5.0 Flooding and Rate Control

5.1 Issue Statements

Aging stormwater control facilities and rapid urbanization caused the Bassett Creek watershed to experience flooding problems, beginning in the 1960s. For decades, flooding caused damages in excess of $2 million annually to homes, businesses, and recreational areas along Bassett Creek. The worst problem was the 1.5-mile long Bassett Creek Tunnel, which was undersized and severely deteriorated. The Bassett Creek Flood Control Project (flood control project), a $40 million cooperative effort of the COE, Minnesota Departments of Transportation (Mn/DOT) and DNR, the BCWMC, and the cities in the watershed addressed these issues. Table 5-1 lists all of the features of the flood control project and the Background section provides a more detailed description of the flood control project.

The current flood control issues include maintenance and repair of the flood control project system, floodproofing or removal of homes that are remaining in the floodplain, and managing development and redevelopment throughout the watershed to prevent flooding.

5.2 Goals and Policies

5.2.1. Flood Control Goals

Reduce flooding along the Bassett Creek trunk system (see the Administration and Implementation Program section for the definition of the trunk system).

Protect human life, property, and surface water systems that could be damaged by flood events.

Regulate stormwater runoff discharges and volumes to minimize flood problems, flood damages and the future costs of stormwater management systems.

Provide leadership and assist member cities with coordination of intercommunity stormwater runoff planning and design.

5.2.2. Flood Control Policies

5.2.2.1 Policies Relating to the BCWMC Flood Control Project

A. The BCWMC will reserve the remaining funds from the BCWMC flood control project construction account for floodproofing of homes, for an emergency fund for repairing flood control project features, and for a maintenance fund for flood control project features (see Table 5-2).

B. The BCWMC will regularly inspect the flood control project system, including water level control and conveyance structures. This is part of the BCWMC's annual water quality and flood control programs (see Table 12-4).

C. The BCWMC will maintain and repair the flood control project system as needed. This is part of the BCWMC's annual water quality and flood control programs (see Table 12-4).

D. The BCWMC will finance maintenance and repair of water level control and conveyance structures that were part of the original flood control project on the same basis as the original project. New road crossings of the creek that were installed as part of the project will be maintained by the city where the structure is located, since its primary function is transportation related. The BCWM will establish and maintain a fund to finance long-term maintenance of the structures. The fund will be created by using $335,000 of the remaining flood control project construction account funds, with annual assessments of $25,000 added to the fund. The fund balance is to be maintained at (but not exceed) $1 million (see Table 5-2).

E. The BCWMC will establish a reserve fund, to be used as needed for emergency repairs to the flood control project system. $500,000 of the remaining flood control project construction account funds will be used to create the reserve fund (see Table 5-2).

F. The cleaning of the flood control project features and related structures, including removing debris, vegetation, etc. is the responsibility of the city the structure is located in.

G. The BCWMC will provide funding assistance for homes along the trunk system that were proposed to be floodproofed as part of the original flood control project that do not have 100-year flood protection. This project is included in the BCWMC's 10-year CIP (Table 12-2). The BCWMC proposes to use $700,000 of the funds from the flood control

project construction account to fund this work. This allocated amount is the BCWMC cost, assuming the BCWMC funds 72.5 percent of the floodproofing costs, including the city's out-of-pocket construction, design, and contract administration costs (see Table 5-2).

H. The BCWMC will construct and fund modifications to existing structures (e.g., control structure at the Golden Valley Brookview Golf Course) built as part of the original flood control project, excluding improvements to private property (e.g., floodproofing of homes), in accordance with the joint powers agreement.

I. The BCWMC will construct and fund new features that increase the benefits provided by the flood control project system in accordance with the joint powers agreement.

J. The member cities shall provide the BCWMC with information regarding proposed changes to the flood control project system. Before any changes can be made to the flood control project, the BCWMC must review and approve the proposed changes. If required, the BCWMC shall modify the flood control project, and the cost of the required modifications will be assessed against the municipality necessitating the modification. The BCWMC will not approve changes to the flood control project system that would result in detrimental effects that cannot be resolved.

K. All proposed changes to existing control structures, structures along the BCWMC trunk system, or structures between the BCWMC storage sites and the designated trunk must be submitted to the BCWMC for review and approval. The location and design of the control structure, including all proposed culverts or other controls, shall also be subject to BCWMC approval. The effect of the 100-year storm on the control structure, the trunk system and the storage site must be examined to ensure that the design does not result in the improper operation of a designated storage site. This policy ensures that the storage sites that are part of the flood control project operate as intended and do not unduly restrict flows.

5.2.2.2 Policies Relating to Floodplain Management

A. The BCWMC will monitor (or arrange for monitoring of) water levels on the primary lakes in the watershed. Water levels on Bassett Creek and other water bodies will be monitored periodically during flooding events.

B. The member cities must implement the BCWMC's development policies.

C. The BCWMC will review proposed improvements, developments and redevelopment projects in the watershed. The member cities need to continue forwarding proposed projects to the BCWMC for review. The BCWMC's review of development, redevelopment and improvement projects in the watershed includes review of proposed work in the BCWMC-established floodplain. The types of projects that must be submitted to the BCWMC for review, the BCWMC's review procedure, submittal requirements, guidelines, design criteria, etc. are provided in the BCWMC's document *Requirements for Improvements and Development Proposals* (BCWMC, November 1998, as revised).

D. Project proposers must apply best management practices to reduce the volume of stormwater runoff, to the maximum practical extent. Examples of stormwater runoff volume reduction methods include:

- Reducing the amount of planned impervious surface (as areas develop).
- Reducing the amount of impervious surface (during redevelopment).
- Promoting infiltration.

E. The BCWMC and the member cities must require rate control in conformance with the flood control project system design and this Plan.

F. The BCWMC adopted 100-year floodplain elevations for those reaches of Bassett Creek and other parts of the trunk system that are under the BCWMC's jurisdiction. Table 5-3 lists these floodplain elevations. The BCWMC defines the floodplain of Bassett Creek as the areas lying below these adopted 100-year floodplain elevations. The 100-year floodplain elevations may be revised due to channel improvement, storage site development, or requirements established by appropriate state or federal governmental agencies.

G. The BCWMC will allow only those land uses in the BCWMC-established floodplain that will not be damaged by floodwaters and will not increase flooding. Allowable types of land use that are consistent with the floodplain include recreation areas, parking lots, excavation and storage areas, public utility lines, agriculture, and other open spaces. The BCWMC will not allow permanent storage piles, fences and other obstructions in the floodplain that would collect debris or restrict flood flows. The BCWMC recognizes that existing streets, utilities, and structures currently exist below the 100-year floodplain. The BCWMC encourages the communities to remove these features from the floodplain as development or redevelopment

allows. No new structures or improvements will be permitted in the floodplain, which would be subject to damage by the 100-year flood, including basements, public utilities, and streets.

