the watersheds, storage, and conveyance in the larger BCWMC watershed, the XP-SWMM model will also be a useful tool for the BCWMC and local entities to evaluate proposed projects and make informed management decisions.

VI. List opportunities for public involvement and describe public response to the proposed project:

Although there is no formal public involvement process for this hydrologic and hydraulic study, this project was approved by the Bassett Creek Watershed Management Commission (an all-citizen commission) after much discussion and input on the benefits and expected outcomes of the project. The modeling and results will be discussed at future BCWMC meetings, which are open to the public. Additionally, the TAC, which includes representatives from each of the member cities, was involved in the development of the project scope and will be involved in the development of the model by providing data as requested, and reviewing the XP-SWMM model results.

a.) Describe partners (if any) and their role in this project.

The BCWMC is funding this hydrologic and hydraulic study. Additionally, the BCWMC TAC (which includes the member cities) will be involved in model development (e.g. provide data such as record drawings as requested) and review of the results. The BCWMC Engineer (Barr Engineering) will perform the XP-SWMM modeling and collect flow monitoring data for the North Branch of Bassett Creek. Three Rivers Park District has collected flow monitoring data for Plymouth Creek on behalf of the City of Plymouth. The North Branch and Plymouth Creek flow monitoring data will be used in the calibration process. Flow monitoring data collected by the Metropolitan Council on the Main Stem of Bassett Creek (WOMP station) will also be used for calibration. Additionally, there may be potential FEMA funding available (administered through the MDNR) that the BCWMC is pursuing.

Project Narrative

VII. Flood Insurance: Do the local government units within your jurisdiction participate in the National Flood Insurance Program?

Yes

VIII. Zoning Ordinances: Is your local government unit administering a state approved shoreland ordinance and flood plain ordinance?

The cities have state approved ordinances.

The BCWMC does not have a state approved floodplain ordinance. However, through the BCWMC watershed management plan policies and the BCWMC development/project review program, the BCWMC implements floodplain policies.

IX. Is this proposed study, plan, or project identified in a comprehensive local water plan prepared under M.S. Chapter 110B or 112 or M.S. 473.875-473.883?

This hydrologic and hydraulic study is included in Table 5-4 of the 90-day review draft of the 2015-2025 BCWMC Watershed Management Plan, as item “Modeling to Update Flood Levels.” The BCWMC anticipates BWSR Board approval of the Plan on August 26, 2015.