H. The BCMWC will generally not allow filling within the BCWMC-established floodplain. Proposals to fill within the BCWMC-established floodplain must obtain BCWMC approval and must provide compensating storage and/or channel modification so that the flood level shall not be increased at any point along the trunk system due to the fill.

I. The BCWMC prohibits expansion of existing non-conforming land uses within the floodplain unless they are fully floodproofed in accordance with existing codes and regulations.

J. The lowest floor of all permanent structures must be at least 2 feet above the established 100-year floodplain elevation. The member cities' ordinances must include this requirement.

K. The BCWMC will review changes in municipal water resource management plans, land use plans, zoning, and other plans, for their effect on the adopted floodplain and flood control project, when such plans are submitted to BCWMC.

L. Economic considerations alone will not be a sufficient reason to alter the floodplain.

M. When a modification to a flood storage site or to any part of the flood control project system is proposed that would result in an increase in the flood profile above the existing flood profile, the BCWMC will modify the existing flood profile to recognize the increased level once the modification has been approved by the BCWMC, local and state regulatory agencies and after a public hearing on the modification plan has been held.

N. The BCWMC will review local watershed management plans for compliance with this Plan's goals and policies regarding flooding and rate control.

O. The BCWMC will not approve any diversions of surface water within, into, or out of the watershed that may have a substantial adverse effect on stream flow or water levels at any point within the watershed. Plans for intra- or inter-watershed diversions must include an analysis of the effects of the diversion on flooding, water quality and aesthetic quality along the creek. BCWMC will review diversion plans to determine the effect of the proposal on the Bassett Creek watershed and such plans will be subject to BCWMC approval. If it is necessary to divert surface water runoff to another watershed, every effort should be made to ensure that there is no fish migration from one watershed to another.

5.3 Background

The BCWMC was originally formed to address flooding issues in the watershed, so flood control was the first major responsibility of the organization. To reduce flooding along the Bassett Creek trunk system, the BCWMC:

- Implements flood control projects (see following paragraphs)
- Monitors water levels on the lakes and streams in the watershed
- Establishes flood levels and manages activities in the floodplains
- Reviews development and redevelopment projects to make sure there are no detrimental flooding impacts to the trunk system

5.3.1. Past Flooding Events

Both summer rainstorms and spring snowmelt runoff caused flooding events on Bassett Creek. Most of the isolated flooding events have been recorded in little or no detail. Residents have indicated that while most of the isolated instances of damaging floods along Bassett Creek have resulted from summer rainstorms, flooding has not been strictly limited to that cause.

The most recent incident of severe flooding of the Bassett Creek watershed occurred on July 23 and July 24, 1987, as the result of a high intensity rainstorm. The amount and intensity of the rain varied over the watershed, with gages in the vicinity of the watershed recording between 6 and 10 inches of precipitation. An average of 7.5 inches of rain fell in 7 hours over the watershed. Rainfall data indicate that 3.5 inches of rain fell in one hour and 5.6 inches fell in two hours during the most intense parts of the storm. In comparison, a 100-year one-hour rainfall event is 3.3 inches and a 100-year two-hour storm is 3.6 inches. Flood levels along some reaches in the watershed peaked at or above the 100-year flood elevation. Total estimated damage caused by the flood was $3,000,000 ($4,500,000 in 2003 dollars). Although most of the damage occurred in the vicinity of the conduit entrance at Glenwood and Dupont in Minneapolis, many homes throughout the watershed suffered flood damage from either direct surface flooding or as a result of sanitary sewer backup into basements. Generally, the watershed drainage system worked very well. Portions of the flood control project (see the Bassett Creek Flood Control Project section for more information) were already in place at that time, including the control structure at Highway 55 near Theodore Wirth Park, which saved property owners in Minneapolis $750,000 to $1,000,000 ($1,100,00 to $1,500,000 in 2003 dollars)in flood damages. As result of the flooding within the Bassett Creek watershed and other

local watersheds, President Reagan declared a major disaster for the area, making the Twin Cities eligible for federal assistance.

Another severe flooding event in the Bassett Creek watershed occurred on July 6 and July 7, 1978, also as the result of a high-intensity rainstorm. Gages in the vicinity of the watershed recorded between 1/2 and 4 inches of precipitation. At the Plymouth gage, approximately 3.9 inches of rainfall was recorded in a two-hour period between midnight and 2:00 a.m. Hundreds of homes in Crystal and Golden Valley suffered flood damage from either direct surface flooding or as a result of sanitary sewer back-ups into basements. Because of the extent of the damage and the number of homes flooded, Hennepin County was declared a flood disaster area by the FEMA.

Another incident of severe flooding in the Bassett Creek watershed occurred on April 27, 1975, as a result of a long-duration spring rainstorm. Approximately 2¼ inches of rain fell in a 24-hour period throughout the watershed. Although this rainfall approximated only a one-year frequency event, its effects were comparable to a much larger runoff event because of severe antecedent conditions. These conditions included a substantial spring snowmelt, which ended approximately April 15, followed by several days of moderate precipitation. As a result of the snowmelt and subsequent periods of rain prior to April 27, the soils throughout the watershed were in a saturated condition and much of the natural upland depression storage was full prior to the rainfall event of April 27. As a result of this storm, areas of Golden Valley, New Hope, Crystal and Minneapolis suffered flood damage. A serious result of this storm was the damage incurred as a result of sanitary sewer back-ups into many homes in Golden Valley, New Hope and Crystal, caused by excessive infiltration into wastewater collection facilities.

Severe flooding also occurred in the Bassett Creek watershed on June 6, 1974, as a result of an intense summer rainstorm. Approximately 3½ inches of rain fell in a 6-hour period in the western portions of the watershed, while approximately 2¼ inches of rain fell in that same six-hour period in the eastern portion of the watershed. As a result of this storm, portions of Golden Valley, New Hope, Crystal, and Minneapolis suffered flood damages.

A severe storm occurred in June 1942. This storm approximated a 50-year rainfall event and was significant because of the damage sustained by commercial and industrial establishments in Minneapolis. In their September 1982 Design Memorandum, the St. Paul District COE estimated that if a storm with a one percent chance of occurring ("100-year storm") were to occur in the Bassett Creek watershed, approximately $12,000,000 ($21,000,000 in 2003 dollars) in flood damages would

be sustained and that, on the average, approximately $1,634,000 ($2,847,000 in 2003 dollars) in flood damages are sustained annually as a result of flooding in the Bassett Creek watershed.

Past and potential future impacts of flooding in the watershed include damage to structures, utilities and transportation facilities, flood fighting costs, post-flood cleanup costs, business losses, increased expenses for normal operating and living during a flood situation, and benefits paid to owners of flood insurance. Other losses that could be suffered during flooding include the loss of life, disruption of normal activities, potential health hazards from contaminated water and food supplies, dislodged fuel storage tanks, and flooding of wastewater collection facilities. Without controls, increased urbanization of a watershed causes an increase in average annual flood damage at a rate approximately proportional to the improvements to existing public facilities, increases in property values, and increases in runoff.

5.3.2. Bassett Creek Flood Control Project

The largest structural flood control project undertaken by the BCWMC was the Bassett Creek Flood Control Project. From 1987 – 1996, the COE constructed the $40 million flood control project. The project was the cooperative effort of the COE, Mn/DOT, DNR, the BCWMC, and the cities in the watershed. The project controls flooding in portions of Golden Valley, Plymouth, Minneapolis, and Crystal and reduced flood elevations along the Bassett Creek corridor by 2 feet in Golden Valley, 1½ feet in Crystal, and up to 4½ feet in Minneapolis. The flood control project also reduced average annual flood damages by 62 percent.

With the flood control project in place, runoff from the watershed area tributary to the old tunnel no longer flows to Bassett Creek. In 2000, the BCWMC and the Mississippi WMO entered into a joint and cooperative agreement for a boundary change to reflect these changed drainage conditions (Appendix G). The boundary change transferred 1,002 acres from the BCWMC to the Mississippi WMO. The city of Minneapolis is now responsible for maintenance of the old tunnel.

The principal feature of the flood control project is the new 1.7-mile tunnel through downtown Minneapolis. The tunnel was built in three phases, at a cost of $28 million. Phase 1 was constructed in 1979, at a cost of $12 million ($27 million in 2003 dollars), Phase 2 was constructed in 1990, at a cost of $2.8 million ($3.9 million in 2003 dollars), and Phase 3 was constructed in 1992, at a cost of $13.4 million ($17.9 million in 2003 dollars). The tunnel diverts Bassett Creek, where it plunges underground at Glenwood and Colfax Avenues in Minneapolis, into the Mississippi River. The original tunnel, some sections of which were built more than a century ago, was undersized and

deteriorating. The tunnel could no longer accommodate increased drainage and was on the verge of collapse. Such a collapse would have caused major flooding. The new tunnel provides cooperative storm drainage for Bassett Creek, Interstate Highways 94 and 394, and portions of the city of Minneapolis. The tunnel empties into the Mississippi River just south (downstream) of St. Anthony Falls.

The flood control project also included construction of the following six major features:

- Highway 100 control structure
- Wisconsin Avenue control structure
- Highway 55 control structure
- Markwood/Edgewood area modifications – Edgewood control structure, Edgewood Avenue basin, and Markwood channel improvements
- Golden Valley Country Club control structure
- Medicine Lake outlet structure

The control structures consist of low flow orifices with overflow weirs to restrict flows.

Other principal features of the COE's flood control project include the Bassett Creek Park Pond project, replacing 10 street crossings, floodproofing 5 homes, and making channel improvements. In addition to providing flood control benefits, some of the project features also provide water quality benefits (e.g., Bassett Creek Park Pond and the fish barrier in the tunnel). The features of the flood control project are shown on Figure 14 and listed in Table 5-1. The project also included the monitoring and disposal of hazardous materials from an area of the project where contaminated soils were present (Irving Avenue dump site).

Each control structure leaves the creek virtually unaffected during normal flow conditions. For large storm events, the storage upstream of control structures generally results in higher water levels than under pre-project conditions. Maintenance will likely be required in storage areas after rainfall events. Each control structure lowers peak discharges immediately downstream of the structure. Implementation of all the control structures and the storage they provide resulted in a smaller tunnel and fewer measures to increase stream capacity.

In the vicinity of Glenwood Inglewood Waters and the abandoned Fruen Mill, downstream of Glenwood Avenue, the flood control project proposed removal of an existing stone dam and retaining walls and installing a concrete drop structure, new retaining walls, and widening of the creek

channel. This work was not supported by the city of Minneapolis and was deleted from the flood control project.

The watershed south of 36th Avenue and west of Hampshire Avenue in the city of Crystal, was diverted to a ponding area downstream of 36th Avenue by the construction of approximately 1,150 feet of culvert. Large inlet structures were constructed on 36th Avenue and on each side of Hampshire Avenue and Louisiana Avenue.

Although the entire flood control project was not yet completed, creekside residents immediately benefited from the modifications. When an 8-inch rainstorm struck the area in July 1987, the Highway 55 control structure, completed just one month previously, protected homes and businesses downstream of the structure from over $1 million ($1.5 million in 2003 dollars) in flood damages.

A construction account was set up for the BCWMC flood control project. Cash contributions to the account totaled over $6.9 million and included contributions from the member cities (assessments), Mn/DOT (drainage to tunnel), the DNR (grants), Hennepin County (grant), General Mills (grant), and interest earned on investments. After paying for the project and paying back $215,000 owed to the BCWMC Administrative account, there was $1,535,000 remaining in the construction account. The BCWMC decided to use the remaining funds for future work related to the flood control project: floodproofing of remaining homes in the floodplain, emergency repairs to the flood control project system, and long-term maintenance and repair of the flood control project system.

Irving Avenue Dump Site

As part of the flood control project, the city of Minneapolis was required to furnish a disposal site for the material excavated during channel widening and tunnel construction. The site selected for disposal of the fill material was a vacant area located on the south side of Bassett Creek, to the west of the city of Minneapolis impound lot. The site was selected because it could be easily acquired by the city and was close to the tunnel inlet and the channel modifications. Unfortunately, the disposal site was formerly used as an unlicensed dump site (Irving Avenue Dump), primarily for demolition debris. The MPCA designated the site as a hazardous waste site.

The city of Minneapolis and the MPCA prepared a report that summarized information on site history, potential sources of the hazardous wastes, and the extent of contamination at the site. Investigation work at the site identified contamination of soil and shallow groundwater, which appeared to be the result of sporadic dumping of hazardous materials. The contaminants present at the site include trace metals and chemicals generally associated with oil wastes. Since there was

limited potential for direct contact with the contaminated soil after it was covered with the clean fill material, the potential risks to human health and environment posed by the site were related to contamination of groundwater and Bassett Creek.

The city of Minneapolis completed additional investigative activities, including determination of any impacts of the site on water quality in Bassett Creek, and determination of groundwater quality and flow direction. The groundwater monitoring program involved sampling of existing wells and installation and sampling of several new wells. The monitoring well network was used to assess the movement of groundwater contaminants and to determine groundwater quality before and after placement of fill material at the site.

Based on the results of the investigation, the MPCA agreed that the materials could be left in place with a cover over the material ("cap"). The material will be left in place with a cap, which will ensure that the material does not contaminate the groundwater at the site.

5.3.3. Other Structural Flood Control Projects

Other structural flood control projects were undertaken to implement the 1990 BCWMC Plan. The city of Golden Valley and Mn/DOT cooperatively constructed the Breck stormwater storage area, upstream of Sweeney Lake on the Sweeney Lake Branch of Bassett Creek. The city of Golden Valley also constructed Courtlawn Pond and Ring Ponds, in the headwaters of the Sweeney Lake Branch of Bassett Creek; these ponds provide both flood control and water quality benefits.

Along the Main Stem of Bassett Creek, the cities of Golden Valley and Robbinsdale acquired all of the area around Rice Lake to preserve this wetland and natural inundation area for temporary stormwater storage. The crossing of the creek at Dresden Lane restricts downstream discharge and causes floodwaters to be temporarily stored in the Rice Lake area.

The city of Crystal acquired easements for temporary storage of stormwater in a pond at 36th Avenue and Winnetka Avenue on the North Branch of Bassett Creek, near the New Hope boundary. In the city of New Hope, temporary stormwater storage is provided in Northwood Park along the creek and on Northwood Lake. At the headwaters of the North Branch of Bassett Creek, the city of Plymouth acquired temporary stormwater storage areas and constructed control structures for them in cooperation with land developers.

The city of Plymouth constructed five major stormwater storage sites on or tributary to Plymouth Creek, as called for in the BCWMC 1990 Plan. The city of Minnetonka adopted a wetland preservation ordinance to protect the natural stormwater storage capability of the Oak Knoll wetland and Crane Lake.

5.3.4. Nonstructural Flood Control Measures

The BCWMC also implements nonstructural flood control measures, which prevent flood damages from occurring along the BCWMC trunk system. Examples of these measures include:

- Floodplain management –
  - Understanding the impact of future (ultimate) land use on flood levels
  - Regulating development to prevent its detrimental impact on flood elevations.
- Establishment of floodplain management areas –
  - Preserving floodplains
  - Preserving flood storage
- Monitoring water levels on lakes and streams in the watershed

Each of the BCWMC member cities has a FIS. The FIS, together with a city's floodplain ordinance, allow the city to take part in the federal government's flood insurance program. Homeowners within FEMA designated floodplains are required to purchase flood insurance. In some cases, homes within FEMA-designated floodplains on the FEMA floodplain maps may actually not be in the floodplain. In order to waive the mandatory flood insurance requirements for their homes, residents must remove their homes from the FEMA-designated floodplain by obtaining a Letter of Map Amendment (LOMA).

The BCWMC worked with the COE and member cities to approve revised flood profiles along sections of Bassett Creek for the National Flood Insurance Program's FIRM. FEMA approved the proposed revision to the FIRM for Bassett Creek in 2002. Minor adjustments to the mapping are still being made and will eventually be incorporated into the Hennepin County FIRM, expected to be finalized in 2003. The BCWMC is using the revised flood profiles in its review of improvements and development proposals.

5.3.4.1 Floodplain Regulations

The floodplain of a stream can be defined as that area adjacent to a stream that is inundated during times of flood. More specifically, the Minnesota Floodplain Management Law defines the floodplain

as that area adjoining a watercourse that is subject to inundation by a flood of 100-year frequency. Under the provisions of this act, local governmental units are required to adopt floodplain management ordinances that include "the delineation of floodplains and floodways, the preservation of the capacity of the floodplain to carry and discharge regional floods, minimization of flood hazards, and the regulation of the use of land in the floodplain." The BCWMC adopted floodplain elevations for those reaches of Bassett Creek and other parts of the trunk system that are under the BCWMC's jurisdiction. Table 5-3 lists these floodplain elevations. The adopted floodplain allows for the maximum storage of floodwaters. The BCWMC worked with FEMA to make sure that the BCWMC floodplain elevations are the same as FEMA's and are accepted by FEMA. Figure 15 shows the flood storage areas for which the BCWMC has adopted floodplain elevations. The floodplain elevations were determined assuming existing channel conditions and stormwater runoff resulting from a 100-year storm occurring over the ultimately urbanized watershed. It represents the area that is subject to the BCWMC's floodplain policies. All of the municipalities within the BCWMC have adopted floodplain management ordinances and are restricting development of floodplain areas.

The BCWMC adopted policies regarding floodplain regulation with the Bassett Creek watershed. The BCWMC reviews improvements and development proposals for compliance with these policies.

5.3.4.2 Diversion of Surface Water

In the future, there may be proposals to divert surface water either out of or into the Bassett Creek watershed. While there may be strong economic reasons for a proposed diversion, it would be unwise to permit such a diversion without first carefully examining the impact it may have upon the rest of the Bassett Creek watershed. Residents downstream of areas from which surface water may be diverted out have a legal right to the water that would flow from those areas, whether or not such flow now exists. This becomes a very important point if, when full urbanization has taken place within the watershed, there is any difficulty in maintaining lake water levels and minimum stream flows that are required for aesthetic purposes along the Main Stem of Bassett Creek. In this case, stormwater proposed to be diverted from those areas may be an important asset to the creek.

In addition to possible aesthetic problems associated with diversion of surface waters, consideration must also be given to the possible effect of such a diversion upon flood levels within the watershed. Whether the diversion results in an increase or decrease in flood levels, it requires careful review.

To prevent flooding and to preserve the natural assets of the watershed, the BCWMC will not approve any diversions of surface water within, into, or out of the watershed that may have a substantial adverse effect on stream flow or water levels at any point within the watershed. Plans for intra- or inter-watershed diversions must include an analysis of the effects of the diversion on flooding, water quality and aesthetic quality along the creek. The BCWMC will review diversion plans to determine the effect of the proposal on the Bassett Creek watershed and such plans will be subject to BCWMC approval. If it is necessary to divert surface water runoff to another watershed, every effort should be made to ensure that there is no fish migration from one watershed to another.

Overflow from the city of Crystal's Memory Lane pond system is currently occasionally pumped onto local streets and eventually drains to Twin Lake in the Shingle Creek watershed. The city of Crystal is evaluating the possibility of an outlet into the Bassett Creek watershed to divert this overflow. The BCWMC will evaluate the diversion proposal when it is submitted by the city of Crystal to determine the effect on the Bassett Creek watershed.

Table 5-1. Bassett Creek Watershed Management Commission – Flood Control Project

Feature	Location	Year Constructed	Partners	Cost[1]
Phase I Tunnel: 2nd Street Tunnel	Minneapolis	1979	BCWMC Mn/DOT COE	$12,000,000 ($27,000,000)
Golden Valley Flood Control Project Regent Avenue Crossing Noble Avenue Crossing Minnaqua Drive Bridge Removal Highway 100 Control Structure 32nd Avenue Crossing Brunswick Avenue Crossing 34th Avenue Crossing Edgewood Ave Control Structure & Embankment Edgewood Avenue Storage Basin Georgia Avenue Crossing 36th Avenue Crossing Hampshire Avenue Crossing Markwood Channel Improvements Floodproofing Five Homes	 Golden Valley Golden Valley Golden Valley GV/Crystal Crystal Crystal Crystal Crystal Crystal Crystal Crystal Crystal Crystal Crystal Crystal	1981-1984	BCWMC COE City of Golden Valley City of Crystal	1,600,000 ($2,700,000)
Douglas Drive Crossing	Crystal	1987	BCWMC City of Crystal Hennepin County	100,000 ($150,000)
Wisconsin Avenue Control Structure	Golden Valley	1987	BCWMC City of Golden Valley	100,000 ($150,000)
Highway 55 Control Structure	Golden Valley	1987	BCWMC COE City of Minneapolis Mn/DNR	85,000 ($130,000)
Plymouth Creek Fish Barrier	Plymouth	1987	BCWMC City of Plymouth Hennepin County Mn/DNR	60,000 ($91,000)
Phase 2 Tunnel: Third Ave. Tunnel	Minneapolis	1990	BCWMC COE City of Minneapolis Mn/DNR Mn/DOT	2,800,000 ($3,900,000)
Phase 3 Tunnel: Box Culvert Double Box Culvert Channel Improvements	Minneapolis	1992	BCWMC COE City of Minneapolis Mn/DNR Mn/DOT	13,400,000 ($17,900,000)
Markwood/Edgewood Area Modifications Control Structure Edgewood Avenue Basin Markwood Channel Improvements	Crystal	1992	BCWMC COE City of Crystal Mn/DNR	500,000 ($70,000)
Westbrook Road Crossing	Golden Valley	1993	BCWMC COE City of Golden Valley Mn/DNR	200,000 ($250,000)
Golden Valley Country Club Control Structure	Golden Valley	1994	BCWMC COE Golden Valley Mn/DNR	450,000 ($550,000)
Bassett Creek Park Pond	Crystal	1995	BCWMC COE City of Crystal Mn/DOT Mn/DNR	1,300,000 ($1,600,000)
Medicine Lake Outlet Structure	Plymouth	1996	BCWMC City of Plymouth Hennepin County Mn/DNR	100,000 ($120,000)

[1] (2003 dollars)

Table 5-2. Summary of Proposed Expenditures Using Remaining Funds from the BCWMC Flood Control Project Construction Account

		Annual Allocations				
Funding Item	**Total Allocation from Flood Control Project**	**2003**	**2004**	**2005**	**2006**	**Annual Assessments 2003-2013**
Floodproofing of homes along trunk system	$700,000	$100,000	$200,000	$300,000	$100,000	$0
Flood Control Emergency Repair Project	$500,000	As needed				$0
Flood Control Project Long Term Maintenance	$335,000	As needed				$25,000
TOTAL	**$1,535,000**					

Floodproofing of homes along trunk system

The BCWMC will provide funding assistance for homes that were proposed to be floodproofed as part of the original flood control project and those homes along the trunk system that do not have 100-year flood protection. The allocated amounts are the BCWMC costs, assuming the BCWMC funds 72.5% of the floodproofing costs, including the city's out-of-pocket construction, design, and contract administration costs.

Flood Control Emergency Repair Project

The BCWMC will establish a reserve fund, to be used as needed for emergency repairs to the flood control project system.

Flood Control Project Long-Term Maintenance

The BCWMC will use this fund as needed for long term maintenance of the flood control project system. The fund will be created by using $335,000 from the flood control project construction account, with annual assessments of $25,000 added to the fund. The fund balance is to be maintained at (but not exceed) $1 million.

Summary of Excess Revenues

A construction account was set up for the flood control project in 1987. Cash contributions to the account totaled over $6.9 million and included contributions from the member cities, Mn/DOT, DNR, Hennepin County, General Mills, and interest earned on investments. After paying for the project and paying back $215,000 owed to the BCWMC Administrative account, there was $1,535,000 remaining in the construction account. The BCWMC decided to use the remaining funds for future work related to the flood control project.

Table 5-3. Bassett Creek Flood Profiles

Location (Description)	Creek Distance Above the Mississippi River (feet)	100-Year		50-Year		10-Year	
		Flood Elevation (feet)	Flow Rate (cfs)	Flood Elevation (feet)	Flow Rate (cfs)	Flood Elevation (feet)	Flow Rate (cfs)
BASSETT CREEK MAIN STEM [1]							
Tunnel Inlet	8,000	807.1	1220	806.7	1050	804.7	675
Irving Avenue Bridge (DS)	9,800	808.4	1135	807.8	980	807.6	630
Irving Avenue Bridge (US)		809.1	1135	808.9	980	807.7	630
Cedar Lake Rd (Bridge))	10,900	812.7	945	813.1	820	812.0	535
MN&S RR Bridge	11,600	814.6	945	814.0	820	812.6	535
Old Penn Ave Bridge (DS)	12,410	814.7	705	814.3	620	813.0	420
Old Penn Ave Bridge (US)		815	705	814.6	620	813.4	420
BN RR Bridge	12,670	815.1	705	814.3	620	813.4	420
MN&S RR Bridge (DS)	13,930	816.2	465	814.7	420	813.4	300
MN&S RR Bridge (US)		816	465	815.2	420	813.8	300
Fruen Mill Dam (DS)	14,150	816.3	510	815.2	435	813.8	260
Fruen Mill Dam (US)		818	510	817.5	435	817	260
Glenwood Ave	14,855	820.1	680	819.7	580	818.8	400
Hwy 55 (DS)	16,500	821.5	680	821	580	820.4	400
Hwy 55 (US)		826	680	825.1	580	823.8	400
Golf Cart Bridge		826	680	825.1	580	823.8	400
MN&S RR Bridge	18,700	826	680	825.1	580	823.8	400
Plymouth Ave Bridge	19,500	826	680	825.2	580	823.9	400
Wirth Parkway (DS)	20,480	826	1570	825.4	1310	823.9	400
Wirth Parkway (US) Bridge		826.3	1570	825.4	1310	823.9	400
Confluence w/ Sweeney Lake Branch	22,000	827	------	826.8	------	825	------
Golden Valley Road (DS) (16’ 7” span CMPA)	23,800	827.2	790	828.2	660	826.7	475
Golden Valley Road (US)	23,800	830	680	828.3	560	826.6	400
Dresden Lane (DS) (2- 10’ 8” CMPA)	25,900	830.3	680	830.3	560	829.6	400
Dresden Lane (US)		831.4	680	830.8	560	829.9	400
Bassett Creek Drive (2 – 11’ 5” CMPA)	27,140	832	665	831.6	550	830.7	390
Bassett Creek Drive (2 – 11’ 5” CMPA)		832.7	665	832.1	550	831.1	390
Pedestrian Bridge	------	------	------	------	------	------	------

[1]Hennepin County FIS – revised December 23, 2002

DS - Downstream
US – Upstream

Table 5-3. Bassett Creek Flood Profiles (continued)

Location (Description)	Creek Distance Above the Mississippi River (feet)	100-Year		50-Year		10-Year	
		Flood Elevation (feet)	Flow Rate (cfs)	Flood Elevation (feet)	Flow Rate (cfs)	Flood Elevation (feet)	Flow Rate (cfs)
BASSETT CREEK MAIN STEM [1] (continued)							
Noble Lane (DS) (30' x 13' 8" Con. Arch)	29,200	839.5	660	838.9	545	838.17	390
Noble Lane (US) (30' by 13' 8" Con. Arch)		839.5	660	838.9	545	838.18	390
Regent Avenue (DS) (30' by 13' 8" Con. Arch)	30,800		660	841.1	545	840.29	390
Regent Avenue (US) (30' by 13' 8" Con. Arch)		841.9	660	841.1	545	840.3	390
Minnaqua Avenue (bridge removed)	31,650	842.5		842		841.3	
Highway 100 (DS) (2- 10'x8' box)	34,020	843.2	770	844.1	690	843.3	470
Hwy 100 (US)	34,020	849	610	847.9	505	846.1	365
DS Confluence N. Branch	34,400	849	495	847.9	415	846.2	295
Slope Change	35,000						
Westbrook Road (DS) (24' x 8' Conc. Arch)	37,000	857.1	940	858.5	770	857.2	440
Westbrook Road (US)		858.1	940	858.9	770	857.4	440
Duluth Street (DS) (2-8'x10' Box)	38,400	861.3	850	862.1	700	860.9	400
Duluth Street (US) (2-8'x10' Box)		861.8	850	862.4	700	860.9	400
St. Croix Avenue (DS) (2- 11' 5" CMPA)	39,800	863	850	862.9	700	862.4	400
St. Croix Avenue (US) (2- 11' 5" CMPA)		864.1	850	864.1	700	862.4	400
Slope Change	40,500	------	------	------	------	------	------
MN&S RR (DS) (Wooden Pile Trestle)	41,660	869.5	760	869.2	630	868.0	365
MN&S RR (US) (also 2 pedestrian bridges)		869.5	760	869.4	630	868.1	365
Douglas Drive (DS) (2-8'x8' Box)	42,130	870.2	670	870.3	560	869.2	325
Douglas Drive (US) (2-8'x8' Box)		871	670	870.7	560	869.4	325
Florida Avenue (DS) (2-6'x8' Box)	42,820	871.6	670	871.7	560	870.25	325
Florida Avenue (US) (2-6'x8' Box)		872.3	670	871.75	560	870.3	325
Hampshire Ave (DS) (2-7'x10' Box)	43,410	872.5	630	872.3	530	870.8	320

[1]Hennepin County FIS – revised December 23, 2002

DS – Downstream
US – Upstream

Table 5-3. Bassett Creek Flood Profiles (continued)

Location (Description)	Creek Distance Above the Mississippi River (feet)	100-Year		50-Year		10-Year	
		Flood Elevation (feet)	Flow Rate (cfs)	Flood Elevation (feet)	Flow Rate (cfs)	Flood Elevation (feet)	Flow Rate (cfs)
BASSETT CREEK MAIN STEM [1] (continued)							
Hampshire Ave (US) (2-7'x10' Box)		873	630	872.38	530	870.83	320
GV Country Club (DS) (4'x8' Box)	44,320	874.4	365	875.2	340	874.3	230
GV Country Club (US) (4'x8' Box)		878.4	405	877.7	340	876.8	230
Slope Change	45,000	------	------	------	------	------	------
Pennsylvania Avenue (DS) (2-6'x8' Box)	46,500	879.3	380	879.7	325	879.0	230
Pennsylvania Avenue(US) (2-6'x8' Box)		880.5	375	880.4	320	879.7	230
C&NW RR (DS) (1-72"CMP & 2-114"CMP)	47,200	881.7	375	881.6	320	881.0	225
C&NW RR (US)		882.9	375	882.6	320	882.0	225
Winnetka Ave (DS) (1-72"CMP & 2-114"CMP)	48,000	883.3	360	883.2	320	882.5	225
Winnetka Ave (US) (1-72"CMP & 2-114"CMP)		883.5	360	883.7	320	882.9	225
Wisconsin Ave (DS)	49,750	884.7	360	884.5	320	883.66	225
Wisconsin Ave (US)	50,100	888	340	887.8	300	886.4	220
Golden Valley Road (DS) (2-8'x10' Box)		888	290	887.8	265	886.4	215
Golden Valley Road (US)		888	290	887.9	265	886.4	215
Westbound Hwy 55 (DS) (10'x20' Box)	51,250	888	290	887.9	265	886.4	215
Eastbound Hwy 55 (US) (10'x20' Box)		888.1	290	887.9	265	886.4	215
Boone Ave (DS) (2-8'x10' Box)		888.2	280	888.01	250	886.58	200
Boone Ave (US) General Mills Blvd		888.3	280	888.05	250	886.62	200
Hwy 169 (DS)	56,500	888.4	255	888.23	230	886.98	180
Hwy 169 (US) (2-7'x10' Box)	56,500	888.5	250	888.23	220	886.99	170
Hwy 55 Ramp (DS) (2-8'x10' Box)	58,300	888.5	235	888.32	210	887.1	160
Hwy 55 Ramp (US) (2-8'x10' Box)		888.5	235	888.33	210	887.1	160
Hwy 55 Eastbound (DS) (10'x20' Box)	58,500	888.5	235	888.3	210	887.1	160

[1]Hennepin County FIS – revised December 23, 2002

DS – Downstream
US – Upstream

Table 5-3. Bassett Creek Flood Profiles (continued)

Location (Description)	Creek Distance Above the Mississippi River (feet)	100-Year		50-Year		10-Year	
		Flood Elevation (feet)	Flow Rate (cfs)	Flood Elevation (feet)	Flow Rate (cfs)	Flood Elevation (feet)	Flow Rate (cfs)
BASSETT CREEK MAIN STEM [1] (continued)							
Hwy 55 Eastbound (US) (10'x20' Box)		888.5	235	888.3	210	887.1	160
Hwy 55 Westbound (DS) (10'x20' Box)		888.5	235	888.4	210	887.1	160
Hwy 55 Westbound (US) (10'x20' Box)		888.8	235	888.4	210	887.1	160
Hwy 169 ramp to W 55 (DS) (2-8'x10' Box)	58,750	888.8	235	888.4	210	887.2	160
Hwy 169 ramp to W 55 (US) (2-8'x10' Box)		888.8	235	888.4	210	887.2	160
Hwy 55 N Frontage Rd (DS) (2-8'x10' Box)	58,850	889	235	888.5	210	887.3	160
Hwy 55 N Frontage Rd (US) (2-8'x10' Box)		889	235	888.5	210	887.3	160
10th Ave (DS)		889		888.8		887.8	
10th Ave (US)		889		888.8		887.8	
C&NW RR Bridge (DS)	63,450	889	200	888.9	175	888.3	125
C&NW RR Bridge (US)		889.4	200	888.9	175	888.4	125
South Shore Drive (DS)	63,800	889.4	190	889.1	165	888.6	115
South Shore Drive (US)		890.3	190	889.1	165	888.6	115
Medicine Lake Weir (DS)	63,960	890.3	190	889.9	165	889.5	115
Inundation Areas							
Theodore Wirth Park		826					
South Rice Lake		831.5					
North Rice Lake		838					
Grimes Avenue Pond		838					
Golden Valley Country Club		878.4					
Brookview Golf Course		888.1					
Westwood Lake		889					
Medicine Lake		890.3					

[1]Hennepin County FIS – revised December 23, 2002

DS – Downstream
US - Upstream

Table 5-3. Bassett Creek Flood Profiles (continued)

Location (Description)	Creek Distance Above Confluence with Main Stem (feet)	100-Year		50-Year		10-Year	
		Flood Elevation (feet)	Flow Rate (cfs)	Flood Elevation (feet)	Flow Rate (cfs)	Flood Elevation (feet)	Flow Rate (cfs)
NORTH BRANCH [2]							
Hwy 100 Control (US)	-----	849	610	847.9	505	846.2	365
Confluence w/Main Stem	0	849	-----	847.9	-----	846.2	-----
29th Avenue (DS) (2-58"x36" RCPA)	200	849	1515	848.1	1270	847.7	760
29th Avenue (US) (2-58"x36" RCPA)		849.5	1515	848.4	1270	848.0	760
32nd Avenue (DS) (2-88"x54" RCPA)	2,600	849.6	1175	849.0	990	848.4	605
32nd Avenue (US) (2-88"x54" RCPA)		854	1175	853.5	990	852.0	605
Brunswick Avenue (DS) (2-115"x72" RCPA)	3,000	854.7	1175	854.0	990	853.5	605
Brunswick Avenue (US) (2-115"x72" RCPA)		855.9	1175	855.5	990	854.5	605
34th Culvert (DS)	4,200	862.8	700	862.6	600	862.0	390
34th Culvert (US)		866.1	430	865.2	380	864	270
Douglas Drive (DS) (4'x12' box)	5,250	870	430	869.34	380	868	270
Douglas Drive (US) (4'x12' box)		870.1	430	869.9	380	869	270
Edgewood Emb (DS) (102"x62" RCPA)	5,600	870.7	430	870.7	380	870	270
Edgewood Emb (US) (102"x62" RCPA)		878.2	340	876.1	295	872.8	230
Georgia Avenue (DS) (2- 136"x88" RCPA)	6,250	878.2	305	876.0	265	872.9	210
Georgia Avenue (US) (2- 136"x88" RCPA)		878.4	305	876.0	265	872.9	210
36th & Hampshire (DS) (2-6'x8' box)	6,800	878.4	260	876.0	225	872.9	185
36th & Hampshire (US) (2-6'x8' box)	6,980	879	260	878.5	225	877.5	185
Louisiana Ave. (DS) (Outlet of 48" CMP)	8,000	881	-----	880.8	-----	880	-----
Maryland Ave. (48" CMP)	8,500	-----	-----	-----	-----	-----	-----
Oregon Ave.(48" CMP)	9,000	-----	-----	-----	-----	-----	-----
MN & S RR (42" CMP)	9,300	-----	-----	-----	-----	-----	-----
Inlet of 42" CMP	9,500	888	-----	-----	-----	-----	-----

[2]Hennepin County – revised December 23, 2002 (DS of Louisiana Avenue); 1990 Bassett Creek Water Management Plan (US of Louisiana Avenue)

DS – Downstream
US – Upstream

Table 5-3. Bassett Creek Flood Profiles (continued)

Location (Description)	Creek Distance Above Confluence with Main Stem (feet)	100-Year		50-Year		10-Year	
		Flood Elevation (feet)	Flow Rate (cfs)	Flood Elevation (feet)	Flow Rate (cfs)	Flood Elevation (feet)	Flow Rate (cfs)
NORTH BRANCH [2] (continued)							
Service Road (58" span CMPA)	10,000	888	-----	-----	-----	-----	-----
Winnetka Ave. (DS) (48" RCP)	10,600	888	-----	-----	-----	-----	-----
Winnetka Ave. (US)		889	-----	-----	-----	-----	-----
Boone Ave. (DS) (60" CMP)	13,500	889.3	-----	-----	-----	-----	-----
Boone Ave. (US)		889.5	-----	-----	-----	-----	-----
Northwood Lake		889.5	-----	-----	-----	-----	-----
TH 169 (DS) (66" RCP)	16,850	889.5	-----	-----	-----	-----	-----
TH 169(US)		890.5	-----	-----	-----	-----	-----
Rockford Road (DS) (27" RCP)	18,350	890.5	-----	-----	-----	-----	-----
Rockford Road (US)		898.5	-----	-----	-----	-----	-----
Inundation Areas							
Bassett Creek Park		849.5					
Edgewood Avenue Pond		878.2					
Winnetka Pond (DS of Winnetka Avenue)		888.0					
Northwood Park		889.3					
Northwood Lake		889.5					

[2]Hennepin County – revised December 23, 2002 (DS of Louisiana Avenue); 1990 Bassett Creek Water Management Plan (US of Louisiana Avenue)

DS – Downstream
US – Upstream

Table 5-3. Bassett Creek Flood Profiles (continued)

Location (Description)	Creek Distance Above Confluence with Main Stem (feet)	100-Year		50-Year		10-Year	
		Flood Elevation (feet)	Flow Rate (cfs)	Flood Elevation (feet)	Flow Rate (cfs)	Flood Elevation (feet)	Flow Rate (cfs)
SWEENEY LAKE BRANCH [3]							
Confluence w/Main Stem	0	827	-----	826.8	-----	825	-----
France Ave extension (DS) (36" CMP)	700	827	-----	-----	-----	-----	-----
France Ave (US)		829	-----	-----	-----	-----	-----
Courage Center & Hidden Lakes Parkway (DS) (65" CMPA)	900	829	-----	-----	-----	-----	-----
Courage Center & Hidden Lakes Parkway (US)		831	-----	-----	-----	-----	-----
Courage Center & Hidden Lakes Parkway (DS) (88" RCPA)	1,330	831	-----	-----	-----	-----	-----
Courage Center & Hidden Lakes Parkway (US)		831.5	-----	-----	-----	-----	-----
Precast Concrete Dam (DS)	1,700	831.5	-----	-----	-----	-----	-----
Sweeney Lake		831.5	-----	-----	-----	-----	-----
Union Pacific RR (DS) (72" RCP w/control structure)	6,800	831.5	-----	-----	-----	-----	-----
Union Pacific RR (US)		836.0	333	835.6	304	834.8	222
Hwy 55 (DS) (6'x6' Box)	8,150	836	230	835.6	217	834.8	173
Hwy 55 (US)		836.6	230	836.2	217	835.4	173
MN & S RR (DS) (5'x5' Box)	9,000	836.6	214	836.2	168	835.4	171
MN & S RR (US)		838.9	214	838.5	168	836.9	171
Breck Pond & Control Structure (US)	9,580	839.6	255	839.2	304	837.4	161
TH 100 (DS) (Breck Pond)	10,400	839.6	332	839.2	337	837.4	219
TH 100 (US)		848.5	332	846.8	337	845.7	251
MN & S RR (DS) (5'x3' Box)	10,750	848.5	228	846.8	214	845.7	172
Turners Crossroad (US) (5'x4' RCPA)	10,950	854.4	228	853.2	214	851.2	172
Glenwood Pond A		854.4	-----	853.2	-----	851.2	-----
MN & S RR (DS) (48" CMP)	11,550	854.4	415	853.2	395	851.2	356
MN & S RR (US)		854.5	415	853.3	395	851.2	356
Glenwood Pond B		854.5	-----	853.3	-----	851.2	-----

[3]1990 Bassett Creek Water Management Plan (DS of Union Pacific Railroad)
July 8, 1999 XP-SWMM model from Mn/DNR used for Sweeney Lake Branch CLOMR (US of Union Pacific Railroad)

DS – Downstream
US – Upstream

Table 5-3. Bassett Creek Flood Profiles (continued)

Location (Description)	Creek Distance Above Confluence with Main Stem (feet)	100-Year		50-Year		10-Year	
		Flood Elevation (feet)	Flow Rate (cfs)	Flood Elevation (feet)	Flow Rate (cfs)	Flood Elevation (feet)	Flow Rate (cfs)
SWEENEY LAKE BRANCH [3] (continued)							
MN & S RR (DS) (78" RCP)	12,300	854.5	384	853.3	363	851.2	273*
MN & S RR	12,400	856.8	384	855.5	363	851.8	273
Glenwood Ave (US) (96" RCP)		857.7	385	856.3	363	854.2	274
84" RCP (DS)	13,260	857.7	69	856.3	65	854.2	53
8'x6' Box	14,470	-----	-----	-----	-----	-----	-----
36" RCP (US)	15,000		-----	-----	-----	-----	-----
Courtlawn Pond		875	69	874.8	65	874.0	53
48" RCP (DS)	16,120	875	82	874.8	81	874.0	71
42" RCP (US)	16,930	880.4	82	879.9	81	878.7	71
East Ring Pond		880.4	82	879.9	81	878.7	71
78" RCP Equalizer	18,800	-----	-----	-----	-----	-----	-----
West Ring Pond		880.4	-----	879.9	-----	878.7	-----
Inundation Areas							
Sweeney Lake		831.5					
Twin Lake		831.5					
Breck Pond		839.6					
Courtlawn Pond		875					
East Ring Pond		880.4					
West Ring Pond		880.4					

[3]1990 Bassett Creek Water Management Plan (DS of Union Pacific Railroad)
July 8, 1999 XP-SWMM model from Mn/DNR used for Sweeney Lake Branch CLOMR (US of Union Pacific Railroad)

DS – Downstream
US - Upstream

Table 5-3. Bassett Creek Flood Profiles (continued)

Location (Description)	Creek Distance Above Main Stem (feet)	100-Year		50-Year		10-Year	
		Flood Elevation (feet)	Flow Rate (cfs)	Flood Elevation (feet)	Flow Rate (cfs)	Flood Elevation (feet)	Flow Rate (cfs)
MEDICINE LAKE BRANCH (PLYMOUTH CREEK) [4]							
Medicine Lake		890.3	-----	-----	-----	-----	-----
West Medicine Lake Drive (DS) (3-120" x 60" concrete box)	10,450	890.3	-----	-----	-----	-----	-----
West Medicine Lake Drive (US)	-----	891.5	-----	-----	-----	-----	-----
Slope change	13,000	895	-----	-----	-----	-----	-----
Slope change	16,000	923	-----	-----	-----	-----	-----
26th Avenue N. (DS) (132" CMP)	16,500	925	-----	-----	-----	-----	-----
26th Avenue N. (US)	-----	925.5	-----	-----	-----	-----	-----
28th Avenue N. Dike (DS) (2-33" RCP)	-----	928	-----	-----	-----	-----	-----
28th Avenue N. Dike (US)	-----	930.8	-----	-----	-----	-----	-----
County Road 61 (DS) (2-73" span RCPA)	-----	930.8	-----	-----	-----	-----	-----
County Road 61 (US)	-----	931.2	-----	-----	-----	-----	-----
Xenium Lane (DS) (3-88" span RCPA)	20,850	931.2	-----	-----	-----	-----	-----
Xenium Lane (US)	-----	931.5	-----	-----	-----	-----	-----
Slope Change	21,600	931.5	-----	-----	-----	-----	-----
I-494 (DS) (154" span RCPA)	22,500	935	-----	-----	-----	-----	-----
I-494 (US)	-----	938.5	-----	-----	-----	-----	-----
Fernbrook Lane (DS) (15" CMPA)	25,000	947	-----	-----	-----	-----	-----
Fernbrook Lane (US)	-----	948	-----	-----	-----	-----	-----
Central Park Pond Outlet Structure (DS) (Weir with 51" span RCPA)	-----	949	-----	-----	-----	-----	-----
Central Park Pond Outlet Structure (US)	-----	953	-----	-----	-----	-----	-----
Slope change	27,600	953	-----	-----	-----	-----	-----
37th Avenue (3-72" RCPA)	28,900	956	-----	-----	-----	-----	-----
County Road 9(3-72" RCPA)	30,450	959	-----	-----	-----	-----	-----

[4]1990 Bassett Creek Water Management Plan

DS – Downstream
US - Upstream

Table 5-3. Bassett Creek Flood Profiles (continued)

Location (Description)	Creek Distance Above Main Stem (feet)	100-Year		50-Year		10-Year	
		Flood Elevation (feet)	Flow Rate (cfs)	Flood Elevation (feet)	Flow Rate (cfs)	Flood Elevation (feet)	Flow Rate (cfs)
MEDICINE LAKE BRANCH (PLYMOUTH CREEK) [4] (continued)							
Vicksburg Lane (DS) (3-72" RCPA)	31,300	961	-----	-----	-----	-----	-----
Vicksburg Lane (US)	-----	962	-----	-----	-----	-----	-----
Slope change	31,600	962	-----	-----	-----	-----	-----
Dunkirk Lane (US) (42" RCP)	34,450	979	-----	-----	-----	-----	-----
Dunkirk Lane (DS)	-----	982	-----	-----	-----	-----	-----
T.H. 55 (DS) (42" RCPA)	38,300	982	-----	-----	-----	-----	-----
T.H. 55 (US)	-----	982.5	-----	-----	-----	-----	-----
Inundation Areas							
Xenium Lane		931.5					
Central Park Pond		952					
Turtle Lake		964					
Rockford Road		968					
Dunkirk Lane		982					
Oak Knoll Pond		917.9					
Crane Lake		919.5					

[4]1990 Bassett Creek Water Management Plan

DS – Downstream
US - Upstream